CEFNS Web Hosting – a Guide for CS212

INTRODUCTION:

In CS212, you will be learning the basics of web development. Therefore, you want to keep your tools to a minimum so that you understand how things really work. Later you can use IDEs to offload much of the creation process but you will still have sufficient knowledge of the details so that you can tweak the resulting code by hand as necessary – no IDE produces perfect results.

One area that can't be avoided is the necessity to publish your work to a server. That requires some form of file transfer tool. In addition, it would be handy if you could create a server on your local machine so you can develop and test more conveniently.

You should get your environment set up AS EARLY AS POSSIBLE. One of the worst things on a project is not being able to get started because the software doesn't work. On the other hand, once you get everything streamlined it becomes super easy to make changes to your site. If you have problems getting things set up or working, ASK FOR HELP. I can help, of course, but often other students, including those in ACM, can get you going.

TOOLS:

Text Editor:

> This is all you need for creating web pages. Even PHP and Javascript are simply text files. You don't want any formatting, which gets ignored anyway, and you should avoid HTML-savvy programs such as Microsoft Word. If you decide to use Word anyway, don't use formatting like tabs or page-breaks, and save you files as plain text with the right file extension for the type of file (more on that in class).

> RECOMMENDED:

> For Apple computers, TextEdit is the way to go. Because OSX knows what kind of file you are trying to open, you have to tweak the settings a bit so you can open and save files correctly. There is a support document at http://support.apple.com/kb/ta20406 that describes the process for HTML files but it also works for the other types of text files you'll be using.

> For Windows machines, Notepad is fine and is, of course, free. When opening files from Explorer (not Internet Explorer), you can right-click and select the Open With option to get the file to open with the right program. Don't forget to save as plain text but you might have to change the extension in Explorer depending on how your Windows is set up.

Good results on all platforms can be had by using a web-savvy IDE such as NetBeans (my favorite) or a simple programming editor such as TextPad. You can use them to organize your projects and do editing (they are smart enough to do text editing and file saving properly) - just simply avoid using the advanced features such as auto-generated code. However, the advanced tools still add a lot of extra 'hidden' code – as I will demonstrate in class – so I require that the first few projects be done using a simple editor. That doesn't stop you from getting an IDE installed and working.

Web Server:

No question about it, XAMPP is the preferred solution here. It has everything we need for this course except that it runs on your local machine. You don't really need a server to see your HTML and CSS files in action but it's a good idea to go ahead and install XAMPP right away, then utilize its default location (or one of your choosing) to keep all your site files organized. Organizing your site on your local machine will make it much easier to publish to the CEFNS servers.

XAMPP is available at http://www.apachefriends.org/en/xampp.html for Apple, Windows, and Linux. Follow their directions for downloading and installing the server suite. When you are done, open the XAMPP Control Panel (this will probably launch automatically but you can start it using the icon installed on your OS if it doesn't) and select Config – the one way at the upper right.
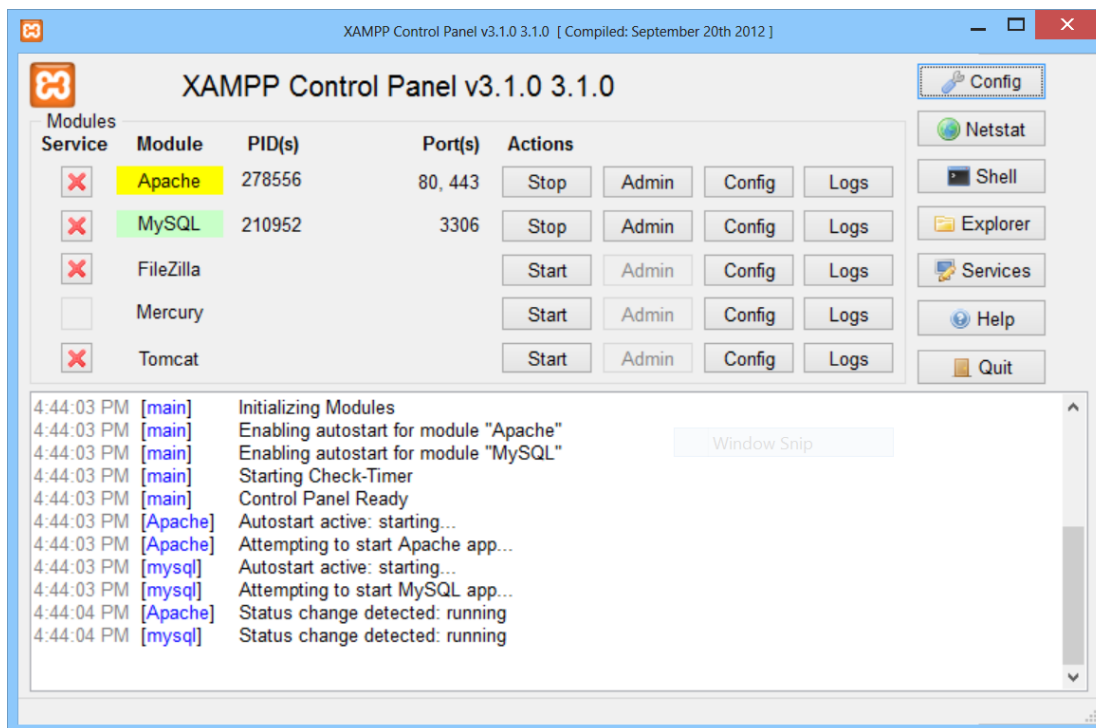

