Installation

There are three technical requirements for executing all of this book's examples: MySQL (the database application), PHP (the scripting language), and the Web server application (that PHP runs through). This appendix describes the installation of these tools on two different platforms—Windows 7 and Mac OS X. If you are using a hosted Web site, all of this will already be provided for you, but these products are all free and easy enough to install, so putting them on your own computer still makes sense.

After covering installation, the appendix discusses related issues that will be of importance to almost every user. First, I introduce how to create users in MySQL. Next, I demonstrate how to test your PHP and MySQL installation, showing techniques you'll want to use when you begin working on any server for the first time. Then, you'll learn how to configure PHP to change how it runs. Finally, and new in this edition of this book, I introduce how to change the Apache Web server's behavior, in order to address common needs.

Installation on Windows

Although you can certainly install a Web server (like Apache, Abyss, or IIS), PHP, and MySQL individually on a Windows computer, I strongly recommend you use an all-in-one installer instead. It's simply easier and more reliable to do so.

There are several all-in-one installers out there for Windows. The two mentioned most frequently are XAMPP (**`www.apachefriends.org`**) and WAMP (**`www.wampserver.com`**). For this appendix, I'll use XAMPP, which runs on most versions of Windows.

Along with Apache, PHP, and MySQL, XAMPP also installs:

- PEAR (PHP Extension and Application Repository), a library of PHP code
- Perl, a very popular programming language
- phpMyAdmin, the Web-based interface to a MySQL server
- A mail server (for sending email)
- Several useful extensions

At the time of this writing XAMPP (Version 1.7.4) installs PHP 5.3.5, MySQL 5.5.8, Apache 2.2.17, and phpMyAdmin 3.3.9.

I'll run through the installation process in these next steps. Note that if you have any problems, you can use the book's supporting forum (**www.LarryUllman.com/forums/**), but you'll probably have more luck turning to the XAMPP site (it is their product, after all). Also, the installer works really well and isn't that hard to use, so rather than detail every single step in the process, I'll highlight the most important considerations.

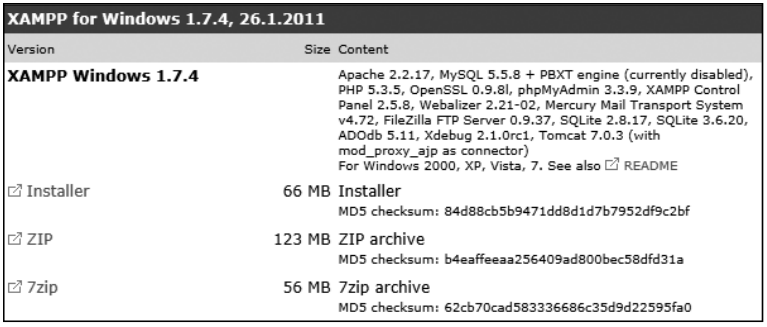
To install XAMPP on Windows:

1. Download the latest release of XAMPP for Windows from **www.apachefriends.org**.

   You'll need to click around a bit to find the download section, but eventually you'll come to an area where you can find the download Ⓐ. Then click *EXE*, which is the specific item you want.

2. On your computer, double-click the downloaded file in order to begin the installation process.

3. If prompted, install XAMPP somewhere other than in the Program Files directory.



XAMPP for Windows 1.7.4, 26.1.2011

Version	Size	Content
XAMPP Windows 1.7.4		Apache 2.2.17, MySQL 5.5.8 + PBXT engine (currently disabled), PHP 5.3.5, OpenSSL 0.9.8l, phpMyAdmin 3.3.9, XAMPP Control Panel 2.5.8, Webalizer 2.21-02, Mercury Mail Transport System v4.72, FileZilla FTP Server 0.9.37, SQLite 2.8.17, SQLite 3.6.20, ADOdb 5.11, Xdebug 2.1.0rc1, Tomcat 7.0.3 (with mod_proxy_ajp as connector) For Windows 2000, XP, Vista, 7. See also README
Installer	66 MB	Installer MD5 checksum: 84d88cb5b9471dd8d1d7b7952df9c2bf
ZIP	123 MB	ZIP archive MD5 checksum: b4eaffeeaa256409ad800bec58dfd31a
7zip	56 MB	7zip archive MD5 checksum: 62cb70cad583336686c35d9d22595fa0

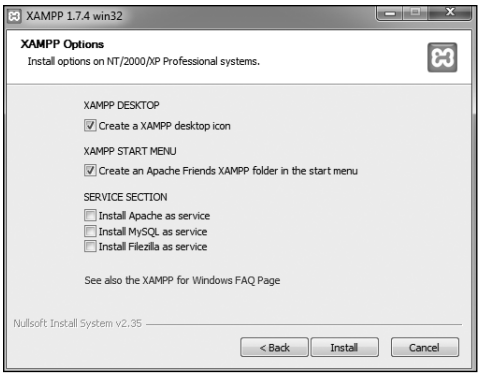
Ⓐ From the Apache Friends Web site, grab the latest installer for Windows.

On Firewalls

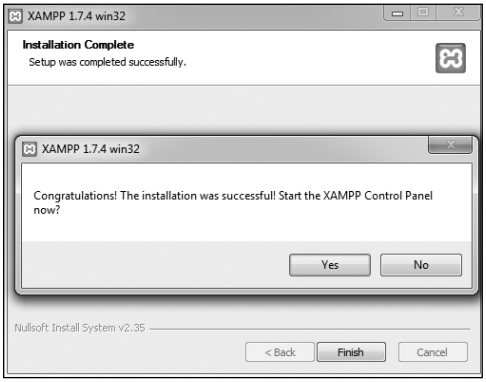
A firewall prevents communication over *ports* (a port is an access point to a computer). Versions of Windows starting with Service Pack 2 of XP include a built-in firewall. You can also download and install third-party firewalls. Firewalls improve the security of your computer, but they may also interfere with your ability to run Apache, MySQL, and some of the other tools used by XAMPP because they all use ports.

When running XAMPP, if you see a security prompt indicating that the firewall is blocking Apache, MySQL, or the like, choose Unblock or Allow, depending upon the version of Windows in use. Otherwise, you can configure your firewall manually (for example, on Windows 7, it's done through Control Panel > System and Security). The ports that need to be open are as follows: 80 (for Apache), 3306 (for MySQL), and 25 (for the Mercury mail server). If you have any problems starting or accessing one of these, disable your firewall and see if it works then. If so, you'll know the firewall is the problem and that it needs to be reconfigured.

Just to be clear, firewalls aren't found just on Windows, but in terms of the instructions in this appendix, the presence of a firewall will more likely trip up a Windows user than any other.



B Select what additional installation options you want.



C The installation of XAMPP is complete!

You shouldn't install it in the Program Files directory because of a permissions issue on some versions of Windows. I recommend installing XAMPP in your root directory (e.g., **C:**).

Wherever you decide to install the program, make note of that location, as you'll need to know it several other times as you work through this appendix.

4. If you want, create Desktop and Start Menu shortcuts B.
5. Continue through the remaining prompts, reading them and pressing Enter/Return to continue.
6. After the installation process has done its thing C, click Yes to start the control panel.

continues on next page

7. To start, stop, and configure XAMPP, use the XAMPP control panel ❶.
8. As needed, using the control panel, start Apache, MySQL, and Mercury.

   Apache has to be running for every chapter in this book. MySQL must be running for about half of the chapters. Mercury is the mail server that XAMPP installs. It needs to be running in order to send email using PHP (see Chapter 11, "Web Application Development").
9. Immediately set a password for the root MySQL user.

