CakePHP Cookbook Documentation

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Contents

CHAPTER 1

Getting Started

The CakePHP framework provides a robust base for your application. It can handle every aspect, from the user's initial request all the way to the final rendering of a web page. And since the framework follows the principles of MVC, it allows you to easily customize and extend most aspects of your application.

The framework also provides a basic organizational structure, from filenames to database table names, keeping your entire application consistent and logical. This concept is simple but powerful. Follow the conventions and you'll always know exactly where things are and how they're organized.

The best way to experience and learn CakePHP is to sit down and build something. To start off we'll build a simple blog application.

CHAPTER 2

Blog Tutorial

Welcome to CakePHP. You're probably checking out this tutorial because you want to learn more about how CakePHP works. It's our aim to increase productivity and make coding more enjoyable: we hope you'll see this as you dive into the code.

This tutorial will walk you through the creation of a simple blog application. We'll be getting and installing Cake, creating and configuring a database, and creating enough application logic to list, add, edit, and delete blog posts.

Here's what you'll need:

1. A running web server. We're going to assume you're using Apache, though the instructions for using other servers should be very similar. We might have to play a little with the server configuration, but most folks can get Cake up and running without any configuration at all. Make sure you have PHP 5.2.8 or greater.
2. A database server. We're going to be using MySQL server in this tutorial. You'll need to know enough about SQL in order to create a database: Cake will be taking the reins from there. Since we're using MySQL, also make sure that you have `pdo_mysql` enabled in PHP.
3. Basic PHP knowledge. The more object-oriented programming you've done, the better: but fear not if you're a procedural fan.
4. Finally, you'll need a basic knowledge of the MVC programming pattern. A quick overview can be found in *Understanding Model-View-Controller*. Don't worry, it's only a half a page or so.

Let's get started!

Getting Cake

First, let's get a copy of fresh Cake code.

To get a fresh download, visit the CakePHP project on GitHub: http://github.com/cakephp/cakephp/downloads and download the latest release of 2.0

You can also clone the repository using git (http://git-scm.com/). `git clone git://github.com/cakephp/cakephp.git`

Regardless of how you downloaded it, place the code inside of your DocumentRoot. Once finished, your directory setup should look something like the following:

```
/path_to_document_root
    /app
    /lib
    /plugins
    /vendors
    .htaccess
    index.php
    README
```

Now might be a good time to learn a bit about how Cake's directory structure works: check out *CakePHP Folder Structure* section.

Creating the Blog Database

Next, lets set up the underlying database for our blog. if you haven't already done so, create an empty database for use in this tutorial, with a name of your choice. Right now, we'll just create a single table to store our posts. We'll also throw in a few posts right now to use for testing purposes. Execute the following SQL statements into your database:

```
/* First, create our posts table: */
CREATE TABLE posts (
    id INT UNSIGNED AUTO_INCREMENT PRIMARY KEY,
    title VARCHAR(50),
    body TEXT,
    created DATETIME DEFAULT NULL,
    modified DATETIME DEFAULT NULL
);

/* Then insert some posts for testing: */
INSERT INTO posts (title,body,created)
    VALUES ('The title', 'This is the post body.', NOW());
INSERT INTO posts (title,body,created)
    VALUES ('A title once again', 'And the post body follows.', NOW());
INSERT INTO posts (title,body,created)
    VALUES ('Title strikes back', 'This is really exciting! Not.', NOW());
```

The choices on table and column names are not arbitrary. If you follow Cake's database naming conventions, and Cake's class naming conventions (both outlined in *CakePHP Conventions*), you'll be able to take advantage of a lot of free functionality and avoid configuration. Cake is flexible enough to accommodate even the worst legacy database schema, but adhering to convention will save you time.

Check out *CakePHP Conventions* for more information, but suffice it to say that naming our table 'posts' automatically hooks it to our Post model, and having fields called 'modified' and 'created' will be automagically managed by Cake.

Cake Database Configuration

Onward and upward: let's tell Cake where our database is and how to connect to it. For many, this is the first and last time you configure anything.

A copy of CakePHP's database configuration file is found in `/app/Config/database.php.default`. Make a copy of this file in the same directory, but name it `database.php`.

The config file should be pretty straightforward: just replace the values in the `$default` array with those that apply to your setup. A sample completed configuration array might look something like the following:

```php
<?php
public $default = array(
    'datasource' => 'Database/Mysql',
    'persistent' => false,
    'host' => 'localhost',
    'port' => '',
    'login' => 'cakeBlog',
    'password' => 'c4k3-rUl3Z',
    'database' => 'cake_blog_tutorial',
    'schema' => '',
    'prefix' => '',
    'encoding' => ''
);
```

Once you've saved your new `database.php` file, you should be able to open your browser and see the Cake welcome page. It should also tell you that your database connection file was found, and that Cake can successfully connect to the database.

Note: Remember that you'll need to have PDO, and pdo_mysql enabled in your php.ini.

Optional Configuration

There are three other items that can be configured. Most developers complete these laundry-list items, but they're not required for this tutorial. One is defining a custom string (or "salt") for use in security hashes. The second is defining a custom number (or "seed") for use in encryption. The third item is allowing CakePHP write access to its `tmp` folder.

The security salt is used for generating hashes. Change the default salt value by editing `/app/Config/core.php` line 187. It doesn't much matter what the new value is, as long as it's not easily guessed.

```php
<?php
/**
 * A random string used in security hashing methods.
 */
Configure::write('Security.salt', 'pl345e-P45s_7h3*S@l7!');
```

The cipher seed is used for encrypt/decrypt strings. Change the default seed value by editing `/app/Config/core.php` line 192. It doesn't much matter what the new value is, as long as it's not easily guessed.

```
<?php
/**
 * A random numeric string (digits only) used to encrypt/decrypt strings.
 */
Configure::write('Security.cipherSeed', '7485712659625147843639846751');
```

The final task is to make the `app/tmp` directory web-writable. The best way to do this is to find out what user your webserver runs as (`<?php echo `whoami`; ?>`) and change the ownership of the `app/tmp` directory to that user. The final command you run (in *nix) might look something like this:

```
$ chown -R www-data app/tmp
```

If for some reason CakePHP can't write to that directory, you'll be informed by a warning while not in production mode.

A Note on mod_rewrite

Occasionally a new user will run in to mod_rewrite issues, so I'll mention them marginally here. If the CakePHP welcome page looks a little funny (no images or css styles), it probably means mod_rewrite isn't functioning on your system. Here are some tips to help get you up and running:

1. Make sure that an .htaccess override is allowed: in your httpd.conf, you should have a section that defines a section for each Directory on your server. Make sure the `AllowOverride` is set to `All` for the correct Directory. For security and performance reasons, do *not* set `AllowOverride` to `All` in `<Directory />`. Instead, look for the `<Directory>` block that refers to your actual website directory.

2. Make sure you are editing the correct httpd.conf rather than a user- or site-specific httpd.conf.

3. For some reason or another, you might have obtained a copy of CakePHP without the needed .htaccess files. This sometimes happens because some operating systems treat files that start with '.' as hidden, and don't copy them. Make sure your copy of CakePHP is from the downloads section of the site or our git repository.

4. Make sure Apache is loading up mod_rewrite correctly! You should see something like:

```
    LoadModule rewrite_module             libexec/httpd/mod_rewrite.so
```

   or (for Apache 1.3):

```
    AddModule             mod_rewrite.c
```

   in your httpd.conf.

If you don't want or can't get mod_rewrite (or some other compatible module) up and running on your server, you'll need to use Cake's built in pretty URLs. In `/app/Config/core.php`, uncomment the line that looks like:

```
Configure::write('App.baseUrl', env('SCRIPT_NAME'));
```

Also remove these .htaccess files:

```
/.htaccess
/app/.htaccess
/app/webroot/.htaccess
```

This will make your URLs look like www.example.com/index.php/controllername/actionname/param rather than www.example.com/controllername/actionname/param.

If you are installing CakePHP on a webserver besides Apache, you can find instructions for getting URL rewriting working for other servers under the *Advanced Installation* section.

Continue to *Blog Tutorial - Adding a layer* to start building your first CakePHP application.

CHAPTER 3

Blog Tutorial - Adding a layer

Create a Post Model

The Model class is the bread and butter of CakePHP applications. By creating a CakePHP model that will interact with our database, we'll have the foundation in place needed to do our view, add, edit, and delete operations later.

CakePHP's model class files go in `/app/Model`, and the file we'll be creating will be saved to `/app/Model/Post.php`. The completed file should look like this:

```
<?php
class Post extends AppModel {
}
```

Naming convention is very important in CakePHP. By naming our model Post, CakePHP can automatically infer that this model will be used in the PostsController, and will be tied to a database table called `posts`.

Note: CakePHP will dynamically create a model object for you, if it cannot find a corresponding file in /app/Model. This also means, that if you accidentally name your file wrong (i.e. post.php or posts.php) CakePHP will not recognize any of your settings and will use the defaults instead.

For more on models, such as table prefixes, callbacks, and validation, check out the *Models* chapter of the Manual.

Create a Posts Controller

Next, we'll create a controller for our posts. The controller is where all the business logic for post interaction will happen. In a nutshell, it's the place where you play with the models and get post-related work done. We'll place this new controller in a file called `PostsController.php` inside the `/app/Controller` directory. Here's what the basic controller should look like:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form');
}
```

Now, lets add an action to our controller. Actions often represent a single function or interface in an application. For example, when users request www.example.com/posts/index (which is also the same as www.example.com/posts/), they might expect to see a listing of posts. The code for that action would look something like this:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form');

    public function index() {
        $this->set('posts', $this->Post->find('all'));
    }
}
```

Let me explain the action a bit. By defining function `index()` in our PostsController, users can now access the logic there by requesting www.example.com/posts/index. Similarly, if we were to define a function called `foobar()`, users would be able to access that at www.example.com/posts/foobar.

Warning: You may be tempted to name your controllers and actions a certain way to obtain a certain URL. Resist that temptation. Follow CakePHP conventions (plural controller names, etc.) and create readable, understandable action names. You can map URLs to your code using "routes" covered later on.

The single instruction in the action uses `set()` to pass data from the controller to the view (which we'll create next). The line sets the view variable called 'posts' equal to the return value of the `find('all')` method of the Post model. Our Post model is automatically available at `$this->Post` because we've followed Cake's naming conventions.

To learn more about Cake's controllers, check out *Controllers* chapter.

Creating Post Views

Now that we have our data flowing to our model, and our application logic and flow defined by our controller, let's create a view for the index action we created above.

Cake views are just presentation-flavored fragments that fit inside an application's layout. For most applications they're HTML mixed with PHP, but they may end up as XML, CSV, or even binary data.

Layouts are presentation code that is wrapped around a view, and can be defined and switched between, but for now, let's just use the default.

Remember in the last section how we assigned the 'posts' variable to the view using the `set()` method? That would hand down data to the view that would look something like this:

```
// print_r($posts) output:

Array
(
    [0] => Array
        (
            [Post] => Array
                (
                    [id] => 1
                    [title] => The title
                    [body] => This is the post body.
                    [created] => 2008-02-13 18:34:55
                    [modified] =>
                )
        )
    [1] => Array
        (
            [Post] => Array
                (
                    [id] => 2
                    [title] => A title once again
                    [body] => And the post body follows.
                    [created] => 2008-02-13 18:34:56
                    [modified] =>
                )
        )
    [2] => Array
        (
            [Post] => Array
                (
                    [id] => 3
                    [title] => Title strikes back
                    [body] => This is really exciting! Not.
                    [created] => 2008-02-13 18:34:57
                    [modified] =>
                )
        )
)
```

Cake's view files are stored in `/app/View` inside a folder named after the controller they correspond to (we'll have to create a folder named 'Posts' in this case). To format this post data in a nice table, our view code might look something like this:

```
<!-- File: /app/View/Posts/index.ctp -->

<h1>Blog posts</h1>
<table>
    <tr>
        <th>Id</th>
        <th>Title</th>
        <th>Created</th>
    </tr>
    <!-- Here is where we loop through our $posts array, printing out post info -->

    <?php foreach ($posts as $post): ?>
    <tr>
        <td><?php echo $post['Post']['id']; ?></td>
        <td>
            <?php echo $this->Html->link($post['Post']['title'],
array('controller' => 'posts', 'action' => 'view', $post['Post']['id'])); ?>
        </td>
        <td><?php echo $post['Post']['created']; ?></td>
    </tr>
    <?php endforeach; ?>
    <?php unset($post); ?>
</table>
```

Hopefully this should look somewhat simple.

You might have noticed the use of an object called `$this->Html`. This is an instance of the CakePHP `HtmlHelper` class. CakePHP comes with a set of view helpers that make things like linking, form output, JavaScript and Ajax a snap. You can learn more about how to use them in *Helpers*, but what's important to note here is that the `link()` method will generate an HTML link with the given title (the first parameter) and URL (the second parameter).

When specifying URLs in Cake, it is recommended that you use the array format. This is explained in more detail in the section on Routes. Using the array format for URLs allows you to take advantage of CakePHP's reverse routing capabilities. You can also specify URLs relative to the base of the application in the form of /controller/action/param1/param2.

At this point, you should be able to point your browser to http://www.example.com/posts/index. You should see your view, correctly formatted with the title and table listing of the posts.

If you happened to have clicked on one of the links we created in this view (that link a post's title to a URL /posts/view/some_id), you were probably informed by CakePHP that the action hasn't yet been defined. If you were not so informed, either something has gone wrong, or you actually did define it already, in which case you are very sneaky. Otherwise, we'll create it in the PostsController now:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form');

    public function index() {
         $this->set('posts', $this->Post->find('all'));
    }

    public function view($id = null) {
        $this->Post->id = $id;
        $this->set('post', $this->Post->read());
    }
}
```

The `set()` call should look familiar. Notice we're using `read()` rather than `find('all')` because we only really want a single post's information.

Notice that our view action takes a parameter: the ID of the post we'd like to see. This parameter is handed to the action through the requested URL. If a user requests /posts/view/3, then the value '3' is passed as `$id`.

Now let's create the view for our new 'view' action and place it in `/app/View/Posts/view.ctp`.

```
<!-- File: /app/View/Posts/view.ctp -->

<h1><?php echo h($post['Post']['title']); ?></h1>

<p><small>Created: <?php echo $post['Post']['created']; ?></small></p>

<p><?php echo h($post['Post']['body']); ?></p>
```

Verify that this is working by trying the links at `/posts/index` or manually requesting a post by accessing `/posts/view/1`.

Adding Posts

Reading from the database and showing us the posts is a great start, but let's allow for the adding of new posts.

First, start by creating an `add()` action in the PostsController:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form', 'Session');
    public $components = array('Session');

    public function index() {
        $this->set('posts', $this->Post->find('all'));
    }

    public function view($id) {
        $this->Post->id = $id;
        $this->set('post', $this->Post->read());

    }

    public function add() {
        if ($this->request->is('post')) {
            if ($this->Post->save($this->request->data)) {
                $this->Session->setFlash('Your post has been saved.');
                $this->redirect(array('action' => 'index'));
            } else {
                $this->Session->setFlash('Unable to add your post.');
            }
        }
    }
}
```

Note: You need to include the SessionComponent - and SessionHelper - in any controller where you will use it. If necessary, include it in your AppController.

Here's what the `add()` action does: if HTTP method of the request was POST, try to save the data using the Post model. If for some reason it doesn't save, just render the view. This gives us a chance to show the user validation errors or other warnings.

Every CakePHP request includes a `CakeRequest` object which is accessible using `$this->request`. The request object contains useful information regarding the request that was just received, and can be used to control the flow of your application. In this case, we use the `CakeRequest::is()` method to check that the request is a HTTP POST request.

When a user uses a form to POST data to your application, that information is available in `$this->request->data`. You can use the `pr()` or `debug()` functions to print it out if you want to see what it looks like.

We use the SessionComponent's `SessionComponent::setFlash()` method to set a message to a session variable to be displayed on the page after redirection. In the layout we have `SessionHelper::flash` which displays the message and clears the corresponding session variable. The controller's `Controller::redirect` function redirects to another URL. The param `array('action' => 'index')` translates to URL /posts i.e the index action of posts controller. You can refer to `Router::url()` function on the api to see the formats in which you can specify a URL for various cake functions.

Calling the `save()` method will check for validation errors and abort the save if any occur. We'll discuss how those errors are handled in the following sections.

Data Validation

Cake goes a long way in taking the monotony out of form input validation. Everyone hates coding up endless forms and their validation routines. CakePHP makes it easier and faster.

To take advantage of the validation features, you'll need to use Cake's FormHelper in your views. The `FormHelper` is available by default to all views at `$this->Form`.

Here's our add view:

```
<!-- File: /app/View/Posts/add.ctp -->

<h1>Add Post</h1>
<?php
echo $this->Form->create('Post');
echo $this->Form->input('title');
echo $this->Form->input('body', array('rows' => '3'));
echo $this->Form->end('Save Post');
?>
```

Here, we use the FormHelper to generate the opening tag for an HTML form. Here's the HTML that `$this->Form->create()` generates:

```
<form id="PostAddForm" method="post" action="/posts/add">
```

If `create()` is called with no parameters supplied, it assumes you are building a form that submits to the current controller's `add()` action (or `edit()` action when `id` is included in the form data), via POST.

The `$this->Form->input()` method is used to create form elements of the same name. The first parameter tells CakePHP which field they correspond to, and the second parameter allows you to specify a wide array of options - in this case, the number of rows for the textarea. There's a bit of introspection and automagic here: `input()` will output different form elements based on the model field specified.

The `$this->Form->end()` call generates a submit button and ends the form. If a string is supplied as the first parameter to `end()`, the FormHelper outputs a submit button named accordingly along with the closing form tag. Again, refer to *Helpers* for more on helpers.

Now let's go back and update our `/app/View/Posts/index.ctp` view to include a new "Add Post" link. Before the `<table>`, add the following line:

```
<?php echo $this->Html->link('Add Post', array('controller' => 'posts', 'action' => 'add')
```

You may be wondering: how do I tell CakePHP about my validation requirements? Validation rules are defined in the model. Let's look back at our Post model and make a few adjustments:

```
<?php
class Post extends AppModel {
    public $validate = array(
        'title' => array(
            'rule' => 'notEmpty'
        ),
        'body' => array(
            'rule' => 'notEmpty'
        )
    );
}
```

The `$validate` array tells CakePHP how to validate your data when the `save()` method is called. Here, I've specified that both the body and title fields must not be empty. CakePHP's validation engine is strong, with a number of pre-built rules (credit card numbers, email addresses, etc.) and flexibility for adding your own validation rules. For more information on that setup, check the *Data Validation*.

Now that you have your validation rules in place, use the app to try to add a post with an empty title or body to see how it works. Since we've used the `FormHelper::input()` method of the FormHelper to create our form elements, our validation error messages will be shown automatically.

Editing Posts

Post editing: here we go. You're a CakePHP pro by now, so you should have picked up a pattern. Make the action, then the view. Here's what the `edit()` action of the PostsController would look like:

```
<?php
public function edit($id = null) {
    $this->Post->id = $id;
    if ($this->request->is('get')) {
        $this->request->data = $this->Post->read();
    } else {
        if ($this->Post->save($this->request->data)) {
            $this->Session->setFlash('Your post has been updated.');
            $this->redirect(array('action' => 'index'));
        } else {
            $this->Session->setFlash('Unable to update your post.');
        }
    }
}
```

This action first checks that the request is a GET request. If it is, then we find the Post and hand it to the view. If the user request is not a GET, it probably contains POST data. We'll use the POST data to update our Post record with, or kick back and show the user the validation errors.

The edit view might look something like this:

```
<!-- File: /app/View/Posts/edit.ctp -->

<h1>Edit Post</h1>
<?php
    echo $this->Form->create('Post', array('action' => 'edit'));
    echo $this->Form->input('title');
    echo $this->Form->input('body', array('rows' => '3'));
    echo $this->Form->input('id', array('type' => 'hidden'));
    echo $this->Form->end('Save Post');
```

This view outputs the edit form (with the values populated), along with any necessary validation error messages.

One thing to note here: CakePHP will assume that you are editing a model if the 'id' field is present in the data array. If no 'id' is present (look back at our add view), Cake will assume that you are inserting a new model when `save()` is called.

You can now update your index view with links to edit specific posts:

```
<!-- File: /app/View/Posts/index.ctp  (edit links added) -->

<h1>Blog posts</h1>
<p><?php echo $this->Html->link("Add Post", array('action' => 'add')); ?></p>
<table>
    <tr>
        <th>Id</th>
        <th>Title</th>
                <th>Action</th>
        <th>Created</th>
    </tr>

<!-- Here's where we loop through our $posts array, printing out post info -->

<?php foreach ($posts as $post): ?>
    <tr>
        <td><?php echo $post['Post']['id']; ?></td>
        <td>
            <?php echo $this->Html->link($post['Post']['title'], array('action' => 'view',
        </td>
        <td>
            <?php echo $this->Html->link('Edit', array('action' => 'edit', $post['Post']['
        </td>
        <td>
            <?php echo $post['Post']['created']; ?>
        </td>
    </tr>
<?php endforeach; ?>

</table>
```

Deleting Posts

Next, let's make a way for users to delete posts. Start with a `delete()` action in the PostsController:

```
<?php
public function delete($id) {
    if ($this->request->is('get')) {
        throw new MethodNotAllowedException();
    }
    if ($this->Post->delete($id)) {
        $this->Session->setFlash('The post with id: ' . $id . ' has been deleted.');
        $this->redirect(array('action' => 'index'));
    }
}
```

This logic deletes the post specified by $id, and uses `$this->Session->setFlash()` to show the user a confirmation message after redirecting them on to `/posts`. If the user attempts to do a delete using a GET request, we throw an Exception. Uncaught exceptions are captured by CakePHP's exception handler, and a nice error page is displayed. There are many built-in *Exceptions* that can be used to indicate the various HTTP errors your application might need to generate.

Because we're just executing some logic and redirecting, this action has no view. You might want to update your index view with links that allow users to delete posts, however:

```
<!-- File: /app/View/Posts/index.ctp -->

<h1>Blog posts</h1>
<p><?php echo $this->Html->link('Add Post', array('action' => 'add')); ?></p>
<table>
    <tr>
        <th>Id</th>
        <th>Title</th>
        <th>Actions</th>
        <th>Created</th>
    </tr>

<!-- Here's where we loop through our $posts array, printing out post info -->

    <?php foreach ($posts as $post): ?>
    <tr>
```

```
        <td><?php echo $post['Post']['id']; ?></td>
        <td>
            <?php echo $this->Html->link($post['Post']['title'], array('action' => 'view',
        </td>
        <td>
            <?php echo $this->Form->postLink(
                'Delete',
                array('action' => 'delete', $post['Post']['id']),
                array('confirm' => 'Are you sure?'));
            ?>
            <?php echo $this->Html->link('Edit', array('action' => 'edit', $post['Post']['
        </td>
        <td>
            <?php echo $post['Post']['created']; ?>
        </td>
    </tr>
    <?php endforeach; ?>

</table>
```

Using `postLink()` will create a link that uses Javascript to do a POST request deleting our post. Allowing content to be deleted using GET requests is dangerous, as web crawlers could accidentally delete all your content.

Note: This view code also uses the FormHelper to prompt the user with a JavaScript confirmation dialog before they attempt to delete a post.

Routes

For some, CakePHP's default routing works well enough. Developers who are sensitive to user-friendliness and general search engine compatibility will appreciate the way that CakePHP's URLs map to specific actions. So we'll just make a quick change to routes in this tutorial.

For more information on advanced routing techniques, see *Routes Configuration*.

By default, CakePHP responds to a request for the root of your site (i.e. http://www.example.com) using its PagesController, rendering a view called "home". Instead, we'll replace this with our PostsController by creating a routing rule.

Cake's routing is found in `/app/Config/routes.php`. You'll want to comment out or remove the line that defines the default root route. It looks like this:

```
<?php
Router::connect('/', array('controller' => 'pages', 'action' => 'display', 'home'));
```

This line connects the URL '/' with the default CakePHP home page. We want it to connect with our own controller, so replace that line with this one:

```
<?php
Router::connect('/', array('controller' => 'posts', 'action' => 'index'));
```

This should connect users requesting '/' to the index() action of our PostsController.

Note: CakePHP also makes use of 'reverse routing' - if with the above route defined you pass `array('controller' => 'posts', 'action' => 'index')` to a function expecting an array, the resultant URL used will be '/'. It's therefore a good idea to always use arrays for URLs as this means your routes define where a URL goes, and also ensures that links point to the same place too.

Conclusion

Creating applications this way will win you peace, honor, love, and money beyond even your wildest fantasies. Simple, isn't it? Keep in mind that this tutorial was very basic. CakePHP has *many* more features to offer, and is flexible in ways we didn't wish to cover here for simplicity's sake. Use the rest of this manual as a guide for building more feature-rich applications.

Now that you've created a basic Cake application you're ready for the real thing. Start your own project, read the rest of the `Cookbook` and API (http://api20.cakephp.org).

If you need help, come see us in #cakephp. Welcome to CakePHP!

Suggested Follow-up Reading

These are common tasks people learning CakePHP usually want to study next:

1. *Layouts*: Customizing your website layout
2. *Elements* Including and reusing view snippets
3. *Scaffolding*: Prototyping before creating code
4. *Code Generation with Bake* Generating basic CRUD code
5. *Simple Authentication and Authorization Application*: User authentication and authorization tutorial

Additional Reading

A Typical CakePHP Request

We've covered the basic ingredients in CakePHP, so let's look at how objects work together to complete a basic request. Continuing with our original request example, let's imagine that our friend Ricardo just clicked on the "Buy A Custom Cake Now!" link on a CakePHP application's landing page.

Figure: 2. Typical Cake Request.

Black = required element, Gray = optional element, Blue = callback

1. Ricardo clicks the link pointing to http://www.example.com/cakes/buy, and his browser makes a request to your web server.

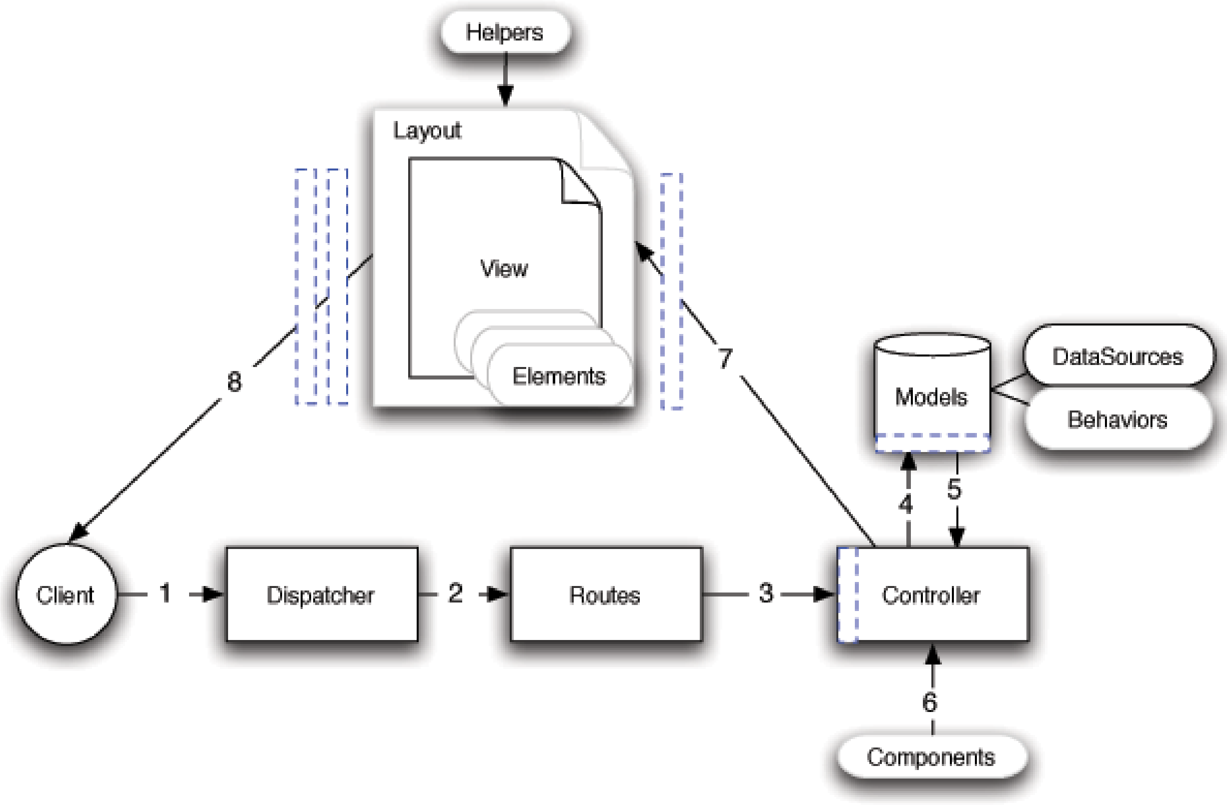


Figure 3.1: Flow diagram showing a typical CakePHP request

2. The Router parses the URL in order to extract the parameters for this request: the controller, action, and any other arguments that will affect the business logic during this request.
3. Using routes, a request URL is mapped to a controller action (a method in a specific controller class). In this case, it's the buy() method of the CakesController. The controller's beforeFilter() callback is called before any controller action logic is executed.
4. The controller may use models to gain access to the application's data. In this example, the controller uses a model to fetch Ricardo's last purchases from the database. Any applicable model callbacks, behaviors, and DataSources may apply during this operation. While model usage is not required, all CakePHP controllers initially require at least one model.
5. After the model has retrieved the data, it is returned to the controller. Model callbacks may apply.
6. The controller may use components to further refine the data or perform other operations (session manipulation, authentication, or sending emails, for example).
7. Once the controller has used models and components to prepare the data sufficiently, that data is handed to the view using the controller's set() method. Controller callbacks may be applied before the data is sent. The view logic is performed, which may include the use of elements and/or helpers. By default, the view is rendered inside of a layout.
8. Additional controller callbacks (like afterFilter) may be applied. The complete, rendered view code is sent to Ricardo's browser.

CakePHP Conventions

We are big fans of convention over configuration. While it takes a bit of time to learn CakePHP's conventions, you save time in the long run: by following convention, you get free functionality, and you free yourself from the maintenance nightmare of tracking config files. Convention also makes for a very uniform system development, allowing other developers to jump in and help more easily.

CakePHP's conventions have been distilled out of years of web development experience and best practices. While we suggest you use these conventions while developing with CakePHP, we should mention that many of these tenets are easily overridden – something that is especially handy when working with legacy systems.

Controller Conventions

Controller classnames are plural, CamelCased, and end in `Controller`. `PeopleController` and `LatestArticlesController` are both examples of conventional controller names.

The first method you write for a controller might be the `index()` method. When a request specifies a controller but not an action, the default CakePHP behavior is to execute the `index()` method of that controller. For example, a request for http://www.example.com/apples/ maps to a call on the `index()` method of the `ApplesController`, whereas http://www.example.com/apples/view/ maps to a call on the `view()` method of the `ApplesController`.

You can also change the visibility of controller methods in CakePHP by prefixing controller method names with underscores. If a controller method has been prefixed with an underscore, the method will not be accessible directly from the web but is available for internal use. For example:

```php
<?php
class NewsController extends AppController {

    public function latest() {
        $this->_findNewArticles();
    }

    protected function _findNewArticles() {
        // Logic to find latest news articles
    }
}
```

While the page http://www.example.com/news/latest/ would be accessible to the user as usual, someone trying to get to the page http://www.example.com/news/_findNewArticles/ would get an error, because the method is preceded with an underscore. You can also use PHP's visibility keywords to indicate whether or not a method can be accessed from a url. Non-public methods cannot be accessed.

URL Considerations for Controller Names

As you've just seen, single word controllers map easily to a simple lower case URL path. For example, `ApplesController` (which would be defined in the file name 'ApplesController.php') is accessed from http://example.com/apples.

Multiple word controllers *can* be any 'inflected' form which equals the controller name so:

- /redApples
- /RedApples
- /Red_apples
- /red_apples

will all resolve to the index of the RedApples controller. However, the convention is that your urls are lowercase and underscored, therefore /red_apples/go_pick is the correct form to access the `RedApplesController::go_pick` action.

For more information on CakePHP URLs and parameter handling, see *Routes Configuration*.

File and Classname Conventions

In general, filenames match the classnames, which are CamelCased. So if you have a class **MyNiftyClass**, then in Cake, the file should be named **MyNiftyClass.php**. Below are examples of how to name the file for each of the different types of classes you would typically use in a CakePHP application:

- The Controller class **KissesAndHugsController** would be found in a file named **KissesAndHugsController.php**
- The Component class **MyHandyComponent** would be found in a file named **MyHandyComponent.php**
- The Model class **OptionValue** would be found in a file named **OptionValue.php**

- The Behavior class **EspeciallyFunkableBehavior** would be found in a file named **EspeciallyFunkableBehavior.php**
- The View class **SuperSimpleView** would be found in a file named **SuperSimpleView.php**
- The Helper class **BestEverHelper** would be found in a file named **BestEverHelper.php**

Each file would be located in the appropriate folder in your app folder.

Model and Database Conventions

Model classnames are singular and CamelCased. Person, BigPerson, and ReallyBigPerson are all examples of conventional model names.

Table names corresponding to CakePHP models are plural and underscored. The underlying tables for the above mentioned models would be `people`, `big_people`, and `really_big_people`, respectively.

You can use the utility library `Inflector` to check the singular/plural of words. See the *Inflector* for more information.

Field names with two or more words are underscored like, first_name.

Foreign keys in hasMany, belongsTo or hasOne relationships are recognized by default as the (singular) name of the related table followed by _id. So if a Baker hasMany Cake, the cakes table will refer to the bakers table via a baker_id foreign key. For a multiple worded table like category_types, the foreign key would be category_type_id.

Join tables, used in hasAndBelongsToMany (HABTM) relationships between models should be named after the model tables they will join in alphabetical order (apples_zebras rather than zebras_apples).

All tables with which CakePHP models interact (with the exception of join tables), require a singular primary key to uniquely identify each row. If you wish to model a table which does not have a single-field primary key, CakePHP's convention is that a single-field primary key is added to the table. You have to add a single-field primary key if you want to use that table's model.

CakePHP does not support composite primary keys. If you want to directly manipulate your join table data, use direct *query* calls or add a primary key to act on it as a normal model. E.g.:

```
CREATE TABLE posts_tags (
id INT(10) NOT NULL AUTO_INCREMENT,
post_id INT(10) NOT NULL,
tag_id INT(10) NOT NULL,
PRIMARY KEY(id));
```

Rather than using an auto-increment key as the primary key, you may also use char(36). Cake will then use a unique 36 character uuid (String::uuid) whenever you save a new record using the Model::save method.

View Conventions

View template files are named after the controller functions they display, in an underscored form. The getReady() function of the PeopleController class will look for a view template in /app/View/People/get_ready.ctp.

The basic pattern is /app/View/Controller/underscored_function_name.ctp.

By naming the pieces of your application using CakePHP conventions, you gain functionality without the hassle and maintenance tethers of configuration. Here's a final example that ties the conventions

- Database table: "people"
- Model class: "Person", found at /app/Model/Person.php
- Controller class: "PeopleController", found at /app/Controller/PeopleController.php
- View template, found at /app/View/People/index.ctp

Using these conventions, CakePHP knows that a request to http://example.com/people/ maps to a call on the index() function of the PeopleController, where the Person model is automatically available (and automatically tied to the 'people' table in the database), and renders to a file. None of these relationships have been configured by any means other than by creating classes and files that you'd need to create anyway.

Now that you've been introduced to CakePHP's fundamentals, you might try a run through the *Blog Tutorial* to see how things fit together.

CakePHP Folder Structure

After you've downloaded and extracted CakePHP, these are the files and folders you should see:

- app
- lib
- vendors
- plugins
- .htaccess
- index.php
- README

You'll notice three main folders:

- The *app* folder will be where you work your magic: it's where your application's files will be placed.
- The *lib* folder is where we've worked our magic. Make a personal commitment **not** to edit files in this folder. We can't help you if you've modified the core.
- Finally, the *vendors* folder is where you'll place third-party PHP libraries you need to use with your CakePHP applications.

The App Folder

CakePHP's app folder is where you will do most of your application development. Let's look a little closer at the folders inside of app.

Config Holds the (few) configuration files CakePHP uses. Database connection details, bootstrapping, core configuration files and more should be stored here.

Controller Contains your application's controllers and their components.

Lib Contains 1st party libraries that do not come from 3rd parties or external vendors. This allows you to separate your organization's internal libraries from vendor libraries.

Locale Stores string files for internationalization.

Model Contains your application's models, behaviors, and datasources.

Plugin Contains plugin packages.

tmp This is where CakePHP stores temporary data. The actual data it stores depends on how you have CakePHP configured, but this folder is usually used to store model descriptions, logs, and sometimes session information.

Make sure that this folder exists and that it is writable, otherwise the performance of your application will be severely impacted. In debug mode, CakePHP will warn you if it is not the case.

Vendor Any third-party classes or libraries should be placed here. Doing so makes them easy to access using the App::import('vendor', 'name') function. Keen observers will note that this seems redundant, as there is also a vendors folder at the top level of our directory structure. We'll get into the differences between the two when we discuss managing multiple applications and more complex system setups.

View Presentational files are placed here: elements, error pages, helpers, layouts, and view files.

webroot In a production setup, this folder should serve as the document root for your application. Folders here also serve as holding places for CSS stylesheets, images, and JavaScript files.

CakePHP Structure

CakePHP features Controller, Model, and View classes, but it also features some additional classes and objects that make development in MVC a little quicker and more enjoyable. Components, Behaviors, and Helpers are classes that provide extensibility and reusability to quickly add functionality to the base MVC classes in your applications. Right now we'll stay at a higher level, so look for the details on how to use these tools later on.

Application Extensions

Controllers, helpers and models each have a parent class you can use to define application-wide changes. AppController (located at `/app/Controller/AppController.php`), AppHelper (located at `/app/View/Helper/AppHelper.php`) and AppModel (located at `/app/Model/AppModel.php`) are great places to put methods you want to share between all controllers, helpers or models.

Although they aren't classes or files, routes play a role in requests made to CakePHP. Route definitions tell CakePHP how to map URLs to controller actions. The default behavior assumes that the URL `/controller/action/var1/var2` maps to Controller::action($var1, $var2), but you can use routes to customize URLs and how they are interpreted by your application.

Some features in an application merit packaging as a whole. A plugin is a package of models, controllers and views that accomplishes a specific purpose that can span multiple applications. A user management system or a simplified blog might be a good fit for CakePHP plugins.

Controller Extensions (“Components”)

A Component is a class that aids in controller logic. If you have some logic you want to share between controllers (or applications), a component is usually a good fit. As an example, the core EmailComponent class makes creating and sending emails a snap. Rather than writing a controller method in a single controller that performs this logic, you can package the logic so it can be shared.

Controllers are also fitted with callbacks. These callbacks are available for your use, just in case you need to insert some logic between CakePHP’s core operations. Callbacks available include:

- `beforeFilter()`, executed before any controller action logic
- `beforeRender()`, executed after controller logic, but before the view is rendered
- `afterFilter()`, executed after all controller logic, including the view render. There may be no difference between `afterRender()` and `afterFilter()` unless you’ve manually made a call to `render()` in your controller action and have included some logic after that call.

Model Extensions (“Behaviors”)

Similarly, Behaviors work as ways to add common functionality between models. For example, if you store user data in a tree structure, you can specify your User model as behaving like a tree, and gain free functionality for removing, adding, and shifting nodes in your underlying tree structure.

Models also are supported by another class called a DataSource. DataSources are an abstraction that enable models to manipulate different types of data consistently. While the main source of data in a CakePHP application is often a database, you might write additional DataSources that allow your models to represent RSS feeds, CSV files, LDAP entries, or iCal events. DataSources allow you to associate records from different sources: rather than being limited to SQL joins, DataSources allow you to tell your LDAP model that it is associated to many iCal events.

Just like controllers, models are featured with callbacks as well:

- beforeFind()
- afterFind()
- beforeValidate()
- beforeSave()
- afterSave()
- beforeDelete()
- afterDelete()

The names of these methods should be descriptive enough to let you know what they do. You can find the details in the models chapter.

View Extensions ("Helpers")

A Helper is a class that aids in view logic. Much like a component used among controllers, helpers allow presentational logic to be accessed and shared between views. One of the core helpers, AjaxHelper, makes Ajax requests within views much easier.

Most applications have pieces of view code that are used repeatedly. CakePHP facilitates view code reuse with layouts and elements. By default, every view rendered by a controller is placed inside a layout. Elements are used when small snippets of content need to be reused in multiple views.

CHAPTER 4

Installation

CakePHP is fast and easy to install. The minimum requirements are a webserver and a copy of Cake, that's it! While this manual focuses primarily on setting up with Apache (because it's the most common), you can configure Cake to run on a variety of web servers such as LightHTTPD or Microsoft IIS.

Requirements

- HTTP Server. For example: Apache. mod_rewrite is preferred, but by no means required.
- PHP 5.2.8 or greater.

Technically a database engine isn't required, but we imagine that most applications will utilize one. CakePHP supports a variety of database storage engines:

- MySQL (4 or greater)
- PostgreSQL
- Microsoft SQL Server
- SQLite

Note: The built-in drivers all require PDO. You should make sure you have the correct PDO extensions installed.

License

CakePHP is licensed under the MIT license. This means that you are free to modify, distribute and republish the source code on the condition that the copyright notices are left intact. You are also free to incorporate CakePHP into any Commercial or closed source application.

Downloading CakePHP

There are two main ways to get a fresh copy of CakePHP. You can either download an archive copy (zip/tar.gz/tar.bz2) from the main website, or check out the code from the git repository.

To download the latest major release of CakePHP. Visit the main website http://www.cakephp.org and follow the "Download Now" link.

All current releases of CakePHP are hosted on Github (http://github.com/cakephp/cakephp). Github houses both CakePHP itself as well as many other plugins for CakePHP. The CakePHP releases are available at Github downloads (http://github.com/cakephp/cakephp/downloads).

Alternatively you can get fresh off the press code, with all the bug-fixes and up to the minute enhancements. These can be accessed from github by cloning the Github (http://github.com/cakephp/cakephp) repository:

```
git clone git://github.com/cakephp/cakephp.git
```

Permissions

CakePHP uses the `app/tmp` directory for a number of different operations. Model descriptions, cached views, and session information are just a few examples.

As such, make sure the directory `app/tmp` and all its subdirectories in your cake installation are writable by the web server user.

Setup

Setting up CakePHP can be as simple as slapping it in your web server's document root, or as complex and flexible as you wish. This section will cover the three main installation types for CakePHP: development, production, and advanced.

- Development: easy to get going, URLs for the application include the CakePHP installation directory name, and less secure.
- Production: Requires the ability to configure the web server's document root, clean URLs, very secure.
- Advanced: With some configuration, allows you to place key CakePHP directories in different parts of the filesystem, possibly sharing a single CakePHP core library folder amongst many CakePHP applications.

Development

A development installation is the fastest method to setup Cake. This example will help you install a CakePHP application and make it available at http://www.example.com/cake_2_0/. We assume for the purposes of this example that your document root is set to `/var/www/html`.

Unpack the contents of the Cake archive into `/var/www/html`. You now have a folder in your document root named after the release you've downloaded (e.g. cake_2.0.0). Rename this folder to cake_2_0. Your development setup will look like this on the file system:

```
/var/www/html/
    cake_2_0/
        app/
        lib/
        plugins/
        vendors/
        .htaccess
        index.php
        README
```

If your web server is configured correctly, you should now find your Cake application accessible at http://www.example.com/cake_2_0/.

Using one CakePHP checkout for multiple applications

If you are developing a number of applications, it often makes sense to have them share the same CakePHP core checkout. There are a few ways in which you can accomplish this. Often the easiest is to use PHP's `include_path`. To start off, clone CakePHP into a directory. For this example, we'll use `~/projects`:

```
git clone git://github.com/cakephp/cakephp.git ~/projects/cakephp
```

This will clone CakePHP into your `~/projects` directory. If you don't want to use git, you can download a zipball and the remaining steps will be the same. Next you'll have to locate and modify your `php.ini`. On *nix systems this is often in `/etc/php.ini`, but using `php -i` and looking for 'Loaded Configuration File'. Once you've found the correct ini file, modify the `include_path` configuration to include `~/projects/cakephp/lib`. An example would look like:

```
include_path = .:/home/mark/projects/cakephp/lib:/usr/local/php/lib/php
```

After restarting your webserver, you should see the changes reflected in `phpinfo()`.

Note: If you are on windows, separate include paths with ; instead of :

Having finished setting up your `include_path` your applications should be able to find CakePHP automatically.

Production

A production installation is a more flexible way to setup Cake. Using this method allows an entire domain to act as a single CakePHP application. This example will help you install Cake anywhere on your filesystem and make it available at http://www.example.com. Note that this installation may require the rights to change the `DocumentRoot` on Apache webservers.

Unpack the contents of the Cake archive into a directory of your choosing. For the purposes of this example, we assume you choose to install Cake into /cake_install. Your production setup will look like this on the filesystem:

```
/cake_install/
    app/
        webroot/ (this directory is set as the ``DocumentRoot``
         directive)
    lib/
    plugins/
    vendors/
    .htaccess
    index.php
    README
```

Developers using Apache should set the `DocumentRoot` directive for the domain to:

```
DocumentRoot /cake_install/app/webroot
```

If your web server is configured correctly, you should now find your Cake application accessible at http://www.example.com.

Advanced Installation and server specific configuration

Advanced Installation

There may be some situations where you wish to place CakePHP's directories on different places on the filesystem. This may be due to a shared host restriction, or maybe you just want a few of your apps to share the same Cake libraries. This section describes how to spread your CakePHP directories across a filesystem.

First, realize that there are three main parts to a Cake application:

1. The core CakePHP libraries, in /lib/Cake.
2. Your application code, in /app.
3. The application's webroot, usually in /app/webroot.

Each of these directories can be located anywhere on your file system, with the exception of the webroot, which needs to be accessible by your web server. You can even move the webroot folder out of the app folder as long as you tell Cake where you've put it.

To configure your Cake installation, you'll need to make some changes to the following files.

- /app/webroot/index.php
- /app/webroot/test.php (if you use the *Testing* feature.)

There are three constants that you'll need to edit: `ROOT`, `APP_DIR`, and `CAKE_CORE_INCLUDE_PATH`.

- `ROOT` should be set to the path of the directory that contains your app folder.
- `APP_DIR` should be set to the (base)name of your app folder.
- `CAKE_CORE_INCLUDE_PATH` should be set to the path of your CakePHP libraries folder.

Let’s run through an example so you can see what an advanced installation might look like in practice. Imagine that I wanted to set up CakePHP to work as follows:

- The CakePHP core libraries will be placed in /usr/lib/cake.
- My application’s webroot directory will be /var/www/mysite/.
- My application’s app directory will be /home/me/myapp.

Given this type of setup, I would need to edit my webroot/index.php file (which will end up at /var/www/mysite/index.php, in this example) to look like the following:

```php
<?php
// /app/webroot/index.php (partial, comments removed)

if (!defined('ROOT')) {
    define('ROOT', DS . 'home' . DS . 'me');
}

if (!defined('APP_DIR')) {
    define ('APP_DIR', 'myapp');
}

if (!defined('CAKE_CORE_INCLUDE_PATH')) {
    define('CAKE_CORE_INCLUDE_PATH', DS . 'usr' . DS . 'lib');
}
```

It is recommended to use the `DS` constant rather than slashes to delimit file paths. This prevents any missing file errors you might get as a result of using the wrong delimiter, and it makes your code more portable.

Apache and mod_rewrite (and .htaccess)

While CakePHP is built to work with mod_rewrite out of the box–and usually does–we’ve noticed that a few users struggle with getting everything to play nicely on their systems.

Here are a few things you might try to get it running correctly. First look at your httpd.conf (Make sure you are editing the system httpd.conf rather than a user- or site-specific httpd.conf).

1. Make sure that an .htaccess override is allowed and that AllowOverride is set to All for the correct DocumentRoot. You should see something similar to:

```
# Each directory to which Apache has access can be configured with respect
# to which services and features are allowed and/or disabled in that
# directory (and its subdirectories).
#
# First, we configure the "default" to be a very restrictive set of
# features.
#
<Directory />
    Options FollowSymLinks
    AllowOverride All
#    Order deny,allow
#    Deny from all
</Directory>
```

2. Make sure you are loading up mod_rewrite correctly. You should see something like:

```
LoadModule rewrite_module libexec/apache2/mod_rewrite.so
```

   In many systems these will be commented out (by being prepended with a #) by default, so you may just need to remove those leading # symbols.

   After you make changes, restart Apache to make sure the settings are active.

   Verify that you your .htaccess files are actually in the right directories.

   This can happen during copying because some operating systems treat files that start with '.' as hidden and therefore won't see them to copy.

3. Make sure your copy of CakePHP is from the downloads section of the site or our GIT repository, and has been unpacked correctly by checking for .htaccess files.

   Cake root directory (needs to be copied to your document, this redirects everything to your Cake app):

```
<IfModule mod_rewrite.c>
   RewriteEngine on
   RewriteRule    ^$ app/webroot/    [L]
   RewriteRule    (.*) app/webroot/$1 [L]
</IfModule>
```

   Cake app directory (will be copied to the top directory of your application by bake):

```
<IfModule mod_rewrite.c>
   RewriteEngine on
   RewriteRule    ^$    webroot/    [L]
   RewriteRule    (.*) webroot/$1    [L]
</IfModule>
```

   Cake webroot directory (will be copied to your application's web root by bake):

```
<IfModule mod_rewrite.c>
    RewriteEngine On
    RewriteCond %{REQUEST_FILENAME} !-d
    RewriteCond %{REQUEST_FILENAME} !-f
    RewriteRule ^(.*)$ index.php [QSA,L]
</IfModule>
```

   If your CakePHP site still has problems with mod_rewrite you might want to try and modify settings for virtualhosts. If on ubuntu, edit the file /etc/apache2/sites-available/default (location is distribution dependent). In this file, ensure that `AllowOverride None` is changed to `AllowOverride All`, so you have:

```
<Directory />
    Options FollowSymLinks
    AllowOverride All
</Directory>
<Directory /var/www>
    Options Indexes FollowSymLinks MultiViews
    AllowOverride All
    Order Allow,Deny
```

```
        Allow from all
    </Directory>
```

If on Mac OSX, another solution is to use the tool virtualhostx to make a virtual host to point to your folder.

For many hosting services (GoDaddy, 1and1), your web server is actually being served from a user directory that already uses mod_rewrite. If you are installing CakePHP into a user directory (http://example.com/~username/cakephp/), or any other URL structure that already utilizes mod_rewrite, you'll need to add RewriteBase statements to the .htaccess files CakePHP uses (/.htaccess, /app/.htaccess, /app/webroot/.htaccess).

This can be added to the same section with the RewriteEngine directive, so for example your webroot .htaccess file would look like:

```
<IfModule mod_rewrite.c>
    RewriteEngine On
    RewriteBase /path/to/cake/app
    RewriteCond %{REQUEST_FILENAME} !-d
    RewriteCond %{REQUEST_FILENAME} !-f
    RewriteRule ^(.*)$ index.php [QSA,L]
</IfModule>
```

The details of those changes will depend on your setup, and can include additional things that are not Cake related. Please refer to Apache's online documentation for more information.

Pretty URLs on nginx

nginx is a popular server that uses less system resources than Apache. Its drawback is that it does not make use of .htaccess files like Apache, so it is necessary to create those rewritten URLs in the site-available configuration. Depending upon your setup, you will have to modify this, but at the very least, you will need PHP running as a FastCGI instance.

```
server {
    listen   80;
    server_name www.example.com;
    rewrite ^(.*) http://example.com$1 permanent;
}

server {
    listen   80;
    server_name example.com;

    # root directive should be global
    root   /var/www/example.com/public/app/webroot/;

    access_log /var/www/example.com/log/access.log;
    error_log /var/www/example.com/log/error.log;

    location / {
        index  index.php index.html index.htm;
        try_files $uri $uri/ /index.php?$uri&$args;
    }

    location ~ \.php$ {
        include /etc/nginx/fcgi.conf;
        fastcgi_pass    127.0.0.1:10005;
        fastcgi_index   index.php;
        fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
    }
}
```

URL Rewrites on IIS7 (Windows hosts)

IIS7 does not natively support .htaccess files. While there are add-ons that can add this support, you can also import htaccess rules into IIS to use CakePHP's native rewrites. To do this, follow these steps:

1. Use Microsoft's Web Platform Installer to install the URL Rewrite Module 2.0.
2. Create a new file in your CakePHP folder, called web.config.
3. Using Notepad or another XML-safe editor, copy the following code into your new web.config file...

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
    <system.webServer>
        <rewrite>
            <rules>
            <rule name="Imported Rule 1" stopProcessing="true">
            <match url="^(.*)$" ignoreCase="false" />
            <conditions logicalGrouping="MatchAll">
                        <add input="{REQUEST_FILENAME}" matchType="IsDirectory" negate="tru
                        <add input="{REQUEST_FILENAME}" matchType="IsFile" negate="true" /
            </conditions>

            <action type="Rewrite" url="index.php?url={R:1}" appendQueryString="true" />

            </rule>

            <rule name="Imported Rule 2" stopProcessing="true">
              <match url="^$" ignoreCase="false" />
              <action type="Rewrite" url="/" />
            </rule>
            <rule name="Imported Rule 3" stopProcessing="true">
              <match url="(.*)" ignoreCase="false" />
              <action type="Rewrite" url="/{R:1}" />
            </rule>
            <rule name="Imported Rule 4" stopProcessing="true">
              <match url="^(.*)$" ignoreCase="false" />
              <conditions logicalGrouping="MatchAll">
                        <add input="{REQUEST_FILENAME}" matchType="IsDirectory" negate="tru
                        <add input="{REQUEST_FILENAME}" matchType="IsFile" negate="true" /
              </conditions>
              <action type="Rewrite" url="index.php/{R:1}" appendQueryString="true" />
            </rule>
            </rules>
        </rewrite>
    </system.webServer>
</configuration>
```

It is also possible to use the Import functionality in IIS's URL Rewrite module to import rules directly from CakePHP's .htaccess files in root, /app/, and /app/webroot/ - although some editing within IIS may be necessary to get these to work. When Importing the rules this way, IIS will automatically create your web.config file for you.

Once the web.config file is created with the correct IIS-friendly rewrite rules, CakePHP's links, css, js, and rerouting should work correctly.

Fire It Up

Alright, let's see CakePHP in action. Depending on which setup you used, you should point your browser to http://example.com/ or http://example.com/cake_install/. At this point, you'll be presented with CakePHP's default home, and a message that tells you the status of your current database connection.

Congratulations! You are ready to *create your first CakePHP application*.

Not working? If you're getting timezone related error from PHP uncomment one line in `app/Config/core.php`:

```
<?php
/**
 * Uncomment this line and correct your server timezone to fix
 * any date & time related errors.
 */
    date_default_timezone_set('UTC');
```

CakePHP Overview

Welcome to the Cookbook, the manual for the CakePHP web application framework that makes developing a piece of cake!

This manual assumes that you have a general understanding of PHP and a basic understanding of object-oriented programming (OOP). Different functionality within the framework makes use of different technologies – such as SQL, JavaScript, and XML – and this manual does not attempt to explain those technologies, only how they are used in context.

What is CakePHP? Why Use it?

CakePHP (http://www.cakephp.org/) is a free (http://en.wikipedia.org/wiki/MIT_License), open-source (http://en.wikipedia.org/wiki/Open_source), rapid development (http://en.wikipedia.org/wiki/Rapid_application_development) framework (http://en.wikipedia.org/wiki/Application_framework) for PHP (http://www.php.net/). It's a foundational structure for programmers to create web applications. Our primary goal is to enable you to work in a structured and rapid manner–without loss of flexibility.

CakePHP takes the monotony out of web development. We provide you with all the tools you need to get started coding what you really need to get done: the logic specific to your application. Instead of reinventing the wheel every time you sit down to a new project, check out a copy of CakePHP and get started with the real guts of your application.

CakePHP has an active developer team (http://cakephp.lighthouseapp.com/contributors) and community, bringing great value to the project. In addition to keeping you from wheel-reinventing, using CakePHP means your application's core is well tested and is being constantly improved.

Here's a quick list of features you'll enjoy when using CakePHP:

- Active, friendly community (http://cakephp.org/feeds)
- Flexible licensing (http://en.wikipedia.org/wiki/MIT_License)
- Compatible with versions PHP 5.2.8 and greater.

- Integrated CRUD (http://en.wikipedia.org/wiki/Create,_read,_update_and_delete) for database interaction.
- Application scaffolding (http://en.wikipedia.org/wiki/Scaffold_(programming)).
- Code generation.
- MVC (http://en.wikipedia.org/wiki/Model-view-controller) architecture.
- Request dispatcher with clean, custom URLs and routes.
- Built-in validation (http://en.wikipedia.org/wiki/Data_validation).
- Fast and flexible templating (http://en.wikipedia.org/wiki/Web_template_system) (PHP syntax, with helpers).
- View Helpers for AJAX, JavaScript, HTML Forms and more.
- Email, Cookie, Security, Session, and Request Handling Components.
- Flexible ACL (http://en.wikipedia.org/wiki/Access_control_list).
- Data Sanitization.
- Flexible Caching (http://en.wikipedia.org/wiki/Web_cache).
- Localization.
- Works from any web site directory, with little to no Apache (http://httpd.apache.org/) configuration involved.

Understanding Model-View-Controller

CakePHP follows the MVC (http://en.wikipedia.org/wiki/Model-view-controller) software design pattern. Programming using MVC separates your application into three main parts:

The Model layer

The Model layer represents the part of your application that implements the business logic. this means that it is responsible for retrieving data, converting it into meaningful concepts to your application, as well as processing, validating, associating and any other task relative to handling this data.

At a first glance, Model objects can be looked at as the first layer of interaction with any database you might be using for your application. But in general they stand for the major concepts around which you implement your application.

In the case of a social network, the Model layer would take care of tasks such as Saving the user data, saving friends associations, storing and retrieving user photos, finding new friends for suggestions, etc. While the model objects can be thought as “Friend”, “User”, “Comment”, “Photo”

The View layer

The View renders a presentation of modeled data. Being separated from the Model objects, it is responsible for using the information it has available to produce any presentational interface your application might need.

For example, as the Model layer returns a set of data, the view would use it to render a HTML page containing it. Or a XML formatted result for others to consume.

The View layer is not only limited to HTML or text representation of the data, it can be used to deliver a wide variety of formats depending on your needs, such as videos, music, documents and any other format you can think of.

The Controller layer

The Controller layer handles requests from users. It's responsible for rendering back a response with the aid of both the Model and the View Layer.

Controllers can be seen as managers taking care that all needed resources for completing a task are delegated to the correct workers. It waits for petitions from clients, checks their validity according to authentication or authorization rules, delegates data fetching or processing to the model, and selects the correct type of presentational data that the client is accepting, to finally delegate this rendering process to the View layer.

CakePHP request cycle

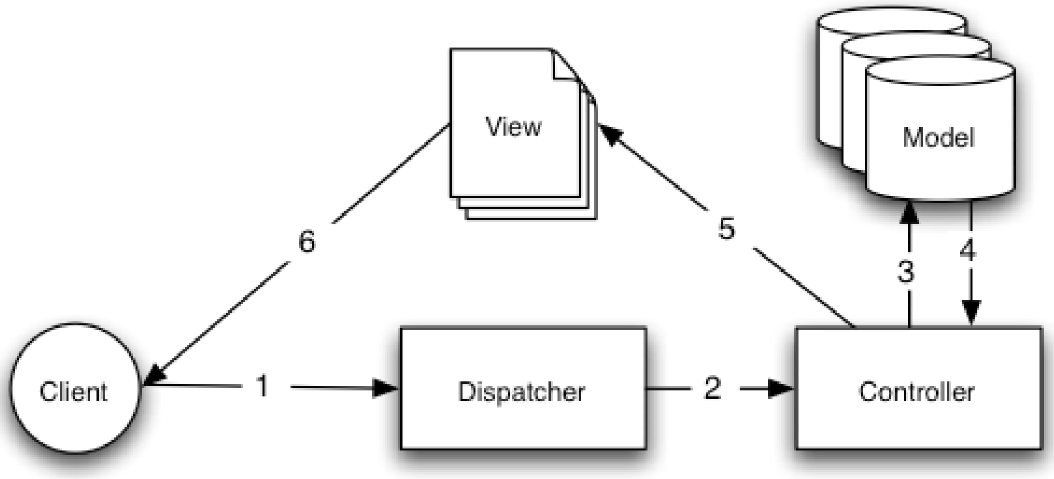


Figure: 1: A Basic MVC Request

Figure: 1 Shows the typical handling of a client request in CakePHP

The typical CakePHP request cycle starts with a user requesting a page or resource in your application. This request is first processed by a dispatcher which will select the correct controller object to handle it.

Once the request arrives at the controller, it will communicate with the Model layer to process any data fetching or saving operation that might be needed. After this communication is over, the controller will proceed at delegating to the correct view object the task of generating an output resulting from the data provided by the model.

Finally, when this output is generated, it is immediately rendered to the user

Almost every request to your application will follow this basic pattern. We'll add some details later on which are specific to CakePHP, so keep this in mind as we proceed.

Benefits

Why use MVC? Because it is a tried and true software design pattern that turns an application into a maintainable, modular, rapidly developed package. Crafting application tasks into separate models, views, and controllers makes your application very light on its feet. New features are easily added, and new faces on old features are a snap. The modular and separate design also allows developers and designers to work simultaneously, including the ability to rapidly prototype (http://en.wikipedia.org/wiki/Software_prototyping). Separation also allows developers to make changes in one part of the application without affecting the others.

If you've never built an application this way, it takes some time getting used to, but we're confident that once you've built your first application using CakePHP, you won't want to do it any other way.

To get started on your first CakePHP application, *try the blog tutorial now*

Where to Get Help

The Official CakePHP website

http://www.cakephp.org

The Official CakePHP website is always a great place to visit. It features links to oft-used developer tools, screencasts, donation opportunities, and downloads.

The Cookbook

http://book.cakephp.org

This manual should probably be the first place you go to get answers. As with many other open source projects, we get new folks regularly. Try your best to answer your questions on your own first. Answers may come slower, but will remain longer – and you'll also be lightening our support load. Both the manual and the API have an online component.

The Bakery

http://bakery.cakephp.org

The CakePHP Bakery is a clearing house for all things CakePHP. Check it out for tutorials, case studies, and code examples. Once you're acquainted with CakePHP, log on and share your knowledge with the community and gain instant fame and fortune.

The API

http://api20.cakephp.org/

Straight to the point and straight from the core developers, the CakePHP API (Application Programming Interface) is the most comprehensive documentation around for all the nitty gritty details of the internal workings of the framework. It's a straight forward code reference, so bring your propeller hat.

The Test Cases

If you ever feel the information provided in the API is not sufficient, check out the code of the test cases provided with CakePHP. They can serve as practical examples for function and data member usage for a class.:

```
lib/Cake/Test/Case
```

The IRC channel

IRC Channels on irc.freenode.net:

- #cakephp – General Discussion
- #cakephp-docs – Documentation
- #cakephp-bakery – Bakery

If you're stumped, give us a holler in the CakePHP IRC channel. Someone from the development team is usually there, especially during the daylight hours for North and South America users. We'd love to hear from you, whether you need some help, want to find users in your area, or would like to donate your brand new sports car.

The Google Group

http://groups.google.com/group/cake-php

CakePHP also has a very active Google Group. It can be a great resource for finding archived answers, frequently asked questions, and getting answers to immediate problems.

CakePHP Questions

http://ask.cakephp.org/

Simply register/login and ask a question. Wait until you've got some answers and pick the correct answer. You can view, comment and vote on previously asked and solved questions as well.

CHAPTER 6

Controllers

Controllers are the 'C' in MVC. After routing has been applied and the correct controller has been found, your controller's action is called. Your controller should handle interpreting the request data, making sure the correct models are called, and the right response or view is rendered. Controllers can be thought of as middle man between the Model and View. You want to keep your controllers thin, and your models fat. This will help you more easily reuse your code and makes your code easier to test.

Commonly, controllers are used to manage the logic around a single model. For example, if you were building a site for an on-line bakery, you might have a RecipesController and an IngredientsController managing your recipes and their ingredients. In CakePHP, controllers are named after the primary model they handle. It's totally possible to have controllers work with more than one model as well.

Your application's controllers extend `AppController` class, which in turn extends the core `Controller` class. The AppController class can be defined in `/app/Controller/AppController.php` and it should contain methods that are shared between all of your application's controllers.

Controllers provide a number of methods which are called *actions*. Actions are methods on a controller that handle requests. By default all public methods on a controller are an action, and accessible from a url. Actions are responsible for interpreting the request and creating the response. Usually responses are in the form of a rendered view, but there are other ways to create responses as well.

The App Controller

As stated in the introduction, the AppController class is the parent class to all of your application's controllers. AppController itself extends the Controller class included in the CakePHP core library. As such, AppController is defined in `/app/Controller/AppController.php` like so:

```php
<?php
class AppController extends Controller {
}
```

Controller attributes and methods created in your AppController will be available to all of your application's controllers. It is the ideal place to create code that is common to all of your controllers. Components (which you'll learn about later) are best used for code that is used in many (but not necessarily all) controllers.

While normal object-oriented inheritance rules apply, CakePHP does a bit of extra work when it comes to special controller attributes. The list of components and helpers used by a controller are treated specially. In these cases, AppController value arrays are merged with child controller class arrays. The values in the child class will always override those in AppController.

Note: CakePHP merges the following variables from the AppController to your application's controllers:

- $components
- $helpers
- $uses

Remember to add the default Html and Form helpers, if you define var `$helpers` in your AppController

Please also remember to call AppController's callbacks within child controller callbacks for best results:

```
<?php
public function beforeFilter() {
    parent::beforeFilter();
}
```

Request parameters

When a request is made to a CakePHP application, CakePHP's `Router` and `Dispatcher` classes use *Routes Configuration* to find and create the correct controller. The request data is encapsulated into a request object. CakePHP puts all of the important request information into the `$this->request` property. See the section on *CakeRequest* for more information on the CakePHP request object.

Controller actions

Controller actions are responsible for converting the request parameters into a response for the browser/user making the request. CakePHP uses conventions to automate this process and remove some boiler-plate code you would otherwise need to write.

By convention CakePHP renders a view with an inflected version of the action name. Returning to our online bakery example, our RecipesController might contain the `view()`, `share()`, and `search()` actions. The controller would be found in `/app/Controller/RecipesController.php` and contain:

```
<?php
# /app/Controller/RecipesController.php

class RecipesController extends AppController {
    public function view($id) {
        //action logic goes here..
    }
    public function share($customerId, $recipeId) {
        //action logic goes here..
    }

    public function search($query) {
        //action logic goes here..
    }
}
```

The view files for these actions would be `app/View/Recipes/view.ctp`, `app/View/Recipes/share.ctp`, and `app/View/Recipes/search.ctp`. The conventional view file name is the lower cased and underscored version of the action name.

Controller actions generally use `set()` to create a context that `View` uses to render the view. Because of the conventions that CakePHP uses, you don' need to create and render the view manually. Instead once a controller action has completed, CakePHP will handle rendering and delivering the View.

If for some reason you'd like to skip the default behavior. Both of the following techniques will by-pass the default view rendering behavior.

- If you return a string, or an object that can be converted to a string from your controller action, it will be used as the response body.
- You can return a `CakeResponse` object with the completely created response.

When controller methods are used with `requestAction()` you will often want to return data that isn't a string. If you have controller methods that are used for normal web requests + requestAction you should check the request type before returning:

```
<?php
class RecipesController extends AppController {
    public function popular() {
        $popular = $this->Recipe->popular();
        if (!empty($this->request->params['requested'])) {
            return $popular;
        }
        $this->set('popular', $popular);
    }
}
```

The above controller action is an example of how a method can be used with `requestAction()` and normal requests. Returning an array data to a non-requestAction request will cause errors and should be avoided. See the section on `Controller::requestAction()` for more tips on using `requestAction()`

In order for you to use a controller effectively in your own application, we'll cover some of the core attributes and methods provided by CakePHP's controllers.

Request Life-cycle callbacks

class Controller

CakePHP controllers come fitted with callbacks you can use to insert logic around the request life-cycle:

`Controller::`**`beforeFilter`**`()`

This function is executed before every action in the controller. It's a handy place to check for an active session or inspect user permissions.

Note: The beforeFilter() method will be called for missing actions, and scaffolded actions.

`Controller::`**`beforeRender`**`()`

Called after controller action logic, but before the view is rendered. This callback is not used often, but may be needed if you are calling render() manually before the end of a given action.

`Controller::`**`afterFilter`**`()`

Called after every controller action, and after rendering is complete. This is the last controller method to run.

In addition to controller life-cycle callbacks, *Components* also provide a similar set of callbacks.

Controller Methods

For a complete list of controller methods and their descriptions visit the CakePHP API. Check out http://api20.cakephp.org/class/controller.

Interacting with Views

Controllers interact with the view in a number of ways. First they are able to pass data to the views, using `set()`. You can also decide which view class to use, and which view file should be rendered from the controller.

`Controller::`**`set`**`(`*string $var*, *mixed $value*`)`

The `set()` method is the main way to send data from your controller to your view. Once you've used `set()`, the variable can be accessed in your view:

```
<?php
// First you pass data from the controller:

$this->set('color', 'pink');

// Then, in the view, you can utilize the data:
?>

You have selected <?php echo $color; ?> icing for the cake.
```

The `set()` method also takes an associative array as its first parameter. This can often be a quick way to assign a set of information to the view. Changed in version 1.3: Array keys will no longer be inflected before they are assigned to the view ('underscored_key' does not become 'underscoredKey' anymore, etc.):

```
<?php
$data = array(
    'color' => 'pink',
    'type' => 'sugar',
    'base_price' => 23.95
);

// make $color, $type, and $base_price
// available to the view:

$this->set($data);
```

The attribute `$pageTitle` no longer exists, use `set()` to set the title:

```
<?php
$this->set('title_for_layout', 'This is the page title');
```

`Controller::`**`render`**(*string $action*, *string $layout*, *string $file*)

The `render()` method is automatically called at the end of each requested controller action. This method performs all the view logic (using the data you've given in using the `set()` method), places the view inside its layout and serves it back to the end user.

The default view file used by render is determined by convention. If the `search()` action of the RecipesController is requested, the view file in /app/View/Recipes/search.ctp will be rendered:

```
<?php
class RecipesController extends AppController {
// ...
    public function search() {
        // Render the view in /View/Recipes/search.ctp
        $this->render();
    }
// ...
}
```

Although CakePHP will automatically call it (unless you've set `$this->autoRender` to false) after every action's logic, you can use it to specify an alternate view file by specifying an action name in the controller using `$action`.

If `$action` starts with '/' it is assumed to be a view or element file relative to the `/app/View` folder. This allows direct rendering of elements, very useful in ajax calls.

```
<?php
// Render the element in /View/Elements/ajaxreturn.ctp
$this->render('/Elements/ajaxreturn');
```

You can also specify an alternate view or element file using the third parameter, `$file`. The `$layout` parameter allows you to specify the layout the view is rendered in.

Rendering a specific view

In your controller you may want to render a different view than what would conventionally be done. You can do this by calling `render()` directly. Once you have called `render()` CakePHP will not try to re-render the view:

```
<?php
class PostsController extends AppController {
    public function my_action() {
        $this->render('custom_file');
    }
}
```

This would render `app/View/Posts/custom_file.ctp` instead of `app/View/Posts/my_action.ctp`

Flow Control

`Controller::`**`redirect`**(*mixed $url*, *integer $status*, *boolean $exit*)

The flow control method you'll use most often is `redirect()`. This method takes its first parameter in the form of a CakePHP-relative URL. When a user has successfully placed an order, you might wish to redirect them to a receipt screen.:

```
<?php
public function place_order() {
    // Logic for finalizing order goes here
    if ($success) {
        $this->redirect(array('controller' => 'orders', 'action' => 'thanks'));
    } else {
        $this->redirect(array('controller' => 'orders', 'action' => 'confirm'));
    }
}
```

You can also use a relative or absolute URL as the $url argument:

```
<?php
$this->redirect('/orders/thanks'));
$this->redirect('http://www.example.com');
```

You can also pass data to the action:

```
<?php
$this->redirect(array('action' => 'edit', $id));
```

The second parameter of `redirect()` allows you to define an HTTP status code to accompany the redirect. You may want to use 301 (moved permanently) or 303 (see other), depending on the nature of the redirect.

The method will issue an `exit()` after the redirect unless you set the third parameter to `false`.

If you need to redirect to the referer page you can use:

```
<?php
$this->redirect($this->referer());
```

The method also supports name based parameters. If you want to redirect to a URL like: `http://www.example.com/orders/confirm/product:pizza/quantity:5` you can use:

```
<?php
$this->redirect(array('controller' => 'orders', 'action' => 'confirm', 'product' => 'p
```

`Controller::`**`flash`**(*string $message*, *string $url*, *integer $pause*, *string $layout*)

Like `redirect()`, the `flash()` method is used to direct a user to a new page after an operation. The `flash()` method is different in that it shows a message before passing the user on to another URL.

The first parameter should hold the message to be displayed, and the second parameter is a CakePHP-relative URL. CakePHP will display the `$message` for `$pause` seconds before forwarding the user on.

If there's a particular template you'd like your flashed message to use, you may specify the name of that layout in the `$layout` parameter.

For in-page flash messages, be sure to check out SessionComponent's setFlash() method.

Callbacks

In addition to the *Request Life-cycle callbacks*. CakePHP also supports callbacks related to scaffolding.

`Controller::`**`beforeScaffold`**(*$method*)

$method name of method called example index, edit, etc.

`Controller::`**`afterScaffoldSave`**(*$method*)

$method name of method called either edit or update.

`Controller::`**`afterScaffoldSaveError`**(*$method*)

$method name of method called either edit or update.

`Controller::`**`scaffoldError`**(*$method*)

$method name of method called example index, edit, etc.

Other Useful Methods

`Controller::`**`constructClasses`**()

This method loads the models required by the controller. This loading process is done by CakePHP normally, but this method is handy to have when accessing controllers from a different perspective. If you need CakePHP in a command-line script or some other outside use, constructClasses() may come in handy.

`Controller::`**`referer`**(*mixed $default = null*, *boolean $local = false*)

Returns the referring URL for the current request. Parameter `$default` can be used to supply a default URL to use if HTTP_REFERER cannot be read from headers. So, instead of doing this:

```
<?php
class UserController extends AppController {
    public function delete($id) {
        // delete code goes here, and then...
        if ($this->referer() != '/') {
            $this->redirect($this->referer());
        } else {
            $this->redirect(array('action' => 'index'));
        }
    }
}
```

you can do this:

```
<?php
class UserController extends AppController {
    public function delete($id) {
        // delete code goes here, and then...
        $this->redirect($this->referer(array('action' => 'index')));
    }
}
```

If `$default` is not set, the function defaults to the root of your domain - '/'.

Parameter `$local` if set to `true`, restricts referring URLs to local server.

`Controller::`**`disableCache`**`()`

Used to tell the user's **browser** not to cache the results of the current request. This is different than view caching, covered in a later chapter.

The headers sent to this effect are:

```
Expires: Mon, 26 Jul 1997 05:00:00 GMT
Last-Modified: [current datetime] GMT
Cache-Control: no-store, no-cache, must-revalidate
Cache-Control: post-check=0, pre-check=0
Pragma: no-cache
```

`Controller::`**`postConditions`**`(`*array $data*, *mixed $op*, *string $bool*, *boolean $exclusive*`)`

Use this method to turn a set of POSTed model data (from HtmlHelper-compatible inputs) into a set of find conditions for a model. This function offers a quick shortcut on building search logic. For example, an administrative user may want to be able to search orders in order to know which items need to be shipped. You can use CakePHP's `FormHelper` and `HtmlHelper` to create a quick form based on the Order model. Then a controller action can use the data posted from that form to craft find conditions:

```
<?php
public function index() {
    $conditions = $this->postConditions($this->request->data);
    $orders = $this->Order->find('all', compact('conditions'));
    $this->set('orders', $orders);
}
```

If `$this->request->data['Order']['destination']` equals "Old Towne Bakery", postConditions converts that condition to an array compatible for use in a Model->find() method. In this case, `array('Order.destination' => 'Old Towne Bakery')`.

If you want to use a different SQL operator between terms, supply them using the second parameter:

```php
<?php
/*
Contents of $this->request->data
array(
    'Order' => array(
        'num_items' => '4',
        'referrer' => 'Ye Olde'
    )
)
*/

// Let's get orders that have at least 4 items and contain 'Ye Olde'
$conditions = $this->postConditions(
    $this->request->data,
    array(
        'num_items' => '>=',
        'referrer' => 'LIKE'
    )
);
$orders = $this->Order->find('all', compact('conditions'));
```

The third parameter allows you to tell CakePHP what SQL boolean operator to use between the find conditions. Strings like 'AND', 'OR' and 'XOR' are all valid values.

Finally, if the last parameter is set to true, and the $op parameter is an array, fields not included in $op will not be included in the returned conditions.

`Controller::`**`paginate`**`()`

This method is used for paginating results fetched by your models. You can specify page sizes, model find conditions and more. See the *pagination* section for more details on how to use paginate.

`Controller::`**`requestAction`**`(`*string $url*, *array $options*`)`

This function calls a controller's action from any location and returns data from the action. The `$url` passed is a CakePHP-relative URL (/controllername/actionname/params). To pass extra data to the receiving controller action add to the $options array.

Note: You can use `requestAction()` to retrieve a fully rendered view by passing 'return' in the options: `requestAction($url, array('return'));`. It is important to note that making a requestAction using 'return' from a controller method can cause script and css tags to not work correctly.

Warning: If used without caching `requestAction` can lead to poor performance. It is rarely appropriate to use in a controller or model.

`requestAction` is best used in conjunction with (cached) elements – as a way to fetch data for an element before rendering. Let's use the example of putting a "latest comments" element in the layout.

First we need to create a controller function that will return the data:

```
<?php
// Controller/CommentsController.php
class CommentsController extends AppController {
    public function latest() {
        if (empty($this->request->params['requested'])) {
            throw new ForbiddenException();
        }
        return $this->Comment->find('all', array('order' => 'Comment.created DESC', 'l
    }
}
```

You should always include checks to make sure your requestAction methods are actually originating from `requestAction`. Failing to do so will allow requestAction methods to be directly accessible from a URL, which is generally undesirable.

If we now create a simple element to call that function:

```
<?php
// View/Elements/latest_comments.ctp

$comments = $this->requestAction('/comments/latest');
foreach ($comments as $comment) {
    echo $comment['Comment']['title'];
}
```

We can then place that element anywhere to get the output using:

```
<?php
echo $this->element('latest_comments');
```

Written in this way, whenever the element is rendered, a request will be made to the controller to get the data, the data will be processed, and returned. However in accordance with the warning above it's best to make use of element caching to prevent needless processing. By modifying the call to element to look like this:

```
<?php
echo $this->element('latest_comments', array('cache' => '+1 hour'));
```

The `requestAction` call will not be made while the cached element view file exists and is valid.

In addition, requestAction now takes array based cake style urls:

```
<?php
echo $this->requestAction(
    array('controller' => 'articles', 'action' => 'featured'),
    array('return')
);
```

This allows the requestAction call to bypass the usage of Router::url which can increase performance. The url based arrays are the same as the ones that `HtmlHelper::link()` uses with one difference - if you are using named or passed parameters, you must put them in a second array and wrap them with the correct key. This is because requestAction merges the named args array (requestAction's 2nd parameter) with the Controller::params member array and does not explicitly place the named args array into the key 'named'; Additional members in the `$option` array will also be made available in the requested action's Controller::params array:

```
<?php
echo $this->requestAction('/articles/featured/limit:3');
echo $this->requestAction('/articles/view/5');
```

As an array in the requestAction would then be:

```
<?php
echo $this->requestAction(
    array('controller' => 'articles', 'action' => 'featured'),
    array('named' => array('limit' => 3))
);

echo $this->requestAction(
    array('controller' => 'articles', 'action' => 'view'),
    array('pass' => array(5))
);
```

Note: Unlike other places where array urls are analogous to string urls, requestAction treats them differently.

When using an array url in conjunction with requestAction() you must specify **all** parameters that you will need in the requested action. This includes parameters like `$this->request->data`. In addition to passing all required parameters, named and pass parameters must be done in the second array as seen above.

`Controller::`**`loadModel`**(*string $modelClass*, *mixed $id*)

The `loadModel` function comes handy when you need to use a model which is not the controller's default model or its associated model:

```
<?php
$this->loadModel('Article');
$recentArticles = $this->Article->find('all', array('limit' => 5, 'order' => 'Article.

$this->loadModel('User', 2);
$user = $this->User->read();
```

Controller Attributes

For a complete list of controller attributes and their descriptions visit the CakePHP API. Check out http://api20.cakephp.org/class/controller.

property `Controller::$`**`name`**

The `$name` attribute should be set to the name of the controller. Usually this is just the plural form of the primary model the controller uses. This property is not required, but saves CakePHP from inflecting it:

```
<?php
// $name controller attribute usage example
class RecipesController extends AppController {
   public $name = 'Recipes';
}
```

$components, $helpers and $uses

The next most often used controller attributes tell CakePHP what helpers, components, and models you'll be using in conjunction with the current controller. Using these attributes make MVC classes given by `$components` and `$uses` available to the controller as class variables (`$this->ModelName`, for example) and those given by `$helpers` to the view as an object reference variable (`$this->{$helpername}`).

Note: Each controller has some of these classes available by default, so you may not need to configure your controller at all.

---

property `Controller::$`**`uses`**

Controllers have access to their primary model available by default. Our RecipesController will have the Recipe model class available at `$this->Recipe`, and our ProductsController also features the Product model at `$this->Product`. However, when allowing a controller to access additional models through the `$uses` variable, the name of the current controller's model must also be included. This is illustrated in the example below.

If you do not wish to use a Model in your controller, set `public $uses = array()`. This will allow you to use a controller without a need for a corresponding Model file. However, the models defined in the `AppController` will still be loaded. You can also use `false` to not load any models at all. Even those defined in the `AppController` Changed in version 2.1: Uses now has a new default value, it also handles `false` differently.

property `Controller::$`**`helpers`**

The Html, Form, and Session Helpers are available by default, as is the SessionComponent. But if you choose to define your own `$helpers` array in AppController, make sure to include `Html` and `Form` if you want them still available by default in your Controllers. To learn more about these classes, be sure to check out their respective sections later in this manual.

Let's look at how to tell a CakePHP controller that you plan to use additional MVC classes:

```
<?php
class RecipesController extends AppController {
    public $uses = array('Recipe', 'User');
    public $helpers = array('Js');
    public $components = array('RequestHandler');
}
```

Each of these variables are merged with their inherited values, therefore it is not necessary (for example) to redeclare the Form helper, or anything that is declared in your App controller.

property `Controller::$`**`components`**

The components array allows you to set which *Components* a controller will use. Like `$helpers` and `$uses` components in your controllers are merged with those in `AppController`. As with `$helpers` you can pass settings into components. See *Configuring Components* for more information.

Other Attributes

While you can check out the details for all controller attributes in the API, there are other controller attributes that merit their own sections in the manual.

More on controllers

Request and Response objects

New in CakePHP 2.0 are request and response objects. In previous versions these objects were represented through arrays, and the related methods were spread across `RequestHandlerComponent`, `Router`, `Dispatcher` and `Controller`. There was no authoritative object on what information the request contained. For 2.0, `CakeRequest` and `CakeResponse` are used for this purpose.

CakeRequest

`CakeRequest` is the default request object used in CakePHP. It centralizes a number of features for interrogating and interacting with request data. On each request one CakeRequest is created and then passed by reference to the various layers of an application that use request data. By default `CakeRequest` is assigned to `$this->request`, and is available in Controller, Views and Helpers. You can also access it in Components by using the controller reference. Some of the duties `CakeRequest` performs include:

- Process the GET, POST, and FILES arrays into the data structures you are familiar with.
- Provide environment introspection pertaining to the request. Things like the headers sent, the client's IP address, and the subdomain/domain information about the application the server is running on.
- Provide access to request parameters both as array indices and object properties.

Accessing request parameters

CakeRequest exposes several interfaces for accessing request parameters. The first is as array indexes, the second is through `$this->request->params`, and the third is as object properties:

```php
<?php
$this->request['controller'];
$this->request->controller;
$this->request->params['controller'];
```

All of the above will both access the same value. Multiple ways of accessing the parameters was done to ease migration for existing applications. All *Route elements* are accessed through this interface.

In addition to *Route elements* you also often need access to *Passed arguments* and *Named parameters*. These are both available on the request object as well:

```
<?php
// Passed arguments
$this->request['pass'];
$this->request->pass;
$this->request->params['pass'];

// named parameters
$this->request['named'];
$this->request->named;
$this->request->params['named'];
```

Will all provide you access to the passed arguments and named parameters. There are several important/useful parameters that CakePHP uses internally, these are also all found in the request parameters:

- `plugin` The plugin handling the request, will be null for no plugin.
- `controller` The controller handling the current request.
- `action` The action handling the current request.
- `prefix` The prefix for the current action. See *Prefix Routing* for more information.
- `bare` Present when the request came from requestAction() and included the bare option. Bare requests do not have layouts rendered.
- `requested` Present and set to true when the action came from requestAction.

Accessing Querystring parameters

Querystring parameters can be read from using `CakeRequest::$query`:

```
<?php
// url is /posts/index?page=1&sort=title
$this->request->query['page'];

// You can also access it via array access
$this->request['url']['page'];
```

Accessing POST data

All POST data can be accessed using `CakeRequest::$data`. Any form data that contains a `data` prefix, will have that data prefix removed. For example:

```
<?php
// An input with a name attribute equal to 'data[Post][title]' is accessible at
$this->request->data['Post']['title'];
```

You can either directly access the data property, or you can use `CakeRequest::data()` to read the data array in an error free manner. Any keys that do not exist will return `null`:

```php
<?php
$foo = $this->request->data('Value.that.does.not.exist');
// $foo == null
```

Accessing PUT or POST data

New in version 2.2. When building REST services you often accept request data on `PUT` and `DELETE` requests. As of 2.2 any `application/x-www-form-urlencoded` request body data will automatically be parsed and set to `$this->data` for `PUT` and `DELETE` requests. If you are accepting JSON or XML data, see below for how you can access those request bodies.

Accessing XML or JSON data

Applications employing *REST* often exchange data in non URL encoded post bodies. You can read input data in any format using `CakeRequest::input()`. By providing a decoding function you can receive the content in a deserialized format:

```php
<?php
// Get JSON encoded data submitted to a PUT/POST action
$data = $this->request->input('json_decode');
```

Since some deserializing methods require additional parameters when being called, such as the 'as array' parameter on `json_decode` or if you want XML converted into a DOMDocument object, `CakeRequest::input()` supports passing in additional parameters as well:

```php
<?php
// Get Xml encoded data submitted to a PUT/POST action
$data = $this->request->input('Xml::build', array('return' => 'domdocument'));
```

Accessing path information

CakeRequest also provides useful information about the paths in your application. `CakeRequest::$base` and `CakeRequest::$webroot` are useful for generating urls, and determining whether or not your application is in a subdirectory.

Inspecting the request

Detecting various request conditions used to require using `RequestHandlerComponent`. These methods have been moved to `CakeRequest`, and offer a new interface alongside a more backwards compatible usage:

```php
<?php
$this->request->is('post');
$this->request->isPost();
```

Both method calls will return the same value. For the time being the methods are still available on RequestHandler, but are deprecated and still might be removed before the final release. You can also easily extend the request detectors that are available, by using `CakeRequest::addDetector()` to create new kinds of detectors. There are four different types of detectors that you can create:

- Environment value comparison - An environment value comparison, compares a value fetched from `env()` to a known value the environment value is equality checked against the provided value.
- Pattern value comparison - Pattern value comparison allows you to compare a value fetched from `env()` to a regular expression.
- Option based comparison - Option based comparisons use a list of options to create a regular expression. Subsequent calls to add an already defined options detector will merge the options.
- Callback detectors - Callback detectors allow you to provide a 'callback' type to handle the check. The callback will receive the request object as its only parameter.

Some examples would be:

```
<?php
// Add an environment detector.
$this->request->addDetector('post', array('env' => 'REQUEST_METHOD', 'value' => 'POST'));

// Add a pattern value detector.
$this->request->addDetector('iphone', array('env' => 'HTTP_USER_AGENT', 'pattern' => '/iPho

// Add an option detector
$this->request->addDetector('internalIp', array(
    'env' => 'CLIENT_IP',
    'options' => array('192.168.0.101', '192.168.0.100')
));

// Add a callback detector. Can either be an anonymous function or a regular callable.
$this->request->addDetector('awesome', array('callback' => function ($request) {
    return isset($request->awesome);
}));
```

`CakeRequest` also includes methods like `CakeRequest::domain()`, `CakeRequest::subdomains()` and `CakeRequest::host()` to help applications with subdomains, have a slightly easier life.

There are several built-in detectors that you can use:

- `is('get')` Check to see if the current request is a GET.
- `is('put')` Check to see if the current request is a PUT.
- `is('post')` Check to see if the current request is a POST.
- `is('delete')` Check to see if the current request is a DELETE.
- `is('head')` Check to see if the current request is HEAD.
- `is('options')` Check to see if the current request is OPTIONS.
- `is('ajax')` Check to see of the current request came with X-Requested-with = XmlHttpRequest.
- `is('ssl')` Check to see if the request is via SSL
- `is('flash')` Check to see if the request has a User-Agent of Flash

- `is('mobile')` Check to see if the request came from a common list of mobile agents.

CakeRequest and RequestHandlerComponent

Since many of the features `CakeRequest` offers used to be the realm of `RequestHandlerComponent` some rethinking was required to figure out how it still fits into the picture. For 2.0, `RequestHandlerComponent` acts as a sugar daddy. Providing a layer of sugar on top of the utility *CakeRequest* affords. Sugar like switching layout and views based on content types or ajax is the domain of `RequestHandlerComponent`. This separation of utility and sugar between the two classes lets you more easily pick and choose what you want and what you need.

Interacting with other aspects of the request

You can use *CakeRequest* to introspect a variety of things about the request. Beyond the detectors, you can also find out other information from various properties and methods.

- `$this->request->webroot` contains the webroot directory.
- `$this->request->base` contains the base path.
- `$this->request->here` contains the full address to the current request
- `$this->request->query` contains the query string parameters.

CakeRequest API

class `CakeRequest`

CakeRequest encapsulates request parameter handling, and introspection.

`CakeRequest::`**`domain`**`()`

Returns the domain name your application is running on.

`CakeRequest::`**`subdomains`**`()`

Returns the subdomains your application is running on as an array.

`CakeRequest::`**`host`**`()`

Returns the host your application is on.

`CakeRequest::`**`method`**`()`

Returns the HTTP method the request was made with.

`CakeRequest::`**`onlyAllow`**`()`

Set allowed HTTP methods, if not matched will throw MethodNotAllowexException The 405 response will include the required 'Allow' header with the passed methods

`CakeRequest::`**`referer`**`()`

Returns the referring address for the request.

`CakeRequest::`**`clientIp`**`()`

Returns the current visitor's IP address.

`CakeRequest::`**`header`**`()`

Allows you to access any of the `HTTP_*` headers that were used for the request:

```
<?php
$this->request->header('User-Agent');
```

Would return the user agent used for the request.

`CakeRequest::`**`input`**`(`*$callback*[, *$options*]`)`

Retrieve the input data for a request, and optionally pass it through a decoding function. Additional parameters for the decoding function can be passed as arguments to input().

`CakeRequest::`**`data`**`(`*$key*`)`

Provides dot notation access to request data. Allows for reading and modification of request data, calls can be chained together as well:

```
<?php
// Modify some request data, so you can prepopulate some form fields.
$this->request->data('Post.title', 'New post')
    ->data('Comment.1.author', 'Mark');

// You can also read out data.
$value = $this->request->data('Post.title');
```

`CakeRequest::`**`is`**`(`*$check*`)`

Check whether or not a Request matches a certain criteria. Uses the built-in detection rules as well as any additional rules defined with `CakeRequest::addDetector()`.

`CakeRequest::`**`addDetector`**`(`*$name*, *$callback*`)`

Add a detector to be used with is(). See *Inspecting the request* for more information.

`CakeRequest::`**`accepts`**`(`*$type*`)`

Find out which content types the client accepts or check if they accept a particular type of content.

Get all types:

```
<?php
$this->request->accepts();
```

Check for a single type:

```
<?php
$this->request->accepts('application/json');
```

static `CakeRequest::`**`acceptLanguage`**`(`*$language*`)`

Get either all the languages accepted by the client, or check if a specific language is accepted.

Get the list of accepted languages:

```
<?php
CakeRequest::acceptLanguage();
```

Check if a specific language is accepted:

```
<?php
CakeRequest::acceptLanguage('es-es');
```

property `CakeRequest::$`**`data`**
An array of POST data. You can use `CakeRequest::data()` to read this property in a way that suppresses notice errors.

property `CakeRequest::$`**`query`**
An array of query string parameters.

property `CakeRequest::$`**`params`**
An array of route elements and request parameters.

property `CakeRequest::$`**`here`**
Returns the current request uri.

property `CakeRequest::$`**`base`**
The base path to the application, usually `/` unless your application is in a subdirectory.

property `CakeRequest::$`**`webroot`**
The current webroot.

CakeResponse

`CakeResponse` is the default response class in CakePHP. It encapsulates a number of features and functionality for generating HTTP responses in your application. It also assists in testing, as it can be mocked/stubbed allowing you to inspect headers that will be sent. Like `CakeRequest`, `CakeResponse` consolidates a number of methods previously found on `Controller`, `RequestHandlerComponent` and `Dispatcher`. The old methods are deprecated in favour of using `CakeResponse`.

`CakeResponse` provides an interface to wrap the common response related tasks such as:

- Sending headers for redirects.
- Sending content type headers.
- Sending any header.
- Sending the response body.

Changing the response class

CakePHP uses `CakeResponse` by default. `CakeResponse` is a flexible and transparent to use class. But if you need to replace it with an application specific class, you can override and replace `CakeResponse` with your own class. By replacing the CakeResponse used in index.php.

This will make all the controllers in your application use `CustomResponse` instead of `CakeResponse`. You can also replace the response instance used by setting `$this->response` in your controllers. Overriding the response object is handy during testing, as it allows you to stub out the methods that interact with `header()`. See the section on *CakeResponse and testing* for more information.

Dealing with content types

You can control the Content-Type of your application's responses with using `CakeResponse::type()`. If your application needs to deal with content types that are not built into CakeResponse, you can map those types with `type()` as well:

```
<?php
// Add a vCard type
$this->response->type(array('vcf' => 'text/v-card'));

// Set the response Content-Type to vcard.
$this->response->type('vcf');
```

Usually you'll want to map additional content types in your controller's `beforeFilter` callback, so you can leverage the automatic view switching features of `RequestHandlerComponent` if you are using it.

Sending attachments

There are times when you want to send Controller responses as files for download. You can either accomplish this using *Media Views* or by using the features of `CakeResponse`. `CakeResponse::download()` allows you to send the response as file for download:

```
<?php
public function sendFile($id) {
    $this->autoRender = false;

    $file = $this->Attachment->getFile($id);
    $this->response->type($file['type']);
    $this->response->download($file['name']);
    $this->response->body($file['content']);
}
```

The above shows how you could use CakeResponse to generate a file download response without using `MediaView`. In general you will want to use MediaView as it provides a few additional features above what CakeResponse does.

Setting headers

Setting headers is done with the `CakeResponse::header()` method. It can be called with a few different parameter configurations:

```
<?php
// Set a single header
$this->response->header('Location', 'http://example.com');

// Set multiple headers
$this->response->header(array('Location' => 'http://example.com', 'X-Extra' => 'My header'
$this->response->header(array('WWW-Authenticate: Negotiate', 'Content-type: application/pd
```

Setting the same header multiple times will result in overwriting the previous values, just like regular header calls. Headers are not sent when `CakeResponse::header()` is called either. They are just buffered until the response is actually sent.

Interacting with browser caching

You sometimes need to force browsers to not cache the results of a controller action. `CakeResponse::disableCache()` is intended for just that:

```
<?php
public function index() {
    // do something.
    $this->response->disableCache();
}
```

Warning: Using disableCache() with downloads from SSL domains while trying to send files to Internet Explorer can result in errors.

You can also tell clients that you want them to cache responses. By using `CakeResponse::cache()`:

```
<?php
public function index() {
    //do something
    $this->response->cache('-1 minute', '+5 days');
}
```

The above would tell clients to cache the resulting response for 5 days, hopefully speeding up your visitors' experience. `cache()` sets the Last-Modified value to the first argument. Expires, and Max-age are set based on the second parameter. Cache-Control is set to public as well.

Fine tuning HTTP cache

One of the best and easiest ways of speeding up your application is using HTTP cache. Under this caching model you are only required to help clients decide if they should use a cached copy of the response by setting a few headers such as modified time, response entity tag and others.

Opposed to having to code the logic for caching and for invalidating (refreshing) it once the data has changed, HTTP uses two models, expiration and validation which usually are a lot simpler than having to manage the cache yourself.

Apart from using `CakeResponse::cache()` you can also use many other methods to fine tune HTTP cache headers to take advantage of browser or reverse proxy caching.

The Cache Control header

New in version 2.1. Used under the expiration model, this header contains multiple indicators which can change the way browsers or proxies use the cached content. A Cache-Control header can look like this:

```
Cache-Control: private, max-age=3600, must-revalidate
```

`CakeResponse` class helps you set this header with some utility methods that will produce a final valid Cache-Control header. First of them is `CakeResponse::sharable()` method, which indicates whether a response in to be considered sharable across different users or clients or users. This method actually controls the *public* or *private* part of this header. Setting a response as private indicates that all or part of it is intended for a single user. To take advantage of shared caches it is needed to set the control directive as public

Second parameter of this method is used to specify a *max-age* for the cache, which is the number of seconds after which the response is no longer considered fresh.:

```
<?php
public function view() {
    ...
    // set the Cache-Control as public for 3600 seconds
    $this->response->sharable(true, 3600);
}

public function my_data() {
    ...
    // set the Cache-Control as private for 3600 seconds
    $this->response->sharable(false, 3600);
}
```

`CakeResponse` exposes separate methods for setting each of the components in the Cache-Control header.

The Expiration header

New in version 2.1. Also under the cache expiration model, you can set the *Expires* header, which according to the HTTP specification is the date/time after which the response is no longer considered fresh. This header can be set using the `CakeResponse::expires()` method:

```
<?php
public function view() {
    $this->response->expires('+5 days');
}
```

This method also accepts a DateTime or any string that can be parsed by the DateTime class.

The Etag header

New in version 2.1. Cache validation in HTTP is often used when content is constantly changing, and asks the application to only generate the response contents if the cache is no longer fresh. Under this model, the client continues to store pages in the cache, but instead of using it directly, it asks the application every time whether the resources changed or not. This is commonly used with static resources such as images and other assets.

The Etag header (called entity tag) is string that uniquely identifies the requested resource. It is very much like the checksum of a file, caching will compare checksums to tell whether they match or not.

To actually get advantage of using this header you have to either call manually `CakeResponse::checkNotModified()` method or have the `RequestHandlerComponent` included in your controller:

```php
<?php
public function index() {
    $articles = $this->Article->find('all');
    $this->response->etag($this->Article->generateHash($articles));
    if ($this->response->checkNotModified($this->request)) {
        return $this->response;
    }
    ...
}
```

The Last Modified header

New in version 2.1. Also under the HTTP cache validation model, you can set the *Last-Modified* header to indicate the date and time at which the resource was modified for the last time. Setting this header helps CakePHP respond to caching clients whether the response was modified or not based on the client cache.

To actually get advantage of using this header you have to either call manually `CakeResponse::checkNotModified()` method or have the `RequestHandlerComponent` included in your controller:

```php
<?php
public function view() {
    $article = $this->Article->find('first');
    $this->response->modified($article['Article']['modified']);
    if ($this->response->checkNotModified($this->request)) {
        return $this->response;
    }
    ...
}
```

The Vary header

In some cases you might want to serve different contents using the same url. This is often the case when you have a multilingual page or respond with different HTML according to the browser that is requesting the resource. For such circumstances, you use the Vary header:

```php
<?php
    $this->response->vary('User-Agent');
    $this->response->vary('Accept-Encoding', 'User-Agent');
    $this->response->vary('Accept-Language');
```

CakeResponse and testing

Probably one of the biggest wins from `CakeResponse` comes from how it makes testing controllers and components easier. Instead of methods spread across several objects, you only have a single object to mock as controllers and components delegate to `CakeResponse`. This helps you get closer to a 'unit' test and makes testing controllers easier:

```php
<?php
public function testSomething() {
    $this->controller->response = $this->getMock('CakeResponse');
    $this->controller->response->expects($this->once())->method('header');
    // ...
}
```

Additionally you can more easily run tests from the command line, as you can use mocks to avoid the 'headers sent' errors that can come up from trying to set headers in CLI.

CakeResponse API

class `CakeResponse`

CakeResponse provides a number of useful methods for interacting with the response you are sending to a client.

`CakeResponse::`**`header`**`()`

Allows you to directly set one or many headers to be sent with the response.

`CakeResponse::`**`charset`**`()`

Sets the charset that will be used in the response.

`CakeResponse::`**`type`**`(`*$type*`)`

Sets the content type for the response. You can either use a known content type alias or the full content type name.

`CakeResponse::`**`cache`**`()`

Allows you to set caching headers in the response.

`CakeResponse::`**`disableCache`**`()`

Sets the headers to disable client caching for the response.

`CakeResponse::`**`sharable`**`(`*$isPublic*, *$time*`)`

Sets the Cache-Control header to be either *public* or *private* and optionally sets a *max-age* directive of the resource New in version 2.1.

`CakeResponse::`**`expires`**`(`*$date*`)`

Allows to set the *Expires* header to a specific date. New in version 2.1.

`CakeResponse::`**`etag`**`(`*$tag*, *$weak*`)`

Sets the *Etag* header to uniquely identify a response resource. New in version 2.1.

`CakeResponse::`**`modified`**`(`*$time*`)`

Sets the *Last-Modified* header to a specific date and time in the correct format. New in version 2.1.

`CakeResponse::`**`checkNotModified`**`(`*CakeRequest $request*`)`

Compares the cache headers for the request object with the cache header from the response and determines if it can still be considered fresh. In that case deletes any response contents and sends the *304 Not Modified* header. New in version 2.1.

`CakeResponse::`**`compress`**`()`
: Turns on gzip compression for the request.

`CakeResponse::`**`download`**`()`
: Allows you to send the response as an attachment and set the filename.

`CakeResponse::`**`statusCode`**`()`
: Allows you to set the status code for the response.

`CakeResponse::`**`body`**`()`
: Set the content body for the response.

`CakeResponse::`**`send`**`()`
: Once you are done creating a response, calling send() will send all the set headers as well as the body. This is done automatically at the end of each request by `Dispatcher`

Scaffolding

Application scaffolding is a technique that allows a developer to define and create a basic application that can create, retrieve, update and delete objects. Scaffolding in CakePHP also allows developers to define how objects are related to each other, and to create and break those links.

All that's needed to create a scaffold is a model and its controller. Once you set the $scaffold variable in the controller, you're up and running.

CakePHP's scaffolding is pretty cool. It allows you to get a basic CRUD application up and going in minutes. It's so cool that you'll want to use it in production apps. Now, we think it's cool too, but please realize that scaffolding is... well... just scaffolding. It's a loose structure you throw up real quick during the beginning of a project in order to get started. It isn't meant to be completely flexible, it's meant as a temporary way to get up and going. If you find yourself really wanting to customize your logic and your views, it's time to pull your scaffolding down in order to write some code. CakePHP's Bake console, covered in the next section, is a great next step: it generates all the code that would produce the same result as the most current scaffold.

Scaffolding is a great way of getting the early parts of developing a web application started. Early database schemas are subject to change, which is perfectly normal in the early part of the design process. This has a downside: a web developer hates creating forms that never will see real use. To reduce the strain on the developer, scaffolding has been included in CakePHP. Scaffolding analyzes your database tables and creates standard lists with add, delete and edit buttons, standard forms for editing and standard views for inspecting a single item in the database.

To add scaffolding to your application, in the controller, add the $scaffold variable:

```php
<?php
class CategoriesController extends AppController {
    public $scaffold;
}
```

Assuming you've created even the most basic Category model class file (in /app/Model/Category.php), you're ready to go. Visit http://example.com/categories to see your new scaffold.

Note: Creating methods in controllers that are scaffolded can cause unwanted results. For example, if you create an index() method in a scaffolded controller, your index method will be rendered rather than the scaffolding functionality.

Scaffolding is knowledgeable about model associations, so if your Category model belongsTo a User, you'll see related User IDs in the Category listings. While scaffolding "knows" about model associations, you will not see any related records in the scaffold views until you manually add the association code to the model. For example, if Group hasMany User and User belongsTo Group, you have to manually add the following code in your User and Group models. Before you add the following code, the view displays an empty select input for Group in the New User form. After you add the following code, the view displays a select input populated with IDs or names from the Group table in the New User form:

```php
<?php
// In Group.php
public $hasMany = 'User';
// In User.php
public $belongsTo = 'Group';
```

If you'd rather see something besides an ID (like the user's first name), you can set the $displayField variable in the model. Let's set the $displayField variable in our User class so that users related to categories will be shown by first name rather than just an ID in scaffolding. This feature makes scaffolding more readable in many instances:

```php
<?php
class User extends AppModel {
    public $name = 'User';
    public $displayField = 'first_name';
}
```

Creating a simple admin interface with scaffolding

If you have enabled admin routing in your app/Config/core.php, with `Configure::write('Routing.prefixes', array('admin'));` you can use scaffolding to generate an admin interface.

Once you have enabled admin routing assign your admin prefix to the scaffolding variable:

```php
<?php
public $scaffold = 'admin';
```

You will now be able to access admin scaffolded actions:

```
http://example.com/admin/controller/index
http://example.com/admin/controller/view
http://example.com/admin/controller/edit
http://example.com/admin/controller/add
http://example.com/admin/controller/delete
```

This is an easy way to create a simple backend interface quickly. Keep in mind that you cannot have both admin and non-admin methods scaffolded at the same time. As with normal scaffolding you can override individual methods and replace them with your own:

```
<?php
public function admin_view($id = null) {
  // custom code here
}
```

Once you have replaced a scaffolded action you will need to create a view file for the action as well.

Customizing Scaffold Views

If you're looking for something a little different in your scaffolded views, you can create templates. We still don't recommend using this technique for production applications, but such a customization may be useful during prototyping iterations.

Custom scaffolding views for a specific controller (PostsController in this example) should be placed like so:

```
/app/View/Posts/scaffold.index.ctp
/app/View/Posts/scaffold.form.ctp
/app/View/Posts/scaffold.view.ctp
```

Custom scaffolding views for all controllers should be placed like so:

```
/app/View/Scaffolds/index.ctp
/app/View/Scaffolds/form.ctp
/app/View/Scaffolds/view.ctp
```

The Pages Controller

CakePHP ships with a default controller `PagesController.php`. This is a simple and optional controller for serving up static content. The home page you see after installation is generated using this controller. If you make the view file `app/View/Pages/about_us.ctp` you can access it using the url `http://example.com/pages/about_us`. You are free to modify the Pages Controller to meet your needs.

When you "bake" an app using CakePHP's console utility the Pages Controller is created in your `app/Controller/` folder. You can also copy the file from `lib/Cake/Console/Templates/skel/Controller/PagesController.php`.
Changed in version 2.1: With CakePHP 2.0 the Pages Controller was part of `lib/Cake`. Since 2.1 the Pages Controller is no longer part of the core but ships in the app folder.

Warning: Do not directly modify ANY file under the `lib/Cake` folder to avoid issues when updating the core in future.

Components

Components are packages of logic that are shared between controllers. If you find yourself wanting to copy and paste things between controllers, you might consider wrapping some functionality in a component.

CakePHP also comes with a fantastic set of core components you can use to aid in:

- Security
- Sessions
- Access control lists
- Emails
- Cookies
- Authentication
- Request handling
- Pagination

Each of these core components are detailed in their own chapters. For now, we'll show you how to create your own components. Creating components keeps controller code clean and allows you to reuse code between projects.

Configuring Components

Many of the core components require configuration. Some examples of components requiring configuration are *Authentication*, *Cookie* and *EmailComponent*. Configuration for these components, and for components in general, is usually done in the `$components` array or your controller's `beforeFilter()` method:

```
<?php
class PostsController extends AppController {
    public $components = array(
        'Auth' => array(
            'authorize' => array('controller'),
            'loginAction' => array('controller' => 'users', 'action' => 'login')
        ),
        'Cookie' => array('name' => 'CookieMonster')
    );
```

Would be an example of configuring a component with the `$components` array. All core components allow their configuration settings to be set in this way. In addition you can configure components in your controller's `beforeFilter()` method. This is useful when you need to assign the results of a function to a component property. The above could also be expressed as:

```
<?php
public function beforeFilter() {
    $this->Auth->authorize = array('controller');
    $this->Auth->loginAction = array('controller' => 'users', 'action' => 'login');

    $this->Cookie->name = 'CookieMonster';
}
```

It's possible, however, that a component requires certain configuration options to be set before the controller's `beforeFilter()` is run. To this end, some components allow configuration options be set in the `$components` array:

```
<?php
public $components = array(
    'DebugKit.Toolbar' => array('panels' => array('history', 'session'))
);
```

Consult the relevant documentation to determine what configuration options each component provides.

One common setting to use is the `className` option, which allows you to alias components. This feature is useful when you want to replace `$this->Auth` or another common Component reference with a custom implementation:

```
<?php
// app/Controller/PostsController.php
class PostsController extends AppController {
    public $components = array(
        'Auth' => array(
            'className' => 'MyAuth'
        )
    );
}

// app/Controller/Component/MyAuthComponent.php
App::uses('AuthComponent', 'Controller/Component');
class MyAuthComponent extends AuthComponent {
    // Add your code to override the core AuthComponent
}
```

The above would *alias* `MyAuthComponent` to `$this->Auth` in your controllers.

Note: Aliasing a component replaces that instance anywhere that component is used, including inside other Components.

Using Components

Once you've included some components in your controller, using them is pretty simple. Each component you use is exposed as a property on your controller. If you had loaded up the `SessionComponent` and the `CookieComponent` in your controller, you could access them like so:

```
<?php
class PostsController extends AppController {
    public $components = array('Session', 'Cookie');

    public function delete() {
        if ($this->Post->delete($this->request->data('Post.id')) {
            $this->Session->setFlash('Post deleted.');
            $this->redirect(array('action' => 'index'));
        }
    }
```

Note: Since both Models and Components are added to Controllers as properties they share the same 'namespace'. Be sure to not give a component and a model the same name.

Loading components on the fly

You might not need all of your components available on every controller action. In situations like this you can load a component at runtime using the *Component Collection*. From inside a controller you can do the following:

```
<?php
$this->OneTimer = $this->Components->load('OneTimer');
$this->OneTimer->getTime();
```

Component Callbacks

Components also offer a few request life-cycle callbacks that allow them to augment the request cycle. See the base *Component API* for more information on the callbacks components offer.

Creating a Component

Suppose our online application needs to perform a complex mathematical operation in many different parts of the application. We could create a component to house this shared logic for use in many different controllers.

The first step is to create a new component file and class. Create the file in `/app/Controller/Component/MathComponent.php`. The basic structure for the component would look something like this:

```
<?php
App::uses('Component', 'Controller');
class MathComponent extends Component {
    public function doComplexOperation($amount1, $amount2) {
        return $amount1 + $amount2;
    }
}
```

Note: All components must extend `Component`. Failing to do this will trigger an exception.

Including your component in your controllers

Once our component is finished, we can use it in the application's controllers by placing the component's name (minus the "Component" part) in the controller's `$components` array. The controller will automatically be given a new attribute named after the component, through which we can access an instance of it:

```
<?php
/* Make the new component available at $this->Math,
as well as the standard $this->Session */
public $components = array('Math', 'Session');
```

Components declared in `AppController` will be merged with those in your other controllers. So there is no need to re-declare the same component twice.

When including Components in a Controller you can also declare a set of parameters that will be passed on to the Component's constructor. These parameters can then be handled by the Component:

```
<?php
public $components = array(
    'Math' => array(
        'precision' => 2,
        'randomGenerator' => 'srand'
    ),
    'Session', 'Auth'
);
```

The above would pass the array containing precision and randomGenerator to `MathComponent::__construct()` as the second parameter. By convention, any settings that have been passed that are also public properties on your component will have the values set based on the settings.

Using other Components in your Component

Sometimes one of your components may need to use another component. In this case you can include other components in your component the exact same way you include them in controllers - using the `$components` var:

```
<?php
// app/Controller/Component/CustomComponent.php
App::uses('Component', 'Controller');
class CustomComponent extends Component {
    // the other component your component uses
    public $components = array('Existing');

    public function initialize(Controller $controller) {
        $this->Existing->foo();
    }

    public function bar() {
        // ...
   }
}

// app/Controller/Component/ExistingComponent.php
App::uses('Component', 'Controller');
class ExistingComponent extends Component {

    public function initialize(Controller $controller) {
        $this->Parent->bar();
    }

    public function foo() {
        // ...
    }
}
```

Component API

class Component

The base Component class offers a few methods for lazily loading other Components through `ComponentCollection` as well as dealing with common handling of settings. It also provides prototypes for all the component callbacks.

`Component::`**`__construct`**(*ComponentCollection $collection*, *$settings = array()*)

Constructor for the base component class. All `$settings` that are also public properties will have their values changed to the matching value in `$settings`.

Callbacks

`Component::`**`initialize`**(*Controller $controller*)

The initialize method is called before the controller's beforeFilter method.

`Component::`**`startup`**(*Controller $controller*)

The startup method is called after the controller's beforeFilter method but before the controller executes the current action handler.

`Component::`**`beforeRender`**(*Controller $controller*)

The beforeRender method is called after the controller executes the requested action's logic but before the controller's renders views and layout.

`Component::`**`shutdown`**(*Controller $controller*)

The shutdown method is called before output is sent to browser.

`Component::`**`beforeRedirect`**(*Controller $controller*, *$url*, *$status=null*, *$exit=true*)

The beforeRedirect method is invoked when the controller's redirect method is called but before any further action. If this method returns false the controller will not continue on to redirect the request. The $url, $status and $exit variables have same meaning as for the controller's method. You can also return a string which will be interpreted as the url to redirect to or return associative array with key 'url' and optionally 'status' and 'exit'.

CHAPTER 7

Views

Views are the **V** in MVC. Views are responsible for generating the specific output required for the request. Often this is in the form of HTML, XML, or JSON, but streaming files and creating PDF's that users can download are also responsibilities of the View Layer.

CakePHP comes with a few built-in View classes for handling the most common rendering scenarios:

- To create XML or JSON webservices you can use the *JSON and XML views*.
- To serve protected files, or dynamically generated files, you can use *Media Views*
- To create multiple themed views, you can use *Themes*

View Templates

The view layer of CakePHP is how you speak to your users. Most of the time your views will be showing (X)HTML documents to browsers, but you might also need to serve AMF data to a Flash object, reply to a remote application via SOAP, or output a CSV file for a user.

By default CakePHP view files are written in plain PHP and have a default extension of .ctp (CakePHP Template). These files contain all the presentational logic needed to get the data it received from the controller in a format that is ready for the audience you're serving to. If you'd prefer using a templating language like Twig, or Smarty, a subclass of View will bridge your templating language and CakePHP

View files are stored in `/app/View/`, in a folder named after the controller that uses the files, and named after the action it corresponds to. For example, the view file for the Products controller's "view()" action, would normally be found in `/app/View/Products/view.ctp`.

The view layer in CakePHP can be made up of a number of different parts. Each part has different uses, and will be covered in this chapter:

- **views**: Views are the part of the page that is unique to the action being run. They form the meat of your application's response.
- **elements**: smaller, reusable bits of view code. Elements are usually rendered inside of views.

- **layouts**: view files that contain presentational code that is found wrapping many interfaces in your application. Most views are rendered inside of a layout.
- **helpers**: these classes encapsulate view logic that is needed in many places in the view layer. Among other things, helpers in CakePHP can help you build forms, build AJAX functionality, paginate model data, or serve RSS feeds.

Extending Views

New in version 2.1. View extending allows you to wrap one view in another. Combining this with *view blocks* gives you a powerful way to keep your views *DRY*. For example, your application has a sidebar that needs to change depending on the specific view being rendered. By extending a common view file you can avoid repeating the common markup for your sidebar, and only define the parts that change:

```
// app/View/Common/view.ctp
<h1><?php echo $this->fetch('title'); ?></h1>
<?php echo $this->fetch('content'); ?>

<div class="actions">
    <h3>Related actions</h3>
    <ul>
    <?php echo $this->fetch('sidebar'); ?>
    </ul>
</div>
```

The above view file could be used as a parent view. It expects that the view extending it will define the `sidebar` and `title` blocks. The `content` block is a special block that CakePHP creates. It will contain all the un-captured content from the extending view. Assuming our view file has a `$posts` variable with the data about our post. Our view could look like:

```
// app/View/Posts/view.ctp
<?php
$this->extend('/Common/view');

$this->assign('title', $post);

$this->start('sidebar');
?>
<li><?php
echo $this->Html->link('edit', array(
    'action' => 'edit',
    $post['Post']['id']
)); ?>
</li>
<?php $this->end(); ?>

<?php
// The remaining content will be available as the 'content' block
// in the parent view.
echo h($post['Post']['body']);
```

The post view above shows how you can extend a view, and populate a set of blocks. Any content not in already in a defined block will captured and put into a special block named `content`. When a view contains a call to `extend()` execution continues to the bottom of the current view file. Once its complete, the extended view will be rendered. Calling `extend()` more than once in a view file will override the parent view that will be processed next:

```
<?php
$this->extend('/Common/view');
$this->extend('/Common/index');
```

The above will result in `/Common/index.ctp` being rendered as the parent view to the current view.

You can nest extended views as many times as necessary. Each view can extend another view if desired. Each parent view will get the previous view's content as the `content` block.

Note: You should avoid using `content` as a block name in your application. CakePHP uses this for un-captured content in extended views.

Using view blocks

New in version 2.1. View blocks replace `$scripts_for_layout` and provide a flexible API that allows you to define slots or blocks in your views/layouts that will be defined elsewhere. For example blocks are ideal for implementing things such as sidebars, or regions to load assets at the bottom/top of the layout. Blocks can be defined in two ways. Either as a capturing block, or by direct assignment. The `start()`, `append()` and `end()` methods allow to to work with capturing blocks:

```
<?php
// create the sidebar block.
$this->start('sidebar');
echo $this->element('sidebar/recent_topics');
echo $this->element('sidebar/recent_comments');
$this->end();


// Append into the sidebar later on.
$this->append('sidebar');
echo $this->element('sidebar/popular_topics');
$this->end();
```

You can also append into a block using `start()` multiple times. `assign()` can be used to clear or overwrite a block at any time:

```
<?php
// Clear the previous content from the sidebar block.
$this->assign('sidebar', '');
```

Note: You should avoid using `content` as a block name. This is used by CakePHP internally for extended views, and view content in the layout.

Displaying blocks

New in version 2.1. You can display blocks using the `fetch()` method. `fetch()` will safely output a block, returning '' if a block does not exist:

```
<?php echo $this->fetch('sidebar'); ?>
```

You can also use fetch to conditionally show content that should surround a block should it exist. This is helpful in layouts, or extended views where you want to conditionally show headings or other markup:

```
// in app/View/Layouts/default.ctp
<?php if ($this->fetch('menu')): ?>
<div class="menu">
    <h3>Menu options</h3>
    <?php echo $this->fetch('menu'); ?>
</div>
<?php endif; ?>
```

Using blocks for script and CSS files

New in version 2.1. Blocks replace the deprecated `$scripts_for_layout` layout variable. Instead you should use blocks. The `HtmlHelper` ties into view blocks, and its `script()`, `css()`, and `meta()` methods each update a block with the same name when used with the `inline = false` option:

```
<?php
// in your view file
$this->Html->script('carousel', array('inline' => false));
$this->Html->css('carousel', null, array('inline' => false));
?>

// In your layout file.
<!DOCTYPE html>
<html lang="en">
    <head>
    <title><?php echo $this->fetch('title'); ?></title>
    <?php echo $this->fetch('script'); ?>
    <?php echo $this->fetch('css'); ?>
    </head>
    // rest of the layout follows
```

The `HtmlHelper` also allows you to control which block the scripts and CSS go to:

```
<?php
// in your view
$this->Html->script('carousel', array('block' => 'scriptBottom'));

// in your layout
echo $this->fetch('scriptBottom');
```

Layouts

A layout contains presentation code that wraps around a view. Anything you want to see in all of your views should be placed in a layout.

Layout files should be placed in `/app/View/Layouts`. CakePHP's default layout can be overridden by creating a new default layout at `/app/View/Layouts/default.ctp`. Once a new default layout has been created, controller-rendered view code is placed inside of the default layout when the page is rendered.

When you create a layout, you need to tell CakePHP where to place the code for your views. To do so, make sure your layout includes a place for `$this->fetch('content')` Here's an example of what a default layout might look like:

```
<!DOCTYPE html>
<html lang="en">
<head>
<title><?php echo $title_for_layout?></title>
<link rel="shortcut icon" href="favicon.ico" type="image/x-icon">
<!-- Include external files and scripts here (See HTML helper for more info.) -->
<?php
echo $this->fetch('meta');
echo $this->fetch('css');
echo $this->fetch('script');
?>
</head>
<body>

<!-- If you'd like some sort of menu to
show up on all of your views, include it here -->
<div id="header">
    <div id="menu">...</div>
</div>

<!-- Here's where I want my views to be displayed -->
<?php echo $this->fetch('content'); ?>

<!-- Add a footer to each displayed page -->
<div id="footer">...</div>

</body>
</html>
```

Note: Prior to version 2.1, method fetch() was not available, `fetch('content')` is a replacement for `$content_for_layout` and lines `fetch('meta')`, `fetch('css')` and `fetch('script')` are contained in the `$scripts_for_layout` variable in version 2.0

The `script`, `css` and `meta` blocks contain any content defined in the views using the built-in HTML helper. Useful for including javascript and CSS files from views.

Note: When using `HtmlHelper::css()` or `HtmlHelper::script()` in view files, specify 'false' for the 'inline' option to place the html source in a block with the same name. (See API for more details on usage).

The `content` block contains the contents of the rendered view.

`$title_for_layout` contains the page title. This variable is generated automatically, but you can override it by setting it in your controller/view.

To set the title for the layout, it's easiest to do so in the controller, setting the `$title_for_layout` variable:

```
<?php
class UsersController extends AppController {
    public function view_active() {
        $this->set('title_for_layout', 'View Active Users');
    }
}
```

You can also set the title_for_layout variable from inside the view file:

```
<?php
$this->set('title_for_layout', $titleContent);
```

You can create as many layouts as you wish: just place them in the `app/View/Layouts` directory, and switch between them inside of your controller actions using the controller or view's `$layout` property:

```
<?php
// from a controller
public function admin_view() {
    // stuff
    $this->layout = 'admin';
}

// from a view file
$this->layout = 'loggedin';
```

For example, if a section of my site included a smaller ad banner space, I might create a new layout with the smaller advertising space and specify it as the layout for all controllers' actions using something like:

```
<?php
class UsersController extends AppController {
    public function view_active() {
        $this->set('title_for_layout', 'View Active Users');
        $this->layout = 'default_small_ad';
    }

    public function view_image() {
        $this->layout = 'image';
        //output user image
    }
}
```

CakePHP features two core layouts (besides CakePHP's default layout) you can use in your own application: 'ajax' and 'flash'. The Ajax layout is handy for crafting Ajax responses - it's an empty layout (most ajax calls only require a bit of markup in return, rather than a fully-rendered interface). The flash layout is used for messages shown by `Controller::flash()` method.

Three other layouts, xml, js, and rss, exist in the core for a quick and easy way to serve up content that isn't text/html.

Using layouts from plugins

New in version 2.1. If you want to use a layout that exists in a plugin, you can use *plugin syntax*. For example to use the contact layout from the Contacts plugin:

```
<?php
class UsersController extends AppController {
    public function view_active() {
        $this->layout = 'Contacts.contact';
    }
}
```

Elements

Many applications have small blocks of presentation code that need to be repeated from page to page, sometimes in different places in the layout. CakePHP can help you repeat parts of your website that need to be reused. These reusable parts are called Elements. Ads, help boxes, navigational controls, extra menus, login forms, and callouts are often implemented in CakePHP as elements. An element is basically a mini-view that can be included in other views, in layouts, and even within other elements. Elements can be used to make a view more readable, placing the rendering of repeating elements in its own file. They can also help you re-use content fragments in your application.

Elements live in the `/app/View/Elements/` folder, and have the .ctp filename extension. They are output using the element method of the view:

```
<?php echo $this->element('helpbox'); ?>
```

Passing Variables into an Element

You can pass data to an element through the element's second argument:

```
<?php
echo $this->element('helpbox', array(
    "helptext" => "Oh, this text is very helpful."
));
```

Inside the element file, all the passed variables are available as members of the parameter array (in the same way that `Controller::set()` in the controller works with view files). In the above example, the `/app/View/Elements/helpbox.ctp` file can use the `$helptext` variable:

```
<?php
// inside app/View/Elements/helpbox.ctp
echo $helptext; //outputs "Oh, this text is very helpful."
```

The `View::element()` method also supports options for the element. The options supported are 'cache' and 'callbacks'. An example:

```
<?php
echo $this->element('helpbox', array(
        "helptext" => "This is passed to the element as $helptext",
        "foobar" => "This is passed to the element as $foobar",
    ),
    array(
        "cache" => "long_view", // uses the "long_view" cache configuration
        "callbacks" => true // set to true to have before/afterRender called for the elemen
    )
);
```

Element caching is facilitated through the `Cache` class. You can configure elements to be stored in any Cache configuration you've setup. This gives you a great amount of flexibility to decide where and for how long elements are stored. To cache different versions of the same element in an application, provide a unique cache key value using the following format:

```
<?php
$this->element('helpbox', array(), array(
        "cache" => array('config' => 'short', 'key' => 'unique value')
    )
);
```

You can take full advantage of elements by using `requestAction()`. The `requestAction()` function fetches view variables from a controller action and returns them as an array. This enables your elements to perform in true MVC style. Create a controller action that prepares the view variables for your elements, then call `requestAction()` inside the second parameter of `element()` to feed the element the view variables from your controller.

To do this, in your controller add something like the following for the Post example:

```
<?php
class PostsController extends AppController {
    // ...
    public function index() {
        $posts = $this->paginate();
        if ($this->request->is('requested')) {
            return $posts;
        } else {
            $this->set('posts', $posts);
        }
    }
}
```

And then in the element we can access the paginated posts model. To get the latest five posts in an ordered list we would do something like the following:

```
<h2>Latest Posts</h2>
<?php $posts = $this->requestAction('posts/index/sort:created/direction:asc/limit:5'); ?>
<?php foreach ($posts as $post): ?>
```

```
<ol>
    <li><?php echo $post['Post']['title']; ?></li>
</ol>
<?php endforeach; ?>
```

Caching Elements

You can take advantage of CakePHP view caching if you supply a cache parameter. If set to true, it will cache the element in the 'default' Cache configuration. Otherwise, you can set which cache configuration should be used. See *Caching* for more information on configuring `Cache`. A simple example of caching an element would be:

```
<?php echo $this->element('helpbox', array(), array('cache' => true)); ?>
```

If you render the same element more than once in a view and have caching enabled be sure to set the 'key' parameter to a different name each time. This will prevent each successive call from overwriting the previous element() call's cached result. E.g.:

```
<?php
echo $this->element(
    'helpbox',
    array('var' => $var),
    array('cache' => array('key' => 'first_use', 'config' => 'view_long')
);

echo $this->element(
    'helpbox',
    array('var' => $differenVar),
    array('cache' => array('key' => 'second_use', 'config' => 'view_long')
);
```

The above will ensure that both element results are cached separately. If you want all element caching to use the same cache configuration, you can save some repetition, by setting `View::$elementCache` to the cache configuration you want to use. CakePHP will use this configuration, when none is given.

Requesting Elements from a Plugin

2.0

To load an element from a plugin, use the *plugin* option (moved out of the *data* option in 1.x):

```
<?php echo $this->element('helpbox', array(), array('plugin' => 'Contacts'));
```

2.1

If you are using a plugin and wish to use elements from within the plugin, just use the familiar *plugin syntax*. If the view is being rendered for a plugin controller/action, the plugin name will automatically be prefixed onto all elements used, unless another plugin name is present. If the element doesn't exist in the plugin, it will look in the main APP folder.:

```
<?php echo $this->element('Contacts.helpbox'); ?>
```

If your view is a part of a plugin you can omit the plugin name. For example, if you are in the `ContactsController` of the Contacts plugin:

```
<?php
echo $this->element('helpbox');
// and
echo $this->element('Contacts.helpbox');
```

Are equivalent and will result in the same element being rendered. Changed in version 2.1: The `$options[plugin]` option was deprecated and support for `Plugin.element` was added.

View API

class View

View methods are accessible in all view, element and layout files. To call any view method use `$this->method()`

`View::`**set**(*string $var*, *mixed $value*)

Views have a `set()` method that is analogous to the `set()` found in Controller objects. Using set() from your view file will add the variables to the layout and elements that will be rendered later. See *Controller Methods* for more information on using set().

In your view file you can do:

```
<?php
$this->set('activeMenuButton', 'posts');
```

Then in your layout the `$activeMenuButton` variable will be available and contain the value 'posts'.

`View::`**getVar**(*string $var*)

Gets the value of the viewVar with the name $var

`View::`**getVars**()

Gets a list of all the available view variables in the current rendering scope. Returns an array of variable names.

`View::`**element**(*string $elementPath*, *array $data*, *array $options = array()*)

Renders an element or view partial. See the section on *Elements* for more information and examples.

`View::`**uuid**(*string $object*, *mixed $url*)

Generates a unique non-random DOM ID for an object, based on the object type and url. This method is often used by helpers that need to generate unique DOM ID's for elements such as the `JsHelper`:

```
<?php
$uuid = $this->uuid('form', array('controller' => 'posts', 'action' => 'index'));
//$uuid contains 'form0425fe3bad'
```

`View::`**`addScript`**(*string $name*, *string $content*)
: Adds content to the internal scripts buffer. This buffer is made available in the layout as `$scripts_for_layout`. This method is helpful when creating helpers that need to add javascript or css directly to the layout. Keep in mind that scripts added from the layout, or elements in the layout will not be added to `$scripts_for_layout`. This method is most often used from inside helpers, like the *JsHelper* and *HtmlHelper* Helpers. Deprecated since version 2.1: Use the *Using view blocks* features instead.

`View::`**`blocks`**()
: Get the names of all defined blocks as an array.

`View::`**`start`**(*$name*)
: Start a capturing block for a view block. See the section on *Using view blocks* for examples. New in version 2.1.

`View::`**`end`**()
: End the top most open capturing block. See the section on *Using view blocks* for examples. New in version 2.1.

`View::`**`append`**(*$name*, *$content*)
: Append into the block with `$name`. See the section on *Using view blocks* for examples. New in version 2.1.

`View::`**`assign`**(*$name*, *$content*)
: Assign the value of a block. This will overwrite any existing content. See the section on *Using view blocks* for examples. New in version 2.1.

`View::`**`fetch`**(*$name*)
: Fetch the value of a block. '' Will be returned for blocks that are not defined. See the section on *Using view blocks* for examples. New in version 2.1.

`View::`**`extend`**(*$name*)
: Extend the current view/element/layout with the named one. See the section on *Extending Views* for examples. New in version 2.1.

property `View::$`**`layout`**
: Set the layout the current view will be wrapped in.

property `View::$`**`elementCache`**
: The cache configuration used to cache elements. Setting this property will change the default configuration used to cache elements. This default can be overridden using the 'cache' option in the element method.

property `View::$`**`request`**
: An instance of `CakeRequest`. Use this instance to access information about the current request.

property `View::$`**`output`**
: Contains the last rendered content from a view, either the view file, or the layout content. Deprecated since version 2.1: Use `$view->Blocks->get('content');` instead.

property `View::$`**`Blocks`**
: An instance of `ViewBlock`. Used to provide view block functionality in view rendering. New in version 2.1.

More about Views

Themes

You can take advantage of themes, making it easy to switch the look and feel of your page quickly and easily.

To use themes, specify the theme name in your controller:

```
<?php
class ExampleController extends AppController {
    public $theme = 'Example';
}
```

Changed in version 2.1: Versions previous to 2.1 required setting the `$this->viewClass = 'Theme'`. 2.1 removes this requirement as the normal `View` class supports themes You can also set or change the theme name within an action or within the `beforeFilter` or `beforeRender` callback functions:

```
<?php
$this->theme = 'AnotherExample';
```

Theme view files need to be within the `/app/View/Themed/` folder. Within the themed folder, create a folder using the same name as your theme name. Beyond that, the folder structure within the `/app/View/Themed/Example/` folder is exactly the same as `/app/View/`.

For example, the view file for an edit action of a Posts controller would reside at `/app/View/Themed/Example/Posts/edit.ctp`. Layout files would reside in `/app/View/Themed/Example/Layouts/`.

If a view file can't be found in the theme, CakePHP will try to locate the view file in the `/app/View/` folder. This way, you can create master view files and simply override them on a case-by-case basis within your theme folder.

Theme assets

Themes can contain static assets as well as view files. A theme can include any necessary assets in its webroot directory. This allows for easy packaging and distribution of themes. While in development, requests for theme assets will be handled by `Dispatcher`. To improve performance for production environments, it's recommended that you either symlink or copy theme assets into the application's webroot. See below for more information.

To use the new theme webroot create directories like `app/View/Themed/<themeName>/webroot<path_to_file` in your theme. The Dispatcher will handle finding the correct theme assets in your view paths.

All of CakePHP's built-in helpers are aware of themes and will create the correct paths automatically. Like view files, if a file isn't in the theme folder, it will default to the main webroot folder:

```
<?php
//When in a theme with the name of 'purple_cupcake'
$this->Html->css('main.css');
```

```
//creates a path like
/theme/purple_cupcake/css/main.css

//and links to
app/View/Themed/PurpleCupcake/webroot/css/main.css
```

Increasing performance of plugin and theme assets

It's a well known fact that serving assets through PHP is guaranteed to be slower than serving those assets without invoking PHP. And while the core team has taken steps to make plugin and theme asset serving as fast as possible, there may be situations where more performance is required. In these situations it's recommended that you either symlink or copy out plugin/theme assets to directories in `app/webroot` with paths matching those used by CakePHP.

- `app/Plugin/DebugKit/webroot/js/my_file.js` becomes `app/webroot/DebugKit/js/my_file.js`
- `app/View/Themed/Navy/webroot/css/navy.css` becomes `app/webroot/theme/Navy/css/navy.css`

Media Views

class MediaView

Media views allow you to send binary files to the user. For example, you may wish to have a directory of files outside of the webroot to prevent users from direct linking them. You can use the Media view to pull the file from a special folder within /app/, allowing you to perform authentication before delivering the file to the user.

To use the Media view, you need to tell your controller to use the MediaView class instead of the default View class. After that, just pass in additional parameters to specify where your file is located:

```
<?php
class ExampleController extends AppController {
    public function download() {
        $this->viewClass = 'Media';
        // Download app/outside_webroot_dir/example.zip
        $params = array(
            'id'        => 'example.zip',
            'name'      => 'example',
            'download'  => true,
            'extension' => 'zip',
            'path'      => APP . 'outside_webroot_dir' . DS
        );
        $this->set($params);
    }
}
```

Here's an example of rendering a file whose mime type is not included in the MediaView's `$mimeType` array. We are also using a relative path which will default to your `app/webroot` folder:

```
<?php
public function download() {
    $this->viewClass = 'Media';
    // Render app/webroot/files/example.docx
    $params = array(
        'id'        => 'example.docx',
        'name'      => 'example',
        'extension' => 'docx',
        'mimeType'  => array(
            'docx' => 'application/vnd.openxmlformats-officedocument.wordprocessingml.docu
        ),
        'path'      => 'files' . DS
    );
    $this->set($params);
}
```

Settable Parameters

id The ID is the file name as it resides on the file server including the file extension.

name The name allows you to specify an alternate file name to be sent to the user. Specify the name without the file extension.

download A boolean value indicating whether headers should be set to force download.

extension The file extension. This is matched against an internal list of acceptable mime types. If the mime type specified is not in the list (or sent in the mimeType parameter array), the file will not be downloaded.

path The folder name, including the final directory separator. The path should be absolute but can be relative to the `app/webroot` folder.

mimeType An array with additional mime types to be merged with MediaView internal list of acceptable mime types.

cache A boolean or integer value - If set to true it will allow browsers to cache the file (defaults to false if not set); otherwise set it to the number of seconds in the future for when the cache should expire.

JSON and XML views

New in CakePHP 2.1 are two new view classes. The `XmlView` and `JsonView` let you easily create XML and JSON responses, and integrate with the `RequestHandlerComponent`.

By enabling `RequestHandlerComponent` in your application, and enabling support for the `xml` and or `json` extensions, you can automatically leverage the new view classes. `XmlView` and `JsonView` will be referred to as data views for the rest of this page.

There are two ways you can generate data views. The first is by using the `_serialize` key, and the second is by creating normal view files.

Enabling data views in your application

Before you can use the data view classes, you'll need to do a bit of setup:

1. Enable the json and or xml extensions with `Router::parseExtensions()`. This will enable Router to handle mulitple extensions.
2. Add the `RequestHandlerComponent` to your controller's list of components. This will enable automatic view class switching on content types. You can also set the component up with the `viewClassMap` setting, to map types to your custom classes and/or map other data types.

    New in version 2.3: `RequestHandlerComponent::viewClassMap()` method has been added to map types to viewClasses. The viewClassMap setting will also not work on earlier versions.

After adding `Router::parseExtensions('json');` to your routes file, CakePHP will automatically switch view classes when a request is done with the `.json` extension, or the Accept header is `application/json`.

Using data views with the serialize key

The `_serialize` key is a special view variable that indicates which other view variable(s) should be serialized when using a data view. This lets you skip defining view files for your controller actions if you don't need to do any custom formatting before your data is converted into json/xml.

If you need to do any formatting or manipulation of your view variables before generating the response, you should use view files. The value of `_serialize` can be either a string or an array of view variables to serialize:

```php
<?php
class PostsController extends AppController {
    public function index() {
        $this->set('posts', $this->paginate());
        $this->set('_serialize', array('posts'));
    }
}
```

You can also define `_serialize` as an array of view variables to combine:

```php
<?php
class PostsController extends AppController {
    public function index() {
        // some code that created $posts and $comments
        $this->set(compact('posts', 'comments'));
        $this->set('_serialize', array('posts', 'comments'));
    }
}
```

Defining `_serialize` as an array has the added benefit of automatically appending a top-level `<response>` element when using `XmlView`. If you use a string value for `_serialize` and XmlView, make sure that your view variable has a single top-level element. Without a single top-level element the Xml will fail to generate.

Using a data view with view files

You should use view files if you need to do some manipulation of your view content before creating the final output. For example if we had posts, that had a field containing generated HTML, we would probably want to omit that from a JSON response. This is a situation where a view file would be useful:

```
<?php
// Controller code
class PostsController extends AppController {
    public function index() {
        $this->set(compact('posts', 'comments'));
    }
}

// View code - app/View/Posts/json/index.ctp
foreach ($posts as &$post) {
    unset($post['Post']['generated_html']);
}
echo json_encode(compact('posts', 'comments'));
```

You can do more more complex manipulations, or use helpers to do formatting as well.

Note: The data view classes don't support layouts. They assume that the view file will output the serialized content.

class XmlView
A view class for generating Xml view data. See above for how you can use XmlView in your application

class JsonView
A view class for generating Json view data. See above for how you can use JsonView in your application.

Helpers

Helpers are the component-like classes for the presentation layer of your application. They contain presentational logic that is shared between many views, elements, or layouts. This chapter will show you how to create your own helpers, and outline the basic tasks CakePHP's core helpers can help you accomplish.

CakePHP features a number of helpers that aid in view creation. They assist in creating well-formed markup (including forms), aid in formatting text, times and numbers, and can even speed up Ajax functionality. For more information on the helpers included in CakePHP, check out *Helpers*.

Using and Configuring Helpers

You enable helpers in CakePHP by making a controller aware of them. Each controller has a `$helpers` property that lists the helpers to be made available in the view. To enable a helper in your view, add the name of the helper to the controller's `$helpers` array:

```
<?php
class BakeriesController extends AppController {
    public $helpers = array('Form', 'Html', 'Js', 'Time');
}
```

Adding helpers from plugins uses the *plugin syntax* used elsewhere in CakePHP:

```
<?php
class BakeriesController extends AppController {
    public $helpers = array('Blog.Comment');
}
```

You can also add helpers from within an action, so they will only be available to that action and not the other actions in the controller. This saves processing power for the other actions that do not use the helper as well as help keep the controller better organized:

```
<?php
class BakeriesController extends AppController {
    public function bake {
        $this->helpers[] = 'Time';
    }
    public function mix {
        // The Time helper is not loaded here and thus not available
    }
}
```

If you need to enable a helper for all controllers add the name of the helper to the `$helpers` array in `/app/Controller/AppController.php` (or create if not present). Remember to include the default Html and Form helpers:

```
<?php
class AppController extends Controller {
    public $helpers = array('Form', 'Html', 'Js', 'Time');
}
```

You can pass options to helpers. These options can be used to set attribute values or modify behavior of a helper:

```
<?php
class AwesomeHelper extends AppHelper {
    public function __construct(View $view, $settings = array()) {
        parent::__construct($view, $settings);
        debug($settings);
    }
}

class AwesomeController extends AppController {
    public $helpers = array('Awesome' => array('option1' => 'value1'));
}
```

One common setting to use is the `className` option, which allows you to create aliased helpers in your views. This feature is useful when you want to replace `$this->Html` or another common Helper reference with a custom implementation:

```
<?php
// app/Controller/PostsController.php
class PostsController extends AppController {
    public $helpers = array(
        'Html' => array(
            'className' => 'MyHtml'
        )
    );
}

// app/View/Helper/MyHtmlHelper.php
App::uses('HtmlHelper', 'View/Helper');
class MyHtmlHelper extends HtmlHelper {
    // Add your code to override the core HtmlHelper
}
```

The above would *alias* `MyHtmlHelper` to `$this->Html` in your views.

Note: Aliasing a helper replaces that instance anywhere that helper is used, including inside other Helpers.

Tip: Aliasing the Html or Session Helper while using the core PagesController will not work. It is better to copy `lib/Cake/Controller/PagesController.php` into your `app/Controller/` folder.

Using helper settings allows you to declaratively configure your helpers and keep configuration logic out of your controller actions. If you have configuration options that cannot be included as part of a class declaration, you can set those in your controller's beforeRender callback:

```
<?php
class PostsController extends AppController {
    public function beforeRender() {
        parent::beforeRender();
        $this->helpers['CustomStuff'] = $this->_getCustomStuffSettings();
    }
}
```

Using Helpers

Once you've configured which helpers you want to use in your controller, each helper is exposed as a public property in the view. For example, if you were using the `HtmlHelper` you would be able to access it by doing the following:

```
<?php
echo $this->Html->css('styles');
```

The above would call the `css` method on the HtmlHelper. You can access any loaded helper using `$this->{$helperName}`. There may come a time where you need to dynamically load a helper from inside a view. You can use the view's `HelperCollection` to do this:

```
<?php
$mediaHelper = $this->Helpers->load('Media', $mediaSettings);
```

The HelperCollection is a *collection* and supports the collection API used elsewhere in CakePHP.

Callback methods

Helpers feature several callbacks that allow you to augment the view rendering process. See the *Helper API* and the *Collections* documentation for more information.

Creating Helpers

If a core helper (or one showcased on github or the Bakery) doesn't fit your needs, helpers are easy to create.

Let's say we wanted to create a helper that could be used to output a specifically crafted CSS-styled link you needed many different places in your application. In order to fit your logic in to CakePHP's existing helper structure, you'll need to create a new class in `/app/View/Helper`. Let's call our helper LinkHelper. The actual PHP class file would look something like this:

```
<?php
/* /app/View/Helper/LinkHelper.php */
App::uses('AppHelper', 'View/Helper');

class LinkHelper extends AppHelper {
    public function makeEdit($title, $url) {
        // Logic to create specially formatted link goes here...
    }
}
```

Note: Helpers must extend either `AppHelper` or `Helper` or implement all the callbacks in the *Helper API*.

Including other Helpers

You may wish to use some functionality already existing in another helper. To do so, you can specify helpers you wish to use with a `$helpers` array, formatted just as you would in a controller:

```
<?php
/* /app/View/Helper/LinkHelper.php (using other helpers) */
App::uses('AppHelper', 'View/Helper');

class LinkHelper extends AppHelper {
    public $helpers = array('Html');

    public function makeEdit($title, $url) {
        // Use the HTML helper to output
        // formatted data:
```

```
        $link = $this->Html->link($title, $url, array('class' => 'edit'));

        return '<div class="editOuter">' . $link . '</div>';
    }
}
```

Using your Helper

Once you've created your helper and placed it in `/app/View/Helper/`, you'll be able to include it in your controllers using the special variable `$helpers`:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Link');
}
```

Once your controller has been made aware of this new class, you can use it in your views by accessing an object named after the helper:

```
<!-- make a link using the new helper -->
<?php echo $this->Link->makeEdit('Change this Recipe', '/recipes/edit/5'); ?>
```

Creating Functionality for All Helpers

All helpers extend a special class, AppHelper (just like models extend AppModel and controllers extend AppController). To create functionality that would be available to all helpers, create `/app/View/Helper/AppHelper.php`:

```
<?php
App::uses('Helper', 'View');

class AppHelper extends Helper {
    public function customMethod() {
    }
}
```

Helper API

class Helper
The base class for Helpers. It provides a number of utility methods and features for loading other helpers.

