Remote Uploading and Interaction

- The Remote Server
- Command-Line Sessions
- From Local to Remote
- Editing Files
- Folder Hierarchy

The Remote Server

- Think of the remote server as just another computer out there, which you want to access for doing work and storing files
- Like your own computer, it has:
  - An operating system
  - Software applications
  - User accounts
  - Files and folders
  - An interface for user interaction: Command-line or Graphical

The Remote Server

- Command Line Interface (CLI)
  - Computer issues a **prompt**, requesting input
  - User types a **command**, with **parameters**
  - Predominantly an old style of interaction that does not require a lot of computer power, but still in use today!
  - Considered to be NOT "user-friendly", but it can be very efficient when combined with "scripting"...
  - Example: UNIX/Linux CLI, command + parameter (Result will be to display the contents of file.txt)

```
$ cat file.txt
```

The Remote Server

- Graphical User Interface (GUI)
  - Computer displays a combination of *text* and *graphical symbols* offering options to the user
  - User manipulates mouse and uses keyboard to select from the offered options ("hot keys") or to enter text
  - More common now (computer power is cheap)
  - Considered by most to be "user friendly"
  - Examples:
    - Windows or Mac OS X
    - Microsoft Office or Libre Office
    - iTunes

The Remote Server

- The CS department's system...
  - Uses the Ubuntu Linux operating system (***Version:*** *16.04.5 LTS*)
  - Is usually accessed through a *CLI*
  - Features a complex file system hierarchy
  - Hosts user accounts (and files) for CS and IT students, faculty, and staff
  - Has a team of system administrators and operators
- For much of your work in here and in other IT/CS classes, you will need to use this system.

The Remote Server

- First, you will want to know some basic information about the server, so you can access and use it, in the first place.
- To connect to the remote server and log in, you will need
  1. The ***Host*** : `users.cs.umb.edu` (or an alias like `users3.cs.umb.edu`)
  2. Your ***Username*** (*the one you created when you applied for your Linux account*)
  3. Your ***Password*** (*known only to you, obviously*)
  4. A ***Port number*** : `22` (*usually the program supplies it for you*)

The Remote Server

- Be aware also of the path to your home directory: `/home/[your username]`
  - For example, user `cs110ck`'s home directory/folder is located at `/home/cs110ck`
  - This is where all your other files and directories on the remote are stored
  - You can have subdirectories, and their paths will *branch off* from your main path.
    - Your IT110 directory: `/home/[your username]/it110`
    - For example, user `cs110ck`'s is `/home/cs110ck/it110`

The Remote Server

- If user `cs110ck` created a subdirectory called "notes" inside of their home, the path would be `/home/cs110ck/notes`
- Inside of there, the user might create more specific directories for notes for classes IT110 and IT116:

  `/home/cs110ck/notes/it110`

  `/home/cs110ck/notes/it116`

- When working on the remote, you will always be "in" some directory -- which will be your **current working directory**

The Remote Server

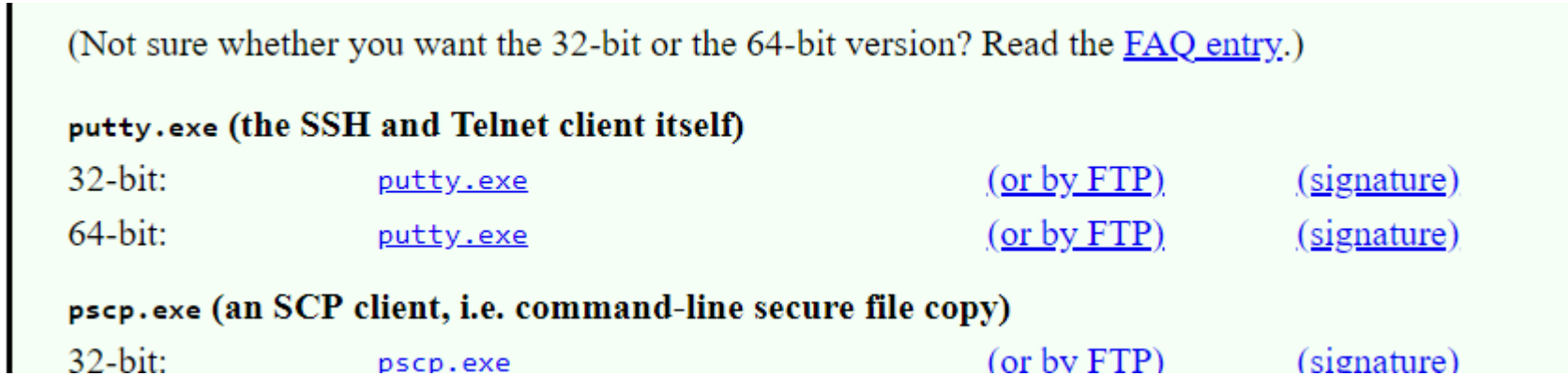
- Make sure that...
  - You know the path to *your current working directory* -- its location within the larger directory hierarchy
  - You know what is *contained within* your current working directory
  - You are certain *this* directory is where you need to be working
  - You are able to *navigate to* a different directory, if needed

