Drupal 6 Performance Tips

Learn how to maximize and optimize your Drupal framework using Drupal 6 best practice performance solutions and tools

Trevor James

TJ Holowaychuk

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Trevor has designed and developed websites for many non-profit, education-based, and small business organizations. He is currently working on a number of Drupal-related projects.

Trevor created an 11.5 hour video tutorial series comprising 114 lessons titled *Introduction to Drupal 6* for **VTC** (**Virtual Training Company**) in 2009. The video is available via the VTC website here: `http://www.vtc.com/products/Introduction-To-Drupal-6-Tutorials.htm`

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Currently, Daniel focuses on large scale community websites and performance optimization using technologies such as Apache Solr and Memcached. His personal blog can be found at `http://danielhanold.com`.

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I'd like to thank my wife Lies for her endless patience and support. We've been through some crazy things together the last 12 years, and I've got a feeling that we ain't seen nothin' yet.

This book is dedicated to my parents, Michael and Judy James,
who taught me the value of hard work and dedication to the task at hand.
– Trevor James

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Preface

The Drupal content management framework allows us to get a website up and running quickly, and proves that a multi-layer website and application environment doesn't need to be complex to set up and configure. The next step after we get our site installed, themed, and populated with content, is to monitor our site's performance. We, as users of the site and developers of the site's architecture and backend, want our site to run smoothly and quickly. We want our page loads to be super quick and our backend administration to run lightning fast. How do we optimize our large Drupal-powered, database-driven, content-heavy website with performance and speed in mind? This book will show you the steps to enable the performance 'boost' on your Drupal site.

We will discuss all aspects of Drupal performance from simple optimization and site maintenance to the larger and more complex issues of anonymous and authenticated site caching. We'll look at some basic core Drupal modules that help to govern and control performance on our site, and also look in detail at more advanced contributed module options, such as the Development, Boost, Authcache, Advanced Cache, and Cache Router modules.

With speed in mind, both for our anonymous site visitors and our logged in users, we're going to take a close look at how to optimize our Drupal site for higher performance. This book is an introduction to this complex and large subject, and we hope that it serves as a stepping stone for both novice and advanced Drupal users and developers.

What this book covers

Chapter 1, *Upgrading Drupal*, focuses on preparing a Drupal environment for running a high performance Drupal website. We will discuss upgrading Drupal 5.x to Drupal 6.x, creating backups of our site files and databases, running the Drupal Status report, upgrading contributed modules to their latest 6.x versions, and running `update.php`. We will also tweak our PHP settings using the Drupal `settings.php` file.

Chapter 2, *Maintaining your Drupal Site*, covers the basics of maintaining your Drupal website including inspecting your Drupal configuration file, checking your MySQL and PHP configurations, enabling and using the Drupal Update Status module, disabling and uninstalling contributed modules, and clearing the Drupal performance cache and theme registry. We'll also look at running `cron` jobs, tweaking our `php.ini` file, and tweaking our `.htaccess` file.

Chapter 3, *Using Development Modules and Tools*, focuses on using Drupal development modules and tools such as the Development module. We will look in detail at the Development module's functionality and use it to monitor performance on our site.

Chapter 4, *Performance Optimization*, focuses on Drupal performance optimization, including throttling modules and blocks through the Development module to generate dummy taxonomy, and content for our site using Views 2.x, and clearing our Views cache.

Chapter 5, *Using DB Maintenance and Boost*, focuses on using the DB Maintenance and the Boost modules. We'll look in detail at a basic configuration of the Boost module to enhance performance for our anonymous site users.

Chapter 6, *Advanced Boost*, focuses on using the Boost module to do advanced performance functionality. We'll look at using the Boost module along with Global Redirect and Transliteration, configuring advanced Boost module caching, configuring Boost crawler, and how to check and tweak our Boost `.htaccess` settings.

Chapter 7, *Using Memcache API and Integration*, focuses on using the Memcache API and Integration module. We will install a development WAMP environment using MoWeS Portable in this chapter as well as install the Memcached binary libraries, integrate and configure Memcached to work with PHP, and test the module on our development site.

Chapter 8, *Advanced Caching and Contributed Modules for Caching*, focuses on Advanced Drupal caching and using contributed modules for caching on our site. We will discuss using the Cache Router, Authcache, and Advanced Cache modules.

Chapter 9, *Multisite Configuration and Performance*, focuses on Drupal multisite configuration and performance. We will create multisite folders and configure our Drupal `settings.php` for multisite. We will tweak our `httpd.conf` file to support multisite, and use caching in a multisite environment.

What you need for this book

To follow along with the examples in this book, you will need a computer which can run MySQL, PHP, and the Apache web server, which are all prerequisites for Drupal. Luckily, every major operating system can run these applications. You may want to create an account with a website hosting company to test your work although you can also use a regular desktop or a laptop computer.

You will also need the Drupal Content Management framework, which is available from `drupal.org`. We will discuss downloading and installing Drupal in Chapter 1.

Who this book is for

This book is for Drupal website users and developers who want to boost and tweak performance on their website using Drupal's core and contributed performance module functionality.

You are expected to know about the basic operation of Drupal, be familiar with the concept of site configuration, and know how core and contributed modules are installed and work in Drupal. No experience with programming Drupal is required. The author will teach you how to implement specific code and patches that work with specific performance modules. Almost everything in the book will be focused on the module visual interface, and how to use this interface to configure and implement the performance module.

This book also covers upgrading Drupal, running Drupal security patches, creating backups of your Drupal site, and other basic Drupal site maintenance that will be helpful to the novice Drupal user and developer. Modules are covered in both their basic and advanced configurations; so both novice and advanced developer will learn how best to implement performance practices on their Drupal site with this step-by-step guide.

Performance is a large discussion within, and presents a large terrain to cover throughout, the Drupal community, but this book does not claim to cover every performance and site optimization issue. The authors have done their best to cover the majority of performance-based tips and tricks to run your Drupal site. They hope that the book will enhance the discussion of Drupal performance, and pave the way for more books and tutorials to be released on Drupal performance topics.

Conventions

In this book, you will find a number of styles of text that distinguish between different kinds of information. Here are some examples of these styles and an explanation of their meaning.

Code words in text are shown as follows: "Update the `$conf` in your `settings.php` file."

A block of code is set as follows:

```
<?php
$conf = array(
   // The path to wherever memcache.inc is. The easiest is to simply
point it
   // to the copy in your module's directory.
 //  'cache_inc' => './sites/all/modules/memcache/memcache.inc',
   // or
   'cache_inc' => './sites/all/modules/memcache/memcache.db.inc',
);
?>
```

New terms and **important words** are introduced in a bold-type font. Words that you see on the screen, in menus or dialog boxes, for example, appear in our text like this: "Once enabled, you can browse to this module's admin interface by going to **Reports | Memcache** status via your administrative menu."

Warnings or important notes appear in a box like this.

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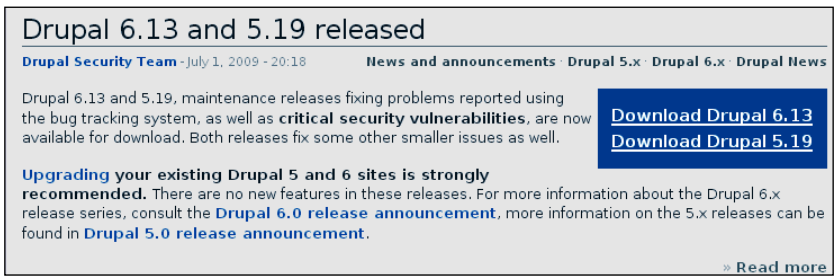
1
Upgrading Drupal

To run a high performance and secure Drupal website, you should keep your Drupal core code and your contributed Drupal module code patched and upgraded regularly. The Drupal project frequently releases updated security patches to its core code and it should be a standard maintenance workflow for you as a Drupal developer to keep your site patched to the latest core Drupal release. This will prevent security issues on your site (most of these patch releases are security upgrades) and it will help to improve your site's performance, as these patch releases fix minor and major issues reported from Drupal's bug tracking tools. Many performance issues and security issues with the Drupal code are fixed on a weekly to monthly basis by Drupal developers working with the Drupal project.

Besides security patches, Drupal releases major upgrades every 1-2 years. The most recent major upgrade was from Drupal 5.x to Drupal 6.x. Plans are underway now for the next major release, Drupal 7.x. It's good practice to begin the process of upgrading your Drupal 5.x site to Drupal 6.x as soon as possible, so you'll be in a better position to eventually upgrade and use Drupal 7.x. Major Drupal releases often solve performance issues reported over months and years by Drupal developers using Drupal sites. It's to your benefit and your site's future growth to upgrade soon after a major release appears.

All security patches and major Drupal upgrade releases are listed at the top of the home page at `http://drupal.org/` and each release provides background information on why the release has occurred.



In this chapter, you will learn how to maintain your Drupal site by doing the following:

- Upgrading your Drupal 5.x core to the latest 5.x version, and upgrading your Drupal 5.x contributed modules to the latest 5.x versions
- Backing up your entire Drupal site and database
- Running Status report
- Taking your Drupal site offline for maintenance
- Upgrading your Drupal 5.x site to Drupal 6.x
- Upgrading your contributed modules to the latest 6.x versions
- Running `update.php`
- Placing your new Drupal 6.x site back online

Learning these steps will allow you as a Drupal webmaster and developer to easily maintain your Drupal site and to troubleshoot performance issues with client websites. You will learn that immediately checking which version of Drupal and contributed modules the site is running can tell you a lot about the performance of the site.

There is a wealth of information about the upgrade process along with upgrade tutorials on `drupal.org` at the following URLs/pages:

- Upgrading from previous versions: `http://drupal.org/upgrade/`
- Upgrading from Drupal 5.x to Drupal 6.x: `http://drupal.org/videocasts/upgrading-to-6`

Upgrading Drupal 5.x core

Before we perform a major upgrade from Drupal 5.x to Drupal 6.x, we need to make sure our Drupal 5.x core and contributed modules are upgraded to the latest 5.x releases. For Drupal core, this is currently Drupal 5.19. We can determine the latest release by visiting `http://drupal.org/` and downloading the `tar.gz` for this release. There are also release notes about each version located at `http://drupal.org/`. For example, the Drupal 5.x release notes are located on: `http://drupal.org/drupal-5.0`. You can read more release notes specific to a version number in the `CHANGELOG.txt` text file and the `UPGRADE.txt` files located in the Drupal root folder of that version.

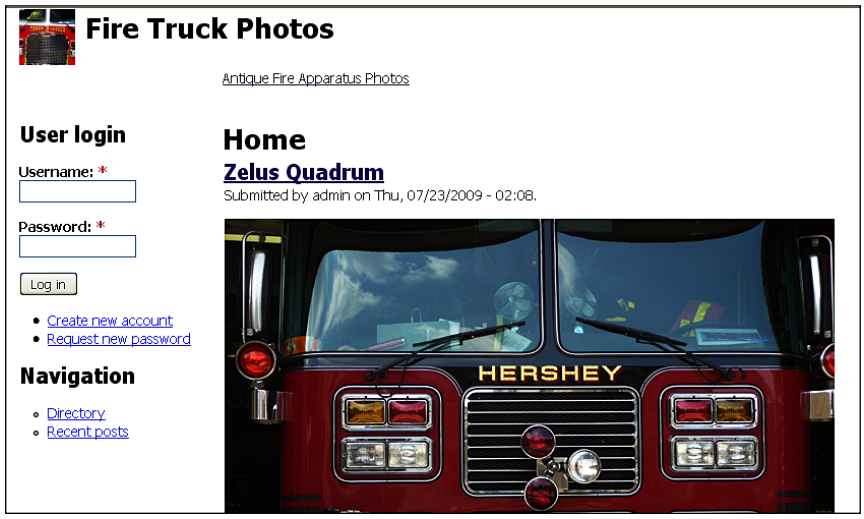
Here is our 5.x upgrade plan:

We're going to upgrade a site running Drupal 5.18 in preparation for a full version upgrade to Drupal 6.x. The first thing we're going to do is to upgrade this site to Drupal 5.19. We're also going to upgrade all of our contributed modules to the latest 5.x versions of those modules. This is important to do before an upgrade to 6.x—if all of your modules and core code are the latest version of 5.x, it will make the upgrade process run more smoothly and leave less room for parse errors, white screens, and other upgrade issues.

`Drupal.org` notes the importance of upgrading to the latest minor version of your current Drupal version before starting an upgrade to a next major version release. So, in our case we need to upgrade to the latest version of Drupal 5.x (at the time of this writing, it is Drupal 5.19) before running an upgrade to Drupal 6.13. See the `Drupal.org` upgrade tutorial and articles at: `http://drupal.org/upgrade/`.

It may seem as though this workflow takes more time, but in the end your upgrade process will run more smoothly and with fewer problems.

The site we're upgrading is running Drupal 5.18. The theme is a custom version of the Zen StarterKit theme. The contributed modules on this site include CCK, Devel, Imagecache, Imagefield, FCK, Panels, Webform, jQuery, Views 1, and Lightbox. One of the main sections of the site includes an image gallery using Views and the Lightbox module to display photos of fire trucks. The Panels module is used to create a home page for the site displaying one blog post and the Lightbox-powered photo gallery.



Backing up your site and database

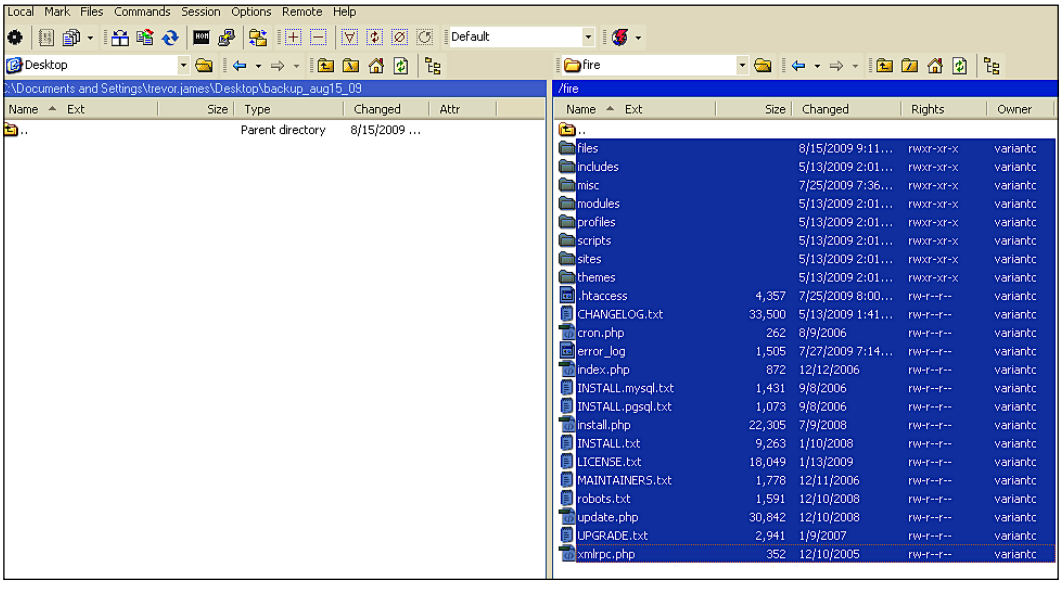
Before beginning, run a full backup of both your Drupal directory and your Drupal database(s). If you run a backup, you can be confident that if an issue arises during the upgrade process causing possible corruption of your database, you can easily restore your site with your backup. The rule is to always run backups before performing any upgrades, even minor security patches.

If you are on a shared hosting server environment, you may have access to your site's directory and files through FTP/SFTP or a cPanel type of file manager utility (cPanel and Plesk being two of the common utilities). You can either use **file transfer protocol (FTP)** to download your directory to your local desktop or use a backup application that your host provides through your cPanel tool.

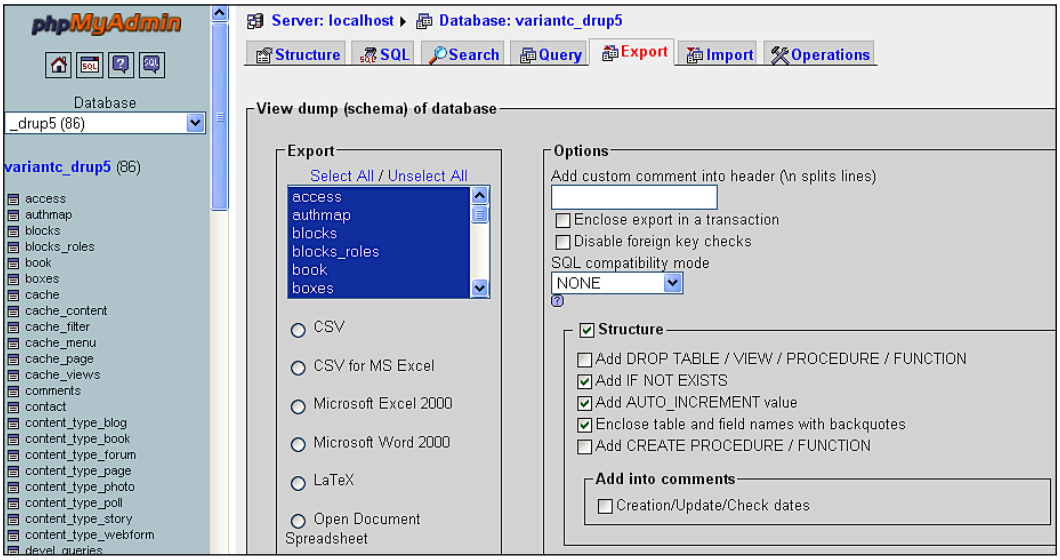
To backup your database, you can use a tool such as phpMyAdmin—this will allow you to connect to your MySQL database and export your full database to your local desktop (as a SQL file). Here are the steps to back up your site:

1. FTP/SFTP into your server and copy all of your Drupal files or directories to your local desktop.

A good habit is to name your local folder with the date of the backup: For example, `backup-09-08-15`—then if something happens, you can easily locate the last backup you ran.



2. Access your `phpMyAdmin` tool in your web browser (if your host provides access) and run an export of your Drupal database. Save the export file as a SQL (`.sql`) file in the same backup directory as your Drupal files.



3. If you are running your Drupal site locally (via localhost) or you have remote access to the actual server, you can simply copy the entire Drupal site folder and paste the folder into a backup folder on your server desktop or computer desktop. Then you can zip the backup or archive and save it until you know you have successfully completed the upgrade process. Before copying the entire Drupal site folder, you may want to check to make sure you can see all the files in your site folder. Occasionally, the operating system will hide files, for example your `.htaccess` file, so it's a good idea to show these files before backing up to make sure you are also backing up your `.htaccess` and any other hidden file.

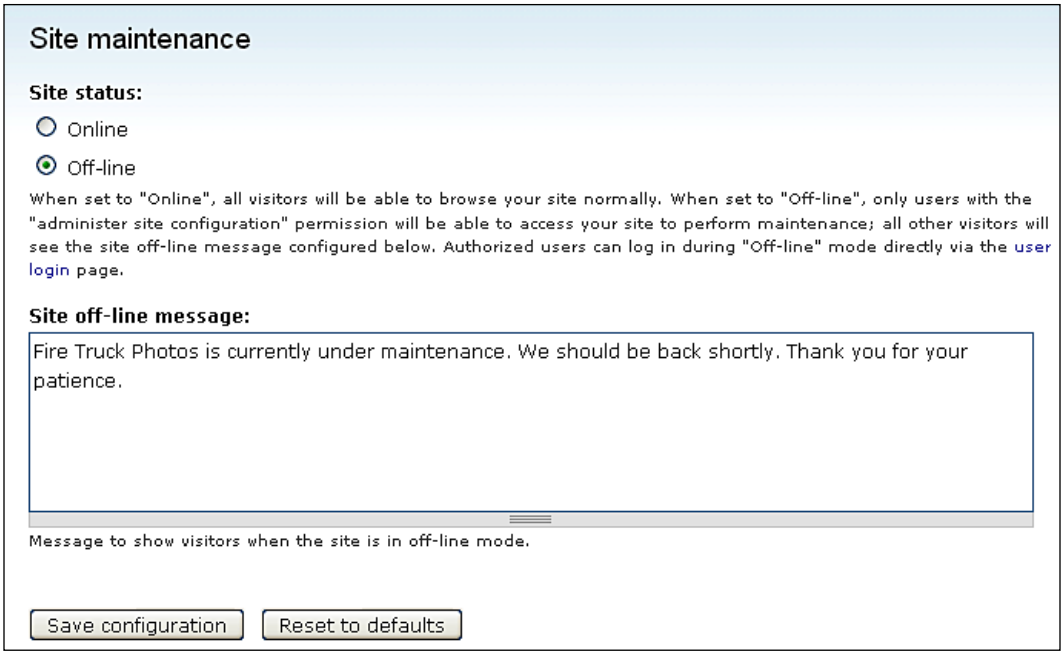
Now you have a full backup of your Drupal site files and your database. You're ready to proceed with upgrading your site to 5.19.

Taking your site offline

The next step is to take your site offline for maintenance. It's good practice to always take your Drupal site offline during the upgrade process to prevent any public site visitor from accessing your site and viewing error messages that may appear during the upgrade. Your authenticated users with administrative level permissions will still be able to login to the site while it's offline. Good practice states that you should advise your authenticated user base that you will be performing site maintenance, so they avoid logging in during the process.

First login to your site as **user/1** (the super user admin) and then:

1. Click on the **Administer** link in your main navigation menu.
2. Click on the **Site Maintenance** link (in the **Site configuration** section of your admin screen).
3. Select the **Off-line radio** button.
4. Type in a Site offline message that your general public site visitors will see when they try launching your site while it's offline. You can add full HTML and images to this message.
5. Click on the **Save configuration** button.

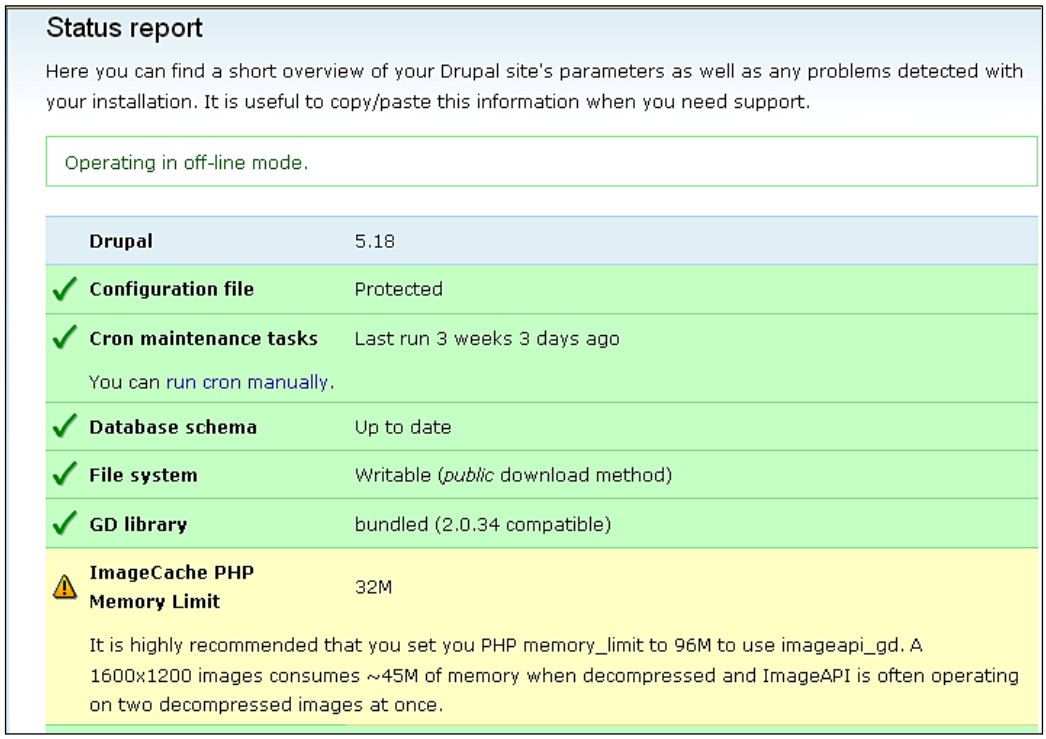


Running Status report

You will be running the Status report often during the upgrade process to check on the status of your Drupal site. The Status report will tell you if you have any issues in your site that need to be resolved before trying an upgrade. To have upgrades run as smoothly as possible, it's good practice to run Status report and make sure the majority of your report is checked green telling you the site is operating smoothly. This will cut down on the amount of parse errors you get during the upgrade process as well as removing other upgrade problems. Let's go ahead and run it now to get a quick update on the site we'll be upgrading. The Status report tells us how our Drupal site is currently running and performing.

1. Go to your Drupal Logs' admin section and click on **Status report** (**Administer | Logs | Status report**)
2. Review the current status of your site. Notice that our site is running Drupal 5.18. This tells us immediately that we need to upgrade to Drupal 5.19 before doing a full upgrade to 6.x.

3. Notice that our PHP `memory_limit` is set too low for performance purposes. We're getting a flag with our **imagecache** settings due to the **32M** limit we have set currently. Once we complete the upgrade process, we'll want to return to this issue and raise our `memory_limit`. This is something we will cover in Chapter 2.
4. Run `cron` manually to flush the Status report and re-index our site. This also will allow you to check to see if any other red flags show up.

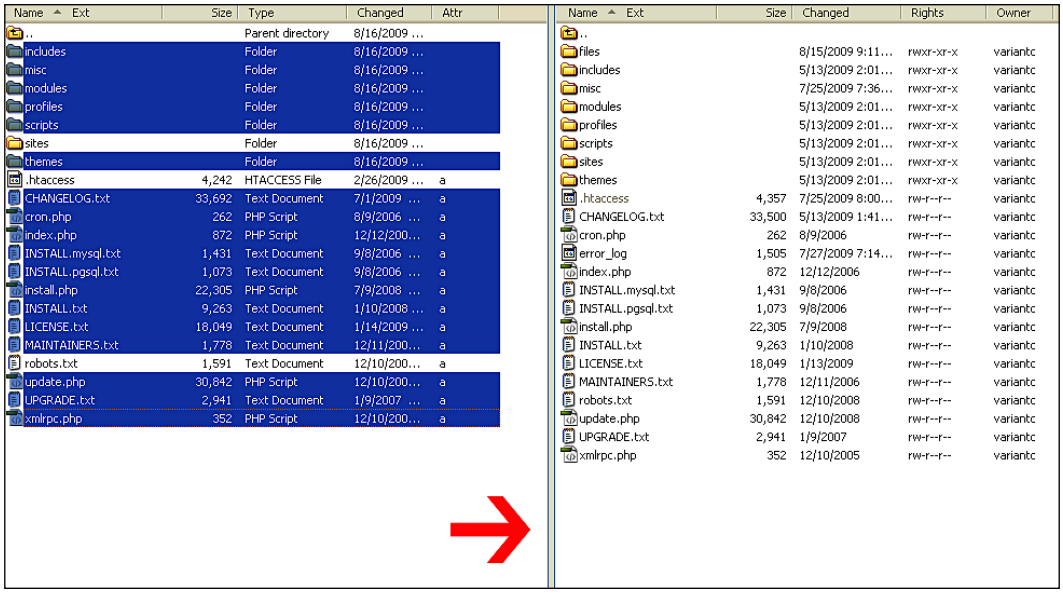


Status report is important when you're maintaining a client site for the first time. You can login to the site as admin and quickly get an update on the site and check the exact Drupal version the site is running. It also gives you a link to your PHP settings, which is something we will cover in Chapter 2.

Upgrading to 5.19

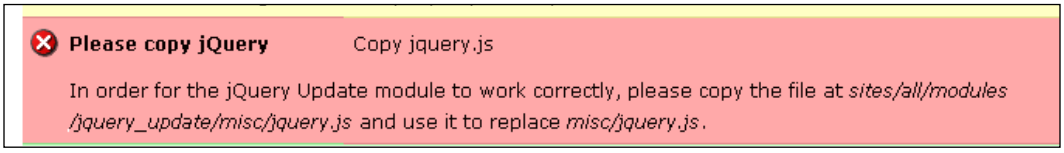
Let's go ahead and start the 5.19 upgrade. Here are the steps:

1. Download and extract the 5.19 `tar.gz` (from `http://drupal.org/`) to your local desktop. This will create a folder titled `drupal-5.19`.
2. Connect to your server through FTP/SFTP. Open up your local FTP window to show the Drupal 5.19 folder. Make sure your remote window shows your current Drupal site.
3. Select and move the following folders: `includes`, `misc`, `modules`, `profiles`, `scripts`, `themes`). Also, move over all of the root level files (`cron.php`, `index.php`, and so on). You do not need to move over the `/sites` folder as this has your customized `settings.php` file. You do not want to replace that file, so just ignore that folder. You do not want to replace your `.htaccess` file or your `robots.txt` file either, as those may also have customized code. The rest of the folders and files will only replace the core Drupal files and folders, updating their code with the latest version. You do not need to replace the `/files` folder either.
4. Start the transfer.



5. As soon as the files have transferred over through FTP, refresh your site's Status report. You should now see Drupal 5.19 listed.

6. Run `cron` manually again to see if you receive any new flag messages or errors. At this point Drupal will tell you that you need to update your database schema by running `update.php`. This is a crucial step during any Drupal upgrade process, as it updates your entire Drupal database schema. For minor version upgrades, you usually do not need to run `update.php`, but if in doubt, run your Status report and this will tell you whether you need to update your database schema.
7. If you are using the jQuery Update module in Drupal 5.x, you may receive a message in your Status report telling you to copy the `jQuery.js` script file to the correct location. The upgrade process places this script into the `/misc` folder and will overwrite your previous `jQuery.js` file. You will need to follow the instructions that Drupal gives you in your Status report and copy the file from `sites/all/modules/jquery_update/misc/jquery.js`.

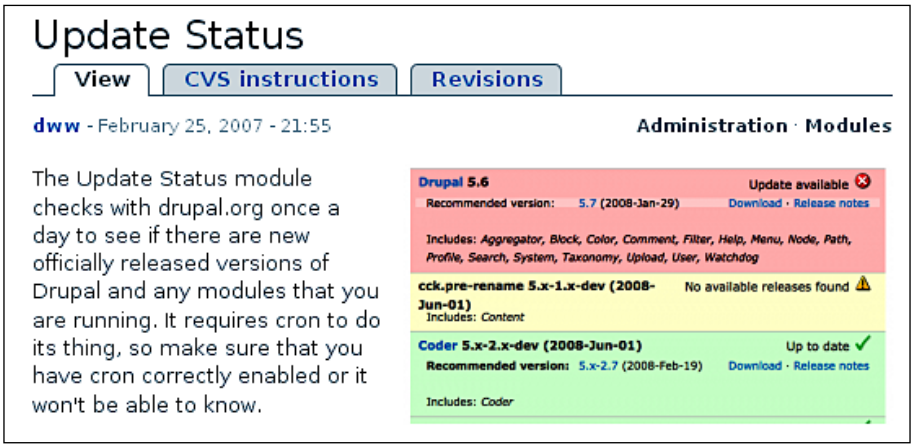


8. Run `cron` once more to check Status report. You should now have a fully upgraded core Drupal 5.19 site.

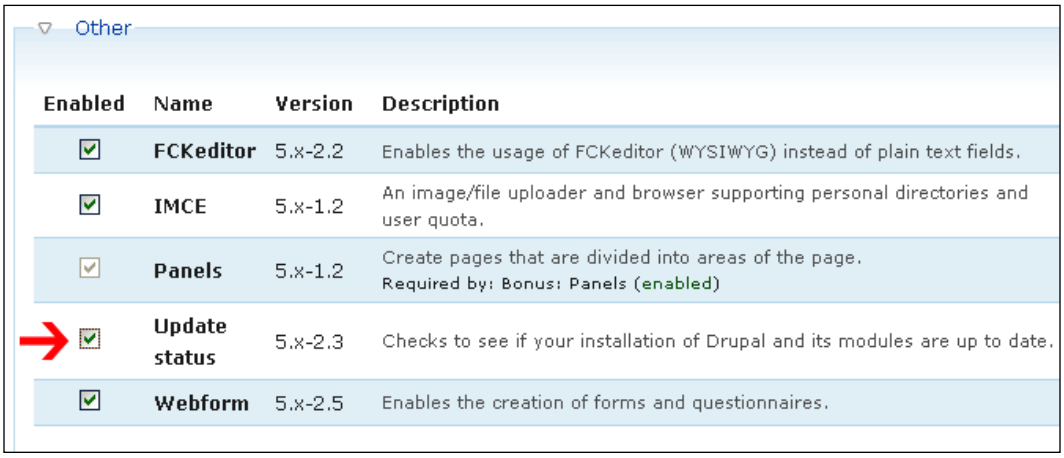
Installing the Update Status module

The next step is to upgrade any contributed modules to the latest 5.x versions. This is a requirement before trying to upgrade to version 6. To determine if there's a new version of our contributed modules, we can install the Drupal Update Status module. Drupal 6.x has update status as part of its core modules, but with Drupal 5.x you need to install a contributed module. This will give you some practice in installing Drupal modules.

1. Go directly here: `http://drupal.org/project/update_status` and download the 5.x-2.3 version.

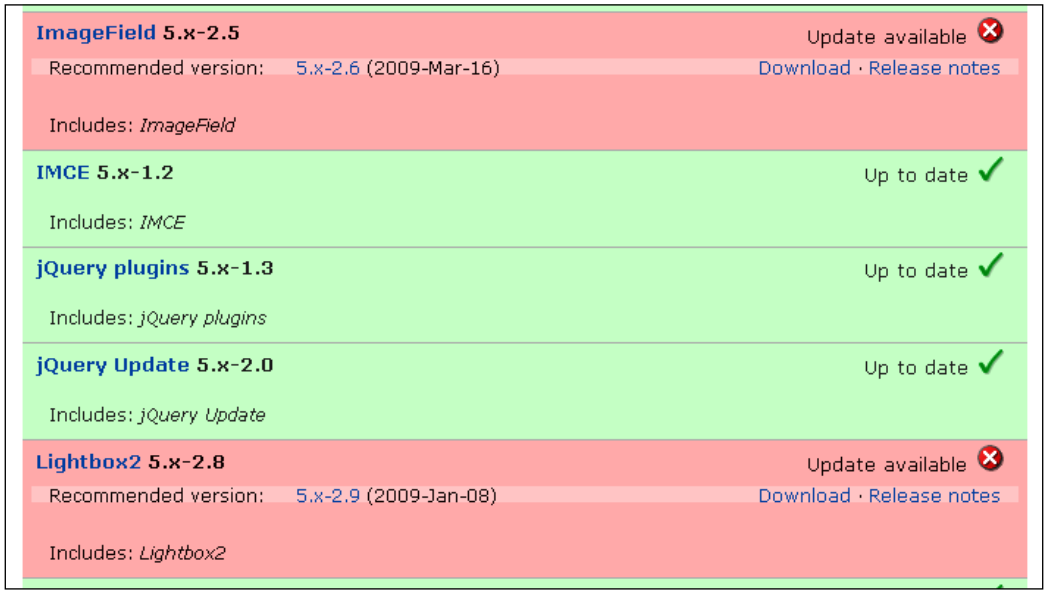


2. Extract the `tar.gz` file to your desktop and then copy the `update_status` folder into your `/sites/all/modules` folder using FTP.
3. Enable the module in your modules admin at **Administer | Site building | Modules**. Save your module configuration.



4. Go back to your Status report. You should see a red-flagged box notifying you that your modules need updating. The **Module update status** box will state: **Not secure!**

5. Click on the **available updates** link to see what contributed modules in your site need updating.
6. The Available Updates page will load and all modules needing updates will be flagged in red with the recommended version listed. The module provides a link to the module's project page at `http://drupal.org/`, so you can easily download the most recent version to your desktop.
7. Notice in our list, we need to update the **ImageField** and the **Lightbox2** modules.



Installing contributed module updates

Remember that you need to update your contributed modules to the latest 5.x released versions before attempting to upgrade your Drupal site to 6.x. Before upgrading the 5.x versions of contributed modules, it's a good idea to back up your site files and database once more now that you're at the core Drupal 5.19 release.

1. Download the latest stable release of the **Imagefield**, **Lightbox2**, and **Webform** modules. The Project pages are here:
   - `http://drupal.org/project/imagefield`
   - `http://drupal.org/project/lightbox2`
   - `http://drupal.org/project/webform`
2. Copy the extracted folders to your `/sites/all/modules` folder to replace current versions. Be aware here that you will be overwriting your contributed module code. So if you have made any hacks or edits to contributed code, you will need to replace those files later after you've upgraded.

Remember that the golden rule followed by the Drupal project and community is *do not hack core*. This is also a good rule to follow with your contributed modules. If you have to manipulate module code, do this by using proper Drupal theme and module overrides in your `template.php` file.

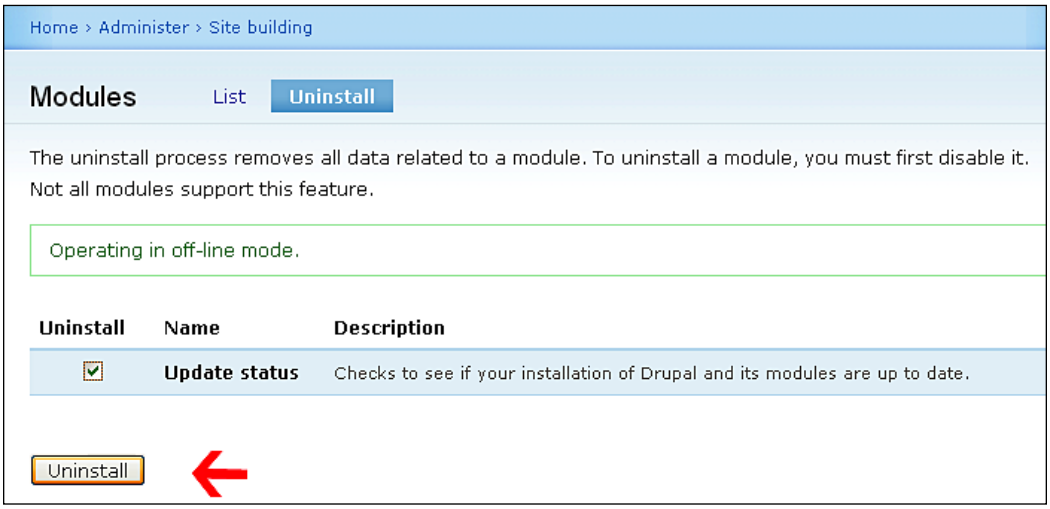
3. Once you have replaced your **Imagefield**, **Lightbox2**, and **Webform** modules, refresh your available updates page.
4. Notice that in our FTP screenshot there's a bunch of `tar.gz` folders residing in our `/sites/all/modules` directory. Sometimes you'll find these zipped folders remaining in your modules directory. They are just taking up unnecessary space. You can delete them safely from your `/sites/all/modules` directory.
5. Once you copy over your new versions, your available updates page should be green next to each module.
6. Run your Status report again—this is important because Drupal will then let you know if you need to run `update.php`. Very often with contributed module upgrades and updates, you need to update your database schema. It's recommended to run `update.php` after every contributed module upgrade.

7. In this case, after running Status report we do not need to update our database schema. The three modules we updated did not make any database level changes. So, we're good to go with our Drupal 5.19 upgrade. The update/upgrade process is now complete and we're ready to move onto the Drupal 6.x upgrade procedure.

Uninstalling and removing Update Status

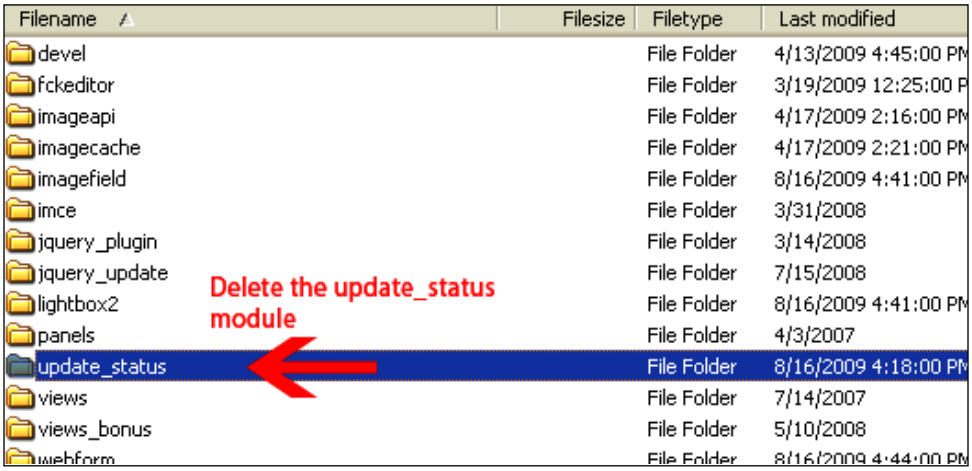
Before proceeding with the full version upgrade to Drupal 6.x, we must uninstall and remove the Drupal Update Status module. This module comes packaged with Drupal 6.x core, so we cannot leave the 5.x version of the **Update status** module in place.

1. Go to your modules admin page (**Administer | Site Building | Modules**).
2. Uncheck the **Update status** module checkbox and save the module configuration. This will disable the module.
3. Click on the **Uninstall** tab at the top of your modules page. This will load the uninstall list and any modules available (disabled modules) for uninstalling.
4. Check the **Update status** module box.
5. Click on the **Uninstall** button.



6. Drupal will ask you to confirm that you want to uninstall the module. Click on **Uninstall** again.
7. The module will be uninstalled.

8. If you revisit your module admin list, you'll notice that the **Update status** module is still listed, but is not checked/enabled. You need to also delete the entire file folder for this module from your `/sites/all/modules` directory before proceeding with the upgrade. If any files are lingering on the server for this module, you could generate errors during the upgrade process.
9. FTP into your server and remove the `update_status` folder from `/sites/all/modules`.



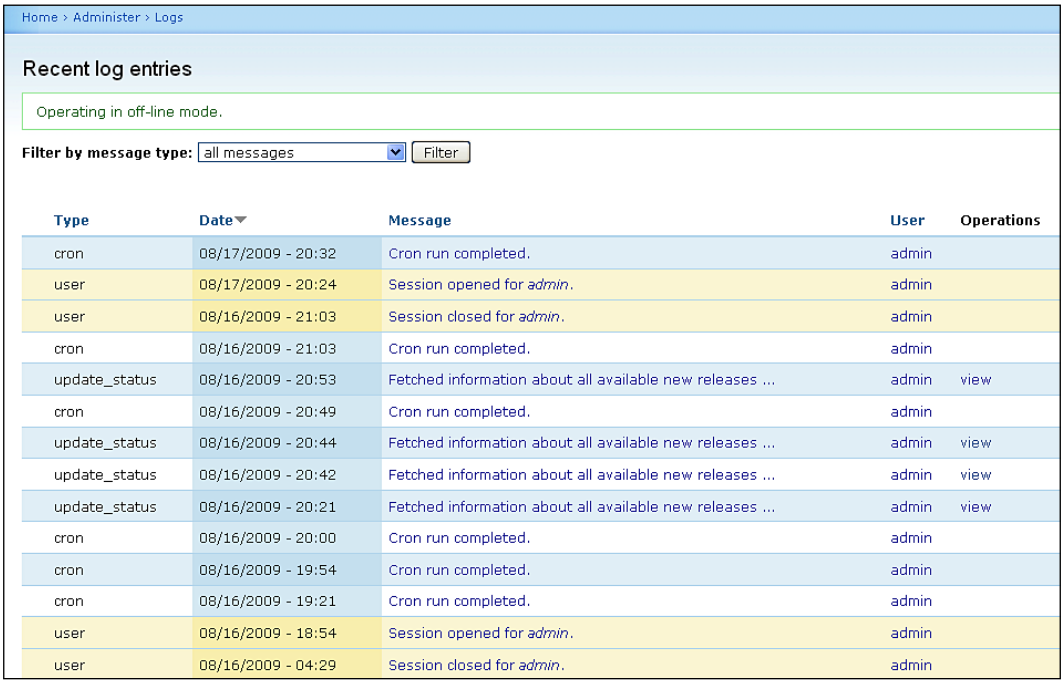
10. Refresh your modules admin list and the `Update_status` module table row should be deleted.

Running cron and checking recent log entries

Before proceeding with the upgrade to Drupal 6.x, complete the following steps:

1. Run `cron` again here: `/admin/logs/status`.
2. View recent log entries to make sure you're not getting any parse errors or other errors in your current Drupal 5.19 site. It's a good idea to check and try to get as few errors as possible in your recent log reports before upgrading to Drupal 6.x. This will make the process go smoother.

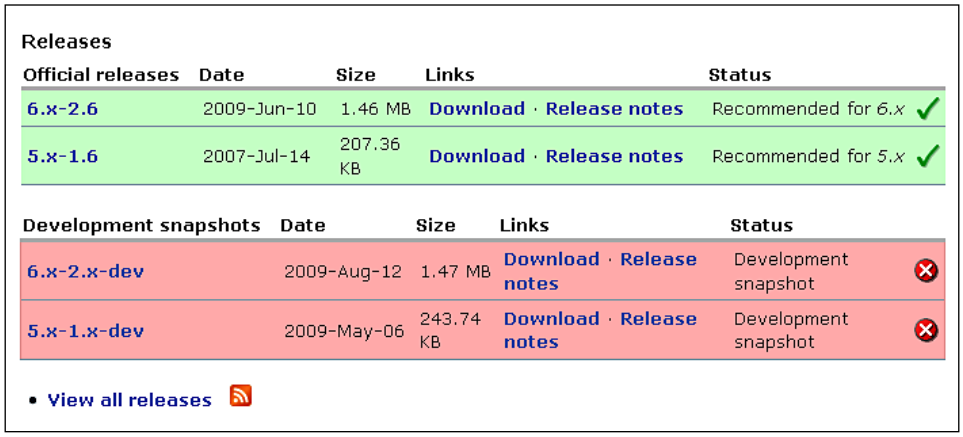
3. To check recent log entries, go to **Administer | Logs | Recent log entries**. Your report or table should list all blue links and successful tasks. If you notice any red errors, make a note of them to troubleshoot before going forward. You should see something similar to the following screenshot (notice that no errors are visible):



Dealing with contributed modules during upgrades

In our upgrade process to Drupal 6.x, I'm going to focus on two contributed modules and the process of upgrading these two modules (as well as our other contributed modules) to their 6.x versions. When upgrading your contributed modules, it's good practice to read all of the module project information on the `drupal.org` website. Visit the Drupal contributed module project page for details about the module and how the module behaves during the upgrade process. You will also want to confirm that your **contributed modules have 6.x versions. If the module has not** been ported to 6.x yet, you will not want to proceed with an upgrade to Drupal 6.x unless you can live without that module's functionality on your website. Many of the contributed modules have been ported to Drupal 6.x at this time, but some are still in development mode. You are responsible for checking for this information and confirming the release version before upgrading.

While viewing a module's project page at `drupal.org`, look for the release versions in the **Releases** table at the bottom of the project page. For example, for the **Views** module you will see this:



Releases

Official releases	Date	Size	Links	Status
6.x-2.6	2009-Jun-10	1.46 MB	Download · Release notes	Recommended for *6.x* ✓
5.x-1.6	2007-Jul-14	207.36 KB	Download · Release notes	Recommended for *5.x* ✓

Development snapshots	Date	Size	Links	Status
6.x-2.x-dev	2009-Aug-12	1.47 MB	Download · Release notes	Development snapshot ⊗
5.x-1.x-dev	2009-May-06	243.74 KB	Download · Release notes	Development snapshot ⊗

• View all releases

Official releases with a green background and blue hyperlinks mean that the release is stable and ported for that version of Drupal. So, Views has a valid and stable 6.x release according to the project page. You will also see many development versions (snapshots) of the release. Use stable versions as much as possible. Development versions should not be run on production web servers.

Backing up and exporting your Drupal 5.x Views

Drupal 5.x uses Views version 1.x. Our site is currently using the last version of Views for Drupal 5.x (`Views 5.x-1.6`). The Views module is notoriously difficult to upgrade to the latest version of Views2 for Drupal 6.x. You will want to make sure you export all of your View code from the Drupal 5.x version, and keep it in backup notepad files in case you need this code to rebuild your Views in Views2 in the event you receive errors during the upgrade process. This is a good practice before upgrading the Views module.

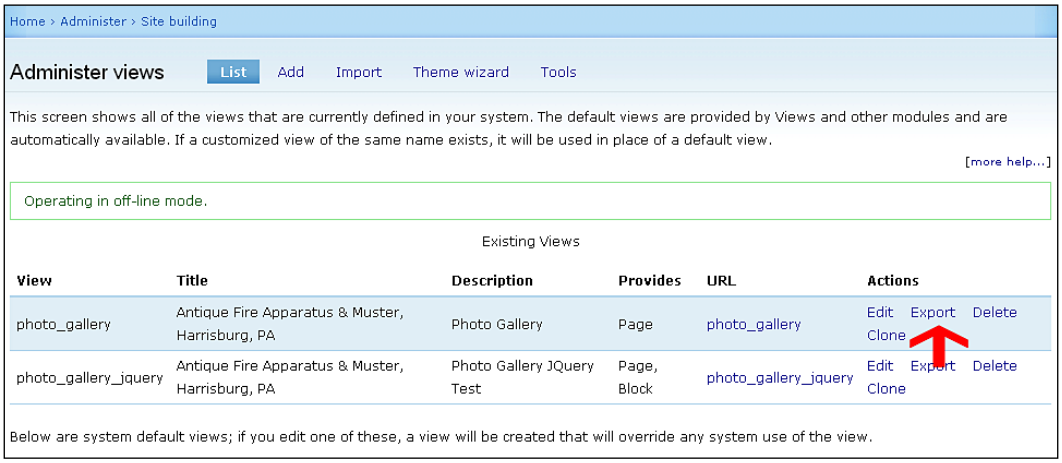
On our site we have two custom Views built, both to control photo galleries on the site. We have a general Photo Gallery view using the Lightbox2 module plugin, and we have a new View that the developer of the site is working on to integrate some jQuery code for the display of the images. This view is not completed and enabled yet, but it's a good idea to export the code to have a backup if necessary.

This is also a great time in the upgrade process to see if you have Views in your site that you no longer need and can delete. Cleaning house is good practice before an upgrade to 6.x. You can export the View code for your disabled Views and keep a backup of that exported code. Then, you can delete those Views and not have to worry about converting them in the upgrade to 6.x.

Default Drupal Views that come packaged in the Drupal Views module should convert and translate without issues to Views2, but if in doubt it's a good idea to export these Views as well.

For more on the Views module visit: `http://drupal.org/project/views`. For Views2 documentation, you'll need to install the Advanced Help module (we'll do this after we upgrade to Drupal 6.x.).

1. To export your Views, click on the **Export** link under the **Actions** column in your Views list, next to the View you want to export.



2. This will launch a screen that contains all of your View's export code. Right-click on the code window and select all, or copy all of the code using your mouse to select it.

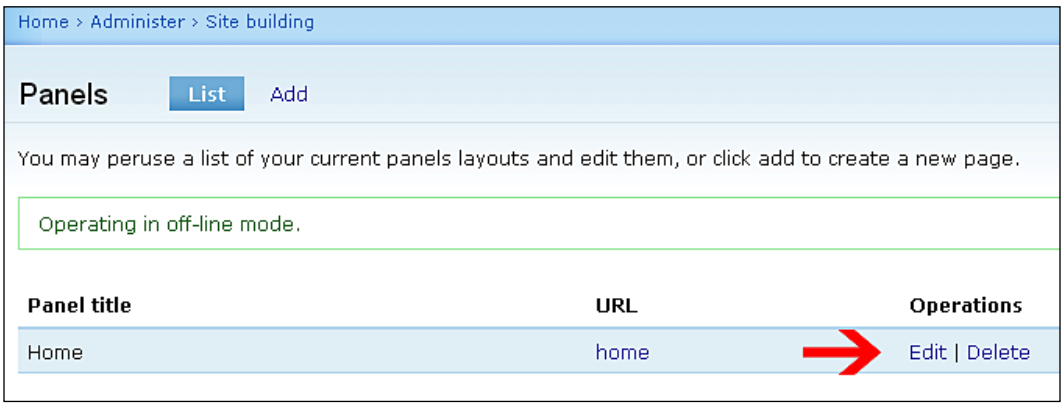
3. Paste the exported code into WordPad or Notepad and save the file with the following naming convention—use the name of your `View_code.txt`. So, for our example we'll name the file `photo_gallery.txt`. This can be a text file, as you'll be copying and pasting the code directly from this file back into Drupal later in the 6.x version, if you need it while using the Views Import Code utility.
4. Do the same process for your other Views if you have multiple Views.
5. You now have export backups for all your View code.

Reviewing your Panels code

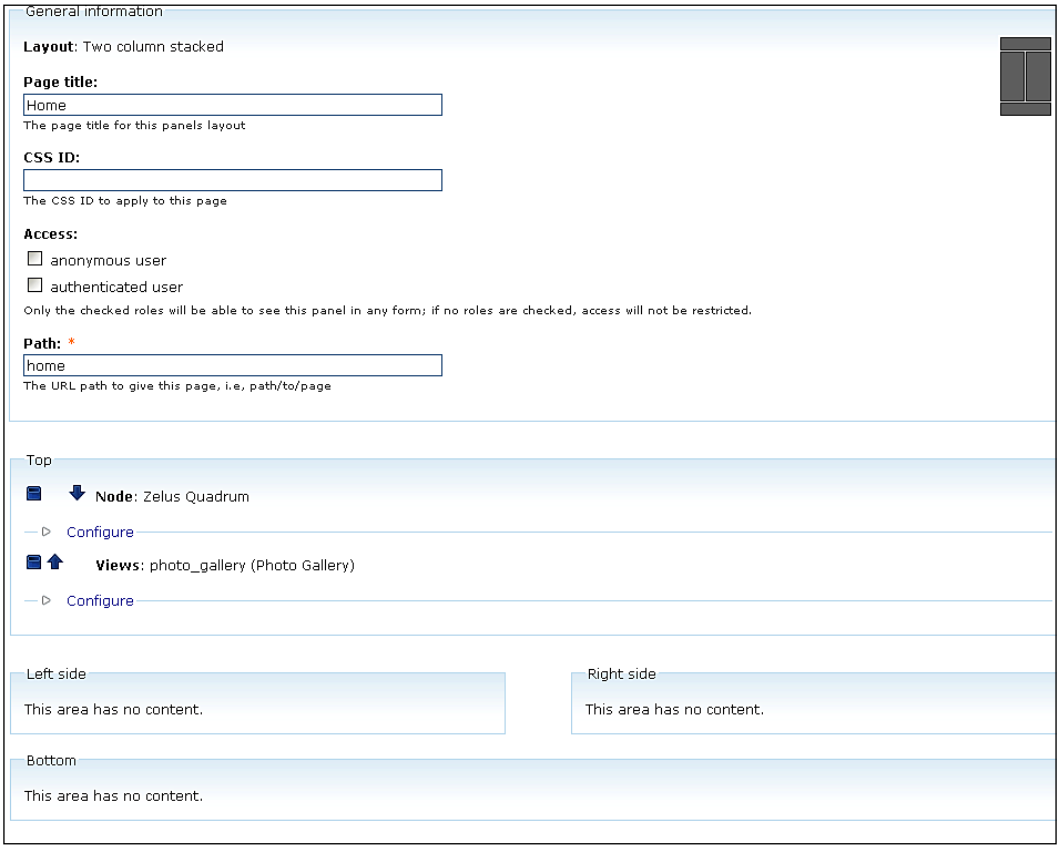
The other module that tends to give developers a difficult time during the upgrade process is Panels. We'll be upgrading from `Panels 5.x-1.2` to the latest stable version for Drupal 6.x, Panels3 (`6.x-3.0-rc1`). Upgrading to and installing Panels 3 will also require us to add another dependent module called CTools. You can learn more about Panels3 and CTools here: `http://drupal.org/project/panels`.

It's a good idea to make notes about your panel configuration—the type of panel you created originally in Drupal 5.x, the content you added to the Panel, and any other detailed configuration you may have added, including CSS styles, and so on. You may need this information to rebuild your Panels in Drupal 6.x if you run into issues or errors.

So, on our site we have one Panel titled **Home** with a URL/path of **home**. If we click on the **Edit** link in our Panels admin, we can view details about the panel.