`Helper::`**`webroot`**`(`*$file*`)`
Resolve a file name to the webroot of the application. If a theme is active and the file exists in the current theme's webroot, the path to the themed file will be returned.

`Helper::`**`url`**`(`*$url*, *$full = false*`)`
Generates an HTML escaped URL, delegates to `Router::url()`.

`Helper::value`(*$options = array(), $field = null, $key = 'value'*)
Get the value for a given input name.

`Helper::domId`(*$options = null, $id = 'id'*)
Generate a CamelCased id value for the currently selected field. Overriding this method in your AppHelper will allow you to change how CakePHP generates ID attributes.

Callbacks

`Helper::beforeRenderFile`(*$viewFile*)
Is called before all view files are rendered. This includes elements, views, parent views, and layouts.

`Helper::afterRenderFile`(*$viewFile, $content*)
Is called after all view files are rendered. This includes elements, views, parent views, and layouts. A callback can modify and return `$content` to change how the rendered content will be displayed in the browser.

`Helper::beforeRender`(*$viewFile*)
The beforeRender method is called after the controller's beforeRender method but before the controller renders view and layout. Receives the file being rendered as an argument.

`Helper::afterRender`(*$viewFile*)
Is called after the view has been rendered but before layout rendering has started.

`Helper::beforeLayout`(*$layoutFile*)
Is called before layout rendering starts. Receives the layout filename as an argument.

`Helper::afterLayout`(*$layoutFile*)
Is called after layout rendering is complete. Receives the layout filename as an argument.

Core Helpers

CacheHelper Used by the core to cache view content.

FormHelper Creates HTML forms and form elements that self populate and handle validation problems.

HtmlHelper Convenience methods for crafting well-formed markup. Images, links, tables, header tags and more.

JsHelper Used to create Javascript compatible with various Javascript libraries.

NumberHelper Number and currency formatting.

Paginator Model data pagination and sorting.

RSS Convenience methods for outputting RSS feed XML data.

SessionHelper Access for reading session values in views.

TextHelper Smart linking, highlighting, word smart truncation.

TimeHelper Proximity detection (is this next year?), nice string formatting(Today, 10:30 am) and time zone conversion.

CHAPTER 8

Models

Models are the classes that sit as the business layer in your application. This means that they should be responsible for managing almost everything that happens regarding your data, its validity, interactions and evolution of the information workflow in your domain of work.

Usually model classes represent data and are used in CakePHP applications for data access, more specifically they represent a database table but they are not limited to this, but can be used to access anything that manipulates data such as files, external web services, iCal events, or rows in a CSV file.

A model can be associated with other models. For example, a Recipe may be associated with the Author of the recipe as well as the Ingredient in the recipe.

This section will explain what features of the model can be automated, how to override those features, and what methods and properties a model can have. It'll explain the different ways to associate your data. It'll describe how to find, save, and delete data. Finally, it'll look at Datasources.

Understanding Models

A Model represents your data model. In object-oriented programming a data model is an object that represents a "thing", like a car, a person, or a house. A blog, for example, may have many blog posts and each blog post may have many comments. The Blog, Post, and Comment are all examples of models, each associated with another.

Here is a simple example of a model definition in CakePHP:

```
<?php
class Ingredient extends AppModel {
    public $name = 'Ingredient';
}
```

With just this simple declaration, the Ingredient model is bestowed with all the functionality you need to create queries along with saving and deleting data. These magic methods come from CakePHP's Model class by the magic of inheritance. The Ingredient model extends the application model, AppModel, which extends CakePHP's internal Model class. It is this core Model class that bestows the functionality onto your Ingredient model.

This intermediate class, AppModel, is empty and if you haven't created your own, is taken from within the CakePHP core folder. Overriding the AppModel allows you to define functionality that should be made available to all models within your application. To do so, you need to create your own `AppModel.php` file that resides in the Model folder, as all other models in your application. Creating a project using *Bake* will automatically generate this file for you.

See also *Behaviors* for more information on how to apply similar logic to multiple models.

Back to our Ingredient model, in order to work on it, create the PHP file in the `/app/Model/` directory. By convention it should have the same name as the class; for this example `Ingredient.php`.

Note: CakePHP will dynamically create a model object for you if it cannot find a corresponding file in /app/Model. This also means that if your model file isn't named correctly (i.e. ingredient.php or Ingredients.php) CakePHP will use an instance of AppModel rather than your missing (from CakePHP's perspective) model file. If you're trying to use a method you've defined in your model, or a behavior attached to your model and you're getting SQL errors that are the name of the method you're calling - it's a sure sign CakePHP can't find your model and you either need to check the file names, your application cache, or both.

Note: Some class names are not usable for model names. For instance "File" cannot be used as "File" is a class already existing in the CakePHP core.

With your model defined, it can be accessed from within your *Controller*. CakePHP will automatically make the model available for access when its name matches that of the controller. For example, a controller named IngredientsController will automatically initialize the Ingredient model and attach it to the controller at `$this->Ingredient`:

```php
<?php
class IngredientsController extends AppController {
    public function index() {
        //grab all ingredients and pass it to the view:
        $ingredients = $this->Ingredient->find('all');
        $this->set('ingredients', $ingredients);
    }
}
```

Associated models are available through the main model. In the following example, Recipe has an association with the Ingredient model:

```php
<?php
class Recipe extends AppModel {

    public function steakRecipes() {
        $ingredient = $this->Ingredient->findByName('Steak');
        return $this->findAllByMainIngredient($ingredient['Ingredient']['id']);
    }
}
```

This shows how to use models that are already linked. To understand how associations are defined take a look at the *Associations section*

More on models

Associations: Linking Models Together

One of the most powerful features of CakePHP is the ability to link relational mapping provided by the model. In CakePHP, the links between models are handled through associations.

Defining relations between different objects in your application should be a natural process. For example: in a recipe database, a recipe may have many reviews, reviews have a single author, and authors may have many recipes. Defining the way these relations work allows you to access your data in an intuitive and powerful way.

The purpose of this section is to show you how to plan for, define, and utilize associations between models in CakePHP.

While data can come from a variety of sources, the most common form of storage in web applications is a relational database. Most of what this section covers will be in that context.

For information on associations with Plugin models, see *Plugin Models*.

Relationship Types

The four association types in CakePHP are: hasOne, hasMany, belongsTo, and hasAndBelongsToMany (HABTM).

Relationship	Association Type	Example
one to one	hasOne	A user has one profile.
one to many	hasMany	A user can have multiple recipes.
many to one	belongsTo	Many recipes belong to a user.
many to many	hasAndBelongsToMany	Recipes have, and belong to many ingredients.

Associations are defined by creating a class variable named after the association you are defining. The class variable can sometimes be as simple as a string, but can be as complete as a multidimensional array used to define association specifics.

```php
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasOne = 'Profile';
    public $hasMany = array(
        'Recipe' => array(
            'className'  => 'Recipe',
            'conditions' => array('Recipe.approved' => '1'),
            'order'      => 'Recipe.created DESC'
        )
    );
}
```

In the above example, the first instance of the word 'Recipe' is what is termed an 'Alias'. This is an identifier for the relationship and can be anything you choose. Usually, you will choose the same name as the class that it references. However, **aliases for each model must be unique app wide**. E.g. it is appropriate to have:

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasMany = array(
        'MyRecipe' => array('className' => 'Recipe'),
    );
    public $hasAndBelongsToMany => array('Member' => array('className' => 'User'));
}

class Group extends AppModel {
    public $name = 'Group';
    public $hasMany = array(
        'MyRecipe' => array(
            'className'  => 'Recipe',
        )
    );
    public $hasAndBelongsToMany => array('MemberOf' => array('className' => 'Group'));
}
```

but the following will not work well in all circumstances::

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasMany = array(
        'MyRecipe' => 'Recipe',
    );
    public $hasAndBelongsToMany => array('Member' => 'User');
}

class Group extends AppModel {
    public $name = 'Group';
    public $hasMany = array(
        'MyRecipe' => array(
            'className'  => 'Recipe',
        )
    );
    public $hasAndBelongsToMany => array('Member' => 'Group');
}
```

because here we have the alias 'Member' referring to both the User (in Group) and the Group (in User) model in the HABTM associations. Choosing non-unique names for model aliases across models can cause unexpected behavior.

Cake will automatically create links between associated model objects. So for example in your `User` model you can access the `Recipe` model as:

```
<?php
$this->Recipe->someFunction();
```

Similarly in your controller you can access an associated model simply by following your model associations:

```
<?php
$this->User->Recipe->someFunction();
```

Note: Remember that associations are defined 'one way'. If you define User hasMany Recipe that has no effect on the Recipe Model. You need to define Recipe belongsTo User to be able to access the User model from your Recipe model

hasOne

Let's set up a User model with a hasOne relationship to a Profile model.

First, your database tables need to be keyed correctly. For a hasOne relationship to work, one table has to contain a foreign key that points to a record in the other. In this case the profiles table will contain a field called user_id. The basic pattern is:

hasOne: the *other* model contains the foreign key.

Relation	Schema
Apple hasOne Banana	bananas.apple_id
User hasOne Profile	profiles.user_id
Doctor hasOne Mentor	mentors.doctor_id

Note: It is not mandatory to follow CakePHP conventions, you can easily override the use of any foreignKey in your associations definitions. Nevertheless sticking to conventions will make your code less repetitive, easier to read and to maintain.

The User model file will be saved in /app/Model/User.php. To define the 'User hasOne Profile' association, add the $hasOne property to the model class. Remember to have a Profile model in /app/Model/Profile.php, or the association won't work:

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasOne = 'Profile';
}
```

There are two ways to describe this relationship in your model files. The simplest method is to set the $hasOne attribute to a string containing the classname of the associated model, as we've done above.

If you need more control, you can define your associations using array syntax. For example, you might want to limit the association to include only certain records.

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasOne = array(
        'Profile' => array(
            'className'    => 'Profile',
            'conditions'   => array('Profile.published' => '1'),
            'dependent'    => true
        )
    );
}
```

Possible keys for hasOne association arrays include:

- **className**: the classname of the model being associated to the current model. If you're defining a 'User hasOne Profile' relationship, the className key should equal 'Profile.'
- **foreignKey**: the name of the foreign key found in the other model. This is especially handy if you need to define multiple hasOne relationships. The default value for this key is the underscored, singular name of the current model, suffixed with '_id'. In the example above it would default to 'user_id'.
- **conditions**: an array of find() compatible conditions or SQL strings such as array('Profile.approved' => true)
- **fields**: A list of fields to be retrieved when the associated model data is fetched. Returns all fields by default.
- **order**: an array of find() compatible order clauses or SQL strings such as array('Profile.last_name' => 'ASC')
- **dependent**: When the dependent key is set to true, and the model's delete() method is called with the cascade parameter set to true, associated model records are also deleted. In this case we set it true so that deleting a User will also delete her associated Profile.

Once this association has been defined, find operations on the User model will also fetch a related Profile record if it exists:

```
//Sample results from a $this->User->find() call.

Array
(
    [User] => Array
        (
            [id] => 121
            [name] => Gwoo the Kungwoo
            [created] => 2007-05-01 10:31:01
        )
    [Profile] => Array
        (
            [id] => 12
            [user_id] => 121
            [skill] => Baking Cakes
            [created] => 2007-05-01 10:31:01
        )
)
```

belongsTo

Now that we have Profile data access from the User model, let's define a belongsTo association in the Profile model in order to get access to related User data. The belongsTo association is a natural complement to the hasOne and hasMany associations: it allows us to see the data from the other direction.

When keying your database tables for a belongsTo relationship, follow this convention:

belongsTo: the *current* model contains the foreign key.

Relation	Schema
Banana belongsTo Apple	bananas.apple_id
Profile belongsTo User	profiles.user_id
Mentor belongsTo Doctor	mentors.doctor_id

Tip: If a model(table) contains a foreign key, it belongsTo the other model(table).

We can define the belongsTo association in our Profile model at /app/Model/Profile.php using the string syntax as follows:

```php
<?php
class Profile extends AppModel {
    public $name = 'Profile';
    public $belongsTo = 'User';
}
```

We can also define a more specific relationship using array syntax:

```php
<?php
class Profile extends AppModel {
    public $name = 'Profile';
    public $belongsTo = array(
        'User' => array(
            'className'    => 'User',
            'foreignKey'   => 'user_id'
        )
    );
}
```

Possible keys for belongsTo association arrays include:

- **className**: the classname of the model being associated to the current model. If you're defining a 'Profile belongsTo User' relationship, the className key should equal 'User.'
- **foreignKey**: the name of the foreign key found in the current model. This is especially handy if you need to define multiple belongsTo relationships. The default value for this key is the underscored, singular name of the other model, suffixed with `_id`.
- **conditions**: an array of find() compatible conditions or SQL strings such as `array('User.active' => true)`
- **type**: the type of the join to use in the SQL query, default is LEFT which may not fit your needs in all situations, INNER may be helpful when you want everything from your main and associated models

or nothing at all! (effective when used with some conditions of course). **(NB: type value is in lower case - i.e. left, inner)**

- **fields**: A list of fields to be retrieved when the associated model data is fetched. Returns all fields by default.
- **order**: an array of find() compatible order clauses or SQL strings such as `array('User.username' => 'ASC')`
- **counterCache**: If set to true the associated Model will automatically increase or decrease the "[singular_model_name]_count" field in the foreign table whenever you do a `save()` or `delete()`. If it's a string then it's the field name to use. The value in the counter field represents the number of related rows. You can also specify multiple counter caches by using an array where the key is field name and value is the conditions. E.g.:

```
array(
    'recipes_count' => true,
    'recipes_published' => array('Recipe.published' => 1)
)
```

- **counterScope**: Optional conditions array to use for updating counter cache field.

Once this association has been defined, find operations on the Profile model will also fetch a related User record if it exists:

```
//Sample results from a $this->Profile->find() call.

Array
(
   [Profile] => Array
        (
            [id] => 12
            [user_id] => 121
            [skill] => Baking Cakes
            [created] => 2007-05-01 10:31:01
        )
    [User] => Array
        (
            [id] => 121
            [name] => Gwoo the Kungwoo
            [created] => 2007-05-01 10:31:01
        )
)
```

hasMany

Next step: defining a "User hasMany Comment" association. A hasMany association will allow us to fetch a user's comments when we fetch a User record.

When keying your database tables for a hasMany relationship, follow this convention:

hasMany: the *other* model contains the foreign key.

Relation	Schema
User hasMany Comment	Comment.user_id
Cake hasMany Virtue	Virtue.cake_id
Product hasMany Option	Option.product_id

We can define the hasMany association in our User model at /app/Model/User.php using the string syntax as follows:

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasMany = 'Comment';
}
```

We can also define a more specific relationship using array syntax:

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasMany = array(
        'Comment' => array(
            'className'     => 'Comment',
            'foreignKey'    => 'user_id',
            'conditions'    => array('Comment.status' => '1'),
            'order'         => 'Comment.created DESC',
            'limit'         => '5',
            'dependent'     => true
        )
    );
}
```

Possible keys for hasMany association arrays include:

- **className**: the classname of the model being associated to the current model. If you're defining a 'User hasMany Comment' relationship, the className key should equal 'Comment.'
- **foreignKey**: the name of the foreign key found in the other model. This is especially handy if you need to define multiple hasMany relationships. The default value for this key is the underscored, singular name of the actual model, suffixed with '_id'.
- **conditions**: an array of find() compatible conditions or SQL strings such as array('Comment.visible' => true)
- **order**: an array of find() compatible order clauses or SQL strings such as array('Profile.last_name' => 'ASC')
- **limit**: The maximum number of associated rows you want returned.
- **offset**: The number of associated rows to skip over (given the current conditions and order) before fetching and associating.
- **dependent**: When dependent is set to true, recursive model deletion is possible. In this example, Comment records will be deleted when their associated User record has been deleted.
- **exclusive**: When exclusive is set to true, recursive model deletion does the delete with a deleteAll() call, instead of deleting each entity separately. This greatly improves performance, but may not be

ideal for all circumstances.

- **finderQuery**: A complete SQL query CakePHP can use to fetch associated model records. This should be used in situations that require very custom results. If a query you're building requires a reference to the associated model ID, use the special `{$__cakeID__$}` marker in the query. For example, if your Apple model hasMany Orange, the query should look something like this: `SELECT Orange.* from oranges as Orange WHERE Orange.apple_id = {$__cakeID__$};`

Once this association has been defined, find operations on the User model will also fetch related Comment records if they exist:

```
//Sample results from a $this->User->find() call.

Array
(
    [User] => Array
        (
            [id] => 121
            [name] => Gwoo the Kungwoo
            [created] => 2007-05-01 10:31:01
        )
    [Comment] => Array
        (
            [0] => Array
                (
                    [id] => 123
                    [user_id] => 121
                    [title] => On Gwoo the Kungwoo
                    [body] => The Kungwooness is not so Gwooish
                    [created] => 2006-05-01 10:31:01
                )
            [1] => Array
                (
                    [id] => 124
                    [user_id] => 121
                    [title] => More on Gwoo
                    [body] => But what of the 'Nut?
                    [created] => 2006-05-01 10:41:01
                )
        )
)
```

One thing to remember is that you'll need a complimentary Comment belongsTo User association in order to get the data from both directions. What we've outlined in this section empowers you to get Comment data from the User. Adding the Comment belongsTo User association in the Comment model empowers you to get User data from the Comment model - completing the connection and allowing the flow of information from either model's perspective.

counterCache - Cache your count()

This function helps you cache the count of related data. Instead of counting the records manually via `find('count')`, the model itself tracks any addition/deleting towards the associated `$hasMany` model and increases/decreases a dedicated integer field within the parent model table.

The name of the field consists of the singular model name followed by a underscore and the word "count":

```
my_model_count
```

Let's say you have a model called `ImageComment` and a model called `Image`, you would add a new INT-field to the `image` table and name it `image_comment_count`.

Here are some more examples:

Model	Associated Model	Example
User	Image	users.image_count
Image	ImageComment	images.image_comment_count
BlogEntry	BlogEntryComment	blog_entries.blog_entry_comment_count

Once you have added the counter field you are good to go. Activate counter-cache in your association by adding a `counterCache` key and set the value to `true`:

```php
<?php
class Image extends AppModel {
    public $belongsTo = array(
        'ImageAlbum' => array('counterCache' => true)
    );
}
```

From now on, every time you add or remove a `Image` associated to `ImageAlbum`, the number within `image_count` is adjusted automatically.

You can also specify `counterScope`. It allows you to specify a simple condition which tells the model when to update (or when not to, depending on how you look at it) the counter value.

Using our Image model example, we can specify it like so:

```php
<?php
class Image extends AppModel {
    public $belongsTo = array(
        'ImageAlbum' => array(
            'counterCache' => true,
            'counterScope' => array('Image.active' => 1) // only count if "Image" is activ
    ));
}
```

hasAndBelongsToMany (HABTM)

Alright. At this point, you can already call yourself a CakePHP model associations professional. You're already well versed in the three associations that take up the bulk of object relations.

Let's tackle the final relationship type: hasAndBelongsToMany, or HABTM. This association is used when you have two models that need to be joined up, repeatedly, many times, in many different ways.

The main difference between hasMany and HABTM is that a link between models in HABTM is not exclusive. For example, we're about to join up our Recipe model with an Ingredient model using HABTM. Using tomatoes as an Ingredient for my grandma's spaghetti recipe doesn't "use up" the ingredient. I can also use it for a salad Recipe.

Links between hasMany associated objects are exclusive. If my User hasMany Comments, a comment is only linked to a specific user. It's no longer up for grabs.

Moving on. We'll need to set up an extra table in the database to handle HABTM associations. This new join table's name needs to include the names of both models involved, in alphabetical order, and separated with an underscore (_). The contents of the table should be two fields, each foreign keys (which should be integers) pointing to both of the primary keys of the involved models. To avoid any issues - don't define a combined primary key for these two fields, if your application requires it you can define a unique index. If you plan to add any extra information to this table, or use a 'with' model, you should add an additional primary key field (by convention 'id').

HABTM requires a separate join table that includes both *model* names.

Relationship	HABTM Table Fields
Recipe HABTM Ingredient	**ingredients_recipes**.id, **ingredients_recipes**.ingredient_id, **ingredients_recipes**.recipe_id
Cake HABTM Fan	**cakes_fans**.id, **cakes_fans**.cake_id, **cakes_fans**.fan_id
Foo HABTM Bar	**bars_foos**.id, **bars_foos**.foo_id, **bars_foos**.bar_id

Note: Table names are by convention in alphabetical order. It is possible to define a custom table name in association definition

Make sure primary keys in tables **cakes** and **recipes** have "id" fields as assumed by convention. If they're different than assumed, it has to be changed in model's *primaryKey*

Once this new table has been created, we can define the HABTM association in the model files. We're gonna skip straight to the array syntax this time:

```
<?php
class Recipe extends AppModel {
    public $name = 'Recipe';
    public $hasAndBelongsToMany = array(
        'Ingredient' =>
            array(
                'className'              => 'Ingredient',
                'joinTable'              => 'ingredients_recipes',
                'foreignKey'             => 'recipe_id',
                'associationForeignKey'  => 'ingredient_id',
                'unique'                 => true,
                'conditions'             => '',
                'fields'                 => '',
                'order'                  => '',
                'limit'                  => '',
                'offset'                 => '',
                'finderQuery'            => '',
                'deleteQuery'            => '',
                'insertQuery'            => ''
            )
    );
}
```

Possible keys for HABTM association arrays include:

- **className**: the classname of the model being associated to the current model. If you're defining a 'Recipe HABTM Ingredient' relationship, the className key should equal 'Ingredient.'
- **joinTable**: The name of the join table used in this association (if the current table doesn't adhere to the naming convention for HABTM join tables).
- **with**: Defines the name of the model for the join table. By default CakePHP will auto-create a model for you. Using the example above it would be called IngredientsRecipe. By using this key you can override this default name. The join table model can be used just like any "regular" model to access the join table directly. By creating a model class with such name and filename you can add any custom behavior to the join table searches, such as adding more information/columns to it
- **foreignKey**: the name of the foreign key found in the current model. This is especially handy if you need to define multiple HABTM relationships. The default value for this key is the underscored, singular name of the current model, suffixed with '_id'.
- **associationForeignKey**: the name of the foreign key found in the other model. This is especially handy if you need to define multiple HABTM relationships. The default value for this key is the underscored, singular name of the other model, suffixed with '_id'.
- **unique: boolean or string `keepExisting`.**
  - If true (default value) cake will first delete existing relationship records in the foreign keys table before inserting new ones. Existing associations need to be passed again when updating.
  - When false, cake will insert the relationship record, and that no join records are deleted during a save operation.
  - When set to `keepExisting`, the behavior is similar to *true*, but existing associations are not deleted.
- **conditions**: an array of find() compatible conditions or SQL string. If you have conditions on an associated table, you should use a 'with' model, and define the necessary belongsTo associations on it.
- **fields**: A list of fields to be retrieved when the associated model data is fetched. Returns all fields by default.
- **order**: an array of find() compatible order clauses or SQL strings
- **limit**: The maximum number of associated rows you want returned.
- **offset**: The number of associated rows to skip over (given the current conditions and order) before fetching and associating.
- **finderQuery, deleteQuery, insertQuery**: A complete SQL query CakePHP can use to fetch, delete, or create new associated model records. This should be used in situations that require very custom results.

Once this association has been defined, find operations on the Recipe model will also fetch related Tag records if they exist:

```
// Sample results from a $this->Recipe->find() call.

Array
(
    [Recipe] => Array
        (
            [id] => 2745
            [name] => Chocolate Frosted Sugar Bombs
            [created] => 2007-05-01 10:31:01
            [user_id] => 2346
        )
    [Ingredient] => Array
        (
            [0] => Array
                (
                    [id] => 123
                    [name] => Chocolate
                )
           [1] => Array
                (
                    [id] => 124
                    [name] => Sugar
                )
           [2] => Array
                (
                    [id] => 125
                    [name] => Bombs
                )
        )
)
```

Remember to define a HABTM association in the Ingredient model if you'd like to fetch Recipe data when using the Ingredient model.

Note: HABTM data is treated like a complete set, each time a new data association is added the complete set of associated rows in database is dropped and created again so you will always need to pass the whole data set for saving. For an alternative to using HABTM see *hasMany through (The Join Model)*

Tip: For more information on saving HABTM objects see *Saving Related Model Data (HABTM)*

hasMany through (The Join Model)

It is sometimes desirable to store additional data with a many to many association. Consider the following

Student hasAndBelongsToMany Course

Course hasAndBelongsToMany Student

In other words, a Student can take many Courses and a Course can be taken by many Students. This is a simple many to many association demanding a table such as this:

```
id | student_id | course_id
```

Now what if we want to store the number of days that were attended by the student on the course and their final grade? The table we'd want would be:

```
id | student_id | course_id | days_attended | grade
```

The trouble is, hasAndBelongsToMany will not support this type of scenario because when hasAndBelongsToMany associations are saved, the association is deleted first. You would lose the extra data in the columns as it is not replaced in the new insert.

> Changed in version 2.1. You can set `unique` setting to `keepExisting` circumvent losing extra data during the save operation. See `unique` key in *HABTM association arrays*.

The way to implement our requirement is to use a **join model**, otherwise known as a **hasMany through** association. That is, the association is a model itself. So, we can create a new model CourseMembership. Take a look at the following models.:

```
<?php
// Student.php
class Student extends AppModel {
    public $hasMany = array(
        'CourseMembership'
    );
}

// Course.php

class Course extends AppModel {
    public $hasMany = array(
        'CourseMembership'
    );
}

// CourseMembership.php

class CourseMembership extends AppModel {
    public $belongsTo = array(
        'Student', 'Course'
    );
}
```

The CourseMembership join model uniquely identifies a given Student's participation on a Course in addition to extra meta-information.

Join models are pretty useful things to be able to use and Cake makes it easy to do so with its built-in hasMany and belongsTo associations and saveAll feature.

Creating and Destroying Associations on the Fly

Sometimes it becomes necessary to create and destroy model associations on the fly. This may be for any number of reasons:

- You want to reduce the amount of associated data fetched, but all your associations are on the first level of recursion.
- You want to change the way an association is defined in order to sort or filter associated data.

This association creation and destruction is done using the CakePHP model bindModel() and unbindModel() methods. (There is also a very helpful behavior called "Containable", please refer to manual section about Built-in behaviors for more information). Let's set up a few models so we can see how bindModel() and unbindModel() work. We'll start with two models:

```
<?php
class Leader extends AppModel {
    public $name = 'Leader';

    public $hasMany = array(
        'Follower' => array(
            'className' => 'Follower',
            'order'     => 'Follower.rank'
        )
    );
}

class Follower extends AppModel {
    public $name = 'Follower';
}
```

Now, in the LeadersController, we can use the find() method in the Leader model to fetch a Leader and its associated followers. As you can see above, the association array in the Leader model defines a "Leader hasMany Followers" relationship. For demonstration purposes, let's use unbindModel() to remove that association in a controller action:

```
<?php
public function some_action() {
    // This fetches Leaders, and their associated Followers
    $this->Leader->find('all');

    // Let's remove the hasMany...
    $this->Leader->unbindModel(
        array('hasMany' => array('Follower'))
    );

    // Now using a find function will return
    // Leaders, with no Followers
    $this->Leader->find('all');

    // NOTE: unbindModel only affects the very next
    // find function. An additional find call will use
    // the configured association information.
    // We've already used find('all') after unbindModel(),
    // so this will fetch Leaders with associated
    // Followers once again...
    $this->Leader->find('all');
}
```

Note: Removing or adding associations using bind- and unbindModel() only works for the *next* find operation only unless the second parameter has been set to false. If the second parameter has been set to *false*, the bind remains in place for the remainder of the request.

Here's the basic usage pattern for unbindModel():

```
<?php
$this->Model->unbindModel(
    array('associationType' => array('associatedModelClassName'))
);
```

Now that we've successfully removed an association on the fly, let's add one. Our as-of-yet unprincipled Leader needs some associated Principles. The model file for our Principle model is bare, except for the public $name statement. Let's associate some Principles to our Leader on the fly (but remember–only for just the following find operation). This function appears in the LeadersController:

```
<?php
public function another_action() {
    // There is no Leader hasMany Principles in
    // the leader.php model file, so a find here,
    // only fetches Leaders.
    $this->Leader->find('all');

    // Let's use bindModel() to add a new association
    // to the Leader model:
    $this->Leader->bindModel(
        array('hasMany' => array(
                'Principle' => array(
                    'className' => 'Principle'
                )
            )
        )
    );

    // Now that we're associated correctly,
    // we can use a single find function to fetch
    // Leaders with their associated principles:
    $this->Leader->find('all');
}
```

There you have it. The basic usage for bindModel() is the encapsulation of a normal association array inside an array whose key is named after the type of association you are trying to create:

```
<?php
$this->Model->bindModel(
    array('associationName' => array(
            'associatedModelClassName' => array(
                // normal association keys go here...
            )
        )
    )
);
```

Even though the newly bound model doesn't need any sort of association definition in its model file, it will still need to be correctly keyed in order for the new association to work properly.

Multiple relations to the same model

There are cases where a Model has more than one relation to another Model. For example you might have a Message model that has two relations to the User model. One relation to the user that sends a message, and a second to the user that receives the message. The messages table will have a field user_id, but also a field recipient_id. Now your Message model can look something like:

```
<?php
class Message extends AppModel {
    public $name = 'Message';
    public $belongsTo = array(
        'Sender' => array(
            'className' => 'User',
            'foreignKey' => 'user_id'
        ),
        'Recipient' => array(
            'className' => 'User',
            'foreignKey' => 'recipient_id'
        )
    );
}
```

Recipient is an alias for the User model. Now let's see what the User model would look like:

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $hasMany = array(
        'MessageSent' => array(
            'className' => 'Message',
            'foreignKey' => 'user_id'
        ),
        'MessageReceived' => array(
            'className' => 'Message',
            'foreignKey' => 'recipient_id'
        )
    );
}
```

It is also possible to create self associations as shown below:

```php
<?php
class Post extends AppModel {
    public $name = 'Post';

    public $belongsTo = array(
        'Parent' => array(
            'className' => 'Post',
            'foreignKey' => 'parent_id'
        )
    );

    public $hasMany = array(
        'Children' => array(
            'className' => 'Post',
            'foreignKey' => 'parent_id'
        )
    );
}
```

Fetching a nested array of associated records:

If your table has `parent_id` field you can also use *find('threaded')* to fetch nested array of records using a single query without setting up any associations.

Joining tables

In SQL you can combine related tables using the JOIN statement. This allows you to perform complex searches across multiples tables (i.e: search posts given several tags).

In CakePHP some associations (belongsTo and hasOne) performs automatic joins to retrieve data, so you can issue queries to retrieve models based on data in the related one.

But this is not the case with hasMany and hasAndBelongsToMany associations. Here is where forcing joins comes to the rescue. You only have to define the necessary joins to combine tables and get the desired results for your query.

Note: Remember you need to set the recursion to -1 for this to work. I.e: $this->Channel->recursive = -1;

To force a join between tables you need to use the “modern” syntax for Model::find(), adding a ‘joins’ key to the $options array. For example:

```php
<?php
$options['joins'] = array(
    array('table' => 'channels',
        'alias' => 'Channel',
        'type' => 'LEFT',
        'conditions' => array(
            'Channel.id = Item.channel_id',
        )
    )
);
```

```
$Item->find('all', $options);
```

Note: Note that the 'join' arrays are not keyed.

In the above example, a model called Item is left joined to the channels table. You can alias the table with the Model name, so the retrieved data complies with the CakePHP data structure.

The keys that define the join are the following:

- **table**: The table for the join.
- **alias**: An alias to the table. The name of the model associated with the table is the best bet.
- **type**: The type of join: inner, left or right.
- **conditions**: The conditions to perform the join.

With joins, you could add conditions based on Related model fields:

```
<?php
$options['joins'] = array(
    array('table' => 'channels',
        'alias' => 'Channel',
        'type' => 'LEFT',
        'conditions' => array(
            'Channel.id = Item.channel_id',
        )
    )
);

$options['conditions'] = array(
    'Channel.private' => 1
);

$privateItems = $Item->find('all', $options);
```

You could perform several joins as needed in hasAndBelongsToMany:

Suppose a Book hasAndBelongsToMany Tag association. This relation uses a books_tags table as join table, so you need to join the books table to the books_tags table, and this with the tags table:

```
<?php
$options['joins'] = array(
    array('table' => 'books_tags',
        'alias' => 'BooksTag',
        'type' => 'inner',
        'conditions' => array(
            'Books.id = BooksTag.books_id'
        )
    ),
    array('table' => 'tags',
        'alias' => 'Tag',
        'type' => 'inner',
        'conditions' => array(
            'BooksTag.tag_id = Tag.id'
        )
    )
);

$options['conditions'] = array(
    'Tag.tag' => 'Novel'
);

$books = $Book->find('all', $options);
```

Using joins allows you to have a maximum flexibility in how CakePHP handles associations and fetch the data, however in most cases you can use other tools to achieve the same results such as correctly defining associations, binding models on the fly and using the Containable behavior. This feature should be used with care because it could lead, in a few cases, into bad formed SQL queries if combined with any of the former techniques described for associating models.

Retrieving Your Data

As stated before, one of the roles of the Model layer is to get data from multiple types of storage. The CakePHP Model class comes with some functions that will help you search for this data, sort it, paginate it, and filter it. The most common function you will use in models is `Model::find()`

find

`find(string $type = 'first', array $params = array())`

Find is the multifunctional workhorse of all model data-retrieval functions. `$type` can be either `'all'`, `'first'`, `'count'`, `'list'`, `'neighbors'` or `'threaded'` or any custom finder you can define. Keep in mind that `$type` is case sensitive. Using an upper case character (for example `All`) will not produce the expected results.

`$params` is used to pass all parameters to the various finds, and has the following possible keys by default - all of which are optional:

```
<?php
array(
    'conditions' => array('Model.field' => $thisValue), //array of conditions
    'recursive' => 1, //int
    'fields' => array('Model.field1', 'DISTINCT Model.field2'), //array of field names
    'order' => array('Model.created', 'Model.field3 DESC'), //string or array defining orde
    'group' => array('Model.field'), //fields to GROUP BY
    'limit' => n, //int
    'page' => n, //int
    'offset' => n, //int
    'callbacks' => true //other possible values are false, 'before', 'after'
)
```

It's also possible to add and use other parameters, as is made use of by some find types, behaviors and of course possibly with your own model methods.

find('first')

`find('first', $params)` will return one result, you'd use this for any case where you expect only one result. Below are a couple of simple (controller code) examples:

```
<?php
public function some_function() {
    // ...
    $semiRandomArticle = $this->Article->find('first');
    $lastCreated = $this->Article->find('first', array(
        'order' => array('Article.created' => 'desc')
    ));
    $specificallyThisOne = $this->Article->find('first', array(
        'conditions' => array('Article.id' => 1)
    ));
    // ...
}
```

In the first example, no parameters at all are passed to find - therefore no conditions or sort order will be used. The format returned from `find('first')` call is of the form:

```
Array
(
    [ModelName] => Array
        (
            [id] => 83
            [field1] => value1
            [field2] => value2
            [field3] => value3
        )

    [AssociatedModelName] => Array
        (
            [id] => 1
            [field1] => value1
            [field2] => value2
            [field3] => value3
        )
)
```

find('count')

`find('count', $params)` returns an integer value. Below are a couple of simple (controller code) examples:

```
<?php
public function some_function() {
    // ...
    $total = $this->Article->find('count');
    $pending = $this->Article->find('count', array(
        'conditions' => array('Article.status' => 'pending')
    ));
    $authors = $this->Article->User->find('count');
    $publishedAuthors = $this->Article->find('count', array(
       'fields' => 'DISTINCT Article.user_id',
       'conditions' => array('Article.status !=' => 'pending')
    ));
    // ...
}
```

Note: Don't pass `fields` as an array to `find('count')`. You would only need to specify fields for a DISTINCT count (since otherwise, the count is always the same - dictated by the conditions).

find('all')

`find('all', $params)` returns an array of (potentially multiple) results. It is in fact the mechanism used by all `find()` variants, as well as `paginate`. Below are a couple of simple (controller code) examples:

```
<?php
public function some_function() {
    // ...
    $allArticles = $this->Article->find('all');
    $pending = $this->Article->find('all', array(
        'conditions' => array('Article.status' => 'pending')
    ));
    $allAuthors = $this->Article->User->find('all');
    $allPublishedAuthors = $this->Article->User->find('all', array(
        'conditions' => array('Article.status !=' => 'pending')
    ));
    // ...
}
```

Note: In the above example `$allAuthors` will contain every user in the users table. There will be no condition applied to the find as none were passed.

The results of a call to `find('all')` will be of the following form:

```
Array
(
    [0] => Array
        (
            [ModelName] => Array
                (
                    [id] => 83
                    [field1] => value1
                    [field2] => value2
                    [field3] => value3
                )

            [AssociatedModelName] => Array
                (
                    [id] => 1
                    [field1] => value1
                    [field2] => value2
                    [field3] => value3
                )

        )
)
```

find('list')

`find('list', $params)` returns an indexed array, useful for any place where you would want a list such as for populating input select boxes. Below are a couple of simple (controller code) examples:

```
<?php
public function some_function() {
    // ...
    $allArticles = $this->Article->find('list');
    $pending = $this->Article->find('list', array(
        'conditions' => array('Article.status' => 'pending')
    ));
    $allAuthors = $this->Article->User->find('list');
    $allPublishedAuthors = $this->Article->find('list', array(
        'fields' => array('User.id', 'User.name'),
        'conditions' => array('Article.status !=' => 'pending'),
        'recursive' => 0
    ));
    // ...
}
```

Note: In the above example `$allAuthors` will contain every user in the users table. There will be no condition applied to the find as none were passed.

The results of a call to `find('list')` will be in the following form:

```
Array
(
    //[id] => 'displayValue',
    [1] => 'displayValue1',
    [2] => 'displayValue2',
    [4] => 'displayValue4',
    [5] => 'displayValue5',
    [6] => 'displayValue6',
    [3] => 'displayValue3',
)
```

When calling `find('list')` the `fields` passed are used to determine what should be used as the array key, value and optionally what to group the results by. By default the primary key for the model is used for the key, and the display field (which can be configured using the model attribute *displayField*) is used for the value. Some further examples to clarify:

```php
<?php
public function some_function() {
    // ...
    $justusernames = $this->Article->User->find('list', array(
        'fields' => array('User.username')
    ));
    $usernameMap = $this->Article->User->find('list', array(
        'fields' => array('User.username', 'User.first_name')
    ));
    $usernameGroups = $this->Article->User->find('list', array(
        'fields' => array('User.username', 'User.first_name', 'User.group')
    ));
    // ...
}
```

With the above code example, the resultant vars would look something like this:

```
$justusernames = Array
(
    //[id] => 'username',
    [213] => 'AD7six',
    [25] => '_psychic_',
    [1] => 'PHPNut',
    [2] => 'gwoo',
    [400] => 'jperras',
)

$usernameMap = Array
(
    //[username] => 'firstname',
    ['AD7six'] => 'Andy',
    ['_psychic_'] => 'John',
    ['PHPNut'] => 'Larry',
    ['gwoo'] => 'Gwoo',
    ['jperras'] => 'Joël',
)

$usernameGroups = Array
(
    ['User'] => Array
    (
        ['PHPNut'] => 'Larry',
        ['gwoo'] => 'Gwoo',
    )

    ['Admin'] => Array
    (
        ['_psychic_'] => 'John',
        ['AD7six'] => 'Andy',
        ['jperras'] => 'Joël',
    )

)
```

find('threaded')

`find('threaded', $params)` returns a nested array, and is appropriate if you want to use the `parent_id` field of your model data to build nested results. Below are a couple of simple (controller code) examples:

```
<?php
public function some_function() {
    // ...
    $allCategories = $this->Category->find('threaded');
    $someCategories = $this->Comment->find('threaded', array(
        'conditions' => array('article_id' => 50)
    ));
    // ...
}
```

Tip: A better way to deal with nested data is using the *Tree* behavior

In the above code example, `$allCategories` will contain a nested array representing the whole category structure. The results of a call to `find('threaded')` will be of the following form:

```
Array
(
    [0] => Array
    (
        [ModelName] => Array
        (
            [id] => 83
            [parent_id] => null
            [field1] => value1
            [field2] => value2
            [field3] => value3
        )

        [AssociatedModelName] => Array
        (
            [id] => 1
            [field1] => value1
            [field2] => value2
            [field3] => value3
        )

        [children] => Array
        (
            [0] => Array
            (
                [ModelName] => Array
                (
                    [id] => 42
                    [parent_id] => 83
                    [field1] => value1
                    [field2] => value2
                    [field3] => value3
                )

                [AssociatedModelName] => Array
                (
                    [id] => 2
                    [field1] => value1
                    [field2] => value2
                    [field3] => value3
                )

                [children] => Array
                (
                )
            )
            ...
        )
    )
)
```

The order results appear can be changed as it is influenced by the order of processing. For example, if `'order' => 'name ASC'` is passed in the params to `find('threaded')`, the results will appear in name order. Likewise any order can be used, there is no inbuilt requirement of this method for the top result to be returned first.

find('neighbors')

`find('neighbors', $params)` will perform a find similar to 'first', but will return the row before and after the one you request. Below is a simple (controller code) example:

```php
<?php
public function some_function() {
   $neighbors = $this->Article->find('neighbors', array('field' => 'id', 'value' => 3));
}
```

You can see in this example the two required elements of the `$params` array: field and value. Other elements are still allowed as with any other find (Ex: If your model acts as containable, then you can specify 'contain' in `$params`). The format returned from a `find('neighbors')` call is in the form:

```
Array
(
    [prev] => Array
    (
        [ModelName] => Array
        (
            [id] => 2
            [field1] => value1
            [field2] => value2
            ...
        )
        [AssociatedModelName] => Array
        (
            [id] => 151
            [field1] => value1
            [field2] => value2
            ...
        )
    )
    [next] => Array
    (
        [ModelName] => Array
        (
            [id] => 4
            [field1] => value1
            [field2] => value2
            ...
        )
        [AssociatedModelName] => Array
        (
            [id] => 122
            [field1] => value1
            [field2] => value2
            ...
        )
    )
)
```

Note: Note how the result always contains only two root elements: prev and next. This function does not honor a model's default recursive var. The recursive setting must be passed in the parameters on each call.

Creating custom find types

The `find` method is flexible enough to accept your custom finders, this is done by declaring your own types in a model variable and by implementing a special function in your model class.

A Model Find Type is a shortcut to find options. For example, the following two finds are equivalent

```
$this->User->find('first');
$this->User->find('all', array('limit' => 1));
```

The following are core find types:

- `first`
- `all`
- `count`

- list
- threaded
- neighbors

But what about other types? Let's say you want a finder for all published articles in your database. The first change you need to do is add your type to the `Model::$findMethods` variable in the model

```
<?php
class Article extends AppModel {
    public $findMethods = array('available' =>  true);
}
```

Basically this is just telling CakePHP to accept the value `available` as the first argument of the `find` function. Next step is to implement the function `_findAvailable`. This is done by convention, if you wanted to implement a finder called `myFancySearch` then the method to implement would be named `_findMyFancySearch`.

```
<?php
class Article extends AppModel {
    public $findMethods = array('available' =>  true);

    protected function _findAvailable($state, $query, $results = array()) {
        if ($state == 'before') {
            $query['conditions']['Article.published'] = true;
            return $query;
        }
        return $results;
    }
}
```

This all comes together in the following example (controller code):

```
<?php
class ArticlesController extends AppController {

    // Will find all published articles and order them by the created column
    public function index() {
        $articles = $this->Article->find('available', array(
            'order' => array('created' => 'desc')
        ));
    }

}
```

The special `_find[Type]` methods receive 3 arguments as shown above. The first one means the state of the query execution, which could be either `before` or `after`. It is done this way because this function is just a sort of callback function that has the ability to modify the query before it is done, or to modify the results after they are fetched.

Typically the first thing to check in our custom find function is the state of the query. The `before` state is the moment to modify the query, bind new associations, apply more behaviors, and interpret any special key that is passed in the second argument of `find`. This state requires you to return the $query argument (modified or not).

The after state is the perfect place to inspect the results, inject new data, process it to return it in another format, or do whatever you like to the recently fetched data. This state requires you to return the $results array (modified or not).

You can create as many custom finders as you like, and they are a great way of reusing code in your application across models.

It is also possible to paginate via a custom find type as follows:

```
<?php
class ArticlesController extends AppController {

    // Will paginate all published articles
    public function index() {
        $this->paginate = array('available');
        $articles = $this->paginate();
        $this->set(compact('articles'));
    }

}
```

Setting the `$this->paginate` property as above on the controller will result in the `type` of the find becoming `available`, and will also allow you to continue to modify the find results.

If your pagination page count is becoming corrupt, it may be necessary to add the following code to your `AppModel`, which should fix pagination count:

```
<?php
class AppModel extends Model {

/**
 * Removes 'fields' key from count query on custom finds when it is an array,
 * as it will completely break the Model::_findCount() call
 *
 * @param string $state Either "before" or "after"
 * @param array $query
 * @param array $results
 * @return int The number of records found, or false
 * @access protected
 * @see Model::find()
 */
    protected function _findCount($state, $query, $results = array()) {
        if ($state === 'before') {
            if (isset($query['type']) && isset($this->findMethods[$query['type']])) {
                $query = $this->{'_find' . ucfirst($query['type'])}('before', $query);
                if (!empty($query['fields']) && is_array($query['fields'])) {
                    if (!preg_match('/^count/i', current($query['fields']))) {
                        unset($query['fields']);
                    }
                }
            }
        }
        return parent::_findCount($state, $query, $results);
    }
}
?>
```

Changed in version 2.2. You no longer need to override _findCount for fixing incorrect count results. The `'before'` state of your custom finder will now be called again with $query['operation'] = 'count'. The returned $query will be used in `_findCount()` If needed you can distinguish by checking for `'operation'` key and return a different `$query`:

```
protected function _findAvailable($state, $query, $results = array()) {
    if ($state == 'before') {
        $query['conditions']['Article.published'] = true;
        if (!empty($query['operation']) && $query['operation'] == 'count') {
            return $query;
        }
        $query['joins'] = array(
            //array of required joins
        );
        return $query;
    }
    return $results;
}
```

Magic Find Types

These magic functions can be used as a shortcut to search your tables by a certain field. Just add the name of the field (in CamelCase format) to the end of these functions, and supply the criteria for that field as the first parameter.

findAllBy() functions will return results in a format like `find('all')`, while findBy() return in the same format as `find('first')`

findAllBy

`findAllBy<fieldName>(string $value, array $fields, array $order, int $limit, int $page, int $recursive)`

findAllBy<x> Example	Corresponding SQL Fragment
`$this->Product->findAllByOrderStatus('3');`	`Product.order_status = 3`
`$this->Recipe->findAllByType('Cookie');`	`Recipe.type = 'Cookie'`
`$this->User->findAllByLastName('Anderson');`	`User.last_name = 'Anderson'`
`$this->Cake->findAllById(7);`	`Cake.id = 7`
`$this->User->findAllByEmailOrUsername('jhon');`	`User.email = 'jhon' OR User.username = 'jhon';`
`$this->User->findAllByUsernameAndPassword('jhon', '123');`	`User.username = 'jhon' AND User.password = '123';`
`$this->User->findAllByLastName('psychic', array(), array('User.user_name => 'asc'));`	`User.last_name = 'psychic' ORDER BY User.user_name ASC`

The returned result is an array formatted just as it would be from `find('all')`.

findBy

`findBy<fieldName>(string $value);`

The findBy magic functions also accept some optional parameters:

`findBy<fieldName>(string $value[, mixed $fields[, mixed $order]]);`

findBy<x> Example	Corresponding SQL Fragment
`$this->Product->findByOrderStatus('3');`	`Product.order_status = 3`
`$this->Recipe->findByType('Cookie');`	`Recipe.type = 'Cookie'`
`$this->User->findByLastName('Anderson');`	`User.last_name = 'Anderson';`
`$this->User->findByEmailOrUsername('jhon');`	`User.email = 'jhon' OR User.username = 'jhon';`
`$this->User->findByUsernameAndPassword('jhon', '123');`	`User.username = 'jhon' AND User.password = '123';`
`$this->Cake->findById(7);`	`Cake.id = 7`

findBy() functions return results like `find('first')`

Model::query()

`query(string $query)`

SQL calls that you can't or don't want to make via other model methods (this should only rarely be necessary) can be made using the model's `query()` method.

If you're ever using this method in your application, be sure to check out CakePHP's *Data Sanitization*, which aids in cleaning up user-provided data from injection and cross-site scripting attacks.

Note: `query()` does not honor $Model->cacheQueries as its functionality is inherently disjoint from that of the calling model. To avoid caching calls to query, supply a second argument of false, ie: `query($query, $cachequeries = false)`

`query()` uses the table name in the query as the array key for the returned data, rather than the model name. For example:

```php
<?php
$this->Picture->query("SELECT * FROM pictures LIMIT 2;");
```

might return:

```
Array
(
    [0] => Array
    (
        [pictures] => Array
        (
            [id] => 1304
            [user_id] => 759
        )
    )

    [1] => Array
    (
        [pictures] => Array
        (
            [id] => 1305
            [user_id] => 759
        )
    )
)
```

To use the model name as the array key, and get a result consistent with that returned by the Find methods, the query can be rewritten:

```
<?php
$this->Picture->query("SELECT * FROM pictures AS Picture LIMIT 2;");
```

which returns:

```
Array
(
    [0] => Array
    (
        [Picture] => Array
        (
            [id] => 1304
            [user_id] => 759
        )
    )

    [1] => Array
    (
        [Picture] => Array
        (
            [id] => 1305
            [user_id] => 759
        )
    )
)
```

Note: This syntax and the corresponding array structure is valid for MySQL only. Cake does not provide any data abstraction when running queries manually, so exact results will vary between databases.

`Model::field()`

`field(string $name, array $conditions = null, string $order = null)`

Returns the value of a single field, specified as `$name`, from the first record matched by $conditions as ordered by $order. If no conditions are passed and the model id is set, will return the field value for the current model result. If no matching record is found returns false.

```
<?php
$this->Post->id = 22;
echo $this->Post->field('name'); // echo the name for row id 22

echo $this->Post->field('name', array('created <' => date('Y-m-d H:i:s')), 'created DESC'),
// echo the name of the last created instance
```

`Model::read()`

`read($fields, $id)`

`read()` is a method used to set the current model data (`Model::$data`)–such as during edits–but it can also be used in other circumstances to retrieve a single record from the database.

`$fields` is used to pass a single field name, as a string, or an array of field names; if left empty, all fields will be fetched.

`$id` specifies the ID of the record to be read. By default, the currently selected record, as specified by `Model::$id`, is used. Passing a different value to `$id` will cause that record to be selected.

`read()` always returns an array (even if only a single field name is requested). Use `field` to retrieve the value of a single field.

Warning: As the `read` method overwrites any information stored in the `data` and `id` property of the model, you should be very careful when using this function in general, especially using it in the model callback functions such as `beforeValidate` and `beforeSave`. Generally the `find` function provides a more robust and easy to work with API than the `read` method.

Complex Find Conditions

Most of the model's find calls involve passing sets of conditions in one way or another. In general CakePHP prefers using arrays for expressing any conditions that needs to be put after the WHERE clause in any SQL query.

Using arrays is clearer and easier to read, and also makes it very easy to build queries. This syntax also breaks out the elements of your query (fields, values, operators, etc.) into discrete, manipulatable parts. This allows CakePHP to generate the most efficient query possible, ensure proper SQL syntax, and properly escape each individual part of the query. Using the array syntax also enables CakePHP to secure your queries against any SQL injection attack

At its most basic, an array-based query looks like this:

```
<?php
$conditions = array("Post.title" => "This is a post", "Post.author_id" => 1);
// Example usage with a model:
$this->Post->find('first', array('conditions' => $conditions));
```

The structure here is fairly self-explanatory: it will find any post where the title equals "This is a post". Note that we could have used just "title" as the field name, but when building queries, it is good practice to always specify the model name, as it improves the clarity of the code, and helps prevent collisions in the future, should you choose to change your schema.

What about other types of matches? These are equally simple. Let's say we wanted to find all the posts where the title is not "This is a post":

```
<?php
array("Post.title !=" => "This is a post")
```

Notice the '!=' that follows the field name. CakePHP can parse out any valid SQL comparison operator, including match expressions using LIKE, BETWEEN, or REGEX, as long as you leave a space between field name and the operator. The one exception here is IN (...)-style matches. Let's say you wanted to find posts where the title was in a given set of values:

```
<?php
array(
    "Post.title" => array("First post", "Second post", "Third post")
)
```

To do a NOT IN(...) match to find posts where the title is not in the given set of values:

```
<?php
array(
    "NOT" => array("Post.title" => array("First post", "Second post", "Third post"))
)
```

Adding additional filters to the conditions is as simple as adding additional key/value pairs to the array:

```
<?php
array (
    "Post.title" => array("First post", "Second post", "Third post"),
    "Post.created >" => date('Y-m-d', strtotime("-2 weeks"))
)
```

You can also create finds that compare two fields in the database:

```
<?php
array("Post.created = Post.modified")
```

This above example will return posts where the created date is equal to the modified date (ie it will return posts that have never been modified).

Remember that if you find yourself unable to form a WHERE clause in this method (ex. boolean operations), you can always specify it as a string like:

```
<?php
array(
    'Model.field & 8 = 1',
    // other conditions as usual
)
```

By default, CakePHP joins multiple conditions with boolean AND; which means, the snippet above would only match posts that have been created in the past two weeks, and have a title that matches one in the given set. However, we could just as easily find posts that match either condition:

```php
<?php
array("OR" => array(
    "Post.title" => array("First post", "Second post", "Third post"),
    "Post.created >" => date('Y-m-d', strtotime("-2 weeks"))
))
```

Cake accepts all valid SQL boolean operations, including AND, OR, NOT, XOR, etc., and they can be upper or lower case, whichever you prefer. These conditions are also infinitely nest-able. Let's say you had a belongsTo relationship between Posts and Authors. Let's say you wanted to find all the posts that contained a certain keyword ("magic") or were created in the past two weeks, but you want to restrict your search to posts written by Bob:

```php
<?php
array(
    "Author.name" => "Bob",
    "OR" => array(
        "Post.title LIKE" => "%magic%",
        "Post.created >" => date('Y-m-d', strtotime("-2 weeks"))
    )
)
```

If you need to set multiple conditions on the same field, like when you want to do a LIKE search with multiple terms, you can do so by using conditions similar to:

```php
<?php
array('OR' => array(
    array('Post.title LIKE' => '%one%'),
    array('Post.title LIKE' => '%two%')
))
```

Cake can also check for null fields. In this example, the query will return records where the post title is not null:

```php
<?php
array("NOT" => array(
        "Post.title" => null
    )
)
```

To handle BETWEEN queries, you can use the following:

```php
<?php
array('Post.read_count BETWEEN ? AND ?' => array(1,10))
```

Note: CakePHP will quote the numeric values depending on the field type in your DB.

How about GROUP BY?:

```php
<?php
array(
    'fields' => array(
        'Product.type',
        'MIN(Product.price) as price'
    ),
    'group' => 'Product.type'
)
```

The data returned for this would be in the following format:

```
Array
(
    [0] => Array
    (
        [Product] => Array
        (
            [type] => Clothing
        )
        [0] => Array
        (
            [price] => 32
        )
    )
    [1] => Array
    ...
```

A quick example of doing a DISTINCT query. You can use other operators, such as MIN(), MAX(), etc., in a similar fashion:

```
<?php
array(
    'fields' => array('DISTINCT (User.name) AS my_column_name'),
    'order' = >array('User.id DESC')
)
```

You can create very complex conditions, by nesting multiple condition arrays:

```
<?php
array(
    'OR' => array(
        array('Company.name' => 'Future Holdings'),
        array('Company.city' => 'CA')
    ),
    'AND' => array(
        array(
            'OR' => array(
                array('Company.status' => 'active'),
                'NOT' => array(
                    array('Company.status' => array('inactive', 'suspended'))
                )
            )
        )
    )
)
```

Which produces the following SQL:

```
SELECT `Company`.`id`, `Company`.`name`,
`Company`.`description`, `Company`.`location`,
`Company`.`created`, `Company`.`status`, `Company`.`size`

FROM
   `companies` AS `Company`
WHERE
   ((`Company`.`name` = 'Future Holdings')
   OR
   (`Company`.`name` = 'Steel Mega Works'))
AND
   ((`Company`.`status` = 'active')
   OR (NOT (`Company`.`status` IN ('inactive', 'suspended'))))
```

Sub-queries

For this example, imagine we have a "users" table with "id", "name" and "status". The status can be "A", "B" or "C". And we want to get all the users that have status other than "B" using sub-query.

In order to achieve that we are going to get the model data source and ask it to build the query as if we were calling a find method, but it will just return the SQL statement. After that we make an expression and add it to the conditions array:

```php
<?php
$conditionsSubQuery['"User2"."status"'] = 'B';

$db = $this->User->getDataSource();
$subQuery = $db->buildStatement(
    array(
        'fields'     => array('"User2"."id"'),
        'table'      => $db->fullTableName($this->User),
        'alias'      => 'User2',
        'limit'      => null,
        'offset'     => null,
        'joins'      => array(),
        'conditions' => $conditionsSubQuery,
        'order'      => null,
        'group'      => null
    ),
    $this->User
);
$subQuery = ' "User"."id" NOT IN (' . $subQuery . ') ';
$subQueryExpression = $db->expression($subQuery);

$conditions[] = $subQueryExpression;

$this->User->find('all', compact('conditions'));
```

This should generate the following SQL:

```
SELECT
    "User"."id" AS "User__id",
    "User"."name" AS "User__name",
    "User"."status" AS "User__status"
FROM
    "users" AS "User"
WHERE
    "User"."id" NOT IN (
        SELECT
            "User2"."id"
        FROM
            "users" AS "User2"
        WHERE
            "User2"."status" = 'B'
    )
```

Also, if you need to pass just part of your query as raw SQL as the above, datasource **expressions** with raw SQL work for any part of the find query.

Prepared Statements

Should you need even more control over your queries, you can make use of prepared statements. This allows you to talk directly to the database driver and send any custom query you like:

```
<?php
$db = $this->getDataSource();
$db->fetchAll(
    'SELECT * from users where username = ? AND password = ?',
    array('jhon', '12345')
);
$db->fetchAll(
    'SELECT * from users where username = :username AND password = :password',
    array('username' => 'jhon','password' => '12345')
);
```

Saving Your Data

CakePHP makes saving model data a snap. Data ready to be saved should be passed to the model's `save()` method using the following basic format:

```
Array
(
    [ModelName] => Array
    (
        [fieldname1] => 'value'
        [fieldname2] => 'value'
    )
)
```

Most of the time you won't even need to worry about this format: CakePHP's `FormHelper`, and model find methods all package data in this format. If you're using either of the helpers, the data is also conveniently available in `$this->request->data` for quick usage.

Here's a quick example of a controller action that uses a CakePHP model to save data to a database table:

```
<?php
public function edit($id) {
    // Has any form data been POSTed?
    if ($this->request->is('post')) {
        // If the form data can be validated and saved...
        if ($this->Recipe->save($this->request->data)) {
            // Set a session flash message and redirect.
            $this->Session->setFlash('Recipe Saved!');
            $this->redirect('/recipes');
        }
    }

    // If no form data, find the recipe to be edited
    // and hand it to the view.
    $this->set('recipe', $this->Recipe->findById($id));
}
```

When save is called, the data passed to it in the first parameter is validated using CakePHP validation mechanism (see *Data Validation* chapter for more information). If for some reason your data isn't saving, be sure to check to see if some validation rules are being broken. You can debug this situation by outputting `Model::$validationErrors`:

```
<?php
if ($this->Recipe->save($this->request->data)) {
    // handle the success.
}
debug($this->Recipe->validationErrors);
```

There are a few other save-related methods in the model that you'll find useful:

Model::set($one, $two = null)

`Model::set()` can be used to set one or many fields of data to the data array inside a model. This is useful when using models with the ActiveRecord features offered by Model:

```
<?php
$this->Post->read(null, 1);
$this->Post->set('title', 'New title for the article');
$this->Post->save();
```

Is an example of how you can use `set()` to update and save single fields, in an ActiveRecord approach. You can also use `set()` to assign new values to multiple fields:

```
<?php
$this->Post->read(null, 1);
$this->Post->set(array(
    'title' => 'New title',
    'published' => false
));
$this->Post->save();
```

The above would update the title and published fields and save them to the database.

`Model::save(array $data = null, boolean $validate = true, array $fieldList = array())`

Featured above, this method saves array-formatted data. The second parameter allows you to sidestep validation, and the third allows you to supply a list of model fields to be saved. For added security, you can limit the saved fields to those listed in `$fieldList`.

Note: If `$fieldList` is not supplied, a malicious user can add additional fields to the form data (if you are not using `SecurityComponent`), and by this change fields that were not originally intended to be changed.

The save method also has an alternate syntax:

```
<?php
save(array $data = null, array $params = array())
```

`$params` array can have any of the following available options as keys:

- `validate` Set to true/false to enable disable validation.
- `fieldList` An array of fields you want to allow for saving.
- `callbacks` Set to false to disable callbacks. Using 'before' or 'after' will enable only those callbacks.

More information about model callbacks is available *here*

Tip: If you don't want the updated field to be updated when saving some data add `'updated' => false` to your `$data` array

---

Once a save has been completed, the ID for the object can be found in the `$id` attribute of the model object - something especially handy when creating new objects.

```
<?php
$this->Ingredient->save($newData);
$newIngredientId = $this->Ingredient->id;
```

Creating or updating is controlled by the model's `id` field. If `$Model->id` is set, the record with this primary key is updated. Otherwise a new record is created:

```
<?php
// Create: id isn't set or is null
$this->Recipe->create();
$this->Recipe->save($this->request->data);

// Update: id is set to a numerical value
$this->Recipe->id = 2;
$this->Recipe->save($this->request->data);
```

Tip: When calling save in a loop, don't forget to call `create()`

If you want to update a value, rather than create a new one, make sure your are passing the primary key field into the data array:

```
<?php
$data = array('id' => 10, 'title' => 'My new title');
// This will update Recipe with id 10
$this->Recipe->save($data);
```

`Model::create(array $data = array())`

This method resets the model state for saving new information.

If the `$data` parameter (using the array format outlined above) is passed, the model instance will be ready to save with that data (accessible at `$this->data`).

If `false` is passed instead of an array, the model instance will not initialize fields from the model schema that are not already set, it will only reset fields that have already been set, and leave the rest unset. Use this to avoid updating fields in the database that were already set.

`Model::saveField(string $fieldName, string $fieldValue, $validate = false)`

Used to save a single field value. Set the ID of the model (`$this->ModelName->id = $id`) just before calling `saveField()`. When using this method, `$fieldName` should only contain the name of the field, not the name of the model and field.

For example, to update the title of a blog post, the call to `saveField` from a controller might look something like this:

```
<?php
$this->Post->saveField('title', 'A New Title for a New Day');
```

Warning: You can't stop the updated field being updated with this method, you need to use the save() method.

`Model::updateAll(array $fields, array $conditions)`

Updates many records in a single call. Records to be updated are identified by the `$conditions` array, and fields to be updated, along with their values, are identified by the `$fields` array.

For example, to approve all bakers who have been members for over a year, the update call might look something like:

```php
<?php
$this_year = date('Y-m-d h:i:s', strtotime('-1 year'));

$this->Baker->updateAll(
    array('Baker.approved' => true),
    array('Baker.created <=' => $this_year)
);
```

Tip: The $fields array accepts SQL expressions. Literal values should be quoted manually using `Sanitize::escape()`.

Note: Even if the modified field exists for the model being updated, it is not going to be updated automatically by the ORM. Just add it manually to the array if you need it to be updated.

For example, to close all tickets that belong to a certain customer:

```php
<?php
$this->Ticket->updateAll(
    array('Ticket.status' => "'closed'"),
    array('Ticket.customer_id' => 453)
);
```

By default, updateAll() will automatically join any belongsTo association for databases that support joins. To prevent this, temporarily unbind the associations.

`Model::saveMany(array $data = null, array $options = array())`

Method used to save multiple rows of the same model at once. The following options may be used:

- `validate`: Set to false to disable validation, true to validate each record before saving, 'first' to validate *all* records before any are saved (default),
- `atomic`: If true (default), will attempt to save all records in a single transaction. Should be set to false if database/table does not support transactions.
- `fieldList`: Equivalent to the $fieldList parameter in Model::save()
- `deep`: (since 2.1) If set to true, also associated data is saved, see also saveAssociated

For saving multiple records of single model, $data needs to be a numerically indexed array of records like this:

```php
<?php
$data = array(
    array('title' => 'title 1'),
    array('title' => 'title 2'),
);
```

Note: Note that we are passing numerical indices instead of usual `$data` containing the Article key. When saving multiple records of same model the records arrays should be just numerically indexed without the model key.

It is also acceptable to have the data in the following format:

```
<?php
$data = array(
    array('Article' => array('title' => 'title 1')),
    array('Article' => array('title' => 'title 2')),
);
```

To save also associated data with `$options['deep'] = true` (since 2.1), the two above examples would look like:

```
<?php
$data = array(
    array('title' => 'title 1', 'Assoc' => array('field' => 'value')),
    array('title' => 'title 2'),
);
$data = array(
    array('Article' => array('title' => 'title 1'), 'Assoc' => array('field' => 'value')),
    array('Article' => array('title' => 'title 2')),
);
$Model->saveMany($data, array('deep' => true));
```

Keep in mind that if you want to update a record instead of creating a new one you just need to add the primary key index to the data row:

```
<?php
$data = array(
    array('Article' => array('title' => 'New article')), // This creates a new row
    array('Article' => array('id' => 2, 'title' => 'title 2')), // This updates an existin
);
```

Model::saveAssociated(array $data = null, array $options = array())

Method used to save multiple model associations at once. The following options may be used:

- `validate`: Set to false to disable validation, true to validate each record before saving, 'first' to validate *all* records before any are saved (default),
- `atomic`: If true (default), will attempt to save all records in a single transaction. Should be set to false if database/table does not support transactions.
- `fieldList`: Equivalent to the $fieldList parameter in Model::save()
- `deep`: (since 2.1) If set to true, not only directly associated data is saved, but deeper nested associated data as well. Defaults to false.

For saving a record along with its related record having a hasOne or belongsTo association, the data array should be like this:

```php
<?php
$data = array(
    'User' => array('username' => 'billy'),
    'Profile' => array('sex' => 'Male', 'occupation' => 'Programmer'),
);
```

For saving a record along with its related records having hasMany association, the data array should be like this:

```php
<?php
$data = array(
    'Article' => array('title' => 'My first article'),
    'Comment' => array(
        array('body' => 'Comment 1', 'user_id' => 1),
        array('body' => 'Comment 2', 'user_id' => 12),
        array('body' => 'Comment 3', 'user_id' => 40),
    ),
);
```

And for saving a record along with its related records having hasMany with more than two levels deep associations, the data array should be as follow:

```php
<?php
$data = array(
    'User' => array('email' => 'john-doe@cakephp.org'),
    'Cart' => array(
        array(
            'payment_status_id' => 2,
            'total_cost' => 250,
            'CartItem' => array(
                array(
                    'cart_product_id' => 3,
                    'quantity' => 1,
                    'cost' => 100,
                ),
                array(
                    'cart_product_id' => 5,
                    'quantity' => 1,
                    'cost' => 150,
                )
            )
        )
    )
);
```

Note: If successful, the foreign key of the main model will be stored in the related models' id field, i.e. `$this->RelatedModel->id`.

Warning: Be careful when checking saveAssociated calls with atomic option set to false. It returns an array instead of boolean.

Changed in version 2.1: You can now save deeper associated data as well with setting

`$options['deep'] = true;` For saving a record along with its related records having hasMany association and deeper associated Comment belongsTo User data as well, the data array should be like this:

```
<?php
$data = array(
    'Article' => array('title' => 'My first article'),
    'Comment' => array(
        array('body' => 'Comment 1', 'user_id' => 1),
        array('body' => 'Save a new user as well', 'User' => array('first' => 'mad', 'last'
    ),
);
```

And save this data with:

```
<?php
$Article->saveAssociated($data, array('deep' => true));
```

Changed in version 2.1: `Model::saveAll()` and friends now support passing the *fieldList* for multiple models. Example of using `fieldList` with multiple models:

```
<?php
$this->SomeModel->saveAll($data, array(
    'fieldList' => array(
        'SomeModel' => array('field_1'),
        'AssociatedModel' => array('field_2', 'field_3')
    )
));
```

The fieldList will be an array of model aliases as keys and arrays with fields as values. The model names are not nested like in the data to be saved.

`Model::saveAll(array $data = null, array $options = array())`

The `saveAll` function is just a wrapper around the `saveMany` and `saveAssociated` methods. it will inspect the data and determine what type of save it should perform. If data is formatted in a numerical indexed array, `saveMany` will be called, otherwise `saveAssociated` is used.

This function receives the same options as the former two, and is generally a backwards compatible function. It is recommended using either `saveMany` or `saveAssociated` depending on the case.

Saving Related Model Data (hasOne, hasMany, belongsTo)

When working with associated models, it is important to realize that saving model data should always be done by the corresponding CakePHP model. If you are saving a new Post and its associated Comments, then you would use both Post and Comment models during the save operation.

If neither of the associated model records exists in the system yet (for example, you want to save a new User and their related Profile records at the same time), you'll need to first save the primary, or parent model.

To get an idea of how this works, let's imagine that we have an action in our UsersController that handles the saving of a new User and a related Profile. The example action shown below will assume that you've POSTed enough data (using the FormHelper) to create a single User and a single Profile:

```php
<?php
public function add() {
    if (!empty($this->request->data)) {
        // We can save the User data:
        // it should be in $this->request->data['User']

        $user = $this->User->save($this->request->data);

        // If the user was saved, Now we add this information to the data
        // and save the Profile.

        if (!empty($user)) {
            // The ID of the newly created user has been set
            // as $this->User->id.
            $this->request->data['Profile']['user_id'] = $this->User->id;

            // Because our User hasOne Profile, we can access
            // the Profile model through the User model:
            $this->User->Profile->save($this->request->data);
        }
    }
}
```

As a rule, when working with hasOne, hasMany, and belongsTo associations, it's all about keying. The basic idea is to get the key from one model and place it in the foreign key field on the other. Sometimes this might involve using the `$id` attribute of the model class after a `save()`, but other times it might just involve gathering the ID from a hidden input on a form that's just been POSTed to a controller action.

To supplement the basic approach used above, CakePHP also offers a very handy method `saveAssociated()`, which allows you to validate and save multiple models in one shot. In addition, `saveAssociated()` provides transactional support to ensure data integrity in your database (i.e. if one model fails to save, the other models will not be saved either).

Note: For transactions to work correctly in MySQL your tables must use InnoDB engine. Remember that MyISAM tables do not support transactions.

Let's see how we can use `saveAssociated()` to save Company and Account models at the same time.

First, you need to build your form for both Company and Account models (we'll assume that Company hasMany Account):

```php
<?php
echo $form->create('Company', array('action' => 'add'));
echo $form->input('Company.name', array('label' => 'Company name'));
echo $form->input('Company.description');
echo $form->input('Company.location');

echo $form->input('Account.0.name', array('label' => 'Account name'));
echo $form->input('Account.0.username');
echo $form->input('Account.0.email');

echo $form->end('Add');
```

Take a look at the way we named the form fields for the Account model. If Company is our main model, `saveAssociated()` will expect the related model's (Account) data to arrive in a specific format. And having `Account.0.fieldName` is exactly what we need.

Note: The above field naming is required for a hasMany association. If the association between the models is hasOne, you have to use ModelName.fieldName notation for the associated model.

Now, in our CompaniesController we can create an `add()` action:

```
<?php
public function add() {
    if (!empty($this->request->data)) {
        // Use the following to avoid validation errors:
        unset($this->Company->Account->validate['company_id']);
        $this->Company->saveAssociated($this->request->data);
    }
}
```

That's all there is to it. Now our Company and Account models will be validated and saved all at the same time. By default `saveAssociated` will validate all values passed and then try to perform a save for each.

Saving hasMany through data

Let's see how data stored in a join table for two models is saved. As shown in the *hasMany through (The Join Model)* section, the join table is associated to each model using a *hasMany* type of relationship. Our example involves the Head of Cake School asking us to write an application that allows him to log a student's attendance on a course with days attended and grade. Take a look at the following code.:

```
<?php
// Controller/CourseMembershipController.php
class CourseMembershipsController extends AppController {
    public $uses = array('CourseMembership');

    public function index() {
        $this->set('courseMembershipsList', $this->CourseMembership->find('all'));
    }

    public function add() {
        if ($this->request->is('post')) {
            if ($this->CourseMembership->saveAssociated($this->request->data)) {
                $this->redirect(array('action' => 'index'));
            }
        }
    }
}

// View/CourseMemberships/add.ctp

<?php echo $this->Form->create('CourseMembership'); ?>
    <?php echo $this->Form->input('Student.first_name'); ?>
    <?php echo $this->Form->input('Student.last_name'); ?>
    <?php echo $this->Form->input('Course.name'); ?>
    <?php echo $this->Form->input('CourseMembership.days_attended'); ?>
    <?php echo $this->Form->input('CourseMembership.grade'); ?>
    <button type="submit">Save</button>
<?php echo  $this->Form->end(); ?>
```

The data array will look like this when submitted.:

```
Array
(
    [Student] => Array
    (
        [first_name] => Joe
        [last_name] => Bloggs
    )

    [Course] => Array
    (
        [name] => Cake
    )

    [CourseMembership] => Array
    (
        [days_attended] => 5
        [grade] => A
    )

)
```

Cake will happily be able to save the lot together and assign the foreign keys of the Student and Course into CourseMembership with a *saveAssociated* call with this data structure. If we run the index action of our CourseMembershipsController the data structure received now from a find('all') is:

```
Array
(
    [0] => Array
    (
        [CourseMembership] => Array
        (
            [id] => 1
            [student_id] => 1
            [course_id] => 1
            [days_attended] => 5
            [grade] => A
        )

        [Student] => Array
        (
            [id] => 1
            [first_name] => Joe
            [last_name] => Bloggs
        )

        [Course] => Array
        (
            [id] => 1
            [name] => Cake
        )
    )
)
```

There are of course many ways to work with a join model. The version above assumes you want to save everything at-once. There will be cases where you want to create the Student and Course independently and at a later point associate the two together with a CourseMembership. So you might have a form that allows selection of existing students and courses from pick lists or ID entry and then the two meta-fields for the CourseMembership, e.g.:

```
// View/CourseMemberships/add.ctp

<?php echo $form->create('CourseMembership'); ?>
    <?php echo $this->Form->input('Student.id', array('type' => 'text', 'label' => 'Student
    <?php echo $this->Form->input('Course.id', array('type' => 'text', 'label' => 'Course I
    <?php echo $this->Form->input('CourseMembership.days_attended'); ?>
    <?php echo $this->Form->input('CourseMembership.grade'); ?>
    <button type="submit">Save</button>
<?php echo $this->Form->end(); ?>
```

And the resultant POST:

```
Array
(
    [Student] => Array
    (
        [id] => 1
    )

    [Course] => Array
    (
        [id] => 1
    )

    [CourseMembership] => Array
    (
        [days_attended] => 10
        [grade] => 5
    )
)
```

Again Cake is good to us and pulls the Student id and Course id into the CourseMembership with the *saveAssociated*.

Saving Related Model Data (HABTM)

Saving models that are associated by hasOne, belongsTo, and hasMany is pretty simple: you just populate the foreign key field with the ID of the associated model. Once that's done, you just call the `save()`

method on the model, and everything gets linked up correctly. An example of the required format for the data array passed to `save()` for the Tag model is shown below:

```
Array
(
    [Recipe] => Array
        (
            [id] => 42
        )
    [Tag] => Array
        (
            [name] => Italian
        )
)
```

You can also use this format to save several records and their HABTM associations with `saveAll()`, using an array like the following:

```
Array
(
    [0] => Array
        (
            [Recipe] => Array
                (
                    [id] => 42
                )
            [Tag] => Array
                (
                    [name] => Italian
                )
        )
    [1] => Array
        (
            [Recipe] => Array
                (
                    [id] => 42
                )
            [Tag] => Array
                (
                    [name] => Pasta
                )
        )
    [2] => Array
        (
            [Recipe] => Array
                (
                    [id] => 51
                )
            [Tag] => Array
                (
                    [name] => Mexican
                )
        )
    [3] => Array
```

```
        (
            [Recipe] => Array
                (
                    [id] => 17
                )
            [Tag] => Array
                (
                    [name] => American (new)
                )
        )
)
```

Passing the above array to `saveAll()` will create the contained tags, each associated with their respective recipes.

As an example, we'll build a form that creates a new tag and generates the proper data array to associate it on the fly with some recipe.

The simplest form might look something like this (we'll assume that `$recipe_id` is already set to something):

```
<?php echo $this->Form->create('Tag'); ?>
    <?php echo $this->Form->input(
        'Recipe.id',
        array('type' => 'hidden', 'value' => $recipe_id)
    ); ?>
    <?php echo $this->Form->input('Tag.name'); ?>
<?php echo $this->Form->end('Add Tag'); ?>
```

In this example, you can see the `Recipe.id` hidden field whose value is set to the ID of the recipe we want to link the tag to.

When the `save()` method is invoked within the controller, it'll automatically save the HABTM data to the database:

```
<?php
public function add() {
    // Save the association
    if ($this->Tag->save($this->request->data)) {
        // do something on success
    }
}
```

With the preceding code, our new Tag is created and associated with a Recipe, whose ID was set in `$this->request->data['Recipe']['id']`.

Other ways we might want to present our associated data can include a select drop down list. The data can be pulled from the model using the `find('list')` method and assigned to a view variable of the model name. An input with the same name will automatically pull in this data into a `<select>`:

```
<?php
// in the controller:
$this->set('tags', $this->Recipe->Tag->find('list'));
```

```
// in the view:
$form->input('tags');
```

A more likely scenario with a HABTM relationship would include a `<select>` set to allow multiple selections. For example, a Recipe can have multiple Tags assigned to it. In this case, the data is pulled out of the model the same way, but the form input is declared slightly different. The tag name is defined using the `ModelName` convention:

```
<?php
// in the controller:
$this->set('tags', $this->Recipe->Tag->find('list'));

// in the view:
$this->Form->input('Tag');
```

Using the preceding code, a multiple select drop down is created, allowing for multiple choices to automatically be saved to the existing Recipe being added or saved to the database.

What to do when HABTM becomes complicated? By default when saving a HasAndBelongsToMany relationship, Cake will delete all rows on the join table before saving new ones. For example if you have a Club that has 10 Children associated. You then update the Club with 2 children. The Club will only have 2 Children, not 12.

Also note that if you want to add more fields to the join (when it was created or meta information) this is possible with HABTM join tables, but it is important to understand that you have an easy option.

HasAndBelongsToMany between two models is in reality shorthand for three models associated through both a hasMany and a belongsTo association.

Consider this example:

```
Child hasAndBelongsToMany Club
```

Another way to look at this is adding a Membership model:

```
Child hasMany Membership
Membership belongsTo Child, Club
Club hasMany Membership.
```

These two examples are almost the exact same. They use the same amount of named fields in the database and the same amount of models. The important differences are that the "join" model is named differently and its behavior is more predictable.

Tip: When your join table contains extra fields besides two foreign keys, you can prevent losing the extra field values by setting `'unique'` array key to `'keepExisting'`. You could think of this similar to 'unique' => true, but without losing data from the extra fields during save operation. See: *HABTM association arrays*.

However, in most cases it's easier to make a model for the join table and setup hasMany, belongsTo associations as shown in example above instead of using HABTM association.

Datatables

While CakePHP can have datasources that aren't database driven, most of the time, they are. CakePHP is designed to be agnostic and will work with MySQL, MSSQL, Oracle, PostgreSQL and others. You can create your database tables as you normally would. When you create your Model classes, they'll automatically map to the tables that you've created. Table names are by convention lowercase and pluralized with multi-word table names separated by underscores. For example, a Model name of Ingredient expects the table name ingredients. A Model name of EventRegistration would expect a table name of event_registrations. CakePHP will inspect your tables to determine the data type of each field and uses this information to automate various features such as outputting form fields in the view. Field names are by convention lowercase and separated by underscores.

Using created and modified

By defining a created or modified field in your database table as datetime fields, CakePHP will recognize those fields and populate them automatically whenever a record is created or saved to the database (unless the data being saved already contains a value for these fields).

The created and modified fields will be set to the current date and time when the record is initially added. The modified field will be updated with the current date and time whenever the existing record is saved.

If you have updated, created or modified data in your $this->data (e.g. from a Model::read or Model::set) before a Model::save() then the values will be taken from $this->data and not automagically updated. Either use `unset($this->data['Model']['modified'])`, etc. Alternatively you can override the Model::save() to always do it for you:

```php
<?php
class AppModel extends Model {

    public function save($data = null, $validate = true, $fieldList = array()) {
        // Clear modified field value before each save
        $this->set($data);
        if (isset($this->data[$this->alias]['modified'])) {
            unset($this->data[$this->alias]['modified']);
        }
        return parent::save($this->data, $validate, $fieldList);
    }

}
```

Deleting Data

CakePHP's Model class offers a few ways to delete records from your database.

delete

`delete(int $id = null, boolean $cascade = true);`

Deletes the record identified by $id. By default, also deletes records dependent on the record specified to be deleted.

For example, when deleting a User record that is tied to many Recipe records (User 'hasMany' or 'hasAndBelongsToMany' Recipes):

- if $cascade is set to true, the related Recipe records are also deleted if the model's dependent-value is set to true.
- if $cascade is set to false, the Recipe records will remain after the User has been deleted.

If your database supports foreign keys and cascading deletes, it's often more efficient to rely on that feature than CakePHP's cascading. The one benefit to using the cascade feature of `Model::delete()` is that it allows you to leverage behaviors and model callbacks:

```
<?php
$this->Comment->delete($this->request->data('Comment.id'));
```

You can hook custom logic into the delete process using the `beforeDelete` and `afterDelete` callbacks present in both Models and Behaviors. See *Callback Methods* for more information.

deleteAll

`deleteAll(mixed $conditions, $cascade = true, $callbacks = false)`

`deleteAll()` is similar to `delete()`, except that `deleteAll()` will delete all records that match the supplied conditions. The `$conditions` array should be supplied as a SQL fragment or array.

- **conditions** Conditions to match
- **cascade** Boolean, Set to true to delete records that depend on this record
- **callbacks** Boolean, Run callbacks

Return boolean True on success, false on failure.

Example:

```
<?php
// Delete with array conditions similar to find()
$this->Comment->deleteAll(array('Comment.spam' => true), false);
```

If you delete with either callbacks and/or cascade, rows will be found and then deleted. This will often result in more queries being issued.

Note: deleteAll() will return true even if no records are deleted, as the conditions for the delete query were successful and no matching records remain.

Data Validation

Data validation is an important part of any application, as it helps to make sure that the data in a Model conforms to the business rules of the application. For example, you might want to make sure that passwords are at least eight characters long, or ensure that usernames are unique. Defining validation rules makes form handling much, much easier.

There are many different aspects to the validation process. What we'll cover in this section is the model side of things. Essentially: what happens when you call the save() method of your model. For more information about how to handle the displaying of validation errors, check out *FormHelper*.

The first step to data validation is creating the validation rules in the Model. To do that, use the Model::validate array in the Model definition, for example:

```php
<?php
class User extends AppModel {
    public $name = 'User';
    public $validate = array();
}
```

In the example above, the `$validate` array is added to the User Model, but the array contains no validation rules. Assuming that the users table has login, password, email and born fields, the example below shows some simple validation rules that apply to those fields:

```php
<?php
class User extends AppModel {
    public $name = 'User';
    public $validate = array(
        'login' => 'alphaNumeric',
        'email' => 'email',
        'born'  => 'date'
    );
}
```

This last example shows how validation rules can be added to model fields. For the login field, only letters and numbers will be accepted, the email should be valid, and born should be a valid date. Defining validation rules enables CakePHP's automagic showing of error messages in forms if the data submitted does not follow the defined rules.

CakePHP has many validation rules and using them can be quite easy. Some of the built-in rules allow you to verify the formatting of emails, URLs, and credit card numbers – but we'll cover these in detail later on.

Here is a more complex validation example that takes advantage of some of these built-in validation rules:

```php
<?php
class User extends AppModel {
    public $name = 'User';
    public $validate = array(
        'login' => array(
            'alphaNumeric' => array(
                'rule'     => 'alphaNumeric',
                'required' => true,
                'message'  => 'Alphabets and numbers only'
            ),
            'between' => array(
                'rule'    => array('between', 5, 15),
                'message' => 'Between 5 to 15 characters'
            )
        ),
        'password' => array(
            'rule'    => array('minLength', '8'),
            'message' => 'Minimum 8 characters long'
        ),
        'email' => 'email',
        'born' => array(
            'rule'       => 'date',
            'message'    => 'Enter a valid date',
            'allowEmpty' => true
        )
    );
}
```

Two validation rules are defined for login: it should contain letters and numbers only, and its length should be between 5 and 15. The password field should be a minimum of 8 characters long. The email should be a valid email address, and born should be a valid date. Also, notice how you can define specific error messages that CakePHP will use when these validation rules fail.

As the example above shows, a single field can have multiple validation rules. And if the built-in rules do not match your criteria, you can always add your own validation rules as required.

Now that you've seen the big picture on how validation works, let's look at how these rules are defined in the model. There are three different ways that you can define validation rules: simple arrays, single rule per field, and multiple rules per field.

Simple Rules

As the name suggests, this is the simplest way to define a validation rule. The general syntax for defining rules this way is:

```
<?php
public $validate = array('fieldName' => 'ruleName');
```

Where, 'fieldName' is the name of the field the rule is defined for, and 'ruleName' is a pre-defined rule name, such as 'alphaNumeric', 'email' or 'isUnique'.

For example, to ensure that the user is giving a well formatted email address, you could use this rule:

```
<?php
public $validate = array('user_email' => 'email');
```

One Rule Per Field

This definition technique allows for better control of how the validation rules work. But before we discuss that, let's see the general usage pattern adding a rule for a single field:

```
<?php
public $validate = array(
    'fieldName1' => array(
        'rule'       => 'ruleName', // or: array('ruleName', 'param1', 'param2' ...)
        'required'    => true,
        'allowEmpty' => false,
        'on'          => 'create', // or: 'update'
        'message'     => 'Your Error Message'
    )
);
```

The 'rule' key is required. If you only set 'required' => true, the form validation will not function correctly. This is because 'required' is not actually a rule.

As you can see here, each field (only one field shown above) is associated with an array that contains five keys: 'rule', 'required', 'allowEmpty', 'on' and 'message'. Let's have a closer look at these keys.

rule

The 'rule' key defines the validation method and takes either a single value or an array. The specified 'rule' may be the name of a method in your model, a method of the core Validation class, or a regular expression. For more information on the rules available by default, see *Core Validation Rules*.

If the rule does not require any parameters, 'rule' can be a single value e.g.:

```
<?php
public $validate = array(
    'login' => array(
        'rule' => 'alphaNumeric'
    )
);
```

If the rule requires some parameters (like the max, min or range), 'rule' should be an array:

```
<?php
public $validate = array(
    'password' => array(
        'rule' => array('minLength', 8)
    )
);
```

Remember, the 'rule' key is required for array-based rule definitions.

required

This key accepts either a boolean, or `create` or `update`. Setting this key to `true` will make the field always required. While setting it to `create` or `update` will make the field required only for update or create operations. If 'required' is evaluated to true, the field must be present in the data array. For example, if the validation rule has been defined as follows:

```
<?php
public $validate = array(
    'login' => array(
        'rule'      => 'alphaNumeric',
        'required' => true
    )
);
```

The data sent to the model's save() method must contain data for the login field. If it doesn't, validation will fail. The default value for this key is boolean false.

`required => true` does not mean the same as the validation rule `notEmpty()`. `required => true` indicates that the array *key* must be present - it does not mean it must have a value. Therefore validation will fail if the field is not present in the dataset, but may (depending on the rule) succeed if the value submitted is empty (''). Changed in version 2.1: Support for `create` and `update` were added.

allowEmpty

If set to `false`, the field value must be **nonempty**, where "nonempty" is defined as `!empty($value) || is_numeric($value)`. The numeric check is so that CakePHP does the right thing when `$value` is zero.

The difference between `required` and `allowEmpty` can be confusing. `'required' => true` means that you cannot save the model without the *key* for this field being present in `$this->data` (the check is performed with `isset`); whereas, `'allowEmpty' => false` makes sure that the current field *value* is nonempty, as described above.

on

The 'on' key can be set to either one of the following values: 'update' or 'create'. This provides a mechanism that allows a certain rule to be applied either during the creation of a new record, or during update of a record.

If a rule has defined 'on' => 'create', the rule will only be enforced during the creation of a new record. Likewise, if it is defined as 'on' => 'update', it will only be enforced during the updating of a record.

The default value for 'on' is null. When 'on' is null, the rule will be enforced during both creation and update.

message

The message key allows you to define a custom validation error message for the rule:

```
<?php
public $validate = array(
    'password' => array(
        'rule'    => array('minLength', 8),
        'message' => 'Password must be at least 8 characters long'
    )
);
```

Multiple Rules per Field

The technique outlined above gives us much more flexibility than simple rules assignment, but there's an extra step we can take in order to gain more fine-grained control of data validation. The next technique we'll outline allows us to assign multiple validation rules per model field.

If you would like to assign multiple validation rules to a single field, this is basically how it should look:

```php
<?php
public $validate = array(
    'fieldName' => array(
        'ruleName' => array(
            'rule' => 'ruleName',
            // extra keys like on, required, etc. go here...
        ),
        'ruleName2' => array(
            'rule' => 'ruleName2',
            // extra keys like on, required, etc. go here...
        )
    )
);
```

As you can see, this is quite similar to what we did in the previous section. There, for each field we had only one array of validation parameters. In this case, each 'fieldName' consists of an array of rule indices. Each 'ruleName' contains a separate array of validation parameters.

This is better explained with a practical example:

```php
<?php
public $validate = array(
    'login' => array(
        'loginRule-1' => array(
            'rule'    => 'alphaNumeric',
            'message' => 'Only alphabets and numbers allowed',
            'last'    => true
         ),
        'loginRule-2' => array(
            'rule'    => array('minLength', 8),
            'message' => 'Minimum length of 8 characters'
        )
    )
);
```

The above example defines two rules for the login field: loginRule-1 and loginRule-2. As you can see, each rule is identified with an arbitrary name.

By default CakePHP tries to validate a field using all the validation rules declared for it and returns the error message for the last failing rule. But if the key `last` is set to `true` for a rule and it fails, then the error message for that rule is returned and further rules are not validated. So if you prefer to show the error message for the first failing rule then set `'last' => true` for each rule.

When using multiple rules per field the 'required' and 'allowEmpty' keys need to be used only once in the first rule.

Custom Validation Rules

If you haven't found what you need thus far, you can always create your own validation rules. There are two ways you can do this: by defining custom regular expressions, or by creating custom validation methods.

Custom Regular Expression Validation

If the validation technique you need to use can be completed by using regular expression matching, you can define a custom expression as a field validation rule:

```php
<?php
public $validate = array(
    'login' => array(
        'rule'    => '/^[a-z0-9]{3,}$/i',
        'message' => 'Only letters and integers, min 3 characters'
    )
);
```

The example above checks if the login contains only letters and integers, with a minimum of three characters.

The regular expression in the `rule` must be delimited by slashes. The optional trailing 'i' after the last slash means the reg-exp is case *i*nsensitive.

Adding your own Validation Methods

Sometimes checking data with regular expression patterns is not enough. For example, if you want to ensure that a promotional code can only be used 25 times, you need to add your own validation function, as shown below:

```php
<?php
class User extends AppModel {
    public $name = 'User';

    public $validate = array(
        'promotion_code' => array(
            'rule'    => array('limitDuplicates', 25),
            'message' => 'This code has been used too many times.'
        )
    );

    public function limitDuplicates($check, $limit) {
        // $check will have value: array('promotion_code' => 'some-value')
        // $limit will have value: 25
        $existing_promo_count = $this->find('count', array(
            'conditions' => $check,
            'recursive' => -1
        ));
        return $existing_promo_count < $limit;
    }
}
```

The current field to be validated is passed into the function as first parameter as an associated array with field name as key and posted data as value.

If you want to pass extra parameters to your validation function, add elements onto the 'rule' array, and handle them as extra params (after the main `$check` param) in your function.

Your validation function can be in the model (as in the example above), or in a behavior that the model implements. This includes mapped methods.

Model/behavior methods are checked first, before looking for a method on the `Validation` class. This means that you can override existing validation methods (such as `alphaNumeric()`) at an application level (by adding the method to `AppModel`), or at model level.

When writing a validation rule which can be used by multiple fields, take care to extract the field value from the $check array. The $check array is passed with the form field name as its key and the field value as its value. The full record being validated is stored in $this->data member variable:

```php
<?php
class Post extends AppModel {
    public $name = 'Post';

    public $validate = array(
        'slug' => array(
            'rule'    => 'alphaNumericDashUnderscore',
            'message' => 'Slug can only be letters, numbers, dash and underscore'
        )
    );

    public function alphaNumericDashUnderscore($check) {
        // $data array is passed using the form field name as the key
        // have to extract the value to make the function generic
        $value = array_values($check);
        $value = $value[0];

        return preg_match('|^[0-9a-zA-Z_-]*$|', $value);
    }
}
```

Note: Your own validation methods must have `public` visibility. Validation methods that are `protected` and `private` are not supported.

Dynamically change validation rules

Using `$validate` property to declare validation rules is a good ways of defining statically rules for each model. Nevertheless there are cases when you want to dynamically add, change or remove validation rules from the predefined set.

All validation rules are stored in a `ModelValidator` object, which holds every rule set for each field in your model. Defining new validation rules is as easy as telling this object to store new validation methods for the fields you want to.

Adding new validation rules

New in version 2.2. The `ModelValidator` objects allows several ways for adding new fields to the set. The first one is using the `add` method:

```php
<?php
// Inside a model class
$this->validator()->add('password', 'required', array(
    'rule' => 'notEmpty',
    'required' => 'create'
));
```

This will add a single rule to the *password* field in the model. You can chain multiple calls to add to create as many rules as you like:

```php
<?php
// Inside a model class
$this->validator()
    ->add('password', 'required', array(
        'rule' => 'notEmpty',
        'required' => 'create'
    ))
    ->add('password', 'size', array(
        'rule' => array('between', 8, 20),
        'message' => 'Password should be at least 8 chars long'
    ));
```

It is also possible to add multiple rules at once for a single field:

```php
<?php
$this->validator()->add('password', array(
    'required' => array(
        'rule' => 'notEmpty',
        'required' => 'create'
    ),
    'size' => array(
        'rule' => array('between', 8, 20),
        'message' => 'Password should be at least 8 chars long'
    )
));
```

Alternatively, you can use the validator object to set rules directly to fields using the array interface:

```php
<?php
$validator = $this->validator();
$validator['username'] = array(
    'unique' => array(
        'rule' => 'isUnique',
        'required' => 'create'
    ),
    'alphanumeric' => array(
        'rule' => 'alphanumeric'
    )
);
```

Modifying current validation rules

New in version 2.2. Modifying current validation rules is also possible using the validator object, there are several ways in which you can alter current rules, append methods to a field or completely remove a rule from a field rule set:

```
<?php
// In a model class
$this->validator()->getField('password')->setRule('required', array(
    'rule' => 'required',
    'required' => true
));
```

You can also completely replace all the rules for a field using a similar method:

```
<?php
// In a model class
$this->validator()->getField('password')->setRules(array(
    'required' => array(...),
    'otherRule' => array(...)
));
```

If you wish to just modify a single property in a rule you can set properties directly into the `CakeValidationRule` object:

```
<?php
// In a model class
$this->validator()->getField('password')
    ->getRule('required')->message = 'This field cannot be left blank';
```

Properties in any `CakeValidationRule` are named as the valid array keys you can use for defining such rules using the `$validate` property in the model.

As with adding new rule to the set, it is also possible to modify existing rules using the array interface:

```
<?php
$validator = $this->validator();
$validator['username']['unique'] = array(
    'rule' => 'isUnique',
    'required' => 'create'
);

$validator['username']['unique']->last = true;
$validator['username']['unique']->message = 'Name already taken';
```

Removing rules from the set

New in version 2.2. It is possible to both completely remove all rules for a field and to delete a single rule in a field's rule set:

```
<?php
// Completely remove all rules for a field
```

```
$this->validator()->remove('username');

// Remove 'required' rule from password
$this->validator()->remove('password', 'required');
```

Optionally, you can use the array interface to delete rules from the set:

```
<?php
$validator = $this->validator();
// Completely remove all rules for a field
unset($validator['username']);

// Remove 'required' rule from password
unset($validator['password']['required']);
```

Core Validation Rules

class Validation

The Validation class in CakePHP contains many validation rules that can make model data validation much easier. This class contains many oft-used validation techniques you won't need to write on your own. Below, you'll find a complete list of all the rules, along with usage examples.

static `Validation::alphaNumeric`(*mixed $check*)

The data for the field must only contain letters and numbers.:

```
<?php
public $validate = array(
    'login' => array(
        'rule'    => 'alphaNumeric',
        'message' => 'Usernames must only contain letters and numbers.'
    )
);
```

static `Validation::between`(*string $check*, *integer $min*, *integer $max*)

The length of the data for the field must fall within the specified numeric range. Both minimum and maximum values must be supplied. Uses = not.:

```
<?php
public $validate = array(
    'password' => array(
        'rule'    => array('between', 5, 15),
        'message' => 'Passwords must be between 5 and 15 characters long.'
    )
);
```

The length of data is "the number of bytes in the string representation of the data". Be careful that it may be larger than the number of characters when handling non-ASCII characters.

static `Validation::blank`(*mixed $check*)

This rule is used to make sure that the field is left blank or only white space characters are present in its value. White space characters include space, tab, carriage return, and newline.:

```
<?php
public $validate = array(
    'id' => array(
        'rule' => 'blank',
        'on'   => 'create'
    )
);
```

static `Validation::`**`boolean`**(*string $check*)

The data for the field must be a boolean value. Valid values are true or false, integers 0 or 1 or strings '0' or '1'.:

```
<?php
public $validate = array(
    'myCheckbox' => array(
        'rule'    => array('boolean'),
        'message' => 'Incorrect value for myCheckbox'
    )
);
```

static `Validation::`**`cc`**(*mixed $check*, *mixed $type = 'fast'*, *boolean $deep = false*, *string $regex = null*)

This rule is used to check whether the data is a valid credit card number. It takes three parameters: 'type', 'deep' and 'regex'.

The 'type' key can be assigned to the values of 'fast', 'all' or any of the following:

- amex
- bankcard
- diners
- disc
- electron
- enroute
- jcb
- maestro
- mc
- solo
- switch
- visa
- voyager

If 'type' is set to 'fast', it validates the data against the major credit cards' numbering formats. Setting 'type' to 'all' will check with all the credit card types. You can also set 'type' to an array of the types you wish to match.

The 'deep' key should be set to a boolean value. If it is set to true, the validation will check the Luhn algorithm of the credit card (http://en.wikipedia.org/wiki/Luhn_algorithm). It defaults to false.

The 'regex' key allows you to supply your own regular expression that will be used to validate the credit card number:

```
<?php
public $validate = array(
    'ccnumber' => array(
        'rule'    => array('cc', array('visa', 'maestro'), false, null),
        'message' => 'The credit card number you supplied was invalid.'
    )
);
```

static `Validation::comparison`(*mixed $check1*, *string $operator = null*, *integer $check2 = null*)

Comparison is used to compare numeric values. It supports "is greater", "is less", "greater or equal", "less or equal", "equal to", and "not equal". Some examples are shown below:

```
<?php
public $validate = array(
    'age' => array(
        'rule'    => array('comparison', '>=', 18),
        'message' => 'Must be at least 18 years old to qualify.'
    )
);

public $validate = array(
    'age' => array(
        'rule'    => array('comparison', 'greater or equal', 18),
        'message' => 'Must be at least 18 years old to qualify.'
    )
);
```

static `Validation::custom`(*mixed $check*, *string $regex = null*)

Used when a custom regular expression is needed:

```
<?php
public $validate = array(
    'infinite' => array(
        'rule'    => array('custom', '\u221E'),
        'message' => 'Please enter an infinite number.'
    )
);
```

static `Validation::date`(*string $check*, *mixed $format = 'ymd'*, *string $regex = null*)

This rule ensures that data is submitted in valid date formats. A single parameter (which can be an array) can be passed that will be used to check the format of the supplied date. The value of the parameter can be one of the following:

- 'dmy' e.g. 27-12-2006 or 27-12-06 (separators can be a space, period, dash, forward slash)
- 'mdy' e.g. 12-27-2006 or 12-27-06 (separators can be a space, period, dash, forward slash)
- 'ymd' e.g. 2006-12-27 or 06-12-27 (separators can be a space, period, dash, forward slash)

- ‘dMy’ e.g. 27 December 2006 or 27 Dec 2006
- ‘Mdy’ e.g. December 27, 2006 or Dec 27, 2006 (comma is optional)
- ‘My’ e.g. (December 2006 or Dec 2006)
- ‘my’ e.g. 12/2006 or 12/06 (separators can be a space, period, dash, forward slash)

If no keys are supplied, the default key that will be used is ‘ymd’:

```
<?php
public $validate = array(
    'born' => array(
        'rule'       => array('date', 'ymd'),
        'message'    => 'Enter a valid date in YY-MM-DD format.',
        'allowEmpty' => true
    )
);
```

While many data stores require a certain date format, you might consider doing the heavy lifting by accepting a wide-array of date formats and trying to convert them, rather than forcing users to supply a given format. The more work you can do for your users, the better.

static `Validation::`**`datetime`**(*array $check*, *mixed $dateFormat* = *‘ymd’*, *string $regex* = *null*)

This rule ensures that the data is a valid datetime format. A parameter (which can be an array) can be passed to specify the format of the date. The value of the parameter can be one or more of the following:

- ‘dmy’ e.g. 27-12-2006 or 27-12-06 (separators can be a space, period, dash, forward slash)
- ‘mdy’ e.g. 12-27-2006 or 12-27-06 (separators can be a space, period, dash, forward slash)
- ‘ymd’ e.g. 2006-12-27 or 06-12-27 (separators can be a space, period, dash, forward slash)
- ‘dMy’ e.g. 27 December 2006 or 27 Dec 2006
- ‘Mdy’ e.g. December 27, 2006 or Dec 27, 2006 (comma is optional)
- ‘My’ e.g. (December 2006 or Dec 2006)
- ‘my’ e.g. 12/2006 or 12/06 (separators can be a space, period, dash, forward slash)

If no keys are supplied, the default key that will be used is ‘ymd’:

```
<?php
public $validate = array(
    'birthday' => array(
        'rule'    => array('datetime', 'dmy'),
        'message' => 'Please enter a valid date and time.'
    )
);
```

Also a second parameter can be passed to specify a custom regular expression. If this parameter is used, this will be the only validation that will occur.

Note that unlike date(), datetime() will validate a date and a time.

static `Validation::decimal`(*integer $check*, *integer $places = null*, *string $regex = null*)

This rule ensures that the data is a valid decimal number. A parameter can be passed to specify the number of digits required after the decimal point. If no parameter is passed, the data will be validated as a scientific float, which will cause validation to fail if no digits are found after the decimal point:

```
<?php
public $validate = array(
    'price' => array(
        'rule' => array('decimal', 2)
    )
);
```

static `Validation::email`(*string $check*, *boolean $deep = false*, *string $regex = null*)

This checks whether the data is a valid email address. Passing a boolean true as the second parameter for this rule will also attempt to verify that the host for the address is valid:

```
<?php
public $validate = array('email' => array('rule' => 'email'));

public $validate = array(
    'email' => array(
        'rule'    => array('email', true),
        'message' => 'Please supply a valid email address.'
    )
);
```

static `Validation::equalTo`(*mixed $check*, *mixed $compareTo*)

This rule will ensure that the value is equal to, and of the same type as the given value.

```
<?php
public $validate = array(
    'food' => array(
        'rule'    => array('equalTo', 'cake'),
        'message' => 'This value must be the string cake'
    )
);
```

static `Validation::extension`(*mixed $check*, *array $extensions = array('gif', 'jpeg', 'png', 'jpg')*)

This rule checks for valid file extensions like .jpg or .png. Allow multiple extensions by passing them in array form.

```
<?php
public $validate = array(
    'image' => array(
        'rule'    => array('extension', array('gif', 'jpeg', 'png', 'jpg')),
        'message' => 'Please supply a valid image.'
    )
);
```

static `Validation::inList`(*string $check*, *array $list*)

This rule will ensure that the value is in a given set. It needs an array of values. The field is valid if the field's value matches one of the values in the given array.

Example:

```
<?php
public $validate = array(
    'function' => array(
        'allowedChoice' => array(
            'rule'    => array('inList', array('Foo', 'Bar')),
            'message' => 'Enter either Foo or Bar.'
        )
    )
);
```

static `Validation::`**`ip`**(*string $check*, *string $type = 'both'*)

This rule will ensure that a valid IPv4 or IPv6 address has been submitted. Accepts as option 'both' (default), 'IPv4' or 'IPv6'.

```
<?php
public $validate = array(
    'clientip' => array(
        'rule'    => array('ip', 'IPv4'), // or 'IPv6' or 'both' (default)
        'message' => 'Please supply a valid IP address.'
    )
);
```

static `Validation::`**`isUnique`**

The data for the field must be unique, it cannot be used by any other rows.

```
<?php
public $validate = array(
    'login' => array(
        'rule'    => 'isUnique',
        'message' => 'This username has already been taken.'
    )
);
```

static `Validation::`**`luhn`**(*string|array $check*, *boolean $deep = false*)

The Luhn algorithm: A checksum formula to validate a variety of identification numbers. See http://en.wikipedia.org/wiki/Luhn_algorithm for more information.

static `Validation::`**`maxLength`**(*string $check*, *integer $max*)

This rule ensures that the data stays within a maximum length requirement.

```
<?php
public $validate = array(
    'login' => array(
        'rule'    => array('maxLength', 15),
        'message' => 'Usernames must be no larger than 15 characters long.'
    )
);
```

The length here is "the number of bytes in the string representation of the data". Be careful that it may be larger than the number of characters when handling non-ASCII characters.

static `Validation::`**`mimeType`**(*mixed $check*, *array $mimeTypes*)

New in version 2.2. This rule checks for valid mimeType

```
<?php
public $validate = array(
    'image' => array(
        'rule'    => array('mimeType', array('image/gif')),
        'message' => 'Invalid mime type.'
    ),
);
```

static `Validation::minLength`(*string $check*, *integer $min*)
This rule ensures that the data meets a minimum length requirement.

```
<?php
public $validate = array(
    'login' => array(
        'rule'    => array('minLength', 8),
        'message' => 'Usernames must be at least 8 characters long.'
    )
);
```

The length here is "the number of bytes in the string representation of the data". Be careful that it may be larger than the number of characters when handling non-ASCII characters.

static `Validation::money`(*string $check*, *string $symbolPosition = 'left'*)
This rule will ensure that the value is in a valid monetary amount.

Second parameter defines where symbol is located (left/right).

```
<?php
public $validate = array(
    'salary' => array(
        'rule'    => array('money', 'left'),
        'message' => 'Please supply a valid monetary amount.'
    )
);
```

static `Validation::multiple`(*mixed $check*, *mixed $options = array()*)
Use this for validating a multiple select input. It supports parameters "in", "max" and "min".

```
<?php
public $validate = array(
    'multiple' => array(
        'rule' => array('multiple', array(
            'in'  => array('do', 'ray', 'me', 'fa', 'so', 'la', 'ti'),
            'min' => 1,
            'max' => 3
        )),
        'message' => 'Please select one, two or three options'
    )
);
```

static `Validation::notEmpty`(*mixed $check*)
The basic rule to ensure that a field is not empty.:

```
<?php
public $validate = array(
    'title' => array(
        'rule'    => 'notEmpty',
        'message' => 'This field cannot be left blank'
    )
);
```

Do not use this for a multiple select input as it will cause an error. Instead, use "multiple".

static `Validation::numeric`(*string $check*)
Checks if the data passed is a valid number.:

```
<?php
public $validate = array(
    'cars' => array(
        'rule'    => 'numeric',
        'message' => 'Please supply the number of cars.'
    )
);
```

static `Validation::naturalNumber`(*mixed $check, boolean $allowZero = false*)
New in version 2.2. This rule checks if the data passed is a valid natural number. If `$allowZero` is set to true, zero is also accepted as a value.

```
<?php
public $validate = array(
    'wheels' => array(
        'rule'    => 'naturalNumber',
        'message' => 'Please supply the number of wheels.'
    ),
    'airbags' => array(
        'rule'    => array('naturalNumber', true),
        'message' => 'Please supply the number of airbags.'
    ),
);
```

static `Validation::phone`(*mixed $check, string $regex = null, string $country = 'all'*)
Phone validates US phone numbers. If you want to validate non-US phone numbers, you can provide a regular expression as the second parameter to cover additional number formats.

```
<?php
public $validate = array(
    'phone' => array(
        'rule' => array('phone', null, 'us')
    )
);
```

static `Validation::postal`(*mixed $check, string $regex = null, string $country = 'us'*)
Postal is used to validate ZIP codes from the U.S. (us), Canada (ca), U.K (uk), Italy (it), Germany (de) and Belgium (be). For other ZIP code formats, you may provide a regular expression as the second parameter.

```
<?php
public $validate = array(
    'zipcode' => array(
        'rule' => array('postal', null, 'us')
    )
);
```

static `Validation::range`(*string $check*, *integer $lower = null*, *integer $upper = null*)

This rule ensures that the value is in a given range. If no range is supplied, the rule will check to ensure the value is a legal finite on the current platform.

```
<?php
public $validate = array(
    'number' => array(
        'rule'    => array('range', -1, 11),
        'message' => 'Please enter a number between 0 and 10'
    )
);
```

The above example will accept any value which is larger than 0 (e.g., 0.01) and less than 10 (e.g., 9.99).

Note: The range lower/upper are not inclusive

static `Validation::ssn`(*mixed $check*, *string $regex = null*, *string $country = null*)

Ssn validates social security numbers from the U.S. (us), Denmark (dk), and the Netherlands (nl). For other social security number formats, you may provide a regular expression.

```
<?php
public $validate = array(
    'ssn' => array(
        'rule' => array('ssn', null, 'us')
    )
);
```

static `Validation::time`(*string $check*)

Time validation, determines if the string passed is a valid time. Validates time as 24hr (HH:MM) or am/pm ([H]H:MM[a|p]m) Does not allow/validate seconds.

static `Validation::uploadError`(*mixed $check*)

New in version 2.2. This rule checks if a file upload has an error.

