CS 1033

MULTIMEDIA AND COMMUNICATIONS

Lab 1: FTP

Remember to have your memory stick or a place in the cloud ready to back up your work in every lab!

Learning objectives for this lab

- Activate your personal web space on the UWO server which will be available to you for the entire time you are at Western.
- List the 4 things required to FTP/SFTP (upload or download) a file from a local machine to a web server.
- Name the 2 web server machines you will be using while taking this course.
- Name the type of operation used to copy a file back and forth from your laptop to a server and give the name of two applications that will perform this operation.
- Copy a file and/or folder from your local machine to the Panther server.
- Copy a file and/or folder from your local machine to the Gaul web server.
- Change the permissions on a folder and/or file.
- Indicate the correct Octal number for the permissions in order to be able to view a folder or file in a browser.
- Open the web address to see your folders/files on the Panther server.
- Open the web address to see your folders/files on the Gaul web server.

Introduction

Computing Environment

WARNING:

In case you are working in Middlesex **(but please remember to sit 2 metres away from anyone else in the lab room during the COVID19 pandemic)**

> We want to keep the lab machines working well so please immediately report any issues/problems (monitor flickering, software not working, etc.) you have when sitting at the machines in either MC 230 or NCB 105.
>
> - For MC 230, report problems here: http://www.csd.uwo.ca/prob_report.html
> - For NCB 105, report problems here: https://wts.uwo.ca/about-wts/contact.html

A **computer network** is a group of computers that are connected to each other. In this course, you will be using two different computer networks: GAUL and UWO (Panther). Accessing a computer on one of these networks requires up to four things:

- User ID
- Password
- Host Name
- Port Number

For both networks, you will use your Western ID (everything before the @uwo.ca in your email address) and your Western password to connect. The host names and port numbers will be different for each of the networks. Both of these networks have web servers that allow the outside world to see files that you upload on to them. Today we will try to upload files onto both of these networks.

Panther Server

The main UWO network is called Panther. This is the general network accessible by all Western students and faculty of any department. Panther is maintained by WTS (Western Technology Services), who are located in the Support Services building on Western Road near Huron College. This network is connected to all library computers and the General Computing labs ("genlabs") scattered throughout the university. You will use this network to hold your first assignment.

GAUL Server

The Computer Science Department's undergraduate network is called GAUL. You will be using the GAUL network to hold your second and third assignment. You will try uploading an image to that network in today's lab.

FTP

FTP (File Transfer Protocol) software enables a user to transfer files between their **local** computer (the computer you are using) and a **remote** server. Read through the glossary below to familiarize yourself with the terms related to this process.

There are many FTP programs but we usually use WinSCP (for PC) or FileZilla (for Mac). Both are free programs and easy to install. The labs have these programs pre-installed; you will need to download and install one of them on your home PC/laptop if you plan to hand in your assignments using your own machine.

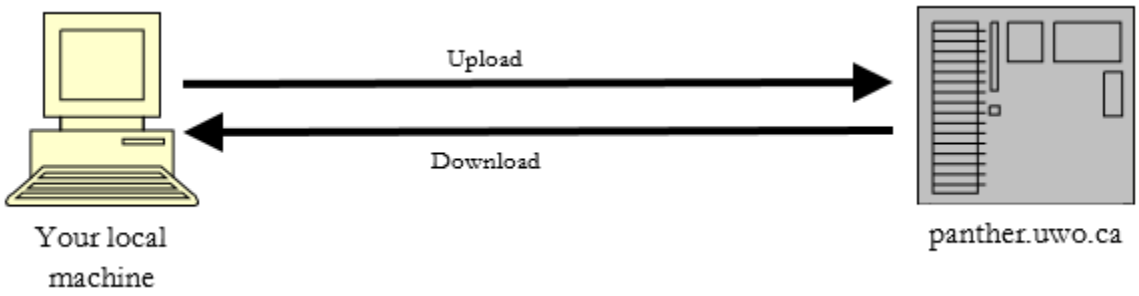
WinSCP (Windows users)

- Download here: https://winscp.net/eng/download.php#download2
- FAQs here: https://winscp.net/eng/docs/faq

FileZilla (Mac or Windows users)

- Download here: https://filezilla-project.org/index.php
- FAQs here: https://filezilla-project.org/faq.php

FTP allows you to move files (such as .jpg files or .html files) between the machine you are sitting at (your local machine) and the web server (i.e. Panther or GAUL).