The Remote Server

- You will also need to be able to do the following with your files and directories
  - ***Create*** a new file or directory
  - ***View*** its contents
    - File: The file's contents
    - Directory: What is contained within it
  - ***Edit*** a file
  - ***Rename***, ***Move***, or ***Delete*** (an *existing* file or directory)

Command-Line Sessions

- Choose an option for creating remote command-line sessions, based on your personal computer's operating system.
- Windows: The best option is probably the software PuTTY
  - Main download page: **https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html**
  - There are many download options, but this is probably your best bet



(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

putty.exe (the SSH and Telnet client itself)

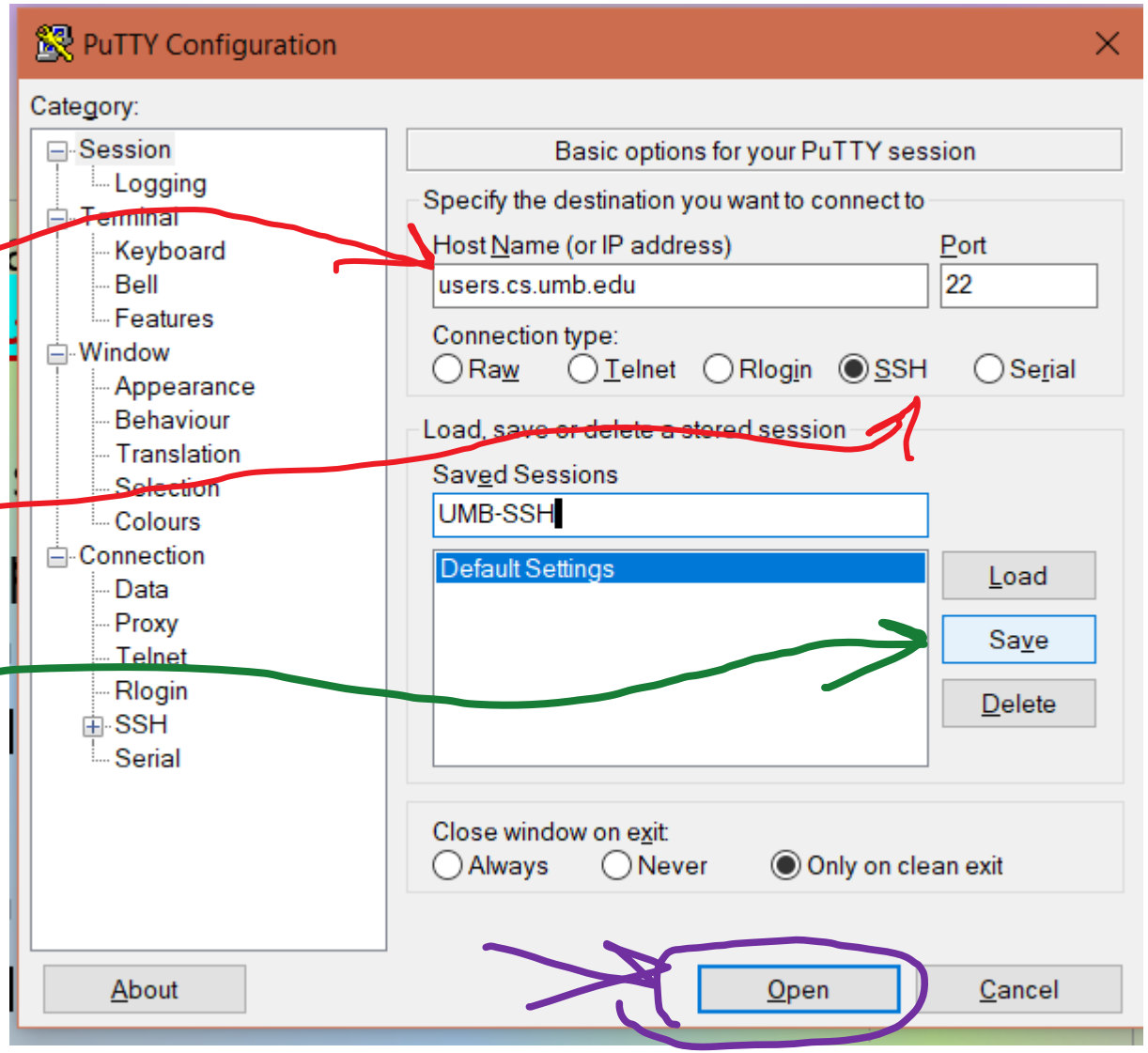
32-bit:	putty.exe	(or by FTP)	(signature)
64-bit:	putty.exe	(or by FTP)	(signature)

