

Last Update

January 31, 2018

Introduction

This Linux tutorial is intended to give you a foundation in how to get the computer to do useful work for you. You won't be a Linux guru at the end but you will be well on your way and armed with the right knowledge and skills to complete your assignments and programming works.

The Command Line

Linux has a graphical user interface and it works pretty much like the GUIs on other systems that you are familiar with such as Windows and OSX. This part won't focus on these as I reckon you can probably figure that part out by yourself. This part will focus instead on the command line.

A command line, or terminal, is a text based interface to the system. You are able to enter commands by typing them on the keyboard and feedback will be given to you similarly as text.

Opening a Terminal

In this part, we will introduce how to open a terminal? If you are on a Linux workstation with GUI, you will easily find the terminal application. But what if you are not in the lab? In that case, you can still work on a lab Linux machine by remote login. **SSH** is the best choice.

To login remotely, you need a ssh client on your local machine.

- For Linux and OSX, you don't need a separate ssh client. Just type ssh commands in your local machine's terminal.
- For Windows, you can use **PuTTY** or **Git Bash** to connect a remote machine. The latter is what I recommend.

Following is the basic command to connect a remote machine through ssh.

```
$ ssh username@hostname  
$ ssh fakename@crockhopper-01.cs.wisc.edu // an example
```

Then you will be prompted to enter your password.

You can also specify IP address instead of host domain name in the command.

For more ssh commands, please read [this](#).

Basic Linux Commands

After opening a terminal or logging in a Linux machine remotely through ssh, you can play with the command line.

Some very useful commands are listed in the table below.

Command	Description
pwd	print current working directory
ls [options]	list directory contents
cd directorypath	change to directory
chmod [options] mode filename	change a file's permissions
clear	clear a command line screen/window for a fresh start
cat [filename]	display file's contents to the standard output device
rm [options] filename/directory	delete file(s) and/or directories
touch filename	create an empty file with the specified name
mkdir [options] directory	create a new directory
cp [options] source destination	copy files and directories
mv [options] source destination	rename or move file(s) or directories
ln [options] source destination	create a shortcut

Feel free to try the commands except for *rm*. Please be careful when you delete any file or directory. :-)

[This website](#) will give you a more detailed tutorial on linux commands. Check it out!

Text Editor

Vi

You must have experience coding with IDE or editor with GUI. What about a command line editor?

[Vi](#) is a powerful command line text editor. As you would be quite aware now, the command line is quite a different environment to your GUI. It's a single window with text input and output only.

[Unix/Linux - The vi Editor Tutorial](#) is a very clear and detailed vi tutorial. It will tell you how to open and edit a file in vi and exit the editor afterwards.

GNU Emacs

Another powerful text editor is **GNU Emacs**, which has a huge difference with Vi.

This is a [tutorial](#) for Emacs beginner.

Other choices

If you feel Vi and Emacs not friendly enough, you can try some alternatives that are easier to master.

- [GNU nano](#): a small and friendly text editor.
- [gedit](#): the default text editor for the GNOME desktop environment.
- [Visual Studio Code](#): a new type of tool that combines the simplicity of a code editor with what developers need for their core edit-build-debug cycle.

Make Tools

In software development, Make is a build automation tool that automatically builds executable programs and libraries from source code by reading files called Makefiles which specify how to derive the target program.

These are two tutorials that will help you master the usage of Make quickly.

- [Quick Guide](#)
- [Official Manual](#)

Author

Wolong Yuan © January 2018

Please send comments suggestions for improvements to deppeler at server cs.wisc.edu with the “linux-tutorial” in the subject.