```
<?php
public $validate = array(
    'image' => array(
        'rule'    => 'uploadError',
        'message' => 'Something went wrong with the upload.'
    ),
);
```

static `Validation::url`(*string $check*, *boolean $strict = false*)

This rule checks for valid URL formats. Supports http(s), ftp(s), file, news, and gopher protocols:

```
<?php
public $validate = array(
    'website' => array(
        'rule' => 'url'
    )
);
```

To ensure that a protocol is in the url, strict mode can be enabled like so:

```
<?php
public $validate = array(
    'website' => array(
        'rule' => array('url', true)
    )
);
```

static `Validation::`**`userDefined`**(*mixed $check*, *object $object*, *string $method*, *array $args = null*)
Runs an user-defined validation.

static `Validation::`**`uuid`**(*string $check*)
Checks that a value is a valid uuid: http://tools.ietf.org/html/rfc4122

Validating Data from the Controller

While normally you would just use the save method of the model, there may be times where you wish to validate the data without saving it. For example, you may wish to display some additional information to the user before actually saving the data to the database. Validating data requires a slightly different process than just saving the data.

First, set the data to the model:

```
<?php
$this->ModelName->set($this->request->data);
```

Then, to check if the data validates, use the validates method of the model, which will return true if it validates and false if it doesn't:

```
<?php
if ($this->ModelName->validates()) {
    // it validated logic
} else {
    // didn't validate logic
    $errors = $this->ModelName->validationErrors;
}
```

It may be desirable to validate your model only using a subset of the validations specified in your model. For example say you had a User model with fields for first_name, last_name, email and password. In this instance when creating or editing a user you would want to validate all 4 field rules. Yet when a user logs in you would validate just email and password rules. To do this you can pass an options array specifying the fields to validate. e.g.

```php
<?php
if ($this->User->validates(array('fieldList' => array('email', 'password')))) {
    // valid
} else {
    // invalid
}
```

The validates method invokes the invalidFields method which populates the validationErrors property of the model. The invalidFields method also returns that data as the result.

```php
<?php
$errors = $this->ModelName->invalidFields(); // contains validationErrors array
```

The validation errors list is not cleared between successive calls to `invalidFields()` So if you are validating in a loop and want each set of errors separately don't use `invalidFields()`. Instead use `validates()` and access the `validationErrors` model property.

It is important to note that the data must be set to the model before the data can be validated. This is different from the save method which allows the data to be passed in as a parameter. Also, keep in mind that it is not required to call validates prior to calling save as save will automatically validate the data before actually saving.

To validate multiple models, the following approach should be used:

```php
<?php
if ($this->ModelName->saveAll($this->request->data, array('validate' => 'only'))) {
  // validates
} else {
  // does not validate
}
```

If you have validated data before save, you can turn off validation to avoid second check.

```php
<?php
if ($this->ModelName->saveAll($this->request->data, array('validate' => false))) {
    // saving without validation
}
```

Callback Methods

If you want to sneak in some logic just before or after a CakePHP model operation, use model callbacks. These functions can be defined in model classes (including your AppModel) class. Be sure to note the expected return values for each of these special functions.

beforeFind

`beforeFind(array $queryData)`

Called before any find-related operation. The `$queryData` passed to this callback contains information about the current query: conditions, fields, etc.

If you do not wish the find operation to begin (possibly based on a decision relating to the `$queryData` options), return *false*. Otherwise, return the possibly modified `$queryData`, or anything you want to get passed to find and its counterparts.

You might use this callback to restrict find operations based on a user's role, or make caching decisions based on the current load.

afterFind

`afterFind(array $results, boolean $primary = false)`

Use this callback to modify results that have been returned from a find operation, or to perform any other post-find logic. The $results parameter passed to this callback contains the returned results from the model's find operation, i.e. something like:

```php
<?php
$results = array(
    0 => array(
        'ModelName' => array(
            'field1' => 'value1',
            'field2' => 'value2',
        ),
    ),
);
```

The return value for this callback should be the (possibly modified) results for the find operation that triggered this callback.

The `$primary` parameter indicates whether or not the current model was the model that the query originated on or whether or not this model was queried as an association. If a model is queried as an association the format of `$results` can differ; instead of the result you would normally get from a find operation, you may get this:

```php
<?php
$results = array(
    'field_1' => 'value1',
    'field_2' => 'value2'
);
```

Warning: Code expecting `$primary` to be true will probably get a "Cannot use string offset as an array" fatal error from PHP if a recursive find is used.

Below is an example of how afterfind can be used for date formatting:

```php
<?php
public function afterFind($results, $primary = false) {
    foreach ($results as $key => $val) {
        if (isset($val['Event']['begindate'])) {
            $results[$key]['Event']['begindate'] = $this->dateFormatAfterFind($val['Event']
        }
    }
    return $results;
}

public function dateFormatAfterFind($dateString) {
    return date('d-m-Y', strtotime($dateString));
}
```

beforeValidate

`beforeValidate(array $options = array())`

Use this callback to modify model data before it is validated, or to modify validation rules if required. This function must also return *true*, otherwise the current save() execution will abort.

beforeSave

`beforeSave(array $options = array())`

Place any pre-save logic in this function. This function executes immediately after model data has been successfully validated, but just before the data is saved. This function should also return true if you want the save operation to continue.

This callback is especially handy for any data-massaging logic that needs to happen before your data is stored. If your storage engine needs dates in a specific format, access it at $this->data and modify it.

Below is an example of how beforeSave can be used for date conversion. The code in the example is used for an application with a begindate formatted like YYYY-MM-DD in the database and is displayed like DD-MM-YYYY in the application. Of course this can be changed very easily. Use the code below in the appropriate model.

```
<?php
public function beforeSave($options = array()) {
    if (!empty($this->data['Event']['begindate']) && !empty($this->data['Event']['enddate'
        $this->data['Event']['begindate'] = $this->dateFormatBeforeSave($this->data['Event'
        $this->data['Event']['enddate'] = $this->dateFormatBeforeSave($this->data['Event']
    }
    return true;
}

public function dateFormatBeforeSave($dateString) {
    return date('Y-m-d', strtotime($dateString));
}
```

Tip: Be sure that beforeSave() returns true, or your save is going to fail.

afterSave

`afterSave(boolean $created)`

If you have logic you need to be executed just after every save operation, place it in this callback method.

The value of `$created` will be true if a new record was created (rather than an update).

beforeDelete

`beforeDelete(boolean $cascade = true)`

Place any pre-deletion logic in this function. This function should return true if you want the deletion to continue, and false if you want to abort.

The value of `$cascade` will be `true` if records that depend on this record will also be deleted.

Tip: Be sure that beforeDelete() returns true, or your delete is going to fail.

```
<?php
// using app/Model/ProductCategory.php
// In the following example, do not let a product category be deleted if it still contains
// A call of $this->Product->delete($id) from ProductsController.php has set $this->id .
// Assuming 'ProductCategory hasMany Product', we can access $this->Product in the model.
public function beforeDelete($cascade = true) {
    $count = $this->Product->find("count", array(
        "conditions" => array("product_category_id" => $this->id)
    ));
    if ($count == 0) {
        return true;
    } else {
        return false;
    }
}
```

afterDelete

`afterDelete()`

Place any logic that you want to be executed after every deletion in this callback method.

onError

`onError()`

Called if any problems occur.

Behaviors

Model behaviors are a way to organize some of the functionality defined in CakePHP models. They allow us to separate and reuse logic that creates a type of behavior, and they do this without requiring inheritance. For example creating tree structures. By providing a simple yet powerful way to enhance models, behaviors allow us to attach functionality to models by defining a simple class variable. That's how behaviors allow models to get rid of all the extra weight that might not be part of the business contract they are modeling, or that is also needed in different models and can then be extrapolated.

As an example, consider a model that gives us access to a database table which stores structural information about a tree. Removing, adding, and migrating nodes in the tree is not as simple as deleting, inserting, and editing rows in the table. Many records may need to be updated as things move around. Rather than creating those tree-manipulation methods on a per model basis (for every model that needs that functionality), we could simply tell our model to use the `TreeBehavior`, or in more formal terms, we tell our model to behave as a Tree. This is known as attaching a behavior to a model. With just one line of code, our CakePHP model takes on a whole new set of methods that allow it to interact with the underlying structure.

CakePHP already includes behaviors for tree structures, translated content, access control list interaction, not to mention the community-contributed behaviors already available in the CakePHP Bakery (http://bakery.cakephp.org). In this section, we'll cover the basic usage pattern for adding behaviors to models, how to use CakePHP's built-in behaviors, and how to create our own.

In essence, Behaviors are Mixins (http://en.wikipedia.org/wiki/Mixin) with callbacks.

Using Behaviors

Behaviors are attached to models through the `$actsAs` model class variable:

```php
<?php
class Category extends AppModel {
    public $name    = 'Category';
    public $actsAs = array('Tree');
}
```

This example shows how a Category model could be managed in a tree structure using the TreeBehavior. Once a behavior has been specified, use the methods added by the behavior as if they always existed as part of the original model:

```php
<?php
// Set ID
$this->Category->id = 42;

// Use behavior method, children():
$kids = $this->Category->children();
```

Some behaviors may require or allow settings to be defined when the behavior is attached to the model. Here, we tell our TreeBehavior the names of the "left" and "right" fields in the underlying database table:

```php
<?php
class Category extends AppModel {
    public $name    = 'Category';
    public $actsAs = array('Tree' => array(
        'left'  => 'left_node',
        'right' => 'right_node'
    ));
}
```

We can also attach several behaviors to a model. There's no reason why, for example, our Category model should only behave as a tree, it may also need internationalization support:

```php
<?php
class Category extends AppModel {
    public $name   = 'Category';
    public $actsAs = array(
        'Tree' => array(
          'left'  => 'left_node',
          'right' => 'right_node'
        ),
        'Translate'
    );
}
```

So far we have been adding behaviors to models using a model class variable. That means that our behaviors will be attached to our models throughout the model's lifetime. However, we may need to "detach" behaviors from our models at runtime. Let's say that on our previous Category model, which is acting as a Tree and a Translate model, we need for some reason to force it to stop acting as a Translate model:

```php
<?php
// Detach a behavior from our model:
$this->Category->Behaviors->unload('Translate');
```

That will make our Category model stop behaving as a Translate model from thereon. We may need, instead, to just disable the Translate behavior from acting upon our normal model operations: our finds, our saves, etc. In fact, we are looking to disable the behavior from acting upon our CakePHP model callbacks. Instead of detaching the behavior, we then tell our model to stop informing of these callbacks to the Translate behavior:

```php
<?php
// Stop letting the behavior handle our model callbacks
$this->Category->Behaviors->disable('Translate');
```

We may also need to find out if our behavior is handling those model callbacks, and if not we then restore its ability to react to them:

```php
<?php
// If our behavior is not handling model callbacks
if (!$this->Category->Behaviors->enabled('Translate')) {
    // Tell it to start doing so
    $this->Category->Behaviors->enable('Translate');
}
```

Just as we could completely detach a behavior from a model at runtime, we can also attach new behaviors. Say that our familiar Category model needs to start behaving as a Christmas model, but only on Christmas day:

```php
<?php
// If today is Dec 25
if (date('m/d') == '12/25') {
    // Our model needs to behave as a Christmas model
    $this->Category->Behaviors->load('Christmas');
}
```

We can also use the load method to override behavior settings:

```
<?php
// We will change one setting from our already attached behavior
$this->Category->Behaviors->load('Tree', array('left' => 'new_left_node'));
```

There's also a method to obtain the list of behaviors a model has attached. If we pass the name of a behavior to the method, it will tell us if that behavior is attached to the model, otherwise it will give us the list of attached behaviors:

```
<?php
// If the Translate behavior is not attached
if (!$this->Category->Behaviors->attached('Translate')) {
    // Get the list of all behaviors the model has attached
    $behaviors = $this->Category->Behaviors->attached();
}
```

Creating Behaviors

Behaviors that are attached to Models get their callbacks called automatically. The callbacks are similar to those found in Models: `beforeFind`, `afterFind`, `beforeSave`, `afterSave`, `beforeDelete`, `afterDelete` and `onError` - see *Callback Methods*.

Your behaviors should be placed in `app/Model/Behavior`. They are named in CamelCase and postfixed by `Behavior`, ex. NameBehavior.php. It's often helpful to use a core behavior as a template when creating your own. Find them in `lib/Cake/Model/Behavior/`.

Every callback and behavior method takes a reference to the model it is being called from as the first parameter.

Besides implementing the callbacks, you can add settings per behavior and/or model behavior attachment. Information about specifying settings can be found in the chapters about core behaviors and their configuration.

A quick example that illustrates how behavior settings can be passed from the model to the behavior:

```
<?php
class Post extends AppModel {
    public $name = 'Post'
    public $actsAs = array(
        'YourBehavior' => array(
            'option1_key' => 'option1_value'
        )
    );
}
```

Since behaviors are shared across all the model instances that use them, it's a good practice to store the settings per alias/model name that is using the behavior. When created behaviors will have their `setup()` method called:

```
<?php
public function setup(Model $Model, $settings = array()) {
    if (!isset($this->settings[$Model->alias])) {
        $this->settings[$Model->alias] = array(
            'option1_key' => 'option1_default_value',
            'option2_key' => 'option2_default_value',
            'option3_key' => 'option3_default_value',
        );
    }
    $this->settings[$Model->alias] = array_merge(
        $this->settings[$Model->alias], (array)$settings);
}
```

Creating behavior methods

Behavior methods are automatically available on any model acting as the behavior. For example if you had:

```
<?php
class Duck extends AppModel {
    public $name = 'Duck';
    public $actsAs = array('Flying');
}
```

You would be able to call `FlyingBehavior` methods as if they were methods on your Duck model. When creating behavior methods you automatically get passed a reference of the calling model as the first parameter. All other supplied parameters are shifted one place to the right. For example:

```
<?php
$this->Duck->fly('toronto', 'montreal');
```

Although this method takes two parameters, the method signature should look like:

```
<?php
public function fly(Model $Model, $from, $to) {
    // Do some flying.
}
```

Keep in mind that methods called in a `$this->doIt()` fashion from inside a behavior method will not get the $model parameter automatically appended.

Mapped methods

In addition to providing 'mixin' methods, behaviors can also provide pattern matching methods. Behaviors can also define mapped methods. Mapped methods use pattern matching for method invocation. This allows you to create methods similar to `Model::findAllByXXX` methods on your behaviors. Mapped methods need to be declared in your behaviors `$mapMethods` array. The method signature for a mapped method is slightly different than a normal behavior mixin method:

```
<?php
class MyBehavior extends ModelBehavior {
    public $mapMethods = array('/do(\w+)/' => 'doSomething');

    public function doSomething(Model $model, $method, $arg1, $arg2) {
        debug(func_get_args());
        //do something
    }
}
```

The above will map every `doXXX()` method call to the behavior. As you can see, the model is still the first parameter, but the called method name will be the 2nd parameter. This allows you to munge the method name for additional information, much like `Model::findAllByXX`. If the above behavior was attached to a model the following would happen:

```
<?php
$model->doReleaseTheHounds('homer', 'lenny');

// would output
'ReleaseTheHounds', 'homer', 'lenny'
```

Behavior callbacks

Model Behaviors can define a number of callbacks that are triggered before/after the model callbacks of the same name. Behavior callbacks allow your behaviors to capture events in attached models and augment the parameters or splice in additional behavior.

The available callbacks are:

- `beforeValidate` is fired before a model's beforeValidate
- `beforeFind` is fired before a model's beforeFind
- `afterFind` is fired before a model's afterFind
- `beforeSave` is fired before a model's beforeSave
- `afterSave` is fired before a model's afterSave
- `beforeDelete` is fired after a model's beforeDelete
- `afterDelete` is fired before a model's afterDelete

Creating a behavior callback

class **`ModelBehavior`**

Model behavior callbacks are defined as simple methods in your behavior class. Much like regular behavior methods, they receive a `$Model` parameter as the first argument. This parameter is the model that the behavior method was invoked on.

`ModelBehavior::`**`setup`**(*Model $Model*, *array $settings = array()*)

Called when a behavior is attached to a model. The settings come from the attached model's `$actsAs` property.

`ModelBehavior::`**`cleanup`**(*Model $Model*)

Called when a behavior is detached from a model. The base method removes model settings based on `$model->alias`. You can override this method and provide custom cleanup functionality.

`ModelBehavior::`**`beforeFind`**(*Model $Model*, *array $query*)

If a behavior's beforeFind return's false it will abort the find(). Returning an array will augment the query parameters used for the find operation.

`ModelBehavior::`**`afterFind`**(*Model $Model*, *mixed $results*, *boolean $primary*)

You can use the afterFind to augment the results of a find. The return value will be passed on as the results to either the next behavior in the chain or the model's afterFind.

`ModelBehavior::`**`beforeDelete`**(*Model $Model*, *boolean $cascade = true*)

You can return false from a behavior's beforeDelete to abort the delete. Return true to allow it continue.

`ModelBehavior::`**`afterDelete`**(*Model $Model*)

You can use afterDelete to perform clean up operations related to your behavior.

`ModelBehavior::`**`beforeSave`**(*Model $Model*)

You can return false from a behavior's beforeSave to abort the save. Return true to allow it continue.

`ModelBehavior::`**`afterSave`**(*Model $Model*, *boolean $created*)

You can use afterSave to perform clean up operations related to your behavior. $created will be true when a record is created, and false when a record is updated.

`ModelBehavior::`**`beforeValidate`**(*Model $Model*)

You can use beforeValidate to modify a model's validate array or handle any other pre-validation logic. Returning false from a beforeValidate callback will abort the validation and cause it to fail.

DataSources

DataSources are the link between models and the source of data that models represent. In many cases, the data is retrieved from a relational database such as MySQL, PostgreSQL or MSSQL. CakePHP is distributed with several database-specific datasources (see the class files in `lib/Cake/Model/Datasource/Database`), a summary of which is listed here for your convenience:

- MySql
- Postgres
- Sqlite
- Sqlserver

Note: You can find additional community contributed datasources in the CakePHP DataSources repository at github (https://github.com/cakephp/datasources/tree/2.0).

When specifying a database connection configuration in `app/Config/database.php`, CakePHP transparently uses the corresponding database datasource for all model operations. So, even though you might not have known about datasources, you've been using them all along.

All of the above sources derive from a base `DboSource` class, which aggregates some logic that is common to most relational databases. If you decide to write a RDBMS datasource, working from one of these (e.g. Mysql, or Sqlite is your best bet.)

Most people, however, are interested in writing datasources for external sources of data, such as remote REST APIs or even an LDAP server. So that's what we're going to look at now.

Basic API For DataSources

A datasource can, and *should* implement at least one of the following methods: `create`, `read`, `update` and/or `delete` (the actual method signatures & implementation details are not important for the moment, and will be described later). You need not implement more of the methods listed above than necessary - if you need a read-only datasource, there's no reason to implement `create`, `update`, and `delete`.

Methods that must be implemented for all CRUD methods:

- `describe($Model)`
- `listSources()`
- `calculate($Model, $func, $params)`
- At least one of:
  - `create($Model, $fields = array(), $values = array())`
  - `read($Model, $queryData = array())`
  - `update($Model, $fields = array(), $values = array())`
  - `delete($Model, $conditions = null)`

It is also possible (and sometimes quite useful) to define the `$_schema` class attribute inside the datasource itself, instead of in the model.

And that's pretty much all there is to it. By coupling this datasource to a model, you are then able to use `Model::find()/save()/delete()` as you would normally, and the appropriate data and/or parameters used to call those methods will be passed on to the datasource itself, where you can decide to implement whichever features you need (e.g. Model::find options such as `'conditions'` parsing, `'limit'` or even your own custom parameters).

An Example

A common reason you would want to write your own datasource is when you would like to access a 3rd party API using the usual `Model::find()/save()/delete()` methods. Let's write a datasource that will access a fictitious remote JSON based API. We'll call it `FarAwaySource` and we'll put it in `app/Model/Datasource/FarAwaySource.php`:

```php
<?php
App::uses('HttpSocket', 'Network/Http');

class FarAwaySource extends DataSource {
```

```
/**
 * An optional description of your datasource
 */
    public $description = 'A far away datasource';

/**
 * Our default config options. These options will be customized in our
 * ``app/Config/database.php`` and will be merged in the ``__construct()``.
 */
    public $config = array(
        'apiKey' => '',
    );

/**
 * If we want to create() or update() we need to specify the fields
 * available. We use the same array keys as we do with CakeSchema, eg.
 * fixtures and schema migrations.
 */
    protected $_schema = array(
        'id' => array(
            'type' => 'integer',
            'null' => false,
            'key' => 'primary',
            'length' => 11,
        ),
        'name' => array(
            'type' => 'string',
            'null' => true,
            'length' => 255,
        ),
        'message' => array(
            'type' => 'text',
            'null' => true,
        ),
    );

/**
 * Create our HttpSocket and handle any config tweaks.
 */
    public function __construct($config) {
        parent::__construct($config);
        $this->Http = new HttpSocket();
    }

/**
 * Since datasources normally connect to a database there are a few things
 * we must change to get them to work without a database.
 */

/**
 * listSources() is for caching. You'll likely want to implement caching in
 * your own way with a custom datasource. So just ``return null``.
 */
```

```
    public function listSources() {
        return null;
    }

/**
 * describe() tells the model your schema for ``Model::save()``.
 *
 * You may want a different schema for each model but still use a single
 * datasource. If this is your case then set a ``schema`` property on your
 * models and simply return ``$Model->schema`` here instead.
 */
    public function describe(Model $Model) {
        return $this->_schema;
    }

/**
 * calculate() is for determining how we will count the records and is
 * required to get ``update()`` and ``delete()`` to work.
 *
 * We don't count the records here but return a string to be passed to
 * ``read()`` which will do the actual counting. The easiest way is to just
 * return the string 'COUNT' and check for it in ``read()`` where
 * ``$data['fields'] == 'COUNT'``.
 */
    public function calculate(Model $Model, $func, $params = array()) {
        return 'COUNT';
    }

/**
 * Implement the R in CRUD. Calls to ``Model::find()`` arrive here.
 */
    public function read(Model $Model, $data = array()) {
        /**
         * Here we do the actual count as instructed by our calculate()
         * method above. We could either check the remote source or some
         * other way to get the record count. Here we'll simply return 1 so
         * ``update()`` and ``delete()`` will assume the record exists.
         */
        if ($data['fields'] == 'COUNT') {
            return array(array(array('count' => 1)));
        }
        /**
         * Now we get, decode and return the remote data.
         */
        $data['conditions']['apiKey'] = $this->config['apiKey'];
        $json = $this->Http->get('http://example.com/api/list.json', $data['conditions']);
        $res = json_decode($json, true);
        if (is_null($res)) {
            $error = json_last_error();
            throw new CakeException($error);
        }
        return array($Model->alias => $res);
    }
```

```
/**
 * Implement the C in CRUD. Calls to ``Model::save()`` without $Model->id
 * set arrive here.
 */
    public function create(Model $Model, $fields = array(), $values = array()) {
        $data = array_combine($fields, $values);
        $data['apiKey'] = $this->config['apiKey'];
        $json = $this->Http->post('http://example.com/api/set.json', $data);
        $res = json_decode($json, true);
        if (is_null($res)) {
            $error = json_last_error();
            throw new CakeException($error);
        }
        return true;
    }

/**
 * Implement the U in CRUD. Calls to ``Model::save()`` with $Model->id
 * set arrive here. Depending on the remote source you can just call
 * ``$this->create()``.
 */
    public function update(Model $Model, $fields = array(), $values = array()) {
        return $this->create($Model, $fields, $values);
    }

/**
 * Implement the D in CRUD. Calls to ``Model::delete()`` arrive here.
 */
    public function delete(Model $Model, $conditions = null) {
        $id = $conditions[$Model->alias . '.id'];
        $json = $this->Http->get('http://example.com/api/remove.json', array(
            'id' => $id,
            'apiKey' => $this->config['apiKey'],
        ));
        $res = json_decode($json, true);
        if (is_null($res)) {
            $error = json_last_error();
            throw new CakeException($error);
        }
        return true;
    }

}
```

We can then configure the datasource in our `app/Config/database.php` file by adding something like this:

```
<?php
public $faraway = array(
    'datasource' => 'FarAwaySource',
    'apiKey'     => '1234abcd',
);
```

Then use the database config in our models like this:

```
<?php
class MyModel extends AppModel {
    public $useDbConfig = 'faraway';
}
```

We can retrieve data from our remote source using the familiar model methods:

```
<?php
// Get all messages from 'Some Person'
$messages = $this->MyModel->find('all', array(
    'conditions' => array('name' => 'Some Person'),
));
```

Similarly we can save a new message:

```
<?php
$this->MyModel->save(array(
    'name' => 'Some Person',
    'message' => 'New Message',
));
```

Update the previous message:

```
<?php
$this->MyModel->id = 42;
$this->MyModel->save(array(
    'message' => 'Updated message',
));
```

And delete the message:

```
<?php
$this->MyModel->delete(42);
```

Plugin DataSources

You can also package Datasources into plugins.

Simply place your datasource file into `Plugin/[YourPlugin]/Model/Datasource/[YourSource].php` and refer to it using the plugin notation:

```
<?php
public $faraway = array(
    'datasource' => 'MyPlugin.FarAwaySource',
    'apiKey'     => 'abcd1234',
);
```

Model Attributes

Model attributes allow you to set properties that can override the default model behavior.

For a complete list of model attributes and their descriptions visit the CakePHP API. Check out http://api20.cakephp.org/class/model.

useDbConfig

The `useDbConfig` property is a string that specifies the name of the database connection to use to bind your model class to the related database table. You can set it to any of the database connections defined within your database configuration file. The database configuration file is stored in /app/Config/database.php.

The `useDbConfig` property is defaulted to the 'default' database connection.

Example usage:

```
<?php
class Example extends AppModel {
    public $useDbConfig = 'alternate';
}
```

useTable

The `useTable` property specifies the database table name. By default, the model uses the lowercase, plural form of the model's class name. Set this attribute to the name of an alternate table, or set it to `false` if you wish the model to use no database table.

Example usage:

```
<?php
class Example extends AppModel {
    public $useTable = false; // This model does not use a database table
}
```

Alternatively:

```
<?php
class Example extends AppModel {
    public $useTable = 'exmp'; // This model uses a database table 'exmp'
}
```

tablePrefix

The name of the table prefix used for the model. The table prefix is initially set in the database connection file at /app/Config/database.php. The default is no prefix. You can override the default by setting the `tablePrefix` attribute in the model.

Example usage:

```
<?php
class Example extends AppModel {
    public $tablePrefix = 'alternate_'; // will look for 'alternate_examples'
}
```

primaryKey

Each table normally has a primary key, `id`. You may change which field name the model uses as its primary key. This is common when setting CakePHP to use an existing database table.

Example usage:

```php
<?php
class Example extends AppModel {
    public $primaryKey = 'example_id'; // example_id is the field name in the database
}
```

displayField

The `displayField` attribute specifies which database field should be used as a label for the record. The label is used in scaffolding and in `find('list')` calls. The model will use `name` or `title`, by default.

For example, to use the `username` field:

```php
<?php
class User extends AppModel {
    public $displayField = 'username';
}
```

Multiple field names cannot be combined into a single display field. For example, you cannot specify, `array('first_name', 'last_name')` as the display field. Instead create a virtual field with the Model attribute virtualFields

recursive

The recursive property defines how deep CakePHP should go to fetch associated model data via `find()`, `findAll()` and `read()` methods.

Imagine your application features Groups which belong to a domain and have many Users which in turn have many Articles. You can set $recursive to different values based on the amount of data you want back from a $this->Group->find() call:

- -1 Cake fetches Group data only, no joins.
- 0 Cake fetches Group data and its domain
- 1 Cake fetches a Group, its domain and its associated Users
- 2 Cake fetches a Group, its domain, its associated Users, and the Users' associated Articles

Set it no higher than you need. Having CakePHP fetch data you aren't going to use slows your app unnecessarily. Also note that the default recursive level is 1.

Note: If you want to combine $recursive with the `fields` functionality, you will have to add the columns containing the required foreign keys to the `fields` array manually. In the example above, this could mean adding `domain_id`.

order

The default ordering of data for any find operation. Possible values include:

```
<?php
$order = "field"
$order = "Model.field";
$order = "Model.field asc";
$order = "Model.field ASC";
$order = "Model.field DESC";
$order = array("Model.field" => "asc", "Model.field2" => "DESC");
```

data

The container for the model's fetched data. While data returned from a model class is normally used as returned from a find() call, you may need to access information stored in $data inside of model callbacks.

_schema

Contains metadata describing the model's database table fields. Each field is described by:

- name
- type (integer, string, datetime, etc.)
- null
- default value
- length

Example Usage:

```
<?php
public $_schema = array(
    'first_name' => array(
        'type' => 'string',
        'length' => 30
    ),
    'last_name' => array(
        'type' => 'string',
        'length' => 30
    ),
    'email' => array(
        'type' => 'string',
        'length' => 30
    ),
    'message' => array('type' => 'text')
);
```

validate

This attribute holds rules that allow the model to make data validation decisions before saving. Keys named after fields hold regex values allowing the model to try to make matches.

Note: It is not necessary to call validate() before save() as save() will automatically validate your data before actually saving.

For more information on validation, see the *Data Validation* later on in this manual.

virtualFields

Array of virtual fields this model has. Virtual fields are aliased SQL expressions. Fields added to this property will be read as other fields in a model but will not be saveable.

Example usage for MySQL:

```
<?php
public $virtualFields = array(
    'name' => "CONCAT(User.first_name, ' ', User.last_name)"
);
```

In subsequent find operations, your User results would contain a `name` key with the result of the concatenation. It is not advisable to create virtual fields with the same names as columns on the database, this can cause SQL errors.

For more information on the `virtualFields` property, its proper usage, as well as limitations, see *Virtual fields*.

name

Name of the model. If you do not specify it in your model file it will be set to the class name by constructor.

Example usage:

```
<?php
class Example extends AppModel {
    public $name = 'Example';
}
```

cacheQueries

If set to true, data fetched by the model during a single request is cached. This caching is in-memory only, and only lasts for the duration of the request. Any duplicate requests for the same data is handled by the cache.

Additional Methods and Properties

While CakePHP's model functions should get you where you need to go, don't forget that model classes are just that: classes that allow you to write your own methods or define your own properties.

Any operation that handles the saving and fetching of data is best housed in your model classes. This concept is often referred to as the fat model.

```
<?php
class Example extends AppModel {
    public function getRecent() {
        $conditions = array(
            'created BETWEEN (curdate() - interval 7 day) and (curdate() - interval 0 day)
        );
        return $this->find('all', compact('conditions'));
    }
}
```

This `getRecent()` method can now be used within the controller.

```
<?php
$recent = $this->Example->getRecent();
```

`Model::associations()`

Get associations:

```
<?php
$result = $this->Example->associations();
// $result equals array('belongsTo', 'hasOne', 'hasMany', 'hasAndBelongsToMany')
```

`Model::buildQuery(string $type = 'first', array $query = array())`

Builds the query array that is used by the data source to generate the query to fetch the data.

`Model::deconstruct(string $field, mixed $data)`

Deconstructs a complex data type (array or object) into a single field value.

`Model::escapeField(string $field = null, string $alias = null)`

Escapes the field name and prepends the model name. Escaping is done according to the current database driver's rules.

Model::exists($id)

Returns true if a record with the particular ID exists.

If ID is not provided it calls `Model::getID()` to obtain the current record ID to verify, and then performs a `Model::find('count')` on the currently configured datasource to ascertain the existence of the record in persistent storage.

Note: Parameter $id was added in 2.1. Prior to that it does not take any parameter.

```
<?php
$this->Example->id = 9;
if ($this->Example->exists()) {
    // ...
}

$exists = $this->Foo->exists(2);
```

Model::getAffectedRows()

Returns the number of rows affected by the last query.

Model::getAssociated(string $type = null)

Gets all the models with which this model is associated.

Model::getColumnType(string $column)

Returns the column type of a column in the model.

Model::getColumnTypes()

Returns an associative array of field names and column types.

Model::getID(integer $list = 0)

Returns the current record's ID.

Model::getInsertID()

Returns the ID of the last record this model inserted.

Model::getLastInsertID()

Alias to `getInsertID()`.

Virtual fields

Virtual fields allow you to create arbitrary SQL expressions and assign them as fields in a Model. These fields cannot be saved, but will be treated like other model fields for read operations. They will be indexed under the model's key alongside other model fields.

Creating virtual fields

Creating virtual fields is easy. In each model you can define a `$virtualFields` property that contains an array of field => expressions. An example of a virtual field definition using MySQL would be:

```
<?php
public $virtualFields = array(
    'name' => 'CONCAT(User.first_name, " ", User.last_name)'
);
```

And with PostgreSQL:

```
<?php
public $virtualFields = array(
    'name' => 'User.first_name || \' \' || User.last_name'
);
```

In subsequent find operations, your User results would contain a `name` key with the result of the concatenation. It is not advisable to create virtual fields with the same names as columns on the database, this can cause SQL errors.

It is not always useful to have **User.first_name** fully qualified. If you do not follow the convention (i.e. you have multiple relations to other tables) this would result in an error. In this case it may be better to just use `first_name || \' \' || last_name` without the Model Name.

Using virtual fields

Creating virtual fields is straightforward and easy, interacting with virtual fields can be done through a few different methods.

Model::hasField()

Model::hasField() will return true if the model has a concrete field passed by the first parameter. By setting the second parameter of *hasField()* to true, virtualFields will also be checked when checking if a model has a field. Using the example field above:

```
<?php
$this->User->hasField('name'); // Will return false, as there is no concrete field called n
$this->User->hasField('name', true); // Will return true as there is a virtual field called
```

Model::isVirtualField()

This method can be used to check if a field/column is a virtual field or a concrete field. Will return true if the column is virtual:

```
<?php
$this->User->isVirtualField('name'); //true
$this->User->isVirtualField('first_name'); //false
```

Model::getVirtualField()

This method can be used to access the SQL expression that comprises a virtual field. If no argument is supplied it will return all virtual fields in a Model:

```
<?php
$this->User->getVirtualField('name'); //returns 'CONCAT(User.first_name, ' ', User.last_nar
```

Model::find() and virtual fields

As stated earlier `Model::find()` will treat virtual fields much like any other field in a model. The value of a virtual field will be placed under the model's key in the resultset:

```
<?php
$results = $this->User->find('first');

// results contains the following
array(
    'User' => array(
        'first_name' => 'Mark',
        'last_name' => 'Story',
        'name' => 'Mark Story',
        //more fields.
    )
);
```

Pagination and virtual fields

Since virtual fields behave much like regular fields when doing find's, `Controller::paginate()` will be able to sort by virtual fields too.

Virtual fields and model aliases

When you are using virtualFields and models with aliases that are not the same as their name, you can run into problems as virtualFields do not update to reflect the bound alias. If you are using virtualFields in models that have more than one alias it is best to define the virtualFields in your model's constructor:

```
<?php
public function __construct($id = false, $table = null, $ds = null) {
    parent::__construct($id, $table, $ds);
    $this->virtualFields['name'] = sprintf('CONCAT(%s.first_name, " ", %s.last_name)', $thi
}
```

This will allow your virtualFields to work for any alias you give a model.

Virtual fields in SQL queries

Using functions in direct SQL queries will prevent data from being returned in the same array as your model's data. For example this:

```
<?php
$this->Timelog->query("SELECT project_id, SUM(id) as TotalHours FROM timelogs AS Timelog GR
```

would return something like this:

```
Array
(
    [0] => Array
        (
            [Timelog] => Array
                (
                    [project_id] => 1234
                )
             [0] => Array
                 (
                     [TotalHours] => 25.5
                 )
        )
 )
```

If we want to group TotalHours into our Timelog array we should specify a virtual field for our aggregate column. We can add this new virtual field on the fly rather than permanently declaring it in the model. We will provide a default value of `0` in case another query attempts to use this virtual field. If that were to occur, `0` would be returned in the TotalHours column:

```
<?php
$this->Timelog->virtualFields['TotalHours'] = 0;
```

In addition to adding the virtual field we also need to alias our column using the form of `MyModel__MyField` like this:

```
<?php
$this->Timelog->query("SELECT project_id, SUM(id) as Timelog__TotalHours FROM timelogs AS T
```

Running the query again after specifying the virtual field should result in a cleaner grouping of values:

```
Array
(
    [0] => Array
        (
            [Timelog] => Array
                (
                    [project_id] => 1234
                    [TotalHours] => 25.5
                )
        )
)
```

Limitations of virtualFields

The implementation of `virtualFields` has a few limitations. First you cannot use `virtualFields` on associated models for conditions, order, or fields arrays. Doing so will generally result in an SQL error as the fields are not replaced by the ORM. This is because it difficult to estimate the depth at which an associated model might be found.

A common workaround for this implementation issue is to copy `virtualFields` from one model to another at runtime when you need to access them:

```
<?php
$this->virtualFields['name'] = $this->Author->virtualFields['name'];
```

or:

```
<?php
$this->virtualFields += $this->Author->virtualFields;
```

Transactions

To perform a transaction, a model's tables must be of a type that supports transactions.

All transaction methods must be performed on a model's DataSource object. To get a model's DataSource from within the model, use:

```
<?php
$dataSource = $this->getDataSource();
```

You can then use the data source to start, commit, or roll back transactions.

```
<?php
$dataSource->begin();

// Perform some tasks

if (/*all's well*/) {
    $dataSource->commit();
} else {
    $dataSource->rollback();
}
```

Nested Transactions

It is possible to start a transaction several times using the `Datasource::begin()` method. The transaction will finish only when the number of *commit* and *rollback* match with begin's.

```
<?php
$dataSource->begin();
// Perform some tasks
$dataSource->begin();
// More few tasks
if (/*latest task ok*/) {
    $dataSource->commit();
} else {
    $dataSource->rollback();
    // Change something in main task
}
$dataSource->commit();
```

This will perform the real nested transaction if your database supports it and it is enabled in the datasource. The methods will always return true when in transaction mode and the nested is not supported or disabled.

If you want to use multiple begin's but not use the nested transaction from database, disable it using `$dataSource->useNestedTransactions = false;`. It will use only the global transaction.

The real nested transaction is disabled by default. Enable it using `$dataSource->useNestedTransactions = true;`.

CHAPTER 9

Core Libraries

CakePHP comes with a plethora of built-in functions and classes. These classes and functions try to cover some of the most common features required in web applications.

General purpose

General purpose libraries are available and reused in many places across CakePHP.

Global Constants and Functions

While most of your day-to-day work in CakePHP will be utilizing core classes and methods, CakePHP features a number of global convenience functions that may come in handy. Many of these functions are for use with CakePHP classes (loading model or component classes), but many others make working with arrays or strings a little easier.

We'll also cover some of the constants available in CakePHP applications. Using these constants will help make upgrades more smooth, but are also convenient ways to point to certain files or directories in your CakePHP application.

Global Functions

Here are CakePHP's globally available functions. Most of them are just convenience wrappers for other CakePHP functionality, such as debugging and translating content.

`__`(*string $string_id*[, *$formatArgs*])

This function handles localization in CakePHP applications. The `$string_id` identifies the ID for a translation. Strings used for translations are treated as format strings for `sprintf()`. You can supply additional arguments to replace placeholders in your string:

```
<?php
__('You have %s unread messages', $number);
```

Note: Check out the *Internationalization & Localization* section for more information.

__c (*string $msg*, *integer $category*, *mixed $args = null*)

Note that the category must be specified with a numeric value, instead of the constant name. The values are:

- 0 - LC_ALL
- 1 - LC_COLLATE
- 2 - LC_CTYPE
- 3 - LC_MONETARY
- 4 - LC_NUMERIC
- 5 - LC_TIME
- 6 - LC_MESSAGES

__d (*string $domain*, *string $msg*, *mixed $args = null*)

Allows you to override the current domain for a single message lookup.

Useful when internationalizing a plugin: `echo __d('PluginName', 'This is my plugin');`

__dc (*string $domain*, *string $msg*, *integer $category*, *mixed $args = null*)

Allows you to override the current domain for a single message lookup. It also allows you to specify a category.

Note that the category must be specified with a numeric value, instead of the constant name. The values are:

- 0 - LC_ALL
- 1 - LC_COLLATE
- 2 - LC_CTYPE
- 3 - LC_MONETARY
- 4 - LC_NUMERIC
- 5 - LC_TIME
- 6 - LC_MESSAGES

__dcn (*string $domain*, *string $singular*, *string $plural*, *integer $count*, *integer $category*, *mixed $args = null*)

Allows you to override the current domain for a single plural message lookup. It also allows you to specify a category. Returns correct plural form of message identified by $singular and $plural for count $count from domain $domain.

Note that the category must be specified with a numeric value, instead of the constant name. The values are:

- 0 - LC_ALL

- 1 - LC_COLLATE
- 2 - LC_CTYPE
- 3 - LC_MONETARY
- 4 - LC_NUMERIC
- 5 - LC_TIME
- 6 - LC_MESSAGES

`__dn` (*string $domain*, *string $singular*, *string $plural*, *integer $count*, *mixed $args = null*)
Allows you to override the current domain for a single plural message lookup. Returns correct plural form of message identified by $singular and $plural for count $count from domain $domain.

`__n` (*string $singular*, *string $plural*, *integer $count*, *mixed $args = null*)
Returns correct plural form of message identified by $singular and $plural for count $count. Some languages have more than one form for plural messages dependent on the count.

`am` (*array $one*, *$two*, *$three...*)
Merges all the arrays passed as parameters and returns the merged array.

`config` ()
Can be used to load files from your application `config`-folder via include_once. Function checks for existence before include and returns boolean. Takes an optional number of arguments.

Example: `config('some_file', 'myconfig');`

`convertSlash` (*string $string*)
Converts forward slashes to underscores and removes the first and last underscores in a string. Returns the converted string.

`debug` (*mixed $var*, *boolean $showHtml = null*, *$showFrom = true*)
If the application's DEBUG level is non-zero, $var is printed out. If `$showHTML` is true or left as null, the data is rendered to be browser-friendly. If $showFrom is not set to false, the debug output will start with the line from which it was called Also see *Debugging*

`env` (*string $key*)
Gets an environment variable from available sources. Used as a backup if `$_SERVER` or `$_ENV` are disabled.

This function also emulates PHP_SELF and DOCUMENT_ROOT on unsupporting servers. In fact, it's a good idea to always use `env()` instead of `$_SERVER` or `getenv()` (especially if you plan to distribute the code), since it's a full emulation wrapper.

`fileExistsInPath` (*string $file*)
Checks to make sure that the supplied file is within the current PHP include_path. Returns a boolean result.

`h` (*string $text*, *boolean $double = true*, *string $charset = null*)
Convenience wrapper for `htmlspecialchars()`.

`LogError` (*string $message*)
Shortcut to `Log::write()`.

pluginSplit (*string $name*, *boolean $dotAppend = false*, *string $plugin = null*)
Splits a dot syntax plugin name into its plugin and classname. If $name does not have a dot, then index 0 will be null.

Commonly used like `list($plugin, $name) = pluginSplit('Users.User');`

pr (*mixed $var*)
Convenience wrapper for `print_r()`, with the addition of wrapping <pre> tags around the output.

sortByKey (*array &$array*, *string $sortby*, *string $order = 'asc'*, *integer $type = SORT_NUMERIC*)
Sorts given $array by key $sortby.

stripslashes_deep (*array $value*)
Recursively strips slashes from the supplied `$value`. Returns the modified array.

Core Definition Constants

Most of the following constants refer to paths in your application.

constant APP
Path to the application's directory.

constant APP_DIR
Equals `app` or the name of your application directory.

constant APPLIBS
Path to the application's Lib directory.

constant CACHE
Path to the cache files directory. It can be shared between hosts in a multi-server setup.

constant CAKE
Path to the cake directory.

constant CAKE_CORE_INCLUDE_PATH
Path to the root lib directory.

constant CORE_PATH
Path to the root directory with ending directory slash.

constant CSS
Path to the public CSS directory.

constant CSS_URL
Web path to the CSS files directory.

constant DS
Short for PHP's DIRECTORY_SEPARATOR, which is / on Linux and \ on windows.

constant FULL_BASE_URL
Full url prefix. Such as `https://example.com`

constant IMAGES
Path to the public images directory.

constant `IMAGES_URL`
Web path to the public images directory.

constant `JS`
Path to the public JavaScript directory.

constant `JS_URL`
Web path to the js files directory.

constant `LOGS`
Path to the logs directory.

constant `ROOT`
Path to the root directory.

constant `TESTS`
Path to the tests directory.

constant `TMP`
Path to the temporary files directory.

constant `VENDORS`
Path to the vendors directory.

constant `WEBROOT_DIR`
Equals `webroot` or the name of your webroot directory.

constant `WWW_ROOT`
Full path to the webroot.

Timing Definition Constants

constant `TIME_START`
Unix timestamp in microseconds as a float from when the application started.

constant `SECOND`
Equals 1

constant `MINUTE`
Equals 60

constant `HOUR`
Equals 3600

constant `DAY`
Equals 86400

constant `WEEK`
Equals 604800

constant `MONTH`
Equals 2592000

constant `YEAR`
Equals 31536000

Events System

New in version 2.1. Creating maintainable applications is both a science and an art. It is well-known that a key for having good quality code is making your objects loosely coupled and strongly cohesive at the same time. Cohesion means that all methods and properties for a class are strongly related to the class itself and it is not trying to do the job other objects should be doing, while loosely coupling is the measure of how little a class is "wired" to external objects, and how much that class is depending on them.

While most of the CakePHP structure and default libraries will help you achieve this goal, there are certain cases where you need to cleanly communicate with other parts in the system without having to hard code those dependencies, thus losing cohesion and increasing class coupling. A very successful design pattern in software engineering is the Observer pattern, where objects can generate events and notify possibly anonymous listeners about changes in the internal state.

Listeners in the observer pattern can subscribe to such events and choose to act upon them, modify the subject state or simply log stuff. If you have used javascript in the past, the chances are that you are already familiar with event driven programming.

CakePHP emulates several aspects of how events are triggered and managed in popular javascript frameworks such as jQuery, while remaining loyal to its object oriented design. In this implementation, an event object is carried across all listeners holding the information and the ability to stop the event propagation at any point. Listeners can register themselves or can delegate this task to other objects and have the chance to alter the state and the event itself for the rest of the callbacks.

Interacting with the event managers

Let's suppose you are building a Cart plugin, but you don't really want to mess with shipping logic, emailing the user or decrementing the item from the stock, it is your wish to handle those things separately in another plugin or in app code. Typically, when not directly using the observer pattern you would do this by attaching behaviors on the fly to your models, and perhaps some components to the controllers.

Doing so represents a challenge most of the time, since you would have to come up with the code for externally loading those behaviors or attaching hooks to your plugin controllers. Prior to CakePHP 2.1 some developers chose to implement generic event systems to solve this problem, and some of those system were offered as plugins. Now, you can benefit from a standard general purpose event system that will let you cleanly separate the concerns of your plugins and application code with the built in events manager.

Dispatching events

So back to our example, we would have an *Order* model that will manage the buying logic, and probably a *place* method to save the order details and do any other logic:

```php
<?php
// Cart/Model/Order.php
class Order extends AppModel {

    public function place($order) {
        if ($this->save($order)) {
            $this->Cart->remove($order);
```

```
                $this->sendNotificationEmail();
                $this->decrementFromStock();
                $this->updateUserStatistics();
                // ...
                return true;
            }
            return false;
        }
    }
```

Well, that does not look right at all. A plugin should not make any assumption about sending emails, and may not even have the inventory data to decrement the item from it, and definitely tracking usage statistics is not the best place to do it. So we need another solution, let's rewrite that using the event manager:

```
<?php
// Cart/Model/Order.php
App::uses('CakeEvent', 'Event');
class Order extends AppModel {

    public function place($order) {
        if ($this->save($order)) {
            $this->Cart->remove($order);
            $this->getEventManager()->dispatch(new CakeEvent('Model.Order.afterPlace', $thi
                'order' => $order
            )));
            return true;
        }
        return false;
    }
}
```

That looks a lot cleaner, at gives us the opportunity to introduce the event classes and methods. The first thing you may notice is the call to `getEventManager()` this is a method that is available by default in all Models, Controller and Views. This method will not return the same manager instance across models, and it is not shared between controllers and models, but they are between controllers and views, nevertheless. We will review later how to overcome this implementation detail.

The `getEventManager` method returns an instance of `CakeEventManager`, and to dispatch events you use `CakeEventManager::dispatch()` which receives an instance of the `CakeEvent` class. Let's dissect now the process of dispatching an event:

```
<?php
new CakeEvent('Model.Order.afterPlace', $this, array(
    'order' => $order
));
```

`CakeEvent` receives 3 arguments in its constructor. The first one is the event name, you should try to keep this name as unique as possible, while making it readable. We suggest a convention as follows: *Layer.eventName* for general events happening at a layer level (e.g. *Controller.startup*, *View.beforeRender*) and *Layer.Class.eventName* for events happening in specific classes on a layer, for example *Model.User.afterRegister* or *Controller.Courses.invalidAccess*.

The second argument is the *subject*, meaning the object associated to the event, usually when it is the same class triggering events about itself, using *$this* will be the most common case. Although a `Component` could trigger controller events too. The subject class is important because listeners will get immediate access to the object properties and have the chance to inspect or change them on the fly.

Finally, the third argument is the event's params. This can be any data you consider useful to pass around so listeners can act upon it. While this can be an argument of any type, we recommend passing an associative array, to make inspection easier.

`CakeEventManager::dispatch()` method accepts the event object as argument and notifies all listener and callbacks passing this object along. So the listeners will handle all the extra logic around the *afterPlace* event, you can log the time, send emails, update user statistics possibly in separate objects and even delegating it to offline tasks if you have the need.

Registering callbacks

How do we register callbacks or observers to our new *afterPlace* event? This is subject to a wide variety of different implementations, but they all have to call the `CakeEventManager::attach()` method to register new actors. For simplicity's sake, let's imagine we know in the plugin what the callbacks are available in the controller, and say this controller is responsible for attaching them. The possible code would look like this:

```
<?php
// Listeners configured somewhere else, maybe a config file:
Configure::write('Order.afterPlace', array(
    'email-sending' => 'EmailSender::sendBuyEmail',
    'inventory' => array($this->InventoryManager, 'decrement'),
    'logger' => function($event) {
        // Anonymous function are only available in PHP 5.3+
        CakeLog::write('info', 'A new order was placed with id: ' . $event->subject()->id)
    }
));

// Cart/Controller/OrdersController.php
class OrdersController extends AppController {

    public function finish() {
        foreach (Configure::read('Order.afterPlace') as $l) {
            $this->Order->getEventManager()->attach($l, 'Model.Order.afterPlace');
        }
        if ($this->Order->place($this->Cart->items())) {
            // ...
        }
    }
}
```

This may not be the cleanest way to do it, so you can come up with your own ways for attaching listeners to an object's event manager. This simple way of defining them using the *Configure* class is intended for didactic purposes only. This little example allows us to showcase what type of callbacks can be attached to the manager. As you may already have figured out, the *attach* method takes any valid PHP *callback* type, this is a string representing a static function call, an array having a class instance and a method, an anonymous function if you use PHP 5.3, etc. Attached callbacks will all receive the event object as first argument

`CakeEventManager::attach()` Accepts three arguments. The leftmost one is the callback itself, anything that PHP can treat as a callable function. The second argument is the event name, and the callback will only get fired if the *CakeEvent* object dispatched has a matching name. The last argument is an array of options to configure the callback priority, and the preference of arguments to be passed.

Registering listeners

Listeners are an alternative, and often cleaner way of registering callbacks for an event. This is done by implementing the `CakeEventListener` interface in any class you wish to register some callbacks. Classes implementing it need to provide the `implementedEvents()` method and return an associative array with all event names that the class will handle.

To keep up with our previous example, let's imagine we have a UserStatistic class responsible for calculating useful information and compiling into the global site statistics. It would be natural to pass an instance of this class as a callback, instead of implementing a custom static function or converting any other workaround to trigger methods in this class. A listener is created as follows:

```php
<?php
App::uses('CakeEventListener', 'Event');
class UserStatistic implements CakeEventListener {

    public function implementedEvents() {
        return array(
            'Model.Order.afterPlace' => 'updateBuyStatistic',
        );
    }

    public function updateBuyStatistic($event) {
        // Code to update statistics
    }
}

// Attach the UserStatistic object to the Order's event manager
$statistics = new UserStatistic();
$this->Order->getEventManager()->attach($statistics);
```

As you can see in the above code, the *attach* function can handle instances of the *CakeEventListener* interface. Internally, the event manager will read the array returned by *implementedEvents* method and wire the callbacks accordingly.

Establishing priorities

In some cases you'd want to run a callback and make sure it gets executed before, or after all the other callbacks have been run. For instance, think again about our user statistics example. It would make sense to run this method only when we can make sure the event was not cancelled, there were no errors and the other callbacks did not change the state of the order itself. For those cases you use priorities.

Priorities are handled using a number associated to the callback itself. The higher the number, the later the method will be fired. Default priority for all callbacks and listener methods are set to *10*. If you need your method to be run before, then using any value below this default will help you do it, even setting the priority to *1* or a negative value should work. On the other hand if you desire to run the callback after the others, using a number above *10* will do.

If two callbacks happen to be allocated in the same priority queue, they will be executed with a *FIFO* policy, the first listener method to be attached is called first and so on. You set priorities using the *attach* method for callbacks, and declaring it in the *implementedEvents* function for event listeners:

```
<?php
// Setting priority for a callback
$callback = array($this, 'doSomething');
$this->getEventManager()->attach($callback, 'Model.Order.afterPlace', array('priority' => 2

// Setting priority for a listener
class UserStatistic implements CakeEventListener {
    public function implementedEvents() {
        return array(
            'Model.Order.afterPlace' => array('callable' => 'updateBuyStatistic', 'priority
        );
    }
}
```

As you see, the main difference for *CakeEventListener* objects is that you need to use an array for specifying the callable method and the priority preference. The *callable* key is an special array entry that the manager will read to know what function in the class it should be calling.

Getting event data as function params

Some developers might prefer having the event data passed as function parameters instead of receiving the event object. While this is an odd preference and using the event object is a lot more powerful, this was needed to provide backwards compatibility with the previous event system and to offer seasoned developers an alternative to what they were used to.

In order to toggle this option you have to add the *passParams* option to the third argument of the *attach* method, or declare it in the *implementedEvents* returned array similar to what you do with priorities:

```
<?php
// Setting priority for a callback
$callback = array($this, 'doSomething');
$this->getEventManager()->attach($callback, 'Model.Order.afterPlace', array('passParams' =>

// Setting priority for a listener
class UserStatistic implements CakeEventListener {
    public function implementedEvents() {
        return array(
            'Model.Order.afterPlace' => array('callable' => 'updateBuyStatistic', 'passPara
        );
    }

    public function updateBuyStatistic($orderData) {
        // ...
    }
}
```

In the above code the *doSomething* function and *updateBuyStatistic* method will receive *$orderData* instead of the *$event* object. This is so, because in our previous example we trigger the *Model.Order.afterPlace* event with some data:

```
<?php
$this->getEventManager()->dispatch(new CakeEvent('Model.Order.afterPlace', $this, array(
    'order' => $order
)));
```

Note: The params can only be passed as function arguments if the event data is an array. Any other data type cannot be converted to function parameters, thus not using this option is often the most adequate choice.

Stopping events

There are circumstances where you will need to stop events so the operation that started it is cancelled. You see examples of this in the model callbacks (e.g. beforeSave) in which it is possible to stop the saving operation if the code detects it cannot proceed any further.

In order to stop events you can either return *false* in your callbacks or call the *stopPropagation* method on the event object:

```
<?php
public function doSomething($event) {
    // ...
    return false; // stops the event
}

public function updateBuyStatistic($event) {
    // ...
    $event->stopPropagation();
}
```

Stopping an event can have two different effects. The first one can always be expected: any callback after the event was stopped will not be called. The second consequence is optional and it depends on the code triggering the event, for instance, in our *afterPlace* example it would not make any sense to cancel the operation since the data was already saved and the cart emptied. Nevertheless, if we had a *beforePlace* stopping the event would have a valid meaning.

To check if an event was stopped, you call the *isStopped()* method in the event object:

```
<?php
public function place($order) {
    $event = new CakeEvent('Model.Order.beforePlace', $this, array('order' => $order));
    $this->getEventManager()->dispatch($event);
    if ($event->isStopped()) {
        return false;
    }
    if ($this->Order->save($order)) {
        // ...
    }
    // ...
}
```

In the previous example the order would not get saved if the event is stopped during the *beforePlace* process.

Getting event results

Every time a callback returns a value, it gets stored in the *$result* property of the event object. This is useful in some cases where letting callbacks modify the main process params enhances the ability of altering the execution aspect of any process. Let's take again our *beforePlace* example and let callbacks modify the $order data.

Event results can be altered either using the event object result property directly or returning the value in the callback itself:

```
<?php
// A listener callback
public function doSomething($event) {
    // ...
    $alteredData = $event->data['order'] + $moreData;
    return $alteredData;
}

// Another listener callback
public function doSomethingElse($event) {
    // ...
    $event->result['order'] = $alteredData;
}

// Using the event result
public function place($order) {
    $event = new CakeEvent('Model.Order.beforePlace', $this, array('order' => $order));
    $this->getEventManager()->dispatch($event);
    if (!empty($event->result['order'])) {
        $order = $event->result['order'];
    }
    if ($this->Order->save($order)) {
        // ...
    }
    // ...
}
```

As you also may have noticed it is possible to alter any event object property and be sure that this new data will get passed to the next callback. In most of the cases, providing objects as event data or result and directly altering the object is the best solution as the reference is kept the same and modifications are shared across all callback calls.

Removing callbacks and listeners

If for any reason you want to remove any callback from the event manager just call the `CakeEventManager::detach()` method using as arguments the first two params you used for attaching it:

```
<?php
// Attaching a function
$this->getEventManager()->attach(array($this, 'doSomething'), 'My.event');

// Detaching the function
$this->getEventManager()->detach(array($this, 'doSomething'), 'My.event');

// Attaching an anonymous function (PHP 5.3+ only);
$myFunction = function($event) { ... };
$this->getEventManager()->attach($myFunction, 'My.event');

// Detaching the anonymous function
$this->getEventManager()->detach($myFunction, 'My.event');

// Attaching a CakeEventListener
$listener = new MyCakeEventLister();
$this->getEventManager()->attach($listener);

// Detaching a single event key from a listener
$this->getEventManager()->detach($listener, 'My.event');

// Detaching all callbacks implemented by a listener
$this->getEventManager()->detach($listener);
```

The global event manager

As previously noted, it might get hard to attach observers to a particular event manager in an object. There are certain cases where having the ability to attach callbacks for an event is needed without having access to the object instance that will trigger it. Also, to prevent people from implementing each of them a different mechanism for loading callbacks into managers based on configuration, CakePHP provides the concept of the global event manager.

The global manager is a singleton instance of a `CakeEventManager` class that receives every event that any event manager in the app dispatches. This is both powerful and flexible, but if you use it you need to take more precautions when dealing with events.

To set the concept right once again, and using our *beforePlace* example let's recall that we were using the local event manager that is returned by the *getEventManager* function. Internally this local event manager dispatches the event into the global one before it triggers the internal attached callbacks. The priority for each manager is independent, the global callbacks will fire in their own priority queue and then the local callbacks will get called in the respective priority order.

Accessing the global event manager is as easy as calling a static function, the following example will attach a global event to the *beforePlace* event:

```php
<?php
// In any configuration file or piece of code that executes before the event
App::uses('CakeEventManager', 'Event');
CakeEventManager::instance()->attach($aCallback, 'Model.Order.beforePlace');
```

As you can see, we just change how we get access to an event manager instance, and we can apply the same concepts we learned before about triggering, attaching, detaching, stopping events, etc.

One important thing you should consider is that there are events that will be triggered having the same name but different subjects, so checking it in the event object is usually required in any function that gets attached globally in order to prevent some bugs. Remember that extreme flexibility implies extreme complexity.

Consider this callback that wants to listen for all Model beforeFinds but in reality, it cannot do its logic if the model is the Cart:

```php
<?php
App::uses('CakeEventManager', 'Event');
CakeEventManager::instance()->attach('myCallback', 'Model.beforeFind');

function myCallback($event) {
    if ($event->subject() instanceof Cart) {
        return;
    }
    return array('conditions' => ...);
}
```

Conclusion

Events are a great way of separating concerns in your application and make classes both cohesive and decoupled from each other, nevertheless using events is not the solution to all problems. Most applications actually won't need this feature at all, we recommend looking into other options when it comes to implementing callbacks such as using behaviors, components or helpers.

Keep in mind that with great power comes great responsibility, decoupling your classes this way also means that you need to perform more and better integration testing on your code. Abusing this tool won't make your apps have a better architecture, quite the opposite, it will make the code harder to read. Whereas in contrast, if you use it wisely, only for the stuff your really need, it will make you code easier to work with, test and integrate.

Additional Reading

Collections

Components, Helpers, Behaviors and Tasks all share a similar structure and set of behaviors. For 2.0, they were given a unified API for interacting with collections of similar objects. The collection objects in CakePHP, give you a uniform way to interact with several different kinds of objects in your application.

While the examples below, will use Components, the same behavior can be expected for Helpers, Behaviors, and Tasks in addition to Components.

Loading and unloading objects Loading objects on every kind of collection can be done using the `load()` method:

```
<?php
$this->Prg = $this->Components->load('Prg');
$this->Prg->process();
```

When loading a component, if the component is not currently loaded into the collection, a new instance will be created. If the component is already loaded, another instance will not be created. When loading components, you can also provide additional configuration for them:

```
<?php
$this->Cookie = $this->Components->load('Cookie', array('name' => 'sweet'));
```

Any keys & values provided will be passed to the Component's constructor. The one exception to this rule is `className`. ClassName is a special key that is used to alias objects in a collection. This allows you to have component names that do not reflect the classnames, which can be helpful when extending core components:

```
<?php
$this->Auth = $this->Components->load('Auth', array('className' => 'MyCustomAuth'));
$this->Auth->user(); // Actually using MyCustomAuth::user();
```

The inverse of loading an object, is unloading it. Unloaded objects are removed from memory, and will not have additional callbacks triggered on them:

```
<?php
$this->Components->unload('Cookie');
$this->Cookie->read(); // Fatal error.
```

Triggering callbacks Callbacks are supported by collection objects. When a collection has a callback triggered, that method will be called on all enabled objects in the collection. You can pass parameters to the callback loop as well:

```
<?php
$this->Behaviors->trigger('afterFind', array($this, $results, $primary));
```

In the above `$viewFile` would be passed as the first argument to every helper's beforeRender method. There are several options that can be used to control how callbacks are fired:

- `breakOn` Set to the value or values you want the callback propagation to stop on. Can either be a scalar value, or an array of values to break on. Defaults to `false`.
- `break` Set to true to enabled breaking. When a trigger is broken, the last returned value will be returned. If used in combination with `collectReturn` the collected results will be returned. Defaults to `false`.
- `collectReturn` Set to true to collect the return of each object into an array. This array of return values will be returned from the trigger() call. Defaults to `false`.
- `triggerDisabled` Will trigger the callback on all objects in the collection even the non-enabled objects. Defaults to false.

- `modParams` Allows each object the callback gets called on to modify the parameters to the next object. Setting modParams to an integer value will allow you to modify the parameter with that index. Any non-null value will modify the parameter index indicated. Defaults to false.

Canceling a callback loop Using the `break` and `breakOn` options you can cancel a callback loop midway similar to stopping event propagation in JavaScript:

```
<?php
$this->Behaviors->trigger(
    'beforeFind',
    array($this, $query),
    array('break' => true, 'breakOn' => false
));
```

In the above example, if any behavior returns `false` from its beforeFind method, no further callbacks will be called. In addition the return of `trigger()` will be false.

Enabling and disabling objects Once an object is loaded into a collection you may need to disable it. Disabling an object in a collection prevents future callbacks from being fired on that object unless the `triggerDisabled` option is used:

```
<?php
// Disable the HtmlHelper
$this->Helpers->disable('Html');

// Re-enable the helper later on
$this->Helpers->enable('Html');
```

Disabled objects can still have their normal methods and properties used. The primary difference between an enabled and disabled object is with regards to callbacks. You can interrogate a collection about the enabled objects, or check if a specific object is still enabled using `enabled()`:

```
<?php
// Check whether or not a specific helper is enabled.
$this->Helpers->enabled('Html');

// $enabled will contain an array of helper currently enabled.
$enabled = $this->Helpers->enabled();
```

Object callback priorities You can prioritize the triggering object callbacks similar to event callbacks. The handling of priority values and order of triggering is the same as explained *here*. Here's how you can specify priority at declaration time:

```
<?php
class SomeController {
    public $components = array(
        'Foo', //Foo gets default priority 10
        'Bar' => array('priority' => 9) //Bar's callbacks are triggered before Foo's
    );
    public $helpers = array(
        'Cache' => array('priority' => 12), //Cache's callbacks will be triggered last
        'Asset',
        'Utility' //Utility has priority 10 same as Asset and its callbacks are trigger
                  //after Asset's
    );
}


<?php
class Post {
    public $actsAs = array(
        'DoFirst' => array('priority' => 1),
        'Media'
    );
}
```

When dynamically loading objects to a collection you can specify the priority like this:

```
<?php
$this->MyComponent = $this->Components->load('MyComponent', array('priority' => 9));
```

You can also change priorities at run time using the `ObjectCollection::setPriority()` function:

```
<?php
//For a single object
$this->Components->setPriority('Foo', 2);

//For multiple objects
$this->Behaviors->setPriority(array('Object1' => 8, 'Object2' => 9));
```

Behaviors

Model behaviors are a way to organize some of the functionality defined in CakePHP models. They allow us to separate and reuse logic that creates a type of behavior, and they do this without requiring inheritance. For example creating tree structures. By providing a simple yet powerful way to enhance models, behaviors allow us to attach functionality to models by defining a simple class variable. That's how behaviors allow models to get rid of all the extra weight that might not be part of the business contract they are modeling, or that is also needed in different models and can then be extrapolated.

As an example, consider a model that gives us access to a database table which stores structural information about a tree. Removing, adding, and migrating nodes in the tree is not as simple as deleting, inserting, and editing rows in the table. Many records may need to be updated as things move around. Rather than creating those tree-manipulation methods on a per model basis (for every model that needs that functionality), we could simply tell our model to use the `TreeBehavior`, or in more formal terms, we tell our model to behave as a Tree. This is known as attaching a behavior to a model. With just one line of code, our CakePHP model takes on a whole new set of methods that allow it to interact with the underlying structure.

CakePHP already includes behaviors for tree structures, translated content, access control list interaction, not to mention the community-contributed behaviors already available in the CakePHP Bakery (http://bakery.cakephp.org). In this section, we'll cover the basic usage pattern for adding behaviors to models, how to use CakePHP's built-in behaviors, and how to create our own.

In essence, Behaviors are Mixins (http://en.wikipedia.org/wiki/Mixin) with callbacks.

Using Behaviors Behaviors are attached to models through the `$actsAs` model class variable:

```
<?php
class Category extends AppModel {
    public $name    = 'Category';
    public $actsAs = array('Tree');
}
```

This example shows how a Category model could be managed in a tree structure using the TreeBehavior. Once a behavior has been specified, use the methods added by the behavior as if they always existed as part of the original model:

```
<?php
// Set ID
$this->Category->id = 42;

// Use behavior method, children():
$kids = $this->Category->children();
```

Some behaviors may require or allow settings to be defined when the behavior is attached to the model. Here, we tell our TreeBehavior the names of the "left" and "right" fields in the underlying database table:

```
<?php
class Category extends AppModel {
    public $name    = 'Category';
    public $actsAs = array('Tree' => array(
        'left'  => 'left_node',
        'right' => 'right_node'
    ));
}
```

We can also attach several behaviors to a model. There's no reason why, for example, our Category model should only behave as a tree, it may also need internationalization support:

```
<?php
class Category extends AppModel {
    public $name    = 'Category';
    public $actsAs = array(
        'Tree' => array(
          'left'  => 'left_node',
          'right' => 'right_node'
        ),
        'Translate'
    );
}
```

So far we have been adding behaviors to models using a model class variable. That means that our behaviors will be attached to our models throughout the model's lifetime. However, we may need to "detach" behaviors from our models at runtime. Let’s say that on our previous Category model, which is acting as a Tree and a Translate model, we need for some reason to force it to stop acting as a Translate model:

```php
<?php
// Detach a behavior from our model:
$this->Category->Behaviors->unload('Translate');
```

That will make our Category model stop behaving as a Translate model from thereon. We may need, instead, to just disable the Translate behavior from acting upon our normal model operations: our finds, our saves, etc. In fact, we are looking to disable the behavior from acting upon our CakePHP model callbacks. Instead of detaching the behavior, we then tell our model to stop informing of these callbacks to the Translate behavior:

```php
<?php
// Stop letting the behavior handle our model callbacks
$this->Category->Behaviors->disable('Translate');
```

We may also need to find out if our behavior is handling those model callbacks, and if not we then restore its ability to react to them:

```php
<?php
// If our behavior is not handling model callbacks
if (!$this->Category->Behaviors->enabled('Translate')) {
    // Tell it to start doing so
    $this->Category->Behaviors->enable('Translate');
}
```

Just as we could completely detach a behavior from a model at runtime, we can also attach new behaviors. Say that our familiar Category model needs to start behaving as a Christmas model, but only on Christmas day:

```php
<?php
// If today is Dec 25
if (date('m/d') == '12/25') {
    // Our model needs to behave as a Christmas model
    $this->Category->Behaviors->load('Christmas');
}
```

We can also use the load method to override behavior settings:

```php
<?php
// We will change one setting from our already attached behavior
$this->Category->Behaviors->load('Tree', array('left' => 'new_left_node'));
```

There’s also a method to obtain the list of behaviors a model has attached. If we pass the name of a behavior to the method, it will tell us if that behavior is attached to the model, otherwise it will give us the list of attached behaviors:

```php
<?php
// If the Translate behavior is not attached
if (!$this->Category->Behaviors->attached('Translate')) {
    // Get the list of all behaviors the model has attached
    $behaviors = $this->Category->Behaviors->attached();
}
```

Creating Behaviors Behaviors that are attached to Models get their callbacks called automatically. The callbacks are similar to those found in Models: `beforeFind`, `afterFind`, `beforeSave`, `afterSave`, `beforeDelete`, `afterDelete` and `onError` - see *Callback Methods*.

Your behaviors should be placed in `app/Model/Behavior`. They are named in CamelCase and postfixed by `Behavior`, ex. NameBehavior.php. It's often helpful to use a core behavior as a template when creating your own. Find them in `lib/Cake/Model/Behavior/`.

Every callback and behavior method takes a reference to the model it is being called from as the first parameter.

Besides implementing the callbacks, you can add settings per behavior and/or model behavior attachment. Information about specifying settings can be found in the chapters about core behaviors and their configuration.

A quick example that illustrates how behavior settings can be passed from the model to the behavior:

```php
<?php
class Post extends AppModel {
    public $name = 'Post'
    public $actsAs = array(
        'YourBehavior' => array(
            'option1_key' => 'option1_value'
        )
    );
}
```

Since behaviors are shared across all the model instances that use them, it's a good practice to store the settings per alias/model name that is using the behavior. When created behaviors will have their `setup()` method called:

```php
<?php
public function setup(Model $Model, $settings = array()) {
    if (!isset($this->settings[$Model->alias])) {
        $this->settings[$Model->alias] = array(
            'option1_key' => 'option1_default_value',
            'option2_key' => 'option2_default_value',
            'option3_key' => 'option3_default_value',
        );
    }
    $this->settings[$Model->alias] = array_merge(
        $this->settings[$Model->alias], (array)$settings);
}
```

Creating behavior methods Behavior methods are automatically available on any model acting as the behavior. For example if you had:

```php
<?php
class Duck extends AppModel {
    public $name = 'Duck';
    public $actsAs = array('Flying');
}
```

You would be able to call `FlyingBehavior` methods as if they were methods on your Duck model. When creating behavior methods you automatically get passed a reference of the calling model as the first parameter. All other supplied parameters are shifted one place to the right. For example:

```
<?php
$this->Duck->fly('toronto', 'montreal');
```

Although this method takes two parameters, the method signature should look like:

```
<?php
public function fly(Model $Model, $from, $to) {
    // Do some flying.
}
```

Keep in mind that methods called in a `$this->doIt()` fashion from inside a behavior method will not get the $model parameter automatically appended.

Mapped methods In addition to providing 'mixin' methods, behaviors can also provide pattern matching methods. Behaviors can also define mapped methods. Mapped methods use pattern matching for method invocation. This allows you to create methods similar to `Model::findAllByXXX` methods on your behaviors. Mapped methods need to be declared in your behaviors `$mapMethods` array. The method signature for a mapped method is slightly different than a normal behavior mixin method:

```
<?php
class MyBehavior extends ModelBehavior {
    public $mapMethods = array('/do(\w+)/' => 'doSomething');

    public function doSomething(Model $model, $method, $arg1, $arg2) {
        debug(func_get_args());
        //do something
    }
}
```

The above will map every `doXXX()` method call to the behavior. As you can see, the model is still the first parameter, but the called method name will be the 2nd parameter. This allows you to munge the method name for additional information, much like `Model::findAllByXX`. If the above behavior was attached to a model the following would happen:

```
<?php
$model->doReleaseTheHounds('homer', 'lenny');

// would output
'ReleaseTheHounds', 'homer', 'lenny'
```

Behavior callbacks Model Behaviors can define a number of callbacks that are triggered before/after the model callbacks of the same name. Behavior callbacks allow your behaviors to capture events in attached models and augment the parameters or splice in additional behavior.

The available callbacks are:

- `beforeValidate` is fired before a model's beforeValidate

- `beforeFind` is fired before a model's beforeFind
- `afterFind` is fired before a model's afterFind
- `beforeSave` is fired before a model's beforeSave
- `afterSave` is fired before a model's afterSave
- `beforeDelete` is fired after a model's beforeDelete
- `afterDelete` is fired before a model's afterDelete

Creating a behavior callback

class **`ModelBehavior`**

Model behavior callbacks are defined as simple methods in your behavior class. Much like regular behavior methods, they receive a `$Model` parameter as the first argument. This parameter is the model that the behavior method was invoked on.

`ModelBehavior::`**`setup`**(*Model $Model*, *array $settings = array()*)

Called when a behavior is attached to a model. The settings come from the attached model's `$actsAs` property.

`ModelBehavior::`**`cleanup`**(*Model $Model*)

Called when a behavior is detached from a model. The base method removes model settings based on `$model->alias`. You can override this method and provide custom cleanup functionality.

`ModelBehavior::`**`beforeFind`**(*Model $Model*, *array $query*)

If a behavior's beforeFind return's false it will abort the find(). Returning an array will augment the query parameters used for the find operation.

`ModelBehavior::`**`afterFind`**(*Model $Model*, *mixed $results*, *boolean $primary*)

You can use the afterFind to augment the results of a find. The return value will be passed on as the results to either the next behavior in the chain or the model's afterFind.

`ModelBehavior::`**`beforeDelete`**(*Model $Model*, *boolean $cascade = true*)

You can return false from a behavior's beforeDelete to abort the delete. Return true to allow it continue.

`ModelBehavior::`**`afterDelete`**(*Model $Model*)

You can use afterDelete to perform clean up operations related to your behavior.

`ModelBehavior::`**`beforeSave`**(*Model $Model*)

You can return false from a behavior's beforeSave to abort the save. Return true to allow it continue.

`ModelBehavior::`**`afterSave`**(*Model $Model*, *boolean $created*)

You can use afterSave to perform clean up operations related to your behavior. $created will be true when a record is created, and false when a record is updated.

`ModelBehavior::`**`beforeValidate`**(*Model $Model*)

You can use beforeValidate to modify a model's validate array or handle any other pre-validation logic. Returning false from a beforeValidate callback will abort the validation and cause it to fail.

Components

Components are packages of logic that are shared between controllers. If you find yourself wanting to copy and paste things between controllers, you might consider wrapping some functionality in a component.

CakePHP also comes with a fantastic set of core components you can use to aid in:

- Security
- Sessions
- Access control lists
- Emails
- Cookies
- Authentication
- Request handling
- Pagination

Each of these core components are detailed in their own chapters. For now, we'll show you how to create your own components. Creating components keeps controller code clean and allows you to reuse code between projects.

Configuring Components Many of the core components require configuration. Some examples of components requiring configuration are *Authentication*, *Cookie* and *EmailComponent*. Configuration for these components, and for components in general, is usually done in the `$components` array or your controller's `beforeFilter()` method:

```
<?php
class PostsController extends AppController {
    public $components = array(
        'Auth' => array(
            'authorize' => array('controller'),
            'loginAction' => array('controller' => 'users', 'action' => 'login')
        ),
        'Cookie' => array('name' => 'CookieMonster')
    );
```

Would be an example of configuring a component with the `$components` array. All core components allow their configuration settings to be set in this way. In addition you can configure components in your controller's `beforeFilter()` method. This is useful when you need to assign the results of a function to a component property. The above could also be expressed as:

```
<?php
public function beforeFilter() {
    $this->Auth->authorize = array('controller');
    $this->Auth->loginAction = array('controller' => 'users', 'action' => 'login');

    $this->Cookie->name = 'CookieMonster';
}
```

It's possible, however, that a component requires certain configuration options to be set before the controller's `beforeFilter()` is run. To this end, some components allow configuration options be set in the `$components` array:

```
<?php
public $components = array(
    'DebugKit.Toolbar' => array('panels' => array('history', 'session'))
);
```

Consult the relevant documentation to determine what configuration options each component provides.

One common setting to use is the `className` option, which allows you to alias components. This feature is useful when you want to replace `$this->Auth` or another common Component reference with a custom implementation:

```
<?php
// app/Controller/PostsController.php
class PostsController extends AppController {
    public $components = array(
        'Auth' => array(
            'className' => 'MyAuth'
        )
    );
}

// app/Controller/Component/MyAuthComponent.php
App::uses('AuthComponent', 'Controller/Component');
class MyAuthComponent extends AuthComponent {
    // Add your code to override the core AuthComponent
}
```

The above would *alias* `MyAuthComponent` to `$this->Auth` in your controllers.

Note: Aliasing a component replaces that instance anywhere that component is used, including inside other Components.

Using Components Once you've included some components in your controller, using them is pretty simple. Each component you use is exposed as a property on your controller. If you had loaded up the `SessionComponent` and the `CookieComponent` in your controller, you could access them like so:

```
<?php
class PostsController extends AppController {
    public $components = array('Session', 'Cookie');

    public function delete() {
        if ($this->Post->delete($this->request->data('Post.id')) {
            $this->Session->setFlash('Post deleted.');
            $this->redirect(array('action' => 'index'));
        }
    }
```

Note: Since both Models and Components are added to Controllers as properties they share the same 'namespace'. Be sure to not give a component and a model the same name.

Loading components on the fly You might not need all of your components available on every controller action. In situations like this you can load a component at runtime using the *Component Collection*. From inside a controller you can do the following:

```
<?php
$this->OneTimer = $this->Components->load('OneTimer');
$this->OneTimer->getTime();
```

Component Callbacks Components also offer a few request life-cycle callbacks that allow them to augment the request cycle. See the base *Component API* for more information on the callbacks components offer.

Creating a Component Suppose our online application needs to perform a complex mathematical operation in many different parts of the application. We could create a component to house this shared logic for use in many different controllers.

The first step is to create a new component file and class. Create the file in `/app/Controller/Component/MathComponent.php`. The basic structure for the component would look something like this:

```
<?php
App::uses('Component', 'Controller');
class MathComponent extends Component {
    public function doComplexOperation($amount1, $amount2) {
        return $amount1 + $amount2;
    }
}
```

Note: All components must extend `Component`. Failing to do this will trigger an exception.

Including your component in your controllers Once our component is finished, we can use it in the application's controllers by placing the component's name (minus the "Component" part) in the controller's `$components` array. The controller will automatically be given a new attribute named after the component, through which we can access an instance of it:

```
<?php
/* Make the new component available at $this->Math,
as well as the standard $this->Session */
public $components = array('Math', 'Session');
```

Components declared in `AppController` will be merged with those in your other controllers. So there is no need to re-declare the same component twice.

When including Components in a Controller you can also declare a set of parameters that will be passed on to the Component's constructor. These parameters can then be handled by the Component:

```php
<?php
public $components = array(
    'Math' => array(
        'precision' => 2,
        'randomGenerator' => 'srand'
    ),
    'Session', 'Auth'
);
```

The above would pass the array containing precision and randomGenerator to `MathComponent::__construct()` as the second parameter. By convention, any settings that have been passed that are also public properties on your component will have the values set based on the settings.

Using other Components in your Component Sometimes one of your components may need to use another component. In this case you can include other components in your component the exact same way you include them in controllers - using the `$components` var:

```php
<?php
// app/Controller/Component/CustomComponent.php
App::uses('Component', 'Controller');
class CustomComponent extends Component {
    // the other component your component uses
    public $components = array('Existing');

    public function initialize(Controller $controller) {
        $this->Existing->foo();
    }

    public function bar() {
        // ...
   }
}

// app/Controller/Component/ExistingComponent.php
App::uses('Component', 'Controller');
class ExistingComponent extends Component {

    public function initialize(Controller $controller) {
        $this->Parent->bar();
    }

    public function foo() {
        // ...
    }
}
```

Component API

class Component

The base Component class offers a few methods for lazily loading other Components through `ComponentCollection` as well as dealing with common handling of settings. It also provides prototypes for all the component callbacks.

`Component::`**`__construct`**(*ComponentCollection $collection*, *$settings = array()*)

Constructor for the base component class. All `$settings` that are also public properties will have their values changed to the matching value in `$settings`.

Callbacks

`Component::`**`initialize`**(*Controller $controller*)

The initialize method is called before the controller's beforeFilter method.

`Component::`**`startup`**(*Controller $controller*)

The startup method is called after the controller's beforeFilter method but before the controller executes the current action handler.

`Component::`**`beforeRender`**(*Controller $controller*)

The beforeRender method is called after the controller executes the requested action's logic but before the controller's renders views and layout.

`Component::`**`shutdown`**(*Controller $controller*)

The shutdown method is called before output is sent to browser.

`Component::`**`beforeRedirect`**(*Controller $controller*, *$url*, *$status=null*, *$exit=true*)

The beforeRedirect method is invoked when the controller's redirect method is called but before any further action. If this method returns false the controller will not continue on to redirect the request. The $url, $status and $exit variables have same meaning as for the controller's method. You can also return a string which will be interpreted as the url to redirect to or return associative array with key 'url' and optionally 'status' and 'exit'.

Helpers

Helpers are the component-like classes for the presentation layer of your application. They contain presentational logic that is shared between many views, elements, or layouts. This chapter will show you how to create your own helpers, and outline the basic tasks CakePHP's core helpers can help you accomplish.

CakePHP features a number of helpers that aid in view creation. They assist in creating well-formed markup (including forms), aid in formatting text, times and numbers, and can even speed up Ajax functionality. For more information on the helpers included in CakePHP, check out *Helpers*.

Using and Configuring Helpers You enable helpers in CakePHP by making a controller aware of them. Each controller has a `$helpers` property that lists the helpers to be made available in the view. To enable a helper in your view, add the name of the helper to the controller's `$helpers` array:

```php
<?php
class BakeriesController extends AppController {
    public $helpers = array('Form', 'Html', 'Js', 'Time');
}
```

Adding helpers from plugins uses the *plugin syntax* used elsewhere in CakePHP:

```
<?php
class BakeriesController extends AppController {
    public $helpers = array('Blog.Comment');
}
```

You can also add helpers from within an action, so they will only be available to that action and not the other actions in the controller. This saves processing power for the other actions that do not use the helper as well as help keep the controller better organized:

```
<?php
class BakeriesController extends AppController {
    public function bake {
        $this->helpers[] = 'Time';
    }
    public function mix {
        // The Time helper is not loaded here and thus not available
    }
}
```

If you need to enable a helper for all controllers add the name of the helper to the `$helpers` array in `/app/Controller/AppController.php` (or create if not present). Remember to include the default Html and Form helpers:

```
<?php
class AppController extends Controller {
    public $helpers = array('Form', 'Html', 'Js', 'Time');
}
```

You can pass options to helpers. These options can be used to set attribute values or modify behavior of a helper:

```
<?php
class AwesomeHelper extends AppHelper {
    public function __construct(View $view, $settings = array()) {
        parent::__construct($view, $settings);
        debug($settings);
    }
}

class AwesomeController extends AppController {
    public $helpers = array('Awesome' => array('option1' => 'value1'));
}
```

One common setting to use is the `className` option, which allows you to create aliased helpers in your views. This feature is useful when you want to replace `$this->Html` or another common Helper reference with a custom implementation:

```
<?php
// app/Controller/PostsController.php
class PostsController extends AppController {
    public $helpers = array(
        'Html' => array(
            'className' => 'MyHtml'
        )
    );
}

// app/View/Helper/MyHtmlHelper.php
App::uses('HtmlHelper', 'View/Helper');
class MyHtmlHelper extends HtmlHelper {
    // Add your code to override the core HtmlHelper
}
```

The above would *alias* `MyHtmlHelper` to `$this->Html` in your views.

Note: Aliasing a helper replaces that instance anywhere that helper is used, including inside other Helpers.

Tip: Aliasing the Html or Session Helper while using the core PagesController will not work. It is better to copy `lib/Cake/Controller/PagesController.php` into your `app/Controller/` folder.

Using helper settings allows you to declaratively configure your helpers and keep configuration logic out of your controller actions. If you have configuration options that cannot be included as part of a class declaration, you can set those in your controller's beforeRender callback:

```
<?php
class PostsController extends AppController {
    public function beforeRender() {
        parent::beforeRender();
        $this->helpers['CustomStuff'] = $this->_getCustomStuffSettings();
    }
}
```

Using Helpers Once you've configured which helpers you want to use in your controller, each helper is exposed as a public property in the view. For example, if you were using the `HtmlHelper` you would be able to access it by doing the following:

```
<?php
echo $this->Html->css('styles');
```

The above would call the `css` method on the HtmlHelper. You can access any loaded helper using `$this->{$helperName}`. There may come a time where you need to dynamically load a helper from inside a view. You can use the view's `HelperCollection` to do this:

```
<?php
$mediaHelper = $this->Helpers->load('Media', $mediaSettings);
```

The HelperCollection is a *collection* and supports the collection API used elsewhere in CakePHP.

Callback methods Helpers feature several callbacks that allow you to augment the view rendering process. See the *Helper API* and the *Collections* documentation for more information.

Creating Helpers If a core helper (or one showcased on github or the Bakery) doesn't fit your needs, helpers are easy to create.

Let's say we wanted to create a helper that could be used to output a specifically crafted CSS-styled link you needed many different places in your application. In order to fit your logic in to CakePHP's existing helper structure, you'll need to create a new class in `/app/View/Helper`. Let's call our helper LinkHelper. The actual PHP class file would look something like this:

```php
<?php
/* /app/View/Helper/LinkHelper.php */
App::uses('AppHelper', 'View/Helper');

class LinkHelper extends AppHelper {
    public function makeEdit($title, $url) {
        // Logic to create specially formatted link goes here...
    }
}
```

Note: Helpers must extend either `AppHelper` or `Helper` or implement all the callbacks in the *Helper API*.

Including other Helpers You may wish to use some functionality already existing in another helper. To do so, you can specify helpers you wish to use with a `$helpers` array, formatted just as you would in a controller:

```php
<?php
/* /app/View/Helper/LinkHelper.php (using other helpers) */
App::uses('AppHelper', 'View/Helper');

class LinkHelper extends AppHelper {
    public $helpers = array('Html');

    public function makeEdit($title, $url) {
        // Use the HTML helper to output
        // formatted data:

        $link = $this->Html->link($title, $url, array('class' => 'edit'));

        return '<div class="editOuter">' . $link . '</div>';
    }
}
```

Using your Helper Once you've created your helper and placed it in `/app/View/Helper/`, you'll be able to include it in your controllers using the special variable `$helpers`:

```php
<?php
class PostsController extends AppController {
    public $helpers = array('Link');
}
```

Once your controller has been made aware of this new class, you can use it in your views by accessing an object named after the helper:

```
<!-- make a link using the new helper -->
<?php echo $this->Link->makeEdit('Change this Recipe', '/recipes/edit/5'); ?>
```

Creating Functionality for All Helpers All helpers extend a special class, AppHelper (just like models extend AppModel and controllers extend AppController). To create functionality that would be available to all helpers, create `/app/View/Helper/AppHelper.php`:

```
<?php
App::uses('Helper', 'View');

class AppHelper extends Helper {
    public function customMethod() {
    }
}
```

Helper API

class `Helper`

The base class for Helpers. It provides a number of utility methods and features for loading other helpers.

`Helper::`**`webroot`**(*$file*)

Resolve a file name to the webroot of the application. If a theme is active and the file exists in the current theme's webroot, the path to the themed file will be returned.

`Helper::`**`url`**(*$url*, *$full = false*)

Generates an HTML escaped URL, delegates to `Router::url()`.

`Helper::`**`value`**(*$options = array()*, *$field = null*, *$key = 'value'*)

Get the value for a given input name.

`Helper::`**`domId`**(*$options = null*, *$id = 'id'*)

Generate a CamelCased id value for the currently selected field. Overriding this method in your AppHelper will allow you to change how CakePHP generates ID attributes.

Callbacks

`Helper::`**`beforeRenderFile`**(*$viewFile*)

Is called before all view files are rendered. This includes elements, views, parent views, and layouts.

`Helper::`**`afterRenderFile`**(*$viewFile*, *$content*)

Is called after all view files are rendered. This includes elements, views, parent views, and layouts. A callback can modify and return `$content` to change how the rendered content will be displayed in the browser.

`Helper::`**`beforeRender`**(*$viewFile*)

The beforeRender method is called after the controller's beforeRender method but before the controller renders view and layout. Receives the file being rendered as an argument.

`Helper::`**`afterRender`**(*$viewFile*)

Is called after the view has been rendered but before layout rendering has started.

`Helper::`**`beforeLayout`**`(`*$layoutFile*`)`
Is called before layout rendering starts. Receives the layout filename as an argument.

`Helper::`**`afterLayout`**`(`*$layoutFile*`)`
Is called after layout rendering is complete. Receives the layout filename as an argument.

Core Helpers

CacheHelper Used by the core to cache view content.

FormHelper Creates HTML forms and form elements that self populate and handle validation problems.

HtmlHelper Convenience methods for crafting well-formed markup. Images, links, tables, header tags and more.

JsHelper Used to create Javascript compatible with various Javascript libraries.

NumberHelper Number and currency formatting.

Paginator Model data pagination and sorting.

RSS Convenience methods for outputting RSS feed XML data.

SessionHelper Access for reading session values in views.

TextHelper Smart linking, highlighting, word smart truncation.

TimeHelper Proximity detection (is this next year?), nice string formatting(Today, 10:30 am) and time zone conversion.

Collections

Components, Helpers, Behaviors and Tasks all share a similar structure and set of behaviors. For 2.0, they were given a unified API for interacting with collections of similar objects. The collection objects in CakePHP, give you a uniform way to interact with several different kinds of objects in your application.

While the examples below, will use Components, the same behavior can be expected for Helpers, Behaviors, and Tasks in addition to Components.

Loading and unloading objects

Loading objects on every kind of collection can be done using the `load()` method:

```
<?php
$this->Prg = $this->Components->load('Prg');
$this->Prg->process();
```

When loading a component, if the component is not currently loaded into the collection, a new instance will be created. If the component is already loaded, another instance will not be created. When loading components, you can also provide additional configuration for them:

```
<?php
$this->Cookie = $this->Components->load('Cookie', array('name' => 'sweet'));
```

Any keys & values provided will be passed to the Component's constructor. The one exception to this rule is `className`. ClassName is a special key that is used to alias objects in a collection. This allows you to have component names that do not reflect the classnames, which can be helpful when extending core components:

```
<?php
$this->Auth = $this->Components->load('Auth', array('className' => 'MyCustomAuth'));
$this->Auth->user(); // Actually using MyCustomAuth::user();
```

The inverse of loading an object, is unloading it. Unloaded objects are removed from memory, and will not have additional callbacks triggered on them:

```
<?php
$this->Components->unload('Cookie');
$this->Cookie->read(); // Fatal error.
```

Triggering callbacks

Callbacks are supported by collection objects. When a collection has a callback triggered, that method will be called on all enabled objects in the collection. You can pass parameters to the callback loop as well:

```
<?php
$this->Behaviors->trigger('afterFind', array($this, $results, $primary));
```

In the above `$viewFile` would be passed as the first argument to every helper's beforeRender method. There are several options that can be used to control how callbacks are fired:

- `breakOn` Set to the value or values you want the callback propagation to stop on. Can either be a scalar value, or an array of values to break on. Defaults to `false`.
- `break` Set to true to enabled breaking. When a trigger is broken, the last returned value will be returned. If used in combination with `collectReturn` the collected results will be returned. Defaults to `false`.
- `collectReturn` Set to true to collect the return of each object into an array. This array of return values will be returned from the trigger() call. Defaults to `false`.
- `triggerDisabled` Will trigger the callback on all objects in the collection even the non-enabled objects. Defaults to false.
- `modParams` Allows each object the callback gets called on to modify the parameters to the next object. Setting modParams to an integer value will allow you to modify the parameter with that index. Any non-null value will modify the parameter index indicated. Defaults to false.

Canceling a callback loop

Using the `break` and `breakOn` options you can cancel a callback loop midway similar to stopping event propagation in JavaScript:

```
<?php
$this->Behaviors->trigger(
    'beforeFind',
    array($this, $query),
    array('break' => true, 'breakOn' => false
));
```

In the above example, if any behavior returns `false` from its beforeFind method, no further callbacks will be called. In addition the return of `trigger()` will be false.

Enabling and disabling objects

Once an object is loaded into a collection you may need to disable it. Disabling an object in a collection prevents future callbacks from being fired on that object unless the `triggerDisabled` option is used:

```
<?php
// Disable the HtmlHelper
$this->Helpers->disable('Html');

// Re-enable the helper later on
$this->Helpers->enable('Html');
```

Disabled objects can still have their normal methods and properties used. The primary difference between an enabled and disabled object is with regards to callbacks. You can interrogate a collection about the enabled objects, or check if a specific object is still enabled using `enabled()`:

```
<?php
// Check whether or not a specific helper is enabled.
$this->Helpers->enabled('Html');

// $enabled will contain an array of helper currently enabled.
$enabled = $this->Helpers->enabled();
```

Object callback priorities

You can prioritize the triggering object callbacks similar to event callbacks. The handling of priority values and order of triggering is the same as explained *here*. Here's how you can specify priority at declaration time:

```
<?php
class SomeController {
    public $components = array(
        'Foo', //Foo gets default priority 10
        'Bar' => array('priority' => 9) //Bar's callbacks are triggered before Foo's
    );

    public $helpers = array(
        'Cache' => array('priority' => 12), //Cache's callbacks will be triggered last
        'Asset',
        'Utility' //Utility has priority 10 same as Asset and its callbacks are trigger
                  //after Asset's
    );
}


<?php
class Post {
    public $actsAs = array(
        'DoFirst' => array('priority' => 1),
        'Media'
    );
}
```

When dynamically loading objects to a collection you can specify the priority like this:

```
<?php
$this->MyComponent = $this->Components->load('MyComponent', array('priority' => 9));
```

You can also change priorities at run time using the `ObjectCollection::setPriority()` function:

```
<?php
//For a single object
$this->Components->setPriority('Foo', 2);

//For multiple objects
$this->Behaviors->setPriority(array('Object1' => 8, 'Object2' => 9));
```

Components

CakePHP has a selection of components to help take care of basic tasks in your controllers. See the section on *Components* for how to configure and use components.

Access Control Lists

class `AclComponent` (*ComponentCollection $collection*, *array $settings = array()*)

CakePHP's access control list functionality is one of the most oft-discussed, most likely because it is the most sought after, but also because it can be the most confusing. If you're looking for a good way to get started with ACLs in general, read on.

Be brave and stick with it, even if the going gets rough. Once you get the hang of it, it's an extremely powerful tool to have on hand when developing your application.

Understanding How ACL Works

Powerful things require access control. Access control lists are a way to manage application permissions in a fine-grained, yet easily maintainable and manageable way.

Access control lists, or ACL, handle two main things: things that want stuff, and things that are wanted. In ACL lingo, things (most often users) that want to use stuff are called access request objects, or AROs. Things in the system that are wanted (most often actions or data) are called access control objects, or ACOs. The entities are called 'objects' because sometimes the requesting object isn't a person - sometimes you might want to limit the access certain Cake controllers have to initiate logic in other parts of your application. ACOs could be anything you want to control, from a controller action, to a web service, to a line on your grandma's online diary.

To review:

- ACO - Access Control Object - Something that is wanted
- ARO - Access Request Object - Something that wants something

Essentially, ACL is what is used to decide when an ARO can have access to an ACO.

In order to help you understand how everything works together, let's use a semi-practical example. Imagine, for a moment, a computer system used by a familiar group of fantasy novel adventurers from the *Lord of the Rings*. The leader of the group, Gandalf, wants to manage the party's assets while maintaining a healthy amount of privacy and security for the other members of the party. The first thing he needs to do is create a list of the AROs involved:

- Gandalf
- Aragorn
- Bilbo
- Frodo
- Gollum
- Legolas
- Gimli
- Pippin
- Merry

Note: Realize that ACL is *not* the same as authentication. ACL is what happens *after* a user has been authenticated. Although the two are usually used in concert, it's important to realize the difference between knowing who someone is (authentication) and knowing what they can do (ACL).

The next thing Gandalf needs to do is make an initial list of things, or ACOs, the system will handle. His list might look something like:

- Weapons
- The One Ring
- Salted Pork
- Diplomacy
- Ale

Traditionally, systems were managed using a sort of matrix, that showed a basic set of users and permissions relating to objects. If this information were stored in a table, it might look like the following table:

x	Weapons	The Ring	Salted Pork	Diplomacy	Ale
Gandalf			Allow	Allow	Allow
Aragorn	Allow		Allow	Allow	Allow
Bilbo					Allow
Frodo		Allow			Allow
Gollum			Allow		
Legolas	Allow		Allow	Allow	Allow
Gimli	Allow		Allow		
Pippin				Allow	Allow
Merry				Allow	Allow

At first glance, it seems that this sort of system could work rather well. Assignments can be made to protect security (only Frodo can access the ring) and protect against accidents (keeping the hobbits out of the salted pork and weapons). It seems fine grained enough, and easy enough to read, right?

For a small system like this, maybe a matrix setup would work. But for a growing system, or a system with a large amount of resources (ACOs) and users (AROs), a table can become unwieldy rather quickly. Imagine trying to control access to the hundreds of war encampments and trying to manage them by unit. Another drawback to matrices is that you can't really logically group sections of users or make cascading permissions changes to groups of users based on those logical groupings. For example, it would sure be nice to automatically allow the hobbits access to the ale and pork once the battle is over: Doing it on an individual user basis would be tedious and error prone. Making a cascading permissions change to all 'hobbits' would be easy.

ACL is most usually implemented in a tree structure. There is usually a tree of AROs and a tree of ACOs. By organizing your objects in trees, permissions can still be dealt out in a granular fashion, while still maintaining a good grip on the big picture. Being the wise leader he is, Gandalf elects to use ACL in his new system, and organizes his objects along the following lines:

- Fellowship of the Ring™
  - Warriors
    - Aragorn
    - Legolas
    - Gimli
  - Wizards
    - Gandalf
  - Hobbits
    - Frodo
    - Bilbo
    - Merry
    - Pippin
  - Visitors
    - Gollum

Using a tree structure for AROs allows Gandalf to define permissions that apply to entire groups of users at once. So, using our ARO tree, Gandalf can tack on a few group-based permissions:

- Fellowship of the Ring (**Deny**: all)
  - Warriors (**Allow**: Weapons, Ale, Elven Rations, Salted Pork)
    - Aragorn
    - Legolas
    - Gimli
  - Wizards (**Allow**: Salted Pork, Diplomacy, Ale)
    - Gandalf
  - Hobbits (**Allow**: Ale)
    - Frodo
    - Bilbo
    - Merry
    - Pippin
  - Visitors (**Allow**: Salted Pork)
    - Gollum

If we wanted to use ACL to see if the Pippin was allowed to access the ale, we'd first get his path in the tree, which is Fellowship->Hobbits->Pippin. Then we see the different permissions that reside at each of those points, and use the most specific permission relating to Pippin and the Ale.

ARO Node	Permission Info	Result
Fellowship of the Ring	Deny all	Denying access to ale.
Hobbits	Allow 'ale'	Allowing access to ale!
Pippin	–	Still allowing ale!

Note: Since the 'Pippin' node in the ACL tree doesn't specifically deny access to the ale ACO, the final result is that we allow access to that ACO.

The tree also allows us to make finer adjustments for more granular control - while still keeping the ability to make sweeping changes to groups of AROs:

- Fellowship of the Ring (**Deny**: all)
  - Warriors (**Allow**: Weapons, Ale, Elven Rations, Salted Pork)
    - Aragorn (Allow: Diplomacy)
    - Legolas
    - Gimli
  - Wizards (**Allow**: Salted Pork, Diplomacy, Ale)
    - Gandalf

- Hobbits (**Allow**: Ale)
  - Frodo (Allow: Ring)
  - Bilbo
  - Merry (Deny: Ale)
  - Pippin (Allow: Diplomacy)
- Visitors (**Allow**: Salted Pork)
  - Gollum

This approach allows us both the ability to make wide-reaching permissions changes, but also fine-grained adjustments. This allows us to say that all hobbits can have access to ale, with one exception—Merry. To see if Merry can access the Ale, we'd find his path in the tree: Fellowship->Hobbits->Merry and work our way down, keeping track of ale-related permissions:

ARO Node	Permission Info	Result
Fellowship of the Ring	Deny all	Denying access to ale.
Hobbits	Allow 'ale'	Allowing access to ale!
Merry	Deny Ale	Denying ale.

Defining Permissions: Cake's INI-based ACL

Cake's first ACL implementation was based on INI files stored in the Cake installation. While it's useful and stable, we recommend that you use the database backed ACL solution, mostly because of its ability to create new ACOs and AROs on the fly. We meant it for usage in simple applications - and especially for those folks who might not be using a database for some reason.

By default, CakePHP's ACL is database-driven. To enable INI-based ACL, you'll need to tell CakePHP what system you're using by updating the following lines in app/Config/core.php

```php
<?php
// Change these lines:
Configure::write('Acl.classname', 'DbAcl');
Configure::write('Acl.database', 'default');

// To look like this:
Configure::write('Acl.classname', 'IniAcl');
//Configure::write('Acl.database', 'default');
```

ARO/ACO permissions are specified in **/app/Config/acl.ini.php**. The basic idea is that AROs are specified in an INI section that has three properties: groups, allow, and deny.

- groups: names of ARO groups this ARO is a member of.
- allow: names of ACOs this ARO has access to
- deny: names of ACOs this ARO should be denied access to

ACOs are specified in INI sections that only include the allow and deny properties.

As an example, let's see how the Fellowship ARO structure we've been crafting would look like in INI syntax:

```
;-------------------------------------
; AROs
;-------------------------------------
[aragorn]
groups = warriors
allow = diplomacy

[legolas]
groups = warriors

[gimli]
groups = warriors

[gandalf]
groups = wizards

[frodo]
groups = hobbits
allow = ring

[bilbo]
groups = hobbits

[merry]
groups = hobbits
deny = ale

[pippin]
groups = hobbits

[gollum]
groups = visitors

;-------------------------------------
; ARO Groups
;-------------------------------------
[warriors]
allow = weapons, ale, salted_pork

[wizards]
allow = salted_pork, diplomacy, ale

[hobbits]
allow = ale

[visitors]
allow = salted_pork
```

Now that you've got your permissions defined, you can skip along to *the section on checking permissions* using the ACL component.

Defining Permissions: Cake's Database ACL

Now that we've covered INI-based ACL permissions, let's move on to the (more commonly used) database ACL.

Getting Started

The default ACL permissions implementation is database powered. Cake's database ACL consists of a set of core models, and a console application that comes with your Cake installation. The models are used by Cake to interact with your database in order to store and retrieve nodes in tree format. The console application is used to initialize your database and interact with your ACO and ARO trees.

To get started, first you'll need to make sure your `/app/Config/database.php` is present and correctly configured. See section 4.1 for more information on database configuration.

Once you've done that, use the CakePHP console to create your ACL database tables:

```
$ cake schema create DbAcl
```

Running this command will drop and re-create the tables necessary to store ACO and ARO information in tree format. The output of the console application should look something like the following:

```
---------------------------------------------------------------
Cake Schema Shell
---------------------------------------------------------------

The following tables will be dropped.
acos
aros
aros_acos

Are you sure you want to drop the tables? (y/n)
[n] > y
Dropping tables.
acos updated.
aros updated.
aros_acos updated.

The following tables will be created.
acos
aros
aros_acos

Are you sure you want to create the tables? (y/n)
[y] > y
Creating tables.
acos updated.
aros updated.
aros_acos updated.
End create.
```

Note: This replaces an older deprecated command, "initdb".

You can also use the SQL file found in `app/Config/Schema/db_acl.sql`, but that's nowhere near as fun.

When finished, you should have three new database tables in your system: acos, aros, and aros_acos (the join table to create permissions information between the two trees).

Note: If you're curious about how Cake stores tree information in these tables, read up on modified database tree traversal. The ACL component uses CakePHP's *Tree* to manage the trees' inheritances. The model class files for ACL are all compiled in a single file db_acl.php (http://api.cakephp.org/file/cake/libs/model/db_acl.php).

Now that we're all set up, let's work on creating some ARO and ACO trees.

Creating Access Request Objects (AROs) and Access Control Objects (ACOs)

In creating new ACL objects (ACOs and AROs), realize that there are two main ways to name and access nodes. The *first* method is to link an ACL object directly to a record in your database by specifying a model name and foreign key value. The *second* method can be used when an object has no direct relation to a record in your database - you can provide a textual alias for the object.

Note: In general, when you're creating a group or higher level object, use an alias. If you're managing access to a specific item or record in the database, use the model/foreign key method.

You create new ACL objects using the core CakePHP ACL models. In doing so, there are a number of fields you'll want to use when saving data: `model`, `foreign_key`, `alias`, and `parent_id`.

The `model` and `foreign_key` fields for an ACL object allows you to link up the object to its corresponding model record (if there is one). For example, many AROs will have corresponding User records in the database. Setting an ARO's `foreign_key` to the User's ID will allow you to link up ARO and User information with a single User model find() call if you've set up the correct model associations. Conversely, if you want to manage edit operation on a specific blog post or recipe listing, you may choose to link an ACO to that specific model record.

The `alias` for an ACL object is just a human-readable label you can use to identify an ACL object that has no direct model record correlation. Aliases are usually useful in naming user groups or ACO collections.

The `parent_id` for an ACL object allows you to fill out the tree structure. Supply the ID of the parent node in the tree to create a new child.

Before we can create new ACL objects, we'll need to load up their respective classes. The easiest way to do this is to include Cake's ACL Component in your controller's $components array:

```php
<?php
public $components = array('Acl');
```

Once we've got that done, let's see what some examples of creating these objects might look like. The following code could be placed in a controller action somewhere:

Note: While the examples here focus on ARO creation, the same techniques can be used to create an ACO tree.

Keeping with our Fellowship setup, let's first create our ARO groups. Because our groups won't really have specific records tied to them, we'll use aliases to create these ACL objects. What we're doing here is from the perspective of a controller action, but could be done elsewhere. What we'll cover here is a bit of an artificial approach, but you should feel comfortable using these techniques to build AROs and ACOs on the fly.

This shouldn't be anything drastically new - we're just using models to save data like we always do:

```
<?php
function any_action() {
    $aro = $this->Acl->Aro;

    // Here's all of our group info in an array we can iterate through
    $groups = array(
        0 => array(
            'alias' => 'warriors'
        ),
        1 => array(
            'alias' => 'wizards'
        ),
        2 => array(
            'alias' => 'hobbits'
        ),
        3 => array(
            'alias' => 'visitors'
        ),
    );

    // Iterate and create ARO groups
    foreach ($groups as $data) {
        // Remember to call create() when saving in loops...
        $aro->create();

        // Save data
        $aro->save($data);
    }

    // Other action logic goes here...
}
```

Once we've got them in there, we can use the ACL console application to verify the tree structure.

```
$ cake acl view aro

Aro tree:
---------------------------------------------------------------
  [1]warriors

  [2]wizards
  [3]hobbits

  [4]visitors

---------------------------------------------------------------
```

I suppose it's not much of a tree at this point, but at least we've got some verification that we've got four top-level nodes. Let's add some children to those ARO nodes by adding our specific user AROs under these groups. Every good citizen of Middle Earth has an account in our new system, so we'll tie these ARO records to specific model records in our database.

Note: When adding child nodes to a tree, make sure to use the ACL node ID, rather than a foreign_key value.

```
<?php
function any_action() {
    $aro = new Aro();

    // Here are our user records, ready to be linked up to new ARO records
    // This data could come from a model and modified, but we're using static
    // arrays here for demonstration purposes.

    $users = array(
        0 => array(
            'alias' => 'Aragorn',
            'parent_id' => 1,
            'model' => 'User',
            'foreign_key' => 2356,
        ),
        1 => array(
            'alias' => 'Legolas',
            'parent_id' => 1,
            'model' => 'User',
            'foreign_key' => 6342,
        ),
        2 => array(
            'alias' => 'Gimli',
            'parent_id' => 1,
            'model' => 'User',
            'foreign_key' => 1564,
        ),
        3 => array(
            'alias' => 'Gandalf',
            'parent_id' => 2,
            'model' => 'User',
            'foreign_key' => 7419,
        ),
        4 => array(
            'alias' => 'Frodo',
            'parent_id' => 3,
            'model' => 'User',
            'foreign_key' => 7451,
        ),
        5 => array(
            'alias' => 'Bilbo',
            'parent_id' => 3,
            'model' => 'User',
            'foreign_key' => 5126,
        ),
        6 => array(
            'alias' => 'Merry',
            'parent_id' => 3,
            'model' => 'User',
            'foreign_key' => 5144,
        ),
        7 => array(
            'alias' => 'Pippin',
            'parent_id' => 3,
            'model' => 'User',
            'foreign_key' => 1211,
        ),
        8 => array(
            'alias' => 'Gollum',
            'parent_id' => 4,
            'model' => 'User',
            'foreign_key' => 1337,
        ),
    );

    // Iterate and create AROs (as children)
    foreach ($users as $data) {
        // Remember to call create() when saving in loops...
        $aro->create();

        //Save data
        $aro->save($data);
    }

    // Other action logic goes here...
}
```

Note: Typically you won't supply both an alias and a model/foreign_key, but we're using both here to make the structure of the tree easier to read for demonstration purposes.

The output of that console application command should now be a little more interesting. Let's give it a try:

```
$ cake acl view aro

Aro tree:
---------------------------------------------------------------
  [1]warriors

    [5]Aragorn
    [6]Legolas

    [7]Gimli

  [2]wizards

    [8]Gandalf

  [3]hobbits

    [9]Frodo

    [10]Bilbo

    [11]Merry

    [12]Pippin

  [4]visitors

    [13]Gollum

---------------------------------------------------------------
```

Now that we've got our ARO tree setup properly, let's discuss a possible approach for structuring an ACO tree. While we can structure more of an abstract representation of our ACO's, it's often more practical to model an ACO tree after Cake's Controller/Action setup. We've got five main objects we're handling in this Fellowship scenario, and the natural setup for that in a Cake application is a group of models, and ultimately the controllers that manipulate them. Past the controllers themselves, we'll want to control access to specific actions in those controllers.

Based on that idea, let's set up an ACO tree that will mimic a Cake app setup. Since we have five ACOs, we'll create an ACO tree that should end up looking something like the following:

- Weapons
- Rings
- PorkChops
- DiplomaticEfforts
- Ales

One nice thing about a Cake ACL setup is that each ACO automatically contains four properties related to CRUD (create, read, update, and delete) actions. You can create children nodes under each of these five main ACOs, but using Cake's built in action management covers basic CRUD operations on a given object. Keeping this in mind will make your ACO trees smaller and easier to maintain. We'll see how these are used later on when we discuss how to assign permissions.

Since you're now a pro at adding AROs, use those same techniques to create this ACO tree. Create these upper level groups using the core Aco model.

Assigning Permissions

After creating our ACOs and AROs, we can finally assign permissions between the two groups. This is done using Cake's core Acl component. Let's continue on with our example.

Here we'll work in the context of a controller action. We do that because permissions are managed by the Acl Component.

```
<?php
class SomethingsController extends AppController {
    // You might want to place this in the AppController
    // instead, but here works great too.

    public $components = array('Acl');

}
```

Let's set up some basic permissions using the AclComponent in an action inside this controller.

