Downloading, installing and testing the Apache HTTP server

The Apache Software Foundation (ASF) is a non-profit corporation founded in 1999 by software professionals dedicated to supporting collaborative, non-proprietary software. Apache is typically pronounced in English as "uh-patch-ee".

The Apache collection of open-source software includes tools such as Ant, Forrest, and Jakarta, used by developers, and network services for corporations and governments (the Apache HTTP server). Close to 47% of all web servers are running the Apache web server. Microsoft servers comprise 23% of the total.[1]

The Apache HTTP server is open-source software you can freely download and install on your workstation, which can then function as a web server. Usually the people who install and administer web sites can save time by installing an open-source ("free") software tool called XAMPP in which the X stands for any of the four different operating systems (Microsoft Windows, Linux, Apple OS X, and Solaris), A for Apache, M for MySQL, P for PHP and P for Perl. The XAMPP software collection (from Apachefriends.org) will have all the necessary modules for using a database (MySQL) and programming (PHP and Perl).

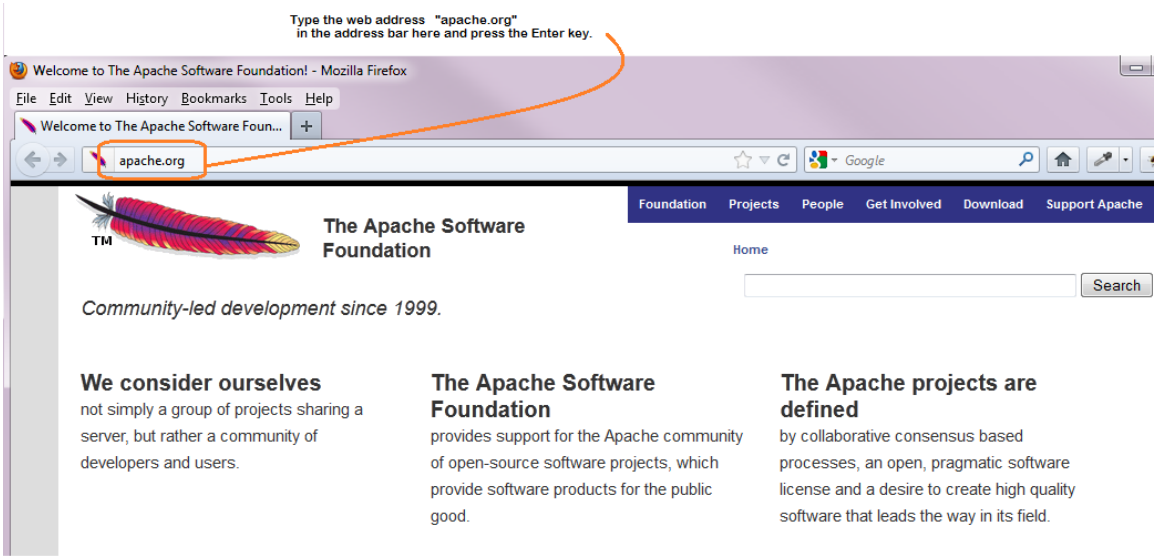
This exercise is about learning how to install and test the Apache web server. If you are using the lab computer (and not your own personal laptop) for this exercise, you will find that the XAMPP tool is already installed and running so you may be required to skip over some of the steps described in this exercise as noted.

Step A – Download the Apache HTTP software from the Apache web site

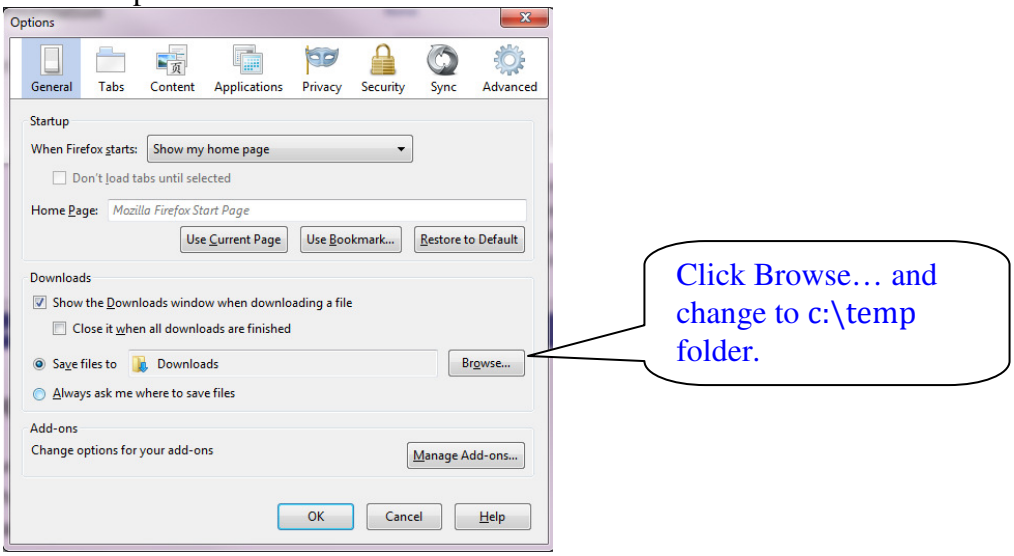
Description: This step shows you how to download and install software called Apache web server to your lab computer (or personal laptop if preferred). The Apache software is prepared for download on many computer sites scattered around the world – these sites are called mirrors. You select the mirror site that is geographically closest to you to minimize the time to download the software and minimize the network bandwidth usage. Since you are downloading the software to a Microsoft Windows-based platform, the software is made available in a format called MSI (Microsoft Installer) – this permits you to download the MSI file then install the contents, rather than having to download the entire software source code, compiling it, and then installing it.

1. Open a browser (Microsoft IE or Firefox or Google Chrome) and set the web address to `apache.org`

[1] http://news.netcraft.com/archives/web_server_survey.html



If you are using the Firefox browser, change the location of the downloads folder from `C:\temp` or Desktop to your personal Downloads folder. To do this, click on Tools | Options.