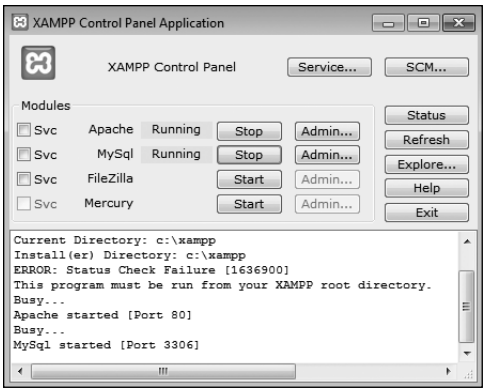
   How you do this is explained later in the appendix.

TIP The XAMPP control panel's various admin links will take you to different Web pages (on your server) and other resources ❷.

TIP See the "PHP Configuration" section to learn how to configure PHP by editing the `php.ini` file.

TIP Your Web root directory—where your PHP scripts should be placed in order to test them—is the `htdocs` folder in the directory where XAMPP was installed. Following these installation instructions, this would be `C:\xampp\htdocs`.

TIP When starting the XAMPP Control Panel using XAMPP 1.7.4 on a 64-bit version of Windows 7, I consistently saw an error message about a "Status Check Failure." I never figured out the cause, but the error didn't prevent XAMPP from being completely usable.



❶ The XAMPP control panel, used to manage the software.

❷ The Web-based splash page for XAMPP, linked from the control panel.

Installation on Mac OS X

Although Mac OS X comes with Apache built in, and installing MySQL is not that hard, I recommend that beginners take a more universally foolproof route and use the all-in-one MAMP installer (**www.mamp.info**). It's available in both free and commercial versions, is very easy to use, and won't affect the Apache server built into the operating system.

Along with Apache, PHP, and MySQL, MAMP also installs phpMyAdmin, the Web-based interface to a MySQL server, along with lots of useful PHP extensions. As of this writing, MAMP (Version 1.9.6.1) installs both PHP 5.2.13 and 5.3.2, in addition to MySQL 5.1.44, Apache 2.0.63, and phpMyAdmin 3.2.5.

I'll run through the installation process in these next steps. If you have any problems, you can use the book's supporting forum (**www.LarryUllman.com/forums/**), but you'll probably have more luck turning to the MAMP site (it is their product, after all). Also, the installer works really well and isn't that hard to use, so rather than detail every single step in the process, I'll highlight the most important considerations.

To install MAMP on Mac OS X:

1. Download the latest release of MAMP from **www.mamp.info**.

   On the front page, click *Downloads*, and then click *Download: MAMP & MAMP PRO 1.9.6.1* Ⓐ. (As new releases of MAMP come out, the link and filename will obviously change accordingly.)

   The same downloaded file is used for both products. In fact, MAMP Pro is just a nicer interface for controlling and customizing the same MAMP software.

continues on next page

Download: MAMP & MAMP PRO 1.9.6.1

Published: 2011-04-20

This download package contains the free MAMP and a free 14-day trial of MAMP PRO.
MAMP can be used stand-alone without MAMP PRO.

The trial Version of MAMP PRO can be upgraded to the full version by buying a serial number.
You can order a serial number at our shop.

All MAMP PRO updates in the current major version (1.x) are free of charge.
If you want to update MAMP PRO from e.g. 1.7.2 to 1.9.6.1 just use the serial number you already got.

- **Requirements:** min. Mac OS X 10.4
  (This version of MAMP & MAMP PRO is indeed compatible with Mac OS X 10.6 Snow Leopard.)
- **Platform:** Universal Binary
- **File type:** dmg
- **File size:** app. 199 MB
- **Translations MAMP:** English, French, German, Italian, Japanese, Russian, Spanish
- **Translations MAMP PRO:** English, German, Japanese

Ⓐ Download MAMP from this page at **www.mamp.info**.

2. On your computer, double-click the downloaded file in order to mount the disk image B.

3. Copy the MAMP folder from the disk image to your **`Applications`** folder.

   If you think you might prefer the commercial MAMP PRO, copy that folder as well (again, it's an interface to MAMP, so both folders are required). MAMP PRO comes with a free 14-day trial period.

   Whichever folder you choose, note that you must place it within the **`Applications`** folder. It cannot go in a subfolder or another directory on your computer.

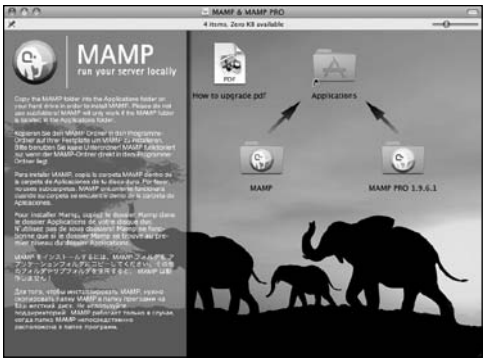
4. Open the **`/Applications/MAMP`** (or **`/Applications/MAMP PRO`**) folder.

5. Double-click the MAMP (or MAMP PRO) application to start the program C.

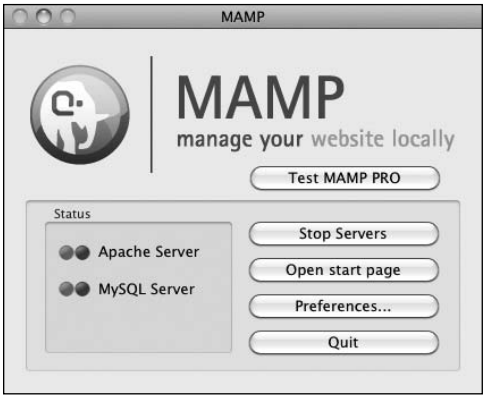
   It may take just a brief moment to start the servers, but then you'll see a result like that in C for MAMP or D for MAMP PRO.

   When starting MAMP, a start page should also open in your default Web browser E. Through this page you can view the version of PHP that's running, as well as how it's configured, and interface with the MySQL database using phpMyAdmin.

   With MAMP PRO, you can access that same page by clicking the WebStart button D.

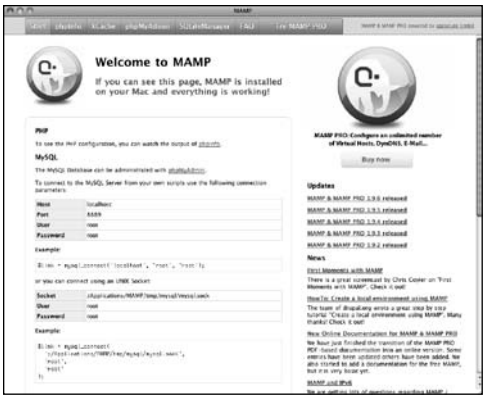


B The contents of the downloaded MAMP disk image.

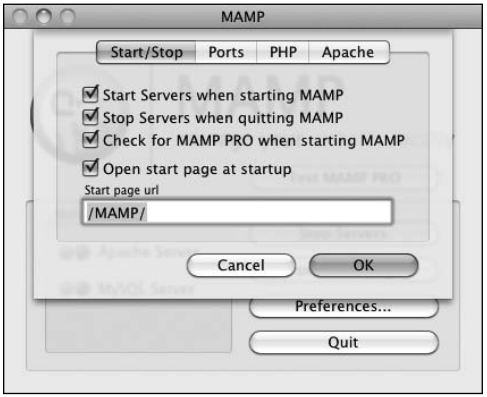


C The simple MAMP application, used to control and configure Apache, PHP, and MySQL.

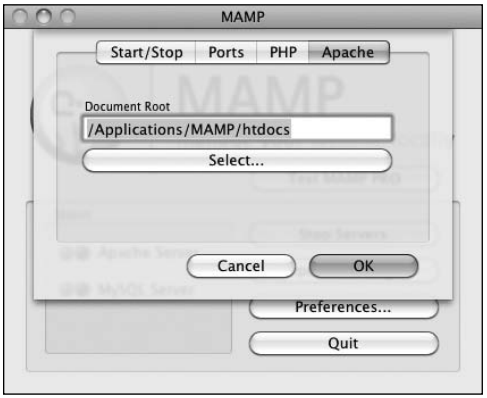
D The MAMP PRO application, used to control and configure Apache, PHP, MySQL, and more.