1 - XAMPP Control Panel

In the configuration dialog box, make sure that Apache and MySQL are checked for autostart (we don't need the other modules for this class).
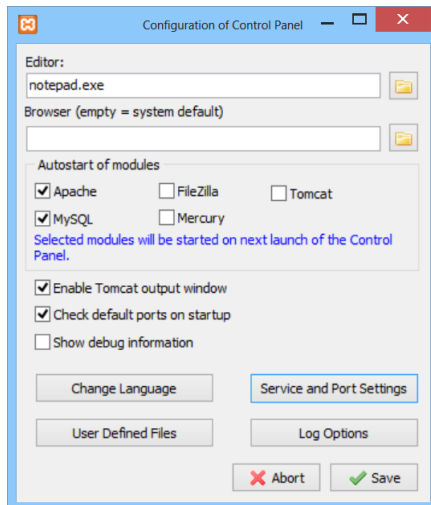
2 - XAMPP configuration dialog

Now start your favorite web browser and at the URL box type 'localhost' (the quotes aren't necessary, neither is anything else like 'http://'). If everything has gone well, you should see a screen like the one below. Congratulations! You've got a web server running on your machine – but there is still more to do.
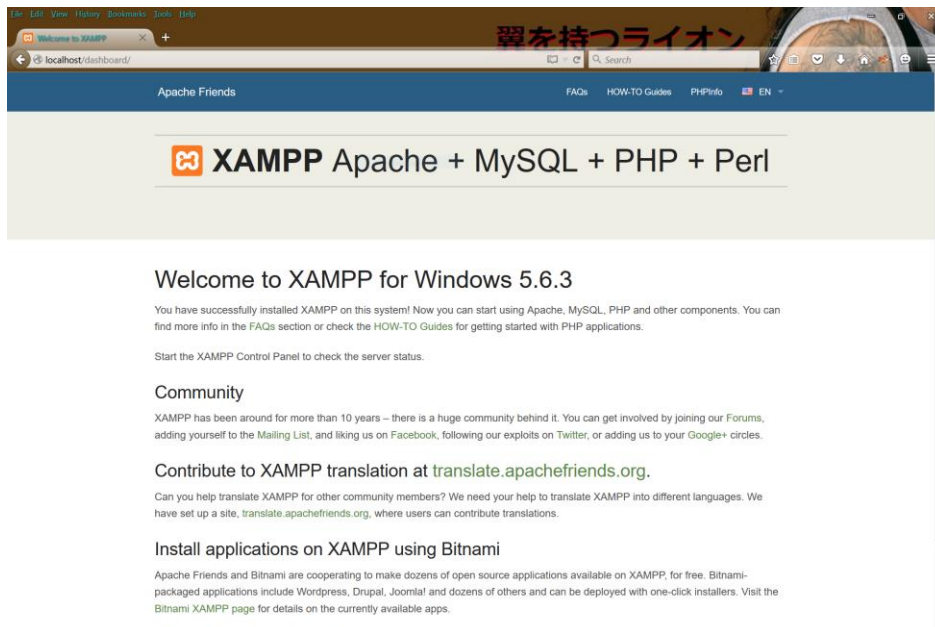
3 - XAMPP welcome screen

Basically, XAMPP just needs a password for the MySQL database. You and I will set up userids and passwords for your MySQL database(s) later so that the CEFNS and your local database match (makes moving your code from local to CEFNS easier) but the root password need not match because you don't (or shouldn't) use it in any code. We'll discuss database security issues more during the semester. For instructions on setting the MySQL password, click the link for How-To Guides and then select the one for resetting the MySQL password.