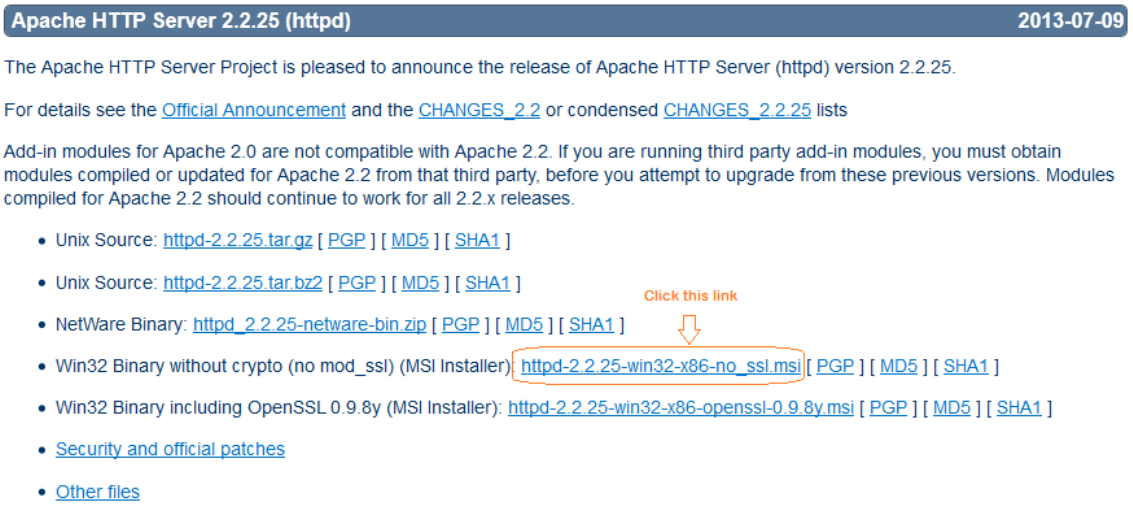


2. Click on the Projects link at the top of the page. Click on the Categories link on the left side of the page under the Indexes heading. Click on the http link under the Category Index heading. Scroll down the page to find the Apache HTTP Server link. Click on the Apache HTTP Server link.

3. The page displays with the header "Apache HTTP Server". Click on the link halfway down the page http://httpd.apache.org/download.cgi

4. Under the Apache HTTP Server (httpd) 2.2.25 heading find the link for the Win32 Binary without crypto bullet. Find the link to apache 2.2.25-win32-x86-no_ssl.msi (MSI Installer). Click on the .msi link. If the browser returns a message that the file is not found, use this archive web address URL instead:

http://apache.mirrors.lucidnetworks.net/httpd/binaries/win32/ and use the link to the 2.2.22 version or later listed there instead.



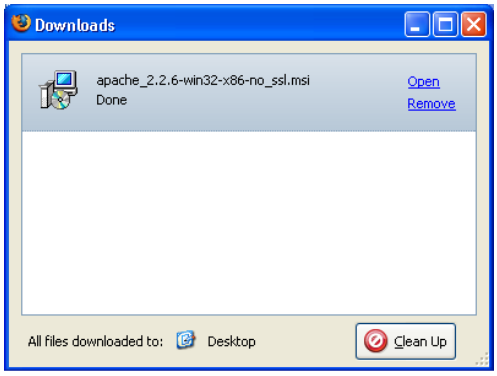


Figure 1. Firefox Downloads

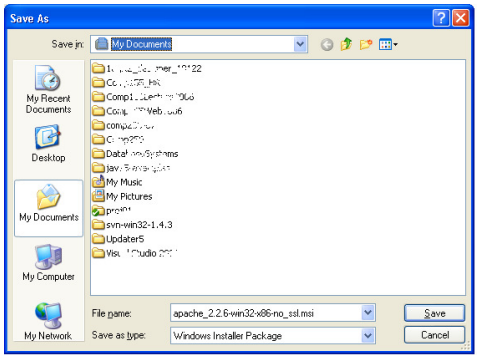


Figure 2. Save As from Microsoft Internet Explorer

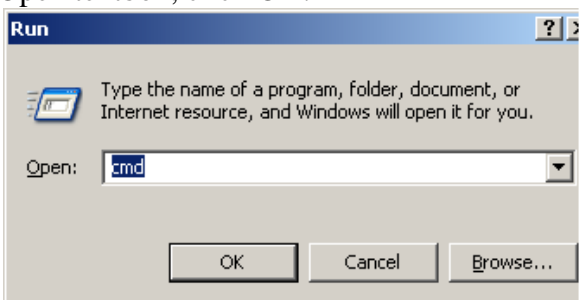
5. If you are using Internet Explorer, click on Save on the File Download dialog. Depending on the connection traffic the download may take anywhere from 1-3 minutes.

6. If you were able to download the .msi file from the main Apache page and not the archive, you can complete this step 6. The [PGP] and [MD5] links to the right of the .msi download link are used to help verify the integrity of the downloaded file. A cryptographic encoding of the .msi file confirms that it is the correct file and it hasn't been tampered with in some way. The encoding, also called a *hash*, is visually compared with the result from a program that generates the hash from the downloaded file. If the hashes match, then the downloaded file is valid. Both PGP and MD5 are commonly used in this way although MD5 has been effectively cracked and had been superseded in 2010 by SHA-2. You can verify your downloaded .msi file this way: (You may optionally complete the following parts a through f for your interest).

a. Click on the MD5 link on the Apache download web page to reveal the .msi file's hash. It will look like a sequence of 32 random letters and numbers.

b. Enter the web address `http://www.cs.camosun.bc.ca/~langs/utils` in the browser. This will display a list of some utilities. Find the one called `md5sums.exe` and use the mouse's right button to click on it. The context menu will appear and select either the "Save target as" or "Save link as" option depending on the browser you are using. Save the file into the `My Documents` folder location where the .msi file is. This md5sums utility is actually freeware from `http://www.pc-tools.net/win32/md5sums`.

c. On the Windows toolbar on the bottom of the screen click on Start, Run and type `cmd` in the Open textbox, click OK.



d. When the command window appears, ensure the prompt begins with `C:\`. If it does not, then enter `C:` (letter c followed by a colon) and enter the command `cd \temp` to make the current folder in your command window the `temp` folder.