E The MAMP Web start page.



F These options dictate what happens when you start and stop the MAMP application.



G MAMP allows you to change where the Web documents are placed.

6. To start, stop, and configure MAMP, use the MAMP or MAMP PRO application C or D.

   There's not much to the MAMP application itself (which is a good thing), but if you click Preferences, you can tweak the application's behavior F, set the version of PHP to run, and more.

   MAMP PRO also makes it easy to create different *virtual hosts* (i.e., different sites; discussed separately later in this appendix), adjust how Apache is configured and runs, use dynamic DNS, change how email is sent, and more.

7. Immediately change the password for the root MySQL user.

   How you do this is explained later in the appendix.

TIP Personally, I appreciate how great MAMP alone is, and that it's free. I also don't like spending money, but I've found the purchase of MAMP PRO to be worth the relatively little money it costs.

TIP See the "PHP Configuration" section to learn how to configure PHP by editing the `php.ini` file.

TIP MAMP also comes with a Dashboard widget you can use to control the Apache and MySQL servers.

TIP Your Web root directory—where your PHP scripts should be placed in order to test them—is the `htdocs` folder in the directory where MAMP was installed. For a standard MAMP installation without alteration, this would be `Applications/MAMP/htdocs`.

TIP You may want to change the Apache Document Root G to the `Sites` directory in your home folder. By doing so, you assure that your Web documents will be backed up along with your other files (and you are performing regular backups, right?).

Managing MySQL Users

Once you've successfully installed MySQL, you can begin creating MySQL users. A MySQL user is a fundamental security concept, limiting access to, and influence over, stored data. Just to clarify, your databases can have several different users, just as your operating system might. But MySQL users are different from operating system users. While learning PHP and MySQL on your own computer, you don't necessarily need to create new users, but live production sites need to have dedicated MySQL users with appropriate permissions.

The initial MySQL installation comes with one user (named *root*) with no password set (except when using MAMP, which sets a default password of *root*). At the very least, you should create a new, secure password for the root user after installing MySQL. After that, you can create other users with more limited permissions. As a rule, you shouldn't use the root user for normal, day-to-day operations.

I'll walk you through both of these processes over the next couple of pages. Note that if you're using a hosted server, they'll likely create the MySQL users for you. These instructions require use of either the command-line mysql client or phpMyAdmin. If you don't know how to access either of these on your computer, quickly read the *Accessing MySQL* section of Chapter 4, "Introduction to MySQL."

Setting the root user password

When you install MySQL, no value—or no secure password—is established for the root user. This is certainly a security risk that should be remedied before you begin to use the server (as the root user has unlimited powers).

You can set any user's password using either phpMyAdmin or the mysql client, so long as the MySQL server is running. If MySQL isn't currently running, start it now using the steps outlined earlier in the appendix.

Second, you must be connected to MySQL as the root user in order to be able to change the root user's password.

To assign a password to the root user via the MySQL client:

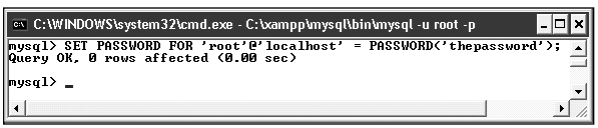
1. Connect to the MySQL client.

   See Chapter 4 for detailed instructions, if needed.

2. Enter the following command, replacing *thepassword* with the password you want to use Ⓐ:

   ```
   SET PASSWORD FOR 'root'@'
   →localhost' = PASSWORD
   →('thepassword');
   ```

   Keep in mind that passwords in MySQL are case-sensitive, so *Kazan* and *kazan* aren't interchangeable. The term **PASSWORD** that precedes the actual quoted password tells MySQL to encrypt that string. And there cannot be a space between *PASSWORD* and the opening parenthesis.



Ⓐ Updating the root user's password using SQL within the MySQL client.

3. Exit the MySQL client:

   ```
   exit
   ```

4. Test the new password by logging in to the MySQL client again.

   Now that a password has been established, you need to add the **`-p`** flag to the connection command. You'll see an *Enter password:* prompt, where you enter the just-created password.

To assign a password to the root user via phpMyAdmin:

1. Open phpMyAdmin in your Web browser.

   See the preceding set of steps for detailed instructions.

2. On the home page, click the Privileges tab.

   You can always click the home icon, in the upper-left corner, to get to the home page.

3. In the list of users, click the Edit Privileges icon on the root user's row ❶.

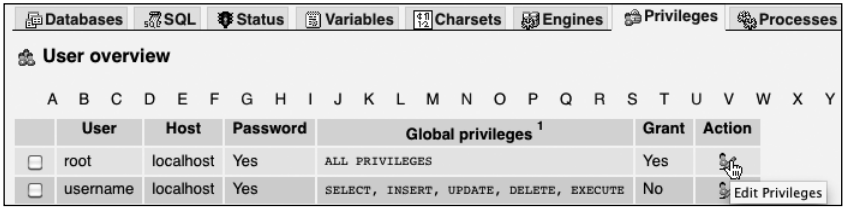
4. Use the Change Password form ❷, found farther down the resulting page, to change the password.

5. Change the root user's password in phpMyAdmin's configuration file, if necessary.

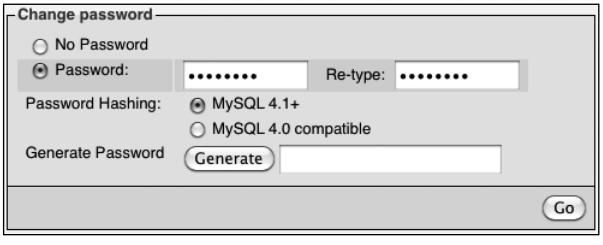
   The result of changing the root user's password will likely be that phpMyAdmin is denied access to the MySQL server. This is because phpMyAdmin, on a local server, normally connects to MySQL as the root user, with the root user's password hard-coded into a configuration file. After following Steps 1–4, find the **`config.inc.php`** file in the phpMyAdmin directory—likely **`/Applications/MAMP/bin/phpMyAdmin`** (Mac OS X with MAMP) or **`C:\xampp\phpMyAdmin`** (Windows with XAMPP). Open that file in any text editor or IDE and change this next line to use the new password:

   ```
   $cfg['Servers'][$i]['password']
   → = 'the_new_password';
   ```

   Then save the file and reload phpMyAdmin in your Web browser.



❶ The list of MySQL users, as shown in phpMyAdmin.



❷ The form for updating a MySQL user's password within phpMyAdmin.

Creating users and privileges

After you have MySQL successfully up and running, and after you've established a password for the root user, you can add other users. To improve the security of your databases, you should always create new users to access your databases rather than using the root user at all times.

The MySQL privileges system was designed to ensure proper authority for certain commands on specific databases. This technology is how a Web host, for example, can let several users access several databases without concern. Each user in the MySQL system can have specific capabilities on specific databases from specific hosts (computers). The root user—the MySQL root user, not the system's—has the most power and is used to create subusers, although subusers can be given rootlike powers (inadvisably so).

When a user attempts to do something with the MySQL server, MySQL first checks to see if the user has permission to connect to the server at all (based on the username, the user's host, the user's password, and the information in the *mysql* database's *user* table). Second, MySQL checks to see if the user has permission to run the specific SQL statement on the specific databases—for example, to select data, insert data, or create a new table. **Table A.1** lists most of the various privileges you can set on a user-by-user basis.