Glossary

hosting	a service that provides storage for website files on a computer and allows access to those files from the Internet
webserver	a computer that is set up to host websites. In this course, we will be hosting some files on the server maintained by WTS (called Panther) and the webserver maintained by Computer Science Dept. (called GAUL)
downloading	copying files from a remote server (such as Panther) to the local PC (the computer you are using right now)
uploading	copying the files from the local PC to a remote server

FTP-ing	copying files from a remote server to the local PC or from the local PC to a remote server, a slang term for downloading and uploading
directory	a folder in a computer to store and organize files

Activity 1

Activating your Panther server space

Before you can put anything on the UWO (Panther) network, a folder (directory) must be created to hold all your work. This folder will be called public_html. For the Gaul network, the Computer Science Department does it for you. For the UWO (Panther) network, the WTS department has created a web page form for you to fill in that will create the public_html folder automatically. (NOTE: you will only need to fill in this form ONCE while you are at Western). To activate/create your public_html folder on Panther, do the following:

1. Open a web browser, like Chrome, and go to this website: https://wts.uwo.ca/services/web/activate_my_personal_web_space.html
2. Enter your Username and Password as requested and hit Submit. In a few minutes, a special area (really just a directory or folder called *public_html*) will be created. Anything you move (upload) to this directory will now be available on the Internet.
3. The place where this folder will be available is: http://publish.uwo.ca/~yourwesternusername (for example if your Western username was jsmith789, then after completing step 2, you would now see something at http://publish.uwo.ca/~jsmith789. In a web browser, try going to your newly activated Panther space using the URL template above but with your Western username, and see if anything shows up. NOTE: this may take a few minutes to activate so if nothing happens right away, move on to Activity 2 and then come back to this in a few minutes.

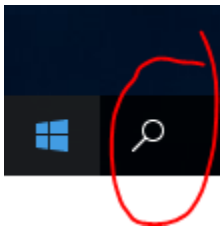
REMEMBER: if you completed the webform in step 1 and 2 above and hit Submit, you should never have to do this step again even in future years. You should only need to do this once and it will remain activated throughout your university life!