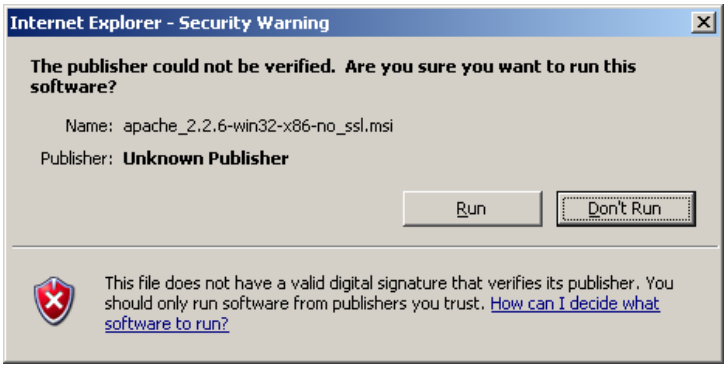
e. Enter the command `md5sums httpd-2.2.25-win32-x86-no_ssl.msi` to generate the MD5 hash from the downloaded .msi file. The result should show under the MD5 sum column in the command window. The result should match the provided MD5 hash from Apache from part a above.

f. Enter the command `exit` to close the command window.

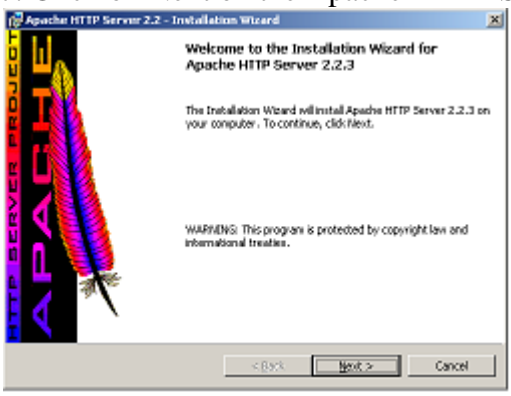
Step B – Install the Apache HTTP software

Description: After the .msi file is downloaded to your My Documents location, you will install the Apache web software locally. Students are not permitted to install software directly into the lab computer Program Files folder but they can install into other folders, `c:\temp`, for instance. Verify that your lab station's `c:\temp` folder does not already contain a folder named anything that starts with Apache. If it does, contact the instructor.

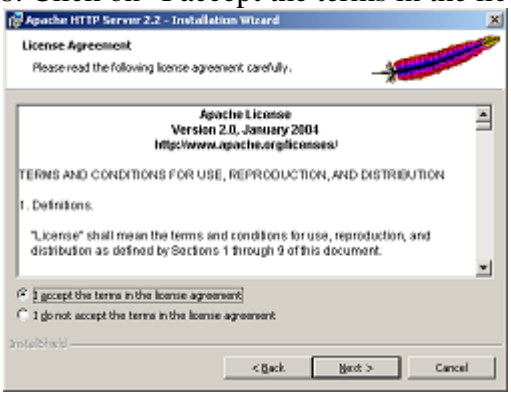
6. Click on Run on the Security Warning dialog (if it appears for those using Microsoft Internet Explorer browser). If you are using the Firefox browser, find the .msi file in your personal My Documents folder and double click on it. The current version of the Apache will be different than the 2.2.6 shown below in the screen snapshot.



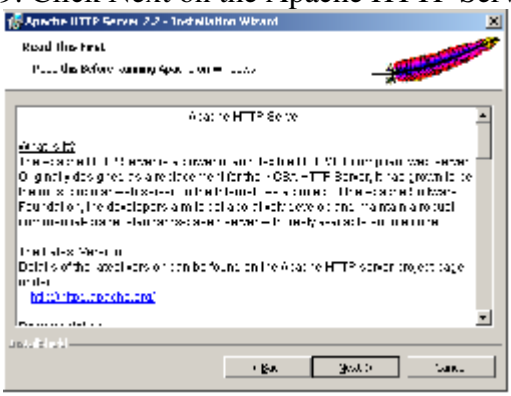
7. Click on Next on the Apache HTTP Server installation wizard dialog



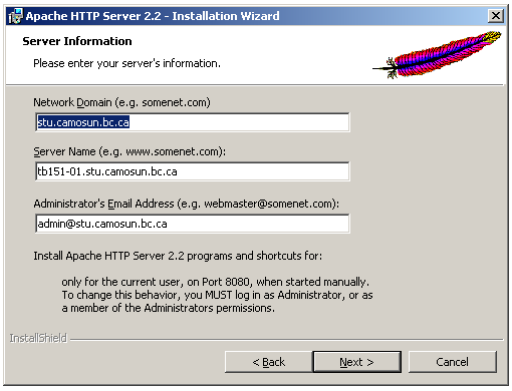
8. Click on "I accept the terms in the license agreement", Click Next



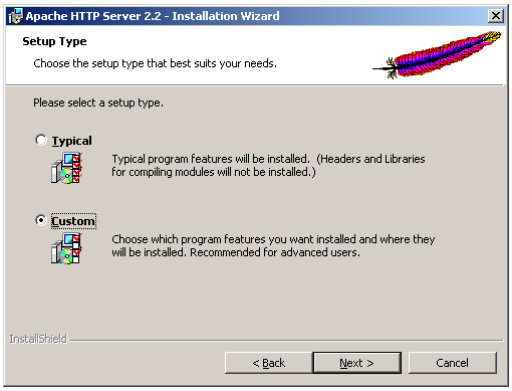
9. Click Next on the Apache HTTP Server dialog



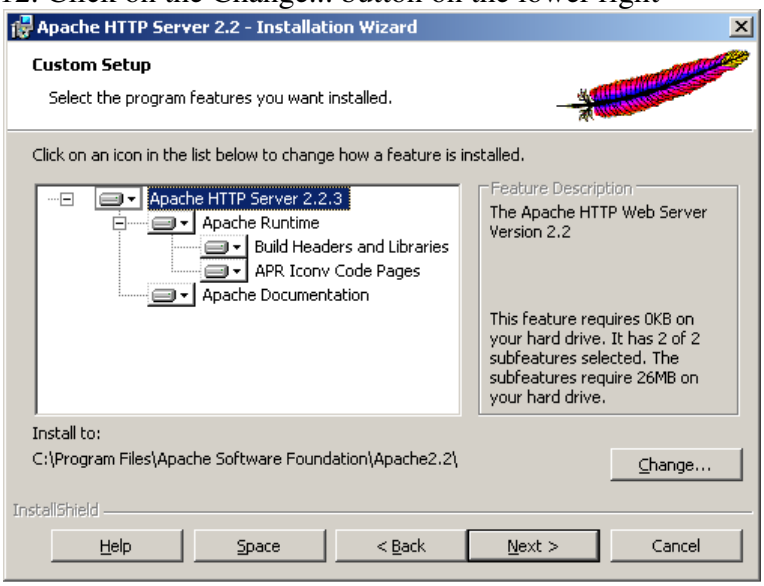
10. Leave the network domain as `stu.camosun.bc.ca`, leave the rest as they are, click Next



11. Click on Custom, click Next. Student accounts do not have the permissions to install software directly to the Program Files folder. But you can install software to another location. In this instance you can install the Apache HTTP server to the `C:\temp` folder.