There are a handful of ways to set users and privileges in MySQL, but I'll start by discussing the **GRANT** command. The syntax goes like this:

```
GRANT privileges ON database.* TO
→'username'@'hostname' IDENTIFIED BY
→'password';
```

For the *privileges* aspect of this statement, you can list specific privileges from Table A.1, or you can allow for all of them by using **ALL** (which isn't prudent). The ***database*.*** part of the statement specifies which database and tables the user can work on. You can name specific tables using the ***database.tablename*** syntax or allow for every database with ***.*** (again, not prudent). Finally, you can specify the username, hostname, and a password.

The username has a maximum length of 16 characters. When creating a username, be sure to avoid spaces (use the underscore instead), and note that usernames are case-sensitive.

TABLE A.1 MySQL Privileges

PRIVILEGE	ALLOWS
SELECT	Read rows from tables.
INSERT	Add new rows of data to tables.
UPDATE	Alter existing data in tables.
DELETE	Remove existing data from tables.
INDEX	Create and drop indexes in tables.
ALTER	Modify the structure of a table.
CREATE	Create new tables or databases.
DROP	Delete existing tables or databases.
RELOAD	Reload the grant tables (and therefore enact user changes).
SHUTDOWN	Stop the MySQL server.
PROCESS	View and stop existing MySQL processes.
FILE	Import data into tables from text files.
GRANT	Create new users.
REVOKE	Remove users' permissions.

The hostname is the computer from which the user is allowed to connect. This could be a domain name, such as *www.example.com*, or an IP address. Normally, *localhost* is specified as the hostname, meaning that the MySQL user must be connecting from the same computer that the MySQL database is running on. To allow for any host, use the hostname wildcard character (**%**):

```
GRANT privileges ON database.*
→TO 'username'@'%' IDENTIFIED BY
→'password';
```

But that is also not recommended. When it comes to creating users, it's best to be explicit and confining.

The password has no length limit but is also case-sensitive. The passwords are encrypted in the MySQL database, meaning they can't be recovered in a plain text format. Omitting the **IDENTIFIED BY** '*password*' clause results in that user not being required to enter a password (which, once again, should be avoided).

As an example of this process, you'll create two new users with specific privileges on a new database named *temp*. Keep in mind that you can only grant permissions to users on existing databases. This next sequence will also show how to create a database.

To create new users:

1. Log in to the MySQL client as a root user.

   Use the steps explained in Chapter 4 to do this, if you don't already know. You must be logged in as a user capable of creating databases and other users.

2. Create the *temp* database:

   ```
   CREATE DATABASE temp;
   ```

   Creating a database is quite easy, using the preceding syntax. This command will work as long as you're connected as a user with the proper privileges.

3. Create a user that has basic-level privileges on the *temp* database ❶:

   ```
   GRANT SELECT, INSERT, UPDATE,
   →DELETE
   ON temp.* TO
   'webuser'@'localhost'
   IDENTIFIED BY 'BroWs1ng';
   ```

   The generic *webuser* user can browse through records (**SELECT** from tables) and add (**INSERT**), modify (**UPDATE**), or **DELETE** them. The user can only connect from *localhost* (from the same computer) and can only access the *temp* database.

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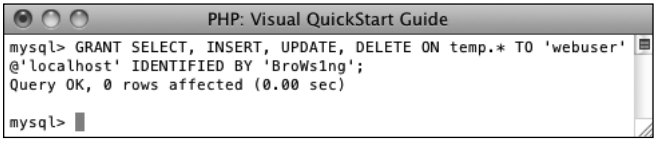


❶ Creating a user that can perform basic tasks on one database.

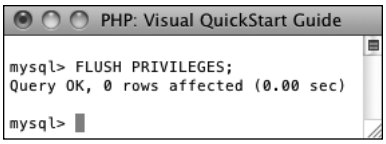
4. Apply the changes E:

```
FLUSH PRIVILEGES;
```

The changes just made won't take effect until you've told MySQL to reset the list of acceptable users and privileges, which is what this command does. Forgetting this step and then being unable to access the database using the newly created users is a common mistake.

TIP Any database whose name begins with *test_* can be modified by any user who has permission to connect to MySQL. Therefore, be careful not to create a database named this way unless it truly is experimental.

TIP The REVOKE command removes users and permissions.



E Don't forget this step before you try to access MySQL using the newly created users.

Creating Users in phpMyAdmin

To create users in phpMyAdmin, start by clicking the Privileges tab on the phpMyAdmin home page. On the Privileges page, click Add A New User. Complete the Add A New User form to define the user's name, host, password, and privileges. Then click Go. This creates the user with general privileges but no database-specific privileges.

On the resulting page, select the database to apply the user's privileges to and then click Go. On the next page, select the privileges this user should have on that database, and then click Go again. This completes the process of creating rights for that user on that database. Note that this process allows you to easily assign a user different rights on different databases.

Finally, click your way back to the Privileges tab on the home page and then click the reload the privileges link.

Testing Your Installation

Now that you've installed everything and created the necessary MySQL users, you should test the installation. Two quick PHP scripts can be used for this purpose. In all likelihood, if an error occurred, you would already know it by now, but these steps will allow you to perform tests on your (or any other) server before getting into complicated PHP, or PHP and MySQL, programming.

The first script being run is **phpinfo.php**. It both tests if PHP is enabled and shows a ton of information about the PHP installation. As simple as this script is, it is one of the most important scripts PHP developers ever write, in my opinion, because it provides so much valuable knowledge.

The second script will serve two purposes. It will first see if support for MySQL has been enabled. If not, you'll need to see the next section of this chapter to change that. The script will also test if the MySQL user has permission to connect to a specific MySQL database.

Script A.1 The **phpinfo.php** script tests and reports upon the PHP installation.

```
1   <?php
2   phpinfo( );
3   ?>
```

A The information for this server's PHP configuration.

To test PHP:

1. Create the following PHP document in a text editor or IDE (**Script A.1**):

   ```
   <?php
   phpinfo( );
   ?>
   ```

   The **phpinfo( )** function returns the configuration information for a PHP installation in a table. It's the perfect tool to test that PHP is working properly.

   You can use almost any application to create your PHP script as long as it can save the file in a plain text format.

2. Save the file as **phpinfo.php**.

   You need to be certain that the file's extension is just **.php**. Be careful when using Notepad on Windows, as it will secretly append **.txt**. Similarly, TextEdit on Mac OS X wants to save everything as **.rtf**.

3. Place the file in the proper directory on your server.

   What the proper directory is depends upon your operating system and your Web server. If you are using a hosted site, check with the hosting company. For Windows users who installed XAMPP, the directory is called **htdocs** and is within the XAMPP directory. For Mac OS X users who installed MAMP, the default directory is called **htdocs**, found within the MAMP folder.

4. Test the PHP script by accessing it in your Web browser A.

   Run this script in your Web browser by going to **http://*your.url.here*/phpinfo.php**. On your own computer, this may be something like **http://localhost/phpinfo.php** (Windows with XAMPP) or **http://localhost:8888/phpinfo.php** (Mac OS X with MAMP).

To test PHP and MySQL:

1. Create a new PHP document in your text editor or IDE (**Script A.2**):

```
<?php
mysqli_connect ('localhost',
'webuser', 'BroWsIng', 'temp');
?>
```

   This script will attempt to connect to the MySQL server using the username and password just established in this appendix.

2. Save the file as **mysqli_test.php**, place it in the proper directory for your Web server, and test it in your Web browser.

   If the script was able to connect, the result will be a blank page. If it could not connect, you should see an error message like B. Most likely this indicates a problem with the MySQL user's privileges or the provided information (see the preceding section of this chapter).

   If you see an error like in C, this means that PHP does not have MySQL support enabled. See the next section of this chapter for the solution.