In our panel we do not have any CSS specified. The panel is a two column stacked panel. We do have two pieces of content loaded into our panel layout. Our top pane has a node and a View loaded. The node is one Drupal page and the View is our **photo_gallery** View. Our other panes are empty. We'll make a note of this layout arrangement in a WordPad document and save it to our desktop for reference later.



Final prep for upgrading to 6.13

Here's a final prep checklist before we start the 6.13 upgrade:

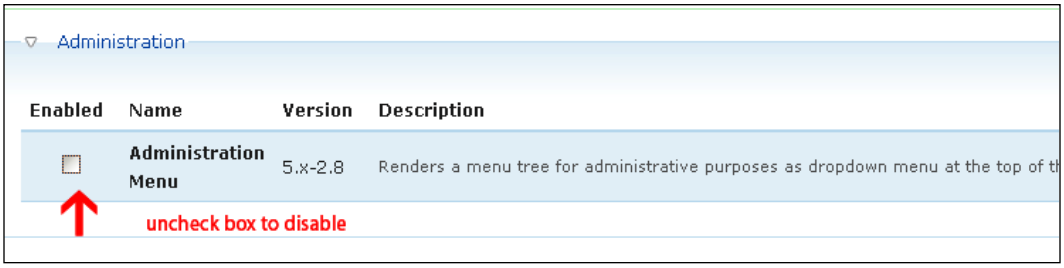
1. Run `cron` manually a final time before the upgrade.
2. Check your recent log entries one final time at **Administer | Logs | Recent log entries** before upgrading.

3. Make a list of all of your contributed modules so that you have a module checklist to work from during the upgrade process. Here is our list of contributed modules for the site that we'll need to update once we upgrade Drupal core:
    - Administration Menu
    - CCK
    - Development (Devel)
    - Imagecache
    - FCKEditor
    - IMCE
    - Lightbox2
    - Panels
    - Webform
    - jQuery plugins
    - Views

It's also good practice to print out the list of your modules before doing the upgrade, so that you have the printout as a reference to fall back on when you're downloading your 6.x versions.

Disabling all contributed modules

Access your Modules list and uncheck all contributed modules to disable them in advance of the upgrade. You do not need to uninstall any of the modules (apart from the Drupal Update Status module that we already removed), but it's a good idea to disable all contributed modules.

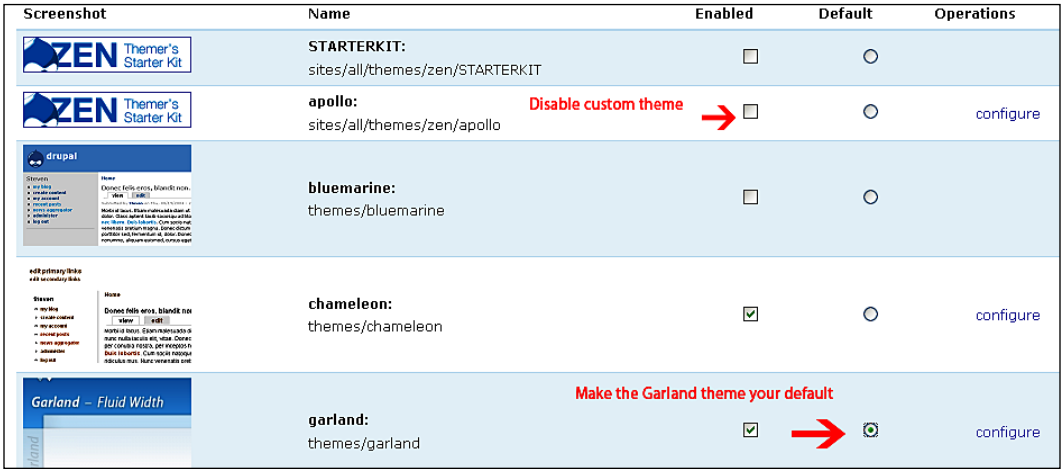


Save your module configuration once you have disabled all the contributed modules.

Enabling the Garland theme site-wide

Before upgrading it's a good idea to disable your custom theme (in this case we are using a sub-theme of Zen called 'Apollo'). Enable the Garland default Drupal theme (the one you're currently using on the admin portions of the site) for your entire site during the upgrade process. We're going to be deleting the entire Zen theme in order to upgrade it to the 6.x version of Zen, so let's disable it first.

1. Go to the **Administer | Site building | Themes** admin list and disable the **Apollo** theme.
2. Check the **Default** radio button next to the **Garland** theme to make it your default system theme for the upgrade process.



3. Save configuration.

Downloading Drupal 6.13

Download the latest stable release of Drupal (for this book it's 6.13) from the `drupal.org` home page.

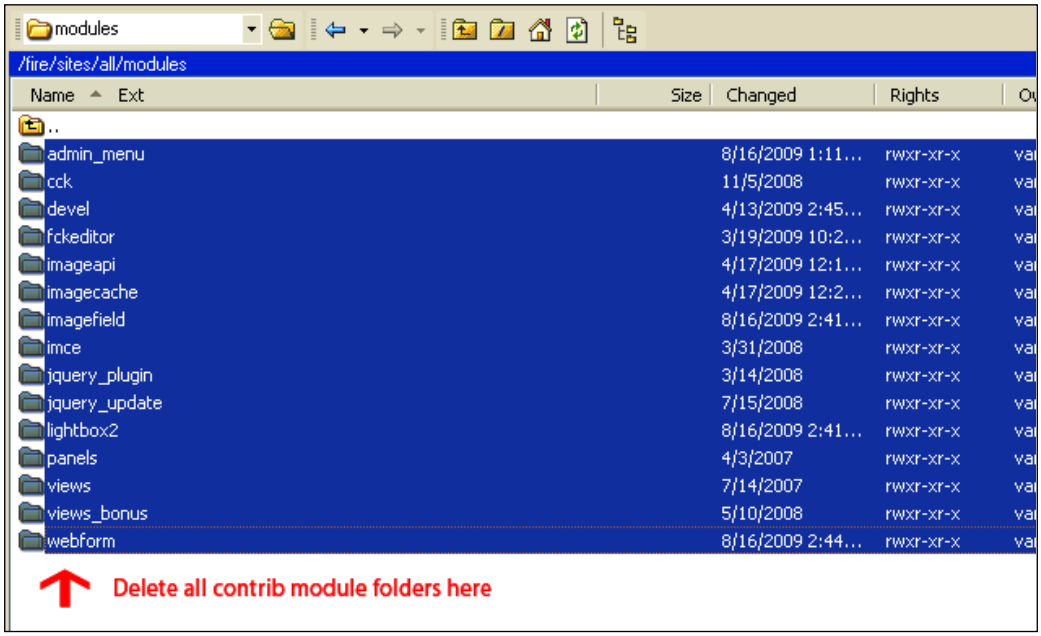
1. Click on **Download Drupal 6.13** and then save the `tar.gz` file to your local desktop.

2. Extract `tar.gz` to your desktop. This will create a `drupal-6.13` folder.

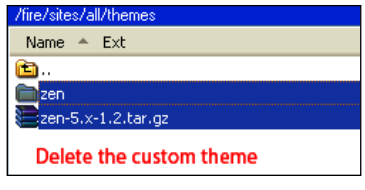
Upgrading Drupal core

We're going to upgrade the Drupal core code first. Here are the steps:

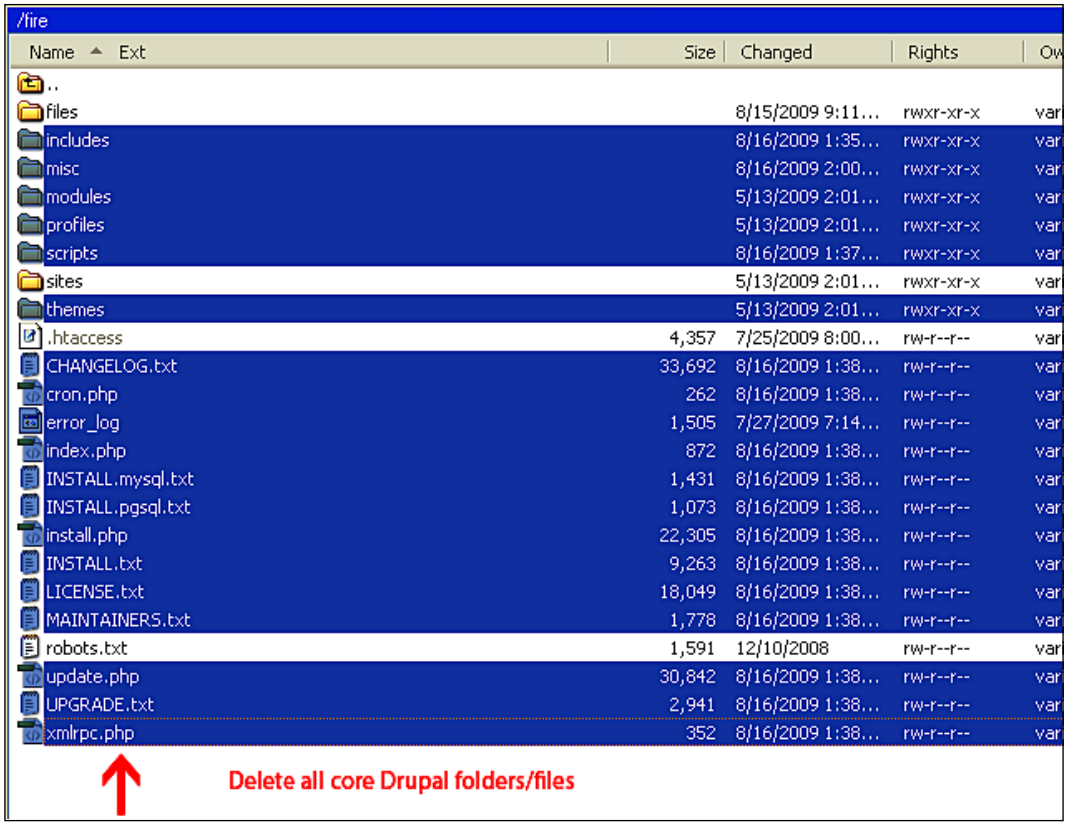
1. Login to your server through FTP/SFTP.
2. You should have your local `drupal-6.13` folder on your local FTP side (left side) and your Drupal site on your right side in the FTP window.
3. Open up `/sites/all/modules` and delete your entire contributed module list—you can safely delete all the contributed module code as you'll be adding the new Drupal 6.x versions during the upgrade process. It's a good idea to remove the legacy module folders first.



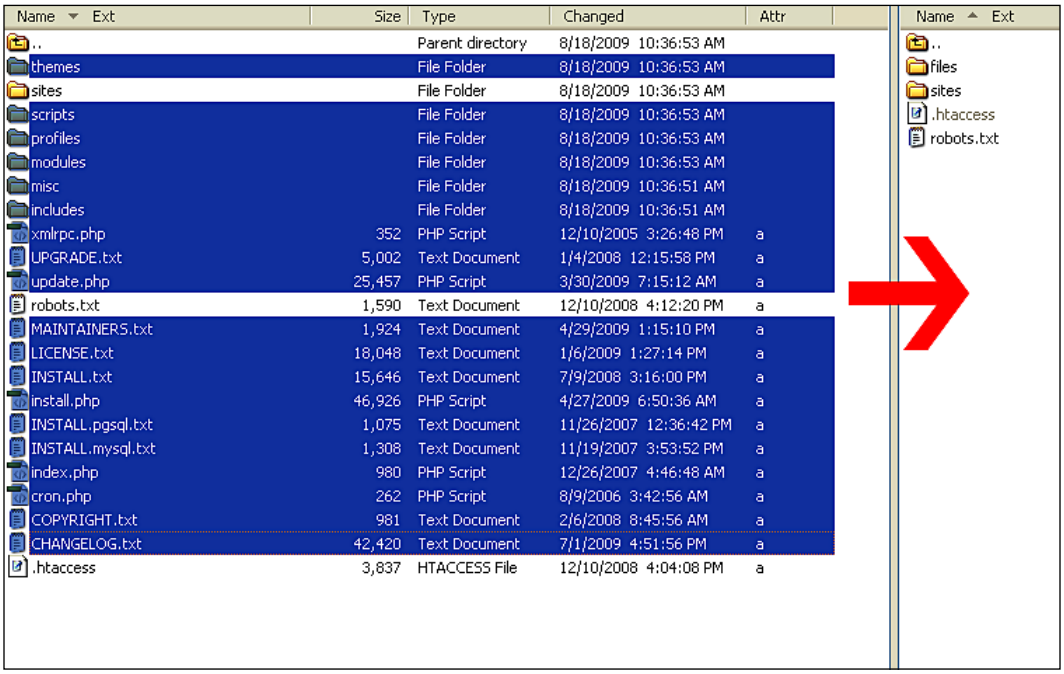
4. After backing up your custom theme files (make sure you have a good backup of all your CSS, and so on), delete the entire custom theme folder (in this case `Zen`). We'll add our custom theme CSS to the site once we complete the core upgrade process.



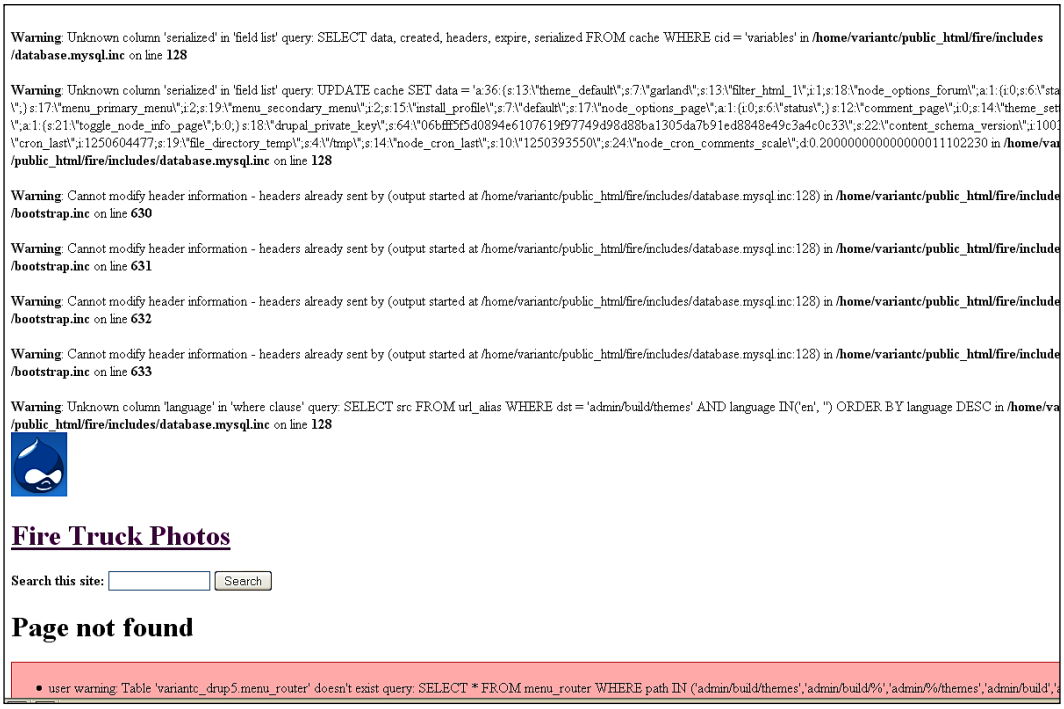
5. Delete all of your core Drupal files taking care not to delete the `/sites` or `/files` folders. Do not delete your `.htaccess`, `robots.txt` files, or any other files you may have added custom code to either. This includes `php.ini`. These files can remain in your Drupal directory.



6. Move your Drupal 6.13 files from your local side to your remote server—this will add all of the Drupal 6.13 core folders and files to your Drupal site/server. You do not need to move over the `/sites` folder, `.htaccess`, or `robots.txt` files. If you accidentally do move over the `/sites` folder, you will not replace your `settings.php` file because Drupal 6.x names this file with a different file name, so you cannot accidentally overwrite the file during an upgrade.



7. Refresh your Drupal site (on whatever admin page you are currently on). If you receive immediate parse errors or a white screen (the infamous white screen of death, though it's really nothing to be afraid of), make sure to carry out the following steps and run your `update.php` to update the database schema. You should see a screen with a bunch of parse errors at this point:

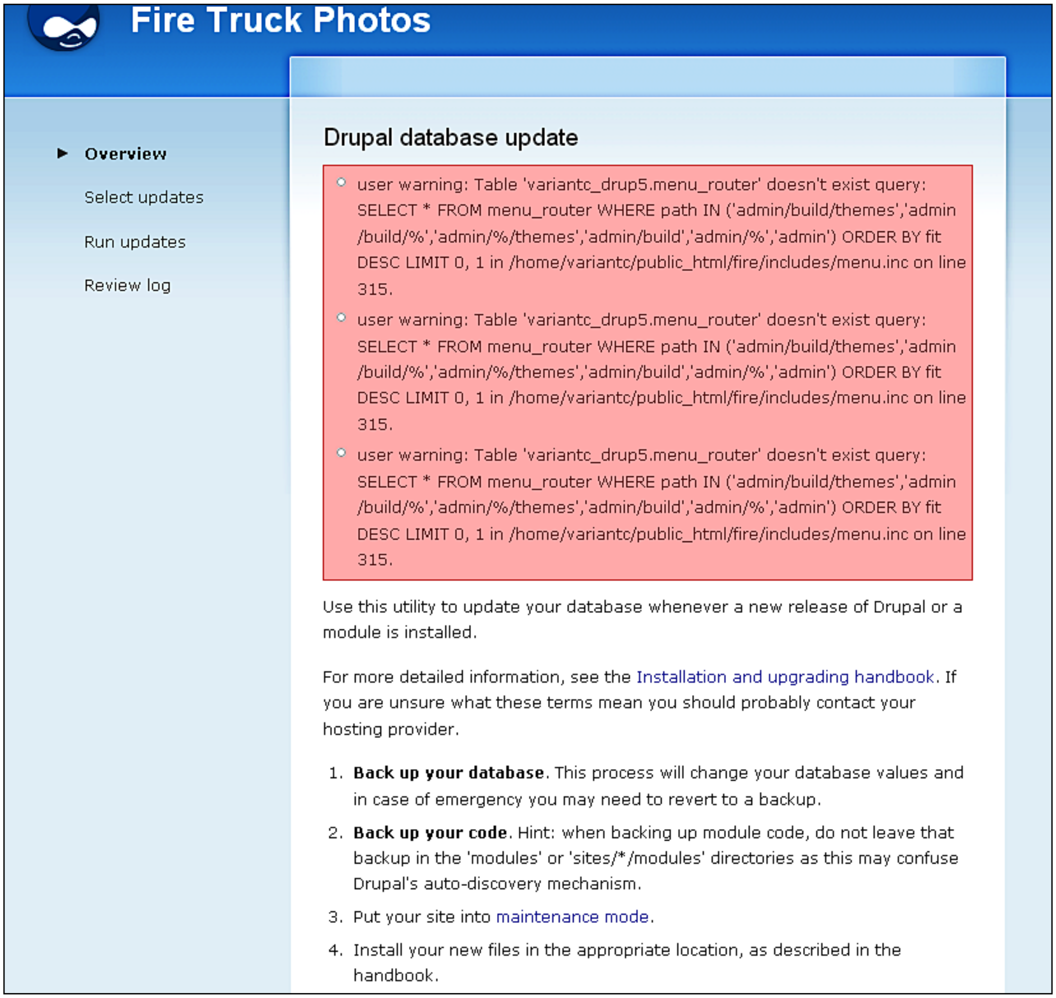


Running update.php

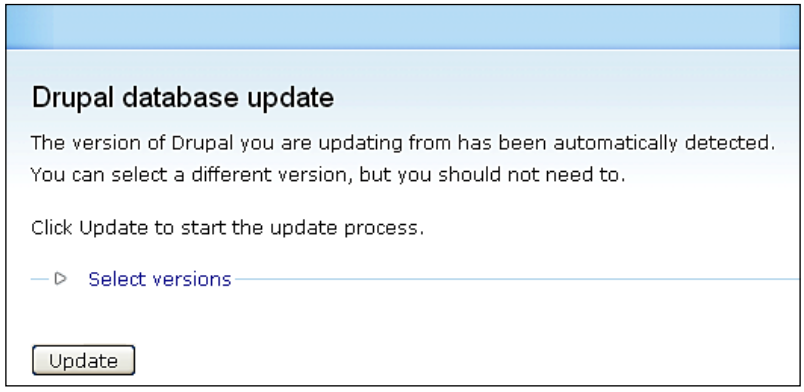
Immediately after moving your new Drupal 6.x core files over to your server and refreshing your site page, you'll see a bunch of parse errors. Don't panic! Follow these steps to run your `update.php` script in order to update your Drupal database schema, so it updates to the latest Drupal 6.x configuration:

1. Type in `update.php` at the root level of your site URL. So, for this site we'll have the following URL to run our script: `http://variantcube.com/fire/update.php`
2. Click the **Return button on your keyboard to load the** `update.php` script.

3. You will see the following Drupal database update page (along with more parse errors):

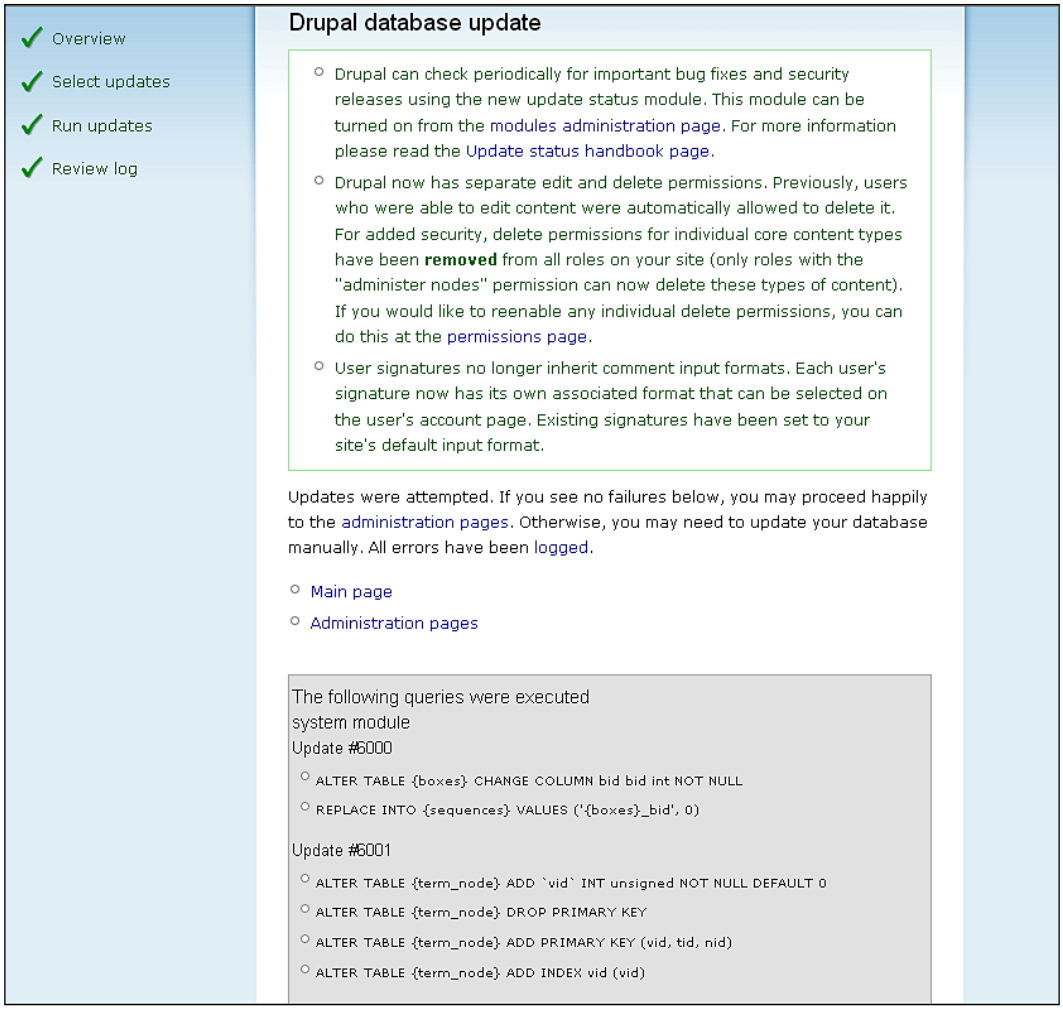


4. Click on the **Continue** button to begin the update process.
5. A second Drupal database update page will load. You do not need to select the versions—Drupal will do this automatically. Click on the **Update** button.

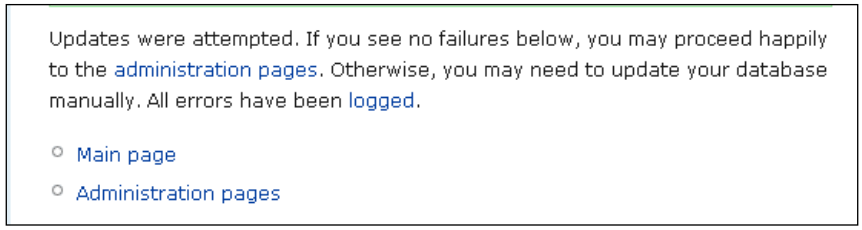


6. The updates will run. You will see a progress bar and each core module will be updated in the database schema. Allow all the database updates to complete. Do not click your mouse during this process.
7. Once completed, you should see a final **Drupal database update** page load. A series of messages will be visible telling you the database update is complete. For example, on our site Drupal tells us that it now has **separate edit and delete permissions**. This is good information to read, as you know exactly what Drupal did during the upgrade process. You'll also see a long list of executed database queries. This list will tell you exactly what updates the Drupal `update.php` script performed in your database tables. For example, if the update script altered or replaced tables.

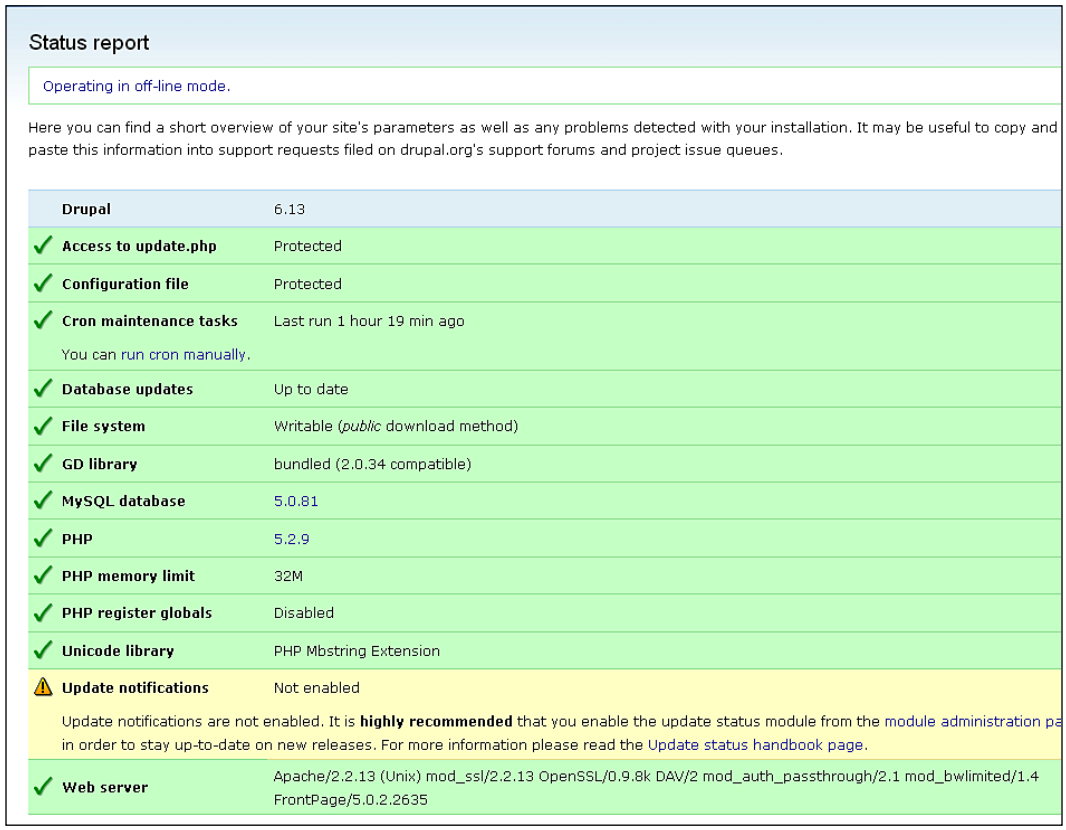
8. At this point your update page should show all green messages and gray query executed updates. You should also see green checks next to your upgrade list at the top left corner of the page—**Overview**, **Select Updates**, **Run updates**, and **Review log**.



9. Your core upgrade process is now completed from the database side.
10. Click on the **Main page** or **Administration pages** link to be taken back to your new 6.13 site. It's a good idea to first click on the **Administration pages** link to make sure the admin pages load correctly.



11. Once you click on the **Administration pages** link, you can then go to your **Status report** page through the **Reports | Status report** link.
12. The **Status report** should now show you the new version of Drupal 6.13 listed. It should also show you green checks next to the rest of your configuration. This shows you that you have successfully upgraded your core code to Drupal 6.13. Congratulations!



13. Run `cron` manually to make sure the Status report loads again without any errors. `cron` should run successfully.
14. We're now ready to complete the entire upgrade process by installing the new 6.x versions of our contributed modules, and our Zen theme and corresponding custom theme files.
15. We will then enable the update status module (that now comes packaged with Drupal 6.x) and that will complete the entire upgrade.

Upgrading contributed modules

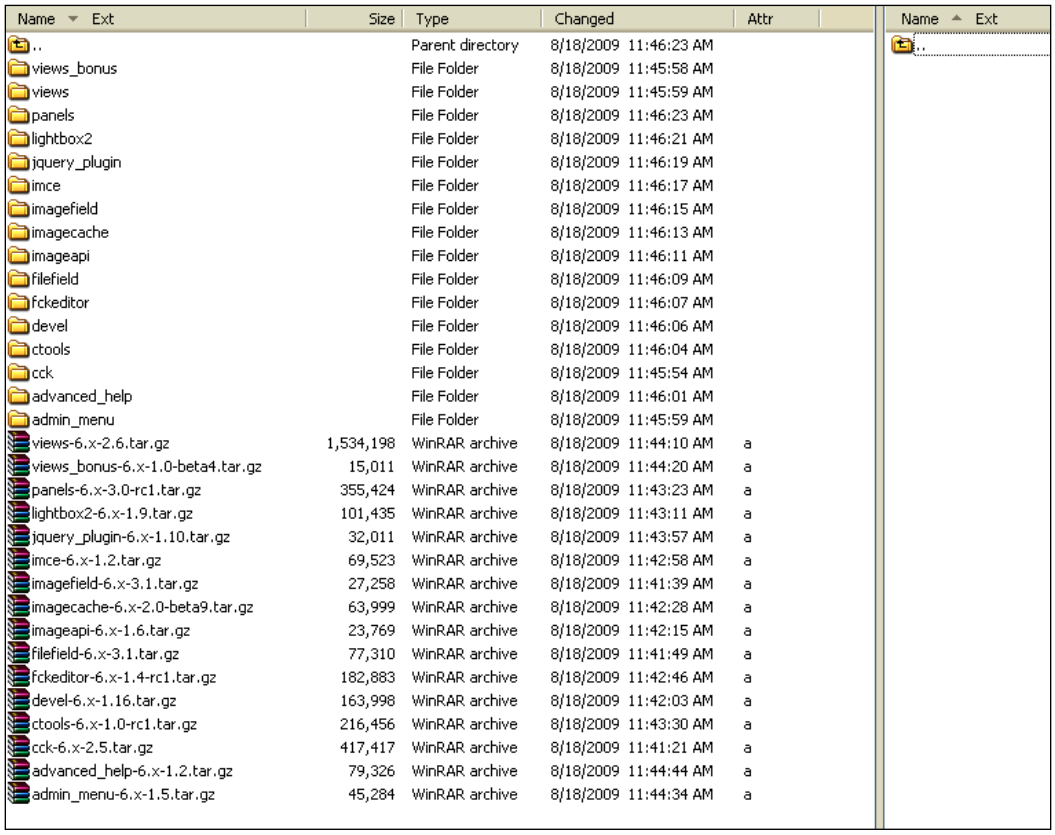
We're now ready to update our contributed modules to their 6.x versions. Follow these steps:

1. Download all of the contributed module `tar.gz` files corresponding to the latest 6.x stable releases to a folder on your desktop. You may want to create a folder called `contrib._module_upgrades` to put the new releases in.
2. Once you have downloaded all the `tar.gz` files, extract them into your contributed modules folder. This will create all of your module folders (one for each module).

If you are using `CCK` and `Imagefield`, you'll also need to download the `Filefield` module—this is a dependency of `Imagefield` in Drupal 6.x.

3. Also, make sure you download and extract the Advanced Help module, so you can add advanced help documentation to your Drupal site (this is a large scale Drupal 6.x enhancement). The project page is here: `http://drupal.org/project/advanced_help`

4. You should by now have extracted all of your modules ready to upload via FTP:

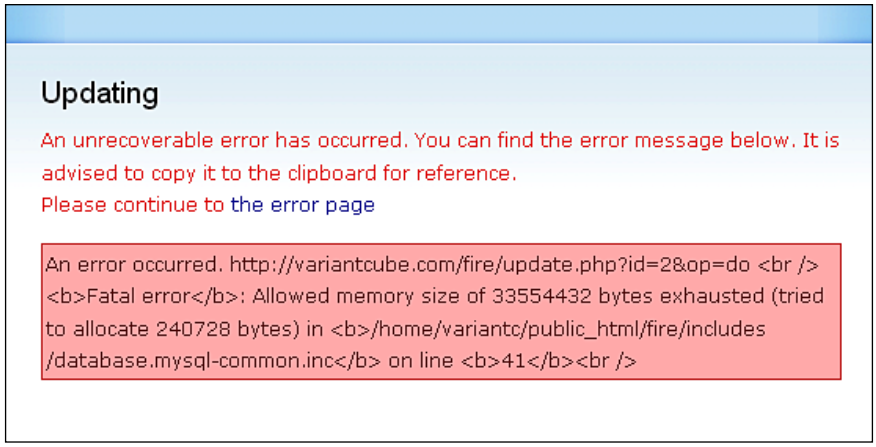


Name	Ext	Size	Type	Changed	Attr
..			Parent directory	8/18/2009 11:46:23 AM	
views_bonus			File Folder	8/18/2009 11:45:58 AM	
views			File Folder	8/18/2009 11:45:59 AM	
panels			File Folder	8/18/2009 11:46:23 AM	
lightbox2			File Folder	8/18/2009 11:46:21 AM	
jquery_plugin			File Folder	8/18/2009 11:46:19 AM	
imce			File Folder	8/18/2009 11:46:17 AM	
imagefield			File Folder	8/18/2009 11:46:15 AM	
imagecache			File Folder	8/18/2009 11:46:13 AM	
imageapi			File Folder	8/18/2009 11:46:11 AM	
filefield			File Folder	8/18/2009 11:46:09 AM	
fckeditor			File Folder	8/18/2009 11:46:07 AM	
devel			File Folder	8/18/2009 11:46:06 AM	
ctools			File Folder	8/18/2009 11:46:04 AM	
cck			File Folder	8/18/2009 11:45:54 AM	
advanced_help			File Folder	8/18/2009 11:46:01 AM	
admin_menu			File Folder	8/18/2009 11:45:59 AM	
views-6.x-2.6.tar.gz		1,534,198	WinRAR archive	8/18/2009 11:44:10 AM	a
views_bonus-6.x-1.0-beta4.tar.gz		15,011	WinRAR archive	8/18/2009 11:44:20 AM	a
panels-6.x-3.0-rc1.tar.gz		355,424	WinRAR archive	8/18/2009 11:43:23 AM	a
lightbox2-6.x-1.9.tar.gz		101,435	WinRAR archive	8/18/2009 11:43:11 AM	a
jquery_plugin-6.x-1.10.tar.gz		32,011	WinRAR archive	8/18/2009 11:43:57 AM	a
imce-6.x-1.2.tar.gz		69,523	WinRAR archive	8/18/2009 11:42:58 AM	a
imagefield-6.x-3.1.tar.gz		27,258	WinRAR archive	8/18/2009 11:41:39 AM	a
imagecache-6.x-2.0-beta9.tar.gz		63,999	WinRAR archive	8/18/2009 11:42:28 AM	a
imageapi-6.x-1.6.tar.gz		23,769	WinRAR archive	8/18/2009 11:42:15 AM	a
filefield-6.x-3.1.tar.gz		77,310	WinRAR archive	8/18/2009 11:41:49 AM	a
fckeditor-6.x-1.4-rc1.tar.gz		182,883	WinRAR archive	8/18/2009 11:42:46 AM	a
devel-6.x-1.16.tar.gz		163,998	WinRAR archive	8/18/2009 11:42:03 AM	a
ctools-6.x-1.0-rc1.tar.gz		216,456	WinRAR archive	8/18/2009 11:43:30 AM	a
cck-6.x-2.5.tar.gz		417,417	WinRAR archive	8/18/2009 11:41:21 AM	a
advanced_help-6.x-1.2.tar.gz		79,326	WinRAR archive	8/18/2009 11:44:44 AM	a
admin_menu-6.x-1.5.tar.gz		45,284	WinRAR archive	8/18/2009 11:44:34 AM	a

5. Move your new contributed modules using FTP to your `/sites/all/modules` directory.
6. Go to your Modules admin list and re-enable the 6.x versions of the modules you just installed through their respective groups. For example, re-enable all of the Views modules and then run your `update.php` script. Then come back to the modules admin list and re-enable your Panels modules. Doing it in this way by enabling the modules as groups will help you to identify problems with your module upgrades and more easily diagnose problems than if you just re-enable all your contributed modules at the same time.
7. The only module you do not need to enable at this time is the Devel module. We're going to look at that module in detail in Chapter 3, so leave it disabled for now. Be sure to enable the Advanced Help module as well. Click on **Save configuration**.

8. You may receive a **Fatal Error** warning about your `memory_limit` size (in your PHP settings). If you receive this, go ahead to the next step and run your `update.php` script. We'll address our memory issue immediately after running `update.php`.
9. If you receive parse errors, immediately run `update.php` again. This time the script will update all of your contributed modules database schemas.
10. You will see your Drupal database update page again (at `update.php`). Click on the **Continue** button.
11. Click on **Update** on the next screen (the same as our `update.php` during core upgrade above).
12. When I run `update.php`, Drupal informs that there is not enough memory to run the upgrade. This is a performance issue due to the amount of modules we've added to our site and the resources these modules require. Before continuing our `update.php` we'll need to upgrade our `memory_limit`. We can do this by editing our site's `settings.php` file. These are screenshots of the two types of errors which may arise at this stage of the process:

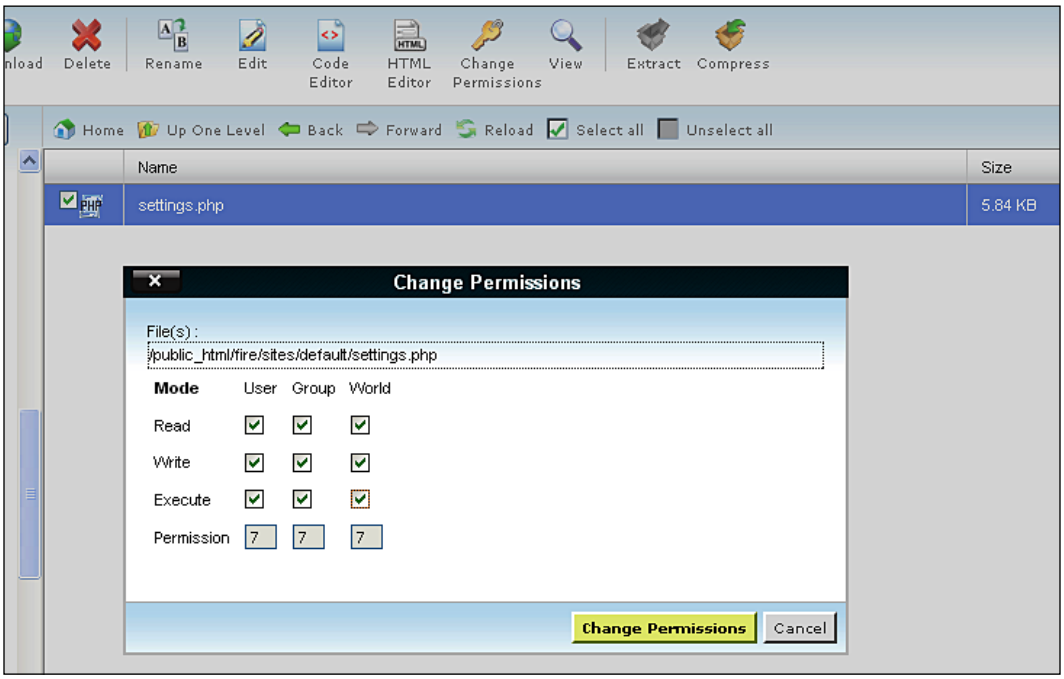
Fatal error: Allowed memory size of 33554432 bytes exhausted (tried to allocate 30720 bytes) in line **131**



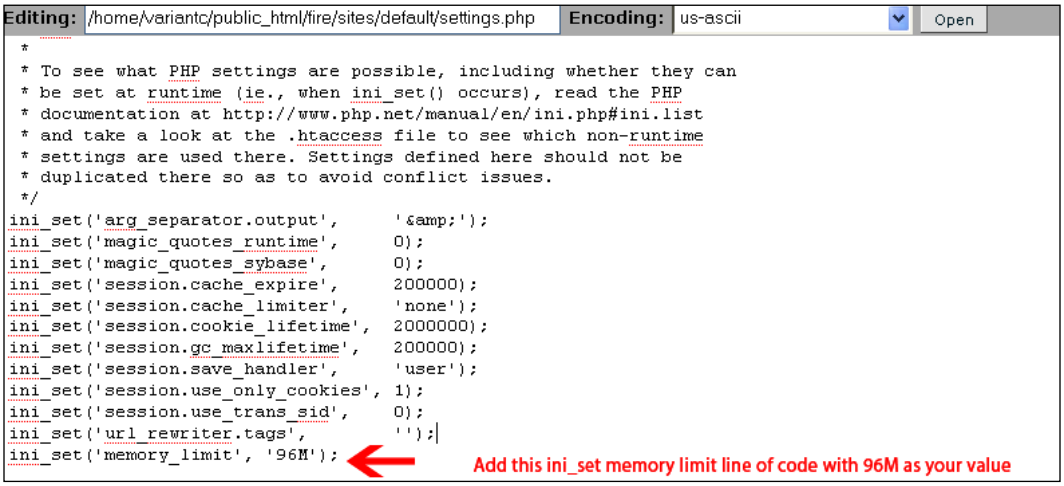
Updating your PHP memory limit

We're getting errors related to PHP memory, so we need to increase our `memory_limit` in our PHP settings. There are a number of methods of doing this. You can set a higher memory limit in your `.htaccess`, `php.ini` or `settings.php` files. We'll try doing this by adding a memory limit increase to our Drupal site's `settings.php` file first. There's more about tweaking Drupal PHP memory limits here: `http://drupal.org/node/207036`

1. Either login to your cPanel File Manager utility or to your site through FTP to edit the `settings.php` file that is in your `/sites/default` folder. If you do this via FTP, you will need to edit the file's permissions first in order to add or edit the file. It needs to have write permissions for editing purposes.
2. I've logged into my cPanel File Manager utility and I've browsed to my `/sites/default` directory.
3. I check the box next to my `settings.php` file and then click on the **Change Permissions** button in the File Manager admin screen. I add full write and execute permissions. I click on the **Change Permissions** button.



4. I then click on the **Edit** button in the File Manager utility.
5. This launches the `settings.php` file in edit mode. I look for the PHP settings section of the file and the array of `ini_set` settings. I add the following line of code to my file: `ini_set('memory_limit', '96M');`
6. I specify `96M` as my new `memory_limit` value.

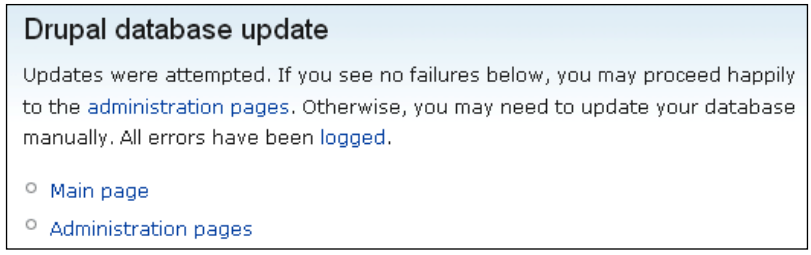


7. Save the changes to your file.
8. Refresh your site admin screen to see if the changes worked.
9. If you refresh your `update.php` screen, the updates should automatically begin because your memory limit is now working. If you receive any remaining parse errors, run the `update.php` script again until you see no errors.
10. Drupal will give you the following note/info when you run `update.php` to upgrade your modules.

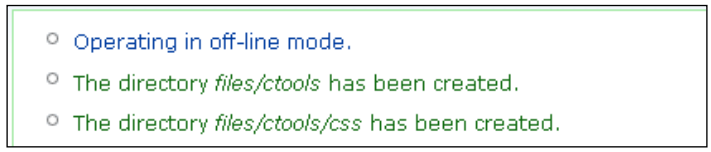
Please **note that the Panels upgrade from Drupal 5 to Drupal 6 is far from** perfect, especially where Views and CCK are involved. Please check all your panels carefully and compare them against the originals. You may need to do some rework to regain your original functionality.

This is why we took the time earlier to make notes about the home page panel we're using on the site, in case we need to rebuild it.

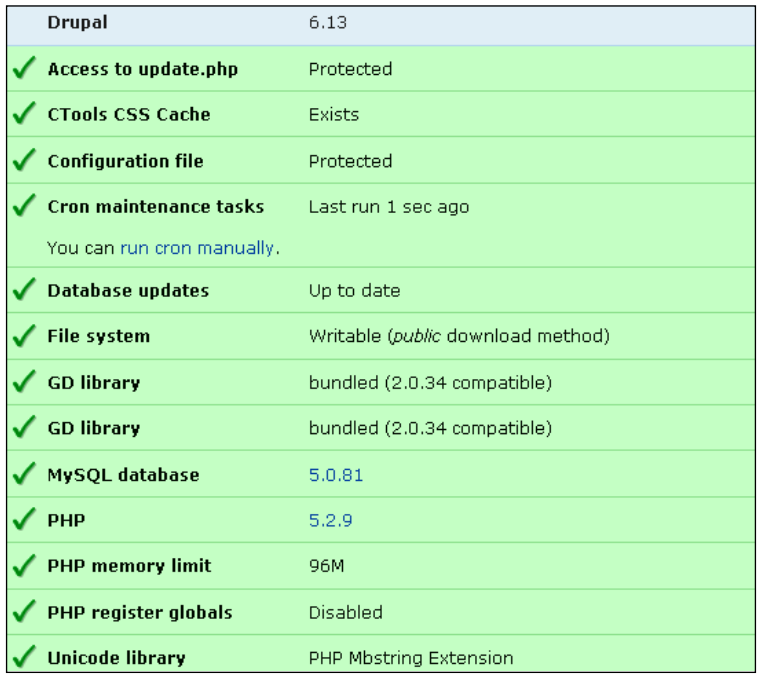
11. You should now see a final Drupal database update screen with links back to your Administration pages (just like at the end of the core upgrade process). Click on the **Administration pages** link.



12. If you have installed the CTools module (to allow Panels to work) you'll see two messages appear at the top of the Administer page: **The directory** *files/ctools* **has been created** and **The directory** *files/ctools/css* **has been created**.



13. Load your **Status report** page and you should see everything in green mode with checks. You've successfully completed stage 1 of the contributed module upgrade process. Congratulations! Notice that on your **Status report** page you'll see the PHP memory limit is now set to **96M**.

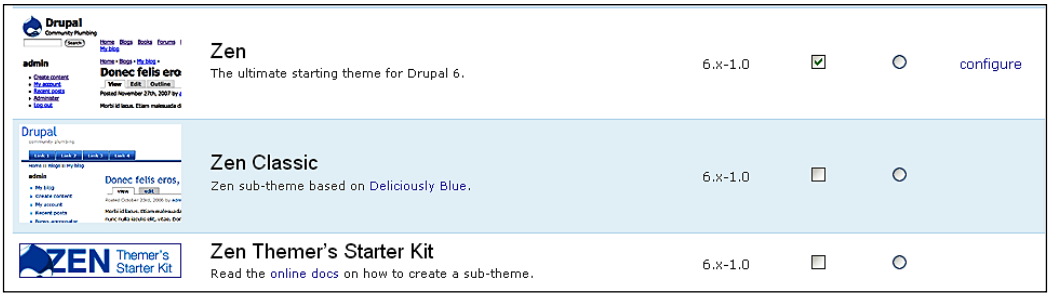


14. Run `cron` manually once more to make sure you do not receive any errors. The last items to address will be to re-enable your View for the photo gallery and your home page panel. Finally, we'll re-install and enable your custom Zen sub-theme.

Installing the updated Zen theme files

We're going to install and upgrade the contributed Zen theme (6.x-1.0) so that we can reinstall and configure our Apollo custom theme files. The first part of this process is to install the main Zen theme folder in your `/sites/all/themes` directory.

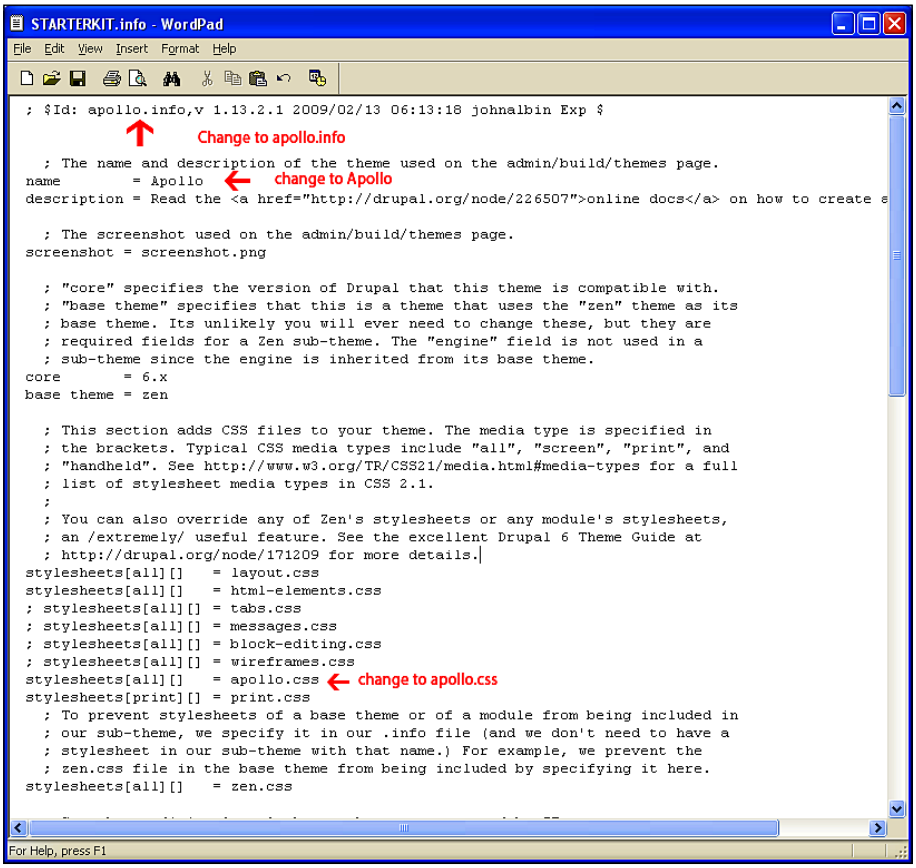
1. Download the 6.x version of the Zen theme from its project page here: `http://drupal.org/project/zen`
2. Extract the file in your contributed modules directory on your desktop.
3. Connect to your site through FTP and browse to the `/sites/all/themes` folder.
4. Upload the Zen folder.
5. Now when you refresh your themes admin list, you'll see the 6.x-1.0 versions of Zen, Zen Classic, and the Zen Themer's Starter Kit.



Upgrading your custom theme

Now we need to add our custom theme back to the site. Our theme is called 'Apollo' and we originally used the Zen Themer's Starter Kit files in Drupal 5.x to create this custom theme. Here are the steps for upgrading our custom theme to Drupal 6.x and for using the new upgraded Zen Themer's Starter Kit code base. Bear in mind that we did not make any template code edits to our original Apollo theme, so we do not need to worry about updating our new template files with our existing template code. This may be different in your specific case. Make sure to have good backups of all your existing Drupal 5.x custom theme files. We will need to copy over the CSS files from our existing Apollo theme, so we have the same CSS styles in our new 6.x site. Here are the steps:

1. Copy over your existing `apollo` folder using FTP into the main `Zen` directory in your `/sites/all/modules` folder.
2. Open the `apollo` folder on the remote side and delete the following files: `template.php`, `theme-settings.php`, and `theme-settings.init.php`. These are the older template files and we will replace these with the latest TPL versions—make sure you note down any specific theme override functions you may have customized or added—you can copy those out and then paste them back into the new TPL files once you add them. In our case, we did not add any specific theme overrides.
3. Now, with Drupal 6.x themes the new rule is that you need to have a `.info` file in your theme directory, so that the theme will show up in the modules admin list, and in order for all of your theme regions to be defined properly. You need to add an `apollo.info` file in the root directory of the theme. Copy the `STARTERKIT.info` file (from the `STARTERKIT` theme folder) to your local side of FTP. Open the file in WordPad, and change any reference to `STARTERKIT` in the file to `apollo`.



4. Save the file and then re-name it to `apollo.info`. Upload this `apollo.info` file back to your `apollo` theme directory.
5. Refresh your themes admin list and the Apollo theme will now be visible.
6. Grab the `template.php` file and the `theme-settings.php` files from the `STARTERKIT` folder and move those to your local site. Rename any instance of `STARTERKIT` in those 2 files to `apollo`. This includes the main function in `template.php` (function `apollo_theme`):

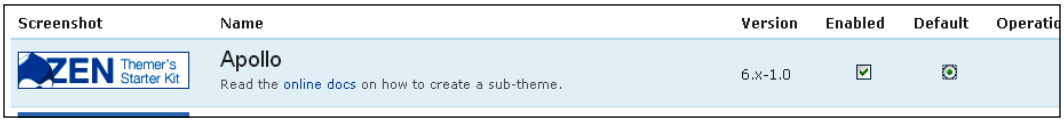
```
/**
* Implementation of HOOK_theme().
*/
function apollo_theme(&$existing, $type, $theme, $path) {
 $hooks = zen_theme($existing, $type, $theme, $path);
 // Add your theme hooks like this:
 /*
 $hooks['hook_name_here'] = array( // Details go here );
 */
 // @TODO: Needs detailed comments. Patches welcome!
 return $hooks;
}
```

   This is the renamed function in `theme-settings.php`:

```
function apollo_settings($saved_settings) {

  // Get the default values from the .info file.
  $defaults = zen_theme_get_default_settings('apollo');

  // Merge the saved variables and their default values.
  $settings = array_merge($defaults, $saved_settings);

  /*
   * Create the form using Forms API: http://api.drupal.org/api/6
   */
```

7. Once those functions are renamed, upload those two PHP files to your `/apollo` directory.

8. Refresh your themes admin listing.
9. Enable your **Apollo** theme as the **Default**.



10. Confirm that your Garland theme is set to the default admin theme here: **Administer | Site Configuration | Administration theme**. You can also choose whether you want to use the Garland theme for content editing. Save configuration.
11. Congratulations! You've upgraded your custom theme to Drupal 6.x. Good work!