12. Click on the Change... button on the lower right

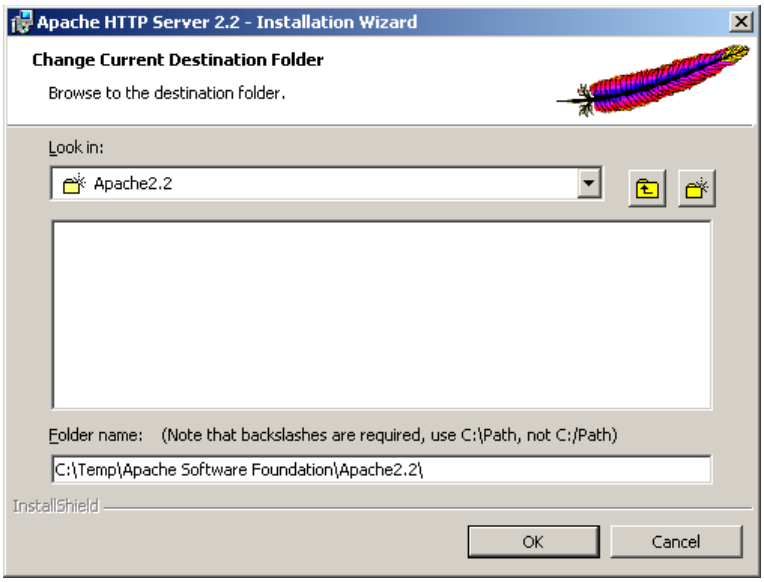


13. Click on the Change button to change the Folder name to

`c:\temp\Apache Software Foundation\Apache2.2\`

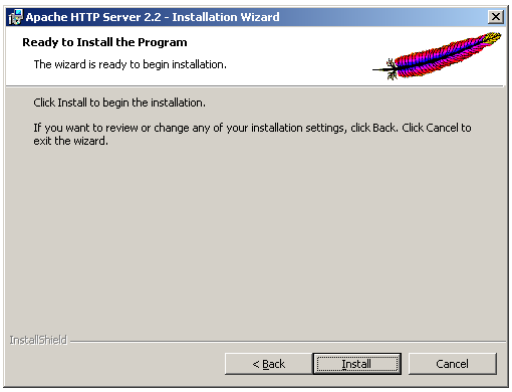
instead of

`c:\Program Files\Apache Software Foundation\Apache2.2\`, click the OK button.

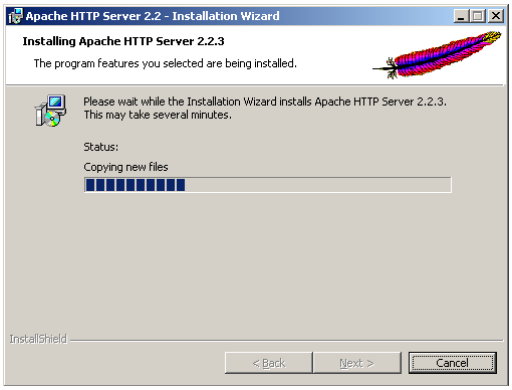


Click Next to continue.

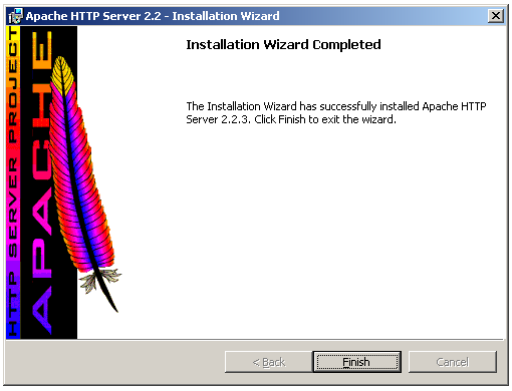
14. Click Install



15. Installation process commences and should take no more than 2-3 minutes. If you get an access error - check that you specified the folder name as `c:\temp` not `c:\Program Files`



16. Click Finish when the installation is complete.



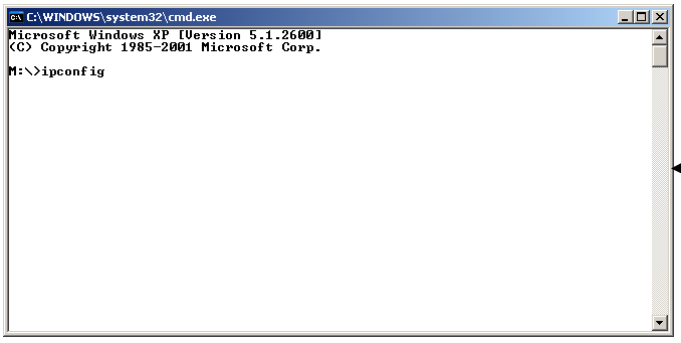
Step C – Test Apache HTTP

Description: In this step you test the operation of the Apache web server by opening the web server's main page in the browser. You will use the TCP/IP command `ipconfig` to determine your lab computer's IP address and use that IP address as the web address in a browser. Also, you will modify your web server's main page to demonstrate that other