Activity 2

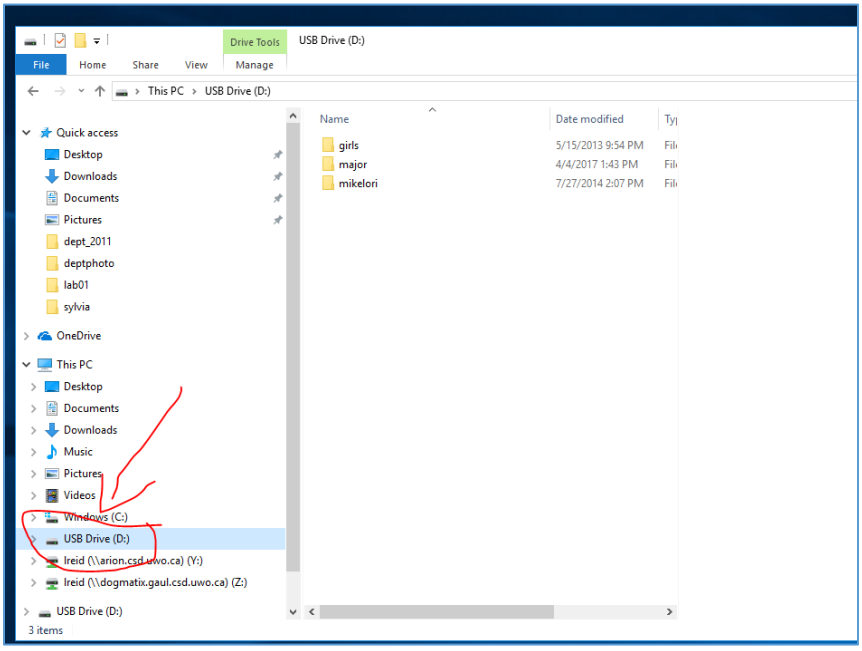
Using your memory stick for this course

NOTE: For the remaining labs in CS1033 remember that **folder** and **directory** mean the same thing. If you are working from Middlesex labs, because the set up in MC 230 is slightly differ than the set up in NCB 105, we have to do a bit of setup so that your memory stick is pointing to the same place in both lab rooms. Normally the memory stick will map to the F: drive, so this lab will ALWAYS refer to the F: drive but just in case, perform the steps below to figure out which drive your memory stick was mapped to. Then we will save everything to the F: drive (i.e. your stick). Do NOT save your lab files to the lab computer itself – these computers often get wiped so anything you save on there could be deleted at any time.

1. Put your memory stick into a USB slot.
2. In Windows 10, open up the File Explorer as follows:
   a. Click on the magnifying glass icon (the Search Windows area) in the bottom left corner next to the Windows icon
   b. In the box that opens that says *Search Windows*, type "File Explorer"
   c. Click on the File Explorer icon (should look like a folder)



3. Look along the left side and see which drive your memory stick was mapped to. It will likely be under an area labeled “USB Drive”. Make sure you remember the drive letter and substitute it every time you see F:\. If your memory stick was mapped to a different drive, it will look like this (this one was mapped to the D: drive):



4. Double click on the F:\ drive (memory stick) to get into this area.
5. Once you have gone into your F:\ drive, create a directory (folder) by right-clicking the F:\ drive and selecting New > Folder. Name the new folder **cs1033**. *This is where you will store your lab files for the course.*

In the next steps you will learn how to copy the lab files (images, documents, video clips, sound clips etc.) that you will be provided with for each lab to your memory stick. For each lab, you will copy the files containing images, documents, video clips, to your F: drive (memory stick). You will need to copy them to your F: drive in the cs1033 folder (directory) every week for each lab.

6. On your memory stick, move to the folder you create above called **cs1033** (it will likely be put on the F: drive)
7. Click into the cs1033 folder and create a sub-folder called **lab01**.
   NOTE: it is VERY important you name your files and folders carefully and use the exact same spelling and exact same case (usually make every file/folder name lowercase with no spaces in the folder name or file name)
8. Move to the **cs1033/lab01** folder and create a sub-folder called **images**.
9. Go to: http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab01 and right-click on the file called *picturepage.html* and select "Save link as" (or "Save target as") and save it to **cs1033/lab01** on your memory stick.
10. Right-click on the file called *Lab1WindowsVersion.pdf* and select "Save link as" (or "Save target as") and save it to **cs1033/lab01** on your memory stick.
11. Using a browser such as Chrome, Firefox, or Edge, open the following website: http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab01/images/
12. Right-click on the file called *middlesex.jpg* and select "Save link as" (or "Save target as") and save it to **cs1033/lab01/images** on your memory stick.
13. Right-click on the file called *ucc.jpg* and select "Save link as" (or "Save target as") and save it to **cs1033/lab01/images** on your memory stick.

Note: the 2 image files should be in the *images* sub-folder while the other 2 documents should be in *lab01*, not in *images*.