```
<?php
function index() {
    // Allow warriors complete access to weapons
    // Both these examples use the alias syntax
    $this->Acl->allow('warriors', 'Weapons');

    // Though the King may not want to let everyone
    // have unfettered access
    $this->Acl->deny('warriors/Legolas', 'Weapons', 'delete');
    $this->Acl->deny('warriors/Gimli',   'Weapons', 'delete');

    die(print_r('done', 1));
}
```

The first call we make to the AclComponent allows any user under the 'warriors' ARO group full access to anything under the 'Weapons' ACO group. Here we're just addressing ACOs and AROs by their aliases.

Notice the usage of the third parameter? That's where we use those handy actions that are in-built for all Cake ACOs. The default options for that parameter are `create`, `read`, `update`, and `delete` but you can add a column in the `aros_acos` database table (prefixed with _ - for example `_admin`) and use it alongside the defaults.

The second set of calls is an attempt to make a more fine-grained permission decision. We want Aragorn to keep his full-access privileges, but deny other warriors in the group the ability to delete Weapons records. We're using the alias syntax to address the AROs above, but you might want to use the model/foreign key syntax yourself. What we have above is equivalent to this:

```
<?php
// 6342 = Legolas
// 1564 = Gimli

$this->Acl->deny(array('model' => 'User', 'foreign_key' => 6342), 'Weapons', 'delete');
$this->Acl->deny(array('model' => 'User', 'foreign_key' => 1564), 'Weapons', 'delete');
```

Note: Addressing a node using the alias syntax uses a slash-delimited string ('/users/employees/developers'). Addressing a node using model/foreign key syntax uses an array with two parameters: `array('model' => 'User', 'foreign_key' => 8282).`

The next section will help us validate our setup by using the AclComponent to check the permissions we've just set up.

Checking Permissions: The ACL Component

Let's use the AclComponent to make sure dwarves and elves can't remove things from the armory. At this point, we should be able to use the AclComponent to make a check between the ACOs and AROs we've created. The basic syntax for making a permissions check is:

```
<?php
$this->Acl->check($aro, $aco, $action = '*');
```

Let's give it a try inside a controller action:

```
<?php
function index() {
    // These all return true:
    $this->Acl->check('warriors/Aragorn', 'Weapons');
    $this->Acl->check('warriors/Aragorn', 'Weapons', 'create');
    $this->Acl->check('warriors/Aragorn', 'Weapons', 'read');
    $this->Acl->check('warriors/Aragorn', 'Weapons', 'update');
    $this->Acl->check('warriors/Aragorn', 'Weapons', 'delete');

    // Remember, we can use the model/id syntax
    // for our user AROs
    $this->Acl->check(array('User' => array('id' => 2356)), 'Weapons');

    // These also return true:
    $result = $this->Acl->check('warriors/Legolas', 'Weapons', 'create');
    $result = $this->Acl->check('warriors/Gimli', 'Weapons', 'read');

    // But these return false:
    $result = $this->Acl->check('warriors/Legolas', 'Weapons', 'delete');
    $result = $this->Acl->check('warriors/Gimli', 'Weapons', 'delete');
}
```

The usage here is demonstrational, but hopefully you can see how checking like this can be used to decide whether or not to allow something to happen, show an error message, or redirect the user to a login.

Authentication

class **`AuthComponent`**(*ComponentCollection $collection*, *array $settings = array()*)

Identifying, authenticating and authorizing users is a common part of almost every web application. In CakePHP AuthComponent provides a pluggable way to do these tasks. AuthComponent allows you to combine authentication objects, and authorization objects to create flexible ways of identifying and checking user authorization.

Authentication

Authentication is the process of identifying users by provided credentials and ensuring that users are who they say they are. Generally this is done through a username and password, that are checked against a known list of users. In CakePHP, there are several built in ways of authenticating users stored in your application.

- `FormAuthenticate` allows you to authenticate users based on form POST data. Usually this is a login form that users enter information into.
- `BasicAuthenticate` allows you to authenticate users using Basic HTTP authentication.
- `DigestAuthenticate` allows you to authenticate users using Digest HTTP authentication.

By default `AuthComponent` uses `FormAuthenticate`.

Choosing an Authentication type

Generally you'll want to offer form based authentication. It is the easiest for users using a web-browser to use. If you are building an API or webservice, you may want to consider basic authentication or digest authentication. The key differences between digest and basic authentication are mostly related to how passwords are handled. In basic authentication, the username and password are transmitted as plain-text to the server. This makes basic authentication un-suitable for applications without SSL, as you would end up exposing sensitive passwords. Digest authentication uses a digest hash of the username, password, and a few other details. This makes digest authentication more appropriate for applications without SSL encryption.

You can also use authentication systems like openid as well, however openid is not part of CakePHP core.

Configuring Authentication handlers

You configure authentication handlers using `$this->Auth->authenticate`. You can configure one or many handlers for authentication. Using multiple handlers allows you to support different ways of logging users in. When logging users in, authentication handlers are checked in the order they are declared. Once one handler is able to identify the user, no other handlers will be checked. Conversely you can halt all authentication by throwing an exception. You will need to catch any thrown exceptions, and handle them as needed.

You can configure authentication handlers in your controller's `beforeFilter` or, in the `$components` array. You can pass configuration information into each authentication object, using an array:

```php
<?php
// Basic setup
$this->Auth->authenticate = array('Form');

// Pass settings in
$this->Auth->authenticate = array(
    'Form' => array('userModel' => 'Member'),
    'Basic' => array('userModel' => 'Member')
);
```

In the second example you'll notice that we had to declare the `userModel` key twice. To help you keep your code DRY, you can use the `all` key. This special key allows you to set settings that are passed to every attached object. The all key is also exposed as `AuthComponent::ALL`:

```
<?php
// Pass settings in using 'all'
$this->Auth->authenticate = array(
    AuthComponent::ALL => array('userModel' => 'Member'),
    'Form',
    'Basic'
);
```

In the above example, both `Form` and `Basic` will get the settings defined for the 'all' key. Any settings passed to a specific authentication object will override the matching key in the 'all' key. The core authentication objects support the following configuration keys.

- `fields` The fields to use to identify a user by.
- `userModel` The model name of the User, defaults to User.
- `scope` Additional conditions to use when looking up and authenticating users, i.e. `array('User.is_active' => 1)`.
- `contain` Containable options for when the user record is loaded. New in version 2.2.

To configure different fields for user in `$components` array:

```
<?php
// Pass settings in $components array
public $components = array(
    'Auth' => array(
        'authenticate' => array(
            'Form' => array(
                'fields' => array('username' => 'email')
            )
        )
    )
);
```

Note: Do not put other Auth configuration keys (like authError, loginAction etc) within the authenticate or Form element. They should be at the same level as the authenticate key. Above setup with other Auth configurations should look something like:

```
<?php
// Pass settings in $components array
public $components = array(
    'Auth' => array(
        'loginAction' => array(
            'controller' => 'users',
            'action' => 'login',
            'plugin' => 'users'
        ),
        'authError' => 'Did you really think you are allowed to see that?',
        'authenticate' => array(
            'Form' => array(
                'fields' => array('username' => 'email')
            )
        )
    )
);
```

In addition to the common configuration, Basic authentication supports the following keys:

- `realm` The realm being authenticated. Defaults to `env('SERVER_NAME')`.

In addition to the common configuration Digest authentication supports the following keys:

- `realm` The realm authentication is for, Defaults to the servername.
- `nonce` A nonce used for authentication. Defaults to `uniqid()`.
- `qop` Defaults to auth, no other values are supported at this time.
- `opaque` A string that must be returned unchanged by clients. Defaults to `md5($settings['realm'])`

Creating Custom Authentication objects

Because authentication objects are pluggable, you can create custom authentication objects in your application or plugins. If for example you wanted to create an OpenID authentication object. In `app/Controller/Component/Auth/OpenidAuthenticate.php` you could put the following:

```
<?php
App::uses('BaseAuthenticate', 'Controller/Component/Auth');

class OpenidAuthenticate extends BaseAuthenticate {
    public function authenticate(CakeRequest $request, CakeResponse $response) {
        // Do things for openid here.
    }
}
```

Authentication objects should return `false` if they cannot identify the user. And an array of user information if they can. It's not required that you extend `BaseAuthenticate`, only that your authentication object implements an `authenticate()` method. The `BaseAuthenticate` class provides a number of helpful methods that are commonly used. You can also implement a `getUser()` method if your authentication object needs to support stateless or cookie-less authentication. See the sections on basic and digest authentication below for more information.

Using custom authentication objects

Once you've created your custom authentication object, you can use them by including them in AuthComponents authenticate array:

```
<?php
$this->Auth->authenticate = array(
    'Openid', // app authentication object.
    'AuthBag.Combo', // plugin authentication object.
);
```

Identifying users and logging them in

In the past `AuthComponent` auto-magically logged users in. This was confusing for many people, and made using AuthComponent a bit difficult at times. For 2.0, you'll need to manually call `$this->Auth->login()` to log a user in.

When authenticating users, attached authentication objects are checked in the order they are attached. Once one of the objects can identify the user, no other objects are checked. A sample login function for working with a login form could look like:

```
<?php
public function login() {
    if ($this->request->is('post')) {
        if ($this->Auth->login()) {
            return $this->redirect($this->Auth->redirect());
        } else {
            $this->Session->setFlash(__('Username or password is incorrect'), 'default', ar
        }
    }
}
```

The above code (without any data passed to the `login` method), will attempt to log a user in using the POST data, and if successful redirect the user to either the last page they were visiting, or `AuthComponent::$loginRedirect`. If the login is unsuccessful, a flash message is set.

Warning: In 2.0 `$this->Auth->login($this->request->data)` will log the user in with whatever data is posted, whereas in 1.3 `$this->Auth->login($this->data)` would try to identify the user first and only log in when successful.

Using Digest and Basic Authentication for logging in Because basic and digest authentication don't require an initial POST to be performed before they initiate the login sequence, your `login()` function will look a bit different than when using `FormAuthentication`:

```
<?php
public function login() {
    if ($this->Auth->login()) {
        return $this->redirect($this->Auth->redirect());
    } else {
        $this->Session->setFlash(__('Username or password is incorrect'), 'default', array
    }
}
```

Once logged in, users using digest and basic auth are not required to have cookies. In fact, all authentication objects are able to provide *stateless* authentication through implementing the `getUser()` method. If the client supports cookies, basic and digest auth will store a user in session much like any other authentication object. If a client doesn't support cookies, (such as a simple HTTP client built on top of CURL) stateless authentication is also supported. Stateless authentication will re-verify the user's credentials on each request, this creates a small amount of additional overhead, but allows clients that cannot or do not support cookies to login in.

Creating stateless authentication systems

Authentication objects can implement a `getUser()` method that can be used to support user login systems that don't rely on cookies. A typical getUser method looks at the request/environment and uses the information there to confirm the identity of the user. HTTP Basic authentication for example uses `$_SERVER['PHP_AUTH_USER']` and `$_SERVER['PHP_AUTH_PW']` for the username and password fields. On each request, if a client doesn't support cookies, these values are used to re-identify the user and ensure they are valid user. As with authentication object's `authenticate()` method the `getUser()` method should return an array of user information on success, and `false` on failure.:

```php
<?php
public function getUser($request) {
    $username = env('PHP_AUTH_USER');
    $pass = env('PHP_AUTH_PW');

    if (empty($username) || empty($pass)) {
        return false;
    }
    return $this->_findUser($username, $pass);
}
```

The above is how you could implement getUser method for HTTP basic authentication. The `_findUser()` method is part of `BaseAuthenticate` and identifies a user based on a username and password.

Displaying auth related flash messages

In order to display the session error messages that Auth generates, you need to add the following code to your layout. Add the following two lines to the `app/View/Layouts/default.ctp` file in the body section preferable before the content_for_layout line.:

```php
<?php
echo $this->Session->flash();
echo $this->Session->flash('auth');
?>
```

You can customize the error messages, and flash settings AuthComponent uses. Using `$this->Auth->flash` you can configure the parameters AuthComponent uses for setting flash messages. The available keys are

- `element` - The element to use, defaults to 'default'.

- `key` - The key to use, defaults to 'auth'
- `params` - The array of additional params to use, defaults to array()

In addition to the flash message settings you can customize other error messages AuthComponent uses. In your controller's beforeFilter, or component settings you can use `authError` to customize the error used for when authorization fails:

```
<?php
$this->Auth->authError = "This error shows up with the user tries to access a part of the w
```

Hashing passwords

AuthComponent no longer automatically hashes every password it can find. This was removed because it made a number of common tasks like validation difficult. You should **never** store plain text passwords, and before saving a user record you should always hash the password. You can use the static `AuthComponent::password()` to hash passwords before saving them. This will use the configured hashing strategy for your application.

After validating the password, you can hash a password in the beforeSave callback of your model:

```
<?php
class User extends AppModel {
    public function beforeSave($options = array()) {
        $this->data['User']['password'] = AuthComponent::password($this->data['User']['pass
        return true;
    }
}
```

You don't need to hash passwords before calling `$this->Auth->login()`. The various authentication objects will hash passwords individually. If you are using Digest authentication, you should not use AuthComponent::password() for generating passwords. See below for how to generate digest hashes.

Hashing passwords for digest authentication Because Digest authentication requires a password hashed in the format defined by the RFC. In order to correctly hash a password for use with Digest authentication you should use the special password hashing function on `DigestAuthenticate`. If you are going to be combining digest authentication with any other authentication strategies, it's also recommended that you store the digest password in a separate column, from the normal password hash:

```
<?php
class User extends AppModel {
    public function beforeSave($options = array()) {
        // make a password for digest auth.
        $this->data['User']['digest_hash'] = DigestAuthenticate::password(
            $this->data['User']['username'], $this->data['User']['password'], env('SERVER_N
        );
        return true;
    }
}
```

Passwords for digest authentication need a bit more information than other password hashes, based on the RFC for digest authentication. If you use AuthComponent::password() for digest hashes you will not be able to login.

Note: The third parameter of DigestAuthenticate::password() must match the 'realm' config value defined when DigestAuthentication was configured in AuthComponent::$authenticate. This defaults to `env('SCRIPT_NAME)`. You may wish to use a static string if you want consistent hashes in multiple environments.

Manually logging users in

Sometimes the need arises where you need to manually log a user in, such as just after they registered for your application. You can do this by calling `$this->Auth->login()` with the user data you want to 'login':

```
<?php
public function register() {
    if ($this->User->save($this->request->data)) {
        $id = $this->User->id;
        $this->request->data['User'] = array_merge($this->request->data['User'], array('id'
        $this->Auth->login($this->request->data['User']);
        $this->redirect('/users/home');
    }
}
```

Warning: Be sure to manually add the new User id to the array passed to the login method. Otherwise you won't have the user id available.

Accessing the logged in user

Once a user is logged in, you will often need some particular information about the current user. You can access the currently logged in user using `AuthComponent::user()`. This method is static, and can be used globally after the AuthComponent has been loaded. You can access it both as an instance method or as a static method:

```
<?php
// Use anywhere
AuthComponent::user('id')

// From inside a controller
$this->Auth->user('id');
```

Logging users out

Eventually you'll want a quick way to de-authenticate someone, and redirect them to where they need to go. This method is also useful if you want to provide a 'Log me out' link inside a members' area of your application:

```
<?php
public function logout() {
    $this->redirect($this->Auth->logout());
}
```

Logging out users that logged in with Digest or Basic auth is difficult to accomplish for all clients. Most browsers will retain credentials for the duration they are still open. Some clients can be forced to logout by sending a 401 status code. Changing the authentication realm is another solution that works for some clients.

Authorization

Authorization is the process of ensuring that an identified/authenticated user is allowed to access the resources they are requesting. If enabled `AuthComponent` can automatically check authorization handlers and ensure that logged in users are allowed to access the resources they are requesting. There are several built-in authorization handlers, and you can create custom ones for your application, or as part of a plugin.

- `ActionsAuthorize` Uses the AclComponent to check for permissions on an action level.
- `CrudAuthorize` Uses the AclComponent and action -> CRUD mappings to check permissions for resources.
- `ControllerAuthorize` Calls `isAuthorized()` on the active controller, and uses the return of that to authorize a user. This is often the most simple way to authorize users.

Configuring Authorization handlers

You configure authorization handlers using `$this->Auth->authorize`. You can configure one or many handlers for authorization. Using multiple handlers allows you to support different ways of checking authorization. When authorization handlers are checked, they will be called in the order they are declared. Handlers should return false, if they are unable to check authorization, or the check has failed. Handlers should return true if they were able to check authorization successfully. Handlers will be called in sequence until one passes. If all checks fail, the user will be redirected to the page they came from. Additionally you can halt all authorization by throwing an exception. You will need to catch any thrown exceptions, and handle them.

You can configure authorization handlers in your controller's `beforeFilter` or, in the `$components` array. You can pass configuration information into each authorization object, using an array:

```
<?php
// Basic setup
$this->Auth->authorize = array('Controller');

// Pass settings in
$this->Auth->authorize = array(
    'Actions' => array('actionPath' => 'controllers/'),
    'Controller'
);
```

Much like `Auth->authenticate`, `Auth->authorize`, helps you keep your code DRY, by using the `all` key. This special key allows you to set settings that are passed to every attached object. The all key is also exposed as `AuthComponent::ALL`:

```
<?php
// Pass settings in using 'all'
$this->Auth->authorize = array(
    AuthComponent::ALL => array('actionPath' => 'controllers/'),
    'Actions',
    'Controller'
);
```

In the above example, both the `Actions` and `Controller` will get the settings defined for the 'all' key. Any settings passed to a specific authorization object will override the matching key in the 'all' key. The core authorize objects support the following configuration keys.

- `actionPath` Used by `ActionsAuthorize` to locate controller action ACO's in the ACO tree.
- `actionMap` Action -> CRUD mappings. Used by `CrudAuthorize` and authorization objects that want to map actions to CRUD roles.
- `userModel` The name of the ARO/Model node user information can be found under. Used with ActionsAuthorize.

Creating Custom Authorize objects

Because authorize objects are pluggable, you can create custom authorize objects in your application or plugins. If for example you wanted to create an LDAP authorize object. In `app/Controller/Component/Auth/LdapAuthorize.php` you could put the following:

```
<?php
App::uses('BaseAuthorize', 'Controller/Component/Auth');

class LdapAuthorize extends BaseAuthorize {
    public function authorize($user, CakeRequest $request) {
        // Do things for ldap here.
    }
}
```

Authorize objects should return `false` if the user is denied access, or if the object is unable to perform a check. If the object is able to verify the user's access, `true` should be returned. It's not required that you extend `BaseAuthorize`, only that your authorize object implements an `authorize()` method. The `BaseAuthorize` class provides a number of helpful methods that are commonly used.

Using custom authorize objects Once you've created your custom authorize object, you can use them by including them in your AuthComponent's authorize array:

```
<?php
$this->Auth->authorize = array(
    'Ldap', // app authorize object.
    'AuthBag.Combo', // plugin authorize object.
);
```

Using no authorization

If you'd like to not use any of the built-in authorization objects, and want to handle things entirely outside of AuthComponent you can set `$this->Auth->authorize = false;`. By default AuthComponent starts off with `authorize = false`. If you don't use an authorization scheme, make sure to check authorization yourself in your controller's beforeFilter, or with another component.

Making actions public

There are often times controller actions that you wish to remain entirely public, or that don't require users to be logged in. AuthComponent is pessimistic, and defaults to denying access. You can mark actions as public actions by using `AuthComponent::allow()`. By marking actions as public, AuthComponent, will not check for a logged in user, nor will authorize objects be checked:

```
<?php
// Allow all actions. CakePHP 2.0
$this->Auth->allow('*');

// Allow all actions. CakePHP 2.1
$this->Auth->allow();

// Allow only the view and index actions.
$this->Auth->allow('view', 'index');

// Allow only the view and index actions.
$this->Auth->allow(array('view', 'index'));
```

You can provide as many action names as you need to `allow()`. You can also supply an array containing all the action names.

Making actions require authorization

If after making actions public, you want to revoke the public access. You can do so using `AuthComponent::deny()`:

```
<?php
// remove one action
$this->Auth->deny('add');

// remove all the actions.
$this->Auth->deny();

// remove a group of actions.
$this->Auth->deny('add', 'edit');
$this->Auth->deny(array('add', 'edit'));
```

You can provide as many action names as you need to `deny()`. You can also supply an array containing all the action names.

Mapping actions when using CrudAuthorize

When using CrudAuthorize or any other authorize objects that use action mappings, it might be necessary to map additional methods. You can map actions -> CRUD permissions using mapAction(). Calling this on AuthComponent will delegate to all the of the configured authorize objects, so you can be sure the settings were applied every where:

```
<?php
$this->Auth->mapActions(array(
    'create' => array('register'),
    'view' => array('show', 'display')
));
```

The keys for mapActions should be the CRUD permissions you want to set, while the values should be an array of all the actions that are mapped to the CRUD permission.

Using ControllerAuthorize

ControllerAuthorize allows you to handle authorization checks in a controller callback. This is ideal when you have very simple authorization, or you need to use a combination of models + components to do your authorization, and don't want to create a custom authorize object.

The callback is always called `isAuthorized()` and it should return a boolean as to whether or not the user is allowed to access resources in the request. The callback is passed the active user, so it can be checked:

```
<?php
class AppController extends Controller {
    public $components = array(
        'Auth' => array('authorize' => 'Controller'),
    );
    public function isAuthorized($user = null) {
        // Any registered user can access public functions
        if (empty($this->request->params['admin'])) {
            return true;
        }

        // Only admins can access admin functions
        if (isset($this->request->params['admin'])) {
            return (bool)($user['role'] === 'admin');
        }

        // Default deny
        return false;
    }
}
```

The above callback would provide a very simple authorization system where, only users with role = admin could access actions that were in the admin prefix.

Using ActionsAuthorize

ActionsAuthorize integrates with the AclComponent, and provides a fine grained per action ACL check on each request. ActionsAuthorize is often paired with DbAcl to give dynamic and flexible permission systems that can be edited by admin users through the application. It can however, be combined with other Acl implementations such as IniAcl and custom application Acl backends.

Using CrudAuthorize

`CrudAuthorize` integrates with AclComponent, and provides the ability to map requests to CRUD operations. Provides the ability to authorize using CRUD mappings. These mapped results are then checked in the AclComponent as specific permissions.

For example, taking `/posts/index` as the current request. The default mapping for `index`, is a `read` permission check. The Acl check would then be for the `posts` controller with the `read` permission. This allows you to create permission systems that focus more on what is being done to resources, rather than the specific actions being visited.

AuthComponent API

AuthComponent is the primary interface to the built-in authorization and authentication mechanics in CakePHP.

property `AuthComponent::$`**`ajaxLogin`**
: The name of an optional view element to render when an Ajax request is made with an invalid or expired session

property `AuthComponent::$`**`authenticate`**
: Set to an array of Authentication objects you want to use when logging users in. There are several core authentication objects, see the section on *Authentication*

property `AuthComponent::$`**`authError`**
: Error to display when user attempts to access an object or action to which they do not have access.

property `AuthComponent::$`**`authorize`**
: Set to an array of Authorization objects you want to use when authorizing users on each request, see the section on *Authorization*

property `AuthComponent::$`**`components`**
: Other components utilized by AuthComponent

property `AuthComponent::$`**`flash`**
: Settings to use when Auth needs to do a flash message with `SessionComponent::setFlash()`. Available keys are:

- `element` - The element to use, defaults to ‘default’.
- `key` - The key to use, defaults to ‘auth’
- `params` - The array of additional params to use, defaults to array()

property `AuthComponent::$`**`loginAction`**

A URL (defined as a string or array) to the controller action that handles logins. Defaults to */users/login*

property `AuthComponent::$`**`loginRedirect`**

The URL (defined as a string or array) to the controller action users should be redirected to after logging in. This value will be ignored if the user has an `Auth.redirect` value in their session.

property `AuthComponent::$`**`logoutRedirect`**

The default action to redirect to after the user is logged out. While AuthComponent does not handle post-logout redirection, a redirect URL will be returned from `AuthComponent::logout()`. Defaults to `AuthComponent::$loginAction`.

property `AuthComponent::$`**`request`**

Request object

property `AuthComponent::$`**`response`**

Response object

property `AuthComponent::$`**`sessionKey`**

The session key name where the record of the current user is stored. If unspecified, it will be "Auth.User".

`AuthComponent::`**`allow`**`(`*$action*[, *$action*, ...]`)`

Set one or more actions as public actions, this means that no authorization checks will be performed for the specified actions. The special value of `'*'` will mark all the current controllers actions as public. Best used in your controller's beforeFilter method.

`AuthComponent::`**`constructAuthenticate`**`()`

Loads the configured authentication objects.

`AuthComponent::`**`constructAuthorize`**`()`

Loads the authorization objects configured.

`AuthComponent::`**`deny`**`(`*$action*[, *$action*, ...]`)`

Toggle one more more actions previously declared as public actions, as non-public methods. These methods will now require authorization. Best used inside your controller's beforeFilter method.

`AuthComponent::`**`flash`**`(`*$message*`)`

Set a flash message. Uses the Session component, and values from `AuthComponent::$flash`.

`AuthComponent::`**`identify`**`(`*$request*, *$response*`)`

Parameters

- **$request** (*CakeRequest*) – The request to use.
- **$response** (*CakeResponse*) – The response to use, headers can be sent if authentication fails.

This method is used by AuthComponent to identify a user based on the information contained in the current request.

`AuthComponent::`**`initialize`**`(`*$Controller*`)`

Initializes AuthComponent for use in the controller.

`AuthComponent::`**`isAuthorized`**`(`*$user = null*, *$request = null*`)`
Uses the configured Authorization adapters to check whether or not a user is authorized. Each adapter will be checked in sequence, if any of them return true, then the user will be authorized for the request.

`AuthComponent::`**`loggedIn`**`()`
Returns true if the current client is a logged in user, or false if they are not.

`AuthComponent::`**`login`**`(`*$user*`)`

Parameters

- **$user** (*array*) – Array of logged in user data.

Takes an array of user data to login with. Allows for manual logging of users. Calling user() will populate the session value with the provided information. If no user is provided, AuthComponent will try to identify a user using the current request information. See `AuthComponent::identify()`

`AuthComponent::`**`logout`**`()`

Returns A string url to redirect the logged out user to.

Logs out the current user.

`AuthComponent::`**`mapActions`**`(`*$map = array()*`)`
Maps action names to CRUD operations. Used for controller-based authentication. Make sure to configure the authorize property before calling this method. As it delegates $map to all the attached authorize objects.

static `AuthComponent::`**`password`**`(`*$pass*`)`
Hash a password with the application's salt value.

`AuthComponent::`**`redirect`**`(`*$url = null*`)`
If no parameter is passed, gets the authentication redirect URL. Pass a url in to set the destination a user should be redirected to upon logging in. Will fallback to `AuthComponent::$loginRedirect` if there is no stored redirect value.

`AuthComponent::`**`shutdown`**`(`*$Controller*`)`
Component shutdown. If user is logged in, wipe out redirect.

`AuthComponent::`**`startup`**`(`*$Controller*`)`
Main execution method. Handles redirecting of invalid users, and processing of login form data.

static `AuthComponent::`**`user`**`(`*$key = null*`)`

Parameters

- **$key** (*string*) – The user data key you want to fetch if null, all user data will be returned. Can also be called as an instance method.

Get data concerning the currently logged in user, you can use a property key to fetch specific data about the user:

```php
<?php
$id = $this->Auth->user('id');
```

If the current user is not logged in or the key doesn't exist, null will be returned.

Cookie

class `CookieComponent`(*ComponentCollection $collection, array $settings = array()*)

The CookieComponent is a wrapper around the native PHP `setcookie` method. It also includes a host of delicious icing to make coding cookies in your controllers very convenient. Before attempting to use the CookieComponent, you must make sure that 'Cookie' is listed in your controllers' $components array.

Controller Setup

There are a number of controller variables that allow you to configure the way cookies are created and managed. Defining these special variables in the beforeFilter() method of your controller allows you to define how the CookieComponent works.

Cookie variable	default	description
string $name	'CakeCookie'	The name of the cookie.
string $key	null	This string is used to encrypt the value written to the cookie. This string should be random and difficult to guess. When using rijndael encryption this value must be longer than 32 bytes.
string $domain	''	The domain name allowed to access the cookie. e.g. Use '.yourdomain.com' to allow access from all your subdomains.
int or string $time	'5 Days'	The time when your cookie will expire. Integers are Interpreted as seconds and a value of 0 is equivalent to a 'session cookie': i.e. the cookie expires when the browser is closed. If a string is set, this will be interpreted with PHP function strtotime(). You can set this directly within the write() method.
string $path	'/'	The server path on which the cookie will be applied. If $cookiePath is set to '/foo/', the cookie will only be available within the /foo/ directory and all sub-directories such as /foo/bar/ of your domain. The default value is the entire domain. You can set this directly within the write() method.
boolean $secure	false	Indicates that the cookie should only be transmitted over a secure HTTPS connection. When set to true, the cookie will only be set if a secure connection exists. You can set this directly within the write() method.
boolean $httpOnly	false	Set to true to make HTTP only cookies. Cookies that are HTTP only are not accessible in Javascript.

The following snippet of controller code shows how to include the CookieComponent and set up the controller variables needed to write a cookie named 'baker_id' for the domain 'example.com' which needs a secure connection, is available on the path '/bakers/preferences/', expires in one hour and is HTTP only:

```php
<?php
public $components = array('Cookie');
public function beforeFilter() {
    parent::beforeFilter();
    $this->Cookie->name = 'baker_id';
    $this->Cookie->time = 3600;  // or '1 hour'
    $this->Cookie->path = '/bakers/preferences/';
    $this->Cookie->domain = 'example.com';
    $this->Cookie->secure = true;  // i.e. only sent if using secure HTTPS
    $this->Cookie->key = 'qSI232qs*&sXOw!adre@34SAv!@*(XSL#$%)asGb$@11~_+!@#HKis~#^';
    $this->Cookie->httpOnly = true;
}
```

Next, let's look at how to use the different methods of the Cookie Component.

Using the Component

The CookieComponent offers a number of methods for working with Cookies.

`CookieComponent::write`(*mixed $key*, *mixed $value = null*, *boolean $encrypt = true*, *mixed $expires = null*)

The write() method is the heart of cookie component, $key is the cookie variable name you want, and the $value is the information to be stored:

```
<?php
$this->Cookie->write('name', 'Larry');
```

You can also group your variables by supplying dot notation in the key parameter:

```
<?php
$this->Cookie->write('User.name', 'Larry');
$this->Cookie->write('User.role', 'Lead');
```

If you want to write more than one value to the cookie at a time, you can pass an array:

```
<?php
$this->Cookie->write('User',
    array('name' => 'Larry', 'role' => 'Lead')
);
```

All values in the cookie are encrypted by default. If you want to store the values as plain-text, set the third parameter of the write() method to false. The encryption performed on cookie values is fairly uncomplicated encryption system. It uses `Security.salt` and a predefined Configure class var `Security.cipherSeed` to encrypt values. To make your cookies more secure you should change `Security.cipherSeed` in app/Config/core.php to ensure a better encryption.:

```
<?php
$this->Cookie->write('name', 'Larry', false);
```

The last parameter to write is $expires – the number of seconds before your cookie will expire. For convenience, this parameter can also be passed as a string that the php strtotime() function understands:

```
<?php
// Both cookies expire in one hour.
$this->Cookie->write('first_name', 'Larry', false, 3600);
$this->Cookie->write('last_name', 'Masters', false, '1 hour');
```

`CookieComponent::read`(*mixed $key = null*)

This method is used to read the value of a cookie variable with the name specified by $key.:

```php
<?php
// Outputs "Larry"
echo $this->Cookie->read('name');

// You can also use the dot notation for read
echo $this->Cookie->read('User.name');

// To get the variables which you had grouped
// using the dot notation as an array use something like
$this->Cookie->read('User');

// this outputs something like array('name' => 'Larry', 'role' => 'Lead')
```

`CookieComponent::`**`delete`**(*mixed $key*)

Deletes a cookie variable of the name in $key. Works with dot notation:

```php
<?php
// Delete a variable
$this->Cookie->delete('bar');

// Delete the cookie variable bar, but not all under foo
$this->Cookie->delete('foo.bar');
```

`CookieComponent::`**`destroy`**()

Destroys the current cookie.

`CookieComponent::`**`type`**(*$type*)

Allows you to change the encryption scheme. By default the 'cipher' scheme is used. However, you should use the 'rijndael' scheme for improved security. Changed in version 2.2: The 'rijndael' type was added.

EmailComponent

`EmailComponent` is now deprecated, but it will keep working. Internally this class is using `CakeEmail` to send emails. Unfortunately, you will need to move your files from `app/views/elements/emails` to `app/View/Emails`. Also, rename the directory `email` to `Emails` in the layouts path. If it affects others places in your application, we recommend to you create symbolic links.

We recommend to you upgrade your code to use `CakeEmail` class instead of the `EmailComponent`. Below some tips about the migration.

- The headers are not changed to be X-... What you set is what is used. So, remember to put X- in your custom headers.
- The `send()` method receives only the message content. The template and layout should be set using `CakeEmail::template()` method.
- The list of attachments should be an array of filenames (that will appear in email) as key and value the full path to real file.
- At any error, `CakeEmail` will throw an exception instead of return false. We recommend to you use try/catch to ensure your messages are delivered correctly.

Below some examples of using `EmailComponent ($component)` and now with `CakeEmail ($lib)`:

- From `$component->to = 'some@example.com';` to `$lib->to('some@example.com');`
- From `$component->to = 'Alias <some@example.com>';` to `$lib->to('some@example.com', 'Alias');` or `$lib->to(array('some@example.com' => 'Alias'));`
- From `$component->subject = 'My subject';` to `$lib->subject('My subject');`
- From `$component->date = 'Sun, 25 Apr 2011 01:00:00 -0300';` to `$lib->addHeaders(array('Date' => 'Sun, 25 Apr 2011 01:00:00 -0300'));`
- From `$component->header['Custom'] = 'only my';` to `$lib->addHeaders(array('X-Custom' => 'only my'));`
- From `$component->send(null, 'template', 'layout');` to `$lib->template('template', 'layout')->send();`
- From `$component->delivery = 'smtp';` to `$lib->transport('smtp');`
- From `$component->smtpOptions = array('host' => 'smtp.example.com');` to `$lib->config(array('host' => 'smtp.example.com'));`
- From `$sent = $component->httpMessage;` to `$sent = $lib->message(CakeEmail::MESSAGE_HTML);`

For more information you should read the *CakeEmail* documentation.

Request Handling

class **`RequestHandlerComponent`**(*ComponentCollection $collection*, *array $settings = array()*)

The Request Handler component is used in CakePHP to obtain additional information about the HTTP requests that are made to your applications. You can use it to inform your controllers about Ajax as well as gain additional insight into content types that the client accepts and automatically changes to the appropriate layout when file extensions are enabled.

By default RequestHandler will automatically detect Ajax requests based on the HTTP-X-Requested-With header that many javascript libraries use. When used in conjunction with `Router::parseExtensions()` RequestHandler will automatically switch the layout and view files to those that match the requested type. Furthermore, if a helper with the same name as the requested extension exists, it will be added to the Controllers Helper array. Lastly, if XML/JSON data is POST'ed to your Controllers, it will be parsed into an array which is assigned to `$this->request->data`, and can then be saved as model data. In order to make use of RequestHandler it must be included in your $components array:

```php
<?php
class WidgetController extends AppController {
    public $components = array('RequestHandler');

    // Rest of controller
}
```

Obtaining Request Information

Request Handler has several methods that provide information about the client and its request.

`RequestHandlerComponent::`**`accepts`**(*$type = null*)

$type can be a string, or an array, or null. If a string, accepts will return true if the client accepts the content type. If an array is specified, accepts return true if any one of the content types is accepted by the client. If null returns an array of the content-types that the client accepts. For example:

```
<?php
class PostsController extends AppController {

    public $components = array('RequestHandler');

    public function beforeFilter() {
        if ($this->RequestHandler->accepts('html')) {
            // Execute code only if client accepts an HTML (text/html) response
        } elseif ($this->RequestHandler->accepts('xml')) {
            // Execute XML-only code
        }
        if ($this->RequestHandler->accepts(array('xml', 'rss', 'atom'))) {
            // Executes if the client accepts any of the above: XML, RSS or Atom
        }
    }
}
```

Other request 'type' detection methods include:

`RequestHandlerComponent::`**`isXml`**()

Returns true if the current request accepts XML as a response.

`RequestHandlerComponent::`**`isRss`**()

Returns true if the current request accepts RSS as a response.

`RequestHandlerComponent::`**`isAtom`**()

Returns true if the current call accepts an Atom response, false otherwise.

`RequestHandlerComponent::`**`isMobile`**()

Returns true if user agent string matches a mobile web browser, or if the client accepts WAP content. The supported Mobile User Agent strings are:

- Android
- AvantGo
- BlackBerry
- DoCoMo

- Fennec
- iPad
- iPhone
- iPod
- J2ME
- MIDP
- NetFront
- Nokia
- Opera Mini
- Opera Mobi
- PalmOS
- PalmSource
- portalmmm
- Plucker
- ReqwirelessWeb
- SonyEricsson
- Symbian
- UP.Browser
- webOS
- Windows CE
- Windows Phone OS
- Xiino

`RequestHandlerComponent::`**`isWap`**`()`

Returns true if the client accepts WAP content.

All of the above request detection methods can be used in a similar fashion to filter functionality intended for specific content types. For example when responding to Ajax requests, you often will want to disable browser caching, and change the debug level. However, you want to allow caching for non-ajax requests. The following would accomplish that:

```php
<?php
if ($this->request->is('ajax')) {
    $this->disableCache();
}
// Continue Controller action
```

Obtaining Additional Client Information

`RequestHandlerComponent::`**`getAjaxVersion`**`()`

Gets Prototype version if call is Ajax, otherwise empty string. The Prototype library sets a special "Prototype version" HTTP header.

Automatically decoding request data

`RequestHandlerComponent::`**`addInputType`**`(`*$type*, *$handler*`)`

Parameters

- **$type** (*string*) – The content type alias this attached decoder is for. e.g. 'json' or 'xml'
- **$handler** (*array*) – The handler information for the type.

Add a request data decoder. The handler should contain a callback, and any additional arguments for the callback. The callback should return an array of data contained in the request input. For example adding a CSV handler in your controllers' beforeFilter could look like:

```
<?php
$parser = function ($data) {
    $rows = str_getcsv($data, "\n");
    foreach ($rows as &$row) {
        $row = str_getcsv($row, ',');
    }
    return $rows;
};
$this->RequestHandler->addInputType('csv', array($parser));
```

The above example requires PHP 5.3, however you can use any callable (http://php.net/callback) for the handling function. You can also pass additional arguments to the callback, this is useful for callbacks like `json_decode`:

```
<?php
$this->RequestHandler->addInputType('json', array('json_decode', true));
```

The above will make `$this->request->data` an array of the JSON input data, without the additional `true` you'd get a set of `StdClass` objects.

Responding To Requests

In addition to request detection RequestHandler also provides easy access to altering the output and content type mappings for your application.

`RequestHandlerComponent::`**`setContent`**`(`*$name*, *$type = null*`)`

- $name string - The name or file extension of the Content-type ie. html, css, json, xml.
- $type mixed - The mime-type(s) that the Content-type maps to.

setContent adds/sets the Content-types for the given name. Allows content-types to be mapped to friendly aliases and or extensions. This allows RequestHandler to automatically respond to requests of each type in its startup method. If you are using Router::parseExtension, you should use the file extension as the name of the Content-type. Furthermore, these content types are used by prefers() and accepts().

setContent is best used in the beforeFilter() of your controllers, as this will best leverage the automagicness of content-type aliases.

The default mappings are:

- **javascript** text/javascript
- **js** text/javascript
- **json** application/json
- **css** text/css
- **html** text/html, */*
- **text** text/plain
- **txt** text/plain
- **csv** application/vnd.ms-excel, text/plain
- **form** application/x-www-form-urlencoded
- **file** multipart/form-data
- **xhtml** application/xhtml+xml, application/xhtml, text/xhtml
- **xhtml-mobile** application/vnd.wap.xhtml+xml
- **xml** application/xml, text/xml
- **rss** application/rss+xml
- **atom** application/atom+xml
- **amf** application/x-amf
- **wap** text/vnd.wap.wml, text/vnd.wap.wmlscript, image/vnd.wap.wbmp
- **wml** text/vnd.wap.wml
- **wmlscript** text/vnd.wap.wmlscript
- **wbmp** image/vnd.wap.wbmp
- **pdf** application/pdf
- **zip** application/x-zip
- **tar** application/x-tar

`RequestHandlerComponent::`**`prefers`**(*$type = null*)

Determines which content-types the client prefers. If no parameter is given the most likely content type is returned. If $type is an array the first type the client accepts will be returned. Preference is determined primarily by the file extension parsed by Router if one has been provided, and secondly by the list of content-types in HTTP_ACCEPT.

`RequestHandlerComponent::`**`renderAs`**`(`*$controller*, *$type*`)`

Parameters

- **$controller** (*Controller*) – Controller Reference
- **$type** (*string*) – friendly content type name to render content for ex. xml, rss.

Change the render mode of a controller to the specified type. Will also append the appropriate helper to the controller's helper array if available and not already in the array.

`RequestHandlerComponent::`**`respondAs`**`(`*$type*, *$options*`)`

Parameters

- **$type** (*string*) – Friendly content type name ex. xml, rss or a full content type like application/x-shockwave
- **$options** (*array*) – If $type is a friendly type name that has more than one content association, $index is used to select the content type.

Sets the response header based on content-type map names.

`RequestHandlerComponent::`**`responseType`**`()`

Returns the current response type Content-type header or null if one has yet to be set.

Taking advantage of HTTP cache validation

New in version 2.1. The HTTP cache validation model is one of the processes used for cache gateways, also known as reverse proxies, to determine if they can serve a stored copy of a response to the client. Under this model, you mostly save bandwidth, but when used correctly you can also save some CPU processing, reducing this way response times.

Enabling the RequestHandlerComponent in your controller automatically activates a check done before rendering the view. This check compares the response object against the original request to determine whether the response was not modified since the last time the client asked for it.

If response is evaluated as not modified, then the view rendering process is stopped, saving processing time an no content is returned to the client, saving bandwidth. The response status code is then set to *304 Not Modified*.

You can opt-out this automatic checking by setting the `checkHttpCache` setting to false:

```php
<?php
public components = array(
    'RequestHandler' => array(
        'checkHttpCache' => false
));
```

Using custom ViewClasses

New in version 2.3. When using JsonView/XmlView you might want to override the default serialization with a custom View class, or add View classes for other types.

You can map existing and new types to your custom classes.

`RequestHandlerComponent::`**`viewClassMap`**(*$type*, *$viewClass*)

Parameters

- **$type** (*string|array*) – The type string or map array with format `array('json' => 'MyJson')`
- **$viewClass** (*string*) – The viewClass to be used for the type without *View* appended

You can also set this automatically by using the `viewClassMap` setting:

```
<?php
public components = array(
    'RequestHandler' => array(
        'viewClassMap' => array(
            'json' => 'ApiKit.MyJson',
            'xml' => 'ApiKit.MyXml',
            'csv' => 'ApiKit.Csv'
        )
));
```

Pagination

class **`PaginatorComponent`**(*ComponentCollection $collection*, *array $settings = array()*)

One of the main obstacles of creating flexible and user-friendly web applications is designing an intuitive UI. Many applications tend to grow in size and complexity quickly, and designers and programmers alike find they are unable to cope with displaying hundreds or thousands of records. Refactoring takes time, and performance and user satisfaction can suffer.

Displaying a reasonable number of records per page has always been a critical part of every application and used to cause many headaches for developers. CakePHP eases the burden on the developer by providing a quick, easy way to paginate data.

Pagination in CakePHP is offered by a Component in the controller, to make building paginated queries easier. In the View `PaginatorHelper` is used to make the generation of pagination links & buttons simple.

Query Setup

In the controller, we start by defining the query conditions pagination will use by default in the `$paginate` controller variable. These conditions, serve as the basis of your pagination queries. They are augmented by the sort, direction limit, and page parameters passed in from the url. It is important to note here that the order key must be defined in an array structure like below:

```php
<?php
class PostsController extends AppController {

    public $paginate = array(
        'limit' => 25,
        'order' => array(
            'Post.title' => 'asc'
        )
    );
}
```

You can also include other `find()` options, such as `fields`:

```php
<?php
class PostsController extends AppController {

    public $paginate = array(
        'fields' => array('Post.id', 'Post.created'),
        'limit' => 25,
        'order' => array(
            'Post.title' => 'asc'
        )
    );
}
```

Other keys that can be included in the `$paginate` array are similar to the parameters of the `Model->find('all')` method, that is: `conditions`, `fields`, `order`, `limit`, `page`, `contain`, `joins`, and `recursive`. In addition to the aforementioned keys, any additional keys will also be passed directly to the model find methods. This makes it very simple to use behaviors like `ContainableBehavior` with pagination:

```php
<?php
class RecipesController extends AppController {

    public $paginate = array(
        'limit' => 25,
        'contain' => array('Article')
    );
}
```

In addition to defining general pagination values, you can define more than one set of pagination defaults in the controller, you just name the keys of the array after the model you wish to configure:

```php
<?php
class PostsController extends AppController {

    public $paginate = array(
        'Post' => array (...),
        'Author' => array (...)
    );
}
```

The values of the `Post` and `Author` keys could contain all the properties that a model/key less `$paginate` array could.

Once the `$paginate` variable has been defined, we can call the `paginate()` method in a controller action. This method will dynamically load the `PaginatorComponent`, and call its paginate() method. This will return `find()` results from the model. It also sets some additional paging statistics, which are added to the request object. The additional information is set to `$this->request->params['paging']`, and is used by `PaginatorHelper` for creating links. `Controller::paginate()` also adds PaginatorHelper to the list of helpers in your controller, if it has not been added already.:

```
<?php
public function list_recipes() {
    // similar to findAll(), but fetches paged results
    $data = $this->paginate('Recipe');
    $this->set('data', $data);
}
```

You can filter the records by passing conditions as second parameter to the `paginate()` function.:

```
<?php
$data = $this->paginate('Recipe', array('Recipe.title LIKE' => 'a%'));
```

Or you can also set `conditions` and other keys in the `$paginate` array inside your action.:

```
<?php
public function list_recipes() {
    $this->paginate = array(
        'conditions' => array('Recipe.title LIKE' => 'a%'),
        'limit' => 10
    );
    $data = $this->paginate('Recipe');
    $this->set(compact('data'));
);
```

Custom Query Pagination

If you're not able to use the standard find options to create the query you need to display your data, there are a few options. You can use a *custom find type*. You can also implement the `paginate()` and `paginateCount()` methods on your model, or include them in a behavior attached to your model. Behaviors implementing `paginate` and/or `paginateCount` should implement the method signatures defined below with the normal additional first parameter of `$model`:

```
<?php
// paginate and paginateCount implemented on a behavior.
public function paginate(Model $model, $conditions, $fields, $order, $limit, $page = 1, $re
    // method content
}

public function paginateCount(Model $model, $conditions = null, $recursive = 0, $extra = a
    // method body
}
```

It's seldom you'll need to implement paginate() and paginateCount(). You should make sure you can't achieve your goal with the core model methods, or a custom finder. To paginate with a custom find type, you should set the `0`'th element, or the `findType` key as of 2.3:

```
<?php
public $paginate = array(
    'popular'
);
```

Since the 0th index is difficult to manage, in 2.3 the `findType` option was added:

```
<?php
public $paginate = array(
    'findType' => 'popular'
);
```

The `paginate()` method should implement the following method signature. To use your own method/logic override it in the model you wish to get the data from:

```
<?php
/**
 * Overridden paginate method - group by week, away_team_id and home_team_id
 */
public function paginate($conditions, $fields, $order, $limit, $page = 1, $recursive = nul
    $recursive = -1;
    $group = $fields = array('week', 'away_team_id', 'home_team_id');
    return $this->find('all', compact('conditions', 'fields', 'order', 'limit', 'page', 're
}
```

You also need to override the core `paginateCount()`, this method expects the same arguments as `Model::find('count')`. The example below uses some Postgres-specifc features, so please adjust accordingly depending on what database you are using:

```
<?php
/**
 * Overridden paginateCount method
 */
public function paginateCount($conditions = null, $recursive = 0, $extra = array()) {
    $sql = "SELECT DISTINCT ON(week, home_team_id, away_team_id) week, home_team_id, away_t
    $this->recursive = $recursive;
    $results = $this->query($sql);
    return count($results);
}
```

The observant reader will have noticed that the paginate method we've defined wasn't actually necessary - All you have to do is add the keyword in controller's `$paginate` class variable:

```
<?php
/**
 * Add GROUP BY clause
 */
public $paginate = array(
    'MyModel' => array(
        'limit' => 20,
        'order' => array('week' => 'desc'),
        'group' => array('week', 'home_team_id', 'away_team_id')
    )
);
```

```
/**
 * Or on-the-fly from within the action
 */
public function index() {
    $this->paginate = array(
        'MyModel' => array(
            'limit' => 20,
            'order' => array('week' => 'desc'),
            'group' => array('week', 'home_team_id', 'away_team_id')
        )
    );
```

In CakePHP 2.0, you no longer need to implement `paginateCount()` when using group clauses. The core `find('count')` will correctly count the total number of rows.

Control which fields used for ordering

By default sorting can be done with any column on a model. This is sometimes undesirable as it can allow users to sort on un-indexed columns, or virtual fields that can be expensive to calculate. You can use the 3rd parameter of `Controller::paginate()` to restrict the columns sorting will be done on:

```
<?php
$this->paginate('Post', array(), array('title', 'slug'));
```

This would allow sorting on the title and slug columns only. A user that sets sort to any other value will be ignored.

Limit the maximum number of rows that can be fetched

The number of results that are fetched is exposed to the user as the `limit` parameter. It is generally undesirable to allow users to fetch all rows in a paginated set. By default CakePHP limits the maximum number of rows that can be fetched to 100. If this default is not appropriate for your application, you can adjust it as part of the pagination options:

```
<?php
public $paginate = array(
    // other keys here.
    'maxLimit' => 10
);
```

If the request's limit param is greater than this value, it will be reduced to the `maxLimit` value.

Pagination with GET parameters

In previous versions of CakePHP you could only generate pagination links using named parameters. But if pages were requested with GET parameters they would still work. For 2.0, we decided to make how you generate pagination parameters more controlled and consistent. You can choose to use either querystring or named parameters in the component. Incoming requests will accept only the chosen type, and the `PaginatorHelper` will generate links with the chosen type of parameter:

```
<?php
public $paginate = array(
    'paramType' => 'querystring'
);
```

The above would enable querystring parameter parsing and generation. You can also modify the `$settings` property on the PaginatorComponent:

```
<?php
$this->Paginator->settings['paramType'] = 'querystring';
```

By default all of the typical paging parameters will be converted into GET arguments.

Note: You can run into a situation where assigning a value to a nonexistent property will throw errors:

```
<?php
$this->paginate['limit'] = 10;
```

will throw the error "Notice: Indirect modification of overloaded property $paginate has no effect". Assigning an initial value to the property solves the issue:

```
<?php
$this->paginate = array();
$this->paginate['limit'] = 10;
//or
$this->paginate = array('limit' => 10);
```

Or just declare the property in the controller class:

```
<?php
class PostsController {
    public $paginate = array();
}
```

Or use `$this->Paginator->setting = array('limit' => 10);`

Make sure you have added the Paginator component to your $components array if you want to modify the `$settings` property of the PaginatorComponent.

Either of these approaches will solve the notice errors.

AJAX Pagination

It's very easy to incorporate Ajax functionality into pagination. Using the `JsHelper` and `RequestHandlerComponent` you can easily add Ajax pagination to your application. See *Ajax Pagination* for more information.

Pagination in the view

Check the `PaginatorHelper` documentation for how to create links for pagination navigation.

Security

class **`SecurityComponent`** (*ComponentCollection $collection*, *array $settings = array()*)

The Security Component creates an easy way to integrate tighter security in your application. It provides methods for various tasks like:

- Restricting which HTTP methods your application accepts.
- CSRF protection.
- Form tampering protection
- Requiring that SSL be used.
- Limiting cross controller communication.

Like all components it is configured through several configurable parameters. All of these properties can be set directly or through setter methods of the same name in your controller's beforeFilter.

By using the Security Component you automatically get CSRF (http://en.wikipedia.org/wiki/Cross-site_request_forgery) and form tampering protection. Hidden token fields will automatically be inserted into forms and checked by the Security component. Among other things, a form submission will not be accepted after a certain period of inactivity, which is controlled by the `csrfExpires` time.

If you are using Security component's form protection features and other components that process form data in their `startup()` callbacks, be sure to place Security Component before those components in your `$components` array.

Note: When using the Security Component you **must** use the FormHelper to create your forms. In addition, you must **not** override any of the fields' "name" attributes. The Security Component looks for certain indicators that are created and managed by the FormHelper (especially those created in `create()` and `end()`). Dynamically altering the fields that are submitted in a POST request (e.g. disabling, deleting or creating new fields via JavaScript) is likely to trigger a black-holing of the request. See the `$validatePost` or `$disabledFields` configuration parameters.

Handling blackhole callbacks

If an action is restricted by the Security Component it is black-holed as an invalid request which will result in a 404 error by default. You can configure this behavior by setting the `$this->Security->blackHoleCallback` property to a callback function in the controller.

`SecurityComponent::`**`blackHole`**(*object $controller*, *string $error*)

Black-hole an invalid request with a 404 error or a custom callback. With no callback, the request will be exited. If a controller callback is set to SecurityComponent::blackHoleCallback, it will be called and passed any error information.

property `SecurityComponent::$`**`blackHoleCallback`**

A Controller callback that will handle and requests that are blackholed. A blackhole callback can be any public method on a controllers. The callback should expect an parameter indicating the type of error:

```
<?php
public function beforeFilter() {
    $this->Security->blackHoleCallback = 'blackhole';
}

public function blackhole($type) {
    // handle errors.
}
```

The `$type` parameter can have the following values:

- 'auth' Indicates a form validation error, or a controller/action mismatch error.
- 'csrf' Indicates a CSRF error.
- 'get' Indicates an HTTP method restriction failure.
- 'post' Indicates an HTTP method restriction failure.
- 'put' Indicates an HTTP method restriction failure.
- 'delete' Indicates an HTTP method restriction failure.
- 'secure' Indicates an SSL method restriction failure.

Restricting HTTP methods

`SecurityComponent::`**`requirePost`**`()`

Sets the actions that require a POST request. Takes any number of arguments. Can be called with no arguments to force all actions to require a POST.

`SecurityComponent::`**`requireGet`**`()`

Sets the actions that require a GET request. Takes any number of arguments. Can be called with no arguments to force all actions to require a GET.

`SecurityComponent::`**`requirePut`**`()`

Sets the actions that require a PUT request. Takes any number of arguments. Can be called with no arguments to force all actions to require a PUT.

`SecurityComponent::`**`requireDelete`**`()`

Sets the actions that require a DELETE request. Takes any number of arguments. Can be called with no arguments to force all actions to require a DELETE.

Restrict actions to SSL

`SecurityComponent::`**`requireSecure`**`()`

Sets the actions that require a SSL-secured request. Takes any number of arguments. Can be called with no arguments to force all actions to require a SSL-secured.

`SecurityComponent::`**`requireAuth`**`()`

Sets the actions that require a valid Security Component generated token. Takes any number of arguments. Can be called with no arguments to force all actions to require a valid authentication.

Restricting cross controller communication

property `SecurityComponent::$`**`allowedControllers`**

A List of Controller from which the actions of the current controller are allowed to receive requests from. This can be used to control cross controller requests.

property `SecurityComponent::$`**`allowedActions`**

Actions from which actions of the current controller are allowed to receive requests. This can be used to control cross controller requests.

Form tampering prevention

By default `SecurityComponent` prevents users from tampering with forms. It does this by working with FormHelper and tracking which files are in a form. It also keeps track of the values of hidden input elements. All of this data is combined and turned into a hash. When a form is submitted, SecurityComponent will use the POST data to build the same structure and compare the hash.

property `SecurityComponent::$`**`unlockedFields`**

Set to a list of form fields to exclude from POST validation. Fields can be unlocked either in the Component, or with `FormHelper::unlockField()`. Fields that have been unlocked are not required to be part of the POST and hidden unlocked fields do not have their values checked.

property `SecurityComponent::$`**`validatePost`**

Set to `false` to completely skip the validation of POST requests, essentially turning off form validation.

CSRF configuration

property `SecurityComponent::$`**`csrfCheck`**

Whether to use CSRF protected forms. Set to `false` to disable CSRF protection on forms.

property `SecurityComponent::$`**`csrfExpires`**

The duration from when a CSRF token is created that it will expire on. Each form/page request will generate a new token that can only be submitted once unless it expires. Can be any value compatible with `strtotime()`. The default is +30 minutes.

property `SecurityComponent::$`**`csrfUseOnce`**

Controls whether or not CSRF tokens are use and burn. Set to `false` to not generate new tokens on each request. One token will be reused until it expires. This reduces the chances of users getting invalid requests because of token consumption. It has the side effect of making CSRF less secure, as tokens are reusable.

Usage

Using the security component is generally done in the controller beforeFilter(). You would specify the security restrictions you want and the Security Component will enforce them on its startup:

```php
<?php
class WidgetController extends AppController {

    public $components = array('Security');

    public function beforeFilter() {
        $this->Security->requirePost('delete');
    }
}
```

In this example the delete action can only be successfully triggered if it receives a POST request:

```php
<?php
class WidgetController extends AppController {

    public $components = array('Security');

    public function beforeFilter() {
        if (isset($this->request->params['admin'])) {
            $this->Security->requireSecure();
        }
    }
}
```

This example would force all actions that had admin routing to require secure SSL requests:

```php
<?php
class WidgetController extends AppController {

    public $components = array('Security');

    public function beforeFilter() {
        if (isset($this->params['admin'])) {
            $this->Security->blackHoleCallback = 'forceSSL';
            $this->Security->requireSecure();
        }
    }

    public function forceSSL() {
        $this->redirect('https://' . env('SERVER_NAME') . $this->here);
    }
}
```

This example would force all actions that had admin routing to require secure SSL requests. When the request is black holed, it will call the nominated forceSSL() callback which will redirect non-secure requests to secure requests automatically.

CSRF protection

CSRF or Cross Site Request Forgery is a common vulnerability in web applications. It allows an attacker to capture and replay a previous request, and sometimes submit data requests using image tags or resources on other domains.

Double submission and replay attacks are handled by the SecurityComponent's CSRF features. They work by adding a special token to each form request. This token once used cannot be used again. If an attempt is made to re-use an expired token the request will be blackholed.

Using CSRF protection

Simply by adding the `SecurityComponent` to your components array, you can benefit from the CSRF protection it provides. By default CSRF tokens are valid for 30 minutes and expire on use. You can control how long tokens last by setting csrfExpires on the component.:

```
<?php
public $components = array(
    'Security' => array(
        'csrfExpires' => '+1 hour'
    )
);
```

You can also set this property in your controller's `beforeFilter`:

```
<?php
public function beforeFilter() {
    $this->Security->csrfExpires = '+1 hour';
    // ...
}
```

The csrfExpires property can be any value that is compatible with strtotime() (http://php.net/manual/en/function.strtotime.php). By default the `FormHelper` will add a `data[_Token][key]` containing the CSRF token to every form when the component is enabled.

Handling missing or expired tokens

Missing or expired tokens are handled similar to other security violations. The SecurityComponent's blackHoleCallback will be called with a 'csrf' parameter. This helps you filter out CSRF token failures, from other warnings.

Using per-session tokens instead of one-time use tokens

By default a new CSRF token is generated for each request, and each token can only be used one. If a token is used twice, it will be blackholed. Sometimes, this behaviour is not desirable, as it can create issues with single page applications. You can toggle on longer, multi-use tokens by setting `csrfUseOnce` to `false`. This can be done in the components array, or in the `beforeFilter` of your controller:

```
<?php
public $components = array(
    'Security' => array(
        'csrfUseOnce' => false
    )
);
```

This will tell the component that you want to re-use a CSRF token until it expires - which is controlled by the `csrfExpires` value. If you are having issues with expired tokens, this is a good balance between security and ease of use.

Disabling the CSRF protection

There may be cases where you want to disable CSRF protection on your forms for some reason. If you do want to disable this feature, you can set `$this->Security->csrfCheck = false;` in your `beforeFilter` or use the components array. By default CSRF protection is enabled, and configured to use one-use tokens.

Disabling Security Component For Specific Actions

There may be cases where you want to disable all security checks for an action (ex. ajax request). You may "unlock" these actions by listing them in `$this->Security->unlockedActions` in your `beforeFilter`. New in version 2.3.

Sessions

class `SessionComponent`(*ComponentCollection $collection*, *array $settings = array()*)

The CakePHP SessionComponent provides a way to persist client data between page requests. It acts as a wrapper for the `$_SESSION` as well as providing convenience methods for several `$_SESSION` related functions.

Sessions can be configured in a number of ways in CakePHP. For more information, you should see the *Session configuration* documentation.

Interacting with Session data

The Session component is used to interact with session information. It includes basic CRUD functions as well as features for creating feedback messages to users.

It should be noted that Array structures can be created in the Session by using *dot notation*. So `User.username` would reference the following:

```
<?php
array('User' => array(
    'username' => 'clark-kent@dailyplanet.com'
));
```

Dots are used to indicate nested arrays. This notation is used for all Session component methods wherever a name/key is used.

`SessionComponent::`**`write`**(*$name*, *$value*)

Write to the Session puts $value into $name. $name can be a dot separated array. For example:

```
<?php
$this->Session->write('Person.eyeColor', 'Green');
```

This writes the value 'Green' to the session under Person => eyeColor.

`SessionComponent::`**`read`**`(`*$name*`)`

Returns the value at $name in the Session. If $name is null the entire session will be returned. E.g:

```
<?php
$green = $this->Session->read('Person.eyeColor');
```

Retrieve the value Green from the session. Reading data that does not exist will return null.

`SessionComponent::`**`check`**`(`*$name*`)`

Used to check if a Session variable has been set. Returns true on existence and false on non-existence.

`SessionComponent::`**`delete`**`(`*$name*`)`

Clear the session data at $name. E.g:

```
<?php
$this->Session->delete('Person.eyeColor');
```

Our session data no longer has the value 'Green', or the index eyeColor set. However, Person is still in the Session. To delete the entire Person information from the session use:

```
<?php
$this->Session->delete('Person');
```

`SessionComponent::`**`destroy`**`()`

The `destroy` method will delete the session cookie and all session data stored in the temporary file system. It will then destroy the PHP session and then create a fresh session:

```
<?php
$this->Session->destroy();
```

Creating notification messages

`SessionComponent::`**`setFlash`**`(`*string $message*, *string $element = 'default'*, *array $params = array()*, *string $key = 'flash'*`)`

Return type void

Often in web applications, you will need to display a one-time notification message to the user after processing a form or acknowledging data. In CakePHP, these are referred to as "flash messages". You can set flash message with the SessionComponent and display them with the `SessionHelper::flash()`. To set a message, use `setFlash`:

```
<?php
// In the controller.
$this->Session->setFlash('Your stuff has been saved.');
```

This will create a one-time message that can be displayed to the user, using the SessionHelper:

```
<?php
// In the view.
echo $this->Session->flash();

// The above will output.
<div id="flashMessage" class="message">
    Your stuff has been saved.
</div>
```

You can use the additional parameters of `setFlash()` to create different kinds of flash messages. For example, error and positive notifications may look differently. CakePHP gives you a way to do that. Using the `$key` parameter you can store multiple messages, which can be output separately:

```
<?php
// set a bad message.
$this->Session->setFlash('Something bad.', 'default', array(), 'bad');

// set a good message.
$this->Session->setFlash('Something good.', 'default', array(), 'good');
```

In the view, these messages can be output and styled differently:

```
<?php
// in a view.
echo $this->Session->flash('good');
echo $this->Session->flash('bad');
```

The `$element` parameter allows you to control which element (located in `/app/View/Elements`) should be used to render the message in. In the element the message is available as `$message`. First we set the flash in our controller:

```
<?php
$this->Session->setFlash('Something custom!', 'flash_custom');
```

Then we create the file `app/View/Elements/flash_custom.ctp` and build our custom flash element:

```
<div id="myCustomFlash"><?php echo $message; ?></div>
```

`$params` allows you to pass additional view variables to the rendered layout. Parameters can be passed affecting the rendered div, for example adding "class" in the $params array will apply a class to the `div` output using `$this->Session->flash()` in your layout or view.:

```
<?php
$this->Session->setFlash('Example message text', 'default', array('class' => 'example_
```

The output from using `$this->Session->flash()` with the above example would be:

```
<div id="flashMessage" class="example_class">Example message text</div>
```

To use an element from a plugin just specify the plugin in the `$params`:

```
    <?php
    // Will use /app/Plugin/Comment/View/Elements/flash_no_spam.ctp
    $this->Session->setFlash('Message!', 'flash_no_spam', array('plugin' => 'Comment'));
```

Helpers

CakePHP features a number of helpers that aid in view creation. They assist in creating well-formed markup (including forms), aid in formatting text, times and numbers, and can even integrate with popular javascript libraries. Here is a summary of the built-in helpers.

Read *Helpers* to learn more about helpers, their api, and how you can create and use your own helpers.

CacheHelper

class `CacheHelper` (*View $view*, *array $settings = array()*)

The Cache helper assists in caching entire layouts and views, saving time repetitively retrieving data. View Caching in Cake temporarily stores parsed layouts and views as simple PHP + HTML files It should be noted that the Cache helper works quite differently than other helpers. It does not have methods that are directly called. Instead a view is marked with cache tags indicating which blocks of content should not be cached. The CacheHelper then uses helper callbacks to process the file and output to generate the cache file.

When a URL is requested, CakePHP checks to see if that request string has already been cached. If it has, the rest of the url dispatching process is skipped. Any nocache blocks are processed normally and the view is served. This creates a big savings in processing time for each request to a cached URL as minimal code is executed. If Cake doesn't find a cached view, or the cache has expired for the requested URL it continues to process the request normally.

Using the Helper

There are two steps you have to take before you can use the CacheHelper. First in your `APP/Config/core.php` uncomment the Configure write call for `Cache.check`. This will tell CakePHP to check for, and generate view cache files when handling requests.

Once you've uncommented the `Cache.check` line you will need to add the helper to your controller's `$helpers` array:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Cache');
}
```

Additional configuration options

CacheHelper has a few additional configuration options you can use to tune and tweak its behavior. This is done through the `$cacheAction` variable in your controllers. `$cacheAction` should be set to an array which contains the actions you want cached, and the duration in seconds you want those views cached. The time value can be expressed in a `strtotime()` format. (ie. “1 hour”, or “3 minutes”).

Using the example of an ArticlesController, that receives a lot of traffic that needs to be cached:

```
<?php
public $cacheAction = array(
    'view' => 36000,
    'index'  => 48000
);
```

This will cache the view action 10 hours, and the index action 13 hours. By making `$cacheAction` a `strtotime()` friendly value you can cache every action in the controller:

```
<?php
public $cacheAction = "1 hour";
```

You can also enable controller/component callbacks for cached views created with `CacheHelper`. To do so you must use the array format for `$cacheAction` and create an array like the following:

```
<?php
public $cacheAction = array(
    'view' => array('callbacks' => true, 'duration' => 21600),
    'add' => array('callbacks' => true, 'duration' => 36000),
    'index' => array('callbacks' => true, 'duration' => 48000)
);
```

By setting `callbacks => true` you tell CacheHelper that you want the generated files to create the components and models for the controller. Additionally, fire the component initialize, controller beforeFilter, and component startup callbacks.

Note: Setting `callbacks => true` partly defeats the purpose of caching. This is also the reason it is disabled by default.

Marking Non-Cached Content in Views

There will be times when you don’t want an *entire* view cached. For example, certain parts of the page may look different whether a user is currently logged in or browsing your site as a guest.

To indicate blocks of content that are *not* to be cached, wrap them in `<!--nocache-->` `<!--/nocache-->` like so:

```
<!--nocache-->
<?php if ($this->Session->check('User.name')): ?>
    Welcome, <?php echo h($this->Session->read('User.name')); ?>.
<?php else: ?>
    <?php echo $html->link('Login', 'users/login'); ?>
<?php endif; ?>
<!--/nocache-->
```

Note: You cannot use `nocache` tags in elements. Since there are no callbacks around elements, they cannot be cached.

It should be noted that once an action is cached, the controller method for the action will not be called. When a cache file is created, the request object, and view variables are serialized with PHP's `serialize()`.

Warning: If you have view variables that contain un-serializable content such as SimpleXML objects, resource handles, or closures you might not be able to use view caching.

Clearing the Cache

It is important to remember that the CakePHP will clear a cached view if a model used in the cached view is modified. For example, if a cached view uses data from the Post model, and there has been an INSERT, UPDATE, or DELETE query made to a Post, the cache for that view is cleared, and new content is generated on the next request.

Note: This automatic cache clearing requires the controller/model name to be part of the URL. If you've used routing to change your urls this feature will not work.

If you need to manually clear the cache, you can do so by calling Cache::clear(). This will clear **all** cached data, excluding cached view files. If you need to clear the cached view files, use `clearCache()`.

FormHelper

class `FormHelper`(*View $view*, *array $settings = array()*)

The FormHelper does most of the heavy lifting in form creation. The FormHelper focuses on creating forms quickly, in a way that will streamline validation, re-population and layout. The FormHelper is also flexible - it will do almost everything for you using conventions, or you can use specific methods to get only what you need.

Creating Forms

The first method you'll need to use in order to take advantage of the FormHelper is `create()`. This special method outputs an opening form tag.

`FormHelper::`**`create`**(*string $model = null*, *array $options = array()*)

All parameters are optional. If `create()` is called with no parameters supplied, it assumes you are building a form that submits to the current controller, via either the current URL. The default method for form submission is POST. The form element is also returned with a DOM ID. The ID is generated using the name of the model, and the name of the controller action, CamelCased. If I were to call `create()` inside a UsersController view, I'd see something like the following output in the rendered view:

```
<form id="UserAddForm" method="post" action="/users/add">
```

Note: You can also pass `false` for `$model`. This will place your form data into the array: `$this->request->data` (instead of in the sub-array: `$this->request->data['Model']`). This can be handy for short forms that may not represent anything in your database.

The `create()` method allows us to customize much more using the parameters, however. First, you can specify a model name. By specifying a model for a form, you are creating that form's *context*. All fields are assumed to belong to this model (unless otherwise specified), and all models referenced are assumed to be associated with it. If you do not specify a model, then it assumes you are using the default model for the current controller:

```
// If you are on /recipes/add
<?php echo $this->Form->create('Recipe'); ?>
```

Output:

```
<form id="RecipeAddForm" method="post" action="/recipes/add">
```

This will POST the form data to the `add()` action of RecipesController. However, you can also use the same logic to create an edit form. The FormHelper uses the `$this->request->data` property to automatically detect whether to create an add or edit form. If `$this->request->data` contains an array element named after the form's model, and that array contains a non-empty value of the model's primary key, then the FormHelper will create an edit form for that record. For example, if we browse to http://site.com/recipes/edit/5, we would get the following:

```
// Controller/RecipesController.php:
<?php
public function edit($id = null) {
    if (empty($this->request->data)) {
        $this->request->data = $this->Recipe->findById($id);
    } else {
        // Save logic goes here
    }
}

// View/Recipes/edit.ctp:
// Since $this->request->data['Recipe']['id'] = 5, we will get an edit form
<?php echo $this->Form->create('Recipe'); ?>
```

Output:

```
<form id="RecipeEditForm" method="post" action="/recipes/edit/5">
<input type="hidden" name="_method" value="PUT" />
```

Note: Since this is an edit form, a hidden input field is generated to override the default HTTP method.

When creating forms for models in plugins, you should always use *plugin syntax* when creating a form. This will ensure the form is correctly generated:

```
<?php
echo $this->Form->create('ContactManager.Contact');
```

The `$options` array is where most of the form configuration happens. This special array can contain a number of different key-value pairs that affect the way the form tag is generated. Changed in version 2.0: The default url for all forms, is now the current url including passed, named, and querystring parameters. You can override this default by supplying `$options['url']` in the second parameter of `$this->Form->create()`.

Options for create()

There are a number of options for create():

- `$options['type']` This key is used to specify the type of form to be created. Valid values include 'post', 'get', 'file', 'put' and 'delete'.

  Supplying either 'post' or 'get' changes the form submission method accordingly:

```
<?php echo $this->Form->create('User', array('type' => 'get')); ?>
```

  Output:

```
<form id="UserAddForm" method="get" action="/users/add">
```

  Specifying 'file' changes the form submission method to 'post', and includes an enctype of "multipart/form-data" on the form tag. This is to be used if there are any file elements inside the form. The absence of the proper enctype attribute will cause the file uploads not to function:

```
<?php echo $this->Form->create('User', array('type' => 'file')); ?>
```

  Output:

```
<form id="UserAddForm" enctype="multipart/form-data" method="post" action="/users/add"
```

  When using 'put' or 'delete', your form will be functionally equivalent to a 'post' form, but when submitted, the HTTP request method will be overridden with 'PUT' or 'DELETE', respectively. This allows CakePHP to emulate proper REST support in web browsers.

- `$options['action']` The action key allows you to point the form to a specific action in your current controller. For example, if you'd like to point the form to the login() action of the current controller, you would supply an $options array like the following:

```
<?php echo $this->Form->create('User', array('action' => 'login')); ?>
```

  Output:

```
<form id="UserLoginForm" method="post" action="/users/login">
</form>
```

- `$options['url']` If the desired form action isn't in the current controller, you can specify a URL for the form action using the 'url' key of the $options array. The supplied URL can be relative to your CakePHP application:

```
<?php
echo $this->Form->create(null, array('url' => '/recipes/add'));
// or
echo $this->Form->create(null, array(
    'url' => array('controller' => 'recipes', 'action' => 'add')
));
```

  Output:

```
<form method="post" action="/recipes/add">
```

  or can point to an external domain:

```
<?php
echo $this->Form->create(null, array(
    'url' => 'http://www.google.com/search',
    'type' => 'get'
));
```

  Output:

```
<form method="get" action="http://www.google.com/search">
```

  Also check `HtmlHelper::url()` method for more examples of different types of urls.

- `$options['default']` If 'default' has been set to boolean false, the form's submit action is changed so that pressing the submit button does not submit the form. If the form is meant to be submitted via AJAX, setting 'default' to false suppresses the form's default behavior so you can grab the data and submit it via AJAX instead.

- `$options['inputDefaults']` You can declare a set of default options for `input()` with the `inputDefaults` key to customize your default input creation:

```
<?php
echo $this->Form->create('User', array(
    'inputDefaults' => array(
        'label' => false,
        'div' => false
    )
));
```

  All inputs created from that point forward would inherit the options declared in inputDefaults. You can override the defaultOptions by declaring the option in the input() call:

```
<?php
echo $this->Form->input('password'); // No div, no label
echo $this->Form->input('username', array('label' => 'Username')); // has a label elem
```

Closing the Form

`FormHelper::end($options = null)`

The FormHelper includes an `end()` method that completes the form. Often, `end()` only outputs a closing form tag, but using `end()` also allows the FormHelper to insert needed hidden form elements that `SecurityComponent` requires:

```
<?php echo $this->Form->create(); ?>

<!-- Form elements go here -->

<?php echo $this->Form->end(); ?>
```

If a string is supplied as the first parameter to `end()`, the FormHelper outputs a submit button named accordingly along with the closing form tag:

```
<?php echo $this->Form->end('Finish'); ?>
```

Will output:

```
<div class="submit">
    <input type="submit" value="Finish" />
</div>
</form>
```

You can specify detail settings by passing an array to `end()`:

```
<?php
$options = array(
    'label' => 'Update',
    'div' => array(
        'class' => 'glass-pill',
    )
);
echo $this->Form->end($options);
```

Will output:

```
<div class="glass-pill"><input type="submit" value="Update" name="Update"></div>
```

See the API (http://api20.cakephp.org) for further details.

Note: If you are using `SecurityComponent` in your application you should always end your forms with `end()`.

Creating form elements

There are a few ways to create form inputs with the FormHelper. We'll start by looking at `input()`. This method will automatically inspect the model field it has been supplied in order to create an appropriate input for that field. Internally `input()` delegates to other methods in FormHelper.

`FormHelper::input` (*string $fieldName, array $options = array()*)

Creates the following elements given a particular `Model.field`:

- Wrapping div.
- Label element
- Input element(s)
- Error element with message if applicable.

The type of input created depends on the column datatype:

Column Type	Resulting Form Field
string (char, varchar, etc.)	text
boolean, tinyint(1)	checkbox
text	textarea
text, with name of password, passwd, or psword	password
date	day, month, and year selects
datetime, timestamp	day, month, year, hour, minute, and meridian selects
time	hour, minute, and meridian selects

The `$options` parameter allows you to customize how `input()` works, and finely control what is generated.

For example, let's assume that your User model includes fields for a username (varchar), password (varchar), approved (datetime) and quote (text). You can use the input() method of the FormHelper to create appropriate inputs for all of these form fields:

```php
<?php
echo $this->Form->create();

echo $this->Form->input('username');   //text
echo $this->Form->input('password');   //password
echo $this->Form->input('approved');   //day, month, year, hour, minute, meridian
echo $this->Form->input('quote');      //textarea

echo $this->Form->end('Add');
```

A more extensive example showing some options for a date field:

```php
<?php
echo $this->Form->input('birth_dt', array(
    'label' => 'Date of birth',
    'dateFormat' => 'DMY',
    'minYear' => date('Y') - 70,
    'maxYear' => date('Y') - 18,
));
```

Besides the specific options for `input()` found below, you can specify any option for the input type & any html attribute (for instance onfocus). For more information on `$options` and `$htmlAttributes` see *HtmlHelper*.

Assuming that User hasAndBelongsToMany Group. In your controller, set a camelCase plural variable (group -> groups in this case, or ExtraFunkyModel -> extraFunkyModels) with the select options. In the controller action you would put the following:

```
<?php
$this->set('groups', $this->User->Group->find('list'));
```

And in the view a multiple select can be created with this simple code:

```
<?php
echo $this->Form->input('Group');
```

If you want to create a select field while using a belongsTo - or hasOne - Relation, you can add the following to your Users-controller (assuming your User belongsTo Group):

```
<?php
$this->set('groups', $this->User->Group->find('list'));
```

Afterwards, add the following to your form-view:

```
<?php
echo $this->Form->input('group_id');
```

If your model name consists of two or more words, e.g., "UserGroup", when passing the data using set() you should name your data in a pluralised and camelCased format as follows:

```
<?php
$this->set('userGroups', $this->UserGroup->find('list'));
// or
$this->set('reallyInappropriateModelNames', $this->ReallyInappropriateModelName->find(
```

Note: Try to avoid using *FormHelper::input()* to generate submit buttons. Use `FormHelper::submit()` instead.

`FormHelper::`**`inputs`**(*mixed $fields = null*, *array $blacklist = null*)

Generate a set of inputs for `$fields`. If $fields is null the current model will be used.

In addition to controller fields output, `$fields` can be used to control legend and fieldset rendering with the `fieldset` and `legend` keys. `$form->inputs(array('legend' => 'My legend'));` Would generate an input set with a custom legend. You can customize individual inputs through `$fields` as well.:

```
<?php
echo $form->inputs(array(
    'name' => array('label' => 'custom label')
));
```

In addition to fields control, inputs() allows you to use a few additional options.

- `fieldset` Set to false to disable the fieldset. If a string is supplied it will be used as the classname for the fieldset element.
- `legend` Set to false to disable the legend for the generated input set. Or supply a string to customize the legend text.

Field naming conventions

The Form helper is pretty smart. Whenever you specify a field name with the form helper methods, it'll automatically use the current model name to build an input with a format like the following:

```
<input type="text" id="ModelnameFieldname" name="data[Modelname][fieldname]">
```

This allows you to omit the model name when generating inputs for the model that the form was created for. You can create inputs for associated models, or arbitrary models by passing in Modelname.fieldname as the first parameter:

```
<?php
echo $this->Form->input('Modelname.fieldname');
```

If you need to specify multiple fields using the same field name, thus creating an array that can be saved in one shot with saveAll(), use the following convention:

```
<?php
echo $this->Form->input('Modelname.0.fieldname');
echo $this->Form->input('Modelname.1.fieldname');
```

Output:

```
<input type="text" id="Modelname0Fieldname" name="data[Modelname][0][fieldname]">
<input type="text" id="Modelname1Fieldname" name="data[Modelname][1][fieldname]">
```

FormHelper uses several field-suffixes internally for datetime input creation. If you are using fields named `year`, `month`, `day`, `hour`, `minute`, or `meridian` and having issues getting the correct input, you can set the `name` attribute to override the default behavior:

```
<?php
echo $this->Form->input('Model.year', array(
    'type' => 'text',
    'name' => 'data[Model][year]'
));
```

Options

`FormHelper::input()` supports a large number of options. In addition to its own options `input()` accepts options for the generated input types, as well as html attributes. The following will cover the options specific to `FormHelper::input()`.

- `$options['type']` You can force the type of an input, overriding model introspection, by specifying a type. In addition to the field types found in the *Creating form elements*, you can also create 'file', 'password', and any type supported by HTML5:

```
<?php
echo $this->Form->input('field', array('type' => 'file'));
echo $this->Form->input('email', array('type' => 'email'));
```

Output:

```
<div class="input file">
    <label for="UserField">Field</label>
    <input type="file" name="data[User][field]" value="" id="UserField" />
</div>
<div class="input email">
    <label for="UserEmail">Email</label>
    <input type="email" name="data[User][email]" value="" id="UserEmail" />
</div>
```

- `$options['div']` Use this option to set attributes of the input's containing div. Using a string value will set the div's class name. An array will set the div's attributes to those specified by the array's keys/values. Alternatively, you can set this key to false to disable the output of the div.

  Setting the class name:

```
<?php
echo $this->Form->input('User.name', array(
    'div' => 'class_name'
));
```

Output:

```
<div class="class_name">
    <label for="UserName">Name</label>
    <input name="data[User][name]" type="text" value="" id="UserName" />
</div>
```

Setting multiple attributes:

```
<?php
echo $this->Form->input('User.name', array(
    'div' => array(
        'id' => 'mainDiv',
        'title' => 'Div Title',
        'style' => 'display:block'
    )
));
```

Output:

```
<div class="input text" id="mainDiv" title="Div Title" style="display:block">
    <label for="UserName">Name</label>
    <input name="data[User][name]" type="text" value="" id="UserName" />
</div>
```

Disabling div output:

```
<?php
echo $this->Form->input('User.name', array('div' => false)); ?>
```

Output:

```
<label for="UserName">Name</label>
<input name="data[User][name]" type="text" value="" id="UserName" />
```

- `$options['label']` Set this key to the string you would like to be displayed within the label that usually accompanies the input:

```
<?php
echo $this->Form->input('User.name', array(
    'label' => 'The User Alias'
));
```

Output:

```
<div class="input">
    <label for="UserName">The User Alias</label>
    <input name="data[User][name]" type="text" value="" id="UserName" />
</div>
```

Alternatively, set this key to false to disable the output of the label:

```
<?php
echo $this->Form->input('User.name', array('label' => false));
```

Output:

```
<div class="input">
    <input name="data[User][name]" type="text" value="" id="UserName" />
</div>
```

Set this to an array to provide additional options for the `label` element. If you do this, you can use a `text` key in the array to customize the label text:

```
<?php
echo $this->Form->input('User.name', array(
    'label' => array(
        'class' => 'thingy',
        'text' => 'The User Alias'
    )
));
```

Output:

```
<div class="input">
    <label for="UserName" class="thingy">The User Alias</label>
    <input name="data[User][name]" type="text" value="" id="UserName" />
</div>
```

- `$options['error']` Using this key allows you to override the default model error messages and can be used, for example, to set i18n messages. It has a number of suboptions which control the wrapping element, wrapping element class name, and whether HTML in the error message will be escaped.

To disable error message output set the error key to false:

```
<?php
$this->Form->input('Model.field', array('error' => false));
```

To modify the wrapping element type and its class, use the following format:

```
<?php
$this->Form->input('Model.field', array(
    'error' => array('attributes' => array('wrap' => 'span', 'class' => 'bzzz'))
));
```

To prevent HTML being automatically escaped in the error message output, set the escape suboption to false:

```
<?php
$this->Form->input('Model.field', array(
    'error' => array(
        'attributes' => array('escape' => false)
    )
));
```

To override the model error messages use an array with the keys matching the validation rule names:

```
<?php
$this->Form->input('Model.field', array(
    'error' => array('tooShort' => __('This is not long enough'))
));
```

As seen above you can set the error message for each validation rule you have in your models. In addition you can provide i18n messages for your forms.

- `$options['before']`, `$options['between']`, `$options['separator']`, and `$options['after']`

  Use these keys if you need to inject some markup inside the output of the input() method:

```
<?php
echo $this->Form->input('field', array(
    'before' => '--before--',
    'after' => '--after--',
    'between' => '--between---'
));
```

Output:

```
<div class="input">
--before--
<label for="UserField">Field</label>
--between---
<input name="data[User][field]" type="text" value="" id="UserField" />
--after--
</div>
```

For radio inputs the 'separator' attribute can be used to inject markup to separate each input/label pair:

```
<?php
echo $this->Form->input('field', array(
    'before' => '--before--',
    'after' => '--after--',
    'between' => '--between---',
    'separator' => '--separator--',
    'options' => array('1', '2')
));
```

Output:

```
<div class="input">
--before--
<input name="data[User][field]" type="radio" value="1" id="UserField1" />
<label for="UserField1">1</label>
--separator--
<input name="data[User][field]" type="radio" value="2" id="UserField2" />
<label for="UserField2">2</label>
--between---
--after--
</div>
```

For `date` and `datetime` type elements the 'separator' attribute can be used to change the string between select elements. Defaults to '-'.

- `$options['format']` The ordering of the html generated FormHelper is controllable as well. The 'format' options supports an array of strings describing the template you would like said element to follow. The supported array keys are: `array('before', 'input', 'between', 'label', 'after','error')`.
- `$options['inputDefaults']` If you find yourself repeating the same options in multiple input() calls, you can use *inputDefaults*' to keep your code dry:

```
<?php
echo $this->Form->create('User', array(
    'inputDefaults' => array(
        'label' => false,
        'div' => false
    )
));
```

All inputs created from that point forward would inherit the options declared in inputDefaults. You can override the defaultOptions by declaring the option in the input() call:

```
<?php
// No div, no label
echo $this->Form->input('password');

// has a label element
echo $this->Form->input('username', array('label' => 'Username'));
```

If you need to later change the defaults you can use `FormHelper::inputDefaults()`.

Generating specific types of inputs

In addition to the generic `input()` method, `FormHelper` has specific methods for generating a number of different types of inputs. These can be used to generate just the input widget itself, and combined with other methods like `label()` and `error()` to generate fully custom form layouts.

Common options

Many of the various input element methods support a common set of options. All of these options are also supported by `input()`. To reduce repetition the common options shared by all input methods are as follows:

- `$options['class']` You can set the classname for an input:

```php
<?php
echo $this->Form->input('title', array('class' => 'custom-class'));
```

- `$options['id']` Set this key to force the value of the DOM id for the input.
- `$options['default']` Used to set a default value for the input field. The value is used if the data passed to the form does not contain a value for the field (or if no data is passed at all).

  Example usage:

```php
<?php
echo $this->Form->input('ingredient', array('default' => 'Sugar'));
```

  Example with select field (Size "Medium" will be selected as default):

```php
<?php
$sizes = array('s' => 'Small', 'm' => 'Medium', 'l' => 'Large');
echo $this->Form->input('size', array('options' => $sizes, 'default' => 'm'));
```

Note: You cannot use `default` to check a checkbox - instead you might set the value in `$this->request->data` in your controller, or set the input option `checked` to true.

Note: Date and datetime fields' default values can be set by using the 'selected' key.

Note: Beware of using false to assign a default value. A false value is used to disable/exclude options of an input field, so `'default' => false` would not set any value at all. Instead use `'default' => 0`.

In addition to the above options, you can mixin any html attribute you wish to use. Any non-special option name will be treated as an HTML attribute, and applied to the generated HTML input element.

Options for select, checkbox and radio inputs

- `$options['selected']` Used in combination with a select-type input (i.e. For types select, date, time, datetime). Set 'selected' to the value of the item you wish to be selected by default when the input is rendered:

```
<?php
echo $this->Form->input('close_time', array(
    'type' => 'time',
    'selected' => '13:30:00'
));
```

Note: The selected key for date and datetime inputs may also be a UNIX timestamp.

- `$options['empty']` If set to true, forces the input to remain empty.

  When passed to a select list, this creates a blank option with an empty value in your drop down list. If you want to have a empty value with text displayed instead of just a blank option, pass in a string to empty:

```
<?php
echo $this->Form->input('field', array(
    'options' => array(1, 2, 3, 4, 5),
    'empty' => '(choose one)'
));
```

  Output:

```
<div class="input">
    <label for="UserField">Field</label>
    <select name="data[User][field]" id="UserField">
        <option value="">(choose one)</option>
        <option value="0">1</option>
        <option value="1">2</option>
        <option value="2">3</option>
        <option value="3">4</option>
        <option value="4">5</option>
    </select>
</div>
```

Note: If you need to set the default value in a password field to blank, use 'value' => '' instead.

  Options can also supplied as key-value pairs.

- `$options['hiddenField']` For certain input types (checkboxes, radios) a hidden input is created so that the key in $this->request->data will exist even without a value specified:

```
<input type="hidden" name="data[Post][Published]" id="PostPublished_" value="0" />
<input type="checkbox" name="data[Post][Published]" value="1" id="PostPublished" />
```

  This can be disabled by setting the `$options['hiddenField'] = false`:

```
<?php
echo $this->Form->checkbox('published', array('hiddenField' => false));
```

Which outputs:

```
<input type="checkbox" name="data[Post][Published]" value="1" id="PostPublished" />
```

If you want to create multiple blocks of inputs on a form that are all grouped together, you should use this parameter on all inputs except the first. If the hidden input is on the page in multiple places, only the last group of input's values will be saved

In this example, only the tertiary colors would be passed, and the primary colors would be overridden:

```
<h2>Primary Colors</h2>
<input type="hidden" name="data[Color][Color]" id="Colors_" value="0" />
<input type="checkbox" name="data[Color][Color][]" value="5" id="ColorsRed" />
<label for="ColorsRed">Red</label>
<input type="checkbox" name="data[Color][Color][]" value="5" id="ColorsBlue" />
<label for="ColorsBlue">Blue</label>
<input type="checkbox" name="data[Color][Color][]" value="5" id="ColorsYellow" />
<label for="ColorsYellow">Yellow</label>

<h2>Tertiary Colors</h2>
<input type="hidden" name="data[Color][Color]" id="Colors_" value="0" />
<input type="checkbox" name="data[Color][Color][]" value="5" id="ColorsGreen" />
<label for="ColorsGreen">Green</label>
<input type="checkbox" name="data[Color][Color][]" value="5" id="ColorsPurple" />
<label for="ColorsPurple">Purple</label>
<input type="checkbox" name="data[Addon][Addon][]" value="5" id="ColorsOrange" />
<label for="ColorsOrange">Orange</label>
```

Disabling the `'hiddenField'` on the second input group would prevent this behavior.

You can set a different hidden field value other than 0 such as 'N':

```
<?php
echo $this->Form->checkbox('published', array(
    'value' => 'Y',
    'hiddenField' => 'N',
));
```

Datetime options

- `$options['timeFormat']` Used to specify the format of the select inputs for a time-related set of inputs. Valid values include '12', '24', and `null`.
- `$options['dateFormat']` Used to specify the format of the select inputs for a date-related set of inputs. Valid values include any combination of 'D', 'M' and 'Y' or `null`. The inputs will be put in the order defined by the dateFormat option.
- `$options['minYear'], $options['maxYear']` Used in combination with a date/datetime input. Defines the lower and/or upper end of values shown in the years select field.

- `$options['orderYear']` Used in combination with a date/datetime input. Defines the order in which the year values will be set. Valid values include 'asc', 'desc'. The default value is 'desc'.
- `$options['interval']` This option specifies the number of minutes between each option in the minutes select box:

```
<?php
echo $this->Form->input('Model.time', array(
    'type' => 'time',
    'interval' => 15
));
```

Would create 4 options in the minute select. One for each 15 minutes.

Form Element-Specific Methods

`FormHelper::`**`label`**(*string $fieldName*, *string $text*, *array $options*)

Create a label element. `$fieldName` is used for generating the DOM id. If `$text` is undefined, `$fieldName` will be used to inflect the label's text:

```
<?php
echo $this->Form->label('User.name');
echo $this->Form->label('User.name', 'Your username');
```

Output:

```
<label for="UserName">Name</label>
<label for="UserName">Your username</label>
```

`$options` can either be an array of html attributes, or a string that will be used as a classname:

```
<?php
echo $this->Form->label('User.name', null, array('id' => 'user-label'));
echo $this->Form->label('User.name', 'Your username', 'highlight');
```

Output:

```
<label for="UserName" id="user-label">Name</label>
<label for="UserName" class="highlight">Your username</label>
```

`FormHelper::`**`text`**(*string $name*, *array $options*)

The rest of the methods available in the FormHelper are for creating specific form elements. Many of these methods also make use of a special $options parameter. In this case, however, $options is used primarily to specify HTML tag attributes (such as the value or DOM id of an element in the form):

```
<?php echo $this->Form->text('username', array('class' => 'users')); ?>
```

Will output:

```
<input name="data[User][username]" type="text" class="users" id="UserUsername" />
```

`FormHelper::`**`password`**(*string $fieldName*, *array $options*)

Creates a password field.:

```
<?php
echo $this->Form->password('password');
```

Will output:

```
<input name="data[User][password]" value="" id="UserPassword" type="password" />
```

`FormHelper::hidden`(*string $fieldName*, *array $options*)

Creates a hidden form input. Example:

```
<?php
echo $this->Form->hidden('id');
```

Will output:

```
<input name="data[User][id]" value="10" id="UserId" type="hidden" />
```

Changed in version 2.0: Hidden fields no longer remove the class attribute. This means that if there are validation errors on hidden fields, the error-field classname will be applied.

`FormHelper::textarea`(*string $fieldName*, *array $options*)

Creates a textarea input field.:

```
<?php
echo $this->Form->textarea('notes');
```

Will output:

```
<textarea name="data[User][notes]" id="UserNotes"></textarea>
```

Note: The `textarea` input type allows for the `$options` attribute of `'escape'` which determines whether or not the contents of the textarea should be escaped. Defaults to `true`.

```
<?php
echo $this->Form->textarea('notes', array('escape' => false);
// OR....
echo $this->Form->input('notes', array('type' => 'textarea', 'escape' => false);
```

Options

In addition to the *Common options*, textarea() supports a few specific options:

- `$options['rows'], $options['cols']` These two keys specify the number of rows and columns:

```
<?php
echo $this->Form->textarea('textarea', array('rows' => '5', 'cols' => '5'));
```

Output:

```
<textarea name="data[Form][textarea]" cols="5" rows="5" id="FormTextarea">
</textarea>
```

`FormHelper::checkbox`(*string $fieldName*, *array $options*)

Creates a checkbox form element. This method also generates an associated hidden form input to force the submission of data for the specified field.:

```
<?php echo $this->Form->checkbox('done'); ?>
```

Will output:

```
<input type="hidden" name="data[User][done]" value="0" id="UserDone_" />
<input type="checkbox" name="data[User][done]" value="1" id="UserDone" />
```

It is possible to specify the value of the checkbox by using the $options array:

```
<?php echo $this->Form->checkbox('done', array('value' => 555)); ?>
```

Will output:

```
<input type="hidden" name="data[User][done]" value="0" id="UserDone_" />
<input type="checkbox" name="data[User][done]" value="555" id="UserDone" />
```

If you don't want the Form helper to create a hidden input:

```
<?php echo $this->Form->checkbox('done', array('hiddenField' => false)); ?>
```

Will output:

```
<input type="checkbox" name="data[User][done]" value="1" id="UserDone" />
```

`FormHelper::radio`(*string $fieldName*, *array $options*, *array $attributes*)

Creates a set of radio button inputs.

Options

- `$attributes['value']` to set which value should be selected default.
- `$attributes['separator']` to specify HTML in between radio buttons (e.g. <br />).
- `$attributes['between']` specify some content to be inserted between the legend and first element.
- `$attributes['disabled']` Setting this to `true` or `'disabled'` will disable all of the generated radio buttons.
- `$attributes['legend']` Radio elements are wrapped with a label and fieldset by default. Set `$attributes['legend']` to false to remove them.:

```
<?php
$options = array('M' => 'Male', 'F' => 'Female');
$attributes = array('legend' => false);
echo $this->Form->radio('gender', $options, $attributes);
```

Will output:

```
<input name="data[User][gender]" id="UserGender_" value="" type="hidden" />
<input name="data[User][gender]" id="UserGenderM" value="M" type="radio" />
<label for="UserGenderM">Male</label>
```

```
    <input name="data[User][gender]" id="UserGenderF" value="F" type="radio" />
    <label for="UserGenderF">Female</label>
```

If for some reason you don't want the hidden input, setting `$attributes['value']` to a selected value or boolean false will do just that. Changed in version 2.1: The `$attributes['disabled']` option was added in 2.1.

`FormHelper::select` (*string $fieldName*, *array $options*, *array $attributes*)

Creates a select element, populated with the items in `$options`, with the option specified by `$attributes['value']` shown as selected by default. Set to false the the 'empty' key in the `$attributes` variable to turn off the default empty option:

```
<?php
$options = array('M' => 'Male', 'F' => 'Female');
echo $this->Form->select('gender', $options);
```

Will output:

```
<select name="data[User][gender]" id="UserGender">
<option value=""></option>
<option value="M">Male</option>
<option value="F">Female</option>
</select>
```

The `select` input type allows for a special `$option` attribute called `'escape'` which accepts a bool and determines whether to HTML entity encode the contents of the select options. Defaults to true:

```
<?php
$options = array('M' => 'Male', 'F' => 'Female');
echo $this->Form->select('gender', $options, array('escape' => false));
```

- `$attributes['options']` This key allows you to manually specify options for a select input, or for a radio group. Unless the 'type' is specified as 'radio', the FormHelper will assume that the target output is a select input:

```
<?php
echo $this->Form->select('field', array(1,2,3,4,5));
```

Output:

```
<select name="data[User][field]" id="UserField">
    <option value="0">1</option>
    <option value="1">2</option>
    <option value="2">3</option>
    <option value="3">4</option>
    <option value="4">5</option>
</select>
```

Options can also be supplied as key-value pairs:

```
<?php
echo $this->Form->select('field', array(
    'Value 1' => 'Label 1',
    'Value 2' => 'Label 2',
    'Value 3' => 'Label 3'
));
```

Output:

```
<select name="data[User][field]" id="UserField">
    <option value="Value 1">Label 1</option>
    <option value="Value 2">Label 2</option>
    <option value="Value 3">Label 3</option>
</select>
```

If you would like to generate a select with optgroups, just pass data in hierarchical format. This works on multiple checkboxes and radio buttons too, but instead of optgroups wraps elements in fieldsets:

```
<?php
$options = array(
   'Group 1' => array(
      'Value 1' => 'Label 1',
      'Value 2' => 'Label 2'
   ),
   'Group 2' => array(
      'Value 3' => 'Label 3'
   )
);
echo $this->Form->select('field', $options);
```

Output:

```
<select name="data[User][field]" id="UserField">
    <optgroup label="Group 1">
        <option value="Value 1">Label 1</option>
        <option value="Value 2">Label 2</option>
    </optgroup>
    <optgroup label="Group 2">
        <option value="Value 3">Label 3</option>
    </optgroup>
</select>
```

- `$options['multiple']` If 'multiple' has been set to true for an input that outputs a select, the select will allow multiple selections:

```
<?php
echo $this->Form->select('Model.field', $options, array('multiple' => true));
```

Alternatively set 'multiple' to 'checkbox' to output a list of related check boxes:

```
<?php
$options = array(
    'Value 1' => 'Label 1',
    'Value 2' => 'Label 2'
);
```

```
echo $this->Form->select('Model.field', $options, array(
    'multiple' => 'checkbox'
));
```

Output:

```
<div class="input select">
   <label for="ModelField">Field</label>
   <input name="data[Model][field]" value="" id="ModelField" type="hidden">
   <div class="checkbox">
      <input name="data[Model][field][]" value="Value 1" id="ModelField1" type="ch
      <label for="ModelField1">Label 1</label>
   </div>
   <div class="checkbox">
      <input name="data[Model][field][]" value="Value 2" id="ModelField2" type="ch
      <label for="ModelField2">Label 2</label>
   </div>
</div>
```

- `$options['disabled']` When creating checkboxes, this option can be set to disable all or some checkboxes. To disable all checkboxes set disabled to `true`:

```
<?php
$options = array(
    'Value 1' => 'Label 1',
    'Value 2' => 'Label 2'
);
echo $this->Form->select('Model.field', $options, array(
    'multiple' => 'checkbox',
    'disabled' => array('Value 1')
));
```

Output:

```
<div class="input select">
   <label for="ModelField">Field</label>
   <input name="data[Model][field]" value="" id="ModelField" type="hidden">
   <div class="checkbox">
      <input name="data[Model][field][]" disabled="disabled" value="Value 1" id="M
      <label for="ModelField1">Label 1</label>
   </div>
   <div class="checkbox">
      <input name="data[Model][field][]" value="Value 2" id="ModelField2" type="ch
      <label for="ModelField2">Label 2</label>
   </div>
</div>
```

Changed in version 2.3: Support for arrays in `$options['disabled']` was added in 2.3.

`FormHelper::`**`file`**(*string $fieldName*, *array $options*)

To add a file upload field to a form, you must first make sure that the form enctype is set to "multipart/form-data", so start off with a create function such as the following:

```
<?php
echo $this->Form->create('Document', array('enctype' => 'multipart/form-data'));
// OR
echo $this->Form->create('Document', array('type' => 'file'));
```

Next add either of the two lines to your form view file:

```
<?php
echo $this->Form->input('Document.submittedfile', array(
    'between' => '<br />',
    'type' => 'file'
));

// OR

echo $this->Form->file('Document.submittedfile');
```

Due to the limitations of HTML itself, it is not possible to put default values into input fields of type 'file'. Each time the form is displayed, the value inside will be empty.

Upon submission, file fields provide an expanded data array to the script receiving the form data.

For the example above, the values in the submitted data array would be organized as follows, if the CakePHP was installed on a Windows server. 'tmp_name' will have a different path in a Unix environment:

```
<?php
$this->request->data['Document']['submittedfile'] = array(
    'name' => 'conference_schedule.pdf',
    'type' => 'application/pdf',
    'tmp_name' => 'C:/WINDOWS/TEMP/php1EE.tmp',
    'error' => 0,
    'size' => 41737,
);
```

This array is generated by PHP itself, so for more detail on the way PHP handles data passed via file fields read the PHP manual section on file uploads (http://php.net/features.file-upload).

Validating Uploads

Below is an example validation method you could define in your model to validate whether a file has been successfully uploaded:

```
<?php
public function isUploadedFile($params) {
    $val = array_shift($params);
    if ((isset($val['error']) && $val['error'] == 0) ||
        (!empty( $val['tmp_name']) && $val['tmp_name'] != 'none')
    ) {
        return is_uploaded_file($val['tmp_name']);
    }
    return false;
}
```

Creates a file input:

```
<?php
echo $this->Form->create('User', array('type' => 'file'));
echo $this->Form->file('avatar');
```

Will output:

```
<form enctype="multipart/form-data" method="post" action="/users/add">
<input name="data[User][avatar]" value="" id="UserAvatar" type="file">
```

Note: When using `$this->Form->file()`, remember to set the form encoding-type, by setting the type option to 'file' in `$this->Form->create()`

Creating buttons and submit elements

`FormHelper::`**`submit`**(*string $caption*, *array $options*)

Creates a submit button with caption `$caption`. If the supplied `$caption` is a URL to an image (it contains a '.' character), the submit button will be rendered as an image.

It is enclosed between `div` tags by default; you can avoid this by declaring `$options['div'] = false`:

```
<?php
echo $this->Form->submit();
```

Will output:

```
<div class="submit"><input value="Submit" type="submit"></div>
```

You can also pass a relative or absolute url to an image for the caption parameter instead of caption text.:

```
<?php
echo $this->Form->submit('ok.png');
```

Will output:

```
<div class="submit"><input type="image" src="/img/ok.png"></div>
```

`FormHelper::`**`button`**(*string $title*, *array $options = array()*)

Creates an HTML button with the specified title and a default type of "button". Setting `$options['type']` will output one of the three possible button types:

1. submit: Same as the `$this->Form->submit` method - (the default).
2. reset: Creates a form reset button.
3. button: Creates a standard push button.

```
<?php
echo $this->Form->button('A Button');
echo $this->Form->button('Another Button', array('type' => 'button'));
echo $this->Form->button('Reset the Form', array('type' => 'reset'));
echo $this->Form->button('Submit Form', array('type' => 'submit'));
```

Will output:

```
<button type="submit">A Button</button>
<button type="button">Another Button</button>
<button type="reset">Reset the Form</button>
<button type="submit">Submit Form</button>
```

The `button` input type supports the `escape` option, which accepts a bool and determines whether to HTML entity encode the $title of the button. Defaults to false:

```
<?php
echo $this->Form->button('Submit Form', array('type' => 'submit', 'escape' => true));
```

`FormHelper::`**`postButton`**(*string $title*, *mixed $url*, *array $options = array ()*)

Create a `<button>` tag with a surrounding `<form>` that submits via POST.

This method creates a `<form>` element. So do not use this method in some opened form. Instead use `FormHelper::submit()` or `FormHelper::button()` to create buttons inside opened forms.

`FormHelper::`**`postLink`**(*string $title*, *mixed $url = null*, *array $options = array ()*, *string $confirmMessage = false*)

Creates an HTML link, but access the url using method POST. Requires javascript to be enabled in browser.

This method creates a `<form>` element. So do not use this method inside an existing form. Instead you should add a submit button using `FormHelper::submit()` Changed in version 2.3: The `method` option was added.

Creating date and time inputs

`FormHelper::`**`dateTime`**(*$fieldName*, *$dateFormat = 'DMY'*, *$timeFormat = '12'*, *$attributes = array()*)

Creates a set of select inputs for date and time. Valid values for $dateformat are 'DMY', 'MDY', 'YMD' or 'NONE'. Valid values for $timeFormat are '12', '24', and null.

You can specify not to display empty values by setting "array('empty' => false)" in the attributes parameter. It will also pre-select the fields with the current datetime.

`FormHelper::`**`year`**(*string $fieldName*, *int $minYear*, *int $maxYear*, *array $attributes*)

Creates a select element populated with the years from `$minYear` to `$maxYear`. HTML attributes may be supplied in $attributes. If `$attributes['empty']` is false, the select will not include an empty option:

```
<?php
echo $this->Form->year('purchased', 2000, date('Y'));
```

Will output:

```
<select name="data[User][purchased][year]" id="UserPurchasedYear">
<option value=""></option>
<option value="2009">2009</option>
<option value="2008">2008</option>
<option value="2007">2007</option>
<option value="2006">2006</option>
<option value="2005">2005</option>
<option value="2004">2004</option>
<option value="2003">2003</option>
<option value="2002">2002</option>
<option value="2001">2001</option>
<option value="2000">2000</option>
</select>
```

`FormHelper::`**`month`**(*string $fieldName*, *array $attributes*)

Creates a select element populated with month names:

```
<?php
echo $this->Form->month('mob');
```

Will output:

```
<select name="data[User][mob][month]" id="UserMobMonth">
<option value=""></option>
<option value="01">January</option>
<option value="02">February</option>
<option value="03">March</option>
<option value="04">April</option>
<option value="05">May</option>
<option value="06">June</option>
<option value="07">July</option>
<option value="08">August</option>
<option value="09">September</option>
<option value="10">October</option>
<option value="11">November</option>
<option value="12">December</option>
</select>
```

You can pass in your own array of months to be used by setting the 'monthNames' attribute, or have months displayed as numbers by passing false. (Note: the default months are internationalized and can be translated using localization.):

```
<?php
echo $this->Form->month('mob', null, array('monthNames' => false));
```

`FormHelper::`**`day`**(*string $fieldName*, *array $attributes*)

Creates a select element populated with the (numerical) days of the month.

To create an empty option with prompt text of your choosing (e.g. the first option is 'Day'), you can supply the text as the final parameter as follows:

```
<?php
echo $this->Form->day('created');
```

Will output:

```
<select name="data[User][created][day]" id="UserCreatedDay">
<option value=""></option>
<option value="01">1</option>
<option value="02">2</option>
<option value="03">3</option>
...
<option value="31">31</option>
</select>
```

`FormHelper::`**`hour`**(*string $fieldName*, *boolean $format24Hours*, *array $attributes*)
Creates a select element populated with the hours of the day.

`FormHelper::`**`minute`**(*string $fieldName*, *array $attributes*)
Creates a select element populated with the minutes of the hour.

`FormHelper::`**`meridian`**(*string $fieldName*, *array $attributes*)
Creates a select element populated with 'am' and 'pm'.

Displaying and checking errors

`FormHelper::`**`error`**(*string $fieldName*, *mixed $text*, *array $options*)
Shows a validation error message, specified by $text, for the given field, in the event that a validation error has occurred.

Options:

- 'escape' bool Whether or not to html escape the contents of the error.
- 'wrap' mixed Whether or not the error message should be wrapped in a div. If a string, will be used as the HTML tag to use.
- 'class' string The classname for the error message

`FormHelper::`**`isFieldError`**(*string $fieldName*)
Returns true if the supplied $fieldName has an active validation error.:

```
<?php
if ($this->Form->isFieldError('gender')) {
    echo $this->Form->error('gender');
}
```

Note: When using `FormHelper::input()`, errors are rendered by default.

`FormHelper::`**`tagIsInvalid`**()
Returns false if given form field described by the current entity has no errors. Otherwise it returns the validation message.

Setting Defaults for all fields

New in version 2.2. You can declare a set of default options for `input()` using `FormHelper::inputDefaults()`. Changing the default options allows you to consolidate repeated options into a single method call:

```
<?php
echo $this->Form->inputDefaults(array(
        'label' => false,
        'div' => false,
        'class' => 'fancy'
    )
));
```

All inputs created from that point forward will inherit the options declared in inputDefaults. You can override the default options by declaring the option in the input() call:

```
<?php
echo $this->Form->input('password'); // No div, no label with class 'fancy'
echo $this->Form->input('username', array('label' => 'Username')); // has a label element
```

Working with SecurityComponent

`SecurityComponent` offers several features that make your forms safer and more secure. By simply including the `SecurityComponent` in your controller, you'll automatically benefit from CSRF and form tampering features.

As mentioned previously when using SecurityComponent, you should always close your forms using `FormHelper::end()`. This will ensure that the special `_Token` inputs are generated.

`FormHelper::`**`unlockField`**`(`*$name*`)`

Unlocks a field making it exempt from the `SecurityComponent` field hashing. This also allows the fields to be manipulated by Javascript. The `$name` parameter should be the entity name for the input:

```
<?php
$this->Form->unlockField('User.id');
```

`FormHelper::`**`secure`**`(`*array $fields = array()*`)`

Generates a hidden field with a security hash based on the fields used in the form.

2.0 updates

$selected parameter removed

The `$selected` parameter was removed from several methods in FormHelper. All methods now support a `$attributes['value']` key now which should be used in place of `$selected`. This change simplifies the FormHelper methods, reducing the number of arguments, and reduces the duplication that `$selected` created. The effected methods are:

- FormHelper::select()

- FormHelper::dateTime()
- FormHelper::year()
- FormHelper::month()
- FormHelper::day()
- FormHelper::hour()
- FormHelper::minute()
- FormHelper::meridian()

Default urls on forms is the current action

The default url for all forms, is now the current url including passed, named, and querystring parameters. You can override this default by supplying `$options['url']` in the second parameter of `$this->Form->create()`

FormHelper::hidden()

Hidden fields no longer remove the class attribute. This means that if there are validation errors on hidden fields, the error-field classname will be applied.

HtmlHelper

class `HtmlHelper`(*View $view*, *array $settings = array()*)

The role of the HtmlHelper in CakePHP is to make HTML-related options easier, faster, and more resilient to change. Using this helper will enable your application to be more light on its feet, and more flexible on where it is placed in relation to the root of a domain.

Many HtmlHelper methods include a `$htmlAttributes` parameter, that allow you to tack on any extra attributes on your tags. Here are a few examples of how to use the $htmlAttributes parameter:

```
Desired attributes: <tag class="someClass" />
Array parameter: array('class' => 'someClass')

Desired attributes: <tag name="foo" value="bar" />
Array parameter:  array('name' => 'foo', 'value' => 'bar')
```

Note: The HtmlHelper is available in all views by default. If you're getting an error informing you that it isn't there, it's usually due to its name being missing from a manually configured $helpers controller variable.

Inserting Well-Formatted elements

The most important task the HtmlHelper accomplishes is creating well formed markup. Don't be afraid to use it often - you can cache views in CakePHP in order to save some CPU cycles when views are being rendered and delivered. This section will cover some of the methods of the HtmlHelper and how to use them.

`HtmlHelper::`**`charset`**(*$charset=null*)

Parameters

- **$charset** (*string*) – Desired character set. If null, the value of `App.encoding` will be used.

Used to create a meta tag specifying the document's character. Defaults to UTF-8

Example use:

```
<?php echo $this->Html->charset(); ?>
```

Will output:

```
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
```

Alternatively,

```
<?php echo $this->Html->charset('ISO-8859-1'); ?>
```

Will output:

```
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
```

`HtmlHelper::`**`css`**(*mixed $path, string $rel = null, array $options = array()*)

Parameters

- **$path** (*mixed*) – Either a string of the css file to link, or an array with multiple files
- **$rel** (*string*) – The value of the generated tag's rel attribute. If null, 'stylesheet' will be used.
- **$options** (*array*) – An array of *html attributes*.

Creates a link(s) to a CSS style-sheet. If key 'inline' is set to false in `$options` parameter, the link tags are added to the `css` block which you can print inside the head tag of the document.

You can use the `block` option to control which block the link element will be appended to. By default it will append to the `css` block.

This method of CSS inclusion assumes that the CSS file specified resides inside the /app/webroot/css directory.:

```
<?php echo $this->Html->css('forms'); ?>
```

Will output:

```
<link rel="stylesheet" type="text/css" href="/css/forms.css" />
```

The first parameter can be an array to include multiple files.:

```
<?php echo $this->Html->css(array('forms', 'tables', 'menu')); ?>
```

Will output:

```
<link rel="stylesheet" type="text/css" href="/css/forms.css" />
<link rel="stylesheet" type="text/css" href="/css/tables.css" />
<link rel="stylesheet" type="text/css" href="/css/menu.css" />
```

You can include css files from any loaded plugin using *plugin syntax*. To include `app/Plugin/DebugKit/webroot/css/toolbar.css` You could use the following:

```
<?php
echo $this->Html->css('DebugKit.toolbar.css');
```

If you want to include a css file which shares a name with a loaded plugin you can do the following. For example if you had a `Blog` plugin, and also wanted to include `app/webroot/css/Blog.common.css`, you would:

```
<?php
echo $this->Html->css('Blog.common.css', null, array('plugin' => false));
```

Changed in version 2.1: The `block` option was added. Support for *plugin syntax* was added.

`HtmlHelper::`**`meta`**(*string $type*, *string $url = null*, *array $options = array()*)

Parameters

- **$type** (*string*) – The type meta tag you want.
- **$url** (*mixed*) – The url for the meta tag, either a string or a *routing array*.
- **$options** (*array*) – An array of *html attributes*.

This method is handy for linking to external resources like RSS/Atom feeds and favicons. Like css(), you can specify whether or not you'd like this tag to appear inline or appended to the `meta` block by setting the 'inline' key in the $attributes parameter to false, ie - `array('inline' => false)`.

If you set the "type" attribute using the $attributes parameter, CakePHP contains a few shortcuts:

type	translated value
html	text/html
rss	application/rss+xml
atom	application/atom+xml
icon	image/x-icon

```
<?php
echo $this->Html->meta(
    'favicon.ico',
    '/favicon.ico',
    array('type' => 'icon')
);
// Output (line breaks added)
<link
    href="http://example.com/favicon.ico"
    title="favicon.ico" type="image/x-icon"
    rel="alternate"
/>

echo $this->Html->meta(
    'Comments',
    '/comments/index.rss',
    array('type' => 'rss')
);
// Output (line breaks added)
<link
    href="http://example.com/comments/index.rss"
    title="Comments"
    type="application/rss+xml"
    rel="alternate"
/>
```

This method can also be used to add the meta keywords and descriptions. Example:

```
    <?php
    echo $this->Html->meta(
        'keywords',
        'enter any meta keyword here'
    );
    // Output
    <meta name="keywords" content="enter any meta keyword here" />

    echo $this->Html->meta(
        'description',
        'enter any meta description here'
    );
    // Output
    <meta name="description" content="enter any meta description here" />
```

If you want to add a custom meta tag then the first parameter should be set to an array. To output a robots noindex tag use the following code:

```
    <?php
    echo $this->Html->meta(array('name' => 'robots', 'content' => 'noindex'));
```

Changed in version 2.1: The `block` option was added.

`HtmlHelper::`**`docType`**(*string $type = 'xhtml-strict'*)

Parameters

- **$type** (*string*) – The type of doctype being made.

Returns a (X)HTML doctype tag. Supply the doctype according to the following table:

type	translated value
html4-strict	HTML4 Strict
html4-trans	HTML4 Transitional
html4-frame	HTML4 Frameset
html5	HTML5
xhtml-strict	XHTML1 Strict
xhtml-trans	XHTML1 Transitional
xhtml-frame	XHTML1 Frameset
xhtml11	XHTML1.1

```
<?php
echo $this->Html->docType();
// Outputs: <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.or

echo $this->Html->docType('html5');
// Outputs: <!DOCTYPE html>

echo $this->Html->docType('html4-trans');
// Outputs: <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www
```

Changed in version 2.1: The default doctype is html5 in 2.1.

`HtmlHelper::`**`style`**(*array $data*, *boolean $oneline = true*)

Parameters

- **$data** (*array*) – A set of key => values with CSS properties.
- **$oneline** (*boolean*) – Should the contents be on one line.

Builds CSS style definitions based on the keys and values of the array passed to the method. Especially handy if your CSS file is dynamic.:

```
<?php
echo $this->Html->style(array(
    'background' => '#633',
    'border-bottom' => '1px solid #000',
    'padding' => '10px'
));
```

Will output:

```
background:#633; border-bottom:1px solid #000; padding:10px;
```

`HtmlHelper::`**`image`**(*string $path*, *array $options = array()*)

Parameters

- **$path** (*string*) – Path to the image.
- **$options** (*array*) – An array of *html attributes*.

Creates a formatted image tag. The path supplied should be relative to /app/webroot/img/.:

```
<?php
echo $this->Html->image('cake_logo.png', array('alt' => 'CakePHP'));
```

Will output:

```
<img src="/img/cake_logo.png" alt="CakePHP" />
```

To create an image link specify the link destination using the `url` option in `$htmlAttributes`.:

```
<?php
echo $this->Html->image("recipes/6.jpg", array(
    "alt" => "Brownies",
    'url' => array('controller' => 'recipes', 'action' => 'view', 6)
));
```

Will output:

```
<a href="/recipes/view/6">
    <img src="/img/recipes/6.jpg" alt="Brownies" />
</a>
```

If you are creating images in emails, or want absolute paths to images you can use the `fullBase` option:

```
<?php
echo $this->Html->image("logo.png", array('fullBase' => true));
```

Will output:

```
<img src="http://example.com/img/logo.jpg" alt="" />
```

You can include image files from any loaded plugin using *plugin syntax*. To include `app/Plugin/DebugKit/webroot/img/icon.png` You could use the following:

```
<?php
echo $this->Html->image('DebugKit.icon.png');
```

If you want to include a image file which shares a name with a loaded plugin you can do the following. For example if you had a `Blog` plugin, and also wanted to include `app/webroot/js/Blog.icon.png`, you would:

```
<?php
echo $this->Html->image('Blog.icon.png', array('plugin' => false));
```

Changed in version 2.1: The `fullBase` option was added. Support for *plugin syntax* was added.

`HtmlHelper::`**`link`**(*string $title*, *mixed $url = null*, *array $options = array()*, *string $confirmMessage = false*)

Parameters

- **$title** (*string*) – The text to display as the body of the link.
- **$url** (*mixed*) – Either the string location, or a *routing array*.
- **$options** (*array*) – An array of *html attributes*.

General purpose method for creating HTML links. Use `$options` to specify attributes for the element and whether or not the `$title` should be escaped.:

```
<?php
echo $this->Html->link('Enter', '/pages/home', array('class' => 'button', 'target' =>
```

Will output:

```
<a href="/pages/home" class="button" target="_blank">Enter</a>
```

Use `'full_base'=>true` option for absolute URLs:

```
<?php
echo $this->Html->link(
    'Dashboard',
    array('controller' => 'dashboards', 'action' => 'index', 'full_base' => true)
);
```

Will output:

```
<a href="http://www.yourdomain.com/dashboards/index">Dashboard</a>
```

Specify `$confirmMessage` to display a javascript `confirm()` dialog:

```
<?php
echo $this->Html->link(
    'Delete',
    array('controller' => 'recipes', 'action' => 'delete', 6),
    array(),
    "Are you sure you wish to delete this recipe?"
);
```

Will output:

```
<a href="/recipes/delete/6" onclick="return confirm('Are you sure you wish to delete t
```

Query strings can also be created with `link()`.:

```
<?php
echo $this->Html->link('View image', array(
    'controller' => 'images',
    'action' => 'view',
    1,
    '?' => array('height' => 400, 'width' => 500))
);
```

Will output:

```
<a href="/images/view/1?height=400&width=500">View image</a>
```

HTML special characters in `$title` will be converted to HTML entities. To disable this conversion, set the escape option to false in the `$options` array.:

```
<?php
echo $this->Html->link(
    $this->Html->image("recipes/6.jpg", array("alt" => "Brownies")),
    "recipes/view/6",
    array('escape' => false)
);
```

Will output:

```
<a href="/recipes/view/6">
    <img src="/img/recipes/6.jpg" alt="Brownies" />
</a>
```

Also check `HtmlHelper::url` method for more examples of different types of urls.

`HtmlHelper::`**`media`**(*string|array $path*, *array $options*)

Parameters

- **$path** (*string|array*) – Path to the video file, relative to the *webroot/{$options['pathPrefix']}* directory. Or an array where each item itself can be a path string or an associate array containing keys *src* and *type*.
- **$options** (*array*) – Array of HTML attributes, and special options.

  Options:

  – *type* Type of media element to generate, valid values are "audio" or "video". If type is not provided media type is guessed based on file's mime type.

  – *text* Text to include inside the video tag

  – *pathPrefix* Path prefix to use for relative urls, defaults to 'files/'

  – *fullBase* If provided the src attribute will get a full address including domain name

New in version 2.1. Returns a formatted audio/video tag:

```
<?php
echo $this->Html->media('audio.mp4');

// Output
<video src="/files/audio.mp3"></audio>

echo $this->Html->media('video.mp4', array('fullBase' => true, 'text' => 'Fallback tex

// Output
<video src="http://www.somehost.com/files/video.mp4">Fallback text</video>

echo $this->Html->media(
    array('video.mp4', array('src' => 'video.ogg', 'type' => "video/ogg; codecs='theor
    array('autoplay')
);

// Output
<video autoplay="autoplay">
    <source src="/files/video.mp4" type="video/mp4"/>
    <source src="/files/video.ogg" type="video/ogg; codecs='theora, vorbis'"/>
</video>
```

`HtmlHelper::`**`tag`**(*string $tag*, *string $text*, *array $htmlAttributes*)

Parameters

- **$tag** (*string*) – The tag name being generated.
- **$text** (*string*) – The contents for the tag.
- **$options** (*array*) – An array of *html attributes*.

Returns text wrapped in a specified tag. If no text is specified then only the opening <tag> is returned.:

```
<?php
echo $this->Html->tag('span', 'Hello World.', array('class' => 'welcome'));

// Output
<span class="welcome">Hello World</span>

// No text specified.
<?php
echo $this->Html->tag('span', null, array('class' => 'welcome'));

// Output
<span class="welcome">
```

Note: Text is not escaped by default but you may use `$htmlOptions['escape'] = true` to escape your text. This replaces a fourth parameter `boolean $escape = false` that was available in previous versions.

`HtmlHelper::`**`div`**(*string $class*, *string $text*, *array $options*)

Parameters

- **$class** (*string*) – The classname for the div.
- **$text** (*string*) – The content inside the div.
- **$options** (*array*) – An array of *html attributes*.

Used for creating div-wrapped sections of markup. The first parameter specifies a CSS class, and the second is used to supply the text to be wrapped by div tags. If the last parameter has been set to true, $text will be printed HTML-escaped.

If no text is specified, only an opening div tag is returned.:

```
<?php
echo $this->Html->div('error', 'Please enter your credit card number.');

// Output
<div class="error">Please enter your credit card number.</div>
```

`HtmlHelper::`**`para`**(*string $class*, *string $text*, *array $options*)

Parameters

- **$class** (*string*) – The classname for the paragraph.
- **$text** (*string*) – The content inside the paragraph.
- **$options** (*array*) – An array of *html attributes*.

Returns a text wrapped in a CSS-classed <p> tag. If no text is supplied, only a starting <p> tag is returned.:

```
<?php
echo $this->Html->para(null, 'Hello World.');
```

```
// Output
<p>Hello World.</p>
```

HtmlHelper::**script**(*mixed $url*, *mixed $options*)

Parameters

- **$url** (*mixed*) – Either a string to a single Javascript file, or an array of strings for multiple files.
- **$options** (*array*) – An array of *html attributes*.

Include a script file(s). If key `inline` is set to false in $options, the script tags are added to the `script` block which you can print inside the head tag of the document. `$options['once']` controls, whether or not you want to include this script once per request or more than once. `$options['block']` allows you to control which block the script tag is appended to. This is useful when you want to place some scripts at the bottom of the layout.

You can use $options to set additional properties to the generated script tag. If an array of script tags is used, the attributes will be applied to all of the generated script tags.

This method of javascript file inclusion assumes that the javascript file specified resides inside the `/app/webroot/js` directory.:

```
<?php
echo $this->Html->script('scripts');
```

Will output:

```
<script type="text/javascript" href="/js/scripts.js"></script>
```

You can link to files with absolute paths as well to link files that are not in `app/webroot/js`:

```
<?php
echo $this->Html->script('/otherdir/script_file');
```

The first parameter can be an array to include multiple files.:

```
<?php
echo $this->Html->script(array('jquery', 'wysiwyg', 'scripts'));
```

Will output:

```
<script type="text/javascript" href="/js/jquery.js"></script>
<script type="text/javascript" href="/js/wysiwyg.js"></script>
<script type="text/javascript" href="/js/scripts.js"></script>
```

You can append the script tag to a specific block using the `block` option:

```
<?php
echo $this->Html->script('wysiwyg', array('block' => 'scriptBottom'));
```

In your layout you can output all the script tags added to 'scriptBottom':

```
<?php
echo $this->fetch('scriptBottom');
```

You can include script files from any loaded plugin using *plugin syntax*. To include `app/Plugin/DebugKit/webroot/js/toolbar.js` You could use the following:

```
<?php
echo $this->Html->script('DebugKit.toolbar.js');
```

If you want to include a script file which shares a name with a loaded plugin you can do the following. For example if you had a `Blog` plugin, and also wanted to include `app/webroot/js/Blog.plugins.js`, you would:

```
<?php
echo $this->Html->script('Blog.plugins.js', array('plugin' => false));
```

Changed in version 2.1: The `block` option was added. Support for *plugin syntax* was added.

`HtmlHelper::`**`scriptBlock`**(*$code*, *$options = array()*)

Parameters

- **$code** (*string*) – The code to go in the script tag.
- **$options** (*array*) – An array of *html attributes*.

Generate a code block containing `$code` set `$options['inline']` to false to have the script block appear in the `script` view block. Other options defined will be added as attributes to script tags. `$this->html->scriptBlock('stuff', array('defer' => true));` will create a script tag with `defer="defer"` attribute.

`HtmlHelper::`**`scriptStart`**(*$options = array()*)

Parameters

- **$options** (*array*) – An array of *html attributes* to be used when scriptEnd is called.

Begin a buffering code block. This code block will capture all output between `scriptStart()` and `scriptEnd()` and create an script tag. Options are the same as `scriptBlock()`

`HtmlHelper::`**`scriptEnd`**()

End a buffering script block, returns the generated script element or null if the script block was opened with inline = false.

An example of using `scriptStart()` and `scriptEnd()` would be:

```
<?php
$this->Html->scriptStart(array('inline' => false));

echo $this->Js->alert('I am in the javascript');

$this->Html->scriptEnd();
```

`HtmlHelper::`**`nestedList`**(*array $list*, *array $options = array()*, *array $itemOptions = array()*, *string $tag = 'ul'*)

Parameters

- **$list** (*array*) – Set of elements to list.
- **$options** (*array*) – Additional HTML attributes of the list (ol/ul) tag or if ul/ol use that as tag.
- **$itemOptions** (*array*) – Additional HTML attributes of the list item (LI) tag.
- **$tag** (*string*) – Type of list tag to use (ol/ul).

Build a nested list (UL/OL) out of an associative array:

```
<?php
$list = array(
    'Languages' => array(
        'English' => array(
            'American',
            'Canadian',
            'British',
        ),
        'Spanish',
        'German',
    )
);
echo $this->Html->nestedList($list);

// Output (minus the whitespace)
<ul>
    <li>Languages
        <ul>
            <li>English
                <ul>
                    <li>American</li>
                    <li>Canadian</li>
                    <li>British</li>
                </ul>
            </li>
            <li>Spanish</li>
            <li>German</li>
        </ul>
    </li>
</ul>
```

`HtmlHelper::`**`tableHeaders`**(*array $names*, *array $trOptions = null*, *array $thOptions = null*)

Parameters

- **$names** (*array*) – An array of strings to create table headings.
- **$trOptions** (*array*) – An array of *html attributes* for the <tr>
- **$thOptions** (*array*) – An array of *html attributes* for the <th> elements

Creates a row of table header cells to be placed inside of <table> tags.:

```
<?php
echo $this->Html->tableHeaders(array('Date', 'Title', 'Active'));
```

```
// Output
<tr>
    <th>Date</th>
    <th>Title</th>
    <th>Active</th>
</tr>

echo $this->Html->tableHeaders(
    array('Date','Title','Active'),
    array('class' => 'status'),
    array('class' => 'product_table')
);

// Output
<tr class="status">
     <th class="product_table">Date</th>
     <th class="product_table">Title</th>
     <th class="product_table">Active</th>
</tr>
```

Changed in version 2.2: `tableHeaders()` now accepts attributes per cell, see below. As of 2.2 you can set attributes per column, these are used instead of the defaults provided in the `$thOptions`:

```
<?php
echo $this->Html->tableHeaders(array(
    'id',
    array('Name' => array('class' => 'highlight')),
    array('Date' => array('class' => 'sortable'))
));

// Output
<tr>
    <th>id</th>
    <th class="highlight">Name</th>
    <th class="sortable">Date</th>
</tr>
```

`HtmlHelper::`**`tableCells`**(*array $data*, *array $oddTrOptions = null*, *array $evenTrOptions = null*, *$useCount = false*, *$continueOddEven = true*)

Parameters

- **$data** (*array*) – A two dimensional array with data for the rows.
- **$oddTrOptions** (*array*) – An array of *html attributes* for the odd <tr>’s.
- **$evenTrOptions** (*array*) – An array of *html attributes* for the even <tr>’s.
- **$useCount** (*boolean*) – Adds class “column-$i”.
- **$continueOddEven** (*boolean*) – If false, will use a non-static $count variable, so that the odd/even count is reset to zero just for that call.

Creates table cells, in rows, assigning <tr> attributes differently for odd- and even-numbered rows. Wrap a single table cell within an array() for specific <td>-attributes.

```
<?php
echo $this->Html->tableCells(array(
    array('Jul 7th, 2007', 'Best Brownies', 'Yes'),
    array('Jun 21st, 2007', 'Smart Cookies', 'Yes'),
    array('Aug 1st, 2006', 'Anti-Java Cake', 'No'),
));

// Output
<tr><td>Jul 7th, 2007</td><td>Best Brownies</td><td>Yes</td></tr>
<tr><td>Jun 21st, 2007</td><td>Smart Cookies</td><td>Yes</td></tr>
<tr><td>Aug 1st, 2006</td><td>Anti-Java Cake</td><td>No</td></tr>

echo $this->Html->tableCells(array(
    array('Jul 7th, 2007', array('Best Brownies', array('class' => 'highlight')) , 'Ye
    array('Jun 21st, 2007', 'Smart Cookies', 'Yes'),
    array('Aug 1st, 2006', 'Anti-Java Cake', array('No', array('id' => 'special'))),
));

// Output
<tr><td>Jul 7th, 2007</td><td class="highlight">Best Brownies</td><td>Yes</td></tr>
<tr><td>Jun 21st, 2007</td><td>Smart Cookies</td><td>Yes</td></tr>
<tr><td>Aug 1st, 2006</td><td>Anti-Java Cake</td><td id="special">No</td></tr>

echo $this->Html->tableCells(
    array(
        array('Red', 'Apple'),
        array('Orange', 'Orange'),
        array('Yellow', 'Banana'),
    ),
    array('class' => 'darker')
);

// Output
<tr class="darker"><td>Red</td><td>Apple</td></tr>
<tr><td>Orange</td><td>Orange</td></tr>
<tr class="darker"><td>Yellow</td><td>Banana</td></tr>
```

HtmlHelper::**url**(*mixed $url = NULL*, *boolean $full = false*)

Parameters

- **$url** (*mixed*) – A *routing array*.
- **$full** (*mixed*) – Either a boolean to indicate whether or not the base path should be included on an array of options for `Router::url()`

Returns an URL pointing to a combination of controller and action. If $url is empty, it returns the REQUEST_URI, otherwise it generates the url for the controller and action combo. If full is true, the full base URL will be prepended to the result:

```
<?php
echo $this->Html->url(array(
    "controller" => "posts",
    "action" => "view",
    "bar"
));

// Output
/posts/view/bar
```

Here are a few more usage examples:

URL with named parameters:

```
<?php
echo $this->Html->url(array(
    "controller" => "posts",
    "action" => "view",
    "foo" => "bar"
));

// Output
/posts/view/foo:bar
```

URL with extension:

```
<?php
echo $this->Html->url(array(
    "controller" => "posts",
    "action" => "list",
    "ext" => "rss"
));

// Output
/posts/list.rss
```

URL (starting with '/') with the full base URL prepended:

```
<?php
echo $this->Html->url('/posts', true);

// Output
http://somedomain.com/posts
```

URL with GET params and named anchor:

```
<?php
echo $this->Html->url(array(
    "controller" => "posts",
    "action" => "search",
    "?" => array("foo" => "bar"),
    "#" => "first"
));

// Output
/posts/search?foo=bar#first
```

For further information check Router::url (http://api20.cakephp.org/class/router#method-Routerurl) in the API.

`HtmlHelper::`**`useTag`**`(`*string $tag*`)`

Returns a formatted existent block of `$tag`:

```
<?php
$this->Html->useTag(
    'form',
    'http://example.com',
    array('method' => 'post', 'class' => 'myform')
);

// Output
<form action="http://example.com" method="post" class="myform">
```

Changing the tags output by HtmlHelper

`HtmlHelper::`**`loadConfig`**`(`*mixed $configFile, string $path = null*`)`

The built in tag sets for `HtmlHelper` are XHTML compliant, however if you need to generate HTML for HTML5 you will need to create and load a new tags config file containing the tags you'd like to use. To change the tags used create `app/Config/html5_tags.php` containing:

```
<?php
$config = array('tags' => array(
    'css' => '<link rel="%s" href="%s" %s>',
    'style' => '<style%s>%s</style>',
    'charset' => '<meta charset="%s">',
    'javascriptblock' => '<script%s>%s</script>',
    'javascriptstart' => '<script>',
    'javascriptlink' => '<script src="%s"%s></script>',
    // ...
));
```

You can then load this tag set by calling `$this->Html->loadConfig('html5_tags');`

Creating breadcrumb trails with HtmlHelper

`HtmlHelper::`**`getCrumbs`**`(`*string $separator = '&raquo;', string $startText = false*`)`

CakePHP has the built in ability to automatically create a breadcrumb trail in your app. To set this up, first add something similar to the following in your layout template:

```
<?php
echo $this->Html->getCrumbs(' > ', 'Home');
```

The `$startText` option can also accept an array. This gives more control over the generated first link:

```
<?php
echo $this->Html->getCrumbs(' > ', array(
    'text' => $this->Html->image('home.png'),
    'url' => array('controller' => 'pages', 'action' => 'display', 'home'),
    'escape' => false
));
```

Any keys that are not `text` or `url` will be passed to `link()` as the `$options` parameter. Changed in version 2.1: The `$startText` parameter now accepts an array.

`HtmlHelper::`**`addCrumb`**(*string $name*, *string $link = null*, *mixed $options = null*)

Now, in your view you'll want to add the following to start the breadcrumb trails on each of the pages:

```
<?php
$this->Html->addCrumb('Users', '/users');
$this->Html->addCrumb('Add User', '/users/add');
```

This will add the output of "**Home > Users > Add User**" in your layout where getCrumbs was added.

`HtmlHelper::`**`getCrumbList`**(*array $options = array()*, *mixed $startText*)

Returns breadcrumbs as a (x)html list.

This method uses `HtmlHelper::tag()` to generate list and its elements. Works similar to `getCrumbs()`, so it uses options which every crumb was added with. You can use the `$startText` parameter to provide the first breadcrumb link/text. This is useful when you always want to include a root link. This option works the same as the `$startText` option for `getCrumbs()`.

..versionchanged:: 2.1 The `$startText` parameter was added.

JsHelper

class `JsHelper`(*View $view*, *array $settings = array()*)

Since the beginning CakePHP's support for Javascript has been with Prototype/Scriptaculous. While we still think these are an excellent Javascript library, the community has been asking for support for other libraries. Rather than drop Prototype in favour of another Javascript library. We created an Adapter based helper, and included 3 of the most requested libraries. Prototype/Scriptaculous, Mootools/Mootools-more, and jQuery/jQuery UI. And while the API is not as expansive as the previous AjaxHelper we feel that the adapter based solution allows for a more extensible solution giving developers the power and flexibility they need to address their specific application needs.

Javascript Engines form the backbone of the new JsHelper. A Javascript engine translates an abstract Javascript element into concrete Javascript code specific to the Javascript library being used. In addition they create an extensible system for others to use.

Using a specific Javascript engine

First of all download your preferred javascript library and place it in `app/webroot/js`

Then you must include the library in your page. To include it in all pages, add this line to the <head> section of `app/View/Layouts/default.ctp` (copy this file from `lib/Cake/View/Layouts/default.ctp` if you have not created your own):

```
<?php
echo $this->Html->script('jquery'); // Include jQuery library
```

Replace `jquery` with the name of your library file (.js will be added to the name).

By default scripts are cached, and you must explicitly print out the cache. To do this at the end of each page, include this line just before the ending `</body>` tag:

```php
<?php
echo $this->Js->writeBuffer(); // Write cached scripts
```

Warning: You must include the library in your page and print the cache for the helper to function.

Javascript engine selection is declared when you include the helper in your controller:

```php
<?php
public $helpers = array('Js' => array('Jquery'));
```

The above would use the Jquery Engine in the instances of JsHelper in your views. If you do not declare a specific engine, the jQuery engine will be used as the default. As mentioned before, there are three engines implemented in the core, but we encourage the community to expand the library compatibility.

Using jQuery with other libraries

The jQuery library, and virtually all of its plugins are constrained within the jQuery namespace. As a general rule, "global" objects are stored inside the jQuery namespace as well, so you shouldn't get a clash between jQuery and any other library (like Prototype, MooTools, or YUI).

That said, there is one caveat: **By default, jQuery uses "$" as a shortcut for "jQuery"**

To override the "$" shortcut, use the jQueryObject variable:

```php
<?php
$this->Js->JqueryEngine->jQueryObject = '$j';
echo $this->Html->scriptBlock(
    'var $j = jQuery.noConflict();',
    array('inline' => false)
);
// Tell jQuery to go into noconflict mode
```

Using the JsHelper inside customHelpers

Declare the JsHelper in the `$helpers` array in your customHelper:

```php
<?php
public $helpers = array('Js');
```

Note: It is not possible to declare a javascript engine inside a custom helper. Doing that will have no effect.

If you are willing to use an other javascript engine than the default, do the helper setup in your controller as follows:

```
<?php
public $helpers = array(
    'Js' => array('Prototype'),
    'CustomHelper'
);
```

Warning: Be sure to declare the JsHelper and its engine **on top** of the `$helpers` array in your controller.

The selected javascript engine may disappear (replaced by the default) from the jsHelper object in your helper, if you miss to do so and you will get code that does not fit your javascript library.

Creating a Javascript Engine

Javascript engine helpers follow normal helper conventions, with a few additional restrictions. They must have the `Engine` suffix. `DojoHelper` is not good, `DojoEngineHelper` is correct. Furthermore, they should extend `JsBaseEngineHelper` in order to leverage the most of the new API.

Javascript engine usage

The `JsHelper` provides a few methods, and acts as a facade for the the Engine helper. You should not directly access the Engine helper except in rare occasions. Using the facade features of the `JsHelper` allows you to leverage the buffering and method chaining features built-in; (method chaining only works in PHP5).

The `JsHelper` by default buffers almost all script code generated, allowing you to collect scripts throughout the view, elements and layout, and output it in one place. Outputting buffered scripts is done with `$this->Js->writeBuffer();` this will return the buffer contents in a script tag. You can disable buffering wholesale with the `$bufferScripts` property or setting `buffer => false` in methods taking `$options`.

Since most methods in Javascript begin with a selection of elements in the DOM, `$this->Js->get()` returns a $this, allowing you to chain the methods using the selection. Method chaining allows you to write shorter, more expressive code:

```
<?php
$this->Js->get('#foo')->event('click', $eventCode);
```

Is an example of method chaining. Method chaining is not possible in PHP4 and the above sample would be written like:

```
<?php
$this->Js->get('#foo');
$this->Js->event('click', $eventCode);
```

Common options

In attempts to simplify development where Js libraries can change, a common set of options is supported by `JsHelper`, these common options will be mapped out to the library specific options internally. If you are not planning on switching Javascript libraries, each library also supports all of its native callbacks and options.

Callback wrapping

By default all callback options are wrapped with the an anonymous function with the correct arguments. You can disable this behavior by supplying the `wrapCallbacks = false` in your options array.

Working with buffered scripts

One drawback to previous implementation of 'Ajax' type features was the scattering of script tags throughout your document, and the inability to buffer scripts added by elements in the layout. The new JsHelper if used correctly avoids both of those issues. It is recommended that you place `$this->Js->writeBuffer()` at the bottom of your layout file above the `</body>` tag. This will allow all scripts generated in layout elements to be output in one place. It should be noted that buffered scripts are handled separately from included script files.

`JsHelper::`**`writeBuffer`**`(`*$options = array()*`)`

Writes all Javascript generated so far to a code block or caches them to a file and returns a linked script.

Options

- `inline` - Set to true to have scripts output as a script block inline if `cache` is also true, a script link tag will be generated. (default true)
- `cache` - Set to true to have scripts cached to a file and linked in (default false)
- `clear` - Set to false to prevent script cache from being cleared (default true)
- `onDomReady` - wrap cached scripts in domready event (default true)
- `safe` - if an inline block is generated should it be wrapped in <![CDATA[...]]> (default true)

Creating a cache file with `writeBuffer()` requires that `webroot/js` be world writable and allows a browser to cache generated script resources for any page.

`JsHelper::`**`buffer`**`(`*$content*`)`

Add `$content` to the internal script buffer.