pscp.exe (an SCP client, i.e. command-line secure file copy)

32-bit:	pscp.exe	(or by FTP)	(signature)

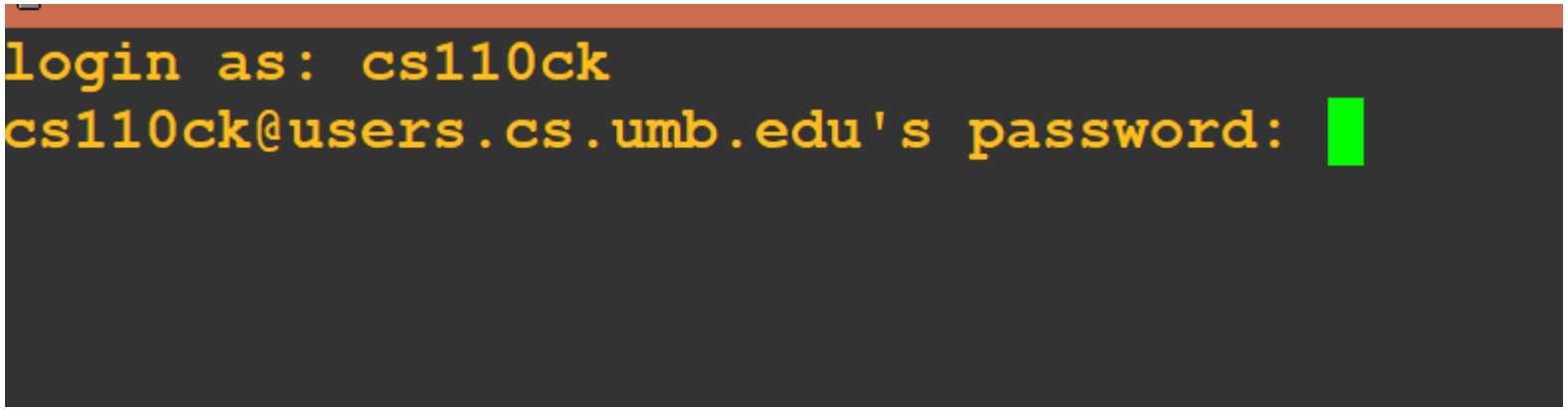
Command-Line Sessions

- Make sure to put the executable (**putty.exe**) in a location on your computer that you will be able to find it easily
- Type in the *Host* (indicated previously) and choose **SSH** as your connection type
- You can save this combination by name and reload as needed.
- This is especially useful if you SSH into many different remote servers for different purposes.



Command-Line Sessions

- Click ***Open***
- At the prompt, type in your Linux username and press ***Enter***
- Then your password, and press ***Enter***
- (Password will not show up on the screen as you type, keep in mind!)



- Mac OS X
  - Start up the program ***Terminal***
  - The ***SSH*** command should already be installed

Command-Line Sessions

- At the prompt, type the following:

  `ssh [your username]@users.cs.umb.edu`

- For example, user `cs110ck` would type

  `ssh cs110ck@users.cs.umb.edu`

- At the prompt, type your password (which will not appear on screen) and press ***Enter***
- If you get errors related to a file called `known_hosts` -- or, for that matter, other errors attempting to connect -- let me know!