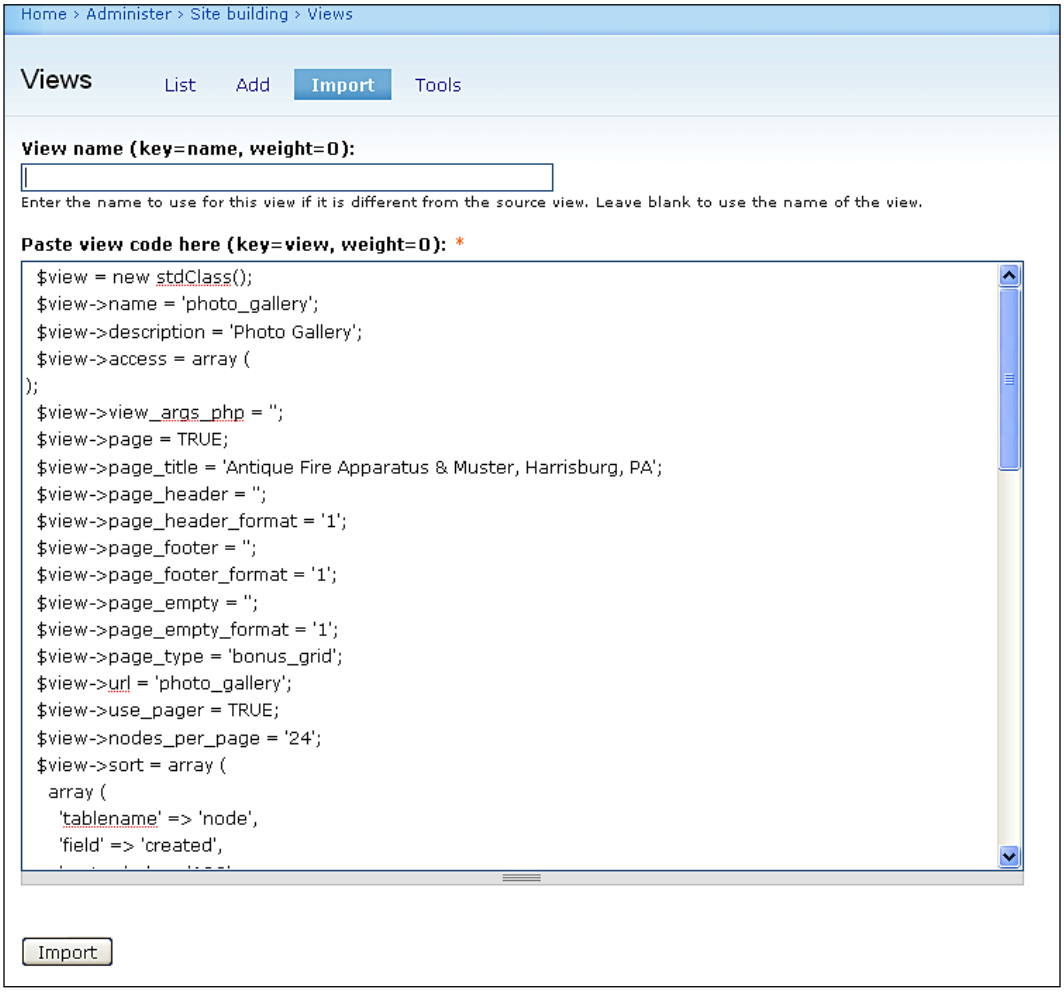
Cleaning up and resetting Views

The last thing to do in order to have a completely successful upgrade process is to carry out any content cleanup that's required and to reset your Views. Looking at our photo gallery content pages post-upgrade, I notice that the Lightbox2 imagecache settings were not implemented during the upgrade process. In order to use the correct **Teaser** and **Full node** display types, you may need to go back into your Photo Gallery content type and manage the **Display fields** configuration on your Photo file field.

The last thing you need to do is import your View code that we had exported from our Drupal 5.x site before we upgraded. Go ahead and open that `.txt` tile you saved and copy all the code.

1. Select all and copy code from your `photo_gallery.txt` file.
2. Go to your **Site Building | Views** admin and click on the **Import** button.
3. Leave the **View name** field blank.
4. Paste your copied View export code into the box.

5. Click on **Import**.



6. Check your View settings in the new Views2 interface to make sure they're translated correctly.
7. Save your View.
8. Test your View as a page and a block.

Placing your site back online

Now that you have completed the upgrade process, you can place your site back online. Browse to **Administer | Site configuration | Site maintenance** and check the **Online** radio button. Save configuration and your site will return to online status.

Summary

Congratulations! You have successfully upgraded your Drupal site. Here's a brief recap of what you did in this chapter:

- After backing up your site and database, taking your site offline and running Status report, you upgraded your Drupal core code to Drupal 5.19.
- You installed the Drupal Update Status module and later removed the module so that it would not cause conflicts during the 6.x upgrade.
- You upgraded all of your 5.x versions of contributed modules—a very important step prior to the upgrade to Drupal 6.x.
- You backed up your Views by exporting their code.
- You prepped for the Drupal 6.x upgrade by disabling all contributed modules and enabling the default Drupal Garland theme.
- You upgraded the Drupal core code to 6.13 and ran `update.php` to update the entire Drupal database schema, thereby confirming that your MySQL database tables were updated.
- You made your first major performance tweak to your server and site by raising the PHP `memory_limit` settings to 96M—this setting needs to be larger to run Drupal 6.x and all of the contributed modules you have.

At this point you can bring your site back online using the site maintenance configuration. We'll see you back here for more performance tips in Chapter 2, including how to manage the Drupal cache system, clear the theme registry, and tweak your PHP settings.

2
Maintaining your Drupal Site

Now that you have upgraded to Drupal 6.13, you're ready to learn how to maintain the site, keep it running smoothly on a regular basis, and enable some performance enhancements that we will continue to monitor. This chapter will show you a selection of best practice Drupal maintenance tips and tricks that you can enable using the core Drupal administration interface. These performance enhancements will help you to run a powerful and well-maintained Drupal site.

Running a Drupal website is like keeping a fire truck prepared to go on a rescue call. The apparatus needs to be washed and inspected daily by firefighters so that it's ready to go fight a fire or rescue someone in need at a moment's notice. Your Drupal site also needs to be closely taken care of daily so that it runs smoothly, leaving less room for issues both on the site frontend and the backend, including the server.

By the end of this chapter, you will be able to perform the following maintenance:

- Inspect your Drupal configuration file.
- Check PHP and MySQL configuration using the Status report.
- Delete files you no longer need in your Drupal directory post upgrade.
- Enable the Drupal 6.x core Drupal Update Status module.
- Disable and uninstall contributed modules that are inactive.
- Enable and configure the Drupal performance cache.
- Clear your Drupal performance cache and clear the theme registry so that you can view theme tweaks immediately.
- Run `cron` tasks manually by using the Status report.
- Run `cron` tasks automatically using the Poormanscron module.
- Set up server side `cron` tasks using the cPanel admin.

- Tweak your `PHP.ini` settings including the `memory_limit`, `upload_max_size`, and `post_max_size`, and check which PHP extensions are enabled or disabled.
- Tweak your `HTACCESS` settings and configuration.
- Back your site up using phpMyAdmin and SFTP via cPanel. Through direct remote access, keep regular site directory and database backups, and use contributed backup modules.

By the conclusion of the chapter, you will develop a new skill set as a Drupal maintenance technician, ready to maintain your own Drupal site on an hourly and daily basis. You've already learned how to upgrade your site, so let's learn how to keep a close watch on the site and maintain its ongoing growth and development.

Checking your Drupal configuration status

Now that you have successfully upgraded to Drupal 6.13, you can run your **Status report** to check on the status of your configuration file and other site components such as the PHP and MySQL versions; GD library version, `memory_limit`, and whether or not your modules are updated. **Status report** will give you the most up-to-date checklist on the general performance of your site. When we run **Status report** we find out the following:

- Our `update.php` file is protected. The permissions on this file are `644`, meaning that read permissions are granted to `user`, `group`, and `world`, while `write` and `execute` permissions are enabled only for the users of the file.
- CTool CSS Cache is in use and exists. This is the CSS cache for the CTools module that is used in conjunction with Panels.
- Our main site `settings.php` file is protected. This has the same permissions level as the `update.php` file: read-only permissions.

It's important to emphasize here that your `settings.php` configuration file should always be set to read-only when your site is online and publicly accessible. If you download the file and view it in a text editor, you'll see this information at the top of the file under the **IMPORTANT NOTE** section. The file also tells you where it's located in your Drupal directory. For example, if you are running one Drupal site then the file is located in the `/sites/default` folder. If you are running a multisite installation, the file may be located in the `/sites/nameofsite.org/` folder. With multisite installations, each site will have its own `settings.php` file in its root directory.

The next set of information in the configuration file specifies your database settings. With Drupal you can integrate your site with one database (the common install method) using one `$db_url` line of code. You can also specify multiple databases if you need your Drupal site to connect to multiple databases (for example, if you're running CiviCRM you could set the CiviCRM database as the second database to use). Finally, you can specify database table prefixes. This is a possible configuration if you need your Drupal site to have a contributed module like Views2 Integrate with another module such as CiviCRM—there are times when this type of `db_prefix` is necessary.

See the following articles on `http://drupal.org/` and CiviCRM for more information. Views2 Integration Module: `http://wiki.civicrm.org/confluence/display/CRMDOC/Views2+Integration+Module`. How to configure multiple databases in your `settings.php` file: `http://drupal.org/node/18429`

As this article states, the code you'll use depends on whether you're connecting to one database or multiple. The default Drupal installation has one line of code:

```
<?php
$db_url = 'mysql://dbusername:dbuserpassword@localhost/dbname';
?>
```

If you are connecting to multiple databases, you'll need to add another `db_url` line of code. Set your main Drupal database as `default`. For example:

```
<?php
$db_url['default'] =
  'mysql://dbusername:dbuserpassword@localhost/dbname';
$db_url['db2'] = 'mysql://dbuser:pwd@localhost/anotherdbname';
$db_url['db3'] = 'mysql://dbuser:pwd@localhost/yetanotherdbname';
?>
```

You may need to configure this type of setup if you are trying to integrate a module such as CiviCRM with a Drupal module such as Views2. You need to set up the Drupal database user to have `SELECT` access to the CiviCRM database as well, and then add a specific array to your `$db_prefix`. For example, this array may look something like the one in this article: `http://wiki.civicrm.org/confluence/display/CRMDOC/Views2+Integration+Module`.

The next section in your configuration file is your Base URL—this should be specified though it's not required. In this section of the file, we'll uncomment the `$base_url` line of code and add our website's URL. In this case it will be:

```
$base_url = 'http://variantcube.com/fire';  // NO trailing slash!
```

Setting the `base_url` becomes more important when installing Drupal in a multisite configuration where you have multiple Drupal instances running off one core Drupal install. In this case you need to set the `base_url` for each of your multisites so that each site runs correctly when a user types in that site's subdomain URL. In our case the `base_url` is not required and you can simply leave this line of code commented out. You can also uncomment it as per my instructions above.

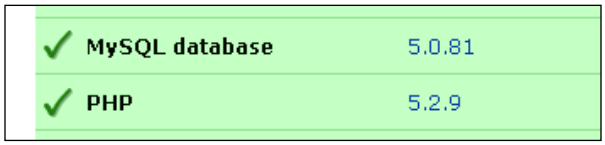
To make changes to your `settings.php` file you'll need to change the permissions on the file to write permissions. Use SFTP or your cPanel file manager utility. Then edit the file and make your changes. Save the file, re-upload it to your server, and then immediately refresh your site to make sure everything is still loading correctly. Then reset the permissions to read-only. When editing the permissions on the file using an FTP file manager utility, you set them to 777 or 755. Once you complete the edits you can restore the permissions to 555.

The next section of your configuration file contains PHP settings. We'll look at this in the next tip. Your **Status report** also provides the following information:

- When your last `cron` run was engaged (in minutes).
- Whether your database schema is up-to-date.
- If your filesystem is writable by the Drupal system.
- What version of the GD imaging library is loaded and whether you have enough site memory to load it.
- The versions of MySQL and PHP installed on your server.
- Your PHP `memory_limit`. You will recall that in Chapter 1 we increased this memory limit to `96M` so that we could successfully install our new upgrade and run all of our contributed modules. `96M` tends to be the recommended default memory limit for a Drupal 6.x site. When you install contributed modules, such as Views, Panels, or CiviCRM, you may need to raise your PHP `memory_limit` to `96M`, or the modules will not work or perform well.
- A specification that `register_globals` is disabled. In order to run Drupal, your host/server will be required to have this PHP setting disabled. If it's enabled, you will receive an error when you try and install or upgrade Drupal.
- The version of your web server (we're running Apache 2.2.13 here).

Checking your PHP and MySQL settings

You can also access your PHP and MySQL configuration settings via the Drupal **Status report**. For PHP it's as simple as clicking on the PHP version number, which is hyperlinked in your **Status report**. The same goes for your MySQL version and settings.



Clicking on the PHP version link loads a `php.info` file that resides in your site. This will give you all of your PHP core configuration settings and all of the PHP extensions you have loaded and enabled on your server. It's good to review this file for the following information that you'll need as you troubleshoot performance.

The location of your loaded `php.ini` configuration file: It's good to know where the default `php.ini` file is located on your web server. You can overwrite this configuration with a custom `php.ini` file or with custom PHP setting code that you load into either your `settings.php` and/or `.htaccess` file. However, there may be times when you need to edit the original default `php.ini` file as long as your host server gives you write access to that file.

Specifications under the **PHP Core configuration** section of the information file note the following information:

- Whether `file_uploads` is enabled/on. You will need to confirm that `file_uploads` is `On` in your PHP settings in order to use Drupal's core file attachments module.
- `Max_execution_time` and `max_input_time`.
- `Memory_limit`: notice its telling us that the local value of the `memory_limit` is `96M`, which is what we set by adding a line of custom code to our `settings.php` file in Chapter 1. The Master value for `memory_limit` is still set server wide to `32M`, but our site is using `96M`. The Master value is being forced by the default server `php.ini` file. When we added our line of code to our local site's `settings.php` file, it only made the new PHP `memory_limit` effective for our site. The local value will be used in your site and will override any master value set.

- `Post_max_size` and `upload_max_filesize`. These settings may need to be tweaked once our users start uploading files to our website. Drupal allows you to control the file sizes per upload (per file) and per user through the Drupal administration configuration. When you make a change to the maximum upload file size (per file and per user) in your Drupal configuration, you need to make sure that these tweaks have also been made in your PHP settings first. So, if you want to raise your maximum upload size per file to 30 MB, you need to make sure to increase your PHP setting for `upload_max_filesize` to 30 MB respectively.

The important thing to grasp now is that you have access to review these PHP settings through your site's Status report and this PHP information file becomes an invaluable tool to troubleshoot the performance of your Drupal site. For example, if a user of your site complains that they are receiving errors every time they try and post a 50 MB PowerPoint file or TIFF image, you can check your PHP settings to see what the `upload_max_filesize` is, and then make a local tweak by adding a line of code to your `settings.php` file or by adding a custom `php.ini` file to your server. We'll try this as an example later in this chapter.

memory_limit	96M ← Local value	32M
open_basedir	*no value*	*no value*
output_buffering	*no value*	*no value*
output_handler	*no value*	*no value*
post_max_size	8M	8M
precision	12	12
realpath_cache_size	16K	16K
realpath_cache_ttl	120	120
register_argc_argv	On	On
register_globals	Off	Off
register_long_arrays	On	On
report_memleaks	On	On
report_zend_debug	On	On
safe_mode	Off	Off
safe_mode_exec_dir	*no value*	*no value*
safe_mode_gid	Off	Off
safe_mode_include_dir	*no value*	*no value*
sendmail_from	*no value*	*no value*
sendmail_path	/usr/sbin/sendmail -t -i	/usr/sbin/sendmail -t -i
serialize_precision	100	100
short_open_tag	On	On
SMTP	localhost	localhost
smtp_port	25	25
sql.safe_mode	Off	Off
track_errors	Off	Off
unserialize_callback_func	*no value*	*no value*
upload_max_filesize	2M ← Local value	2M
upload_tmp_dir	*no value*	*no value*
user_dir	*no value*	*no value*
variables_order	EGPCS	EGPCS
xmlrpc_error_number	0	0
xmlrpc_errors	Off	Off
y2k_compliance	On	On
zend.ze1_compatibility_mode	Off	Off

Files to delete and clean up

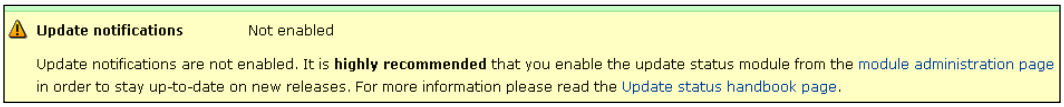
Your Status report tells you that your `update.php` file is protected. This is good as you do not want anyone to launch your Drupal site and try running `update.php` to update your database schema. You only want to do this as a super user admin. Another tip is to delete your `install.php` file from your Drupal site. You do not need to keep the `install.php` file on your production site. Removing it is a good precaution and the added benefit is that no unauthorized site user can try and run your `install.php` file. To do this:

1. SFTP into your site or access through cPanel.
2. Copy a backup of your `install.php` to your local backup folder so that you have it if you need it later.
3. Select your `install.php` file and delete it.

This would also be a good time to review your site's `/sites/modules` and `/sites/themes` folders, and make sure you do not have any residual files or `tar.gz` files remaining post upgrade. If you do, you can safely remove them from your site. You do not want to have module folders in your site if you don't need them because they will just take up space, which in turn makes your site/server sluggish.

Enabling the Update Status module

Remember that when we ran our Drupal 5.x site, we had to install the contributed Update Status module in order to get status notifications on our site's modules. This module now comes packaged with Drupal 6.13 core. So all we need to do is enable it. We see the module is currently disabled by checking our Status report and viewing the notification that the module is disabled:

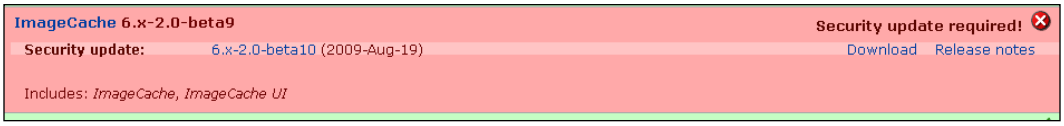


1. Visit your modules admin page here: `http://variantcube.com/fire/admin/build/modules`
2. Under your Core-optional module list, look for **Update status** and check the box next to the module to enable it. Save configuration.

Revisit your Status report and you should receive new notifications of modules or themes that need updating. Update Status will flag two types of updates in its notification system. The first type of update will be shown marked with a yellow background in your Available updates table. Yellow flagged updates are recommended version upgrades. These are usually new versions of the module that include potential new module functionality. They are not required as they do not include security patches to the module.

The second type of update is marked in dark red with a pastel red background color. These are required security patch upgrades that you should run as soon as possible after receiving the notification.

Notice that we have a new security update notification on our site displayed with the red background and red text. The Drupal Update Status module has located a new version of **ImageCache (6.x-2.0-beta9)**. This is a security patch release so it's a required patch we'll need to download in the near future.



Download the latest 6.x version of `Imagecache` and upload the new module folder to your server to replace the existing outdated module. You may need to run `update.php` again if the module makes any updates on your MySQL database tables. The latest `Imagecache` module is here: `http://drupal.org/project/imagecache`.

Disabling unused modules and themes

Now that you have your Drupal 6.13 site up and running, it's a good idea to review the core and contributed modules you're using, and to disable those modules and themes that are not being actively used. Disabling the modules will let Drupal know that it does not need to load those module hooks when they are not being used on the site. Disabling the module will keep the module in your site for future use and will keep that module's data in your database, but it will not be loaded during page loads or any other Drupal functionality since it's been disabled.

You can also choose to uninstall a module completely from your site if you are not using it, but bear in mind that if you uninstall a module in Drupal, it will remove not only the module but all the data associated with it. So, be sure to make a full backup of your site and database before removing any modules for good.

You can also disable all core modules and themes that you are not using. Check which these are, disable them, and this will help to speed up your website.

1. Go to your modules admin list at: `http://variantcube.com/fire/admin/build/modules`.
2. Uncheck any modules not being used. If you uncheck a contributed module you're no longer using, and do not need the module at all in your site, you can proceed to uninstall it.
3. For example, currently in my site I'm not using the sub-module of CCK called **Node Reference** nor the **User Reference** module. So I'm going to disable these. I may use them in the future, so I will leave them on my site in case I decide to re-enable them later.
4. I'm also not going to allow my users to change the colors of the themes, so I'm going to disable the core **Color** module. Go ahead and disable any specific modules you are not using.

You can also disable any core or contributed themes you are not planning to use following these instructions. Load the themes admin page here: `http://variantcube.com/fire/admin/build/themes` and make sure you only have the public and admin themes you're using enabled. In our case on the `/fire` site, we're using **Garland** as the admin theme so that's enabled and we're using **Apollo** as the **Zen** sub-theme. I will also leave the main **Zen** theme enabled. I can safely disable the other themes.

The good thing about doing this type of maintenance is that it prevents your users (both admin and public) from being able to access those additional themes.

Introduction to Drupal caching

Drupal gives you various methods of caching your site's data and content by using the Drupal core administrative interface. There are a variety of contributed modules that allow for more advanced caching (we'll look at these in later chapters). Drupal allows you to cache data and content in order to speed up the performance of your site in terms of how quickly your pages and entire site loads for the end user.

Caching as much data and content as possible, especially the content that you show to your anonymous site visitors which includes content, blocks, and menus that may not change frequently, will help Drupal to speed up page load times on your site. Drupal will keep the cached data stored in a temp location either on the server or in the MySQL database. The site can easily fetch it for load time from that location.

Drupal does this by storing cached data in specific database tables of your MySQL database, so it can easily retrieve the cached data instead of recomputing, reloading, and reprocessing menu, block, and theme data each time the page loads. For example, your Drupal site may have 50 nodes of content. Each time someone visits your site they may load 5 of those nodes. The next time a visitor comes to your site and loads the same 5 nodes, Drupal has to process those nodes a second time, and each successive time for each visitor. So, what Drupal allows you to do is cache this data so that the node only loads once.

Drupal stores the cached version of the page in the cache table of the database. This way the next time a visitor launches that page, menu, or block item, they are loading the cached page. This ultimately speeds up the entire load process and load times of your site.

Drupal caches the following content and data:

- Sessions
- Variables
- Menus and blocks
- Nodes (pages)
- Views

There are times, however, when you do not want to cache data and content on your site. This is what we're going to focus on now in this chapter. We want to take a look at the methods Drupal gives us for controlling our performance caching on our site, and the different options we can select for caching when we're, both, in development of our site and in production 'live' site environments. Other issues can come up with cached pages. If you are actively developing a site and working on content, when you make a change to a node and the site visitor loads a cached version of that node, they will not see your active changes to that node. So, this could be a drawback. We'll explore these different options and see how we can easily clear our performance cache, and also set the cache for a specific minimum lifetime so that you can expire a performance cache on a specific set of Drupal content.

Enabling and configuring Drupal caching

We will first explore the Drupal cache options by looking at what Drupal core gives us out of the box in terms of caching and performance options to control and configure.

To access your core performance cache administrative page go to **Site configuration | Performance**. This will load the main Performance admin page.

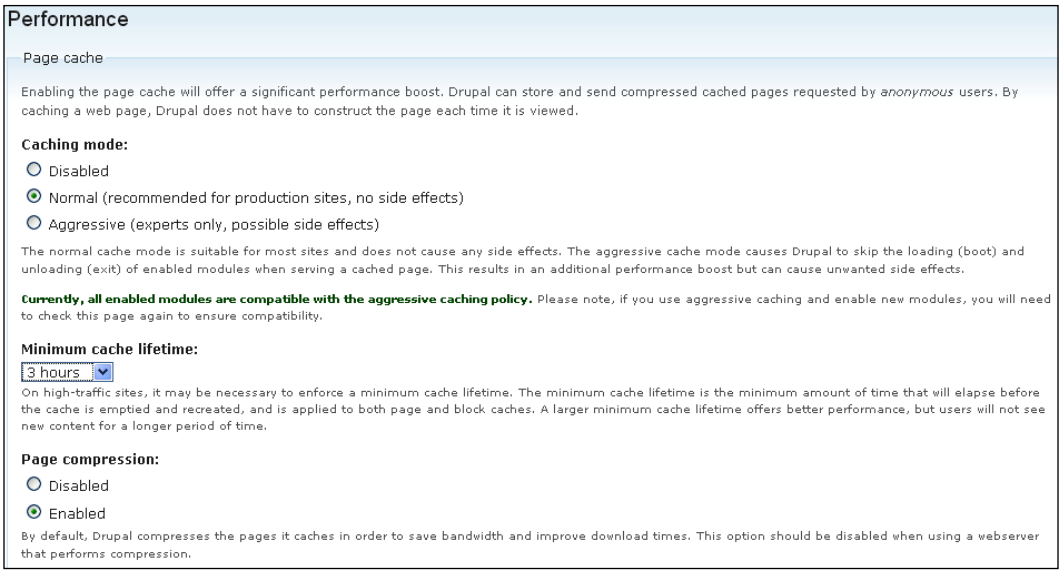
The first section of this page is devoted to Page cache. These settings control how your Drupal node content is being cached and stored by the Drupal system. There are 3 caching modes and you must choose one option as the admin or developer of the site. By default the option for **Disabled** caching will be set:

- Disabled
- Normal
- Aggressive

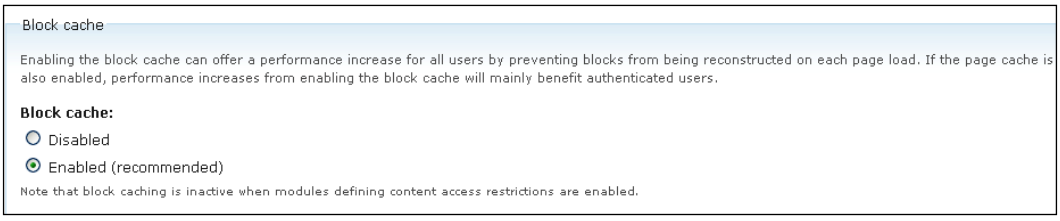
The default has caching set to **Disabled** on the site. The recommended setting is to have normal caching mode enabled. Normal mode is fine to use for production level websites. As Drupal explains, normal mode does not cause side effects on your site or with your modules.

Aggressive mode caching can potentially cause side effects. It's a trade off, as aggressive caching causes a significant performance boost on your site, but it can also interfere with your content loading correctly and your contributed modules loading correctly. When you enable some contributed modules, they may not be compatible with aggressive caching mode, so be sure to check this page every time you enable a new module.

We're going to enable the **Normal** caching mode by clicking on the radio button to select it. We are also going to set our **Minimum cache lifetime** to 3 hours. This means that every 3 hours our cache will be cleared by Drupal, but if content is edited on the site within 3 hours from when the cache was last cleared, your users may not see that new content, menu item, or block item. We will also enable **Page compression**, which will cause the pages to load faster and save bandwidth on our web server. You may want to check with your hosting company to see if they already perform this type of optimization on your site/server before enabling it through your Drupal admin.

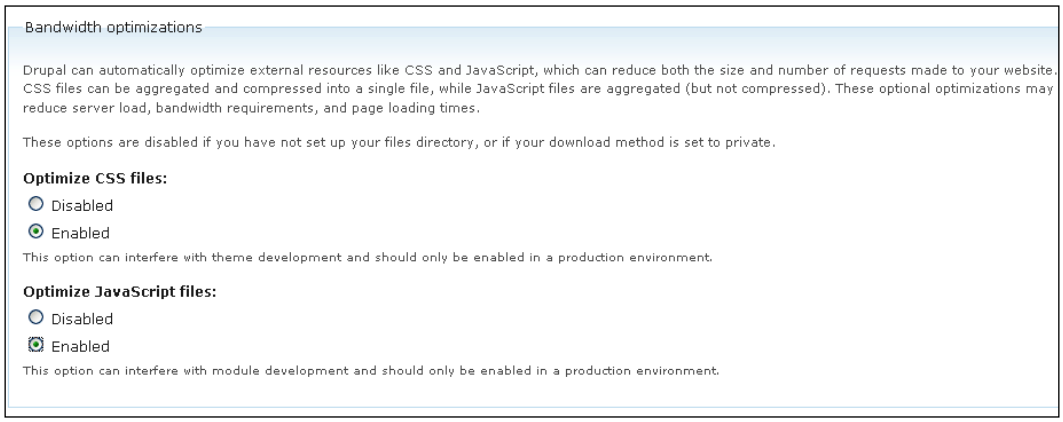


We will also enable our **Block cache** so that our block content and blocks load from a cached version instead of reloading them each time a user loads a Drupal site node. Notice that Drupal tells us here that if we also have page cache enabled, the performance of the block cache will mostly affect authenticated users on the site. Let's go ahead and enable **Block cache** mode. Also, note that if we have block content access restrictions in place, for example, if we have a block only showing to a specific role, the caching will be disabled for that block at that point in the process.



If you have a theme that contains a large amount of CSS files being called and loaded from different folders of your theme folder, you may want to consider enabling optimization of CSS files under **Optimize CSS files**. Drupal will load all of the CSS code in one temporary cached CSS file as opposed to loading each individual CSS file separately. This can also improve overall site performance and load times. Beware, however, that caching CSS will cause issues while you're in development of the site, and you may not see your CSS changes/tweaks if you have this enabled while working on your theme. It's best to disable this before working on your theme files. Because our **Zen** sub theme is using about 4 different stylesheets, let's go ahead and enable this optimization and see how it affects our site.

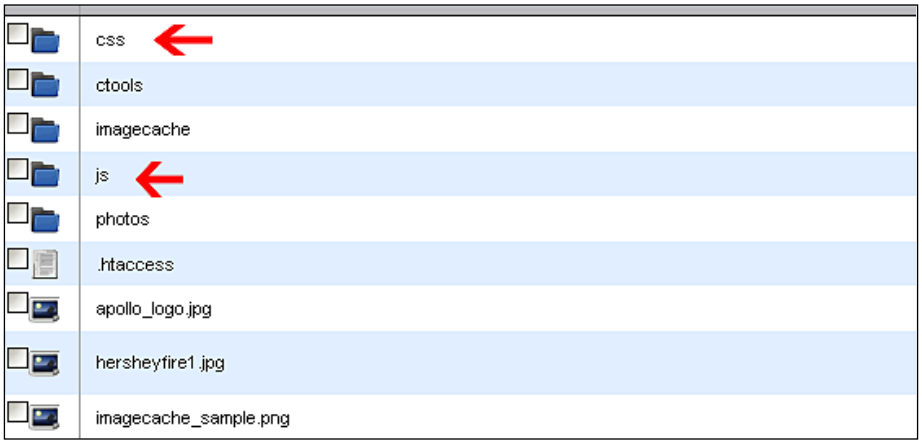
Finally, let's enable our **JavaScript file optimization** as well. Again, beware that this can also cause interference with our contributed modules while in development, so only enable this when you are taking your site to a production environment.



Save your configuration.

Once enabled, your caching and optimization settings will take effect and Drupal will be in caching mode until the minimum cache lifetime expires or until you disable the caching manually.

Additionally, 2 folders will be created in your `/files` folder. One is for CSS and one for your JavaScript cached files. Your cached temp versions of CSS and JS files will be stored in these folders:

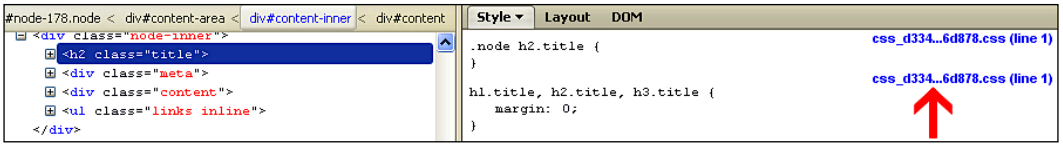


You can see this in action if you download and install the Firebug web developer's extension tool for Firefox and inspect your CSS. Using Firebug if I click to inspect the `.node h2.title` div class element in my Firebug HTML mode, notice that my style element is being pulled from a temp CSS cached file in the following location: `http://variantcube.com/fire/files/css/css_e89481daee17b96def6fa7826e52a571.css`.

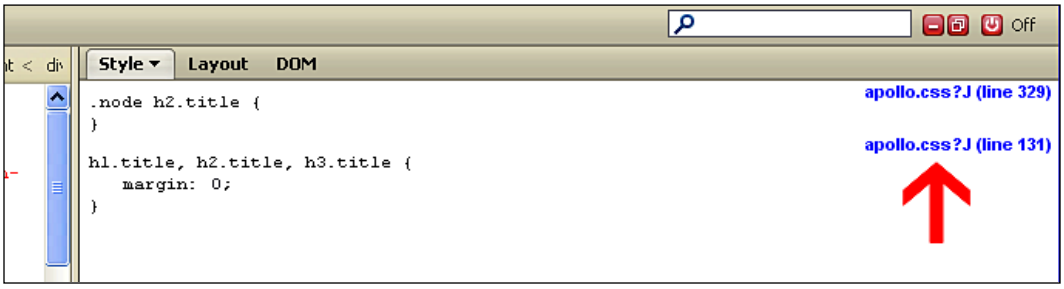
So, the cached CSS file is being saved to my `/files/css` folder. Cached versions of CSS files are saved in a `css` sub folder of your main site `/files` folder. I could potentially edit this CSS file, but the better practice in development would be to disable CSS optimization, and then edit my main theme's `apollo.css` file. Once you disable CSS optimization, and refresh your site and then access Firebug, you should see the following as the main style path:

`http://variantcube.com/fire/sites/all/themes/zen/apollo/apollo.css?9`

In this case, the CSS file is being loaded from your theme's root directory. It's not being cached now. Notice that if you go ahead and disable your CSS caching and then enable it again, the next temp CSS file will have a different filename than the first one we loaded above because it will be a new cached file by Drupal. This will happen each time you re-enable your CSS cache. This is why it's a good idea to only edit your main `apollo.css` or `style.css` (it may be named `style.css` if you're using another theme) file if you are having difficulty locating the CSS file to use and the correct enabled version of that file. Here's what Firebug will look like when you have CSS optimization enabled. Notice the long CSS filename and location of the temp file.



Here's what you'll see when CSS optimization is disabled:



Cache tables in your MySQL database

If you view your MySQL Drupal database using a tool such as phpMyAdmin (provided your host provides this utility), then you can view your database tables including the cache tables. This will show you where the tables are located on your server and also give you a more detailed look at the content that is being cached. Follow these steps to view your database cache tables:

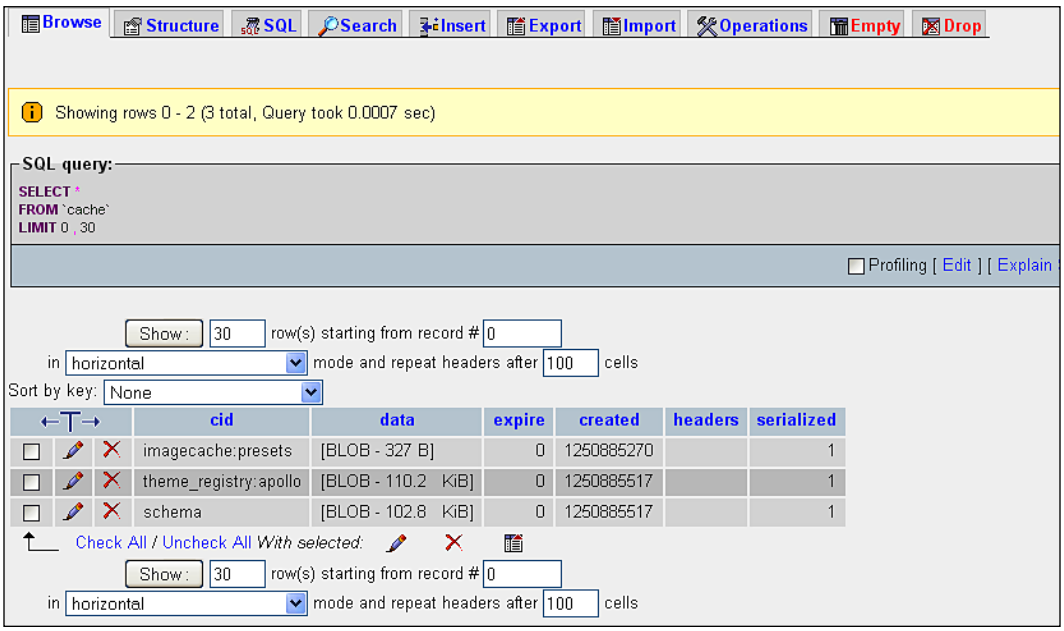
1. Open up your phpMyAdmin utility and select your Drupal site database in the left phpMyAdmin menu.
2. The tables will load in the right screen.
3. Look for the cache tables—this includes the following tables:

☐	cache							3	MyISAM	utf8_general_ci	343.7 KiB	118.3 KiB
☐	cache_block							0	MyISAM	utf8_general_ci	4.0 KiB	-
☐	cache_content							2	MyISAM	utf8_general_ci	35.9 KiB	-
☐	cache_filter							10	MyISAM	utf8_general_ci	17.2 KiB	-
☐	cache_form							0	MyISAM	utf8_general_ci	4.0 KiB	-
☐	cache_menu							7	MyISAM	utf8_general_ci	422.2 KiB	30.7 KiB
☐	cache_page							0	MyISAM	utf8_general_ci	4.0 KiB	-
☐	cache_update							3	MyISAM	utf8_general_ci	301.3 KiB	-
☐	cache_views							0	MyISAM	utf8_general_ci	4.0 KiB	-
☐	cache_views_data							0	MyISAM	utf8_general_ci	4.0 KiB	-

The phpMyAdmin table shows you the type of data in the table, the collation, and the size. For caching, it is necessary to pay special attention to the size of your database cache tables. As you cache more data, and if you do not have a miminum lifetime set on the cache, these tables will start to grow in data size. For example, currently the main cache table is `343.7 KiB` in size.

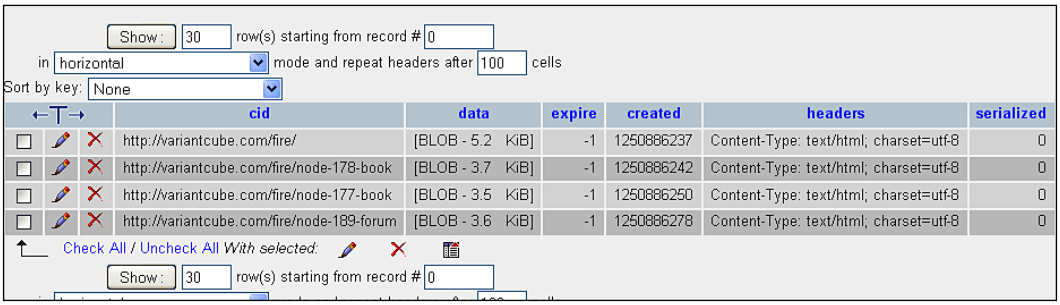
The main cache table contains your `imagecache` presets, if you have set these through the **Imagecache** module, and your theme registry files for your sub-theme. To access this data (browse the data), click on the filesize link in the size column next to the table in question or check the table box and then click on the **Browse** icon to browse the data.

You will then see something like this, if you are browsing the main cache table:



Let's look more closely at the `cache_page` table. This is the table that stores your cached Drupal node data. So, each time you load a Drupal node, the cached version (if you have Page caching enabled) will be stored in the **data** field of this table. If you refresh nodes on your site, load a bunch of Drupal nodes, and browse to this table to view the cached data, then you'll see something like this. For example, I went ahead and loaded this node numerous times using the web browser: `http://variantcube.com/fire/node-178-book`.

Now when I browse to my `cache_page` table to browse the data stored, I see the following:

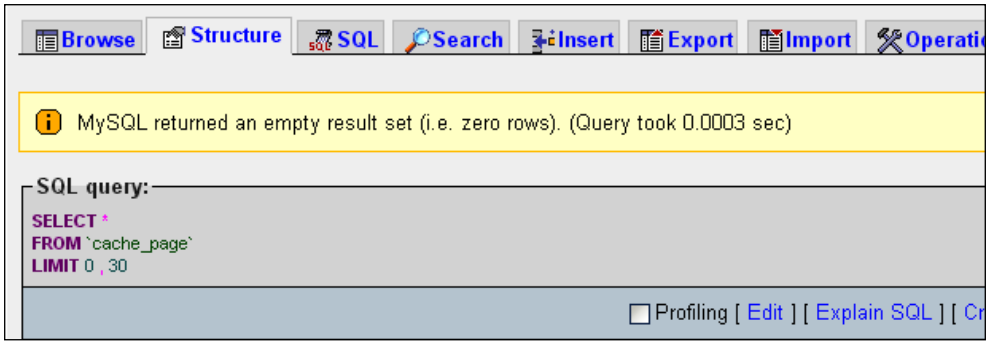


This is showing me that 4 nodes on the site have been cached so far—the main home page, **node-178**, **node-177**, and **node-189**. It also tells me the Drupal content type that the node is associated with. For example, **node-178** is a **book** and **node-189** is a **forum** posting. The table also gives us a column showing **data** size (per node) and when the cache is set to **expire**.

Clearing your performance cache

To clear your cache manually through the Drupal performance administration page go to **Administer | Site configuration | Performance**. Scroll to the bottom of the page and click on the **Clear cached data** button. This will clear your database cache tables. For example, if you click the button to clear the cache and then refresh your database `cache_page` table, you'll see that all of the previous primary key (**cid**) rows that were listed (and that we covered above) have been deleted.

Go ahead and try this! Clear your cache by means of the Drupal admin page and then refresh your database table view through phpMyAdmin to see the immediate effect. phpMyAdmin will give me the following result if I try browsing the `cache_page` table: **MySQL returned an empty result set (i.e. zero rows)**.



Clearing your theme registry

Another component of Drupal caching is the theme registry. Your theme and its associated functions and CSS elements can be cached by Drupal as it loads. Drupal stores this information as cached data. You may only need to worry about the theme registry if you are developing your theme and adding theme override functions to your `template.php` files and other Drupal theme template files.

Drupal template files control all of the PHP and HTML output of your Drupal theme. These template files are stored in the root folder of the theme you are using. You will see the following template files (and you may see more depending on how complex the theme is) when you look in a theme folder: `template.php`, `page.tpl.php`, `node.tpl.php`.

After adding a function to your template files, you may notice that your changes do not take effect immediately when you refresh your page. You can do the following to ensure that your function overrides show up immediately.

Clear your main Drupal cache using the method discussed earlier. Clear your cache at **Administer | Site configuration | Performance**. This will rebuild the theme registry on your site. Then reload the page in question and you should see your TPL changes. Another method of clearing the theme registry is to visit your **Site building | Themes configuration page** and click on the **Save configuration** button to re-save your theme's configuration. By doing this you will clear the theme registry and your latest theme changes and tweaks at the template level will be visible.

Enable your theme registry through your theme admin, if the theme developer provides an admin checkbox for this API function. For example, we're using a sub-theme of the Zen theme. As we're using the Zen theme, we have this additional **Theme registry** checkbox available to us. This is not included in all contributed themes.

If you go to your theme configuration page at **Administer | Site building | Themes** and then click on **Configure**, and select your specific sub-theme, you'll see a **Theme Registry** section. In this case with Zen, it's in a pane of the sub-theme configuration page, titled **Theme development settings**.

Check the box to enable the rebuilding of the theme registry on every page during development.

Drupal warns you not to enable the theme registry on a production website, as it can cause performance issues if you have it enabled and are rebuilding the theme registry on every page load. So, for now we're going to leave it disabled by unchecking the box. You can then select the box again later if you start doing theme development.

For more on the Drupal theme registry click on the link in the text next to the theme registry checkbox that is hyperlinked to **Rebuild the theme registry on every page**. This will launch a help page on `drupal.org` with more information about theme registry functionality: `http://drupal.org/node/173880#theme-registry`.

Running cron manually

Another tip is to run your `cron` task often in order to clear out your database of stale data including old log entries (saved through the Drupal **watchdog** module), cache entries that have not been cleared when you cleared your cache tables, and any other stale data. The `cron` task will also activate other maintenance tasks on your site and force these tasks to run, including re-indexing your site for the Drupal search functionality, force RSS feeds to refresh with new feed content and to update and perform various tasks that are dependent on this utility. For example, if you have the **Statistics** module enabled, you'll need to run `cron` in order to index your latest page hits and views. You will also need to run `cron` in order to activate the **Search** module indexing of your site's new content.

To run `cron` you tell Drupal when to execute the `cron.php` script that sits at the root of your site's directory. `cron` will then run on a specified timetable—either immediately if you run it manually or on a scheduled time specified in hours, day of the month, or month.

The `cron.php` file is installed with Drupal core when you extract your Drupal directory to your server. You just need to tell Drupal when to execute the script. When it is run, the `cron.php` file will load at the following URL of our site:

```
http://variantcube.com/fire/cron.php
```

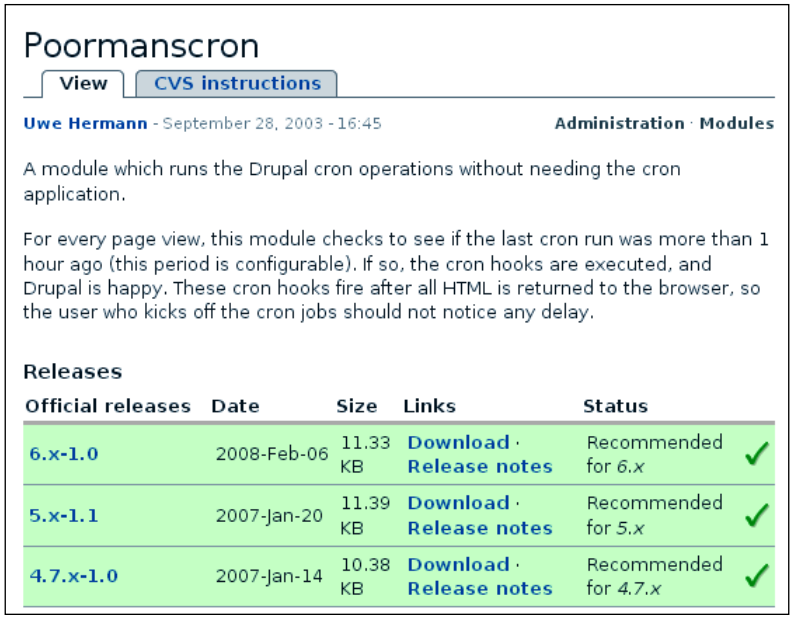
You can execute the `cron` script by going to that URL. You can also run it through the Drupal Status report by following these steps:

1. Go to **Administer | Reports | Status report**.
2. Look for the table row for `cron` maintenance tasks. This will show you when the `cron` was last run. In our case, we just ran it through the script URL, so it's showing us that it was **Last run 1 sec ago**.
3. Go ahead and click on the **run cron manually** link.
4. This will run `cron` again and you'll receive a green message when the page reloads telling you that `cron` ran successfully.

Installing the Poormanscron module

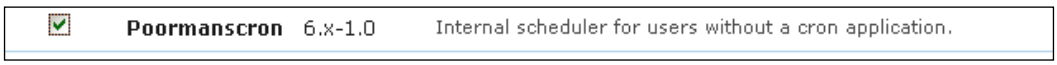
It will become inconvenient to have to login to your site and run `cron` manually each time you want to clear stale data, re-index your search module, and perform other routine tasks. If you do not have access to set up a scheduled `cron` task on your server via cPanel or through other methods your host provides, you may want to consider installing the Drupal **Poormanscron** contributed module. This allows you to install a `cron` module and configure it to run scheduled `cron` tasks. The module's project page is here:

`http://drupal.org/project/poormanscron`



Let's go ahead and install the module. Here are the steps:

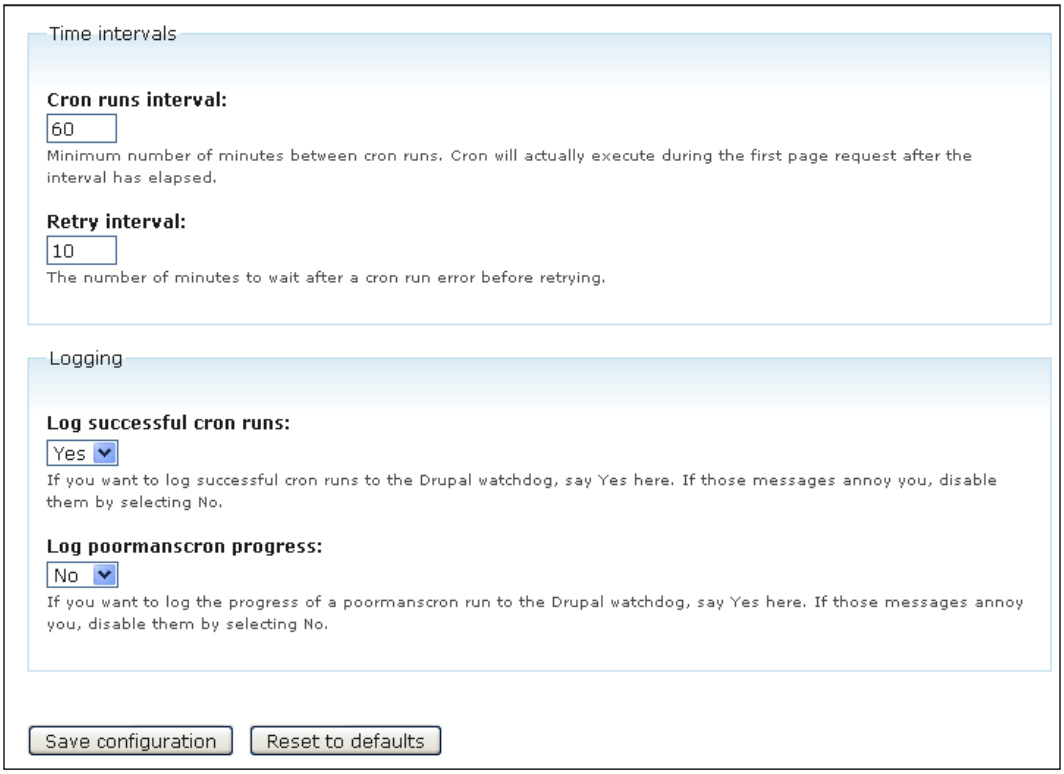
1. Download the **6.x-1.0** version from the project page.
2. Extract the folder to your desktop and then upload to your `/sites/all/modules` folder via SFTP.
3. Enable the module through your admin modules list.



Now let's configure the module. Here are the steps:

1. Go to **Site Configuration | Poormanscron**.
2. Here you can set your `cron` run intervals. We'll set the `cron` to run every 60 minutes. Every hour, the `cron` tasks will execute after the first page loads immediately at the 60 minute mark.
3. We'll set the error wait setting to 10 minutes. This means that if the `cron` run experiences an error and does not run completely, the task will re-run and try again 10 minutes later.
4. We'll log successful `cron` runs to the watchdog table in our database and we'll see these appear as line items in our **Recent log entries** report.

5. You can also log the entire `cron` progress report to your recent log entries. If you do not want to see a long list of messages related to the `cron` run, just leave this set to **No**.



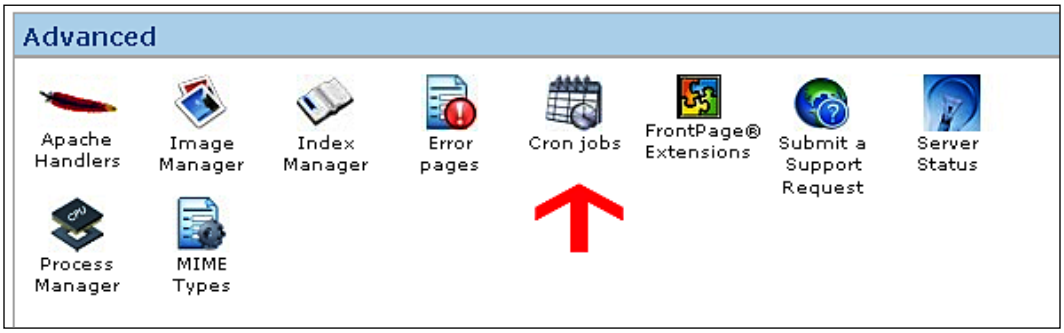
It appears that developers and Drupal webmasters are divided on whether this module contributes to other performance issues on your site. For example, it's been reported that the Drupal system needs to check through the module if it's time to run the `cron` job. This check can take time and cause potential performance bottlenecks. There is more about the potential disadvantages of using the **Poormanscron** module in this article: `http://drupal.org/node/102647`.

The advantages of using the module for those of us who do not have access to set up `cron` scripts on our server are large. We can rely on this module instead of having to login to our site every day or every hour to run our `cron` manually.

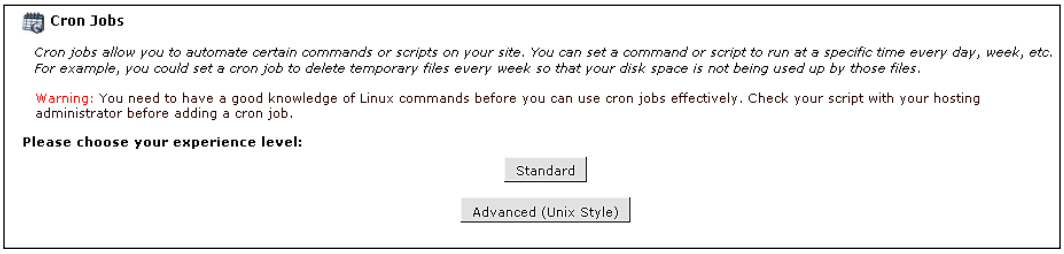
Setting up cron through cPanel

If you have a cPanel or Plesk utility for your server, you can also set up and configure `cron` tasks using this tool. We're going to login to our cPanel now and take a look at the interface to set up `cron` tasks.

1. Login to cPanel.
2. Look for a `cron` jobs icon/button under the **Advanced** section of your cPanel utility. Click on this icon.



3. cPanel will give you some introductory text detailing what `cron` is and then allow you to use either a standard method of setting the `cron` or the Advanced Unix style of configuration. More about this is detailed in the following article on `drupal.org`: `http://drupal.org/node/369267`.



Backing up your site using SFTP/FTP and cPanel

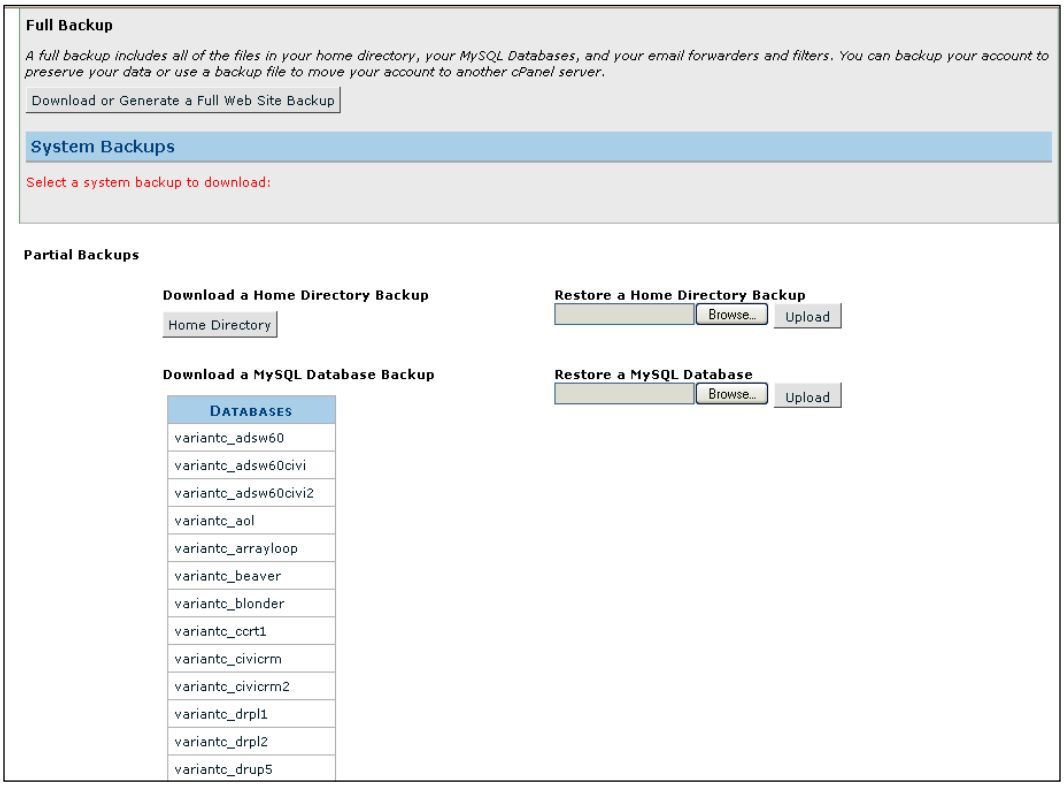
Now that we have completed our initial investigation of the best practice methods for maintaining and monitoring our new Drupal 6.13 site, it's a good idea to run a full backup of the site directory (all of our Drupal files and folders), and of the database. We did this in Chapter 1 before we completed our initial Drupal 5.x upgrade, but we're now going to look at this in more detail. Backups are essential to keep our site performing well over time. Eventually, you may run into an issue or glitch in your site or database, which will cause you to be forced to restore some of your Drupal core or module files and restore your Drupal database. You may never need to resort to a backup, but it's a requirement to have a backup in case you do need it because issues and errors in your site and database can come up unexpectedly.