All is well so far but you will want to have your own web page come up when you use localhost. One way is to simply replace whatever is in the \htdocs folder (subdirectory of XAMPP; in Windows this is C:\xampp\htdocs by default) with your own files. However, that eliminates the convenient web-based console for XAMPP. A better way is to create a new folder under the htdocs folder (mine is C:\xampp\htdocs\website. Now, open the file index.php in the htdocs folder using a plain text editor. You can see that I've opened it in Notepad and highlighted the default directory; it will be replaced with the name of the directory I just created, 'website'.



```php
<?php
        if (!empty($_SERVER['HTTPS']) && ('on' == $_SERVER['HTTPS'])) {
                $uri = 'https://';
        } else {
                $uri = 'http://';
        }
        $uri .= $_SERVER['HTTP_HOST'];
        header('Location: '.$uri.'/xampp/');
        exit;
?>
Something is wrong with the XAMPP installation :-(
```

4 - editing index.php

Once you've saved your changes, create another file in your new directory that has the following code:

```
<http>
<head>
     <title>Test Page</title>
</head>
<body>
     This is a test of the server setup.<br>
     If you can read this, everything is good.
</body>
</http>
```

Save the file as index.htm or index.html and then try browsing to local host. You should see a page with your body text and the title text in the tab (assuming you are using a tabbed browser). You can still get to your XAMPP web console by typing 'localhost/xampp' instead of just 'localhost'. You can also test your database setup by going to 'localhost/phpmyadmin'. You will be prompted for credentials; the userid is 'root' and the password is the one you chose earlier. You should be able to log in and get a screen like the one on the following page. In the list of tables on the right, there should be one with the userid you chose for your site (mine is 'flion').
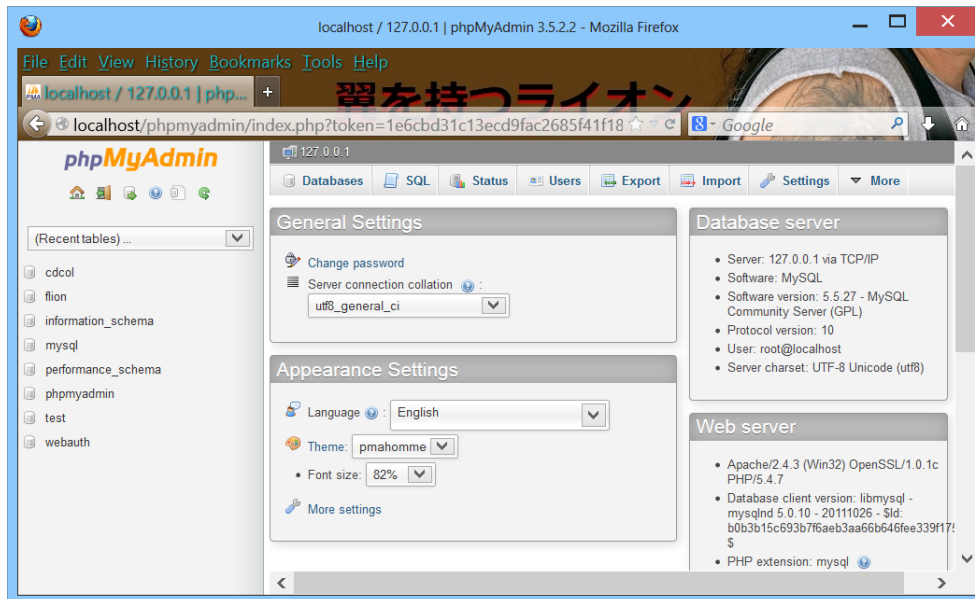
5 - phpMyAdmin page for MySQL database

That's enough of setting up a web server for right now. During the semester, we'll be changing the database settings but that's about all. There's tons more you can do with your web server but that's a subject for a more advanced course or your own study and exploration.

