

Getting Started with Flash and PHP

The process of getting started includes the installation and configuration of Apache, MySQL, and PHP. The examples in this book assume the installation will be done locally; however, you can modify the paths and URLs if you want to use a remote server.

The order in which you install these programs is important because they use paths and variables from each other, which results in the complete development environment.

This installation guide covers Windows and UNIX systems. If you have decided to work from the book on an existing server, you can skip to Chapter 2. However, there is some security and configuration information within this chapter you may find useful.

Adding Apache to a Web Server

The first step to working with Flash and PHP is to install the necessary components. The installation process is defined by installing Apache, then MySQL, and finally PHP. This order is required because PHP needs paths to Apache and MySQL in order to provide that support.

You can recompile (build) any one of these components in the future. However, if you follow this installation order it will mean less work and rework in the future.

The components to be installed change from time to time, but the overall installation process remains fairly constant. This means you can download

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the latest files from their respective project sites, or to ensure all the components work together, you can obtain these files from the book's site.

You should have a basic understanding of the system on which you will be installing. It is important to run a development system in a secured location. The best setup is a computer behind a physical firewall or on an internal network. If this is not possible, simply configure Apache to not allow remote connections and you can change the port number to hide it on your network.

NOTE

Development systems can require more advanced configuration depending on how they have been set up. You can find common issues explained on the book's Web site.

Installing Apache for Windows

Once you determine on which system you are installing the development system you can begin to download the necessary components. It is recommended that you use the files provided with the book. I also provide the necessary locations to download the latest files.

Access the latest version from Apache's Web site. It is easier to install from the binary installer version rather than compiling the source. However, compiling from source does offer a higher level of customization and allows you to understand what is running under the hood.

CAUTION Building from source is not for the beginner. It does require a certain level of experience and is only recommended to those who truly feel up to the challenge.

The latest Windows binary installer files for Apache can be found at www.apache.org/dyn/closer.cgi/httpd/binaries/win32/.

Installing

Start the installation process by opening the Windows installer file that was either downloaded from the book site or directly from Apache's Web site.

This installation will be mostly visual because the Windows installer is a graphical setup. The key to a successful installation is carefully following and reading the screens throughout the entire installation process. The first screen, as shown in Figure 1.1, requires no modification.

The next two screens are the license agreement, which you can take the time to read or you can simply click Next, because it is pretty standard information.

After that, you will find an introduction to Apache, which gives you a good overview of what Apache has to offer, as shown in Figure 1.2. The screen will also provide links to very valuable resources surrounding the Apache community.

FIGURE 1.1

The first screen requires no user modification. Simply click Next to continue the installation process.



FIGURE 1.2

The Server Information for a development system does not need to be real, as this figure shows.

岃Apache HTTP Server 2.0 - Installation Wizard	×
Server Information Please enter your server's information.	
Network Domain (e.g. somenet.com)	
mydomain.com	
Server Name (e.g. www.somenet.com):	
www.mydomain.com	
Administrator's Email Address (e.g. webmaster@somenet.com): admin@mydomain.com	
Instal Apache HTTP Server 2.0 programs and shortcuts for:	
⊙ for All Users, on Port 80, as a Service Recommended.	
O only for the Current User, on Port 8080, when started Mani	ually.
Instalishield < Back	ext > Cancel

The server installation is where you define the specific configuration for your environment. If you were installing Apache on a real system, you would fill in this page with the correct information, otherwise Apache would not route requests correctly. You can accept the default options for a development setup, such as this.

Being that this installation is for a development server you don't have to fill in the screen with real data, unless you are using this guide to install on a live server.

The Install Apache HTTP Server 2.0 programs and shortcuts for: option is when you want to install Apache so only the current user can access it. If you want all users to be able to access Apache, then you will want to install it as a service.

The installation process of Apache can be done in two ways, as shown in Figure 1.3. The first option is to accept all of the default settings, which results in a quicker installation, but it's not always the best option.

The second more common option is the Custom alternative where you tell Apache which tools and libraries you want to install. Occasionally when installing an application you can experience a shortage of hard drive space.

Apache, on the other hand, is so small with all of the extra tools installed that you should not have a problem installing it.

FIGURE 1.3

The Custom option is selected to ensure all of the development tools are installed, such as library and module building capability.

岃 Apache HTTP Se	erver 2.0 - Installation Wizard 🛛 🛛 🛛 🔊
Setup Type Choose the set	tup type that best suits your needs.
Please select a	setup type,
O Typical	Typical program features will be installed. (Headers and Libraries for compiling modules will not be installed.)
⊙ Custom	Choose which program features you want installed and where they will be installed. Recommended for advanced users.
Instaliähield ———	< Back Next > Cancel

For the examples in this book, it is best to accept the Custom installation and make sure all of the libraries and extensions are installed. For example, some of the modules used to modify the user requests are only available when you install the full version.

Depending on the system, it may take a while to install Apache. Even if the status bar stops moving don't get concerned; some of the files take longer than others to install. The application notifies you if something happens during the installation process, which is very rare. Apache will update the progress bar, as shown in Figure 1.4, while the installation is occurring.

FIGURE 1.4

Apache installation status

岃 Apache H	TTP Server 2.0 - Installation Wizard 📃 🗆 🛛
Installing The proc	Apache HTTP Server 2.0.59 gram features you selected are being installed.
j e	Please wait while the Installation Wizard installs Apache HTTP Server 2.0.59. This may take several minutes. Status:
InstaliShield –	< Back Next > Cancel

The last screen you should see is a note that the installation was successful. A DOS prompt may appear notifying you that the Apache service is starting. You may also get a Firewall warning, and you will need to grant Apache the access it requests.

