# Lab 1 – Orientation and Intro to Linux

## Introduction:

Lab 1 has two parts to it. The first part is to get the student familiar and comfortable with the lab environment. All the core computer hardware and software is Intel and Linux based. Most students will not have much, if any, experience in the UNIX/Linux environment. The second part of the lab will be an introdution to basic Linux commmands.

***Note:*** Items noted with a \*\* are the key concepts for this lab. Pay special attention to what is done at these steps and why. Also note that the \*\* is *not* part of the commands!

Table 1: Common Linux Commmands

| **Command** | **Description** |
| --- | --- |
| cat | List the contents of a file |
| cd | Change directory, works similar to the Windows command |
| cp | Copy a file. It has a lot of flexibility. Basic command: cp source deste.g.: cp fromfile.ext to\_directory  |
| df | Report disk file space usage |
| du | Estimate disk usage |
| file | Report on the type of contents of a file |
| grep  | Search a file for patterns. Basic form: grep pattern filename |
| jobs | Reports on the current jobs and their job number |
| kill | Stops a program. The parameter %n (where n is the job number) will kill a job with that job number. If the parameter is a number it kills that program with that process number |
| less | Show the contents of a file. The file can be scrolled up and down. Type ‘q’ to exit. |
| ls | List directory contents, similar to dir in Windows. Additional options can give more information. E.g. ls –la gives a complete listing with sizes, permissions and more. |
| man | Show the instructions for a command |
| mkdir | Create a directory |
| more | Show the contents of a file one page at a time. Space bar shows the next page, the<enter> key shows the next line. |
| passwd | Change password. Just follow the prompts. |
| ps | Reports the current processes, their process number, and the status for each |
| rm | Remove a file. Deletes files and directories. Be careful using this command, you can wipe out a whole system by accident! |
| time | Run a program and summarize system resource usage, mainly how long the program took. |
| vi or vim | The ubiquitous editor found on all Unix/Linux systems |

All of the above commands have a slew of options. Use man to find the details

## Part 1: Familiarizeyourself with the lab environment

This part of the lab is to familiarize you with the lab environment. This part of the lab is to be done individually.

### System Startup

1. Select a workstation
2. Start system
	1. Watch the system as it turns on
	Note the messages as processes start, etc.\*\* Details are not needed. Describe what you see at a generic or high level.
3. Log onto system
	1. Generic ID
		1. Credentials
			1. UserID: userNN (where NN is the machine number)
			2. Password: userNN (same as the UserID)
	2. Log on with your ID (*optional if IDs not created yet*)
		1. Credentials
			1. UserID: Same as student’s Niner ID
			2. Password: student’s 800 ID with an ‘a’ appended at the beginning

### System Orientation

#### Familiarize yourself with the system.

Take a look at the toolbar at the top of the screen. Check out what is in the dropdowns for *Applications*, *Places*, and *Systems*. Note that many of the items in those dropdowns may have additional menu items.

1. Navigate in the workstation environment
	1. Find the browsers (there might be more than one). What browsers are available? \*\*
		1. Browse 172.16.1.250, note the results. \*\*
		2. Browse lab302-web.hades.lab, note the results.\*\*
	2. Find the ***Terminal*** interfaces
		1. What is the difference between ***Termina***l and ***Root Terminal***?\*\*
		2. In the ***Terminal*** try the following commands and note the differences:
			1. whoami \*\*
			2. who am I \*\*
		3. What is your machine name? \*\*Hint: look at the prompt.
			1. What other info is in the prompt? \*\*
			Hint: There are 3 pieces of information in the prompt.

Q1: Where are the following items: \*\*

* terminal
* the browsers
* Synaptic Package Manager
* Users and Groups
* Shutdown

## Part 2: Linux

**Helpful hints:** The tab key and up and down arrows are your friends!!! Learn to use them to make your work with Linux faster and more error free!

**Tab:** when typing in a command or file name the tab key can be used at any time. If the name typed has only one unique ending using the tab will finish the typing for you. Sometimes it will autotype for you up to a point and beep indicating at that point there are choices. Using tab again then will list the choices. If there are multiple possibilities when tab is used, you will hear a beep. Hitting tab again will list the choices. You can then add some more characters and use tab again to finish.

**Up and down arrows:** use the up and down arrow to retrieve previously used commands. Up goes “back” in time, down goes forward in time.

**<Ctrl-C> :** use control-C to stop certain programs if the quit, exit or bye commands are not available or don’t work.

**First:** endure the Linux lecture…

**Second:** capture data as text when possible; do not use screenshots to document steps unless that is the only method to document (e.g. showing a Web browsing).

### Familiarize yourself with the file system using the GUI

Find the *Computer* icon. Click on it and notice the files available. Depending on the hardware available on your machine you will see icons for Floppy Drives, CDs or DVDs, Network Drives, Filesytem and others. Filesystem is basically the hard drive(s) on your machine. The lab workstations are set up so non-privileged users (e.g. students) cannot change the data on the systems. One exception is the ***scratch*** directory. Students may write to that directory, and delete files if they are the owners of the file. One other exception is the users Home directory. Usually when a new ID is created a directory is also created so the user has space allocated for their use.

**Warning:** On the lab systems data in the user’s home directory will be deleted overnight.

### Command Line Interface

Before using each of the commands check the manual for its syntax and use. The command for this is:
man command\_you\_want\_info\_for

Example:
man man
will give you the information for the man command. To exit man type *q* to quit.

#### Look at the file structures using a terminal

##### Open a terminal. A terminal window will open at the user’s default directory space. Again, note the information given at the prompt.

##### Where am I?

The *pwd* command lists the name of current directory (Present Working Directory.) Try the pwd command in your current directory. You will be using this command later.

##### List the directory contents

The *ls* command list the contents of a directory. There are several options or flags. Try the following commands:

##### ls

* ls –la

Note the difference in the listings. \*\*

##### Changing Directories

The *cd* command is used to change directories. Try to use *man* to find the syntax and note the results.

Change to the root directory (/):

* cd /

List the directory contents with the base list command ls, and then with –l flag, then with the –a flag and finally combine them with the –la flags. Note the format and number of files that change with the various flags. \*\*

Look for the bin directory and switch to it ( cd bin ). List the contents of the bin directory with and without the –la flags. If there is too much information to display on one screen pipe the output to the *more* command:

* ls –la | more

**Note:** if you’re in the root directory (/) you can change to the bin directory directly with the cd bin comand. If you are in *any other* directory you can go to it directly with the cd /bin command.

To scroll down in *more* you can use the space bar (one page at a time) or the enter key (one line at a time) Note the different letters for attributes and permissions at the start of each line.

Note: directories are noted by the character *‘d’* in the first character, normal files are denoted with a ‘–‘.

Switch back to the root directory, then change to the system’s home directory. This can be done one of two ways:

* multiple steps, doing one directory change at a time:
	+ cd /
	+ cd home
* all in one command:
	+ cd /home

##### Exploring your home directory:

Change to your home directory

* cd ~

**Note:** ~ is a short hand notation for the***current***user’s home directory.

Check what the current directory is by looking at the prompt information and by using the *pwd* command.

##### File contents

Examine the contents of two files in the /etc directory: *hosts* and *services*. Commands to show file content are *cat*, *less*, *more* and *file*.

General format for each command:

* cat filename
* file filename
* less filename
* more filename

Start with the file command to check the file content type, then use cat, less, and more to view text files. Note how the same information (the file contents) is displayed differently for each command. \*\*