SFTP Program:

Eventually you will want to copy your files to the CEFNS server. Publishing a site (database aside) is that easy; the instant it is copied it is visible to the world! Of course, you can often use a web browser or command line console to move files one at a time but that is tedious, especially if your site has lots of files. SFTP (it stands for Secure File Transfer Protocol) programs usually have features that allow you to copy many files at once.

RECOMMENDED:

I don't have a good recommendation for any platform other than Windows; that's because I do most of my work in that OS. If you find something good for your platform, let me know and I'll add it to this document.

For Windows, I really like WinSCP, available at http://winscp.net/eng/index.php for free. You'll see why, as I show you how to set it up for easy transfer. Students using other platforms should look for similar features in their SFTP software (by the way, OSX and Linux users can still use WinSCP installed under Parallels or Wine respectively – but an OS-native solution would probably be better). Installation is easy, just follow the download instructions. Then launch the program to set it up.
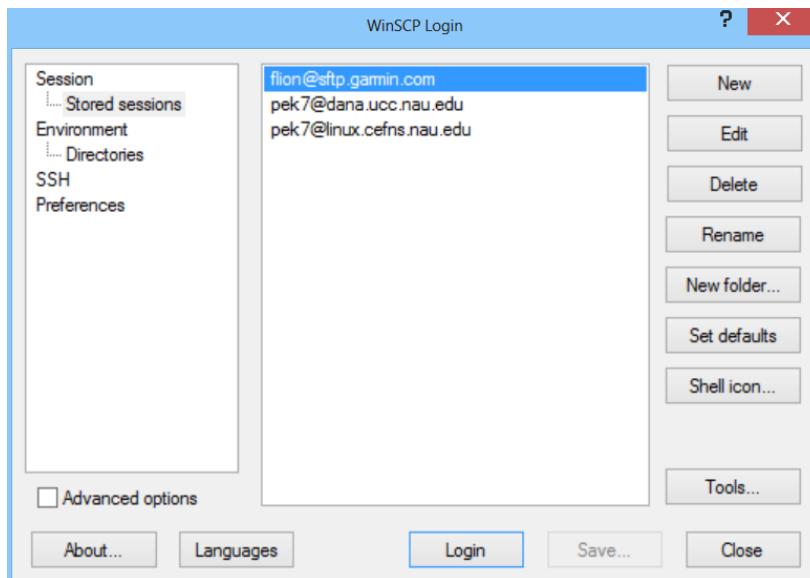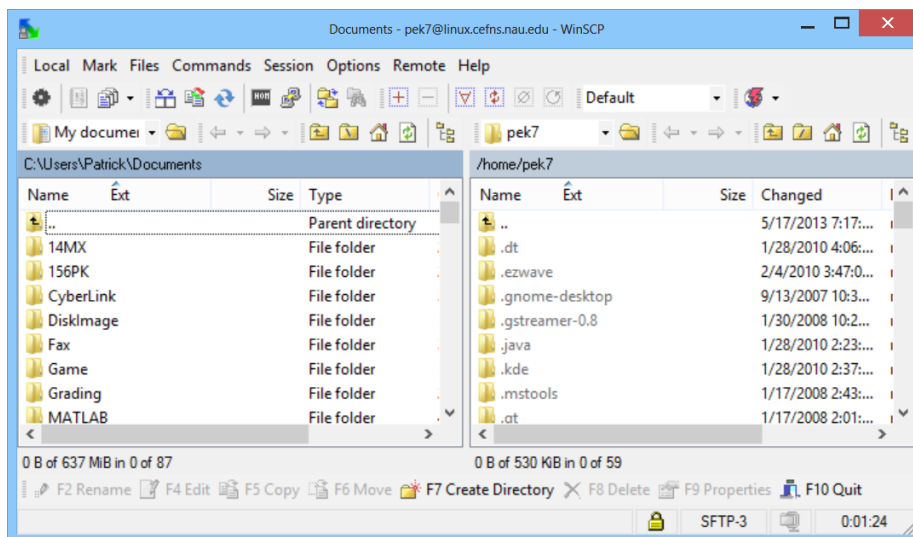