Command-Line Sessions

- Either way, once your command-line session is going, you should get a prompt, like the following:

```
cs110ck@itserver6:~$
```

- To confirm you are in your home, try entering this command: `pwd`
- `pwd` displays your current working directory, so you know where you are.

```
cs110ck@itserver6:~$ pwd
/home/cs110ck
cs110ck@itserver6:~$
```

Command-Line Sessions

- To see what is in your current working directory, enter: `ls`
  - Of course, that is just a basic listing, and it only shows visible items
  - A future assignment will have you explore variations on that command

```
cs110ck@itserver6:~$ pwd
/home/cs110ck
cs110ck@itserver6:~$ ls
cs110     Desktop    Downloads  hw4.sh   it1
cs110.d   Documents  hw4.pdf    it110    it3
cs110ck@itserver6:~$
```

- To change to another directory, enter:

```
cd [path to new directory]
```

Command-Line Sessions

- For example, if inside your home directory, you could type **cd it110** to get into your IT110 directory

```
cs110ck@itserver6:~$ cd it110
cs110ck@itserver6:~/it110$
```

- To enter your current directory's parent, type: **cd ..**

```
cs110ck@itserver6:~$ cd it110
cs110ck@itserver6:~/it110$ cd ..
cs110ck@itserver6:~$
```

- To create a new folder inside your current folder, type: **mkdir [new directory path]**
  - For example, if inside your home directory, you could create a "notes" subdirectory: **mkdir notes**

```
cs110ck@itserver6:~$ mkdir notes
cs110ck@itserver6:~$
```

  - You could also create more subdirectories inside of "notes"...

Command-Line Sessions

```
er6:~$ mkdir notes
er6:~$ ls
op     Downloads   hw4.sh   it114   it441   notes   Pictu
ents   hw4.pdf     it110    it341   Music   perl5   Publi
er6:~$
```

- From directly inside of it:

  `cd notes`

  `mkdir it110`

  `mkdir it116`

```
cs110ck@itserver6:~$ cd notes
cs110ck@itserver6:~/notes$ mkdir it110
cs110ck@itserver6:~/notes$ mkdir it116
cs110ck@itserver6:~/notes$ ls
it110  it116
cs110ck@itserver6:~/notes$
```

- From inside the parent directory that ***contains*** "notes"

  `mkdir notes/it110`

  `mkdir notes/it116`

```
cs110ck@itserver6:~$ mkdir notes/it110
cs110ck@itserver6:~$ mkdir notes/it116
cs110ck@itserver6:~$ cd notes
cs110ck@itserver6:~/notes$ ls
it110  it116
cs110ck@itserver6:~/notes$
```

- Just be aware of what you are doing, so that you do not end up creating confusing or redundant directory structures!
  - To end a session, type and enter: `exit`
  - We will explore more in a future assignment!

```
k@itserver6:~/notes$ ls
 it116
k@itserver6:~/notes$ exit
```