The first method is to run a backup of all of your Drupal files and folders. One method of doing this is through SFTP. Connect to your site using an SFTP client and then copy all of your folders and files back to your local desktop or local server/sandbox environment. Be sure to run this backup through secure FTP, if your host gives you access to an SFTP client or connection. This will minimize the risk of having your data comprised as it is being transferred via FTP. This is the method of backup we ran in Chapter 1.

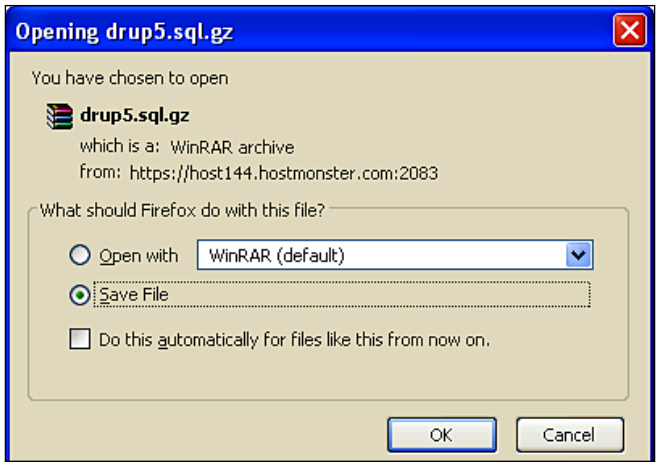
Another method of creating a backup of your site and/or server is to use a tool that your cPanel may provide. Utilities, such as cPanel, often provide a backup interface that you can use to create a full backup of your site's home directory or `public_html` directory. You can then save this backup to another directory on your server and restore from this directory if necessary. The benefit of doing a backup using this method is that it's potentially more secure than your SFTP method, as the data is staying on your remote server. Here are the steps:

1. Login to your cPanel.
2. Locate the **Backups** icon/button usually under a section titled **Files** or **File Management**. Click on that icon.

3. This will launch a page that will give you options to download either a **Full Backup** (all of your site directories, databases, and e-mail forwarders and filters), or a specific **Home Directory Backup**, which will include all the site directories in the home directory of your web server.

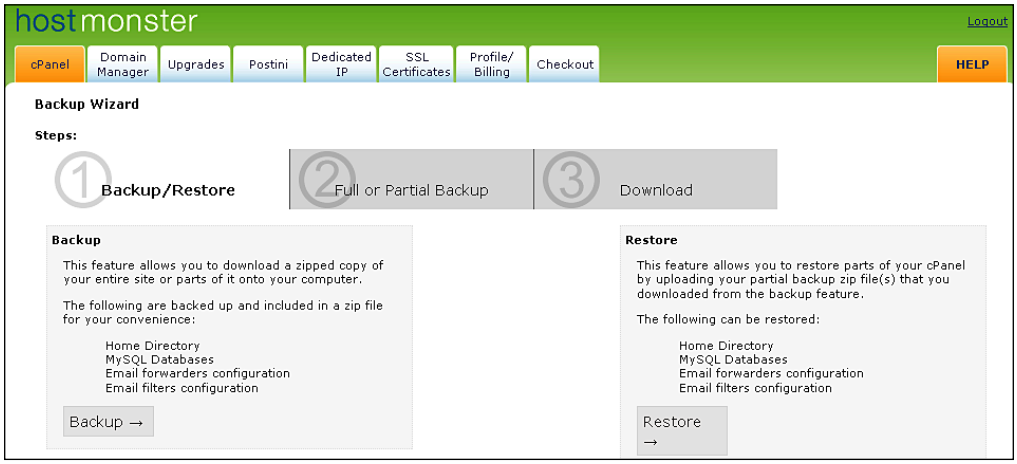


4. You can also download backups of your MySQL databases through this admin page. Click on the links to the database in question to download its backup. For example, here we'll click on the link to the **variantc_drup5** database.



5. You can also restore your home directory backup and your MySQL databases from this page.

You can also use the Backup wizard option through cPanel, if your cPanel provides this. It's basically the same functionality as described above with the Backups utility, but this walks you through the steps, one at a time, in wizard workflow format. The wizard asks you if you want to **Backup/Restore** or **Restore**. Then you click and follow the steps. If you select a Backup, it will then prompt you for whether you want to do a **Full Backup** or a **Partial Backup**.



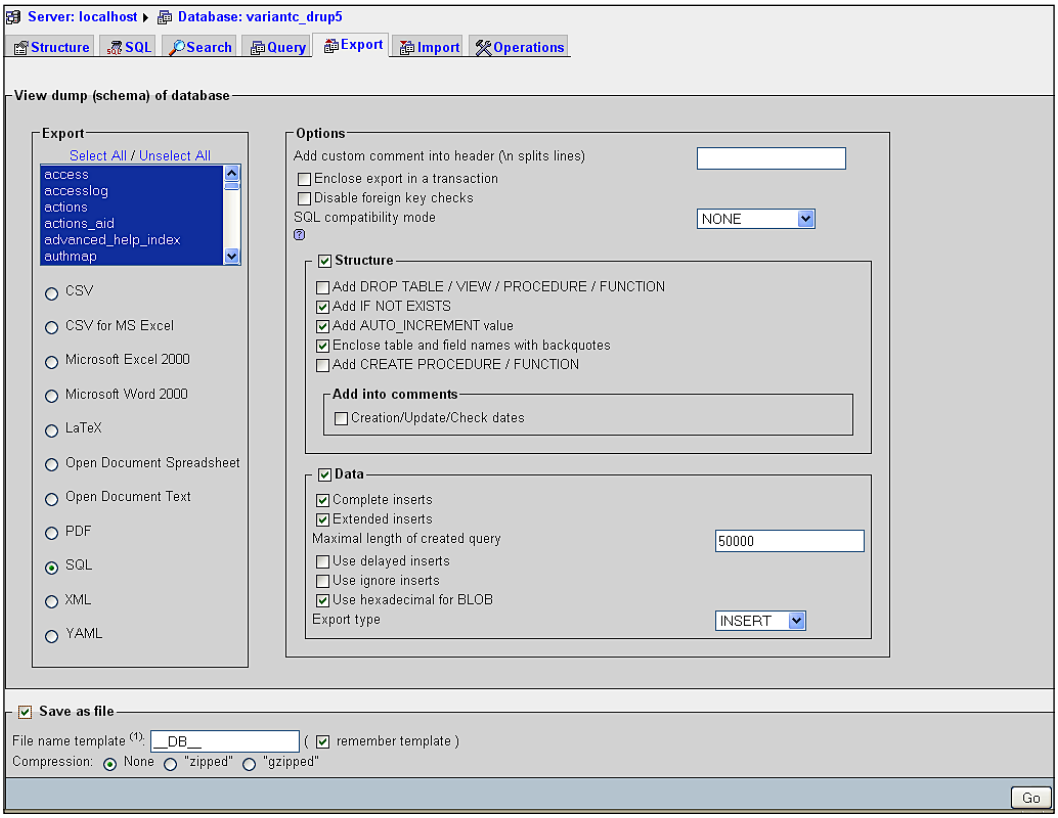
Backing up your database through phpMyAdmin

You can do a full backup of your database using phpMyAdmin, if your host provides you access to this utility.

1. Launch phpMyAdmin from your cPanel.

2. You will be redirected to your phpMyAdmin URL.
3. When it loads, locate your database name in the left menu and click on it.
4. Once your database tables load, click on the **Export** tab.
5. Select the tables you want to export or **Select All** to export the entire database. Make sure you're exporting the structure and the data of the database, so check to make sure those checkboxes are selected. You can also choose to only export the structure of the database or just export the data.
6. Make sure to select the `SQL` radio button under the **Export** table in the left column in order to export the data as `SQL` data.

7. Check the **Save as** file checkbox and then click on **Go** to initiate the export.



Tweaking your HTACCESS file

Your site directory contains an `.htaccess` file that sits at the root level of your Drupal site. This file comes packaged with the Drupal install and gets installed with Drupal by default. **You can view and edit this file using your cPanel or SFTP, if you** first change its permissions to `write` permissions as it's a ready-only file.

Your `.htaccess` file allows you to tweak directory permissions, specify how Drupal handles error messages, and present errors (404 errors) to the end user. You can also override your PHP settings in this file in a similar way to how you override your PHP settings in your `settings.php` file and your `php.ini` file. This presents another option. Usually host servers provide multiple methods of tweaking your PHP settings in case you do not have permissions or access as a developer to the Drupal configuration file, the `php.ini` file, or the `.htaccess` file. In your `.htaccess` file, you'll look for the version of PHP you're using (in this case PHP 5) and then look

for the lines of `php_value` code that's under this version. For example, this is what that set of values looks like in our `.htaccess` file:

```
# PHP 5, Apache 1 and 2.
<IfModule mod_php5.c>
  php_value magic_quotes_gpc                0
  php_value register_globals                0
  php_value session.auto_start              0
  php_value mbstring.http_input             pass
  php_value mbstring.http_output            pass
  php_value mbstring.encoding_translation   0
</IfModule>
```

You can add overrides for php `memory_limit` and `upload_max_size` here to the `.htaccess` file and then save your file. Then refresh your Status report and you should see your changes in effect. Let's go ahead and add a new `upload_max_size` value here, as we want to increase our local value above the current 2 MB default.

To do this we're going to add the following lines of code to the PHP5 section of our `.htaccess` file:

```
php_value post_max_size 20M
php_value upload_max_filesize 10M
```

1. Change your permissions through cPanel on your `.htaccess` file to `777` so that you can write to the file.
2. Edit the file.
3. Add the 2 lines of code mentioned above and make the `post_max_size` 20M. Make the `upload_max_size` 10M.
4. Save changes to your file.
5. Refresh your Status report through Drupal. If for some reason your changes did not take immediate effect, you may need to ask your hosting service to restart the Apache web server.

6. Your `.htaccess` file code should now look similar to this:

```
# PHP 5, Apache 1 and 2.
<IfModule mod_php5.c>
  php_value magic_quotes_gpc                0
  php_value register_globals                0
  php_value session.auto_start              0
  php_value mbstring.http_input             pass
  php_value mbstring.http_output            pass
  php_value mbstring.encoding_translation   0
  php_value post_max_size                   20M
  php_value upload_max_filesize             10M
</IfModule>
```

Summary

Congratulations! Here's a recap of what you accomplised in this chapter and why it's important:

- You reviewed your main `settings.php` file in detail and made tweaks to the `base_url` path designation, and you learned how to tweak PHP settings in your `settings.php` file and your `.htaccess` file.
- You reviewed your contributed modules and themes and deleted any of these that you no longer needed enabled, and also deleted any files in your Drupal directory that you no longer needed on your production site.
- You enabled the Drupal 6.x Update Status module that is now part of core Drupal.
- You learned how to run your `cron` tasks through the Drupal admin and cPanel, and you installed and configured the Poormanscron module to set up and configure your `cron`.
- You received an introduction to Drupal caching and learned where cached data is stored and why it's stored in your Drupal database. You learned how to maintain this cached data, and how to clear it and enable it.
- You learned the best practice methods for backing up your Drupal site directory and database.

You're now ready to do more advanced monitoring of your site using some of Drupal's contributed modules including the **Devel (Development**) module, as well as take a closer look at how Drupal caching works, and monitor your log entries and errors. See you in Chapter 3!

3
Using Development Modules and Tools

In this chapter, we're going to use the Devel module to monitor performance on our Drupal site to assist us in locating bottlenecks. The Devel module can be used to quickly gather detailed information on your site's theme elements, monitor your site's page loads and database queries, generate test content for your site, and give you easy methods for clearing your site's theme registry and performance cache. It's an essential tool for the performance-minded Drupal developer. We're also going to look more closely at how your site logs access entries and how you can view your log entries to troubleshoot performance issues.

Our focus in this chapter will be on using the Devel module to monitor performance. The module logs performance issues, such as page load times and memory usage, which allows you as a developer to find issues quickly and troubleshoot. In this chapter, we'll learn how to enable detailed and summarized performance logging on our site.

To summarize, here's what we'll be doing in this chapter:

- Viewing log entries and reports
- Using the Devel module to monitor site performance
- Using the Development block to access site performance logs and to tweak functionality

Viewing and inspecting recent log entries

The Drupal **Dblog** (formerly called **Watchdog** in earlier Drupal versions) module keeps recent log entries in your Drupal administration as long as you have not cleared your performance cache. You can tell Drupal how long you want to keep the log entries stored in your site's database.

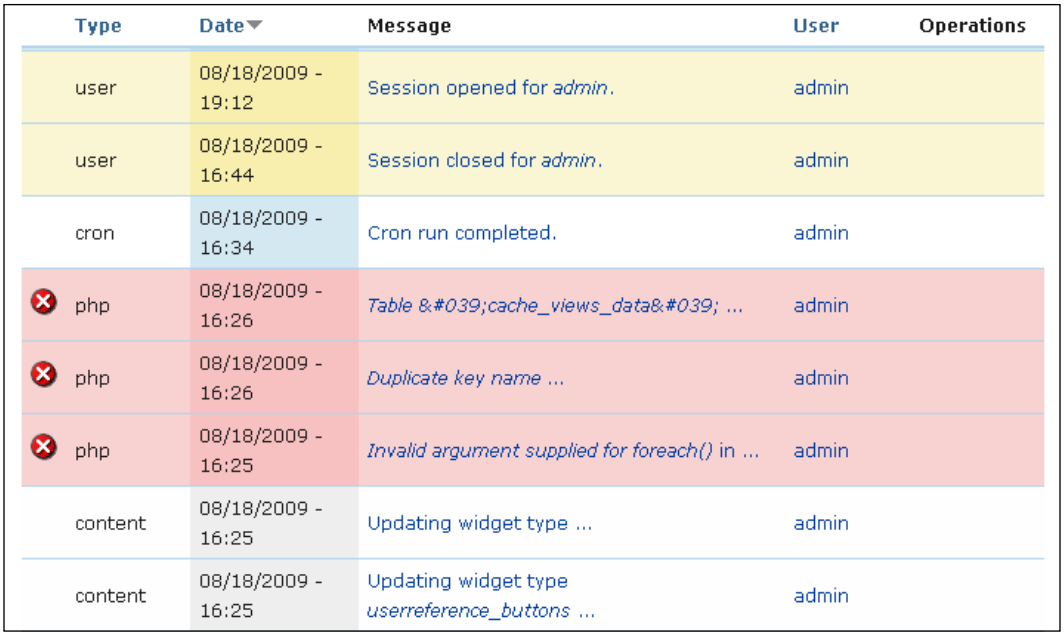
Viewing your recent log entries

Having saved the configuration settings, launch the **Recent log entries** report pages by going to **Administer | Reports | Recent log entries**. This will launch the following page: `http://variantcube.com/fire/admin/reports/dblog`

The logs will be displayed in a table by **Type**, **Date**, and the detailed log **Message** or error. Errors will be noted with a red X icon, and warnings will be flagged with a yellow exclamation point icon. For example, a **php** error will usually throw a red X line item, while a **page not found** error will show a yellow exclamation point warning. A column is also presented in the log entries table showing the user account and session during which the error occurred.

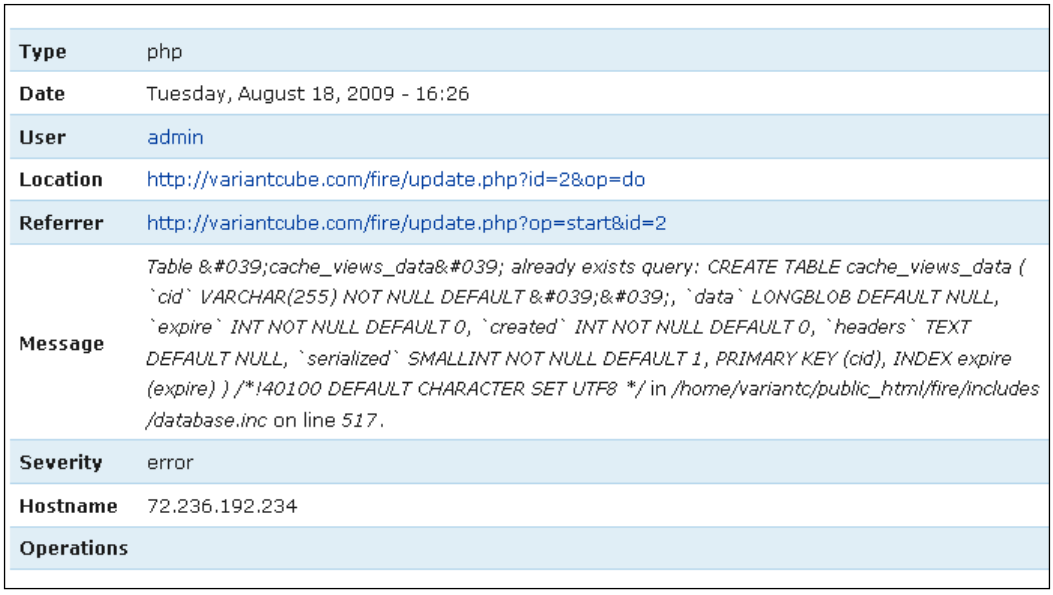
You should check this report often so that you can confirm that your site is logging errors and which errors need troubleshooting. Often, if you are getting an error on your site it's a good idea to immediately try running your recent log entry report and check to see if the error is being logged. Viewing the log entries may provide you with the code line in a specific module and the location in the module code of the specific error. This can greatly reduce the time spent searching for the issue, as the error log will usually narrow the error down to a specific line in the template code. The logs also tell you the date and time of the error so that you can locate an issue that occurred at a specific moment on the site and/or server.

Notice in this screenshot the Dblog is reporting three **php** errors from August 18. The error messages are hyperlinked and if we click on the links, we can see more details of the entire error.



Type	Date	Message	User	Operations
user	08/18/2009 - 19:12	Session opened for *admin*.	admin	
user	08/18/2009 - 16:44	Session closed for *admin*.	admin	
cron	08/18/2009 - 16:34	Cron run completed.	admin	
php	08/18/2009 - 16:26	*Table 'cache_views_data' ...*	admin	
php	08/18/2009 - 16:26	*Duplicate key name ...*	admin	
php	08/18/2009 - 16:25	*Invalid argument supplied for foreach()* in ...	admin	
content	08/18/2009 - 16:25	Updating widget type ...	admin	
content	08/18/2009 - 16:25	Updating widget type *userreference_buttons* ...	admin	

For example, the first error in the list is related to the `update.php` script being run. Drupal is telling us that the table the `update.php` script is trying to create—`cache_views_data`—already exists.



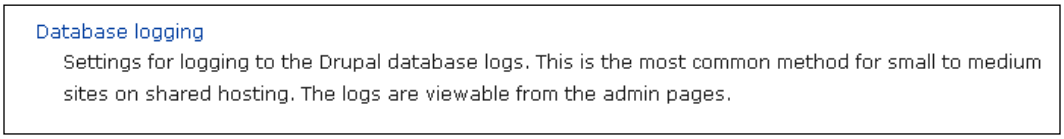
Type	php
Date	Tuesday, August 18, 2009 - 16:26
User	admin
Location	http://variantcube.com/fire/update.php?id=2&op=do
Referrer	http://variantcube.com/fire/update.php?op=start&id=2
Message	*Table 'cache_views_data' already exists query: CREATE TABLE cache_views_data (`cid` VARCHAR(255) NOT NULL DEFAULT '', `data` LONGBLOB DEFAULT NULL, `expire` INT NOT NULL DEFAULT 0, `created` INT NOT NULL DEFAULT 0, `headers` TEXT DEFAULT NULL, `serialized` SMALLINT NOT NULL DEFAULT 1, PRIMARY KEY (cid), INDEX expire (expire)) /*!40100 DEFAULT CHARACTER SET UTF8 */* in */home/variantc/public_html/fire/includes/database.inc* on line *517*.
Severity	error
Hostname	72.236.192.234
Operations	

Remember to run `cron` to clear your older log entries and keep the log entries screen up-to-date.

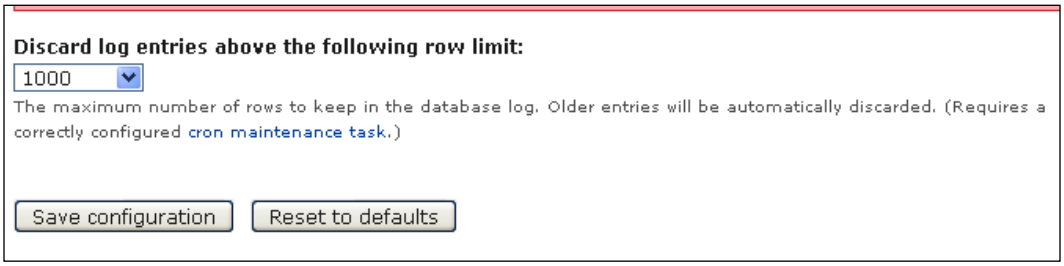
Logging and alerts configuration

First, let's check our logging configuration and settings. To access your **Dblog** configuration follow these steps:

1. Go to **Site configuration** | **Logging and alerts**: `http://variantcube.com/fire/admin/settings/logging`



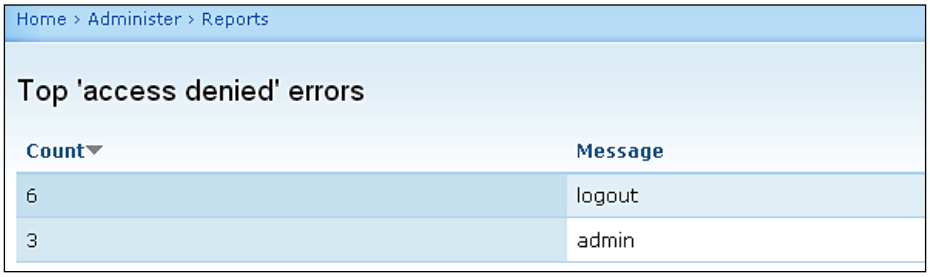
2. Click on **Database logging**.
3. This will load the configuration page where you can tell `Dblog` the maximum number of log entries to keep in the database. So, if you select to keep **1000** log entries at any given time, it will be the most recent **1000** log entries. When you run `cron`, the older entries will be cleared and the log will be refreshed.
4. Click on **Save configuration**.



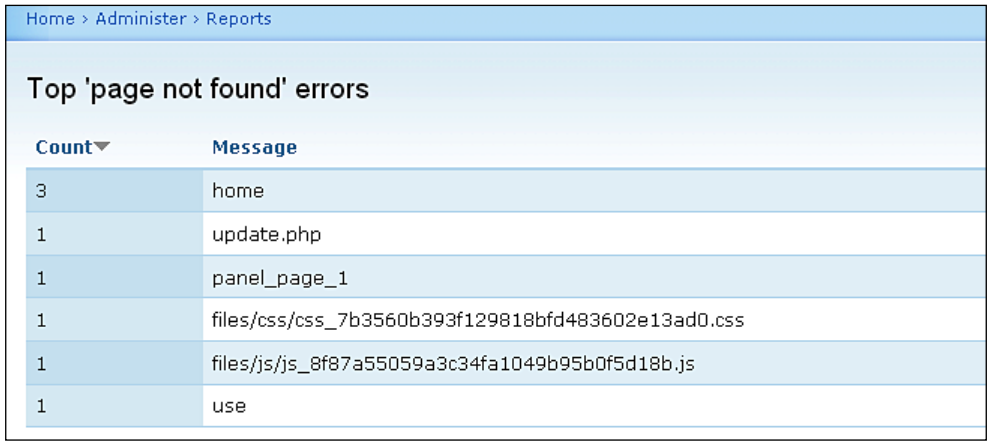
Page not found and access denied errors

The `Dblog` module also keeps tabs on your top 'access denied' (403) errors and top 'page not found' (404) errors. For access denied errors go to **Reports | Top 'access denied' errors** at `http://variantcube.com/fire/admin/reports/access-denied`. This will display a table that shows the Drupal page path that generated the access denied error and how many times it's been generated. In the following screenshot, you see that the `/admin` path has generated access denied errors three times and the `/logout` path has generated an error once. Keeping an eye on this it can also tell you

where a user interface bottleneck might be occurring. For example, if you see a lot of access denied errors on a specific page, there may be an issue on your site where you have a menu link going to this node that anonymous users are clicking on.



Here's a screenshot of the **Top 'page not found' errors**. As with the **Top 'access denied' errors**, this table shows the number of times the page generated the 404 error. This can also help you to determine why a page does not exist on your site, but continues to be hit, and makes it easier to create a page that does function on your site.



The recent log entries reports are invaluable to you as a performance-minded developer. If you check them regularly and try to keep them as clear of errors and warnings as possible, then your site will continue to perform well.

The Devel module

The Devel module provides a suite of tools for the Drupal theme and performance developer. Two major components of the Devel module include helper utilities that monitor performance of your site, and tools for themers that allow for quick and more accurate theme development.

Developers can use the module to monitor all of the database queries that occur as each Drupal page loads. This tool will show you how many times the database query executes on each page when it loads. Knowing this is essential when monitoring performance because it allows you to find out which queries are repetitive and creating potential bottlenecks or other performance issues especially on a large site or multisite environment. As the module project page points out, you do not want to see queries running multiple times on the same page. The development component of the module also tells you how long the queries take to run. This can give you detailed information on which queries and functions may need to be tweaked and optimized during your development work.

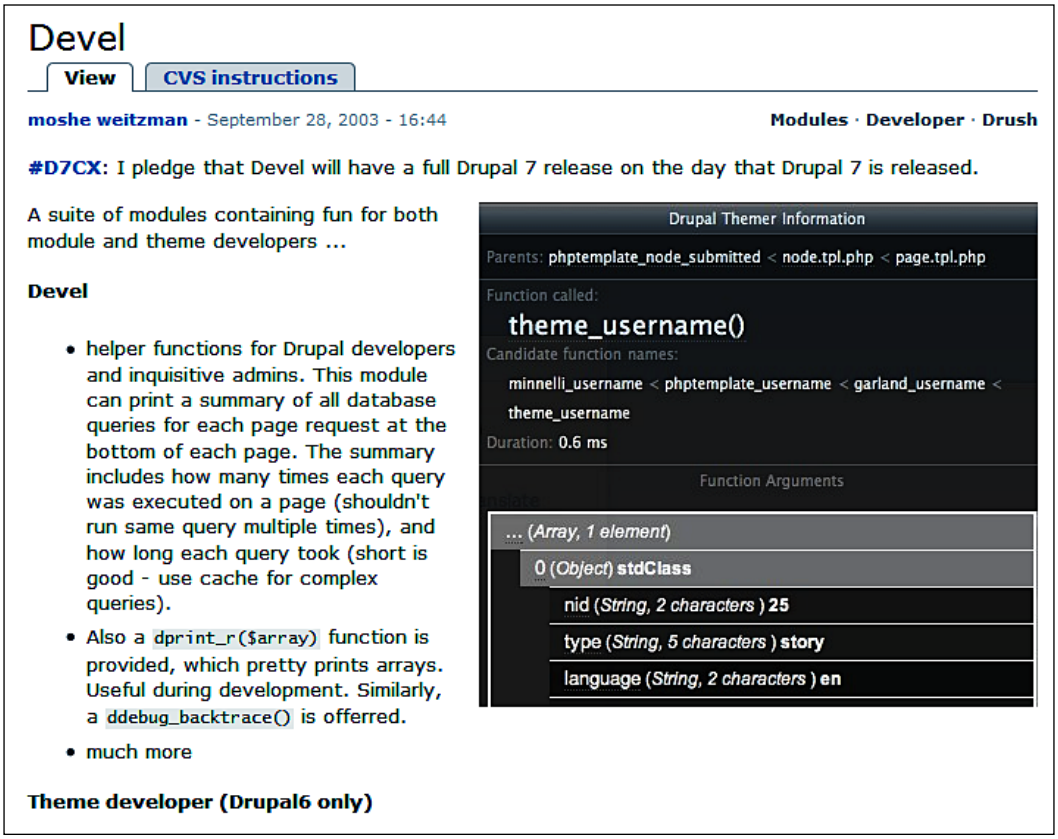
You can also run `print_r` commands to print your arrays. This is helpful to a Drupal developer, as it will show you all of the array variables available and you can do it through the module interface instead of having to run a `print_r` command on each Drupal node or in your template files.

The theming component of Devel offers the developer various tools that are similar in scope and functionality to the Firebug extension or the Firefox Web Developer extension. This has caused the Devel module to garner the nickname 'firebug for Drupal'. The theme wizard in Devel gives you a visual outline of your template functions and available variables, and allows you to select an element on your Drupal site visually to gather this information. So, you can outline an element such that a navigation menu block and then view the theme information on the Devel screen.

You can also use the Devel module to quickly generate test content, what's commonly called dummy `lorem ipsum` content and test nodes, and content types for your site. The module also gives you a report of any node access issues your site may be experiencing.

The Devel module is available for download from its project page at `drupal.org` (`http://drupal.org/project/devel`). I encourage you to read all of the information on the project page and to browse the issues and forum support tickets that have been generated for this module, as this research will teach you more about how it works.

The current version we are using is `6.x-1.17`. Let's go ahead and download the latest version and upload it to our site. On our site we'll actually be upgrading the 1.16 version that we've had installed since our 6.x upgrade.

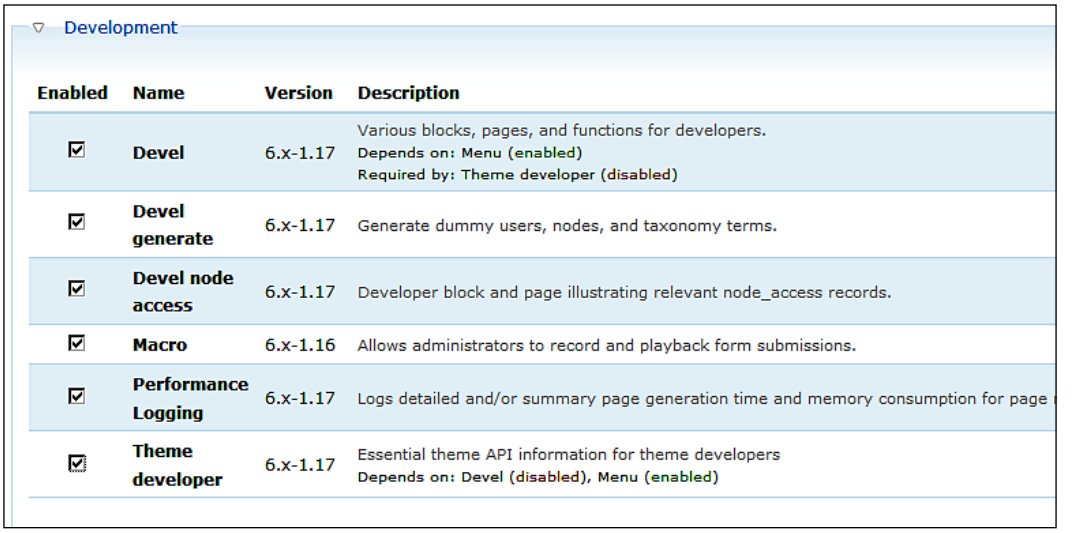


Installing and enabling Devel

Let's install the Devel module and proceed with our initial configuration of the module.

1. Download the latest release of Devel from its Drupal project page.
2. Extract it to your local desktop and upload the folder to your `/sites/all/modules` directory in your Drupal site using SFTP or cPanel.

3. Enable the module and its components via your modules admin page. Make sure to enable all modules including **Devel**, **Devel generate**, **Devel node access**, **Macro**, **Performance Logging**, and **Theme Developer**.



4. Save your module configuration.
5. Check your site Status report to see if you need to run `update.php` **after** enabling this module. The performance module components of Devel do have database tables they write to, so if you're upgrading Devel you may need to update your database schema as well.
6. Once saved, you should notice an immediate change to your site. In the lower left-hand corner of your site you'll see a small gray box with the title **Themer info** and a check box next to it.
7. Before we start using the **Themer info** functionality, let's set some Devel module permissions.

Checking Devel module permissions

Another item to check before you or any of your site admins start using the Devel module features and the Development block discussed later in this section are the permissions to use the module. Go to **User management | Permissions** and look for the Devel module permissions. Make sure you have checked the appropriate permissions for your site admins or other admin roles. This may include allowing them permissions to:

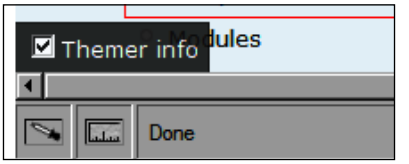
- Access Devel information
- Display source code
- Execute PHP code
- Switch users

You may also give them permissions to view **devel_node_access_information** as part of the **devel_node_access** module.

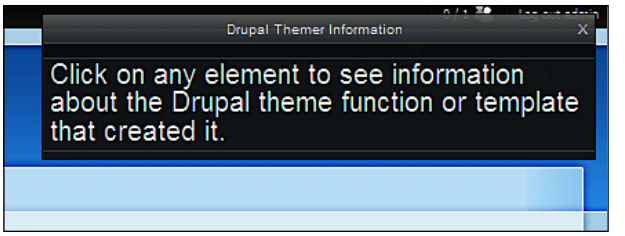
devel module		
access devel information	☐	☑
display source code	☐	☑
execute php code	☐	☑
switch users	☐	☑
devel_node_access module		
view devel_node_access information	☐	☑

Enabling Themer info

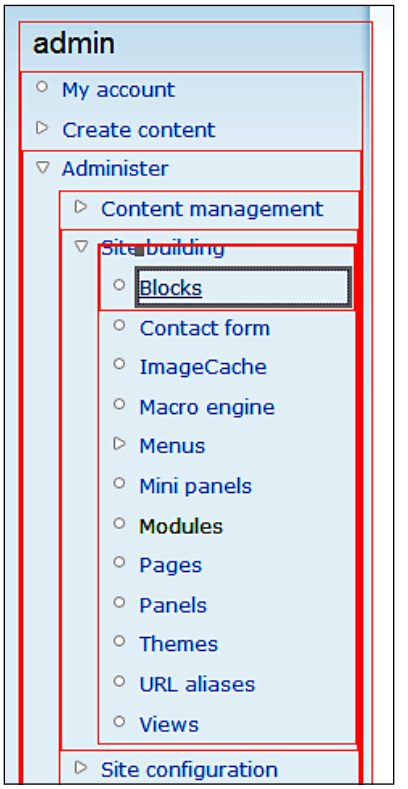
To enable the **Themer info** tool, click on the checkbox or anywhere in the gray rectangle.



Once clicked, you'll see a second rectangle appear in the upper right corner of your site. This box tells you to click on elements on your page to see detailed information about the Drupal theme function and information about the template file that contains the theme function.



As you move your mouse around the Drupal page you'll notice red borders surrounding any element that you move over. For example, as I move my mouse over the left admin menu sidebar, a red box surrounds the entire menu element. When I click on the element the red border box turns gray and the corresponding theme function information shows on my right-hand Devel box. Notice that you can drill down to the specific `<ul>` or `<li>` element in the navigation and get information on those elements.



When you click on an element, the element is surrounded by a gray box or border. This helps to differentiate an active clicked item that will show you information in the Themer information box from other elements that you have rolled your mouse over.

So, in this case if I select the **Blocks** menu list item in my administration menu block, the Themer toolbox tells me the following information:

- The function called is `theme_menu_item_link()`. This is already very helpful to us if we're going to do any theming. If we wanted to override this function in our main `template.php` file, we already know the name of the function through the Devel module. We do not need to hunt for the function code in the actual core Block module files. This tool tells us the name of the function and now we can override that function in our specific theme template by replacing `theme_` with the name of our theme. So, if we're using the Garland theme, we'd replace `theme_` with `garland_`. The helper text in the theme developer box tells us that this is a potential candidate for the override.

The Themer information also tells you how long it takes the function to load in Drupal on that specific page. So, when this page loads, the function loads in **0.25 ms**. If you move your mouse over other page elements, you'll notice that the loading duration will change, increasing or decreasing depending on how complex the function is.

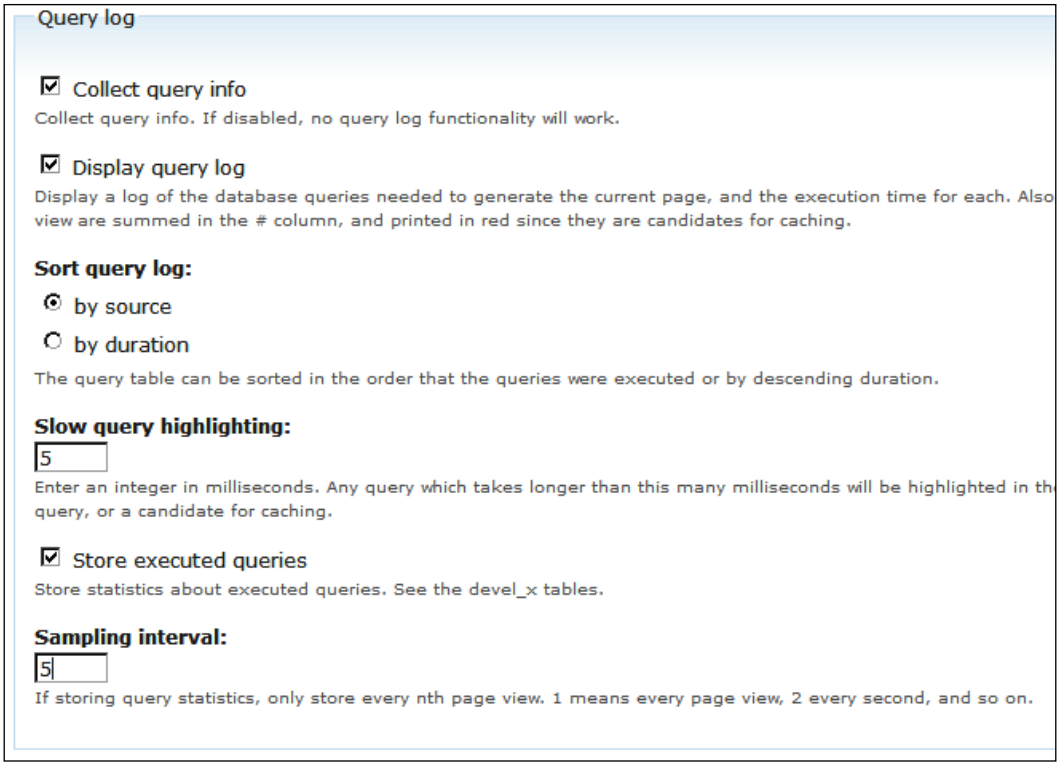
This is an introduction to how the Devel module can be used for theming purposes. Our focus is on performance, so let's enable some of the module's performance-based components.

Devel settings

To enable more Devel module settings, including performance options, go to **Site configuration | Devel settings** or to here: `http://variantcube.com/fire/admin/settings/devel`

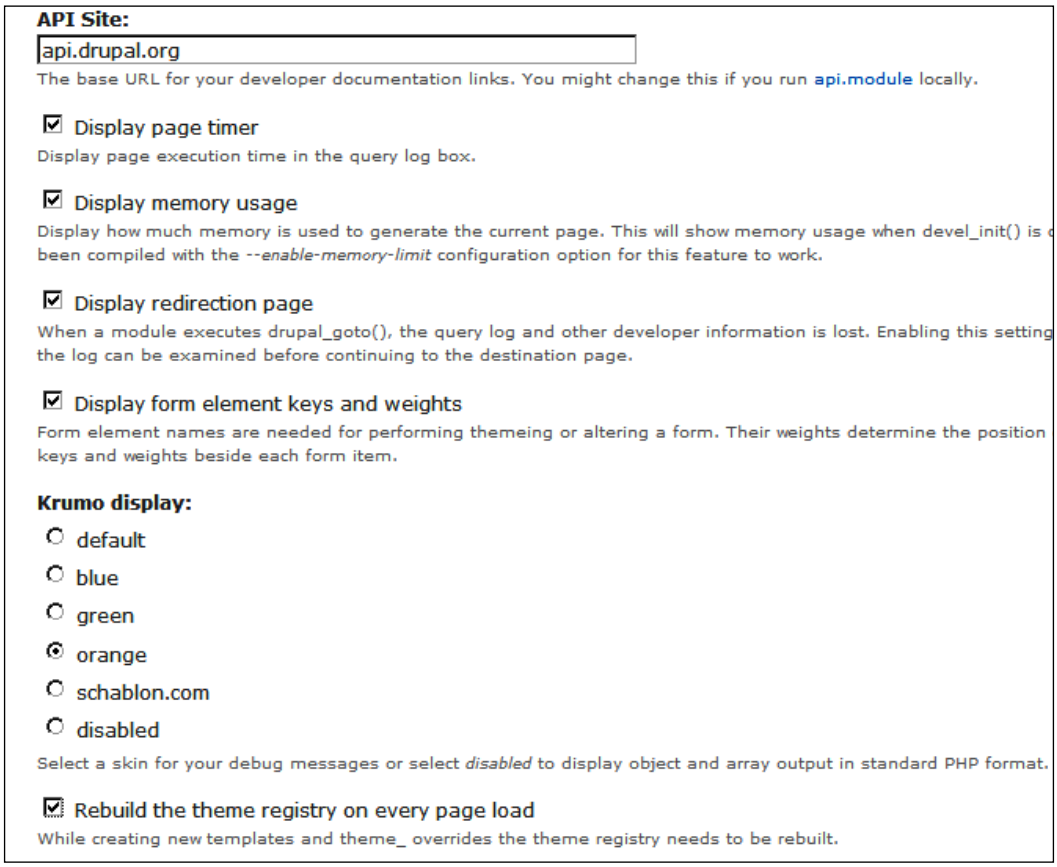
This is where you can configure Devel to collect database query information and display query logs. Follow these steps to configure performance logging:

1. Check the box next to **Collect query info** if you want Devel to collect database query info.
2. Check the **Display query log** box if you want Devel to display a log of these database queries. The log will also display the execution time for each query. It will also keep tabs on repeated queries and note these in the logs in a separate **#** column. These queries will be highlighted in red to draw your attention to them and then you can decide whether you need to focus caching mechanisms on these specific queries to improve performance.
3. Tell Devel how you want to sort the query log—by source or by duration. We will leave sorting by **source** so that it displays them in the order of execution.
4. In the **Slow query highlighting** section, you can enter a baseline millisecond integer that the Devel module will use as its benchmark. Devel will highlight any query that takes longer than your sourced and benchmarked millisecond specification. This can also help you decide what needs caching on the site. Right now, we'll leave this set to the default of **5** millisecond.
5. You can also choose to store statistics about queries in your Devel database. We'll enable this and store every page view to start, as we're working on a development site. On a production site, you may not want to capture every page view, for example, raising this to capture every twentieth page view. This will help to stop our database table from overloading with statistics, but still allow us to capture some.



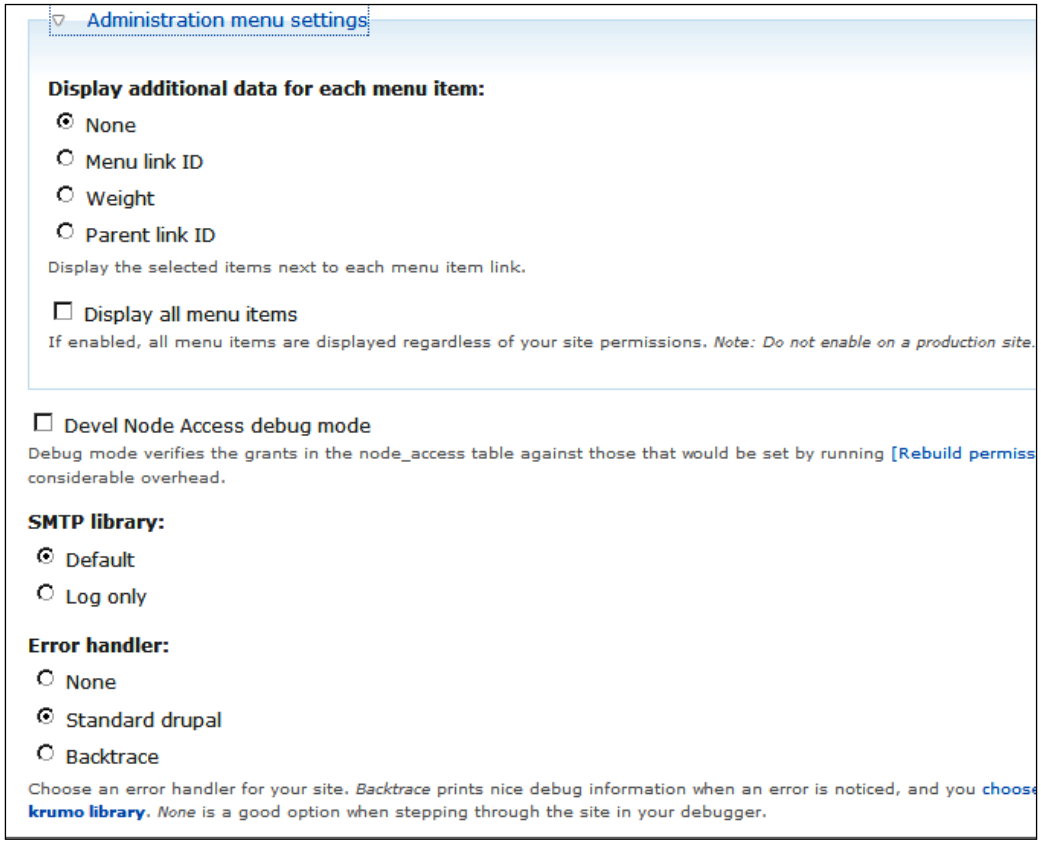
6. The next setting is the URL for your API documentation. We'll just leave this set to the default Drupal API URL, which is `api.drupal.org`. Some developers store all of their API documentation locally, so if you do this you would want to enter your local URL/path here.
7. By checking the **Display page timer** box we can see page execution times in our query logs.
8. Check the box next to **Display memory usage**. We'll want to see how much memory we're using to generate pages.
9. Check the **Display redirection page**. This will prevent any query logs from being lost if a `drupal_goto()` function is run. We'll be presented with a redirect hyperlink path to the page that Drupal wants to direct us to after it shows us the query information.
10. Check the **Display form element keys and weights** box.
11. Another nice option here is the ability to skin your debug information. The **Krumo display** radio buttons allow you to pick a skin for your interface. Go ahead and choose one. I'll go with orange.

12. Because we're in the course of developing this site, let's check the box **Rebuild the theme registry on every page load**. We would not want to do this on a production site, as it could cause significant sluggishness, but while we're in development it's okay.



13. Expand the Administration menu settings. This allows you to tell the Devel module to **display additional information next to each menu item** on your site. For now let's leave this unchecked.
14. **Devel node access debug mode** allows you to have Devel module test node access permissions. As it states here, this can cause significant performance overhead. So for now, even on our development site, let's leave this unchecked. If we want to check the node access debug, we can come back and enable it later.
15. Select the default **SMTP library**.

16. Use the **Standard drupal error handler. Backtrace** will give you a nicer display of your debug information, but you'll need to install the Krumo library in order to use this.



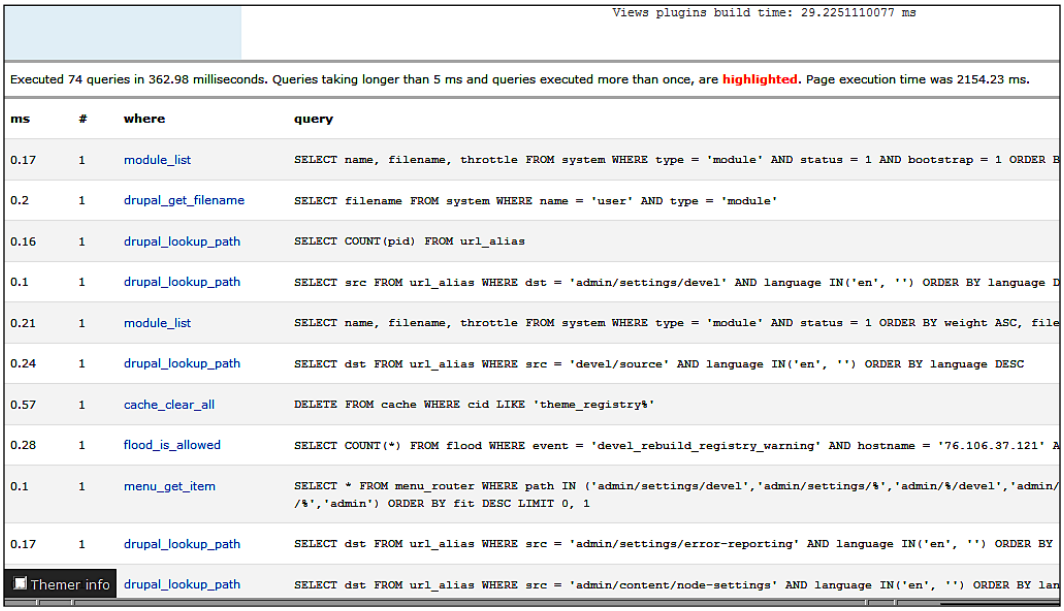
17. Save configuration.

Inspecting database queries and Devel results

Immediately after you save your Devel settings configuration, you should see the results. The Devel settings page will reload and you will see a message concerning the user being redirected to that page at its URL here. **The user is being redirected to** `http://variantcube.com/fire/admin/settings/devel`. This shows you that the setting to show any redirections is working. This redirection did work. You'll also see a log entry on the page that shows the **Views plugins build time**. This would be more meaningful on a Drupal Views page that is using a Views plugin. The message we see here is **Views plugins build time: 27.6119709015 ms**

The meat and potatoes of our settings are visible at the very bottom of our Drupal page. If you scroll down, you'll notice all of the database query information. All of the query logged information presents itself in a styled table directly under your content. This can be quite intimidating the first time you view the table, as there is a massive amount of information presented. Remember that Drupal is a content management framework that is completely database driven. So when you view the Devel logs, you are really viewing all of the database work that Drupal is doing. This is excellent evidence of all the database queries being run and all the work Drupal is doing while integrating with MySQL.

The table starts out with a header that tells you how many queries were run on this specific page load and how long the entire query run took in milliseconds. Here we see that 74 queries ran in 362.98 milliseconds. Then, it tells us that our longer queries, those that are longer than 5 milliseconds, will be highlighted in red in the table report. These are the queries we want to pay closer attention to, as they take longer to run.



Views plugins build time: 29.2251110077 ms

Executed 74 queries in 362.98 milliseconds. Queries taking longer than 5 ms and queries executed more than once, are **highlighted**. Page execution time was 2154.23 ms.

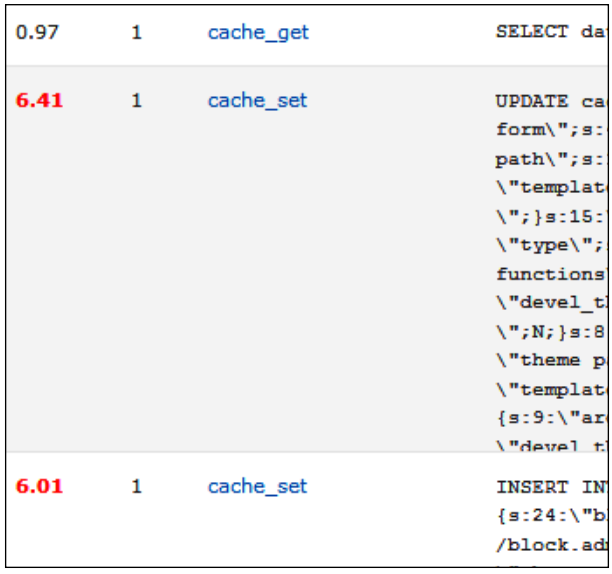
ms	#	where	query
0.17	1	module_list	SELECT name, filename, throttle FROM system WHERE type = 'module' AND status = 1 AND bootstrap = 1 ORDER B
0.2	1	drupal_get_filename	SELECT filename FROM system WHERE name = 'user' AND type = 'module'
0.16	1	drupal_lookup_path	SELECT COUNT(pid) FROM url_alias
0.1	1	drupal_lookup_path	SELECT src FROM url_alias WHERE dst = 'admin/settings/devel' AND language IN('en', '') ORDER BY language D
0.21	1	module_list	SELECT name, filename, throttle FROM system WHERE type = 'module' AND status = 1 ORDER BY weight ASC, file
0.24	1	drupal_lookup_path	SELECT dst FROM url_alias WHERE src = 'devel/source' AND language IN('en', '') ORDER BY language DESC
0.57	1	cache_clear_all	DELETE FROM cache WHERE cid LIKE 'theme_registry%'
0.28	1	flood_is_allowed	SELECT COUNT(*) FROM flood WHERE event = 'devel_rebuild_registry_warning' AND hostname = '76.106.37.121' A
0.1	1	menu_get_item	SELECT * FROM menu_router WHERE path IN ('admin/settings/devel','admin/settings/%','admin/%/devel','admin/ /%','admin') ORDER BY fit DESC LIMIT 0, 1
0.17	1	drupal_lookup_path	SELECT dst FROM url_alias WHERE src = 'admin/settings/error-reporting' AND language IN('en', '') ORDER BY
Themer info		drupal_lookup_path	SELECT dst FROM url_alias WHERE src = 'admin/content/node-settings' AND language IN('en', '') ORDER BY lan

You can also inspect the table for repeated and duplicated queries, as all the queries are listed under the query column, and the table also tells you where the query took place (you can search for bottlenecks and repeated queries in the table).

One example we can point out here is the theme registry cache clear that Drupal runs based on the Devel module setting we chose. We told Devel to clear the theme registry on each page load. When the settings page reloaded after we made our settings choices, the query shows in the table. Look for the `cache_clear_all` function in the **where** column. This query took **.5 ms** to run and it cleared out the theme registry. The query reads: `DELETE FROM cache WHERE cid LIKE 'theme_registry%'`

If you have any doubts about the functions in the **where** column, you can click on the function link and it will take you to the API documentation that we enabled when we saved our Devel module settings. When I click on that link, the API function document loads at `api.drupal.org` here: `http://api.drupal.org/api/function/cache_clear_all/6`. The CID is set to `theme_registry` here, so that is what Drupal clears. The documentation tells us this, explaining the parameter in detail: **$cid If set, the cache ID to delete. Otherwise, all cache entries that can expire are deleted.**

Scroll down in the query table to see if you can locate any potential issues or bottlenecks, especially looking for any red highlighted millisecond columns. Looking through the table, there appear to be two longer queries run for `cache_set`. Both of these come in at over 5 ms. This is probably not severe because this is the caching that we've set in our Drupal core cache settings. We may want to keep an eye on this as we view other page loads. You could also disable caching on the site to see if this makes a difference in the millisecond time.



The module also reports on queries which are executed more than once on your page load. These will also be highlighted in red. For example, if I go to the main Administer page of my site and load the page, then the query table reports that `_update_cache_get` query ran twice. The query did not take over 5 milliseconds, but it did get duplicated. The **#** column shows this with a red **2**.

0.56	1	_update_cache_get	SELECT data, created, expire, serialized
0.57	2	_update_cache_get	SELECT data, created, expire, serialized
0.98	2	_update_cache_get	SELECT data, created, expire, serialized
0.21	1	drupal_lookup_path	SELECT dst FROM url_alias WHERE src = 'a

At the bottom of the page, under the entire table of database queries and logs, the summary is shown. It should look something like this:
Memory usage:
Memory used at: devel_init()=1.77 MB, devel_shutdown()=32.58 MB.