`JsHelper::`**`getBuffer`**`(`*$clear = true*`)`

Get the contents of the current buffer. Pass in false to not clear the buffer at the same time.

Buffering methods that are not normally buffered

Some methods in the helpers are buffered by default. The engines buffer the following methods by default:

- event

- sortable
- drag
- drop
- slider

Additionally you can force any other method in JsHelper to use the buffering. By appending an boolean to the end of the arguments you can force other methods to go into the buffer. For example the `each()` method does not normally buffer:

```
<?php
$this->Js->each('alert("whoa!");', true);
```

The above would force the `each()` method to use the buffer. Conversely if you want a method that does buffer to not buffer, you can pass a `false` in as the last argument:

```
<?php
$this->Js->event('click', 'alert("whoa!");', false);
```

This would force the event function which normally buffers to return its result.

Other Methods

The core Javascript Engines provide the same feature set across all libraries, there is also a subset of common options that are translated into library specific options. This is done to provide end developers with as unified an API as possible. The following list of methods are supported by all the Engines included in the CakePHP core. Whenever you see separate lists for `Options` and `Event Options` both sets of parameters are supplied in the `$options` array for the method.

`JsHelper::`**`object`**(*$data*, *$options = array()*)

Serializes `$data` into JSON. This method is a proxy for `json_encode()` with a few extra features added via the `$options` parameter.

Options:

- `prefix` - String prepended to the returned data.
- `postfix` - String appended to the returned data.

Example Use:

```
<?php
$json = $this->Js->object($data);
```

`JsHelper::`**`sortable`**(*$options = array()*)

Sortable generates a javascript snippet to make a set of elements (usually a list) drag and drop sortable.

The normalized options are:

Options

- `containment` - Container for move action
- `handle` - Selector to handle element. Only this element will start sort action.

- `revert` - Whether or not to use an effect to move sortable into final position.
- `opacity` - Opacity of the placeholder
- `distance` - Distance a sortable must be dragged before sorting starts.

Event Options

- `start` - Event fired when sorting starts
- `sort` - Event fired during sorting
- `complete` - Event fired when sorting completes.

Other options are supported by each Javascript library, and you should check the documentation for your javascript library for more detailed information on its options and parameters.

Example Use:

```
<?php
$this->Js->get('#my-list');
$this->Js->sortable(array(
    'distance' => 5,
    'containment' => 'parent',
    'start' => 'onStart',
    'complete' => 'onStop',
    'sort' => 'onSort',
    'wrapCallbacks' => false
));
```

Assuming you were using the jQuery engine, you would get the following code in your generated Javascript block

```
$("#myList").sortable({containment:"parent", distance:5, sort:onSort, start:onStart, s
```

`JsHelper::`**`request`**(*$url*, *$options = array()*)

Generate a javascript snippet to create an `XmlHttpRequest` or 'AJAX' request.

Event Options

- `complete` - Callback to fire on complete.
- `success` - Callback to fire on success.
- `before` - Callback to fire on request initialization.
- `error` - Callback to fire on request failure.

Options

- `method` - The method to make the request with defaults to GET in more libraries
- `async` - Whether or not you want an asynchronous request.
- `data` - Additional data to send.
- `update` - Dom id to update with the content of the request.

- `type` - Data type for response. 'json' and 'html' are supported. Default is html for most libraries.
- `evalScripts` - Whether or not <script> tags should be eval'ed.
- `dataExpression` - Should the `data` key be treated as a callback. Useful for supplying `$options['data']` as another Javascript expression.

Example use:

```
<?php
$this->Js->event(
    'click',
    $this->Js->request(
        array('action' => 'foo', 'param1'),
        array('async' => true, 'update' => '#element')
    )
);
```

`JsHelper::`**`get`**`(`*$selector*`)`

Set the internal 'selection' to a CSS selector. The active selection is used in subsequent operations until a new selection is made:

```
<?php
$this->Js->get('#element');
```

The `JsHelper` now will reference all other element based methods on the selection of `#element`. To change the active selection, call `get()` again with a new element.

`JsHelper::`**`set`**`(`*mixed $one*, *mixed $two = null*`)`

Pass variables into Javascript. Allows you to set variables that will be output when the buffer is fetched with `JsHelper::getBuffer()` or `JsHelper::writeBuffer()`. The Javascript variable used to output set variables can be controlled with `JsHelper::$setVariable`.

`JsHelper::`**`drag`**`(`*$options = array()*`)`

Make an element draggable.

Options

- `handle` - selector to the handle element.
- `snapGrid` - The pixel grid that movement snaps to, an array(x, y)
- `container` - The element that acts as a bounding box for the draggable element.

Event Options

- `start` - Event fired when the drag starts
- `drag` - Event fired on every step of the drag
- `stop` - Event fired when dragging stops (mouse release)

Example use:

```
<?php
$this->Js->get('#element');
```

```
$this->Js->drag(array(
    'container' => '#content',
    'start' => 'onStart',
    'drag' => 'onDrag',
    'stop' => 'onStop',
    'snapGrid' => array(10, 10),
    'wrapCallbacks' => false
));
```

If you were using the jQuery engine the following code would be added to the buffer

```
$("#element").draggable({containment:"#content", drag:onDrag, grid:[10,10], start:onSt
```

`JsHelper::drop($options = array())`

Make an element accept draggable elements and act as a dropzone for dragged elements.

Options

- `accept` - Selector for elements this droppable will accept.
- `hoverclass` - Class to add to droppable when a draggable is over.

Event Options

- `drop` - Event fired when an element is dropped into the drop zone.
- `hover` - Event fired when a drag enters a drop zone.
- `leave` - Event fired when a drag is removed from a drop zone without being dropped.

Example use:

```
<?php
$this->Js->get('#element');
$this->Js->drop(array(
    'accept' => '.items',
    'hover' => 'onHover',
    'leave' => 'onExit',
    'drop' => 'onDrop',
    'wrapCallbacks' => false
));
```

If you were using the jQuery engine the following code would be added to the buffer

```
$("#element").droppable({accept:".items", drop:onDrop, out:onExit, over:onHover});
```

Note: Droppables in Mootools function differently from other libraries. Droppables are implemented as an extension of Drag. So in addition to making a get() selection for the droppable element. You must also provide a selector rule to the draggable element. Furthermore, Mootools droppables inherit all options from Drag.

`JsHelper::slider($options = array())`

Create snippet of Javascript that converts an element into a slider ui widget. See your libraries implementation for additional usage and features.

Options

- `handle` - The id of the element used in sliding.
- `direction` - The direction of the slider either 'vertical' or 'horizontal'
- `min` - The min value for the slider.
- `max` - The max value for the slider.
- `step` - The number of steps or ticks the slider will have.
- `value` - The initial offset of the slider.

Events

- `change` - Fired when the slider's value is updated
- `complete` - Fired when the user stops sliding the handle

Example use:

```
<?php
$this->Js->get('#element');
$this->Js->slider(array(
    'complete' => 'onComplete',
    'change' => 'onChange',
    'min' => 0,
    'max' => 10,
    'value' => 2,
    'direction' => 'vertical',
    'wrapCallbacks' => false
));
```

If you were using the jQuery engine the following code would be added to the buffer

```
$("#element").slider({change:onChange, max:10, min:0, orientation:"vertical", stop:onC
```

`JsHelper::`**`effect`**(*$name*, *$options = array()*)

Creates a basic effect. By default this method is not buffered and returns its result.

Supported effect names

The following effects are supported by all JsEngines

- `show` - reveal an element.
- `hide` - hide an element.
- `fadeIn` - Fade in an element.
- `fadeOut` - Fade out an element.
- `slideIn` - Slide an element in.
- `slideOut` - Slide an element out.

Options

- `speed` - Speed at which the animation should occur. Accepted values are 'slow', 'fast'. Not all effects use the speed option.

Example use

If you were using the jQuery engine:

```
<?php
$this->Js->get('#element');
$result = $this->Js->effect('fadeIn');

// $result contains $("#foo").fadeIn();
```

`JsHelper::`**`event`**(*$type*, *$content*, *$options = array()*)

Bind an event to the current selection. `$type` can be any of the normal DOM events or a custom event type if your library supports them. `$content` should contain the function body for the callback. Callbacks will be wrapped with `function (event) { ... }` unless disabled with the `$options`.

Options

- `wrap` - Whether you want the callback wrapped in an anonymous function. (defaults to true)
- `stop` - Whether you want the event to stopped. (defaults to true)

Example use:

```
<?php
$this->Js->get('#some-link');
$this->Js->event('click', $this->Js->alert('hey you!'));
```

If you were using the jQuery library you would get the following Javascript code:

```
$('#some-link').bind('click', function (event) {
    alert('hey you!');
    return false;
});
```

You can remove the `return false;` by passing setting the `stop` option to false:

```
<?php
$this->Js->get('#some-link');
$this->Js->event('click', $this->Js->alert('hey you!'), array('stop' => false));
```

If you were using the jQuery library you would the following Javascript code would be added to the buffer. Note that the default browser event is not cancelled:

```
$('#some-link').bind('click', function (event) {
    alert('hey you!');
});
```

`JsHelper::`**`domReady`**(*$callback*)

Creates the special 'DOM ready' event. `JsHelper::writeBuffer()` automatically wraps the buffered scripts in a domReady method.

`JsHelper::`**`each`**`(`*$callback*`)`

Create a snippet that iterates over the currently selected elements, and inserts `$callback`.

Example:

```
<?php
$this->Js->get('div.message');
$this->Js->each('$(this).css({color: "red"});');
```

Using the jQuery engine would create the following Javascript:

```
$('div.message').each(function () { $(this).css({color: "red"}); });
```

`JsHelper::`**`alert`**`(`*$message*`)`

Create a javascript snippet containing an `alert()` snippet. By default, `alert` does not buffer, and returns the script snippet.:

```
<?php
$alert = $this->Js->alert('Hey there');
```

`JsHelper::`**`confirm`**`(`*$message*`)`

Create a javascript snippet containing a `confirm()` snippet. By default, `confirm` does not buffer, and returns the script snippet.:

```
<?php
$alert = $this->Js->confirm('Are you sure?');
```

`JsHelper::`**`prompt`**`(`*$message*, *$default*`)`

Create a javascript snippet containing a `prompt()` snippet. By default, `prompt` does not buffer, and returns the script snippet.:

```
<?php
$prompt = $this->Js->prompt('What is your favorite color?', 'blue');
```

`JsHelper::`**`submit`**`(`*$caption = null*, *$options = array()*`)`

Create a submit input button that enables `XmlHttpRequest` submitted forms. Options can include both those for `FormHelper::submit()` and JsBaseEngine::request(), JsBaseEngine::event();

Forms submitting with this method, cannot send files. Files do not transfer over `XmlHttpRequest` and require an iframe, or other more specialized setups that are beyond the scope of this helper.

Options

- `url` - The url you wish the XHR request to submit to.
- `confirm` - Confirm message displayed before sending the request. Using confirm, does not replace any `before` callback methods in the generated XmlHttpRequest.
- `buffer` - Disable the buffering and return a script tag in addition to the link.
- `wrapCallbacks` - Set to false to disable automatic callback wrapping.

Example use:

```
<?php
echo $this->Js->submit('Save', array('update' => '#content'));
```

Will create a submit button with an attached onclick event. The click event will be buffered by default.:

```
<?php
echo $this->Js->submit('Save', array('update' => '#content', 'div' => false, 'type' =>
```

Shows how you can combine options that both `FormHelper::submit()` and `JsHelper::request()` when using submit.

`JsHelper::link($title, $url = null, $options = array())`

Create an html anchor element that has a click event bound to it. Options can include both those for `HtmlHelper::link()` and `JsHelper::request()`, `JsHelper::event()`, `$options` is a *html attributes* array that are appended to the generated anchor element. If an option is not part of the standard attributes or `$htmlAttributes` it will be passed to `JsHelper::request()` as an option. If an id is not supplied, a randomly generated one will be created for each link generated.

Options

- `confirm` - Generate a confirm() dialog before sending the event.
- `id` - use a custom id.
- `htmlAttributes` - additional non-standard htmlAttributes. Standard attributes are class, id, rel, title, escape, onblur and onfocus.
- `buffer` - Disable the buffering and return a script tag in addition to the link.

Example use:

```
<?php
echo $this->Js->link('Page 2', array('page' => 2), array('update' => '#content'));
```

Will create a link pointing to `/page:2` and updating #content with the response.

You can use the `htmlAttributes` option to add in additional custom attributes.:

```
<?php
echo $this->Js->link('Page 2', array('page' => 2), array(
    'update' => '#content',
    'htmlAttributes' => array('other' => 'value')
));

// Creates the following html
<a href="/posts/index/page:2" other="value">Page 2</a>
```

`JsHelper::serializeForm($options = array())`

Serialize the form attached to $selector. Pass `true` for $isForm if the current selection is a form element. Converts the form or the form element attached to the current selection into a string/json object (depending on the library implementation) for use with XHR operations.

Options

- `isForm` - is the current selection a form, or an input? (defaults to false)
- `inline` - is the rendered statement going to be used inside another JS statement? (defaults to false)

Setting inline == false allows you to remove the trailing `;`. This is useful when you need to serialize a form element as part of another Javascript operation, or use the serialize method in an Object literal.

`JsHelper::`**`redirect`**`(`*$url*`)`

Redirect the page to `$url` using `window.location`.

`JsHelper::`**`value`**`(`*$value*`)`

Converts a PHP-native variable of any type to a JSON-equivalent representation. Escapes any string values into JSON compatible strings. UTF-8 characters will be escaped.

Ajax Pagination

Much like Ajax Pagination in 1.2, you can use the JsHelper to handle the creation of Ajax pagination links instead of plain HTML links.

Making Ajax Links

Before you can create ajax links you must include the Javascript library that matches the adapter you are using with `JsHelper`. By default the `JsHelper` uses jQuery. So in your layout include jQuery (or whichever library you are using). Also make sure to include `RequestHandlerComponent` in your components. Add the following to your controller:

```
<?php
public $components = array('RequestHandler');
public $helpers = array('Js');
```

Next link in the javascript library you want to use. For this example we'll be using jQuery:

```
<?php
echo $this->Html->script('jquery');
```

Similar to 1.2 you need to tell the `PaginatorHelper` that you want to make Javascript enhanced links instead of plain HTML ones. To do so you use `options()`:

```
<?php
$this->Paginator->options(array(
    'update' => '#content',
    'evalScripts' => true
));
```

The `PaginatorHelper` now knows to make javascript enhanced links, and that those links should update the `#content` element. Of course this element must exist, and often times you want to wrap `$content_for_layout` with a div matching the id used for the `update` option. You also should set `evalScripts` to true if you are using the Mootools or Prototype adapters, without `evalScripts` these libraries will not be able to chain requests together. The `indicator` option is not supported by `JsHelper` and will be ignored.

You then create all the links as needed for your pagination features. Since the `JsHelper` automatically buffers all generated script content to reduce the number of `<script>` tags in your source code you **must** call write the buffer out. At the bottom of your view file. Be sure to include:

```
<?php
echo $this->Js->writeBuffer();
```

If you omit this you will **not** be able to chain ajax pagination links. When you write the buffer, it is also cleared, so you don't have worry about the same Javascript being output twice.

Adding effects and transitions

Since `indicator` is no longer supported, you must add any indicator effects yourself:

```
<!DOCTYPE html>
<html>
    <head>
        <?php echo $this->Html->script('jquery'); ?>
        //more stuff here.
    </head>
    <body>
    <div id="content">
        <?php echo $content_for_layout; ?>
    </div>
    <?php echo $this->Html->image('indicator.gif', array('id' => 'busy-indicator')); ?>
    </body>
</html>
```

Remember to place the indicator.gif file inside app/webroot/img folder. You may see a situation where the indicator.gif displays immediately upon the page load. You need to put in this css `#busy-indicator { display:none; }` in your main css file.

With the above layout, we've included an indicator image file, that will display a busy indicator animation that we will show and hide with the `JsHelper`. To do that we need to update our `options()` function:

```
<?php
$this->Paginator->options(array(
    'update' => '#content',
    'evalScripts' => true,
    'before' => $this->Js->get('#busy-indicator')->effect('fadeIn', array('buffer' => false
    'complete' => $this->Js->get('#busy-indicator')->effect('fadeOut', array('buffer' => fa
));
```

This will show/hide the busy-indicator element before and after the `#content` div is updated. Although `indicator` has been removed, the new features offered by `JsHelper` allow for more control and more complex effects to be created.

NumberHelper

class NumberHelper(*View $view, array $settings = array()*)

The NumberHelper contains convenience methods that enable display numbers in common formats in your views. These methods include ways to format currency, percentages, data sizes, format numbers to specific precisions and also to give you more flexibility with formatting numbers. Changed in version 2.1: `NumberHelper` have been refactored into `CakeNumber` class to allow easier use outside of the `View` layer. Within a view, these methods are accessible via the `NumberHelper` class and you can call it as you would call a normal helper method: `$this->Number->method($args);`. All of these functions return the formatted number; They do not automatically echo the output into the view.

`NumberHelper::`**`currency`**(*mixed $number*, *string $currency = 'USD'*, *array $options = array()*)

Parameters

- **$number** (*float*) – The value to covert.
- **$currency** (*string*) – The known currency format to use.
- **$options** (*array*) – Options, see below.

This method is used to display a number in common currency formats (EUR,GBP,USD). Usage in a view looks like:

```
<?php
// called as NumberHelper
echo $this->Number->currency($number, $currency);

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::currency($number, $currency);
```

The first parameter, $number, should be a floating point number that represents the amount of money you are expressing. The second parameter is used to choose a predefined currency formatting scheme:

$currency	1234.56, formatted by currency type
EUR	€ 1.236,33
GBP	£ 1,236.33
USD	$ 1,236.33

The third parameter is an array of options for further defining the output. The following options are available:

Option	Description
before	The currency symbol to place before whole numbers ie. '$'
after	The currency symbol to place after decimal numbers ie. 'c'. Set to boolean false to use no decimal symbol. eg. 0.35 => $0.35.
zero	The text to use for zero values, can be a string or a number. ie. 0, 'Free!'
places	Number of decimal places to use. ie. 2
thousands	Thousands separator ie. ','
decimals	Decimal separator symbol ie. '.'
negative	Symbol for negative numbers. If equal to '()', the number will be wrapped with (and)
escape	Should the output be htmlentity escaped? Defaults to true
wholeSymbol	String to use for whole numbers ie. ' dollars'
wholePosition	Either 'before' or 'after' to place the whole symbol
fractionSymbol	String to use for fraction numbers ie. ' cents'
fractionPosition	Either 'before' or 'after' to place the fraction symbol

If a non-recognized $currency value is supplied, it is prepended to a USD formatted number. For example:

```php
<?php
// called as NumberHelper
echo $this->Number->currency('1234.56', 'FOO');

// Outputs
FOO 1,234.56

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::currency('1234.56', 'FOO');
```

`NumberHelper::`**`addFormat`**(*string $formatName*, *array $options*)

Parameters

- **$formatName** (*string*) – The format name to be used in the future
- **$options** (*array*) – The array of options for this format. Uses the same `$options` keys as `CakeNumber::currency()`.

Add a currency format to the Number helper. Makes reusing currency formats easier:

```php
<?php
// called as NumberHelper
$this->Number->addFormat('BRR', array('before' => 'R$ '));

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
CakeNumber::addFormat('BRR', array('before' => 'R$ '));
```

You can now use *BRR* as a short form when formatting currency amounts:

```
<?php
// called as NumberHelper
echo $this->Number->currency($value, 'BRR');

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::currency($value, 'BRR');
```

Added formats are merged with the following defaults:

```
<?php
array(
    'wholeSymbol'      => '',
    'wholePosition'    => 'before',
    'fractionSymbol'   => '',
    'fractionPosition' => 'after',
    'zero'             => 0,
    'places'           => 2,
    'thousands'        => ',',
    'decimals'         => '.',
    'negative'         => '()',
    'escape'           => true
)
```

`NumberHelper::`**`precision`**(*mixed $number*, *int $precision = 3*)

Parameters

- **$number** (*float*) – The value to covert
- **$precision** (*integer*) – The number of decimal places to display

This method displays a number with the specified amount of precision (decimal places). It will round in order to maintain the level of precision defined.:

```
<?php
// called as NumberHelper
echo $this->Number->precision(456.91873645, 2);

// Outputs
456.92

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::precision(456.91873645, 2);
```

`NumberHelper::`**`toPercentage`**(*mixed $number*, *int $precision = 2*)

Parameters

- **$number** (*float*) – The value to covert
- **$precision** (*integer*) – The number of decimal places to display

Like precision(), this method formats a number according to the supplied precision (where numbers are rounded to meet the given precision). This method also expresses the number as a percentage and prepends the output with a percent sign.:

```
<?php
// called as NumberHelper
echo $this->Number->toPercentage(45.691873645);

// Outputs
45.69%

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::toPercentage(45.691873645);
```

`NumberHelper::`**`toReadableSize`**`(`*string $data_size*`)`

Parameters

- **$data_size** (*string*) – The number of bytes to make readable.

This method formats data sizes in human readable forms. It provides a shortcut way to convert bytes to KB, MB, GB, and TB. The size is displayed with a two-digit precision level, according to the size of data supplied (i.e. higher sizes are expressed in larger terms):

```
<?php
// called as NumberHelper
echo $this->Number->toReadableSize(0); // 0 Bytes
echo $this->Number->toReadableSize(1024); // 1 KB
echo $this->Number->toReadableSize(1321205.76); // 1.26 MB
echo $this->Number->toReadableSize(5368709120); // 5.00 GB

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::toReadableSize(0); // 0 Bytes
echo CakeNumber::toReadableSize(1024); // 1 KB
echo CakeNumber::toReadableSize(1321205.76); // 1.26 MB
echo CakeNumber::toReadableSize(5368709120); // 5.00 GB
```

`NumberHelper::`**`format`**`(`*mixed $number*, *mixed $options=false*`)`

This method gives you much more control over the formatting of numbers for use in your views (and is used as the main method by most of the other NumberHelper methods). Using this method might looks like:

```
<?php
// called as NumberHelper
$this->Number->format($number, $options);

// called as CakeNumber
CakeNumber::format($number, $options);
```

The $number parameter is the number that you are planning on formatting for output. With no $options supplied, the number 1236.334 would output as 1,236. Note that the default precision is zero decimal places.

The $options parameter is where the real magic for this method resides.

- If you pass an integer then this becomes the amount of precision or places for the function.
- If you pass an associated array, you can use the following keys:
  - places (integer): the amount of desired precision
  - before (string): to be put before the outputted number
  - escape (boolean): if you want the value in before to be escaped
  - decimals (string): used to delimit the decimal places in a number
  - thousands (string): used to mark off thousand, millions, … places

Example:

```php
<?php
// called as NumberHelper
echo $this->Number->format('123456.7890', array(
    'places' => 2,
    'before' => '¥ ',
    'escape' => false,
    'decimals' => '.',
    'thousands' => ','
));
// output '¥ 123,456.79'

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::format('123456.7890', array(
    'places' => 2,
    'before' => '¥ ',
    'escape' => false,
    'decimals' => '.',
    'thousands' => ','
));
// output '¥ 123,456.79'
```

Paginator

class **`PaginatorHelper`**(*View $view*, *array $settings = array()*)

The Pagination helper is used to output pagination controls such as page numbers and next/previous links. It works in tandem with `PaginatorComponent`.

See also *Pagination* for information on how to create paginated datasets and do paginated queries.

Creating sort links

`PaginatorHelper::`**`sort`**(*$key*, *$title = null*, *$options = array()*)

Parameters

- **$key** (*string*) – The name of the key that the recordset should be sorted.
- **$title** (*string*) – Title for the link. If $title is null $key will be used for the title and will be generated by inflection.
- **$options** (*array*) – Options for sorting link.

Generates a sorting link. Sets named or querystring parameters for the sort and direction. Links will default to sorting by asc. After the first click, links generated with `sort()` will handle direction switching automatically. Link sorting default by 'asc'. If the resultset is sorted 'asc' by the specified key the returned link will sort by 'desc'.

Accepted keys for `$options`:

- `escape` Whether you want the contents html entity encoded, defaults to true.
- `model` The model to use, defaults to PaginatorHelper::defaultModel().

Assuming you are paginating some posts, and are on page one:

```
<?php
echo $this->Paginator->sort('user_id');
// creates
<a href="/posts/index/page:1/sort:user_id/dir:asc/">User Id</a>
```

You can use the title parameter to create custom text for your link:

```
<?php
echo $this->Paginator->sort('user_id', 'User account');
// creates
<a href="/posts/index/page:1/sort:user_id/dir:asc/">User account</a>
```

If you are using HTML like images in your links remember to set escaping off:

```
<?php
echo $this->Paginator->sort('user_id', '<em>User account</em>', array('escape' => false));
// creates
<a href="/posts/index/page:1/sort:user_id/dir:asc/"><em>User account</em></a>
```

The direction option can be used to set the default direction for a link. Once a link is active, it will automatically switch directions like normal:

```
<?php
echo $this->Paginator->sort('user_id', null, array('direction' => 'desc'));
// creates
<a href="/posts/index/page:1/sort:user_id/dir:desc/">User Id</a>
```

`PaginatorHelper::`**`sortDir`**(*string $model = null, mixed $options = array()*)

Gets the current direction the recordset is sorted.

`PaginatorHelper::`**`sortKey`**(*string $model = null, mixed $options = array()*)

Gets the current key by which the recordset is sorted.

Creating page number links

`PaginatorHelper::numbers($options = array())`

Returns a set of numbers for the paged result set. Uses a modulus to decide how many numbers to show on each side of the current page By default 8 links on either side of the current page will be created if those pages exist. Links will not be generated for pages that do not exist. The current page is also not a link.

Supported options are:

- `before` Content to be inserted before the numbers.
- `after` Content to be inserted after the numbers.
- `model` Model to create numbers for, defaults to `PaginatorHelper::defaultModel()`.
- `modulus` how many numbers to include on either side of the current page, defaults to 8.
- `separator` Separator content defaults to `` | ``
- `tag` The tag to wrap links in, defaults to 'span'.
- `class` The classname used on the wrapping tag.
- `currentClass` The classname to use on the current/active link. Defaults to *current*.
- `first` Whether you want first links generated, set to an integer to define the number of 'first' links to generate. Defaults to false. If a string is set a link to the first page will be generated with the value as the title:

```
<?php
echo $this->Paginator->numbers(array('first' => 'First page'));
```

- `last` Whether you want last links generated, set to an integer to define the number of 'last' links to generate. Defaults to false. Follows the same logic as the `first` option. There is a `last()`` method to be used separately as well if you wish.
- `ellipsis` Ellipsis content, defaults to '...'

While this method allows a lot of customization for its output. It is also ok to just call the method without any params.:

```
<?php
echo $this->Paginator->numbers();
```

Using the first and last options you can create links to the beginning and end of the page set. The following would create a set of page links that include links to the first 2 and last 2 pages in the paged results:

```
<?php
echo $this->Paginator->numbers(array('first' => 2, 'last' => 2));
```

Changed in version 2.1: The `currentClass` option was added in 2.1.

Creating jump links

In addition to generating links that go directly to specific page numbers, you'll often want links that go to the previous and next links, first and last pages in the paged data set.

`PaginatorHelper::`**`prev`**(*$title = '<< Previous', $options = array(), $disabledTitle = null, $disabledOptions = array()*)

Parameters

- **$title** (*string*) – Title for the link.
- **$options** (*mixed*) – Options for pagination link.
- **$disabledTitle** (*string*) – Title when the link is disabled, as when you're already on the first page, no previous page to go.
- **$disabledOptions** (*mixed*) – Options for the disabled pagination link.

Generates a link to the previous page in a set of paged records.

`$options` and `$disabledOptions` supports the following keys:

- `tag` The tag wrapping tag you want to use, defaults to 'span'.
- `escape` Whether you want the contents html entity encoded, defaults to true.
- `model` The model to use, defaults to PaginatorHelper::defaultModel()

A simple example would be:

```
<?php
echo $this->Paginator->prev(' << ' . __('previous'), array(), null, array('class' => '
```

If you were currently on the second page of posts, you would get the following:

```
<span class="prev"><a href="/posts/index/page:1/sort:title/order:desc" rel="prev"><< p
```

If there were no previous pages you would get:

```
<span class="prev disabled"><< previous</span>
```

You can change the wrapping tag using the `tag` option:

```
<?php
echo $this->Paginator->prev(__('previous'), array('tag' => 'li'));
// Would create
<li class="prev"><a href="/posts/index/page:1/sort:title/order:desc" rel="prev">previo
```

If you leave the `$disabledOptions` empty the `$options` parameter will be used. This can save some additional typing if both sets of options are the same.

`PaginatorHelper::`**`next`**(*$title = 'Next >>', $options = array(), $disabledTitle = null, $disabledOptions = array()*)

This method is identical to `prev()` with a few exceptions. It creates links pointing to the next page instead of the previous one. It also uses `next` as the rel attribute value instead of `prev`

`PaginatorHelper::`**`first`**(*$first = '<< first', $options = array()*)

Returns a first or set of numbers for the first pages. If a string is given, then only a link to the first page with the provided text will be created:

```
<?php
echo $this->Paginator->first('< first');
```

The above creates a single link for the first page. Will output nothing if you are on the first page. You can also use an integer to indicate how many first paging links you want generated:

```
<?php
echo $this->Paginator->first(3);
```

The above will create links for the first 3 pages, once you get to the third or greater page. Prior to that nothing will be output.

The options parameter accepts the following:

- `tag` The tag wrapping tag you want to use, defaults to 'span'
- `after` Content to insert after the link/tag
- `model` The model to use defaults to PaginatorHelper::defaultModel()
- `separator` Content between the generated links, defaults to ' | '
- `ellipsis` Content for ellipsis, defaults to '...'

`PaginatorHelper::`**`last`**(*$last = 'last >>', $options = array()*)

This method works very much like the `first()` method. It has a few differences though. It will not generate any links if you are on the last page for a string values of `$last`. For an integer value of `$last` no links will be generated once the user is inside the range of last pages.

`PaginatorHelper::`**`current`**(*string $model = null*)

Gets the current page of the recordset for the given model:

```
<?php
// Our url is: http://example.com/comments/view/page:3
echo $this->Paginator->current('Comment');
// Output is 3
```

`PaginatorHelper::`**`hasNext`**(*string $model = null*)

Returns true if the given result set is not at the last page.

`PaginatorHelper::`**`hasPrev`**(*string $model = null*)

Returns true if the given result set is not at the first page.

`PaginatorHelper::`**`hasPage`**(*string $model = null, integer $page = 1*)

Returns true if the given result set has the page number given by `$page`.

Creating a page counter

`PaginatorHelper::`**`counter`**(*$options = array()*)

Returns a counter string for the paged result set. Using a provided format string and a number of options you can create localized and application specific indicators of where a user is in the paged data set.

There are a number of options for `counter()`. The supported ones are:

- `format` Format of the counter. Supported formats are 'range', 'pages' and custom. Defaults to pages which would output like '1 of 10'. In the custom mode the supplied string is parsed and tokens are replaced with actual values. The available tokens are:
  - `{:page}` - the current page displayed.
  - `{:pages}` - total number of pages.
  - `{:current}` - current number of records being shown.
  - `{:count}` - the total number of records in the result set.
  - `{:start}` - number of the first record being displayed.
  - `{:end}` - number of the last record being displayed.
  - `{:model}` - The pluralized human form of the model name. If your model was 'RecipePage', `{:model}` would be 'recipe pages'. This option was added in 2.0.

  You could also supply only a string to the counter method using the tokens available. For example:

```
<?php
echo $this->Paginator->counter(
    'Page {:page} of {:pages}, showing {:current} records out of
     {:count} total, starting on record {:start}, ending on {:end}'
);
```

  Setting 'format' to range would output like '1 - 3 of 13':

```
<?php
echo $this->Paginator->counter(array(
    'format' => 'range'
));
```

- `separator` The separator between the actual page and the number of pages. Defaults to ' of '. This is used in conjunction with 'format' = 'pages' which is 'format' default value:

```
<?php
echo $this->Paginator->counter(array(
    'separator' => ' of a total of '
));
```

- `model` The name of the model being paginated, defaults to PaginatorHelper::defaultModel(). This is used in conjunction with the custom string on 'format' option.

Modifying the options PaginatorHelper uses

`PaginatorHelper::`**`options`**(*$options = array()*)

Parameters

- **$options** (*mixed*) – Default options for pagination links. If a string is supplied - it is used as the DOM id element to update.

Sets all the options for the Paginator Helper. Supported options are:

- `url` The url of the paginating action. url has a few sub options as well:
  - `sort` The key that the records are sorted by.
  - `direction` The direction of the sorting. Defaults to 'ASC'.
  - `page` The page number to display.

  The above mentioned options can be used to force particular pages/directions. You can also append additional url content into all urls generated in the helper:

```
<?php
$this->Paginator->options(array(
    'url' => array(
        'sort' => 'email', 'direction' => 'desc', 'page' => 6,
        'lang' => 'en'
    )
));
```

  The above adds the `en` route parameter to all links the helper will generate. It will also create links with specific sort, direction and page values. By default PaginatorHelper will merge in all of the current pass and named parameters. So you don't have to do that in each view file.

- `escape` Defines if the title field for links should be HTML escaped. Defaults to true.
- `update` The CSS selector of the element to update with the results of AJAX pagination calls. If not specified, regular links will be created:

```
<?php
$this->Paginator->options(array('update' => '#content'));
```

  This is useful when doing *Ajax Pagination*. Keep in mind that the value of update can be any valid CSS selector, but most often is is simpler to use an id selector.

- `model` The name of the model being paginated, defaults to PaginatorHelper::defaultModel().

Using GET parameters for pagination

Normally Pagination in CakePHP uses *Named parameters*. There are times you want to use GET parameters instead. While the main configuration option for this feature is in `PaginatorComponent`, you have some additional control in the view. You can use `options()` to indicate that you want other named parameters to be converted:

```
<?php
$this->Paginator->options(array('convertKeys' => array('your', 'keys', 'here')));
```

Configuring the PaginatorHelper to use a javascript helper

By default the `PaginatorHelper` uses `JsHelper` to do ajax features. However, if you don't want that and want to use a custom helper for ajax links, you can do so by changing the `$helpers` array in your controller. After running `paginate()` do the following:

```
<?php
// In your controller action.
$this->set('posts', $this->paginate());
$this->helpers['Paginator'] = array('ajax' => 'CustomJs');
```

Will change the `PaginatorHelper` to use the `CustomJs` for ajax operations. You could also set the 'ajax' key to be any helper, as long as that class implements a `link()` method that behaves like `HtmlHelper::link()`

Pagination in Views

It's up to you to decide how to show records to the user, but most often this will be done inside HTML tables. The examples below assume a tabular layout, but the PaginatorHelper available in views doesn't always need to be restricted as such.

See the details on PaginatorHelper (http://api20.cakephp.org/class/paginator-helper) in the API. As mentioned, the PaginatorHelper also offers sorting features which can be easily integrated into your table column headers:

```
// app/View/Posts/index.ctp
<table>
    <tr>
        <th><?php echo $this->Paginator->sort('id', 'ID'); ?></th>
        <th><?php echo $this->Paginator->sort('title', 'Title'); ?></th>
    </tr>
       <?php foreach ($data as $recipe): ?>
    <tr>
        <td><?php echo $recipe['Recipe']['id']; ?> </td>
        <td><?php echo h($recipe['Recipe']['title']); ?> </td>
    </tr>
    <?php endforeach; ?>
</table>
```

The links output from the `sort()` method of the `PaginatorHelper` allow users to click on table headers to toggle the sorting of the data by a given field.

It is also possible to sort a column based on associations:

```
<table>
    <tr>
        <th><?php echo $this->Paginator->sort('title', 'Title'); ?></th>
        <th><?php echo $this->Paginator->sort('Author.name', 'Author'); ?></th>
    </tr>
       <?php foreach ($data as $recipe): ?>
    <tr>
        <td><?php echo h($recipe['Recipe']['title']); ?> </td>
        <td><?php echo h($recipe['Author']['name']); ?> </td>
    </tr>
    <?php endforeach; ?>
</table>
```

The final ingredient to pagination display in views is the addition of page navigation, also supplied by the PaginationHelper:

```
<?php
// Shows the page numbers
echo $this->Paginator->numbers();

// Shows the next and previous links
echo $this->Paginator->prev('« Previous', null, null, array('class' => 'disabled'));
echo $this->Paginator->next('Next »', null, null, array('class' => 'disabled'));

// prints X of Y, where X is current page and Y is number of pages
echo $this->Paginator->counter();
```

The wording output by the counter() method can also be customized using special markers:

```
<?php
echo $this->Paginator->counter(array(
    'format' => 'Page {:page} of {:pages}, showing {:current} records out of
             {:count} total, starting on record {:start}, ending on {:end}'
));
```

Other Methods

`PaginatorHelper::`**`link`**(*$title*, *$url = array()*, *$options = array()*)

Parameters

- **$title** (*string*) – Title for the link.
- **$url** (*mixed*) – Url for the action. See Router::url()
- **$options** (*array*) – Options for the link. See options() for list of keys.

Accepted keys for `$options`:

- **update - The Id of the DOM element you wish to update. Creates** Ajax enabled links.
- **escape Whether you want the contents html entity encoded,** defaults to true.
- **model The model to use, defaults to** PaginatorHelper::defaultModel() .

Creates a regular or AJAX link with pagination parameters:

```
<?php
echo $this->Paginator->link('Sort by title on page 5',
        array('sort' => 'title', 'page' => 5, 'direction' => 'desc'));
```

If created in the view for `/posts/index` Would create a link pointing at '/posts/index/page:5/sort:title/direction:desc'

`PaginatorHelper::url`(*$options = array()*, *$asArray = false*, *$model = null*)

Parameters

- **$options** (*array*) – Pagination/URL options array. As used on `options()` or `link()` method.
- **$asArray** (*boolean*) – Return the url as an array, or a URI string. Defaults to false.
- **$model** (*string*) – Which model to paginate on

By default returns a full pagination URL string for use in non-standard contexts (i.e. JavaScript).:

```
<?php
echo $this->Paginator->url(array('sort' => 'title'), true);
```

`PaginatorHelper::defaultModel`()

Gets the default model of the paged sets or null if pagination is not initialized.

`PaginatorHelper::params`(*string $model = null*)

Gets the current paging parameters from the resultset for the given model:

```
<?php
debug($this->Paginator->params());
/*
Array
(
    [page] => 2
    [current] => 2
    [count] => 43
    [prevPage] => 1
    [nextPage] => 3
    [pageCount] => 3
    [order] =>
    [limit] => 20
    [options] => Array
        (
            [page] => 2
            [conditions] => Array
                (
                )
        )
    [paramType] => named
)
*/
```

RSS

class `RssHelper`(*View $view*, *array $settings = array()*)

The RSS helper makes generating XML for RSS feeds easy.

Creating an RSS feed with the RssHelper

This example assumes you have a Posts Controller and Post Model already created and want to make an alternative view for RSS.

Creating an xml/rss version of posts/index is a snap with CakePHP. After a few simple steps you can simply append the desired extension .rss to `posts/index` making your URL `posts/index.rss`. Before we jump too far ahead trying to get our webservice up and running we need to do a few things. First parseExtensions needs to be activated, this is done in `app/Config/routes.php`:

```
<?php
Router::parseExtensions('rss');
```

In the call above we've activated the .rss extension. When using `Router::parseExtensions()` you can pass as many arguments or extensions as you want. This will activate each extension/content-type for use in your application. Now when the address `posts/index.rss` is requested you will get an xml version of your `posts/index`. However, first we need to edit the controller to add in the rss-specific code.

Controller Code

It is a good idea to add RequestHandler to your PostsController's $components array. This will allow a lot of automagic to occur:

```
<?php
public $components = array('RequestHandler');
```

Our view will also use the `TextHelper` for formatting, so that should be added to the controller as well:

```
<?php
public $helpers = array('Text');
```

Before we can make an RSS version of our posts/index we need to get a few things in order. It may be tempting to put the channel metadata in the controller action and pass it to your view using the `Controller::set()` method but this is inappropriate. That information can also go in the view. That will come later though, for now if you have a different set of logic for the data used to make the RSS feed and the data for the html view you can use the `RequestHandler::isRss()` method, otherwise your controller can stay the same:

```
<?php
// Modify the Posts Controller action that corresponds to
// the action which deliver the rss feed, which is the
// index action in our example

public function index() {
    if ($this->RequestHandler->isRss() ) {
        $posts = $this->Post->find('all', array('limit' => 20, 'order' => 'Post.created DES
        return $this->set(compact('posts'));
    }

    // this is not an Rss request, so deliver
    // data used by website's interface
    $this->paginate['Post'] = array('order' => 'Post.created DESC', 'limit' => 10);

    $posts = $this->paginate();
    $this->set(compact('posts'));
}
```

With all the View variables set we need to create an rss layout.

Layout

An Rss layout is very simple, put the following contents in `app/View/Layouts/rss/default.ctp`:

```
<?php
if (!isset($documentData)) {
    $documentData = array();
}
if (!isset($channelData)) {
    $channelData = array();
}
if (!isset($channelData['title'])) {
    $channelData['title'] = $title_for_layout;
}
$channel = $this->Rss->channel(array(), $channelData, $content_for_layout);
echo $this->Rss->document($documentData, $channel);
```

It doesn't look like much but thanks to the power in the `RssHelper` it's doing a lot of lifting for us. We haven't set `$documentData` or `$channelData` in the controller, however in CakePHP your views can pass variables back to the layout. Which is where our `$channelData` array will come from setting all of the meta data for our feed.

Next up is view file for my posts/index. Much like the layout file we created, we need to create a `View/Posts/rss/` directory and create a new `index.ctp` inside that folder. The contents of the file are below.

View

Our view, located at `app/View/Posts/rss/index.ctp`, begins by setting the `$documentData` and `$channelData` variables for the layout, these contain all the metadata for our RSS feed. This is done by using the `View::set()` ` method which is analogous to the Controller::set() method. Here though we are passing the channel's metadata back to the layout:

```
<?php
$this->set('channelData', array(
    'title' => __("Most Recent Posts"),
    'link' => $this->Html->url('/', true),
    'description' => __("Most recent posts."),
    'language' => 'en-us'
));
```

The second part of the view generates the elements for the actual records of the feed. This is accomplished by looping through the data that has been passed to the view ($items) and using the `RssHelper::item()` method. The other method you can use, `RssHelper::items()` which takes a callback and an array of items for the feed. (The method I have seen used for the callback has always been called `transformRss()`. There is one downfall to this method, which is that you cannot use any of the other helper classes to prepare your data inside the callback method because the scope inside the method does not include anything that is not passed inside, thus not giving access to the TimeHelper or any other helper that you may need. The `RssHelper::item()` transforms the associative array into an element for each key value pair.

Note: You will need to modify the $postLink variable as appropriate to your application.

```php
<?php
// You should import Sanitize
App::uses('Sanitize', 'Utility');

foreach ($posts as $post) {
    $postTime = strtotime($post['Post']['created']);

    $postLink = array(
        'controller' => 'posts',
        'action' => 'view',
        'year' => date('Y', $postTime),
        'month' => date('m', $postTime),
        'day' => date('d', $postTime),
        $post['Post']['slug']
    );

    // This is the part where we clean the body text for output as the description
    // of the rss item, this needs to have only text to make sure the feed validates
    $bodyText = preg_replace('=\(.*?\)=is', '', $post['Post']['body']);
    $bodyText = $this->Text->stripLinks($bodyText);
    $bodyText = Sanitize::stripAll($bodyText);
    $bodyText = $this->Text->truncate($bodyText, 400, array(
        'ending' => '...',
        'exact'  => true,
        'html'   => true,
    ));

    echo  $this->Rss->item(array(), array(
        'title' => $post['Post']['title'],
        'link' => $postLink,
        'guid' => array('url' => $postLink, 'isPermaLink' => 'true'),
        'description' => $bodyText,
        'pubDate' => $post['Post']['created']
    ));
}
```

You can see above that we can use the loop to prepare the data to be transformed into XML elements. It is important to filter out any non-plain text characters out of the description, especially if you are using a rich text editor for the body of your blog. In the code above we use the `TextHelper::stripLinks()`

method and a few methods from the Sanitize class, but we recommend writing a comprehensive text cleaning helper to really scrub the text clean. Once we have set up the data for the feed, we can then use the `RssHelper::item()` method to create the XML in RSS format. Once you have all this setup, you can test your RSS feed by going to your site `/posts/index.rss` and you will see your new feed. It is always important that you validate your RSS feed before making it live. This can be done by visiting sites that validate the XML such as Feed Validator or the w3c site at http://validator.w3.org/feed/.

Note: You may need to set the value of 'debug' in your core configuration to 1 or to 0 to get a valid feed, because of the various debug information added automagically under higher debug settings that break XML syntax or feed validation rules.

Rss Helper API

property `RssHelper::$`**`action`**
Current action

property `RssHelper::$`**`base`**
Base URL

property `RssHelper::$`**`data`**
POSTed model data

property `RssHelper::$`**`field`**
Name of the current field

property `RssHelper::$`**`helpers`**
Helpers used by the RSS Helper

property `RssHelper::$`**`here`**
URL to current action

property `RssHelper::$`**`model`**
Name of current model

property `RssHelper::$`**`params`**
Parameter array

property `RssHelper::$`**`version`**
Default spec version of generated RSS.

`RssHelper::`**`channel`**(*array $attrib = array (), array $elements = array (), mixed $content = null*)

Return type string

Returns an RSS `<channel />` element.

`RssHelper::`**`document`**(*array $attrib = array (), string $content = null*)

Return type string

Returns an RSS document wrapped in `<rss />` tags.

`RssHelper::`**`elem`**(*string $name*, *array $attrib = array ()*, *mixed $content = null*, *boolean $endTag = true*)

Return type string

Generates an XML element.

`RssHelper::`**`item`**(*array $att = array ()*, *array $elements = array ()*)

Return type string

Converts an array into an `<item />` element and its contents.

`RssHelper::`**`items`**(*array $items*, *mixed $callback = null*)

Return type string

Transforms an array of data using an optional callback, and maps it to a set of `<item />` tags.

`RssHelper::`**`time`**(*mixed $time*)

Return type string

Converts a time in any format to an RSS time. See `TimeHelper::toRSS()`.

SessionHelper

class **`SessionHelper`**(*View $view*, *array $settings = array()*)

As a natural counterpart to the Session Component, the Session Helper replicates most of the components functionality and makes it available in your view.

The major difference between the Session Helper and the Session Component is that the helper does *not* have the ability to write to the session.

As with the Session Component, data is read by using *dot notation* array structures:

```
<?php
array('User' => array(
    'username' => 'super@example.com'
));
```

Given the previous array structure, the node would be accessed by `User.username`, with the dot indicating the nested array. This notation is used for all Session helper methods wherever a `$key` is used.

`SessionHelper::`**`read`**(*string $key*)

Return type mixed

Read from the Session. Returns a string or array depending on the contents of the session.

`SessionHelper::`**`check`**(*string $key*)

Return type boolean

Check to see if a key is in the Session. Returns a boolean on the key's existence.

`SessionHelper::`**`error`**()

Return type string

Returns last error encountered in a session.

`SessionHelper::valid()`

Return type boolean

Used to check is a session is valid in a view.

Displaying notifications or flash messages

`SessionHelper::flash`(*string $key = 'flash', array $params = array()*)

Return type string

As explained in *Creating notification messages* you can create one-time notifications for feedback. After creating messages with `SessionComponent::setFlash()` you will want to display them. Once a message is displayed, it will be removed and not displayed again:

```
<?php
echo $this->Session->flash();
```

The above will output a simple message, with the following html:

```
<div id="flashMessage" class="message">
    Your stuff has been saved.
</div>
```

As with the component method you can set additional properties and customize which element is used. In the controller you might have code like:

```
<?php
// in a controller
$this->Session->setFlash('The user could not be deleted.');
```

When outputting this message, you can choose the element used to display this message:

```
<?php
// in a layout.
echo $this->Session->flash('flash', array('element' => 'failure'));
```

This would use `View/Elements/failure.ctp` to render the message. The message text would be available as `$message` in the element.

Inside the failure element file would be something like this:

```
<div class="flash flash-failure">
    <?php echo $message; ?>
</div>
```

You can also pass additional parameters into the `flash()` method, which allow you to generate customized messages:

```
<?php
// In the controller
$this->Session->setFlash('Thanks for your payment %s');

// In the layout.
echo $this->Session->flash('flash', array(
    'params' => array('name' => $user['User']['name'])
    'element' => 'payment'
));

// View/Elements/payment.ctp
<div class="flash payment">
    <?php printf($message, h($name)); ?>
</div>
```

TextHelper

class TextHelper(*View $view*, *array $settings = array()*)

The TextHelper contains methods to make text more usable and friendly in your views. It aids in enabling links, formatting urls, creating excerpts of text around chosen words or phrases, highlighting key words in blocks of text, and to gracefully truncating long stretches of text. Changed in version 2.1: Several of `TextHelper` methods have been moved into `String` class to allow easier use outside of the `View` layer. Within a view, these methods are accessible via the *TextHelper* class and you can called it as you would call a normal helper method: `$this->Text->method($args);`.

`TextHelper::`**`autoLinkEmails`**(*string $text*, *array $options=array()*)

Parameters

- **$text** (*string*) – The text to convert.
- **$options** (*array*) – An array of *html attributes* for the generated links.

Adds links to the well-formed email addresses in $text, according to any options defined in `$htmlOptions` (see `HtmlHelper::link()`).:

```
<?php
$myText = 'For more information regarding our world-famous pastries and desserts, cont
$linkedText = $this->Text->autoLinkEmails($myText);
```

Output:

```
For more information regarding our world-famous pastries and desserts,
contact <a href="mailto:info@example.com">info@example.com</a>
```

Changed in version 2.1: In 2.1 this method automatically escapes its input. Use the `escape` option to disable this if necessary.

`TextHelper::`**`autoLinkUrls`**(*string $text*, *array $htmlOptions=array()*)

Parameters

- **$text** (*string*) – The text to convert.

- **$htmlOptions** (*array*) – An array *html attributes* for the generated links

Same as in `autoLinkEmails()`, only this method searches for strings that start with https, http, ftp, or nntp and links them appropriately. Changed in version 2.1: In 2.1 this method automatically escapes its input. Use the `escape` option to disable this if necessary.

`TextHelper::`**`autoLink`**(*string $text*, *array $htmlOptions=array()*)

Parameters

- **$text** (*string*) – The text to autolink.
- **$htmlOptions** (*array*) – An array *html attributes* for the generated links

Performs the functionality in both `autoLinkUrls()` and `autoLinkEmails()` on the supplied `$text`. All URLs and emails are linked appropriately given the supplied `$htmlOptions`. Changed in version 2.1: In 2.1 this method automatically escapes its input. Use the `escape` option to disable this if necessary.

`TextHelper::`**`highlight`**(*string $haystack*, *string $needle*, *array $options = array()*)

Parameters

- **$haystack** (*string*) – The string to search.
- **$needle** (*string*) – The string to find.
- **$options** (*array*) – An array of options, see below.

Highlights `$needle` in `$haystack` using the `$options['format']` string specified or a default string.

Options:

- 'format' - string The piece of html with that the phrase will be highlighted
- 'html' - bool If true, will ignore any HTML tags, ensuring that only the correct text is highlighted

Example:

```
<?php
// called as TextHelper
echo $this->Text->highlight($lastSentence, 'using', array('format' => '<span class="hi

// called as String
App::uses('String', 'Utility');
echo String::highlight($lastSentence, 'using', array('format' => '<span class="highlig
```

Output:

```
Highlights $needle in $haystack <span class="highlight">using</span>
the $options['format'] string specified  or a default string.
```

`TextHelper::`**`stripLinks`**(*$text*)

Strips the supplied `$text` of any HTML links.

`TextHelper::`**`truncate`**(*string $text*, *int $length=100*, *array $options*)

Parameters

- **$text** (*string*) – The text to truncate.
- **$length** (*int*) – The length to trim to.
- **$options** (*array*) – An array of options to use.

Cuts a string to the `$length` and adds a suffix with `'ellipsis'` if the text is longer than `$length`. If `'exact'` is passed as `false`, the truncation will occur after the next word ending. If `'html'` is passed as `true`, html tags will be respected and will not be cut off.

`$options` is used to pass all extra parameters, and has the following possible keys by default, all of which are optional:

```
array(
    'ellipsis' => '...',
    'exact' => true,
    'html' => false
)
```

Example:

```
<?php
// called as TextHelper
echo $this->Text->truncate(
    'The killer crept forward and tripped on the rug.',
    22,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);

// called as String
App::uses('String', 'Utility');
echo String::truncate(
    'The killer crept forward and tripped on the rug.',
    22,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);
```

Output:

```
The killer crept...
```

Changed in version 2.3: `ending` has been replaced by `ellipsis`. `ending` is still used in 2.2.1

`TextHelper::`**`tail`**(*string $text*, *int $length=100*, *array $options*)

Parameters

- **$text** (*string*) – The text to truncate.
- **$length** (*int*) – The length to trim to.

- **$options** (*array*) – An array of options to use.

Cuts a string to the `$length` and adds a prefix with `'ellipsis'` if the text is longer than `$length`. If `'exact'` is passed as `false`, the truncation will occur before the next word ending.

`$options` is used to pass all extra parameters, and has the following possible keys by default, all of which are optional:

```
array(
    'ellipsis' => '...',
    'exact' => true
)
```

New in version 2.3. Example:

```
<?php
// called as TextHelper
echo $this->Text->tail(
    'I packed my bag and in it I put a PSP, a PS3, a TV, a C# program that can divide
    70,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);

// called as String
App::uses('String', 'Utility');
echo String::tail(
    'I packed my bag and in it I put a PSP, a PS3, a TV, a C# program that can divide
    70,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);
```

Output:

```
...a TV, a C# program that can divide by zero, death metal t-shirts
```

`TextHelper::`**`excerpt`**(*string $haystack*, *string $needle*, *integer $radius=100*, *string $ellipsis="..."*)

Parameters

- **$haystack** (*string*) – The string to search.
- **$needle** (*string*) – The string to excerpt around.
- **$radius** (*int*) – The number of characters on either side of $needle you want to include.
- **$ellipsis** (*string*) – Text to append/prepend to the beginning or end of the result.

Extracts an excerpt from `$haystack` surrounding the `$needle` with a number of characters on each side determined by `$radius`, and prefix/suffix with `$ellipsis`. This method is especially handy for search results. The query string or keywords can be shown within the resulting document.:

```
<?php
// called as TextHelper
echo $this->Text->excerpt($lastParagraph, 'method', 50, '...');

// called as String
App::uses('String', 'Utility');
echo String::excerpt($lastParagraph, 'method', 50, '...');
```

Output:

```
... by $radius, and prefix/suffix with $ellipsis. This method is
especially handy for search results. The query...
```

`TextHelper::`**`toList`**(*array $list*, *$and='and'*)

Parameters

- **$list** (*array*) – Array of elements to combine into a list sentence.
- **$and** (*string*) – The word used for the last join.

Creates a comma-separated list where the last two items are joined with 'and'.:

```
<?php
// called as TextHelper
echo $this->Text->toList($colors);

// called as String
App::uses('String', 'Utility');
echo String::toList($colors);
```

Output:

```
red, orange, yellow, green, blue, indigo and violet
```

TimeHelper

class `TimeHelper`(*View $view*, *array $settings = array()*)

The Time Helper does what it says on the tin: saves you time. It allows for the quick processing of time related information. The Time Helper has two main tasks that it can perform:

1. It can format time strings.
2. It can test time (but cannot bend time, sorry).

Changed in version 2.1: `TimeHelper` have been refactored into `CakeTime` class to allow easier use outside of the `View` layer. Within a view, these methods are accessible via the *TimeHelper* class and you can called it as you would call a normal helper method: `$this->Time->method($args);`.

Using the Helper

A common use of the Time Helper is to offset the date and time to match a user’s time zone. Lets use a forum as an example. Your forum has many users who may post messages at any time from any part of the world. An easy way to manage the time is to save all dates and times as GMT+0 or UTC. Uncomment the line `date_default_timezone_set(’UTC’);` in `app/Config/core.php` to ensure your application’s time zone is set to GMT+0.

Next add a time zone field to your users table and make the necessary modifications to allow your users to set their time zone. Now that we know the time zone of the logged in user we can correct the date and time on our posts using the Time Helper:

```
<?php
echo $this->Time->format(’F jS, Y h:i A’, $post[’Post’][’created’], null, $user[’User’][’t
// Will display August 22nd, 2011 11:53 PM for a user in GMT+0
// August 22nd, 2011 03:53 PM for a user in GMT-8
// and August 23rd, 2011 09:53 AM GMT+10
```

Most of the Time Helper methods contain a $userOffset. The $userOffset parameter accepts a decimal number between -12 and 12.

Formatting

`TimeHelper::`**`convert`**(*$serverTime*, *$timezone = NULL*)

Return type integer

Converts given time (in server’s time zone) to user’s local time, given his/her timezone.:

```
<?php
// called via TimeHelper
echo $this->Time->convert(time(), ’Asia/Jakarta’);
// 1321038036

// called as CakeTime
App::uses(’CakeTime’, ’Utility’);
echo CakeTime::convert(time(), new DateTimeZone(’Asia/Jakarta’));
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.

`TimeHelper::`**`convertSpecifiers`**(*$format*, *$time = NULL*)

Return type string

Converts a string representing the format for the function strftime and returns a windows safe and i18n aware format.

`TimeHelper::`**`dayAsSql`**(*$dateString*, *$field_name*, *$timezone = NULL*)

Return type string

Creates a string in the same format as daysAsSql but only needs a single date object:

```
<?php
// called via TimeHelper
echo $this->Time->dayAsSql('Aug 22, 2011', 'modified');
// (modified >= '2011-08-22 00:00:00') AND (modified <= '2011-08-22 23:59:59')

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::dayAsSql('Aug 22, 2011', 'modified');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`daysAsSql`**(*$begin*, *$end*, *$fieldName*, *$timezone = NULL*)

Return type string

Returns a string in the format "($field_name >= '2008-01-21 00:00:00') AND ($field_name <= '2008-01-25 23:59:59')". This is handy if you need to search for records between two dates inclusively:

```
<?php
// called via TimeHelper
echo $this->Time->daysAsSql('Aug 22, 2011', 'Aug 25, 2011', 'created');
// (created >= '2011-08-22 00:00:00') AND (created <= '2011-08-25 23:59:59')

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::daysAsSql('Aug 22, 2011', 'Aug 25, 2011', 'created');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`format`**(*$format*, *$dateString = NULL*, *$invalid = false*, *$timezone = NULL*)

Return type string

Will return a string formatted to the given format using the PHP date() formatting options (http://www.php.net/manual/en/function.date.php):

```
<?php
// called via TimeHelper
echo $this->Time->format('Y-m-d H:i:s');
// The Unix Epoch as 1970-01-01 00:00:00

echo $this->Time->format('F jS, Y h:i A', '2011-08-22 11:53:00');
// August 22nd, 2011 11:53 AM

echo $this->Time->format('r', '+2 days', true);
// 2 days from now formatted as Sun, 13 Nov 2011 03:36:10 +0800

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::format('Y-m-d H:i:s');
echo CakeTime::format('F jS, Y h:i A', '2011-08-22 11:53:00');
echo CakeTime::format('r', '+2 days', true);
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`fromString`**(*$dateString*, *$timezone = NULL*)

Return type string

Takes a string and uses strtotime (http://us.php.net/manual/en/function.date.php) to convert it into a date integer:

```
<?php
// called via TimeHelper
echo $this->Time->fromString('Aug 22, 2011');
// 1313971200

echo $this->Time->fromString('+1 days');
// 1321074066 (+1 day from current date)

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::fromString('Aug 22, 2011');
echo CakeTime::fromString('+1 days');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`gmt`**(*$dateString = NULL*)

Return type integer

Will return the date as an integer set to Greenwich Mean Time (GMT).:

```
<?php
// called via TimeHelper
echo $this->Time->gmt('Aug 22, 2011');
// 1313971200

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::gmt('Aug 22, 2011');
```

`TimeHelper::`**`i18nFormat`**(*$date*, *$format = NULL*, *$invalid = false*, *$timezone = NULL*)

Return type string

Returns a formatted date string, given either a UNIX timestamp or a valid strtotime() date string. It take in account the default date format for the current language if a LC_TIME file is used. Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.

`TimeHelper::`**`nice`**(*$dateString = NULL*, *$timezone = NULL*)

Return type string

Takes a date string and outputs it in the format "Tue, Jan 1st 2008, 19:25":

```
<?php
// called via TimeHelper
```

```
echo $this->Time->nice('2011-08-22 11:53:00');
// Mon, Aug 22nd 2011, 11:53

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::nice('2011-08-22 11:53:00');
```

`TimeHelper::`**`niceShort`**(*$dateString = NULL*, *$timezone = NULL*)

> **Return type** string

Takes a date string and outputs it in the format "Jan 1st 2008, 19:25". If the date object is today, the format will be "Today, 19:25". If the date object is yesterday, the format will be "Yesterday, 19:25":

```
<?php
// called via TimeHelper
echo $this->Time->niceShort('2011-08-22 11:53:00');
// Aug 22nd, 11:53

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::niceShort('2011-08-22 11:53:00');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`serverOffset`**()

> **Return type** integer

Returns server's offset from GMT in seconds.

`TimeHelper::`**`timeAgoInWords`**(*$dateString*, *$options = array()*)

> **Return type** string

Will take a datetime string (anything that is parsable by PHP's strtotime() function or MySQL's datetime format) and convert it into a friendly word format like, "3 weeks, 3 days ago":

```
<?php
// called via TimeHelper
echo $this->Time->timeAgoInWords('Aug 22, 2011');
// on 22/8/11

echo $this->Time->timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y'));
// on August 22nd, 2011

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::timeAgoInWords('Aug 22, 2011');
echo CakeTime::timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y'));
```

Use the 'end' option to determine the cutoff point to no longer will use words; default '+1 month':

```
<?php
// called via TimeHelper
```

```
echo $this->Time->timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y', 'end' =>
// On Nov 10th, 2011 it would display: 2 months, 2 weeks, 6 days ago

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y', 'end' => '+
```

Use the 'accuracy' option to determine how precise the output should be. You can use this to limit the output:

```
<?php
// If $timestamp is 1 month, 1 week, 5 days and 6 hours ago
echo CakeTime::timeAgoInWords($timestamp, array(
    'accuracy' => array('month' => 'month'),
    'end' => '1 year'
));
// Outputs '1 month ago'
```

Changed in version 2.2: The `accuracy` option was added.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`toAtom`**(*$dateString*, *$timezone = NULL*)

Return type string

Will return a date string in the Atom format "2008-01-12T00:00:00Z" Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`toQuarter`**(*$dateString*, *$range = false*)

Return type mixed

Will return 1, 2, 3 or 4 depending on what quarter of the year the date falls in. If range is set to true, a two element array will be returned with start and end dates in the format "2008-03-31":

```
<?php
// called via TimeHelper
echo $this->Time->toQuarter('Aug 22, 2011');
// Would print 3

$arr = $this->Time->toQuarter('Aug 22, 2011', true);
/*
Array
(
    [0] => 2011-07-01
    [1] => 2011-09-30
)
*/

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::toQuarter('Aug 22, 2011');
$arr = CakeTime::toQuarter('Aug 22, 2011', true);
```

New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`toRSS`**`(`*$dateString*, *$timezone = NULL*`)`

Return type string

Will return a date string in the RSS format "Sat, 12 Jan 2008 00:00:00 -0500" Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`toUnix`**`(`*$dateString*, *$timezone = NULL*`)`

Return type integer

A wrapper for fromString. Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`TimeHelper::`**`toServer`**`(`*$dateString*, *$timezone = NULL*, *$format = 'Y-m-d H:i:s'*`)`

Return type mixed

New in version 2.2: Returns a formatted date in server's timezone.

`TimeHelper::`**`timezone`**`(`*$timezone = NULL*`)`

Return type DateTimeZone

New in version 2.2: Returns a timezone object from a string or the user's timezone object. If the function is called without a parameter it tries to get timezone from 'Config.timezone' configuration variable.

`TimeHelper::`**`listTimezones`**`(`*$filter = null*, *$country = null*, *$group = true*`)`

Return type array

New in version 2.2: Returns a list of timezone identifiers.

Testing Time

`TimeHelper::`**`isToday`**`(`*$dateString*, *$timezone = NULL*`)`

`TimeHelper::`**`isThisWeek`**`(`*$dateString*, *$timezone = NULL*`)`

`TimeHelper::`**`isThisMonth`**`(`*$dateString*, *$timezone = NULL*`)`

`TimeHelper::`**`isThisYear`**`(`*$dateString*, *$timezone = NULL*`)`

`TimeHelper::`**`wasYesterday`**`(`*$dateString*, *$timezone = NULL*`)`

`TimeHelper::`**`isTomorrow`**`(`*$dateString*, *$timezone = NULL*`)`

`TimeHelper::`**`wasWithinLast`**`(`*$timeInterval*, *$dateString*, *$timezone = NULL*`)`

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object. All of the above functions return true or false when passed a date string. `wasWithinLast` takes an additional `$timeInterval` option:

```
<?php
// called via TimeHelper
$this->Time->wasWithinLast($timeInterval, $dateString);

// called as CakeTime
App::uses('CakeTime', 'Utility');
CakeTime::wasWithinLast($timeInterval, $dateString);
```

`wasWithinLast` takes a time interval which is a string in the format "3 months" and accepts a time interval of seconds, minutes, hours, days, weeks, months and years (plural and not). If a time interval is not recognized (for example, if it is mistyped) then it will default to days.

Behaviors

Behaviors add extra functionality to your models. CakePHP comes with a number of built-in behaviors such as `TreeBehavior` and `ContainableBehavior`.

To learn about creating and using behaviors, read the section on *Behaviors*.

ACL

class AclBehavior

The Acl behavior provides a way to seamlessly integrate a model with your ACL system. It can create both AROs or ACOs transparently.

To use the new behavior, you can add it to the $actsAs property of your model. When adding it to the actsAs array you choose to make the related Acl entry an ARO or an ACO. The default is to create ACOs:

```
<?php
class User extends AppModel {
    public $actsAs = array('Acl' => array('type' => 'requester'));
}
```

This would attach the Acl behavior in ARO mode. To join the ACL behavior in ACO mode use:

```
<?php
class Post extends AppModel {
    public $actsAs = array('Acl' => array('type' => 'controlled'));
}
```

For User and Group models it is common to have both ACO and ARO nodes, to achieve this use:

```
<?php
class User extends AppModel {
    public $actsAs = array('Acl' => array('type' => 'both'));
}
```

You can also attach the behavior on the fly like so:

```php
<?php
$this->Post->Behaviors->attach('Acl', array('type' => 'controlled'));
```

Changed in version 2.1: You can now safely attach AclBehavior to AppModel. Aco, Aro and AclNode now extend Model instead of AppModel, which would cause an infinite loop. If your application depends on having those models to extend AppModel for some reason, then copy AclNode to your application and have it extend AppModel again.

Using the AclBehavior

Most of the AclBehavior works transparently on your Model's afterSave(). However, using it requires that your Model has a parentNode() method defined. This is used by the AclBehavior to determine parent->child relationships. A model's parentNode() method must return null or return a parent Model reference:

```php
<?php
function parentNode() {
    return null;
}
```

If you want to set an ACO or ARO node as the parent for your Model, parentNode() must return the alias of the ACO or ARO node:

```php
<?php
function parentNode() {
    return 'root_node';
}
```

A more complete example. Using an example User Model, where User belongsTo Group:

```php
<?php
function parentNode() {
    if (!$this->id && empty($this->data)) {
        return null;
    }
    $data = $this->data;
    if (empty($this->data)) {
        $data = $this->read();
    }
    if (!$data['User']['group_id']) {
        return null;
    } else {
        return array('Group' => array('id' => $data['User']['group_id']));
    }
}
```

In the above example the return is an array that looks similar to the results of a model find. It is important to have the id value set or the parentNode relation will fail. The AclBehavior uses this data to construct its tree structure.

node()

The AclBehavior also allows you to retrieve the Acl node associated with a model record. After setting $model->id. You can use $model->node() to retrieve the associated Acl node.

You can also retrieve the Acl Node for any row, by passing in a data array:

```
<?php
$this->User->id = 1;
$node = $this->User->node();

$user = array('User' => array(
    'id' => 1
));
$node = $this->User->node($user);
```

Will both return the same Acl Node information.

If you had setup AclBehavior to create both ACO and ARO nodes, you need to specify which node type you want:

```
<?php
$this->User->id = 1;
$node = $this->User->node(null, 'Aro');

$user = array('User' => array(
    'id' => 1
));
$node = $this->User->node($user, 'Aro');
```

Containable

class ContainableBehavior

A new addition to the CakePHP 1.2 core is the `ContainableBehavior`. This model behavior allows you to filter and limit model find operations. Using Containable will help you cut down on needless wear and tear on your database, increasing the speed and overall performance of your application. The class will also help you search and filter your data for your users in a clean and consistent way.

Containable allows you to streamline and simplify operations on your model bindings. It works by temporarily or permanently altering the associations of your models. It does this by using supplied the containments to generate a series of `bindModel` and `unbindModel` calls.

To use the new behavior, you can add it to the $actsAs property of your model:

```
<?php
class Post extends AppModel {
    public $actsAs = array('Containable');
}
```

You can also attach the behavior on the fly:

```
<?php
$this->Post->Behaviors->attach('Containable');
```

Using Containable

To see how Containable works, let's look at a few examples. First, we'll start off with a find() call on a model named Post. Let's say that Post hasMany Comment, and Post hasAndBelongsToMany Tag. The amount of data fetched in a normal find() call is rather extensive:

```
<?php
debug($this->Post->find('all'));

[0] => Array
        (
            [Post] => Array
                (
                    [id] => 1
                    [title] => First article
                    [content] => aaa
                    [created] => 2008-05-18 00:00:00
                )
            [Comment] => Array
                (
                    [0] => Array
                        (
                            [id] => 1
                            [post_id] => 1
                            [author] => Daniel
                            [email] => dan@example.com
                            [website] => http://example.com
                            [comment] => First comment
                            [created] => 2008-05-18 00:00:00
                        )
                    [1] => Array
                        (
                            [id] => 2
                            [post_id] => 1
                            [author] => Sam
                            [email] => sam@example.net
                            [website] => http://example.net
                            [comment] => Second comment
                            [created] => 2008-05-18 00:00:00
                        )
                )
            [Tag] => Array
                (
                    [0] => Array
                        (
                            [id] => 1
                            [name] => Awesome
                        )
                    [1] => Array
```

```
                        (
                            [id] => 2
                            [name] => Baking
                        )
                )
        )
[1] => Array
        (
            [Post] => Array
                (...
```

For some interfaces in your application, you may not need that much information from the Post model. One thing the `ContainableBehavior` does is help you cut down on what find() returns.

For example, to get only the post-related information, you can do the following:

```
<?php
$this->Post->contain();
$this->Post->find('all');
```

You can also invoke Containable's magic from inside the find() call:

```
<?php
$this->Post->find('all', array('contain' => false));
```

Having done that, you end up with something a lot more concise:

```
[0] => Array
        (
            [Post] => Array
                (
                    [id] => 1
                    [title] => First article
                    [content] => aaa
                    [created] => 2008-05-18 00:00:00
                )
        )
[1] => Array
        (
            [Post] => Array
                (
                    [id] => 2
                    [title] => Second article
                    [content] => bbb
                    [created] => 2008-05-19 00:00:00
                )
        )
```

This sort of help isn't new: in fact, you can do that without the `ContainableBehavior` doing something like this:

```
<?php
$this->Post->recursive = -1;
$this->Post->find('all');
```

Containable really shines when you have complex associations, and you want to pare down things that sit at the same level. The model's `$recursive` property is helpful if you want to hack off an entire level of recursion, but not when you want to pick and choose what to keep at each level. Let's see how it works by using the `contain()` method.

The contain method's first argument accepts the name, or an array of names, of the models to keep in the find operation. If we wanted to fetch all posts and their related tags (without any comment information), we'd try something like this:

```php
<?php
$this->Post->contain('Tag');
$this->Post->find('all');
```

Again, we can use the contain key inside a find() call:

```php
<?php
$this->Post->find('all', array('contain' => 'Tag'));
```

Without Containable, you'd end up needing to use the `unbindModel()` method of the model, multiple times if you're paring off multiple models. Containable creates a cleaner way to accomplish this same task.

Containing deeper associations

Containable also goes a step deeper: you can filter the data of the *associated* models. If you look at the results of the original find() call, notice the author field in the Comment model. If you are interested in the posts and the names of the comment authors — and nothing else — you could do something like the following:

```php
<?php
$this->Post->contain('Comment.author');
$this->Post->find('all');

// or..

$this->Post->find('all', array('contain' => 'Comment.author'));
```

Here, we've told Containable to give us our post information, and just the author field of the associated Comment model. The output of the find call might look something like this:

```
[0] => Array
        (
            [Post] => Array
                (
                    [id] => 1
                    [title] => First article
                    [content] => aaa
                    [created] => 2008-05-18 00:00:00
                )
            [Comment] => Array
                (
                    [0] => Array
                        (
                            [author] => Daniel
                            [post_id] => 1
                        )
                    [1] => Array
                        (
                            [author] => Sam
                            [post_id] => 1
                        )
                )
        )
[1] => Array
        (...
```

As you can see, the Comment arrays only contain the author field (plus the post_id which is needed by CakePHP to map the results).

You can also filter the associated Comment data by specifying a condition:

```
<?php
$this->Post->contain('Comment.author = "Daniel"');
$this->Post->find('all');

//or...

$this->Post->find('all', array('contain' => 'Comment.author = "Daniel"'));
```

This gives us a result that gives us posts with comments authored by Daniel:

```
[0] => Array
        (
            [Post] => Array
                (
                    [id] => 1
                    [title] => First article
                    [content] => aaa
                    [created] => 2008-05-18 00:00:00
                )
            [Comment] => Array
                (
                    [0] => Array
                        (
                            [id] => 1
                            [post_id] => 1
                            [author] => Daniel
                            [email] => dan@example.com
                            [website] => http://example.com
                            [comment] => First comment
                            [created] => 2008-05-18 00:00:00
                        )
                )
        )
```

Additional filtering can be performed by supplying the standard *find* options:

```
<?php
$this->Post->find('all', array('contain' => array(
    'Comment' => array(
        'conditions' => array('Comment.author =' => "Daniel"),
        'order' => 'Comment.created DESC'
    )
)));
```

Here's an example of using the `ContainableBehavior` when you've got deep and complex model relationships.

Let's consider the following model associations:

```
User->Profile
User->Account->AccountSummary
User->Post->PostAttachment->PostAttachmentHistory->HistoryNotes
User->Post->Tag
```

This is how we retrieve the above associations with Containable:

```
<?php
$this->User->find('all', array(
    'contain' => array(
        'Profile',
        'Account' => array(
            'AccountSummary'
        ),
        'Post' => array(
            'PostAttachment' => array(
                'fields' => array('id', 'name'),
                'PostAttachmentHistory' => array(
                    'HistoryNotes' => array(
                        'fields' => array('id', 'note')
                    )
                )
            ),
            'Tag' => array(
                'conditions' => array('Tag.name LIKE' => '%happy%')
            )
        )
    )
));
```

Keep in mind that `contain` key is only used once in the main model, you don't need to use 'contain' again for related models

Note: When using 'fields' and 'contain' options - be careful to include all foreign keys that your query directly or indirectly requires. Please also note that because Containable must to be attached to all models used in containment, you may consider attaching it to your AppModel.

ContainableBehavior options

The `ContainableBehavior` has a number of options that can be set when the Behavior is attached to a model. The settings allow you to fine tune the behavior of Containable and work with other behaviors more easily.

- **recursive** (boolean, optional) set to true to allow containable to automatically determine the recursiveness level needed to fetch specified models, and set the model recursiveness to this level. setting it to false disables this feature. The default value is `true`.
- **notices** (boolean, optional) issues E_NOTICES for bindings referenced in a containable call that are not valid. The default value is `true`.
- **autoFields**: (boolean, optional) auto-add needed fields to fetch requested bindings. The default value is `true`.

You can change ContainableBehavior settings at run time by reattaching the behavior as seen in *Additional Methods and Properties*

ContainableBehavior can sometimes cause issues with other behaviors or queries that use aggregate functions and/or GROUP BY statements. If you get invalid SQL errors due to mixing of aggregate and non-aggregate fields, try disabling the `autoFields` setting.:

```
<?php
$this->Post->Behaviors->attach('Containable', array('autoFields' => false));
```

Using Containable with pagination

By including the 'contain' parameter in the `$paginate` property it will apply to both the find('count') and the find('all') done on the model

See the section *Using Containable* for further details.

Here's an example of how to contain associations when paginating:

```
<?php
$this->paginate['User'] = array(
    'contain' => array('Profile', 'Account'),
    'order' => 'User.username'
);

$users = $this->paginate('User');
```

Translate

class `TranslateBehavior`

TranslateBehavior is actually quite easy to setup and works out of the box with very little configuration. In this section, you will learn how to add and setup the behavior to use in any model.

If you are using TranslateBehavior in alongside containable issue, be sure to set the 'fields' key for your queries. Otherwise you could end up with invalid SQL generated.

Initializing the i18n Database Tables

You can either use the CakePHP console or you can manually create it. It is advised to use the console for this, because it might happen that the layout changes in future versions of CakePHP. Sticking to the console will make sure that you have the correct layout.:

```
./cake i18n
```

Select `[I]` which will run the i18n database initialization script. You will be asked if you want to drop any existing and if you want to create it. Answer with yes if you are sure there is no i18n table already, and answer with yes again to create the table.

Attaching the Translate Behavior to your Models

Add it to your model by using the `$actsAs` property like in the following example.:

```
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate'
    );
}
```

This will do nothing yet, because it expects a couple of options before it begins to work. You need to define which fields of the current model should be tracked in the translation table we've created in the first step.

Defining the Fields

You can set the fields by simply extending the `'Translate'` value with another array, like so:

```
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate' => array(
            'fieldOne', 'fieldTwo', 'and_so_on'
        )
    );
}
```

After you have done that (for example putting "title" as one of the fields) you already finished the basic setup. Great! According to our current example the model should now look something like this:

```
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate' => array(
            'title'
        )
    );
}
```

When defining fields for TranslateBehavior to translate, be sure to omit those fields from the translated model's schema. If you leave the fields in, there can be issues when retrieving data with fallback locales.

Conclusion

From now on each record update/creation will cause TranslateBehavior to copy the value of "title" to the translation table (default: i18n) along with the current locale. A locale is the identifier of the language, so to speak.

Reading translated content

By default the TranslateBehavior will automatically fetch and add in data based on the current locale. The current locale is read from `Configure::read('Config.language')` which is assigned by the `L10n` class. You can override this default on the fly using `$Model->locale`.

Retrieve translated fields in a specific locale

By setting `$Model->locale` you can read translations for a specific locale:

```
<?php
// Read the spanish locale data.
$this->Post->locale = 'es';
$results = $this->Post->find('first', array(
    'conditions' => array('Post.id' => $id)
));
// $results will contain the spanish translation.
```

If you need to read translated content for multiple locales at the same time you can do so by setting `locale` to an array of locales:

```
<?php
// Read the spanish locale data.
$this->Post->locale = array('es', 'pt');
$results = $this->Post->find('first', array(
    'conditions' => array('Post.id' => $id)
));
// $results will contain the portuguese and spanish translation.
```

Retrieve all translation records for a field

If you want to have all translation records attached to the current model record you simply extend the *field array* in your behavior setup as shown below. The naming is completely up to you.:

```php
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate' => array(
            'title' => 'titleTranslation'
        )
    );
}
```

With this setup the result of $this->Post->find() should look something like this:

```
Array
(
     [Post] => Array
         (
             [id] => 1
             [title] => Beispiel Eintrag
             [body] => lorem ipsum...
             [locale] => de_de
         )

     [titleTranslation] => Array
         (
             [0] => Array
                 (
                     [id] => 1
                     [locale] => en_us
                     [model] => Post
                     [foreign_key] => 1
                     [field] => title
                     [content] => Example entry
                 )

             [1] => Array
                 (
                     [id] => 2
                     [locale] => de_de
                     [model] => Post
                     [foreign_key] => 1
                     [field] => title
                     [content] => Beispiel Eintrag
                 )

         )
)
```

Note: The model record contains a *virtual* field called “locale”. It indicates which locale is used in this result.

Note that only fields of the model you are directly doing ‘find‘ on will be translated. Models attached via associations won’t be translated because triggering callbacks on associated models is currently not supported.

Using the bindTranslation method

You can also retrieve all translations, only when you need them, using the bindTranslation method

`bindTranslation($fields, $reset)`

`$fields` is a named-key array of field and association name, where the key is the translatable field and the value is the fake association name.:

```
<?php
$this->Post->bindTranslation(array('title' => 'titleTranslation'));
$this->Post->find('all', array('recursive' => 1)); // need at least recursive 1 for this to
```

With this setup the result of your find() should look something like this:

```
Array
(
     [Post] => Array
         (
             [id] => 1
             [title] => Beispiel Eintrag
             [body] => lorem ipsum...
             [locale] => de_de
         )

     [titleTranslation] => Array
         (
             [0] => Array
                 (
                     [id] => 1
                     [locale] => en_us
                     [model] => Post
                     [foreign_key] => 1
                     [field] => title
                     [content] => Example entry
                 )

             [1] => Array
                 (
                     [id] => 2
                     [locale] => de_de
                     [model] => Post
                     [foreign_key] => 1
                     [field] => title
                     [content] => Beispiel Eintrag
                 )

         )
)
```

Saving in another language

You can force the model which is using the TranslateBehavior to save in a language other than the on detected.

To tell a model in what language the content is going to be you simply change the value of the `$locale` property on the model before you save the data to the database. You can do that either in your controller or you can define it directly in the model.

Example A: In your controller:

```php
<?php
class PostsController extends AppController {
    public $name = 'Posts';

    public function add() {
        if (!empty($this->request->data)) {
            $this->Post->locale = 'de_de'; // we are going to save the german version
            $this->Post->create();
            if ($this->Post->save($this->request->data)) {
                $this->redirect(array('action' => 'index'));
            }
        }
    }
}
```

Example B: In your model:

```php
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate' => array(
            'title'
        )
    );

    // Option 1) just define the property directly
    public $locale = 'en_us';

    // Option 2) create a simple method
    public function setLanguage($locale) {
        $this->locale = $locale;
    }
}
```

Multiple Translation Tables

If you expect a lot entries you probably wonder how to deal with a rapidly growing database table. There are two properties introduced by TranslateBehavior that allow to specify which "Model" to bind as the model containing the translations.

These are **$translateModel** and **$translateTable**.

Lets say we want to save our translations for all posts in the table "post_i18ns" instead of the default "i18n" table. To do so you need to setup your model like this:

```
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate' => array(
            'title'
        )
    );

    // Use a different model (and table)
    public $translateModel = 'PostI18n';
}
```

Important is that you have to pluralize the table. It is now a usual model and can be treated as such and thus comes with the conventions involved. The table schema itself must be identical with the one generated by the CakePHP console script. To make sure it fits one could just initialize a empty i18n table using the console and rename the table afterwards.

Create the TranslateModel

For this to work you need to create the actual model file in your models folder. Reason is that there is no property to set the displayField directly in the model using this behavior yet.

Make sure that you change the `$displayField` to `'field'`.:

```
<?php
class PostI18n extends AppModel {
    public $displayField = 'field'; // important
}
// filename: PostI18n.php
```

That's all it takes. You can also add all other model stuff here like $useTable. But for better consistency we could do that in the model which actually uses this translation model. This is where the optional `$translateTable` comes into play.

Changing the Table

If you want to change the name of the table you simply define $translateTable in your model, like so:

```
<?php
class Post extends AppModel {
    public $name = 'Post';
    public $actsAs = array(
        'Translate' => array(
            'title'
        )
    );
    // Use a different model
    public $translateModel = 'PostI18n';

    // Use a different table for translateModel
    public $translateTable = 'post_translations';
}
```

Please note that **you can't use $translateTable alone**. If you don't intend to use a custom `$translateModel` then leave this property untouched. Reason is that it would break your setup and show you a "Missing Table" message for the default I18n model which is created in runtime.

Tree

class `TreeBehavior`

It's fairly common to want to store hierarchical data in a database table. Examples of such data might be categories with unlimited subcategories, data related to a multilevel menu system or a literal representation of hierarchy such as is used to store access control objects with ACL logic.

For small trees of data, or where the data is only a few levels deep it is simple to add a parent_id field to your database table and use this to keep track of which item is the parent of what. Bundled with cake however, is a powerful behavior which allows you to use the benefits of MPTT logic (http://www.sitepoint.com/hierarchical-data-database-2/) without worrying about any of the intricacies of the technique - unless you want to ;).

Requirements

To use the tree behavior, your database table needs 3 fields as listed below (all are ints):

- parent - default fieldname is parent_id, to store the id of the parent object
- left - default fieldname is lft, to store the lft value of the current row.
- right - default fieldname is rght, to store the rght value of the current row.

If you are familiar with MPTT logic you may wonder why a parent field exists - quite simply it's easier to do certain tasks if a direct parent link is stored on the database - such as finding direct children.

Note: The `parent` field must be able to have a NULL value! It might seem to work if you just give the top elements a parent value of zero, but reordering the tree (and possible other operations) will fail.

Basic Usage

The tree behavior has a lot packed into it, but let's start with a simple example - create the following database table and put some data in it:

```
CREATE TABLE categories (
    id INTEGER(10) UNSIGNED NOT NULL AUTO_INCREMENT,
    parent_id INTEGER(10) DEFAULT NULL,
    lft INTEGER(10) DEFAULT NULL,
    rght INTEGER(10) DEFAULT NULL,
    name VARCHAR(255) DEFAULT '',
    PRIMARY KEY  (id)
);

INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(1, 'My Categorie
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(2, 'Fun', 1, 2,
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(3, 'Sport', 2, 3
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(4, 'Surfing', 3,
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(5, 'Extreme knit
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(6, 'Friends', 2,
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(7, 'Gerald', 6,
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(8, 'Gwendolyn',
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(9, 'Work', 1, 1
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(10, 'Reports', 9
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(11, 'Annual', 1
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(12, 'Status', 1
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(13, 'Trips', 9,
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(14, 'National',
INSERT INTO `categories` (`id`, `name`, `parent_id`, `lft`, `rght`) VALUES(15, 'Internation
```

For the purpose of checking that everything is setup correctly, we can create a test method and output the contents of our category tree to see what it looks like. With a simple controller:

```php
<?php
class CategoriesController extends AppController {
    public $name = 'Categories';

    public function index() {
        $data = $this->Category->generateTreeList(null, null, null, '&nbsp;&nbsp;&nbsp;');
        debug($data); die;
    }
}
```

and an even simpler model definition::

```php
<?php
// app/Model/Category.php
class Category extends AppModel {
    public $name = 'Category';
    public $actsAs = array('Tree');
}
```

We can check what our category tree data looks like by visiting /categories You should see something like this:

- My Categories
  - Fun
    - Sport

      - Surfing
      - Extreme knitting
    - Friends
      - Gerald
      - Gwendolyn
  - Work
    - Reports
      - Annual
      - Status
    - Trips
      - National
      - International

Adding data

In the previous section, we used existing data and checked that it looked hierarchal via the method `generateTreeList`. However, usually you would add your data in exactly the same way as you would for any model. For example:

```
<?php
// pseudo controller code
$data['Category']['parent_id'] = 3;
$data['Category']['name'] = 'Skating';
$this->Category->save($data);
```

When using the tree behavior it's not necessary to do any more than set the parent_id, and the tree behavior will take care of the rest. If you don't set the parent_id, the tree behavior will add to the tree making your new addition a new top level entry:

```
<?php
// pseudo controller code
$data = array();
$data['Category']['name'] = 'Other People\'s Categories';
$this->Category->save($data);
```

Running the above two code snippets would alter your tree as follows:

- My Categories
  - Fun
    - Sport
      - Surfing
      - Extreme knitting

        - Skating **New**
      - Friends
        - Gerald
        - Gwendolyn
    - Work
      - Reports
        - Annual
        - Status
      - Trips
        - National
        - International
- Other People's Categories **New**

Modifying data

Modifying data is as transparent as adding new data. If you modify something, but do not change the parent_id field - the structure of your data will remain unchanged. For example:

```
<?php
// pseudo controller code
$this->Category->id = 5; // id of Extreme knitting
$this->Category->save(array('name' => 'Extreme fishing'));
```

The above code did not affect the parent_id field - even if the parent_id is included in the data that is passed to save if the value doesn't change, neither does the data structure. Therefore the tree of data would now look like:

- My Categories
- Fun
- Sport
  - Surfing
  - Extreme fishing **Updated**
  - Skating
- Friends
  - Gerald
  - Gwendolyn
- Work
- Reports

  - Annual
  - Status
- Trips
  - National
  - International
- Other People’s Categories

Moving data around in your tree is also a simple affair. Let’s say that Extreme fishing does not belong under Sport, but instead should be located under Other People’s Categories. With the following code:

```
<?php
// pseudo controller code
$this->Category->id = 5; // id of Extreme fishing
$newParentId = $this->Category->field('id', array('name' => 'Other People\'s Categories'))
$this->Category->save(array('parent_id' => $newParentId));
```

As would be expected the structure would be modified to:

- My Categories
- Fun
  - Sport
    - Surfing
    - Skating
  - Friends
    - Gerald
    - Gwendolyn
- Work
  - Reports
    - Annual
    - Status
  - Trips
    - National
    - International
- Other People’s Categories
- Extreme fishing **Moved**

Deleting data

The tree behavior provides a number of ways to manage deleting data. To start with the simplest example; let's say that the reports category is no longer useful. To remove it *and any children it may have* just call delete as you would for any model. For example with the following code:

```php
<?php
// pseudo controller code
$this->Category->id = 10;
$this->Category->delete();
```

The category tree would be modified as follows:

- My Categories
- Fun
    - Sport
        - Surfing
        - Skating
    - Friends
        - Gerald
        - Gwendolyn
- Work
    - Trips
        - National
        - International
- Other People's Categories
- Extreme fishing

Querying and using your data

Using and manipulating hierarchical data can be a tricky business. In addition to the core find methods, with the tree behavior there are a few more tree-orientated permutations at your disposal.

Note: Most tree behavior methods return and rely on data being sorted by the `lft` field. If you call `find()` and do not order by `lft`, or call a tree behavior method and pass a sort order, you may get undesirable results.

class **`TreeBehavior`**

`children`(*$id = null*, *$direct = false*, *$fields = null*, *$order = null*, *$limit = null*, *$page = 1*, *$recursive = null*)

Parameters

- **$id** – The ID of the record to look up
- **$direct** – Set to true to return only the direct descendants
- **$fields** – Single string field name or array of fields to include in the return
- **$order** – SQL string of ORDER BY conditions
- **$limit** – SQL LIMIT statement
- **$page** – for accessing paged results
- **$recursive** – Number of levels deep for recursive associated Models

The `children` method takes the primary key value (the id) of a row and returns the children, by default in the order they appear in the tree. The second optional parameter defines whether or not only direct children should be returned. Using the example data from the previous section:

```php
<?php
$allChildren = $this->Category->children(1); // a flat array with 11 items
// -- or --
$this->Category->id = 1;
$allChildren = $this->Category->children(); // a flat array with 11 items

// Only return direct children
$directChildren = $this->Category->children(1, true); // a flat array with 2 items
```

Note: If you want a recursive array use `find('threaded')`

childCount(*$id = null*, *$direct = false*)

As with the method `children`, `childCount` takes the primary key value (the id) of a row and returns how many children it has. The second optional parameter defines whether or not only direct children are counted. Using the example data from the previous section:

```php
<?php
$totalChildren = $this->Category->childCount(1); // will output 11
// -- or --
$this->Category->id = 1;
$directChildren = $this->Category->childCount(); // will output 11

// Only counts the direct descendants of this category
$numChildren = $this->Category->childCount(1, true); // will output 2
```

generateTreeList(*$conditions=null*, *$keyPath=null*, *$valuePath=null*, *$spacer= '_'*, *$recursive=null*)

Parameters

- **$conditions** – Uses the same conditional options as find().
- **$keyPath** – Path to the field to use for the key.

- **$valuePath** – Path to the field to use for the label.
- **$spacer** – The string to use in front of each item to indicate depth.
- **$recursive** – The number of levels deep to fetch associated records

This method will return data similar to *find('list')*, with an indented prefix to show the structure of your data. Below is an example of what you can expect this method to return:

```php
<?php
$treelist = $this->Category->generateTreeList();
```

Output:

```
array(
    [1] =>  "My Categories",
    [2] =>  "_Fun",
    [3] =>  "__Sport",
    [4] =>  "___Surfing",
    [16] => "___Skating",
    [6] =>  "__Friends",
    [7] =>  "___Gerald",
    [8] =>  "___Gwendolyn",
    [9] =>  "_Work",
    [13] => "__Trips",
    [14] => "___National",
    [15] => "___International",
    [17] => "Other People's Categories",
    [5] =>  "_Extreme fishing"
)
```

getParentNode()

This convenience function will, as the name suggests, return the parent node for any node, or *false* if the node has no parent (it's the root node). For example:

```php
<?php
$parent = $this->Category->getParentNode(2); //<- id for fun
// $parent contains All categories
```

getPath(*$id = null*, *$fields = null*, *$recursive = null*)

The 'path' when referring to hierarchal data is how you get from where you are to the top. So for example the path from the category "International" is:

- My Categories
- ...
- Work
  - Trips
    - ...
    - International

Using the id of "International" getPath will return each of the parents in turn (starting from the top).:

```
<?php
$parents = $this->Category->getPath(15);
```

```
// contents of $parents
array(
    [0] =>  array('Category' => array('id' => 1, 'name' => 'My Categories', ..)),
    [1] =>  array('Category' => array('id' => 9, 'name' => 'Work', ..)),
    [2] =>  array('Category' => array('id' => 13, 'name' => 'Trips', ..)),
    [3] =>  array('Category' => array('id' => 15, 'name' => 'International', ..)),
)
```

Advanced Usage

The tree behavior doesn't only work in the background, there are a number of specific methods defined in the behavior to cater for all your hierarchical data needs, and any unexpected problems that might arise in the process.

`TreeBehavior::`**`moveDown`**`()`

Used to move a single node down the tree. You need to provide the ID of the element to be moved and a positive number of how many positions the node should be moved down. All child nodes for the specified node will also be moved.

Here is an example of a controller action (in a controller named Categories) that moves a specified node down the tree:

```
<?php
public function movedown($id = null, $delta = null) {
    $this->Category->id = $id;
    if (!$this->Category->exists()) {
       throw new NotFoundException(__('Invalid category'));
    }

    if ($delta > 0) {
        $this->Category->moveDown($this->Category->id, abs($delta));
    } else {
        $this->Session->setFlash('Please provide the number of positions the field sho
    }

    $this->redirect(array('action' => 'index'), null, true);
}
```

For example, if you'd like to move the "Sport" (id of 3) category one position down, you would request: /categories/movedown/3/1.

`TreeBehavior::`**`moveUp`**`()`

Used to move a single node up the tree. You need to provide the ID of the element to be moved and a positive number of how many positions the node should be moved up. All child nodes will also be moved.

Here's an example of a controller action (in a controller named Categories) that moves a node up the tree:

```
<?php
public function moveup($id = null, $delta = null) {
    $this->Category->id = $id;
    if (!$this->Category->exists()) {
       throw new NotFoundException(__('Invalid category'));
    }

    if ($delta > 0) {
        $this->Category->moveUp($this->Category->id, abs($delta));
    } else {
        $this->Session->setFlash('Please provide a number of positions the category sh
    }

    $this->redirect(array('action' => 'index'), null, true);
}
```

For example, if you would like to move the category "Gwendolyn" (id of 8) up one position you would request /categories/moveup/8/1. Now the order of Friends will be Gwendolyn, Gerald.

`TreeBehavior::`**`removeFromTree`**(*$id = null*, *$delete = false*)

Using this method will either delete or move a node but retain its sub-tree, which will be re-parented one level higher. It offers more control than *delete*, which for a model using the tree behavior will remove the specified node and all of its children.

Taking the following tree as a starting point:

- My Categories
  - Fun
    - Sport
      - Surfing
      - Extreme knitting
      - Skating

Running the following code with the id for 'Sport':

```
<?php
$this->Node->removeFromTree($id);
```

The Sport node will be become a top level node:

- My Categories
  - Fun
    - Surfing
    - Extreme knitting
    - Skating

- Sport **Moved**

This demonstrates the default behavior of `removeFromTree` of moving the node to have no parent, and re-parenting all children.

If however the following code snippet was used with the id for 'Sport':

```
<?php
$this->Node->removeFromTree($id, true);
```

The tree would become

- My Categories
  - Fun
    - Surfing
    - Extreme knitting
    - Skating

This demonstrates the alternate use for `removeFromTree`, the children have been reparented and 'Sport' has been deleted.

`TreeBehavior::`**`reorder`**(*array('id' => null, 'field' => $Model->displayField, 'order' => 'ASC', 'verify' => true)*)

Reorders the nodes (and child nodes) of the tree according to the field and direction specified in the parameters. This method does not change the parent of any node.:

```
<?php
$model->reorder(array(
    'id' => ,    //id of record to use as top node for reordering, default: $Model->i
    'field' => , //which field to use in reordering, default: $Model->displayField
    'order' => , //direction to order, default: 'ASC'
    'verify' =>  //whether or not to verify the tree before reorder, default: true
));
```

Note: If you have saved your data or made other operations on the model, you might want to set `$model->id = null` before calling `reorder`. Otherwise only the current node and it's children will be reordered.

Data Integrity

Due to the nature of complex self referential data structures such as trees and linked lists, they can occasionally become broken by a careless call. Take heart, for all is not lost! The Tree Behavior contains several previously undocumented features designed to recover from such situations.

`TreeBehavior::`**`recover`**(*$mode = 'parent', $missingParentAction = null*)

The `mode` parameter is used to specify the source of info that is valid/correct. The opposite source of data will be populated based upon that source of info. E.g. if the MPTT fields are corrupt or empty, with the `$mode 'parent'` the values of the `parent_id` field will be used to populate the left and right fields. The `missingParentAction` parameter only applies to "parent" mode and determines what to do if the parent field contains an id that is not present.

Available `$mode` options:

- `'parent'` - use the existing `parent_id`'s to update the `lft` and `rght` fields
- `'tree'` - use the existing `lft` and `rght` fields to update `parent_id`

Available `missingParentActions` options when using `mode='parent'`:

- `null` - do nothing and carry on
- `'return'` - do nothing and return
- `'delete'` - delete the node
- `int` - set the parent_id to this id

Example:

```
<?php
// Rebuild all the left and right fields based on the parent_id
$this->Category->recover();
// or
$this->Category->recover('parent');

// Rebuild all the parent_id's based on the lft and rght fields
$this->Category->recover('tree');
```

`TreeBehavior::`**`reorder`**(*$options = array()*)

Reorders the nodes (and child nodes) of the tree according to the field and direction specified in the parameters. This method does not change the parent of any node.

Reordering affects all nodes in the tree by default, however the following options can affect the process:

- `'id'` - only reorder nodes below this node.
- `'field`' - field to use for sorting, default is the `displayField` for the model.
- `'order'` - `'ASC'` for ascending, `'DESC'` for descending sort.
- `'verify'` - whether or not to verify the tree prior to resorting.

`$options` is used to pass all extra parameters, and has the following possible keys by default, all of which are optional:

```
array(
    'id' => null,
    'field' => $model->displayField,
    'order' => 'ASC',
    'verify' => true
)
```

`TreeBehavior::`**`verify`**()

Returns `true` if the tree is valid otherwise an array of errors, with fields for type, incorrect index and message.

Each record in the output array is an array of the form (type, id, message)

- `type` is either `'index'` or `'node'`
- `'id'` is the id of the erroneous node.
- `'message'` depends on the error

Example Use:

```php
<?php
$this->Category->verify();
```

Example output:

```
Array
(
    [0] => Array
        (
            [0] => node
            [1] => 3
            [2] => left and right values identical
        )
    [1] => Array
        (
            [0] => node
            [1] => 2
            [2] => The parent node 999 doesn't exist
        )
    [10] => Array
        (
            [0] => index
            [1] => 123
            [2] => missing
        )
    [99] => Array
        (
            [0] => node
            [1] => 163
            [2] => left greater than right
        )

)
```

Core Libraries

Beyond the core MVC components, CakePHP includes a great selection of utility classes that help you do everything from webservice requests, to caching, to logging, internationalization and more.

App Class

class App

The app class is responsible for path management, class location and class loading. Make sure you follow the *File and Classname Conventions*.

Packages

CakePHP is organized around the idea of packages, each class belongs to a package or folder where other classes reside. You can configure each package location in your application using `App::build('APackage/SubPackage', $paths)` to inform the framework where should each class be loaded. Almost every class in the CakePHP framework can be swapped with your own compatible implementation. If you wish to use you own class instead of the classes the framework provides, just add the class to your libs folder emulating the directory location of where CakePHP expects to find it.

For instance if you'd like to use your own HttpSocket class, put it under:

```
app/Lib/Network/Http/HttpSocket.php
```

Once you've done this App will load your override file instead of the file inside CakePHP.

Loading classes

static `App::`**`uses`**(*string $class*, *string $package*)

Return type void

Classes are lazily loaded in CakePHP, however before the autoloader can find your classes you need to tell App, where it can find the files. By telling App which package a class can be found in, it can properly locate the file and load it the first time a class is used.

Some examples for common types of classes are:

Controller `App::uses('PostsController', 'Controller');`

Component `App::uses('AuthComponent', 'Controller/Component');`

Model `App::uses('MyModel', 'Model');`

Behaviors `App::uses('TreeBehavior', 'Model/Behavior');`

Views `App::uses('ThemeView', 'View');`

Helpers `App::uses('HtmlHelper', 'View/Helper');`

Libs `App::uses('PaymentProcessor', 'Lib');`

Vendors `App::uses('Textile', 'Vendor');`

Utility `App::uses('String', 'Utility');`

So basically the second param should simply match the folder path of the class file in core or app.

Note: Loading vendors usually means you are loading packages that do not follow conventions. For most vendor packages using `App::import()` is recommended.

Loading files from plugins

Loading classes in plugins works much the same as loading app and core classes except you must specify the plugin you are loading from:

```php
<?php
// Load the class Comment in app/Plugin/PluginName/Model/Comment.php
App::uses('Comment', 'PluginName.Model');

// Load the class CommentComponent in app/Plugin/PluginName/Controller/Component/CommentCo
App::uses('CommentComponent', 'PluginName.Controller/Component');
```

Finding paths to packages using App::path()

static `App::`**`path`**(*string $package*, *string $plugin = null*)

Return type array

Used to read information stored path:

```php
<?php
// return the model paths in your application
App::path('Model');
```

This can be done for all packages that are apart of your application. You can also fetch paths for a plugin:

```php
<?php
// return the component paths in DebugKit
App::path('Component', 'DebugKit');
```

static `App::`**`paths`**()

Return type array

Get all the currently loaded paths from App. Useful for inspecting or storing all paths App knows about. For a paths to a specific package use `App::path()`

static `App::`**`core`**(*string $package*)

Return type array

Used for finding the path to a package inside CakePHP:

```php
<?php
// Get the path to Cache engines.
App::core('Cache/Engine');
```

static `App::location(string $className)`

> **Return type** string

Returns the package name where a class was defined to be located at.

Adding paths for App to find packages in

static `App::build(array $paths = array(), mixed $mode = App::PREPEND)`

> **Return type** void

Sets up each package location on the file system. You can configure multiple search paths for each package, those will be used to look for files one folder at a time in the specified order. All paths should be terminated with a directory separator.

Adding additional controller paths for example would alter where CakePHP looks for controllers. This allows you to split your application up across the filesystem.

Usage:

```
<?php
//will setup a new search path for the Model package
App::build(array('Model' => array('/a/full/path/to/models/')));

//will setup the path as the only valid path for searching models
App::build(array('Model' => array('/path/to/models/')), App::RESET);

//will setup multiple search paths for helpers
App::build(array('View/Helper' => array('/path/to/helpers/', '/another/path/')));
```

If reset is set to true, all loaded plugins will be forgotten and they will be needed to be loaded again.

Examples:

```
<?php
App::build(array('controllers' => array('/full/path/to/controllers')));
//becomes
App::build(array('Controller' => array('/full/path/to/Controller')));

App::build(array('helpers' => array('/full/path/to/views/helpers')));
//becomes
App::build(array('View/Helper' => array('/full/path/to/View/Helper')));
```

Changed in version 2.0: `App::build()` will not merge app paths with core paths anymore.

Add new packages to an application

`App::build()` can be used to add new package locations. This is useful when you want to add new top level packages or, sub-packages to your application:

```
<?php
App::build(array(
    'Service' => array('%s' . 'Service' . DS)
), App::REGISTER);
```

The `%s` in newly registered packages will be replaced with the `APP` path. You must include a trailing `/` in registered packages. Once packages are registered, you can use `App::build()` to append/prepend/reset paths like any other package. Changed in version 2.1: Registering packages was added in 2.1

Finding which objects CakePHP knows about

static `App::`**`objects`**`(`*string $type*, *mixed $path = null*, *boolean $cache = true*`)`

Return type mixed Returns an array of objects of the given type or false if incorrect.

You can find out which objects App knows about using `App::objects('Controller')` for example to find which application controllers App knows about.

Example usage:

```
<?php
//returns array('DebugKit', 'Blog', 'User');
App::objects('plugin');

//returns array('PagesController', 'BlogController');
App::objects('Controller');
```

You can also search only within a plugin's objects by using the plugin dot syntax.:

```
<?php
// returns array('MyPluginPost', 'MyPluginComment');
App::objects('MyPlugin.Model');
```

Changed in version 2.0.

1. Returns `array()` instead of false for empty results or invalid types
2. Does not return core objects anymore, `App::objects('core')` will return `array()`.
3. Returns the complete class name

Locating plugins

static `App::`**`pluginPath`**`(`*string $plugin*`)`

Return type string

Plugins can be located with App as well. Using `App::pluginPath('DebugKit');` for example, will give you the full path to the DebugKit plugin:

```
<?php
$path = App::pluginPath('DebugKit');
```

Locating themes

static `App::themePath`(*string $theme*)

Return type string

Themes can be found `App::themePath('purple');`, would give the full path to the *purple* theme.

Including files with App::import()

static `App::import`(*mixed $type = null*, *string $name = null*, *mixed $parent = true*, *array $search = array()*, *string $file = null*, *boolean $return = false*)

Return type boolean

At first glance `App::import` seems complex, however in most use cases only 2 arguments are required.

Note: This method is equivalent to `require`'ing the file. It is important to realize that the class subsequently needs to be initialized.

```
<?php
// The same as require('Controller/UsersController.php');
App::import('Controller', 'Users');

// We need to load the class
$Users = new UsersController();

// If we want the model associations, components, etc to be loaded
$Users->constructClasses();
```

All classes that were loaded in the past using App::import('Core', $class) will need to be loaded using App::uses() referring to the correct package. This change has provided large performance gains to the framework. Changed in version 2.0.

- The method no longer looks for classes recursively, it strictly uses the values for the paths defined in `App::build()`
- It will not be able to load `App::import('Component', 'Component')` use `App::uses('Component', 'Controller');`.
- Using `App::import('Lib', 'CoreClass');` to load core classes is no longer possible.
- Importing a non-existent file, supplying a wrong type or package name, or null values for `$name` and `$file` parameters will result in a false return value.
- `App::import('Core', 'CoreClass')` is no longer supported, use `App::uses()` instead and let the class autoloading do the rest.
- Loading Vendor files does not look recursively in the vendors folder, it will also not convert the file to underscored anymore as it did in the past.

Overriding classes in CakePHP

You can override almost every class in the framework, exceptions are the `App` and `Configure` classes. whenever you like to perform such overriding, just add your class to your app/Lib folder mimicking the internal structure of the framework. Some examples to follow

- To override the `Dispatcher` class, create `app/Lib/Routing/Dispatcher.php`
- To override the `CakeRoute` class, create `app/Lib/Routing/Route/CakeRoute.php`
- To override the `Model` class, create `app/Lib/Model/Model.php`

When you load the replaced files, the app/Lib files will be loaded instead of the built-in core classes.

Loading Vendor Files

You can use `App::uses()` to load classes in vendors directories. It follows the same conventions as loading other files:

```php
<?php
// Load the class Geshi in app/Vendor/Geshi.php
App::uses('Geshi', 'Vendor');
```

To load classes in subdirectories, you'll need to add those paths with `App::build()`:

```php
<?php
// Load the class ClassInSomePackage in app/Vendor/SomePackage/ClassInSomePackage.php
App::build(array('Vendor' => array(APP . 'Vendor' . DS . 'SomePackage')));
App::uses('ClassInSomePackage', 'Vendor');
```

Your vendor files may not follow conventions, have a class that differs from the file name or does not contain classes. You can load those files using `App::import()`. The following examples illustrate how to load vendor files from a number of path structures. These vendor files could be located in any of the vendor folders.

To load **app/Vendor/geshi.php**:

```php
<?php
App::import('Vendor', 'geshi');
```

Note: The geshi file must be a lower-case file name as Cake will not find it otherwise.

To load **app/Vendor/flickr/flickr.php**:

```php
<?php
App::import('Vendor', 'flickr/flickr');
```

To load **app/Vendor/some.name.php**:

```php
<?php
App::import('Vendor', 'SomeName', array('file' => 'some.name.php'));
```

To load **app/Vendor/services/well.named.php**:

```
<?php
App::import('Vendor', 'WellNamed', array('file' => 'services' . DS . 'well.named.php'));
```

It wouldn't make a difference if your vendor files are inside your /vendors directory. Cake will automatically find it.

To load **vendors/vendorName/libFile.php**:

```
<?php
App::import('Vendor', 'aUniqueIdentifier', array('file' => 'vendorName' . DS . 'libFile.php
```

App Init/Load/Shutdown Methods

static `App::init()`

Return type void

Initializes the cache for App, registers a shutdown function.

static `App::load(`*string $className*`)`

Return type boolean

Method to handle the automatic class loading. It will look for each class' package defined using `App::uses()` and with this information it will resolve the package name to a full path to load the class from. File name for each class should follow the class name. For instance, if a class is name `MyCustomClass` the file name should be `MyCustomClass.php`

static `App::shutdown()`

Return type void

Object destructor. Writes cache file if changes have been made to the `$_map`.

Caching

Caching is frequently used to reduce the time it takes to create or read from other resources. Caching is often used to make reading from expensive resources less expensive. You can easily store the results of expensive queries, or remote webservice access that doesn't frequently change in a cache. Once in the cache, re-reading the stored resource from the cache is much cheaper than accessing the remote resource.

Caching in CakePHP is primarily facilitated by the `Cache` class. This class provides a set of static methods that provide a uniform API to dealing with all different types of Caching implementations. CakePHP comes with several cache engines built-in, and provides an easy system to implement your own caching systems. The built-in caching engines are:

- `FileCache` File cache is a simple cache that uses local files, it is the slowest cache engine, and doesn't provide as many features for atomic operations. However, since disk storage is often quite cheap, storing large objects, or elements that are infrequently written work well in files.

- `ApcCache` APC cache uses the PHP APC (http://php.net/apc) extension This extension uses shared memory on the webserver to store objects. This makes it very fast, and able to provide atomic read/write features. By default CakePHP will use this cache engine if it's available.
- `Wincache` Wincache uses the Wincache (http://php.net/wincache) extension. Wincache is similar to APC in features and performance, but optimized for windows and IIS.
- `XcacheEngine` Similar to APC, Xcache (http://xcache.lighttpd.net/) is a PHP extension that provides similar features to APC.
- `MemcacheEngine` Uses the Memcache (http://php.net/memcache) extension. Memcache provides a very fast cache system that can be distributed across many servers, and provides atomic operations.
- `RedisEngine` Uses the phpredis (https://github.com/nicolasff/phpredis) extension. Redis provides a fast and persistent cache system similar to memcached, also provides atomic operations.

Regardless of the CacheEngine you choose to use, your application interacts with `Cache` in a consistent manner. This means you can easily swap cache engines as your application grows. In addition to the `Cache` class, the *CacheHelper* allows for full page caching, which can greatly improve performance as well.

Configuring Cache class

Configuring the Cache class can be done anywhere, but generally you will want to configure Cache in `app/Config/bootstrap.php`. You can configure as many cache configurations as you need, and use any mixture of cache engines. CakePHP uses two cache configurations internally, which are configured in `app/Config/core.php`. If you are using APC or Memcache you should make sure to set unique keys for the core caches. This will prevent multiple applications from overwriting each other's cached data.

Using multiple cache configurations can help reduce the number of times you need to use `Cache::set()` as well as centralize all your cache settings. Using multiple configurations also lets you incrementally change the storage as needed.

Note: You must specify which engine to use. It does **not** default to File.

Example:

```php
<?php
Cache::config('short', array(
    'engine' => 'File',
    'duration' => '+1 hours',
    'path' => CACHE,
    'prefix' => 'cake_short_'
));

// long
Cache::config('long', array(
    'engine' => 'File',
    'duration' => '+1 week',
    'probability' => 100,
    'path' => CACHE . 'long' . DS,
));
```

By placing the above code in your `app/Config/bootstrap.php` you will have two additional Cache configurations. The name of these configurations 'short' or 'long' is used as the `$config` parameter for `Cache::write()` and `Cache::read()`.

Note: When using the FileEngine you might need to use the `mask` option to ensure cache files are made with the correct permissions.

Creating a storage engine for Cache

You can provide custom `Cache` adapters in `app/Lib` as well as in plugins using `$plugin/Lib`. App/plugin cache engines can also override the core engines. Cache adapters must be in a cache directory. If you had a cache engine named `MyCustomCacheEngine` it would be placed in either `app/Lib/Cache/Engine/MyCustomCacheEngine.php` as an app/libs. Or in `$plugin/Lib/Cache/Engine/MyCustomCacheEngine.php` as part of a plugin. Cache configs from plugins need to use the plugin dot syntax.:

```php
<?php
Cache::config('custom', array(
    'engine' => 'CachePack.MyCustomCache',
    // ...
));
```

Note: App and Plugin cache engines should be configured in `app/Config/bootstrap.php`. If you try to configure them in core.php they will not work correctly.

Custom Cache engines must extend `CacheEngine` which defines a number of abstract methods as well as provides a few initialization methods.

The required API for a CacheEngine is

class `CacheEngine`
The base class for all cache engines used with Cache.

`CacheEngine::`**`write`**`(`*$key*, *$value*, *$duration*`)`

Returns boolean for success.

Write value for a key into cache, $duration specifies how long the entry should exist in the cache.

`CacheEngine::`**`read`**`(`*$key*`)`

Returns The cached value or false for failure.

Read a key from the cache. Return false to indicate the entry has expired or does not exist.

`CacheEngine::`**`delete`**`(`*$key*`)`

Returns Boolean true on success.

Delete a key from the cache. Return false to indicate that the entry did not exist or could not be deleted.

`CacheEngine::`**`clear`**`(`*$check*`)`

> **Returns** Boolean true on success.
>
> Delete all keys from the cache. If $check is true, you should validate that each value is actually expired.

`CacheEngine::`**`clearGroup`**`(`*$group*`)`

> **Returns** Boolean true on success.
>
> Delete all keys from the cache belonging to the same group.

`CacheEngine::`**`decrement`**`(`*$key, $offset = 1*`)`

> **Returns** Boolean true on success.
>
> Decrement a number under the key and return decremented value

`CacheEngine::`**`increment`**`(`*$key, $offset = 1*`)`

> **Returns** Boolean true on success.
>
> Increment a number under the key and return incremented value

`CacheEngine::`**`gc`**`()`

> Not required, but used to do clean up when resources expire. FileEngine uses this to delete files containing expired content.

Using Cache to store common query results

You can greatly improve the performance of your application by putting results that infrequently change, or that are subject to heavy reads into the cache. A perfect example of this are the results from `Model::find()` A method that uses Cache to store results could look like:

```
<?php
class Post extends AppModel {

    public function newest() {
        $result = Cache::read('newest_posts', 'longterm');
        if (!$result) {
            $result = $this->find('all', array('order' => 'Post.updated DESC', 'limit' =>
            Cache::write('newest_posts', $result, 'longterm');
        }
        return $result;
    }
}
```

You could improve the above code by moving the cache reading logic into a behavior, that read from the cache, or ran the associated model method. That is an exercise you can do though.

Using Cache to store counters

Counters for various things are easily stored in a cache. For example a simple countdown for remaining 'slots' in a contest could be store in Cache. The Cache class exposes atomic ways to increment/decrement counter values in an easy way. Atomic operations are important for these values as it reduces the risk of contention, and ability for two users to simultaneously lower the value by one resulting in an incorrect value.

After setting an integer value you can manipulate it using `Cache::increment()` and `Cache::decrement()`:

```php
<?php
Cache::write('initial_count', 10);

// Later on
Cache::decrement('initial_count');

// or
Cache::increment('initial_count');
```

Note: Incrementing and decrementing do not work with FileEngine. You should use APC, Redis or Memcache instead.

Using groups

New in version 2.2. Sometimes you will want to mark multiple cache entries to belong to certain group or namespace. This is a common requirement for mass-invalidating keys whenever some information changes that is shared among all entries in the same group. This is possible by declaring the groups in cache configuration:

```php
<?php
Cache::config('site_home', array(
    'engine' => 'Redis',
    'duration' => '+999 days',
    'groups' => array('comment', 'post')
));
```

Let's say you want to store the html generated for your homepage in cache, but would also want to automatically invalidate this cache every time a comment or post is added to your database. By adding the groups `comment` and `post` we have effectively tagged any key stored into this cache configuration with both group names.

For instance whenever a new post is added, we could tell the Cache engine to remove all entries associated to the `post` group:

```php
<?php
// Model/Post.php

public function afterSave($created) {
    if ($created) {
        Cache::clearGroup('post', 'site_home');
    }
}
```

Groups are shared across all cache configs using the same engine and same prefix. If you are using groups and what to take advantage of group deletion, choose a common prefix for all your configs.

Cache API

class Cache

The Cache class in CakePHP provides a generic frontend for several backend caching systems. Different Cache configurations and engines can be setup in your app/Config/core.php

static `Cache::`**`config`**(*$name = null*, *$settings = array()*)

`Cache::config()` is used to create additional Cache configurations. These additional configurations can have different duration, engines, paths, or prefixes than your default cache config.

static `Cache::`**`read`**(*$key*, *$config = 'default'*)

Cache::read() is used to read the cached value stored under `$key` from the `$config`. If $config is null the default config will be used. `Cache::read()` will return the cached value if it is a valid cache or `false` if the cache has expired or doesn't exist. The contents of the cache might evaluate false, so make sure you use the strict comparison operator === or `!==`.

For example:

```
<?php
$cloud = Cache::read('cloud');

if ($cloud !== false) {
    return $cloud;
}

// generate cloud data
// ...

// store data in cache
Cache::write('cloud', $cloud);
return $cloud;
```

static `Cache::`**`write`**(*$key*, *$value*, *$config = 'default'*)

Cache::write() will write a $value to the Cache. You can read or delete this value later by referring to it by `$key`. You may specify an optional configuration to store the cache in as well. If no `$config` is specified default will be used. Cache::write() can store any type of object and is ideal for storing results of model finds.:

```
<?php
if (($posts = Cache::read('posts')) === false) {
    $posts = $this->Post->find('all');
    Cache::write('posts', $posts);
}
```

Using Cache::write() and Cache::read() to easily reduce the number of trips made to the database to fetch posts.

static `Cache::`**`delete`**`(`*$key*, *$config = 'default'*`)`

`Cache::delete()` will allow you to completely remove a cached object from the Cache store.

static `Cache::`**`set`**`(`*$settings = array()*, *$value = null*, *$config = 'default'*`)`

`Cache::set()` allows you to temporarily override a cache configs settings for one operation (usually a read or write). If you use `Cache::set()` to change the settings for a write, you should also use `Cache::set()` before reading the data back in. If you fail to do so, the default settings will be used when the cache key is read.:

```
<?php
Cache::set(array('duration' => '+30 days'));
Cache::write('results', $data);

// Later on

Cache::set(array('duration' => '+30 days'));
$results = Cache::read('results');
```

If you find yourself repeatedly calling `Cache::set()` perhaps you should create a new `Cache::config()`. This will remove the need to call `Cache::set()`.

static `Cache::`**`increment`**`(`*$key*, *$offset = 1*, *$config = 'default'*`)`

Atomically increment a value stored in the cache engine. Ideal for modifying counters or semaphore type values.

static `Cache::`**`decrement`**`(`*$key*, *$offset = 1*, *$config = 'default'*`)`

Atomically decrement a value stored in the cache engine. Ideal for modifying counters or semaphore type values.

static `Cache::`**`clear`**`(`*$check*, *$config = 'default'*`)`

Destroy all cached values for a cache configuration. In engines like Apc, Memcache and Wincache, the cache configuration's prefix is used to remove cache entries. Make sure that different cache configurations have different prefixes.

`Cache::`**`clearGroup`**`(`*$group*, *$config = 'default'*`)`

Returns Boolean true on success.

Delete all keys from the cache belonging to the same group.

static `Cache::`**`gc`**`(`*$config*`)`

Garbage collects entries in the cache configuration. This is primarily used by FileEngine. It should be implemented by any Cache engine that requires manual eviction of cached data.

CakeEmail

class **`CakeEmail`**`(`*mixed $config = null*`)`

`CakeEmail` is a new class to send email. With this class you can send email from any place of your application. In addition to using the EmailComponent from your controller, you can also send mail from Shells, and Models.

This class replaces the `EmailComponent` and gives more flexibility in sending emails. For example, you can create your own transports to send email instead of using the provided smtp and mail.

Basic usage

First of all, you should ensure the class is loaded using `App::uses()`:

```
<?php
App::uses('CakeEmail', 'Network/Email');
```

Using CakeEmail is similar to using `EmailComponent`. But instead of using attributes you must use methods. Example:

```
<?php
$email = new CakeEmail();
$email->from(array('me@example.com' => 'My Site'));
$email->to('you@example.com');
$email->subject('About');
$email->send('My message');
```

To simplify things, all of the setter methods return the instance of class. You can re-write the above code as:

```
<?php
$email = new CakeEmail();
$email->from(array('me@example.com' => 'My Site'))
    ->to('you@example.com')
    ->subject('About')
    ->send('My message');
```

Choosing the sender

When sending email on behalf of other people it's often a good idea to define the original sender using the Sender header. You can do so using `sender()`:

```
<?php
$email = new CakeEmail();
$email->sender('app@example.com', 'MyApp emailer');
```

Note: It's also a good idea to set the envelope sender when sending mail on another person's behalf. This prevents them from getting any messages about deliverability.

Configuration

Similar of database configuration, emails can have a class to centralize all the configuration.

Create the file `app/Config/email.php` with the class `EmailConfig`. The `app/Config/email.php.default` has an example of this file.

`CakeEmail` will create an instance of the `EmailConfig` class to access the config. If you have dynamic data to put in the configs, you can use the constructor to do that:

```php
<?php
class EmailConfig {
    public function __construct() {
        // Do conditional assignments here.
    }
}
```

It is not required to create `app/Config/email.php`, `CakeEmail` can be used without it and use respective methods to set all configurations separately or load an array of configs.

To load a config from `EmailConfig` you can use the `config()` method or pass it to the constructor of `CakeEmail`:

```php
<?php
$email = new CakeEmail();
$email->config('default');

//or in constructor::
$email = new CakeEmail('default');
```

Instead of passing a string which matches the configuration name in `EmailConfig` you can also just load an array of configs:

```php
<?php
$email = new CakeEmail();
$email->config(array('from' => 'me@example.org', 'transport' => 'MyCustom'));

//or in constructor::
$email = new CakeEmail(array('from' => 'me@example.org', 'transport' => 'MyCustom'));
```

You can configure SSL SMTP servers, like GMail. To do so, put the `'ssl://'` at prefix in the host and configure the port value accordingly. Example:

```php
<?php
class EmailConfig {
    public $gmail = array(
        'host' => 'ssl://smtp.gmail.com',
        'port' => 465,
        'username' => 'my@gmail.com',
        'password' => 'secret',
        'transport' => 'Smtp'
    );
}
```

Note: To use this feature, you will need to have the SSL configured in your PHP install.

As of 2.3.0 you can also enable TLS SMTP using the `tls` option:

```php
<?php
class EmailConfig {
    public $gmail = array(
        'host' => 'smtp.gmail.com',
        'port' => 465,
        'username' => 'my@gmail.com',
        'password' => 'secret',
        'transport' => 'Smtp',
        'tls' => true
    );
}
```

The above configuration would enable TLS communication for email messages.

Configurations

The following configuration keys are used:

- `'from'`: Email or array of sender. See `CakeEmail::from()`.
- `'sender'`: Email or array of real sender. See `CakeEmail::sender()`.
- `'to'`: Email or array of destination. See `CakeEmail::to()`.
- `'cc'`: Email or array of carbon copy. See `CakeEmail::cc()`.
- `'bcc'`: Email or array of blind carbon copy. See `CakeEmail::bcc()`.
- `'replyTo'`: Email or array to reply the e-mail. See `CakeEmail::replyTo()`.
- `'readReceipt'`: Email address or an array of addresses to receive the receipt of read. See `CakeEmail::readReceipt()`.
- `'returnPath'`: Email address or and array of addresses to return if have some error. See `CakeEmail::returnPath()`.
- `'messageId'`: Message ID of e-mail. See `CakeEmail::messageId()`.
- `'subject'`: Subject of the message. See `CakeEmail::subject()`.
- `'message'`: Content of message. Do not set this field if you are using rendered content.
- `'headers'`: Headers to be included. See `CakeEmail::setHeaders()`.
- `'viewRender'`: If you are using rendered content, set the view classname. See `CakeEmail::viewRender()`.
- `'template'`: If you are using rendered content, set the template name. See `CakeEmail::template()`.
- `'theme'`: Theme used when rendering template. See `CakeEmail::theme()`.
- `'layout'`: If you are using rendered content, set the layout to render. If you want to render a template without layout, set this field to null. See `CakeEmail::template()`.
- `'viewVars'`: If you are using rendered content, set the array with variables to be used in the view. See `CakeEmail::viewVars()`.
- `'attachments'`: List of files to attach. See `CakeEmail::attachments()`.

- `'emailFormat'`: Format of email (html, text or both). See `CakeEmail::emailFormat()`.
- `'transport'`: Transport name. See `CakeEmail::transport()`.
- `'log'`: Log level to log the email headers and message. `true` will use LOG_DEBUG. See also `CakeLog::write()`

All these configurations are optional, except `'from'`. If you put more configuration in this array, the configurations will be used in the `CakeEmail::config()` method and passed to the transport class `config()`. For example, if you are using smtp transport, you should pass the host, port and other configurations.

Note: The values of above keys using Email or array, like from, to, cc etc. will be passed as first parameter of corresponding methods. The equivalent for: `CakeEmail::from('my@example.com', 'My Site')` would be defined as `'from' => array('my@example.com' => 'My Site')` in your config

Setting headers

In `CakeEmail` you are free to set whatever headers you want. When migrating to use CakeEmail, do not forget to put the `X-` prefix in your headers.

See `CakeEmail::setHeaders()` and `CakeEmail::addHeaders()`

Sending templated emails

Emails are often much more than just a simple text message. In order to facilitate that, CakePHP provides a way to send emails using CakePHP's *view layer*.

The templates for emails reside in a special folder in your applications `View` directory. Email views can also use layouts, and elements just like normal views:

```
<?php
$email = new CakeEmail();
$email->template('welcome', 'fancy')
    ->emailFormat('html')
    ->to('bob@example.com')
    ->from('app@domain.com')
    ->send();
```

The above would use `app/View/Emails/html/welcome.ctp` for the view, and `app/View/Layouts/Emails/html/fancy.ctp` for the layout. You can send multipart templated email messages as well:

```
<?php
$email = new CakeEmail();
$email->template('welcome', 'fancy')
    ->emailFormat('both')
    ->to('bob@example.com')
    ->from('app@domain.com')
    ->send();
```

This would use the following view files:

- `app/View/Emails/text/welcome.ctp`
- `app/View/Layouts/Emails/text/fancy.ctp`
- `app/View/Emails/html/welcome.ctp`
- `app/View/Layouts/Emails/html/fancy.ctp`

When sending templated emails you have the option of sending either `text`, `html` or `both`.