Testing

Congratulations. If all went well you should now have Apache installed on your Windows machine. To test the installation, open a Web browser and point it to the local Apache Web server, which is also known as localhost.

http://localhost/

You should be presented with a screen similar to what is seen in Figure 1.5, which basically informs you that Apache is properly installed and is ready to start serving up your content.

Depending on the installation process, you can modify this location, which is sometimes required when installed on a remote server. You would not be able to access the Apache Web server on the localhost address. Instead, you would point to the IP address or the domain name of your Web site.

FIGURE 1.5

The default Welcome Screen for Apache

Test Page for Apache Installation - Wind	ows Internet Explorer		- 0
- E http://localhost/		Scoule	P
•			
🔅 😵 🔹 🗫 Index of /pub/apache/ht	🖉 Test Page for Apach 🗴	🕲 • 🔊 - 👼 • 🗗	age 🕶 🍈 Tools 🔻
' you can see this, it means that the i nstallati eplace this page.	on of the <u>Apache web server</u> software on this syste	m was successful. You may now add content to thi	s directory and
So	eing this instead of the website	you expected?	
his page is here because the site administra erver with questions. The Apache Softw is site and cannot help resolve configuratio	tor has changed the configuration of this web server are Foundation, which wrote the web server softwa n issues.	Please contact the person responsible for mai re this site administrator is using, has nothing to do	ntaining this with maintaining
he Apache documentation has been includ	ed with this distribution.		
ou are free to use the image below on an /	Apache-powered web server. Thanks for using Apa	che!	
	Powered by		
	APACH	E	

With Apache installed, you can modify the default page to truly see how Apache functions.

The Web files that Apache serves are located in the document root. This is similar to the public_html or www that you have most likely seen on a remote Web server. Unlike a remote Web server, permissions on these files are often unavailable to other users not viewing from your own personal computer.

The location of this Web directory in Windows using a default installation is:

C:\Program Files\Apache Group\Apache2\htdocs

You will see many different files in this directory, such as the same index files in various languages.

You don't want to modify any of these files because it could mess up the core of Apache or introduce errors that would be very hard to track, so create a new file. Using your favorite text editor, create a very simple HTML page, such as the following:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" lang="en">
<head>
<title>My Custom Page</title>
<body>
   <h1>Welcome to my custom page</h1>
   This is a test of the customization of Apache!
Pretty cool huh?
</body>
</html>
```

Save this new file in the Apache Web directory and name it myPage.html. After saving the file, open it in your Web browser to witness the flexibility in Apache.

This is not the most advanced example, but it should give you the basic idea of how to modify and work with the Apache Web server. Now is the time to create more useful examples, because you have the basics down.

At this point, with Apache installed and tested, you can move on to the installation and configuration of PHP, or you can jump ahead to the configuration process of Apache.

Alternatively, you can read through the installation of Apache on UNIX, which is covered in the next section.

The installation of Apache in UNIX would be closer to working with a remote server, because you will find that most Web servers are built on Linux. This doesn't mean you will never find a Windows-based live Web server, but it certainly isn't as common.

Installing Apache for UNIX

The installation process in UNIX is more advanced than the Windows installation. However, the UNIX installation is often the more common scenario for a live server.

The first step to installing Apache is downloading the source. This source can either be downloaded from the book's site or directly from Apache's Web site. Using the source provided on the book site ensures you're running a nearly identical system to the one used for writing this book.

You will find the source, as shown in Figure 1.6, directly from Apache at the following URL: http://httpd.apache.org/download.cgi.

FIGURE 1.6

Here is a list of the possible versions of the source code to download from the Apache server.

🥭 Download - The Apac	he HTTP Server Project - Windows Internet Explorer		
🗇 💽 👻 🔪 http://http	d-apache.org/download.cgi	💌 🖅 🗶 Google	P•
€ -			
🚖 🕸 🔪 Download - 1	The Apache HTTP Server Project	🖞 • 🗟 - 🖨 • 🕞 Pe	ge 🕶 🍈 Tools 💌 🎽
	Apache HTTP Server 2.2.6 is the best available	version 2007-0	09-07
Get Involved Mailing Lists Bug Reports Developer Info	The Apache HITP Server Project is pleased to ann 2.2.6. This release represents ten years of innovation releases! In particular, this release fixes a few potent For details see the Official Announcement and the <u>C</u>	ounce the release of Apache HTTP Server, version by the project, and is recommended over all previous ial security vulnerabilites. <u>HANGES 2.2 and CHANGES 2.2.6</u> lists	
Subprojects Docs Test Flood Bapreq Miscellaneous	 Add-in modules for Apache 1.3 or 2.0 are not com add-in modules, you must obtain modules compiled you attempt to upgrade from these previous version work for all 2.2 x releases. Unix Source: <u>httpd-2.2.6 tar.pz</u> [PGP] [MD2 0 Unix Source: <u>httpd-2.2.6 tar.pz</u> [PGP] Win32 Source: <u>httpd-2.2.6 tar.pz</u> [PGP] Win32 Source: <u>httpd-2.2.6 tar.pz</u> [PGP] Other files 	patible with Apache 2.2. If you are running third party or updated for Apache 2.2 from that third party, before s. Modules compiled for Apache 2.2 should continue to [=
<u>Awards</u> <u>Contributors</u> <u>Sponsors</u> <u>Sponsors</u> <u>Sponsorship</u> <u>Support</u> <u>Webring</u>	Apache HTTP Server 2.0.61 is also available Apache 2.0.61 is the current stable version of the 2. release. This release fixes a few potential security vu For details see the Official Announcement and the Q Apache 2.0 add-in modules are not compatible with party add-in modules, you will need to obtain modul third party, before you attempt to use this specific ret • Unix Source: httpd-2.0.61.tnr gz [PGP] [M] • Unix Source: httpd-2.0.61.tnr bz2 [PGP] [M] • Win32 Source: httpd-2.0.61.win32-src.zip [2007-0 0 series, and is recommended over any previous 2.0 Incrabilities. HANGES 2.0 and <u>CHANGES 2.0.61</u> lists. Apache 1.3 nor 2.2 modules. If you are running third is compiled for or compatible with Apache 2.0 from that lease. 5] DSJ PGP] [MD5]	99-07
	Apache 1.3.39 is also available	2007-0	9-07

After downloading the source for Apache, you can begin the installation process.

Preinstallation

Before installation can begin, the source must be extracted from the downloaded file. This is done by simply uncompressing the tarball file and untarring the uncompressed file.

\$ gzip -d httpd-2.2.6.tar.gz \$ tar xvf httpd-2.2.6.tar

Once the previous two processes are complete, you are left with a new directory containing the source code.

Before continuing, change to this directory, which means you will be in the directory the source code is located in.

\$ cd httpd-2.2.6/

Installation

When the source code is extracted, you can begin the installation process. Apache will install using its own set of options, but you have the ability to modify these. If you want to configure Apache using the defaults, simply type ./configure.

However, it is a better practice to tailor the installation process to your environment.

One of the most important options you can define is the --prefix, which is where Apache will be installed. This option is used throughout the application and also is used later during the PHP installation and configuration section.

For simplicity a partially modified configuration process is used, but feel free to look through the Apache documentation to gain a better understanding of what settings can be changed.

