A Beginner's Guide to MECH 215

Jamiel Rahi

jamiel.nr@gmail.com

1 Getting Started

1.1 Basic UNIX Commands

These commands will work on any Linux operating system as well as MacOS. If you're interested in using Linux through Windows, you can follow this guide.

- `ls` – list everything in the current directory.
- `cd` – change directory.
- Absolute file path – e.g. `cd /home/j/j_rahi/PUBLIC` takes you there no matter where you are.
- Relative file path – if you are already in `/home/j/j_rahi/`, then `cd PUBLIC` does the same thing as above.
- `cd ..` – takes you back one directory.
- `mkdir folder_name` – create a new folder in the directory you are in. Or, you can specify an absolute file path.
- `touch file_name.cpp` – create a new C++ file.
- `rm file.cpp` – delete a file.
- `rm -rf folder_name` – delete a folder (or file).

- `more file.txt` – shows you the contents of a file. *Note: this does not work for PDFs!*
- `gedit file_name.cpp` – edit a file. *Note: This is Linux-only. If you're on Mac or Windows use Sublime Text.*

1.2 Compile and Run

Here, we will compile and run a C++ program from a UNIX terminal. If you're doing this on Mac, you have to install the command line tools.

First we'll create a simple program as demo.cpp:

```
#include <iostream>
using namespace std;

int main(){
    int loudness;
    cin >> loudness;
    if (loudness < 11 || loudness > 11){
        cout << "lame";
        // OR
        printf("lame");
    }
    else {
        cout << "Turn it up to " << loudness << endl;
        // OR
        cout << "Turn it up to " << loudness << "\n";
        // OR
        printf("Turn it up to %d \n", loudness);
    }
return 0;
}
```

To compile the program, we can run the command:

```
g++ demo.cpp
```

By default, the executable is saved as `a.out`. To name the file to `demo` instead, we can specify it:

```
g++ demo.cpp -o demo
```

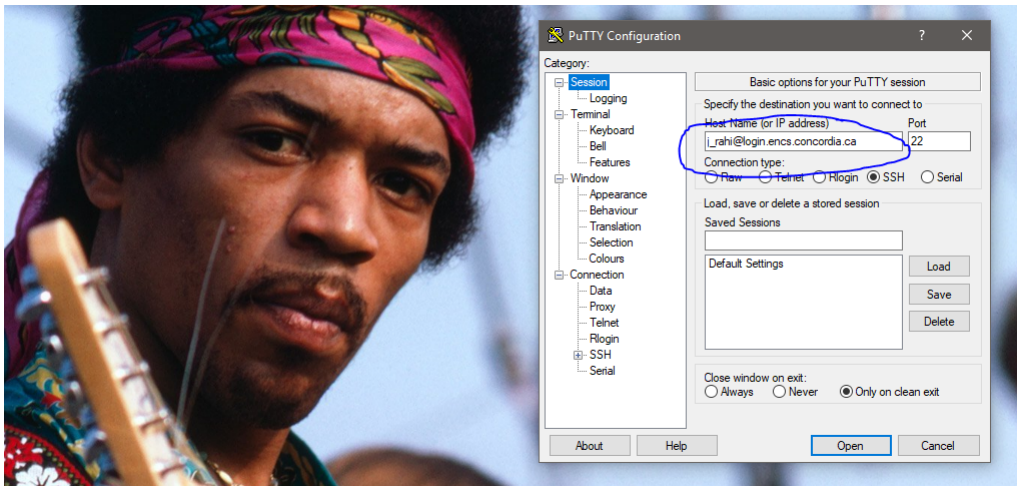
Now we can run the program with:

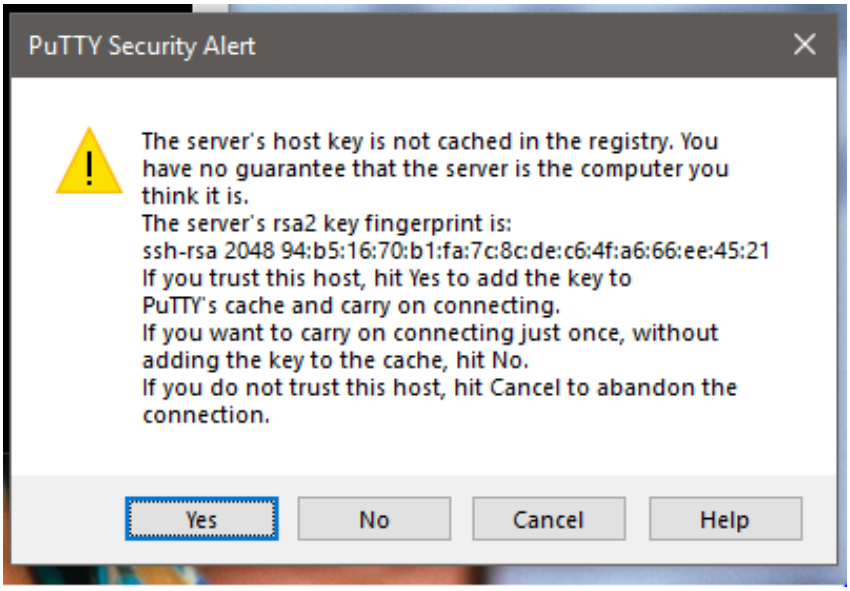
```
./demo
```

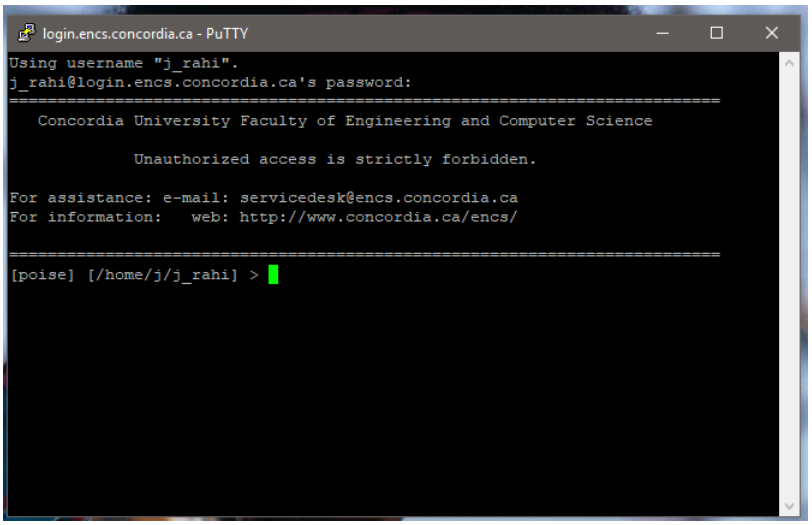
If you have problems at runtime, you can force quit at any time by pressing ctrl+c.

1.3 Remote Access (SSH) on PC

1. Download and install PuTTy.
2. Open PuTTy and type `your_encs_username@login.encs.concordia.ca` under Host Name.
3. Click "Open".
4. Say "Yes".
5. Authenticate with your ENCS password. Note that you cannot see your password while typing it. This is normal.
6. You should now be in your home directory, as if you were using a lab computer.


PuTTY Configuration
Category:
Session
Logging
Terminal
Keyboard
Bell
Features
Window
Appearance
Behaviour
Translation
Selection
Colours
Connection
Data
Proxy
Telnet
Rlogin
SSH
Serial
Basic options for your PuTTY session
Specify the destination you want to connect to
Host Name (or IP address)
Port
i_rahi@login.encs.concordia.ca
22
Connection type:
Raw
Telnet
Rlogin
SSH
Serial
Load, save or delete a stored session
Saved Sessions
Default Settings
Load
Save
Delete
Close window on exit:
Always
Never
Only on clean exit
About
Help
Open
Cancel


PuTTY Security Alert
The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 2048 94:b5:16:70:b1:fa:7c:8c:de:c6:4f:a6:66:ee:45:21
If you trust this host, hit Yes to add the key to PuTTY's cache and carry on connecting.
If you want to carry on connecting just once, without adding the key to the cache, hit No.
If you do not trust this host, hit Cancel to abandon the connection.
Yes
No
Cancel
Help



1.4 Remote Access (SSH) on Mac

1. Open the Terminal application. It might be in Applications/Utilities. For a shortcut, press cmd+space and type "terminal".

2. Enter the following command into the terminal:

   `ssh your_encs_username@login.encs.concordia.ca`

   where `your_encs_username` is the username you normally use to log in to a lab computer.

3. The terminal will ask you if you trust this server. You do.

4. The server will prompt you for your ENCS password. Note that you cannot see it while you type it. This is normal.

5. You should now be logged remotely to the ENCS network. Your terminal is now exactly what you would have if you opened a terminal on a lab computer. You should see:
   `[computer_name] [/home/j/j_rahi/] >`
   but with your own username.

1.5 Accessing Ted's Notes and Practice Problems

By now you should have an idea of how to do this. Once you're in the ENCS network (either from a lab computer or remotely), go to his public folder:

```
cd /home/t/ted/PUBLIC/MECH215/
```

Now you're in Ted's MECH 215 folder with notes, practice problems, past exams, etc. You can use the commands from Section 1.1 to navigate this folder. Can you find a way to email the files to yourself?

2 A Practice Problem

Suppose we want a program that takes a percentage grade as input and returns a letter grade as output. The output should be something like this:

```
Enter your percentage grade:
95
Your grade is:  A+
```

Or,

```
Enter your percentage grade:
23
Damn!  F
```

Once you do it for the a few letter grades, the rest are trivial. The percentage-to-letter ranges can be found here.

3 Useful Stuff

90% of the life of a developer is spent reading Stack Overflow (a popular forum).

- Sublime Text – Objectively the best text editor
- Vim Tutorial – Sometimes you need to edit text inside the terminal window (if you were in SSH and wanted to create a file in your home folder, you can't use gedit because you're doing everything through the terminal, and you can't use Sublime Text because that's installed on *your* computer, which is different from the server access in the terminal window).
- Google – This will inevitably lead you to Stack Overflow
- YouTube – There is a plethora of beginner C++ tutorials
- cpp.sh – Run C++ code online
- Hacker Typer

Seriously, use Google!

4 Conclusion

"I always thought something was fundamentally wrong with the universe" [1]

References

[1] D. Adams. *The Hitchhiker's Guide to the Galaxy.* San Val, 1995.