This reports the total memory used to load this page and all of its queries (**1.77 MB**). Another nice feature of this overall memory usage report is that you can run Devel on your pages and check to make sure your memory usage is consistent. So, if all of your pages are using a consistent **1.77 MB** approximate of memory, then you know that all pages are equally optimized and that your performance is also optimized. If you notice one page consuming more memory or large amounts of memory, this is a potential bottleneck that you will want to investigate in more detail.

Enabling the Devel module block

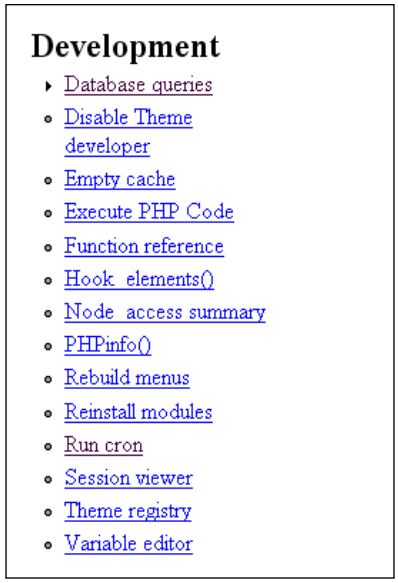
When you install the Devel module, the module will add a block to your site that you can enable and use as a site admin. The block allows you to get to Devel module functionality quickly. To enable the block follow these steps:

1. Go to **Site building | Blocks** here: `http://variantcube.com/fire/admin/build/block`
2. In your disabled blocks region look for the **Development** block and configure it. On the configuration screen you can check the block for an authenticated user or a site admin role (if you've created one) under the **Show block for specific roles**. This will prevent any anonymous user or default Drupal authenticated user from viewing the Devel block.

3. Save your block configuration.
4. To enable your block, click in the region drop-down box and select **right sidebar**, so the block will appear in the right sidebar of your site.

5. Save blocks.

Your Development block will now be visible in your right sidebar. I'm currently viewing the Devel block in my Apollo Zen sub-theme. You should see something like this:



You may have noticed that the Development block does not show if you navigate to an admin section of your site and have the Garland theme installed as the default administration theme. The workaround for this is to disable your custom theme, enable Garland as your default theme, and then re-enable the Development block in Garland in the right sidebar. If you are working on a production site, you may want to take your site offline before making this tweak.

Using the Devel module block

The Devel block gives you quick access through links to your Devel functionality. You can perform the following with the block:

- Access your database queries on one page report view
- Disable your Theme developer and re-enable it
- Empty your entire site performance cache
- Execute PHP code
- Access a function reference
- Access `Hook_elements()`
- Access your `node_access` summary
- Get information on your PHP settings
- Rebuild your site menus
- Reinstall your modules
- Run your `cron`
- View sessions
- Clear your Theme registry
- Edit variables

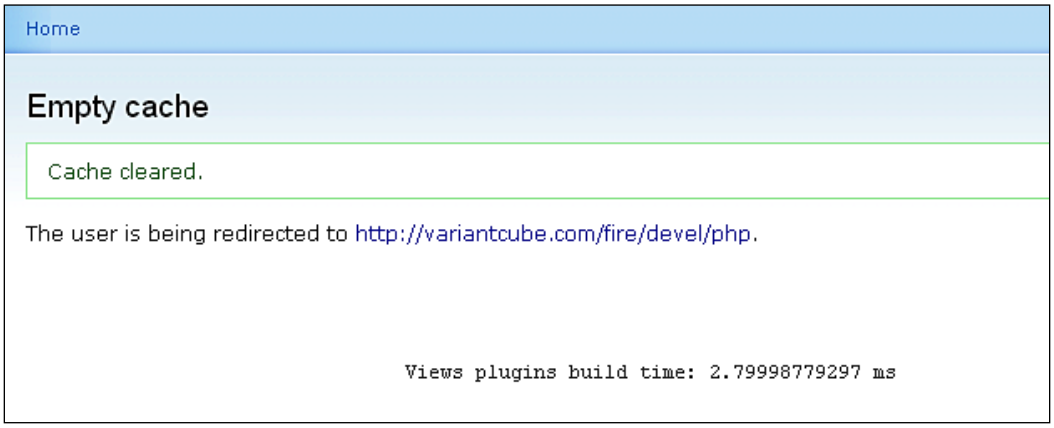
Let's look at each of these tools briefly. The best way to learn how to use the Devel block is to start accessing all of its functionality through the block links and to try out each component.

Database queries

We've already discussed Database queries in detail, but if you click on this link in the Devel block, it will launch a page of all the database queries that the Devel module is running. This is another way to get to those queries.

Empty cache

Clicking on the **Empty cache** link will clear your site's performance cache. This is a nice, quick, and easy method of clearing your cache. Once run, the **Empty cache** page will load with a message that your **Cache cleared**.



Disable/Enable Theme developer

If you want to **disable your theme developer functionality, click on the Disable Theme developer** link in the Development block. When you do this, you'll notice that your theme developer box will disappear. To enable it again, click on the **Enable Theme developer** link.

Execute PHP code

To execute PHP code, click on the link and you'll be presented with a page that has a text area box where you can paste your PHP code. For example, go ahead and execute a simple PHP info script. Execute this code, but remember not to add any PHP tags. You do not need to surround your code with opening and closing PHP brackets. Just type or paste in:

```
phpinfo();
```

Click on the **Execute** button. Your code will execute. The results will not look as pretty as the PHP info page you get through your Status report. Basically, here Drupal will output the results in HTML without any style formatting rendered. So, you'll see your PHP info report, but it will be surrounded by HTML code. Here's what I see after executing the script:

```
<tr><td class="e">auto_prepend_file</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td>
<tr><td class="e">browscap</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td></tr>
<tr><td class="e">default_charset</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td></
<tr><td class="e">default_mimetype</td><td class="v">text/html</td><td class="v">text/html</td></tr>
<tr><td class="e">define_syslog_variables</td><td class="v">Off</td><td class="v">Off</td></tr>
<tr><td class="e">disable_classes</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td></
<tr><td class="e">disable_functions</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td>
<tr><td class="e">display_errors</td><td class="v">On</td><td class="v">On</td></tr>
<tr><td class="e">display_startup_errors</td><td class="v">Off</td><td class="v">Off</td></tr>
<tr><td class="e">doc_root</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td></tr>
<tr><td class="e">docref_ext</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td></tr>
<tr><td class="e">docref_root</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></td></tr>
<tr><td class="e">enable_dl</td><td class="v">On</td><td class="v">On</td></tr>
<tr><td class="e">error_append_string</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></
<tr><td class="e">error_log</td><td class="v">error_log</td><td class="v">error_log</td></tr>
<tr><td class="e">error_prepend_string</td><td class="v"><i>no value</i></td><td class="v"><i>no value</i></
<tr><td class="e">error_reporting</td><td class="v">6135</td><td class="v">6135</td></tr>
<tr><td class="e">expose_php</td><td class="v">On</td><td class="v">On</td></tr>
<tr><td class="e">extension_dir</td><td class="v">/usr/local/lib/php/extensions/no-debug-zts-20060613</td><td
<tr><td class="e">file_uploads</td><td class="v">On</td><td class="v">On</td></tr>
<tr><td class="e">highlight.bg</td><td class="v"><font style="color: #FFFFFF">#FFFFFF</font></td><td class="
<tr><td class="e">highlight.comment</td><td class="v"><font style="color: #FF8000">#FF8000</font></td><td cl
<tr><td class="e">highlight.default</td><td class="v"><font style="color: #0000BB">#0000BB</font></td><td cl
<tr><td class="e">highlight.html</td><td class="v"><font style="color: #000000">#000000</font></td><td class=
<tr><td class="e">highlight.keyword</td><td class="v"><font style="color: #007700">#007700</font></td><td cl
```

Function reference

The **Function reference** link will load a page that shows a list of all the user functions that are generated during a page load on the site. It's a long list on our site covering all functions from `_advanced_help_parse_ini` to `xmlrpc`. You can click on a function link to view more details about it and read its documentation. For example, if you click on the `_comment_form_submit` function link, you'll load the function page at `api.drupal.org` which is here: `http://api.drupal.org/api/function/comment_form_submit/6`. This will explain the function and give you an example of its use.

Hook_elements()

`Hook_elements` launches a page that displays all of your hook arrays. This will be presented in a nice Krumo-based screen using the orange skin we selected when we configured our Devel module.

You can click on an array in the table to view its corresponding elements.

PHPinfo()

`PHPinfo()` launches your site's default PHP information page. This is the same PHP information page that you can launch from your site's Status report. The Devel block gives you easier access to it, so you do not have to load your Status report page each time you need information on your PHP settings.

Rebuild menus

Rebuild menus flush your menu configuration, return your menu items to their default status, and remove any customization you've made to a specific menu item. Be careful with this setting, as you will most likely not want to do this on a production site. However, this may prove helpful on a development site if you need to troubleshoot why menus are not behaving correctly.

Reinstall modules

This is another Development block tool that you need to be careful with. It provides easy access to your modules admin, and you can select any of your core or contributed modules and reinstall them here. But beware that if you do this, the module reinstallation will wipe out and override any customizations you had made. Reinstalling modules will also wipe out any data you have in your module's database tables, so be sure to only use this functionality if you know what you are doing as an advanced module developer. This is a good tool for module developers.

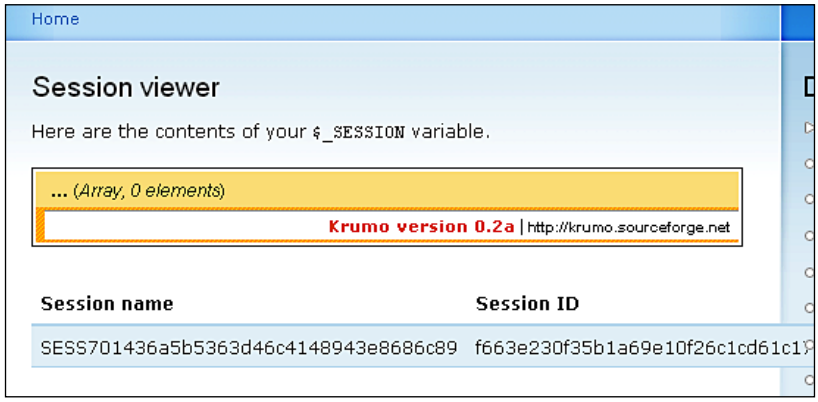
Running cron

This link provides easy access to running `cron` manually on your site without having to load your Status report.

Session viewer

This shows you the contents of your session variable. Drupal session variables are variables that store site visitor information in the Drupal application framework for the entire length of the logged in user's session. So, as soon as you logout of the site, your session variable will expire. The variable may also expire after a certain period of inactivity on the website. These variables help to store information about a specific authenticated site visitor who is logged into your site.

So, when I'm logged into this site at this moment as the admin user, the session name and session ID is shown. The Session name is **SESS701436a5b5363d46c4148943e8686c89**, and the Session ID is **8582e26c836f16d48b0c1048bfd**. Notice here that if I logout of the site and then login, and run the **session viewer** link again I will generate different name and ID numbers.



Theme registry

Theme registry shows you all of your theme arrays and corresponding elements. This is helpful for the theme developer. For example, you can get theme function names here by clicking to expand an array and looking at its elements and functions. If we click on **Image**, we can see that the function, **theme_image**, is listed.

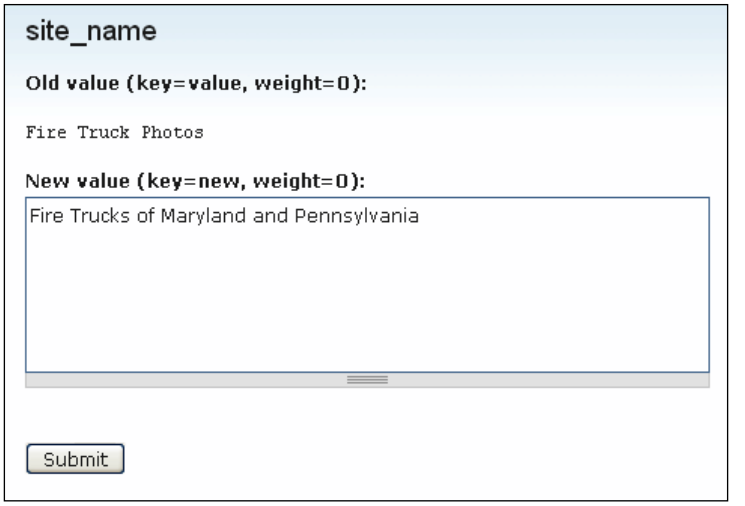
Variable editor

Finally, the last link in the Development block is the Variable editor. This shows you all of the site variables that are stored in the database. This is a very helpful list. I can glance quickly through the alphabetical list looking for the `site_name` variable name and locate its value. The value is the name of our site, for example, **Fire Trucks of Maryland and Pennsylvania**. So, this table gives you the variable name along with its value. Another example is the administration theme we're using. The variable is called `admin_theme` and the value for this is `s:7:"garland";`. This shows that the Garland theme is our current administration theme.

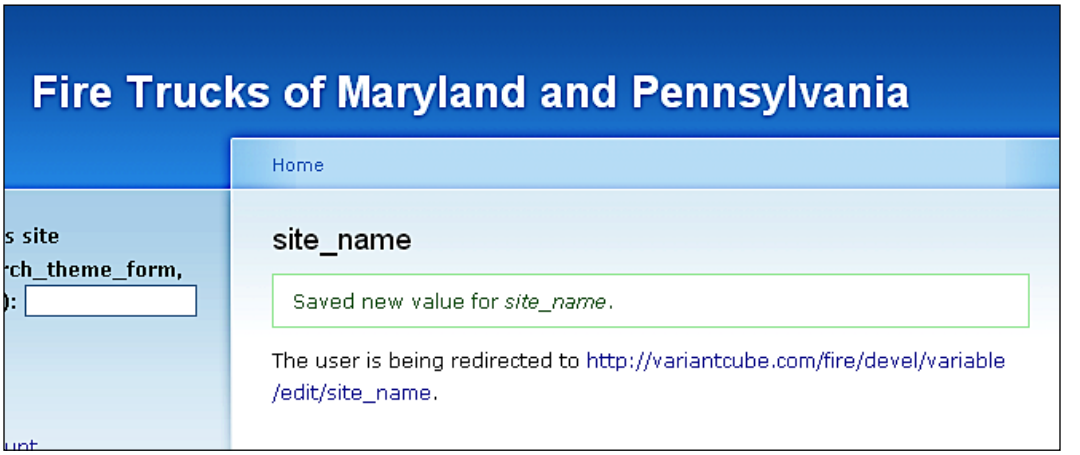
The Variable editor tool also provides you with an Edit link that allows you to edit the variable on the fly, using the Devel module. You can also select the checkbox next to the variable name to delete it, but beware that if you delete the variable here it will delete it from the database.

☐	site_mail	s:22:"trevor@variantcube.com";	30	edit
☐	site_mission	s:0:"";	7	edit
☐	site_name	s:40:"Fire Trucks of Maryland and Pennsylvania";	48	edit
☐	site_offline	s:1:"0";	8	edit
☐	site_offline_message	s:105:"Fire Truck Photos is currently under maintenance. We shoul...	114	edit
☐	site_slogan	s:0:"";	7	edit

Click on the **Edit** link next to the `site_name` variable. This will launch a page with a text area box. The box will contain the current value of the variable. Go ahead and delete the value and add a new one, or edit the one that is there. Then click on **Submit**. This is a wonderful tool that allows you to quickly locate site variables and edit their values without having to search through the Drupal administration for the specific node, block, or menu, or other configuration that contains the variable. You can get the entire list here and edit them. I'm going to tweak the value to be **Fire Trucks of Maryland and Pennsylvania**. Then I'll click on **Submit** and refresh my site page, and the new site name should be visible.



Here's a screenshot of the result:



Summary

We've covered a lot of material in this chapter and looked at one of the larger Drupal contributed modules—a module that provides a huge amount of functionality and tools to the Drupal performance developer. You should now take time to use the Devel module every day during your Drupal development work and get to know each component in greater detail. Here's what we covered:

- We looked at recent log entries in order to check on any potential PHP errors or other parse errors that may be occurring on our site. We also looked at the top page not found and access denied errors.
- We installed and configured the Devel module and set permissions for our admin users to use the module.
- We used the Devel module to check on database queries that occur during our page loads and how long these queries take to run. We also looked for duplicate queries and learned to watch out for those queries that take longer than our threshold millisecond benchmark.
- We used the Development block to get easier access to some common performance tools such as the manual Drupal `cron` task, clearing our performance cache, checking our theme registry, and tweaking our site variables.

Let's take a break! When we come back in Chapter 4, we'll discuss how best to implement the trifecta of Drupal modules CCK, Views, and Panels for best performance on our site. We'll also learn how to clear our Views and Panels caches, and to throttle content, blocks, and other elements on our site.

4
Performance Optimization

In this chapter, we're going to learn how to throttle modules and blocks on our site in order to increase performance and reduce server load during high traffic periods. We will use the Throttle module to do this.

We'll return to a discussion of the Devel module and how it can be used to generate dummy content, users, and taxonomy categories for our development site. Using Devel to generate test or dummy content provides an easy method of building a test or demo site quickly.

We'll look at caching mechanisms in two of the larger scale contributed modules, Views and Panels, which you may find yourself using frequently. Panels and Views both allow you to cache the data and content that you insert into these modules. We'll look at how these caching mechanisms work and how you can maintain your cache in both modules.

To summarize, here's what we'll be doing in this chapter:

- Throttling modules and blocks
- Using the Development module to generate taxonomy, users, and content
- How to run Views 2.x for best performance, including how to clear your Views cache
- Panels module caching mechanisms and how to maintain your Panels cache.

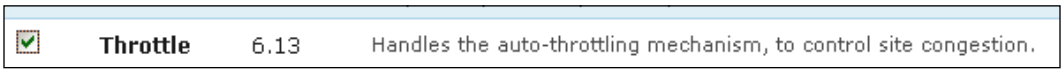
Enabling and configuring the Throttle module

Drupal allows you to control when your modules and blocks get enabled and shown to your site visitors. This helps you to prevent bottlenecks in your server's web traffic and to optimize your server load to prevent any congestion that it might experience with its bandwidth and traffic. Throttling blocks and modules becomes increasingly important on larger scale websites where you have many blocks and modules active. You may have a site that contains a large number of blocks, for example, that have been built with the Views module. You can throttle these blocks, so they only get enabled when the site visitor calls a page that is supposed to show that block. The throttle module allows you to configure it, so it automatically gets enabled when the usage of your site goes above a certain threshold. For example, this can be the number of anonymous users visiting your site. When a certain amount of visitors are on your site, you can have Drupal enable throttling.

Using the Throttle module is essential on shared servers where you may not have all of the resources on the server made available to you at any given time or on a server that gives you limited CPU resources and bandwidth. You may not need to use Throttle on higher performance-dedicated servers because they will most likely be providing you with good performance. But on shared servers it does become important to use Throttle.

If you did not enable the Throttle module after we upgraded our site to Drupal 6.13, we need to enable it first. Once enabled, we can then configure the module. Follow these steps:

Under your Core-optional module list, check the box next to **Throttle** and then save your module configuration.



There are two methods of accessing the Throttle module configuration. You can visit the main Throttle configuration page to set auto throttling settings for your site. Also, you can enable throttling for each module and block on your site. We'll look at both methods now. Note that your modules admin page explains how to access and enable both types of throttling (module and auto) at the top of the page in its introductory help text. You will only see your module throttle checkboxes available if you have enabled the Throttle module first.

Configuring the Throttle module for auto throttling features

Go to **Site configuration | Throttle** to load your Throttle module settings form or click on the **throttle configuration page** link through your main modules admin page.

The Throttle configuration page explains what the Throttle module does and gives you a link to more information through the **more help** link. If you click on that link and have the Advanced Help module active, you will launch a detailed Throttle module help and explanation page.

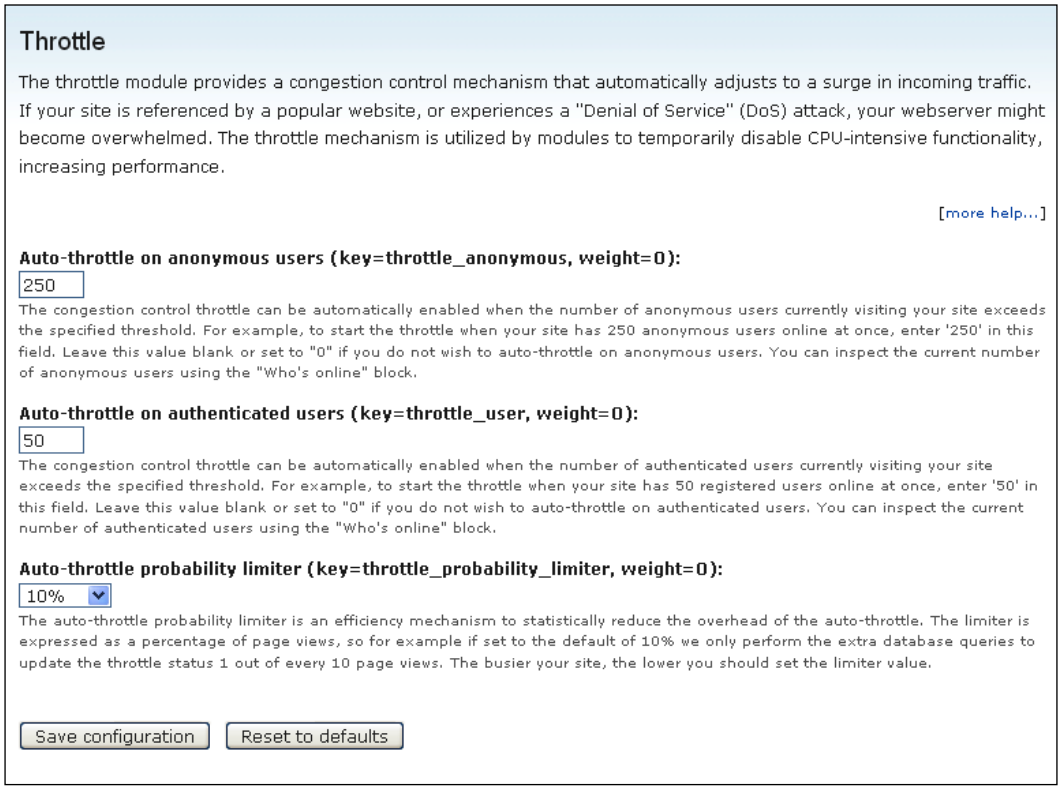
On this page you can configure three throttle elements that fall under the default Throttle module congestion control feature:

- Auto-throttle on anonymous users
- Auto-throttle on authenticated users
- Auto-throttle probability limiter

Auto-throttle on anonymous users allows you to set a threshold for enabling your congestion control throttle dependent on anonymous user activity. So, for example, you will want to choose a threshold number of anonymous users to enter into this field. When this number of anonymous users is reached, the auto-throttle feature will be enabled. If you want the auto-throttle to be enabled after 250 anonymous users are on your site at the same time, you can type **250** into this field. Set this field to **0** if you do not want to use the auto-throttle feature.

Drupal also tells you here that you can determine how many users are on your site at any given time by enabling the **Who's Online** block—this will show you all of the anonymous users who are browsing your site and authenticated users who are logged into your site.

The **Auto-throttle on authenticated users** works using the same method. Add the threshold number of authenticated users that you want logged into your site before the point your throttle gets enabled. We'll set this to **50** authenticated users.



The **Auto-throttle probability limiter** helps to reduce the overhead of the auto-throttle module. It's a built-in performance check just for this Throttle module. You can set a percentage of page views for your site. For example, if you set the page view percentage to **10%**, then the module will only perform extra database queries to update the Throttle module status once for every 10 page views. Drupal tells you that the busier your website, the lower you want to set this value. Leave it set to the default of **10%**. Save your auto-throttle configuration.

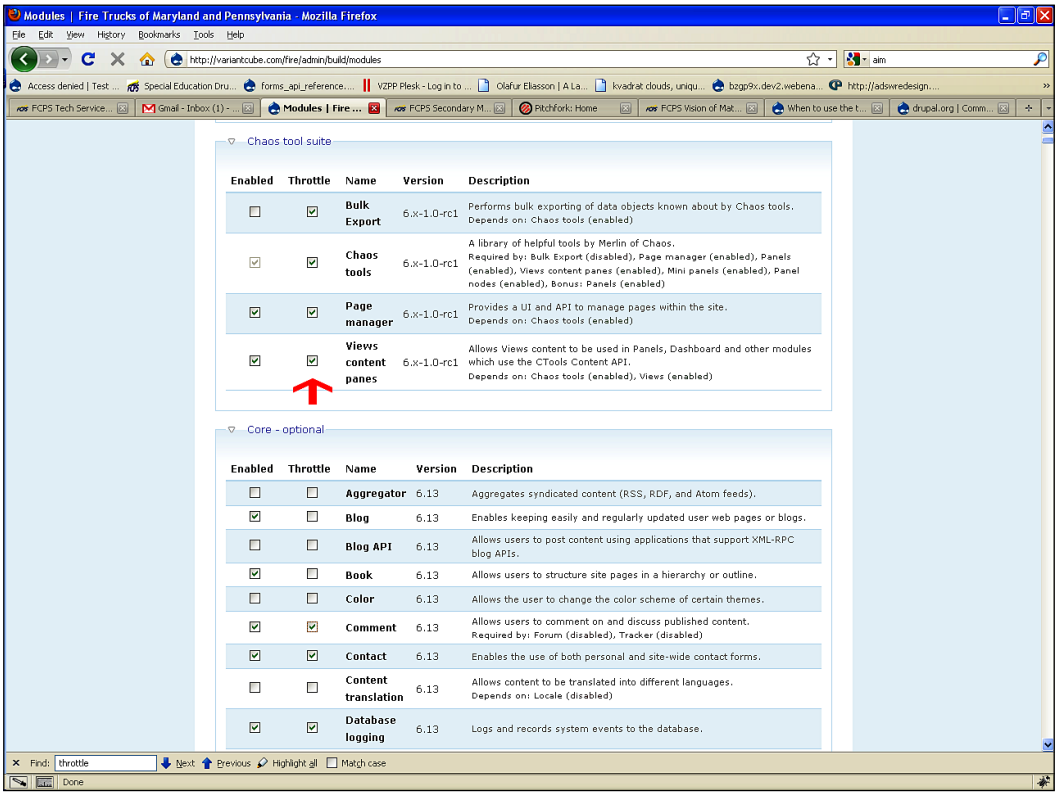
Throttling your modules

You can also throttle each of your core and contributed modules as long as they have a Throttle checkbox next to their line item on the modules admin page. Load your modules admin page and look for the Throttle checkboxes. This allows you to tell Drupal to throttle a specific module during high traffic periods on your site. This means that when your site reaches a high traffic threshold (based on the auto throttling settings you determined above) your site will temporarily disable the module in question. This will throttle the module until your site returns to a stable status.

You do need to be careful here. You should throttle those modules that are of lesser importance when your site reaches its threshold of user activity. When you throttle, you are temporarily disabling the module, so it will also temporarily disable that module's functionality during high server loads. So, you may want to disable some modules, such as Views, but leave your CCK module enabled so that your users can still see the content that is being filtered into the View. We'll go ahead and throttle the following modules:

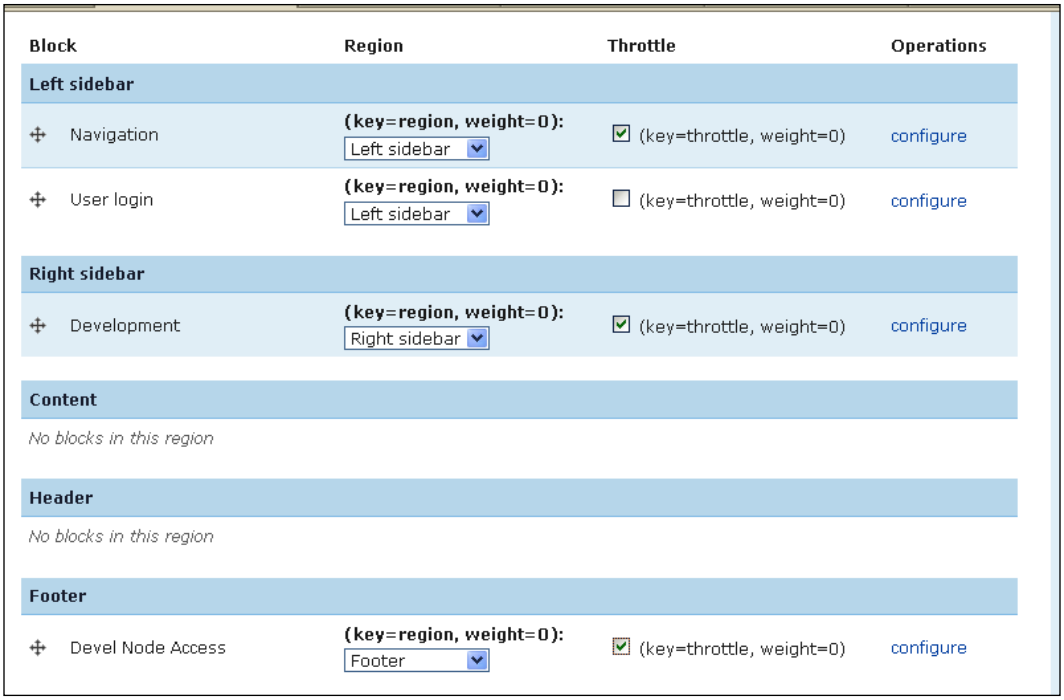
- Administration menu (because this module is only being used by our logged in admins)
- Chaos tool suite (all submodules here)
- Comment
- Contact
- Database logging
- Help
- PHP filter
- Search
- Statistics
- Advanced Help
- FCKEditor
- IMCE
- Lightbox2
- Poormanscron

You can select more modules to throttle based on your preferences and the usage of your site. Use the above as an example and model to follow. Check the throttle boxes and save your configuration. During the next high server load period, these modules will be disabled temporarily to increase the performance of your site during its high server load period.



Throttling blocks

You can also throttle your blocks. To do this, go to the Blocks admin page here: **Administer | Site building | Blocks**. You'll notice that there is a new checkbox selection for Throttle. You can choose which blocks to throttle by checking the **Throttle** checkbox next to each of your enabled blocks. We'll go ahead and throttle all of our blocks except for the **User login**, as we still want to allow users to login to the site during high traffic periods. The throttle functionality works the same here as it does with modules. These blocks will be temporarily disabled during high site traffic.



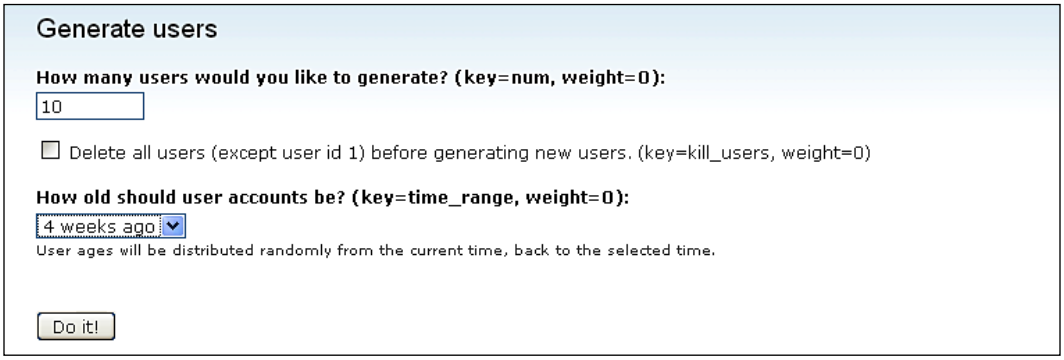
Once you check your throttle boxes, save your blocks configuration. The next time you have high site traffic, these blocks will be temporarily disabled.

Generating test users, categories, and content

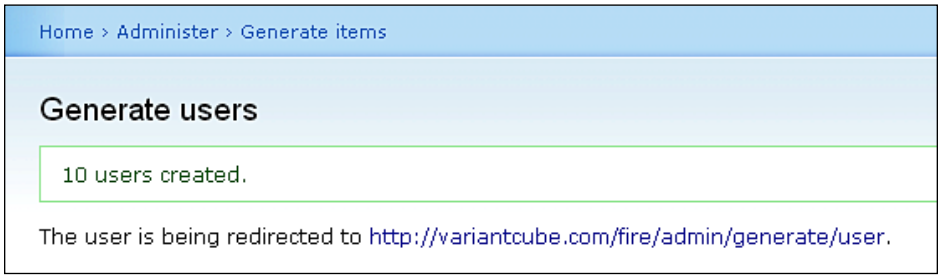
Another use of the Devel module besides all the great functionality we discussed in Chapter 3 is to generate test 'dummy' content, taxonomy categories, and users for your website. This functionality is part of the Devel module and to confirm that you can use this, go to your admin modules list and check to make sure the Devel generate module is enabled.

To generate users, nodes, and taxonomy terms for your site go to the **Generate items** main page in your site admin. That will launch a page with links to **Generate categories**, **Generate content**, and **Generate users**. As we already have some content on our site (that I originally implemented by using **Generate content**), we're going to try generating some test users for our website. Follow these steps to generate users:

1. Click on the **Generate users** link.
2. Tell the Devel module how many users to add to the site. The default is **50**. We'll add 10 users to our site. Type **10** in the field.
3. You can also tell Drupal to kill or delete all the other users (if you've already added test users) on your site apart from the super user admin (with User ID 1). This is helpful. You can add some test users and then easily delete them using this module. As we do not have any users on our site besides the super user, we'll leave this box unchecked.
4. The Devel module will randomly generate a user account history time for each account. You can tell Devel how far back to go in the select box under the **How old should user accounts be?**. We'll change this to **4 weeks ago**.
5. Click on the **Do it!** button.

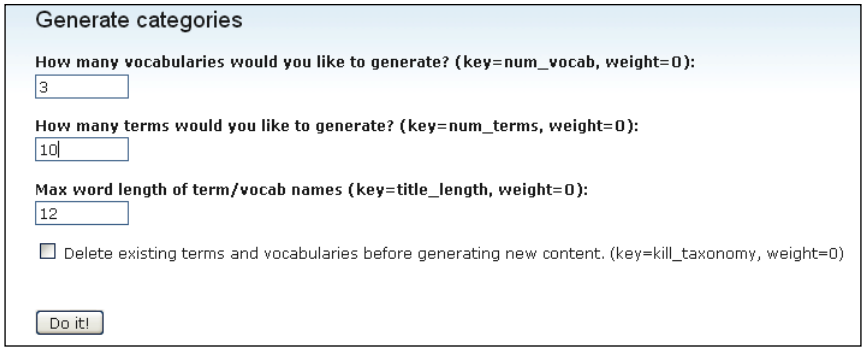


As soon as you click on the **Do it!** button, the user accounts will be created automatically by the Devel module.

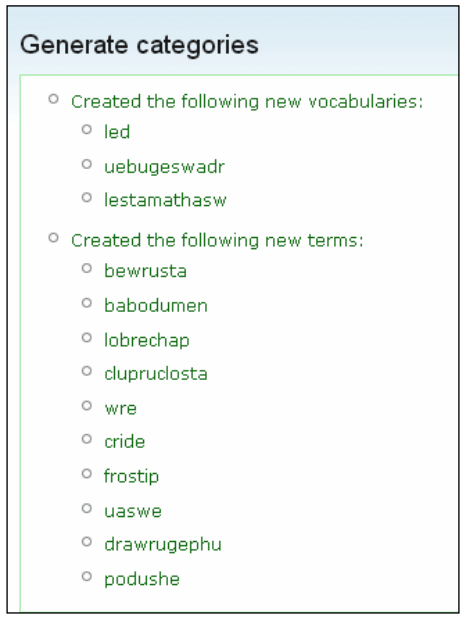


Go to your Users list to see the dummy users that the Devel module created for you. They should all have usernames and be set to active status.

You can also use the **Generate items** functionality of the Devel module to generate content and categories. Click on each of these links to try out this functionality. When you click on **Generate categories**, the module will ask you about **vocabularies**, **terms**, and the **max word length** for a term or **vocab** name. Plug some numbers into these fields and then click on the **Do it!** button. Let's generate **3 vocabs** and **10 terms per vocab**. The **Max word length of term/vocab names** will be set to the default of **12** characters.



Drupal will tell you it created the new vocabs and terms. You can browse to your taxonomy page to view the vocabs and terms.

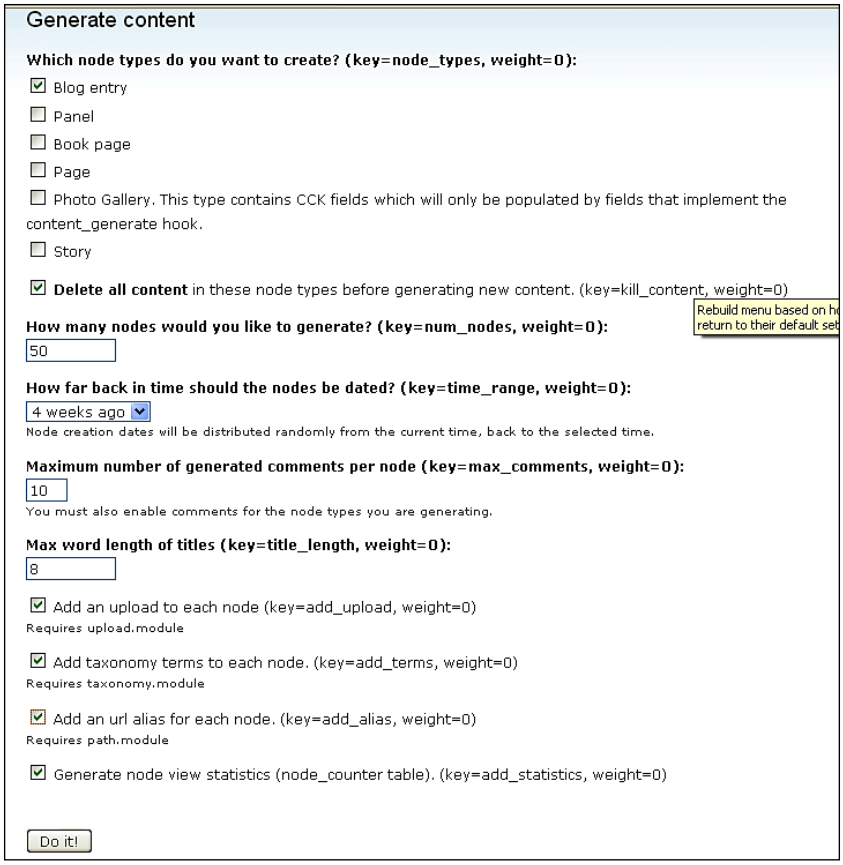


Once you click on **Do it!**, browse to your Taxonomy admin list and you should now see the new vocabularies and terms in the site that were generated using the Devel module.

Now that you have added some dummy taxonomy content using the Devel module, you can view your taxonomy vocabs and terms by visiting **Content Management | Taxonomy**. On this page you'll see the new list of vocabs. If you click on the **list terms** link, you'll see all of the tags per vocab that were added.

To generate test content go to the **Generate content** page, fill out the form fields for the types of node content you'd like to create, how many nodes, the maximum number of generated comments, whether you want to add taxonomy terms to each node, and URL aliases per node. This also allows you to delete any previously posted test content that you may have integrated with your site using the Devel module before. Fill out all the fields you need and then click on **Do it!**. The test content will be generated.

For our next example using the Views module (in the next section on *Views caching*), I'm going to generate Blog entry test nodes along with the corresponding taxonomy. Generate your own test nodes that you will use in the next section on the Views module. I'm going to go ahead and delete all of my previous test blog content so that I can start afresh with brand new content. I'll generate the default **50** nodes of content. Nodes will be dated as far back as 4 weeks ago. I'll generate a maximum number of **10** comments per blog post. I will add taxonomy terms, upload functionality, and URL aliases to each node. Click on **Do it!** button.



Drupal will generate the content and you'll see a progress task bar as the content batch is generated. Then, Drupal will show you a confirmation screen showing a list of all the blog entry content that was created.

If you browse to your main content admin list, you will also see all the new blog entries that were created using Devel.

Now that we have test content, categories, and terms generated in our site, we're now ready to build a View using our test content and to start using View caching to increase the performance of our Views. We can also integrate our View with the Panels module and utilize some of the Panels module cache functionality.

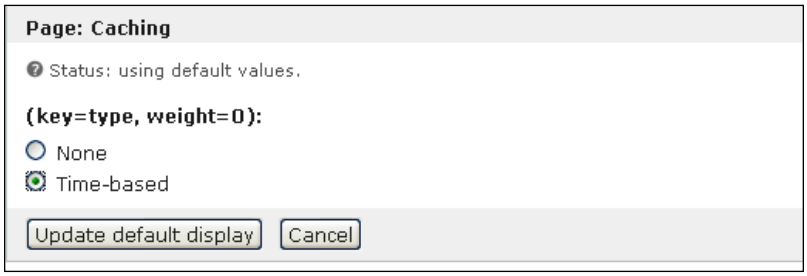
Views caching

The Views 2 module allows you to cache your Views data and content. You can cache Views data per View. We're going to enable caching on one of our existing Views, and also create a brand new View and set caching for that as well using the test content we just generated. This will show you a nice integration of the Devel functionality with the Views module and then how caching works with Views.

Go to your **Site building | Views** configuration page and you'll see many of your default and custom views listed. We have a view on this site for our main photo gallery. The view is named **photo_gallery** in our View listing. Go ahead and click on one of your Views **edit** links to get into edit mode for a View.

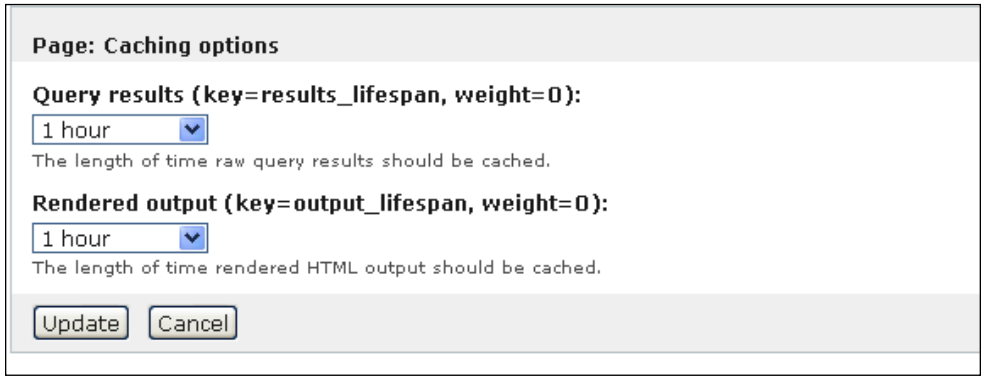
In our Views 2 interface mode, we'll see our tabs for **default**, **Page**, and/or **Block** View display. I'm going to click on my **Page** tab to see my View's page settings. Under my **Basic settings** configuration, I'll see a link for **Caching**. Currently, our **Caching** link states **None**, meaning that no caching has been configured for this view.

Click on the **None** link. Select the **Time-based** radio button. This will enable **Time-based** caching for our View page.



Click the **Update default display** button. The next caching options configuration screen will ask you to set the amount of time for both, your View **Query results** and for your View **Rendered output**. **Query results** refer to the amount of time raw queries should be cached. **Rendered output** is the amount of time the View HTML output should be cached. So basically, you can cache both your data and your frontend HTML output.

Set them both to the default of **1 hour**. You can also set one to a specific time and the other to **None**. Go ahead and tweak these settings to your own requirements. I'm leaving both set to the default of **1 hour**.

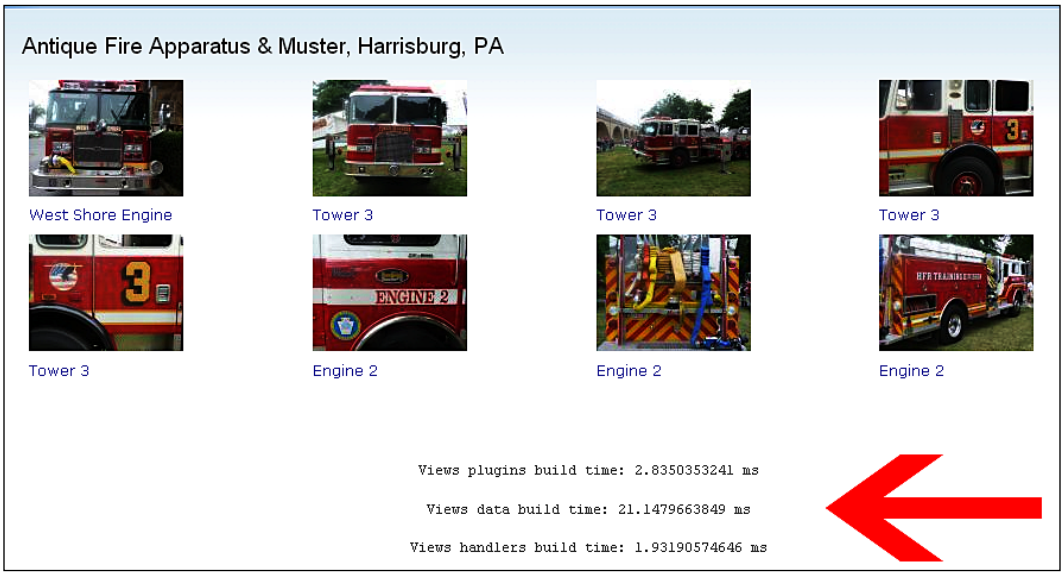


Click on the **Update** button to save your caching options settings.

You are now caching your View. Save your View by clicking on the **Save** button. The next time you look at your View interface you should see the caching time notation listed under your Basic settings. It will say **1 hour/1 hour** for this setting.

Once you enable Views caching, if you make a change to your View settings and configuration, the results and output of the View may not update while you have caching enabled. So, while in Views development you may want to disable caching and set it to **None**. Otherwise, this next section will show you how to disable your Views cache while you are in development.

To see the performance results of this, you can use the Devel module's functionality again. When you load your View after you enable caching, you should see a decrease in the amount of **ms** (milliseconds) needed to build your Views plugin, data, and handlers. So, if your Views plugin build loaded in **27.1 ms** before you enabled caching, you may notice that it changes to something less—for example, in my case it now shows that it loads in **2.8 ms**. You can immediately see a slight performance increase with your View build.

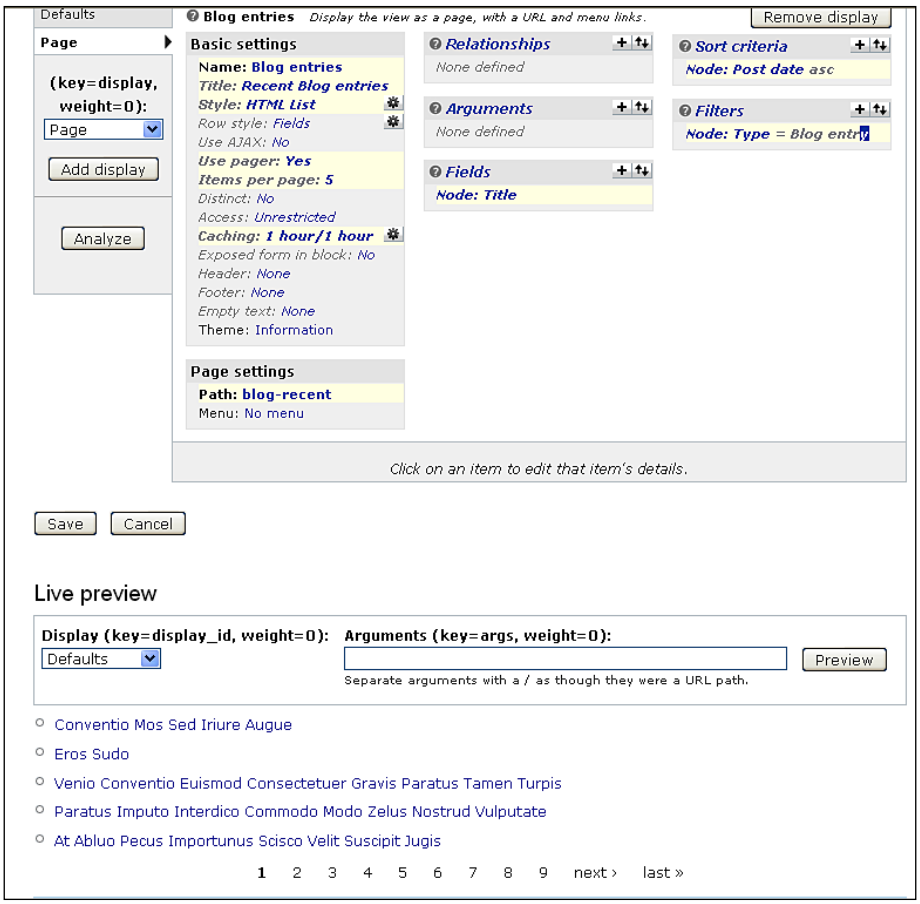


Let's go ahead and build a brand new View using the test content that we generated with the Devel module and then enable caching for this View as well.

Go to your Views admin and follow these steps:

1. **Add** a new View.
2. Name the View, add a description and a tag if applicable.
3. Click on **Next**.
4. I'm going to create a View that filters my blog entries and lists the new blog entries in post date order using the Devel content I generated.

5. Add a **Page** display to your new View.
6. Name the page View.
7. Give the page View a **title**.
8. Give your View an **HTML list style**.
9. Set the View to display **5 posts** and to use a **full pager**.
10. Set your caching to **Time-based** (following instructions above in the first view we edited).
11. Give the view a **path**.
12. Add a **Node:Title** field and set the field to be linked to its node.
13. Add a filter in order to filter by **Node:Type** and then select **Blog entry**.
14. Set your **Sort criteria** to sort by **Node:Post** date in **ascending** order by hour.
15. Your settings should look similar to this:



Save your View by clicking on the **Save** button. Your new View will be visible at the **Page** path you gave it and it will also be caching the content and data it presents. Again, if you refresh your View page each time you should notice that the plugins, data, and handlers build times decrease or stay very similar and consistent in load times. You should also notice that the Devel database queries status is telling you that it's using the **cached results** and **cached output** for the View build times and the MySQL statements. You should see the following code sitting below your page content on the View page you are looking at. It will resemble this:

```
Views plugins build time: 23.509979248 ms

Views data build time: 55.7069778442 ms

Views handlers build time: 1.95503234863 ms

SELECT node.nid AS nid,
   node_data_field_photo_gallery_photo.field_photo_gallery_photo_fid
AS node_data_field_photo_gallery_photo_field_photo_gallery_photo_fid,
   node_data_field_photo_gallery_photo.field_photo_gallery_photo_list
AS node_data_field_photo_gallery_photo_field_photo_gallery_photo_list,
   node_data_field_photo_gallery_photo.field_photo_gallery_photo_data
AS node_data_field_photo_gallery_photo_field_photo_gallery_photo_data,
   node.type AS node_type,
   node.vid AS node_vid,
   node.title AS node_title,
   node.created AS node_created
 FROM {node} node
 LEFT JOIN {content_type_photo} node_data_field_photo_gallery_photo ON
node.vid = node_data_field_photo_gallery_photo.vid
 WHERE (node.status <> 0) AND (node.type in ('%s'))
   ORDER BY node_created ASC

Used cached results

Used cached output
```

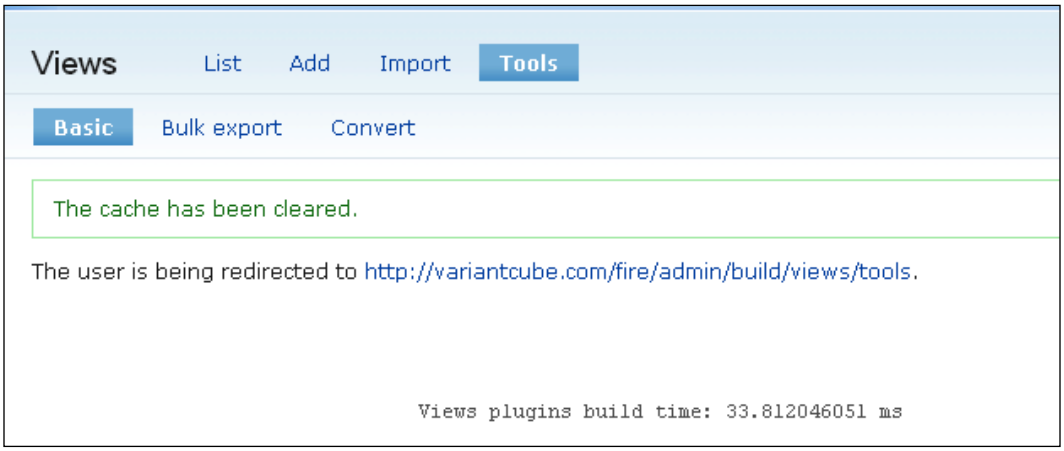
The next section will show you how to clear your Views cache while you are in development mode.

Clearing your Views 2 module cache

If you are working with the Views module in your site, you'll want to know how to clear your Views module cache so that updates and tweaks you make to your Views via the Views 2 UI show up immediately. The Views module will cache existing View configuration, settings, and content, so if you're not seeing the changes you've made or are experiencing other issues with your Views, you'll want to make sure to clear the cache.

Here are the steps to clear your Views cache:

1. Go to **Site building | Views** to access your Views admin.
2. At the top of the page you'll see a **Tools** button. Click on it.
3. The simplest method of clearing your Views cache is to click on the **Clear Views' cache** button.
4. You will receive a message: **The cache has been cleared**.



There are other settings available to you through this Views Tools page. You can choose to **Add View signatures to all SQL queries**—doing this will add a `VIEWS` string to the `WHERE` clause in your query. This can cause a performance issue potentially though, as it is more work for the database. So, you can opt out of this. Drupal advises that you should only use this method for troubleshooting and development purposes.

You can also choose to disable Views caching. However, we do want Views to cache data because it will give us a performance enhancement. We can easily clear our Views cache using the above method if necessary, so let's leave the caching functionality for Views enabled.

If you do not have the Advanced Help module installed or if it's disabled, you can tell Views to ignore this and not show you errors telling you the Advanced Help integration with Views is disabled. Again, this is optional, but a nice setting to have if you do not want to see the error messages popping up.

We can also **enable Views performance statistics if we have the Devel module** installed. Go ahead and make sure this is checked. It should be, if you have been receiving Devel module Views statements regarding build times as noted earlier.

Set the **Page region to output performance statistics** as the **Footer** region—this is the default.

Click on the **Save configuration** button.

Using Panels caching

The Panels 3.x module allows you to distribute your site's content and Views into custom layouts. You can use Panels to set up and configure these layouts and then integrate content into the layout that you choose. The Panels module uses what the module developers call a pluggable caching mechanism. This mechanism allows you to set up caching for all of your panels as a whole or for specific individual content panes within one panel. This allows for a large amount of caching flexibility. This section assumes that you have some experience using the Panels module to configure a panel layout and add content to it. I'm going to walk you through those configuration steps quickly and then we'll look at Panels caching more closely.

Creating a panel and adding content to it

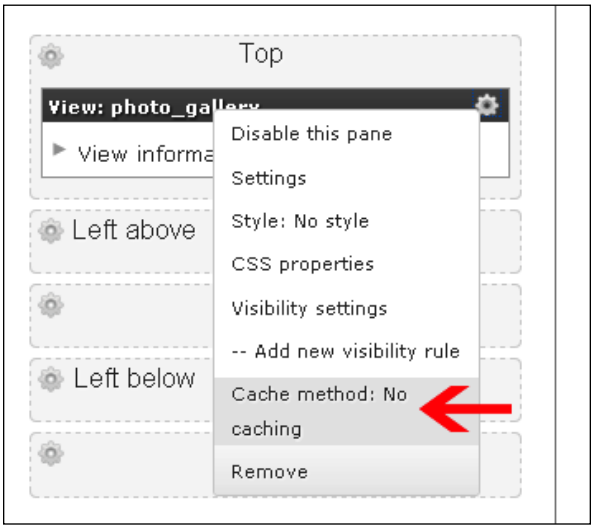
To get started with Panels caching, make sure you have a Panel to use on your site. I'm going to go ahead and set up a Panel quickly and add some content to it, which we'll use to test the Panels caching mechanism.

