ISP January 24, 2019

- Complete TACC account set-up
- Complete SSH client installation
- Intro to SSH
- Log into your account on the ISP server
- Intro to Linux
- Using preferred editor, create new file `hello.cpp`
- Compile and run `hello.cpp`
- Homework for Tuesday

Intro to Secure Shell (SSH)

Connecting to remote computers using an SSH client

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What is a Secure SHell (SSH) Client?

- The "Secure" part of SSH means the connection utilizes some form of cryptographic method to make the plain text traffic, coded to outside viewers.
- The "SHell" part of SSH is the interface (e.g. blinking cursor) the user transmits commands or network data through.
- The client is an application used to create the SSH connection to a remote computer over a given network.

Some Sample SSH Clients

Note: We don't care what SSH client you use as long as you can log into the class server.

Windows

-PuTTY

-MobaXTerm

MacOS

-Terminal

-iTerm

iOS

- SSH Term

Android

-JuiceSSH

Linux

-Terminal

Chromium
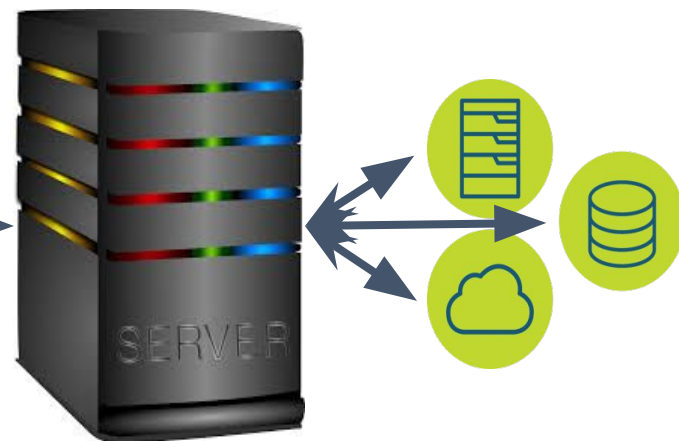
-Secure Shell

What happens during a SSH connection

Local

Remote

`$ssh jhpowell@isp.tacc.utexas.edu`

`[jhpowell@isp02 ~]$_`

Internet

```
OpenSSH_7.6p1, LibreSSL 2.6.2
debug1: Reading configuration data
/Users/jpowell/.ssh/config
debug1: Connecting to isp.tacc.utexas.edu port 22.
debug1: Connection established….
```

SSH command syntax

$ **ssh *TACCusername*@isp.tacc.utexas.edu**

or

$ **ssh -l *TACCusername* isp.tacc.utexas.edu**

SSH command syntax

You can also execute commands on the remote machine using `ssh`:

$ ssh slindsey@isp.tacc.utexas.edu /usr/bin/hostname
slindsey@isp.tacc.utexas.edu's password:
isp02.tacc.utexas.edu

Example from MacOS Terminal App

Intro to Linux-ish

Brief story of Linux and the Open Source Movement

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Where did Linux come from??

- Between 1960-1970 UNIX ruled the world!
- GNU (1984) and Linux (1991) were both designed as UNIX alternatives
- Two were later combined into a single kernel named GNU/Linux.

Torvald

29 Million
Users
or
.7% Market
Share

Stallman

Principles of Linux

GNU GPL License (CopyLeft)

- Any vendor distributing binaries (packaged software code) must also make the "human-readable" code available.
- Any modified versions of GPL code must also be released under the same GPL license as the original.
- "Liberty or Death" Clause - If someone has some type of restriction placed on their code that stops other users from redistributing modified versions of the code, then he or she cannot distribute it at all.
- Tivoization Clause - Hardware can not restrict any CopyLeft software.

The OpenSource Movement
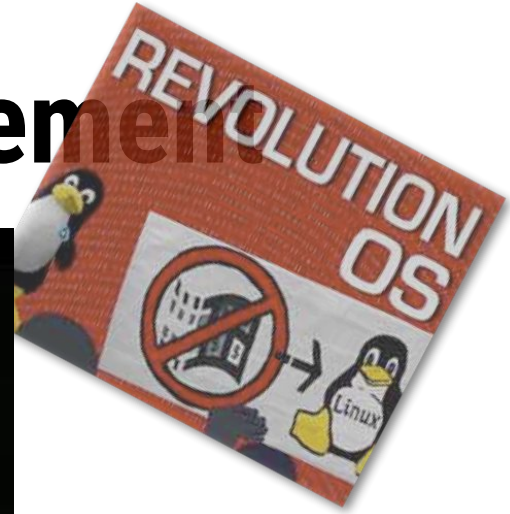
How much does Linux cost?

- Personal Use = Free!
  - Download from the web.
  - Borrow from a friend.
  - Purchase a Disk / Flash drive that has Linux on it.
- Enterprise = Up to $10,000 US (Service)
  - Direct purchase from a Linux distribution company.

Are there choices in Linux?

How can I switch when Microsoft owns my soul?

How can I switch when Microsoft owns my soul?

	Windows	Linux
Desktop Shell	Explorer	Gnome, KDE, Bash
Desktop Publishing	Microshaft Office ($466.99)	OpenOffice (Free)
Web Browser	Internet Exploder	Mozilla Firefox
Email	Outlook Mail	Evolution Mail
Software Compiler	Visual Studio ($1,119.99)	GCC, Make (Free)

But I heard both driver and support are very limited!

- Decentralized OS support
  - Community based support through Blogs, Forums, Wiki's, and personal web sites.
  - Microsoft charges between $99 - $245 for phone based support.
- Not all companies support Linux natively
- 406,000,000 available resources for linux support according to Google

I installed Linux, now where did everything go?

/ - the root or base directory

/bin - non-essential binaries (applications)

/sbin - binaries essential to the system

/dev - contains all folders for devices

/etc - contains all configuration files

/home - user specific folder

/opt - holds software add-on packages

/var - holds spooling data

Your first C++ program: Hello World

```cpp
#include <iostream>
using std::cout;
using std::endl;

int main() {
    cout << "Hello, beautiful world!" << endl;
    return 0;
}
```

Edit, compile, and run...

```
$ vim hello.cpp
..
$ icpc hello.cpp
$ ./a.out
Hello, beautiful world!
```