Activity 3

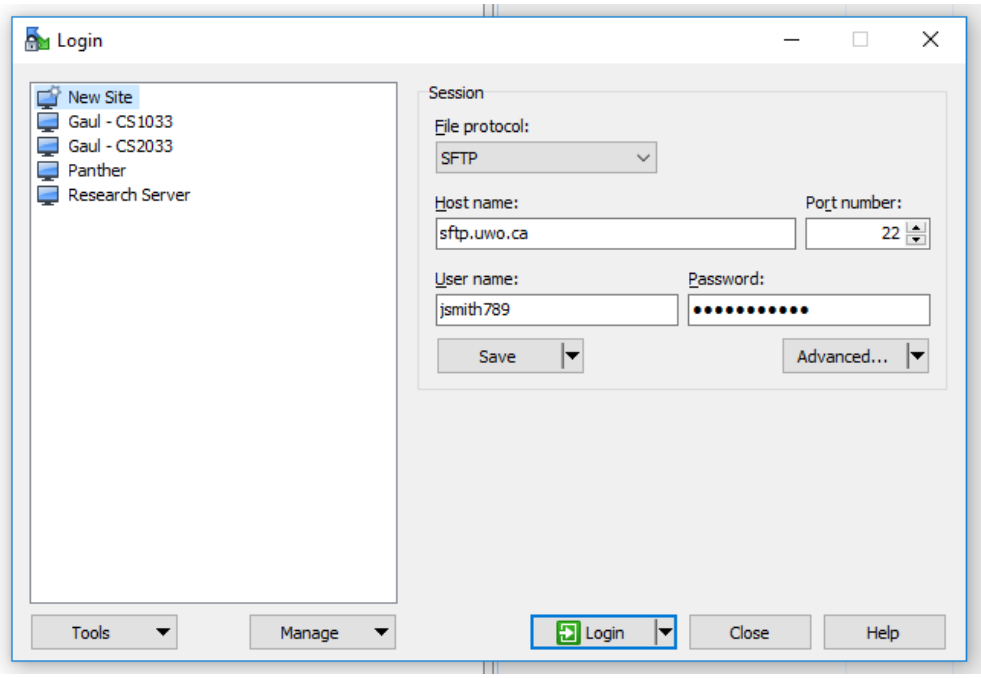
Connecting to Panther via FTP/SFTP

You are now going to learn how to use SFTP to connect to the Western server called Panther to upload files to the Internet.

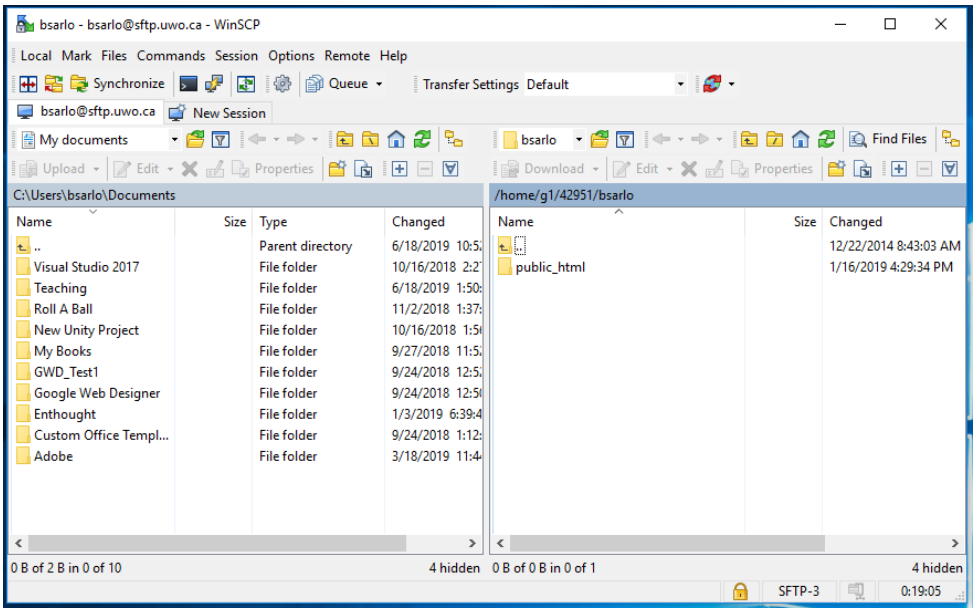
Since Panther is a remote server, you must use a SFTP program such as WinSCP (or FileZilla or Fugu) to connect and copy files onto Panther. In the first activity, when you did "Activate my Personal Web Site", you created a "publish area" (a folder called public_html) – this is where you upload files to be accessible on the Internet by others.

1. Open WinSCP (either click on this icon 

OR click the Search Windows icon and type "WinSCP" to find it).
2. The WinSCP login window should pop up in front of the rest of the program. You must log in to a server before you can do anything else.
3. Enter **sftp.uwo.ca** in the *Host name* box.
4. Enter **22** in the *Port number* box.
5. Enter your own Western username in the *User name* box.
6. Enter your own Western password in the *Password* box.
7. Then click the **Login** button.



8. Don't worry if you see a pop-up window or two about Authentication. Just click Yes or Continue.
9. If you entered these credentials correctly, it should connect to your Panther space now. The screen is split into two panels:



The left panel is your local computer side (or your memory stick if you navigate to it). We call this the **Local side**.