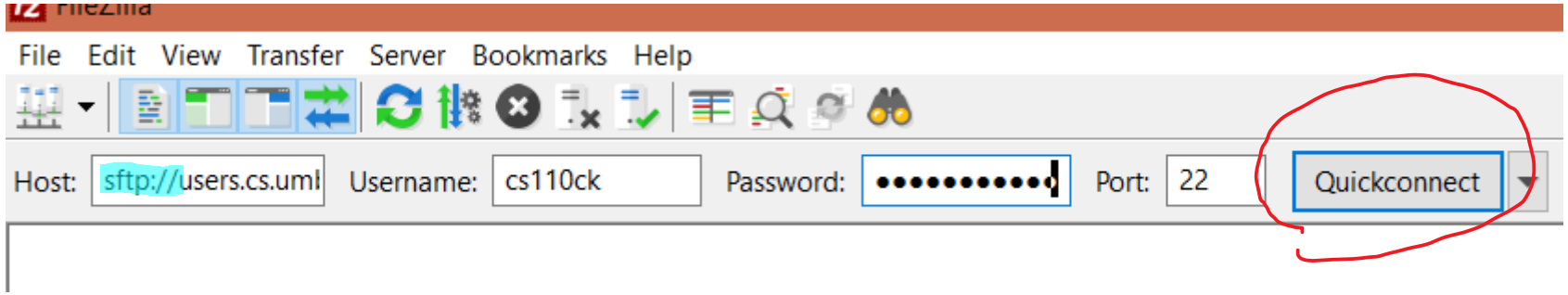
GUI Session

- Find a FTP client program that will run on your personal computer.
  - Here, we will look at FileZilla because that is available on multiple operating systems.
  - For other client programs, there are likely analogous methods for completing the same tasks shown here with FileZilla!
- Here is a FileZilla download link:

https://filezilla-project.org/download.php?type=client

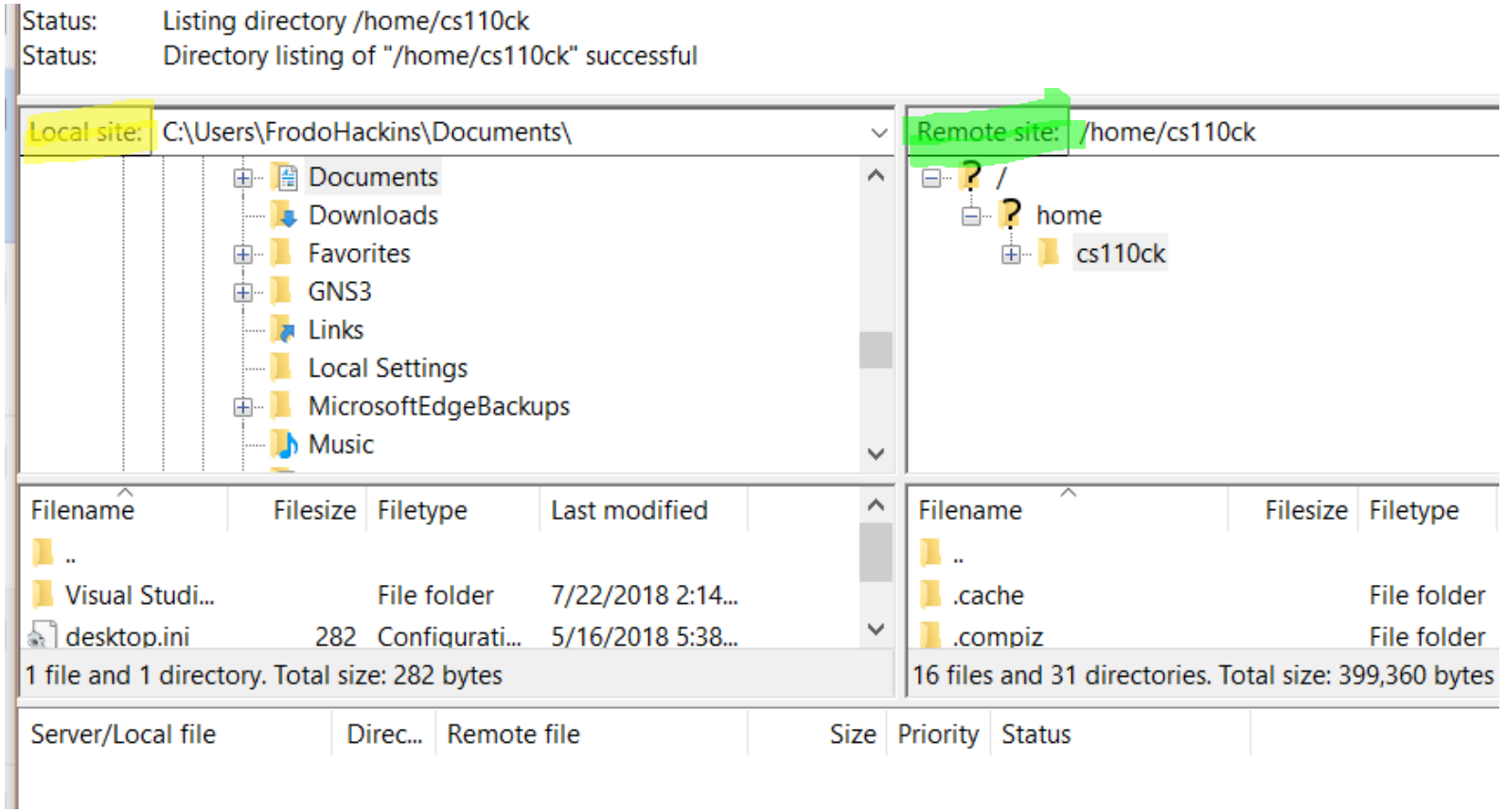
GUI Session

- Once you have it installed, you may start up the program and provide the host, your username, your password, and the port number
  - NOTE: For FileZilla, you will need to prepend the host with **sftp://**
  - Click Quickconnect
  - If you want to save this session for future log-ins, go to:
    - File -> Copy current connection to Site Manager
  - You may also go into Site Manager and manually create log-in profiles



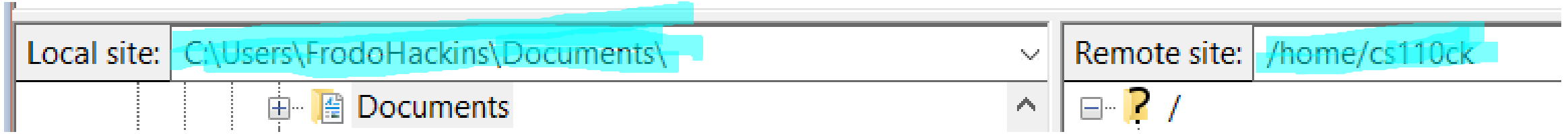
GUI Session

- Once logged in, you will have two panes: left and right
  - **Left Side = Local:** The files and folders on the computer you're currently using
  - **Right Side = Remote:** The files and folders on the remote server.
  - Thus, you have ***two*** current working directories -- one *local* and one *remote*
  - You can move around both these directory trees *independently*



GUI Session

- From there, you can navigate either directory tree using:
  - Your mouse or your keyboard
  - The folder path fields ("Local site:" and "Remote site:"), which also will tell you where your current working directories are right now



- You can click-and-drag to move files and folders
  - Both within and between local and remote

GUI Session

- Though dragging between will copy, I believe, while leaving the original intact in its present location
- Dragging **local** to **remote** *uploads*
- Dragging **remote** to **local** *downloads*
- Be sure that you do not accidentally overwrite a file version that you want to keep!

- You can right-click on a file or folder to do things like…
  - Rename it
  - Change file/folder permissions (may discuss later)

GUI Session

- Delete it
  - Be super careful doing this!
  - On the remote server, especially, recovering an accidentally-deleted file or folder will be virtually impossible!
- Create new directories
- *Upload* (from local to remote)
- or *Download* (from remote to local)
- Refresh current view
- And more…

Create/Edit a Text File on Remote (CLI)

- Start up your command-line session by logging in
- Change to the directory where
  - The file is located, or
  - Where you want to locate the file
- For example, let's say that
  - I am logged in as `cs110ck`
  - My current working directory is `/home/cs110ck`
  - I want to place the new file in my subdirectory `notes/it116`
  - I want to call the file `20180912_notes.txt`

Create/Edit a Text File on Remote (CLI)

```
cs110ck: ~
$ cd notes

cs110ck: ~/notes
$ cd it116

cs110ck: ~/notes/it116
$ nano 20180912_notes.txt
```

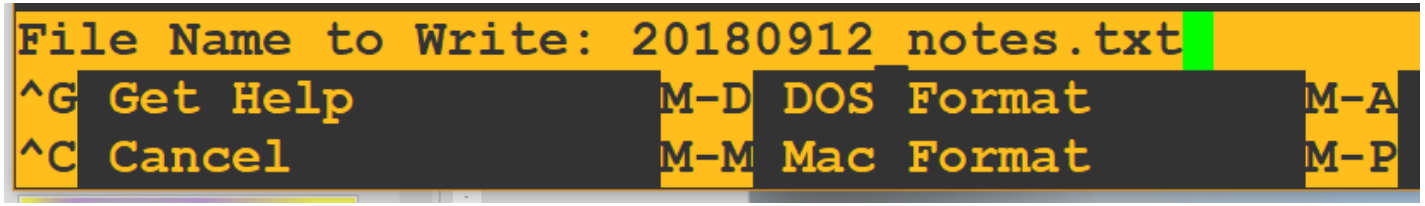
- I would do these steps:

  cd notes

  cd it116

  nano 20180912_notes.txt

  - At this interface (keyboard only!), type the desired text:
  - To save, press **Ctrl**+**O** (Mac Users: I mean the Control key - NOT the Apple Command key!)
    - Assuming "File name to write" matches, press Enter