TIP **For security reasons, you should not leave the phpinfo.php script on a live server because it gives away too much information.**

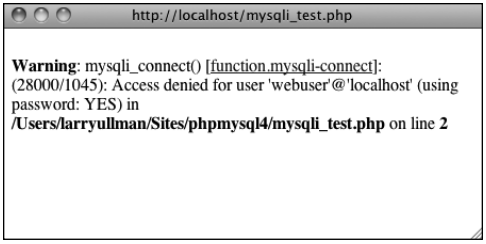
TIP **If you run a PHP script in your Web browser and it attempts to download the file, then your Web server is not recognizing that file extension as PHP. Check your Apache (or other Web server) configuration to correct this.**

TIP **PHP scripts must always be run from a URL starting with *http://*. They cannot be run directly off a hard drive (as if you had opened it in your browser).**

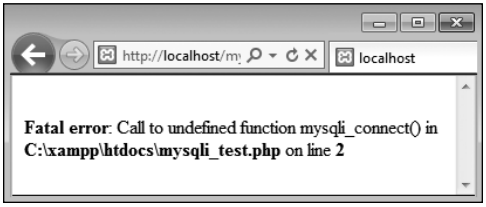
TIP **If a PHP script cannot connect to a MySQL server, it is normally because of a permissions issue. Double-check the username, password, and host being used, and be absolutely certain to flush the MySQL privileges.**

Script A.2 The **mysqli_test.php** script tests for MySQL support in PHP and if the proper MySQL user privileges have been set.

```
1   <?php
2   mysqli_connect ('localhost', 'webuser',
    'BroWsIng', 'temp');
3   ?>
```



B The script was not able to connect to the MySQL server.



C The script was not able to connect to the MySQL server because PHP does not have MySQL support enabled.

Configuring PHP

One of the benefits of installing PHP on your own computer is that you can configure it however you prefer. How PHP runs is determined by the **php.ini** configuration file, which is normally created when PHP is installed.

Changing PHP's behavior is very simple and will most likely be required at some point in time. Just a few of the things you'll want to consider adjusting are

- Whether or not *display_errors* is on
- The default level of error reporting
- Support for the Improved MySQL Extension functions
- SMTP values for sending emails

What each of these means—if you don't already know—is covered in the book's chapters and in the PHP manual. But for starters, I would highly recommend that you make sure that *display_errors* is on and that you set error reporting to its highest level.

Changing PHP's configuration is really simple. The short version is: edit the **php.ini** file and then restart the Web server. But because many different problems can arise, I'll cover configuration in more detail. If you are looking to enable support for an extension, like the MySQL functions, the configuration is more complicated (see the sidebar).

Enabling Extension Support

Many PHP configuration options can be altered by just editing the **php.ini** file. But enabling (or disabling) an extension—in other words, adding support for extended functionality—requires more effort. To enable support for an extension for just a single PHP page, you can use the **dl( )** function. To enable support for an extension for all PHP scripts requires a bit of work. Unfortunately, for Unix and Mac OS X users, you'll need to rebuild PHP with support for this new extension (a process that's not for the faint of heart). Windows users have it easier:

First, edit the **php.ini** file (see the steps in this section), removing the semicolon before the extension you want to enable. For example, to enable Improved MySQL Extension support, you'll need to find the line that says

```
;extension=php_mysqli.dll
```

and remove that semicolon.

Next, find the line that sets the *extension__dir* and adjust this for your PHP installation. Assuming you installed PHP using XAMPP into **C:\xampp**, then your **php.ini** file should say

```
extension_dir = "C:/xampp/php/ext"
```

This tells PHP where to find the extension.

Next, make sure that the actual extension file, **php_mysqli.dll** in this example, exists in the extension directory.

Save the **php.ini** file and restart your Web server. If the restart process indicates an error finding the extension, double-check to make sure that the extension exists in the *extension_dir* and that your pathnames are correct. If you continue to have problems, search the Web or use the book's corresponding forum for assistance.

To alter PHP's configuration:

1. In your Web browser, execute a script that invokes the **`phpinfo( )`** function.

   The **`phpinfo( )`** function, discussed in the previous section of the appendix (see A), reveals oodles of information about the PHP installation.

2. In the browser's output, search for Loaded Configuration File **A**.

   The value next to this text is the location of the active configuration file. This will be something like **`C:\xampp\php\php.ini`** or **`/ /Applications/MAMP/conf/php5.3/php.ini`**. Your server may have multiple **`php.ini`** files on it, but this is the one that counts.

   If there is no value for the Loaded Configuration File, your server has no active **`php.ini`** file. In that case, you'll need to download the PHP source code, from **`www.php.net`**, to find a sample configuration file.

3. Open the **`php.ini`** file in any text editor.

   If you go to the directory listed and there's no **`php.ini`** file there, you'll need to download this file from the PHP Web site (it's part of the PHP source code).

4. Make any changes you want, keeping in mind the following:

   - Comments are marked using a semicolon. Anything after the semicolon is ignored.
   - Instructions on what most of the settings mean are included in the file.
   - The top of the file lists general information with examples. Do not change these values! Change the settings where they appear later in the file.

Configuration File (php.ini) Path	C:\Windows
Loaded Configuration File	C:\xampp\php\php.ini

A Use a **`phpinfo( )`** script to confirm the active PHP configuration file to be edited.

Enabling Mail

The PHP **`mail()`** function works only if the computer running PHP has access to sendmail or another mail server. One way to enable the **`mail()`** function is to set the **`smtp`** value in the **`php.ini`** file (for Windows only). This approach works, for example, if your Internet provider has an SMTP address you can use. Unfortunately, you can't use this value if your ISP's SMTP server requires authentication.

For Windows, there are also a number of free SMTP servers, like Mercury. It's installed along with XAMPP, or you can install it yourself if you're not using XAMPP.

Mac OS X comes with a mail server installed—postfix and/or sendmail—that needs to be enabled. Search Google for instructions on manually enabling your mail server on Mac OS X.

Alternatively, you can search some of the PHP code libraries to learn how to use an SMTP server that requires authentication.

- For safety purposes, don't change any original settings. Just comment them out (by preceding the line with a semicolon) and then add the new, modified line afterward.
- Add a comment (using the semicolon) to mark what changes you made and when. For example:

```
; display_errors = Off
; Next line added by LEU
08/28/2011
display_errors = On
```

5. Save the **`php.ini`** file.
6. Restart your Web server.

   You do not have to restart the entire computer, just the Web serving application (Apache, IIS, etc.). How you do this depends upon the application being used, the operating system, and the installation method. Windows users can use the XAMPP Control Panel. Mac OS X users can use the MAMP Control Panel. Unix users can normally just enter **`apachectl graceful`** in a Terminal window.
7. Rerun the **`phpinfo.php`** script to make sure the changes took effect.

TIP If you edit the `php.ini` file and restart the Web server but your changes don't take effect, make sure you're editing the proper `php.ini` file (you may have more than one on your computer).

TIP MAMP PRO on Mac OS X uses a template for the `php.ini` file that must be edited within MAMP PRO itself. To change the PHP settings when using MAMP PRO, select File > Edit Template > PHP *X.X.X* php.ini.

Configuring Apache

New in this edition of this book is this section, providing an introduction to configuring the Apache Web server. Like PHP, Apache is an open-source technology, and has become a dominant force in Web technologies. If you installed either XAMPP or MAMP on your computer, you now have a functional version of Apache. If you're using a hosted Web site, more than likely you're being provided with Apache there as well.

Once Apache with support for PHP has successfully been installed, many PHP programmers never think twice about the Web server. But as you continue to learn about Web development, picking up a bit more knowledge of Apache is a logical next step.