You can set view variables with `CakeEmail::viewVars()`:

```
<?php
$email = new CakeEmail('templated');
$email->viewVars(array('value' => 12345));
```

In your email templates you can use these with:

```
<p>Here is your value: <b><?php echo $value; ?></b></p>
```

You can use helpers in emails as well, much like you can in normal view files. By default only the `HtmlHelper` is loaded. You can load additional helpers using the `helpers()` method:

```
<?php
$email->helpers(array('Html', 'Custom', 'Text'));
```

When setting helpers be sure to include 'Html' or it will be removed from the helpers loaded in your email template.

If you want to send email using templates in a plugin you can use the familiar *plugin syntax* to do so:

```
<?php
$email = new CakeEmail();
$email->template('Blog.new_comment', 'Blog.auto_message');
```

The above would use templates from the Blog plugin as an example.

In some cases, you might need to override the default template provided by plugins. You can do this using themes by telling CakeEmail to use appropriate theme using `CakeEmail::theme()` method:

```
<?php
$email = new CakeEmail();
$email->template('Blog.new_comment', 'Blog.auto_message');
$email->theme('TestTheme');
```

This allows you to override the *new_comment* template in your theme without modifying the Blog plugin. The template file needs to be created in the following path: `APP/View/Themed/TestTheme/Blog/Emails/text/new_comment.ctp`.

Sending attachments

`CakeEmail::`**`attachments`**`(`*$attachments = null*`)`

You can attach files to email messages as well. There are a few different formats depending on what kind of files you have, and how you want the filenames to appear in the recipient's mail client:

1. String: `$email->attachments('/full/file/path/file.png')` will attach this file with the name file.png.
2. Array: `$email->attachments(array('/full/file/path/file.png')` will have the same behavior as using a string.
3. Array with key: `$email->attachments(array('photo.png' => '/full/some_hash.png'))` will attach some_hash.png with the name photo.png. The recipient will see photo.png, not some_hash.png.
4. Nested arrays:

```
<?php
$email->attachments(array(
    'photo.png' => array(
        'file' => '/full/some_hash.png',
        'mimetype' => 'image/png',
        'contentId' => 'my-unique-id'
    )
));
```

The above will attach the file with different mimetype and with custom Content ID (when set the content ID the attachment is transformed to inline). The mimetype and contentId are optional in this form.

4.1. When you are using the `contentId`, you can use the file in the html body like `<img src="cid:my-content-id">`.

4.2. You can use the `contentDisposition` option to disable the `Content-Disposition` header for an attachment. This is useful when sending ical invites to clients using outlook.

Changed in version 2.3: The `contentDisposition` option was added in 2.3

Using transports

Transports are classes designed to send the e-mail over some protocol or method. CakePHP support the Mail (default), Debug and Smtp transports.

To configure your method, you must use the `CakeEmail::transport()` method or have the transport in your configuration

Creating custom Transports You are able to create your custom transports to integrate with others email systems (like SwiftMailer). To create your transport, first create the file `app/Lib/Network/Email/ExampleTransport.php` (where Example is the name of your transport). To start off your file should look like:

```php
<?php
App::uses('AbstractTransport', 'Network/Email');

class ExampleTransport extends AbstractTransport {

    public function send(CakeEmail $email) {
        // magic inside!
    }

}
```

You must implement the method `send(CakeEmail $email)` with your custom logic. Optionally, you can implement the `config($config)` method. `config()` is called before send() and allows you to accept user configurations. By default, this method puts the configuration in protected attribute `$_config`.

If you need to call additional methods on the transport before send, you can use `CakeEmail::transportClass()` to get an instance of the transport. Example:

```php
<?php
$yourInstance = $email->transport('your')->transportClass();
$yourInstance->myCustomMethod();
$email->send();
```

Sending messages quickly

Sometimes you need a quick way to fire off an email, and you don't necessarily want do setup a bunch of configuration ahead of time. `CakeEmail::deliver()` is intended for that purpose.

You can create your configuration in `EmailConfig`, or use an array with all options that you need and use the static method `CakeEmail::deliver()`. Example:

```php
<?php
CakeEmail::deliver('you@example.com', 'Subject', 'Message', array('from' => 'me@example.co
```

This method will send an email to you@example.com (you@example.com), from me@example.com (me@example.com) with subject Subject and content Message.

The return of `deliver()` is a `CakeEmail` instance with all configurations set. If you do not want to send the email right away, and wish to configure a few things before sending, you can pass the 5th parameter as false.

The 3rd parameter is the content of message or an array with variables (when using rendered content).

The 4th parameter can be an array with the configurations or a string with the name of configuration in `EmailConfig`.

If you want, you can pass the to, subject and message as null and do all configurations in the 4th parameter (as array or using `EmailConfig`). Check the list of *configurations* to see all accepted configs.

CakeNumber

class **CakeNumber**

If you need `NumberHelper` functionalities outside of a `View`, use the `CakeNumber` class:

```
<?php
class UsersController extends AppController {

    public $components = array('Auth');

    public function afterLogin() {
        App::uses('CakeNumber', 'Utility');
        $storageUsed = $this->Auth->user('storage_used');
        if ($storageUsed > 5000000) {
            // notify users of quota
            $this->Session->setFlash(__('You are using %s storage', CakeNumber::toReadableS
        }
    }
}
```

New in version 2.1: `CakeNumber` has been factored out from `NumberHelper`. All of these functions return the formatted number; They do not automatically echo the output into the view.

`CakeNumber::`**`currency`**(*mixed $number*, *string $currency = 'USD'*, *array $options = array()*)

Parameters

- **$number** (*float*) – The value to covert.
- **$currency** (*string*) – The known currency format to use.
- **$options** (*array*) – Options, see below.

This method is used to display a number in common currency formats (EUR,GBP,USD). Usage in a view looks like:

```
<?php
// called as NumberHelper
echo $this->Number->currency($number, $currency);

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::currency($number, $currency);
```

The first parameter, $number, should be a floating point number that represents the amount of money you are expressing. The second parameter is used to choose a predefined currency formatting scheme:

$currency	1234.56, formatted by currency type
EUR	€ 1.236,33
GBP	£ 1,236.33
USD	$ 1,236.33

The third parameter is an array of options for further defining the output. The following options are available:

Option	Description
before	The currency symbol to place before whole numbers ie. '$'
after	The currency symbol to place after decimal numbers ie. 'c'. Set to boolean false to use no decimal symbol. eg. 0.35 => $0.35.
zero	The text to use for zero values, can be a string or a number. ie. 0, 'Free!'
places	Number of decimal places to use. ie. 2
thousands	Thousands separator ie. ','
decimals	Decimal separator symbol ie. '.'
negative	Symbol for negative numbers. If equal to '()', the number will be wrapped with (and)
escape	Should the output be htmlentity escaped? Defaults to true
wholeSymbol	String to use for whole numbers ie. ' dollars'
wholePosition	Either 'before' or 'after' to place the whole symbol
fractionSymbol	String to use for fraction numbers ie. ' cents'
fractionPosition	Either 'before' or 'after' to place the fraction symbol

If a non-recognized $currency value is supplied, it is prepended to a USD formatted number. For example:

```php
<?php
// called as NumberHelper
echo $this->Number->currency('1234.56', 'FOO');

// Outputs
FOO 1,234.56

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::currency('1234.56', 'FOO');
```

`CakeNumber::`**`addFormat`**(*string $formatName*, *array $options*)

Parameters

- **$formatName** (*string*) – The format name to be used in the future
- **$options** (*array*) – The array of options for this format. Uses the same `$options` keys as `CakeNumber::currency()`.

Add a currency format to the Number helper. Makes reusing currency formats easier:

```php
<?php
// called as NumberHelper
$this->Number->addFormat('BRR', array('before' => 'R$ '));

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
CakeNumber::addFormat('BRR', array('before' => 'R$ '));
```

You can now use *BRR* as a short form when formatting currency amounts:

```
<?php
// called as NumberHelper
echo $this->Number->currency($value, 'BRR');

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::currency($value, 'BRR');
```

Added formats are merged with the following defaults:

```
<?php
array(
    'wholeSymbol'      => '',
    'wholePosition'    => 'before',
    'fractionSymbol'   => '',
    'fractionPosition' => 'after',
    'zero'             => 0,
    'places'           => 2,
    'thousands'        => ',',
    'decimals'         => '.',
    'negative'         => '()',
    'escape'           => true
)
```

`CakeNumber::`**`precision`**(*mixed $number*, *int $precision = 3*)

Parameters

- **$number** (*float*) – The value to covert
- **$precision** (*integer*) – The number of decimal places to display

This method displays a number with the specified amount of precision (decimal places). It will round in order to maintain the level of precision defined.:

```
<?php
// called as NumberHelper
echo $this->Number->precision(456.91873645, 2);

// Outputs
456.92

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::precision(456.91873645, 2);
```

`CakeNumber::`**`toPercentage`**(*mixed $number*, *int $precision = 2*)

Parameters

- **$number** (*float*) – The value to covert
- **$precision** (*integer*) – The number of decimal places to display

Like precision(), this method formats a number according to the supplied precision (where numbers are rounded to meet the given precision). This method also expresses the number as a percentage and prepends the output with a percent sign.:

```
<?php
// called as NumberHelper
echo $this->Number->toPercentage(45.691873645);

// Outputs
45.69%

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::toPercentage(45.691873645);
```

`CakeNumber::`**`toReadableSize`**(*string $data_size*)

Parameters

- **$data_size** (*string*) – The number of bytes to make readable.

This method formats data sizes in human readable forms. It provides a shortcut way to convert bytes to KB, MB, GB, and TB. The size is displayed with a two-digit precision level, according to the size of data supplied (i.e. higher sizes are expressed in larger terms):

```
<?php
// called as NumberHelper
echo $this->Number->toReadableSize(0); // 0 Bytes
echo $this->Number->toReadableSize(1024); // 1 KB
echo $this->Number->toReadableSize(1321205.76); // 1.26 MB
echo $this->Number->toReadableSize(5368709120); // 5.00 GB

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::toReadableSize(0); // 0 Bytes
echo CakeNumber::toReadableSize(1024); // 1 KB
echo CakeNumber::toReadableSize(1321205.76); // 1.26 MB
echo CakeNumber::toReadableSize(5368709120); // 5.00 GB
```

`CakeNumber::`**`format`**(*mixed $number*, *mixed $options=false*)

This method gives you much more control over the formatting of numbers for use in your views (and is used as the main method by most of the other NumberHelper methods). Using this method might looks like:

```
<?php
// called as NumberHelper
$this->Number->format($number, $options);

// called as CakeNumber
CakeNumber::format($number, $options);
```

The $number parameter is the number that you are planning on formatting for output. With no $options supplied, the number 1236.334 would output as 1,236. Note that the default precision is zero decimal places.

The $options parameter is where the real magic for this method resides.

- If you pass an integer then this becomes the amount of precision or places for the function.
- If you pass an associated array, you can use the following keys:
  - places (integer): the amount of desired precision
  - before (string): to be put before the outputted number
  - escape (boolean): if you want the value in before to be escaped
  - decimals (string): used to delimit the decimal places in a number
  - thousands (string): used to mark off thousand, millions, … places

Example:

```
<?php
// called as NumberHelper
echo $this->Number->format('123456.7890', array(
    'places' => 2,
    'before' => '¥ ',
    'escape' => false,
    'decimals' => '.',
    'thousands' => ','
));
// output '¥ 123,456.79'

// called as CakeNumber
App::uses('CakeNumber', 'Utility');
echo CakeNumber::format('123456.7890', array(
    'places' => 2,
    'before' => '¥ ',
    'escape' => false,
    'decimals' => '.',
    'thousands' => ','
));
// output '¥ 123,456.79'
```

CakeTime

class CakeTime

If you need `TimeHelper` functionalities outside of a `View`, use the `CakeTime` class:

```
<?php
class UsersController extends AppController {

    public $components = array('Auth');

    public function afterLogin() {
        App::uses('CakeTime', 'Utility');
        if (CakeTime::isToday($this->Auth->user('date_of_birth'))) {
            // greet user with a happy birthday message
```

```
                $this->Session->setFlash(__('Happy birthday you...'));
            }
        }
}
```

New in version 2.1: `CakeTime` has been factored out from `TimeHelper`.

Formatting

`CakeTime::`**`convert`**(*$serverTime*, *$timezone = NULL*)

Return type integer

Converts given time (in server's time zone) to user's local time, given his/her timezone.:

```
<?php
// called via TimeHelper
echo $this->Time->convert(time(), 'Asia/Jakarta');
// 1321038036

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::convert(time(), new DateTimeZone('Asia/Jakarta'));
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.

`CakeTime::`**`convertSpecifiers`**(*$format*, *$time = NULL*)

Return type string

Converts a string representing the format for the function strftime and returns a windows safe and i18n aware format.

`CakeTime::`**`dayAsSql`**(*$dateString*, *$field_name*, *$timezone = NULL*)

Return type string

Creates a string in the same format as daysAsSql but only needs a single date object:

```
<?php
// called via TimeHelper
echo $this->Time->dayAsSql('Aug 22, 2011', 'modified');
// (modified >= '2011-08-22 00:00:00') AND (modified <= '2011-08-22 23:59:59')

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::dayAsSql('Aug 22, 2011', 'modified');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`daysAsSql`**(*$begin*, *$end*, *$fieldName*, *$timezone = NULL*)

Return type string

Returns a string in the format "($field_name >= '2008-01-21 00:00:00') AND ($field_name <= '2008-01-25 23:59:59')". This is handy if you need to search for records between two dates inclusively:

```
<?php
// called via TimeHelper
echo $this->Time->daysAsSql('Aug 22, 2011', 'Aug 25, 2011', 'created');
// (created >= '2011-08-22 00:00:00') AND (created <= '2011-08-25 23:59:59')

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::daysAsSql('Aug 22, 2011', 'Aug 25, 2011', 'created');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`format`**(*$format*, *$dateString = NULL*, *$invalid = false*, *$timezone = NULL*)

Return type string

Will return a string formatted to the given format using the PHP date() formatting options (http://www.php.net/manual/en/function.date.php):

```
<?php
// called via TimeHelper
echo $this->Time->format('Y-m-d H:i:s');
// The Unix Epoch as 1970-01-01 00:00:00

echo $this->Time->format('F jS, Y h:i A', '2011-08-22 11:53:00');
// August 22nd, 2011 11:53 AM

echo $this->Time->format('r', '+2 days', true);
// 2 days from now formatted as Sun, 13 Nov 2011 03:36:10 +0800

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::format('Y-m-d H:i:s');
echo CakeTime::format('F jS, Y h:i A', '2011-08-22 11:53:00');
echo CakeTime::format('r', '+2 days', true);
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`fromString`**(*$dateString*, *$timezone = NULL*)

Return type string

Takes a string and uses strtotime (http://us.php.net/manual/en/function.date.php) to convert it into a date integer:

```
<?php
// called via TimeHelper
echo $this->Time->fromString('Aug 22, 2011');
// 1313971200

echo $this->Time->fromString('+1 days');
```

```
// 1321074066 (+1 day from current date)

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::fromString('Aug 22, 2011');
echo CakeTime::fromString('+1 days');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`gmt`**`(`*$dateString = NULL*`)`

Return type integer

Will return the date as an integer set to Greenwich Mean Time (GMT).:

```
<?php
// called via TimeHelper
echo $this->Time->gmt('Aug 22, 2011');
// 1313971200

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::gmt('Aug 22, 2011');
```

`CakeTime::`**`i18nFormat`**`(`*$date, $format = NULL, $invalid = false, $timezone = NULL*`)`

Return type string

Returns a formatted date string, given either a UNIX timestamp or a valid strtotime() date string. It take in account the default date format for the current language if a LC_TIME file is used. Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.

`CakeTime::`**`nice`**`(`*$dateString = NULL, $timezone = NULL*`)`

Return type string

Takes a date string and outputs it in the format "Tue, Jan 1st 2008, 19:25":

```
<?php
// called via TimeHelper
echo $this->Time->nice('2011-08-22 11:53:00');
// Mon, Aug 22nd 2011, 11:53

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::nice('2011-08-22 11:53:00');
```

`CakeTime::`**`niceShort`**`(`*$dateString = NULL, $timezone = NULL*`)`

Return type string

Takes a date string and outputs it in the format "Jan 1st 2008, 19:25". If the date object is today, the format will be "Today, 19:25". If the date object is yesterday, the format will be "Yesterday, 19:25":

```
<?php
// called via TimeHelper
echo $this->Time->niceShort('2011-08-22 11:53:00');
// Aug 22nd, 11:53

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::niceShort('2011-08-22 11:53:00');
```

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`serverOffset`**`()`

Return type integer

Returns server's offset from GMT in seconds.

`CakeTime::`**`timeAgoInWords`**`(`*$dateString*, *$options = array()*`)`

Return type string

Will take a datetime string (anything that is parsable by PHP's strtotime() function or MySQL's datetime format) and convert it into a friendly word format like, "3 weeks, 3 days ago":

```
<?php
// called via TimeHelper
echo $this->Time->timeAgoInWords('Aug 22, 2011');
// on 22/8/11

echo $this->Time->timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y'));
// on August 22nd, 2011

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::timeAgoInWords('Aug 22, 2011');
echo CakeTime::timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y'));
```

Use the 'end' option to determine the cutoff point to no longer will use words; default '+1 month':

```
<?php
// called via TimeHelper
echo $this->Time->timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y', 'end' =>
// On Nov 10th, 2011 it would display: 2 months, 2 weeks, 6 days ago

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::timeAgoInWords('Aug 22, 2011', array('format' => 'F jS, Y', 'end' => '+
```

Use the 'accuracy' option to determine how precise the output should be. You can use this to limit the output:

```
<?php
// If $timestamp is 1 month, 1 week, 5 days and 6 hours ago
echo CakeTime::timeAgoInWords($timestamp, array(
    'accuracy' => array('month' => 'month'),
    'end' => '1 year'
));
// Outputs '1 month ago'
```

Changed in version 2.2: The `accuracy` option was added.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`toAtom`**`(`*$dateString*, *$timezone = NULL*`)`

Return type string

Will return a date string in the Atom format "2008-01-12T00:00:00Z" Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`toQuarter`**`(`*$dateString*, *$range = false*`)`

Return type mixed

Will return 1, 2, 3 or 4 depending on what quarter of the year the date falls in. If range is set to true, a two element array will be returned with start and end dates in the format "2008-03-31":

```
<?php
// called via TimeHelper
echo $this->Time->toQuarter('Aug 22, 2011');
// Would print 3

$arr = $this->Time->toQuarter('Aug 22, 2011', true);
/*
Array
(
    [0] => 2011-07-01
    [1] => 2011-09-30
)
*/

// called as CakeTime
App::uses('CakeTime', 'Utility');
echo CakeTime::toQuarter('Aug 22, 2011');
$arr = CakeTime::toQuarter('Aug 22, 2011', true);
```

New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`toRSS`**`(`*$dateString*, *$timezone = NULL*`)`

Return type string

Will return a date string in the RSS format "Sat, 12 Jan 2008 00:00:00 -0500" Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`toUnix`**`(`*$dateString*, *$timezone = NULL*`)`

Return type integer

A wrapper for fromString. Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object.

`CakeTime::`**`toServer`**`(`*$dateString*, *$timezone = NULL*, *$format = 'Y-m-d H:i:s'*`)`

Return type mixed

New in version 2.2: Returns a formatted date in server's timezone.

`CakeTime::`**`timezone`**`(`*$timezone = NULL*`)`

Return type DateTimeZone

New in version 2.2: Returns a timezone object from a string or the user's timezone object. If the function is called without a parameter it tries to get timezone from 'Config.timezone' configuration variable.

`CakeTime::`**`listTimezones`**`(`*$filter = null*, *$country = null*, *$group = true*`)`

Return type array

New in version 2.2: Returns a list of timezone identifiers.

Testing Time

`CakeTime::`**`isToday`**`(`*$dateString*, *$timezone = NULL*`)`

`CakeTime::`**`isThisWeek`**`(`*$dateString*, *$timezone = NULL*`)`

`CakeTime::`**`isThisMonth`**`(`*$dateString*, *$timezone = NULL*`)`

`CakeTime::`**`isThisYear`**`(`*$dateString*, *$timezone = NULL*`)`

`CakeTime::`**`wasYesterday`**`(`*$dateString*, *$timezone = NULL*`)`

`CakeTime::`**`isTomorrow`**`(`*$dateString*, *$timezone = NULL*`)`

`CakeTime::`**`wasWithinLast`**`(`*$timeInterval*, *$dateString*, *$timezone = NULL*`)`

Changed in version 2.2: `$timezone` parameter replaces `$userOffset` parameter used in 2.1 and below.New in version 2.2: `$dateString` parameter now also accepts a DateTime object. All of the above functions return true or false when passed a date string. `wasWithinLast` takes an additional `$timeInterval` option:

```php
<?php
// called via TimeHelper
$this->Time->wasWithinLast($timeInterval, $dateString);

// called as CakeTime
App::uses('CakeTime', 'Utility');
CakeTime::wasWithinLast($timeInterval, $dateString);
```

`wasWithinLast` takes a time interval which is a string in the format "3 months" and accepts a time interval of seconds, minutes, hours, days, weeks, months and years (plural and not). If a time interval is not recognized (for example, if it is mistyped) then it will default to days.

Data Sanitization

class Sanitize

The CakePHP Sanitize class can be used to rid user-submitted data of malicious data and other unwanted information. Sanitize is a core library, so it can be used anywhere inside of your code, but is probably best used in controllers or models.

CakePHP already protects you against SQL Injection **if** you use CakePHP's ORM methods (such as find() and save()) and proper array notation (ie. array('field' => $value)) instead of raw SQL. For sanitization against XSS it's generally better to save raw HTML in database without modification and sanitize at the time of output/display.

All you need to do is include the Sanitize core library (e.g. before the controller class definition):

```
<?php
App::uses('Sanitize', 'Utility');

class MyController extends AppController {
    ...
    ...
}
```

Once you've done that, you can make calls to Sanitize statically.

static Sanitize::**clean**(*$data*, *$options*)

Parameters

- **$data** (*mixed*) – Data to clean.
- **$options** (*mixed*) – Options to use when cleaning, see below.

This function is an industrial-strength, multi-purpose cleaner, meant to be used on entire arrays (like $this->data, for example). The function takes an array (or string) and returns the clean version. The following cleaning operations are performed on each element in the array (recursively):

- Odd spaces (including 0xCA) are replaced with regular spaces.
- Double-checking special chars and removal of carriage returns for increased SQL security.
- Adding of slashes for SQL (just calls the sql function outlined above).
- Swapping of user-inputted backslashes with trusted backslashes.

The $options argument can either be a string or an array. When a string is provided it's the database connection name. If an array is provided it will be merged with the following options:

- connection
- odd_spaces
- encode
- dollar
- carriage

- unicode
- escape
- backslash
- remove_html (must be used in conjunction with the encode parameter)

Usage of clean() with options looks something like the following:

```
<?php
$this->data = Sanitize::clean($this->data, array('encode' => false));
```

static `Sanitize::`**`escape`**(*$string*, *$connection*)

Parameters

- **$string** (*string*) – Data to clean.
- **$connection** (*string*) – The name of the database to quote the string for, as named in your app/Config/database.php file.

Used to escape SQL statements by adding slashes, depending on the system's current magic_quotes_gpc setting,

static `Sanitize::`**`html`**(*$string*, *$options = array()*)

Parameters

- **$string** (*string*) – Data to clean.
- **$options** (*array*) – An array of options to use, see below.

This method prepares user-submitted data for display inside HTML. This is especially useful if you don't want users to be able to break your layouts or insert images or scripts inside of your HTML pages. If the $remove option is set to true, HTML content detected is removed rather than rendered as HTML entities:

```
<?php
$badString = '<font size="99" color="#FF0000">HEY</font><script>...</script>';
echo Sanitize::html($badString);
// output: &lt;font size=&quot;99&quot; color=&quot;#FF0000&quot;&gt;HEY&lt;/font&gt;&
echo Sanitize::html($badString, array('remove' => true));
// output: HEY...
```

Escaping is often a better strategy than stripping, as it has less room for error, and isn't vulnerable to new types of attacks, the stripping function does not know about.

static `Sanitize::`**`paranoid`**(*$string*, *$allowedChars*)

Parameters

- **$string** (*string*) – Data to clean.
- **$allowedChars** (*array*) – An array of non alpha numeric characters allowed.

This function strips anything out of the target $string that is not a plain-jane alphanumeric character. The function can be made to overlook certain characters by passing them in $allowedChars array:

```
    <?php
    $badString = ";:<script><html><   // >@@#";
    echo Sanitize::paranoid($badString);
    // output: scripthtml
    echo Sanitize::paranoid($badString, array(' ', '@'));
    // output: scripthtml    @@
```

Folder & File

The Folder and File utilities are convenience classes to help you read, write, and append to files; list files within a folder and other common directory related tasks.

Basic usage

Ensure the classes are loaded using `App::uses()`:

```
<?php
App::uses('Folder', 'Utility');
App::uses('File', 'Utility');
```

Then we can setup a new folder instance:

```
<?php
$dir = new Folder('/path/to/folder');
```

and search for all *.ctp* files within that folder using regex:

```
<?php
$files = $dir->find('.*\.ctp');
```

Now we can loop through the files and read, write or append to the contents or simply delete the file:

```
<?php
foreach ($files as $file) {
    $file = new File($dir->pwd() . DS . $file);
    $contents = $file->read();
    // $file->write('I am overwriting the contents of this file');
    // $file->append('I am adding to the bottom of this file.');
    // $file->delete(); // I am deleting this file
    $file->close(); // Be sure to close the file when you're done
}
```

Folder API

class **`Folder`**(*string $path = false*, *boolean $create = false*, *mixed $mode = false*)

```
<?php
// Create a new folder with 0755 permissions
$dir = new Folder('/path/to/folder', true, 0755);
```

property `Folder::$path`

Current path to the folder. `Folder::pwd()` will return the same information.

property `Folder::$sort`

Whether or not the list results should be sorted by name.

property `Folder::$mode`

Mode to be used when creating folders. Defaults to `0755`. Does nothing on windows machines.

static `Folder::addPathElement`(*$path*, *$element*)

Return type string

Returns $path with $element added, with correct slash in-between:

```
<?php
$path = Folder::addPathElement('/a/path/for', 'testing');
// $path equals /a/path/for/testing
```

`Folder::cd`(*$path*)

Return type string

Change directory to $path. Returns false on failure:

```
<?php
$folder = new Folder('/foo');
echo $folder->path; // Prints /foo
$folder->cd('/bar');
echo $folder->path; // Prints /bar
$false = $folder->cd('/non-existent-folder');
```

`Folder::chmod`(*$path*, *$mode = false*, *$recursive = true*, *$exceptions = array ( )*)

Return type boolean

Change the mode on a directory structure recursively. This includes changing the mode on files as well:

```
<?php
$dir = new Folder();
$dir->chmod('/path/to/folder', 0755, true, array('skip_me.php'));
```

`Folder::copy`(*$options = array ( )*)

Return type boolean

Recursively copy a directory. The only parameter $options can either be a path into copy to or an array of options:

```
<?php
$folder1 = new Folder('/path/to/folder1');
$folder1->copy('/path/to/folder2');
// Will put folder1 and all its contents into folder2

$folder = new Folder('/path/to/folder');
$folder->copy(array(
    'to' => '/path/to/new/folder',
    'from' => '/path/to/copy/from', // will cause a cd() to occur
    'mode' => 0755,
    'skip' => array('skip-me.php', '.git')
));
```

static `Folder::`**`correctSlashFor`**`(`*$path*`)`

> **Return type** string

Returns a correct set of slashes for given $path. (\ for Windows paths and / for other paths.)

`Folder::`**`create`**`(`*$pathname*, *$mode = false*`)`

> **Return type** boolean

Create a directory structure recursively. Can be used to create deep path structures like */foo/bar/baz/shoe/horn*:

```
<?php
$folder = new Folder();
if ($folder->create('foo' . DS . 'bar' . DS . 'baz' . DS . 'shoe' . DS . 'horn')) {
    // Successfully created the nested folders
}
```

`Folder::`**`delete`**`(`*$path = NULL*`)`

> **Return type** boolean

Recursively remove directories if the system allows:

```
<?php
$folder = new Folder('foo');
if ($folder->delete()) {
    // Successfully deleted foo its nested folders
}
```

`Folder::`**`dirsize`**`()`

> **Return type** integer

Returns the size in bytes of this Folder and its contents.

`Folder::`**`errors`**`()`

> **Return type** array

Get error from latest method.

`Folder::`**`find`**`(`*$regexpPattern = '.*'*, *$sort = false*`)`

> **Return type** array

Returns an array of all matching files in current directory:

```
<?php
// Find all .png in your app/webroot/img/ folder and sort the results
$dir = new Folder(WWW_ROOT . 'img');
```

```
$files = $dir->find('.*\.png', true);
/*
Array
(
    [0] => cake.icon.png
    [1] => test-error-icon.png
    [2] => test-fail-icon.png
    [3] => test-pass-icon.png
    [4] => test-skip-icon.png
)
*/
```

Note: The folder find and findRecursive methods will only find files. If you would like to get folders and files see `Folder::read()` or `Folder::tree()`

`Folder::`**`findRecursive`**`(`*$pattern* = '.*', *$sort* = *false*`)`

Return type array

Returns an array of all matching files in and below current directory:

```
<?php
// Recursively find files beginning with test or index
$dir = new Folder(WWW_ROOT);
$files = $dir->findRecursive('(test|index).*');
/*
Array
(
    [0] => /var/www/cake/app/webroot/index.php
    [1] => /var/www/cake/app/webroot/test.php
    [2] => /var/www/cake/app/webroot/img/test-skip-icon.png
    [3] => /var/www/cake/app/webroot/img/test-fail-icon.png
    [4] => /var/www/cake/app/webroot/img/test-error-icon.png
    [5] => /var/www/cake/app/webroot/img/test-pass-icon.png
)
*/
```

`Folder::`**`inCakePath`**`(`*$path* = ''`)`

Return type boolean

Returns true if the File is in a given CakePath.

`Folder::`**`inPath`**`(`*$path* = '', *$reverse* = *false*`)`

Return type boolean

Returns true if the File is in given path:

```
<?php
$Folder = new Folder(WWW_ROOT);
$result = $Folder->inPath(APP);
// $result = true, /var/www/example/app/ is in /var/www/example/app/webroot/
```

```
    $result = $Folder->inPath(WWW_ROOT . 'img' . DS, true);
    // $result = true, /var/www/example/app/webroot/ is in /var/www/example/app/webroot/im
```

static `Folder::`**`isAbsolute`**(*$path*)

Return type boolean

Returns true if given $path is an absolute path.

static `Folder::`**`isSlashTerm`**(*$path*)

Return type boolean

Returns true if given $path ends in a slash (i.e. is slash-terminated):

```
    <?php
    $result = Folder::isSlashTerm('/my/test/path');
    // $result = false
    $result = Folder::isSlashTerm('/my/test/path/');
    // $result = true
```

static `Folder::`**`isWindowsPath`**(*$path*)

Return type boolean

Returns true if given $path is a Windows path.

`Folder::`**`messages`**()

Return type array

Get messages from latest method.

`Folder::`**`move`**(*$options*)

Return type boolean

Recursive directory move.

static `Folder::`**`normalizePath`**(*$path*)

Return type string

Returns a correct set of slashes for given $path. (\ for Windows paths and / for other paths.)

`Folder::`**`pwd`**()

Return type string

Return current path.

`Folder::`**`read`**(*$sort = true*, *$exceptions = false*, *$fullPath = false*)

Return type mixed

Parameters

- **$sort** (*boolean*) – If true will sort results.
- **$exceptions** (*mixed*) – An array of files and folder names to ignore. If true or '.' this method will ignore hidden or dot files.

- **$fullPath** (*boolean*) – If true will return results using absolute paths.

Returns an array of the contents of the current directory. The returned array holds two arrays: One of directories and one of files:

```
<?php
$dir = new Folder(WWW_ROOT);
$files = $dir->read(true, array('files', 'index.php'));
/*
Array
(
    [0] => Array
        (
            [0] => css
            [1] => img
            [2] => js
        )
    [1] => Array
        (
            [0] => .htaccess
            [1] => favicon.ico
            [2] => test.php
        )
)
*/
```

`Folder::`**`realpath`**(*$path*)

Return type string

Get the real path (taking ".." and such into account).

static `Folder::`**`slashTerm`**(*$path*)

Return type string

Returns $path with added terminating slash (corrected for Windows or other OS).

`Folder::`**`tree`**(*$path = NULL*, *$exceptions = true*, *$type = NULL*)

Return type mixed

Returns an array of nested directories and files in each directory.

File API

class **`File`**(*string $path*, *boolean $create = false*, *integer $mode = 493*)

```
<?php
// Create a new file with 0644 permissions
$file = new File('/path/to/file.php', true, 0644);
```

property `File::$`**`Folder`**

The Folder object of the file.

property `File::$name`

The name of the file with the extension. Differs from `File::name()` which returns the name without the extension.

property `File::$info`

An array of file info. Use `File::info()` instead.

property `File::$handle`

Holds the file handler resource if the file is opened.

property `File::$lock`

Enable locking for file reading and writing.

property `File::$path`

Current file's absolute path.

`File::append`(*$data*, *$force = false*)

Return type boolean

Append given data string to this File.

`File::close()`

Return type boolean

Closes the current file if it is opened.

`File::copy`(*$dest*, *$overwrite = true*)

Return type boolean

Copy the File to $dest

`File::create()`

Return type boolean

Creates the File.

`File::delete()`

Return type boolean

Deletes the File.

`File::executable()`

Return type boolean

Returns true if the File is executable.

`File::exists()`

Return type boolean

Returns true if the File exists.

`File::ext()`

Return type string

Returns the File extension.

`File::`**`Folder`**`()`

Return type Folder

Returns the current folder.

`File::`**`group`**`()`

Return type integer

Returns the File's group.

`File::`**`info`**`()`

Return type string

Returns the File info. Changed in version 2.1: `File::info()` now includes filesize & mimetype information.

`File::`**`lastAccess`**`()`

Return type integer

Returns last access time.

`File::`**`lastChange`**`()`

Return type integer

Returns last modified time.

`File::`**`md5`**`(`*$maxsize = 5*`)`

Return type string

Get md5 Checksum of file with previous check of Filesize

`File::`**`name`**`()`

Return type string

Returns the File name without extension.

`File::`**`offset`**`(`*$offset = false*, *$seek = 0*`)`

Return type mixed

Sets or gets the offset for the currently opened file.

`File::`**`open`**`(`*$mode = 'r'*, *$force = false*`)`

Return type boolean

Opens the current file with a given $mode

`File::`**`owner`**`()`

Return type integer

Returns the File's owner.

`File::`**`perms`**`()`

> **Return type** string

Returns the "chmod" (permissions) of the File.

static `File::`**`prepare`**`(`*$data*, *$forceWindows = false*`)`

> **Return type** string

Prepares a ascii string for writing. Converts line endings to the correct terminator for the current platform. If windows "rn" will be used all other platforms will use "n"

`File::`**`pwd`**`()`

> **Return type** string

Returns the full path of the File.

`File::`**`read`**`(`*$bytes = false*, *$mode = 'rb'*, *$force = false*`)`

> **Return type** mixed

Return the contents of this File as a string or return false on failure.

`File::`**`readable`**`()`

> **Return type** boolean

Returns true if the File is readable.

`File::`**`safe`**`(`*$name = NULL*, *$ext = NULL*`)`

> **Return type** string

Makes filename safe for saving.

`File::`**`size`**`()`

> **Return type** integer

Returns the Filesize.

`File::`**`writable`**`()`

> **Return type** boolean

Returns true if the File is writable.

`File::`**`write`**`(`*$data*, *$mode = 'w'*, *$force = false*`)`

> **Return type** boolean

Write given data to this File.

New in version 2.1: `File::mime()`

`File::`**`mime`**`()`

> **Return type** mixed

Get the file's mimetype, returns false on failure.

HttpSocket

class HttpSocket (*mixed $config = array()*)

CakePHP includes an HttpSocket class which can be used easily for making requests. It is a great way to communicate with external webservices, or remote apis.

Making a request

You can use HttpSocket to create most kinds of HTTP requests with the different HTTP methods.

HttpSocket::**get**(*$uri*, *$query*, *$request*)

The `$query` parameter, can either be a query string, or an array of keys and values. The get method makes a simple HTTP GET request returning the results:

```
<?php
App::uses('HttpSocket', 'Network/Http');

$HttpSocket = new HttpSocket();

// string query
$results = $HttpSocket->get('http://www.google.com/search', 'q=cakephp');

// array query
$results = $HttpSocket->get('http://www.google.com/search', array('q' => 'cakephp'));
```

HttpSocket::**post**(*$uri*, *$data*, *$request*)

The post method makes a simple HTTP POST request returning the results.

The parameters for the `post` method are almost the same as the get method, `$uri` is the web address where the request is being made; `$query` is the data to be posted, either as s string, or as an array of keys and values:

```
<?php
App::uses('HttpSocket', 'Network/Http');

$HttpSocket = new HttpSocket();

// string data
$results = $HttpSocket->post(
    'http://example.com/add',
    'name=test&type=user'
);

// array data
$data = array('name' => 'test', 'type' => 'user');
$results = $HttpSocket->post('http://example.com/add', $data);
```

HttpSocket::**put**(*$uri*, *$data*, *$request*)

The put method makes a simple HTTP PUT request returning the results.

The parameters for the `put` method is the same as the `post()` method.

`HttpSocket::`**`delete`**`(`*$uri*, *$query*, *$request*`)`

The put method makes a simple HTTP PUT request returning the results.

The parameters for the `delete` method is the same as the `get()` method. The `$query` parameter can either be a string or an array of query string arguments for the request.

`HttpSocket::`**`request`**`(`*$request*`)`

The base request method, which is called from all the wrappers (get, post, put, delete). Returns the results of the request.

$request is a keyed array of various options. Here is the format and default settings:

```
public $request = array(
    'method' => 'GET',
    'uri' => array(
        'scheme' => 'http',
        'host' => null,
        'port' => 80,
        'user' => null,
        'pass' => null,
        'path' => null,
        'query' => null,
        'fragment' => null
    ),
    'auth' => array(
        'method' => 'Basic',
        'user' => null,
        'pass' => null
    ),
    'version' => '1.1',
    'body' => '',
    'line' => null,
    'header' => array(
        'Connection' => 'close',
        'User-Agent' => 'CakePHP'
    ),
    'raw' => null,
    'redirect' => false,
    'cookies' => array()
);
```

Handling the response

Responses from requests made with `HttpSocket` are instances of `HttpResponse`. This object gives you a few accessor methods to access the contents of an HTTP response. This class implements the ArrayAccess (http://php.net/manual/en/class.arrayaccess.php) and __toString() (http://www.php.net/manual/en/language.oop5.magic.php#language.oop5.magic.tostring), so you can continue using the `$http->response` as array and the return of request methods as string:

```
<?php
App::uses('HttpSocket', 'Network/Http');
```

```
$http = new HttpSocket();
$response = $http->get('http://www.cakephp.org');

// Check the body for the presence of a title tag.
$titlePos = strpos($response->body, '<title>');

// Get the status code for the response.
$code = $response->code;
```

The `HttpResponse` has the following attributes:

- `body` returns body of HTTP response (normally the HTML).
- `headers` returns array with headers.
- `cookies` returns array with new cookies (cookies from others request are not stored here).
- `httpVersion` returns string with HTTP version (from first line in response).
- `code` returns the integer with HTTP code.
- `reasonPhrase` returns the string with HTTP code response.
- `raw` returns the unchanged response from server.

The `HttpResponse` also exposes the following methods:

- `body()` returns the body
- `isOk()` returns if code is 200;
- `isRedirect()` returns if code is 301, 302, 303 or 307 and the *Location* header is set.
- `getHeader()` allows you to fetch headers, see the next section.

Getting headers from a response

Following others places in core, the HttpSocket does not change the casing of headers. **RFC 2616** (http://tools.ietf.org/html/rfc2616.html) states that headers are case insensitive, and HttpSocket preserves the values the remote host sends:

```
HTTP/1.1 200 OK
Date: Mon, 16 Apr 2007 04:14:16 GMT
server: CakeHttp Server
content-tyPe: text/html
```

Your `$response->headers` (or `$response['header']`) will contain the exact keys sent. In order to safely access the header fields, it's best to use `getHeader()`. If your headers looks like:

```
Date: Mon, 16 Apr 2007 04:14:16 GMT
server: CakeHttp Server
content-tyPe: text/html
```

You could fetch the above headers by calling:

```
<?php
// $response is an instance of HttpResponse
// get the Content-Type header.
$response->getHeader('Content-Type');

// get the date
$response->getHeader('date');
```

Headers can be fetched case-insensitively.

Automatically handling a redirect response

When the response has a valid redirect status code (see `HttpResponse::isRedirect`), an extra request can be automatically done according to the received *Location* header:

```
<?php
App::uses('HttpSocket', 'Network/Http');

$HttpSocket = new HttpSocket();
$response = $HttpSocket->get('http://example.com/redirecting_url', array(), array('redirect
```

The *redirect* option can take the following values

- **true** : all redirecting responses will fire a consequent new request
- **integer** : the set value is the maximum number of redirections allowed (after reaching it, the *redirect* value is considered as **false**)
- **false** (default) : no consequent request will be fired

The returned `$response` will be the final one, according to the settings.

Creating a custom response class

You can create your own response class to use with HttpSocket. You could create the file `app/Lib/Network/Http/YourResponse.php` with the content:

```
<?php
App::uses('HttpResponse', 'Network/Http');

class YourResponse extends HttpResponse {

    public function parseResponse($message) {
        parent::parseResponse($message);
        // Make what you want
    }
}
```

Before your request you'll need to change the responseClass property:

```
<?php
App::uses('HttpSocket', 'Network/Http');

$http = new HttpSocket();
$http->responseClass = 'YourResponse';
```

Downloading the results

HttpSocket has a new method called *setContentResource()*. By setting a resource with this method, the content will be written to this resource, using *fwrite()*. To you download a file, you can do:

```
<?php
App::uses('HttpSocket', 'Network/Http');

$http = new HttpSocket();
$f = fopen(TMP . 'bakery.xml', 'w');
$http->setContentResource($f);
$http->get('http://bakery.cakephp.org/comments.rss');
fclose($f);
```

Note: The headers are not included in file, you will only get the body content written to your resource. To disable saving into the resource, use `$http->setContentResource(false)`.

Using authentication

HttpSocket supports a HTTP Basic and Digest authentication methods out of the box. You can also create custom authentication objects to support protocols like OAuth. To use any authentication system you need to configure the `HttpSocket` instance:

```
<?php
App::uses('HttpSocket', 'Network/Http');

$http = new HttpSocket();
$http->configAuth('Basic', 'user', 'password');
```

The above would configure the `HttpSocket` instance to use Basic authentication using `user` and `password` as the credentials.

Creating a custom authentication object

You can now create your own authentication method to use with HttpSocket. You could create the file `app/Lib/Network/Http/YourMethodAuthentication.php` with the content:

```
<?php

class YourMethodAuthentication {
```

```
/**
 * Authentication
 *
 * @param HttpSocket $http
 * @param array $authInfo
 * @return void
 */
    public static function authentication(HttpSocket $http, &$authInfo) {
        // Do something, for example set $http->request['header']['Authentication'] value
    }

}
```

To configure HttpSocket to use your auth configuration, you can use the new method `configAuth()`:

```
<?php
$http->configAuth('YourMethod', array('config1' => 'value1', 'config2' => 'value2'));
$http->get('http://secure.your-site.com');
```

The `authentication()` method will be called to append the request headers.

Using a HttpSocket with a proxy

As part of auth configuration, you can configure proxy authentication. You can create your customized method to proxy authentication in the same class of authentication. For example:

```
<?php

class YourMethodAuthentication {

/**
 * Authentication
 *
 * @param HttpSocket $http
 * @param array $authInfo
 * @return void
 */
    public static function authentication(HttpSocket $http, &$authInfo) {
        // Do something, for example set $http->request['header']['Authentication'] value
    }

/**
 * Proxy Authentication
 *
 * @param HttpSocket $http
 * @param array $proxyInfo
 * @return void
 */
    public static function proxyAuthentication(HttpSocket $http, &$proxyInfo) {
        // Do something, for example set $http->request['header']['Proxy-Authentication']
    }
}
```

Note: To use a proxy, you must call the `HttpSocket::configProxy()` similar to `HttpSocket::configAuth()`.

Inflector

class `Inflector`

The Inflector class takes a string and can manipulate it to handle word variations such as pluralizations or camelizing and is normally accessed statically. Example: `Inflector::pluralize('example')` returns "examples".

static `Inflector::`**`pluralize`**`(`*$singular*`)`

- **Input:** Apple, Orange, Person, Man
- **Output:** Apples, Oranges, People, Men

static `Inflector::`**`singularize`**`(`*$plural*`)`

Input: Apples, Oranges, People, Men **Output:** Apple, Orange, Person, Man

static `Inflector::`**`camelize`**`(`*$underscored*`)`

- **Input:** Apple_pie, some_thing, people_person
- **Output:** ApplePie, SomeThing, PeoplePerson

static `Inflector::`**`underscore`**`(`*$camelCase*`)`

It should be noted that underscore will only convert camelCase formatted words. Words that contains spaces will be lower-cased, but will not contain an underscore.

- **Input:** applePie, someThing
- **Output:** apple_pie, some_thing

static `Inflector::`**`humanize`**`(`*$underscored*`)`

- **Input:** apple_pie, some_thing, people_person
- **Output:** Apple Pie, Some Thing, People Person

static `Inflector::`**`tableize`**`(`*$camelCase*`)`

- **Input:** Apple, UserProfileSetting, Person
- **Output:** apples, user_profile_settings, people

static `Inflector::`**`classify`**`(`*$underscored*`)`

- **Input:** apples, user_profile_settings, people
- **Output:** Apple, UserProfileSetting, Person

static `Inflector::`**`variable`**`(`*$underscored*`)`

- **Input:** apples, user_result, people_people
- **Output:** apples, userResult, peoplePeople

static `Inflector::slug`(*$word*, *$replacement* = '_')

Slug converts special characters into latin versions and converting unmatched characters and spaces to underscores. The slug method expects UTF-8 encoding.

- **Input:** apple purée
- **Output:** apple_puree

static `Inflector::reset`

Resets Inflector back to its initial state, useful in testing.

static `Inflector::rules`(*$type*, *$rules*, *$reset* = *false*)

Define new inflection and transliteration rules for Inflector to use. See *Inflection Configuration* for more information.

Internationalization & Localization

One of the best ways for your applications to reach a larger audience is to cater for multiple languages. This can often prove to be a daunting task, but the internationalization and localization features in CakePHP make it much easier.

First, it's important to understand some terminology. *Internationalization* refers to the ability of an application to be localized. The term *localization* refers to the adaptation of an application to meet specific language (or culture) requirements (i.e., a "locale"). Internationalization and localization are often abbreviated as i18n and l10n respectively; 18 and 10 are the number of characters between the first and last character.

Internationalizing Your Application

There are only a few steps to go from a single-language application to a multi-lingual application, the first of which is to make use of the `__()` function in your code. Below is an example of some code for a single-language application:

```
<h2>Posts</h2>
```

To internationalize your code, all you need to do is to wrap strings in `__()` like so:

```
<h2><?php echo __('Posts'); ?></h2>
```

If you do nothing further, these two code examples are functionally identical - they will both send the same content to the browser. The `__()` function will translate the passed string if a translation is available, or return it unmodified. It works similar to other Gettext (http://en.wikipedia.org/wiki/Gettext) implementations (as do the other translate functions, such as `__d()` , `__n()` etc)

With your code ready to be multilingual, the next step is to create your pot file (http://en.wikipedia.org/wiki/Gettext), which is the template for all translatable strings in your application. To generate your pot file(s), all you need to do is run the *i18n console task*, which will look for where you've used a translate function in your code and generate your pot file(s) for you. You can and should re-run this console task any time you change the translations in your code.

The pot file(s) themselves are not used by CakePHP, they are the templates used to create or update your po files (http://en.wikipedia.org/wiki/Gettext), which contain the translations. Cake will look for your po files in the following location:

```
/app/Locale/<locale>/LC_MESSAGES/<domain>.po
```

The default domain is 'default', therefore your locale folder would look something like this:

```
/app/Locale/eng/LC_MESSAGES/default.po (English)
/app/Locale/fre/LC_MESSAGES/default.po (French)
/app/Locale/por/LC_MESSAGES/default.po (Portuguese)
```

To create or edit your po files it's recommended that you do *not* use your favorite editor. To create a po file for the first time it is possible to copy the pot file to the correct location and change the extension *however* unless you're familiar with their format, it's quite easy to create an invalid po file or to save it as the wrong charset (if you're editing manually, use UTF-8 to avoid problems). There are free tools such as PoEdit (http://www.poedit.net) which make editing and updating your po files an easy task; especially for updating an existing po file with a newly updated pot file.

The three-character locale codes conform to the ISO 639-2 (http://www.loc.gov/standards/iso639-2/php/code_list.php) standard, although if you create regional locales (en_US, en_GB, etc.) cake will use them if appropriate.

Remember that po files are useful for short messages, if you find you want to translate long paragraphs, or even whole pages - you should consider implementing a different solution. e.g.:

```php
<?php
// App Controller Code.
public function beforeFilter() {
    $locale = Configure::read('Config.language');
    if ($locale && file_exists(VIEWS . $locale . DS . $this->viewPath)) {
        // e.g. use /app/View/fre/Pages/tos.ctp instead of /app/View/Pages/tos.ctp
        $this->viewPath = $locale . DS . $this->viewPath;
    }
}
```

or:

```php
<?php
// View code
echo $this->element(Configure::read('Config.language') . '/tos');
```

Internationalizing CakePHP Plugins

If you want to include translation files within your application you'll need to follow a few conventions.

Instead of __() and __n() you will have to use __d() and __dn(). The D means domain. So if you have a plugin called 'DebugKit' you would have to do this:

```php
<?php
__d('debug_kit', 'My example text');
```

Using the underscored syntax is important, if you don't use it CakePHP won't find your translation file.

Your translation file for this example should go into:

```
/app/Plugin/DebugKit/Locale/<locale>/LC_MESSAGES/<domain>.po
```

And for other languages than the default:

```
/app/Plugin/DebugKit/Locale/eng/LC_MESSAGES/debug_kit.po (English)
/app/Plugin/DebugKit/Locale/fre/LC_MESSAGES/debug_kit.po (French)
/app/Plugin/DebugKit/Locale/por/LC_MESSAGES/debug_kit.po (Portuguese)
```

The reason for that is that CakePHP will use the lower cased and underscored plugin name to compare it to the translation domain and is going to look into the plugin if there is a match for the given translation file.

Localization in CakePHP

To change or set the language for your application, all you need to do is the following:

```
<?php
Configure::write('Config.language', 'fre');
```

This tells Cake which locale to use (if you use a regional locale, such as fr_FR, it will use the ISO 639-2 (http://www.loc.gov/standards/iso639-2/php/code_list.php) locale as a fallback if it doesn't exist), you can change the language at any time during a request. e.g. in your bootstrap if you're setting the application default language, in your (app) controller beforeFilter if it's specific to the request or user, or in fact anytime at all before you want a message in a different language. To set the language for the current user, you can store the setting in the Session object, like this:

```
<?php
$this->Session->write('Config.language', 'fre');
```

At the beginning of each request in your controller's `beforeFilter` you should configure `Configure` as well:

```
<?php
class AppController extends Controller {
    public function beforeFilter() {
        Configure::write('Config.language', $this->Session->read('Config.language'));
    }
}
```

Doing this will ensure that both `I18n` and `TranslateBehavior` access the same language value.

It's a good idea to serve up public content available in multiple languages from a unique url - this makes it easy for users (and search engines) to find what they're looking for in the language they are expecting. There are several ways to do this, it can be by using language specific subdomains (en.example.com, fra.example.com, etc.), or using a prefix to the url such as is done with this application. You may also wish to glean the information from the browser's user-agent, among other things.

As mentioned in the previous section, displaying localized content is done using the `__()` convenience function, or one of the other translation functions all of which are globally available, but probably be best utilized in your views. The first parameter of the function is used as the msgid defined in the .po files.

CakePHP will automatically assume that all model validation error messages in your `$validate` array are intended to be localized. When running the i18n shell these strings will also be extracted.

There's one other aspect of localizing your application which is not covered by the use of the translate functions, and that is date/money formats. Don't forget that CakePHP is PHP :), therefore to set the formats for these things you need to use setlocale (http://www.php.net/setlocale).

If you pass a locale that doesn't exist on your computer to setlocale (http://www.php.net/setlocale) it will have no effect. You can find the list of available locales by running the command `locale -a` in a terminal.

Translating model validation errors

CakePHP will automatically extract the validation error when you are using the *i18n console task*. By default, the default domain is used. This can be overwritten by setting the `$validationDomain` property in your model:

```php
<?php
class User extends AppModel {

    public $validationDomain = 'validation_errors';
}
```

Additional parameters defined in the validation rule are passed to the translation function. This allows you to create dynamic validation messages:

```php
<?php
class User extends AppModel {

    public $validationDomain = 'validation';

    public $validate = array(
        'username' => array(
                'length' => array(
                'rule' => array('between', 2, 10),
                'message' => 'Username should be between %d and %d characters'
            )
        )
    )
}
```

Which will do the following internal call:

```php
<?php
__d('validation', 'Username should be between %d and %d characters', array(2, 10));
```

Logging

While CakePHP core Configure Class settings can really help you see what's happening under the hood, there are certain times that you'll need to log data to the disk in order to find out what's going on. In a world that is becoming more dependent on technologies like SOAP and AJAX, debugging can be rather difficult.

Logging can also be a way to find out what's been going on in your application over time. What search terms are being used? What sorts of errors are my users being shown? How often is a particular query being executed?

Logging data in CakePHP is easy - the log() function is a part of the Object class, which is the common ancestor for almost all CakePHP classes. If the context is a CakePHP class (Model, Controller, Component... almost anything), you can log your data. You can also use `CakeLog::write()` directly. See *Writing to logs*

Creating and configuring log streams

Log stream handlers can be part of your application, or part of plugins. If for example you had a database logger called `DatabaseLogger`. As part of your application it would be placed in `app/Lib/Log/Engine/DatabaseLogger.php`. As part of a plugin it would be placed in `app/Plugin/LoggingPack/Lib/Log/Engine/DatabaseLogger.php`. When configured `CakeLog` will attempt to load Configuring log streams is done by calling `CakeLog::config()`. Configuring our DataBaseLogger would look like:

```php
<?php
// for app/Lib
CakeLog::config('otherFile', array(
    'engine' => 'DatabaseLogger',
    'model' => 'LogEntry',
    // ...
));

// for plugin called LoggingPack
CakeLog::config('otherFile', array(
    'engine' => 'LoggingPack.DatabaseLogger',
    'model' => 'LogEntry',
    // ...
));
```

When configuring a log stream the `engine` parameter is used to locate and load the log handler. All of the other configuration properties are passed to the log stream's constructor as an array.:

```php
<?php
App::uses('CakeLogInterface', 'Log');

class DatabaseLogger implements CakeLogInterface {
    public function __construct($options = array()) {
        // ...
    }

    public function write($type, $message) {
        // write to the database.
    }
}
```

CakePHP has no requirements for Log streams other than that they must implement a `write` method. This write method must take two parameters `$type, $message` in that order. `$type` is the string type of the logged message, core values are `error`, `warning`, `info` and `debug`. In addition you can define your own types by using them when you call `CakeLog::write`.

Note: Always configure loggers in `app/Config/bootstrap.php` Trying to use Application or plugin loggers in core.php will cause issues, as application paths are not yet configured.

Error and Exception logging

Errors and Exceptions can also be logged. By configuring the co-responding values in your core.php file. Errors will be displayed when debug > 0 and logged when debug == 0. Set `Exception.log` to true to log uncaught exceptions. See *Configuration* for more information.

Interacting with log streams

You can introspect the configured streams with `CakeLog::configured()`. The return of `configured()` is an array of all the currently configured streams. You can remove streams using `CakeLog::drop()`. Once a log stream has been dropped it will no longer receive messages.

Using the default FileLog class

While CakeLog can be configured to write to a number of user configured logging adapters, it also comes with a default logging configuration. The default logging configuration will be used any time there are *no other* logging adapters configured. Once a logging adapter has been configured you will need to also configure FileLog if you want file logging to continue.

As its name implies FileLog writes log messages to files. The type of log message being written determines the name of the file the message is stored in. If a type is not supplied, LOG_ERROR is used which writes to the error log. The default log location is `app/tmp/logs/$type.log`:

```php
<?php
// Executing this inside a CakePHP class
$this->log("Something didn't work!");

// Results in this being appended to app/tmp/logs/error.log
// 2007-11-02 10:22:02 Error: Something didn't work!
```

You can specify a custom log name using the first parameter. The default built-in FileLog class will treat this log name as the file you wish to write logs to:

```php
<?php
// called statically
CakeLog::write('activity', 'A special message for activity logging');

// Results in this being appended to app/tmp/logs/activity.log (rather than error.log)
// 2007-11-02 10:22:02 Activity: A special message for activity logging
```

The configured directory must be writable by the web server user in order for logging to work correctly.

You can configure additional/alternate FileLog locations using `CakeLog::config()`. FileLog accepts a `path` which allows for custom paths to be used:

```php
<?php
CakeLog::config('custom_path', array(
    'engine' => 'FileLog',
    'path' => '/path/to/custom/place/'
));
```

Writing to logs

Writing to the log files can be done in 2 different ways. The first is to use the static `CakeLog::write()` method:

```php
<?php
CakeLog::write('debug', 'Something did not work');
```

The second is to use the log() shortcut function available on any class that extends `Object`. Calling log() will internally call CakeLog::write():

```php
<?php
// Executing this inside a CakePHP class:
$this->log("Something did not work!", 'debug');
```

All configured log streams are written to sequentially each time `CakeLog::write()` is called. You do not need to configure a stream in order to use logging. If no streams are configured when the log is written to, a `default` stream using the core `FileLog` class will be configured to output into `app/tmp/logs/` just as CakeLog did in previous versions.

Logging Scopes

New in version 2.2. Often times you'll want to configure different logging behavior for different subsystems or parts of your application. Take for example an e-commerce shop. You'll probably want to handle logging for orders and payments differently than you do other less critical logs.

CakePHP exposes this concept as logging scopes. When log messages are written you can include a scope name. If there is a configured logger for that scope, the log messages will be directed to those loggers. If a log message is written to an unknown scope, loggers that handle that level of message will log the message. For example:

```php
<?php
// configure tmp/logs/shops.log to receive all types (log levels), but only
// those with `orders` and `payments` scope
CakeLog::config('shops', array(
    'engine' => 'FileLog',
    'types' => array(),
    'scopes' => array('orders', 'payments'),
    'file' => 'shops.log',
));

// configure tmp/logs/payments.log to receive all types, but only
// those with `payments` scope
CakeLog::config('shops', array(
    'engine' => 'FileLog',
    'types' => array(),
    'scopes' => array('payments'),
    'file' => 'payments.log',
));

CakeLog::warning('this gets written only to shops.log', 'orders');
CakeLog::warning('this gets written to both shops.log and payments.log', 'payments');
CakeLog::warning('this gets written to both shops.log and payments.log', 'unknown');
```

CakeLog API

class CakeLog

A simple class for writing to logs.

static `CakeLog::`**`config`**`(`*$name*, *$config*`)`

Parameters

- **$name** (*string*) – Name for the logger being connected, used to drop a logger later on.
- **$config** (*array*) – Array of configuration information and constructor arguments for the logger.

Connect a new logger to CakeLog. Each connected logger receives all log messages each time a log message is written.

static `CakeLog::`**`configured`**

Returns An array of configured loggers.

Get the names of the configured loggers.

static `CakeLog::`**`drop`**`(`*$name*`)`

Parameters

- **$name** (*string*) – Name of the logger you wish to no longer receive messages.

static `CakeLog::`**`write`**`(`*$level*, *$message*, *$scope = array()*`)`

Write a message into all the configured loggers. $level indicates the level of log message being created. $message is the message of the log entry being written to. Changed in version 2.2: `$scope` was added

New in version 2.2: Log levels and scopes

static `CakeLog::`**`levels`**

Call this method without arguments, eg: *CakeLog::levels()* to obtain current level configuration.

To append additional level 'user0' and 'user1' to to default log levels:

```
<?php
CakeLog::levels(array('user0', 'user1'));
// or
CakeLog::levels(array('user0', 'user1'), true);
```

will result in:

```
<?php
array(
    0 => 'emergency',
    1 => 'alert',
    ...
    8 => 'user0',
    9 => 'user1',
);
```

To set/replace existing configuration, pass an array with the second argument set to false:

```
<?php
CakeLog::levels(array('user0', 'user1'), false);
```

will result in:

```
<?php
array(
    0 => 'user0',
    1 => 'user1',
);
```

static `CakeLog::`**`defaultLevels`**

Resets log levels to the original value

Returns An array of the default log levels values

static `CakeLog::`**`enabled`**(*$streamName*)

Checks wether $streamName is enable

Returns boolean

static `CakeLog::`**`enable`**(*$streamName*)

Enable stream $streamName

static `CakeLog::`**`disable`**(*$streamName*)

Disable stream $streamName

static `CakeLog::`**`stream`**(*$streamName*)

Gets $streamName from the active streams

Convenience methods

New in version 2.2. The following convenience methods were added to log *$message* with the appropriate log level.

static `CakeLog::`**`emergency`**(*$message*, *$scope = array()*)

static `CakeLog::`**`alert`**(*$message*, *$scope = array()*)

static `CakeLog::`**`critical`**(*$message*, *$scope = array()*)

static `CakeLog::`**`notice`**(*$message*, *$scope = array()*)

static `CakeLog::`**`debug`**(*$message*, *$scope = array()*)

static `CakeLog::`**`info`**(*$message*, *$scope = array()*)

Router

Router can be used to parse urls into arrays containing indexes for the controller, action, and any parameters, and the opposite: to convert url arrays (eg. array('controller' => 'posts', 'action' => 'index')) to string urls.

Read more about ways to *configure the Router* and the `Router` class.

Security

class **`Security`**

The security library (http://api20.cakephp.org/class/security) handles basic security measures such as providing methods for hashing and encrypting data.

Security API

static `Security::`**`cipher`**(*$text*, *$key*)

Return type string

Encrypts/Decrypts a text using the given key.:

```
<?php
// Encrypt your secret password with my_key
$secret = Security::cipher('my secret password', 'my_key');

// Later decrypt your secret password
$nosecret = Security::cipher($secret, 'my_key');
```

`cipher()` uses a **weak** XOR cipher and should **not** be used for important or sensitive data.

static `Security::`**`rijndael`**(*$text*, *$key*, *$mode*)

Parameters

- **$text** (*string*) – The text to encrypt
- **$key** (*string*) – The key to use for encryption. This must be longer than 32 bytes.
- **$mode** (*string*) – The mode to use, either 'encrypt' or 'decrypt'

Encrypts/Decrypts text using the rijndael-256 cipher. This requires the mcrypt extension (http://php.net/mcrypt) to be installed:

```
<?php
// Encrypt some data.
$encrypted = Security::rijndael('a secret', Configure::read('Security.key'), 'encrypt'

// Later decrypt it.
$decrypted = Security::rijndael($encrypted, Configure::read('Security.key'), 'decrypt'
```

`rijndael()` can be used to store data you need to decrypt later, like the contents of cookies. It should **never** be used to store passwords. Instead you should use the one way hashing methods provided by `hash()` New in version 2.2: `Security::rijndael()` was added in 2.2.

static `Security::`**`generateAuthKey`**`()`

Return type

string

Generate authorization hash.

static `Security::`**`getInstance`**`()`

Return type object

Singleton implementation to get object instance.

static `Security::`**`hash`**`(`*$string*, *$type = NULL*, *$salt = false*`)`

Return type string

Create a hash from string using given method. Fallback on next available method. If `$salt` is set to true, the applications salt value will be used:

```
<?php
// Using the application's salt value
$sha1 = Security::hash('CakePHP Framework', 'sha1', true);

// Using a custom salt value
$md5 = Security::hash('CakePHP Framework', 'md5', 'my-salt');

// Using the default hash algorithm
$hash = Security::hash('CakePHP Framework');
```

`hash()` also supports more secure hashing algorithms like bcrypt. When using bcrypt, you should be mindful of the slightly different usage. Creating an initial hash works the same as other algorithms:

```
<?php
// Create a hash using bcrypt
Security::setHash('blowfish');
$hash = Security::hash('CakePHP Framework');
```

Unlike other hash types comparing plain text values to hashed values should be done as follows:

```
<?php
// $storedPassword, is a previously generated bcrypt hash.
$newHash = Security::hash($newPassword, 'blowfish', $storedPassword);
```

When comparing values hashed with bcrypt, the original hash should be provided as the `$salt` parameter. This allows bcrypt to reuse the same cost and salt values, allowing the generated hash to end up with the same resulting hash given the same input value. Changed in version 2.3: Support for bcrypt was added in 2.3

static `Security::`**`inactiveMins`**`()`

Return type integer

Get allowed minutes of inactivity based on security level.:

```
<?php
$mins = Security::inactiveMins();
// If your config Security.level is set to 'medium' then $mins will equal 100
```

static `Security::`**`setHash`**`(`*$hash*`)`

Return type void

Sets the default hash method for the Security object. This affects all objects using Security::hash().

static `Security::`**`validateAuthKey`**`(`*$authKey*`)`

Return type boolean

Validate authorization hash.

Hash

class **`Hash`**

New in version 2.2. Array management, if done right, can be a very powerful and useful tool for building smarter, more optimized code. CakePHP offers a very useful set of static utilities in the Hash class that allow you to do just that.

CakePHP's Hash class can be called from any model or controller in the same way Inflector is called. Example: `Hash::combine()`.

Hash path syntax

The path syntax described below is used by all the methods in `Hash`. Not all parts of the path syntax are available in all methods. A path expression is made of any number of tokens. Tokens are composed of two groups. Expressions, are used to traverse the array data, while matchers are used to qualify elements. You apply matchers to expression elements.

Expression	Definition
`{n}`	Represents a numeric key. Will match any string or numeric key.
`{s}`	Represents a string. Will match any any string value including numeric string values.
`Foo`	Matches keys with the exact same value.

All expression elements are supported all methods. In addition to expression elements you can use attribute matching with methods like `extract()`.

Matcher	Definition
`[id]`	Match elements with a given array key.
`[id=2]`	Match elements with id equal to 2.
`[id!=2]`	Match elements with id not equal to 2.
`[id>2]`	Match elements with id greater than 2.
`[id>=2]`	Match elements with id greater than or equal to 2.
`[id<2]`	Match elements with id less than 2
`[id<=2]`	Match elements with id less than or equal to 2.
`[text=/.../]`	Match elements that have values matching the regular expression inside `...`.

static `Hash::`**`get`**`(`*array $data*, *$path*`)`

Return type mixed

`get()` is a simplified version of `extract()`, it only supports direct path expressions. Paths with `{n}`, `{s}` or matchers are not supported. Use `get()` when you want exactly one value out of an array.

static `Hash::`**`extract`**`(`*array $data*, *$path*`)`

Return type array

`Hash::extract()` supports all expression, and matcher components of *Hash path syntax*. You can use extract to retrieve data from arrays, along arbitrary paths quickly without having to loop through the data structures. Instead you use path expressions to qualify which elements you want returned

```
<?php
// Common Usage:
$users = $this->User->find("all");
$results = Hash::extract($users, '{n}.User.id');
// $results equals:
// array(1,2,3,4,5,...);
```

static `Hash::`**`insert`**`(`*array $data*, *$path*, *$values = null*`)`

Return type array

Inserts $data into an array as defined by $path. This method only supports the expression types of *Hash path syntax*:

```
<?php
$a = array(
    'pages' => array('name' => 'page')
);
$result = Hash::insert($a, 'files', array('name' => 'files'));
// $result now looks like:
Array
(
    [pages] => Array
        (
            [name] => page
        )
    [files] => Array
        (
            [name] => files
        )
)
```

You can use paths using {n} and {s} to insert data into multiple points:

```
$users = $this->User->find('all');
$users = Set::insert($users, '{n}.User.new', 'value');
```

static Hash::**remove**(*array $data*, *$path = null*)

Return type array

Removes all elements from an array that match $path. This method supports all the expression elements of *Hash path syntax*:

```
<?php
$a = array(
    'pages' => array('name' => 'page'),
    'files' => array('name' => 'files')
);
$result = Hash::remove($a, 'files');
/* $result now looks like:
    Array
    (
        [pages] => Array
            (
                [name] => page
            )

    )
*/
```

Using {n} and {s} will allow you to remove multiple values at once.

static Hash::**combine**(*array $data*, *$keyPath = null*, *$valuePath = null*, *$groupPath = null*)

Return type array

Creates an associative array using a $keyPath as the path to build its keys, and optionally $valuePath as path to get the values. If $valuePath is not specified, or doesn't match anything, values will be initialized to null. You can optionally group the values by what is obtained when following the path specified in $groupPath.:

```
<?php
$a = array(
    array(
        'User' => array(
            'id' => 2,
            'group_id' => 1,
            'Data' => array(
                'user' => 'mariano.iglesias',
                'name' => 'Mariano Iglesias'
            )
        )
    ),
    array(
        'User' => array(
            'id' => 14,
            'group_id' => 2,
            'Data' => array(
                'user' => 'phpnut',
                'name' => 'Larry E. Masters'
            )
        )
    ),
);

$result = Hash::combine($a, '{n}.User.id');
/* $result now looks like:
    Array
    (
        [2] =>
        [14] =>
    )
*/

$result = Hash::combine($a, '{n}.User.id', '{n}.User.Data');
/* $result now looks like:
    Array
    (
        [2] => Array
            (
                [user] => mariano.iglesias
                [name] => Mariano Iglesias
            )
        [14] => Array
            (
                [user] => phpnut
                [name] => Larry E. Masters
            )
    )
*/

$result = Hash::combine($a, '{n}.User.id', '{n}.User.Data.name');
/* $result now looks like:
    Array
    (
        [2] => Mariano Iglesias
        [14] => Larry E. Masters
    )
*/

$result = Hash::combine($a, '{n}.User.id', '{n}.User.Data', '{n}.User.group_id');
/* $result now looks like:
    Array
    (
        [1] => Array
            (
                [2] => Array
                    (
                        [user] => mariano.iglesias
                        [name] => Mariano Iglesias
                    )
            )
        [2] => Array
            (
                [14] => Array
                    (
                        [user] => phpnut
                        [name] => Larry E. Masters
                    )
            )
    )
*/

$result = Hash::combine($a, '{n}.User.id', '{n}.User.Data.name', '{n}.User.group_id');
/* $result now looks like:
    Array
    (
        [1] => Array
            (
                [2] => Mariano Iglesias
            )
        [2] => Array
            (
                [14] => Larry E. Masters
            )
    )
*/
```

You can provide array's for both $keyPath and $valuePath. If you do this, the first value will be used as a format string, for values extracted by the other paths:

```
    <?php
    $result = Hash::combine(
        $a,
        '{n}.User.id',
        array('%s: %s', '{n}.User.Data.user', '{n}.User.Data.name'),
        '{n}.User.group_id'
    );
    /* $result now looks like:
        Array
        (
            [1] => Array
                (
                    [2] => mariano.iglesias: Mariano Iglesias
                )
            [2] => Array
                (
                    [14] => phpnut: Larry E. Masters
                )
        )
    */

    $result = Hash::combine(
        $a,
        array('%s: %s', '{n}.User.Data.user', '{n}.User.Data.name'),
        '{n}.User.id'
    );
    /* $result now looks like:
        Array
        (
            [mariano.iglesias: Mariano Iglesias] => 2
            [phpnut: Larry E. Masters] => 14
        )
    */
```

static `Hash::`**`format`**(*array $data*, *array $paths*, *$format*)

Return type array

Returns a series of values extracted from an array, formatted with a format string:

```
    <?php
    $data = array(
        array(
            'Person' => array(
                'first_name' => 'Nate',
                'last_name' => 'Abele',
                'city' => 'Boston',
                'state' => 'MA',
                'something' => '42'
            )
        ),
        array(
            'Person' => array(
                'first_name' => 'Larry',
                'last_name' => 'Masters',
                'city' => 'Boondock',
                'state' => 'TN',
                'something' => '{0}'
            )
        ),
        array(
            'Person' => array(
                'first_name' => 'Garrett',
                'last_name' => 'Woodworth',
                'city' => 'Venice Beach',
                'state' => 'CA',
                'something' => '{1}'
            )
        )
    );

    $res = Hash::format($data, array('{n}.Person.first_name', '{n}.Person.something'), '%2
/*
Array
(
    [0] => 42, Nate
    [1] => 0, Larry
    [2] => 0, Garrett
)
*/

$res = Hash::format($data, array('{n}.Person.first_name', '{n}.Person.something'), '%1
/*
Array
(
    [0] => Nate, 42
    [1] => Larry, 0
    [2] => Garrett, 0
)
*/
```

static `Hash::`**`contains`**(*array $data*, *array $needle*)

Return type boolean

Determines if one Hash or array contains the exact keys and values of another:

```
<?php
$a = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about')
);
$b = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about'),
    2 => array('name' => 'contact'),
    'a' => 'b'
);

$result = Hash::contains($a, $a);
// true
$result = Hash::contains($a, $b);
// false
$result = Hash::contains($b, $a);
// true
```

static `Hash::`**`check`**(*array $data*, *string $path = null*)

Return type boolean

Checks if a particular path is set in an array:

```
<?php
$set = array(
    'My Index 1' => array('First' => 'The first item')
);
$result = Hash::check($set, 'My Index 1.First');
```

```
// $result == True

$result = Hash::check($set, 'My Index 1');
// $result == True

$set = array(
    'My Index 1' => array('First' =>
        array('Second' =>
            array('Third' =>
                array('Fourth' => 'Heavy. Nesting.'))))
);
$result = Hash::check($set, 'My Index 1.First.Second');
// $result == True

$result = Hash::check($set, 'My Index 1.First.Second.Third');
// $result == True

$result = Hash::check($set, 'My Index 1.First.Second.Third.Fourth');
// $result == True

$result = Hash::check($set, 'My Index 1.First.Seconds.Third.Fourth');
// $result == False
```

static `Hash::`**`filter`**(*array $data*, *$callback = array('Hash', 'filter')*)

Return type array

Filters empty elements out of array, excluding '0'. You can also supply a custom $callback to filter the array elements. You callback should return `false` to remove elements from the resulting array:

```
<?php
$data = array(
    '0',
    false,
    true,
    0,
    array('one thing', 'I can tell you', 'is you got to be', false)
);
$res = Hash::filter($data);

/* $data now looks like:
    Array (
        [0] => 0
        [2] => true
        [3] => 0
        [4] => Array
            (
                [0] => one thing
                [1] => I can tell you
                [2] => is you got to be
            )
    )
*/
```

static `Hash::flatten`(*array $data*, *string $separator* = '.')

Return type array

Collapses a multi-dimensional array into a single dimension:

```
<?php
$arr = array(
    array(
        'Post' => array('id' => '1', 'title' => 'First Post'),
        'Author' => array('id' => '1', 'user' => 'Kyle'),
    ),
    array(
        'Post' => array('id' => '2', 'title' => 'Second Post'),
        'Author' => array('id' => '3', 'user' => 'Crystal'),
    ),
);
$res = Hash::flatten($arr);
/* $res now looks like:
    Array (
        [0.Post.id] => 1
        [0.Post.title] => First Post
        [0.Author.id] => 1
        [0.Author.user] => Kyle
        [1.Post.id] => 2
        [1.Post.title] => Second Post
        [1.Author.id] => 3
        [1.Author.user] => Crystal
    )
*/
```

static `Hash::expand`(*array $data*, *string $separator* = '.')

Return type array

Expands an array that was previously flattened with `Hash::flatten()`:

```
<?php
$data = array(
    '0.Post.id' => 1,
    '0.Post.title' => First Post,
    '0.Author.id' => 1,
    '0.Author.user' => Kyle,
    '1.Post.id' => 2,
    '1.Post.title' => Second Post,
    '1.Author.id' => 3,
    '1.Author.user' => Crystal,
);
$res = Hash::expand($data);
/* $res now looks like:
array(
    array(
        'Post' => array('id' => '1', 'title' => 'First Post'),
        'Author' => array('id' => '1', 'user' => 'Kyle'),
    ),
    array(
        'Post' => array('id' => '2', 'title' => 'Second Post'),
        'Author' => array('id' => '3', 'user' => 'Crystal'),
    ),
);
*/
```

static `Hash::merge`(*array $data*, *array $merge*[, *array $n*])

Return type array

This function can be thought of as a hybrid between PHP's `array_merge` and `array_merge_recursive`. The difference to the two is that if an array key contains another array then the function behaves recursive (unlike `array_merge`) but does not do if for keys containing strings (unlike `array_merge_recursive`).

Note: This function will work with an unlimited amount of arguments and typecasts non-array parameters into arrays.

```
<?php
$array = array(
    array(
        'id' => '48c2570e-dfa8-4c32-a35e-0d71cbdd56cb',
        'name' => 'mysql raleigh-workshop-08 < 2008-09-05.sql ',
        'description' => 'Importing an sql dump'
    ),
    array(
        'id' => '48c257a8-cf7c-4af2-ac2f-114ecbdd56cb',
        'name' => 'pbpaste | grep -i Unpaid | pbcopy',
        'description' => 'Remove all lines that say "Unpaid".',
    )
);
$arrayB = 4;
$arrayC = array(0 => "test array", "cats" => "dogs", "people" => 1267);
$arrayD = array("cats" => "felines", "dog" => "angry");
$res = Hash::merge($array, $arrayB, $arrayC, $arrayD);

/* $res now looks like:
Array
(
    [0] => Array
        (
            [id] => 48c2570e-dfa8-4c32-a35e-0d71cbdd56cb
            [name] => mysql raleigh-workshop-08 < 2008-09-05.sql
            [description] => Importing an sql dump
        )
    [1] => Array
        (
            [id] => 48c257a8-cf7c-4af2-ac2f-114ecbdd56cb
            [name] => pbpaste | grep -i Unpaid | pbcopy
            [description] => Remove all lines that say "Unpaid".
        )
    [2] => 4
    [3] => test array
    [cats] => felines
    [people] => 1267
    [dog] => angry
)
*/
```

static `Hash::`**`numeric`**(*array $data*)

> **Return type** boolean

Checks to see if all the values in the array are numeric:

```
<?php
$data = array('one');
$res = Hash::numeric(array_keys($data));
// $res is true

$data = array(1 => 'one');
$res = Hash::numeric($data);
// $res is false
```

static `Hash::`**`dimensions`**(*array $data*)

> **Return type** integer

Counts the dimensions of an array. This method will only consider the dimension of the first element in the array:

```
<?php
$data = array('one', '2', 'three');
$result = Hash::dimensions($data);
// $result == 1

$data = array('1' => '1.1', '2', '3');
$result = Hash::dimensions($data);
// $result == 1

$data = array('1' => array('1.1' => '1.1.1'), '2', '3' => array('3.1' => '3.1.1'));
$result = Hash::dimensions($data);
// $result == 2

$data = array('1' => '1.1', '2', '3' => array('3.1' => '3.1.1'));
$result = Hash::dimensions($data);
// $result == 1


$data = array('1' => array('1.1' => '1.1.1'), '2', '3' => array('3.1' => array('3.1.1'
$result = Hash::countDim($data);
// $result == 2
```

static `Hash::`**`maxDimensions`**(*array $data*)

Similar to `dimensions()`, however this method returns, the deepest number of dimensions of any element in the array:

```
<?php
$data = array('1' => '1.1', '2', '3' => array('3.1' => '3.1.1'));
$result = Hash::dimensions($data, true);
// $result == 2

$data = array('1' => array('1.1' => '1.1.1'), '2', '3' => array('3.1' => array('3.1.1'
$result = Hash::countDim($data, true);
// $result == 3
```

static `Hash::`**`map`**(*array $data*, *$path*, *$function*)
Creates a new array, by extracting $path, and mapping $function across the results. You can use both expression and matching elements with this method.

static `Hash::`**`reduce`**(*array $data*, *$path*, *$function*)
Creates a single value, by extracting $path, and reducing the extracted results with $function. You can use both expression and matching elements with this method.

static `Hash::`**`sort`**(*array $data*, *$path*, *$dir*, *$type = 'regular'*)

Return type array

Sorts an array by any value, determined by a *Hash path syntax* Only expression elements are supported by this method:

```
<?php
$a = array(
    0 => array('Person' => array('name' => 'Jeff')),
    1 => array('Shirt' => array('color' => 'black'))
);
$result = Hash::sort($a, '{n}.Person.name', 'asc');
/* $result now looks like:
    Array
    (
        [0] => Array
            (
                [Shirt] => Array
                    (
                        [color] => black
                    )
            )
        [1] => Array
            (
                [Person] => Array
                    (
                        [name] => Jeff
                    )
            )
    )
*/
```

`$dir` can be either `asc` or `desc`.   ``$type` can be one of the following values:

- `regular` for regular sorting.
- `numeric` for sorting values as their numeric equivalents.

- `string` for sorting values as their string value.
- `natural` for sorting values in a human friendly way. Will sort `foo10` below `foo2` as an example. Natural sorting requires PHP 5.4 or greater.

static `Hash::`**`diff`**(*array $data*, *array $compare*)

Return type array

Computes the difference between two arrays:

```
<?php
$a = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about')
);
$b = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about'),
    2 => array('name' => 'contact')
);

$result = Hash::diff($a, $b);
/* $result now looks like:
    Array
    (
        [2] => Array
            (
                [name] => contact
            )
    )
*/
```

static `Hash::`**`mergeDiff`**(*array $data*, *array $compare*)

Return type array

This function merges two arrays and pushes the differences in data to the bottom of the resultant array.

Example 1

```
<?php
$array1 = array('ModelOne' => array('id' => 1001, 'field_one' => 'a1.m1.f1', 'field_tw
$array2 = array('ModelOne' => array('id' => 1003, 'field_one' => 'a3.m1.f1', 'field_tw
$res = Hash::mergeDiff($array1, $array2);

/* $res now looks like:
    Array
    (
        [ModelOne] => Array
            (
                [id] => 1001
                [field_one] => a1.m1.f1
                [field_two] => a1.m1.f2
                [field_three] => a3.m1.f3
            )
    )
*/
```

Example 2

```
<?php
$array1 = array("a" => "b", 1 => 20938, "c" => "string");
$array2 = array("b" => "b", 3 => 238, "c" => "string", array("extra_field"));
$res = Hash::mergeDiff($array1, $array2);
/* $res now looks like:
    Array
    (
        [a] => b
        [1] => 20938
        [c] => string
        [b] => b
        [3] => 238
        [4] => Array
            (
                [0] => extra_field
            )
    )
*/
```

static `Hash::`**`normalize`**(*array $data*, *$assoc = true*)

Return type array

Normalizes an array. If `$assoc` is true, the resulting array will be normalized to be an associative array. Numeric keys with values, will be converted to string keys with null values. Normalizing an array, makes using the results with `Hash::merge()` easier:

```
<?php
$a = array('Tree', 'CounterCache',
    'Upload' => array(
        'folder' => 'products',
        'fields' => array('image_1_id', 'image_2_id')
    )
);
$result = Hash::normalize($a);
/* $result now looks like:
    Array
    (
        [Tree] => null
        [CounterCache] => null
        [Upload] => Array
            (
                [folder] => products
                [fields] => Array
                    (
                        [0] => image_1_id
                        [1] => image_2_id
                    )
            )
    )
*/

$b = array(
    'Cacheable' => array('enabled' => false),
    'Limit',
    'Bindable',
    'Validator',
    'Transactional'
);
$result = Hash::normalize($b);
/* $result now looks like:
    Array
    (
        [Cacheable] => Array
            (
                [enabled] => false
            )

        [Limit] => null
        [Bindable] => null
        [Validator] => null
        [Transactional] => null
    )
*/
```

static `Hash::`**`nest`** (*array $data*, *array $options = array()*)

Takes a flat array set, and creates a nested, or threaded data structure. Used by methods like `Model::find('threaded')`.

Options:

- `children` The key name to use in the result set for children. Defaults to 'children'.
- `idPath` The path to a key that identifies each entry. Should be compatible with `Hash::extract()`. Defaults to `{n}.$alias.id`
- `parentPath` The path to a key that identifies the parent of each entry. Should be compatible with `Hash::extract()`. Defaults to `{n}.$alias.parent_id`
- `root` The id of the desired top-most result.

Example:

```
<?php
$data = array(
    array('ModelName' => array('id' => 1, 'parent_id' => null)),
    array('ModelName' => array('id' => 2, 'parent_id' => 1)),
    array('ModelName' => array('id' => 3, 'parent_id' => 1)),
    array('ModelName' => array('id' => 4, 'parent_id' => 1)),
    array('ModelName' => array('id' => 5, 'parent_id' => 1)),
    array('ModelName' => array('id' => 6, 'parent_id' => null)),
    array('ModelName' => array('id' => 7, 'parent_id' => 6)),
    array('ModelName' => array('id' => 8, 'parent_id' => 6)),
    array('ModelName' => array('id' => 9, 'parent_id' => 6)),
    array('ModelName' => array('id' => 10, 'parent_id' => 6))
);

$result = Hash::nest($data, array('root' => 6));
/* $result now looks like:
array(
        (int) 0 => array(
            'ModelName' => array(
                'id' => (int) 6,
                'parent_id' => null
            ),
            'children' => array(
                (int) 0 => array(
                    'ModelName' => array(
                        'id' => (int) 7,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                ),
                (int) 1 => array(
                    'ModelName' => array(
                        'id' => (int) 8,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                ),
                (int) 2 => array(
                    'ModelName' => array(
                        'id' => (int) 9,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                ),
                (int) 3 => array(
                    'ModelName' => array(
                        'id' => (int) 10,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                )
            )
        )
    )
    */
```

Set

class Set

Array management, if done right, can be a very powerful and useful tool for building smarter, more optimized code. CakePHP offers a very useful set of static utilities in the Set class that allow you to do just that.

CakePHP's Set class can be called from any model or controller in the same way Inflector is called. Example: `Set::combine()`. Deprecated since version 2.2: The Set class has been deprecated in 2.2 in favour of the `Hash` class. It offers a more consistent interface and API.

Set-compatible Path syntax

The Path syntax is used by (for example) sort, and is used to define a path.

Usage example (using `Set::sort()`):

```
<?php
$a = array(
    0 => array('Person' => array('name' => 'Jeff'), 'Friend' => array(array('name' => 'Nate
    1 => array('Person' => array('name' => 'Tracy'),'Friend' => array(array('name' => 'Linc
    2 => array('Person' => array('name' => 'Adam'),'Friend' => array(array('name' => 'Bob')
);
$result = Set::sort($a, '{n}.Person.name', 'asc');
/* result now looks like
 array(
    0 => array('Person' => array('name' => 'Adam'),'Friend' => array(array('name' => 'Bob'
    1 => array('Person' => array('name' => 'Jeff'), 'Friend' => array(array('name' => 'Nate
    2 => array('Person' => array('name' => 'Tracy'),'Friend' => array(array('name' => 'Linc
);
*/
```

As you can see in the example above, some things are wrapped in {}'s, others not. In the table below, you can see which options are available.

Expression	Definition
{n}	Represents a numeric key
{s}	Represents a string
Foo	Any string (without enclosing brackets) is treated like a string literal.
{[a-z]+}	Any string enclosed in brackets (besides {n} and {s}) is interpreted as a regular expression.

static `Set::`**`apply`**(*$path*, *$array*, *$callback*, *$options = array()*)

Return type mixed

Apply a callback to the elements of an array extracted by a Set::extract compatible path:

```
<?php
$data = array(
    array('Movie' => array('id' => 1, 'title' => 'movie 3', 'rating' => 5)),
    array('Movie' => array('id' => 1, 'title' => 'movie 1', 'rating' => 1)),
    array('Movie' => array('id' => 1, 'title' => 'movie 2', 'rating' => 3)),
);

$result = Set::apply('/Movie/rating', $data, 'array_sum');
// result equals 9

$result = Set::apply('/Movie/title', $data, 'strtoupper', array('type' => 'map'));
// result equals array('MOVIE 3', 'MOVIE 1', 'MOVIE 2')
// $options are: - type : can be 'pass' uses call_user_func_array(), 'map' uses array_
```

static `Set::check` (*$data*, *$path = null*)

Return type boolean/array

Checks if a particular path is set in an array. If $path is empty, $data will be returned instead of a boolean value:

```
<?php
$set = array(
    'My Index 1' => array('First' => 'The first item')
);
$result = Set::check($set, 'My Index 1.First');
// $result == True
$result = Set::check($set, 'My Index 1');
// $result == True
$result = Set::check($set, array());
// $result == array('My Index 1' => array('First' => 'The first item'))
$set = array(
    'My Index 1' => array('First' =>
        array('Second' =>
            array('Third' =>
                array('Fourth' => 'Heavy. Nesting.'))))
);
$result = Set::check($set, 'My Index 1.First.Second');
// $result == True
$result = Set::check($set, 'My Index 1.First.Second.Third');
// $result == True
$result = Set::check($set, 'My Index 1.First.Second.Third.Fourth');
// $result == True
$result = Set::check($set, 'My Index 1.First.Seconds.Third.Fourth');
// $result == False
```

static `Set::classicExtract` (*$data*, *$path = null*)

Return type array

Gets a value from an array or object that is contained in a given path using an array path syntax, i.e.:

- "{n}.Person.{[a-z]+}" - Where "{n}" represents a numeric key, "Person" represents a string literal
- "{[a-z]+}" (i.e. any string literal enclosed in brackets besides {n} and {s}) is interpreted as a regular expression.

Example 1

```
<?php
$a = array(
    array('Article' => array('id' => 1, 'title' => 'Article 1')),
    array('Article' => array('id' => 2, 'title' => 'Article 2')),
    array('Article' => array('id' => 3, 'title' => 'Article 3'))
);
$result = Set::classicExtract($a, '{n}.Article.id');
/* $result now looks like:
    Array
    (
            [0] => 1
            [1] => 2
            [2] => 3
        )
*/
$result = Set::classicExtract($a, '{n}.Article.title');
/* $result now looks like:
    Array
    (
        [0] => Article 1
        [1] => Article 2
        [2] => Article 3
    )
*/
$result = Set::classicExtract($a, '1.Article.title');
// $result == "Article 2"

$result = Set::classicExtract($a, '3.Article.title');
// $result == null
```

Example 2

```
<?php
$a = array(
    0 => array('pages' => array('name' => 'page')),
    1 => array('fruites' => array('name' => 'fruit')),
    'test' => array(array('name' => 'jippi')),
    'dot.test' => array(array('name' => 'jippi'))
);

$result = Set::classicExtract($a, '{n}.{s}.name');
/* $result now looks like:
    Array
    (
        [0] => Array
            (
                [0] => page
            )
        [1] => Array
            (
                [0] => fruit
            )
    )
*/
$result = Set::classicExtract($a, '{s}.{n}.name');
/* $result now looks like:
    Array
    (
        [0] => Array
            (
                [0] => jippi
            )
        [1] => Array
```

```
                (
                    [0] => jippi
                )
        )
    */
    $result = Set::classicExtract($a,'{\w+}.{\w+}.name');
    /* $result now looks like:
        Array
        (
            [0] => Array
                (
                    [pages] => page
                )
            [1] => Array
                (
                    [fruites] => fruit
                )
            [test] => Array
                (
                    [0] => jippi
                )
            [dot.test] => Array
                (
                    [0] => jippi
                )
        )
    */
    $result = Set::classicExtract($a,'{\d+}.{\w+}.name');
    /* $result now looks like:
        Array
        (
            [0] => Array
                (
                    [pages] => page
                )
            [1] => Array
                (
                    [fruites] => fruit
                )
        )
    */
    $result = Set::classicExtract($a,'{n}.{\w+}.name');
    /* $result now looks like:
        Array
        (
            [0] => Array
                (
                    [pages] => page
                )
            [1] => Array
                (
                    [fruites] => fruit
                )
        )
    */
    $result = Set::classicExtract($a,'{s}.{\d+}.name');
    /* $result now looks like:
        Array
        (
            [0] => Array
                (
                    [0] => jippi
                )
            [1] => Array
                (
                    [0] => jippi
                )
        )
    */
    $result = Set::classicExtract($a,'{s}');
    /* $result now looks like:
        Array
        (

            [0] => Array
                (
                    [0] => Array
                        (
                            [name] => jippi
                        )
                )
            [1] => Array
                (
                    [0] => Array
                        (
                            [name] => jippi
                        )
                )
        )
    */
    $result = Set::classicExtract($a,'{[a-z]}');
    /* $result now looks like:
        Array
        (
            [test] => Array
                (
                    [0] => Array
                        (
                            [name] => jippi
                        )
                )

            [dot.test] => Array
                (
                    [0] => Array
                        (
                                [name] => jippi
                            )
                    )
            )
    */
    $result = Set::classicExtract($a, '{dot\.test}.{n}');
    /* $result now looks like:
        Array
        (
            [dot.test] => Array
                (
                    [0] => Array
                        (
                            [name] => jippi
                        )
                )
        )
    */
```

static `Set::`**`combine`**(*$data*, *$path1 = null*, *$path2 = null*, *$groupPath = null*)

Return type array

Creates an associative array using a $path1 as the path to build its keys, and optionally $path2 as path to get the values. If $path2 is not specified, all values will be initialized to null (useful for Set::merge). You can optionally group the values by what is obtained when following the path specified in $groupPath.:

```
    <?php
    $result = Set::combine(array(), '{n}.User.id', '{n}.User.Data');
    // $result == array();

    $result = Set::combine('', '{n}.User.id', '{n}.User.Data');
    // $result == array();

    $a = array(
        array(
            'User' => array(
                'id' => 2,
                'group_id' => 1,
                'Data' => array(
                    'user' => 'mariano.iglesias',
                    'name' => 'Mariano Iglesias'
                )
            )
        ),
        array(
            'User' => array(
                'id' => 14,
                'group_id' => 2,
                'Data' => array(
                    'user' => 'phpnut',
                    'name' => 'Larry E. Masters'
                )
            )
        ),
        array(
            'User' => array(
                'id' => 25,
                'group_id' => 1,
                'Data' => array(
                    'user' => 'gwoo',
                    'name' => 'The Gwoo'
                )
            )
        )
    );
    $result = Set::combine($a, '{n}.User.id');
    /* $result now looks like:
        Array
        (
            [2] =>
            [14] =>
            [25] =>
        )
    */

    $result = Set::combine($a, '{n}.User.id', '{n}.User.non-existent');
    /* $result now looks like:
        Array
        (
            [2] =>
            [14] =>
            [25] =>
        )
    */

    $result = Set::combine($a, '{n}.User.id', '{n}.User.Data');
    /* $result now looks like:
        Array
        (
            [2] => Array
                (
                    [user] => mariano.iglesias
                    [name] => Mariano Iglesias
                )
            [14] => Array
                (
                    [user] => phpnut
                    [name] => Larry E. Masters
                )
            [25] => Array
                (
                    [user] => gwoo
                    [name] => The Gwoo
                )
        )
```

```
    */

    $result = Set::combine($a, '{n}.User.id', '{n}.User.Data.name');
    /* $result now looks like:
        Array
        (
            [2] => Mariano Iglesias
            [14] => Larry E. Masters
            [25] => The Gwoo
        )
    */

    $result = Set::combine($a, '{n}.User.id', '{n}.User.Data', '{n}.User.group_id');
    /* $result now looks like:
        Array
        (
            [1] => Array
                (
                    [2] => Array
                        (
                            [user] => mariano.iglesias
                            [name] => Mariano Iglesias
                        )
                    [25] => Array
                        (
                            [user] => gwoo
                            [name] => The Gwoo
                        )
                )
            [2] => Array
                (
                    [14] => Array
                        (
                            [user] => phpnut
                            [name] => Larry E. Masters
                        )
                )
        )
    */

    $result = Set::combine($a, '{n}.User.id', '{n}.User.Data.name', '{n}.User.group_id');
    /* $result now looks like:
        Array
        (
            [1] => Array
                (
                    [2] => Mariano Iglesias
                    [25] => The Gwoo
                )
            [2] => Array
                (
                    [14] => Larry E. Masters
                )
        )
    */

    $result = Set::combine($a, '{n}.User.id', array('{0}: {1}', '{n}.User.Data.user', '{n}
    /* $result now looks like:
        Array
        (
            [1] => Array
                (
                    [2] => mariano.iglesias: Mariano Iglesias
                    [25] => gwoo: The Gwoo
                )
            [2] => Array
                (
                    [14] => phpnut: Larry E. Masters
                )
        )
    */

    $result = Set::combine($a, array('{0}: {1}', '{n}.User.Data.user', '{n}.User.Data.name
    /* $result now looks like:
        Array
        (
            [mariano.iglesias: Mariano Iglesias] => 2
            [phpnut: Larry E. Masters] => 14
            [gwoo: The Gwoo] => 25
        )
    */

    $result = Set::combine($a, array('{1}: {0}', '{n}.User.Data.user', '{n}.User.Data.name
    /* $result now looks like:
        Array
        (
            [Mariano Iglesias: mariano.iglesias] => 2
            [Larry E. Masters: phpnut] => 14
            [The Gwoo: gwoo] => 25
        )
    */

    $result = Set::combine($a, array('%1$s: %2$d', '{n}.User.Data.user', '{n}.User.id'), '

    /* $result now looks like:
        Array
        (
            [mariano.iglesias: 2] => Mariano Iglesias
            [phpnut: 14] => Larry E. Masters
            [gwoo: 25] => The Gwoo
        )
    */

    $result = Set::combine($a, array('%2$d: %1$s', '{n}.User.Data.user', '{n}.User.id'), '
    /* $result now looks like:
        Array
        (
            [2: mariano.iglesias] => Mariano Iglesias
            [14: phpnut] => Larry E. Masters
            [25: gwoo] => The Gwoo
        )
    */
```

static `Set::contains`(*$val1*, *$val2 = null*)

Return type boolean

Determines if one Set or array contains the exact keys and values of another:

```
<?php
$a = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about')
);
$b = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about'),
    2 => array('name' => 'contact'),
    'a' => 'b'
);

$result = Set::contains($a, $a);
// True
$result = Set::contains($a, $b);
// False
$result = Set::contains($b, $a);
// True
```

static `Set::countDim`(*$array = null*, *$all = false*, *$count = 0*)

Return type integer

Counts the dimensions of an array. If $all is set to false (which is the default) it will only consider the dimension of the first element in the array:

```
<?php
$data = array('one', '2', 'three');
$result = Set::countDim($data);
// $result == 1

$data = array('1' => '1.1', '2', '3');
$result = Set::countDim($data);
// $result == 1

$data = array('1' => array('1.1' => '1.1.1'), '2', '3' => array('3.1' => '3.1.1'));
$result = Set::countDim($data);
// $result == 2

$data = array('1' => '1.1', '2', '3' => array('3.1' => '3.1.1'));
$result = Set::countDim($data);
// $result == 1
```

```
$data = array('1' => '1.1', '2', '3' => array('3.1' => '3.1.1'));
$result = Set::countDim($data, true);
// $result == 2

$data = array('1' => array('1.1' => '1.1.1'), '2', '3' => array('3.1' => array('3.1.1'
$result = Set::countDim($data);
// $result == 2

$data = array('1' => array('1.1' => '1.1.1'), '2', '3' => array('3.1' => array('3.1.1'
$result = Set::countDim($data, true);
// $result == 3

$data = array('1' => array('1.1' => '1.1.1'), array('2' => array('2.1' => array('2.1.1
$result = Set::countDim($data, true);
// $result == 4

$data = array('1' => array('1.1' => '1.1.1'), array('2' => array('2.1' => array('2.1.1
$result = Set::countDim($data, true);
// $result == 5

$data = array('1' => array('1.1' => '1.1.1'), array('2' => array('2.1' => array('2.1.1
$result = Set::countDim($data, true);
// $result == 5

$set = array('1' => array('1.1' => '1.1.1'), array('2' => array('2.1' => array('2.1.1'
$result = Set::countDim($set, false, 0);
// $result == 2

$result = Set::countDim($set, true);
// $result == 5
```

static `Set::diff`(*$val1*, *$val2 = null*)

Return type array

Computes the difference between a Set and an array, two Sets, or two arrays:

```
<?php
$a = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about')
);
$b = array(
    0 => array('name' => 'main'),
    1 => array('name' => 'about'),
    2 => array('name' => 'contact')
);

$result = Set::diff($a, $b);
/* $result now looks like:
    Array
    (
        [2] => Array
            (
                [name] => contact
            )
    )
*/
$result = Set::diff($a, array());
/* $result now looks like:
    Array
    (
        [0] => Array
            (
                [name] => main
            )
        [1] => Array
            (
                [name] => about
            )
    )
*/
$result = Set::diff(array(), $b);
/* $result now looks like:
    Array
    (
        [0] => Array
            (
                [name] => main
            )
        [1] => Array
            (
                [name] => about
            )
        [2] => Array
            (
                [name] => contact
            )
    )
*/

$b = array(
    0 => array('name' => 'me'),
    1 => array('name' => 'about')
);

$result = Set::diff($a, $b);
/* $result now looks like:
    Array
    (
        [0] => Array
            (
                [name] => main
            )
    )
*/
```

static `Set::enum`(*$select*, *$list = null*)

Return type string

The enum method works well when using html select elements. It returns a value from an array list if the key exists.

If a comma separated $list is passed arrays are numeric with the key of the first being 0 $list = 'no, yes' would translate to $list = array(0 => 'no', 1 => 'yes');

If an array is used, keys can be strings example: array('no' => 0, 'yes' => 1);

$list defaults to 0 = no 1 = yes if param is not passed:

```
<?php
$res = Set::enum(1, 'one, two');
// $res is 'two'

$res = Set::enum('no', array('no' => 0, 'yes' => 1));
// $res is 0

$res = Set::enum('first', array('first' => 'one', 'second' => 'two'));
// $res is 'one'
```

static `Set::extract`(*$path*, *$data = null*, *$options = array()*)

Return type array

Set::extract uses basic XPath 2.0 syntax to return subsets of your data from a find or a find all. This function allows you to retrieve your data quickly without having to loop through multi dimensional arrays or traverse through tree structures.

Note: If `$path` does not contain a '/' the call will be delegated to `Set::classicExtract()`

```
<?php
// Common Usage:
$users = $this->User->find("all");
$results = Set::extract('/User/id', $users);
// results returns:
// array(1,2,3,4,5,...);
```

Currently implemented selectors:

Selector	Note
/User/id	Similar to the classic {n}.User.id
/User[2]/name	Selects the name of the second User
/User[id<2]	Selects all Users with an id < 2
/User[id>2][<5]	Selects all Users with an id > 2 but 5
/Post/Comment[author_name=john]/../name	Selects the name of all Posts that have at least one Comment written by john
/Posts[title]	Selects all Posts that have a 'title' key
/Comment/.[1]	Selects the contents of the first comment
/Comment/.[:last]	Selects the last comment
/Comment/.[:first]	Selects the first comment
/Comment[text=/cakephp/i]	Selects all comments that have a text matching the regex /cakephp/i
/Comment/@*	Selects the key names of all comments Currently only absolute paths starting with a single '/' are supported. Please report any bugs as you find them. Suggestions for additional features are welcome.

To learn more about Set::extract() refer to the function testExtract() in `/lib/Cake/Test/Case/Utility/SetTest.php`.

static `Set::`**`filter`**(*$var*, *$isArray = null*)

Return type array

Filters empty elements out of a route array, excluding '0':

```
<?php
$res = Set::filter(array('0', false, true, 0, array('one thing', 'I can tell you', 'is

/* $res now looks like:
    Array (
        [0] => 0
        [2] => 1
        [3] => 0
        [4] => Array
            (
                [0] => one thing
                [1] => I can tell you
                [2] => is you got to be
            )
    )
*/
```

static `Set::`**`flatten`**(*$data*, *$separator = '.'*)

Return type array

Collapses a multi-dimensional array into a single dimension:

```
<?php
$arr = array(
    array(
        'Post' => array('id' => '1', 'title' => 'First Post'),
        'Author' => array('id' => '1', 'user' => 'Kyle'),
    ),
    array(
        'Post' => array('id' => '2', 'title' => 'Second Post'),
        'Author' => array('id' => '3', 'user' => 'Crystal'),
    ),
);
$res = Set::flatten($arr);
/* $res now looks like:
    Array (
        [0.Post.id] => 1
        [0.Post.title] => First Post
        [0.Author.id] => 1
        [0.Author.user] => Kyle
        [1.Post.id] => 2
        [1.Post.title] => Second Post
        [1.Author.id] => 3
        [1.Author.user] => Crystal
    )
*/
```

static `Set::`**`format`**(*$data*, *$format*, *$keys*)

Return type array

Returns a series of values extracted from an array, formatted in a format string:

```
    <?php
    $data = array(
        array('Person' => array('first_name' => 'Nate', 'last_name' => 'Abele', 'city' =>
        array('Person' => array('first_name' => 'Larry', 'last_name' => 'Masters', 'city'
        array('Person' => array('first_name' => 'Garrett', 'last_name' => 'Woodworth', 'ci
    );

    $res = Set::format($data, '{1}, {0}', array('{n}.Person.first_name', '{n}.Person.last_
    /*
    Array
    (
        [0] => Abele, Nate
        [1] => Masters, Larry
        [2] => Woodworth, Garrett
    )
    */

    $res = Set::format($data, '{0}, {1}', array('{n}.Person.city', '{n}.Person.state'));
    /*
    Array
    (
        [0] => Boston, MA
        [1] => Boondock, TN
        [2] => Venice Beach, CA
    )
    */
    $res = Set::format($data, '{{0}, {1}}', array('{n}.Person.city', '{n}.Person.state'));
    /*
```

```
Array
(
    [0] => {Boston, MA}
    [1] => {Boondock, TN}
    [2] => {Venice Beach, CA}
)
*/
$res = Set::format($data, '{%2$d, %1$s}', array('{n}.Person.something', '{n}.Person.sc
/*
Array
(
    [0] => {42, 42}
    [1] => {0, {0}}
    [2] => {0, {1}}
)
*/
$res = Set::format($data, '%2$d, %1$s', array('{n}.Person.first_name', '{n}.Person.som
/*
Array
(
    [0] => 42, Nate
    [1] => 0, Larry
    [2] => 0, Garrett
)
*/
$res = Set::format($data, '%1$s, %2$d', array('{n}.Person.first_name', '{n}.Person.som
/*
Array
(
    [0] => Nate, 42
    [1] => Larry, 0
    [2] => Garrett, 0
)
*/
```

static `Set::insert`(*$list*, *$path*, *$data = null*)

Return type array

Inserts $data into an array as defined by $path.:

```
<?php
$a = array(
    'pages' => array('name' => 'page')
);
$result = Set::insert($a, 'files', array('name' => 'files'));
/* $result now looks like:
    Array
    (
        [pages] => Array
            (
                [name] => page
            )
        [files] => Array
```

```
                (
                    [name] => files
                )
        )
*/

$a = array(
    'pages' => array('name' => 'page')
);
$result = Set::insert($a, 'pages.name', array());
/* $result now looks like:
    Array
    (
        [pages] => Array
            (
                [name] => Array
                    (
                    )
            )
    )
*/

$a = array(
    'pages' => array(
        0 => array('name' => 'main'),
        1 => array('name' => 'about')
    )
);
$result = Set::insert($a, 'pages.1.vars', array('title' => 'page title'));
/* $result now looks like:
    Array
    (
        [pages] => Array
            (
                [0] => Array
                    (
                        [name] => main
                    )
                [1] => Array
                    (
                        [name] => about
                        [vars] => Array
                            (
                                [title] => page title
                            )
                    )
            )
    )
*/
```

static `Set::`**`map`**(*$class = 'stdClass'*, *$tmp = 'stdClass'*)

Return type object

This method Maps the contents of the Set object to an object hierarchy while maintaining numeric keys as arrays of objects.

Basically, the map function turns array items into initialized class objects. By default it turns an array into a stdClass Object, however you can map values into any type of class. Example: Set::map($array_of_values, 'nameOfYourClass');:

```
<?php
$data = array(
    array(
        "IndexedPage" => array(
            "id" => 1,
            "url" => 'http://blah.com/',
            'hash' => '68a9f053b19526d08e36c6a9ad150737933816a5',
            'get_vars' => '',
            'redirect' => '',
            'created' => "1195055503",
            'updated' => "1195055503",
        )
    ),
    array(
        "IndexedPage" => array(
            "id" => 2,
            "url" => 'http://blah.com/',
            'hash' => '68a9f053b19526d08e36c6a9ad150737933816a5',
            'get_vars' => '',
            'redirect' => '',
            'created' => "1195055503",
            'updated' => "1195055503",
        ),
    )
);
$mapped = Set::map($data);

/* $mapped now looks like:

    Array
    (
        [0] => stdClass Object
            (
                [_name_] => IndexedPage
                [id] => 1
                [url] => http://blah.com/
                [hash] => 68a9f053b19526d08e36c6a9ad150737933816a5
                [get_vars] =>
                [redirect] =>
                [created] => 1195055503
                [updated] => 1195055503
            )

        [1] => stdClass Object
            (
                [_name_] => IndexedPage
                [id] => 2
```

```
                    [url] => http://blah.com/
                    [hash] => 68a9f053b19526d08e36c6a9ad150737933816a5
                    [get_vars] =>
                    [redirect] =>
                    [created] => 1195055503
                    [updated] => 1195055503
                )

        )

    */
```

Using Set::map() with a custom class for second parameter:

```
<?php
class MyClass {
    public function sayHi() {
        echo 'Hi!';
    }
}

$mapped = Set::map($data, 'MyClass');
//Now you can access all the properties as in the example above,
//but also you can call MyClass's methods
$mapped->[0]->sayHi();
```

static `Set::matches` (*$conditions*, *$data = array()*, *$i = null*, *$length = null*)

Return type boolean

Set::matches can be used to see if a single item or a given xpath match certain conditions.:

```
<?php
$a = array(
    array('Article' => array('id' => 1, 'title' => 'Article 1')),
    array('Article' => array('id' => 2, 'title' => 'Article 2')),
    array('Article' => array('id' => 3, 'title' => 'Article 3'))
);
$res = Set::matches(array('id>2'), $a[1]['Article']);
// returns false
$res = Set::matches(array('id>=2'), $a[1]['Article']);
// returns true
$res = Set::matches(array('id>=3'), $a[1]['Article']);
// returns false
$res = Set::matches(array('id<=2'), $a[1]['Article']);
// returns true
$res = Set::matches(array('id<2'), $a[1]['Article']);
// returns false
$res = Set::matches(array('id>1'), $a[1]['Article']);
// returns true
$res = Set::matches(array('id>1', 'id<3', 'id!=0'), $a[1]['Article']);
// returns true
$res = Set::matches(array('3'), null, 3);
// returns true
```

```
$res = Set::matches(array('5'), null, 5);
// returns true
$res = Set::matches(array('id'), $a[1]['Article']);
// returns true
$res = Set::matches(array('id', 'title'), $a[1]['Article']);
// returns true
$res = Set::matches(array('non-existent'), $a[1]['Article']);
// returns false
$res = Set::matches('/Article[id=2]', $a);
// returns true
$res = Set::matches('/Article[id=4]', $a);
// returns false
$res = Set::matches(array(), $a);
// returns true
```

static `Set::merge`(*$arr1*, *$arr2 = null*)

Return type array

This function can be thought of as a hybrid between PHP's array_merge and array_merge_recursive. The difference to the two is that if an array key contains another array then the function behaves recursive (unlike array_merge) but does not do if for keys containing strings (unlike array_merge_recursive). See the unit test for more information.

Note: This function will work with an unlimited amount of arguments and typecasts non-array parameters into arrays.

```
<?php
$arry1 = array(
    array(
        'id' => '48c2570e-dfa8-4c32-a35e-0d71cbdd56cb',
        'name' => 'mysql raleigh-workshop-08 < 2008-09-05.sql ',
        'description' => 'Importing an sql dump'
    ),
    array(
        'id' => '48c257a8-cf7c-4af2-ac2f-114ecbdd56cb',
        'name' => 'pbpaste | grep -i Unpaid | pbcopy',
        'description' => 'Remove all lines that say "Unpaid".',
    )
);
$arry2 = 4;
$arry3 = array(0 => 'test array', 'cats' => 'dogs', 'people' => 1267);
$arry4 = array('cats' => 'felines', 'dog' => 'angry');
$res = Set::merge($arry1, $arry2, $arry3, $arry4);

/* $res now looks like:
Array
(
    [0] => Array
        (
            [id] => 48c2570e-dfa8-4c32-a35e-0d71cbdd56cb
            [name] => mysql raleigh-workshop-08 < 2008-09-05.sql
```

```
                [description] => Importing an sql dump
            )

        [1] => Array
            (
                [id] => 48c257a8-cf7c-4af2-ac2f-114ecbdd56cb
                [name] => pbpaste | grep -i Unpaid | pbcopy
                [description] => Remove all lines that say "Unpaid".
            )

        [2] => 4
        [3] => test array
        [cats] => felines
        [people] => 1267
        [dog] => angry
    )
    */
```

static `Set::`**`nest`** (*$data*, *$options = array()*)

Return type array

Takes in a flat array and returns a nested array:

```
<?php
$data = array(
    array('ModelName' => array('id' => 1, 'parent_id' => null)),
    array('ModelName' => array('id' => 2, 'parent_id' => 1)),
    array('ModelName' => array('id' => 3, 'parent_id' => 1)),
    array('ModelName' => array('id' => 4, 'parent_id' => 1)),
    array('ModelName' => array('id' => 5, 'parent_id' => 1)),
    array('ModelName' => array('id' => 6, 'parent_id' => null)),
    array('ModelName' => array('id' => 7, 'parent_id' => 6)),
    array('ModelName' => array('id' => 8, 'parent_id' => 6)),
    array('ModelName' => array('id' => 9, 'parent_id' => 6)),
    array('ModelName' => array('id' => 10, 'parent_id' => 6))
);

$result = Set::nest($data, array('root' => 6));

/* $result now looks like:
    array(
        (int) 0 => array(
            'ModelName' => array(
                'id' => (int) 6,
                'parent_id' => null
            ),
            'children' => array(
                (int) 0 => array(
                    'ModelName' => array(
                        'id' => (int) 7,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                ),
                (int) 1 => array(
                    'ModelName' => array(
                        'id' => (int) 8,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                ),
                (int) 2 => array(
                    'ModelName' => array(
                        'id' => (int) 9,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                ),
                (int) 3 => array(
                    'ModelName' => array(
                        'id' => (int) 10,
                        'parent_id' => (int) 6
                    ),
                    'children' => array()
                )
            )
        )
    ) */
```

static `Set::`**`normalize`**(*$list*, *$assoc = true*, *$sep = ', '*, *$trim = true*)

Return type array

Normalizes a string or array list.:

```
<?php
$a = array(
    'Tree',
    'CounterCache',
    'Upload' => array(
        'folder' => 'products',
        'fields' => array('image_1_id', 'image_2_id', 'image_3_id', 'image_4_id', 'ima
    )
);
$b = array(
    'Cacheable' => array('enabled' => false),
    'Limit',
    'Bindable',
    'Validator',
    'Transactional'
);
$result = Set::normalize($a);
/* $result now looks like:
    Array
    (
        [Tree] =>
        [CounterCache] =>
```

```
            [Upload] => Array
                (
                    [folder] => products
                    [fields] => Array
                        (
                            [0] => image_1_id
                            [1] => image_2_id
                            [2] => image_3_id
                            [3] => image_4_id
                            [4] => image_5_id
                        )
                )
        )
    */
    $result = Set::normalize($b);
    /* $result now looks like:
        Array
        (
            [Cacheable] => Array
                (
                    [enabled] =>
                )

            [Limit] =>
            [Bindable] =>
            [Validator] =>
            [Transactional] =>
        )
    */
    $result = Set::merge($a, $b);
    /* $result now looks like:
        Array
        (
            [0] => Tree
            [1] => CounterCache
            [Upload] => Array
                (
                    [folder] => products
                    [fields] => Array
                        (
                            [0] => image_1_id
                            [1] => image_2_id
                            [2] => image_3_id
                            [3] => image_4_id
                            [4] => image_5_id
                        )

                )
            [Cacheable] => Array
                (
                    [enabled] =>
                )
            [2] => Limit
            [3] => Bindable
            [4] => Validator
            [5] => Transactional
        )
    */
    $result = Set::normalize(Set::merge($a, $b)); // Now merge the two and normalize
    /* $result now looks like:
        Array
        (
            [Tree] =>
            [CounterCache] =>
            [Upload] => Array
                (
                    [folder] => products
                    [fields] => Array
                        (
                            [0] => image_1_id
                            [1] => image_2_id
                            [2] => image_3_id
                            [3] => image_4_id
                            [4] => image_5_id
                        )

                )
            [Cacheable] => Array
                (
                    [enabled] =>
                )
            [Limit] =>
            [Bindable] =>
            [Validator] =>
            [Transactional] =>
        )
    */
```

static `Set::`**`numeric`**(*$array=null*)

Return type boolean

Checks to see if all the values in the array are numeric:

```
    <?php
    $data = array('one');
    $res = Set::numeric(array_keys($data));

    // $res is true

    $data = array(1 => 'one');
    $res = Set::numeric($data);

    // $res is false

    $data = array('one');
    $res = Set::numeric($data);
    // $res is false

    $data = array('one' => 'two');
    $res = Set::numeric($data);

    // $res is false

    $data = array('one' => 1);
    $res = Set::numeric($data);

    // $res is true

    $data = array(0);
    $res = Set::numeric($data);

    // $res is true

    $data = array('one', 'two', 'three', 'four', 'five');
    $res = Set::numeric(array_keys($data));

    // $res is true

    $data = array(1 => 'one', 2 => 'two', 3 => 'three', 4 => 'four', 5 => 'five');
    $res = Set::numeric(array_keys($data));

    // $res is true

    $data = array('1' => 'one', 2 => 'two', 3 => 'three', 4 => 'four', 5 => 'five');
    $res = Set::numeric(array_keys($data));

    // $res is true

    $data = array('one', 2 => 'two', 3 => 'three', 4 => 'four', 'a' => 'five');
    $res = Set::numeric(array_keys($data));

    // $res is false
```

static `Set::`**`pushDiff`**(*$array1*, *$array2*)

Return type array

This function merges two arrays and pushes the differences in array2 to the bottom of the resultant array.

Example 1

```
    <?php
    $array1 = array('ModelOne' => array('id' => 1001, 'field_one' => 'a1.m1.f1', 'field_tw
    $array2 = array('ModelOne' => array('id' => 1003, 'field_one' => 'a3.m1.f1', 'field_tw
    $res = Set::pushDiff($array1, $array2);

    /* $res now looks like:
        Array
        (
            [ModelOne] => Array
                (
                    [id] => 1001
                    [field_one] => a1.m1.f1
                    [field_two] => a1.m1.f2
                    [field_three] => a3.m1.f3
                )
        )
    */
```

Example 2

```
<?php
$array1 = array("a" => "b", 1 => 20938, "c" => "string");
$array2 = array("b" => "b", 3 => 238, "c" => "string", array("extra_field"));
$res = Set::pushDiff($array1, $array2);
/* $res now looks like:
    Array
    (
        [a] => b
        [1] => 20938
        [c] => string
        [b] => b
        [3] => 238
        [4] => Array
            (
                [0] => extra_field
            )
    )
*/
```

static `Set::`**`remove`**(*$list*, *$path = null*)

Return type array

Removes an element from a Set or array as defined by $path:

```
<?php
$a = array(
    'pages' => array('name' => 'page'),
    'files' => array('name' => 'files')
);

$result = Set::remove($a, 'files');
/* $result now looks like:
    Array
    (
        [pages] => Array
            (
                [name] => page
            )

    )
*/
```

static `Set::reverse($object)`

Return type array

Set::reverse is basically the opposite of `Set::map`. It converts an object into an array. If $object is not an object, reverse will simply return $object.:

```
<?php
$result = Set::reverse(null);
// Null
$result = Set::reverse(false);
// false
$a = array(
    'Post' => array('id' => 1, 'title' => 'First Post'),
    'Comment' => array(
        array('id' => 1, 'title' => 'First Comment'),
        array('id' => 2, 'title' => 'Second Comment')
    ),
    'Tag' => array(
        array('id' => 1, 'title' => 'First Tag'),
        array('id' => 2, 'title' => 'Second Tag')
    ),
);
$map = Set::map($a); // Turn $a into a class object
/* $map now looks like:
    stdClass Object
    (
        [_name_] => Post
        [id] => 1
        [title] => First Post
        [Comment] => Array
            (
                [0] => stdClass Object
                    (
                        [id] => 1
                        [title] => First Comment
                    )
                [1] => stdClass Object
                    (
                        [id] => 2
                        [title] => Second Comment
                    )
            )
        [Tag] => Array
            (
                [0] => stdClass Object
                    (
                        [id] => 1
                        [title] => First Tag
                    )
                [1] => stdClass Object
                    (
                        [id] => 2
                        [title] => Second Tag
                    )
            )
    )
*/

$result = Set::reverse($map);
/* $result now looks like:
    Array
    (
        [Post] => Array
            (
                [id] => 1
                [title] => First Post
                [Comment] => Array
                    (
                        [0] => Array
                            (
                                [id] => 1
                                [title] => First Comment
                            )
                        [1] => Array
                            (
                                [id] => 2
                                [title] => Second Comment
                            )
                    )
                [Tag] => Array
                    (
                        [0] => Array
                            (
                                [id] => 1
                                [title] => First Tag
                            )
                        [1] => Array
                            (
                                [id] => 2
                                [title] => Second Tag
                            )
                    )
            )
    )
*/

$result = Set::reverse($a['Post']); // Just return the array
/* $result now looks like:
    Array
    (
        [id] => 1
        [title] => First Post
    )
*/
```

static `Set::`**`sort`**(*$data*, *$path*, *$dir*)

Return type array

Sorts an array by any value, determined by a Set-compatible path:

```
<?php
$a = array(
    0 => array('Person' => array('name' => 'Jeff'), 'Friend' => array(array('name' =>
    1 => array('Person' => array('name' => 'Tracy'),'Friend' => array(array('name' =>
    2 => array('Person' => array('name' => 'Adam'),'Friend' => array(array('name' => '
);
$result = Set::sort($a, '{n}.Person.name', 'asc');
/* $result now looks like:
array(
    0 => array('Person' => array('name' => 'Adam'),'Friend' => array(array('name' => '
    1 => array('Person' => array('name' => 'Jeff'), 'Friend' => array(array('name' =>
    2 => array('Person' => array('name' => 'Tracy'),'Friend' => array(array('name' =>
);
*/

$result = Set::sort($a, '{n}.Person.name', 'desc');
/* $result now looks like:
array(
    2 => array('Person' => array('name' => 'Tracy'),'Friend' => array(array('name' =>
    1 => array('Person' => array('name' => 'Jeff'), 'Friend' => array(array('name' =>
    0 => array('Person' => array('name' => 'Adam'),'Friend' => array(array('name' => '
);
*/
```

String

class String

The String class includes convenience methods for creating and manipulating strings and is normally accessed statically. Example: `String::uuid()`.

If you need `TextHelper` functionalities outside of a `View`, use the `String` class:

```
<?php
class UsersController extends AppController {

    public $components = array('Auth');

    public function afterLogin() {
        App::uses('String', 'Utility');
        $message = $this->User->find('new_message');
        if (!empty($message)) {
            // notify user of new message
            $this->Session->setFlash(__('You have a new message: %s', String::truncate($mes
        }
    }
}
```

Changed in version 2.1: Several methods from `TextHelper` have been moved to `String` class.

static `String::`**`uuid`**

The uuid method is used to generate unique identifiers as per

RFC 4122 (http://tools.ietf.org/html/rfc4122.html). The uuid is a 128bit string in the format of 485fc381-e790-47a3-9794-1337c0a8fe68.