Create/Edit a Text File on Remote (CLI)

- To exit the `nano` text editor:
  - Press **Ctrl**+**X**

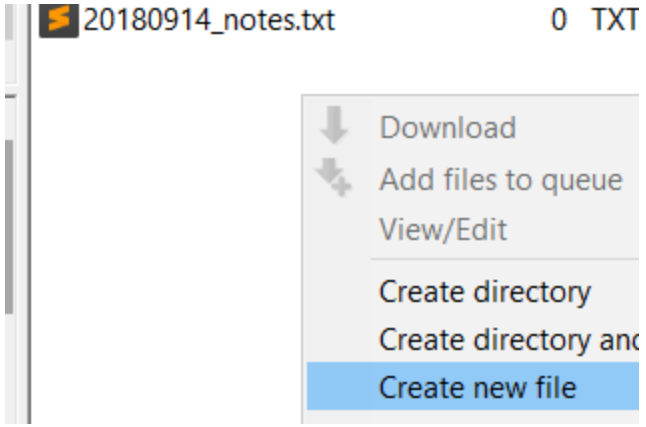
- To later edit that same file, I would
  - Make sure I was within the containing directory
  - Put in the same command: `nano 20180912_notes.txt`
    - This opens up the pre-existing file with its current contents
    - I can then edit those contents as needed
  - Save your work and exit the `nano` text editor in the same manner as before

Create/Edit a Text File on Remote (CLI)

- You can, in fact, paste text into the `nano` text editor!
  - Mac Users: Just use your normal paste shortcut Command+V
  - PuTTY Users on Windows:
    - Click the right mouse button, or...
    - Find the appropriate keyboard shortcut for use with PuTTY (look this up!)
- If I want to just read the file's contents, without editing, I can use this command: `cat 20180912_notes.txt`
  - This is mostly good for shorter files though
  - With longer files, the cat command can get rather unwieldly

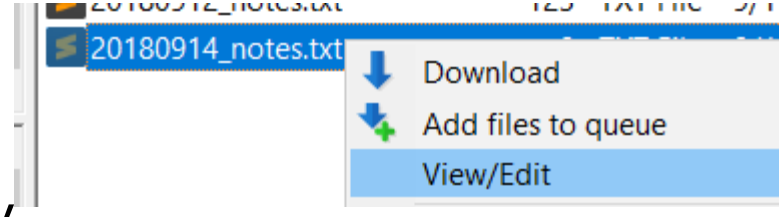
Create/Edit a Text File on Remote (GUI - FileZilla)

- On the right (remote) pane, make sure you are in the directory where you want to create/edit a file
- To create a file,
  - Right-click in the white area where the files are
  - Choose "Create new file"
  - Type in the name for the new file, including the extension



- To edit a file,
  - Select and right-click on the file name

Create/Edit a Text File on Remote (GUI - FileZilla)



- Choose "View/Edit", which will normally
  - Download the file as a temporary, local copy
  - Open that file in your default text editor (unless you customize this behavior differently yourself)
- Edit the file text however you will
- Whenever you save the local temporary file and go back to FileZilla, it will offer to upload the most recent version back to the remote, and you can
  - Delete the local temp copy
  - Or not, in case you want to make/upload more edits

Create/Edit a Text File on Remote (GUI - FileZilla)

- To double-check your work, you may wish to
  - Start up a command-line session
  - Navigate to the directory containing the file
  - Use the cat command with the file's name to view it's contents and confirm correctness

Final Note:

- The more unfamiliar you are with these tasks, the more imperative is for you to get started on these as soon as possible
- When learning anything new, there ***will*** be a learning curve!
  - Depending on any number for factors, that may be steeper or shallower for you
  - If you get started earlier, we have a chance to work out potential issues well before an assignment's due date
  - If you wait until the last minute, then it will quickly become overwhelming!
- Besides, if you want to go on in IT, you should make it a priority to master such skills because you will need them repeatedly.