The most common reasons you'll need to know more about Apache include being able to do the following:

- Create virtual hosts
- Add Secure Sockets Layer (SSL) support
- Protect directories
- Enable URL rewrites

These, and other changes to Apache's behavior, can be made in two ways: by editing the primary configuration file or by creating directory-specific files. The primary configuration file is **`httpd.conf`**, found within a **`conf`** directory, and it dictates how the entire Apache Web server runs. An **`.htaccess`** file (pronounced "H-T access") is placed within the Web directories and is used to affect how Apache behaves within just that folder and subfolders.

Generally speaking, it's preferred to make changes in the **`httpd.conf`** file, as this file only needs to be read by the Web server each time the server is started. Conversely, **`.htaccess`** files must be read by the Web server once for every request to that which an **`.htaccess`** file might apply. For example, if you have **`www.example.com/somedir/.htaccess`**, any request to **`www.example.com/somedir/`*`whatever`*** requires reading the **`.htaccess`** file, as well as reading an **`.htaccess`** file that might exist in **`www.example.com/`**. On the other hand, in shared hosting environments, individual users are not allowed to customize the entire Apache configuration, but may be allowed to use **`.htaccess`** to make changes that only affect their sites.

Over the next few pages, I'll explain some of the fundamentals for working with these two types of files. In the process, you'll learn how to perform some standard Apache customizations.

TIP To be safe, I'd recommend making a backup copy of your original Apache configuration file, before pursuing any of the subsequent edits.

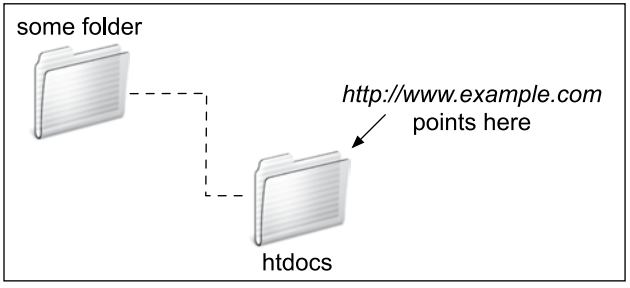
TIP In this book, I cannot adequately explain how to enable HTTPS (HTTP over an SSL) as the key component—obtaining and installing an SSL certificate varies too much from one person and server to the next. Look online for specific details, or post a message in my support forums (`www.LarryUllman.com/forums/`), if you need assistance. If you have a hosted account wherein you want to enable SSL, speak with your hosting company.

Creating Virtual Hosts

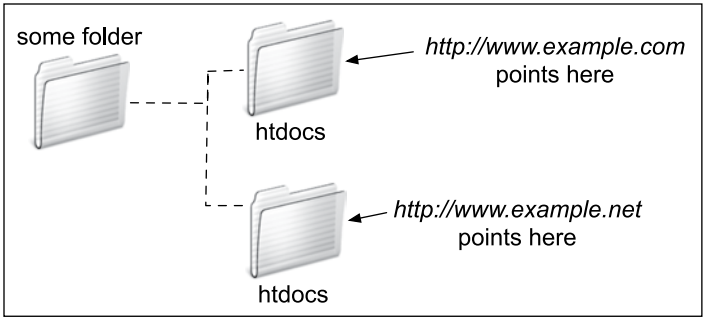
When you install Apache on a computer, Apache is set up to serve one Web site, such as **www.example.com**. For the Web site being served, Apache associates a hostname (and/or an IP address) with a directory on the server, called the *Web document root*. When a user visits **www.example.com**, Apache provides files from that site's directory Ⓐ.

But Apache can easily be configured to serve several different sites, all hosted on the same computer, by creating *virtual hosts*. After establishing one or more virtual hosts, Apache will know that when a user makes a request of **www.example.com**, documents from X directory should be served, but requests of **www.example.net** should be pointed to the documents from Y directory Ⓑ.

Understand that setting up virtual hosts does not, in fact, make **www.example.com** or **www.example.net** a valid domain name, accessible over the Internet. Accomplishing that requires use of DNS (Domain Name System), a much more complicated subject. You can, however, use virtual hosts to create different hosts for your own development projects on your home computer, as explained in the following sequence.



Ⓐ The Web server associates a URL or hostname with a directory or file on the computer.



Ⓑ Thanks to virtual hosts, different directories on the computer can be associated with different hostnames.

To create a virtual host:

1. Open **`httpd.conf`** in any text editor or IDE.

   If you're using XAMPP on Windows, the file to open is **`C:\xampp\apache\conf\httpd.conf`** (assuming XAMPP is installed in the root of the C drive). If you're using MAMP on Mac OS X, the file to open is **`/Applications/MAMP/conf/apache/httpd.conf`**. Note that if you're using MAMP Pro, virtual hosts are created within that application's control panel.

2. At the very end of the configuration file, add:

   ```
   NameVirtualHost 127.0.0.1
   ```

   Virtual hosts are conventionally defined at the end of the configuration file (or in a separate configuration file, to be included by this one). This line says that Apache should watch for *named* virtual hosts (as opposed to IP address-based virtual hosts) on the 127.0.0.1 IP address. This is a special IP address, always equating to *localhost* (i.e., this same computer).

   Depending upon your server, this line may already be present in the configuration file, but prefaced by a **#**, which makes it a comment (i.e., renders it ineffectual). In that case, just remove the **#**.

3. On the next line, add:

   ```
   <VirtualHost 127.0.0.1>
   </VirtualHost>
   ```

   The **`VirtualHost`** tags are used to create a new virtual host. For each opening tag, there needs to be a closing one. Within the opening tag, the IP address or hostname to watch for is identified, here: 127.0.0.1. This value needs to match that used on the **`NameVirtualHost`** line.

   The rest of the virtual host definition will go between these opening and closing tags.

4. Within the virtual host tags, add:

   ```
   DocumentRoot /path/to/folder
   ServerName servername
   ```

   The **`DocumentRoot`** directive indicates the Web root directory for the virtual host: in other words, where the actual files for this site can be found. On XAMPP on Windows, this value might be **`C:/xampp/htdocs/something`**. On MAMP on Mac OS X, this value might be **`/Applications/MAMP/htdocs/something`**.

   The **`ServerName`** is where you put the *hostname*: what you'll enter into the browser to access this site.

   As an example, if you wanted to create a virtual host for the forums site from Chapter 17, "Example—Message Board," you could create a new folder within **`htdocs`**, called **`forums`**, and copy all of the applicable scripts there. Then you would use **`C:/xampp/htdocs/forums`** or **`/Applications/MAMP/htdocs/forums`** as the **`DocumentRoot`** value. For the **`ServerName`** value, I would use something meaningful, such as **`forums.local`**: a local version of a forums site.

5. Add a second virtual host for localhost C:

```
<VirtualHost 127.0.0.1>
  DocumentRoot "C:/xampp/htdocs"
  ServerName localhost
</VirtualHost>
```

   The previous set of steps created a new virtual host, but in the process, the one original Web site (*localhost*, the default for your own computer) will become unusable. The fix is to create another virtual host for that site.

6. Save the configuration file.

7. Restart Apache.

   Any changes to the configuration file will not take effect until the Web server is restarted. You can restart Apache using the XAMPP or MAMP control panel.

   If there is an error in the configuration file, Apache will not be able to start and you'll need to check the error logs to find out why.

   Note that you can't access the virtual host using your browser yet, as you still need to update your computer's list of hosts.

TIP The default Apache configuration file, `httpd.conf`, has comments in it indicating what each section of code does. You can browse through it to learn some things about configuring Apache.

TIP The `DocumentRoot` value, or any value in the `httpd.conf` file, must be quoted if it contains spaces.

TIP The definition of a virtual host can contain other directives, but I'm trying to introduce these fundamental Apache concepts as simply as possible.

TIP It's actually preferable to have Apache only listen for activity on a specific port, commonly 80. In that case, the virtual hosts configuration would start

```
NameVirtualHost 127.0.0.1:80
<VirtualHost 127.0.0.1:80>
```

But as MAMP on Mac OS X, and XAMPP, depending upon possible conflicts, don't always use port 80, I'm using code that's most foolproof.