6 – WinSCP

I already have some credentials set up, so you probably won't see anything in the center pane but you can click on the New button to set one up. Otherwise, you can simply click the Login button and it will prompt you for host and credentials. Since you'll be doing this a lot, I suggest saving your credentials so you can just select them and click Login. The credentials screen is shown below.
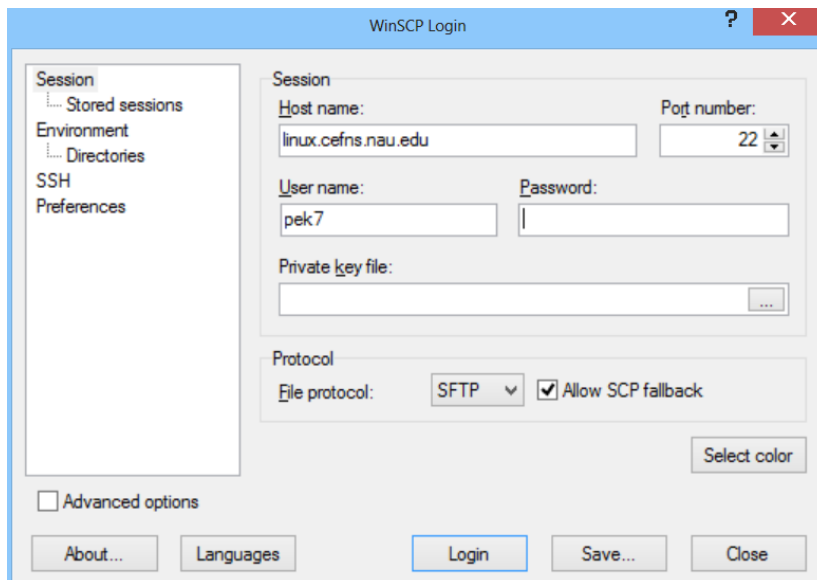
7 - Creating or Editing WinSCP login credentials.

> Use the host name shown and your own CAS credentials. I suggest you don't save your password; WinSCP will simply prompt you for it when you click Login. Don't forget to click the Save button before logging in.


8 - WinSCP browsing screen

> Once you are logged in, you should see a screen similar to the one above. On the left side is the Documents folder from your local machine. On the right side is the home directory of the CEFNS server for your userid. You COULD simply drag and drop files and folders, but you can make it easier. Notice above both frames there is a duplicate set of navigation tools. Click the file folder icon to the right of the folder name for the My documents frame. Then click Browse to get something like:
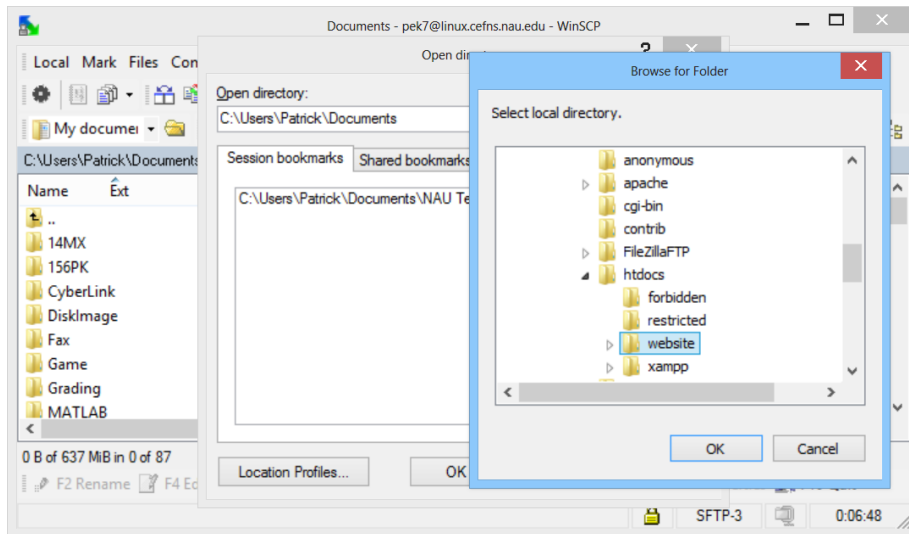
9 - setting a local directory shortcut in WinSCP

Notice that I've browsed to my site folder location under the xampp\htdocs directory; you will want to do the same. Then click OK and click Add on the previous screen. Now you can always open this dialog and select the folder and click OK to go directly to it.