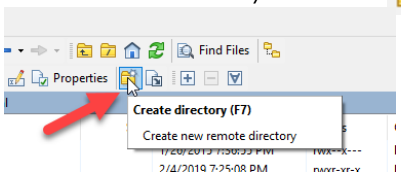
The right panel is the Panther server side and we call this the **Remote side**.

Important notes:

- Any files you upload to the remote side could potentially be viewed by anybody if they know the website address or find it through Google!
- There may be times when you won't see your files on either side of the panels after you have uploaded. If this is the case, you can always refresh the panel by clicking the little icon of two green arrows.
- Be careful not to delete files on the left panel since that is your local drive. You may have to delete and re-upload files to the right panel if you make changes to a website file, etc. but make sure you do not delete from the left panel or it will be permanently gone!

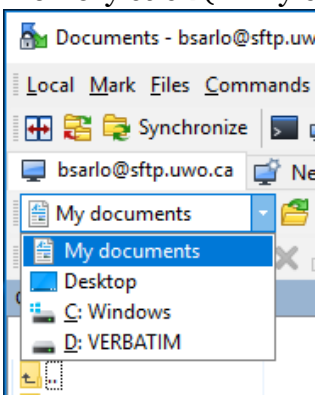
10. Find the folder called **public_html** on the Remote side. You will be uploading files into this folder for some labs and assignments. Note: if you did not complete the first activity earlier, this folder might not exist. If you do not see it, you either need to go back and complete activity 1 OR just wait a few more minutes as it takes some time to show up after you activate it.

11. Click into your public_html folder. You may see files in there (i.e. index.html) but you can ignore that for now.
12. Try clicking back and forth between the Local side and the Remote side. You should notice two things change as you toggle between the sides: 1) the blue bar along the top of each panel becomes brighter and 2) the title text along the very top of the program bar.
13. Click on the Remote side to ensure it is active. Make sure you are still inside the public_html folder. Then click F7 to create a directory or click on the little *Create directory* icon.



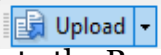
14. In the *Create folder* window that pops up, enter the name **cs1033**, check the *Set permissions* checkbox, and ensure that it says **0755** beside the Octal box (this should be the default but if for some reason it's not there, just type it in yourself). The permissions will be explained more in the next activity. Then click on the OK button to create the folder.
15. Click into this new **cs1033** folder on the Remote side. The blue bar at the top of this panel should look something like this (except with your Western username and the previous character sequences are probably different):

16. Click on the Local side to make that panel active.
17. Now you need to change the current directory that is open in the Local side. This usually defaults to the Documents directory but you will need to point to the folder on your memory stick: **cs1033/lab01**. There are different ways to do this but the quickest way is to use the dropdown menu to move directly to your memory stick (in my case it is D: but it may be F: or another letter for you).



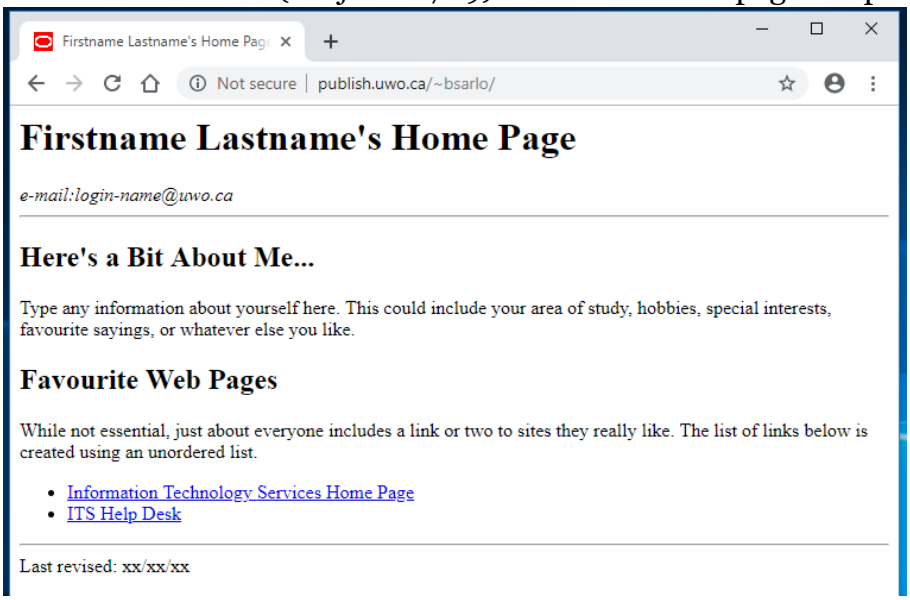
18. From the memory stick drive, click into **cs1033** and then **lab01**.
19. You are ready to begin uploading (transferring) files from the Local side to the Remote side, i.e. moving them from the cs1033/lab01 folder on your memory stick to an online server.