```
$ ./configure --prefix=/usr/local/apache
--enable-rewrite=shared \
--enable-spelling=shared
```

Once the configuration process begins, it can take a few minutes to complete. Most of the time you will see the process printing in your terminal window, but even if it is not, it is running.

After the configure command has completed you can run make to build the Apache package.

\$ make

Again, this process may take time depending on your system, so please be patient. Once the make command is complete, the last command to run installs the package and wraps up the installation portion.

\$ make install

Testing

With Apache installed, you can start it and test it in the browser.

Apache installs a very useful tool, apachect1, which can be found in the bin/ directory of the installation location. Using the path chosen for this installation, the apachect1 application would be found here.

```
$ usr/local/apache/bin/apachectl
```

Use the following command to start the Apache server:

\$ usr/local/apache/bin/apachectl start

Use this command to stop the Apache server:

\$ usr/local/apache/bin/apachectl stop

To restart the Apache server, use this command:

```
$ usr/local/apache/bin/apachectl restart
```

Testing out the server is done by making a call to localhost from your web browser at http://localhost/.

As you can now see, the installation was a success. To further test and better understand how to modify the files Apache serves, create a new HMTL file and save it in the Apache Web root.

Using your favorite text editor, which in UNIX will most likely be vi, create this new HTML file. The following commands assume you are using vi.

Create a new file:

\$ vi /usr/local/apache/htdocs/sampleFile.html

In order to begin entering the HTML code, you need to tell vi to enter Insert mode, which is done by pressing I. Press ESC to exit Insert mode.

Paste or type the following sample HTML code:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
    <html xmlns="http://www.w3.org/1999/xhtml" lang="en">
    <head>
    <title>My Custom Page</title>
    <body>
        <h1>Welcome to my custom page</h1>
        This is a test of the customization of Apache!
        Pretty cool huh?
    </body>
    </html>
```

Once the file is created, press ESC and type the following command to save and close the editor. Note, the : is part of the command.

:wq

Certain files you add or modify require you to restart Apache; however, basic Web files do not fall into that category. You can now display the new page by appending the filename to the local-host call at http://localhost/sampleFile.html.

As you can see, the Apache server has been properly installed and you were able to add a custom file that Apache properly served up. At this point, you should have a basic understanding of how Apache functions. The next section (platform independent) goes into more detail about how you can modify Apache.

Modifying Apache for Windows and UNIX

The following tips, tricks, and tweaks can be performed on Windows or UNIX installations. This is because they are specific to Apache and not the environment it runs on.

When working on development systems it isn't rare to require more than one installation of Apache. This could be to test bleeding-edge code, support more plug-ins, or just to ensure a project is running on a clone of the live system.

The installation process of Apache stays pretty much the same. You only need to change the prefix option by pointing it to a new/different location. You can run multiple versions of Apache; how-ever, they require separate installation locations. Running multiple versions of Apache at the same time using only the default installation options isn't possible. This is due to Apache being set up to listen for requests on port 80 by default.

You can modify the port that Apache listens on by editing the configuration file. The configuration files are located in the conf/ directory, which is located in the directory that you designate during the Apache install.

For example, you can change the port that Apache runs on. Start by opening the configuration file.

To open the configuration file in UNIX, use vi.

```
$ vi /usr/local/apache/conf/httpd.conf
```

To open the configuration file in Windows, navigate to the installation directory and open the httpd.conf file in your favorite text editor.

```
C:\Program Files\Apache Group\Apache2\conf\httpd.conf
```

When the file is open, scroll down or search for the Listen directive, which will look similar to the following:

```
#
#
Listen: Allows you to bind Apache to specific IP addresses
and/or
# ports, instead of the default. See also the <VirtualHost>
# directive.
#
Listen 80
```

```
NOTE
```

Apache will only look at this file during startup. When you are finished editing, make sure you restart the Apache server.

Changing that one value allows you to run multiple copies of Apache. However, running multiple Apache instances can be processor intensive, so make sure you only run as many instances as required. In most cases, you will run only one instance on a live server.

Installing MySQL

Now that Apache is installed, the next component to install is MySQL. This would be the database that your application contents are stored in and managed using PHP.

Installing MySQL for Windows

Much like the Apache installation process, MySQL has a Windows installer that makes the entire process much easier. The installer guides you through the process of installing the core database and any additional components you need. For this setup, the default installation is used, but feel free to customize, which is a very good way to learn.