Next we repeat the process for the CEFNS frame but, since it's a bit difficult to navigate (we have to go through some directories that we don't have permissions in), it's easier just to type the path, especially as it is really short - /www/*id*, where *id* is your NAU CAS id. As before, click Add and then you can simply return to this dialog each time you start WinSCP and select the folder and click Ok. Once you do this, you should see a screen something like the one below except, unless you already have some web stuff on CEFNS, the right side will be empty. The left side will show anything you have in your local site directory (probably only the test index.html from earlier). I'll talk about all the folders I have later in this document.
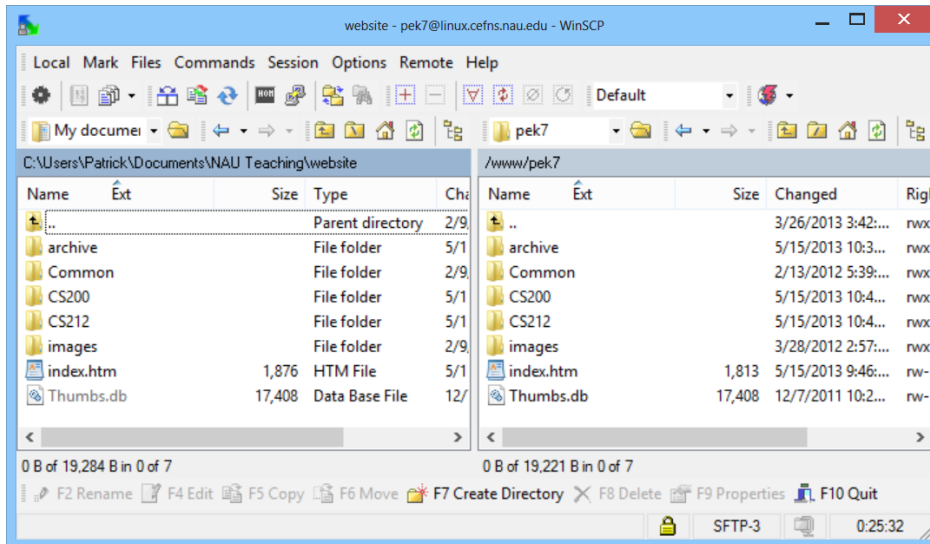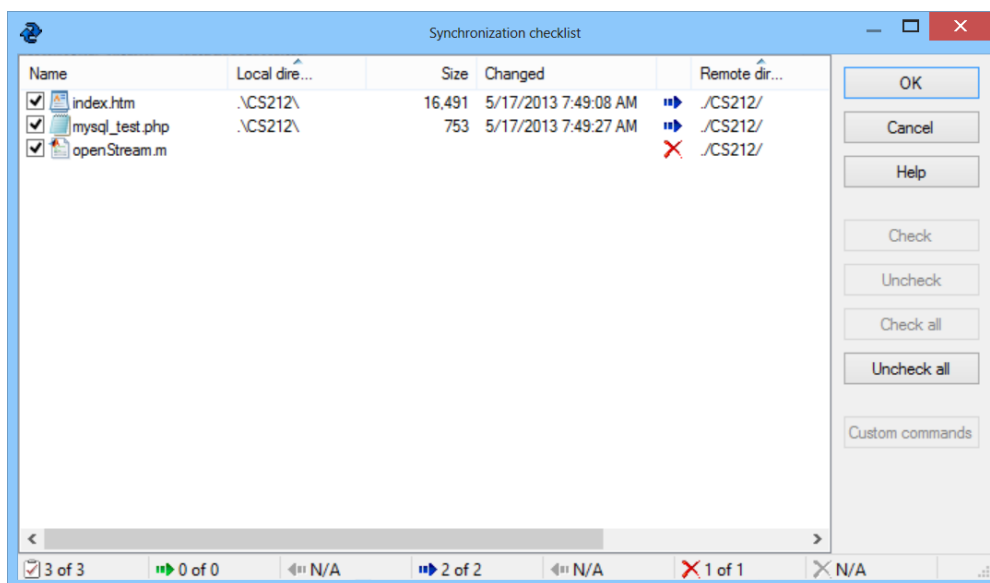
4 - WinSCP pointing to local and CEFNS site directories

Now it would be much easier to drag and drop files but we can automate the process even more. Typically, you only want to copy from local to CEFNS, and only any new or updated files. Sometimes you want to delete files or folders at the server to match changes you made on the local machine. Fortunately, WinSCP can do all that for you automatically. From the menu at the top, click Commands and then select Synchronize… from the drop-down menu to get a screen similar to the one below.