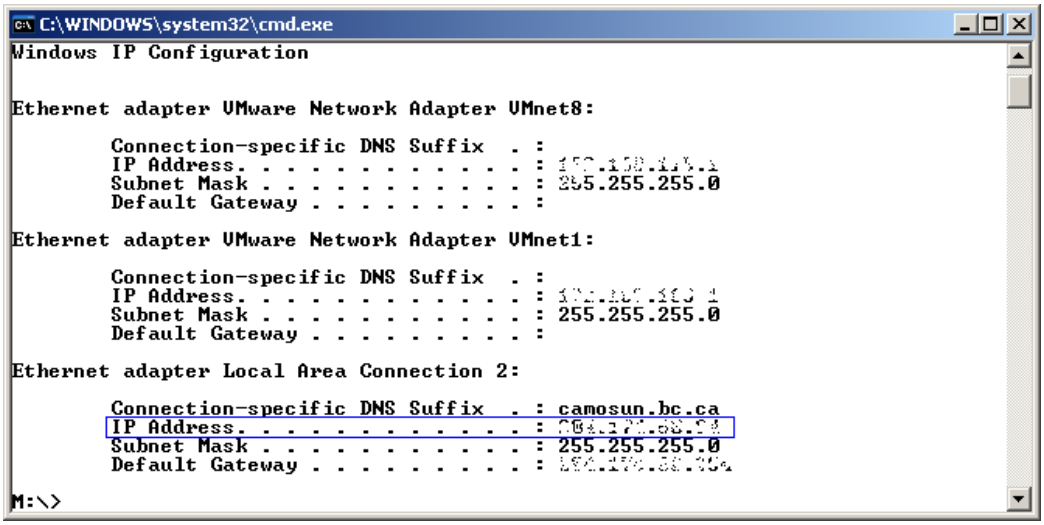
students in the lab can see your page.

17. On the Windows toolbar on the bottom of the screen click on the Start button, then click on Accessories, then click on Command Prompt. This creates a new *command window* which you type in commands. This is what most desktop computer operations used in the early to mid 1980's before graphical user interfaces became widely used.

18. In the command window, type the command `ipconfig` then press the Enter key. Locate the value of your network connection's IP address; it should be **`204.174.60.`**`???` (where ??? represents a 2 or 3 digit number). If you are unable to find an entry that reads `IP Address.....204.174.60.`, then contact your instructor. Your workstation needs to be connected to appropriate subnet for the purposes of this lab.

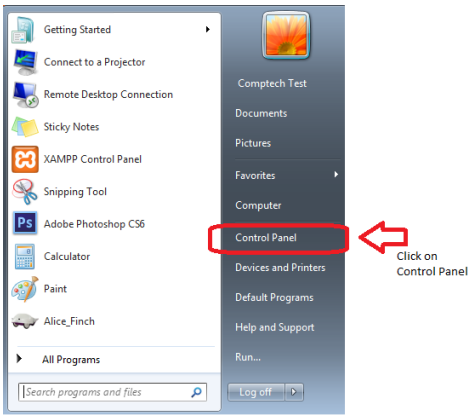


The command window will have a black background with white text foreground by default. For this lab description the white/black is reversed.

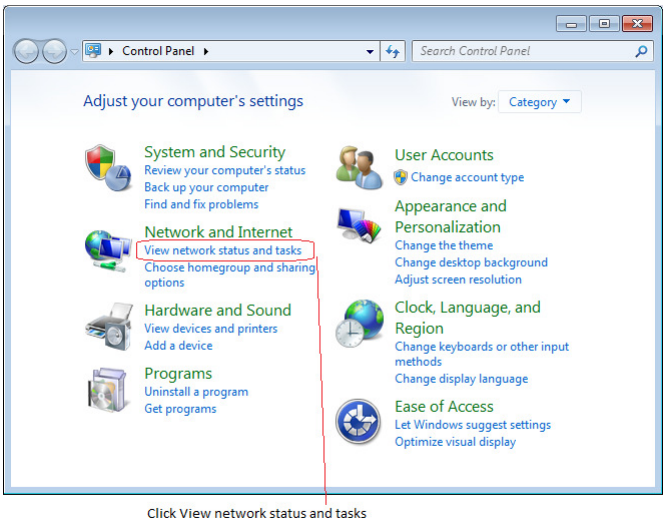


18(b). Another way of determining your computer's IP address in Windows 7 is to use the Control Panel this way:

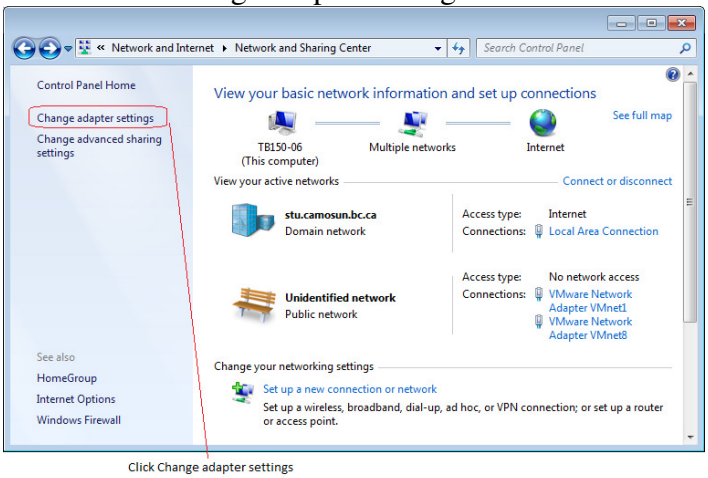
i) Click on the Start button in the lower left and click on the Control Panel.



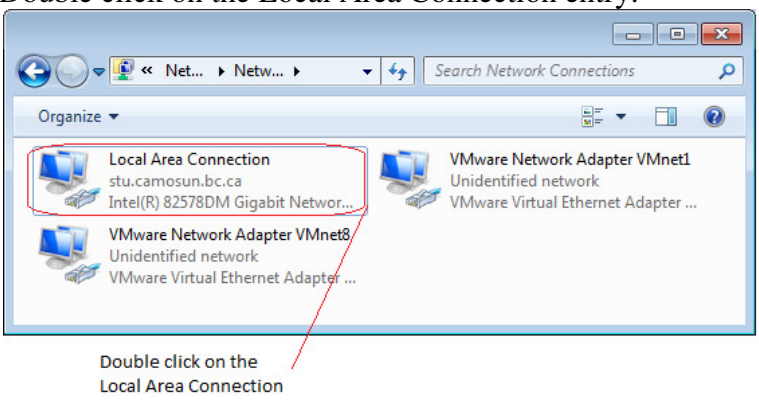
ii) Click on View network status and tasks.