NOTE: There are various ways to upload files. First select one or more files that you wish to upload, then use one of the following options to begin the upload on the selected file(s). If you see a pop-up window, just push OK.

a. Click the Upload button above this Local side 

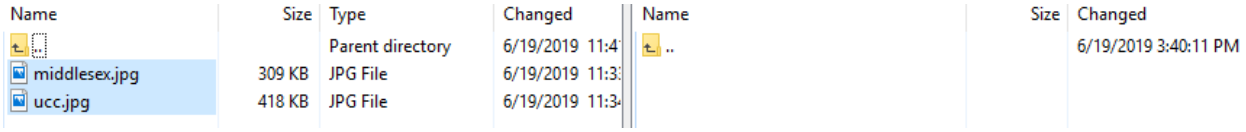
b. Click on the selected files and drag your mouse to the Remote side and then un-click (let go of the click action)
c. Press the F5 key

20. Upload **Lab1WindowsVersion.pdf** by selecting it and clicking the Upload button (option A) OR by dragging it across to the Remote side.
21. Upload **picturepage.html** by selecting it and pushing F5.
22. Don't upload the images yet. First, we will check if your files were properly uploaded by looking for them in a web browser.
23. Open a browser like Chrome and enter the URL: http://publish.uwo.ca/~youruserid where youruserid would be your own Western username (i.e. jsmith789). The default webpage template looks like this:



24. We're more interested in seeing the files uploaded to the cs1033 directory. Click into the address bar in the browser and add **/cs1033** at the end of the URL and hit Enter. You should see the list of files that you uploaded to this directory.

25. Click on Lab1WindowsVersion.pdf and it will try to open it in the browser or download it, depending on your browser and settings. Click picturepage.html and it will open the webpage in the browser. Note: when you open this webpage, you'll see that there are supposed to be two images in the page that aren't loading. This is because we uploaded the webpage (picturepage.html) file but not the image files.
26. Go back into WinSCP and click into the Remote side. Within the cs1033 directory, add a new sub-directory and name it **images**. Remember to ensure that the permissions are properly checked. Click into this **images** directory, which should be empty since you just created it.
27. Click on the Local side now and click into the **images** directory on that side which should have the 2 image files you downloaded earlier.
28. Select both image files as a group and then use any of the 3 upload options to transfer them across to the Remote side.



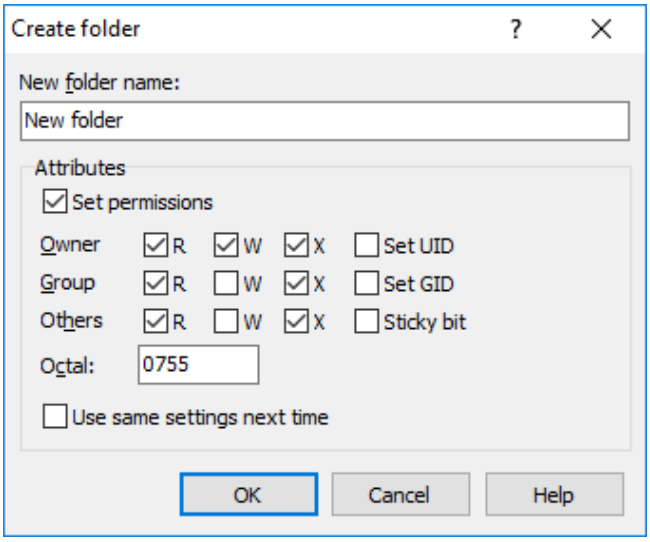
29. Click back into the browser and open *picturepage.html* again. This time you should see the two images embedded in the website properly because they are now uploaded to the server.