To create a new panel go to **Site building | Panels** and click on the **Panel page** link to create a new panel. Give the panel an **administrative title**, **machine name**, and a **path**. Click on the **Continue** button.

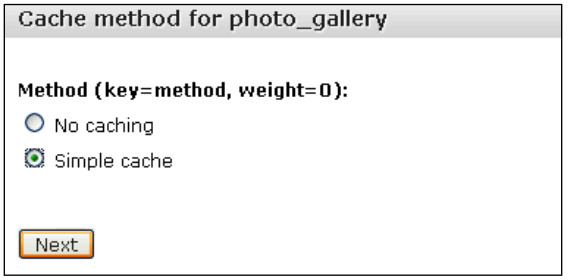
Choose a layout for your panel. Let's use the **Two column bricks** layout. Click on the **Continue** button.

This will launch your layout admin page where you can click on each panel section to add content to it. Add content to your panel's regions. We'll add two of our Views to the panel. Let's add our photo gallery View to our Top panel region. Click on the gear icon in the left corner of the region to open the region options. Click on **Add content**. Browse for your photo gallery view and add it to that panel region.

Once added, you will notice another gear icon in the upper right corner of the content pane you just added to your panel region. Click on this icon. When you click on this icon, a selection box will open and you will see a link to **Cache method**. The cache method for this content in your panel is currently set to **None**. Click on this link to open the cache method settings.

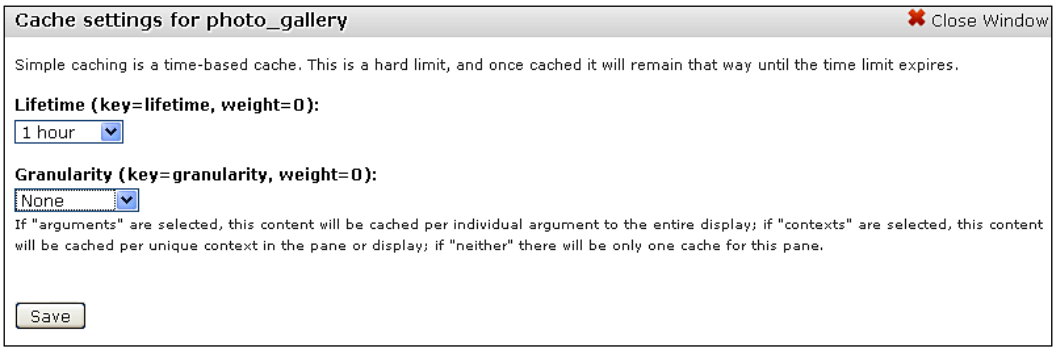


Similar to how you were presented with the Views caching configuration, Panels caching will ask you if you want to implement **No caching** on the content in the Panel or **Simple cache**. Select the **Simple cache** radio button and click on **Next**.



Like the Views caching, panels simple cache is time-based. Content will remain cached for the length of the time limit that you configure. Set a **Lifetime** cache time limit. We'll set a **Lifetime** cache of **1 hour**.

Also, set a **Granularity** cache if you are using contexts or arguments in your Panel. We're not using either, so we'll leave this set to **None**. If you do have contexts selected in your Panel, you can further cache depending on the context using this granularity cache mechanism. Again, Drupal and panels are giving you a lot of flexibility and granularity here.



Click on the **Save** button to save your cache settings. Make sure to update and save your Panel again now that you have configured its cache mechanism by clicking on the **Update** button. Your panels are now set to cache the content you specifically configured using the cache configuration above.

Summary

In this chapter, we learned the following performance tips:

- Used the Throttle module to throttle our blocks and modules.
- Used the Devel module to generate test content, users, and categories.
- Configured caching for our Views and learned how to enable and disable caching per View. We also looked at how the Devel module returns information about our Views build times based on these cache settings.
- Learned how to clear our Views cache.
- Looked at how the Panels module uses caching and how you can enable caching per panel.

Let's take a break! When we come back in Chapter 5, we'll take a look at contributed modules that are built for specific types of performance monitoring. This will include the Boost, Memcache, DB Maintenance, Block Cache, Advanced Cache, and File Based Caching modules.

5
Using DB Maintenance and Boost

In this chapter, we're going to install, configure, and utilize the DB Maintenance and Boost modules. DB Maintenance will allow us to maintain and optimize our MySQL database from within the Drupal admin interface. Boost will help us to speed up page load times on our site for our anonymous site users by using its sophisticated and advanced page, HTML, CSS, and JavaScript caching mechanisms. We'll look at basic introductory Boost concepts in this chapter, and later in Chapter 6 we will look at more advanced topics using the Boost module. Consider this a two part dose of the Boost module. Both of these contributed modules will help you diagnose problems on your site and server as well as help to keep your site running smoothly and in an optimized fashion. These are not required modules, but rather are recommended modules to add to your Drupal performance arsenal. The way this chapter will work is that we'll outline the purpose of each module, install and configure it, and then use it on a specific topic, for example, within your site. This will give you some practice using contributed Drupal modules and also a look at the variety of performance-based modules that are available from the Drupal project community.

By the end of this chapter you will know how to install, configure, and use the following contributed performance modules:

- DB Maintenance module
- Boost

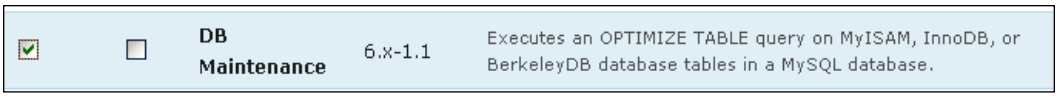
Using the DB Maintenance module

The DB Maintenance module can be used to optimize your MySQL database tables. Depending on the type of database you are running, the module allows you to use a function called `OPTIMIZE TABLE`, which troubleshoots and then optimizes various errors in your MySQL tables. For MyISAM tables, the `OPTIMIZE TABLE` will repair your database tables if they have deleted rows. For BDB and InnoDB types of tables the function will rebuild the entire table. You can use this module in tandem with phpMyAdmin to determine if you do or do not need to optimize your database tables. The benefit of this module is that it allows you to keep your database optimized and defragmented, similar to keeping your computer hard drive optimized and defragmented so that it runs faster, and you can do all this from the Drupal administrative interface.

The project page where you can download the module is here: `http://drupal.org/project/db_maintenance`.

Download the module `tar.gz` and extract it to your desktop. Then, upload the files through FTP, or upload and extract using a cPanel utility if your host provides this. The module should go in your `/sites/all/modules` directory.

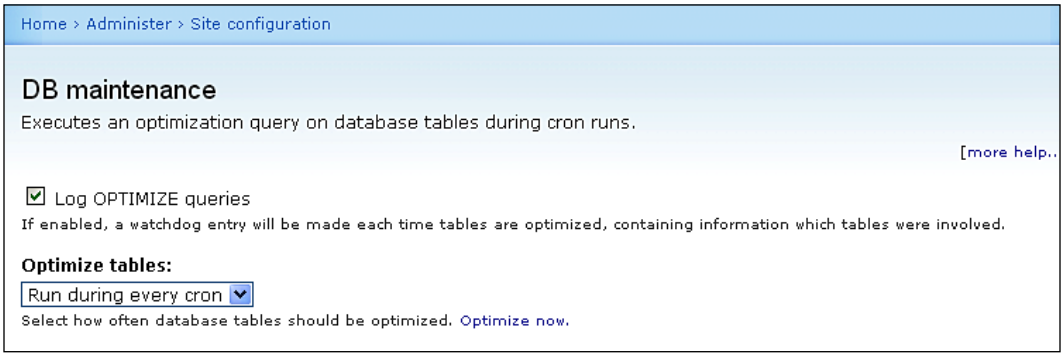
Once you upload and extract the module folder, enable the module on your modules admin page and save your configuration. We'll use the version that's recommended for Drupal 6.x, which is **6.x-1.1**. You can try out the beta version, but you should not run this beta version on a production level website unless you've tested it sufficiently in a sandbox environment.



Once you save your module configuration, you'll notice that the module adds a link to its settings and configuration page under your main **Site configuration** section. Go to **Site configuration | DB maintenance** to access the configuration admin screen for the module. The DB maintenance screen will contain a checkbox at the top allowing you to **log OPTIMIZE queries**. If you check this box, your watchdog log entries module will log all table optimization entries and give you detailed information on the tables that were optimized.

At the time of writing this book, the 1.1 version of the DB Maintenance module contained bugs that caused glitches with the method of adding this module's queries to the recent log entries or prevented this entirely. You may also experience these glitches. The module's developers are aware of the issues because they have been posted to the issue queue at `http://drupal.org/` on the module project page.

Let's go ahead and check this box. You can then select the frequency with which you would like to run the optimization. The choices are **daily**, **Run during every cron**, **Hourly**, **Bi-Hourly**, **Daily, Bi-Daily**, **Weekly**, **Bi-Weekly**, **Monthly**, and **Bi-Monthly.** You can also click on the **Optimize now** link to force the optimization to occur immediately without scheduling in advance. We'll click on this link for the purpose of this demo, but in future you may want to schedule the optimization. We'll then run a `cron` job through the Status report, or a module such as Poormanscron, and the tables will be optimized.

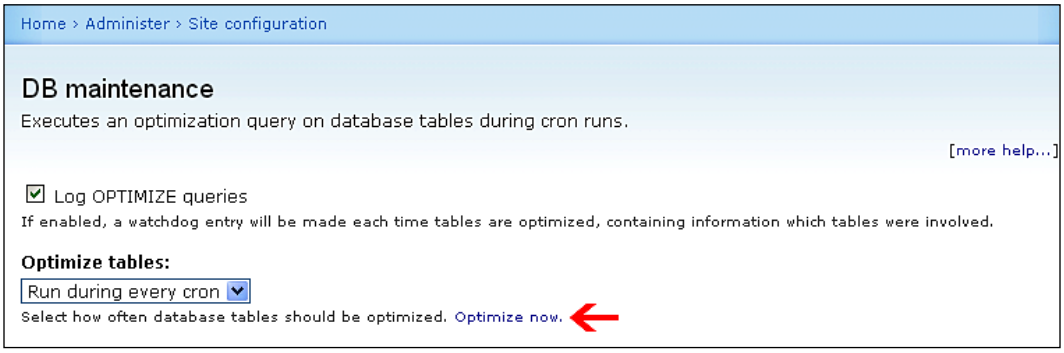


Next, you can select the tables in your Drupal database that you want to optimize. A nice feature of this module is that it allows you to multi select database tables, only select a few tables, or just one table. This gives you the same flexibility and functionality as your phpMyAdmin tool, but you can run everything from within your Drupal interface. It's like a phpMyAdmin lite version right in your Drupal site. This is a preferred option for those developers who may not have immediate access to a client's phpMyAdmin or a host's database management utility.

Choose a selection of tables that you want to optimize, or select all the tables. For this demo I'm going to optimize all of my content type tables, so I'll select all of those. I'll also optimize my block tables:

```
blocks
blocks_roles
content_type_blog
content_type_book
content_type_forum
content_type_page
content_type_photo
content_type_poll
content_type_story
content_type_webform
```

Once you've selected the tables you want to optimize, click on the **Optimize now** link.



As with any module or optimization enhancement that you make to your Drupal site, it is good practice to run a full backup of your MySQL database before performing any maintenance, including optimizing tables using the DB Maintenance module. This way you will have a full backup of your data if you run into any issues that the module could potentially create. It's better to play it safe and perform the backup first.

Once you click on the **Optimize now** link, you should receive a message notifying you that the Database tables are optimized.

This concludes our discussion and walkthrough of using the DB Maintenance module. Let's now turn to the Boost module and use it to speed up our site page and content loads.

Using the Boost module

We're going to turn our attention to the Boost module in this section. Boost is a contributed module that allows you to run incredibly advanced static page caching on your Drupal site. This caching mechanism will help to increase performance and scalability on your site, especially if it gets heavy traffic and anonymous page visits, and it is on a shared hosting environment. This is usually the first contributed performance-based module to turn to for help when you host your Drupal site on a shared server. Developers running Drupal sites on shared servers and running sites that serve predominantly anonymous Drupal users will definitely want to try out this module. It's also a fun module to use from a technical standpoint because you can see the results immediately, as you configure it.

The Drupal project page for the module is here: `http://drupal.org/project/boost`. There is a wealth of detailed information about the module on this project page, including announcements about upcoming conference presentations that focus on the Boost module, testimonials, install instructions, and links to documentation and associated modules that you may want to run alongside Boost. It is very popular and has quite a following in the Drupal development community. I definitely recommend reading about this module and all of its install and configuration instructions in detail before attempting to use it.

The install paragraph suggests reading through the module `README.txt` file before running the install for details on how the module works. There are also detailed instructions and documentation on the module here: `http://drupal.org/node/545664`.

Note that the one requirement to use this module is that your Drupal site must have clean URLs configured and enabled. It's a good idea to make sure you are running clean URLs on your site before you start installing and configuring Boost.

Additionally, there are some recommended modules that the developers encourage you to install in tandem with the Boost module. We will install two of these modules: **Global Redirect** and **Transliteration**. The Global Redirect module runs a number of checks on your website including the following:

- Checks the current URL for a Drupal path alias and does a 301 redirect to the URL if it is not being used.
- Checks the current URL for a trailing / and removes the slash if it's present in Drupal URLs.
- Checks if the current URL is the same as the site's front page and redirects to the front page if it locates a match.

- Checks to see if you are using clean URLs. If you do have clean URLs enabled, this module ensures URLs are accessed using the clean URL method rather than an unclean method (for example, `?q=user`).
- Checks access to the URL. If a user does not have permissions to view the URL, then no redirects are allowed. This helps to protect private URL aliases.
- Checks to ensure the alias matches the URL it is aliasing. So, if you have a URL alias such as `/about` and this directs to `node/23`, then a user on your site can access the page using either of those URLs.
- The Transliteration module removes white space and non-ASCII characters in your URLs. For example, it will try and add underscores to fill white space in a URL.

Installing and enabling these two modules will help remove glitches and errors in your site's path structure.

If you haven't already, we'll also take the time now to install the **Poormanscron** module and set up and configure automatic `cron` runs instead of having to continue running `cron` manually. We'll return to installing and configuring Poormanscron later in this chapter, but just keep it on your radar for now.

Let's go ahead and install the Boost module and take a closer look at some of its features.

Installing and configuring Boost

Installation and configuration instructions are provided on `drupal.org` and also in the module's `README` file. Read these in detail before installing and enabling the module: `http://drupal.org/node/545908`.

Additionally, the module notes specify that the module will install and enable using smart defaults and these should work fine in most shared server environments. We'll look at the default settings in this chapter and how to make more advanced configurations in Chapter 6.

Follow these steps to install the module(s):

- Download the **Boost** module along with **Transliteration**, **Global Redirect**, and **Poormanscron** to your desktop. Unzip them and then upload to your `/sites/all/modules` directory. The latest version of Boost is **6.x-1.13**, **Transliteration** is **6.x-2.1**, and **Global Redirect** is **6.x-1.2**.
- Check to make sure you have clean URLs enabled and working correctly in your site at the settings page here: `/admin/settings/clean-urls`.
- Go to your modules admin list and enable the **Boost**, **Transliteration**, **Global Redirect,** and **Poormanscron** modules. Boost will be in its own Caching section of the modules list.

Once enabled, you will see a series of messages loading on the modules page telling you that:

- **Existing filenames have not been transliterated**.
- **Boost has been successfully installed**. There will be a link to the module configuration settings page and a notification telling you that two blocks can be enabled to help you administer Boost, as well as a block to support stats.

It's nice that the Transliteration module informs you that it has not changed the URL paths of your previously posted Drupal pages. It's only going to affect new pages, and only if you enable and configure the module.

Click on the configuration settings link to launch the Boost admin page. You'll notice that the Boost configuration page is a tab that's part of the overall Drupal Performance admin section of the site. You can also get to the configuration page by going to **Site configuration | Performance | Boost Settings**.

Boost settings

Boost settings are split up into the following sections:

- Boost File Cache
- Boost cacheability settings
- Boost directories and file extensions
- Boost advanced settings
- Boost crawler
- Boost Apache
- Clear Boost's Database

All of these sections and settings are explained in detail on the Drupal module project Installation and Settings page here: `http://drupal.org/node/545908`. We're going to look at most of these configuration settings in detail.

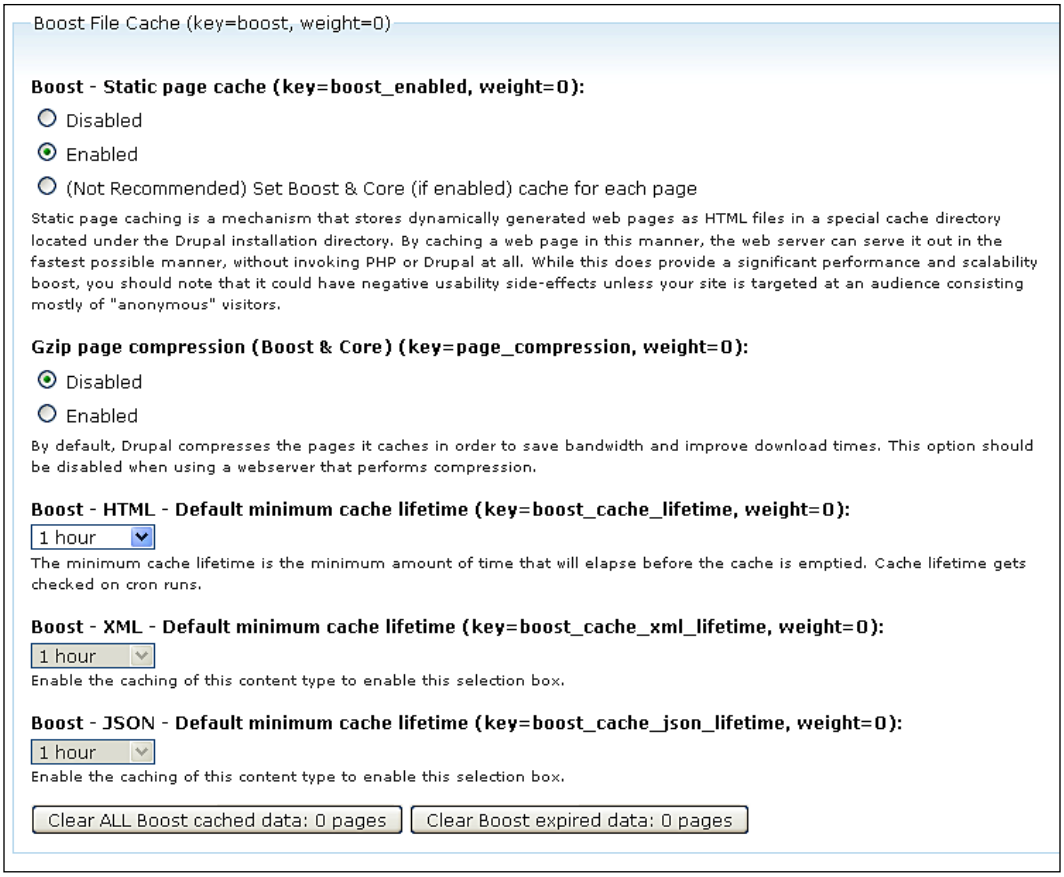
Boost File Cache settings

Most of the default settings will work for us here, but let's run through them all. We want to make sure that we have **Boost – Static page cache** set to **Enabled.** What this will do is store all of our Drupal-generated nodes and pages as static HTML files in a special cache directory in our Drupal site directory. Caching pages will help our site to deliver its pages and content in the fastest possible manner without turning to PHP or Drupal. This will provide us with improved performance, but you need to bear in mind that this type of caching will mostly benefit anonymous users of your website and not logged-in authenticated users who will be depending more on your Drupal functionality. In some cases, if you have a site that functions on multiple levels (for anonymous and authenticated users), it will be a trade-off to use this module, it is more advantageous to use it on sites that have more anonymous user access. On popular sites that allow mostly anonymous user visits, this module is a necessity.

Gzip page compression setting should be set to **Disabled** for our example. Page compression is normally handled by the Apache web server itself and you will not need to enable any additional page compression. If Apache is compressing pages, this can actually interfere with the Drupal page compression and crash your website, so do not enable this until you are sure Apache or the web server you are using is not performing page compression.

We'll leave the **Boost – HTML – Default minimum cache lifetime** set to **1 hour** for **HTML**, **XML**, and **JSON**.

You will also notice that you can easily clear your Boost cached data by clicking on the **Clear ALL Boost cached data** button, and your expired cached data by clicking on that button. Your screen should look something like this:



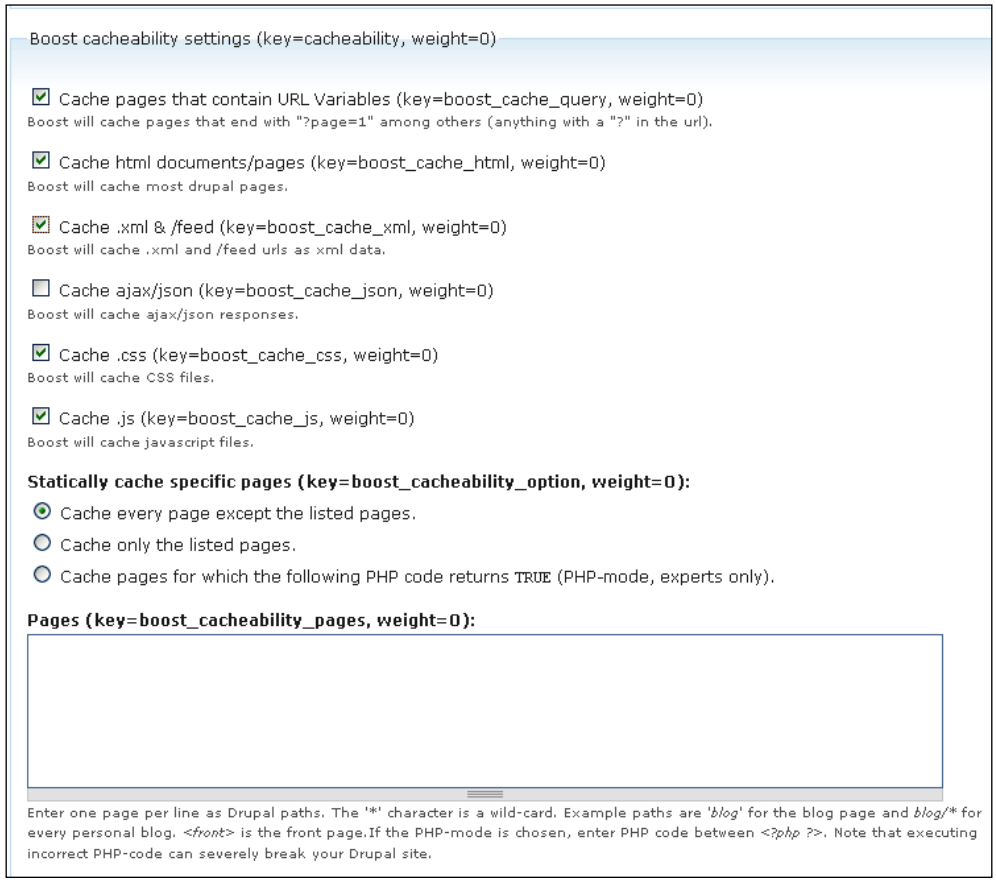
Boost cacheability settings

Scroll to this section and leave the defaults enabled—this includes **Cache pages that contain URL Variables** and **Cache HTML documents** that will cause Boost to cache all content in your Drupal pages. You can choose here to **Cache your XML** and **JSON**. When you select cache **XML** and **JSON**, the corresponding **Boost – XML** and **Boost – JSON** minimum cache lifetimes will be selectable in the **Boost File Cache** section. Let's go ahead and check the box to cache our XML and RSS feeds.

Let's leave the **Cache .css** and **Cache .js** checked, so our CSS and JavaScript files are also cached.

Optionally, you can specify which pages on your site to cache by adding the page URLs to the Pages box and then by specifying that you only want to cache those pages. You can also enable PHP code here if you have specific PHP code snippets you want to run. This is similar to how the core Drupal Block configuration works. You can see that the module developers spent a lot of time working out the best workflow for the configuration so that it matches other core Drupal module configuration pages in usability and workflow.

At this point your screen should look similar to this:



Boost directories and file extensions

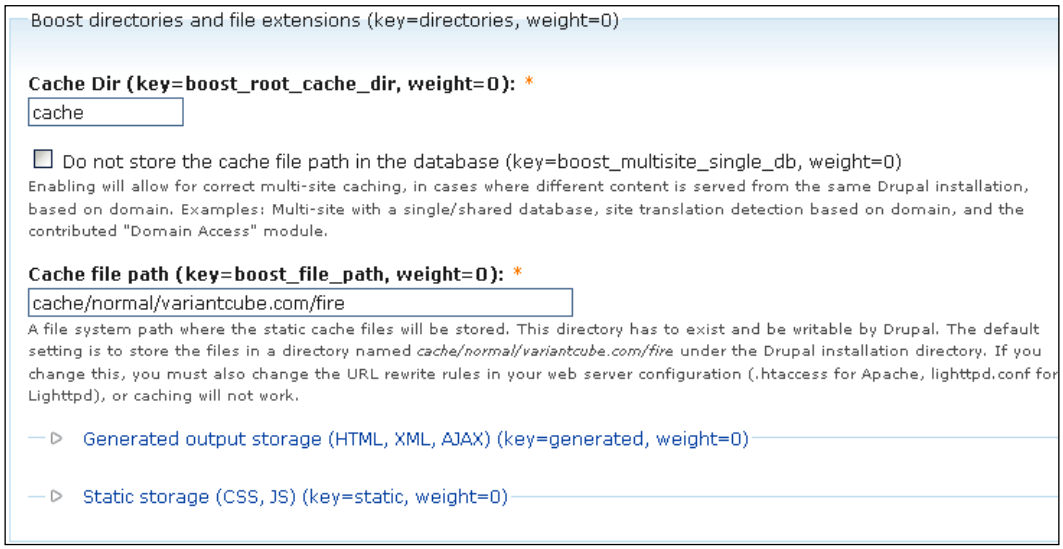
This is a very important section. Here you tell Boost module where to store your cached data and files. The `README` file also explains this section in detail and the corresponding tweaks we will eventually run to our `HTACCESS` file to enable Boost to work.

We need to create a folder in our site's directory for our cached material. Our folder will be called `cache`, but it needs to exist on the site. So if this folder and the subsequent path folders do not exist, you need to create them and make sure they are writeable on the web server. The `/cache` folder should be created in the root directory of your Drupal site. Create a folder called `cache` at the root of your Drupal installation alongside your other Drupal folders such as `/files`, `includes`, `misc`, and so on. Make sure the `/cache` folder is writeable. This means setting your permissions for the `/cache` folder to `777`. Drupal or the Boost module may create the folder automatically if you do not create the folder in advance, but it's a good idea to create it anyway.

You can create the cache folder through FTP or a file manager utility like cPanel. The directory we create must be named `cache`, and the Cache file path is set to `cache/normal/variantcube.com/fire`. Then make sure that this directory and its sub folders are created on the site and are writeable. So I'll go ahead and create the `cache`, `normal`, `variantcube.com`, and `fire` folders.

We'll return to this discussion during our multisite chapter because we can tell the Boost module not to store cache file paths in the database. This is helpful in multisite installations when you are running Boost.

Your screen should look something like this:



You can also specify storage locations for your HTML, XML, and AJAX output, and static storage for your CSS and JS files if you want to keep those in a specific location of the cache folder. I will leave these as the default settings for our examples and let Boost decide where it wants to store each set of files within the path and directory structure I've created.

Before moving on to enabling the Boost default admin blocks, save the configuration and then create the `.htaccess` file. First, **save configuration on your main Boost settings** configuration page. This will save the configuration work we've just enabled. Having done this, let's move on to make a required tweak to our `.htaccess` file.

HTACCESS file tweaks

There is one important tweak that we need to carry out on our `.htaccess` file. We need to do this in order to make our Boost configuration work. So far in this section on the Boost module, this is the most complex configuration step we've taken. Follow these steps in order to tweak your `.htaccess` (this is also explained in detail in the `README` file in the module folder):

1. Back up your original `.htaccess` file in your Drupal install directory so that you have a backup in case of problems.
2. Copy the custom generated `htaccess` **rule from Administer | Site configuration | Performance | htaccess rules generation** or by clicking on the tab in your **Performance** section that says **Boost htaccess rules generation**.
3. When you click on the button, you'll see a text box with the rules presented as a big block of code. Copy this code and paste it into your `.htaccess` file (through editing mode in either FTP or cPanel). The module help text here tells you to copy this rule and paste it below the `# RewriteBase / and above the # Rewrite URLs of the form 'x' to the form 'index.php?q=x'.`

   So you should have something in your current `.htaccess` that looks like the following:

   ```
   # RewriteBase /
   ------------ paste the rules here ------------

   #Rewrite URLs of the form 'x' to the form 'index.php?q=x'.
   ```

4. Paste the code in the position indicated `paste the rules here`. Make sure you look for the `# RewriteBase /` commented line of code and then paste in your rewrite rules immediately following that comment line. Go ahead and do this now.

The resulting code looks like this:

```
### BOOST START ###
AddDefaultCharset utf-8
<FilesMatch "(\.html|\.xml)$">
  <IfModule mod_headers.c>
    Header set Expires "Sun, 19 Nov 1978 05:00:00 GMT"
    Header set Cache-Control "no-store, no-cache, must-revalidate,
      post-check=0, pre-check=0"
  </IfModule>
</FilesMatch>
<IfModule mod_mime.c>
  AddCharset utf-8 .html
  AddCharset utf-8 .xml
  AddCharset utf-8 .css
  AddCharset utf-8 .js
</IfModule>
<FilesMatch "\.html\.gz$">
  ForceType text/html
</FilesMatch>
<FilesMatch "\.xml\.gz$">
  ForceType text/xml
</FilesMatch>
<FilesMatch "\.css\.gz$">
  ForceType text/css
</FilesMatch>
<FilesMatch "\.js\.gz$">
  ForceType text/javascript
</FilesMatch>

  # Gzip Cookie Test
  RewriteRule boost-gzip-cookie-test\.html  cache/perm/boost-gzip-
cookie-test\.html\.gz [L,T=text/html]

  # NORMAL - Cached css & js files
  RewriteCond %{DOCUMENT_ROOT}/fire/cache/perm/%{SERVER_
NAME}%{REQUEST_URI}_\.css -s
  RewriteRule .* cache/perm/%{SERVER_NAME}%{REQUEST_URI}_\.css
[L,QSA,T=text/css]
  RewriteCond %{DOCUMENT_ROOT}/fire/cache/perm/%{SERVER_
NAME}%{REQUEST_URI}_\.js -s
  RewriteRule .* cache/perm/%{SERVER_NAME}%{REQUEST_URI}_\.js
[L,QSA,T=text/javascript]

  # Caching for anonymous users
```

```
  # Skip boost IF not get request OR uri has wrong dir OR cookie is
set OR request came from this server OR https request
  RewriteCond %{REQUEST_METHOD} !^GET$ [OR]
  RewriteCond %{REQUEST_URI} (^/fire(admin|cache|misc|modules|s
ites|system|themes|node/add))|(/(comment/reply|edit|user|user/
(login|password|register))$) [OR]
  RewriteCond %{HTTP_COOKIE} DRUPAL_UID [OR]
  RewriteCond %{REMOTE_ADDR} ^74\.220\.207\.144$ [OR]
  RewriteCond %{HTTPS} on
  RewriteRule .* - [S=2]

  # NORMAL
  RewriteCond %{DOCUMENT_ROOT}/fire/cache/normal/%{SERVER_
NAME}%{REQUEST_URI}_%{QUERY_STRING}\.html -s
  RewriteRule .* cache/normal/%{SERVER_NAME}%{REQUEST_URI}_%{QUERY_
STRING}\.html [L,T=text/html]
  RewriteCond %{DOCUMENT_ROOT}/fire/cache/normal/%{SERVER_
NAME}%{REQUEST_URI}_%{QUERY_STRING}\.xml -s
  RewriteRule .* cache/normal/%{SERVER_NAME}%{REQUEST_URI}_%{QUERY_
STRING}\.xml [L,T=text/xml]

  ### BOOST END ###
```

Once it's pasted in my `.htaccess` file, I should see the code start below `my #RewriteBase /` and it will look like this (this is just an excerpt):

```
# RewriteBase /
  ### BOOST START ###
  AddDefaultCharset utf-8
  <FilesMatch "(\.html|\.xml)$">
    <IfModule mod_headers.c>
      Header set Expires "Sun, 19 Nov 1978 05:00:00 GMT"
      Header set Cache-Control "no-store, no-cache, must-revalidate,
post-check=0, pre-check=0"
    </IfModule>
  </FilesMatch>
  <IfModule mod_mime.c>
    AddCharset utf-8 .html
    AddCharset utf-8 .xml
    AddCharset utf-8 .css
    AddCharset utf-8 .js
  </IfModule>
  <FilesMatch "\.html\.gz$">
    ForceType text/html
  </FilesMatch>
  <FilesMatch "\.xml\.gz$">
```

```
  ForceType text/xml
</FilesMatch>
<FilesMatch "\.css\.gz$">
  ForceType text/css
</FilesMatch>
<FilesMatch "\.js\.gz$">
  ForceType text/javascript
</FilesMatch>
```

Refresh your Performance settings page in Drupal. That's it! You're now ready to use the Boost module and start speeding up your page loads. Let's start using it as an anonymous user on our site.

Testing your Boost configuration

Now we're going to test out our Boost configuration and make sure everything is working with our initial basic settings and the `.htaccess` configuration that we're running. Log out of your website in your current browser or open up another web browser so that you can browse around your site as an anonymous user.

The main thing we want to check on is that our static HTML type files (our Drupal pages or nodes) are being cached and stored in the cache directory we have specified in the module configuration. If we chose to use a GZIP compression, we will want to check to make sure the ZIP files are being generated and stored.

Also, run your **Status report** and view your log entries to check to see if any errors related to the module configuration are being thrown.

You should start noticing a performance boost on your site immediately, as you browse around your site. Start clicking around and opening different nodes on your site and admire the faster performance! You should notice it.

If we check the `cache` directory on our site, we should notice that the Boost module has started writing HTML files to our cache directory. In the directory you should now see the following folders:

```
/cache/normal/variantcube.com/fire/node
```

Boost has automatically created a new folder called `/node` where it will store the cached HTML versions of the Drupal pages it loads. For example, if we look into our `/node` directory, we should see a bunch of HTML files that have been cached while we've browsed anonymously on our site. You can almost see this happen in real time if you browse to a page and then immediately refresh your remote server/site window in your FTP client (while in the `/node` folder). I see the following files corresponding to their Drupal nodes:

```
201_.html
202_.html
203_.html
206_.html
208_.html
```

These correspond to:

```
node/201
node/202
node/203
node/206
node/208
```

Also, at the root of our `/fire` directory, we should see any non-node pages (for example, pages created using Drupal Views module). In our case, our main Photo gallery View page has been cached: `photo_gallery.html`. This page corresponds to our `photo_gallery` View page.

You can immediately see the power and flexibility of this module by inspecting your cache directory.

You should notice a performance increase on all of these cached pages because the pages that are loading are now your Boost-powered HTML pages. So, multiple clicking on one Drupal node should demonstrate how quickly your pages are now loading.

The module has created another folder in your `/fire/cache` directory called `perm`. The `/perm` folder contains your CSS and JS files as they are cached. If you look in this folder, you'll see paths to the following folders:

```
/cache/perm/variantcube.com/fire/files/css
/cache/perm/variantcube.com/fire/files/js
```

If you look in your CSS directory, you should see cached versions of your CSS files, and if you look in your `/js` directory, you should see a cached version of your JavaScript.

Another method of checking the module is working correctly is to view source on your pages (by viewing source in your web browser) and see if the following code is being added to your HTML output:

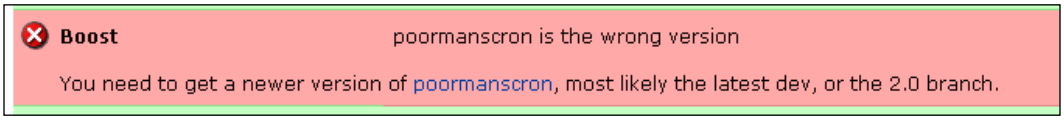
```
<!-- Page cached by Boost @ 2009-10-23 13:56:03, expires @ 2009-10-23
  14:56:03 -->
```

So the actual HTML source in the web browser will tell you that you are viewing a cached version of the page rather than a dynamically generated version of the page. It also tells you when this cached page version will expire—based on our configuration, basically one hour after it's been loaded depending on our Boost module settings.

Everything appears to be working fine with our initial Boost installation and configuration. Sit back and behold the power of Boost!

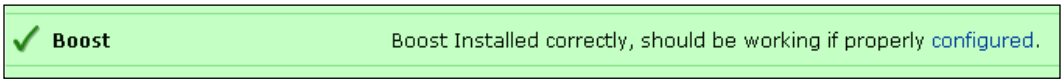
Boost and Poormanscron

Checking our Status report will show us that we're running an incorrect version of Poormanscron. Boost is optimized to work with the latest dev or 2.0 branch of Poormanscron. So let's go ahead and install the latest version so that our `cron` runs will work correctly with Boost.



Visit the Poormanscron project page and download the `6.x.-2.0-beta1` release and extract and upload it to our `/sites/all/modules` directory. Then run your Status report again to check to make sure the Boost warning has disappeared. You may need to run your `update.php` script, as this module update will make changes to your database schema. Run `update.php` and then refresh your Status report.

In your Status report, you should now see the Boost row state: **Boost Installed correctly, should be working if properly configured.**



Configuring Poormanscron

The updated `2.x-beta1` version of Poormanscron is the precursor module to the eventual Drupal 7 core `cron` functionality. In Drupal 7, the functionality of the Poormanscron module will be part of the default core processes. For this reason the `beta1` version does not give you a module configuration page. It will just run `cron` automatically, based on a setting on your Site information page. Go here to see that setting: **Site configuration | Site information**. Now you have an automatically run `cron` setting that you can select from. We'll use the default 1 hour `cron` run. This is a nice preview of some of the new built-in functionality of Drupal 7 core.

Clearing the Boost cache

If you want to clear your Boost cache at any time and see how this affects the `/cache` folder on your site, go to the Boost cache configuration page at **Performance | Boost Settings** and click on the **Clear ALL Boost cached data** button and the **Clear Boost expired data** button. Since you started caching, these buttons will tell you how many pages they are caching respectively. This is another good example of the flexibility of this module.

Once you have cleared cached data from Boost, you will receive messages telling you that the **Boost: Static page cache cleared** and/or a message stating **Boost: Expired stale files from static page cache**. To see the results, check your `/cache` directories and you should see that all the previously cached HTML pages are now deleted. Through FTP you may need to run your *F5* function key to refresh the `/node` directory. The HTML files will be deleted. If you refresh your `/node` directory, it should now be empty. This is a method of clearing the cache manually instead of waiting for it to clear based on the minimum cache lifetime you set as per `cron` runs. Again, this is a very flexible functionality allowing you both manual control and auto control of your page caching.

Boost admin and stats blocks

The Boost module provides you with three blocks that you can enable and use on the administrative side of the site. Go to **Site building | Blocks** and look for the following blocks:

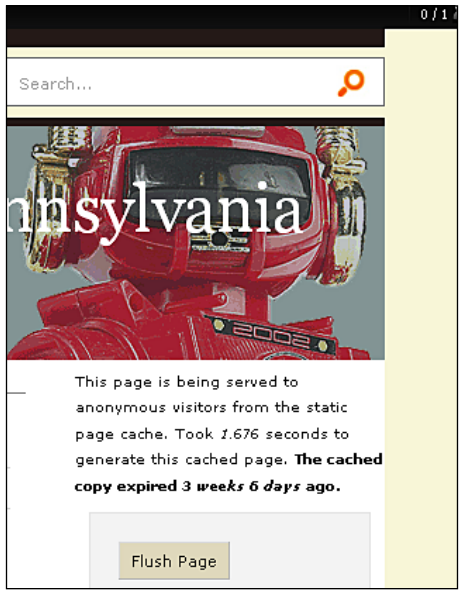
- Boost: AJAX core statistics
- Boost: Pages cache configuration
- Boost: Pages cache status

Enable all three of these blocks to show in the right sidebar of your site. You can configure each block and choose to show it only on specific pages of your site and for specific roles as well, such as site admin, if you prefer. Configure each block and then enable in your right sidebar. I'm also going to make sure my two new blocks are showing at the top of the right sidebar area above any other blocks I may have configured. I'll put the status block first and the cache configuration block second in weight order.

Now, in your right sidebar on each page, when you are logged in as an admin user you should see both the Pages cache configuration block and the Pages cache status block. In another browser (if you haven't already), browse around your website as an anonymous user. Now load those same pages as an authenticated admin user and view the blocks and the information they are showing you about each page.

Boost: Pages cache status block

This is what the **Boost: Pages cache status block** should look like (or similar to) in your site. Here I'm on `node/203` of our site and the block looks like this:



The status block tells us whether the site is being served to anonymous users as a static cached HTML page or whether it's still being served 'live' as a dynamic Drupal page. This is very helpful if you have thousands of pages on your site and you're trying to determine if the page is being served static or live. You can then determine quickly if you need to enable caching on that specific page (if you have a more complex Boost configuration where you're only using Boost to serve specific pages).

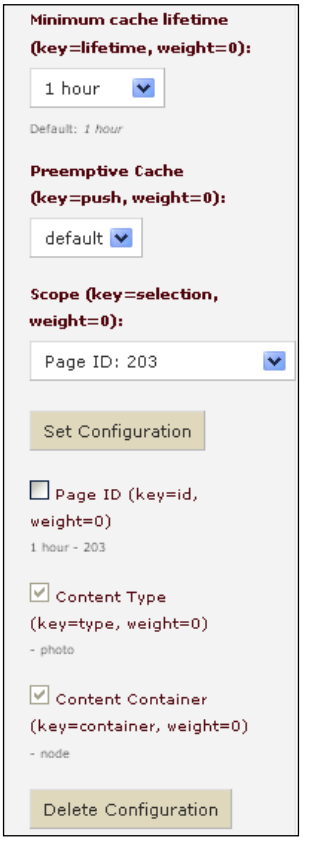
This block also tells us how many seconds it takes to generate the cached page. Here, on `node/203`, it takes **2.186** seconds to serve the HTML version of the page. Additionally, the status block tells us when the cached copy of the page is set to expire (based on our minimum cache lifetime settings).

You can also click on the **Flush Page** button and this will clear the Drupal page from the Boost cache entirely. Again, this is a very nice functionality to have if you are setting up a more complex Boost cache configuration.

Load some other pages both as an anonymous user and as your admin user, and check the status blocks for Status reports on the caching for that specific page.

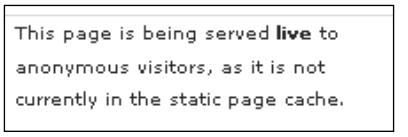
Boost: Pages cache configuration block

This block allows you to configure your basic Boost settings for a specific Drupal page while you're administering the page itself. So go ahead and launch a node on your site and you'll see the block in the right sidebar. It will look similar to this:



This block allows you to set and adjust the minimum cache lifetime (**1 hour**, **3 hours**, and so on), the preemptive cache and whether it's enabled, as well as the scope of the Drupal page you are viewing. **Scope** will tell you the page ID of the node and what type of content the node is built from—in this case we're looking at a Photo content type node. The type of container (node, block, or otherwise) is also noted here. You can tweak the configuration settings here and save a new configuration. You can also delete your configuration here.

If you choose to set a new configuration here, for example, changing your page cache minimum cache lifetime to 3 hours versus 1 hour, the cache will be flushed and reset to your new 3 hour lifetime. So your status block will show that the page is being served live again on the site until you visit that page as an anonymous user. When the Drupal node is **being served live**, this is what the status block looks like:



Summary of Boost's basic configuration

The one thing to remember when using the Boost module is that only your anonymous site visitors will be served static HTML page versions of your Drupal dynamic data. It will be business as usual for your authenticated site visitors. When they login, they will continue to receive the dynamic live version of the Drupal node. You will want to keep this in mind when you decide whether you will use this module on your site. If your site is heavily trafficked by anonymous users, then you'll want to try out Boost. If you have a community portal site that depends on authenticated user comments and forum activity, you may not want to use the Boost module or at least be aware of its limitations when it comes to how it works on that type of site.

Additionally, the Boost module only works on web servers running Apache server software. Much more about Boost is available on its Drupal module project page.

Summary

In this chapter, we looked in detail at two contributed modules—DB Maintenance and Boost, which help to both maintain and speed up performance of our website. Specifically, we did the following:

- Installed and configured the DB Maintenance contributed module in order to optimize, repair, and back up our MySQL database.
- Installed and configured the Boost module in order to set up basic static HTML page cached versions of our Drupal nodes.
- Tweaked our `HTACCESS` file to enable the Boost settings through the Boost htaccess rules generator functionality.
- Enabled the following Boost module blocks: Pages cache status, Pages cache configuration, and AJAX core configuration.

Let's take a break! When we come back in Chapter 6, we'll take a detailed look at Boost's advanced settings, including a discussion of how to troubleshoot the Boost module if it's not working correctly on your site.

6
Advanced Boost

In this chapter, we're going to continue to use the Boost module and look in detail at some of the module's advanced settings and its configuration.

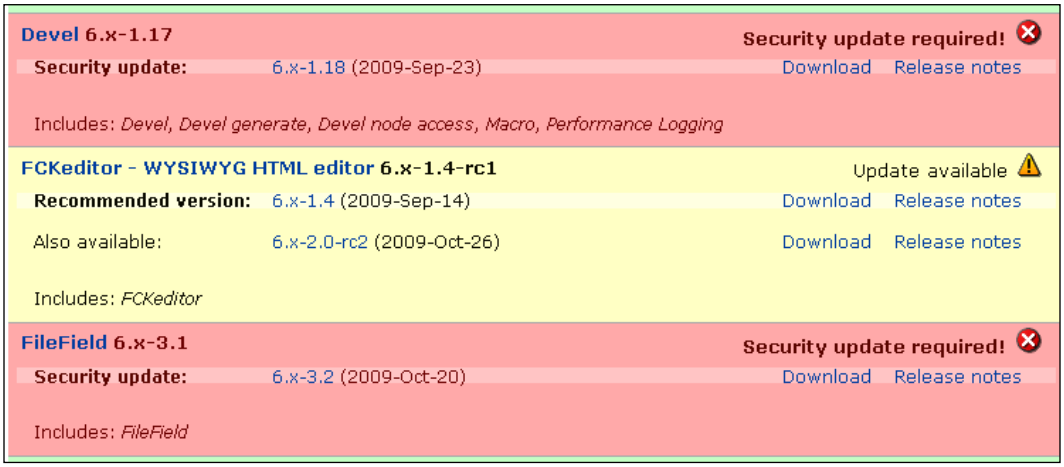
By the end of this chapter you will know how to install, configure, and use the following contributed modules as well as how to use the advanced Boost functionality:

- Global Redirect module and configuration
- Transliteration module and configuration
- Configuring advanced Boost cache settings
- Using and configuring the Boost crawler
- Knowing where to look for the Boost `.htaccess` settings if you need to tweak their configuration after enabling Boost crawler settings

Updating contributed modules

Before we start looking at Boost's advanced settings, let's run our Status report and check on our site's contributed module status. I have been noticing some warning messages appearing across the site notifying us that we need to upgrade the following contributed modules to their latest security patch releases. So now is a good time to do that. The modules we're going to upgrade are:

- Devel module (upgrade to `6.x-1.18`)
- FileField (upgrade to `6.x-3.2`)



Download the updates from the modules' project page at `http://drupal.org/`, extract them locally on your desktop, and then upload the modules to your `/sites/all/modules` folder. You'll be asked to replace the existing files. Click on **Yes** to this and then browse to your Status report page once you have completed the copy of the module files. You should notice that your Update Notifications are enabled and in green mode showing that everything on your site module-wise has been updated. We are ready to move on.

Recommended modules that work with Boost

You will recall that when we installed the Boost module for the first time, there were a couple of recommended modules that work with Boost to help optimize your site for performance. These are the Global Redirect, Pathauto, and Transliteration modules. Let's briefly look at each of these modules and view their configuration and settings to understand how they will work on our site and help speed up performance.

Global Redirect

The Global Redirect module allows you to remove trailing slashes / from URLs. It also checks to see if your Drupal site has clean URLs enabled and, if so, will prevent unclean URLs from ever being accessed. You can do a lot more with this module and all of the details are listed on its Drupal project page here: `http://drupal.org/project/globalredirect`.

The module also redirects any specific `node/ID` page to its alias if an alias exists. This is important, as your site will get requests by visitors for duplicate nodes or pages. Some people will visit your `node/12` page and others may visit it by its alias name. This module makes sure they can only load your node through its corresponding alias. This helps with performance and also makes sure you're not getting slammed by search engine bots. We already installed Global Redirect in the last chapter. Let's go to its settings page and see what we can configure. Go to **Site configuration | Global Redirect**. This will launch the configuration page.

Here you find the items you'll want to configure. First, make sure that you have selected to enable the deslash. This will remove all trailing / from URLs in your site. This will help to prevent duplicate node content from being loaded. One thing to consider is that if you do have a requirement for requests using a /, then you may need to leave this disabled. It will depend on your site requirements. Enable it for now.

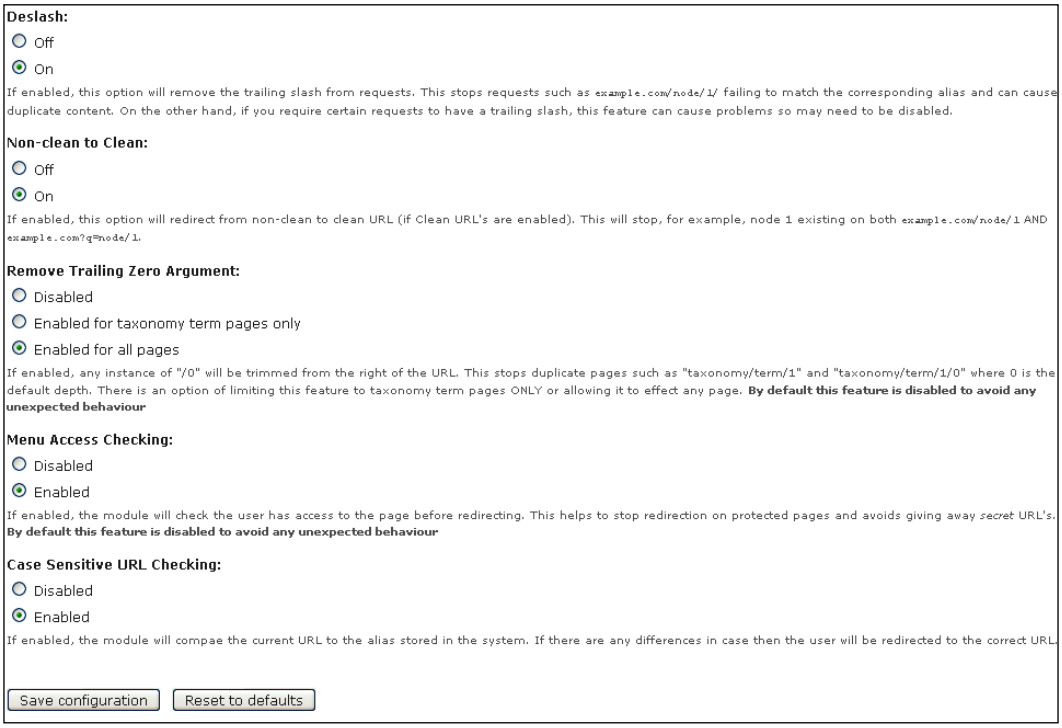
Enable the **Non-clean to Clean URL** configuration. This will stop any requests loading a non-clean URL such as `variantcube.com/fire?q=node/1`.

Enable the **Remove Trailing Zero Argument** setting. This will help to trim your taxonomy URLs and prevent duplicate term URLs from loading when the URL refers to the same taxonomy term. For example, if you have a URL `/taxonomy/term/1` and this term can also be loaded by going to `/taxonomy/term/1/0`, then enabling this functionality will trim the `/0` from the URL and load the default depth of the term which is the `/taxonomy/term/1`.

Enable **Menu Access Checking**, as this will help to prevent your anonymous users or authenticated users who do not have permissions from trying to load admin content through admin URLs.

Also enable **Case Sensitive URL Checking**. This will make sure the user is always directed to the correct URL in your site based on specific characters in the URL.

Once you have configured the module settings, click on the **Save configuration** button.

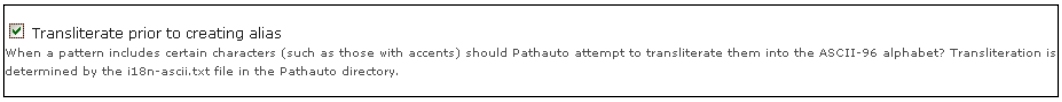


Transliteration and Pathauto

This module can be enabled from your main modules admin list. The current version is `6.x-2.1`. Go ahead and enable it on your site. The module does not have a configuration admin page in your Drupal site, but you can learn more about its configuration and what it does through its Drupal project page: `http://drupal.org/project/transliteration`.

In a nutshell, this module provides transliteration resources for other Drupal modules including Boost, and also sanitizes your file upload names. For example, if a user uploads a file to your site using the Drupal attachment core module and the filename contains special non-ASCII characters, this module, if enabled, will convert and try to represent that data in US-ASCII characters, which are the universally accepted character codebase.

You can also use Transliteration along with the Pathauto module and it works similarly to its configuration for file uploads. In your Pathauto settings, you can enable Transliteration prior to creating any automatic alias. In order to do this you'll need to add an `i18n-ascii.txt` file to the Pathauto directory. You can view instructions for configuring this functionality by going to **Site building | URL aliases | Automated alias settings** and then expanding the General settings in the Pathauto module configuration. You will see a checkbox next to **Transliterate prior to creating alias**.



You can find this `i18n-ascii.txt` file by doing a search for it on `http://drupal.org/`. Using Google search, one example of the file is here: `http://textpattern.googlecode.com/svn/development/crockery/textpattern/lib/i18n-ascii.txt`. Download the file and copy it to your Pathauto module directory. Once you do this, you can enable the **Transliterate prior to creating alias** setting. When you upload this file, make sure to rename it `i18n-ascii.txt` so that it's recognized by the Pathauto and Transliteration modules. Again, much of this will be your personal preference and decision as to whether you want to use the Transliteration module in your site. If you do, it will open up various configuration possibilities for your Boost module. It's good to understand generally how all of these modules work hand in hand to help optimize your site.

Let's take a look at some advanced Boost module settings and their configuration.

Advanced Boost settings

Let's do a quick review of our Boost configuration upto this point. We have set up Boost to cache our Drupal nodes. This stores our Drupal nodes as static HTML web pages. When an anonymous user visits our site, they are delivered the static HTML version of the web page, and this helps considerably with speed and optimization of our page loads. We have set our minimum cache lifetimes for HTML, XML, and JSON content to be 1 hour. We also have the option of clearing all of our Boost-cached data and expired data manually by clicking on the respective buttons on the Boost settings page in the Boost File Cache pane.

We configured Boost to cache pages that contain URL variables even though we're using clean URLs on our site. We are caching all HTML documents or Drupal pages, all XML and feed content, all AJAX and JSON content, and CSS and JavaScript files. We also determined that we can tell Boost to only cache specific pages or use PHP code to run conditional statements for our cache settings. This is very similar to how the Blocks settings and configuration works.

We configured Boost to store all of our cached files and pages in the main `/cache` directory and specifically in `/cache/normal/variantcube.com/fire`. Once we configured this, we edited our `.htaccess` file to permit this storage to occur. We also looked at the specific configurations we can set up to store files using Boost. We can store our HTML, XML, and AJAX files in specific subdirectories in the `/cache` folder, and we can also store our CSS and JS files in specific subdirectories. Boost provides a lot of flexible storage options for us to take advantage of.