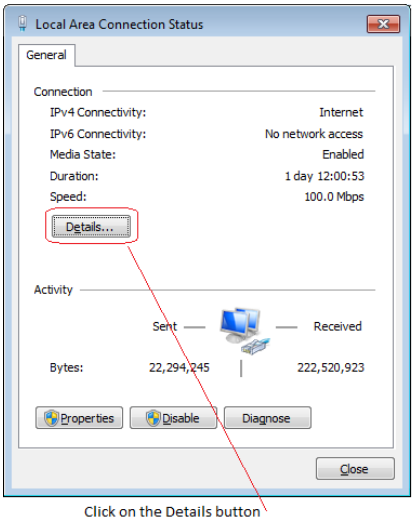
iii) Click on the Change adapter settings on the left



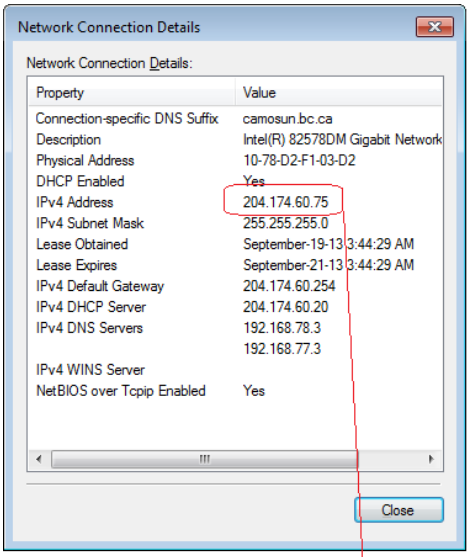
iv) Double click on the Local Area Connection entry.



v) Click on the Details button.



vi) The IP address is shown next to the IPv4 Address property.



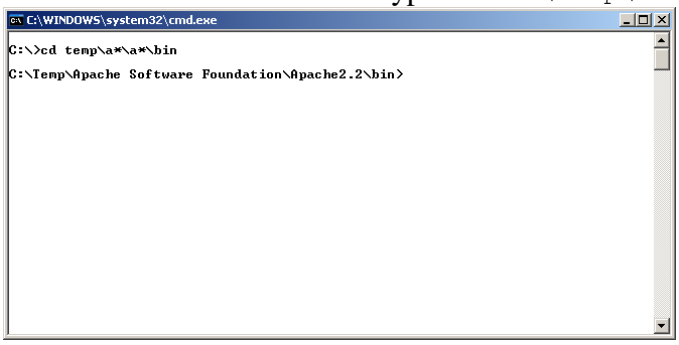
vii) Confirm the IP address you found in this way matches the IP address you found using the command line **`ipconfig`**.

viii) Click on the Close button for each of the Control Panel dialogs to close them.

19. The following two steps are to completed only if you are currently using your own personal laptop. If you are using the lab computer, then skip now to step 21.

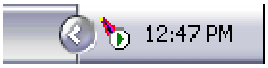
In the command window, type: `c:` press the Enter key

then type: `cd c:\temp\a*\a*\bin` press the Enter key

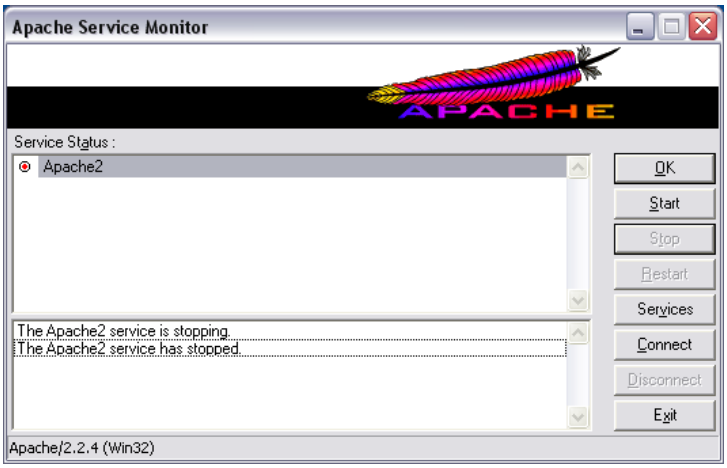


20. Check the lower right hand corner of your screen to determine if the Apache server is currently running. The Apache monitor icon will appear as in the lower right as a red-pink feather with either a green arrow (signifies that Apache httpd is running as shown below) or a red square superimposed on it (Apache is stopped and needs to be started – not shown):

Apache monitor icon indicates web server is running:



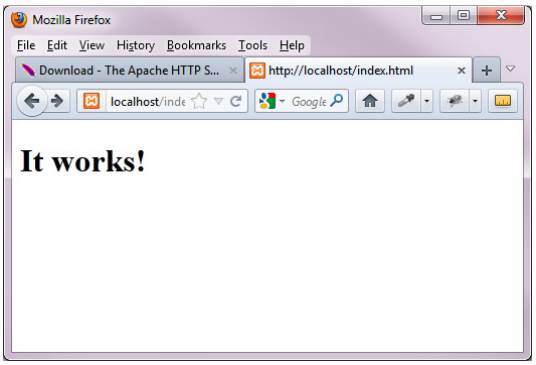
If you do not see the Apache monitor icon, enter the command `httpd` in the command window in step 19. If the Apache server is not yet started, double click on the monitor icon and click on the monitor's start button.



21. Start a browser and enter the web address

`http://localhost/index.html`

The browser will look for your local HTTP server main page (the page's name is `index.html` by default), if one is installed. You should see the installation success message in the browser window. Congratulations, you just installed your own personal web server!
If you don't see the installation success message in the browser window, then contact the instructor. There may be a conflict with a previously installed Apache web server or Microsoft's web server (IIS) on your workstation.