Activity 4

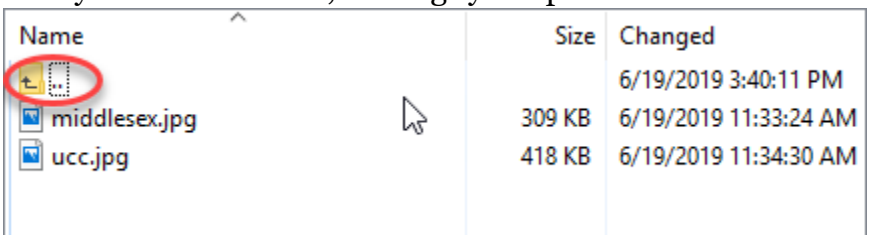
Setting file/folder permissions

In the previous activity, you created directories and checked the *Set permissions* box but this wasn't explained to you yet. Here you will learn what permissions are, how they affect the files/folders online, and what to set them to.

Permissions allow us to control who has access to our files. They are a standard way of indicating whether our files are publicly accessible or private. There are three different categories of users to assign permissions to: Owner, Group, and Others. For each category, up to three actions may be granted: Read (R), Write (W), and Execute (X). For example, you could allow the general public to view/read a file you upload but not to edit the file in any way. In this activity, you will see what happens when you try to open a file which has private permissions set.



1. In WinSCP, click on the Remote side to make it active.
2. Double-click on the top folder that has an up arrow and two dots beside it. Any time you click this icon, it brings you up one level from the directory you were in.



3. Repeat step 2 to go up an additional level. You should now be in the public_html level (not inside the cs1033 directory).
4. In public_html, create a new directory called **junk**. Check the *Set permissions* box but then change the *Octal* box to **0744**..
5. Push OK to create the **junk** directory with the **0744** permission code.
6. Look under the *Rights* column and you will see the permissions sequences.

7. Click into the new junk directory.
8. From the Local side, you should still have the **images** directory open. Select both images and upload them to the **junk** folder on the server.
9. In a browser, open http://publish.uwo.ca/~youruserid/junk where youruserid would be your own Western username (i.e. jsmith789).
10. Both images are listed there. Click on the images to try to view them. You should see an error page come up that says "Authorization required". This page means that the file you are trying to open is restricted due to permissions. Hit the Back button in the browser to return to the junk directory list.
11. Now go back to WinSCP and, on the remote side, step out one level to get back into **public_html**.

12. Right-click on **junk** and select *Properties*.
13. Change the *Octal* code to **0700** and push OK.
14. Go back to the browser that has your **junk** directory open and hit Refresh.
15. The "authorization required" error page has come back up but this time you can't even see the directory listing! That is because we just removed the Reading permissions on the whole directory so even seeing the files within it is prohibited.
16. Go back into WinSCP and open the **junk** properties window again. This time, give it the *Octal* code **0755** – the same permissions as the **cs1033** directory has – and push OK.
17. Refresh the browser page again and try opening the images. Everything should be viewable now that the permissions are set to public.

IMPORTANT: Always remember to set your permissions and remember that the Octal permissions for:

- directories (folders) must be **0755**
- files (.jpg, .gif, .html, .doc, etc.) must be **0644**

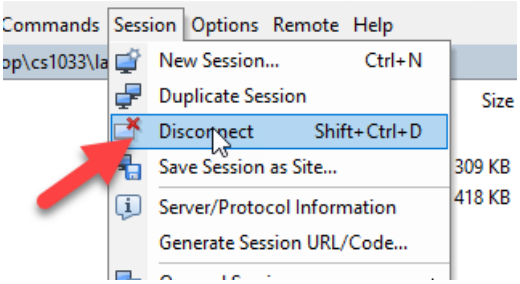
If the permissions are not set correctly, then when you try to view it from the browser you will get an error message saying "Authorization required..."