Downloading

The first step to installing MySQL is downloading the latest install files. You can use the files provided on the book's Web site to ensure compatibility or you can visit MySQL's Web site at http://dev.mysql.com/downloads/mysql/5.0.html#win32 to get the latest stable version at this time.

Choose the Win32 installer with Setup to make the overall installation process easier. This allows you to use the GUI instead of the traditional command-line process of previous versions.

Installation

After you download and open the installer a Welcome page appears, followed by other pages that make up the install process, as shown in Figure 1.7. Similar to the Apache installation, MySQL also has various configuration options that need to be modified. Carefully look over the following steps to ensure your database will function properly.

Choose the Typical install option, which installs the core components necessary to run and maintain a MySQL database. Click Next to move to the next step.

At this point, MySQL has been installed. The final page gives you the option to launch the configuration section when you click Next.

Make sure you select this option. If you accidentally close this page you can rerun it or open the configuration application in the mysql/ directory in program files.

The installation of MySQL does not offer all that much in modification. This is because the supporting application Configuration Wizard handles all the necessary configuration options.

Select the Detailed Configuration option, as shown in Figure 1.8. This allows you to fine-tune the MySQL configuration as opposed to using all of the defaults. Click Next to continue.

FIGURE 1.7

This page is the install process. The install can take several minutes, depending on the system.



If you select the Standard Configuration option you are presented with a smaller list of configuration screens. This speeds up the configuration process, but doesn't allow you to customize the functionality of MySQL and could result in a less efficient system.

FIGURE 1.8

Select the configuration type.

MySQL Server Instance Configuration Wizard
MySQL Server Instance Configuration
Configure the MySQL Server 5.0 server instance.
Please select a configuration type.
Detailed Configuration
Choose this configuration type to create the optimal server setup for this machine.
O Standard Configuration
Use this only on machines that do not already have a MySQL server installation. This will use a general purpose configuration for the server that can be tuned manually.
<back next=""> Cancel</back>

The server type determines the memory, hard drive, and CPU usage. This has been installed on your development machine so you want to ensure that MySQL doesn't become overly processor or resource intensive. Selecting the Developer Machine option ensures this doesn't happen.

The other two options are for dedicated servers. The Server Machine option would be used when you install MySQL on the same machine your Web server, such as Apache, is running. This is okay for a medium-trafficked site, but you may find a spike in resource usage as your site becomes more active.

When this happens, you will want to introduce a dedicated machine to run your MySQL database, which at this time you would select the Dedicated MySQL Server Machine option. This option tells MySQL it is installed on a dedicated machine and to use all the resources and memory that are present.

NOILE Be sure you never accidentally select the Dedicated MySQL Server Machine option when installing on a Web server. Your system will not be able to manage resources properly and could eventually fail.

MySQL will constantly attempt to allocate all free memory whenever it is made available, which means when your Web server closes a stale connection, MySQL could potentially steal that free memory until there is no more room for connection available.

After you select an option (in this example Dedicated Machine), click Next (see Figure 1.9).

FIGURE 1.9

Select the Developer Machine option for your server type.



Select the Multifunctional Database option as the database usage type to allow the ultimate expandability of the system. This allows MySQL to optimize for both InnoDB and MyISAM storage engines. If this is your first time installing MySQL, which is very possible because many systems ship with it already installed, you may be asking how the other two options are used.

The Transactional Database Only option is used when you will be running a lot of transactionbased queries. This means you would be wrapping a bunch of queries (UPDATE, SELECT, DELETE, INSERT) in one run to ensure all the proper tables and data are modified. But if something goes wrong in one of those modifications it could ruin the remaining data.

This would mean a lot of unnecessary data editing and in some cases could result in bad data. A transaction looks for an error or trigger and if found all the modifications made during the start of the transaction are rolled back and reverted to their nonmodified state.

Here is a simple example of a MySQL-based transaction, which modifies two separate portions of data on the same table.

START TRANSACTION; UPDATE users SET credits = credits - 100 WHERE id = 3002; UPDATE users SET credits = credits + 100 WHERE id = 3002; COMMIT;

During the process of a transaction those entries are made unavailable to other sessions to ensure the data cannot be read or modified while a transaction is being performed. You can think of this process as being similar to turning the power off in your house to ensure someone can't accidentally flip a light switch while you are working on something.

The Non-Transactional Database Only option is selected when you know you will never need transaction abilities. This only enables the MyISAM storage engine, which can provide better results, but also limits overall functionality.

Oftentimes you will find the Multifunctional Database option, as shown in Figure 1.10, to the best choice, but it is also good to know what the other options offer.

FIGURE 1.10

The Multifunctional Database option is selected as the database storage type.

MySQL Server Instance Configuration Wizard			
MySQL Server Instance Configuration			
Configure the MySQL Server 5.0 server instance.			
Please select the database usage.			
Multifunctional Database			
General purpose databases. This will optimize the server for the use of the fast transactional innoDB storage engine and the high speed MyISAM storage engine.			
🔿 Transactional Database Only			
Optimized for application servers and transactional web applications. This will make InnoDB the main storage engine. Note that the My15AM engine can still be used.			
O Non-Transactional Database Only			
Suited for simple web applications, monitoring or logging applications as well as analysis programs. Only the non-transactional MyISAM storage engine will be activated.			
< Back Next > Cancel			

The next page allows you to customize the InnoDB storage system, but it is best to just leave it with the default settings.

In some instances, you may want to choose a separate location, which you can do by clicking the Browse button to the right of the installation box. Choosing a different location is only necessary when the Drive Info notice at the bottom of the window reports a small amount of Free disk space, which means your database could consume the remainder of your resources.

CAUTION

Make sure you never choose a removable drive as the storage location because you could harm the database if that drive is not attached at all times.

As stated earlier, most often it is best to leave this option at its default choice, as shown in Figure 1.11, to ensure your database functions properly.