TIP On a full-scale Web server, it's preferable to create multiple configuration files, which will then be read and used by the primary configuration file. On your own personal computer, without too much customization, a single configuration file is fine.

```
512  # Enable virtual hosting:
513  NameVirtualHost 127.0.0.1
514
515  # Add a virtual host for the forums site:
516  <VirtualHost 127.0.0.1>
517      DocumentRoot "C:/xampp/htdocs/forums"
518      ServerName forums.local
519  </VirtualHost>
520
521  # Add localhost:
522  <VirtualHost 127.0.0.1>
523      DocumentRoot "C:/xampp/htdocs"
524      ServerName localhost
525  </VirtualHost>
```

C The new directives added to the end of the Apache configuration file.

Updating Your Computer's Hosts

The previous sequence of steps created a virtual host in Apache, allowing you to access, in this example, the forums Web site by going to **`http://forums.local`** in your Web browser. There is a catch, however: if you were to enter that URL into your browser, the browser would attempt to find **`forums.local`** on the Internet, and would be unable to do so ❶. To solve this dilemma, you need to tell your browser(s) that **`forums.local`** can be found on your computer. This is done by modifying your operating system's **`hosts`** file, per these directions.

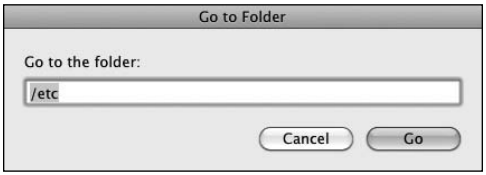
To update your computer's hosts:

1. Open your computer's **`hosts`** file in any text editor or IDE.

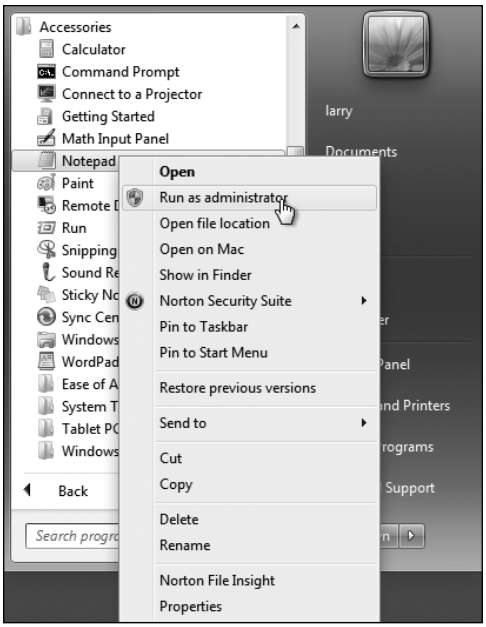
   This is the only tricky part of this process: finding and opening the **`hosts`** file. On Mac OS X and Unix, the hosts file is **`/etc/hosts`** (there's no file extension), where **`/`** refers to the computer's root directory. On Mac OS X, **`/etc`** is a *hidden* directory, making **`hosts`** a hidden file. There are three easy ways of finding this file:

   - Use your editing application to open it directly, if the application is capable of opening hidden files.
   - In the Finder, select Go > Go To Folder, and enter **`/etc`** in the prompt ❷ to open the **`/etc`** directory in the Finder. Then drag the **`hosts`** file onto the editing application in the Dock.
   - Use the Terminal to find and open the file.

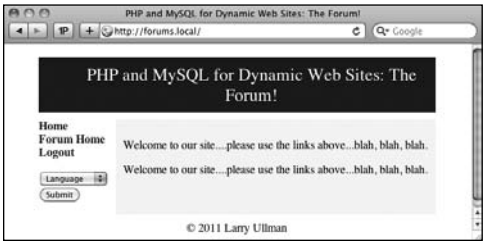
❶ The error that Internet Explorer displays when it can't find the local virtual host.



❷ The Finder's Go > Go to Folder option can be used to access hidden directories.



F You can open Notepad in administrator mode in order to edit system files.



G The forums site, available locally through the URL `http://forums.local`.

On Windows, baring a nonstandard installation, the file in question is `C:\Windows\System32\drivers\etc\hosts`. Unfortunately, you may have permissions issues in trying to edit this file. I had good luck by opening Notepad in administrator mode (right-click on Notepad in the Start Menu to be given this option F), and then opening the file within Notepad.

2. At the very end of the file, add:

```
127.0.0.1  forums.local
```

This associates the name *forums.local* with the IP address 127.0.0.1, which is to say the same computer.

3. Save the file.
4. Load `http://forums.local` in your Web browser G.

TIP Repeat these two sequences of steps—creating the virtual host in Apache and adding the host to your hosts file—any time you want to create a new Web site project with its own associated hostname.

Using .htaccess Files

As already stated, all Apache configuration can actually be accomplished within the `httpd.conf` file. In fact, doing so is preferred. But the configuration file is not always available for you to edit, so it's worth also knowing how to use `.htaccess` files to change how a site functions.

An `.htaccess` file is just a plain-text file, with the name `.htaccess` (again, no file extension, and the initial period makes this a hidden file). When placed within a Web directory, the directives defined in the `.htaccess` file will apply to that directory and its subdirectories.

continues on next page

A common hang-up when using **.htaccess** files is that permission has to be granted to allow **.htaccess** to make server behavior changes. Depending upon the installation and configuration, Apache, on the strictest level of security, will not allow **.htaccess** files to change Apache behavior. This is accomplished with code like the following, in **httpd.conf**:

```
<Directory />
AllowOverride None
</Directory>
```

The **Directory** directive is used within **httpd.conf** to modify Apache's behavior within a specific directory. In the above code, the root directory (**/**) is the target, meaning that Apache will not allow overrides—changes—made within any directories on the computer at all. Prior to creating **.htaccess** files, then, the main configuration file must be set to allow overrides in the applicable Web directory (or directories).

The **AllowOverride** directive takes one or more flags indicating what, specifically, can be overridden:

- *AuthConfig*, for using authorization and authentication
- *FileInfo*, for performing redirects and URL rewriting
- *Indexes*, for listing directory contents
- *Limit*, for restricting access to the directory
- *Options*, for setting directory behavior, such as the ability to execute CGI scripts or to index folder contents
- *All*
- *None*

Setting the Default Directory Page

Commonly, Web browsers make requests without specifying a file, such as **www.example.com/** or **www.example.com/*folder/***. In these cases, Apache must make a decision as to what to do. Historically, Apache provides an **index.htm** or **index.html** file, if one exists in the directory. If no index file exists, and if directory browsing is allowed by the server, Apache will instead reveal a list of files in the directory (this is not secure, but you've no doubt seen this online before).

The applicable directive to tell Apache what to do in these situations is **DirectoryIndex**. Following it, you list the file to use as the folder's index, with multiple options placed in order of preference. For example, the following will attempt to load **index.htm**, then **index.html**, if **index.htm** does not exist, then **index.php**, if **index.html** does not exist:

```
DirectoryIndex index.htm index.html index.php
```

Similarly, the **ErrorDocument** directive tells Apache what file to provide when a server error occurs. Its syntax is

```
ErrorDocument error_code /page.html
```

The error code value comes from the server status codes, such as 401 (Unauthorized), 403 (Forbidden), and 500 (Internal Server Error). For each code you can dictate what page should be served. Note that you'll want to provide an absolute path to the error files (i.e., start them with **/**, which is the Web root directory).

For example, to allow *AuthConfig* and *FileInfo* to be overridden within the forums directory (just created), the **httpd.conf** file should include:

```
<Directory /path/to/forums>
AllowOverride AuthConfig FileInfo
</Directory>
```

As long as this code comes after any **AllowOverride None** block, an **.htaccess** file in the **forums** directory will be able to make some changes to Apache's behavior when serving files from that directory (and its subdirectories).