Activity 5

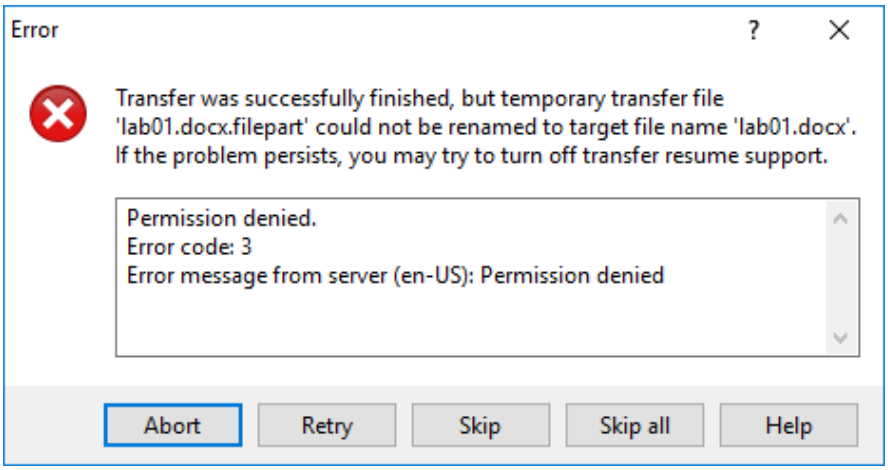
Practice with GAUL

You are now going to learn how to use WinSCP to work with the Gaul server. It is very similar to making the connection to the Panther server.

1. In the WinSCP menu, select Session > Disconnect to terminate your Panther connection.



2. A new Login window for a new session will now appear. To connect to the Gaul server (which is the Computer Science Department's server), enter the following information:
    a. **Host name**: cs1033.gaul.csd.uwo.ca
    b. **Port number**: 1033
    c. **Username**: your Western user ID
    d. **Password**: your Western password
    e. **File Protocol**: this SHOULD be SFTP by default but if it's not, select SFTP in the dropdown menu
3. Click on the Login button
4. Once the connection is made, on the right side (the Remote side now being the Gaul server), you will be directly inside the directory where you will upload your **lab01** folder (i.e. this time you do NOT have to move to publish_html).
5. Make a folder called **lab01** on the remote side as you did for panther. (This time you will NOT have it inside of a folder called cs1033). You are creating it at the root level which is where WinSCP places you once you connect to the server.
6. Double-click on **lab01** in the Remote side to enter into it.
7. From the Local side, navigate to your F: drive and into the **lab01** directory.
8. Select all the files on this side and upload them over to the new **lab01** directory you created on the Gaul server.
   Note: In case you have a .doc or .docx file in your local **lab01** directory and you drag it to the Remote side, Gaul server does not accept certain file types like Word documents (.doc or .docx). Thus, you will see a similar error message like this when it gets to the uploaded .docx file. Push Skip so it ignores this file and moves on to other files.



9. To check that this upload worked, you will need to open a different web address in your browser to view your files:
   http://cs1033.gaul.csd.uwo.ca/~youruserid where youruserid would be your own Western username (i.e. jsmith789).
10. Click the lab01 directory and then click picturepage.html so make sure it opens properly. You should see the two images embedded in the page as well. If you get any authorization errors or broken image errors, then you need to check the file

permissions or double check that the images uploaded into the **images** sub-directory.

Note: you will be using FTP for all 3 assignments in this course so make sure you understand this process now. You can always refer back to this lab if you forget how to do something.

Lab1 OWL Submission

1. In your Internet browser, go to https://owl.uwo.ca and login with your UWO username and password.
2. Go to your CS1033 OWL site.
3. On the left-side panel, click on **Week By Week**. Click on the **Week 1** button, then click on the **Lab 1** button, this will take you directly to **the Lab 1** submission area in Owl.
4. In the textbox under Submission, copy and paste your submission link which is:
    a. http://publish.uwo.ca/~**youruserid**/cs1033
    b. http://publish.uwo.ca/~**youruserid**/junk
    c. http://cs1033.gaul.csd.uwo.ca/~**youruserid**
    d. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab01

5. Click on Submit.

Remember to save all your Lab01 folder on your backup memory stick or cloud storage!