FIGURE 1.11

InnoDB Tablespace settings

MySQL Server Instance Configuration Wizard	×		
MySQL Server Instance Configuration Configure the MySQL Server 5.0 server instance.			
Please select the drive for the InnoD8 datafile, if you do not want to use the default settings. InnoD8 Tablespace Settings Please should be placed. C: Installation Path			
< Back Next > Cancel)		

The next option is an approximation of how many concurrent connections your MySQL database will need to handle. Because this installation is being performed on a development server, an estimate of no more than 25 is a realistic assumption. Actually, it would be rare to have more than 5, but 25 is a good base number.

Select the Online Transaction Processing (OLTP) option under the "Decision Support" heading when you are developing a Web application to which the public has access. This is because you really have no idea how many people may attempt to access the system at any given time. As your application continues to grow you may even need to chain multiple databases together to handle the load, but for now one database is enough, especially considering this installation is being performed on your local system.

Select the Manual Setting option when you want to specify an exact number. This is only necessary when you want full control over your Web application. Oftentimes you see this manual number set to 300 on live Web applications. This appears to be a good average with the ability to handle many connections.

Be careful not to set the concurrent connections option, as shown in Figure 1.12, too high because your system will only have so many resources that can be split and shared by each connection. If you add more memory to your application you can increase this number, but that may not always be the best option.

FIGURE 1.12

Set the approximate number of concurrent connections.

MySQL Server	Instance Configuration Wizard	×		
MySQL Server Configure the f	Instance Configuration MySQL Server 5.0 server instance.	\bigcirc		
Please set the	approximate number of concurrenct connections to the server.			
O Decision S	upport (DSS)/OLAP			
	Select this option for database applications that will not require a high number of concurrent connections. A number of 20 connections will be assumed.			
🔿 Online Tra	nsaction Processing (OLTP)			
Choose this option for highly concurrent applications that may have at any one time up to 500 active connections such as heavily loaded web servers.				
O Manual Se	O Manual Setting			
32	Please enter the approximate number of concurrent connections.			
	Concurrent connections: 15			
<back next=""> Cancel</back>				

The networking options determine if your MySQL databases will be visible to other machines beyond the local setup. For the ultimate security, disable the Enable TCP/IP option. If you have multiple development machines, you can enable it and choose a nonstandard port.

For this installation, networking is enabled, as shown in Figure 1.13, and the default port is used because I do not intend to allow others to connect, but my Web server is located behind a hard-ware firewall for added security.

Choose a nonstandard port number if you install another version of MySQL on the same system. This is not very common, but sometimes you have to deploy backwards-compatible environments to test your code in various setups. This is a cost-effective alternative to building and maintaining another physical machine to handle the testing process.

Make sure you select the Enable Strict Mode option to ensure your database server functions properly.

FIGURE 1.13

Setting the networking options



On the next page you can select the default character set used in your database. The Standard Character Set option is selected for this example (see Figure 1.14), but oftentimes this is not the best option because it does not allow the most compatibility with existing systems or allow for expansion over time. For this example it will work just fine because you will not have any advanced characters being used.

You can, of course, select any option that best fits your usage, but I prefer the Best Support for Multilingualism option. This option allows for greater expansion and is highly recommended when storing text in many different languages.

Select the Manual Selected Default Character Set/Collection option for the rare times when you want to specify a certain character set to use rather than choosing a selection of them. You will probably never use this option because it is too specific, but it is available if needed.

If you think you will be using multiple languages, I recommend the second option, Best Support for Multilingualism, to ensure your applications will be able to expand, and also allow you to experiment with different options later on.

The Windows Options page (see Figure 1.15) determines how MySQL is initialized. For example, if you choose to run MySQL as a service it will start or stop automatically, controlled by the operating system. If you have installed a previous version of MySQL you will want to choose a different service name. This is to ensure the existing service does not collide with this one.

Select the Launch the MySQL Server automatically option to ensure the database is available when the system starts. This is not required, but it makes it so you don't have to start the service manually each time you restart your machine. You can, of course, access the service application on your system and modify this option at any time, as well as turn off the service until the next time the machine starts up.

FIGURE 1.14

Selecting a default character set



The Include Bin Directory in Windows PATH option, when selected, includes MySQL support from the command line by simply typing mysql. This means any command prompt will allow you quick access to your MySQL database. You can refer to your operating system instructions for modifying this PATH variable.

You can also add PHP and Apache to this same PATH variable, which would expose them to the command prompt as well. In fact, when you install PHP some instructional material for performing this modification is offered.

FIGURE 1.15

The Windows options determine how MySQL is started and accessed.

MySQL Server Instance Configuration Wizard			
MySQL Server Instance Configuration			
Configure the MySQL Server 5.0 server instance.			
Please set the Windows options.			
✓ Install As Windows Service			
This is the recommended way to run the MySQL server on Windows.			
Service Name: MySQL MySQL Service automatically			
✓ Include Bin Directory in Windows PATH			
Check this option to include the directory containing the server / cliant executables in the Windows PATH variable so they can be called from the command line.			
<pre>< Back Next > Cancel</pre>			

The final configuration is used to set a root password, as shown in Figure 1.16. The root user has global permissions over your databases, so you can imagine how important securing this user is. You do not have to choose a password, but by default, MySQL is installed with no root password, which means anyone has access to your databases.

It is best to choose a difficult-to-guess password, retype it once more and be sure that the Enable root access from remote machines option is not selected to disable the ability to administer the databases remotely. It may seem this option would allow for better usability, but there are some exceptions, one of which is overall security of a system.

Even though this setup is being performed on a development server, it is best to keep security in the forefront of the installation process. Doing so will ensure you follow the necessary precautions when you perform a similar installation on a remote setup.