```php
<?php
String::uuid(); // 485fc381-e790-47a3-9794-1337c0a8fe68
```

static `String::`**`tokenize`**(*$data*, *$separator = ', '*, *$leftBound = '('*, *$rightBound = ')'*)

Tokenizes a string using `$separator`, ignoring any instance of `$separator` that appears between `$leftBound` and `$rightBound`.

This method can be useful when splitting up data in that has regular formatting such as tag lists:

```php
<?php
$data = "cakephp 'great framework' php";
$result = String::tokenize($data, ' ', "'", "'");
// result contains
array('cakephp', "'great framework'", 'php');
```

static `String::`**`insert`**(*$string*, *$data*, *$options = array()*)

The insert method is used to create string templates and to allow for key/value replacements:

```php
<?php
String::insert('My name is :name and I am :age years old.', array('name' => 'Bob', 'ag
// generates: "My name is Bob and I am 65 years old."
```

static `String::`**`cleanInsert`**(*$string*, *$options = array()*)

Cleans up a `String::insert` formatted string with given $options depending on the 'clean' key in $options. The default method used is text but html is also available. The goal of this function is to replace all whitespace and unneeded markup around placeholders that did not get replaced by Set::insert.

You can use the following options in the options array:

```php
<?php
$options = array(
    'clean' => array(
        'method' => 'text', // or html
    ),
    'before' => '',
    'after' => ''
);
```

static `String::`**`wrap`**(*$text*, *$options = array()*)

Wraps a block of text to a set width, and indent blocks as well. Can intelligently wrap text so words are not sliced across lines:

```php
<?php
$text = 'This is the song that never ends.';
$result = String::wrap($text, 22);

// returns
```

```
This is the song
that never ends.
```

You can provide an array of options that control how wrapping is done. The supported options are:

- `width` The width to wrap to. Defaults to 72.
- `wordWrap` Whether or not to wrap whole words. Defaults to true.
- `indent` The character to indent lines with. Defaults to ‘’.
- `indentAt` The line number to start indenting text. Defaults to 0.

`String::`**`highlight`**(*string $haystack*, *string $needle*, *array $options = array()*)

Parameters

- **$haystack** (*string*) – The string to search.
- **$needle** (*string*) – The string to find.
- **$options** (*array*) – An array of options, see below.

Highlights `$needle` in `$haystack` using the `$options['format']` string specified or a default string.

Options:

- ‘format’ - string The piece of html with that the phrase will be highlighted
- ‘html’ - bool If true, will ignore any HTML tags, ensuring that only the correct text is highlighted

Example:

```
<?php
// called as TextHelper
echo $this->Text->highlight($lastSentence, 'using', array('format' => '<span class="hi

// called as String
App::uses('String', 'Utility');
echo String::highlight($lastSentence, 'using', array('format' => '<span class="highlig
```

Output:

```
Highlights $needle in $haystack <span class="highlight">using</span>
the $options['format'] string specified  or a default string.
```

`String::`**`stripLinks`**(*$text*)

Strips the supplied `$text` of any HTML links.

`String::`**`truncate`**(*string $text*, *int $length=100*, *array $options*)

Parameters

- **$text** (*string*) – The text to truncate.
- **$length** (*int*) – The length to trim to.
- **$options** (*array*) – An array of options to use.

Cuts a string to the `$length` and adds a suffix with `'ellipsis'` if the text is longer than `$length`. If `'exact'` is passed as `false`, the truncation will occur after the next word ending. If `'html'` is passed as `true`, html tags will be respected and will not be cut off.

`$options` is used to pass all extra parameters, and has the following possible keys by default, all of which are optional:

```
array(
    'ellipsis' => '...',
    'exact' => true,
    'html' => false
)
```

Example:

```
<?php
// called as TextHelper
echo $this->Text->truncate(
    'The killer crept forward and tripped on the rug.',
    22,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);

// called as String
App::uses('String', 'Utility');
echo String::truncate(
    'The killer crept forward and tripped on the rug.',
    22,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);
```

Output:

```
The killer crept...
```

Changed in version 2.3: `ending` has been replaced by `ellipsis`. `ending` is still used in 2.2.1

`String::`**`tail`**(*string $text*, *int $length=100*, *array $options*)

Parameters

- **$text** (*string*) – The text to truncate.
- **$length** (*int*) – The length to trim to.
- **$options** (*array*) – An array of options to use.

Cuts a string to the `$length` and adds a prefix with `'ellipsis'` if the text is longer than `$length`. If `'exact'` is passed as `false`, the truncation will occur before the next word ending.

`$options` is used to pass all extra parameters, and has the following possible keys by default, all of which are optional:

```
array(
    'ellipsis' => '...',
    'exact' => true
)
```

New in version 2.3. Example:

```
<?php
// called as TextHelper
echo $this->Text->tail(
    'I packed my bag and in it I put a PSP, a PS3, a TV, a C# program that can divide
    70,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);

// called as String
App::uses('String', 'Utility');
echo String::tail(
    'I packed my bag and in it I put a PSP, a PS3, a TV, a C# program that can divide
    70,
    array(
        'ellipsis' => '...',
        'exact' => false
    )
);
```

Output:

```
...a TV, a C# program that can divide by zero, death metal t-shirts
```

`String::`**`excerpt`** (*string $haystack*, *string $needle*, *integer $radius=100*, *string $ellipsis="..."*)

Parameters

- **$haystack** (*string*) – The string to search.
- **$needle** (*string*) – The string to excerpt around.
- **$radius** (*int*) – The number of characters on either side of $needle you want to include.
- **$ellipsis** (*string*) – Text to append/prepend to the beginning or end of the result.

Extracts an excerpt from `$haystack` surrounding the `$needle` with a number of characters on each side determined by `$radius`, and prefix/suffix with `$ellipsis`. This method is especially handy for search results. The query string or keywords can be shown within the resulting document.:

```
<?php
// called as TextHelper
echo $this->Text->excerpt($lastParagraph, 'method', 50, '...');
```

```
// called as String
App::uses('String', 'Utility');
echo String::excerpt($lastParagraph, 'method', 50, '...');
```

Output:

```
... by $radius, and prefix/suffix with $ellipsis. This method is
especially handy for search results. The query...
```

`String::`**`toList`**(*array $list*, *$and='and'*)

Parameters

- **$list** (*array*) – Array of elements to combine into a list sentence.
- **$and** (*string*) – The word used for the last join.

Creates a comma-separated list where the last two items are joined with 'and'.:

```
<?php
// called as TextHelper
echo $this->Text->toList($colors);

// called as String
App::uses('String', 'Utility');
echo String::toList($colors);
```

Output:

```
red, orange, yellow, green, blue, indigo and violet
```

Xml

class `Xml`

The Xml class was all refactored. As PHP 5 have SimpleXML (http://php.net/simplexml) and DOMDocument (http://php.net/domdocument), the CakePHP doesn't need to re-implement an XML parser. The new XML class will basically transform an array into SimpleXMLElement or DOMDocument objects, and vice versa.

Importing data to Xml class

In CakePHP 1.3 you can pass array, XML as string, URL or file path to the constructor of Xml class to import data. In CakePHP 2.0 you can do it using `Xml::build()`. Unless the return is an Xml object, it will return a SimpleXMLElement or DOMDocument object (depending of your options parameter - default is SimpleXMLElement). Below the samples how to import data from URL:

```
<?php
// Old method:
$xml = new Xml('http://bakery.cakephp.org/articles/rss');
```

```
// New method using SimpleXML
$xml = Xml::build('http://bakery.cakephp.org/articles/rss');
// $xml now is a instance of SimpleXMLElement

//or
$xml = Xml::build('http://bakery.cakephp.org/articles/rss', array('return' => 'simplexml')
// $xml now is a instance of SimpleXMLElement

// New method using DOMDocument
$xml = Xml::build('http://bakery.cakephp.org/articles/rss', array('return' => 'domdocument'
// $xml now is a instance of DOMDocument
```

You can use `Xml::build()` to build XML objects from a variety of sources. You can use XML to build objects from string data:

```
<?php
$text = '<?xml version="1.0" encoding="utf-8"?>
<post>
    <id>1</id>
    <title>Best post</title>
    <body> ... </body>
</post>';
$xml = Xml::build($text);
```

You can also build Xml objects from either local files, or remote files. Remote files will be fetched with `HttpSocket`:

```
<?php
// local file
$xml = Xml::build('/home/awesome/unicorns.xml');

// remote file
$xml = Xml::build('http://bakery.cakephp.org/articles/rss');
```

You can also build Xml objects using an array:

```
<?php
$data = array(
    'post' => array(
        'id' => 1,
        'title' => 'Best post',
        'body' => ' ... '
    )
);
$xml = Xml::build($data);
```

If your input is invalid the Xml class will throw a Exception:

```
<?php
$xmlString = 'What is XML?'
try {
    $xmlObject = Xml::build($xmlString); // Here will throw a Exception
} catch (XmlException $e) {
    throw new InternalErrorException();
}
```

Note: DOMDocument (http://php.net/domdocument) and SimpleXML (http://php.net/simplexml) implement different API's. Be sure to use the correct methods on the object you request from Xml.

Transforming a XML string in array

Converting XML strings into arrays is simple with the Xml class as well. By default you'll get a SimpleXml object back:

```
<?php
//Old method:
$xmlString = '<?xml version="1.0"?><root><child>value</child></root>';
$xmlObject = new Xml($xmlString);
$xmlArray = $xmlObject->toArray();

// New method:
$xmlString = '<?xml version="1.0"?><root><child>value</child></root>';
$xmlArray = Xml::toArray(Xml::build($xmlString));
```

If your XML is invalid it will throw a Exception.

Transforming an array into a string of XML

```
<?php
// Old method:
$xmlArray = array('root' => array('child' => 'value'));
$xmlObject = new Xml($xmlArray, array('format' => 'tags'));
$xmlString = $xmlObject->toString();

// New method:
$xmlArray = array('root' => array('child' => 'value'));
$xmlObject = Xml::fromArray($xmlArray, array('format' => 'tags')); // You can use Xml::bui
$xmlString = $xmlObject->asXML();
```

Your array must have only one element in the "top level" and it can not be numeric. If the array is not in this format, Xml will throw a Exception. Examples of invalid arrays:

```
<?php
// Top level with numeric key
array(
    array('key' => 'value')
);

// Multiple keys in top level
array(
    'key1' => 'first value',
    'key2' => 'other value'
);
```

Warning: The default format option was changed from *attributes* to *tags*. This was done to make the Xml that the Xml class generates more compatible with XML in the wild. Be careful if you depend of this. In the new version you can create a mixed array with tags, attributes and value, just use format as tags (or do not say anything, because it is the default value) and prefix keys that are supposed to be attributes with @. For value text, use @ as the key.

```
<?php
$xmlArray = array(
    'project' => array(
        '@id' => 1,
        'name' => 'Name of project, as tag',
        '@' => 'Value of project'
    )
);
$xmlObject = Xml::fromArray($xmlArray);
$xmlString = $xmlObject->asXML();
```

The content of `$xmlString` will be:

```
<?php
<?xml version="1.0"?>
<project id="1">Value of project<name>Name of project, as tag</name></project>
```

Note: The structure of array was changed. Now the child must have in a sub-tree and not in the same tree. Moreover, the strings not will be changed by `Inflector`. See the sample below:

```
<?php
$oldArray = array(
    'Projects' => array(
        array(
            'Project' => array('id' => 1, 'title' => 'Project 1'),
            'Industry' => array('id' => 1, 'name' => 'Industry 1')
        ),
        array(
            'Project' => array('id' => 2, 'title' => 'Project 2'),
            'Industry' => array('id' => 2, 'name' => 'Industry 2')
        )
    )
);

$newArray = array(
    'projects' => array(
        'project' => array(
            array(
                'id' => 1, 'title' => 'Project 1',
                'industry' => array('id' => 1, 'name' => 'Industry 1')
            ),
            array(
                'id' => 2, 'title' => 'Project 2',
                'industry' => array('id' => 2, 'name' => 'Industry 2')
            )
        )
    )
);
```

The both will result the below XML:

```
<?xml version="1.0"?>
<projects>
    <project>
        <id>1</id>
        <title>Project 1</title>
        <industry>
            <id>1</id>
            <name>Industry 1</name>
        </industry>
    </project>
    <project>
        <id>2</id>
        <title>Project 2</title>
        <industry>
            <id>2</id>
            <name>Industry 2</name>
        </industry>
    </project>
</projects>
```

Using Namespaces

To use XML Namespaces, in your array you must create a key with name `xmlns:` to generic namespace or input the prefix `xmlns:` in a custom namespace. See the samples:

```
<?php
$xmlArray = array(
    'root' => array(
        'xmlns:' => 'http://cakephp.org',
        'child' => 'value'
    )
);
$xml1 = Xml::fromArray($xmlArray);

$xmlArray(
    'root' => array(
        'tag' => array(
            'xmlns:pref' => 'http://cakephp.org',
            'pref:item' => array(
                'item 1',
                'item 2'
            )
        )
    )
);
$xml2 = Xml::fromArray($xmlArray);
```

The value of `$xml1` and `$xml2` will be, respectively:

```
<?xml version="1.0"?>
<root xmlns="http://cakephp.org"><child>value</child>


<?xml version="1.0"?>
<root><tag xmlns:pref="http://cakephp.org"><pref:item>item 1</pref:item><pref:item>item 2</
```

Creating a child

The Xml class of CakePHP 2.0 doesn't provide the manipulation of content, this must be made using SimpleXMLElement or DOMDocument. But, how CakePHP is so sweet, below has the steps to do for create a child node:

```
<?php
// CakePHP 1.3
$myXmlOriginal = '<?xml version="1.0"?><root><child>value</child></root>';
$xml = new Xml($myXmlOriginal, array('format' => 'tags'));
$xml->children[0]->createNode('young', 'new value');

// CakePHP 2.0 - Using SimpleXML
$myXmlOriginal = '<?xml version="1.0"?><root><child>value</child></root>';
$xml = Xml::build($myXmlOriginal);
$xml->root->addChild('young', 'new value');

// CakePHP 2.0 - Using DOMDocument
$myXmlOriginal = '<?xml version="1.0"?><root><child>value</child></root>';
$xml = Xml::build($myXmlOriginal, array('return' => 'domdocument'));
$child = $xml->createElement('young', 'new value');
$xml->firstChild->appendChild($child);
```

Tip: After manipulate your XML using SimpleXMLElement or DomDocument you can use `Xml::toArray()` without problem.

Xml API

A factory and conversion class for creating SimpleXml or DOMDocument objects from a number of sources including strings, arrays and remote urls.

static `Xml::`**`build`**(*$input*, *$options = array()*)

Initialize SimpleXMLElement or DOMDocument from a given XML string, file path, URL or array

Building XML from a string:

```
<?php
$xml = Xml::build('<example>text</example>');
```

Building XML from string (output DOMDocument):

```
<?php
$xml = Xml::build('<example>text</example>', array('return' => 'domdocument'));
```

Building XML from a file path:

```
<?php
$xml = Xml::build('/path/to/an/xml/file.xml');
```

Building from a remote URL:

```
<?php
$xml = Xml::build('http://example.com/example.xml');
```

Building from an array:

```
<?php
$value = array(
    'tags' => array(
        'tag' => array(
            array(
                'id' => '1',
                'name' => 'defect'
            ),
            array(
                'id' => '2',
                'name' => 'enhancement'
        )
        )
    )
);
$xml = Xml::build($value);
```

When building XML from an array ensure that there is only one top level element.

static `Xml::`**`toArray`**(*$obj*)

Convert either a SimpleXml or DOMDocument object into an array.

CHAPTER 10

Plugins

CakePHP allows you to set up a combination of controllers, models, and views and release them as a packaged application plugin that others can use in their CakePHP applications. Have a sweet user management module, simple blog, or web services module in one of your applications? Package it as a CakePHP plugin so you can pop it into other applications.

The main tie between a plugin and the application it has been installed into, is the application's configuration (database connection, etc.). Otherwise, it operates in its own little space, behaving much like it would if it were an application on its own.

Installing a Plugin

To install a plugin, start by simply dropping the plugin folder in your app/Plugin folder. If you're installing a plugin named 'ContactManager' then you should have a folder in app/Plugin named 'ContactManager' under which are the plugin's View, Model, Controller, webroot, and any other directories.

New for CakePHP 2.0, plugins need to be loaded manually in app/Config/bootstrap.php.

You can either load them one by one or all of them in a single call:

```php
<?php
CakePlugin::loadAll(); // Loads all plugins at once
CakePlugin::load('ContactManager'); //Loads a single plugin
```

loadAll loads all plugins available, while allowing you to set certain settings for specific plugins. load() works similarly, but only loads the plugins you explicitly specify.

Plugin configuration

There is a lot you can do with the load and loadAll methods to help with plugin configuration and routing. Perhaps you want to load all plugins automatically, while specifying custom routes and bootstrap files for certain plugins.

No problem:

```
<?php
CakePlugin::loadAll(array(
    'Blog' => array('routes' => true),
    'ContactManager' => array('bootstrap' => true),
    'WebmasterTools' => array('bootstrap' => true, 'routes' => true),
));
```

With this style of configuration, you no longer need to manually include() or require() a plugin's configuration or routes file–It happens automatically at the right time and place. The exact same parameters could have also been supplied to the load() method, which would have loaded only those three plugins, and not the rest.

Finally, you can also specify a set of defaults for loadAll which will apply to every plugin that doesn't have a more specific configuration.

Load the bootstrap file from all plugins, and the routes from the Blog plugin:

```
<?php
CakePlugin::loadAll(array(
    array('bootstrap' => true),
    'Blog' => array('routes' => true)
));
```

Note that all files specified should actually exist in the configured plugin(s) or PHP will give warnings for each file it cannot load. This is especially important to remember when specifying defaults for all plugins.

Some plugins additionally need to create one or more tables in your database. In those cases, they will often include a schema file which you can call from the cake shell like this:

```
user@host$ cake schema create -plugin ContactManager
```

Most plugins will indicate the proper procedure for configuring them and setting up the database in their documentation. Some plugins will require more setup than others.

Advanced bootstrapping

If you like to load more than one bootstrap file for a plugin. You can specify an array of files for the bootstrap configuration key:

```
<?php
CakePlugin::loadAll(array(
    'Blog' => array(
        'bootstrap' => array(
            'config1',
            'config2'
        )
    )
));
```

You can also specify a callable function that needs to be called when the plugin has been loaded:

```
<?php

function aCallableFunction($pluginName, $config) {

}

CakePlugin::loadAll(array(
    'Blog' => array(
        'bootstrap' => 'aCallableFunction'
    )
));
```

Using a Plugin

You can reference a plugin's controllers, models, components, behaviors, and helpers by prefixing the name of the plugin before the class name.

For example, say you wanted to use the ContactManager plugin's ContactInfoHelper to output some pretty contact information in one of your views. In your controller, your $helpers array could look like this:

```
<?php
public $helpers = array('ContactManager.ContactInfo');
```

You would then be able to access the ContactInfoHelper just like any other helper in your view, such as:

```
<?php
echo $this->ContactInfo->address($contact);
```

Creating Your Own Plugins

As a working example, let's begin to create the ContactManager plugin referenced above. To start out, we'll set up our plugin's basic directory structure. It should look like this:

```
/app
    /Plugin
        /ContactManager
            /Controller
                /Component
            /Model
                /Behavior
            /View
                /Helper
                /Layouts
```

Note the name of the plugin folder, '**ContactManager**'. It is important that this folder has the same name as the plugin.

Inside the plugin folder, you'll notice it looks a lot like a CakePHP application, and that's basically what it is. You don't actually have to include any of those folders if you do not use them. Some plugins might only define a Component and a Behavior, and in that case they can completely omit the 'View' directory.

A plugin can also have basically any of the other directories that your application can, such as Config, Console, Lib, webroot, etc.

Note: If you want to be able to access your plugin with a URL, defining an AppController and AppModel for the plugin is required. These two special classes are named after the plugin, and extend the parent application's AppController and AppModel. Here's what they should look like for our ContactManager example:

```
<?php
// /app/Plugin/ContactManager/Controller/ContactManagerAppController.php:
class ContactManagerAppController extends AppController {
}
```

```
<?php
// /app/Plugin/ContactManager/Model/ContactManagerAppModel.php:
class ContactManagerAppModel extends AppModel {
}
```

If you forgot to define these special classes, CakePHP will hand you "Missing Controller" errors until you've done so.

Please note that the process of creating plugins can be greatly simplified by using the Cake shell.

In order to bake a plugin please use the following command:

```
user@host$ cake bake plugin ContactManager
```

Now you can bake using the same conventions which apply to the rest of your app. For example - baking controllers:

```
user@host$ cake bake controller Contacts --plugin ContactManager
```

Please refer to the chapter *Code Generation with Bake* if you have any problems with using the command line.

Plugin Controllers

Controllers for our ContactManager plugin will be stored in /app/Plugin/ContactManager/Controller/. Since the main thing we'll be doing is managing contacts, we'll need a ContactsController for this plugin.

So, we place our new ContactsController in /app/Plugin/ContactManager/Controller and it looks like so:

```
<?php
// app/Plugin/ContactManager/Controller/ContactsController.php
class ContactsController extends ContactManagerAppController {
    public $uses = array('ContactManager.Contact');

    public function index() {
        //...
    }
}
```

Note: This controller extends the plugin's AppController (called ContactManagerAppController) rather than the parent application's AppController.

Also note how the name of the model is prefixed with the name of the plugin. This is required to differentiate between models in the plugin and models in the main application.

In this case, the $uses array would not be required as ContactManager.Contact would be the default model for this controller, however it is included to demonstrate how to properly prepend the plugin name.

If you want to access what we've got going thus far, visit /contact_manager/contacts. You should get a "Missing Model" error because we don't have a Contact model defined yet.

Plugin Models

Models for the plugin are stored in /app/Plugin/ContactManager/Model. We've already defined a ContactsController for this plugin, so let's create the model for that controller, called Contact:

```
<?php
// /app/Plugin/ContactManager/Model/Contact.php:
class Contact extends ContactManagerAppModel {
}
```

Visiting /contact_manager/contacts now (given you've got a table in your database called 'contacts') should give us a "Missing View" error. Let's create that next.

Note: If you need to reference a model within your plugin, you need to include the plugin name with the model name, separated with a dot.

For example:

```
<?php
// /app/Plugin/ContactManager/Model/Contact.php:
class Contact extends ContactManagerAppModel {
    public $hasMany = array('ContactManager.AltName');
}
```

If you would prefer that the array keys for the association not have the plugin prefix on them, use the alternative syntax:

```
<?php
// /app/Plugin/ContactManager/Model/Contact.php:
class Contact extends ContactManagerAppModel {
        public $hasMany = array(
                'AltName' => array(
                        'className' => 'ContactManager.AltName'
                )
        );
}
```

Plugin Views

Views behave exactly as they do in normal applications. Just place them in the right folder inside of the /app/Plugin/[PluginName]/View/ folder. For our ContactManager plugin, we'll need a view for our ContactsController::index() action, so let's include that as well:

```
// /app/Plugin/ContactManager/View/Contacts/index.ctp:
<h1>Contacts</h1>
<p>Following is a sortable list of your contacts</p>
<!-- A sortable list of contacts would go here....-->
```

Note: For information on how to use elements from a plugin, look up *Elements*

Overriding plugin views from inside your application

You can override any plugin views from inside your app using special paths. If you have a plugin called 'ContactManager' you can override the view files of the plugin with more application specific view logic by creating files using the following template "app/View/Plugin/[Plugin]/[Controller]/[view].ctp". For the Contacts controller you could make the following file:

```
/app/View/Plugin/ContactManager/Contacts/index.ctp
```

Creating this file, would allow you to override "/app/Plugin/ContactManager/View/Contacts/index.ctp".

Plugin assets

A plugin's web assets (but not PHP files) can be served through the plugin's 'webroot' directory, just like the main application's assets:

```
app/Plugin/ContactManager/webroot/
                                    css/
                                    js/
                                    img/
                                    flash/
                                    pdf/
```

You may put any type of file in any directory, just like a regular webroot. The only restriction is that `MediaView` needs to know the mime-type of that asset.

Linking to assets in plugins

Simply prepend /plugin_name/ to the beginning of a request for an asset within that plugin, and it will work as if the asset were in your application's webroot.

For example, linking to '/contact_manager/js/some_file.js' would serve the asset 'app/Plugin/ContactManager/webroot/js/some_file.js'.

Note: It is important to note the **/your_plugin/** prefix before the asset path. That makes the magic happen!

Components, Helpers and Behaviors

A plugin can have Components, Helpers and Behaviors just like a regular CakePHP application. You can even create plugins that consist only of Components, Helpers or Behaviors which can be a great way to build reusable components that can easily be dropped into any project.

Building these components is exactly the same as building it within a regular application, with no special naming convention.

Referring to your component from inside or outside of your plugin requires only that you prefix the plugin name before the name of the component. For example:

```
<?php
// Component defined in 'ContactManager' plugin
class ExampleComponent extends Component {
}

// within your controllers:
public $components = array('ContactManager.Example');
```

The same technique applies to Helpers and Behaviors.

Note: When creating Helpers you may find AppHelper is not automatically available. You should declare the resources you need with Uses:

```
<?php
// Declare use of AppHelper for your Plugin's Helper
App::uses('AppHelper', 'View/Helper');
```

Expand Your Plugin

This example created a good start for a plugin, but there is a lot more that you can do. As a general rule, anything you can do with your application, you can do inside of a plugin instead.

Go ahead, include some third-party libraries in 'Vendor', add some new shells to the cake console, and don't forget to create test cases so your plugin users can automatically test your plugin's functionality!

In our ContactManager example, we might create add/remove/edit/delete actions in the ContactsController, implement validation in the Contact model, and implement the functionality one might expect when managing their contacts. It's up to you to decide what to implement in your plugins. Just don't forget to share your code with the community so that everyone can benefit from your awesome, reusable components!

Plugin Tips

Once a plugin has been installed in /app/Plugin, you can access it at the URL /plugin_name/controller_name/action. In our ContactManager plugin example, we'd access our ContactsController at /contact_manager/contacts.

Some final tips on working with plugins in your CakePHP applications:

- When you don't have a [Plugin]AppController and [Plugin]AppModel, you'll get missing Controller errors when trying to access a plugin controller.
- You can define your own layouts for plugins, inside app/Plugin/[Plugin]/View/Layouts. Otherwise, plugins will use the layouts from the /app/View/Layouts folder by default.
- You can do inter-plugin communication by using `$this->requestAction('/plugin_name/controller_` in your controllers.
- If you use requestAction, make sure controller and model names are as unique as possible. Otherwise you might get PHP "redefined class ..." errors.

CHAPTER 11

Console and Shells

CakePHP features not only a web framework but also a console framework for creating console applications. Console applications are ideal for handling a variety of background tasks such as maintenance, and completing work outside of the request-response cycle. CakePHP console applications allow you to reuse your application classes from the command line.

CakePHP comes with a number of console applications out of the box. Some of these applications are used in concert with other CakePHP features (like ACL or i18n), and others are for general use in getting you working faster.

The CakePHP console

This section provides an introduction into CakePHP at the command-line. If you've ever needed access to your CakePHP MVC classes in a cron job or other command-line script, this section is for you.

PHP provides a CLI client that makes interfacing with your file system and applications much smoother. The CakePHP console provides a framework for creating shell scripts. The Console uses a dispatcher-type setup to load a shell or task, and hand it its parameters.

Note: A command-line (CLI) build of PHP must be available on the system if you plan to use the Console.

Before we get into specifics, let's make sure we can run the CakePHP Console. First, you'll need to bring up a system shell. The examples shown in this section will be in bash, but the CakePHP Console is Windows-compatible as well. Let's execute the Console program from bash. This example assumes that the user is currently logged into a bash prompt and is currently at the root of a CakePHP application.

CakePHP applications contain a `Console` directory that contains all the shells and tasks for an application. It also comes with an executable:

```
$ cd /path/to/cakephp/app
$ Console/cake
```

It's often wise to add the core cake executable to your system path so you can use the cake command anywhere. This comes in handy when you are creating new projects. See *Adding cake to your system path* for how to make `cake` available systemwide.

Running the Console with no arguments produces this help message:

```
Welcome to CakePHP v2.0.0 Console
---------------------------------------------------------------
App : app
Path: /path/to/cakephp/app/
---------------------------------------------------------------
Current Paths:

 -app: app
 -working: /path/to/cakephp/app
 -root: /path/to/cakephp/
 -core: /path/to/cakephp/core

Changing Paths:

your working path should be the same as your application path
to change your path use the '-app' param.
Example: -app relative/path/to/cakephp/app or -app /absolute/path/to/cakephp/app

Available Shells:

 acl [CORE]                              i18n [CORE]
 api [CORE]                              import [app]
 bake [CORE]                             schema [CORE]
 command_list [CORE]                     testsuite [CORE]
 console [CORE]                          upgrade [CORE]

To run a command, type 'cake shell_name [args]'
To get help on a specific command, type 'cake shell_name help'
```

The first information printed relates to paths. This is especially helpful if you're running the console from different parts of the filesystem.

Since many users add the CakePHP console to their system's path so it can be accessed easily. Printing out the working, root, app, and core paths allows you to see where the console will be making changes. To change the app folder you wish to work with, you can supply its path as the first argument to the cake command. This next example shows how to specify an app folder, assuming you've already added the console folder to your `PATH`:

```
$ cake -app /path/to/cakephp/app
```

The path supplied can be relative to the current working directory or supplied as an absolute path.

Adding cake to your system path

If you are on a *nix system (linux, MacOSX) the following steps will let you add the cake executable to your system path.

1. Locate where your CakePHP install, and cake executable are. For example `/Users/mark/cakephp/lib/Cake/Console/cake`
2. Edit your `.bashrc` or `.bash_profile` file in your home directory, and add the following:

```
export PATH="$PATH:/Users/mark/cakephp/lib/Cake/Console"
```

3. Reload the bash configuration or open a new terminal, and `cake` should work anywhere.

If you are on Windows Vista or 7, you should follow the steps below.

1. Locate where your CakePHP install and cake executable are. For example `C:\xampp\htdocs\cakephp\lib\Cake\Console`
2. Open System Properties window from My Computer. You want to try the shortcut Windows Key + Pause or Windows Key + Break. Or, from the Desktop, right-click My Computer, click Properties then click Advanced System Settings link in the left column
3. Go under Advanced tab and click on Environment Variables button
4. In the System Variables portion, reach Path variable and double-click on it to Edit
5. Add the `cake` install path string followed by a semi colon. Result example:

```
%SystemRoot%\system32;%SystemRoot%;C:\xampp\htdocs\cakephp\Cake\lib\Console;
```

6. Click Ok and `cake` should work anywhere.

Creating a shell

Let's create a shell for use in the Console. For this example, we'll create a simple Hello world shell. In your applications `Console/Command` directory create `HelloShell.php`. Put the following code inside it:

```php
<?php
class HelloShell extends AppShell {
    public function main() {
        $this->out('Hello world.');
    }
}
```

The conventions for shell classes are that the class name should match the file name, with the suffix of Shell. In our shell we created a `main()` method. This method is called when a shell is called with no additional commands. We'll add some more commands in a bit, but for now lets just run our shell. From your application directory, run:

```
Console/cake hello
```

You should see the following output:

```
Welcome to CakePHP v2.0.0 Console
---------------------------------------------------------------
App : app
Path: /Users/markstory/Sites/cake_dev/app/
```

```
---------------------------------------------------------------
Hello world.
```

As mentioned before, the `main()` method in shells is a special method called whenever there are no other commands or arguments given to a shell. You may have also noticed that HelloShell is extending `AppShell`. Much like *The App Controller*, AppShell gives you a base class to contain all your common functions or logic. You can define an AppShell, by creating `app/Console/Command/AppShell.php`. If you don't have one, CakePHP will use the built-in one. Since our main method wasn't very interesting lets add another command that does something:

```
<?php
class HelloShell extends AppShell {
    public function main() {
        $this->out('Hello world.');
    }

    public function hey_there() {
        $this->out('Hey there ' . $this->args[0]);
    }
}
```

After saving this file you should be able to run `Console/cake hello hey_there your-name` and see your name printed out. Any public method not prefixed by an _ is allowed to be called from the command line. In our `hey_there` method we also used `$this->args`, this property contains an array of all the positional arguments provided to a command. You can also use switches or options on shell applications, these are available at `$this->params`, but we'll cover that in a bit.

When using a `main()` method you won't be able to use the positional arguments or parameters. This is because the first positional argument or option is interpreted as the command name. If you want to use arguments and options, you should use method names other than `main`.

Using Models in your shells

You'll often need access to your application's business logic in shell utilities; CakePHP makes that super easy. By setting a `$uses` property, you can define an array of models you want to have access to in your shell. The defined models are loaded in as properties attached to your shell, just like a controller gets models attached to it:

```
<?php
class UserShell extends AppShell {
    public $uses = array('User');

    public function show() {
        $user = $this->User->findByUsername($this->args[0]);
        $this->out(print_r($user, true));
    }
}
```

The above shell, will fetch a user by username and display the information stored in the database.

Shell tasks

There will be times when building more advanced console applications, you'll want to compose functionality into re-usable classes that can be shared across many shells. Tasks allow you to extract commands into classes. For example the `bake` is made almost entirely of tasks. You define a shell's tasks by using the `$tasks` property:

```
<?php
class UserShell extends AppShell {
    public $tasks = array('Template');
}
```

You can use tasks from plugins using the standard *plugin syntax*. Tasks are stored in `Console/Command/Task/` in files named after their classes. So if we were to create a new 'FileGenerator' task, you would create `Console/Command/Task/FileGeneratorTask.php`.

Each task must at least implement an `execute()` method. The ShellDispatcher, will call this method when the task is invoked. A task class looks like:

```
<?php
class FileGeneratorTask extends Shell {
    public $uses = array('User');
    public function execute() {

    }
}
```

A shell can also access it's tasks as properties, which makes tasks great for making re-usable chunks of functionality similar to *Components*:

```
<?php
// found in Console/Command/SeaShell.php
class SeaShell extends AppShell {
    public $tasks = array('Sound'); // found in Console/Command/Task/SoundTask.php
    public function main() {
        $this->Sound->execute();
    }
}
```

You can also access tasks directly from the command line:

```
$ cake sea sound
```

Note: In order to access tasks directly from the command line, the task **must** be included in the shell class' $tasks property. Therefore, be warned that a method called "sound" in the SeaShell class would override the ability to access the functionality in the Sound task specified in the $tasks array.

Loading tasks on the fly with TaskCollection

You can load tasks on the fly using the Task collection object. You can load tasks that were not declared in $tasks this way:

```
<?php
$Project = $this->Tasks->load('Project');
```

Would load and return a ProjectTask instance. You can load tasks from plugins using:

```
<?php
$ProgressBar = $this->Tasks->load('ProgressBar.ProgressBar');
```

Invoking other shells from your shell

Shells no longer have direct access to the ShellDispatcher any more through *$this->Dispatch*. There are still many cases where you will want to invoke one shell from another though. *Shell::dispatchShell()* gives you the ability to call other shells by providing the *argv* for the sub shell. You can provide arguments and options either as var args or as a string:

```
<?php
// As a string
$this->dispatchShell('schema create Blog --plugin Blog');

// As an array
$this->dispatchShell('schema', 'create', 'Blog', '--plugin', 'Blog');
```

The above shows how you can call the schema shell to create the schema for a plugin from inside your plugin's shell.

Console output levels

Shells often need different levels of verbosity. When running as cron jobs, most output is un-necessary. And there are times when you are not interested in everything that a shell has to say. You can use output levels to flag output appropriately. The user of the shell, can then decide what level of detail they are interested in by setting the correct flag when calling the shell. `Shell::out()` supports 3 types of output by default.

- QUIET - Only absolutely important information should be marked for quiet output.
- NORMAL - The default level, and normal usage
- VERBOSE - Mark messages that may be too noisy for everyday use, but helpful for debugging as VERBOSE

You can mark output as follows:

```
<?php
// would appear at all levels.
$this->out('Quiet message', 1, Shell::QUIET);
```

```
// would not appear when quiet output is toggled
$this->out('normal message', 1, Shell::NORMAL);
$this->out('loud message', 1, Shell::VERBOSE);

// would only appear when verbose output is enabled.
$this->out('extra message', 1, Shell::VERBOSE);
```

You can control the output level of shells, by using the `--quiet` and `--verbose` options. These options are added by default, and allow you to consistently control output levels inside your CakePHP shells.

Styling output

Styling output is done by including tags - just like html - in your output. ConsoleOutput will replace these tags with the correct ansi code sequence, or remove the tags if you are on a console that doesn't support ansi codes. There are several built in styles, and you can create more. The built in ones are

- `error` Error messages. Red underlined text.
- `warning` Warning messages. Yellow text.
- `info` Informational messages. Cyan text.
- `comment` Additional text. Blue text.
- `question` Text that is a question, added automatically by shell.

You can create additional styles using *$this->stdout->styles()*. To declare a new output style you could do:

```
<?php
$this->stdout->styles('flashy', array('text' => 'magenta', 'blink' => true));
```

This would then allow you to use a `<flashy>` tag in your shell output, and if ansi colours are enabled, the following would be rendered as blinking magenta text `$this->out('<flashy>Whoooa</flashy> Something went wrong');`. When defining styles you can use the following colours for the *text* and *background* attributes:

- black
- red
- green
- yellow
- blue
- magenta
- cyan
- white

You can also use the following options as boolean switches, setting them to a truthy value enables them.

- bold

- underline
- blink
- reverse

Adding a style makes it available on all instances of ConsoleOutput as well, so you don't have to redeclare styles for both stdout and stderr objects.

Turning off colouring

Although colouring is pretty awesome, there may be times when you want to turn it off, or force it on:

```
<?php
$this->output->outputAs(ConsoleOutput::RAW);
```

The above will put the output object into raw output mode. In raw output mode, no styling is done at all. There are three modes you can use.

- `ConsoleOutput::RAW` - Raw output, no styling or formatting will be done. This is a good mode to use if you are outputting XML or, want to debug why your styling isn't working.
- `ConsoleOutput::PLAIN` - Plain text output, known style tags will be stripped from the output.
- `ConsoleOutput::COLOR` - Output with color escape codes in place.

By default on *nix systems ConsoleOutput objects default to colour output. On windows systems, plain output is the default unless the `ANSICON` environment variable is present.

Configuring options and generating help

class `ConsoleOptionParser`

Console option parsing in CakePHP has always been a little bit different from everything else on the command line. In 2.0 `ConsoleOptionParser` helps provide a more familiar command line option and argument parser.

OptionParsers allow you to accomplish two goals at the same time. First they allow you to define the options and arguments, separating basic input validation and your code. Secondly, it allows you to provide documentation, that is used to generate well formatted help file.

The console framework gets your shell's option parser by calling `$this->getOptionParser()`. Overriding this method allows you to configure the OptionParser to match the expected inputs of your shell. You can also configure subcommand option parsers, which allow you to have different option parsers for subcommands and tasks. The ConsoleOptionParser implements a fluent interface and includes methods for easily setting multiple options/arguments at once.:

```
<?php
public function getOptionParser() {
    $parser = parent::getOptionParser();
    //configure parser
    return $parser;
}
```

Configuring an option parser with the fluent interface

All of the methods that configure an option parser can be chained, allowing you to define an entire option parser in one series of method calls:

```
<?php
function getOptionParser() {
    $parser = parent::getOptionParser();
    $parser->addArgument('type', array(
        'help' => 'Either a full path or type of class.'
    ))->addArgument('className', array(
        'help' => 'A CakePHP core class name (e.g: Component, HtmlHelper).'
    ))->addOption('method', array(
        'short' => 'm',
        'help' => __('The specific method you want help on.')
    ))->description(__('Lookup doc block comments for classes in CakePHP.'));
    return $parser;
}
```

The methods that allow chaining are:

- description()
- epilog()
- command()
- addArgument()
- addArguments()
- addOption()
- addOptions()
- addSubcommand()
- addSubcommands()

`ConsoleOptionParser::`**`description`**`(`*$text = null*`)`

Gets or sets the description for the option parser. The description displays above the argument and option information. By passing in either an array or a string, you can set the value of the description. Calling with no arguments will return the current value:

```
<?php
// Set multiple lines at once
$parser->description(array('line one', 'line two'));

// read the current value
$parser->description();
```

`ConsoleOptionParser::`**`epilog`**`(`*$text = null*`)`

Gets or sets the epilog for the option parser. The epilog is displayed after the argument and option information. By passing in either an array or a string, you can set the value of the epilog. Calling with no arguments will return the current value:

```
<?php
// Set multiple lines at once
$parser->epilog(array('line one', 'line two'));

// read the current value
$parser->epilog();
```

Adding arguments

`ConsoleOptionParser::`**`addArgument`**`(`*$name*, *$params = array()*`)`

Positional arguments are frequently used in command line tools, and `ConsoleOptionParser` allows you to define positional arguments as well as make them required. You can add arguments one at a time with `$parser->addArgument();` or multiple at once with `$parser->addArguments();`:

```
<?php
$parser->addArgument('model', array('help' => 'The model to bake'));
```

You can use the following options when creating an argument:

- `help` The help text to display for this argument.
- `required` Whether this parameter is required.
- **`index` The index for the arg, if left undefined the argument will be put** onto the end of the arguments. If you define the same index twice the first option will be overwritten.
- **`choices` An array of valid choices for this argument. If left empty all** values are valid. An exception will be raised when parse() encounters an invalid value.

Arguments that have been marked as required will throw an exception when parsing the command if they have been omitted. So you don't have to handle that in your shell.

`ConsoleOptionParser::`**`addArguments`**`(`*array $args*`)`

If you have an array with multiple arguments you can use `$parser->addArguments()` to add multiple arguments at once.:

```
<?php
$parser->addArguments(array(
    'node', array('help' => 'The node to create', 'required' => true),
    'parent' => array('help' => 'The parent node', 'required' => true)
));
```

As with all the builder methods on ConsoleOptionParser, addArguments can be used as part of a fluent method chain.

Validating arguments

When creating positional arguments, you can use the `required` flag, to indicate that an argument must be present when a shell is called. Additionally you can use `choices` to force an argument to be from a list of valid choices:

```
<?php
$parser->addArgument('type', array(
    'help' => 'The type of node to interact with.',
    'required' => true,
    'choices' => array('aro', 'aco')
));
```

The above will create an argument that is required and has validation on the input. If the argument is either missing, or has an incorrect value an exception will be raised and the shell will be stopped.

Adding Options

`ConsoleOptionParser::`**`addOption`**(*$name*, *$options = array()*)

Options or flags are also frequently used in command line tools. `ConsoleOptionParser` supports creating options with both verbose and short aliases, supplying defaults and creating boolean switches. Options are created with either `$parser->addOption()` or `$parser->addOptions()`.:

```
<?php
$parser->addOption('connection', array(
    'short' => 'c',
    'help' => 'connection',
    'default' => 'default',
));
```

The above would allow you to use either `cake myshell --connection=other`, `cake myshell --connection other`, or `cake myshell -c other` when invoking the shell. You can also create boolean switches, these switches do not consume values, and their presence just enables them in the parsed parameters.:

```
<?php
$parser->addOption('no-commit', array('boolean' => true));
```

With this option, when calling a shell like `cake myshell --no-commit something` the no-commit param would have a value of true, and 'something' would be a treated as a positional argument. The built-in `--help`, `--verbose`, and `--quiet` options use this feature.

When creating options you can use the following options to define the behavior of the option:

- `short` - The single letter variant for this option, leave undefined for none.
- `help` - Help text for this option. Used when generating help for the option.
- `default` - The default value for this option. If not defined the default will be true.
- `boolean` - The option uses no value, it's just a boolean switch. Defaults to false.

- `choices` An array of valid choices for this option. If left empty all values are valid. An exception will be raised when parse() encounters an invalid value.

`ConsoleOptionParser::`**`addOptions`**(*array $options*)

If you have an array with multiple options you can use `$parser->addOptions()` to add multiple options at once.:

```
<?php
$parser->addOptions(array(
    'node' => array('short' => 'n', 'help' => 'The node to create'),
    'parent' => array('short' => 'p', 'help' => 'The parent node')
));
```

As with all the builder methods on ConsoleOptionParser, addOptions is can be used as part of a fluent method chain.

Validating options

Options can be provided with a set of choices much like positional arguments can be. When an option has defined choices, those are the only valid choices for an option. All other values will raise an `InvalidArgumentException`:

```
<?php
$parser->addOption('accept', array(
    'help' => 'What version to accept.',
    'choices' => array('working', 'theirs', 'mine')
));
```

Using boolean options

Options can be defined as boolean options, which are useful when you need to create some flag options. Like options with defaults, boolean options always include themselves into the parsed parameters. When the flags are present they are set to true, when they are absent false:

```
<?php
$parser->addOption('verbose', array(
    'help' => 'Enable verbose output.',
    'boolean' => true
));
```

The following option would result in `$this->params['verbose']` always being available. This lets you omit `empty()` or `isset()` checks for boolean flags:

```
<?php
if ($this->params['verbose']) {
    // do something
}
```

Since the boolean options are always defined as `true` or `false` you can omit additional check methods.

Adding subcommands

`ConsoleOptionParser::`**`addSubcommand`**`(`*$name*, *$options = array()*`)`

Console applications are often made of subcommands, and these subcommands may require special option parsing and have their own help. A perfect example of this is `bake`. Bake is made of many separate tasks that all have their own help and options. `ConsoleOptionParser` allows you to define subcommands and provide command specific option parsers so the shell knows how to parse commands for its tasks:

```
<?php
$parser->addSubcommand('model', array(
    'help' => 'Bake a model',
    'parser' => $this->Model->getOptionParser()
));
```

The above is an example of how you could provide help and a specialized option parser for a shell's task. By calling the Task's `getOptionParser()` we don't have to duplicate the option parser generation, or mix concerns in our shell. Adding subcommands in this way has two advantages. First it lets your shell easily document its subcommands in the generated help, and it also allows easy access to the subcommand help. With the above subcommand created you could call `cake myshell --help` and see the list of subcommands, and also run `cake myshell model --help` to view the help for just the model task.

When defining a subcommand you can use the following options:

- `help` - Help text for the subcommand.
- `parser` - A ConsoleOptionParser for the subcommand. This allows you to create method specific option parsers. When help is generated for a subcommand, if a parser is present it will be used. You can also supply the parser as an array that is compatible with `ConsoleOptionParser::buildFromArray()`

Adding subcommands can be done as part of a fluent method chain.

Building a ConsoleOptionParser from an array

`ConsoleOptionParser::`**`buildFromArray`**`(`*$spec*`)`

As previously mentioned, when creating subcommand option parsers, you can define the parser spec as an array for that method. This can help make building subcommand parsers easier, as everything is an array:

```
<?php
$parser->addSubcommand('check', array(
    'help' => __('Check the permissions between an ACO and ARO.'),
    'parser' => array(
        'description' => array(
            __("Use this command to grant ACL permissions. Once executed, the ARO "),
            __("specified (and its children, if any) will have ALLOW access to the"),
            __("specified ACO action (and the ACO's children, if any).")
        ),
        'arguments' => array(
            'aro' => array('help' => __('ARO to check.'), 'required' => true),
            'aco' => array('help' => __('ACO to check.'), 'required' => true),
            'action' => array('help' => __('Action to check'))
        )
    )
));
```

Inside the parser spec, you can define keys for `definition`, `arguments`, `options`, and `epilog`. You cannot define subcommands inside an array style builder. The values for arguments, and options, should follow the format that `ConsoleOptionParser::addArguments()` and `ConsoleOptionParser::addOptions()` use. You can also use buildFromArray on its own, to build an option parser:

```
<?php
public function getOptionParser() {
    return ConsoleOptionParser::buildFromArray(array(
        'description' => array(
            __("Use this command to grant ACL permissions. Once executed, the ARO "),
            __("specified (and its children, if any) will have ALLOW access to the"),
            __("specified ACO action (and the ACO's children, if any).")
        ),
        'arguments' => array(
            'aro' => array('help' => __('ARO to check.'), 'required' => true),
            'aco' => array('help' => __('ACO to check.'), 'required' => true),
            'action' => array('help' => __('Action to check'))
        )
    ));
}
```

Getting help from shells

With the addition of ConsoleOptionParser getting help from shells is done in a consistent and uniform way. By using the `--help` or `-h` option you can view the help for any core shell, and any shell that implements a ConsoleOptionParser:

```
cake bake --help
cake bake -h
```

Would both generate the help for bake. If the shell supports subcommands you can get help for those in a similar fashion:

```
cake bake model --help
cake bake model -h
```

This would get you the help specific to bake's model task.

Getting help as XML

When building automated tools or development tools that need to interact with CakePHP shells, its nice to have help available in a machine parse-able format. The ConsoleOptionParser can provide help in xml by setting an additional argument:

```
cake bake --help xml
cake bake -h xml
```

The above would return an XML document with the generated help, options, arguments and subcommands for the selected shell. A sample XML document would look like:

```
<?xml version="1.0"?>
<shell>
    <command>bake fixture</command>
    <description>Generate fixtures for use with the test suite. You can use
        `bake fixture all` to bake all fixtures.</description>
    <epilog>Omitting all arguments and options will enter into an interactive mode.</epilog
    <subcommands/>
    <options>
        <option name="--help" short="-h" boolean="1">
            <default/>
            <choices/>
        </option>
        <option name="--verbose" short="-v" boolean="1">
            <default/>
            <choices/>
        </option>
        <option name="--quiet" short="-q" boolean="1">
            <default/>
            <choices/>
        </option>
        <option name="--count" short="-n" boolean="">
            <default>10</default>
            <choices/>
        </option>
        <option name="--connection" short="-c" boolean="">
            <default>default</default>
            <choices/>
        </option>
        <option name="--plugin" short="-p" boolean="">
            <default/>
            <choices/>
        </option>
        <option name="--records" short="-r" boolean="1">
            <default/>
            <choices/>
        </option>
    </options>
    <arguments>
        <argument name="name" help="Name of the fixture to bake.
            Can use Plugin.name to bake plugin fixtures." required="">
            <choices/>
        </argument>
    </arguments>
</shell>
```

Shell API

class `AppShell`

AppShell can be used as a base class for all your shells. It should extend `Shell`, and be located in `Console/Command/AppShell.php`

class `Shell` (*$stdout = null*, *$stderr = null*, *$stdin = null*)

Shell is the base class for all shells, and provides a number of functions for interacting with user input, outputting text a generating errors.

property `Shell::$`**`tasks`**

An array of tasks you want loaded for this shell/task.

property `Shell::$`**`uses`**

An array of models that should be loaded for this shell/task.

`Shell::`**`clear`**`()`

Clears the current output being displayed.

`Shell::`**`createFile`**(*$path*, *$contents*)

Parameters

- **$path** (*string*) – Absolute path to the file you want to create.
- **$contents** (*string*) – Contents to put in the file.

Creates a file at a given path. If the Shell is interactive, a warning will be generated, and the user asked if they want to overwrite the file if it already exists. If the shell's interactive property is false, no question will be asked and the file will simply be overwritten.

`Shell::`**`dispatchShell`**`()`

Dispatch a command to another Shell. Similar to `Controller::requestAction()` but intended for running shells from other shells.

See *Invoking other shells from your shell*.

`Shell::`**`err`**(*$message = null*, *$newlines = 1*)

Parameters

- **$method** (*string*) – The message to print.
- **$newlines** (*integer*) – The number of newlines to follow the message.

Outputs a method to `stderr`, works similar to `Shell::out()`

`Shell::`**`error`**(*$title*, *$message = null*)

Parameters

- **$title** (*string*) – Title of the error
- **$message** (*string*) – An optional error message

Displays a formatted error message and exits the application with status code 1

`Shell::`**`getOptionParser`**`()`

Should return a `ConsoleOptionParser` object, with any sub-parsers for the shell.

`Shell::`**`hasMethod`**`(`*$name*`)`

Check to see if this shell has a callable method by the given name.

`Shell::`**`hasTask`**`(`*$task*`)`

Check to see if this shell has a task with the provided name.

`Shell::`**`hr`**`(`*$newlines = 0*, *$width = 63*`)`

Parameters

- **$newlines** (*int*) – The number of newlines to precede and follow the line.
- **$width** (*int*) – The width of the line to draw.

Create a horizontal line preceded and followed by a number of newlines.

`Shell::`**`in`**`(`*$prompt*, *$options = null*, *$default = null*`)`

Parameters

- **$prompt** (*string*) – The prompt to display to the user.
- **$options** (*array*) – An array of valid choices the user can pick from. Picking an invalid option will force the user to choose again.
- **$default** (*string*) – The default option if there is one.

This method helps you interact with the user, and create interactive shells. It will return the users answer to the prompt, and allows you to provide a list of valid options the user can choose from:

```php
<?php
$selection = $this->in('Red or Green?', array('R', 'G'), 'R');
```

The selection validation is case-insensitive.

`Shell::`**`initialize`**`()`

Initializes the Shell acts as constructor for subclasses allows configuration of tasks prior to shell execution.

`Shell::`**`loadTasks`**`()`

Loads tasks defined in public `Shell::$tasks`

`Shell::`**`nl`**`(`*$multiplier = 1*`)`

:param int $multiplier Number of times the linefeed sequence should be repeated

Returns a number of linefeed sequences.

`Shell::`**`out`**`(`*$message = null*, *$newlines = 1*, *$level = Shell::NORMAL*`)`

Parameters

- **$method** (*string*) – The message to print.
- **$newlines** (*integer*) – The number of newlines to follow the message.

- **$level** (*integer*) – The highest *Console output levels* this message should display at.

The primary method for generating output to the user. By using levels, you can limit how verbose a shell is. out() also allows you to use colour formatting tags, which will enable coloured output on systems that support it. There are several built in styles for colouring text, and you can define your own.

- `error` Error messages.
- `warning` Warning messages.
- `info` Informational messages.
- `comment` Additional text.
- `question` Magenta text used for user prompts

By formatting messages with style tags you can display styled output:

```
<?php
$this->out('<warning>This will remove data from the filesystems.</warning>');
```

By default on *nix systems ConsoleOutput objects default to colour output. On windows systems, plain output is the default unless the `ANSICON` environment variable is present.

`Shell::`**`runCommand`**`(`*$command*, *$argv*`)`
Runs the Shell with the provided argv.

Delegates calls to Tasks and resolves methods inside the class. Commands are looked up with the following order:

- Method on the shell.
- Matching task name.
- main() method.

If a shell implements a main() method, all missing method calls will be sent to main() with the original method name in the argv.

`Shell::`**`shortPath`**`(`*$file*`)`
Makes absolute file path easier to read.

`Shell::`**`startup`**`()`
Starts up the Shell and displays the welcome message. Allows for checking and configuring prior to command or main execution

Override this method if you want to remove the welcome information, or otherwise modify the pre-command flow.

`Shell::`**`wrapText`**`(`*$text*, *$options = array()*`)`
Wrap a block of text. Allows you to set the width, and indenting on a block of text.

Parameters

- **$text** (*string*) – The text to format

- **$options** (*array*) –
  - `width` The width to wrap to. Defaults to 72
  - `wordWrap` Only wrap on words breaks (spaces) Defaults to true.
  - `indent` Indent the text with the string provided. Defaults to null.

More topics

Running Shells as cronjobs

A common thing to do with a shell is making it run as a cronjob to clean up the database once in a while or send newsletters. However, when you have added the console path to the PATH variable via `~/.profile`, it will be unavailable to the cronjob.

The following BASH script will call your shell and append the needed paths to $PATH. Copy and save this to your Console folder as 'cakeshell' and don't forget to make it executable. (`chmod +x cakeshell`)

```
#!/bin/bash
TERM=dumb
export TERM
cmd="cake"
while [ $# -ne 0 ]; do
    if [ "$1" = "-cli" ] || [ "$1" = "-console" ]; then
        PATH=$PATH:$2
        shift
    else
        cmd="${cmd} $1"
    fi
    shift
done
$cmd
```

You can call it like::

```
$ ./Console/cakeshell myshell myparam -cli /usr/bin -console /cakes/2.x.x/lib/Cake/Console
```

The `-cli` parameter takes a path which points to the php cli executable and the `-console` parameter takes a path which points to the CakePHP console.

As a cronjob this would look like:

```
# m h dom mon dow command
*/5 *   *   *   * /full/path/to/cakeshell myshell myparam -cli /usr/bin -console /cakes/2.x
```

A simple trick to debug a crontab is to set it up to dump it's output to a logfile. You can do this like:

```
# m h dom mon dow command
*/5 *   *   *   * /full/path/to/cakeshell myshell myparam -cli /usr/bin -console /cakes/2.x
```

Code Generation with Bake

CakePHP's Bake console is another effort to get you up and running in CakePHP – fast. The Bake console can create any of CakePHP's basic ingredients: models, views and controllers. And we aren't just talking skeleton classes: Bake can create a fully functional application in just a few minutes. In fact, Bake is a natural step to take once an application has been scaffolded.

Those new to Bake (especially Windows users) may find the Bake screencast (http://tv.cakephp.org/video/gwoo/2010/12/24/setting_up_the_cakephp_console_on_windows) helpful in setting things up before continuing.

Depending on the configuration of your setup, you may have to set execute rights on the cake bash script or call it using ./cake bake. The cake console is run using the PHP CLI (command line interface). If you have problems running the script, ensure that you have the PHP CLI installed and that it has the proper modules enabled (eg: MySQL).

When running Bake for the first time, you'll be prompted to create a Database Configuration file, if you haven't created one already.

After you've created a Database Configuration file, running Bake will present you with the following options:

```
---------------------------------------------------------------
App : app
Path: /path-to/project/app
---------------------------------------------------------------
Interactive Bake Shell
---------------------------------------------------------------
[D]atabase Configuration
[M]odel
[V]iew
[C]ontroller
[P]roject
[F]ixture
[T]est case
[Q]uit
What would you like to Bake? (D/M/V/C/P/F/T/Q)
>
```

Alternatively, you can run any of these commands directly from the command line:

```
$ cake bake db_config
$ cake bake model
$ cake bake view
$ cake bake controller
$ cake bake project
$ cake bake fixture
$ cake bake test
$ cake bake plugin plugin_name
$ cake bake all
```

Modify default HTML produced by "baked" templates

If you wish to modify the default HTML output produced by the "bake" command, follow these simple steps:

For baking custom views

1. Go into: lib/Cake/Console/Templates/default/views
2. Notice the 4 files there
3. Copy them to your: app/Console/Templates/[themename]/views
4. Make changes to the HTML output to control the way "bake" builds your views

The `[themename]` path segment should be the name of the bake theme that you are creating. Bake theme names need to be unique, so don't use 'default'.

For baking custom projects

Go into: lib/Cake/Console/Templates/skel Notice the base application files there Copy them to your: app/Console/Templates/skel Make changes to the HTML output to control the way "bake" builds your views Pass the skeleton path parameter to the project task

```
cake bake project --skel Console/Templates/skel
```

Note:

- You must run the specific project task `cake bake project` so that the path parameter can be passed.
- The template path is relative to the current path of the Command Line Interface.
- Since the full path to the skeleton needs to be manually entered, you can specify any directory holding your template build you want, including using multiple templates. (Unless Cake starts supporting overriding the skel folder like it does for views)

Bake improvements in 1.3

For 1.3 bake has had a significant overhaul, and a number of features and enhancements have been built in.

- Two new tasks (FixtureTask and TestTask) are accessible from the main bake menu
- A third task (TemplateTask) has been added for use in your shells.
- All the different bake tasks now allow you to use connections other than default for baking. Using the `-connection` parameter.
- Plugin support has been greatly improved. You can use either `-plugin PluginName` or `Plugin.class`.

- Questions have been clarified, and made easier to understand.
- Multiple validations on models has been added.
- Self Associated models using `parent_id` are now detected. For example if your model is named Thread, a ParentThread and ChildThread association will be created.
- Fixtures and Tests can be baked separately.
- Baked Tests include as many fixtures as they know about, including plugin detection (plugin detection does not work on PHP4).

So with the laundry list of features, we'll take some time to look at some of the new commands, new parameters and updated features.

New FixtureTask, TestTask and TemplateTask.

Fixture and test baking were a bit of a pain in the past. You could only generate tests when baking the classes, and fixtures could only be generated when baking models. This made adding tests to your applications later or even regenerating fixtures with new schemas a bit painful. For 1.3 we've separated out Fixture and Test making them separate tasks. This allows you to re-run them and regenerate tests and fixtures at any point in your development process.

In addition to being rebuildable at any time, baked tests are now attempt to find as many fixtures as possible. In the past getting into testing often involved fighting through numerous 'Missing Table' errors. With more advanced fixture detection we hope to make testing easier and more accessible.

Test cases also generate skeleton test methods for every non-inherited public method in your classes. Saving you one extra step.

`TemplateTask` is a behind the scenes task, and it handles file generation from templates. In previous versions of CakePHP baked views were template based, but all other code was not. With 1.3 almost all the content in the files generated by bake are controlled by templates and the `TemplateTask`.

The `FixtureTask` not only generates fixtures with dummy data, but using the interactive options or the `-records` option you can enable fixture generation using live data.

New bake command New commands have been added to make baking easier and faster. Controller, Model, View baking all feature an `all` subcommand, that builds everything at once and makes speedy rebuilds easy.

```
cake bake model all
```

Would bake all the models for an application in one shot. Similarly `cake bake controller all` would bake all controllers and `cake bake view all` would generate all view files. Parameters on the `ControllerTask` have changed as well. `cake bake controller scaffold` is now `cake bake controller public`. `ViewTask` has had an `-admin` flag added, using `-admin` will allow you to bake views for actions that begin with `Routing.admin`

As mentioned before `cake bake fixture` and `cake bake test` are new, and have several subcommands each. `cake bake fixture all` will regenerate all the basic fixtures for your application. The `-count` parameter allows you to set the number of fake records that are created. By running fixture task interactively you can generate fixtures using the data in your live tables. You can use `cake bake test <type> <class>` to create test cases for already created objects in your app. Type should be one of the standard CakePHP types ('component', 'controller', 'model', 'helper', 'behavior') but doesn't have to be. Class should be an existing object of the chosen type.

Templates Galore

New in bake for 1.3 is the addition of more templates. In 1.2 baked views used templates that could be changed to modify the view files bake generated. In 1.3 templates are used to generate all output from bake. There are separate templates for controllers, controller action sets, fixtures, models, test cases, and the view files from 1.2. As well as more templates, you can also have multiple template sets or, bake themes. Bake themes can be provided in your app, or as part of plugins. An example plugin path for bake theme would be `app/Plugin/BakeTheme/Console/Templates/dark_red/`. An app bake theme called `blue_bunny` would be placed in `app/Console/Templates/blue_bunny`. You can look at `lib/Cake/Console/Templates/default/` to see what directories and files are required of a bake theme. However, like view files, if your bake theme doesn't implement a template, other installed themes will be checked until the correct template is found.

Additional plugin support.

New in 1.3 are additional ways to specify plugin names when using bake. In addition to `cake bake plugin Todo controller Posts`, there are two new forms. `cake bake controller Todo.Posts` and `cake bake controller Posts -plugin Todo`. The plugin parameter can be while using interactive bake as well. `cake bake controller -plugin Todo`, for example will allow you to use interactive bake to add controllers to your Todo plugin. Additional / multiple plugin paths are supported as well. In the past bake required your plugin to be in app/plugins. In 1.3 bake will find which of the pluginPaths the named plugin is located on, and add the files there.

Schema management and migrations

The SchemaShell provides a functionality to create schema objects, schema sql dumps as well as create snapshots and restore database snapshots.

Generating and using Schema files

A generated schema file allows you to easily transport a database agnostic schema. You can generate a schema file of your database using:

```
$ Console/cake schema generate
```

This will generate a schema.php file in your `app/Config/Schema` directory.

Note: The schema shell will only process tables for which there are models defined. To force the schema shell to process all the tables, you must add the `-f` option in the command line.

To later rebuild the database schema from your previously made schema.php file run:

```
$ Console/cake schema create
```

This will drop and create the tables based on the contents of the schema.php.

Schema files can also be used to generate sql dump files. To generate a sql file containing the `CREATE TABLE` statements, run:

```
$ Console/cake schema dump --write filename.sql
```

Where filename.sql is the desired filename for the sql dump. If you omit filename.sql the sql dump will be output to the console but not written to a file.

CakeSchema callbacks

After generating a schema you might want to insert data on some tables to get your app started. This can be achieved through CakeSchema callbacks. Every schema file is generated with a `before($event = array())` and a `after($event = array())` method.

The `$event` param holds an array with two keys. One to tell if a table is being dropped or created and another for errors. Examples:

```
array('drop' => 'posts', 'errors' => null)
array('create' => 'posts', 'errors' => null)
```

Adding data to a posts table for example would like this:

```
<?php
App::uses('Post', 'Model');
public function after($event = array()) {
    if (isset($event['create'])) {
        switch ($event['create']) {
            case 'posts':
                $post = ClassRegistry::init('Post');
                $post->create();
                $post->save(
                    array('Post' =>
                        array('title' => 'CakePHP Schema Files')
                    )
                );
                break;
        }
    }
}
```

The `before()` and `after()` callbacks run each time a table is created or dropped on the current schema.

When inserting data to more than one table you'll need to flush the database cache after each table is created. Cache can be disable by setting `$db->cacheSources = false` in the before action().

```
<?php
public $connection = 'default';

public function before($event = array()) {
    $db = ConnectionManager::getDataSource($this->connection);
    $db->cacheSources = false;
    return true;
}
```

Migrations with CakePHP schema shell

Migrations allow for versioning of your database schema, so that as you develop features you have an easy and database agnostic way to distribute database changes. Migrations are achieved through either SCM controlled schema files or schema snapshots. Versioning a schema file with the schema shell is quite easy. If you already have a schema file created running:

```
$ Console/cake schema generate
```

Will bring up the following choices:

```
Generating Schema...
Schema file exists.
 [O]verwrite
 [S]napshot
 [Q]uit
Would you like to do? (o/s/q)
```

Choosing [s] (snapshot) will create an incremented schema.php. So if you have schema.php, it will create schema_2.php and so on. You can then restore to any of these schema files at any time by running:

```
$ cake schema update -s 2
```

Where 2 is the snapshot number you wish to run. The schema shell will prompt you to confirm you wish to perform the `ALTER` statements that represent the difference between the existing database the currently executing schema file.

You can perform a dry run by adding a `--dry` to your command.

Workflow examples

Create schema and commit

On a project which use versioning, the usage of cake schema would follow these steps:

1. Create or modify your database tables
2. Execute cake schema to export a full description of your database
3. Commit the created or updated schema.php file:

```
    $ # once your database has been updated
    $ Console/cake schema generate
    $ git commit -a
```

Note: If the project is not versioned, managing schemas would be done through snapshots. (see previous section to manage snapshots)

Getting the last changes

When you pull the last changes of your repository, and discover changes in the structure of the database (possibly because of an error message saying you are missing a table):

1. Execute cake schema to update your database:

```
    $ git pull
    $ Console/cake schema create
    $ Console/cake schema update
```

All these operations can be done in dry-run mode.

Rolling back

If at some point you need to revert and get back to the state in which you were before updating your database, you should be informed that this is currently not supported by cake schema.

More specifically, you can't automatically drop your tables once they have been created.

Using `update` will, on the contrary, drop any field which differ from the schema file:

```
$ git revert HEAD
$ Console/cake schema update
```

Will bring up the following choices:

```
The following statements will run.
ALTER TABLE `roles`
DROP `position`;
Are you sure you want to alter the tables? (y/n)
[n] >
```

I18N shell

The i18n features of CakePHP use po files (http://en.wikipedia.org/wiki/GNU_gettext) as their translation source. This makes them easily to integrate with tools like poedit (http://www.poedit.net/) and other common translation tools.

The i18n shell provides a quick and easy way to generate po template files. These templates files can then be given to translators so they can translate the strings in your application. Once you have translations done, pot files can be merged with existing translations to help update your translations.

Generating POT files

POT files can be generated for an existing application using the `extract` command. This command will scan your entire application for `__()` style function calls, and extract the message string. Each unique string in your application will be combined into a single POT file:

```
./Console/cake i18n extract
```

The above will run the extraction shell. In addition to extracting strings in `__()` methods, validation messages in models will be extracted as well. The result of this command will be the file `app/Locale/default.pot`. You use the pot file as a template for creating po files. If you are manually creating po files from the pot file, be sure to correctly set the `Plural-Forms` header line.

Generating POT files for plugins

You can generate a POT file for a specific plugin using:

```
./Console/cake i18n extract --plugin <Plugin>
```

This will generate the required POT files used in the plugins.

Model validation messages

You can set the domain to be used for extracted validation messages in your models. If the model already has a `$validationDomain` property, the given validation domain will be ignored:

```
./Console/cake i18n extract --validation-domain validation_errors
```

You can also prevent the shell from extracting validation messages:

```
./Console/cake i18n extract --ignore-model-validation
```

Excluding folders

You can pass a comma separated list of folders that you wish to be excluded. Any path containing a path segment with the provided values will be ignored:

```
./Console/cake i18n extract --exclude Test,Vendor
```

Skipping overwrite warnings for existing POT files

New in version 2.2. By adding –overwrite, the shell script will no longer warn you if a POT file already exists and will overwrite by default:

```
./Console/cake i18n extract --overwrite
```

Extracting messages from the CakePHP core libraries

New in version 2.2. By default, the extract shell script will ask you if you like to extract the messages used in the CakePHP core libraries. Set –extract-core to yes or no to set the default behavior.

```
./Console/cake i18n extract --extract-core yes

or

./Console/cake i18n extract --extract-core no
```

Create the tables used by TranslateBehavior

The i18n shell can also be used to initialize the default tables used by the `TranslateBehavior`:

```
./Console/cake i18n initdb
```

This will create the `i18n` table used by translate behavior.

ACL Shell

The AclShell is useful for managing and inspecting your Acl databases records. It's often more convenient than adding one time modifications to your controllers.

Most acl shell subcommands involve referencing aco/aro nodes. As there are two 'forms' of these nodes, there is two notations in the shell:

```
# A Model + foreign_key reference
./Console/cake acl view Model.1

# An alias path reference
./Console/cake acl view root/controllers
```

Using a `.` indicates that you are going to use a bound record style reference while using a `/` indicates an alias path.

Installing the database tables

Before using the database ACL you'll need to setup the tables. You can do that using:

```
./Console/cake acl initdb
```

Create and delete nodes

You can use the create and delete subcommands to create and delete nodes:

```
./Console/cake acl create aco controllers/Posts
```

Would create an aco record using an alias path. You could do the following as well:

```
./Console/cake acl create aro Group.1
```

To create an aro node for the Group id = 1.

Grant and deny access

Use the grant command to grant ACL permissions. Once executed, the ARO specified (and its children, if any) will have ALLOW access to the specified ACO action (and the ACO's children, if any):

```
./Console/cake acl grant Group.1 controllers/Posts
```

The above would grant all privileges. You could grant only the read privilege using the following:

```
./Console/cake acl grant Group.1 controllers/Posts read
```

Denying permission works in the exact same way. The only difference is you switch 'deny' in for 'grant'.

Check permissions

Use this command to grant ACL permissions. Once executed, the ARO specified (and its children, if any) will have ALLOW access to the specified ACO action (and the ACO's children, if any):

```
./Console/cake acl check Group.1 controllers/Posts read
```

The output will either be `success` or `not allowed`.

View the node trees

The view command will return the ARO or ACO tree. The optional node parameter allows you to return only a portion of the requested tree:

```
./Console/cake acl view
```

Test shell

Once you've started writing *Tests* you can run them using the test shell.

For more information on basic usage of the test shell see *Running tests from command line*. Changed in version 2.1: The `test` shell was added in 2.1. The 2.0 `testsuite` shell is still available but the new syntax is preferred.

Upgrade shell

The upgrade shell will do most of the work to upgrade your CakePHP application from 1.3 to 2.0.

To run all upgrade steps:

```
./Console/cake upgrade all
```

If you would like to see what the shell will do without modifying files perform a dry run first with –dry-run:

```
./Console/cake upgrade all --dry-run
```

To upgrade your plugin run the command:

```
./Console/cake upgrade all --plugin YourPluginName
```

You are able to run each upgrade step individually. To see all the steps available run the command:

```
./Console/cake upgrade --help
```

Or visit the API docs for more info: http://api20.cakephp.org/class/upgrade-shell

Upgrade Your App

Here is a guide to help you upgrade your CakePHP 1.3 app to 2.x using the upgrade shell. Your 1.3 app structure will likely look like this:

```
mywebsite/
    app/             <- Your App
    cake/            <- 1.3 Version of CakePHP
    plugins/
    vendors/
    .htaccess
    index.php
```

The first step is to download or `git clone` the new version of CakePHP into another folder outside of your `mywebsite` folder, we'll call it `cakephp`. We don't want the downloaded `app` folder to overwrite your app folder. Now is a good time to make a backup of your app folder, eg.: `cp -R app app-backup`.

Copy the `cakephp/lib` folder to your `mywebsite/lib` to setup the new CakePHP version in your app, eg.: `cp -R ../cakephp/lib .`. Symlinking is a good alternative to copy as well, eg.: `ln -s /var/www/cakephp/lib`.

Before we can run the upgrade shell we need the new console scripts as well. Copy the `cakephp/app/Console` folder into your `mywebsite/app`, eg.: `cp -R ../cakephp/app/Console ./app`.

Your folder structure should look like this now:

```
mywebsite/
    app/              <- Your App
        Console/      <- Copied app/Console Folder
    app-backup/       <- Backup Copy of Your App
    cake/             <- 1.3 Version of CakePHP
    lib/              <- 2.x Version of CakePHP
        Cake/
    plugins/
    vendors/
    .htaccess
    index.php
```

Now we can run the upgrade shell by `cd`'ing into your `app` folder and running the command:

```
./Console/cake upgrade all
```

This will do **most** of the work to upgrade your app to 2.x. Check things over in your upgraded `app` folder. If everything looks good then congratulate yourself and delete your `mywebsite/cake` folder. Welcome to 2.x!

CHAPTER 12

Development

In this section we'll cover the various aspects of developing a CakePHP application. Topics like Configuration, handling errors & exceptions, debugging, and testing will be covered.

Configuration

Configuring a CakePHP application is a piece of cake. After you have installed CakePHP, creating a basic web application requires only that you setup a database configuration.

There are, however, other optional configuration steps you can take in order to take advantage of CakePHP flexible architecture. You can easily add to the functionality inherited from the CakePHP core, configure additional/different URL mappings (routes), and define additional/different inflections.

Database Configuration

CakePHP expects database configuration details to be in a file at `app/Config/database.php`. An example database configuration file can be found at `app/Config/database.php.default`. A finished configuration should look something like this:

```
<?php
class DATABASE_CONFIG {
    public $default = array(
        'datasource'  => 'Database/Mysql',
        'persistent'  => false,
        'host'        => 'localhost',
        'login'       => 'cakephpuser',
        'password'    => 'c4k3roxx!',
        'database'    => 'my_cakephp_project',
        'prefix'      => ''
    );
}
```

The $default connection array is used unless another connection is specified by the `$useDbConfig` property in a model. For example, if my application has an additional legacy database in addition to the default one, I could use it in my models by creating a new $legacy database connection array similar to the $default array, and by setting `public $useDbConfig = 'legacy';` in the appropriate models.

Fill out the key/value pairs in the configuration array to best suit your needs.

datasource The name of the datasource this configuration array is for. Examples: Database/Mysql, Database/Sqlserver, Database/Postgres, Database/Sqlite. You can use *plugin syntax* to indicate plugin datasource to use.

persistent Whether or not to use a persistent connection to the database.

host The database server's hostname (or IP address).

login The username for the account.

password The password for the account.

database The name of the database for this connection to use.

prefix (*optional*) The string that prefixes every table name in the database. If your tables don't have prefixes, set this to an empty string.

port (*optional*) The TCP port or Unix socket used to connect to the server.

encoding Indicates the character set to use when sending SQL statements to the server. This defaults to the database's default encoding for all databases other than DB2. If you wish to use UTF-8 encoding with mysql/mysqli connections you must use 'utf8' without the hyphen.

schema Used in PostgreSQL database setups to specify which schema to use.

datasource non-DBO datasource to use, e.g. 'ldap', 'twitter'

unix_socket Used by drivers that support it to connect via unix socket files.

Note: The prefix setting is for tables, **not** models. For example, if you create a join table for your Apple and Flavor models, you name it prefix_apples_flavors (**not** prefix_apples_prefix_flavors), and set your prefix setting to 'prefix_'.

At this point, you might want to take a look at the *CakePHP Conventions*. The correct naming for your tables (and the addition of some columns) can score you some free functionality and help you avoid configuration. For example, if you name your database table big_boxes, your model BigBox, your controller BigBoxesController, everything just works together automatically. By convention, use underscores, lower case, and plural forms for your database table names - for example: bakers, pastry_stores, and savory_cakes.

Additional Class Paths

It's occasionally useful to be able to share MVC classes between applications on the same system. If you want the same controller in both applications, you can use CakePHP's bootstrap.php to bring these additional classes into view.

By using `App::build()` in bootstrap.php we can define additional paths where CakePHP will look for classes:

```
<?php
App::build(array(
    'Model'                     => array('/path/to/models', '/next/path/to/models'),
    'Model/Behavior'            => array('/path/to/behaviors', '/next/path/to/behaviors'),
    'Model/Datasource'          => array('/path/to/datasources', '/next/path/to/datasource
    'Model/Datasource/Database' => array('/path/to/databases', '/next/path/to/database'),
    'Model/Datasource/Session'  => array('/path/to/sessions', '/next/path/to/sessions'),
    'Controller'                => array('/path/to/controllers', '/next/path/to/controller
    'Controller/Component'      => array('/path/to/components', '/next/path/to/components')
    'Controller/Component/Auth' => array('/path/to/auths', '/next/path/to/auths'),
    'Controller/Component/Acl'  => array('/path/to/acls', '/next/path/to/acls'),
    'View'                      => array('/path/to/views', '/next/path/to/views'),
    'View/Helper'               => array('/path/to/helpers', '/next/path/to/helpers'),
    'Console'                   => array('/path/to/consoles', '/next/path/to/consoles'),
    'Console/Command'           => array('/path/to/commands', '/next/path/to/commands'),
    'Console/Command/Task'      => array('/path/to/tasks', '/next/path/to/tasks'),
    'Lib'                       => array('/path/to/libs', '/next/path/to/libs'),
    'Locale'                    => array('/path/to/locales', '/next/path/to/locales'),
    'Vendor'                    => array('/path/to/vendors', '/next/path/to/vendors'),
    'Plugin'                    => array('/path/to/plugins', '/next/path/to/plugins'),
));
```

Note: All additional path configuration should be done at the top of your application's bootstrap.php. This will ensure that the paths are available for the rest of your application.

Core Configuration

Each application in CakePHP contains a configuration file to determine CakePHP's internal behavior. `app/Config/core.php`. This file is a collection of Configure class variable definitions and constant definitions that determine how your application behaves. Before we dive into those particular variables, you'll need to be familiar with `Configure`, CakePHP's configuration registry class.

CakePHP Core Configuration

The `Configure` class is used to manage a set of core CakePHP configuration variables. These variables can be found in `app/Config/core.php`. Below is a description of each variable and how it affects your CakePHP application.

debug Changes CakePHP debugging output. 0 = Production mode. No output. 1 = Show errors and warnings. 2 = Show errors, warnings, and SQL. [SQL log is only shown when you add $this->element('sql_dump') to your view or layout.]

Error Configure the Error handler used to handle errors for your application. By default `ErrorHandler::handleError()` is used. It will display errors using `Debugger`, when debug > 0 and log errors with `CakeLog` when debug = 0.

Sub-keys:

- `handler` - callback - The callback to handle errors. You can set this to any callback type, including anonymous functions.
- `level` - int - The level of errors you are interested in capturing.
- `trace` - boolean - Include stack traces for errors in log files.

Exception Configure the Exception handler used for uncaught exceptions. By default, ErrorHandler::handleException() is used. It will display a HTML page for the exception, and while debug > 0, framework errors like Missing Controller will be displayed. When debug = 0, framework errors will be coerced into generic HTTP errors. For more information on Exception handling, see the *Exceptions* section.

App.baseUrl Un-comment this definition if you **don't** plan to use Apache's mod_rewrite with CakePHP. Don't forget to remove your .htaccess files too.

App.encoding Define what encoding your application uses. This encoding is used to generate the charset in the layout, and encode entities. It should match the encoding values specified for your database.

Routing.prefixes Un-comment this definition if you'd like to take advantage of CakePHP prefixed routes like admin. Set this variable with an array of prefix names of the routes you'd like to use. More on this later.

Cache.disable When set to true, persistent caching is disabled site-wide. This will make all read/writes to `Cache` fail.

Cache.check If set to true, enables view caching. Enabling is still needed in the controllers, but this variable enables the detection of those settings.

Session Contains an array of settings to use for session configuration. The defaults key is used to define a default preset to use for sessions, any settings declared here will override the settings of the default config.

Sub-keys

- `name` - The name of the cookie to use. Defaults to 'CAKEPHP'
- `timeout` - The number of minutes you want sessions to live for. This timeout is handled by CakePHP
- `cookieTimeout` - The number of minutes you want session cookies to live for.
- `checkAgent` - Do you want the user agent to be checked when starting sessions? You might want to set the value to false, when dealing with older versions of IE, Chrome Frame or certain web-browsing devices and AJAX
- `defaults` - The default configuration set to use as a basis for your session. There are four builtins: php, cake, cache, database.
- `handler` - Can be used to enable a custom session handler. Expects an array of callables, that can be used with *session_save_handler*. Using this option will automatically add *session.save_handler* to the ini array.
- `autoRegenerate` - Enabling this setting, turns on automatic renewal of sessions, and sessionids that change frequently. See `CakeSession::$requestCountdown`.

- `ini` - An associative array of additional ini values to set.

The built in defaults are:

- 'php' - Uses settings defined in your php.ini.
- 'cake' - Saves session files in CakePHP's /tmp directory.
- 'database' - Uses CakePHP's database sessions.
- 'cache' - Use the Cache class to save sessions.

To define a custom session handler, save it at `app/Model/Datasource/Session/<name>.php`. Make sure the class implements `CakeSessionHandlerInterface` and set Session.handler to <name>

To use database sessions, run the `app/Config/Schema/sessions.php` schema using the cake shell command: `cake schema create Sessions`

Security.salt A random string used in security hashing.

Security.cipherSeed A random numeric string (digits only) used to encrypt/decrypt strings.

Asset.timestamp Appends a timestamp which is last modified time of the particular file at the end of asset files urls (CSS, JavaScript, Image) when using proper helpers. Valid values: (bool) false - Doesn't do anything (default) (bool) true - Appends the timestamp when debug > 0 (string) 'force' - Appends the timestamp when debug >= 0

Acl.classname, Acl.database Constants used for CakePHP's Access Control List functionality. See the Access Control Lists chapter for more information.

Note: Cache configuration is also found in core.php — We'll be covering that later on, so stay tuned.

The `Configure` class can be used to read and write core configuration settings on the fly. This can be especially handy if you want to turn the debug setting on for a limited section of logic in your application, for instance.

Configuration Constants

While most configuration options are handled by Configure, there are a few constants that CakePHP uses during runtime.

constant `LOG_ERROR`

Error constant. Used for differentiating error logging and debugging. Currently PHP supports LOG_DEBUG.

Core Cache Configuration

CakePHP uses two cache configurations internally. `_cake_model_` and `_cake_core_`. `_cake_core_` is used to store file paths, and object locations. `_cake_model_` is used to store schema descriptions, and source listings for datasources. Using a fast cache storage like APC or Memcached is recommended for these configurations, as they are read on every request. By default both of these configurations expire every 10 seconds when debug is greater than 0.

As with all cached data stored in `Cache` you can clear data using `Cache::clear()`.

Configure Class

class Configure

Despite few things needing to be configured in CakePHP, it's sometimes useful to have your own configuration rules for your application. In the past you may have defined custom configuration values by defining variable or constants in some files. Doing so forces you to include that configuration file every time you needed to use those values.

CakePHP's Configure class can be used to store and retrieve application or runtime specific values. Be careful, this class allows you to store anything in it, then use it in any other part of your code: a sure temptation to break the MVC pattern CakePHP was designed for. The main goal of Configure class is to keep centralized variables that can be shared between many objects. Remember to try to live by "convention over configuration" and you won't end up breaking the MVC structure we've set in place.

This class can be called from anywhere within your application, in a static context:

```
<?php
Configure::read('debug');
```

static `Configure::`**`write`**`(`*$key*, *$value*`)`

Parameters

- **$key** (*string*) – The key to write, can use be a *dot notation* value.
- **$value** (*mixed*) – The value to store.

Use `write()` to store data in the application's configuration:

```
<?php
Configure::write('Company.name','Pizza, Inc.');
Configure::write('Company.slogan','Pizza for your body and soul');
```

Note: The *dot notation* used in the `$key` parameter can be used to organize your configuration settings into logical groups.

The above example could also be written in a single call:

```
<?php
Configure::write(
    'Company', array('name' => 'Pizza, Inc.', 'slogan' => 'Pizza for your body and sou
);
```

You can use `Configure::write('debug', $int)` to switch between debug and production modes on the fly. This is especially handy for AMF or SOAP interactions where debugging information can cause parsing problems.

static `Configure::read`(*$key = null*)

Parameters

- **$key** (*string*) – The key to read, can use be a *dot notation* value

Used to read configuration data from the application. Defaults to CakePHP's important debug value. If a key is supplied, the data is returned. Using our examples from write() above, we can read that data back:

```
<?php
Configure::read('Company.name');    //yields: 'Pizza, Inc.'
Configure::read('Company.slogan');  //yields: 'Pizza for your body and soul'

Configure::read('Company');

//yields:
array('name' => 'Pizza, Inc.', 'slogan' => 'Pizza for your body and soul');
```

If $key is left null, all values in Configure will be returned.

static `Configure::delete`(*$key*)

Parameters

- **$key** (*string*) – The key to delete, can use be a *dot notation* value

Used to delete information from the application's configuration:

```
<?php
Configure::delete('Company.name');
```

static `Configure::version`

Returns the CakePHP version for the current application.

static `Configure::config`(*$name*, *$reader*)

Parameters

- **$name** (*string*) – The name of the reader being attached.
- **$reader** (*ConfigReaderInterface*) – The reader instance being attached.

Attach a configuration reader to Configure. Attached readers can then be used to load configuration files. See *Loading configuration files* for more information on how to read configuration files.

static `Configure::configured`(*$name = null*)

Parameters

- **$name** (*string*) – The name of the reader to check, if null a list of all attached readers will be returned.

Either check that a reader with a given name is attached, or get the list of attached readers.

static `Configure::drop`(*$name*)

Drops a connected reader object.

Reading and writing configuration files

CakePHP comes with two built-in configuration file readers. `PhpReader` is able to read PHP config files, in the same format that Configure has historically read. `IniReader` is able to read ini config files. See the PHP documentation (http://php.net/parse_ini_file) for more information on the specifics of ini files. To use a core config reader, you'll need to attach it to Configure using `Configure::config()`:

```
<?php
App::uses('PhpReader', 'Configure');
// Read config files from app/Config
Configure::config('default', new PhpReader());

// Read config files from another path.
Configure::config('default', new PhpReader('/path/to/your/config/files/'));
```

You can have multiple readers attached to Configure, each reading different kinds of configuration files, or reading from different types of sources. You can interact with attached readers using a few other methods on Configure. To see check which reader aliases are attached you can use `Configure::configured()`:

```
<?php
// Get the array of aliases for attached readers.
Configure::configured();

// Check if a specific reader is attached
Configure::configured('default');
```

You can also remove attached readers. `Configure::drop('default')` would remove the default reader alias. Any future attempts to load configuration files with that reader would fail.

Loading configuration files

static `Configure::`**`load`**(*$key*, *$config = 'default'*, *$merge = true*)

Parameters

- **$key** (*string*) – The identifier of the configuration file to load.
- **$config** (*string*) – The alias of the configured reader.
- **$merge** (*boolean*) – Whether or not the contents of the read file should be merged, or overwrite the existing values.

Once you've attached a config reader to Configure you can load configuration files:

```
<?php
// Load my_file.php using the 'default' reader object.
Configure::load('my_file', 'default');
```

Loaded configuration files merge their data with the existing runtime configuration in Configure. This allows you to overwrite and add new values into the existing runtime configuration. By setting `$merge` to true, values will not ever overwrite the existing configuration.

Creating or modifying configuration files

static `Configure::`**`dump`**(*$key*, *$config = 'default'*, *$keys = array()*)

Parameters

- **$key** (*string*) – The name of the file/stored configuration to be created.
- **$config** (*string*) – The name of the reader to store the data with.
- **$keys** (*array*) – The list of top-level keys to save. Defaults to all keys.

Dumps all or some of the data in Configure into a file or storage system supported by a config reader. The serialization format is decided by the config reader attached as $config. For example, if the 'default' adapter is a `PhpReader`, the generated file will be a PHP configuration file loadable by the `PhpReader`

Given that the 'default' reader is an instance of PhpReader. Save all data in Configure to the file *my_config.php*:

```
<?php
Configure::dump('my_config.php', 'default');
```

Save only the error handling configuration:

```
<?php
Configure::dump('error.php', 'default', array('Error', 'Exception'));
```

`Configure::dump()` can be used to either modify or overwrite configuration files that are readable with `Configure::load()` New in version 2.2: `Configure::dump()` was added in 2.2.

Storing runtime configuration

static `Configure::`**`store`**(*$name*, *$cacheConfig = 'default'*, *$data = null*)

Parameters

- **$name** (*string*) – The storage key for the cache file.
- **$cacheConfig** (*string*) – The name of the cache configuration to store the configuration data with.
- **$data** (*mixed*) – Either the data to store, or leave null to store all data in Configure.

You can also store runtime configuration values for use in a future request. Since configure only remembers values for the current request, you will need to store any modified configuration information if you want to use it in subsequent requests:

```
<?php
// Store the current configuration in the 'user_1234' key in the 'default' cache.
Configure::store('user_1234', 'default');
```

Stored configuration data is persisted in the `Cache` class. This allows you to store Configuration information in any storage engine that `Cache` can talk to.

Restoring runtime configuration

static `Configure::`**`restore`**`(`*$name*, *$cacheConfig = 'default'*`)`

Parameters

- **$name** (*string*) – The storage key to load.
- **$cacheConfig** (*string*) – The cache configuration to load the data from.

Once you've stored runtime configuration, you'll probably need to restore it so you can access it again. `Configure::restore()` does exactly that:

```
<?php
// restore runtime configuration from the cache.
Configure::restore('user_1234', 'default');
```

When restoring configuration information it's important to restore it with the same key, and cache configuration as was used to store it. Restored information is merged on top of the existing runtime configuration.

Creating your own Configuration readers

Since configuration readers are an extensible part of CakePHP, you can create configuration readers in your application and plugins. Configuration readers need to implement the `ConfigReaderInterface`. This interface defines a read method, as the only required method. If you really like XML files, you could create a simple Xml config reader for you application:

```
<?php
// in app/Lib/Configure/XmlReader.php
App::uses('Xml', 'Utility');
class XmlReader implements ConfigReaderInterface {
    public function __construct($path = null) {
        if (!$path) {
            $path = APP . 'Config' . DS;
        }
        $this->_path = $path;
    }

    public function read($key) {
        $xml = Xml::build($this->_path . $key . '.xml');
        return Xml::toArray($xml);
    }
}
```

In your `app/Config/bootstrap.php` you could attach this reader and use it:

```
<?php
App::uses('XmlReader', 'Configure');
Configure::config('xml', new XmlReader());
...

Configure::load('my_xml');
```

The `read()` method of a config reader, must return an array of the configuration information that the resource named `$key` contains.

interface `ConfigReaderInterface`

Defines the interface used by classes that read configuration data and store it in `Configure`

`ConfigReaderInterface::`**`read`**`(`*$key*`)`

Parameters

- **$key** (*string*) – The key name or identifier to load.

This method should load/parse the configuration data identified by `$key` and return an array of data in the file.

exception `ConfigureException`

Thrown when errors occur when loading/storing/restoring configuration data. `ConfigReaderInterface` implementations should throw this error when they encounter an error.

Built-in Configuration readers

class `PhpReader`

Allows you to read configuration files that are stored as plain PHP files. You can read either files from your `app/Config` or from plugin configs directories by using *plugin syntax*. Files **must** contain a `$config` variable. An example configuration file would look like:

```
<?php
$config = array(
    'debug' => 0,
    'Security' => array(
        'salt' => 'its-secret'
    ),
    'Exception' => array(
        'handler' => 'ErrorHandler::handleException',
        'renderer' => 'ExceptionRenderer',
        'log' => true
    )
);
```

Files without `$config` will cause an `ConfigureException`

Load your custom configuration file by inserting the following in app/Config/bootstrap.php:

Configure::load('customConfig');

class `IniReader`

Allows you to read configuration files that are stored as plain .ini files. The ini files must be compatible with php's `parse_ini_file` function, and benefit from the following improvements

- dot separated values are expanded into arrays.
- boolean-ish values like 'on' and 'off' are converted to booleans.

An example ini file would look like:

```
    debug = 0

    Security.salt = its-secret

    [Exception]
    handler = ErrorHandler::handleException
    renderer = ExceptionRenderer
    log = true
```

The above ini file, would result in the same end configuration data as the PHP example above. Array structures can be created either through dot separated values, or sections. Sections can contain dot separated keys for deeper nesting.

Inflection Configuration

Cake's naming conventions can be really nice - you can name your database table big_boxes, your model BigBox, your controller BigBoxesController, and everything just works together automatically. The way CakePHP knows how to tie things together is by *inflecting* the words between their singular and plural forms.

There are occasions (especially for our non-English speaking friends) where you may run into situations where CakePHP's inflector (the class that pluralizes, singularizes, camelCases, and under_scores) might not work as you'd like. If CakePHP won't recognize your Foci or Fish, you can tell CakePHP about your special cases.

Loading custom inflections

You can use `Inflector::rules()` in the file `app/Config/bootstrap.php` to load custom inflections:

```
<?php
Inflector::rules('singular', array(
    'rules' => array('/^(bil)er$/i' => '\1', '/^(inflec|contribu)tors$/i' => '\1ta'),
    'uninflected' => array('singulars'),
    'irregular' => array('spins' => 'spinor')
));
```

or:

```
<?php
Inflector::rules('plural', array('irregular' => array('phylum' => 'phyla')));
```

Will merge the supplied rules into the inflection sets defined in lib/Cake/Utility/Inflector.php, with the added rules taking precedence over the core rules.

Bootstrapping CakePHP

If you have any additional configuration needs, use CakePHP's bootstrap file, found in app/Config/bootstrap.php. This file is executed just after CakePHP's core bootstrapping.

This file is ideal for a number of common bootstrapping tasks:

- Defining convenience functions.
- Registering global constants.
- Defining additional model, view, and controller paths.
- Creating cache configurations.
- Configuring inflections.
- Loading configuration files.

Be careful to maintain the MVC software design pattern when you add things to the bootstrap file: it might be tempting to place formatting functions there in order to use them in your controllers.

Resist the urge. You'll be glad you did later on down the line.

You might also consider placing things in the `AppController` class. This class is a parent class to all of the controllers in your application. `AppController` is a handy place to use controller callbacks and define methods to be used by all of your controllers.

Routing

Routing is a feature that maps URLs to controller actions. It was added to CakePHP to make pretty URLs more configurable and flexible. Using Apache's mod_rewrite is not required for using routes, but it will make your address bar look much more tidy.

Routing in CakePHP also encompasses the idea of reverse routing, where an array of parameters can be reversed into a string url. By using reverse routing, you can easily re-factor your applications url structure without having to update all your code.

Routes Configuration

Routes in an application are configured in `app/Config/routes.php`. This file is included by the `Dispatcher` when handling routes and allows you to define application specific routes you want used. Routes declared in this file are processed top to bottom when incoming requests are matched. This means that the order you place routes can affect how routes are parsed. It's generally a good idea to place most frequently visited routes at the top of the routes file if possible. This will save having to check a number of routes that won't match on each request.

Routes are parsed and matched in the order they are connected in. If you define two similar routes, the first defined route will have higher priority over the one defined latter. After connecting routes you can manipulate the order of routes using `Router::promote()`.

CakePHP also comes with a few default routes to get you started. These can be disabled later on once you are sure you don't need them. See *Disabling the default routes* on how to disable the default routing.

Default Routing

Before you learn about configuring your own routes, you should know that CakePHP comes configured with a default set of routes. CakePHP's default routing will get you pretty far in any application. You can access an action directly via the URL by putting its name in the request. You can also pass parameters to your controller actions using the URL.:

```
URL pattern default routes:
http://example.com/controller/action/param1/param2/param3
```

The URL /posts/view maps to the view() action of the PostsController, and /products/view_clearance maps to the view_clearance() action of the ProductsController. If no action is specified in the URL, the index() method is assumed.

The default routing setup also allows you to pass parameters to your actions using the URL. A request for /posts/view/25 would be equivalent to calling view(25) on the PostsController, for example. The default routing also provides routes for plugins, and prefix routes should you choose to use those features.

The built-in routes live in `Cake/Config/routes.php`. You can disable the default routing by removing them from your application's *routes.php* file.

Connecting Routes

Defining your own routes allows you to define how your application will respond to a given URL. Define your own routes in the `app/Config/routes.php` file using the `Router::connect()` method.

The `connect()` method takes up to three parameters: the URL you wish to match, the default values for your route elements, and regular expression rules to help the router match elements in the URL.

The basic format for a route definition is:

```
<?php
Router::connect(
    'URL',
    array('default' => 'defaultValue'),
    array('option' => 'matchingRegex')
);
```

The first parameter is used to tell the router what sort of URL you're trying to control. The URL is a normal slash delimited string, but can also contain a wildcard (*) or *Route elements*. Using a wildcard tells the router that you are willing to accept any additional arguments supplied. Routes without a * only match the exact template pattern supplied.

Once you've specified a URL, you use the last two parameters of `connect()` to tell CakePHP what to do with a request once it has been matched. The second parameter is an associative array. The keys of the array should be named after the route elements in the URL, or the default elements: `:controller`, `:action`, and `:plugin`. The values in the array are the default values for those keys. Let's look at some basic examples before we start using the third parameter of connect():

```
<?php
Router::connect(
    '/pages/*',
    array('controller' => 'pages', 'action' => 'display')
);
```

This route is found in the routes.php file distributed with CakePHP. This route matches any URL starting with `/pages/` and hands it to the `display()` action of the `PagesController();` The request /pages/products would be mapped to `PagesController->display('products')`.

In addition to the greedy star `/*` there is also the `/**` trailing star syntax. Using a trailing double star, will capture the remainder of a URL as a single passed argument. This is useful when you want to use an argument that included a `/` in it:

```
<?php
Router::connect(
    '/pages/**',
    array('controller' => 'pages', 'action' => 'show')
);
```

The incoming URL of `/pages/the-example-/-and-proof` would result in a single passed argument of `the-example-/-and-proof`. New in version 2.1. You can use the second parameter of `Router::connect()` to provide any routing parameters that are composed of the default values of the route:

```
<?php
Router::connect(
    '/government',
    array('controller' => 'products', 'action' => 'display', 5)
);
```

This example shows how you can use the second parameter of `connect()` to define default parameters. If you built a site that features products for different categories of customers, you might consider creating a route. This allows you link to `/government` rather than `/pages/display/5`.

Note: Although you can connect alternate routes, the default routes will continue to work. This could create situations, where content could end up with 2 urls. See *Disabling the default routes* to disable default routes, and only provide the urls you define.

Another common use for the Router is to define an "alias" for a controller. Let's say that instead of accessing our regular URL at `/users/some_action/5`, we'd like to be able to access it by `/cooks/some_action/5`. The following route easily takes care of that:

```
<?php
Router::connect(
    '/cooks/:action/*', array('controller' => 'users')
);
```

This is telling the Router that any url beginning with `/cooks/` should be sent to the users controller. The action called will depend on the value of the `:action` parameter. By using *Route elements*, you can create variable routes, that accept user input or variables. The above route also uses the greedy star. The greedy star indicates to `Router` that this route should accept any additional positional arguments given. These arguments will be made available in the *Passed arguments* array.

When generating urls, routes are used too. Using `array('controller' => 'users', 'action' => 'some_action', 5)` as a url will output /cooks/some_action/5 if the above route is the first match found.

If you are planning to use custom named arguments with your route, you have to make the router aware of it using the `Router::connectNamed()` function. So if you want the above route to match urls like `/cooks/some_action/type:chef` we do:

```
<?php
Router::connectNamed(array('type'));
Router::connect(
    '/cooks/:action/*', array('controller' => 'users')
);
```

Route elements

You can specify your own route elements and doing so gives you the power to define places in the URL where parameters for controller actions should lie. When a request is made, the values for these route elements are found in `$this->request->params` on the controller. This is different than how named parameters are handled, so note the difference: named parameters (/controller/action/name:value) are found in `$this->request->params['named']`, whereas custom route element data is found in `$this->request->params`. When you define a custom route element, you can optionally specify a regular expression - this tells CakePHP how to know if the URL is correctly formed or not. If you choose to not provide a regular expression, any non `/` will be treated as part of the parameter:

```
<?php
Router::connect(
    '/:controller/:id',
    array('action' => 'view'),
    array('id' => '[0-9]+')
);
```

This simple example illustrates how to create a quick way to view models from any controller by crafting a URL that looks like `/controllername/:id`. The URL provided to connect() specifies two route elements: `:controller` and `:id`. The `:controller` element is a CakePHP default route element, so the router knows how to match and identify controller names in URLs. The `:id` element is a custom route element, and must be further clarified by specifying a matching regular expression in the third parameter of connect().

Note: Patterns used for route elements must not contain any capturing groups. If they do, Router will not function correctly.

Once this route has been defined, requesting `/apples/5` is the same as requesting `/apples/view/5`. Both would call the view() method of the ApplesController. Inside the view() method, you would need to access the passed ID at `$this->request->params['id']`.

If you have a single controller in your application and you do not want the controller name to appear in the url, you can map all urls to actions in your controller. For example, to map all urls to actions of the `home` controller, e.g have urls like `/demo` instead of `/home/demo`, you can do the following:

```php
<?php
Router::connect('/:action', array('controller' => 'home'));
```

One more example, and you'll be a routing pro:

```php
<?php
Router::connect(
    '/:controller/:year/:month/:day',
    array('action' => 'index', 'day' => null),
    array(
        'year' => '[12][0-9]{3}',
        'month' => '0[1-9]|1[012]',
        'day' => '0[1-9]|[12][0-9]|3[01]'
    )
);
```

This is rather involved, but shows how powerful routes can really become. The URL supplied has four route elements. The first is familiar to us: it's a default route element that tells CakePHP to expect a controller name.

Next, we specify some default values. Regardless of the controller, we want the index() action to be called. We set the day parameter (the fourth element in the URL) to null to flag it as being optional.

Finally, we specify some regular expressions that will match years, months and days in numerical form. Note that parenthesis (grouping) are not supported in the regular expressions. You can still specify alternates, as above, but not grouped with parenthesis.

Once defined, this route will match `/articles/2007/02/01`, `/posts/2004/11/16`, and `/products/2001/05` (as defined, the day parameter is optional as it has a default), handing the requests to the index() actions of their respective controllers, with the date parameters in `$this->request->params`.

There are several route elements that have special meaning in CakePHP, and should not be used unless you want the special meaning

- `controller` Used to name the controller for a route.
- `action` Used to name the controller action for a route.
- `plugin` Used to name the plugin a controller is located in.
- `prefix` Used for *Prefix Routing*
- `ext` Used for *File extensions* routing.

Passing parameters to action

When connecting routes using *Route elements* you may want to have routed elements be passed arguments instead. By using the 3rd argument of `Router::connect()` you can define which route elements should also be made available as passed arguments:

```php
<?php
// SomeController.php
public function view($articleId = null, $slug = null) {
    // some code here...
}

// routes.php
Router::connect(
    '/blog/:id-:slug', // E.g. /blog/3-CakePHP_Rocks
    array('controller' => 'blog', 'action' => 'view'),
    array(
        // order matters since this will simply map ":id" to $articleId in your action
        'pass' => array('id', 'slug'),
        'id' => '[0-9]+'
    )
);
```

And now, thanks to the reverse routing capabilities, you can pass in the url array like below and Cake will know how to form the URL as defined in the routes:

```
// view.ctp
// this will return a link to /blog/3-CakePHP_Rocks
<?php
echo $this->Html->link('CakePHP Rocks', array(
    'controller' => 'blog',
    'action' => 'view',
    'id' => 3,
    'slug' => 'CakePHP_Rocks'
));
```

Per-route named parameters

While you can control named parameters on a global scale using `Router::connectNamed()` you can also control named parameter behavior at the route level using the 3rd argument of `Router::connect()`:

```
<?php
Router::connect(
    '/:controller/:action/*',
    array(),
    array(
        'named' => array(
            'wibble',
            'fish' => array('action' => 'index'),
            'fizz' => array('controller' => array('comments', 'other')),
            'buzz' => 'val-[\d]+'
        )
    )
);
```

The above route definition uses the `named` key to define how several named parameters should be treated. Lets go through each of the various rules one-by-one:

- 'wibble' has no additional information. This means it will always parse if found in a url matching this route.

- 'fish' has an array of conditions, containing the 'action' key. This means that fish will only be parsed as a named parameter if the action is also index.
- 'fizz' also has an array of conditions. However, it contains two controllers, this means that 'fizz' will only be parsed if the controller matches one of the names in the array.
- 'buzz' has a string condition. String conditions are treated as regular expression fragments. Only values for buzz matching the pattern will be parsed.

If a named parameter is used and it does not match the provided criteria, it will be treated as a passed argument instead of a named parameter.

Prefix Routing

Many applications require an administration section where privileged users can make changes. This is often done through a special URL such as `/admin/users/edit/5`. In CakePHP, prefix routing can be enabled from within the core configuration file by setting the prefixes with Routing.prefixes. Note that prefixes, although related to the router, are to be configured in `app/Config/core.php`:

```
<?php
Configure::write('Routing.prefixes', array('admin'));
```

In your controller, any action with an `admin_` prefix will be called. Using our users example, accessing the url `/admin/users/edit/5` would call the method `admin_edit` of our `UsersController` passing 5 as the first parameter. The view file used would be `app/View/Users/admin\_edit.ctp`

You can map the url /admin to your `admin_index` action of pages controller using following route:

```
<?php
Router::connect('/admin', array('controller' => 'pages', 'action' => 'index', 'admin' => tr
```

You can configure the Router to use multiple prefixes too. By adding additional values to `Routing.prefixes`. If you set:

```
<?php
Configure::write('Routing.prefixes', array('admin', 'manager'));
```

Cake will automatically generate routes for both the admin and manager prefixes. Each configured prefix will have the following routes generated for it:

```
<?php
Router::connect("/{$prefix}/:plugin/:controller", array('action' => 'index', 'prefix' => $p
Router::connect("/{$prefix}/:plugin/:controller/:action/*", array('prefix' => $prefix, $pre
Router::connect("/{$prefix}/:controller", array('action' => 'index', 'prefix' => $prefix, $
Router::connect("/{$prefix}/:controller/:action/*", array('prefix' => $prefix, $prefix => t
```

Much like admin routing all prefix actions should be prefixed with the prefix name. So `/manager/posts/add` would map to `PostsController::manager_add()`.

Additionally, the current prefix will be available from the controller methods through `$this->request->prefix`

When using prefix routes it's important to remember, using the HTML helper to build your links will help maintain the prefix calls. Here's how to build this link using the HTML helper:

```
<?php
// Go into a prefixed route.
echo $html->link('Manage posts', array('manager' => true, 'controller' => 'posts', 'action'

// leave a prefix
echo $html->link('View Post', array('manager' => false, 'controller' => 'posts', 'action' =
```

Plugin routing

Plugin routing uses the **plugin** key. You can create links that point to a plugin, but adding the plugin key to your url array:

```
<?php
echo $html->link('New todo', array('plugin' => 'todo', 'controller' => 'todo_items', 'actio
```

Conversely if the active request is a plugin request and you want to create a link that has no plugin you can do the following:

```
<?php
echo $html->link('New todo', array('plugin' => null, 'controller' => 'users', 'action' => '
```

By setting `plugin => null` you tell the Router that you want to create a link that is not part of a plugin.

File extensions

To handle different file extensions with your routes, you need one extra line in your routes config file:

```
<?php
Router::parseExtensions('html', 'rss');
```

This will tell the router to remove any matching file extensions, and then parse what remains.

If you want to create a URL such as /page/title-of-page.html you would create your route as illustrated below:

```
<?php
Router::connect(
    '/page/:title',
    array('controller' => 'pages', 'action' => 'view'),
    array(
        'pass' => array('title')
    )
);
```

Then to create links which map back to the routes simply use:

```
<?php
$html->link(
    'Link title',
    array('controller' => 'pages', 'action' => 'view', 'title' => 'super-article', 'ext' =>
);
```

File extensions are used by `RequestHandlerComponent` to do automatic view switching based on content types. See the RequestHandlerComponent for more information.

Passed arguments

Passed arguments are additional arguments or path segments that are used when making a request. They are often used to pass parameters to your controller methods.:

```
http://localhost/calendars/view/recent/mark
```

In the above example, both `recent` and `mark` are passed arguments to `CalendarsController::view()`. Passed arguments are given to your controllers in three ways. First as arguments to the action method called, and secondly they are available in `$this->request->params['pass']` as a numerically indexed array. Lastly there is `$this->passedArgs` available in the same way as the second one. When using custom routes you can force particular parameters to go into the passed arguments as well.

If you were to visit the previously mentioned url, and you had a controller action that looked like:

```
<?php
CalendarsController extends AppController {
    public function view($arg1, $arg2) {
        debug(func_get_args());
    }
}
```

You would get the following output:

```
Array
(
    [0] => recent
    [1] => mark
)
```

This same data is also available at `$this->request->params['pass']` and `$this->passedArgs` in your controllers, views, and helpers. The values in the pass array are numerically indexed based on the order they appear in the called url.

```
<?php
debug($this->request->params['pass']);
debug($this->passedArgs);
```

Either of the above would output:

```
Array
(
    [0] => recent
    [1] => mark
)
```

Note: $this->passedArgs may also contain named parameters as a named array mixed with Passed arguments.

When generating urls, using a *routing array* you add passed arguments as values without string keys in the array:

```
<?php
array('controller' => 'posts', 'action' => 'view', 5)
```

Since `5` has a numeric key, it is treated as a passed argument.

Named parameters

You can name parameters and send their values using the URL. A request for `/posts/view/title:first/category:general` would result in a call to the view() action of the PostsController. In that action, you'd find the values of the title and category parameters inside `$this->params['named']`. They are also available inside `$this->passedArgs`. In both cases you can access named parameters using their name as an index. If named parameters are omitted, they will not be set.

Note: What is parsed as a named parameter is controlled by `Router::connectNamed()`. If your named parameters are not reverse routing, or parsing correctly, you will need to inform `Router` about them.

Some summarizing examples for default routes might prove helpful:

```
URL to controller action mapping using default routes:

URL: /monkeys/jump
Mapping: MonkeysController->jump();

URL: /products
Mapping: ProductsController->index();

URL: /tasks/view/45
Mapping: TasksController->view(45);

URL: /donations/view/recent/2001
Mapping: DonationsController->view('recent', '2001');

URL: /contents/view/chapter:models/section:associations
Mapping: ContentsController->view();
$this->passedArgs['chapter'] = 'models';
$this->passedArgs['section'] = 'associations';
$this->params['named']['chapter'] = 'models';
$this->params['named']['section'] = 'associations';
```

When making custom routes, a common pitfall is that using named parameters will break your custom routes. In order to solve this you should inform the Router about which parameters are intended to be named parameters. Without this knowledge the Router is unable to determine whether named parameters are intended to actually be named parameters or routed parameters, and defaults to assuming you intended them to be routed parameters. To connect named parameters in the router use `Router::connectNamed()`:

```
<?php
Router::connectNamed(array('chapter', 'section'));
```

Will ensure that your chapter and section parameters reverse route correctly.

When generating urls, using a *routing array* you add named parameters as values with string keys matching the name:

```
<?php
array('controller' => 'posts', 'action' => 'view', 'chapter' => 'association')
```

Since 'chapter' doesn't match any defined route elements, it's treated as a named parameter.

Note: Both named parameters and route elements share the same key-space. It's best to avoid re-using a key for both a route element and a named parameter.

Named parameters also support using arrays to generate and parse urls. The syntax works very similar to the array syntax used for GET parameters. When generating urls you can use the following syntax:

```
<?php
$url = Router::url(array(
    'controller' => 'posts',
    'action' => 'index',
    'filter' => array(
        'published' => 1
        'frontpage' => 1
    )
));
```

The above would generate the url `/posts/index/filter[published]:1/filter[frontpage]:1`. The parameters are then parsed and stored in your controller's passedArgs variable as an array, just as you sent them to `Router::url`:

```
<?php
$this->passedArgs['filter'] = array(
    'published' => 1
    'frontpage' => 1
);
```

Arrays can be deeply nested as well, allowing you even more flexibility in passing arguments:

```
<?php
$url = Router::url(array(
    'controller' => 'posts',
    'action' => 'search',
    'models' => array(
        'post' => array(
            'order' => 'asc',
            'filter' => array(
                'published' => 1
            )
        ),
        'comment' => array(
            'order' => 'desc',
            'filter' => array(
                'spam' => 0
            )
        ),
    ),
    'users' => array(1, 2, 3)
));
```

You would end up with a pretty long url like this (wrapped for easy reading):

```
posts/search
  /models[post][order]:asc/models[post][filter][published]:1
  /models[comment][order]:desc/models[comment][filter][spam]:0
  /users[]:1/users[]:2/users[]:3
```

And the resulting array that would be passed to the controller would match that which you passed to the router:

```
<?php
$this->passedArgs['models'] = array(
    'post' => array(
        'order' => 'asc',
        'filter' => array(
            'published' => 1
        )
    ),
    'comment' => array(
        'order' => 'desc',
        'filter' => array(
            'spam' => 0
        )
    ),
);
```

Controlling named parameters

You can control named parameter configuration at the per-route-level or control them globally. Global control is done through `Router::connectNamed()` The following gives some examples of how you can control named parameter parsing with connectNamed().

Do not parse any named parameters:

```
<?php
Router::connectNamed(false);
```

Parse only default parameters used for CakePHP's pagination:

```
<?php
Router::connectNamed(false, array('default' => true));
```

Parse only the page parameter if its value is a number:

```
<?php
Router::connectNamed(array('page' => '[\d]+'), array('default' => false, 'greedy' => false
```

Parse only the page parameter no matter what:

```
<?php
Router::connectNamed(array('page'), array('default' => false, 'greedy' => false));
```

Parse only the page parameter if the current action is 'index':

```
<?php
Router::connectNamed(
    array('page' => array('action' => 'index')),
    array('default' => false, 'greedy' => false)
);
```

Parse only the page parameter if the current action is 'index' and the controller is 'pages':

```
<?php
Router::connectNamed(
    array('page' => array('action' => 'index', 'controller' => 'pages')),
    array('default' => false, 'greedy' => false)
);
```

connectNamed() supports a number of options:

- `greedy` Setting this to true will make Router parse all named params. Setting it to false will parse only the connected named params.
- `default` Set this to true to merge in the default set of named parameters.
- `reset` Set to true to clear existing rules and start fresh.
- `separator` Change the string used to separate the key & value in a named parameter. Defaults to *:*

Reverse routing

Reverse routing is a feature in CakePHP that is used to allow you to easily change your url structure without having to modify all your code. By using *routing arrays* to define your urls, you can later configure routes and the generated urls will automatically update.

If you create urls using strings like:

```
<?php
$this->Html->link('View', '/posts/view/' + $id);
```

And then later decide that `/posts` should really be called 'articles' instead, you would have to go through your entire application renaming urls. However, if you defined your link like:

```
<?php
$this->Html->link(
    'View',
    array('controller' => 'posts', 'action' => 'view', $id)
);
```

Then when you decided to change your urls, you could do so by defining a route. This would change both the incoming URL mapping, as well as the generated urls.

When using array urls, you can define both query string parameters and document fragments using special keys:

```
<?php
Router::url(array(
    'controller' => 'posts',
    'action' => 'index',
    '?' => array('page' => 1),
    '#' => 'top'
));

// will generate a url like.
/posts/index?page=1#top
```

Redirect routing

Redirect routing allows you to issue HTTP status 30x redirects for incoming routes, and point them at different urls. This is useful when you want to inform client applications that a resource has moved and you don't want to expose two urls for the same content

Redirection routes are different from normal routes as they perform an actual header redirection if a match is found. The redirection can occur to a destination within your application or an outside location:

```
<?php
Router::redirect(
    '/home/*',
    array('controller' => 'posts', 'action' => 'view'),
    array('persist' => true)
);
```

Redirects `/home/*` to `/posts/view` and passes the parameters to `/posts/view`. Using an array as the redirect destination allows you to use other routes to define where a url string should be redirected to. You can redirect to external locations using string urls as the destination:

```
<?php
Router::redirect('/posts/*', 'http://google.com', array('status' => 302));
```

This would redirect `/posts/*` to `http://google.com` with a HTTP status of 302.

Disabling the default routes

If you have fully customized all your routes, and want to avoid any possible duplicate content penalties from search engines, you can remove the default routes that CakePHP offers by deleting them from your application's routes.php file.

This will cause CakePHP to serve errors, when users try to visit urls that would normally be provided by CakePHP but have not been connected explicitly.

Custom Route classes

Custom route classes allow you to extend and change how individual routes parse requests and handle reverse routing. A route class should extend `CakeRoute` and implement one or both of `match()` and/or `parse()`. `parse()` is used to parse requests and `match()` is used to handle reverse routing.

You can use a custom route class when making a route by using the `routeClass` option, and loading the file containing your route before trying to use it:

```php
<?php
Router::connect(
     '/:slug',
     array('controller' => 'posts', 'action' => 'view'),
     array('routeClass' => 'SlugRoute')
);
```

This route would create an instance of `SlugRoute` and allow you to implement custom parameter handling.

Router API

class Router

Router manages generation of outgoing urls, and parsing of incoming request uri's into parameter sets that CakePHP can dispatch.

static `Router::`**`connect`**(*$route*, *$defaults = array()*, *$options = array()*)

Parameters

- **$route** (*string*) – A string describing the template of the route
- **$defaults** (*array*) – An array describing the default route parameters. These parameters will be used by default and can supply routing parameters that are not dynamic.
- **$options** (*array*) – An array matching the named elements in the route to regular expressions which that element should match. Also contains additional parameters such as which routed parameters should be shifted into the passed arguments, supplying patterns for routing parameters and supplying the name of a custom routing class.

Routes are a way of connecting request urls to objects in your application. At their core routes are a set or regular expressions that are used to match requests to destinations.

Examples:

```php
<?php
Router::connect('/:controller/:action/*');
```

The first parameter will be used as a controller name while the second is used as the action name. The '/*' syntax makes this route greedy in that it will match requests like */posts/index* as well as requests like `/posts/edit/1/foo/bar` .:

```
<?php
Router::connect('/home-page', array('controller' => 'pages', 'action' => 'display', 'h
```

The above shows the use of route parameter defaults. And providing routing parameters for a static route.:

```
<?php
Router::connect(
    '/:lang/:controller/:action/:id',
    array(),
    array('id' => '[0-9]+', 'lang' => '[a-z]{3}')
);
```

Shows connecting a route with custom route parameters as well as providing patterns for those parameters. Patterns for routing parameters do not need capturing groups, as one will be added for each route params.

$options offers three 'special' keys. `pass`, `persist` and `routeClass` have special meaning in the $options array.

- `pass` is used to define which of the routed parameters should be shifted into the pass array. Adding a parameter to pass will remove it from the regular route array. Ex. `'pass' => array('slug')`
- `persist` is used to define which route parameters should be automatically included when generating new urls. You can override persistent parameters by redefining them in a url or remove them by setting the parameter to `false`. Ex. `'persist' => array('lang')`
- `routeClass` is used to extend and change how individual routes parse requests and handle reverse routing, via a custom routing class. Ex. `'routeClass' => 'SlugRoute'`
- `named` is used to configure named parameters at the route level. This key uses the same options as `Router::connectNamed()`

static `Router::`**`redirect`**(*$route*, *$url*, *$options = array()*)

Parameters

- **$route** (*string*) – A route template that dictates which urls should be redirected.
- **$url** (*mixed*) – Either a *routing array* or a string url for the destination of the redirect.
- **$options** (*array*) – An array of options for the redirect.

Connects a new redirection Route in the router. See *Redirect routing* for more information.

static `Router::`**`connectNamed`**(*$named*, *$options = array()*)

Parameters

- **$named** (*array*) – A list of named parameters. Key value pairs are accepted where values are either regex strings to match, or arrays.
- **$options** (*array*) – Allows control of all settings: separator, greedy, reset, default

Specifies what named parameters CakePHP should be parsing out of incoming urls. By default CakePHP will parse every named parameter out of incoming URLs. See *Controlling named parameters* for more information.

static `Router::`**`promote`**(*$which = null*)

Parameters

- **$which** (*integer*) – A zero-based array index representing the route to move. For example, if 3 routes have been added, the last route would be 2.

Promote a route (by default, the last one added) to the beginning of the list.

static `Router::`**`url`**(*$url = null*, *$full = false*)

Parameters

- **$url** (*mixed*) – Cake-relative URL, like "/products/edit/92" or "/presidents/elect/4" or a *routing array*
- **$full** (*mixed*) – If (bool) true, the full base URL will be prepended to the result. If an array accepts the following keys
  - escape - used when making urls embedded in html escapes query string '&'
  - full - if true the full base URL will be prepended.

Generate a URL for the specified action. Returns an URL pointing to a combination of controller and action. $url can be:

- Empty - the method will find the address to the actual controller/action.
- '/' - the method will find the base URL of application.
- A combination of controller/action - the method will find the url for it.

There are a few 'special' parameters that can change the final URL string that is generated:

- `base` - Set to false to remove the base path from the generated URL. If your application is not in the root directory, this can be used to generate URLs that are 'cake relative'. Cake relative URLs are required when using requestAction.
- `?` - Takes an array of query string parameters
- `#` - Allows you to set URL hash fragments.
- `full_base` - If true the `FULL_BASE_URL` constant will be prepended to generated URLs.

static `Router::`**`mapResources`**(*$controller*, *$options = array()*)

Creates REST resource routes for the given controller(s). See the *REST* section for more information.

static `Router::`**`parseExtensions`**(*$types*)

Used in routes.php to declare which *File extensions* your application supports. By providing no arguments, all file extensions will be supported.

static `Router::`**`setExtensions`**(*$extensions*, *$merge = true*)

New in version 2.2. Set or add valid extensions. To have the extensions parsed, you are still required to call `Router::parseExtensions()`.

static `Router::`**`defaultRouteClass`**`(`*$classname*`)`

New in version 2.1. Set the default route to be used when connecting routes in the future.

class **`CakeRoute`**

The base class for custom routes to be based on.

`CakeRoute::`**`parse`**`(`*$url*`)`

Parameters

- **$url** (*string*) – The string url to parse.

Parses an incoming url, and generates an array of request parameters that Dispatcher can act upon. Extending this method allows you to customize how incoming URLs are converted into an array. Return `false` from URL to indicate a match failure.

`CakeRoute::`**`match`**`(`*$url*`)`

Parameters

- **$url** (*array*) – The routing array to convert into a string URL.

Attempt to match a URL array. If the URL matches the route parameters and settings, then return a generated string URL. If the URL doesn't match the route parameters, false will be returned. This method handles the reverse routing or conversion of URL arrays into string URLs.

`CakeRoute::`**`compile`**`()`

Force a route to compile its regular expression.

Sessions

CakePHP provides a wrapper and suite of utility features on top of PHP's native `session` extension. Sessions allow you to identify unique users across the requests and store persistent data for specific users. Unlike Cookies, session data is not available on the client side. Usage of the `$_SESSION` is generally avoided in CakePHP, and instead usage of the Session classes is preferred.

Session Configuration

Session configuration is stored in `Configure`, and the session classes will retrieve it from there as needed. Session configuration is stored under the top level `Session` key, and a number of options are available:

- `Session.cookie` - Change the name of the session cookie.
- `Session.timeout` - The number of *minutes* you want sessions to last.
- `Session.cookieTimeout` - The number of *minutes* you want sessions to last. If this is undefined, the value from `Session.timeout` will be used.
- `Session.checkAgent` - Should the user agent be checked, on each request. If the useragent does not match the session will be destroyed.
- `Session.autoRegenerate` - Enabling this setting, turns on automatic renewal of sessions, and sessionids that change frequently. Enabling this value will use the session's `Config.countdown`

value to keep track of requests. Once the countdown reaches 0, the session id will be regenerated. This is a good option to use for applications that need frequently changing session ids for security reasons. You can control the number of requests needed to regenerate the session by modifying `CakeSession::$requestCountdown`.

- `Session.defaults` - Allows you to use one the built-in default session configurations as a base for your session configuration.
- `Session.handler` - Allows you to define a custom session handler. The core database and cache session handlers use this. This option replaces `Session.save` in previous versions. See below for additional information on Session handlers.
- `Session.ini` - Allows you to set additional session ini settings for your config. This combined with `Session.handler` replace the custom session handling features of previous versions

CakePHP's defaults to setting `session.cookie_secure` to true, when your application is on an SSL protocol. If your application serves from both SSL and non-SSL protocols, then you might have problems with sessions being lost. If you need access to the session on both SSL and non-SSL domains you will want to disable this:

```php
<?php
Configure::write('Session', array(
    'defaults' => 'php',
    'ini' => array(
        'session.cookie_secure' => false
    )
));
```

Session cookie paths default to `/` in 2.0, to change this you can use the `session.cookie_path` ini flag to the directory path of your application:

```php
<?php
Configure::write('Session', array(
    'defaults' => 'php',
    'ini' => array(
        'session.cookie_path' => '/app/dir'
    )
));
```

Built-in Session handlers & configuration

CakePHP comes with several built in session configurations. You can either use these as the basis for your session configuration, or you can create a fully custom solution. To use defaults, simply set the 'defaults' key to the name of the default you want to use. You can then override any sub setting by declaring it in your Session config:

```php
<?php
Configure::write('Session', array(
    'defaults' => 'php'
));
```

The above will use the built-in 'php' session configuration. You could augment part or all of it by doing the following:

```php
<?php
Configure::write('Session', array(
    'defaults' => 'php',
    'cookie' => 'my_app',
    'timeout' => 4320 //3 days
));
```

The above overrides the timeout and cookie name for the 'php' session configuration. The built-in configurations are:

- `php` - Saves sessions with the standard settings in your php.ini file.
- `cake` - Saves sessions as files inside `app/tmp/sessions`. This is a good option when on hosts that don't allow you to write outside your own home dir.
- `database` - Use the built in database sessions. See below for more information.
- `cache` - Use the built in cache sessions. See below for more information.

Session Handlers

Session handlers can also be defined in the session config array. When defined they allow you to map the various `session_save_handler` values to a class or object you want to use for session saving. There are two ways to use the 'handler'. The first is to provide an array with 5 callables. These callables are then applied to `session_set_save_handler`:

```php
<?php
Configure::write('Session', array(
    'userAgent' => false,
    'cookie' => 'my_cookie',
    'timeout' => 600,
    'handler' => array(
        array('Foo', 'open'),
        array('Foo', 'close'),
        array('Foo', 'read'),
        array('Foo', 'write'),
        array('Foo', 'destroy'),
        array('Foo', 'gc'),
    ),
    'ini' => array(
        'cookie_secure' => 1,
        'use_trans_sid' => 0
    )
));
```

The second mode is to define an 'engine' key. This key should be a classname that implements `CakeSessionHandlerInterface`. Implementing this interface will allow CakeSession to automatically map the methods for the handler. Both the core Cache and Database session handlers use this method for saving sessions. Additional settings for the handler should be placed inside the handler array. You can then read those values out from inside your handler.

You can also use session handlers from inside plugins. By setting the engine to something like `MyPlugin.PluginSessionHandler`. This will load and use the `PluginSessionHandler` class from inside the MyPlugin of your application.

CakeSessionHandlerInterface

This interface is used for all custom session handlers inside CakePHP, and can be used to create custom user land session handlers. Simply implement the interface in your class and set `Session.handler.engine` to the classname you've created. CakePHP will attempt to load the handler from inside `app/Model/Datasource/Session/$classname.php`. So if your classname is `AppSessionHandler` the file should be `app/Model/Datasource/Session/AppSessionHandler.php`.

Database sessions

The changes in session configuration change how you define database sessions. Most of the time you will only need to set `Session.handler.model` in your configuration as well as choose the database defaults:

```php
<?php
Configure::write('Session', array(
    'defaults' => 'database',
    'handler' => array(
        'model' => 'CustomSession'
    )
));
```

The above will tell CakeSession to use the built in 'database' defaults, and specify that a model called `CustomSession` will be the delegate for saving session information to the database.

Cache Sessions

The Cache class can be used to store sessions as well. This allows you to store sessions in a cache like APC, memcache, or Xcache. There are some caveats to using cache sessions, in that if you exhaust the cache space, sessions will start to expire as records are evicted.

To use Cache based sessions you can configure you Session config like:

```php
<?php
Configure::write('Session', array(
    'defaults' => 'cache',
    'handler' => array(
        'config' => 'session'
    )
));
```

This will configure CakeSession to use the `CacheSession` class as the delegate for saving the sessions. You can use the 'config' key which cache configuration to use. The default cache configuration is `'default'`.

Setting ini directives

The built-in defaults attempt to provide a common base for session configuration. You may need to tweak specific ini flags as well. CakePHP exposes the ability to customize the ini settings for both default configurations, as well as custom ones. The `ini` key in the session settings, allows you to specify individual configuration values. For example you can use it to control settings like `session.gc_divisor`:

```
<?php
Configure::write('Session', array(
    'defaults' => 'php',
    'ini' => array(
        'session.gc_divisor' => 1000,
        'session.cookie_httponly' => true
    )
));
```

Creating a custom session handler

Creating a custom session handler is straightforward in CakePHP. In this example we'll create a session handler that stores sessions both in the Cache (apc) and the database. This gives us the best of fast IO of apc, without having to worry about sessions evaporating when the cache fills up.

First we'll need to create our custom class and put it in `app/Model/Datasource/Session/ComboSession.php`. The class should look something like:

```
<?php
App::uses('DatabaseSession', 'Model/Datasource/Session');

class ComboSession extends DatabaseSession implements CakeSessionHandlerInterface {
    public $cacheKey;

    public function __construct() {
        $this->cacheKey = Configure::read('Session.handler.cache');
        parent::__construct();
    }

    // read data from the session.
    public function read($id) {
        $result = Cache::read($id, $this->cacheKey);
        if ($result) {
            return $result;
        }
        return parent::read($id);
    }

    // write data into the session.
    public function write($id, $data) {
        $result = Cache::write($id, $data, $this->cacheKey);
        if ($result) {
            return parent::write($id, $data);
        }
        return false;
    }

    // destroy a session.
    public function destroy($id) {
        $result = Cache::delete($id, $this->cacheKey);
        if ($result) {
            return parent::destroy($id);
        }
        return false;
    }

    // removes expired sessions.
    public function gc($expires = null) {
        return Cache::gc($this->cacheKey) && parent::gc($expires);
    }
}
```

Our class extends the built-in `DatabaseSession` so we don't have to duplicate all of its logic and behavior. We wrap each operation with a `Cache` operation. This lets us fetch sessions from the fast cache, and not have to worry about what happens when we fill the cache. Using this session handler is also easy. In your `core.php` make the session block look like the following:

```
<?php
Configure::write('Session', array(
    'defaults' => 'database',
    'handler' => array(
        'engine' => 'ComboSession',
        'model' => 'Session',
        'cache' => 'apc'
    )
));

// Make sure to add a apc cache config
Cache::config('apc', array('Engine' => 'Apc'));
```

Now our application will start using our custom session handler for reading & writing session data.

class `CakeSession`

Reading & writing session data

Depending on the context you are in your application you have different classes that provide access to the session. In controllers you can use `SessionComponent`. In the view, you can use `SessionHelper`. In any part of your application you can use `CakeSession` to access the session as well. Like the other interfaces to the session, `CakeSession` provides a simple CRUD interface.

static `CakeSession::`**`read`**(*$key*)

You can read values from the session using `Set::classicExtract()` compatible syntax:

```
<?php
CakeSession::read('Config.language');
```

static `CakeSession::write($key, $value)`

`$key` should be the dot separated path you wish to write `$value` to:

```
<?php
CakeSession::write('Config.language', 'eng');
```

static `CakeSession::delete($key)`

When you need to delete data from the session, you can use delete:

```
<?php
CakeSession::delete('Config.language');
```

You should also see the documentation on *Sessions* and *SessionHelper* for how to access Session data in the controller and view.

Exceptions

Exceptions can be used for a variety of uses in your application. CakePHP uses exceptions internally to indicate logic errors or misuse. All of the exceptions CakePHP raises extend `CakeException`, and there are class/task specific exceptions that extend this base class.

CakePHP also provides a number of exception classes that you can use for HTTP errors. See the section on *Built in Exceptions for CakePHP* for more information.

Exception configuration

There are a few keys available for configuring exceptions:

```
<?php
Configure::write('Exception', array(
    'handler' => 'ErrorHandler::handleException',
    'renderer' => 'ExceptionRenderer',
    'log' => true
));
```

- `handler` - callback - The callback to handle exceptions. You can set this to any callback type, including anonymous functions.
- `renderer` - string - The class responsible for rendering uncaught exceptions. If you choose a custom class you should place the file for that class in app/Lib/Error. This class needs to implement a `render()` method.
- `log` - boolean - When true, exceptions + their stack traces will be logged to CakeLog.
- `consoleHandler` - callback - The callback used to handle exceptions, in a console context. If undefined, CakePHP's default handler will be used.

Exception rendering by default displays an HTML page, you can customize either the handler or the renderer by changing the settings. Changing the handler, allows you to take full control over the exception handling process, while changing the renderer allows you to easily change the output type/contents, as well as add in application specific exception handling. New in version 2.2: The `Exception.consoleHandler` option was added in 2.2.

Exception classes

There are a number of exception classes in CakePHP. Each exception replaces a `cakeError()` error messages from the past. Exceptions offer additional flexibility in that they can be extended and contain some logic. The built in exception handling will capture any uncaught exceptions and render a useful page. Exceptions that do not specifically use a 400 range code, will be treated as an Internal Server Error.

Creating your own application exceptions

You can create your own application exceptions using any of the built in SPL exceptions (http://php.net/manual/en/spl.exceptions.php), `Exception` itself, or `CakeException`. Application exceptions that extend Exception or the SPL exceptions will be treated as 500 error in production mode. `CakeException` is special in that all `CakeException` objects are coerced into into either 500 or 404 errors depending on the code they use. When in development mode `CakeException` objects simply need a new template that matches the class name in order to provide useful information. If your application contained the following exception:

```
<?php
class MissingWidgetException extends CakeException {};
```

You could provide nice development errors, by creating `app/View/Errors/missing_widget.ctp`. When in production mode, the above error would be treated as a 500 error. The constructor for `CakeException` has been extended, allowing you to pass in hashes of data. These hashes are interpolated into the the messageTemplate, as well as into the view that is used to represent the error in development mode. This allows you to create data rich exceptions, by providing more context for your errors. You can also provide a message template which allows the native `__toString()` methods to work as normal:

```
<?php
class MissingWidgetException extends CakeException {
    protected $_messageTemplate = 'Seems that %s is missing.';
}

throw new MissingWidgetException(array('widget' => 'Pointy'));
```

When caught by the built in exception handler, you would get a `$widget` variable in your error view template. In addition if you cast the exception as a string or use its `getMessage()` method you will get `Seems that Pointy is missing.`. This allows you easily and quickly create your own rich development errors, just like CakePHP uses internally.

Creating custom status codes

You can create custom HTTP status codes by changing the code used when creating an exception:

```
<?php
throw new MissingWidgetHelperException('Its not here', 501);
```

Will create a `501` response code, you can use any HTTP status code you want. In development, if your exception doesn’t have a specific template, and you use a code equal to or greater than `500` you will see the `error500` template. For any other error code you’ll get the `error400` template. If you have defined an error template for your custom exception, that template will be used in development mode. If you’d like your own exception handling logic even in production, see the next section.

Extending and implementing your own Exception handlers

You can implement application specific exception handling in one of a few ways. Each approach gives you different amounts of control over the exception handling process.

- Set `Configure::write('Exception.handler', 'YourClass::yourMethod');`
- Create `AppController::appError();`
- Set `Configure::write('Exception.renderer', 'YourClass');`

In the next few sections, we will detail the various approaches and the benefits each has.

Create your own Exception handler with *Exception.handler*

Creating your own exception handler gives you full control over the exception handling process. The class you choose should be loaded in your `app/Config/bootstrap.php`, so it’s available to handle any exceptions. You can define the handler as any callback type. By settings `Exception.handler` CakePHP will ignore all other Exception settings. A sample custom exception handling setup could look like:

```
<?php
// in app/Config/core.php
Configure::write('Exception.handler', 'AppExceptionHandler::handle');

// in app/Config/bootstrap.php
App::uses('AppExceptionHandler', 'Lib');

// in app/Lib/AppExceptionHandler.php
class AppExceptionHandler {
    public static function handle($error) {
        echo 'Oh noes! ' . $error->getMessage();
        // ...
    }
    // ...
}
```

You can run any code you wish inside `handleException`. The code above would simple print ‘Oh noes! ‘ plus the exception message. You can define exception handlers as any type of callback, even an anonymous function if you are using PHP 5.3:

```
<?php
Configure::write('Exception.handler', function ($error) {
    echo 'Ruh roh ' . $error->getMessage();
});
```

By creating a custom exception handler you can provide custom error handling for application exceptions. In the method provided as the exception handler you could do the following:

```php
<?php
// in app/Lib/AppErrorHandler.php
class AppErrorHandler {
    public static function handleException($error) {
        if ($error instanceof MissingWidgetException) {
            return self::handleMissingWidget($error);
        }
        // do other stuff.
    }
}
```

Using AppController::appError();

Implementing this method is an alternative to implementing a custom exception handler. It's primarily provided for backwards compatibility, and is not recommended for new applications. This controller method is called instead of the default exception rendering. It receives the thrown exception as its only argument. You should implement your error handling in that method:

```php
<?php
class AppController extends Controller {
    public function appError($error) {
        // custom logic goes here.
    }
}
```

Using a custom renderer with Exception.renderer to handle application exceptions

If you don't want to take control of the exception handling, but want to change how exceptions are rendered you can use `Configure::write('Exception.renderer', 'AppExceptionRenderer');` to choose a class that will render exception pages. By default :php:class‘ExceptionRenderer‘ is used. Your custom exception renderer class should be placed in `app/Lib/Error`. Or an `Error`` directory in any bootstrapped Lib path. In a custom exception rendering class you can provide specialized handling for application specific errors:

```php
<?php
// in app/Lib/Error/AppExceptionRenderer.php
App::uses('ExceptionRenderer', 'Error');

class AppExceptionRenderer extends ExceptionRenderer {
    public function missingWidget($error) {
        echo 'Oops that widget is missing!';
    }
}
```

The above would handle any exceptions of the type `MissingWidgetException`, and allow you to provide custom display/handling logic for those application exceptions. Exception handling methods get the exception being handled as their argument.

Note: Your custom renderer should expect an exception in its constructor, and implement a render method. Failing to do so will cause additional errors.

Note: If you are using a custom Exception.handler this setting will have no effect. Unless you reference it inside your implementation.

Creating a custom controller to handle exceptions

In your ExceptionRenderer sub-class, you can use the _getController method to allow you to return a custom controller to handle your errors. By default CakePHP uses CakeErrorController which omits a few of the normal callbacks to help ensure errors always display. However, you may need a more custom error handling controller in your application. By implementing _getController in your AppExceptionRenderer class, you can use any controller you want:

```php
<?php
class AppExceptionRenderer extends ExceptionRenderer {
    protected function _getController($exception) {
        App::uses('SuperCustomError', 'Controller');
        return new SuperCustomErrorController();
    }
}
```

Alternatively, you could just override the core CakeErrorController, by including one in app/Controller. If you are using a custom controller for error handling, make sure you do all the setup you need in your constructor, or the render method. As those are the only methods that the built-in ErrorHandler class directly call.

Logging exceptions

Using the built-in exception handling, you can log all the exceptions that are dealt with by ErrorHandler by setting Exception.log to true in your core.php. Enabling this will log every exception to CakeLog and the configured loggers.

Note: If you are using a custom Exception.handler this setting will have no effect. Unless you reference it inside your implementation.

Built in Exceptions for CakePHP

There are several built-in exceptions inside CakePHP, outside of the internal framework exceptions, there are several exceptions for HTTP methods

exception BadRequestException
Used for doing 400 Bad Request error.

exception `ForbiddenException`
Used for doing a 403 Forbidden error.

exception `NotFoundException`
Used for doing a 404 Not found error.

exception `MethodNotAllowedException`
Used for doing a 405 Method Not Allowed error.

exception `InternalErrorException`
Used for doing a 500 Internal Server Error.

exception `NotImplementedException`
Used for doing a 501 Not Implemented Errors.

You can throw these exceptions from you controllers to indicate failure states, or HTTP errors. An example use of the HTTP exceptions could be rendering 404 pages for items that have not been found:

```php
<?php
public function view($id) {
    $post = $this->Post->findById($id);
    if (!$post) {
        throw new NotFoundException('Could not find that post');
    }
    $this->set('post', $post);
}
```

By using exceptions for HTTP errors, you can keep your code both clean, and give RESTful responses to client applications and users.

In addition, the following framework layer exceptions are available, and will be thrown from a number of CakePHP core components:

exception `MissingViewException`
The chosen view file could not be found.

exception `MissingLayoutException`
The chosen layout could not be found.

exception `MissingHelperException`
A helper was not found.

exception `MissingBehaviorException`
A configured behavior could not be found.

exception `MissingComponentException`
A configured component could not be found.

exception `MissingTaskException`
A configured task was not found.

exception `MissingShellException`
The shell class could not be found.

exception `MissingShellMethodException`
The chosen shell class has no method of that name.

exception MissingDatabaseException
The configured database is missing.

exception MissingConnectionException
A model's connection is missing.

exception MissingTableException
A model's table is missing.

exception MissingActionException
The requested controller action could not be found.

exception MissingControllerException
The requested controller could not be found.

exception PrivateActionException
Private action access. Either accessing private/protected/_ prefixed actions, or trying to access prefixed routes incorrectly.

exception CakeException
Base exception class in CakePHP. All framework layer exceptions thrown by CakePHP will extend this class.

These exception classes all extend `CakeException`. By extending CakeException, you can create your own 'framework' errors. All of the standard Exceptions that CakePHP will throw also extend CakeException. New in version 2.3: CakeBaseException was added

exception CakeBaseException
Base exception class in CakePHP. All CakeExceptions and HttpExceptions above extend this class.

`CakeBaseException::`**`responseHeader`**(*$header = null*, *$value = null*)
See `CakeResponse::header()`

All Http and Cake exceptions extend the CakeBaseException class, which has a method to add headers to the response. For instance when throwing a 405 MethodNotAllowedException the rfc2616 says: "The response MUST include an Allow header containing a list of valid methods for the requested resource."

Using HTTP exceptions in your controllers

You can throw any of the HTTP related exceptions from your controller actions to indicate failure states. For example:

```php
<?php
public function view($id) {
    $post = $this->Post->read(null, $id);
    if (!$post) {
        throw new NotFoundException();
    }
    $this->set(compact('post'));
}
```

The above would cause the configured `Exception.handler` to catch and process the `NotFoundException`. By default this will create an error page, and log the exception.

Error Handling

For 2.0 `Object::cakeError()` has been removed. Instead it has been replaced with a number of exceptions. All of the core classes that previously called cakeError are now throwing exceptions. This lets you either choose to handle the errors in your application code, or let the built in exception handling deal with them.

There is more control than ever for error and exception handling in CakePHP 2.0. You can configure which methods you want to set as the default error handler, and exception handler using configure.

Error configuration

Error configuration is done inside your application's `app/Config/core.php` file. You can define a callback to be fired each time your application triggers any PHP error - exceptions are handled *Exceptions* separately. The callback can be any PHP callable, including an anonymous function. The default error handling configuration looks like:

```php
<?php
Configure::write('Error', array(
    'handler' => 'ErrorHandler::handleError',
    'level' => E_ALL & ~E_DEPRECATED,
    'trace' => true
));
```

You have 5 built-in options when configuring error handlers:

- `handler` - callback - The callback to handle errors. You can set this to any callable type, including anonymous functions.
- `level` - int - The level of errors you are interested in capturing. Use the built-in php error constants, and bitmasks to select the level of error you are interested in.
- `trace` - boolean - Include stack traces for errors in log files. Stack traces will be included in the log after each error. This is helpful for finding where/when errors are being raised.
- `consoleHandler` - callback - The callback used to handle errors when running in the console. If undefined, CakePHP's default handlers will be used.

ErrorHandler by default, displays errors when `debug` > 0, and logs errors when debug = 0. The type of errors captured in both cases is controlled by `Error.level`. The fatal error handler will be called independent of `debug` level or `Error.level` configuration, but the result will be different based on `debug` level.

Note: If you use a custom error handler, the trace setting will have no effect, unless you refer to it in your error handling function.

New in version 2.2: The `Error.consoleHandler` option was added in 2.2.Changed in version 2.2: The `Error.handler` and `Error.consoleHandler` will receive the fatal error codes as well. The default behavior is show a page to internal server error (`debug` disabled) or a page with the message, file and line (`debug` enabled).

Creating your own error handler

You can create an error handler out of any callback type. For example you could use a class called `AppError` to handle your errors. The following would need to be done:

```
<?php
//in app/Config/core.php
Configure::write('Error.handler', 'AppError::handleError');

//in app/Config/bootstrap.php
App::uses('AppError', 'Lib');

//in app/Lib/AppError.php
class AppError {
    public static function handleError($code, $description, $file = null, $line = null, $co
        echo 'There has been an error!';
    }
}
```

This class/method will print out 'There has been an error!' each time an error occurs. Since you can define an error handler as any callback type, you could use an anonymous function if you are using PHP5.3 or greater.:

```
<?php
Configure::write('Error.handler', function($code, $description, $file = null, $line = null,
    echo 'Oh no something bad happened';
});
```

It is important to remember that errors captured by the configured error handler will be php errors, and that if you need custom error handling, you probably also want to configure *Exceptions* handling as well.

Changing fatal error behavior

Since CakePHP 2.2 the `Error.handler` will receive the fatal error codes as well. If you do not want to show the cake error page, you can override it like:

```
<?php
//in app/Config/core.php
Configure::write('Error.handler', 'AppError::handleError');

//in app/Config/bootstrap.php
App::uses('AppError', 'Lib');

//in app/Lib/AppError.php
class AppError {
    public static function handleError($code, $description, $file = null, $line = null, $co
        list(, $level) = ErrorHandler::mapErrorCode($code);
        if ($level === LOG_ERROR) {
            // Ignore fatal error. It will keep the PHP error message only
            return false;
        }
        return ErrorHandler::handleError($code, $description, $file, $line, $context);
    }
}
```

If you want to keep the default fatal error behavior, you can call `ErrorHandler::handleFatalError()` from your custom handler.

Debugging

Debugging is an inevitable and necessary part of any development cycle. While CakePHP doesn't offer any tools that directly connect with any IDE or editor, CakePHP does provide several tools to assist in debugging and exposing what is running under the hood of your application.

Basic Debugging

debug(*mixed $var*, *boolean $showHtml = null*, *$showFrom = true*)

Parameters

- **$var** (*mixed*) – The contents to print out. Arrays and objects work well.
- **$showHTML** (*boolean*) – Set to true, to enable escaping. Escaping is enabled by default in 2.0 when serving web requests.
- **$showFrom** (*boolean*) – Show the line and file the debug() occurred on.

The debug() function is a globally available function that works similarly to the PHP function print_r(). The debug() function allows you to show the contents of a variable in a number of different ways. First, if you'd like data to be shown in an HTML-friendly way, set the second parameter to true. The function also prints out the line and file it is originating from by default.

Output from this function is only shown if the core debug variable has been set to a value greater than 0. Changed in version 2.1: The output of `debug()` more resembles `var_dump()`, and uses `Debugger` internally.

Debugger Class

The debugger class was introduced with CakePHP 1.2 and offers even more options for obtaining debugging information. It has several functions which are invoked statically, and provide dumping, logging, and error handling functions.

The Debugger Class overrides PHP's default error handling, replacing it with far more useful error reports. The Debugger's error handling is used by default in CakePHP. As with all debugging functions, `Configure::debug` must be set to a value higher than 0.

When an error is raised, Debugger both outputs information to the page and makes an entry in the error.log file. The error report that is generated has both a stack trace and a code excerpt from where the error was raised. Click on the "Error" link type to reveal the stack trace, and on the "Code" link to reveal the error-causing lines.

Using the Debugger Class

class Debugger

To use the debugger, first ensure that Configure::read('debug') is set to a value greater than 0.

static Debugger::**dump**(*$var*)

Dump prints out the contents of a variable. It will print out all properties and methods (if any) of the supplied variable:

```
<?php
$foo = array(1,2,3);

Debugger::dump($foo);

// outputs
array(
    1,
    2,
    3
)

// simple object
$car = new Car();

Debugger::dump($car);

// outputs
Car
Car::colour = 'red'
Car::make = 'Toyota'
Car::model = 'Camry'
Car::mileage = '15000'
Car::accelerate()
Car::decelerate()
Car::stop()
```

Changed in version 2.1: In 2.1 forward the output was updated for readability. See `Debugger::exportVar()`

static Debugger::**log**(*$var*, *$level = 7*)

Creates a detailed stack trace log at the time of invocation. The log() method prints out data similar to that done by Debugger::dump(), but to the debug.log instead of the output buffer. Note your app/tmp directory (and its contents) must be writable by the web server for log() to work correctly.

static Debugger::**trace**(*$options*)

Returns the current stack trace. Each line of the trace includes the calling method, including which file and line the call originated from.:

```
<?php
//In PostsController::index()
pr(Debugger::trace());

//outputs
```

```
PostsController::index() - APP/Controller/DownloadsController.php, line 48
Dispatcher::_invoke() - CORE/lib/Cake/Routing/Dispatcher.php, line 265
Dispatcher::dispatch() - CORE/lib/Cake/Routing/Dispatcher.php, line 237
[main] - APP/webroot/index.php, line 84
```

Above is the stack trace generated by calling Debugger::trace() in a controller action. Reading the stack trace bottom to top shows the order of currently running functions (stack frames). In the above example, index.php called Dispatcher::dispatch(), which in-turn called Dispatcher::_invoke(). The _invoke() method then called PostsController::index(). This information is useful when working with recursive operations or deep stacks, as it identifies which functions are currently running at the time of the trace().

static `Debugger::`**`excerpt`**(*$file*, *$line*, *$context*)
Grab an excerpt from the file at $path (which is an absolute filepath), highlights line number $line with $context number of lines around it.:

```
<?php
pr(Debugger::excerpt(ROOT . DS . LIBS . 'debugger.php', 321, 2));

//will output the following.
Array
(
    [0] => <code><span style="color: #000000"> * @access public</span></code>
    [1] => <code><span style="color: #000000"> */</span></code>
    [2] => <code><span style="color: #000000">    function excerpt($file, $line, $cont

    [3] => <span class="code-highlight"><code><span style="color: #000000">        $da
    [4] => <code><span style="color: #000000">        $data = @explode("\n", file_get_
)
```

Although this method is used internally, it can be handy if you're creating your own error messages or log entries for custom situations.

static `Debugger::`**`exportVar`**(*$var*, *$recursion = 0*)
Converts a variable of any type to a string for use in debug output. This method is also used by most of Debugger for internal variable conversions, and can be used in your own Debuggers as well. Changed in version 2.1: This function generates different output in 2.1 forward.

static `Debugger::`**`invoke`**(*$debugger*)
Replace the CakePHP Debugger with a new instance.

static `Debugger::`**`getType`**(*$var*)
Get the type of a variable. Objects will return their classname New in version 2.1.

Using Logging to debug

Logging messages is another good way to debug applications, and you can use `CakeLog` to do logging in your application. All objects that extend `Object` have an instance method *log()* which can be used to log messages:

```
<?php
$this->log('Got here', 'debug');
```

The above would write `Got here` into the debug log. You can use log entries to help debug methods that involve redirects or complicated loops. You can also use `CakeLog::write()` to write log messages. This method can be called statically anywhere in your application one CakeLog has been loaded:

```
<?php
// in app/Config/bootstrap.php
App::uses('CakeLog', 'Log');

// Anywhere in your application
CakeLog::write('debug', 'Got here');
```

Debug Kit

DebugKit is a plugin that provides a number of good debugging tools. It primarily provides a toolbar in the rendered HTML, that provides a plethora of information about your application and the current request. You can download DebugKit (https://github.com/cakephp/debug_kit) from github.

Testing

CakePHP comes with comprehensive testing support built-in. CakePHP comes with integration for PHPUnit (http://phpunit.de). In addition to the features offered by PHPUnit, CakePHP offers some additional features to make testing easier. This section will cover installing PHPUnit, and getting started with Unit Testing, and how you can use the extensions that CakePHP offers.

Installing PHPUnit

CakePHP uses PHPUnit as its underlying test framework. PHPUnit is the de-facto standard for unit testing in PHP. It offers a deep and powerful set of features for making sure your code does what you think it does. PHPUnit can be installed through the pear installer (http://pear.php.net). To install PHPUnit run the following:

```
pear upgrade PEAR
pear config-set auto_discover 1
pear install pear.phpunit.de/PHPUnit
```

Note: Depending on your system's configuration, you make need to run the previous commands with `sudo`

Once PHPUnit is installed with the pear installer, you should confirm that the PHPUnit libraries are on PHP's `include_path`. You can do this by checking your php.ini file and making sure that the PHPUnit files are in one of the `include_path` directories.

Tip: All output is swallowed when using PHPUnit 3.6+. Add the `--debug` modifier if using the CLI or add `&debug=1` to the url if using the web runner to display output.

Test Database Setup

Remember to have a debug level of at least 1 in your `app/Config/core.php` file before running any tests. Tests are not accessible via the web runner when debug is equal to 0. Before running any tests you should be sure to add a `$test` database configuration. This configuration is used by CakePHP for fixture tables and data:

```php
<?php
public $test = array(
    'datasource' => 'Database/Mysql',
    'persistent' => false,
    'host'       => 'dbhost',
    'login'      => 'dblogin',
    'password'   => 'dbpassword',
    'database'   => 'test_database'
);
```

Note: It's a good idea to make the test database and your actual database different databases. This will prevent any embarrassing mistakes later.

Checking the Test Setup

After installing PHPUnit and setting up your `$test` database configuration you can make sure you're ready to write and run your own tests by running one of the core tests. There are two built-in runners for testing, we'll start off by using the web runner. The tests can then be accessed by browsing to http://localhost/your_app/test.php. You should see a list of the core test cases. Click on the 'AllConfigure' test. You should see a green bar with some additional information about the tests run, and number passed.

Congratulations, you are now ready to start writing tests!

Test Case Conventions

Like most things in CakePHP, test cases have some conventions. concerning tests:

1. PHP files containing tests should be in your `app/Test/Case/[Type]` directories.
2. The filenames of these files should end in `Test.php` instead of just .php.
3. The classes containing tests should extend `CakeTestCase`, `ControllerTestCase` or `PHPUnit_Framework_TestCase`.
4. Like other classnames, the test case classnames should match the filename. `RouterTest.php` should contain `class RouterTest extends CakeTestCase`.

5. The name of any method containing a test (i.e. containing an assertion) should begin with `test`, as in `testPublished()`. You can also use the `@test` annotation to mark methods as test methods.

When you have created a test case, you can execute it by browsing to `http://localhost/you_app/test.php` (depending on how your specific setup looks). Click App test cases, and then click the link to your specific file. You can run tests from the command line using the test shell:

```
./Console/cake test app Model/Post
```

For example, would run the tests for your Post model.

Creating Your First Test Case

In the following example, we'll create a test case for a very simple helper method. The helper we're going to test will be formatting progress bar HTML. Our helper looks like:

```
<?php
class ProgressHelper extends AppHelper {
    public function bar($value) {
        $width = round($value / 100, 2) * 100;
        return sprintf(
            '<div class="progress-container">
                <div class="progress-bar" style="width: %s%%"></div>
            </div>', $width);
    }
}
```

This is a very simple example, but it will be useful to show how you can create a simple test case. After creating and saving our helper, we'll create the test case file in `app/Test/Case/View/Helper/ProgressHelperTest.php`. In that file we'll start with the following:

```
<?php
App::uses('Controller', 'Controller');
App::uses('View', 'View');
App::uses('ProgressHelper', 'View/Helper');

class ProgressHelperTest extends CakeTestCase {
    public function setUp() {

    }

    public function testBar() {

    }
}
```

We'll flesh out this skeleton in a minute. We've added two methods to start with. First is `setUp()`. This method is called before every *test* method in a test case class. Setup methods should initialize the objects needed for the test, and do any configuration needed. In our setup method we'll add the following:

```
<?php
public function setUp() {
    parent::setUp();
    $Controller = new Controller();
    $View = new View($Controller);
    $this->Progress = new ProgressHelper($View);
}
```

Calling the parent method is important in test cases, as CakeTestCase::setUp() does a number things like backing up the values in `Configure` and, storing the paths in `App`.

Next, we'll fill out the test method. We'll use some assertions to ensure that our code creates the output we expect:

```
<?php
public function testBar() {
    $result = $this->Progress->bar(90);
    $this->assertContains('width: 90%', $result);
    $this->assertContains('progress-bar', $result);

    $result = $this->Progress->bar(33.3333333);
    $this->assertContains('width: 33%', $result);
}
```

The above test is a simple one but shows the potential benefit of using test cases. We use `assertContains()` to ensure that our helper is returning a string that contains the content we expect. If the result did not contain the expected content the test would fail, and we would know that our code is incorrect.

By using test cases you can easily describe the relationship between a set of known inputs and their expected output. This helps you be more confident of the code you're writing as you can easily check that the code you wrote fulfills the expectations and assertions your tests make. Additionally because tests are code, they are easy to re-run whenever you make a change. This helps prevent the creation of new bugs.

Running Tests

Once you have PHPUnit installed and some test cases written, you'll want to run the test cases very frequently. It's a good idea to run tests before committing any changes to help ensure you haven't broken anything.

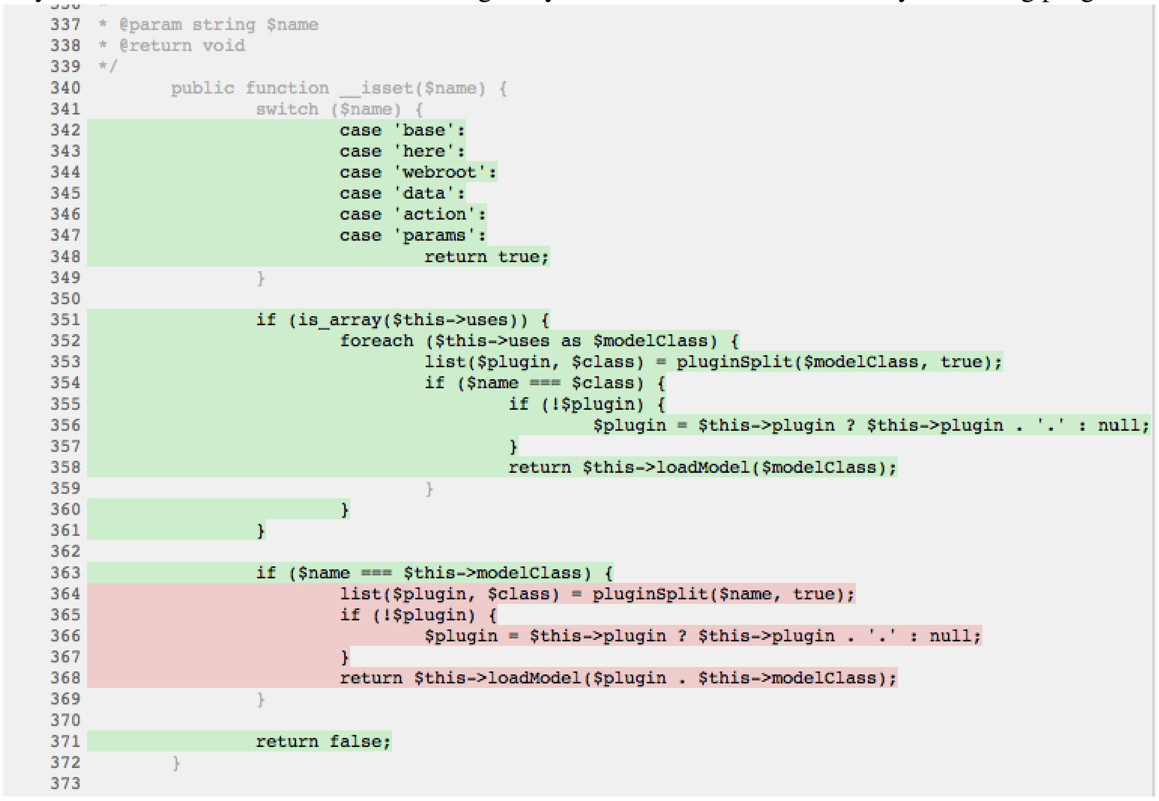
Running tests from a browser

CakePHP provides a web interface for running tests, so you can execute your tests through a browser if you're more comfortable in that environment. You can access the web runner by going to `http://localhost/your_app/test.php`. The exact location of test.php will change depending on your setup. But the file is at the same level as `index.php`.

Once you've loaded up the test runner, you can navigate App, Core and Plugin test suites. Clicking an individual test case will run that test and display the results.

Viewing code coverage

If you have XDebug (http://xdebug.org) installed, you can view code coverage results. Code coverage is useful for telling you what parts of your code your tests do not reach. Coverage is useful for determining where you should add tests in the future, and gives you one measurement to track your testing progress with.



```
 * @param string $name
 * @return void
 */
	public function __isset($name) {
		switch ($name) {
			case 'base':
			case 'here':
			case 'webroot':
			case 'data':
			case 'action':
			case 'params':
				return true;
		}

		if (is_array($this->uses)) {
			foreach ($this->uses as $modelClass) {
				list($plugin, $class) = pluginSplit($modelClass, true);
				if ($name === $class) {
					if (!$plugin) {
						$plugin = $this->plugin ? $this->plugin . '.' : null;
					}
					return $this->loadModel($modelClass);
				}
			}
		}

		if ($name === $this->modelClass) {
			list($plugin, $class) = pluginSplit($name, true);
			if (!$plugin) {
				$plugin = $this->plugin ? $this->plugin . '.' : null;
			}
			return $this->loadModel($plugin . $this->modelClass);
		}

		return false;
	}
```

The inline code coverage uses green lines to indicate lines that have been run. If you hover over a green line a tooltip will indicate which tests covered the line. Lines in red did not run, and have not been exercised by your tests. Grey lines are considered unexecutable code by xdebug.

Running tests from command line

CakePHP provides a `test` shell for running tests. You can run app, core and plugin tests easily using the test shell. It accepts all the arguments you would expect to find on the normal PHPUnit command line tool as well. From your app directory you can do the following to run tests:

```
# Run a model tests in the app
./Console/cake test app Model/Article

# Run a component test in a plugin
./Console/cake test DebugKit Controller/Component/ToolbarComponent

# Run the configure class test in CakePHP
./Console/cake test core Core/Configure
```

Note: If you are running tests that interact with the session it's generally a good idea to use the `--stderr` option. This will fix issues with tests failing because of headers_sent warnings.

Changed in version 2.1: The `test` shell was added in 2.1. The 2.0 `testsuite` shell is still available but the new syntax is preferred. You can also run `test` shell in the project root directory. This shows you a full list of all the tests that you currently have. You can then freely choose what test(s) to run:

```
# Run test in project root directory for application folder called app
lib/Cake/Console/cake test app

# Run test in project root directory for an application in ./myapp
lib/Cake/Console/cake test --app myapp app
```

Filtering test cases

When you have larger test cases, you will often want to run a subset of the test methods when you are trying to work on a single failing case. With the CLI runner you can use an option to filter test methods:

```
./Console/cake test core Console/ConsoleOutput --filter testWriteArray
```

The filter parameter is used as a case-sensitive regular expression for filtering which test methods to run.

Generating code coverage

You can generate code coverage reports from the command line using PHPUnit's built-in code coverage tools. PHPUnit will generate a set of static HTML files containing the coverage results. You can generate coverage for a test case by doing the following:

```
./Console/cake test app Model/Article --coverage-html webroot/coverage
```

This will put the coverage results in your application's webroot directory. You should be able to view the results by going to `http://localhost/your_app/coverage`.

Test Case Lifecycle Callbacks

Test cases have a number of lifecycle callbacks you can use when doing testing:

- `setUp` is called before every test method. Should be used to create the objects that are going to be tested, and initialize any data for the test. Always remember to call `parent::setUp()`
- `tearDown` is called after every test method. Should be used to cleanup after the test is complete. Always remember to call `parent::tearDown()`.
- `setupBeforeClass` is called once before test methods in a case are started. This method must be *static*.
- `tearDownAfterClass` is called once after test methods in a case are started. This method must be *static*.

Fixtures

When testing code that depends on models and the database, one can use **fixtures** as a way to generate temporary data tables loaded with sample data that can be used by the test. The benefit of using fixtures is that your test has no chance of disrupting live application data. In addition, you can begin testing your code prior to actually developing live content for an application.

CakePHP uses the connection named `$test` in your `app/Config/database.php` configuration file. If this connection is not usable, an exception will be raised and you will not be able to use database fixtures.

CakePHP performs the following during the course of a fixture based test case:

1. Creates tables for each of the fixtures needed.
2. Populates tables with data, if data is provided in fixture.
3. Runs test methods.
4. Empties the fixture tables.
5. Removes fixture tables from database.

Creating fixtures

When creating a fixture you will mainly define two things: how the table is created (which fields are part of the table), and which records will be initially populated to the table. Let's create our first fixture, that will be used to test our own Article model. Create a file named `ArticleFixture.php` in your `app/Test/Fixture` directory, with the following content:

```php
<?php
class ArticleFixture extends CakeTestFixture {

      /* Optional. Set this property to load fixtures to a different test datasource */
      public $useDbConfig = 'test';
      public $fields = array(
          'id' => array('type' => 'integer', 'key' => 'primary'),
          'title' => array('type' => 'string', 'length' => 255, 'null' => false),
          'body' => 'text',
          'published' => array('type' => 'integer', 'default' => '0', 'null' => false),
          'created' => 'datetime',
          'updated' => 'datetime'
      );
      public $records = array(
          array('id' => 1, 'title' => 'First Article', 'body' => 'First Article Body', 'pu
          array('id' => 2, 'title' => 'Second Article', 'body' => 'Second Article Body', 'p
          array('id' => 3, 'title' => 'Third Article', 'body' => 'Third Article Body', 'pu
      );
 }
```

The `$useDbConfig` property defines the datasource of which the fixture will use. You can specify an arbitrary name, eg.: `myapp`, and the testsuite will use `test_myapp` if it exists. Doing this is optional, and when unspecified, the default `test` datasource will be used.

We use `$fields` to specify which fields will be part of this table, and how they are defined. The format used to define these fields is the same used with `CakeSchema`. The keys available for table definition are:

`type`

CakePHP internal data type. Currently supported:

- `string`: maps to `VARCHAR`
- `text`: maps to `TEXT`
- `integer`: maps to `INT`
- `float`: maps to `FLOAT`
- `datetime`: maps to `DATETIME`
- `timestamp`: maps to `TIMESTAMP`
- `time`: maps to `TIME`
- `date`: maps to `DATE`
- `binary`: maps to `BLOB`

`key` Set to `primary` to make the field AUTO_INCREMENT, and a PRIMARY KEY for the table.

`length` Set to the specific length the field should take.

`null` Set to either `true` (to allow NULLs) or `false` (to disallow NULLs).

`default` Default value the field takes.

We can define a set of records that will be populated after the fixture table is created. The format is fairly straight forward, `$records` is an array of records. Each item in `$records` should be a single row. Inside each row, should be an associative array of the columns and values for the row. Just keep in mind that each record in the $records array must have a key for **every** field specified in the `$fields` array. If a field for a particular record needs to have a `null` value, just specify the value of that key as `null`.

Dynamic data and fixtures

Since records for a fixture are declared as a class property, you cannot easily use functions or other dynamic data to define fixtures. To solve this problem, you can define `$records` in the init() function of your fixture. For example if you wanted all the created and updated timestamps to reflect today's date you could do the following:

```php
<?php
class ArticleFixture extends CakeTestFixture {

    public $fields = array(
        'id' => array('type' => 'integer', 'key' => 'primary'),
        'title' => array('type' => 'string', 'length' => 255, 'null' => false),
        'body' => 'text',
        'published' => array('type' => 'integer', 'default' => '0', 'null' => false),
        'created' => 'datetime',
        'updated' => 'datetime'
    );

    public function init() {
        $this->records = array(
            array(
                'id' => 1,
                'title' => 'First Article',
                'body' => 'First Article Body',
                'published' => '1',
                'created' => date('Y-m-d H:i:s'),
                'updated' => date('Y-m-d H:i:s'),
            ),
        );
        parent::init();
    }
}
```

When overriding `init()` just remember to always call `parent::init()`.

Importing table information and records

Your application may have already working models with real data associated to them, and you might decide to test your application with that data. It would be then a duplicate effort to have to define the table definition and/or records on your fixtures. Fortunately, there's a way for you to define that table definition and/or records for a particular fixture come from an existing model or an existing table.

Let's start with an example. Assuming you have a model named Article available in your application (that maps to a table named articles), change the example fixture given in the previous section (`app/Test/Fixture/ArticleFixture.php`) to:

```
<?php
class ArticleFixture extends CakeTestFixture {
    public $import = 'Article';
}
```

This statement tells the test suite to import your table definition from the table linked to the model called Article. You can use any model available in your application. The statement will only import the Article schema, and does not import records. To import records you can do the following:

```
<?php
class ArticleFixture extends CakeTestFixture {
    public $import = array('model' => 'Article', 'records' => true);
}
```

If on the other hand you have a table created but no model available for it, you can specify that your import will take place by reading that table information instead. For example:

```
<?php
class ArticleFixture extends CakeTestFixture {
    public $import = array('table' => 'articles');
}
```

Will import table definition from a table called ‘articles’ using your CakePHP database connection named ‘default’. If you want to use a different connection use:

```
<?php
class ArticleFixture extends CakeTestFixture {
    public $import = array('table' => 'articles', 'connection' => 'other');
}
```

Since it uses your CakePHP database connection, if there’s any table prefix declared it will be automatically used when fetching table information. The two snippets above do not import records from the table. To force the fixture to also import its records, change the import to:

```
<?php
class ArticleFixture extends CakeTestFixture {
    public $import = array('table' => 'articles', 'records' => true);
}
```

You can naturally import your table definition from an existing model/table, but have your records defined directly on the fixture as it was shown on previous section. For example:

```
<?php
class ArticleFixture extends CakeTestFixture {
    public $import = 'Article';
    public $records = array(
        array('id' => 1, 'title' => 'First Article', 'body' => 'First Article Body', 'publi
        array('id' => 2, 'title' => 'Second Article', 'body' => 'Second Article Body', 'pub
        array('id' => 3, 'title' => 'Third Article', 'body' => 'Third Article Body', 'publi
    );
}
```

Loading fixtures in your test cases

After you’ve created your fixtures, you’ll want to use them in your test cases. In each test case you should load the fixtures you will need. You should load a fixture for every model that will have a query run against it. To load fixtures you define the `$fixtures` property in your model:

```
<?php
class ArticleTest extends CakeTestCase {
    public $fixtures = array('app.article', 'app.comment');
}
```

The above will load the Article and Comment fixtures from the application’s Fixture directory. You can also load fixtures from CakePHP core, or plugins:

```
<?php
class ArticleTest extends CakeTestCase {
    public $fixtures = array('plugin.debug_kit.article', 'core.comment');
}
```

Using the `core` prefix will load fixtures from CakePHP, and using a plugin name as the prefix, will load the fixture from the named plugin.

You can control when your fixtures are loaded by setting `CakeTestCase::$autoFixtures` to `false` and later load them using `CakeTestCase::loadFixtures()`:

```
<?php
class ArticleTest extends CakeTestCase {
    public $fixtures = array('app.article', 'app.comment');
    public $autoFixtures = false;

    public function testMyFunction() {
        $this->loadFixtures('Article', 'Comment');
    }
}
```

Testing Models

Let's say we already have our Article model defined on `app/Model/Article.php`, which looks like this:

```
<?php
class Article extends AppModel {
    public function published($fields = null) {
        $params = array(
            'conditions' => array(
                $this->name . '.published' => 1
            ),
            'fields' => $fields
        );

        return $this->find('all', $params);
    }
}
```

We now want to set up a test that will use this model definition, but through fixtures, to test some functionality in the model. CakePHP test suite loads a very minimum set of files (to keep tests isolated), so we have to start by loading our model - in this case the Article model which we already defined.

Let's now create a file named `ArticleTest.php` in your `app/Test/Case/Model` directory, with the following contents:

```
<?php
App::uses('Article', 'Model');

class ArticleTest extends CakeTestCase {
    public $fixtures = array('app.article');
}
```

In our test cases' variable `$fixtures` we define the set of fixtures that we'll use. You should remember to include all the fixtures that will have queries run against them.

Note: You can override the test model database by specifying the `$useDbConfig` property. Ensure that the relevant fixture uses the same value so that the table is created in the correct database.

Creating a test method

Let's now add a method to test the function published() in the Article model. Edit the file `app/Test/Case/Model/ArticleTest.php` so it now looks like this:

```php
<?php
App::uses('Article', 'Model');

class ArticleTest extends CakeTestCase {
    public $fixtures = array('app.article');

    public function setUp() {
        parent::setUp();
        $this->Article = ClassRegistry::init('Article');
    }

    public function testPublished() {
        $result = $this->Article->published(array('id', 'title'));
        $expected = array(
            array('Article' => array('id' => 1, 'title' => 'First Article')),
            array('Article' => array('id' => 2, 'title' => 'Second Article')),
            array('Article' => array('id' => 3, 'title' => 'Third Article'))
        );

        $this->assertEquals($expected, $result);
    }
}
```

You can see we have added a method called `testPublished()`. We start by creating an instance of our `Article` model, and then run our `published()` method. In `$expected` we set what we expect should be the proper result (that we know since we have defined which records are initially populated to the article table.) We test that the result equals our expectation by using the `assertEquals` method. See the *Running Tests* section for more information on how to run your test case.

Note: When setting up your Model for testing be sure to use `ClassRegistry::init('YourModelName');` as it knows to use your test database connection.

Testing Controllers

While you can test controller classes in a similar fashion to Helpers, Models, and Components, CakePHP offers a specialized `ControllerTestCase` class. Using this class as the base class for your controller test cases allows you to use `testAction()` for simpler test cases. `ControllerTestCase` allows you to easily mock out components and models, as well as potentially difficult to test methods like `redirect()`.

Say you have a typical Articles controller, and its corresponding model. The controller code looks like:

```php
<?php
class ArticlesController extends AppController {
    public $helpers = array('Form', 'Html');
    public function index($short = null) {
        if (!empty($this->request->data)) {
            $this->Article->save($this->request->data);
        }
        if (!empty($short)) {
            $result = $this->Article->findAll(null, array('id', 'title'));
        } else {
            $result = $this->Article->findAll();
        }

        if (isset($this->params['requested'])) {
            return $result;
        }

        $this->set('title', 'Articles');
        $this->set('articles', $result);
    }
}
```

Create a file named `ArticlesControllerTest.php` in your `app/Test/Case/Controller` directory and put the following inside:

```
<?php
class ArticlesControllerTest extends ControllerTestCase {
    public $fixtures = array('app.article');

    public function testIndex() {
        $result = $this->testAction('/articles/index');
        debug($result);
    }

    public function testIndexShort() {
        $result = $this->testAction('/articles/index/short');
        debug($result);
    }

    public function testIndexShortGetRenderedHtml() {
        $result = $this->testAction(
           '/articles/index/short',
            array('return' => 'contents')
        );
        debug($result);
    }

    public function testIndexShortGetViewVars() {
        $result = $this->testAction(
            '/articles/index/short',
            array('return' => 'vars')
        );
        debug($result);
    }

    public function testIndexPostData() {
        $data = array(
            'Article' => array(
                'user_id' => 1,
                'published' => 1,
                'slug' => 'new-article',
                'title' => 'New Article',
                'body' => 'New Body'
            )
        );
        $result = $this->testAction(
            '/articles/index',
            array('data' => $data, 'method' => 'post')
        );
        debug($result);
    }
}
```

This example shows a few of the ways you can use testAction to test your controllers. The first parameter of `testAction` should always be the URL you want to test. CakePHP will create a request and dispatch the controller and action.

When testing actions that contain `redirect()` and other code following the redirect it is generally a good idea to return when redirecting. The reason for this, is that `redirect()` is mocked in testing, and does not exit like normal. And instead of your code exiting, it will continue to run code following the redirect. For example:

```
<?php
class ArticlesController extends AppController {
    public function add() {
        if ($this->request->is('post')) {
            if ($this->Article->save($this->request->data)) {
                $this->redirect(array('action' => 'index'));
            }
        }
        // more code
    }
}
```

When testing the above code, you will still run `// more code` even when the redirect is reached. Instead, you should write the code like:

```
<?php
class ArticlesController extends AppController {
    public function add() {
        if ($this->request->is('post')) {
            if ($this->Article->save($this->request->data)) {
                return $this->redirect(array('action' => 'index'));
            }
        }
        // more code
    }
}
```

In this case `// more code` will not be executed as the method will return once the redirect is reached.

Simulating GET requests

As seen in the `testIndexPostData()` example above, you can use `testAction()` to test POST actions as well as GET actions. By supplying the `data` key, the request made to the controller will be POST. By default all requests will be POST requests. You can simulate a GET request by setting the method key:

```php
<?php
public function testAdding() {
    $data = array(
        'Post' => array(
            'title' => 'New post',
            'body' => 'Secret sauce'
        )
    );
    $this->testAction('/posts/add', array('data' => $data, 'method' => 'get'));
    // some assertions.
}
```

The data key will be used as query string parameters when simulating a GET request.

Choosing the return type

You can choose from a number of ways to inspect the success of your controller action. Each offers a different way to ensure your code is doing what you expect:

- `vars` Get the set view variables.
- `view` Get the rendered view, without a layout.
- `contents` Get the rendered view including the layout.
- `result` Get the return value of the controller action. Useful for testing requestAction methods.

The default value is `result`. As long as your return type is not `result` you can also access the various other return types as properties in the test case:

```php
<?php
public function testIndex() {
    $this->testAction('/posts/index');
    $this->assertInternalType('array', $this->vars['posts']);
}
```

Using mocks with testAction

There will be times when you want to replace components or models with either partially mocked objects or completely mocked objects. You can do this by using `ControllerTestCase::generate()`. `generate()` takes the hard work out of generating mocks on your controller. If you decide to generate a controller to be used in testing, you can generate mocked versions of its models and components along with it:

```php
<?php
$Posts = $this->generate('Posts', array(
    'methods' => array(
        'isAuthorized'
    ),
    'models' => array(
        'Post' => array('save')
    ),
    'components' => array(
        'RequestHandler' => array('isPut'),
        'Email' => array('send'),
        'Session'
    )
));
```

The above would create a mocked `PostsController`, stubbing out the `isAuthorized` method. The attached Post model will have `save()` stubbed, and the attached components would have their respective methods stubbed. You can choose to stub an entire class by not passing methods to it, like Session in the example above.

Generated controllers are automatically used as the testing controller to test. To enable automatic generation, set the `autoMock` variable on the test case to true. If `autoMock` is false, your original controller will be used in the test.

The response object in the generated controller is always replaced with a mock that does not send headers. After using `generate()` or `testAction()` you can access the controller object at `$this->controller`.

A more complex example

In its simplest form, `testAction()` will run `PostsController::index()` on your testing controller (or an automatically generated one), including all of the mocked models and components. The results of the test are stored in the `vars`, `contents`, `view`, and `return` properties. Also available is a headers property which gives you access to the `headers` that would have been sent, allowing you to check for redirects:

```php
<?php
public function testAdd() {
    $Posts = $this->generate('Posts', array(
        'components' => array(
            'Session',
            'Email' => array('send')
        )
    ));
    $Posts->Session
        ->expects($this->once())
        ->method('setFlash');
    $Posts->Email
        ->expects($this->once())
        ->method('send')
        ->will($this->returnValue(true));

    $this->testAction('/posts/add', array(
        'data' => array(
            'Post' => array('name' => 'New Post')
        )
    ));

    $this->assertContains('/posts/index', $this->headers['Location']);
    $this->assertEquals('New Post', $this->vars['post']['Post']['name']);
    $this->assertRegExp('/<html/', $this->contents);
    $this->assertRegExp('/<form/', $this->view);
}
```

This example shows a slightly more complex use of the `testAction()` and `generate()` methods. First, we generate a testing controller and mock the `SessionComponent`. Now that the SessionComponent is mocked, we have the ability to run testing methods on it. Assuming `PostsController::add()` redirects us to index, sends an email and sets a flash message, the test will pass. For the sake of example, we also check to see if the layout was loaded by checking the entire rendered contents, and checks the view for a form tag. As you can see, your freedom to test controllers and easily mock its classes is greatly expanded with these changes.

When doing controller tests using mocks that use static methods you'll have to use a different method to register your mock expectations. For example if you wanted to mock out `AuthComponent::user()` you'd have to do the following:

```
<?php
public function testAdd() {
    $Posts = $this->generate('Posts', array(
        'components' => array(
            'Session',
            'Auth' => array('user')
        )
    ));
    $Posts->Auth->staticExpects($this->any())
        ->method('user')
        ->with('id')
        ->will($this->returnValue(2));
}
```

By using `staticExpects` you will be able to mock and manipulate static methods on components and models.

Testing a JSON Responding Controller

JSON is a very friendly and common format to use when building a web service. Testing the endpoints of your web service is very simple with CakePHP. Let us begin with a simple example controller that responds in JSON:

```php
<?php
class MarkersController extends AppController {
    public $autoRender = false;
    public function index() {
        $data = $this->Marker->find('first');
        $this->response->body(json_encode($data));
    }
}
```

Now we create the file `app/Test/Case/Controller/MarkersControllerTest.php` and make sure our web service is returning the proper response:

```php
<?php
class MarkersControllerTest extends ControllerTestCase {
    public function testIndex() {
        $result = $this->testAction('/markers/index.json');
        $result = json_decode($result, true);
        $expected = array(
            'Marker' => array('id' => 1, 'lng' => 66, 'lat' => 45),
        );
        $this->assertEquals($expected, $result);
    }
}
```

Testing Components

Lets pretend we have a component called PagematronComponent in our application. This component helps us set the pagination limit value across all the controllers that use it. Here is our example component located in `app/Controller/Component/PagematronComponent.php`:

```php
<?php
class PagematronComponent extends Component {
    public $Controller = null;

    public function startup(Controller $controller) {
        parent::startup($controller);
        $this->Controller = $controller;
        // Make sure the controller is using pagination
        if (!isset($this->Controller->paginate)) {
            $this->Controller->paginate = array();
        }
    }

    public function adjust($length = 'short') {
        switch ($length) {
            case 'long':
                $this->Controller->paginate['limit'] = 100;
            break;
            case 'medium':
                $this->Controller->paginate['limit'] = 50;
            break;
            default:
                $this->Controller->paginate['limit'] = 20;
            break;
        }
    }
}
```

Now we can write tests to ensure our paginate `limit` parameter is being set correctly by the `adjust` method in our component. We create the file `app/Test/Case/Controller/Component/PagematronComponentTest.php`:

```php
<?php
App::uses('Controller', 'Controller');
App::uses('CakeRequest', 'Network');
App::uses('CakeResponse', 'Network');
App::uses('ComponentCollection', 'Controller');
App::uses('PagematronComponent', 'Controller/Component');

// A fake controller to test against
class TestPagematronController extends Controller {
    public $paginate = null;
}

class PagematronComponentTest extends CakeTestCase {
    public $PagematronComponent = null;
    public $Controller = null;

    public function setUp() {
        parent::setUp();
        // Setup our component and fake test controller
        $Collection = new ComponentCollection();
        $this->PagematronComponent = new PagematronComponent($Collection);
        $CakeRequest = new CakeRequest();
        $CakeResponse = new CakeResponse();
        $this->Controller = new TestPagematronController($CakeRequest, $CakeResponse);
        $this->PagematronComponent->startup($this->Controller);
    }

    public function testAdjust() {
        // Test our adjust method with different parameter settings
        $this->PagematronComponent->adjust();
        $this->assertEquals(20, $this->Controller->paginate['limit']);

        $this->PagematronComponent->adjust('medium');
        $this->assertEquals(50, $this->Controller->paginate['limit']);

        $this->PagematronComponent->adjust('long');
        $this->assertEquals(100, $this->Controller->paginate['limit']);
    }

    public function tearDown() {
        parent::tearDown();
        // Clean up after we're done
        unset($this->PagematronComponent);
        unset($this->Controller);
    }
}
```

Testing Helpers

Since a decent amount of logic resides in Helper classes, it’s important to make sure those classes are covered by test cases.

First we create an example helper to test. The `CurrencyRendererHelper` will help us display currencies in our views and for simplicity only has one method `usd()`.

```
<?php
// app/View/Helper/CurrencyRendererHelper.php
class CurrencyRendererHelper extends AppHelper {
    public function usd($amount) {
        return 'USD ' . number_format($amount, 2, '.', ',');
    }
}
```

Here we set the decimal places to 2, decimal separator to dot, thousands separator to comma, and prefix the formatted number with ‘USD’ string.

Now we create our tests:

```
<?php
// app/Test/Case/View/Helper/CurrencyRendererHelperTest.php

App::uses('Controller', 'Controller');
App::uses('View', 'View');
App::uses('CurrencyRendererHelper', 'View/Helper');

class CurrencyRendererHelperTest extends CakeTestCase {
    public $CurrencyRenderer = null;

    // Here we instantiate our helper
    public function setUp() {
        parent::setUp();
        $Controller = new Controller();
        $View = new View($Controller);
        $this->CurrencyRenderer = new CurrencyRendererHelper($View);
    }

    // Testing the usd() function
    public function testUsd() {
        $this->assertEquals('USD 5.30', $this->CurrencyRenderer->usd(5.30));

        // We should always have 2 decimal digits
        $this->assertEquals('USD 1.00', $this->CurrencyRenderer->usd(1));
        $this->assertEquals('USD 2.05', $this->CurrencyRenderer->usd(2.05));

        // Testing the thousands separator
        $this->assertEquals('USD 12,000.70', $this->CurrencyRenderer->usd(12000.70));
    }
}
```

Here, we call `usd()` with different parameters and tell the test suite to check if the returned values are equal to what is expected.

Save this in and execute the test. You should see a green bar and messaging indicating 1 pass and 4 assertions.

Creating Test Suites

If you want several of your tests to run at the same time, you can creating a test suite. A testsuite is composed of several test cases. `CakeTestSuite` offers a few methods for easily creating test suites based on the file system. If we wanted to create a test suite for all our model tests we could would create `app/Test/Case/AllModelTest.php`. Put the following in it:

```
<?php
class AllModelTest extends CakeTestSuite {
    public static function suite() {
        $suite = new CakeTestSuite('All model tests');
        $suite->addTestDirectory(TESTS . 'Case' . DS . 'Model');
        return $suite;
    }
}
```

The code above will group all test cases found in the `/app/Test/Case/Model/` folder. To add an individual file, use `$suite->addTestFile($filename);`. You can recursively add a directory for all tests using:

```
<?php
$suite->addTestDirectoryRecursive(TESTS . 'Case');
```

Would recursively add all test cases in the `app/Test/Case/` directory.

Creating Tests for Plugins

Tests for plugins are created in their own directory inside the plugins folder.:

```
/app
    /Plugin
        /Blog
            /Test
                /Case
                /Fixture
```

They work just like normal tests but you have to remember to use the naming conventions for plugins when importing classes. This is an example of a testcase for the `BlogPost` model from the plugins chapter of this manual. A difference from other tests is in the first line where 'Blog.BlogPost' is imported. You also need to prefix your plugin fixtures with `plugin.blog.blog_post`:

```
<?php
App::uses('BlogPost', 'Blog.Model');

class BlogPostTest extends CakeTestCase {

    // Plugin fixtures located in /app/Plugin/Blog/Test/Fixture/
    public $fixtures = array('plugin.blog.blog_post');
    public $BlogPost;

    public function testSomething() {
        // ClassRegistry makes the model use the test database connection
        $this->BlogPost = ClassRegistry::init('Blog.BlogPost');

        // do some useful test here
        $this->assertTrue(is_object($this->BlogPost));
    }
}
```

If you want to use plugin fixtures in the app tests you can reference them using `plugin.pluginName.fixtureName` syntax in the `$fixtures` array.

Integration with Jenkins

Jenkins (http://jenkins-ci.org) is a continuous integration server, that can help you automate the running of your test cases. This helps ensure that all your tests stay passing and your application is always ready.

Integrating a CakePHP application with Jenkins is fairly straightforward. The following assumes you've already installed Jenkins on *nix system, and are able to administer it. You also know how to create jobs, and run builds. If you are unsure of any of these, refer to the Jenkins documentation (http://jenkins-ci.org/) .

Create a job

Start off by creating a job for your application, and connect your repository so that jenkins can access your code.

Add test database config

Using a separate database just for Jenkins is generally a good idea, as it stops bleed through and avoids a number of basic problems. Once you've created a new database in a database server that jenkins can access (usually localhost). Add a *shell script step* to the build that contains the following:

```
cat > app/Config/database.php <<'DATABASE_PHP'
<?php
class DATABASE_CONFIG {
    public $test = array(
        'datasource' => 'Database/Mysql',
        'host'       => 'localhost',
        'database'   => 'jenkins_test',
        'login'      => 'jenkins',
        'password'   => 'cakephp_jenkins',
        'encoding'   => 'utf8'
    );
}
DATABASE_PHP
```

This ensures that you'll always have the correct database configuration that Jenkins requires. Do the same for any other configuration files you need to. It's often a good idea to drop and re-create the database before each build as well. This insulates you from chained failures, where one broken build causes others to fail. Add another *shell script step* to the build that contains the following:

```
mysql -u jenkins -pcakephp_jenkins -e 'DROP DATABASE IF EXISTS jenkins_test; CREATE DATABAS
```

Add your tests

Add another *shell script step* to your build. In this step run the tests for your application. Creating a junit log file, or clover coverage is often a nice bonus, as it gives you a nice graphical view of your testing results:

```
app/Console/cake test app AllTests \
--stderr \
--log-junit junit.xml \
--coverage-clover clover.xml
```

If you use clover coverage, or the junit results, make sure to configure those in Jenkins as well. Failing to configure those steps will mean you won't see the results.

Run a build

You should be able to run a build now. Check the console output and make any necessary changes to get a passing build.

REST

Many newer application programmers are realizing the need to open their core functionality to a greater audience. Providing easy, unfettered access to your core API can help get your platform accepted, and allows for mashups and easy integration with other systems.

While other solutions exist, REST is a great way to provide easy access to the logic you've created in your application. It's simple, usually XML-based (we're talking simple XML, nothing like a SOAP envelope), and depends on HTTP headers for direction. Exposing an API via REST in CakePHP is simple.

The Simple Setup

The fastest way to get up and running with REST is to add a few lines to your routes.php file, found in app/Config. The Router object features a method called `mapResources()`, that is used to set up a number of default routes for REST access to your controllers. Make sure `mapResources()` comes before `require CAKE . 'Config' . DS . 'routes.php';` and other routes which would override the routes. If we wanted to allow REST access to a recipe database, we'd do something like this:

```
<?php
//In app/Config/routes.php...

Router::mapResources('recipes');
Router::parseExtensions();
```

The first line sets up a number of default routes for easy REST access where method specifies the desired result format (e.g. xml, json, rss). These routes are HTTP Request Method sensitive.

HTTP format	URL.format	Controller action invoked
GET	/recipes.format	RecipesController::index()
GET	/recipes/123.format	RecipesController::view(123)
POST	/recipes.format	RecipesController::add()
PUT	/recipes/123.format	RecipesController::edit(123)
DELETE	/recipes/123.format	RecipesController::delete(123)
POST	/recipes/123.format	RecipesController::edit(123)

CakePHP's Router class uses a number of different indicators to detect the HTTP method being used. Here they are in order of preference:

1. The *_method* POST variable
2. The X_HTTP_METHOD_OVERRIDE
3. The REQUEST_METHOD header

The *_method* POST variable is helpful in using a browser as a REST client (or anything else that can do POST easily). Just set the value of _method to the name of the HTTP request method you wish to emulate.

Once the router has been set up to map REST requests to certain controller actions, we can move on to creating the logic in our controller actions. A basic controller might look something like this:

```
<?php
// Controller/RecipesController.php
class RecipesController extends AppController {

    public $components = array('RequestHandler');

    public function index() {
        $recipes = $this->Recipe->find('all');
        $this->set(array(
            'recipes' => $recipes,
            '_serialize' => array('recipe')
        ));
    }

    public function view($id) {
        $recipe = $this->Recipe->findById($id);
        $this->set(array(
            'recipe' => $recipe,
            '_serialize' => array('recipe')
        ));
    }

    public function edit($id) {
        $this->Recipe->id = $id;
        if ($this->Recipe->save($this->request->data)) {
            $message = 'Saved';
        } else {
            $message = 'Error';
        }
        $this->set(array(
            'message' => $message,
            '_serialize' => array('message')
        ));
    }

    public function delete($id) {
        if ($this->Recipe->delete($id)) {
            $message = 'Deleted';
        } else {
            $message = 'Error';
        }
        $this->set(array(
            'message' => $message,
            '_serialize' => array('message')
        ));
    }
}
```

Since we've added a call to `Router::parseExtensions()`, the CakePHP router is already primed to serve up different views based on different kinds of requests. Since we're dealing with REST requests, we'll be making XML views. You can also easily make JSON views using CakePHP's built in *JSON and XML views*. By using the built in `XmlView` we can define a `_serialize` view variable. This special view variable is used to define which view variables `XmlView` should serialize into XML.

If we wanted to modify the data before it is converted into XML we should not define the `_serialize` view variable, and instead use view files. We place the REST views for our RecipesController inside `app/View/recipes/xml`. We can also use the `Xml` for quick-and-easy XML output in those views. Here's what our index view might look like:

```
// app/View/Recipes/xml/index.ctp
<?php
// Do some formatting and manipulation on
// the $recipes array.
$xml = Xml::fromArray(array('response' => $recipes));
echo $xml->asXML();
```

When serving up a specific content type using parseExtensions(), CakePHP automatically looks for a view helper that matches the type. Since we're using XML as the content type, there is no built-in helper, however if you were to create one it would automatically be loaded for our use in those views.

The rendered XML will end up looking something like this:

```
<recipes>
    <recipe id="234" created="2008-06-13" modified="2008-06-14">
        <author id="23423" first_name="Billy" last_name="Bob"></author>
        <comment id="245" body="Yummy yummmy"></comment>
    </recipe>
    <recipe id="3247" created="2008-06-15" modified="2008-06-15">
        <author id="625" first_name="Nate" last_name="Johnson"></author>
        <comment id="654" body="This is a comment for this tasty dish."></comment>
    </recipe>
</recipes>
```

Creating the logic for the edit action is a bit trickier, but not by much. Since you're providing an API that outputs XML, it's a natural choice to receive XML as input. Not to worry, the `RequestHandler` and `Router` classes make things much easier. If a POST or PUT request has an XML content-type, then the input is run through Cake's `Xml` class, and the array representation of the data is assigned to *$this->request->data*. Because of this feature, handling XML and POST data in parallel is seamless: no changes are required to the controller or model code. Everything you need should end up in `$this->request->data`.

Accepting input in other formats

Typically REST applications not only output content in alternate data formats they also accept data in different formats. In CakePHP, the `RequestHandlerComponent` helps facilitate this. By default it will decode any incoming JSON/XML input data for POST/PUT requests and supply the array version of that data in *$this->request->data*. You can also wire in additional deserializers for alternate formats if you need them, using `RequestHandler::addInputType()`

Modifying the default REST routes

New in version 2.1. If the default REST routes don't work for your application, you can modify them using `Router::resourceMap()`. This method allows you to set the default routes that get set with `Router::mapResources()`. When using this method you need to set *all* the defaults you want to use:

```php
<?php
Router::resourceMap(array(
    array('action' => 'index', 'method' => 'GET', 'id' => false),
    array('action' => 'view', 'method' => 'GET', 'id' => true),
    array('action' => 'add', 'method' => 'POST', 'id' => false),
    array('action' => 'edit', 'method' => 'PUT', 'id' => true),
    array('action' => 'delete', 'method' => 'DELETE', 'id' => true),
    array('action' => 'update', 'method' => 'POST', 'id' => true)
));
```

By overwriting the default resource map, future calls to `mapResources()` will use the new values.

Custom REST Routing

If the default routes created by `Router::mapResources()` don't work for you, use the `Router::connect()` method to define a custom set of REST routes. The `connect()` method allows you to define a number of different options for a given URL. The first parameter is the URL itself, and the second parameter allows you to supply those options. The third parameter allows you to specify regex patterns to help CakePHP identify certain markers in the specified URL.

We'll provide a simple example here, and allow you to tailor this route for your other RESTful purposes. Here's what our edit REST route would look like, without using `Router::mapResources()`:

```
<?php
Router::connect(
    "/:controller/:id",
    array("action" => "edit", "[method]" => "PUT"),
    array("id" => "[0-9]+")
);
```

Advanced routing techniques are covered elsewhere, so we'll focus on the most important point for our purposes here: the [method] key of the options array in the second parameter. Once that key has been set, the specified route works only for that HTTP request method (which could also be GET, DELETE, etc.)

Dispatcher Filters

New in version 2.2. There are several reasons to want a piece of code to be run before any controller code is executed or right before the response is sent to the client, such as response caching, header tuning, special authentication or just to provide access to a mission-critical API response in lesser time than a complete request dispatching cycle would take.

CakePHP provides for such cases a clean and extensible interface for attaching filters to this dispatching cycle, similar to a middleware layer thought to provide stackable services or routines for every request. We call them *Dispatcher Filters*

Configuring Filters

Filters are usually configured in the `bootstrap.php` file, but you could easily load them from any other configuration file before the request is dispatched. Adding and removing filters is done through the *Configure* class, using the special key `Dispatch.filters`. By default CakePHP comes with a couple filter classes already enabled for all requests, let's take a look at how they are added:

```
<?php
Configure::write('Dispatcher.filters', array(
    'AssetDispatcher',
    'CacheDispatcher'
));
```

Each of those array values are class names that will be instantiated and added as listeners for the events generated at dispatcher level. The first one, `AssetDispatcher` is meant to check whether the request is referring to a theme or plugin asset file, such as a css, javascript or image stored on either a plugin's webroot folder or the corresponding one for a Theme. It will serve the file accordingly if found, stopping the rest of the dispatching cycle. The `CacheDispatcher` filter, when `Cache.check` config variable is enabled, will check if the response was already cached in the file system for a similar request and serve the cached code immediately.

As you can see, both provided filters have the responsibility of stopping any further code and send the response right away to the client. But filters are not limited to this role, as we will show shortly in this section.

You can add your own class names to the list of filters, and they will get executed in the order they were defined. There is also an alternative way for attaching filters that do not involve the special `DispatcherFilter` classes:

```
<?php
Configure::write('Dispatcher.filters', array(
    'my-filter' => array('callable' => array($classInstance, 'methodName'), 'on' => 'after'
));
```

As shown above, you can pass any valid PHP callback (http://php.net/callback) type, as you may remember, a *callback* is anything that PHP can execute with `call_user_func`. We do make a little exception, if a string is provided it will be treated as a class name, not as a possible function name. This of course gives the ability to PHP 5.3 users to attach anonymous functions as filters:

```
<?php
Configure::write('Dispatcher.filters', array(
   'my-filter' => array('callable' => function($event) {...}, 'on' => 'before'),
   //more filters here
));
```

The `on` key only takes `before` and `after` as valid values, and evidently means whether the filter should run before or after any controller code is executed. Additionally to defining filters with the `callable` key, you also get the chance to define a priority for your filters, if none is specified then a default of `10` is selected for you

As all filters will have default priority `10`, should you want to run a filter before any other in the list, select lower priority numbers as needed:

```
<?php
Configure::write('Dispatcher.filters', array(
   'my-filter' => array(
        'callable' => function($event) {...},
        'on' => 'before',
        'priority' => 5
    ),
    'other-filter' => array(
        'callable' => array($class, 'method'),
        'on' => 'after',
        'priority' => 1
    ),
   //more filters here
));
```

Obviously, when defining priorities the order in which filters are declared does not matter but for those having the same. When defining filters as class names there is no option to define priority in-line, we will get into that soon. Finally, CakePHP's plugin notation can be used to define filters located in plugins:

```
<?php
Configure::write('Dispatcher.filters', array(
    'MyPlugin.MyFilter',
));
```

Feel free to remove the default attached filters if you choose to use a more advanced/faster way of serving theme and plugin assets or if you do not wish to use built-in full page caching, or just implement your own.

Filter Classes

Dispatcher filters, when defined as class names in configuration, should extend the class `DispatcherFilter` provided in the *Routing* CakePHP's directory. Let's create a simple filter to respond to a specific url with a 'Hello World' text:

```
<?php
App::uses('DispatcherFilter', 'Routing');
class HelloWorldFilter extends DispatcherFilter {

    public $priority = 9;

    public function beforeDispatch($event) {
        $request = $event->data['request'];
        $response = $event->data['response'];

        if ($request->url === 'hello-world') {
            $response->body('Hello World');
            $event->stopPropagation();
            return $response;
        }
    }
}
```

This class should be saved in a file in `app/Routing/Filter/HelloWorldFilter.php` and configured in the bootstrap file according to how it was explained in the previous section. There is plenty to explain here, let's begin with the `$priority` value.

As mentioned before, when using filter classes you can only define the order in which they are run using the `$priority` property in the class, default value is 10 if the property is declared, this means that it will get executed _after_ the Router class has parsed the request. We do not want this to happen in our previous example, because most probably you do not have any controller set up for answering to that url, hence we chose 9 as our priority.

`DispatcherFilter` exposes two methods that can be overridden in subclasses, they are `beforeDispatch` and `afterDispatch`, and are executed before or after any controller is executed respectively. Both methods receive a `CakeEvent` object containing the `request` and `response` objects (`CakeRequest` and `CakeResponse` instances) along with an `additionalParams` array inside the `data` property. The latter contains information used for internal dispatching when calling `requestAction`.

In our example we conditionally returned the `$response` object as a result, this will tell the Dispatcher to not instantiate any controller and return such object as response immediately to the client. We also added `$event->stopPropagation()` to prevent other filters from being executed after this one.

Let's now create another filter for altering response headers in any public page, in our case it would be anything served from the `PagesController`:

```
<?php
App::uses('DispatcherFilter', 'Routing');
class HttpCacheFilter extends DispatcherFilter {

    public function afterDispatch($event) {
        $request = $event->data['request'];
        $response = $event->data['response'];

        if ($request->params['controller'] !== 'pages') {
            return;
        }
        if ($response->statusCode() === 200) {
            $response->sharable(true);
            $response->expires(strtotime('+1 day'));
        }
    }
}
```

This filter will send a expiration header to 1 day in the future for all responses produced by the pages controller. You could of course do the same in the controller, this is just an example of what could be done with filters. For instance, instead of altering the response you could cache it using the `Cache` class and serve the response from the `beforeDispatch` callback.

Inline Filters

Our last example will use an anonymous function (only available on PHP 5.3+) to serve a list of posts in json format, we encourage you to do so using controllers and the `JsonView` class, but let's imagine you need to save a few milliseconds for this mission-critical API endpoint:

```
<?php
$postsList = function($event) {
    if ($event->data['request']->url !== 'posts/recent.json') {
        return;
    }
    App::uses('ClassRegistry', 'Utility');
    $postModel = ClassRegistry::init('Post');
    $event->data['response']->body(json_encode($postModel->find('recent')));
    $event->stopPropagation();
    return $event->data['response'];
};

Configure::write('Dispatcher.filters', array(
    'AssetDispatcher',
    'CacheDispatcher',
    'recent-posts' => array(
        'callable' => $postsList,
        'priority' => 9,
        'on'=> 'before'
    )
));
```

In previous example we have selected a priority of `9` for our filter, so to skip any other logic either placed in custom or core filters such as CakePHP internal routing system. Although it is not required, it shows how to make your important code run first in case you need to trim as much fat as possible from some requests.

For obvious reasons this has the potential of making your app very difficult to maintain. Filters are a extremely powerful tool when used wisely, adding response handlers for each url in your app is not a good use for it. But if you got a valid reason to do so, then you have a clean solution at hand. Keep in mind that not everything need to be a filter, *Controllers* and *Components* are usually a more accurate choice for adding any request handling code to your app.

Vendor packages

Vendor file information goes here.

Vendor assets

Support for vendor assets have been removed for 1.3. It is recommended that you take any vendor assets you have and repackage them into plugins. See *Plugin assets* for more information.

CHAPTER 13

Deployment

Once your application is complete, or even before that you'll want to deploy it. There are a few things you should do when deploying a CakePHP application.

Check your security

If you're throwing your application out into the wild, it's a good idea to make sure it doesn't have any leaks. Check the *Security* to guard against CSRF attacks, form field tampering, and others. Doing *Data Validation*, and/or *Data Sanitization* is also a great idea, for protecting your database and also against XSS attacks. Check that only your `webroot` directory should be publicly visible, and that your secrets (such as your app salt, and any security keys) are private and unique as well!

Set document root

Setting the document root correctly on your application is an important step to keeping your code secure and your application safer. CakePHP applications, should have the document root set to the application's `app/webroot`. This makes the application and configuration files inaccessible through a URL. Setting the document root is different for different webservers. See the *Advanced Installation* documentation for webserver specific information.

Update core.php

Updating core.php, specifically the value of `debug` is extremely important. Turning debug = 0 disables a number of development features that should never be exposed to internet at large. Disabling debug changes the following types of things:

- Debug messages, created with `pr()` and `debug()` are disabled.
- Core CakePHP caches are flushed every 99 years, instead of every 10 seconds as in development.

- Error views are less informative, and give generic error messages instead.
- Errors are not displayed.
- Exception stack traces are disabled.

In addition to the above, many plugins and application extensions use `debug` to modify their behavior.

Multiple CakePHP applications using the same core

There are a few ways you can configure multiple applications to use the same CakePHP core. You can either use PHP's `include_path` or set the `CAKE_CORE_INCLUDE_PATH` in your application's `webroot/index.php`. Generally using PHP's `include_path` is easier and more robust. CakePHP comes preconfigured to look on the `include_path` as well so it's simple to use.

In your `php.ini` file locate the existing `include_path` directive, and either append to it or add an `include_path` directive:

```
include_path = '.:/usr/share/php:/usr/share/cakephp-2.0/lib'
```

This assumes you are running a *nix server, and have CakePHP in `/usr/share/cakephp-2.0`.

CHAPTER 14

Tutorials & Examples

In this section, you can walk through typical CakePHP applications to see how all of the pieces come together.

Alternatively, you can refer to the non-official CakePHP plugin repository CakePackages (http://cakepackages.com/) and the Bakery (http://bakery.cakephp.org/) for existing applications and components.

Blog Tutorial

Welcome to CakePHP. You're probably checking out this tutorial because you want to learn more about how CakePHP works. It's our aim to increase productivity and make coding more enjoyable: we hope you'll see this as you dive into the code.

This tutorial will walk you through the creation of a simple blog application. We'll be getting and installing Cake, creating and configuring a database, and creating enough application logic to list, add, edit, and delete blog posts.

Here's what you'll need:

1. A running web server. We're going to assume you're using Apache, though the instructions for using other servers should be very similar. We might have to play a little with the server configuration, but most folks can get Cake up and running without any configuration at all. Make sure you have PHP 5.2.8 or greater.

2. A database server. We're going to be using MySQL server in this tutorial. You'll need to know enough about SQL in order to create a database: Cake will be taking the reins from there. Since we're using MySQL, also make sure that you have `pdo_mysql` enabled in PHP.

3. Basic PHP knowledge. The more object-oriented programming you've done, the better: but fear not if you're a procedural fan.

4. Finally, you'll need a basic knowledge of the MVC programming pattern. A quick overview can be found in *Understanding Model-View-Controller*. Don't worry, it's only a half a page or so.

Let’s get started!

Getting Cake

First, let’s get a copy of fresh Cake code.

To get a fresh download, visit the CakePHP project on GitHub: http://github.com/cakephp/cakephp/downloads and download the latest release of 2.0

You can also clone the repository using git (http://git-scm.com/). `git clone git://github.com/cakephp/cakephp.git`

Regardless of how you downloaded it, place the code inside of your DocumentRoot. Once finished, your directory setup should look something like the following:

```
/path_to_document_root
    /app
    /lib
    /plugins
    /vendors
    .htaccess
    index.php
    README
```

Now might be a good time to learn a bit about how Cake’s directory structure works: check out *CakePHP Folder Structure* section.

Creating the Blog Database

Next, lets set up the underlying database for our blog. if you haven’t already done so, create an empty database for use in this tutorial, with a name of your choice. Right now, we’ll just create a single table to store our posts. We’ll also throw in a few posts right now to use for testing purposes. Execute the following SQL statements into your database:

```
/* First, create our posts table: */
CREATE TABLE posts (
    id INT UNSIGNED AUTO_INCREMENT PRIMARY KEY,
    title VARCHAR(50),
    body TEXT,
    created DATETIME DEFAULT NULL,
    modified DATETIME DEFAULT NULL
);

/* Then insert some posts for testing: */
INSERT INTO posts (title,body,created)
    VALUES ('The title', 'This is the post body.', NOW());
INSERT INTO posts (title,body,created)
    VALUES ('A title once again', 'And the post body follows.', NOW());
INSERT INTO posts (title,body,created)
    VALUES ('Title strikes back', 'This is really exciting! Not.', NOW());
```

The choices on table and column names are not arbitrary. If you follow Cake's database naming conventions, and Cake's class naming conventions (both outlined in *CakePHP Conventions*), you'll be able to take advantage of a lot of free functionality and avoid configuration. Cake is flexible enough to accommodate even the worst legacy database schema, but adhering to convention will save you time.

Check out *CakePHP Conventions* for more information, but suffice it to say that naming our table 'posts' automatically hooks it to our Post model, and having fields called 'modified' and 'created' will be automagically managed by Cake.

Cake Database Configuration

Onward and upward: let's tell Cake where our database is and how to connect to it. For many, this is the first and last time you configure anything.

A copy of CakePHP's database configuration file is found in `/app/Config/database.php.default`. Make a copy of this file in the same directory, but name it `database.php`.

The config file should be pretty straightforward: just replace the values in the `$default` array with those that apply to your setup. A sample completed configuration array might look something like the following:

```
<?php
public $default = array(
    'datasource' => 'Database/Mysql',
    'persistent' => false,
    'host' => 'localhost',
    'port' => '',
    'login' => 'cakeBlog',
    'password' => 'c4k3-rUl3Z',
    'database' => 'cake_blog_tutorial',
    'schema' => '',
    'prefix' => '',
    'encoding' => ''
);
```

Once you've saved your new `database.php` file, you should be able to open your browser and see the Cake welcome page. It should also tell you that your database connection file was found, and that Cake can successfully connect to the database.

Note: Remember that you'll need to have PDO, and pdo_mysql enabled in your php.ini.

Optional Configuration

There are three other items that can be configured. Most developers complete these laundry-list items, but they're not required for this tutorial. One is defining a custom string (or "salt") for use in security hashes. The second is defining a custom number (or "seed") for use in encryption. The third item is allowing CakePHP write access to its `tmp` folder.

The security salt is used for generating hashes. Change the default salt value by editing `/app/Config/core.php` line 187. It doesn't much matter what the new value is, as long as it's not easily guessed.

```
<?php
/**
 * A random string used in security hashing methods.
 */
Configure::write('Security.salt', 'pl345e-P45s_7h3*S@l7!');
```

The cipher seed is used for encrypt/decrypt strings. Change the default seed value by editing `/app/Config/core.php` line 192. It doesn't much matter what the new value is, as long as it's not easily guessed.

```
<?php
/**
 * A random numeric string (digits only) used to encrypt/decrypt strings.
 */
Configure::write('Security.cipherSeed', '7485712659625147843639846751');
```

The final task is to make the `app/tmp` directory web-writable. The best way to do this is to find out what user your webserver runs as (`<?php echo `whoami`; ?>`) and change the ownership of the `app/tmp` directory to that user. The final command you run (in *nix) might look something like this:

```
$ chown -R www-data app/tmp
```

If for some reason CakePHP can't write to that directory, you'll be informed by a warning while not in production mode.

A Note on mod_rewrite

Occasionally a new user will run in to mod_rewrite issues, so I'll mention them marginally here. If the CakePHP welcome page looks a little funny (no images or css styles), it probably means mod_rewrite isn't functioning on your system. Here are some tips to help get you up and running:

1. Make sure that an .htaccess override is allowed: in your httpd.conf, you should have a section that defines a section for each Directory on your server. Make sure the `AllowOverride` is set to `All` for the correct Directory. For security and performance reasons, do *not* set `AllowOverride` to `All` in `<Directory />`. Instead, look for the `<Directory>` block that refers to your actual website directory.

2. Make sure you are editing the correct httpd.conf rather than a user- or site-specific httpd.conf.

3. For some reason or another, you might have obtained a copy of CakePHP without the needed .htaccess files. This sometimes happens because some operating systems treat files that start with '.' as hidden, and don't copy them. Make sure your copy of CakePHP is from the downloads section of the site or our git repository.

4. Make sure Apache is loading up mod_rewrite correctly! You should see something like:

```
    LoadModule rewrite_module             libexec/httpd/mod_rewrite.so
```

or (for Apache 1.3):

```
AddModule                mod_rewrite.c
```

in your httpd.conf.

If you don't want or can't get mod_rewrite (or some other compatible module) up and running on your server, you'll need to use Cake's built in pretty URLs. In `/app/Config/core.php`, uncomment the line that looks like:

```
Configure::write('App.baseUrl', env('SCRIPT_NAME'));
```

Also remove these .htaccess files:

```
/.htaccess
/app/.htaccess
/app/webroot/.htaccess
```

This will make your URLs look like www.example.com/index.php/controllername/actionname/param rather than www.example.com/controllername/actionname/param.

If you are installing CakePHP on a webserver besides Apache, you can find instructions for getting URL rewriting working for other servers under the *Advanced Installation* section.

Continue to *Blog Tutorial - Adding a layer* to start building your first CakePHP application.

Blog Tutorial - Adding a layer

Create a Post Model

The Model class is the bread and butter of CakePHP applications. By creating a CakePHP model that will interact with our database, we'll have the foundation in place needed to do our view, add, edit, and delete operations later.

CakePHP's model class files go in `/app/Model`, and the file we'll be creating will be saved to `/app/Model/Post.php`. The completed file should look like this:

```
<?php
class Post extends AppModel {
}
```

Naming convention is very important in CakePHP. By naming our model Post, CakePHP can automatically infer that this model will be used in the PostsController, and will be tied to a database table called `posts`.

Note: CakePHP will dynamically create a model object for you, if it cannot find a corresponding file in /app/Model. This also means, that if you accidentally name your file wrong (i.e. post.php or posts.php) CakePHP will not recognize any of your settings and will use the defaults instead.

For more on models, such as table prefixes, callbacks, and validation, check out the *Models* chapter of the Manual.

Create a Posts Controller

Next, we'll create a controller for our posts. The controller is where all the business logic for post interaction will happen. In a nutshell, it's the place where you play with the models and get post-related work done. We'll place this new controller in a file called `PostsController.php` inside the `/app/Controller` directory. Here's what the basic controller should look like:

```php
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form');
}
```

Now, lets add an action to our controller. Actions often represent a single function or interface in an application. For example, when users request www.example.com/posts/index (which is also the same as www.example.com/posts/), they might expect to see a listing of posts. The code for that action would look something like this:

```php
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form');

    public function index() {
        $this->set('posts', $this->Post->find('all'));
    }
}
```

Let me explain the action a bit. By defining function `index()` in our PostsController, users can now access the logic there by requesting www.example.com/posts/index. Similarly, if we were to define a function called `foobar()`, users would be able to access that at www.example.com/posts/foobar.

Warning: You may be tempted to name your controllers and actions a certain way to obtain a certain URL. Resist that temptation. Follow CakePHP conventions (plural controller names, etc.) and create readable, understandable action names. You can map URLs to your code using "routes" covered later on.

The single instruction in the action uses `set()` to pass data from the controller to the view (which we'll create next). The line sets the view variable called 'posts' equal to the return value of the `find('all')` method of the Post model. Our Post model is automatically available at `$this->Post` because we've followed Cake's naming conventions.

To learn more about Cake's controllers, check out *Controllers* chapter.

Creating Post Views

Now that we have our data flowing to our model, and our application logic and flow defined by our controller, let's create a view for the index action we created above.

Cake views are just presentation-flavored fragments that fit inside an application's layout. For most applications they're HTML mixed with PHP, but they may end up as XML, CSV, or even binary data.

Layouts are presentation code that is wrapped around a view, and can be defined and switched between, but for now, let's just use the default.

Remember in the last section how we assigned the 'posts' variable to the view using the `set()` method? That would hand down data to the view that would look something like this:

```
// print_r($posts) output:

Array
(
    [0] => Array
        (
            [Post] => Array
                (
                    [id] => 1
                    [title] => The title
                    [body] => This is the post body.
                    [created] => 2008-02-13 18:34:55
                    [modified] =>
                )
        )
    [1] => Array
        (
            [Post] => Array
                (
                    [id] => 2
                    [title] => A title once again
                    [body] => And the post body follows.
                    [created] => 2008-02-13 18:34:56
                    [modified] =>
                )
        )
    [2] => Array
        (
            [Post] => Array
                (
                    [id] => 3
                    [title] => Title strikes back
                    [body] => This is really exciting! Not.
                    [created] => 2008-02-13 18:34:57
                    [modified] =>
                )
        )
)
```

Cake's view files are stored in `/app/View` inside a folder named after the controller they correspond to (we'll have to create a folder named 'Posts' in this case). To format this post data in a nice table, our view code might look something like this:

```
<!-- File: /app/View/Posts/index.ctp -->

<h1>Blog posts</h1>
<table>
    <tr>
```

```
        <th>Id</th>
        <th>Title</th>
        <th>Created</th>
    </tr>

    <!-- Here is where we loop through our $posts array, printing out post info -->

    <?php foreach ($posts as $post): ?>
    <tr>
        <td><?php echo $post['Post']['id']; ?></td>
        <td>
            <?php echo $this->Html->link($post['Post']['title'],
array('controller' => 'posts', 'action' => 'view', $post['Post']['id'])); ?>
        </td>
        <td><?php echo $post['Post']['created']; ?></td>
    </tr>
    <?php endforeach; ?>
    <?php unset($post); ?>
</table>
```

Hopefully this should look somewhat simple.

You might have noticed the use of an object called `$this->Html`. This is an instance of the CakePHP `HtmlHelper` class. CakePHP comes with a set of view helpers that make things like linking, form output, JavaScript and Ajax a snap. You can learn more about how to use them in *Helpers*, but what's important to note here is that the `link()` method will generate an HTML link with the given title (the first parameter) and URL (the second parameter).

When specifying URLs in Cake, it is recommended that you use the array format. This is explained in more detail in the section on Routes. Using the array format for URLs allows you to take advantage of CakePHP's reverse routing capabilities. You can also specify URLs relative to the base of the application in the form of /controller/action/param1/param2.

At this point, you should be able to point your browser to http://www.example.com/posts/index. You should see your view, correctly formatted with the title and table listing of the posts.

If you happened to have clicked on one of the links we created in this view (that link a post's title to a URL /posts/view/some_id), you were probably informed by CakePHP that the action hasn't yet been defined. If you were not so informed, either something has gone wrong, or you actually did define it already, in which case you are very sneaky. Otherwise, we'll create it in the PostsController now:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form');

    public function index() {
         $this->set('posts', $this->Post->find('all'));
    }

    public function view($id = null) {
        $this->Post->id = $id;
        $this->set('post', $this->Post->read());
    }
}
```

The `set()` call should look familiar. Notice we're using `read()` rather than `find('all')` because we only really want a single post's information.

Notice that our view action takes a parameter: the ID of the post we'd like to see. This parameter is handed to the action through the requested URL. If a user requests /posts/view/3, then the value '3' is passed as `$id`.

Now let's create the view for our new 'view' action and place it in `/app/View/Posts/view.ctp`.

```
<!-- File: /app/View/Posts/view.ctp -->

<h1><?php echo h($post['Post']['title']); ?></h1>

<p><small>Created: <?php echo $post['Post']['created']; ?></small></p>

<p><?php echo h($post['Post']['body']); ?></p>
```

Verify that this is working by trying the links at `/posts/index` or manually requesting a post by accessing `/posts/view/1`.

Adding Posts

Reading from the database and showing us the posts is a great start, but let's allow for the adding of new posts.

First, start by creating an `add()` action in the PostsController:

```
<?php
class PostsController extends AppController {
    public $helpers = array('Html', 'Form', 'Session');
    public $components = array('Session');

    public function index() {
        $this->set('posts', $this->Post->find('all'));
    }

    public function view($id) {
        $this->Post->id = $id;
        $this->set('post', $this->Post->read());

    }

    public function add() {
        if ($this->request->is('post')) {
            if ($this->Post->save($this->request->data)) {
                $this->Session->setFlash('Your post has been saved.');
                $this->redirect(array('action' => 'index'));
            } else {
                $this->Session->setFlash('Unable to add your post.');
            }
        }
    }
}
```

Note: You need to include the SessionComponent - and SessionHelper - in any controller where you will use it. If necessary, include it in your AppController.

Here's what the `add()` action does: if HTTP method of the request was POST, try to save the data using the Post model. If for some reason it doesn't save, just render the view. This gives us a chance to show the user validation errors or other warnings.

Every CakePHP request includes a `CakeRequest` object which is accessible using `$this->request`. The request object contains useful information regarding the request that was just received, and can be used to control the flow of your application. In this case, we use the `CakeRequest::is()` method to check that the request is a HTTP POST request.

When a user uses a form to POST data to your application, that information is available in `$this->request->data`. You can use the `pr()` or `debug()` functions to print it out if you want to see what it looks like.

We use the SessionComponent's `SessionComponent::setFlash()` method to set a message to a session variable to be displayed on the page after redirection. In the layout we have `SessionHelper::flash` which displays the message and clears the corresponding session variable. The controller's `Controller::redirect` function redirects to another URL. The param `array('action' => 'index')` translates to URL /posts i.e the index action of posts controller. You can refer to `Router::url()` function on the api to see the formats in which you can specify a URL for various cake functions.

Calling the `save()` method will check for validation errors and abort the save if any occur. We'll discuss how those errors are handled in the following sections.

Data Validation

Cake goes a long way in taking the monotony out of form input validation. Everyone hates coding up endless forms and their validation routines. CakePHP makes it easier and faster.

To take advantage of the validation features, you'll need to use Cake's FormHelper in your views. The `FormHelper` is available by default to all views at `$this->Form`.

Here's our add view:

```
<!-- File: /app/View/Posts/add.ctp -->

<h1>Add Post</h1>
<?php
echo $this->Form->create('Post');
echo $this->Form->input('title');
echo $this->Form->input('body', array('rows' => '3'));
echo $this->Form->end('Save Post');
?>
```

Here, we use the FormHelper to generate the opening tag for an HTML form. Here's the HTML that `$this->Form->create()` generates:

```
<form id="PostAddForm" method="post" action="/posts/add">
```

If `create()` is called with no parameters supplied, it assumes you are building a form that submits to the current controller's `add()` action (or `edit()` action when `id` is included in the form data), via POST.

The `$this->Form->input()` method is used to create form elements of the same name. The first parameter tells CakePHP which field they correspond to, and the second parameter allows you to specify a wide array of options - in this case, the number of rows for the textarea. There's a bit of introspection and automagic here: `input()` will output different form elements based on the model field specified.

The `$this->Form->end()` call generates a submit button and ends the form. If a string is supplied as the first parameter to `end()`, the FormHelper outputs a submit button named accordingly along with the closing form tag. Again, refer to *Helpers* for more on helpers.

Now let's go back and update our `/app/View/Posts/index.ctp` view to include a new "Add Post" link. Before the `<table>`, add the following line:

```
<?php echo $this->Html->link('Add Post', array('controller' => 'posts', 'action' => 'add')
```

You may be wondering: how do I tell CakePHP about my validation requirements? Validation rules are defined in the model. Let's look back at our Post model and make a few adjustments:

```
<?php
class Post extends AppModel {
    public $validate = array(
        'title' => array(
            'rule' => 'notEmpty'
        ),
        'body' => array(
            'rule' => 'notEmpty'
        )
    );
}
```

The `$validate` array tells CakePHP how to validate your data when the `save()` method is called. Here, I've specified that both the body and title fields must not be empty. CakePHP's validation engine is strong, with a number of pre-built rules (credit card numbers, email addresses, etc.) and flexibility for adding your own validation rules. For more information on that setup, check the *Data Validation*.

Now that you have your validation rules in place, use the app to try to add a post with an empty title or body to see how it works. Since we've used the `FormHelper::input()` method of the FormHelper to create our form elements, our validation error messages will be shown automatically.

Editing Posts

Post editing: here we go. You're a CakePHP pro by now, so you should have picked up a pattern. Make the action, then the view. Here's what the `edit()` action of the PostsController would look like:

```
<?php
public function edit($id = null) {
    $this->Post->id = $id;
    if ($this->request->is('get')) {
        $this->request->data = $this->Post->read();
    } else {
        if ($this->Post->save($this->request->data)) {
            $this->Session->setFlash('Your post has been updated.');
            $this->redirect(array('action' => 'index'));
        } else {
            $this->Session->setFlash('Unable to update your post.');
        }
    }
}
```

This action first checks that the request is a GET request. If it is, then we find the Post and hand it to the view. If the user request is not a GET, it probably contains POST data. We'll use the POST data to update our Post record with, or kick back and show the user the validation errors.

The edit view might look something like this:

```
<!-- File: /app/View/Posts/edit.ctp -->

<h1>Edit Post</h1>
<?php
    echo $this->Form->create('Post', array('action' => 'edit'));
    echo $this->Form->input('title');
    echo $this->Form->input('body', array('rows' => '3'));
    echo $this->Form->input('id', array('type' => 'hidden'));
    echo $this->Form->end('Save Post');
```

This view outputs the edit form (with the values populated), along with any necessary validation error messages.

One thing to note here: CakePHP will assume that you are editing a model if the 'id' field is present in the data array. If no 'id' is present (look back at our add view), Cake will assume that you are inserting a new model when `save()` is called.

You can now update your index view with links to edit specific posts:

```
<!-- File: /app/View/Posts/index.ctp  (edit links added) -->

<h1>Blog posts</h1>
<p><?php echo $this->Html->link("Add Post", array('action' => 'add')); ?></p>
<table>
    <tr>
        <th>Id</th>
        <th>Title</th>
                <th>Action</th>
        <th>Created</th>
    </tr>

<!-- Here's where we loop through our $posts array, printing out post info -->
```

```
<?php foreach ($posts as $post): ?>
    <tr>
        <td><?php echo $post['Post']['id']; ?></td>
        <td>
            <?php echo $this->Html->link($post['Post']['title'], array('action' => 'view',
        </td>
        <td>
            <?php echo $this->Html->link('Edit', array('action' => 'edit', $post['Post']['
        </td>
        <td>
            <?php echo $post['Post']['created']; ?>
        </td>
    </tr>
<?php endforeach; ?>

</table>
```

Deleting Posts

Next, let's make a way for users to delete posts. Start with a `delete()` action in the PostsController:

```
<?php
public function delete($id) {
    if ($this->request->is('get')) {
        throw new MethodNotAllowedException();
    }
    if ($this->Post->delete($id)) {
        $this->Session->setFlash('The post with id: ' . $id . ' has been deleted.');
        $this->redirect(array('action' => 'index'));
    }
}
```

This logic deletes the post specified by $id, and uses `$this->Session->setFlash()` to show the user a confirmation message after redirecting them on to `/posts`. If the user attempts to do a delete using a GET request, we throw an Exception. Uncaught exceptions are captured by CakePHP's exception handler, and a nice error page is displayed. There are many built-in *Exceptions* that can be used to indicate the various HTTP errors your application might need to generate.

Because we're just executing some logic and redirecting, this action has no view. You might want to update your index view with links that allow users to delete posts, however:

```
<!-- File: /app/View/Posts/index.ctp -->

<h1>Blog posts</h1>
<p><?php echo $this->Html->link('Add Post', array('action' => 'add')); ?></p>
<table>
    <tr>
        <th>Id</th>
        <th>Title</th>
        <th>Actions</th>
        <th>Created</th>
    </tr>
```

```
<!-- Here's where we loop through our $posts array, printing out post info -->

    <?php foreach ($posts as $post): ?>
    <tr>
        <td><?php echo $post['Post']['id']; ?></td>
        <td>
            <?php echo $this->Html->link($post['Post']['title'], array('action' => 'view',
        </td>
        <td>
            <?php echo $this->Form->postLink(
                'Delete',
                array('action' => 'delete', $post['Post']['id']),
                array('confirm' => 'Are you sure?'));
            ?>
            <?php echo $this->Html->link('Edit', array('action' => 'edit', $post['Post']['
        </td>
        <td>
            <?php echo $post['Post']['created']; ?>
        </td>
    </tr>
    <?php endforeach; ?>

</table>
```

Using `postLink()` will create a link that uses Javascript to do a POST request deleting our post. Allowing content to be deleted using GET requests is dangerous, as web crawlers could accidentally delete all your content.

Note: This view code also uses the FormHelper to prompt the user with a JavaScript confirmation dialog before they attempt to delete a post.

Routes

For some, CakePHP's default routing works well enough. Developers who are sensitive to user-friendliness and general search engine compatibility will appreciate the way that CakePHP's URLs map to specific actions. So we'll just make a quick change to routes in this tutorial.

For more information on advanced routing techniques, see *Routes Configuration*.

By default, CakePHP responds to a request for the root of your site (i.e. http://www.example.com) using its PagesController, rendering a view called "home". Instead, we'll replace this with our PostsController by creating a routing rule.

Cake's routing is found in `/app/Config/routes.php`. You'll want to comment out or remove the line that defines the default root route. It looks like this:

```
<?php
Router::connect('/', array('controller' => 'pages', 'action' => 'display', 'home'));
```

This line connects the URL '/' with the default CakePHP home page. We want it to connect with our own controller, so replace that line with this one:

```php
<?php
Router::connect('/', array('controller' => 'posts', 'action' => 'index'));
```

This should connect users requesting '/' to the index() action of our PostsController.

Note: CakePHP also makes use of 'reverse routing' - if with the above route defined you pass `array('controller' => 'posts', 'action' => 'index')` to a function expecting an array, the resultant URL used will be '/'. It's therefore a good idea to always use arrays for URLs as this means your routes define where a URL goes, and also ensures that links point to the same place too.

Conclusion

Creating applications this way will win you peace, honor, love, and money beyond even your wildest fantasies. Simple, isn't it? Keep in mind that this tutorial was very basic. CakePHP has *many* more features to offer, and is flexible in ways we didn't wish to cover here for simplicity's sake. Use the rest of this manual as a guide for building more feature-rich applications.

Now that you've created a basic Cake application you're ready for the real thing. Start your own project, read the rest of the `Cookbook` and API (http://api20.cakephp.org).

If you need help, come see us in #cakephp. Welcome to CakePHP!

Suggested Follow-up Reading

These are common tasks people learning CakePHP usually want to study next:

1. *Layouts*: Customizing your website layout
2. *Elements* Including and reusing view snippets
3. *Scaffolding*: Prototyping before creating code
4. *Code Generation with Bake* Generating basic CRUD code
5. *Simple Authentication and Authorization Application*: User authentication and authorization tutorial

Simple Authentication and Authorization Application

Following our *Blog Tutorial* example, imagine we wanted to secure the access to certain urls, based on the logged in user. We also have another requirement, to allow our blog to have multiple authors so each one of them can create their own posts, edit and delete them at will disallowing other authors to make any changes on one's posts.

Creating all users' related code

First, let's create a new table in our blog database to hold our users' data:

```
CREATE TABLE users (
    id INT UNSIGNED AUTO_INCREMENT PRIMARY KEY,
    username VARCHAR(50),
    password VARCHAR(50),
    role VARCHAR(20),
    created DATETIME DEFAULT NULL,
    modified DATETIME DEFAULT NULL
);
```

We have adhered to the CakePHP conventions in naming tables, but we're also taking advantage of another convention: by using the username and password columns in a users table, CakePHP will be able to auto configure most things for us when implementing the user login.

Next step is to create our User model, responsible for finding, saving and validating any user data:

```
<?php
// app/Model/User.php
class User extends AppModel {
    public $name = 'User';
    public $validate = array(
        'username' => array(
            'required' => array(
                'rule' => array('notEmpty'),
                'message' => 'A username is required'
            )
        ),
        'password' => array(
            'required' => array(
                'rule' => array('notEmpty'),
                'message' => 'A password is required'
            )
        ),
        'role' => array(
            'valid' => array(
                'rule' => array('inList', array('admin', 'author')),
                'message' => 'Please enter a valid role',
                'allowEmpty' => false
            )
        )
    );
}
```

Let's also create our UsersController, the following contents correspond to a basic *baked* UsersController class using the code generation utilities bundled with CakePHP:

```
<?php
// app/Controller/UsersController.php
class UsersController extends AppController {

    public function beforeFilter() {
        parent::beforeFilter();
        $this->Auth->allow('add', 'logout');
    }

    public function index() {
        $this->User->recursive = 0;
        $this->set('users', $this->paginate());
    }

    public function view($id = null) {
        $this->User->id = $id;
        if (!$this->User->exists()) {
            throw new NotFoundException(__('Invalid user'));
        }
        $this->set('user', $this->User->read(null, $id));
    }

    public function add() {
        if ($this->request->is('post')) {
            $this->User->create();
            if ($this->User->save($this->request->data)) {
                $this->Session->setFlash(__('The user has been saved'));
                $this->redirect(array('action' => 'index'));
            } else {
                $this->Session->setFlash(__('The user could not be saved. Please, try agai
            }
        }
    }

    public function edit($id = null) {
        $this->User->id = $id;
        if (!$this->User->exists()) {
            throw new NotFoundException(__('Invalid user'));
        }
        if ($this->request->is('post') || $this->request->is('put')) {
            if ($this->User->save($this->request->data)) {
                $this->Session->setFlash(__('The user has been saved'));
                $this->redirect(array('action' => 'index'));
            } else {
                $this->Session->setFlash(__('The user could not be saved. Please, try agai
            }
        } else {
            $this->request->data = $this->User->read(null, $id);
            unset($this->request->data['User']['password']);
        }
    }

    public function delete($id = null) {
        if (!$this->request->is('post')) {
            throw new MethodNotAllowedException();
        }
        $this->User->id = $id;
        if (!$this->User->exists()) {
            throw new NotFoundException(__('Invalid user'));
        }
        if ($this->User->delete()) {
            $this->Session->setFlash(__('User deleted'));
            $this->redirect(array('action' => 'index'));
        }
        $this->Session->setFlash(__('User was not deleted'));
        $this->redirect(array('action' => 'index'));
    }
}
```

In the same way we created the views for our blog posts or by using the code generation tool, we implement the views. For the purpose of this tutorial, we will show just the add.ctp:

```
<!-- app/View/Users/add.ctp -->
<div class="users form">
<?php echo $this->Form->create('User'); ?>
    <fieldset>
        <legend><?php echo __('Add User'); ?></legend>
    <?php
        echo $this->Form->input('username');
        echo $this->Form->input('password');
        echo $this->Form->input('role', array(
            'options' => array('admin' => 'Admin', 'author' => 'Author')
        ));
    ?>
    </fieldset>
<?php echo $this->Form->end(__('Submit')); ?>
</div>
```

Authentication (login and logout)

We're now ready to add our authentication layer. In CakePHP this is handled by the `AuthComponent`, a class responsible for requiring login for certain actions, handling user sign-in and sign-out, and also authorizing logged in users to the actions are allowed to reach.

To add this component to your application open your `app/Controller/AppController.php` file and add the following lines:

```
<?php
// app/Controller/AppController.php
class AppController extends Controller {
    //...

    public $components = array(
        'Session',
        'Auth' => array(
            'loginRedirect' => array('controller' => 'posts', 'action' => 'index'),
            'logoutRedirect' => array('controller' => 'pages', 'action' => 'display', 'home
        )
    );
    public function beforeFilter() {
        $this->Auth->allow('index', 'view');
    }
    //...
}
```

There is not much to configure, as we used the conventions for the users table. We just set up the urls that will be loaded after the login and logout actions is performed, in our case to `/posts/` and `/` respectively.

What we did in the `beforeFilter` function was to tell the AuthComponent to not require a login for all `index` and `view` actions, in every controller. We want our visitors to be able to read and list the entries without registering in the site.

Now, we need to be able to register new users, save their username and password, and more importantly hash their password so it is not stored as plain text in our database. Let's tell the AuthComponent to let un-authenticated users to access the users add function and implement the login and logout action:

```
<?php
// app/Controller/UsersController.php

public function beforeFilter() {
    parent::beforeFilter();
    $this->Auth->allow('add'); // Letting users register themselves
}

public function login() {
    if ($this->request->is('post')) {
        if ($this->Auth->login()) {
            $this->redirect($this->Auth->redirect());
        } else {
            $this->Session->setFlash(__('Invalid username or password, try again'));
        }
    }
}

public function logout() {
    $this->redirect($this->Auth->logout());
}
```

Password hashing is not done yet, open your `app/Model/User.php` model file and add the following:

```
<?php
// app/Model/User.php
App::uses('AuthComponent', 'Controller/Component');
class User extends AppModel {

// ...

public function beforeSave($options = array()) {
    if (isset($this->data[$this->alias]['password'])) {
        $this->data[$this->alias]['password'] = AuthComponent::password($this->data[$this->-
    }
    return true;
}
```

```
// ...
```

So, now every time a user is saved, the password is hashed using the default hashing provided by the AuthComponent class. We're just missing a template view file for the login function, here it is:

```
<div class="users form">
<?php echo $this->Session->flash('auth'); ?>
<?php echo $this->Form->create('User'); ?>
    <fieldset>
        <legend><?php echo __('Please enter your username and password'); ?></legend>
    <?php
        echo $this->Form->input('username');
        echo $this->Form->input('password');
    ?>
    </fieldset>
<?php echo $this->Form->end(__('Login')); ?>
</div>
```

You can now register a new user by accessing the `/users/add` url and log-in with the newly created credentials by going to `/users/login` url. Also try to access any other url that was not explicitly allowed such as `/posts/add`, you will see that the application automatically redirects you to the login page.

And that's it! It looks too simple to be truth. Let's go back a bit to explain what happened. The `beforeFilter` function is telling the AuthComponent to not require a login for the `add` action in addition to the `index` and `view` actions that were already allowed int the AppController's `beforeFilter` function.

The `login` action calls the `$this->Auth->login()` function in the AuthComponent, and it works without any further config because we are following conventions as mentioned earlier. That is, having a User model with a username and a password column, and use a form posted to a controller with the user data. This function returns whether the login was successful or not, and in the case it succeeds, then we redirect the user to the configured redirection url that we used when adding the AuthComponent to our application.

The logout works by just accessing the `/users/logout` url and will redirect the user to the configured logoutUrl formerly described. This url is the result of the `AuthComponent::logout()` function on success

Authorization (who's allowed to access what)

As stated before, we are converting this blog in a multi user authoring tool, and in order to do this, we need to modify the posts table a bit to add the reference to the User model:

```
ALTER TABLE posts ADD COLUMN user_id INT(11);
```

Also, a small change in the PostsController is required to store the currently logged in user as a reference for the created post:

```
<?php
// app/Controller/PostsController.php
public function add() {
    if ($this->request->is('post')) {
        $this->request->data['Post']['user_id'] = $this->Auth->user('id'); //Added this li
        if ($this->Post->save($this->request->data)) {
            $this->Session->setFlash('Your post has been saved.');
            $this->redirect(array('action' => 'index'));
        }
    }
}
```

The `user()` function provided by the component returns any column from the currently logged in user. We used this method to add the data into the request info that is saved.

Let's secure our app to prevent some authors to edit or delete the others' posts. Basic rules for our app are that admin users can access every url, while normal users (the author role) can only access the permitted actions. Open again the AppController class and add a few more options to the Auth config:

```
<?php
// app/Controller/AppController.php

public $components = array(
    'Session',
    'Auth' => array(
        'loginRedirect' => array('controller' => 'posts', 'action' => 'index'),
        'logoutRedirect' => array('controller' => 'pages', 'action' => 'display', 'home'),
        'authorize' => array('Controller') // Added this line
    )
);

public function isAuthorized($user) {
    // Admin can access every action
    if (isset($user['role']) && $user['role'] === 'admin') {
        return true;
    }

    // Default deny
    return false;
}
```

We just created a very simple authorization mechanism. In this case the users with role `admin` will be able to access any url in the site when logged in, but the rest of them (i.e the role `author`) can't do anything different from not logged in users.

This is not exactly what we wanted, so we need to fix to supply more rules to our `isAuthorized()` method. But instead of doing it in AppController, let's delegate each controller to supply those extra rules. The rules we're going to add to PostsController should allow authors to create posts but prevent the edition of posts if the author does not match. Open the file `PostsController.php` and add the following content:

```
<?php
// app/Controller/PostsController.php

public function isAuthorized($user) {
    // All registered users can add posts
    if ($this->action === 'add') {
        return true;
    }

    // The owner of a post can edit and delete it
    if (in_array($this->action, array('edit', 'delete'))) {
        $postId = $this->request->params['pass'][0];
        if ($this->Post->isOwnedBy($postId, $user['id'])) {
            return true;
        }
    }

    return parent::isAuthorized($user);
}
```

We're now overriding the AppController's `isAuthorized()` call and internally checking if the parent class is already authorizing the user. If he isn't, then just allow him to access the add action, and conditionally access edit and delete. A final thing is left to be implemented, to tell whether the user is authorized to edit the post or not, we're calling a `isOwnedBy()` function in the Post model. It is in general a good practice to move as much logic as possible into models. Let's then implement the function:

```
<?php
// app/Model/Post.php

public function isOwnedBy($post, $user) {
    return $this->field('id', array('id' => $post, 'user_id' => $user)) === $post;
}
```

This concludes our simple authentication and authorization tutorial. For securing the UsersController you can follow the same technique we did for PostsController, you could also be more creative and code something more general in AppController based on your own rules.

Should you need more control, we suggest you reading the complete Auth guide in the *Authentication* section where you will find more about configuring the component, creating custom Authorization classes, and much more.

Suggested Follow-up Reading

1. *Code Generation with Bake* Generating basic CRUD code
2. *Authentication*: User registration and login

Simple Acl controlled Application

In this tutorial you will create a simple application with *Authentication* and *Access Control Lists*. This tutorial assumes you have read the *Blog Tutorial* tutorial, and you are familiar with *Code Generation with Bake*. You should have some experience with CakePHP, and be familiar with MVC concepts. This tutorial is a brief introduction to the `AuthComponent` and `AclComponent`.

What you will need

1. A running web server. We're going to assume you're using Apache, though the instructions for using other servers should be very similar. We might have to play a little with the server configuration, but most folks can get Cake up and running without any configuration at all.
2. A database server. We're going to be using MySQL in this tutorial. You'll need to know enough about SQL in order to create a database: Cake will be taking the reins from there.
3. Basic PHP knowledge. The more object-oriented programming you've done, the better: but fear not if you're a procedural fan.

Preparing our Application

First, let's get a copy of fresh Cake code.

To get a fresh download, visit the CakePHP project at GitHub: http://github.com/cakephp/cakephp/downloads and download the stable release. For this tutorial you need the latest 2.0 release.

You can also clone the repository using git (http://git-scm.com/). `git clone git://github.com/cakephp/cakephp.git`

Once you've got a fresh copy of cake setup your database.php config file, and change the value of Security.salt in your app/Config/core.php. From there we will build a simple database schema to build our application on. Execute the following SQL statements into your database:

```
CREATE TABLE users (
    id INT(11) NOT NULL AUTO_INCREMENT PRIMARY KEY,
    username VARCHAR(255) NOT NULL UNIQUE,
    password CHAR(40) NOT NULL,
    group_id INT(11) NOT NULL,
    created DATETIME,
    modified DATETIME
);


CREATE TABLE groups (
    id INT(11) NOT NULL AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    created DATETIME,
    modified DATETIME
);


CREATE TABLE posts (
    id INT(11) NOT NULL AUTO_INCREMENT PRIMARY KEY,
    user_id INT(11) NOT NULL,
    title VARCHAR(255) NOT NULL,
    body TEXT,
    created DATETIME,
    modified DATETIME
);

CREATE TABLE widgets (
    id INT(11) NOT NULL AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    part_no VARCHAR(12),
    quantity INT(11)
);
```

These are the tables we will be using to build the rest of our application. Once we have the table structure in the database we can start cooking. Use *Code Generation with Bake* to quickly create your models, controllers, and views.

To use cake bake, call "cake bake all" and this will list the 4 tables you inserted into mySQL. Select "1. Group", and follow the prompts. Repeat for the other 3 tables, and this will have generated the 4 controllers, models and your views for you.

Avoid using Scaffold here. The generation of the ACOs will be seriously affected if you bake the controllers with the Scaffold feature.

While baking the Models cake will automagically detect the associations between your Models (or relations between your tables). Let cake supply the correct hasMany and belongsTo associations. If you are prompted to pick hasOne or hasMany, generally speaking you'll need a hasMany (only) relationships for this tutorial.

Leave out admin routing for now, this is a complicated enough subject without them. Also be sure **not** to add either the Acl or Auth Components to any of your controllers as you are baking them. We'll be doing that soon enough. You should now have models, controllers, and baked views for your users, groups, posts and widgets.

Preparing to Add Auth

We now have a functioning CRUD application. Bake should have setup all the relations we need, if not add them in now. There are a few other pieces that need to be added before we can add the Auth and Acl components. First add a login and logout action to your `UsersController`:

```
<?php
public function login() {
    if ($this->request->is('post')) {
        if ($this->Auth->login()) {
            $this->redirect($this->Auth->redirect());
        } else {
            $this->Session->setFlash('Your username or password was incorrect.');
        }
    }
}

public function logout() {
    //Leave empty for now.
}
```

Then create the following view file for login at `app/View/Users/login.ctp`:

```
<?php
echo $this->Form->create('User', array('action' => 'login'));
echo $this->Form->inputs(array(
    'legend' => __('Login'),
    'username',
    'password'
));
echo $this->Form->end('Login');
```

Next we'll have to update our User model to hash passwords before they go into the database. Storing plaintext passwords is extremely insecure and AuthComponent will expect that your passwords are hashed. In `app/Model/User.php` add the following:

```
<?php
App::uses('AuthComponent', 'Controller/Component');
class User extends AppModel {
    // other code.

    public function beforeSave($options = array()) {
        $this->data['User']['password'] = AuthComponent::password($this->data['User']['pas
        return true;
    }
}
```

Next we need to make some modifications to `AppController`. If you don't have `/app/Controller/AppController.php`, create it. Note that this goes in /app/Controller/, not /app/app_controllers.php. Since we want our entire site controlled with Auth and Acl, we will set them up in `AppController`:

```
<?php
class AppController extends Controller {
    public $components = array(
        'Acl',
        'Auth' => array(
            'authorize' => array(
                'Actions' => array('actionPath' => 'controllers')
            )
        ),
        'Session'
    );
    public $helpers = array('Html', 'Form', 'Session');

    public function beforeFilter() {
        //Configure AuthComponent
        $this->Auth->loginAction = array('controller' => 'users', 'action' => 'login');
        $this->Auth->logoutRedirect = array('controller' => 'users', 'action' => 'login');
        $this->Auth->loginRedirect = array('controller' => 'posts', 'action' => 'add');
    }
}
```

Before we set up the ACL at all we will need to add some users and groups. With `AuthComponent` in use we will not be able to access any of our actions, as we are not logged in. We will now add some exceptions so `AuthComponent` will allow us to create some groups and users. In **both** your `GroupsController` and your `UsersController` Add the following:

```
<?php
public function beforeFilter() {
    parent::beforeFilter();
    $this->Auth->allow('*');
}
```

These statements tell AuthComponent to allow public access to all actions. This is only temporary and will be removed once we get a few users and groups into our database. Don't add any users or groups just yet though.

Initialize the Db Acl tables

Before we create any users or groups we will want to connect them to the Acl. However, we do not at this time have any Acl tables and if you try to view any pages right now, you will get a missing table error ("Error: Database table acos for model Aco was not found."). To remove these errors we need to run a schema file. In a shell run the following:

```
./Console/cake schema create DbAcl
```

This schema will prompt you to drop and create the tables. Say yes to dropping and creating the tables.

If you don't have shell access, or are having trouble using the console, you can run the sql file found in /path/to/app/Config/Schema/db_acl.sql.

With the controllers setup for data entry, and the Acl tables initialized we are ready to go right? Not entirely, we still have a bit of work to do in the user and group models. Namely, making them auto-magically attach to the Acl.

Acts As a Requester

For Auth and Acl to work properly we need to associate our users and groups to rows in the Acl tables. In order to do this we will use the `AclBehavior`. The `AclBehavior` allows for the automagic connection of models with the Acl tables. Its use requires an implementation of `parentNode()` on your model. In our `User` model we will add the following:

```
<?php
class User extends AppModel {
    public $name = 'User';
    public $belongsTo = array('Group');
    public $actsAs = array('Acl' => array('type' => 'requester'));

    public function parentNode() {
        if (!$this->id && empty($this->data)) {
            return null;
        }
        if (isset($this->data['User']['group_id'])) {
            $groupId = $this->data['User']['group_id'];
        } else {
            $groupId = $this->field('group_id');
        }
        if (!$groupId) {
            return null;
        } else {
            return array('Group' => array('id' => $groupId));
        }
    }
}
```

Then in our `Group` Model Add the following:

```
<?php
class Group extends AppModel {
    public $actsAs = array('Acl' => array('type' => 'requester'));

    public function parentNode() {
        return null;
    }
}
```

What this does, is tie the `Group` and `User` models to the Acl, and tell CakePHP that every-time you make a User or Group you want an entry on the `aros` table as well. This makes Acl management a piece of cake as your AROs become transparently tied to your `users` and `groups` tables. So anytime you create or delete a user/group the Aro table is updated.

Our controllers and models are now prepped for adding some initial data, and our `Group` and `User` models are bound to the Acl table. So add some groups and users using the baked forms by browsing to http://example.com/groups/add and http://example.com/users/add. I made the following groups:

- administrators
- managers
- users

I also created a user in each group so I had a user of each different access group to test with later. Write everything down or use easy passwords so you don't forget. If you do a `SELECT * FROM aros;` from a mysql prompt you should get something like the following:

```
+----+-----------+-------+-------------+-------+------+------+
| id | parent_id | model | foreign_key | alias | lft  | rght |
+----+-----------+-------+-------------+-------+------+------+
|  1 |      NULL | Group |           1 | NULL  |    1 |    4 |
|  2 |      NULL | Group |           2 | NULL  |    5 |    8 |
|  3 |      NULL | Group |           3 | NULL  |    9 |   12 |
|  4 |         1 | User  |           1 | NULL  |    2 |    3 |
|  5 |         2 | User  |           2 | NULL  |    6 |    7 |
|  6 |         3 | User  |           3 | NULL  |   10 |   11 |
+----+-----------+-------+-------------+-------+------+------+
6 rows in set (0.00 sec)
```

This shows us that we have 3 groups and 3 users. The users are nested inside the groups, which means we can set permissions on a per-group or per-user basis.

Group-only ACL

In case we want simplified per-group only permissions, we need to implement `bindNode()` in `User` model:

```
<?php
public function bindNode($user) {
    return array('model' => 'Group', 'foreign_key' => $user['User']['group_id']);
}
```

This method will tell ACL to skip checking `User` Aro's and to check only `Group` Aro's.

Every user has to have assigned `group_id` for this to work.

In this case our `aros` table will look like this:

```
+----+-----------+-------+-------------+-------+------+------+
| id | parent_id | model | foreign_key | alias | lft  | rght |
+----+-----------+-------+-------------+-------+------+------+
|  1 |      NULL | Group |           1 | NULL  |    1 |    2 |
|  2 |      NULL | Group |           2 | NULL  |    3 |    4 |
|  3 |      NULL | Group |           3 | NULL  |    5 |    6 |
+----+-----------+-------+-------------+-------+------+------+
3 rows in set (0.00 sec)
```

Creating ACOs (Access Control Objects)

Now that we have our users and groups (aros), we can begin inputting our existing controllers into the Acl and setting permissions for our groups and users, as well as enabling login / logout.

Our ARO are automatically creating themselves when new users and groups are created. What about a way to auto-generate ACOs from our controllers and their actions? Well unfortunately there is no magic way in CakePHP's core to accomplish this. The core classes offer a few ways to manually create ACO's though. You can create ACO objects from the Acl shell or You can use the `AclComponent`. Creating Acos from the shell looks like:

```
./Console/cake acl create aco root controllers
```

While using the AclComponent would look like:

```
<?php
$this->Acl->Aco->create(array('parent_id' => null, 'alias' => 'controllers'));
$this->Acl->Aco->save();
```

Both of these examples would create our 'root' or top level ACO which is going to be called 'controllers'. The purpose of this root node is to make it easy to allow/deny access on a global application scope, and allow the use of the Acl for purposes not related to controllers/actions such as checking model record permissions. As we will be using a global root ACO we need to make a small modification to our `AuthComponent` configuration. `AuthComponent` needs to know about the existence of this root node, so that when making ACL checks it can use the correct node path when looking up controllers/actions. In `AppController` ensure that your `$components` array contains the `actionPath` defined earlier:

```
<?php
class AppController extends Controller {
    public $components = array(
        'Acl',
        'Auth' => array(
            'authorize' => array(
                'Actions' => array('actionPath' => 'controllers')
            )
        ),
        'Session'
    );
```

Continue to *Simple Acl controlled Application - part 2* to continue the tutorial.

Simple Acl controlled Application - part 2

An Automated tool for creating ACOs

As mentioned before, there is no pre-built way to input all of our controllers and actions into the Acl. However, we all hate doing repetitive things like typing in what could be hundreds of actions in a large application.

For this purpose exists a very handy plugin available at github, called AclExtras (https://github.com/markstory/acl_extras/tree/2.0) which can be downloaded in The Github Downloads page (https://github.com/markstory/acl_extras/zipball/2.0). We're going to briefly describe how to use it to generate all our ACO's

First grab a copy of the plugin and unzipped or clone it using git into *app/Plugin/AclExtras*. Then activate the plugin in your *app/Config/boostrap.php* file as shown below:

```
<?php
//app/Config/boostrap.php
// ...
CakePlugin::load('AclExtras');
```

Finally execute the following command in the CakePHP console:

```
./Console/cake AclExtras.AclExtras aco_sync
```

You can get a complete guide for all available commands like this:

```
./Console/cake AclExtras.AclExtras -h
./Console/cake AclExtras.AclExtras aco_sync -h
```

Once populated your *acos* table proceed to create your application permissions.

Setting up permissions

Creating permissions much like creating ACO's has no magic solution, nor will I be providing one. To allow ARO's access to ACO's from the shell interface use the AclShell. For more information on how to use it consult the AclShell help which can be accessed by running:

```
./Console/cake acl --help
```

Note: * needs to be quoted ('*')

In order to allow with the `AclComponent` we would use the following code syntax in a custom method:

```
<?php
$this->Acl->allow($aroAlias, $acoAlias);
```

We are going to add in a few allow/deny statements now. Add the following to a temporary function in your `UsersController` and visit the address in your browser to run them (e.g. http://localhost/cake/app/users/initdb). If you do a `SELECT * FROM aros_acos` you should see a whole pile of 1's and -1's. Once you've confirmed your permissions are set, remove the function:

```
<?php

public function beforeFilter() {
    parent::beforeFilter();
    $this->Auth->allow('initDB'); // We can remove this line after we're finished
}

public function initDB() {
    $group = $this->User->Group;
    //Allow admins to everything
    $group->id = 1;
    $this->Acl->allow($group, 'controllers');

    //allow managers to posts and widgets
    $group->id = 2;
    $this->Acl->deny($group, 'controllers');
    $this->Acl->allow($group, 'controllers/Posts');
    $this->Acl->allow($group, 'controllers/Widgets');

    //allow users to only add and edit on posts and widgets
    $group->id = 3;
    $this->Acl->deny($group, 'controllers');
    $this->Acl->allow($group, 'controllers/Posts/add');
    $this->Acl->allow($group, 'controllers/Posts/edit');
    $this->Acl->allow($group, 'controllers/Widgets/add');
    $this->Acl->allow($group, 'controllers/Widgets/edit');
    //we add an exit to avoid an ugly "missing views" error message
    echo "all done";
    exit;
}
```

We now have set up some basic access rules. We've allowed administrators to everything. Managers can access everything in posts and widgets. While users can only access add and edit in posts & widgets.

We had to get a reference of a `Group` model and modify its id to be able to specify the ARO we wanted, this is due to how `AclBehavior` works. `AclBehavior` does not set the alias field in the `aros` table so we must use an object reference or an array to reference the ARO we want.

You may have noticed that I deliberately left out index and view from my Acl permissions. We are going to make view and index public actions in `PostsController` and `WidgetsController`. This allows non-authorized users to view these pages, making them public pages. However, at any time you can remove these actions from `AuthComponent::allowedActions` and the permissions for view and edit will revert to those in the Acl.

Now we want to take out the references to `Auth->allowedActions` in your users and groups controllers. Then add the following to your posts and widgets controllers:

```php
<?php
public function beforeFilter() {
    parent::beforeFilter();
    $this->Auth->allow('index', 'view');
}
```

This removes the 'off switches' we put in earlier on the users and groups controllers, and gives public access on the index and view actions in posts and widgets controllers. In `AppController::beforeFilter()` add the following:

```php
<?php
 $this->Auth->allow('display');
```

This makes the 'display' action public. This will keep our PagesController::display() public. This is important as often the default routing has this action as the home page for your application.

Logging in

Our application is now under access control, and any attempt to view non-public pages will redirect you to the login page. However, we will need to create a login view before anyone can login. Add the following to `app/View/Users/login.ctp` if you haven't done so already:

```php
<h2>Login</h2>
<?php
echo $this->Form->create('User', array('url' => array('controller' => 'users', 'action' =>
echo $this->Form->input('User.username');
echo $this->Form->input('User.password');
echo $this->Form->end('Login');
?>
```

If a user is already logged in, redirect him by adding this to your UsersController:

```php
<?php
public function login() {
    if ($this->Session->read('Auth.User')) {
        $this->Session->setFlash('You are logged in!');
        $this->redirect('/', null, false);
    }
}
```

You should now be able to login and everything should work auto-magically. When access is denied Auth messages will be displayed if you added the `echo $this->Session->flash('auth')`

Logout

Now onto the logout. Earlier we left this function blank, now is the time to fill it. In `UsersController::logout()` add the following:

```php
<?php
$this->Session->setFlash('Good-Bye');
$this->redirect($this->Auth->logout());
```

This sets a Session flash message and logs out the User using Auth's logout method. Auth's logout method basically deletes the Auth Session Key and returns a url that can be used in a redirect. If there is other session data that needs to be deleted as well add that code here.

All done

You should now have an application controlled by Auth and Acl. Users permissions are set at the group level, but you can set them by user at the same time. You can also set permissions on a global and per-controller and per-action basis. Furthermore, you have a reusable block of code to easily expand your ACO table as your app grows.

CHAPTER 15

Glossary

routing array An array of attributes that are passed to `Router::url()`. They typically look like:

```
array('controller' => 'posts', 'action' => 'view', 5)
```

html attributes An array of key => values that are composed into html attributes. For example:

```
<?php
// Given
array('class' => 'my-class', '_target' => 'blank')

// Would generate
class="my-class" _target="blank"
```

If an option can be minimized or accepts it's name as the value, then `true` can be used:

```
<?php
// Given
array('checked' => true)

// Would generate
checked="checked"
```

plugin syntax Plugin syntax refers to the dot separated classname indicating classes are part of a plugin. E.g. `DebugKit.Toolbar` The plugin is DebugKit, and the classname is Toolbar.

dot notation Dot notation defines an array path, by separating nested levels with `.` For example:

```
Asset.filter.css
```

Would point to the following value:

```
array(
    'Asset' => array(
        'filter' => array(
            'css' => 'got me'
        )
        )
    )
```

CSRF Cross Site Request Forgery. Prevents replay attacks, double submissions and forged requests from other domains.

routes.php A file in APP/Config that contains routing configuration. This file is included before each request is processed. It should connect all the routes your application needs so requests can be routed to the correct controller + action.

DRY Don't repeat yourself. Is a principle of software development aimed at reducing repetition of information of all kinds. In CakePHP DRY is used to allow you to code things once and re-use them across your application.

CHAPTER 16

Indices and tables

- *genindex*
- *modindex*

Index