Boost advanced settings

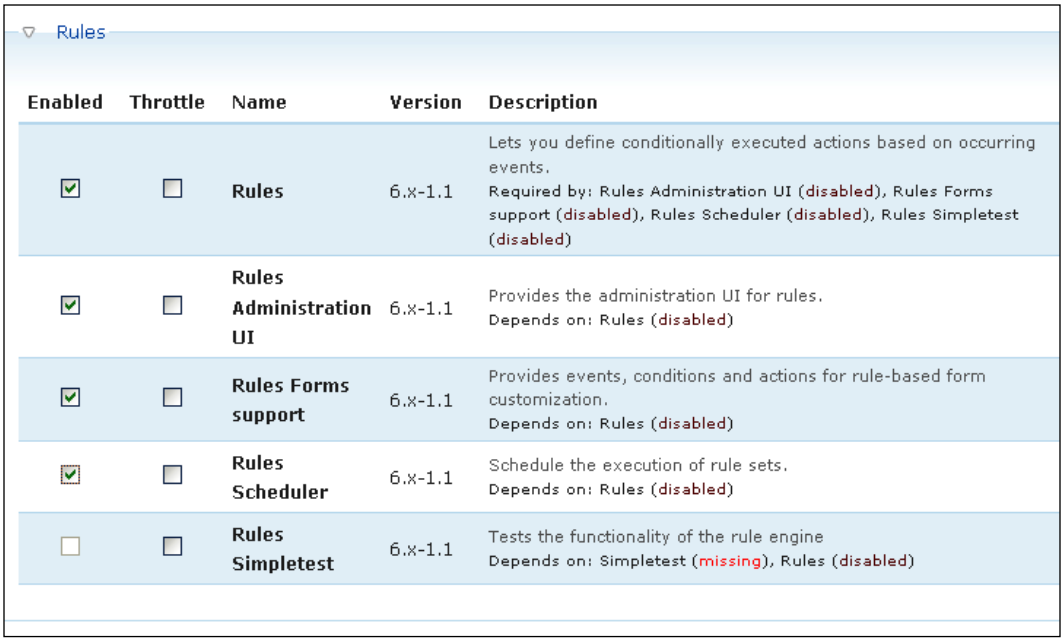
Let's start looking at our advanced Boost configuration. The first item we want to note is that we can tell Boost to clear expired pages on `cron` runs. This will clear all expired cached pages when our `cron` runs. If you disable this, you will need to clear your Boost cache manually through the **Boost: Pages cache status block** (we looked at this block configuration in Chapter 5).

The next setting is even more flexible. Boost will only clear and flush expired content if it sees that there's been a change in the database timestamps, that is, if there's new database content. This is a setting you'll want to enable if you do not want to rely on the `cron` run to clear your site cache and if you have content being posted to your site frequently that you want your anonymous users to view without problems. Here we will take advantage of the Boost timestamp function, and use it to rebuild and flush cache only on pages that have been updated in the database. This PHP-based functionality will refresh the cache on that one specific Drupal node and not have to flush or rebuild the entire site cache. This enables you to target your Drupal nodes and database much more granularly rather than having to flush the entire Boost cache.

Let's go ahead and do this. We'll first check the box next to the **Check database timestamps for any site changes**.

Next, we're going to install the Rules module so that we can set up a rule that will run `cron` on our site every time a node is updated and saved. The Rules module allows you to define conditional PHP statements throughout your Drupal site and on specific Drupal events. The Rules module is on `drupal.org` (`http://drupal.org/project/rules`). Download the latest version of Rules, which is `6.x-1.1`. Extract and upload the module to your `/sites/all/modules` directory.

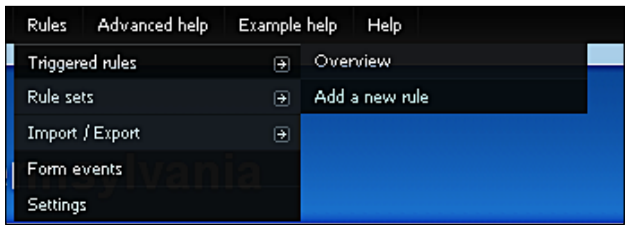
Once uploaded to your site, go to your modules admin list and enable the Rules module and its constituent modules. Also, enable the PHP filter module if you have not already.



Rules

Enabled	Throttle	Name	Version	Description
☑	☐	**Rules**	6.x-1.1	Lets you define conditionally executed actions based on occurring events. Required by: Rules Administration UI (disabled), Rules Forms support (disabled), Rules Scheduler (disabled), Rules Simpletest (disabled)
☑	☐	**Rules Administration UI**	6.x-1.1	Provides the administration UI for rules. Depends on: Rules (disabled)
☑	☐	**Rules Forms support**	6.x-1.1	Provides events, conditions and actions for rule-based form customization. Depends on: Rules (disabled)
☑	☐	**Rules Scheduler**	6.x-1.1	Schedule the execution of rule sets. Depends on: Rules (disabled)
☐	☐	**Rules Simpletest**	6.x-1.1	Tests the functionality of the rule engine Depends on: Simpletest (missing), Rules (disabled)

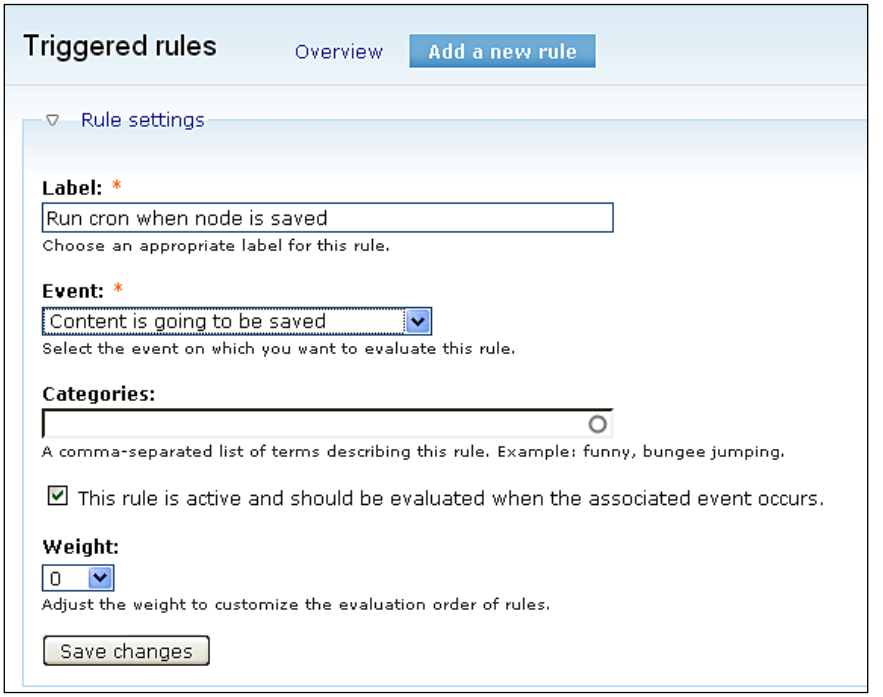
Save your module configuration. Then visit the Rules configuration page by going to **Rules | Triggered Rules | Add a new rule**.



We're going to add a new rule and event by doing the following:

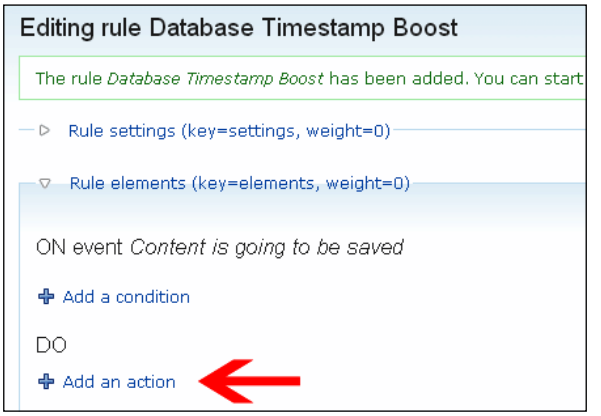
1. In the **Label** field, type in the following: **Run cron when node is saved**.
2. In the **Event** drop-down menu, choose the following event under the Node category: **Content is going to be saved**.

3. Check the box next to the statement: **This rule is active and should be evaluated when the associated event occurs**.
4. Click on **Save changes**.

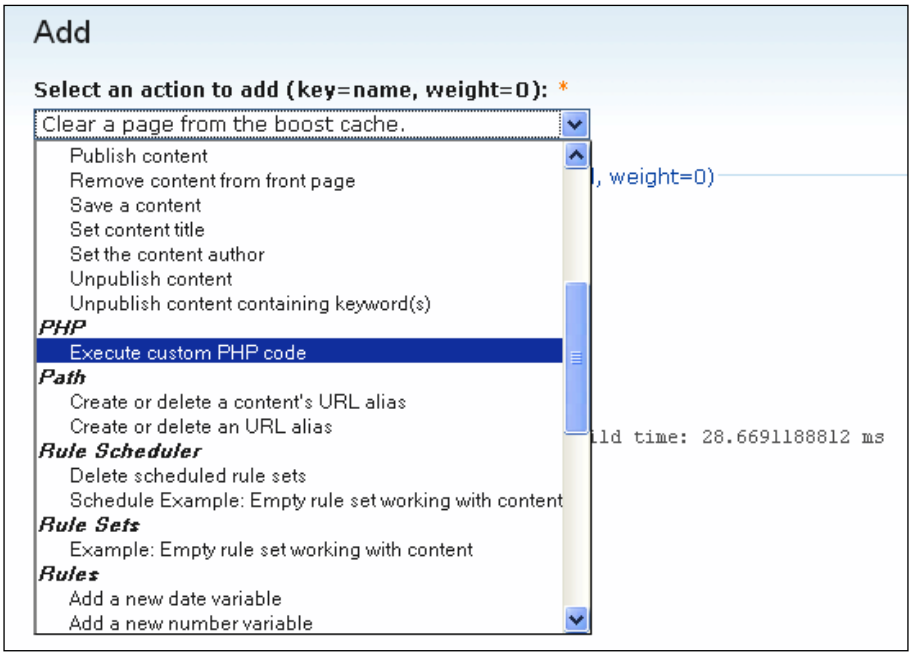


Once you click on **Save changes**, you'll be presented with a screen that allows you to edit the **Database Timestamp Boost** rule you just configured. Here do the following:

- Click on the **Add an action** link.

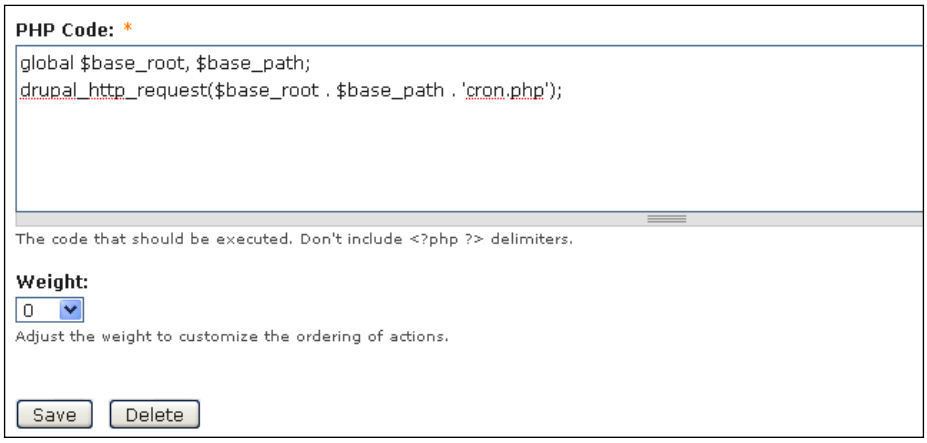


- From the **Select an action to add** drop-down menu, select the **Execute custom PHP code** statement and then click on **Next**.



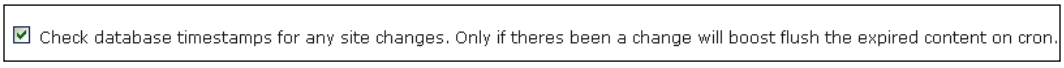
- On the next screen, in the **PHP Code** box, copy and paste the following code. Remember here that you do not need to include the opening and closing PHP brackets `<?php and ?>`.

```
global $base_root, $base_path;
drupal_http_request($base_root . $base_path . 'cron.php');
```



This code is provided from the Boost advanced settings help and support documentation page on `drupal.org` (`http://drupal.org/node/583264`)

- Click on **Save**. You will receive a confirmation that **The action Execute custom PHP code has been saved**.
- Return to your Boost advanced settings and check the box next to **Check database timestamps for any site changes**. Only if there's been a change will Boost flush the expired content on `cron`.
- Save your Boost settings configuration.



As soon as you do this, Boost will now refresh the cache on any one page on your site that has been changed in the database.

Testing your Database timestamp settings

Let's go ahead and test the functionality we just implemented. You'll see immediately how this works in the new caching mechanism we've configured. First, logout of your site and then browse to a page and load it as an anonymous user. Check your `/cache/normal/variantcube.com/fire/node` folder to make sure the HTML version of the cached page is showing up. I'm visiting `node/207` on my site and I notice immediately that once I load `node/207`, the HTML version shows up in my cache folder.

If you are having trouble seeing this happen through FTP or SFTP, refresh your remote window in your FTP client.

Now log back into your site and visit the same node as your admin authenticated user. Edit the node and add some content to it, or tweak some content so that the change will be noticeable to your anonymous users. I'm editing `node/207` and I'm adding some new textual content to my title field for that node. Save your node.

Now, immediately go into your FTP client and refresh your remote view. You should see the HTML version of the node disappear. The script you are running through the Rules module and Boost is working. You made a database level change to this node and now the node cache has been flushed. The HTML version is gone and you're ready to serve out the latest version of this node to your anonymous users. To finish the test, logout of your site and load the same node, as an anonymous user. Now, immediately go into your FTP client and refresh. You should now see the cached version of the node again and you should also see the edited content on your node as an anonymous user. It's working!

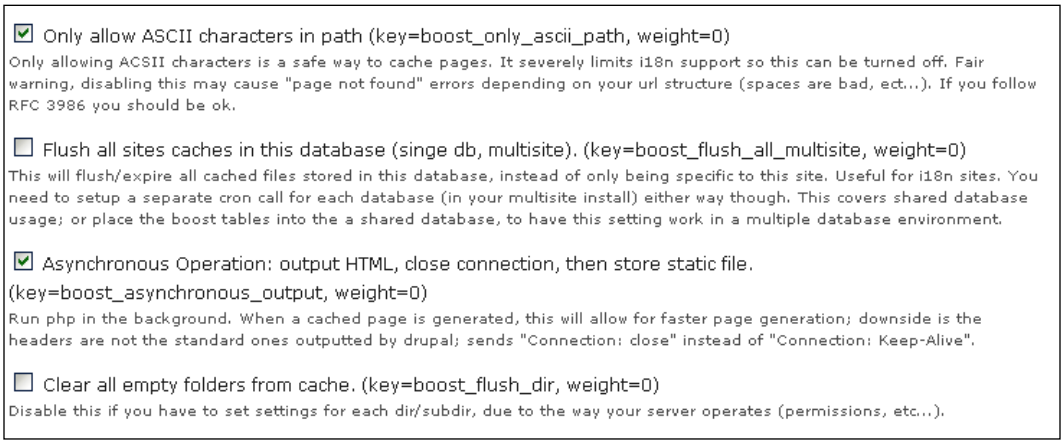
You'll also notice that all of your other cached HTML page versions are unchanged and unaffected by this rule's actions. The PHP script you are running only targeted this one node that had changed content. Bear in mind that running `cron` using the rule you have created will cause the `cron` to run every time a node is saved. This may cause `cron` to run more frequently than you have it set to run via your Poormanscron module or a `cron` configuration you have configured on the server. If this is the case, then your `cron` could take more time to run because it will be flushing other module actions, for example, if your modules rely on `cron` for specific module functionality. Just keep this in mind as you work with this rule.

Let's look at some more Boost advanced settings. The next checkbox on the Boost settings page asks you if you want to **force the site to only allow ASCII characters** in a URL path. **I would suggest leaving this checked if you're not using any content** translation or `i18n` functionality on your Drupal site.

The next setting pertains to multisite environment and development. If you're running a multisite, you can select to **Flush all sites caches in this database**. This will only work if you're running a multisite environment from one Drupal database. So, if you want to flush all the sites' caches, you can enable this here. We're not running multisite currently, so I'm going to leave this unchecked.

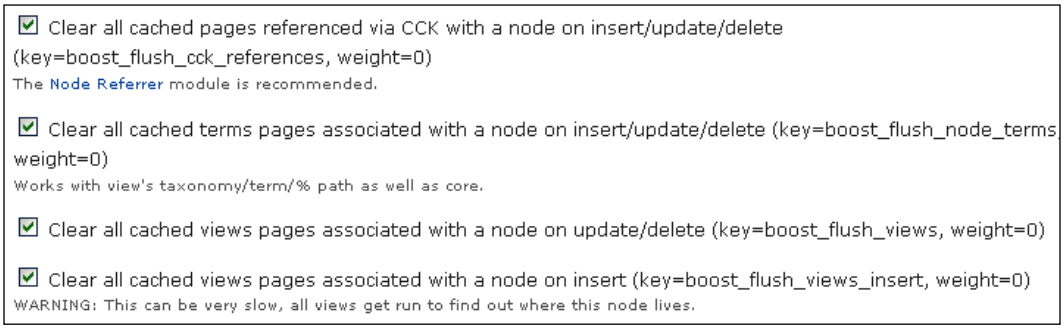
Asynchronous Operation: output HTML, close connection, then store static file helps to speed up your caching process even more. Here the caching will generate the cached HTML page without paying close attention to the PHP on the page. PHP will remain running in the background, but the cache page will only pay attention to HTML. This will also help to generate faster page loads.

The next setting allows you to not only clear cached files, but also the entire folder in your `/cache` directory. This gives you an added feature to help clean house, but you need to be careful if you have set specific writeable subdirectories. If you clear those subdirectories, you will need to rebuild them again through FTP or a file manager and set the correct permission because clearing them will wipe them from the server. So use this with caution.



The next four settings refer to Boost's integration and behavior with the CCK, Views, and Taxonomy modules. You can tell Boost to **Clear all cached pages referenced via CCK with a node on insert/update/delete**. This will clear the cached pages for any node that references another node via a CCK node reference field. Both nodes will be cleared. There is a module that works well with this functionality called the **Node Referrer** module. If you plan to use this functionality, you should install and configure this module.

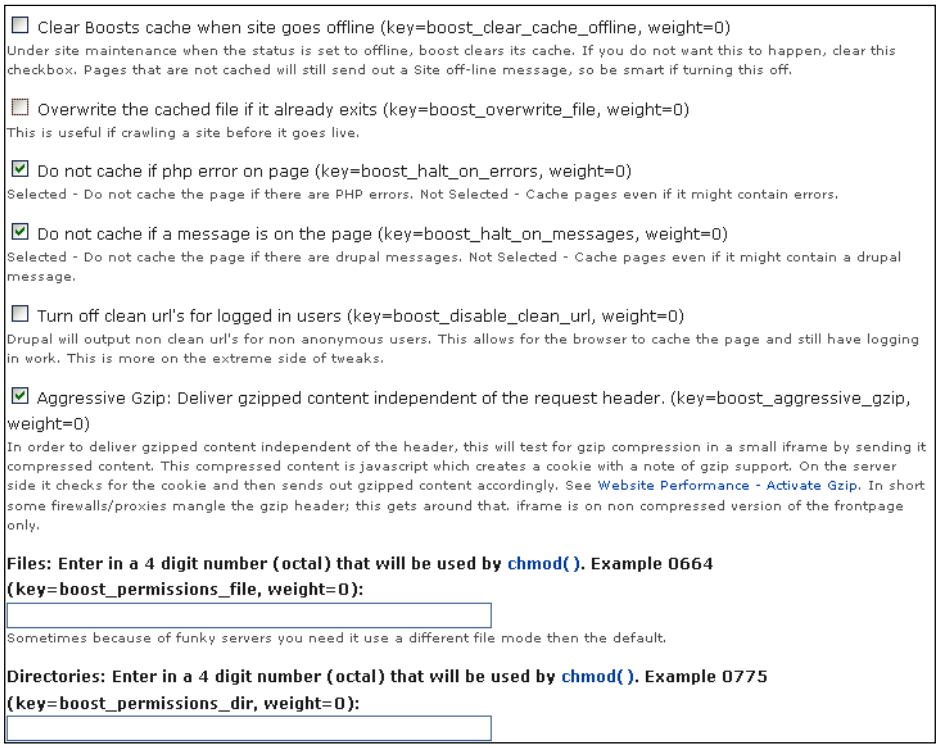
You can also have Boost **Clear all cached terms pages associated with a node on insert/ update/delete**, **Clear all cached views pages associated with a node on insert/update/and delete**. Note that if you do this specifically, the views page associated with a node on insert can be a slow process because all of your Views will process so that Boost can locate the node that is being cached. Use this functionality with caution.



You can tell Boost to clear cache when you put your site offline for maintenance mode, overwrite the cached file if it already exists, and not to cache a page if there is a PHP error on the page. We'll go ahead and check this box. You can also check the box next to the **Do not cache if a message is on the page**.

You can choose to turn off clean URLs for logged in users. We want to use clean URLs for both of our user bases, so we'll leave this unchecked. This setting is recommended for sites that have mostly admin-based authenticated users who may not mind using non-clean URLs.

You can also choose to use Aggressive Gzip caching if you have your site configured to use Books for Gzip caching.

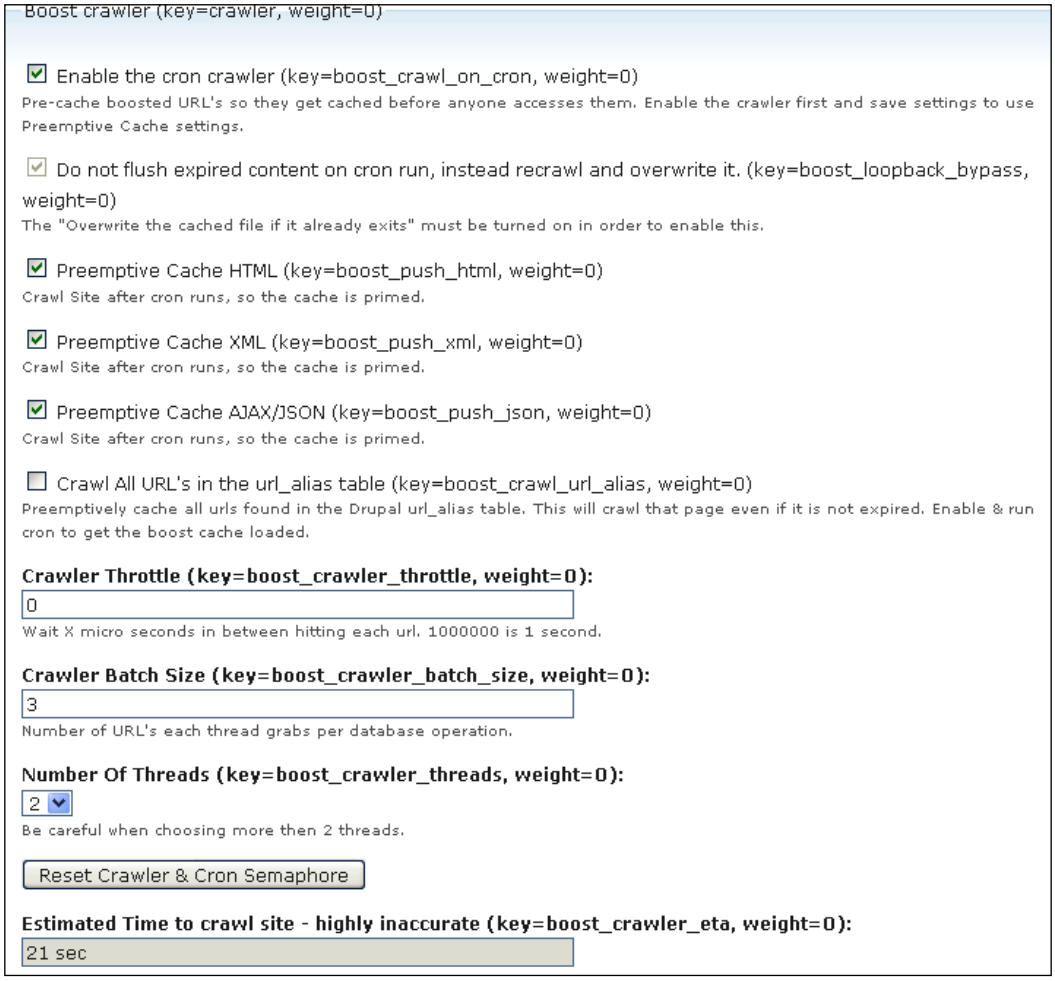


Another one of the tweaks that Boost allows for is the **Expire content in DB, do not flush file**. This will expire the database entry for the file or node before actually flushing the cached version of the node. Again, this provides even greater flexibility in your Boost configuration.

Finally, you can tell Boost to **Ignore cache flushing** (recommended only if you are caching CSS and JS files) and whether you want to record all Boost errors to the Drupal watchdog recent log entries.

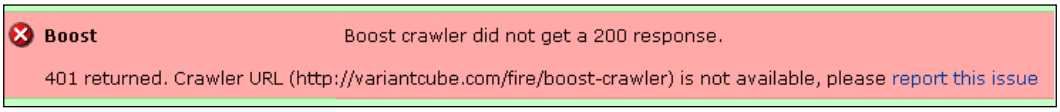
Boost crawler settings

Boost crawler allows you to cache your Drupal pages preemptively, allowing pages to be cached before anonymous users or any visitor on your site loads them. First, you need to check the box to **enable the** `cron` crawler. You must check this box and save your entire configuration before you are able to check the specific caching boxes in the Boost crawler section of the Boost settings. I encourage you to test this functionality on your site before putting it in a production environment. You may not need to use pre-caching, but again the module provides you with this flexible functionality. The handbook content recommends using this functionality on shared hosts and in conjunction with the database timestamp configuration we enabled earlier in this chapter. You may also have to update your `.htaccess` settings to use this type of configuration.



Remember that if you do change the above settings in the Boost crawler section, you may need to regenerate your `.htaccess` rules and re-paste them into your `.htaccess` file, as you will now have updated and potentially changed the settings. So, save your entire Boost advanced settings and main settings configuration first. Then, having done this, run your site's Status report. This will tell you whether Boost is configured correctly or if you need to update your `.htaccess`.

For example, I enabled the Boost `cron` crawler. Once I did this and visited my Status report, I received this error message:



If you do need to make updates, go back to your Boost configuration page and click on the **Boost htaccess rules generation** link and copy your latest Generated Rules. Then paste this into your `.htaccess` file to update it.

Since I'm receiving this error, I'm going to go back and regenerate my Boost `htaccess` rules and re-paste them into my `.htaccess` file. Once I do this and run my Status report again, I should receive the green box telling me that Boost is running correctly and can run the Boost crawler.

Summary

In this chapter, we learned the following Boost module advanced configuration tips:

- Installing and configuring the Global Redirect contributed module.
- Setting up a Boost database timestamp PHP-based rules configuration for clearing static pages using the Rules module and Boost advanced configuration
- Testing the database timestamp rule
- Configuring additional Boost advanced configuration
- Configuring Boost crawler settings

Let's take a break! When we come back in Chapter 7, we'll take a look at contributed modules that are built for specific types of performance monitoring. These will include the Memcache, Advanced Cache, and File Based Caching modules.

7
Using Memcache API and Integration

In this chapter, we're going to return to our discussion of Drupal caching mechanisms and take a detailed look at the Memcache API and Integration contributed module along with the best methods of installing and configuring this module to allow for more granular and advanced cache configurations within our site. In Chapters 5 and 6, we used the Boost module to enable advanced caching for our anonymous site visitors. In this chapter and in Chapter 8, we're going to look at the best methods of enabling caching for our authenticated users, and investigate how to get even more control and flexibility over the Drupal caching system using contributed modules.

By the end of this chapter you will know how to:

- Install a development WAMP environment using MoWeS Portable
- Install Memcached binary libraries on your development server
- Integrate and configure Memcached to work with your PHP 5.2.x application
- Extract and install the Memcache API and Integration module
- Configure your `settings.php` to recognize and use the Memcache API module
- Enable the Memcache admin module
- Test the module on your development site and view its detailed reporting and statistics

The focus of this chapter will be how to use the Memcache API and Integration contributed caching module and integrate this with a Drupal 6.x site, and how best to implement these modules first in a development or sandbox type of hosting environment with the flexibility to implement them later on production websites. By doing this we'll actually see how the modules can contribute to performance optimization and speed on our sandbox and development sites before rolling them out into a production environment. Let's get started!

Using the Memcache API and Integration module

The Memcache API and integration module provides an API for integration with the Memcached daemon or service. There are many methods of installing the prerequisites for using this module, specifically the Memcached library; but we're going to focus on how to easily install Memcached and the Drupal 6.x version of the module in a Windows WAMP environment using PHP 5.2.x. In order to use the Drupal module, we'll need to first install the Memcached service on our local development server and then integrate this service with our PHP version. There are many instructions available on the web for installing Memcached on a Linux or Mac OS system. You can do a Google search for tutorials on how to get Memcached installed or see the note below with links to resources on `http://drupal.org/` and on Lullabot's website. Our focus here is to get Memcached up and running as quickly as possible so that you can see examples of how it works in a sandbox environment, so we're going to install using WAMP on Windows XP.

The `drupal.org` project page for the Memcache API and Integration module is here and provides a wealth of information and resources about the module: `http://drupal.org/project/memcache`. There are instructions and tutorials on how to install Memcached and the module in a Linux environment (Red Hat, CentOS, and Debian) through the `Lullabot.com` websites at the following URLS: `http://www.lullabot.com/articles/how_install_memcache_debian_etch` and `http://www.lullabot.com/articles/installing-memcached-redhat-or-centos`. If you want to read more about Memcached, you can find resources on its main organization website here: `http://memcached.org/`.

MoWeS Portable development WAMP server

The first thing you'll want to do in order to follow these instructions is make sure you're running a WAMP localhost environment on your Windows XP system. I am using the portable application called MoWeS that installs Apache, MySQL, and PHP on your `C` drive so that you can run the Apache web server in a development configuration through your `localhost`. You can download the MoWeS Portable packages here: `http://www.chsoftware.net/en/useware/mowes/mowes.htm`.

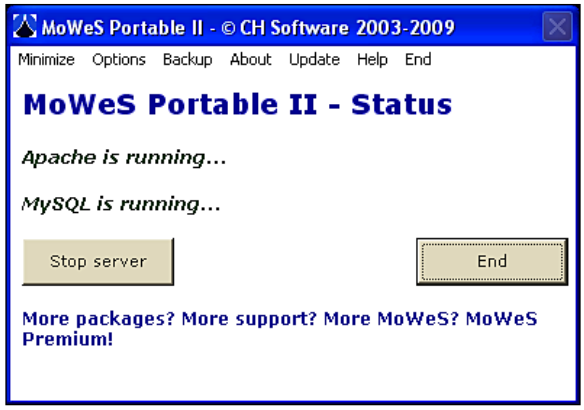
To install MoWeS follow these steps:

1. Visit the MoWeS website and go to the **Download** link.
2. Select the **I do not have a MoWeS portable II Package and want to obtain a new package** link if you are installing a brand new MoWeS install. Click on **Go**.
3. Choose the applications you want to install. I chose the following: **Apache 2, MySQL 5, PHP52 (version 5.2.10)**. If you choose to use another popular localhost package such as **WAMP** (**Windows Apache**, **MySQL**, **PHP**) make sure to use the package that includes PHP 5.2.x. PHP 5.3.x will cause issues with some Drupal contributed modules due to an issue with `ereg()` being deprecated in PHP 5.3 and higher. So for now make sure that you are using PHP 5.2 in your production and live environments.
4. You do not need to choose any application software because you can install Drupal manually in your `/www directory` once you install MoWeS.
5. Download the package called `mowes_portable.zip` to your desktop.
6. Move the ZIP file to your `C` drive and extract it. It will create all of the application directories necessary including `mysql` and `php5`.
7. Run the `mowes.exe` file to install MoWeS. If you run into installation issues, check the MoWeS documentation and support on the MoWeS site.

Once you get MoWeS (or a similar portable application that provides a WAMP environment) installed, you should have the following folders located in your `C` drive:

- `www`: This is where all of your localhost Drupal sites will reside.
- `apache2`: The Apache web server folder and files.
- `mysql`: The MySQL folder and files.
- `php5`: PHP folder and files.
- `mowes.exe`: This is the MoWeS Portable executable file that lives at the root of your `C` drive. Double-click on this to fire up your MoWeS Portable application and start the Apache web server.

Start up your MoWeS Portable application by clicking on the `mowes.exe` file. Once you do this, you should see a MoWeS Portable status box open telling you that Apache and MySQL are running without issue. Everything in the box should be green and you should also see a **Stop server** button and an **End** button.



Now that you have a MoWeS development environment make sure you install a Drupal site and database that you can use for the rest of this chapter and its examples, following the instructions provided in Chapter 1 of this book for installing Drupal. Once you have a Drupal site installed and configured, you're ready to install Memcached and the Memcache API.

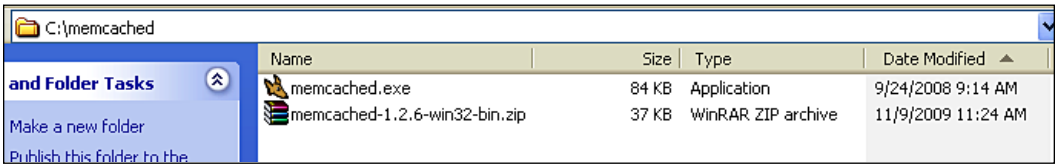
Installing Memcached libraries and service

Memcached is an entire service similar to MySQL or PHP that runs on your web server and integrates with other applications like PHP and Drupal. We need to get Memcached installed first on our development server and then we need to integrate it with our PHP installation and environment.

To install Memcached on Windows XP, you first need to download the `memcached-1.2.6` version for `win32`. I'm using the binary version available from this website: `http://code.jellycan.com/memcached/`.

Download the `memcached-1.2.6-win32-bin.zip` to your `C` drive.

We're going to now install Memcached as a service on our web server. To do this, first create a new folder on your `C` drive called `memcached`. You should have a folder `c:\memcached` and in that folder move and extract the ZIP file you just downloaded. This will extract and create a file called `memcached.exe`. You should see something in your folder that looks like this:



You now have the executable file of the Memcached binaries on your local computer. Now we want to install them. To do this, follow these steps:

1. Click on your **Start** menu button, select **Run**, then enter `cmd` or `cmd.exe`, and hit the *Enter* key. This will put you in command-line mode.
2. Install the Memcached service by typing the following:
   `c:\memcached\memcached.exe -d install`
3. Once installed, you need to start the service. To do this type in the following:
   `c:\memcached\memcached.exe -d start`

The Memcached service should now be installed and started. Now we need to integrate it with your PHP so that you can use it with your Drupal websites.

Integrating and testing Memcached with PHP 5.2.x

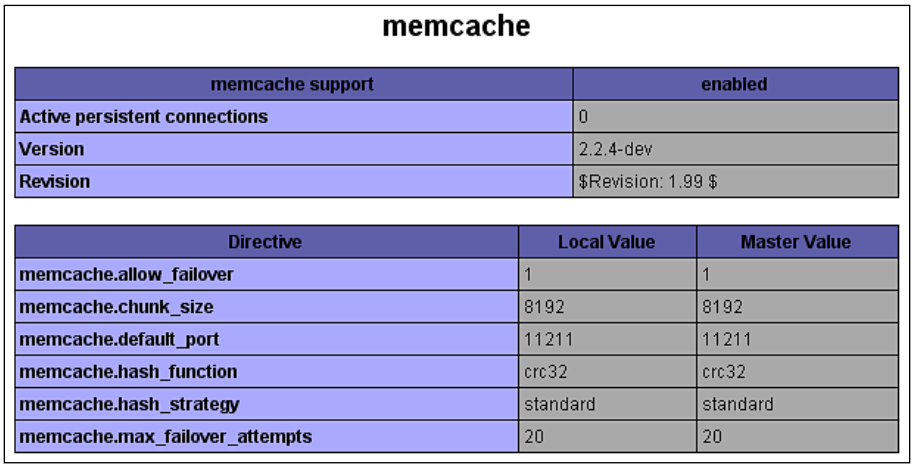
The first thing you need to do is check your PHP extensions directory to see if the Memcached extension is already installed. Go to `c:\php5\ext` directory and see if you can locate the `php_memcache.dll` file. If it's not there, you need to download it and paste it into your `\ext` folder.

You can get a copy of the DLL file here. This file works with PHP 5.2.x configurations: `www.pureformsolutions.com/pureform.wordpress.com/2008/06/17/php_memcache.dll`.

Now you need to tell your main `php.ini` file to reference the `php_memcache dll` extension. To do this, find your `php.ini` file and open it to edit in WordPad. Look for the extensions section of the `.ini` file and add the following extension:

```
extension=php_memcache.dll
```

Save your `php.ini` file and then click on the **Stop server** button in your MoWeS Portable utility window. Then **Restart** the server. Once you restart Apache, go ahead and create a file called `phpinfo.php` and add this line of code to it: `<?php phpinfo(); ?>`. Then browse to that `phpinfo` file in your web browser, for example: `http://localhost/start/phpinfo.php`. This will give you all of your PHP configuration and lists of extensions. You should see the following section on this page showing you that Memcache is indeed installed and running on the server:



memcache

memcache support	enabled
Active persistent connections	0
Version	2.2.4-dev
Revision	$Revision: 1.99 $

Directive	Local Value	Master Value
memcache.allow_failover	1	1
memcache.chunk_size	8192	8192
memcache.default_port	11211	11211
memcache.hash_function	crc32	crc32
memcache.hash_strategy	standard	standard
memcache.max_failover_attempts	20	20

You can also test your Memcached installation by creating a PHP file in your `/www root` and running the following code. I called my file `memcache.php` and the code follows:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en-US"
      lang="en-US">
<head>
  <titleMemcache Test</title>
  <meta http-equiv="content-type" content="text/html;
     charset=iso-8859-1" />
  <title>Testing Memcache</title>
</head>
<body>
<?php
    $memcache = new Memcache;
    $memcache->connect("localhost",11211);
    # You might need to set "localhost" to "127.0.0.1"
    echo "Server's version: " . $memcache->getVersion() . "<br />\n";
    $tmp_object = new stdClass;
```

```
    $tmp_object->str_attr = "test";
    $tmp_object->int_attr = 123;

    $memcache->set("key",$tmp_object,false,10);
    echo "Store data in the cache (data will expire in 10 seconds)
     <br />\n";

    echo "Data from the cache:<br />\n";
    var_dump($memcache->get("key"));
?>
</body>
</html>
```

Running this code should return something similar to the following as a web page display when you browse to `/localhost/memcache.php`. If you receive no errors, you're good to go and have installed Memcached correctly.

```
Server's version: 1.2.6
Store data in the cache (data will expire in 10 seconds)
Data from the cache:
object(stdClass)#3 (2) { ["str_attr"]=> string(4) "test" ["int_
attr"]=> int(123) }
```

Installing the Memcache API and Integration module

We're now ready to install the Drupal contributed Memcache API module into our Drupal site. Bear in mind here that this is a good starting point for you to work from. But the focus here will be on a Windows development environment using the MoWeS Portable Apache configuration. You may be using a different WAMP set up on Windows or using MAMP on a Mac. Your configuration may be different, so you can use this as a starting guide to getting Memcache up and running.

There is an additional configuration step to take with the previously installed Memcached libraries before we continue. Open up your `php.ini` file in WordPad again and add the following line if it's not in there already:

```
memcache.hash_strategy=consistent
```

You can add this line immediately after the last extension listed in your Windows extensions section.

If you run `phpinfo.php` before making this change, you'll notice that your `memcache.hash_strategy` is set to standard—you're changing it to be consistent. You'll need to restart your Apache server using MoWeS to effect the changes. Go ahead and do this and then refresh your `phpinfo` page.

Now you're ready to install and enable the module. First, you want to put your development Drupal site in offline mode. This is good practice before implementing any advanced modules such as Memcache.

Before installing the Memcache module make sure to read thoroughly the installation instructions provided on the `drupal.org` project page as well as those in the `INSTALLATION.txt` file that comes with the module.

Here are the steps to install the Memcache API and Integration module:

- Put your Drupal site in offline mode.
- Download the latest version of the module from the project page here: `http://drupal.org/project/memcache`. Latest version is `6.x-1.4`.
- Extract and copy the `memcache` module folder to your `/sites/all/modules` folder.
- Confirm that you have Memcached running as a service on your server (using instructions in the previous section).

Now, as you're going to be using the Memcache module to perform all caching on your website, you need to make sure that your Drupal site knows which Memcache include file to use when it's running its caching mechanism.

There are two Memcache module INC files: `Memcache.inc` is the default core INC file to use whereas `Memcache.db.inc` can be used as a variant that offers you more flexibility. Using `Memcache.db.inc` will save all your cached data into the MySQL database, so you can still use caching if your site is offline. `Memcache.inc` does not store any data in the database, so it's much lower overhead and lighter in weight on your site and site database, and this will give you the best performance results. However, this file also uses the most memory resources allocated to your site, so make sure you have enough PHP memory running because it will be storing all the page caching directly in memory and not in the database.

You can decide which INC files to use. You do need to tell Drupal to use a specific INC file, so you'll need to edit your `settings.php` file and add the following code to call the specific `.inc` file you want to use. We'll use the `memcache.db.inc` file for now and then tweak this to try and run everything from memory using the `memcache.inc` file later. Update the `$conf` in your `settings.php` file to contain the following code:

```
<?php
$conf = array(
  // The path to wherever memcache.inc is. The easiest is to simply
point it
    // to the copy in your module's directory.
 //  'cache_inc' => './sites/all/modules/memcache/memcache.inc',
    // or
    'cache_inc' => './sites/all/modules/memcache/memcache.db.inc',
);
?>
```

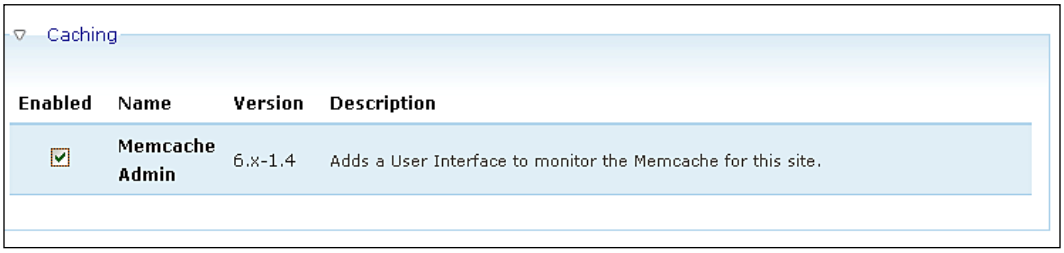
Make sure you comment out the correct line above so that the `memcache.db.inc` is the reference being used.

Also, make sure you're running high enough on your PHP `memory_limit` in your `php.ini`. I had to raise my setting in this site to `96M`.

Bring your site back online and browse to your modules admin list in your Drupal site.

Enabling the Memcache Admin module

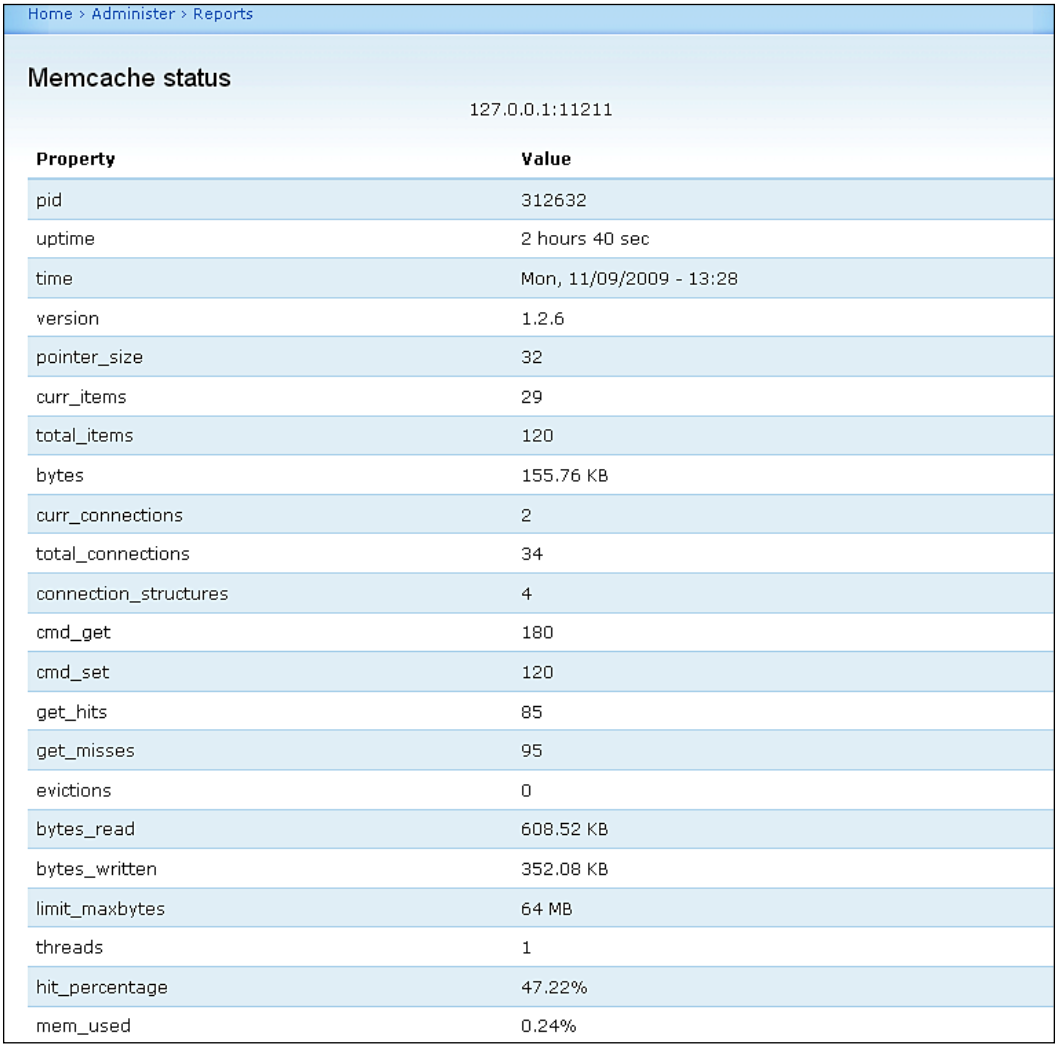
Congratulations! You now have the Memcache module running on your development site. Memcache API and Integration provides a sub module called **Memcache Admin** that gives you a simple Drupal-based admin interface to check on your Memcache stats and reporting. The module is located under your Caching modules section. Enable this module and save your module configuration.



Once enabled, you can browse to this module's admin interface by going to **Reports | Memcache** status through your administrative menu.

Memcache status

The Memcache status page gives you a table showing your site's Memcache status and configuration on one Drupal page. You should see a column listing properties and a column listing values. It should look similar to this:



Home › Administer › Reports

Memcache status

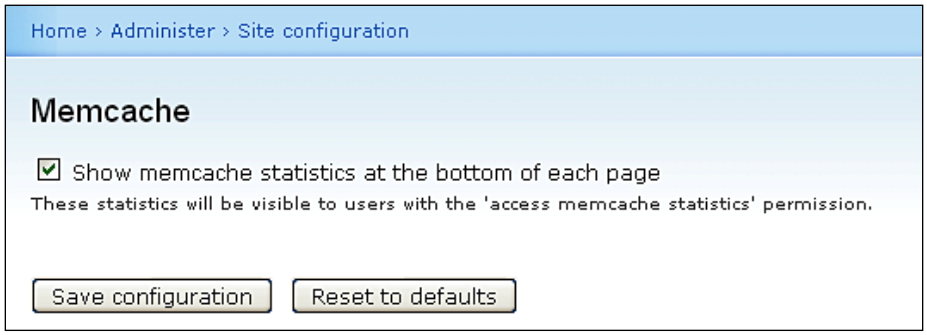
127.0.0.1:11211

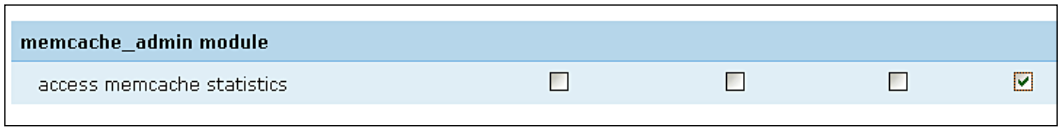
Property	Value
pid	312632
uptime	2 hours 40 sec
time	Mon, 11/09/2009 - 13:28
version	1.2.6
pointer_size	32
curr_items	29
total_items	120
bytes	155.76 KB
curr_connections	2
total_connections	34
connection_structures	4
cmd_get	180
cmd_set	120
get_hits	85
get_misses	95
evictions	0
bytes_read	608.52 KB
bytes_written	352.08 KB
limit_maxbytes	64 MB
threads	1
hit_percentage	47.22%
mem_used	0.24%

For example, this page shows you how much memory you're using (0.24%), **uptime** of your site, version of Memcached you are running, **total_items** that you are caching, and the `memory_limit` that Memcache is using here (64MB).

Memcache statistics per page

You can also tell Drupal whether to show Memcache module statistics on each Drupal page when you're logged into the site. To access this setting, go to **Site configuration | Memcache** and check the **Show memcache statistics at the bottom of each page**. As the module notes, these statistics will be visible to any role or user that has permissions to access Memcache statistics.





Now, browse to one of your nodes and you would see the Memcache statistics shown at the bottom of the page.