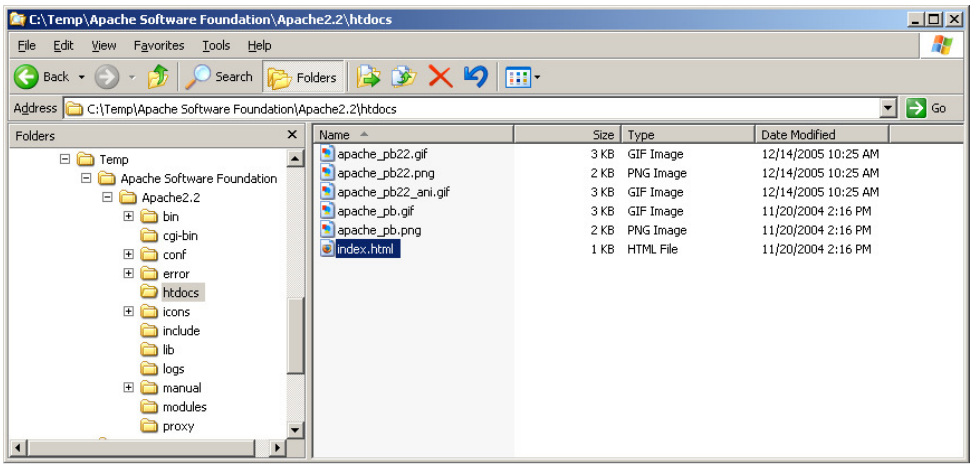
22. In the browser change the web address to `http://204.174.60.???/index.html` (where ??? is the 2 or 3 digit number of your IP address). You should see the same page. The URL `http://localhost` is *resolved* by the browser to point to the local workstation's IP address. Keep the browser open.

23. Use the Windows Explorer (click on Start button, then click All Programs, then Accessories) to view the folder `c:\xampp\htdocs` if you are using a lab computer.

If you are currently using your own personal laptop instead of the lab computer, then view the folder `c:\temp\Apache Software Foundation\Apache2.2\htdocs`.

23b. If you are using the lab computer, use the mouse to right-click on the file `c:\xampp\htdocs\index.html`; (otherwise use `c:\temp\Apache Software Foundation\Apache2.2\htdocs\`**`index.html)`** and select the TextPad option from the context menu.

The `htdocs` folder is intended to contain all the content you want to make available to the Internet.



24. Immediately after the text "`It works! </h1>`", add a new line of text which contains your name and today's date as in Tuesday Sept 24. Save and close the file. To do this, click on the TextPad File menu at the top and select Save, then click on the File menu again and select Exit.

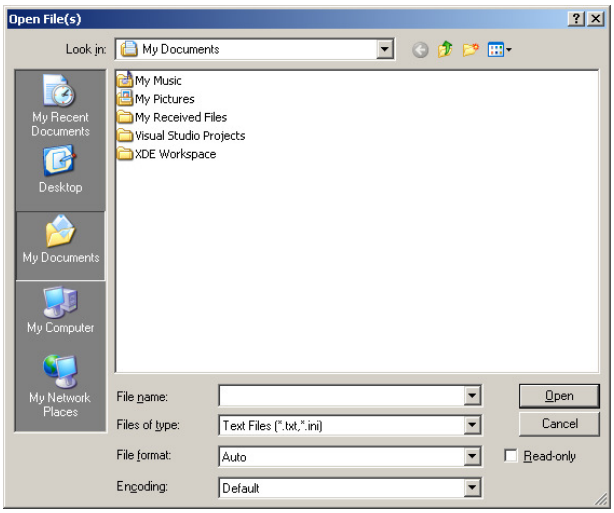
25. Return to the browser and refresh the link to your Apache server main page. To do this, click on the circular blue arrow in the Firefox browser or the button with two small green arrows in the Internet Explorer browser. You should see your name on the page now. If you don't see your name, return to the editor and make sure you have saved the file correctly.

26. In your browser enter the URL for somebody else's IP in the lab to confirm you see their name on their modified Apache main server page. Don't forget to add the `index.html` in the web address. If your browser is unable to connect to another's web server or they are unable to connect to yours, there may be a Windows firewall running. Contact the instructor to have the firewall temporarily disabled for the purposes of this lab.

Step D – Examine Apache HTTP server configuration files

Description: In this step you will explore three of the many files that the Apache web server uses for its operation. The processes in steps 27 to 29 describe how to view the configuration files if you are using your own personal laptop. If you are using a lab computer, then skip to step 30 and do not do steps 27-29.

27. Activate the TextPad window and click on File menu option, then select Open. The window should appear as below:



Change the Look in: folder from My Documents to `c:\temp\Apache Software Foundation\Apache2.2\conf\` by clicking on the down arrow on the right of My Documents and navigating to the folder.

You will use the TextPad application to open the file `httpd.conf`, which is found in the `conf` folder.

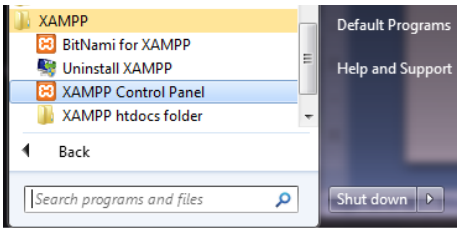
To make TextPad find this file in the above window, change the Files of type from Text Files(*.txt, *.ini) to All Files (*.*). You should now see the `httpd.conf` file, which you can select with the mouse, then click Open.

In the TextPad editor examine the file. This file contains configuration information on the web server setup. Note the values for `ServerName` and `DocumentRoot`. Close the file – do not make any changes.

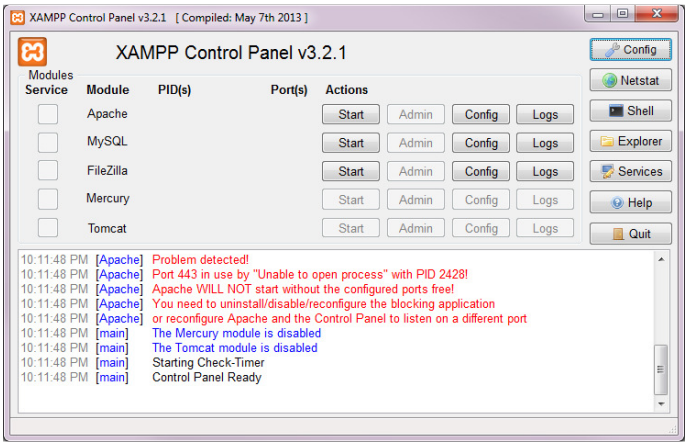
28. In the TextPad editor examine the file `c:\temp\Apache Software Foundation\Apache2.2\conf\`**`mime.types`**. This file contains information about the different mime type files the web server can handle. Close the file – do not make any changes.