Aside from the directories, which should match what you have pre-selected from the main WinSCP screen, you should make sure all the buttons and check boxes match what is in the figure. The first time you use this, you should also check the 'Use same options next time' box to save these setting. This tells WinSCP to make your CEFNS site match your local site and show you what it will do before it does anything irreversible. Figure 12 is a sample of some changes I've made to my site, shown in the preview dialog.

5 - WinSCP Syncronization dialog
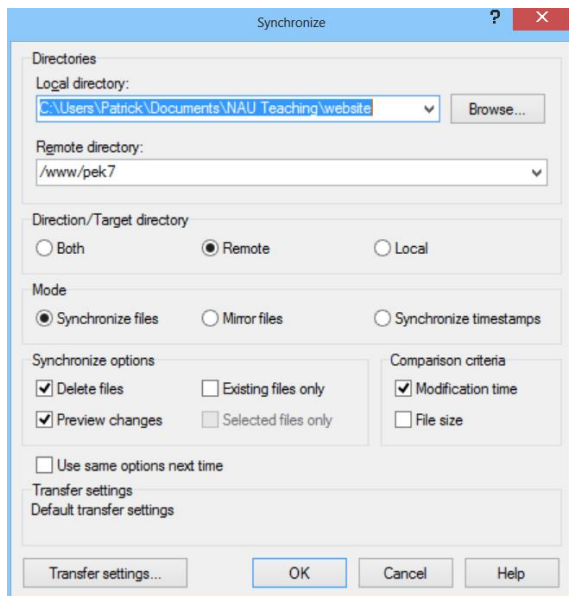
6 - WinSCP Synchronization preview

WinSCP did a comparison of the two directories (you'll see a lot of dialogs flashing by but don't worry, nothing changed yet) and gave me a list of the things it needed to do to make them match. You can un-check any of the items or cancel completely but usually you just let it do what it wants by clicking Ok. In this example, it is updating two files to newer versions and deleting one file that was removed from the local site.

If you already have files in your site on the server, you will want to do this in reverse the first time. Simply change the direction in the synchronization dialog to Local to copy everything from your site to your local machine, and then use Remote thereafter.

If you didn't have web files up on the CEFNS server, then the first time you use synchronize it will place the test file you created earlier on your site. You can now browse to http://www.cefns.nau.edu/~ *id* /, where *id* is your NAU CAS ID. The '~' may not be necessary; newer IDs don't need it. If everything went well, you should see your test page displayed.

Browser:

Of course you need a browser to test your work. Better still, have several. Each browser does things differently, so you want to check on more than one to be sure that they all work the same or, at least, that you can live with the differences. It may be difficult to test for all the possible browsers out there (I know a relative who is still stubbornly using Mozilla 4.0) but you should at least have the major ones. For ones that don't run on your platform, borrow a friend's or fellow student's machine. Luckily for you, we won't be looking at mobile browsers but you might want to see how your work looks on a smartphone or tablet.

GENERAL DEVELOPMENT:

Now that you've installed your tools and everything is working, think a moment about how to organize your site and also your development process. Being organized will make things much easier for you.

My site, shown in the examples above, has a root directory (\website) which is where the html file for the page at www.cefns.nau.edu/~pek7/ is at. The image that you see on that page is in an images subfolder (\website\images) and I only link to two local pages (CS200 and CS212). Each of those pages has its own subfolder and each one contains all the files necessary for those pages. This organization lets me quickly find the files I need to work on for any particular page.

The primary file for any subfolder is 'index' (either index.htm or index.html or index.php) and is the one that shows up if you just enter the folder path into your browser. For other files you have to enter the filename as well. For example, to display the file CS212 Syllabus.pdf in the CS212 folder you have to enter http://www.cefns.nau.edu/~pek7/CS212/CS%20212%20Syllabus.pdf into the browser. (The %20 stands for a space character; most modern browsers let you get away with using a regular space instead.)

When you are developing, it will probably go faster if you get everything working and tested on your local machine and then do a massive upload to the server. Uploading small changes to the server all the time will only slow you down (the server won't be bothered). However, once you've uploaded your site, don't forget to test again. Weird things happen despite your best intentions; the server isn't exactly like your local machine and so some differences can happen. Never assume that just because it worked on your local machine it will be working correctly on the server. You will be graded by what is on the CEFNS server, so it won't fly as an excuse to say that it was working on your machine. Retest and be sure.

That's it. I welcome suggestions for improvements to this document. Let me know about any cool tools you've found or any techniques that help. Especially let me know if something doesn't work; things change and I don't always know if something has been affected.