If security is not a concern, you do have the option to create an Anonymous Account. However, creating such an account is nearly identical to a root login with no password and will suffer from the same overall security concerns.

FIGURE 1.16

Security options for MySQL

MySQL Server Instance Configuration Wizard				
MySQL Server Instance Configuration				
Configure the	MySQL Server 5.0 server i	nstance.		
Please set the	security options.			
🗹 Modify Se	curity Settings			
	New root password:	******	Enter the root password.	
root	Confirm:	******	Retype the password.	
Enable root access from remote machines				
Create An Anonymous Account This option will create an anonymous account on this server. Please note that this can lead to an insecure system.				
<back next=""> Cancel</back>				

The last page, as shown in Figure 1.17, is for the processing of the configuration values set in the previous pages. If for some reason an error is encountered, MySQL will notify you.

Most of the time you will see each bullet point with a check mark applied as it is completed.

When processing is complete, you are presented with a notice informing you the configuration has been completed and MySQL is ready to use.

You have now successfully installed and configured MySQL to be used for the remainder of this book. Click Finish to close the configuration page and begin testing the installation.

FIGURE 1.17

Display of configuration processing with proper notices as each task is completed.



Testing

After you install MySQL you can test it. You can view the service status using the MySQL monitor, which determines if the database server is up and running. You can use the command line to log in and investigate the MySQL database just like you would on a remote server.

To open a new command prompt, as shown in Figure 1.18, press Windows key+R. When the prompt open, type the following command to log in:

\$ mysql -uroot -p



If you get "command not found" you need to add MySQL to the path variable.

An Enter Password notice appears. Type the password you set in the configuration process.

NOTE When typing a p

When typing a password the prompt will not show any text updates.

FIGURE 1.18

Command prompt with the command entered to log in to the MySQL database server



If the login is successful, a notice describing the MySQL server appears. The notice contains the version of MySQL that you are currently running. The following is an example of the notice:

Welcome to the MySQL monitor. Commands end with ; or \g. Your MySQL connection id is 5 Server version: 5.0T.45-community-nt MySQL Community Edition (GPL)

Once you log in to MySQL, your command prompt changes to mysql>. From this point on, until you log out, all commands are directed to the database server.

For example, to see what databases are available, type the following command:

mysql> show databases;

To test the database installation, create a new database:

mysql> create database flashphp;

When the database is created, you can select it with the following command:

mysql> use flashphp;

You can even pass in the database name during the login phase, such as:

\$ mysql -uroot -p flashphp

At this point, MySQL should be successfully installed on your Windows development server. The next section covers how to install MySQL for UNIX and UNIX-like systems. The PHP installation process is directly following the UNIX instructions. Feel free to jump ahead if you only want to focus on a Windows system.

Installing MySQL for UNIX

You can install MySQL on your UNIX system using the provided source code on the book's site, or you can download the latest files from MySQL directly at http://dev.mysql.com/ downloads/mysql/5.0.html#linux.

NOTE The version to download depends on the environment on which you are installing. Consult the following guide for further information:

http://dev.mysql.com/doc/refman/5.0/en/which-version.html.

After you download the necessary installation files, you can begin the preparation for the installation process. The first step is to add the user and group mysql for MySQL to run as. The following command creates the mysql group and adds a mysql user to that new group:

```
$ groupadd mysql
$ useradd -g mysql mysql
```

Choose the directory in which you want to install MySQL. You can choose the same location where you installed Apache to keep all of your development components in the same location.

```
$ cd /usr/local
```

NOTE You may need to perform the MySQL installation as root if the directory is protected.

Unpack the distribution package and create a symbolic link to that directory.

```
$ gunzip < /usr/local/mysql-5.0.45-linux-i686-glibc23.tar.gz | tar xvf -
$ ln -s /usr/local/ mysql-5.0.45-linux-i686-glibc23 mysql</pre>
```

When the unpacking command is complete, change to the installation directory.

\$ cd mysql

Change the ownership of the files to MySQL by running a recursive ownership command. The first command changes the ownership and the second changes the group attribute.

```
$ chown -R mysql
$ chgrp -R mysql
```

If you have not installed a previous version of MySQL on this machine, you must create the MySQL data directory and grant tables.

```
scripts/mysql_install_db --user=mysql
```

If you want MySQL to run automatically when the machine starts, you can copy the mysql.server file located in the support/ directory to the location where your system has its other startup files. For more information regarding the location of that directory and other system specific concerns, go to http://dev.mysql.com/doc/refman/5.0/en/UNIX-post-installation.html#automatic-start.

When everything is properly unpacked and installed, you can begin testing.

To start the MySQL server, run the following command from the mysql installation directory:

```
$ bin/mysqld_safe -- user=mysql &
```

Use the following command to verify the server is actually running:

\$ bin/mysqladmin version
\$ bin/mysqladmin variables

The output from mysqladmin version will vary depending on the version installed. This is a sample returned from that command:

```
mysqladmin Ver 14.12 Distrib 5.0.54, for pc-linux-gnu on i686
Copyright (C) 2000 MySQL AB & MySQL Finland AB & TCX DataKonsult
  AB
This software comes with ABSOLUTELY NO WARRANTY. This is free
  software,
and you are welcome to modify and redistribute it under the GPL
  license
Server version 5.0.54
Protocol version
                     10
                     Localhost via UNIX socket
Connection
UNIX socket
                     /var/lib/mysql/mysql.sock
                      0 days 2 hours 2 min 07 sec
Uptime:
Threads: 1 Questions: 323 Slow queries: 0
Opens: 0 Flush tables: 1 Open tables: 7
Queries per second avg: 0.000
```

Protecting MySQL

It is important that you protect MySQL users from malicious activity. By default, MySQL installs the root and anonymous users with no passwords, which is the same as using a global default. It is a very good practice to immediately assign passwords and in some cases remove the anonymous users altogether.