29. In the TextPad editor examine the file `c:\temp\Apache Software Foundation\Apache2.2\logs\`**`access.log`**. This is the log file for HTTP requests to the Apache web server. What information does this file provide? After completing this, go directly to Step E and do not do steps 30-36.

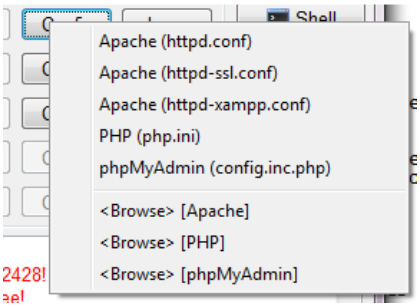
30. Click on the Start button and look for the XAMPP application folder and click on it to open it. Click on the XAMPP Control Panel as shown highlighted below.



31. The XAMPP Control Panel allows you to view the configuration files for the Apache web server and other optional modules you may have installed as well such as MySQL and FileZilla.



32. Along the row where the column heading shows Apache, click the Config button (it is the one that is at the top of the column of Config buttons). Then click the top configuration item Apache (httpd.conf).



33. Examine the file httpd.conf. This file contains configuration information on the web server setup. Note the values for `ServerName` and `DocumentRoot`. Close the file – do not make any changes to it.

34. Click on the top Config button for Apache again and this time click on the <Browse>[Apache] option shown third from the bottom. This action brings up the Apache folder contents for XAMPP on your lab computer using File Explorer. Double click on the folder named conf to open it for viewing. There should be a file named mime.types shown in the list of folder contents. Right click on the file mime.types and

select the TextPad option to view this file in TextPad. This file contains information about the different mime type files the web server can handle. Close the file – do not make any changes. Close the File Explorer window.

35. Return to the XAMPP control panel. Click on the Logs button for the Apache module and then click on the Apache (access.log) entry shown. This is the log file for HTTP requests to the Apache web server. What information does this file provide? Hint: something looks like a date and time.

36. Skip Step E and proceed to step F.

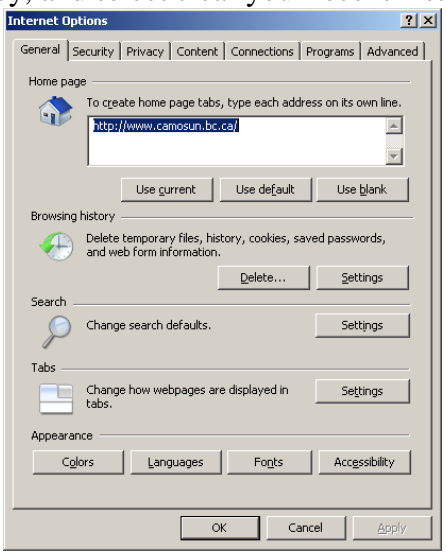
Step E – End the Apache HTTP server

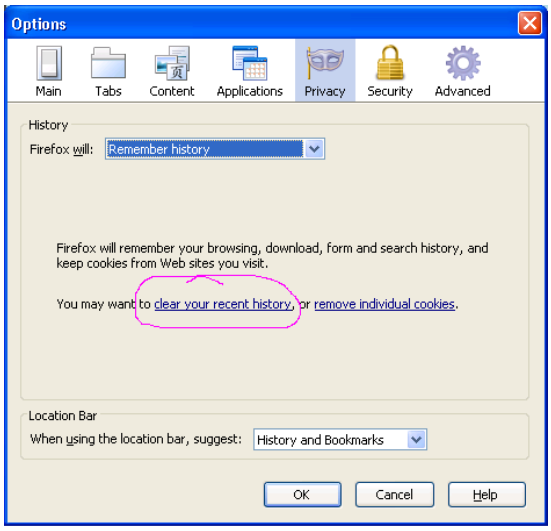
Description: This step is done only if you are using your own personal laptop computer and not the lab computer. To end the operation of your local Apache web server, double click on the Apache monitor found at the lower right of the screen. Click the Stop button on the monitor panel to end `httpd`.

A clean up of the browser's cached files is done next to confirm that the local web server no longer functions. The httpd is called HTTP *daemon* (from the Unix world) and is a program that sits behind a web server and waits for requests from clients for web content. The daemon automatically replies to the requests and serves the content back to the browser over the Internet.

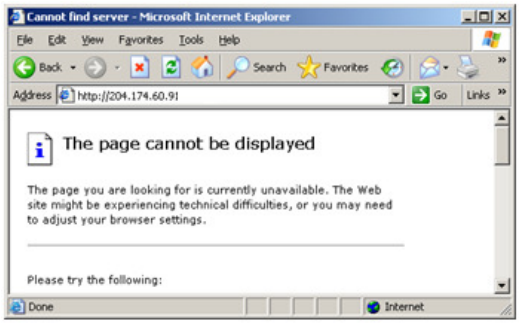
You may wish to verify this by starting a browser and entering the web address to the localhost as in step 21 above.

31. The cached files that the browser used to store your web server files need to be removed. In the IE browser select Tools, Internet Options, General tab and select Delete… to remove your cached files. In the Firefox browser select Tools, Options, Privacy, and select clear your recent history.





32. Wait a minute then refresh the browser to your main Apache web page. The browser will inform you that it cannot locate any content. The local web server is not running.



33. Type `exit` in the command window to close the window.

Step F – Uninstall the Apache HTTP server

Description: Removing the Apache software from your laptop computer.

34. On the bottom of the Windows screen click on Start, Settings, Control Panel, Add or remove Programs

35. Select the Apache HTTP Server software 2.2.25, and click the Remove button.

36. Click Yes to confirm the removal of the Apache Server from the computer.

37. Use Windows Explorer to delete the folder:

```
c:\temp\Apache Software Foundation\Apache2.2
```

38. Use Windows Explorer to delete the .msi file you downloaded into your workstation's `c:\temp` folder.