To allow .htaccess overrides:

1. Open **httpd.conf** in any text editor or IDE.
2. Within the **VirtualHost** tag for the site in question, add:

   ```
   <Directory /path/to/directory>
   </Directory>
   ```

   The **Directory** tag is how you customize Apache behavior within a specific directory or its subdirectories. Within the opening tag, provide an absolute path to the directory in question, such as **C:\xampp\htdocs\somedir** or **/Applications/MAMP/htdocs/somedir**.
3. Within the **Directory** tags, add ❶:

   ```
   AllowOverride All
   ```

   This is a heavy-handed solution, but will do the trick. On a live, publicly available server, you'd want to be more specific about what exact settings can be overridden, but on your home computer, this won't be a problem.
4. Save the configuration file.
5. Restart Apache.

TIP The Directory directive does not have to go within the VirtualHost tag for the involved site, but it makes sense to place it there.

TIP If a directory is not allowed to override a setting, the .htaccess file will just be ignored.

TIP Anything accomplished within an .htaccess file can also be achieved using a Directory tag within httpd.conf.

```
512 # Enable virtual hosting:
513 NameVirtualHost 127.0.0.1
514
515 # Add a virtual host for the forums site:
516 <VirtualHost 127.0.0.1>
517     DocumentRoot "C:/xampp/htdocs/forums"
518     ServerName forums.local
519
520     # Allow overrides in this site:
521     <Directory "C:/xampp/htdocs/forums">
522     AllowOverride All
523     </Directory>
524
525 </VirtualHost>
```

❶ The updated virtual hosts configuration, now allowing for overrides within the forums Web directory.

Protected Directories

A common use of an **.htaccess** file is to protect the contents of a directory. There are two possible scenarios:

- Denying all access
- Restricting access to authorized users

Strange as it may initially sound, there are plenty of situations in which files and folders placed in the Web directory should be made unavailable. For example, you could create an **includes** directory that has sensitive PHP scripts or an **uploads** directory for storing uploaded files. In both cases, the contents of the directory would not be meant for direct access, but rather PHP scripts in other directories would reference that content as needed. To deny all access to a directory, place the code in **Script A.3** in an **.htaccess** file in that folder (comments indicate what each line does).

Again, this code just prevents direct access to that directory's contents via a Web browser. A PHP script could still use **include( )**, **require( )**, **readfile( )**, and other functions to access that content. In fact, the **show_image.php** script from Chapter 11 does exactly that: acting as a *proxy script* to display an image stored outside of the Web document root (i.e., otherwise unavailable in the Web browser).

There are a couple of ways of restricting access to authorized users, with the **mod_auth** module being the most basic and common. This module creates prompts in the browser wherein the user can enter her or his credentials ❶. Apache will compare those credentials to those stored in a file on the server, allowing or denying access accordingly. It's not hard to use **mod_auth**, but you have to invoke a secondary Apache tool to create the credentials file. If you want to pursue this route, just do a search online for Apache **mod_auth**.

TIP Apache will not display .htaccess files in the Web browser, by default, which is a smart security approach.

TIP When creating .htaccess files, make sure your text editor or IDE is not secretly adding a .txt extension. Notepad, for example, will do this. You can confirm this has happened if you can load www.example.com/.htaccess.txt in your Web browser. In Notepad, you can prevent the added extension by quoting the file name and saving it as type "All files".

Script A.3 This code, in an **.htaccess** file, will deny all access to the contents of a directory, and its subdirectories.

```
1   # Disable directory browsing:
2   Options All -Indexes
3
4   # Prevent folder listing:
5   IndexIgnore *
6
7   # Prevent access to any file:
8   <FilesMatch "^.*$">
9   Order Allow,Deny
10  Deny from all
11  </FilesMatch>
```

❶ This prompt, as displayed in Internet Explorer on Windows, is generated by Apache to limit access to authenticated users.

Enabling URL Rewriting

The final topic to be discussed in this appendix is how to perform *URL rewriting*. URL rewriting has gained attention as part of the overbearing focus on *Search Engine Optimization* (SEO), but URL rewriting has been a useful tool for years. With a dynamically driven site, like an e-commerce store, a value will often be passed to a page in the URL to indicate what category of products to display, resulting in URLs such as **www.example.com/category.php?id=23**. The PHP script, **category.php**, would then use the value of **$_GET['id']** to know what products to pull from the database and display. (There are oodles of similar examples in this book.)

With URL rewriting applied, the URL shown in the browser, visible to the end user, and referenced in search engine results, can be transformed into something more obviously meaningful, such as **www.example.com/category/23/** or, better yet, **www.example.com/category/garden+gnomes/**. Apache, via URL rewriting, takes the more user-friendly URL and parses it into something usable by the PHP scripts. This is made possible by the Apache **mod_rewrite** module. To use it, the **.htaccess** file must first check for the module and turn on the rewrite engine:

```
<IfModule mod_rewrite.c>
RewriteEngine on
</IfModule>
```

After enabling the engine, and before the closing **IfModule** tag, you add rules dictating the rewrites. The syntax is:

```
RewriteRule match rewrite
```

For example, you could do the following (although it's not a good use of **mod_rewrite**):

```
RewriteRule somepage.php otherpage.php
```

Part of the complication with performing URL rewrites is that Perl-Compatible Regular Expressions (PCRE) are needed to most flexibly find matches. If you're not already comfortable with regular expressions, you'll need to read Chapter 14, "Perl-Compatible Regular Expressions," to follow the rest of this material.

For example, to treat **www.example.com/category/23** as if it were **www.example.com/category.php?id=23**, you would have the following rule:

```
RewriteRule ^category/([0-9]+)/?$
→ category.php?id=$1
```

The initial caret (^) says that the expression must match the beginning of the string. After that should be the word *category*, followed by a slash. Then, any quantity of digits follows, concluding with an optional slash (allowing for both *category/23* and *category/23/*). The dollar sign closes the match, meaning that nothing can follow the optional slash. That's the pattern for the example match (and it's a simple pattern at that, really).

The rewrite part is what will actually be executed, unbeknownst to the Web browser and the end user. In this line, that's **category.php?id=$1**. The *$1* is a *backreference* to the first parenthetical grouping in the match (e.g., 23). Thus, **www.example.com/category/23** is treated by the server as if the URL was actually **www.example.com/category.php?id=23**.

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This is the underlying premise with **mod_rewrite**. Unfortunately, mastering **mod_rewrite** requires mastery, or near mastery, of PCRE, which can be daunting. If you want to practice this, you can take the simple example just explained and apply it to any of the examples in the book in which a value is passed in the URL. For example, in Chapter 10, "Common Programming Techniques," a user ID is passed in the URL to **delete_user.php** and **edit_user.php**. Both could be transformed into "prettier" URLs, such as **www.example.com/delete/45/** or **www.example.com/edit/895/**.

As always, search online for more information on this subject, should you be interested, and post a question in the supporting forums (**www.LarryUllman.com/forums/**) if you run into problems.

Changing PHP's Configuration

If PHP is running as an Apache module, you can also change how PHP runs within specific directories using an Apache **.htaccess** file. The directives to use are **php_flag** and **php_value**:

```
php_flag item value
php_value item value
```

The **php_flag** directive is for any setting that has an on or off value; **php_value** is for any other setting. For example:

```
php_flag display_errors on
php_value error_reporting 30719
```

Note that you cannot use PHP constants, such as **E_ALL** for the highest level of error reporting, as this code is within Apache configuration files, not within PHP scripts.

(You can also change how PHP runs by editing the **httpd.conf** file, but if you're going to make a global server change that requires a restart of Apache anyway, you might as well just edit the PHP configuration file instead).