Setting a password on Windows

The password for the root account was given a password when you ran the installer. However, if for some reason you want to change it, simply run the following command, substituting NEW_PASSWORD with the actual password you want to use:

```
$ mysql -uroot
mysql> SET PASSWORD FOR 'root'@'localhost' =
    PASSWORD(NEW_PASSWORD);
mysql> SET PASSWORD FOR 'root'@'%' = PASSWORD(NEW_PASSWORD);
```

Setting a password on UNIX

The installation of MySQL on UNIX leaves the root login with no password, unlike the Windows installation. It is very important to assign a password immediately:

```
$ mysql -uroot
mysql> SET PASSWORD FOR 'root'@'localhost' =
PASSWORD(NEW_PASSWORD);
mysql> SET PASSWORD FOR 'root'@'host_name' =
PASSWORD(NEW_PASSWORD);
```

Replace host_name with the name of the server host. If you do not know the server host, run this command while logged in to MySQL to determine that information:

SELECT Host, User FROM mysql.user;

To remove the anonymous account, log in to MySQL and issue the following command:

DROP USER '';

CAUTION

Use caution when removing a user and double-check the spelling of the user's name before you issue that command.

Setting up PHP on the Web Server

PHP is the final component to install in order to complete the process of building the development system. The process of installing PHP is straightforward, but it requires some customization.



When installing the support for the XML and GD libraries, your system may require additional libraries and components.

Installing PHP for Windows

Installing PHP for Windows is actually fairly simple. A lot of the installation process consists of moving files around and editing existing files. You can find the PHP installation files on the book's Web site or you can download the latest files directly from the php.org site atwww.php.net/downloads.php.

Installation

To begin the process of installing PHP, run the installer application that you downloaded. The Welcome page for the setup wizard appears, as shown in Figure 1.19.

The destination folder, as shown in Figure 1.20, is where you install PHP. By default, it chose a directory path with Program Files within it. This can cause issues on some servers. A common path is C: \php or C: \php5 if you intend to install multiple copies of PHP.

FIGURE 1.19

The PHP installation Welcome page



FIGURE 1.20

Choose the Destination folder.

岃 PHP 5.2.5 Setup	
Destination Folder	pho
Click Next to install to the default folder or click Browse to choose another.	Prip
Instal PHP 5.2.5 to:	
C:\php	
Browse	
Back Next	Cancel

The PHP installer is built to configure both PHP and Apache to work together. This includes the editing of the configuration files of Apache.

On the Web Server Setup page, as shown in Figure 1.21, select the version of Apache that you previously installed. If you are unsure which version is installed, you can run the following command in the prompt:

/usr/local/apache2/bin/httpd -v

The following is a sample output from the previous command:

```
Server version: Apache/2.0.59
Server built: Aug 31 2007 01:58:43
```

FIGURE 1.21

The PHP Installer Web Server Setup page

岃 PHP 5.2.5 Setup	9	
Web Server Setup Select the Web Server you wish to setup	p. ph	P
 Apache 1.3.x Module Apache 2.0.x Module Apache 2.2.x Module Apache CGI IIS ISAPI module IIS FastCGI IIS CGI NSAPI Xitami Sambar Server Other CGI Do not setup a web server 		
	Back Next Cancel	

The next page, see Figure 1.22, is where you inform the installer of the location of the Apache configuration directory. For example, if you followed the Apache installation guide at the beginning of this chapter, the path would be the following:

C:\Program Files\Apache Group\Apache2\conf\

On the next page you choose the extra extensions needed for this book (see Figure 1.23). Those extensions are GD2, EXIF, MySQL, and PEAR. You can also choose to install any others that you think may be useful.

FIGURE 1.22

Apache Configuration Directory page

岃 PHP 5.2.5 Setup	×
Apache Configuration Directory	J.D. D. Contraction
Browse to select the directory containing the Apache Configuration Files (c	PIP
Apache Configuration Directory:	
C:\Program Files\Apache Group\Apache2\conf\	
Browse	
Back Next	Cancel

FIGURE 1.23

Choose which extensions you want to install in addition to PHP.

岃 PHP 5.2.5 Setup	
Choose Items to Install Select the way you want features to be installed.	php
Click the icons in the tree below to change the wa	y features wil be installed.
PHP Program Extensions X Activescript X Activescript X ActionScript Message X APD X	Installs PHP with all server modules and all extensions enabled. It is recommended to only select the extensions and modules you nee This feature requires 332KB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 14MB on you
Location: C:\php5\	Browse
Reset Disk Usage Be	ack Next Cancel

The entire configuration is set up at this point, and you can click Install to begin the process of installing PHP. When the installation is finished a Completed page appears.

You can open the directory in which PHP is installed and look at the various files. You can also edit the php.ini file to meet your specific needs.

C:\php5\php.ini

The default configuration of the php.ini should work for a development setup with the exception that you should enable display_errors. Enabling the display of errors tells PHP to print any errors to the screen. In a production setup this could be considered a security concern. A development server is generally only seen by authorized viewers, which means enabling this option is not a problem.

Open the php.ini file and search for the section referring to error_reporting.

```
display_errors = Off
```

Change the value to On.

display_errors = On

Changes to the php.ini file are not visible until you restart the server.

Make sure you restart the Apache web server before continuing because you made some modifications to the Apache configuration.

Testing

NOTE

After you install PHP you can create a sample PHP file to test it out. A common sample file is the phpinfo file, which allows you to see the configuration variables for the PHP installation on the server.

You can use Notepad or any other text editor to create this sample file. If you install the full Web Suite from Adobe, you can use Dreamweaver to write PHP files (see Figure 1.24).

Here is the syntax for the phpinfo file.