```
Memcache statistics
get:
variables
schema
content_type_info
2:235414efa8e61006e64907a167bdde0e
fieldgroup_data
theme_registry:garland
2:131b75eb6b19b2335d70625889990433
links:navigation:page-cid:node/9:1
links:navigation:tree-data:367b971e55cf3486a97ca90fde50b6fe
links:secondary-links:page-cid:node/9:1
```

```
links:secondary-links:tree-data:38163dbbcf6e9baec7e1ea26143c42de
links:primary-links:page-cid:node/9:1
links:primary-links:tree-data:d2d9d9bd2c2432fa9266e090b3a3d72a
links:admin_menu:all-cid:0
links:admin_menu:tree-data:81b7e3b51fc4399be385976c0fc112fc
set:
variables
links:navigation:tree-data:367b971e55cf3486a97ca90fde50b6fe
links:navigation:page-cid:node/9:1
links:secondary-links:page-cid:node/9:1
links:primary-links:page-cid:node/9:1
hit:
schema
content_type_info
2:235414efa8e61006e64907a167bdde0e
fieldgroup_data
theme_registry:garland
2:131b75eb6b19b2335d70625889990433
links:secondary-links:tree-data:38163dbbcf6e9baec7e1ea26143c42de
links:primary-links:tree-data:d2d9d9bd2c2432fa9266e090b3a3d72a
links:admin_menu:all-cid:0
links:admin_menu:tree-data:81b7e3b51fc4399be385976c0fc112fc
bins:
cache
cache
cache
cache_content
cache_filter
cache_content
cache
cache_filter
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
cache_menu
```

Viewing the Memcache tables in MySQL

The Memcache API utilizes your default Drupal cache tables in your MySQL database if you are using the `memcache.db.inc` file and configuration. If you view your Memcache module statistics per Drupal page, you'll see that the statistics show the module referencing the MySQL cache tables via the `bins` section. These include `cache`, `cache_filter`, and `cache_menu`. If you view your MySQL database via phpMyAdmin, you'll see the cache tables. This is a nice flexible feature, as this module does not insert any new database tables or special database configuration. Memcache API uses your Drupal default core caching tables to store the cached data.

Running Memcache without saving cache data to your database

Now, let's tweak our `settings.php` file to change the `$conf` array to reference the other include file in our arsenal. This will be the `memcache.inc` file. Comment out the `memcache.db.inc` file, and then remove the comment before your `memcache.inc` file line of code.

Your `settings.php $conf` array should read the following:

```
$conf = array(
   // The path to wherever memcache.inc is. The easiest is to simply
point it
   // to the copy in your module's directory.
  'cache_inc' => './sites/all/modules/memcache/memcache.inc',
   // or
    //'cache_inc' => './sites/all/modules/memcache/memcache.db.inc',
);
```

You're now caching your site content without saving to the cache tables in your MySQL database. One thing to be careful about here—as we're not saving our cached data to the MySQL tables, we're relying on the Memcached libraries more here, so make sure you have enough system memory on your server to handle this load. Your website should be responding much faster now, but you also want to make sure you have enough system resources to handle Memcache. The default that Memcache is using is `64MB` of system memory, but this tends to be low. You know that it's running `64MB` by checking your Memcache status in your Drupal site. It tells you this as the value of the `limit_maxbytes` property. You may want to change your Memcached memory to run with `512MB` of memory. To do this, follow these instructions:

1. Go to your `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\memcached Server` in your system registry.

2. Locate the `ImagePath` entry and change it to look like this:
   `c:\memcached\memcached.exe –d runservice –m 512`
3. You'll only be able to make these adjustments if you have access to your system registry.

Summary

In this chapter we completed the following steps and now have a good understanding of how Memcached API and Integration module works with our Drupal site:

- Installed the MoWeS Portable suite of applications and Apache server on our Windows XP local machine
- Installed the Memcached service and libraries in order to use the Memcache API and Integration module
- Integrated and tested Memcached with our PHP settings
- Installed and configured the Memcache API and Integration module into our Drupal site
- Enabled the Memcache Admin module in order to display our Memcache statistics on each page load
- Checked our Memcache stats on example nodes

Let's take a break! When we come back in Chapter 8, we'll take a look at contributed modules that are built to work along with the Memcache API module and will help us to enhance our caching mechanisms in our Drupal site even further. This will include the Cache Router, Authenticated User Page Caching, Advanced Cache, and File Based Caching modules. See you back in Chapter 8.

8
Advanced Caching and Contributed Modules for Caching

This chapter will discuss contributed modules for advanced caching including Cache Router, Authenticated User Page Caching, Advanced Cache, **APC** (**Alternative PHP Cache**), File Cache, and so on.

In this chapter, we're going to return to our discussion of Drupal caching mechanisms and take a detailed look at a group of contributed caching modules that allow for more granular and advanced cache configurations within our site.

By the end of this chapter you will know how to install and configure the following contributed caching modules:

- Cache Router
- Authenticated User Page Caching (Authcache)
- Advanced Cache

The focus of this chapter will be how to use contributed caching modules that work and integrate well with Drupal 6.x sites, and how best to implement these modules, first in a development or sandbox type of hosting environment, with the flexibility to implement them later in practice on production websites. We'll see how the modules can contribute to performance optimization and speed on our sandbox and development sites, before rolling them out into a production environment.

Cache Router

The Cache Router contributed module allows you to set up a caching system that assigns specific cache tables to specific Drupal cache technologies. This module works closely with the following cache technologies including Memcache API, the module we worked with in Chapter 7.

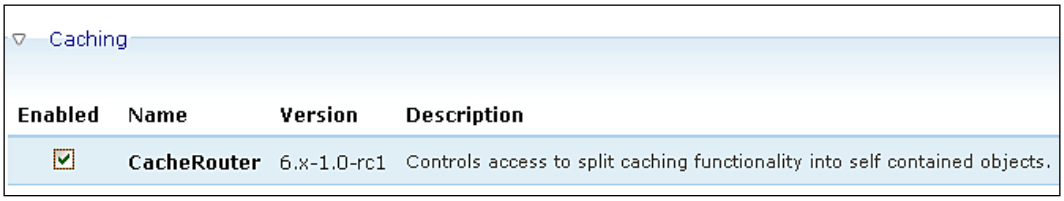
- APC
- Database
- eAccelerator
- File
- Memcache API
- XCache

Cache Router is a relatively new and promising module contributed by Steve Rude, available for download at `http://drupal.org/project/cacherouter`. The module allows you to map specific caching technologies or engines to specific cache tables. As mentioned on the module's project page, the engines mainly consist of refactoring previous cache modules such as the Memcache module already discussed.

This module also implements the `page_cache_fastpath` Drupal function for all engines except the database engine, allowing nearly all of Drupal to be bypassed for anonymous users.

Download the latest version of the module `6.x-1.0-rc1` for Drupal 6, extract it to your desktop, and then install it in your `/sites/all/modules` folder. Then enable it from the Drupal modules admin. Also, make sure you have another caching technology, engine, or module installed (such as Memcache API) before using this module.

Enable the module at your modules admin page and save your module configuration.



Now the default Cache Router settings will work for your site. However, the module project page does point out that there are some tweaks you can make to your `settings.php` file to get the module to work with Memcache as the main caching engine on your site and server.

Open up your `settings.php` file in a text editor and add the following lines of code. We're currently using Memcache API as our caching engine, so I'll add Memcache as the engine. If you were using APC, Database, File, or Xcache, you would add one of those caching engines. Our server will be localhost and then an array of port combinations.

Go ahead and add the following code to your `settings.php` file:

```
$conf['cacherouter'] = array(
  'default' => array(
    'engine' => 'memcache',
    'server' => array('MYIP:MYPORT'),
    'shared' => TRUE,
    'prefix' => '',
    'path' => 'sites/default/files/filecache',
    'static' => FALSE,
    'fast_cache' => TRUE,
  ),
);
```

Now you will have Cache Router working along with your Memcache API caching system.

Cache Router versus Memcache API

There are some drawbacks to using and configuring Cache Router in your site. Memcache API, as we discovered in Chapter 7, provides a nice administrative user interface and shows you statistics on each Drupal page. The Cache Router does not have an administrative interface and will not show you statistics in a visual mode. The project page advertises this with screenshots, but evidently this functionality has been removed from the latest Cache Router version. The module developer is working on integrating stats in future releases of the module as noted in this post on `drupal.org`: `http://drupal.org/node/338906`.

Authenticated User Page Caching (Authcache)

Let's take a look at another contributed module for caching. This module will allow us to configure caching for our authenticated users. It is frequently referred to as the Authcache module and the project page is here: `http://drupal.org/project/authcache`. The module will cache for both anonymous and authenticated users, and it will increase your page load and Drupal site performance because the page loads will be optimized to about 1-2 milliseconds (according to the module project description). To use this module for anonymous page caching is relatively straightforward. Setting it up for authenticated users will take more detailed and complex crafting.

Authcache will save static HTML versions of Drupal pages and you can configure it to work for specific authenticated user roles in Drupal. The module depends on JavaScript and AJAX to function, and if an anonymous user has JavaScript disabled, they will not see cached versions of the pages. The project page explains how this module works with AJAX in detail.

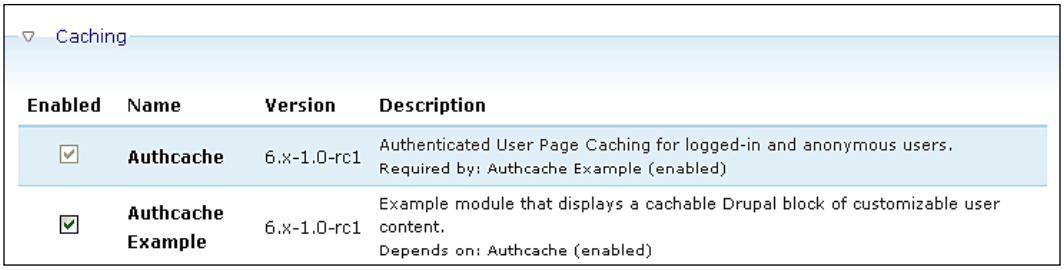
As with the Memcache API module, you can choose to use Drupal database caching where the module will store all cached pages in the `cache_page` table.

If you do not want to save cached pages to the database (as the Cache Router module works), the Authcache module works with caching engines such as Memcache and the Memcache API module. The advantage—as the project page points out as a general benefit of a caching engine—is that the database will not be storing all the cached data and this will increase your site's performance.

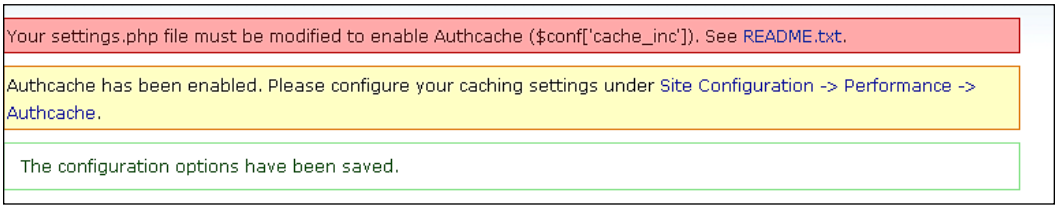
The huge benefit of using this module for your site's performance is that it will greatly increase page load times. According to the module project page, you have a chance of getting page load times under 1 millisecond.

Let's go ahead and try out the module. First, make sure you have a Drupal cache handler module and engine installed, such as Cache Router or Memcache API. We're already using Memcache API, so let's continue to use that. To simplify our caching mechanisms, I'm going to disable Cache Router for the moment and just rely on Memcache API since we have that installed and configured. So, I'll disable Cache Router through my modules admin page and then I'll check my Memcache status to make sure that module is still running without issue.

Download the latest version of the **Authcache** module (`6.x-1.0-rc1`) for Drupal 6.x and install it in your `/sites/all/modules` folder. Enable the module on your modules admin page. Enable both the **Authcache** and the **Authcache Example** modules in your caching section. Save your module configuration.



Once enabled, the module will give you a message when you reload your modules admin page that you need to update your `settings.php` file in order to properly configure the **Authcache module. It will also give you a link to your Site Configuration | Performance | Authcache configuration** settings page. Let's look at both of these elements next.



Tweaking your settings.php file to support Authcache

Based on the warning message we see once we enable the Authcache module, we need to make some tweaks to our `settings.php` file to reflect the change to our `$conf` array for our `cache_inc`. As you recall we're currently using the Memcache API module and referencing this in our `$conf` array. We need to tweak this and reference our new Authcache module, and also add a reference to our Memcache so that we can use both of these integrated. Open your `settings.php` file and comment out the previous array you configured for Memcache. Then add the following lines of code to your file. First, to reference the Memcache API module, we're going to add this:

```
$conf['memcache_servers'] = array('localhost:11211' => 'default');
```

Then to reference our **Authcache module we'll add this:**

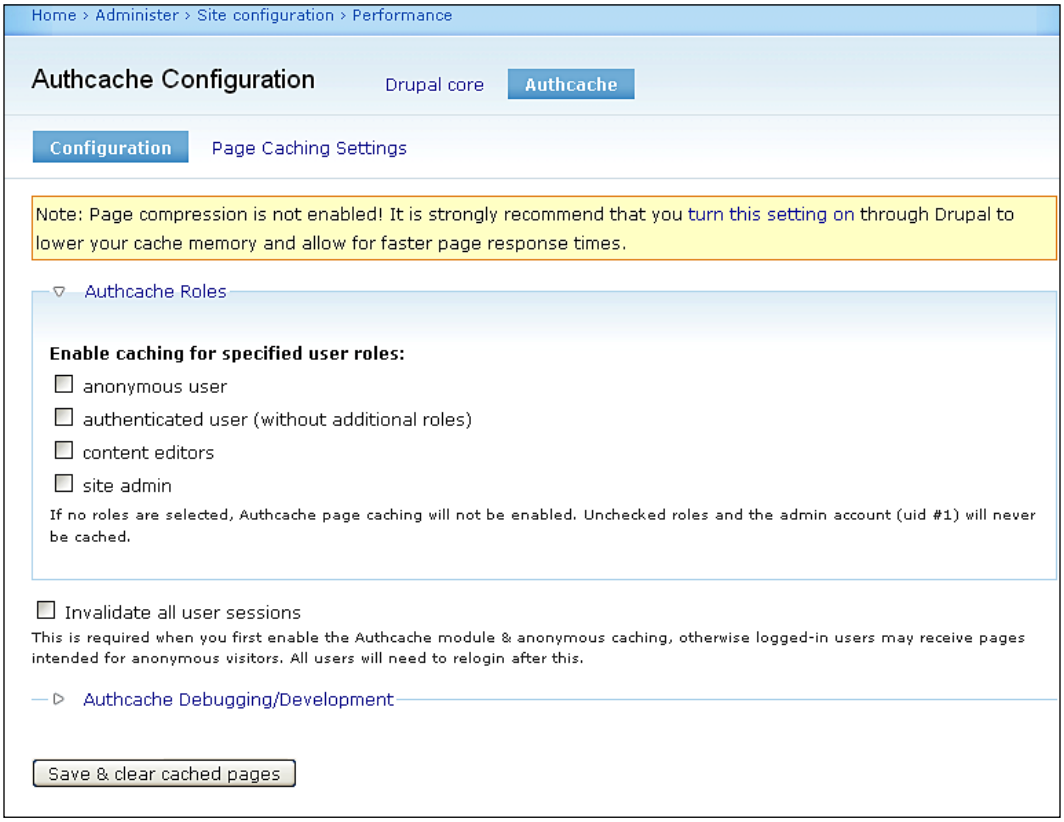
```
$conf['cache_inc'] = './sites/all/modules/authcache/authcache.inc';
```

Once you make these tweaks save your `settings.php` file and then refresh your main modules admin page. The warning message should disappear.

Remember that if no caching engine or module such as Memcache API is installed, the Authcache module will use the default Drupal core database cache tables to work.

Configuring the Authcache module

To configure the Authcache module settings, go to **Site Configuration | Performance | Authcache** or by visiting this URL: `http://localhost/drupal/admin/settings/performance/authcache`. You should see a form that looks similar to this:

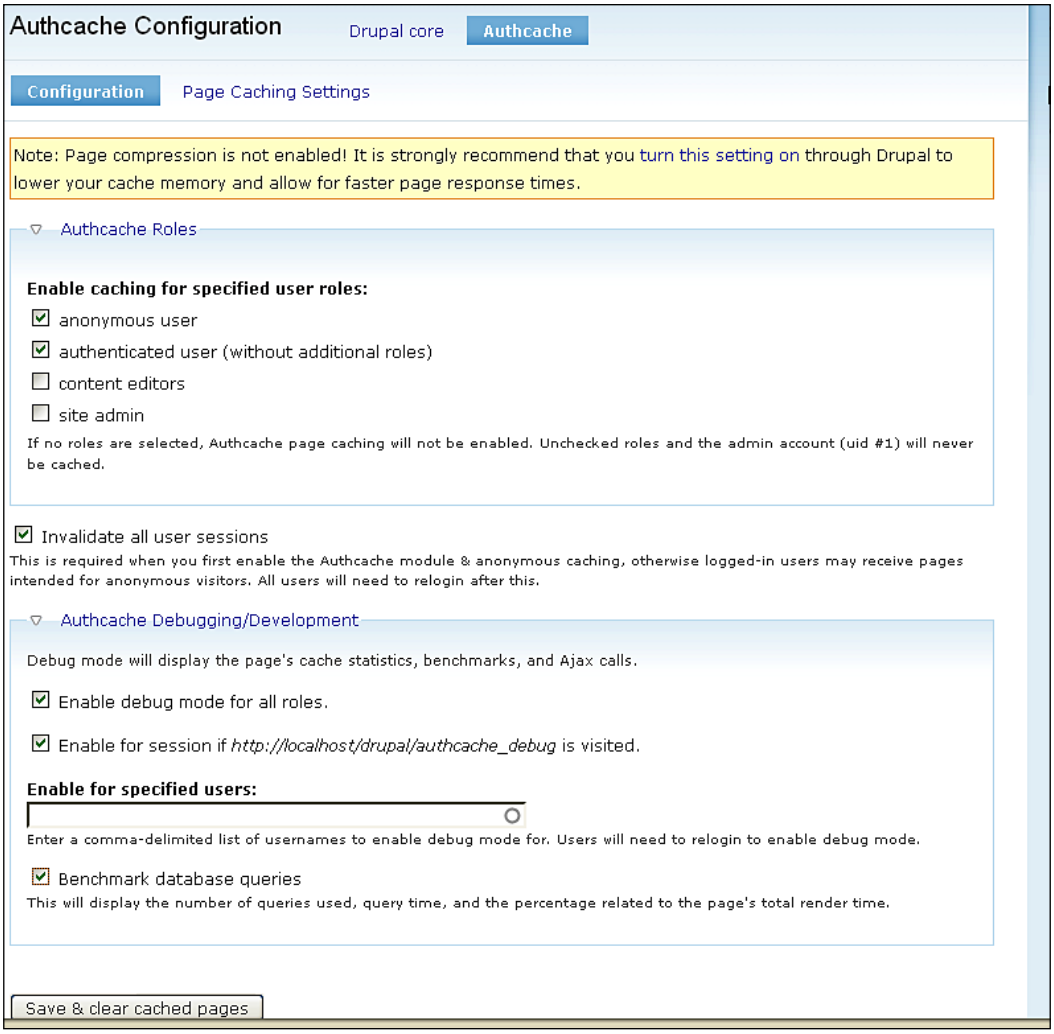


This settings page shows us that we can set caching for specific roles. You can set caching for all of your site's roles or just for specific roles such as anonymous users. The settings also tell you here that the super user admin role account will never be cached. Let's check the **Enable caching for specified user roles** boxes next to **the anonymous user** and the **authenticated user**.

Check the box next to **Invalidate all user sessions**. By doing this your authenticated users will be forced to login to the site again (if they are currently logged in for their user session).

Expand the **Authcache Debugging/Development** section and check the boxes for **Enable debug mode for all roles** and **Enable for session if http://localhost/drupal/authcache_debug is visited**. Also, check the box next to **Benchmark database queries** so that you can gather statistics on the number of queries used, query time, and percentages related to the page load time.

Click on the **Save & clear cached pages** button.



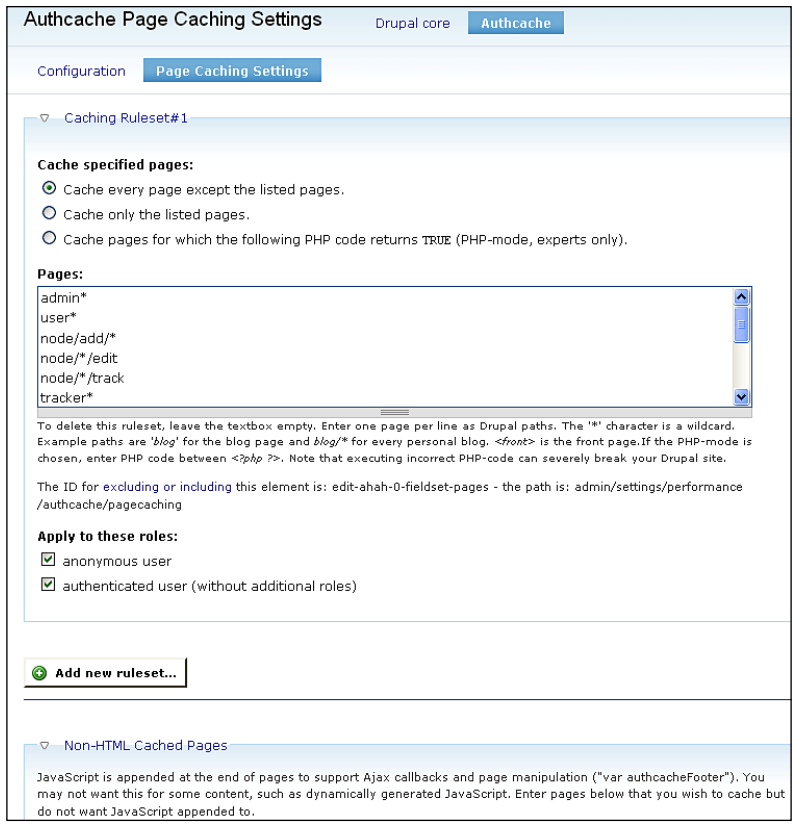
Once saved, Authcache will show you a message stating the following:

- **0 user sessions have been invalidated**
- **Drupal's built-in page caching for anonymous users has been disabled to avoid redundant caching**
- **Your Authcache settings have been saved**
- **Cached pages have been cleared**

You may also see a message telling you to enable Page compression in your performance settings. This will help to optimize your page load performance even more. You can decide whether you want to enable Page compression or not.

Page Caching Settings

Click on the **Page Caching Settings** tab on your **Authcache Page Caching Settings** admin page. This will launch the **Caching Ruleset** configuration. This page and form is only visible once you set up the initial Authcache configuration as per the instructions in the previous section. You should see a screen that looks like the following:

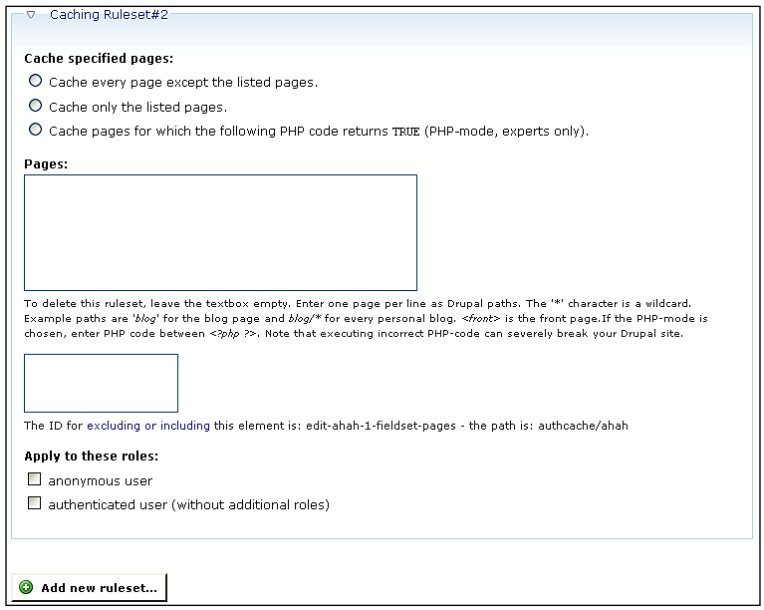


This form allows you to cache specific pages on your site using Authcache or to cache all pages. The Cache-specified pages section is set up similar to how Boost works, as well as the block administration page. You'll notice here that Authcache adds some default pages that are not going to be cached including any `/admin` page. The full list of these pages looks like this:

```
admin*
user*
node/add/*
node/*/edit
node/*/track
tracker*
comment/edit*
civicrm*
cart*
*/ajax/*
*/autocomplete/*
ajax_comments*
```

Let's leave these sensible Authcache defaults in place. You can also choose which roles to apply this specific ruleset. If you want to add different rulesets for each role, you can then click on the **Add new ruleset...** button and this will add an entirely new ruleset that you can configure for your role. You can see that this module provides a lot of flexibility and functionality similar to the Boost module.

Clicking on the **Add new ruleset...** button, you'll then be presented with a new ruleset form:



When you are satisfied with your configuration, click on the **Save & clear cached pages** button again.

Testing the Authcache module and its caching mechanism

Let's test out the module now to make sure it's caching our pages for anonymous and authenticated users.

There are two methods of testing whether the module is working correctly.
Let's look at both.

Checking the AuthcacheFooter code

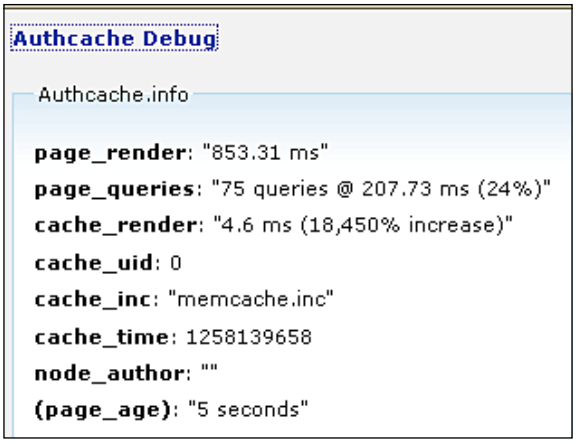
When the module is enabled and configured, logout of the website and view one of your nodes as an anonymous user. If you view source on the node, you should see the following script code and JSON object at the bottom of your HTML code. It should look like this and it will be commented out as the `Authcache Footer JSON` object:

```
<!-- Authcache Footer JSON -->
<script language="JavaScript">
var authcacheFooter = { "info": { "page_render": 853.31, "page_
queries": "75 queries @ 207.73 ms (24%)", "cache_render": "-1",
"cache_uid": 0, "cache_inc": "memcache.inc", "cache_time": 1258139658,
"node_author": "" }, "ajax": { "q": "node/8" } };
</script>
```

This code actually gives you some debug information including `page_queries`, `cache_render`, and `memcache cache time`, all for that specific node.

Checking the Authcache Debug window

You can also enable and give permissions to specific roles to view the debug statistics for a node via the **Authcache Debug** window. This is a JavaScript-powered window that appears in the upper-left corner of your site via the **Authcache Debug** link. If you click on this link, you'll see the debug stats expand. You should see something similar to this:



If you only want specific roles to be able to view this debug information, tweak the permissions for viewing it. Uncheck the **Enable debug mode for all roles** if you do not want your anonymous users viewing your debug window and statistics.

Remember that you also enabled caching for your authenticated user role. Log in as an authenticated user to test this out. Once logged in, view a node and you should see the debug information. This shows you that caching is working for authenticated users as well.

You now have a clear overview of the Authcache module, have put it into action on your site, and used it for both anonymous and authenticated user page caching. Let's move on and look at another module that we can use for caching.

Advanced cache

Now, what if you like to take advantage of several new cache opportunities, such as setting up caching for your site's comments, forums, search, taxonomy, and more? This is where the Advanced cache module will help out. This module provides advanced level caching by way of running a set of patches to your site's code that will allow for caching in areas of Drupal that do not currently cache by default. This includes comments, taxonomy terms, trees, vocabs and terms-per-node, path aliases, and search results.

To use this module, you need to install the Advanced cache module that currently has a production version for Drupal 5.x and development versions for Drupal 6.x. You will also need to apply some or all of the patches that come with the module. You can apply patches through command line or shell if you have access to your server via shell. The main Drupal module project page, `http://drupal.org/project/advcache`, contains detailed descriptions of all the patches that ship with the module. Of course, as with any dev version module, there are noted bugs in some of these patches, so you use this module and its patches at your own risk.

Not only do these patches allow for modules, such as Memcache, to do an even greater job, they will increase performance for authenticated users. Once installed from `http://drupal.org/project/advcache`, we may now patch all using `all_patches.patch` or choose the select few that we are interested in.

We will now touch on what additional functionality each of the patches provides, helping us decide which patch we should apply.

block_cache.patch

Caches enable blocks per user and then per theme for both authenticated and anonymous users. This patch is compatible with the blockcache module. The module project page claims that this module will take 1.5 milliseconds off of your page load times.

comment_cache.patch

Caches comment markup. It will still display changes made via settings or new comments (including the new indication).

forum_cache.patch

This patch caches the forum structure on your site, but beware that this patch is buggy and broken, and you are not advised to use it.

node_cache.patch

Caches node displays for users. When your site is made up of nearly all anonymous users, this is a patch you may wish to skip. However, if many users authenticate to your site and do not contain multiple roles, this patch will be very beneficial.

path_cache.patch

This patch will cache path aliases. So if you are using the path module, you most likely would like to apply this patch, shaving off a single query per internal link displayed on the site (not including those previously cached in blocks, nodes, and so on). This patch is also buggy and broken at this point, so beware and use with caution.

search_cache.patch

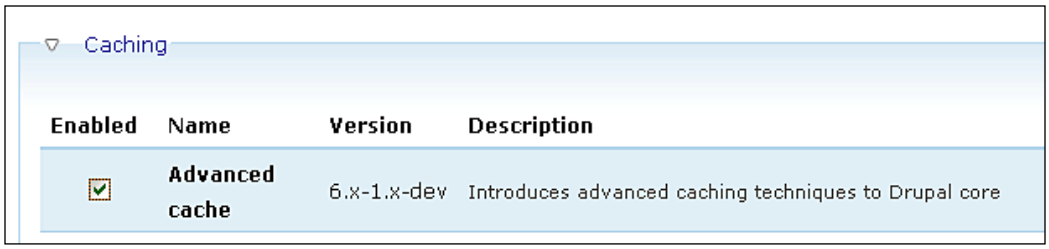
Similar to `node_cache.patch`, this will cache search results per authenticated user, per role. This patch is also broken at this point.

taxonomy_cache.patch

Caches taxonomy trees, terms, and vocabularies.

Let's go ahead and install the module and apply one of these patches. First, download the development version of the Advanced Cache module for Drupal 6.x. The current version is `6.x-1.x-dev`. Download and install in your `/sites/all/modules` directory.

Enable the module on your admin modules page.



If you try enabling the dev version of the module, you may receive the following parse error:

Fatal error: Cannot redeclare advcache_update_1() (previously declared in C:\www\drupal\sites\all\modules\advcache\advcache.install:58) in C:\www\drupal\sites\all\modules\advcache\advcache.install on line 238

To fix this, you will need to apply the following patch as per this troubleshooting document on `drupal.org` (`http://drupal.org/node/430700`).

Here's the patch:

```
--- advcache.install.bak  2009-04-11 11:00:19.000000000 +0200
+++ advcache.install  2009-04-11 11:02:22.000000000 +0200
@@ -206,33 +206,3 @@
    }
 }

-
-function advcache_update_1() {
-  switch ($GLOBALS['db_type']) {
-    case 'mysql':
-    case 'mysqli':
-      $ret[] = update_sql("CREATE TABLE {cache_forum} (
-        cid varchar(255) NOT NULL default '',
-        data longblob,
-        expire int NOT NULL default '0',
-        created int NOT NULL default '0',
-        headers text,
-        PRIMARY KEY (cid),
-        INDEX expire (expire)
-      ) /*!40100 DEFAULT CHARACTER SET UTF8 */ ");
-      break;
-
-    case 'pgsql':
-      $ret[] = update_sql("CREATE TABLE {cache_forum} (
-        cid varchar(255) NOT NULL default '',
-        data bytea,
-        expire int NOT NULL default '0',
-        created int NOT NULL default '0',
-        headers text,
-        PRIMARY KEY (cid)
-      )");
-      db_query("CREATE INDEX {cache_forum}_expire_idx ON {cache_
forum} (expire)");
-      break;
-  }
-  return $ret;
-}
```

Install the patch, and then try refreshing the browser to see if the parse error disappears. The patch basically tells you to delete the entire second occurrence of this set of code because it's duplicated in the `advcache.install` file. Remove the second instance of this function.

The development version of this module for Drupal 6.x currently only has the following patches for you to try:

- `node.patch`
- `nath.patch`
- `taxonomy.patch`

To run a patch, open up your command line or command/shell utility if using Windows and type in the following:

```
Cd C:\www\drupal patch < sites/all/modules/advcache/
   DRUPAL-6-10/taxonomy.patch
```

Alternatively copy the patch file in question to the root of your `/advcache` folder and then run the patch from that directory.

APC (Alternative PHP cache)

At the time of writing, the APC module has been revoked for Drupal 5 and 6.x. This is due to the fact that APC will be included in Drupal 7 with the Drupal 7 caching system. The Drupal 7.x caching system will allow for custom cache backend configuration, thus making the module unnecessary and not supportable in earlier versions of Drupal. The module maintainer informs the developer that they can use other caching modules, such as Cache Router, to perform similar caching operations. See the APC module page here: `http://drupal.org/project/apc`.

File Cache module

The File Cache module is currently available for Drupal 5.x, but does not have a version for Drupal 6.x. The module maintainer recommends using the Memcache API for any type of complex file caching that you may need to implement. The project page for this module is here: `http://drupal.org/project/filecache`

Summary

In this chapter, we completed the following steps and now have a good understanding of how more complex and advanced caching modules work with our Drupal site. We have:

- Installed and configured the Cache Router module
- Installed and configured the **Authcache module**
- Tweaked our `settings.php` file to support the **Authcache module**
- Integrated and tested **Authcache**
- Installed and configured the Advanced Cache module
- Briefly glanced at the Alternative PHP cache module (APC)
- Briefly discussed File caching

Let's take a break! When we come back in Chapter 9, we'll take a look at how best to run a high performance Drupal multisite. See you back in Chapter 9.

9
Multisite Configuration and Performance

In this final chapter, we are going to set up and configure a Drupal multisite environment on our localhost development server. The benefits to running a multisite installation include allowing multisites to share one Drupal database and core module configuration, or to share a core module configuration and allow each site to have its own database. We will also look at how multisite installations can help to boost performance for your overall Drupal configuration and help to increase performance on your server whether it be a shared or dedicated server environment.

By the end of this chapter you will know how to install and configure a Drupal multisite including the following configuration steps:

- Creating multisite folders and `settings.php` files
- Allowing each multisite to talk to its own MySQL database
- Configuring your HTTPD configuration file (`httpd.conf`) to support Virtual Hosts
- Tweaking the Windows system driver for Hosts
- Using caching in a multisite environment
- Looking at Shared database tables versus individual databases
- Installing modules and themes to multisites
- Using `update.php` on multisites
- Exploring Resources for Drupal multisite development

Let's go ahead and set up a Drupal multisite environment.

Using Drupal multisite

What is Drupal multisite and why should we use it? Multisite allows you to run multiple Drupal websites and instances from one main Drupal core codebase. As we have seen throughout this book, when we install and configure Drupal, we are using Drupal's main core system and database to power and drive our website. This includes the core `/modules` and `/themes` folders, as well as `/scripts`, `/profiles`, `/misc`, and `/includes`. The flexibility of Drupal allows us to install additional websites (as many as we need) and share all of our core files, modules, and themes within these multisites. This helps tremendously when we are planning to build a large website environment for a company or organization that has multiple departments, divisions, or stakeholders. We can offer these types of clients a large scale Drupal multisite. The sites will be more flexible, will perform better, and be easier to maintain.

One benefit here is that when you need to upgrade or patch a core or contributed module or theme and you're sharing those modules and themes with the other Drupal sites in your `/sites` folder, you only need to patch once and the updates will work across all sites. You can easily see the benefits from a maintenance and performance perspective here. If you need to update the modules only once and the updates are applied to all your sites, then this will save you time from a maintenance perspective. It will also provide for a much more consistent development and performance framework because all the sites will be running smoothly from the same codebase.

The other large benefit of a multisite is that you can install contributed and custom themes and modules to specific sites. All of your multisites can be running different custom themes and they can run different contributed modules. They will also have their own file system for associated images, documents, and other files. Finally, you can tweak performance per site so that if you want to run caching on one site, you can, without that caching mechanism affecting your other multisites.

We're going to focus on running multiple Drupal sites that all work with their own MySQL database. The benefit to this is that you have data separation for your contributed content and module code. Each site has its own database and therefore if issues arise with one site, these issues will not necessarily affect the other sites in your multisite environment. This type of environment will also help you to troubleshoot better. You can also run Drupal multisite from one shared database and we'll discuss this method as well. Both methods have their advantages and disadvantages.

Configuring multisite in a localhost environment

We are going to configure our Drupal multisite environment on our localhost development server, either on Windows or Linux. I'm going to walk through the steps of setting this up on Windows because there's an additional trick for Windows users to make sure they can get a Drupal multisite environment functioning easily in a Windows development environment. However, these instructions will also work on a Linux system or a MAMP system on Mac OS. We'll also briefly discuss how to best approach setting up multisite environments on production servers including Ubuntu Linux, and using a more common cPanel solution on shared servers.
First let's start by configuring a multisite development environment on our local development environment.

You have already prepped your multisite environment in the previous chapter when we set up a Drupal site on our localhost using MoWeS Portable applications. When doing this we installed the Apache web server, PHP, and MySQL on our local development environment. We now have Apache running and we have access to phpMyAdmin to do our database work by going here: `http://127.0.0.1/phpmyadmin/`.

We also installed a Drupal website in our `C:\www` root web docs folder. Our site is simply called `/drupal` and is located here via the web browser: `http://localhost/`.

So, we have the base Drupal core site set up. Our core Drupal site is working smoothly, and in the previous chapter recall that we also configured Memcache API and Authcache to run caching mechanisms on our site. The next thing we're going to do is configure this core `/drupal` site to be the core codebase for two new Drupal sites that we're going to install and configure. To make things simple, I'm going to just duplicate this site and use the same content for the two new sites. I'll do this by exporting the data from the core `/drupal` site's database and importing that data into two new MySQL databases that we're going to create. Once we complete the multisite configuration, all three of our Drupal sites will be running from their own database, but they will be sharing the core codebase, core modules, and themes.

Creating the multisite folders

The first thing we need to do is create folders for each site we want to run. To do this, go to your main `/drupal` site folder and open the main `/sites` folder. For Drupal multisite, you need to add your site folders into the main core `/sites` folder. So, we're going to add two sites and create the following folders in our `/drupal/sites` folder:

- `site1`
- `site2`

You should now have your folder directory looking like this:

```
/sites/site1
      /site2
```

The next step is to copy your main `/sites/default/settings.php` file and paste a copy of it into each of your multisite folders. So you'll have:

```
/site1/settings.php
/site2/settings.php
```

The reason you do this is that each multisite needs to have its own `settings.php` configuration file so that you can tell that site what database to work with and also what `base_url` to use. We'll change those settings in a moment.

You must also create `/files` folders inside each of your site's directories.
So you'll have:

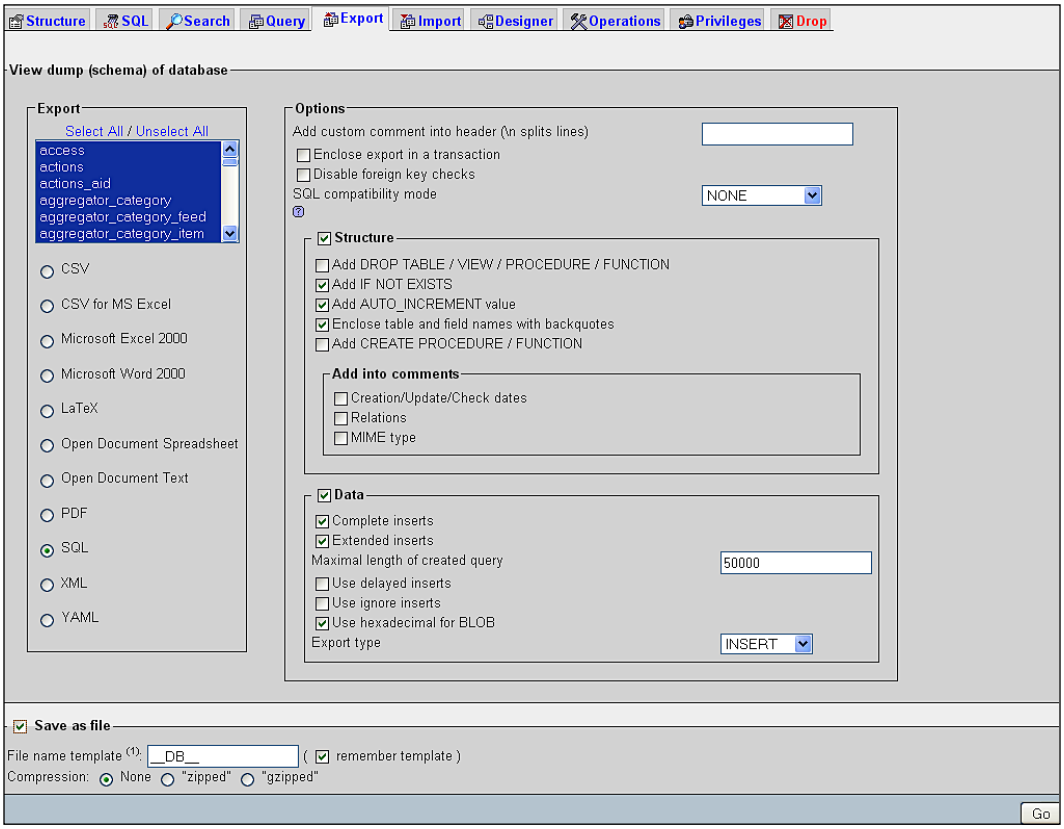
```
/site1/files
/site2/files
```

Setting up databases for your multisite

Now we already have a core database for our `/drupal` folder. We're going to create two new databases (one for each of our new sites). To do this I'm going to use the same data that my core database contains. So the first thing I'm going to do is export a clean database dump of the `/drupal` database and save that locally on my desktop. Then I'll import that data into each new database that I configure. Here are the steps:

1. Fire up your phpMyAdmin at: `http://localhost/phpmyadmin`.
2. Locate your main site's database and open it.

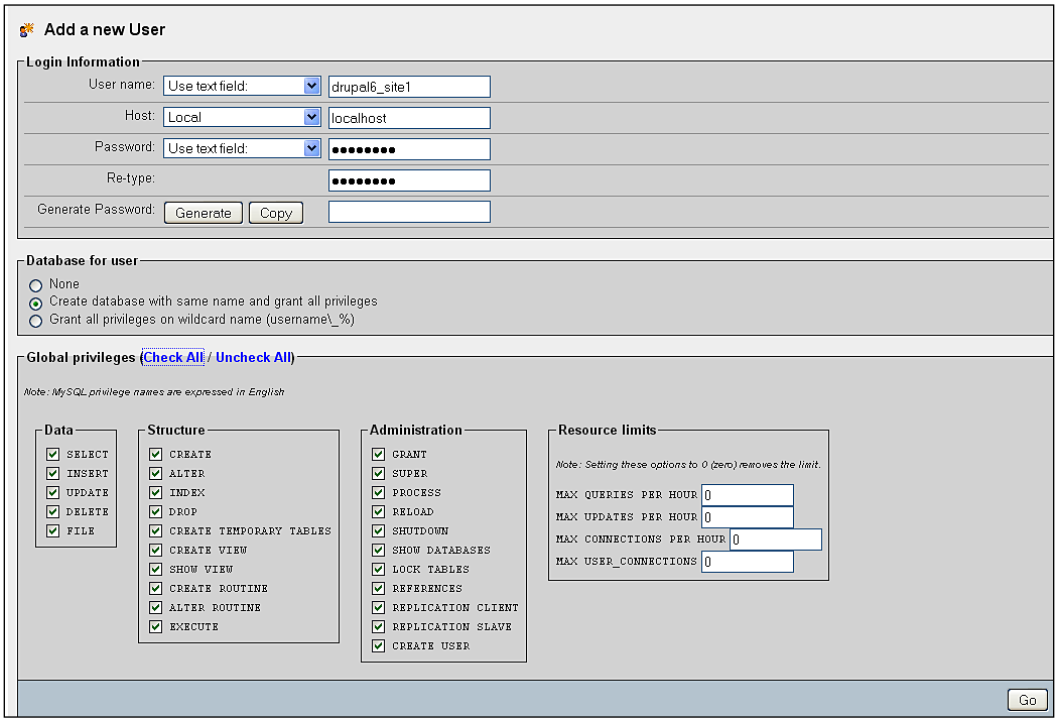
3. Click on the **Export** tab and then select **Save as file** and click on the **GO** button.



4. This will save a `.sql` file to your desktop.
5. Now load your main phpMyAdmin screen and click on the **Privileges** link.

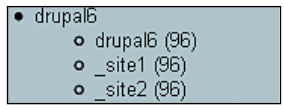
6. Click on **Add a new User**.

7. Type in a new username in the text field box and set the host to `localhost`. Type and confirm a password into the **Password** field. This will be the username and password for your new site's database, so make a note of this because you will be re-entering this information into your site's `settings.php` file. You will need to know the database username, password, and database name. A hint for what to name your new site's databases: call them `_site1` and `_site2`, using your main core's database name as the appended name. So, for example, my new site's databases are called `drupal6_site1` and `drupal6_site2`.
8. Check the radio button next to **Create database with same name and grant all privileges**.
9. Click on the **Check All** link **in the Global privileges** section and then click on **Go**. This will create the new database.



10. Repeat steps 5 to 9 to create a database for your second multisite site. Now you have both databases created. The username for each database is the same as the database name, and the password used for each is `drupal`. You will want to use a more complex password combination on a production site or server, but here we can keep things simple. Make a note of these details, as you'll need them when we edit the `settings.php` file for each new site.

11. Now you need to import the exported data (from your main core database) into these new databases.
12. Click on the database link in the left sidebar of phpMyAdmin and then click on the **Import** tab.
13. Browse for your saved `.sql` file and then make sure the format of the file to be imported is set to **SQL**.
14. Click on **Go** and this will import the database tables to your new database.
15. Repeat steps 11 to 14 for your second site's database.
16. You should now have a set of three databases with the same data in your phpMyAdmin. The main **drupal6** database is your core site's database. The `_site1` and `_site2` databases are for each of your site's multisite installations. You should see something in phpMyAdmin that looks like the following screenshot:



Tweaking settings.php for each site

Now that you have duplicated your database and set up your databases for your new multisites, let's make tweaks to the `settings.php` file for each of these new sites.

Open up your `/site1` folder and open the `settings.php` file to edit it in a text editor. You will need to change the permissions on the `settings.php` file before editing it because the file is normally set to `read-only`. To do that in a Windows environment, right-click on the file and select **Properties** from your menu options. Then on your properties **General** tab, uncheck `Read-only` in the **Attributes** section. You can also click on the **Security** tab in your **Properties** box and then check the permissions for your system **Users**. Make sure that system **Users** (or at least **Administrators** if you are currently logged into your computer as its main admin user) have write permissions to the file. You can also change these permissions using FTP or a Filemanager utility. With FTP on your remote host side of the FTP client, right-click on the `settings.php` file and you should be able to set the permissions for the file. In a Filemanager utility via cPanel, you should see a button (**Change Permissions**) to change permissions for the file.

We need to update the `$db_url` to reference our new `_site1` database. You insert your database user, password, and then the database name in this line of code in the `settings.php` file. This site will have its own database, but will share core resources with the main Drupal site configuration, as those database tables have been copied over into the `_site1` database. Change your `db_url` to:

```
$db_url = 'mysqli://drupal6_site1:drupal@localhost/drupal6_site1';
$db_prefix = '';
```

Do the same for the `settings.php` file of `/site2`. That site's `$db_url` should read:

```
$db_url = 'mysqli://drupal6_site2:drupal@localhost/drupal6_site2';
$db_prefix = '';
```

If you are installing multisites, but sharing the additional sites with the main core Drupal site database, you'll need to reference the same `$db_url`, but update your `$db_prefix` to note the additional site name. This way you can share the same database and make sure each site has its own database table prefix. That code would look like the following for `site1`:

```
$db_url = 'mysqli://drupal6:drupal@localhost/drupal6';
$db_prefix = 'site1_';
```

This would be the `site2` configuration:

```
$db_url = 'mysqli://drupal6:drupal@localhost/drupal6';
$db_prefix = 'site2_';
```

For now let's keep this configuration using different databases as per my instructions above.

Editing your Apache configuration

The next step in multisite configuration is to add virtual host entries to our Apache web server configuration. You need to tell Apache to look for these additional sites in our multisite configuration when a site visitor loads the site's web address in the web browser. To do this we use a virtual host entry in the Apache configuration file.

Locate your Apache `httpd.conf` file. It should be in the following folder location on your localhost server:

```
C:\apache2\conf\httpd.conf
```

Open this `.conf` file in your text editor. You will need to know what port your localhost is listening on. Usually it's port `80`, but if you are not sure check your server configuration. The default settings in the `httpd.conf` file should be correct.

First look for the following code in your `httpd.conf` file and make sure it's uncommented. This code should be in Section 3: Virtual Hosts of your conf file. We want the following uncommented:

```
NameVirtualHost *:80
```

Below this you will see some `VirtualHost` examples. You can use the examples the configuration file provides, and just make sure they are uncommented and have the correct settings as per your configuration. This is what the code should look like:

```
<VirtualHost *:80>
   DocumentRoot /www/drupal
   ServerName localhost
</VirtualHost>

<VirtualHost 127.0.0.1:80>
ServerName site1
DocumentRoot "C:/www/drupal"
    <Directory />
      Options All
      AllowOverride All
     #Simply allow all directives to be overridden in .htaccess
      Order allow,deny
      Allow from localhost
     #Only allow access from localhost
    </Directory>
</VirtualHost>

<VirtualHost 127.0.0.1:80>
ServerName site2
DocumentRoot "C:/www/drupal"
    <Directory />
     Options All
     AllowOverride All
     #Simply allow all directives to be overridden in .htaccess
      Order allow,deny
      Allow from localhost
     #Only allow access from localhost
   </Directory>
</VirtualHost>
```

Make these code additions and tweaks, then save your `httpd.conf` file and close it. Then stop your MoWeS Apache web server and restart it so that the above changes take effect.

Here's what the above code does. The first section of code tells Apache to use localhost as the server and to set the document root for that server to the Drupal core site you have configured. In this case, the document root is `/www/drupal`. This is reflected in this code excerpt:

```
<VirtualHost *:80>
   DocumentRoot /www/drupal
   ServerName localhost
</VirtualHost>
```

The next set of code is the `VirtualHost` directives to tell Apache to look for your multisites. First, we have a selection that names `ServerName` as the multisite entry (`site1` or `site2`) and then instructs it to use the same document root as the main core site `/www/drupal`. This allows Apache to look for these multisites in your main core `/sites` folder and then to deliver them to the site visitor when they type in `site1` or `site2` in the web browser URL menu.

Once you restart the web server, you will need to make one final tweak on Windows computers to make sure this new multisite configuration works for you.

Tweaking the hosts driver file on Windows

Now, in order for this to work on Windows, we need to tweak the driver file for Host configurations in the system settings folder. Browse to the `C:\WINDOWS\system32\drivers\etc` folder and look for the hosts file. If you do not see the file, then it's most likely hidden. To show the file on your Windows system, go to the **Tools** menu at the top of your folder window and select **Folder Options**. Then click on the **View** tab and select the **Show hidden files and folders** radio button that resides in the **Hidden files and folders** folder icon. Open that file in the text editor.

Look for the hostname code at the bottom of the file and make sure it lists localhost as well as your multisites. You should add the following if it's not there already:

```
127.0.0.1       localhost
127.0.0.1       site1
127.0.0.1       site2
```

Make sure this code is uncommented. Save this file.

Tweaking the Base URL

You should also make sure to tweak your Base URL setting in each of your site's `settings.php` files. Open each `settings.php` file and look for the Base URL section. You will need to uncomment the line of code that reads:

```
$base_url = 'http://localhost';  // NO trailing slash!
```

Make sure this has the URL address for your site. So the above is for the main localhost site and the following are for your multisites (in their respective `settings.php` files):

```
$base_url = 'http://site1';  // NO trailing slash!
$base_url = 'http://site2';  // NO trailing slash!
```

Loading your multisites

That's it! You are ready to fire up all of your sites in your web browser. First, load the main localhost site, which is your main core Drupal site. Load that by going to: `http://localhost/`.

Now load `site1`, which will be: `http://site1/`.

`Site2` will be: `http://site2/`.

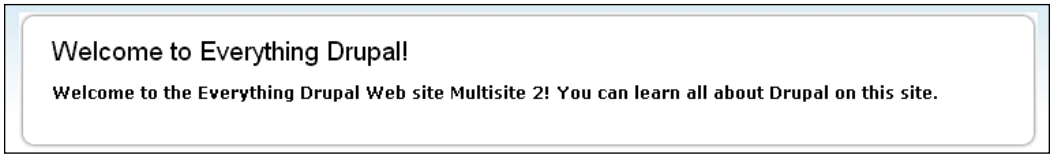
Each of these sites is now behaving as their own Drupal site with their own databases. We will now work with each site to show you how you can install and enable modules independently on each site or share core and contributed modules from site to site. Congratulations on getting multisite configured and working!

Testing your multisite configuration

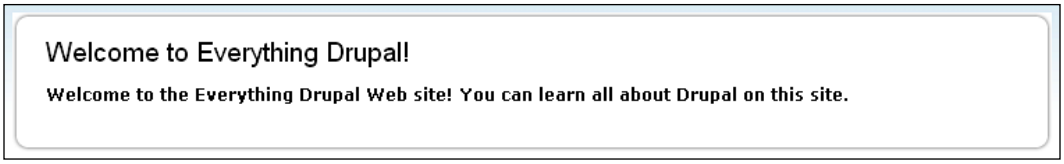
Now that we have Drupal multisite working in our localhost environment, let's go ahead and test it to make sure all three databases and sites are working correctly and independently. First, go to your `site2` site and login to it here: `http://site2/user`. Your username and password on this site will be the same as on your core site, as you simply duplicated the same database to use with this new multisite. Go ahead and login.

Now, if you have caching enabled on this site, let's disable the caching modules for the moment so that we can immediately see our content edits occur for anonymous users. Disable the Authcache and Memcache API modules if you have enabled them in `site2`, and also clear this site's database performance cache.

Now open one of your site's nodes and make some edits to the node. For example, I'm going to edit the home page pane content that states **Welcome to Everything Drupal!** and I'm going to add a note in that pane that specifies that this site is Drupal Web site Multisite 2!. Here's a screenshot of what that content looks like:



Now, logout of `site2` and browse back to your main localhost core site here: `http://localhost/`. Here you should not see the above text tweaks you made to the content on `site2`. Here it should look like your original, or:



This shows that content editing is working correctly in your multisite. The `site2` edits are posting to the `site2` database, but not to your core site's database.

Using core and contributed modules in multisite

One large benefit of using Drupal multisite is that you can install all of your core and contributed modules into the main core Drupal site installation and then enable or disable modules in each of your sites in your `/sites` folder. So your main site can run specific core and contributed modules while your multisites can run their own choice of core and contributed modules. Let's look at this in detail to see how it works. First, login to your core Drupal site and browse to the modules admin page to view the modules you have currently installed.

Notice that we have the Webform and Panels contributed modules installed on our core site. Let's leave all of these modules enabled on our core site. Now, login to one of your new multisite installs, such as `site1`, and browse to the modules admin page.

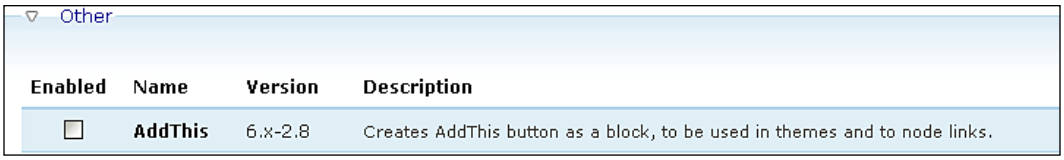
On `site1`, uncheck the boxes next to Webform and Panels to disable these modules, only on our `site1` site. Save the configuration on your modules page. This will disable these modules on `site1`. But if you browse back to your main localhost site, you will see that these contributed modules are still enabled. You will see the power and flexibility of Drupal multisite with this example.

Installing modules and themes to a multisite

Another flexible bonus to a multisite installation is the ability to install and enable contributed modules on your multisites, but not on your main core site. Here you just need to remember that when the contributed module receives a security upgrade or patch, you'll need to update the module in the `/sites/site/modules` folder for that specific site and then run `update.php` on that site so that the site updates the database schema correctly.

Let's go ahead and install and enable a module in our `site1` site. Download a module such as the Drupal **AddThis** Button module and extract this module in your `/sites/site1/modules` directory. If you do not have a `/modules` or `/themes` directory in `/sites/site1/`, make sure to create these folders. These will contain just the contributed modules and themes for your `/site1`.

Once extracted, browse to your `site1` modules page, you should see the **AddThis** module in your list. However, if you browse to your modules admin page in your localhost or your `site2` sites, you will not see the module in the list.



Once enabled, this **AddThis** module will show up in your `site1` administration menu. Look for **Site configuration | AddThis.** Browse to the **AddThis** configuration page. If you try this in `site2` or localhost, you will see that you cannot get to this configuration page, as the module is not enabled in those sites.

Setting themes per multisite

With Drupal multisite you can also set different themes as the default enabled theme on each multisite. So, we can run one specific theme, such as Garland, on our main localhost and a different core or contributed module on our `site1` and/or `site2`. Let's go ahead and try this. Leave the core Garland theme set as the default enabled theme on your localhost site. Then browse to your themes admin page in either `site1` or `site2` and enable a different core theme as your default enabled theme.

I'm going to set the `site1` theme to Bluemarine. I could also choose a contributed or custom theme if I have one installed in my `/site1/themes` folder. Save your theme configuration. You will also notice that if you have a contributed theme installed in your core site's `/sites/themes` folder, then these contributed themes will show up in your multisites' themes admin page and you can choose to enable those as well.

Now if you browse to your `site1` home page, you should see that Bluemarine is active as the default site theme. If you browse back to your localhost or `site2` sites, you will see that the Garland theme is still active and enabled.

Caching and multisite

As you work through these examples, you may notice that changes do not take effect immediately on each site or that if you make a change on `site1` or `site2`, then those changes also take effect on localhost. This is not supposed to happen. But if you have caching enabled from your previous single site experiments using Memcache API, Memcached, or Authcache, you will need to disable those modules and also comment out your caching code from your `settings.php` files.

You'll recall that the configuration instructions for enabling caching in a multisite environment are different from a single site environment. So, let's first disable the Memcache and Authcache code, and then come back to this to tweak later if we want to enable caching on our multisite environment.

Open your `settings.php` files and comment out the following lines (comment these out in each `settings.php` file):

```
#$conf['memcache_servers']  = array('localhost:11211' => 'default');
#$conf['cache_inc'] = './sites/all/modules/authcache/authcache.inc';
```

Now when you revisit your multisites, all of your tweaks and changes per site following the previous examples in this chapter should work without any issues.

Enabling page caching and CSS/JS optimization per site

With the Memcached disabled, you can visit your main site's performance admin page and enable page caching, compression, and CSS/JS optimization for each site. Then `site1` and `site2` could potentially run Drupal caching while you leave caching disabled on your localhost site.

In your `site1`, visit the main **Site configuration | Performance** page and set the page caching mode to **Normal**. Also, set a minimum cache lifetime, leave page compressions disabled, enable block cache, and optimize CSS and JavaScript files. Save configuration. Now you will have caching working on `site1`.

To run more advanced caching mechanisms in a multisite environment, you will need to review the configuration instructions for the respective module. For example, if you visit the Memcache API project page, you will see that there's an entire section devoted to Prefixing. If you have a multisite installation and you want to share the Memcached instance, you will need to add a unique prefix to each of the site's `settings.php` files in the `$conf` section. We already commented this code out, so we would need to go back to our `settings.php` file and tweak the Memcache `$conf` to make it look something like this:

```
$conf = array(
  'memcache_key_prefix' => 'site1',
);

The conf array for site2 would look something like this:
$conf = array(
  'memcache_key_prefix' => 'site2',
);
```

Earlier in the book, we discussed the Boost module. If you are using Boost to enhance performance on a multisite instance of Drupal, make sure to re-configure your Boost settings to support multisite. The Boost project page contains a wealth of resources and information on how to configure Boost for Drupal multisite. For example, if you are using Boost to cache directories and file extensions, you'll need to pay attention to the multisite information that the project page gives you regarding Boost directories and file extensions.

Multisite resources

If you continue using Drupal multisite, you will want to investigate how to configure multisite in various different environments, such as Linux, Mac, shared and dedicated servers. `Drupal.org` provides a wealth of resources on the Drupal multisite topic. There's an entire **Multi-site how-tos** page on `drupal.org` that contains links to various resources on Drupal. Everything, from installing multisite in 10 minutes to running multiple domains or virtual hosts using different databases, is covered. The Drupal multisite universe is a large one and will only become more flexible with the imminent release of Drupal 7.x. The Multisite resource guides are here on `drupal.org`: `http://drupal.org/node/43816`.

Summary

In this chapter, we installed and configured Drupal multisite in order to run multiple Drupal websites from the same core codebase, utilize contributed modules per multisite, and integrate with databases per site. We also discussed performance monitoring and caching in the Drupal multisite environment. You have successfully completed the following steps to configuring and setting up a Drupal multisite for fast performance:

- Installed Drupal multisite on Windows in a localhost development environment
- Set up multiple databases to support each site in our multisite
- Tweaked the `settings.php` file for each site in our multisite
- Edited the Apache configuration file to support `VirtualHosts`
- Tweaked the Windows hosts drivers to support our multiple sites and domain URLs
- Enabled modules and themes in each multisite site
- Discussed caching in a multisite environment
- Looked at multisite Drupal resources on `drupal.org`

You have successfully completed the *Drupal 6 Performance Tips* book and learned a wealth of information and resources about running your Drupal sites for faster optimized performance. To conclude, you should continue to work with Drupal daily and experiment with the myriad of performance, caching, and modular solutions that can help speed up your Drupal site and make it perform as well as possible. Drupal on!

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