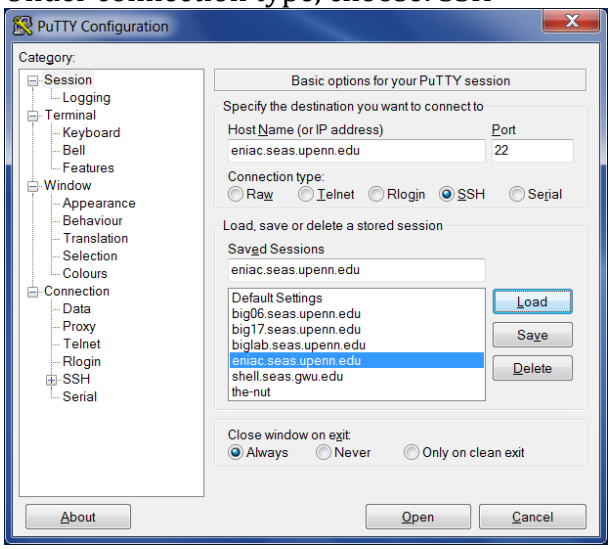
TUTORIAL:
Connecting to, Transferring files to/from, & Compiling on ENIAC

To access Upenn's Linux system: ENIAC, you will need to connect to it using something known as an SSH client. SSH stands for "Secure SHell." It is a way of forming a connection over a network between two computers that is encrypted.

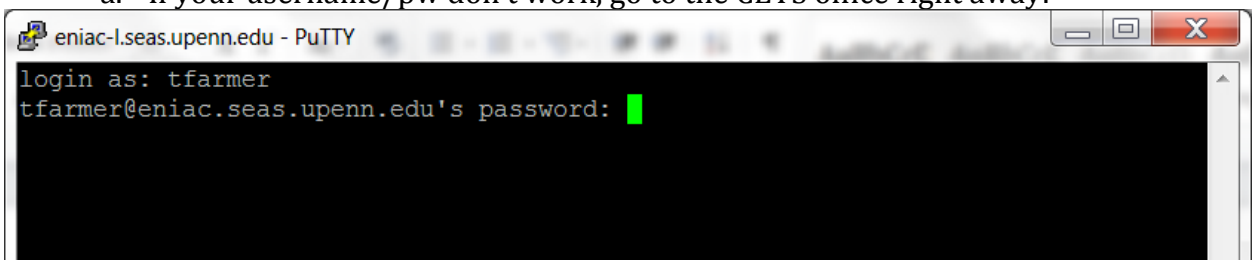
Part I: Connecting to ENIAC from a PC:

1) Download any SSH client. Our favorite is: putty. It is located here: http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

   Look for "putty.exe" Save it to your desktop. It doesn't need to be installed, it is only 1 file that you can immediately run (hence why it is our favorite!).
2) Double click on "putty.exe"
3) When it opens, look for the field: hostname, fill in: `eniac.seas.upenn.edu`
   a. Under connection type, choose: SSH



4) You can "save" this connection, this way you can reconnect later without retyping
5) Once saved, click "Open" at the bottom of the screen and it will initiate a connection
   a. You will be prompted to save an "ssh-key" the 1st time you connect, press OK
6) Upon successful connection, enter your pennkey and password
   a. If your username/pw don't work, go to the CETS office right away!



7) Skip the next section and continue to Part III

Part II: Connecting to ENIAC from a Mac:

1) Mac's have an SSH client built into them by default. To access it, open a "terminal" window. You should be able to find the terminal by typing "terminal" into the system's search.
2) In the terminal window type:
   `ssh -X your_pennkey@eniac.seas.upenn.edu`
   a. Replace "your_pennkey" with your Upenn pennkey
3) Upon a successful connection to eniac, it will prompt you for your pennkey passwd
   a. Type it and press enter
   b. If your username/pw don't work, go to the CETS office right away!
4) Once connected, continue on to Part III

Part III: Compiling a C File

Once you are connected to eniac, you have access to all the programs installed on eniac. Realize that all the work you do is running on the remote system (eniac). All the files you create "live" or rather, exist on eniac.

1) Once you have logged in through your SSH client, you might see the "message of the day" Just some daily notes from the admin's of eniac that you should read
2) Your "prompt" will appear as follows:
   `pennkey@ampersand:~>`
   or
   `pennkey@minus:~>`

   Eniac is actually two different computers, ampersand and minus, whichever one is less busy you will get connected to. No need to worry, all the files are shared between them
3) The prompt tells you *who you are*, *machine name* you are connected to, and *where you are* on eniac's file system
   a. By default, when you login, you are put in your "home directory" a folder viewable by only you.
   b. This "home directory" is simply listed as: ~
4) Let's make a simple directory so you can see how it works:
   a. At the prompt, type: `mkdir my_dir`
   b. Next type: `cd my_dir`
   c. Notice your prompt has changed to:
      `pennkey@ampersand:~/my_dir>`
      The prompt helps you figure out where you are
5) Let's make a simple C program and compile it:
   a. At the prompt, type: nano my_program.c
   b. The "nano" text editor will open (its like notepad on a PC).
   c. Type in a simple C program:

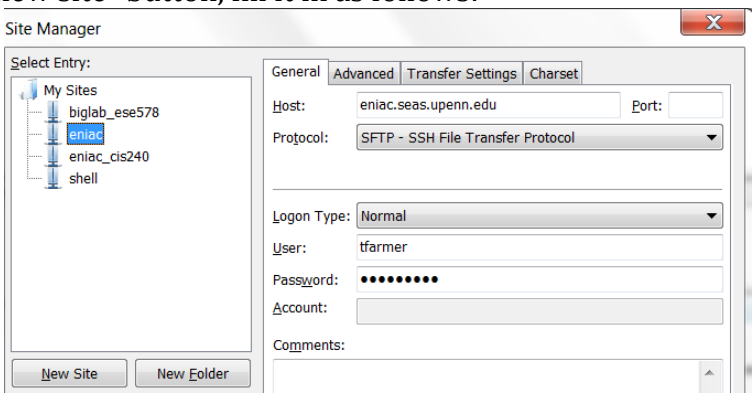
```
#include <stdio.h>
int main ()
{
        printf ("Hello World\n") ;
}
```

   d. Press <ctrl> X (at the same time)
   e. Answer: Y, accept the filename to write: my_program.c
6) To Compile a program:
   a. After the editor exits, you are returned to the prompt, to compile your C program type:
      `clang my_program.c`
   b. If you didn't make any errors, your program is created in a file called: a.out
   c. You can run this program by typing:
      `./a.out`
7) To see the files in your directory type (this means "list all files"):
   `ls -al`

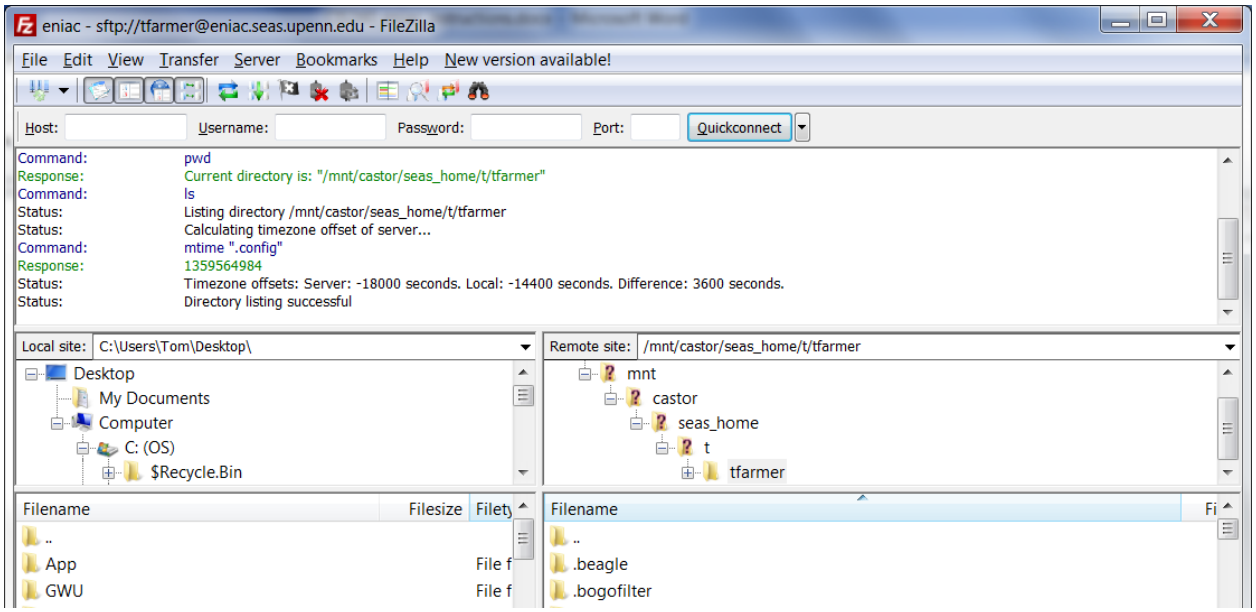
Part IV: Transferring Files To/From Eniac

From a PC:

1) Download any secure FTP **client**. Our favorite is: filezilla, it's free!
    a. A secure FTP client uses SSH to transfer files between 2 computers
2) It is located here: http://filezilla-project.org/
3) After you install it open it
4) The "site manager" should come up when you first open it
    a. If it does not, on the menu choose: File->Site Manager
5) Click on the "new site" button, fill it in as follows:



6) Press "connect" once you have it configured
7) Once you connect, you have two columns: your PC (local), and ENIAC (remote)



8) Look for the directory: "my_dir" on the right, double click on it and find: my_program.c
9) In the left hand window, choose where you'd like to put that file on your PC
10) Then "drag" the file from the remote system to the local
11) This can go both ways (in case you want to transfer something from local to remote)

Note: A great deal more "unix" information will be given to you in class an in the Unix tutorial. But this document will at least get you started!

Part IV: Transferring Files To/From Eniac

From a Mac:

1) Mac's have an SCP client built into them by default (stands for Secure Copy). To access it, open a "terminal" window.
2) Change to the directory on your Mac where you would like to put files from eniac
    a. To put them on your desktop, type: `cd Desktop`
    b. Or type: `cd ~/Desktop`
3) As an example, let's transfer the file we made in part III of this tutorial to your desktop
    a. Type:

    ```
    scp your_pennkey@eniac.seas.upenn.edu:~/my_dir/my_program.c  .
    ```
    (note, that last "." is not punctuation, you need to type that)

    b. enter your password when prompted and it will transfer the file
4) This command can be used in the other direction to transfer files from your mac to eniac:

    Let's assume you have a file called: file_on_my_mac.txt in the directory where you will be typing the following command:

    ```
    scp file_on_my_mac.txt your_pennkey@eniac.seas.upenn.edu:~/cis240
    ```

    This will upload the file from your mac to eniac and place it in your home directory in a subfolder called: cis240. If you don't have a directory called cis240 on eniac, it will instead rename file_on_my_mac.txt to cis240.

5) To learn more about the syntax of SCP, type: man scp. Its syntax is identical to the copy command: scp. So switches like "-r" to copy entire directories will also work.

Note: A great deal more "unix" information will be given to you in class an in the Unix tutorial. But this document will at least get you started!