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

Save this file as info.php in the Document Root of the Apache installation. For example, if you install Apache to the default location, the PHP file is saved to:

C:\Program Files\Apache Group\Apache2\htdocs\info.php

FIGURE 1.24

The sample PHP file as seen in Dreamweaver CS3

🔤 Adobe	Dreamweaver CS3 - [C:\Program Files\Apache Group\Apache2\htdocs\info.php (XHTML)]	- 2 X			
File Edi	t View Insert Modify Text Commands Site Window Help				
₩ Insert	Common Layout Forms PHP Data Spry Text Feronices	E,			
Q 🖸	\$\H = I, 4, 5 \$\L \ U & \{\cdots} \B \\ U & \\\U & \\U &				
lafa aba		- = ×			
		_			
L 2	Lubade	-			
** 3 4	phpinfo();	- 11			
13 S	p	- 11			
¥		- 11			
4		- 11			
$\langle 0 \rangle$		- 11			
		- 11			
100 C		- 11			
ų,					
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<u></u>		- 11			
ð.		- 11			
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		- 11			
		- 11			
		- 11			
<		>			
		1K / 1 sec			
Froperbes					

You can now open this file in your Web browser, as seen in Figure 1.25.

```
http://localhost/info.php
```

If you prefer, you can create a custom PHP file to test whether PHP is properly running, such as the following:

```
<?php
print "Hello, World! This is PHP.";
?>
```

When you run this file in the browser, you should see your message displayed.

FIGURE 1.25

PHP information displayed in a Web browser

C phpir	fo() - Windows Int	ernet Explorer		
G · ttp://ocahost/rfo.php			▼ 4 × 6.	eogle elge
€ 1 •				
会 余 @ phpinfo()			<u>ن</u> ا • ۱	🖞 🔹 🖶 🔹 🕞 Paga 💌 🎯 Tools 💌 🏁
		PHP Version 5.2.5	php	
		System	Windows NT MACPROXP 5.1 build 2600	
		Build Date	Nov 8 2007 23:18:08	
		Configure Command	cscript /nologo configure.js "enable-snapshot-build" "with-gd=shared"	
		Server API	Apache 2.0 Handler	
		Virtual Directory Support	enabled	
		Configuration File (php.ini) Path	C:WINDOWS	
		Loaded Configuration File	C:\php5\php.ini	
		PHP API	20041225	
		PHP Extension	20060613	
		Zend Extension	220060519	
		Debug Build	n0	
		Thread Safety	enabled	
		Zend Memory Manager	enabled	
		IPv6 Support	enabled	
		Registered PHP Streams	php, file, data, http, ftp, compress.zlib	
		Registered Stream Socket Transports	tcp, udp	
		Registered Stream Filters	converticonv.", string.rot13, string.toupper, string.tolower, string.strip_tags, convert ", consumed, zlib."	
		This program makes use of th Zend Engine v2.2.0, Copyright	e Zend Scripting Language Engine: (c) 1999-2007 Zend Technologies	

Installing PHP for UNIX

Installing PHP for UNIX is more detailed and requires more configuration. This is true for most command-line installation setups. You can download the installer files from the book's Web site or one the official PHP Web sites.

After you obtain the PHP installer files, you can begin the process of installation. Before you begin the installation, it is a good idea to stop Apache to ensure none of the files becomes corrupted.

```
/usr/local/apache/bin/apachectl stop
```

To start the installation, create the directory where PHP will be installed.

mkdir /usr/local/php5

You can substitute php5 for simply php. However, adding the version number makes it easier to have multiple installations and will be easier to manage in the future.

cd /usr/local/php5

Unpack the files and type the installation directory:

```
gunzip php-5.2.5.tar.gz
tar -xvf php-5.2.5.tar
cd php-5.2.5
```

Building configuration parameters

The next step is to build the config line. This will contain all the necessary extensions and features you want to include in the installation. For example, you need to include database and image support to complete some of the chapters in this book, among others. Each option is contained within a set of single quotes (') and will include the path if necessary.

```
./configure' '--prefix=/usr/local/php5' '--with-
apxs=/usr/local/apache/bin/apxs' '--with-gd' '--enable-exif'
'--with-mysql=shared,/usr/local/php5' '--with-
mysqli=shared,/usr/local/php5/bin/mysql_config' '--with-
libxml-dir=shared,/usr/local/php5' '--with-
xsl=shared,/usr/local/php5' '--with-jpeg-dir=/usr/local/php5'
'--with-png-dir=/usr/local/php5' '--enable-gd-native-ttf' '--
with-freetype-dir=/usr/local/php5' '--with-
gettext=shared,/usr/local/php5'
```

When the configuration process is complete (which can take a while depending on the system), create and run the installer:

make make install

After the make install command is completed, PHP should be installed.

Configuration

A few portions of PHP need to be configured to make sure it works seamlessly with Apache and your overall development system. This process is fairly easy to complete, but incorrect modification can result in a broken system. Also, when modifying configuration files, it is best to make a backup first.

The first step is to move the php.ini file to a central location that PHP will use when it starts up.

```
cp php.ini.recommended /usr/local/lib/php.ini
```

In order for Apache to load PHP files, add the necessary module references:

```
LoadModule php5_module modules/libphp5.so
AddType application/x-httpd-php .phpml
AddType application/x-httpd-php-source .phps
```

Restart Apache to have these changes take effect. Any time you edit the values in PHP or Apache, you must restart the server.

```
/usr/local/apache/bin/apachectl start
```

With everything properly installed, you can test the setup by running a sample PHP file:

<?php phpinfo(); ?>

Summary

In this chapter, you went through the steps necessary to install the complete development system. This process included the installation of Apache, PHP, and MySQL on a Windows or UNIX Web server. The next chapter walks you through the process of making this development setup more secure. This includes securing the files on the server as well as the overall server configuration through the httpd.conf configuration file.