

Using the “CLI”

UNIX/ Linux Preparation Course

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The format of a command

`command [options] parameters`

“Traditionally, UNIX command-line options consist of a dash, followed by one or more lowercase letters. The GNU utilities added a double-dash, followed by a complete word or compound word.”

Two very typical examples are:

`-h`

`--help`

and

`-v`

`--version`

Command parameters

- The ***parameter*** is what a command ***acts upon***.
- Often there are multiple parameters.
- In Unix UPPERCASE and lowercase for both options and parameters matter.
- **Spaces** ____ are ____ critical ____

“-- help” is wrong.



“--help” is right.

Some command examples*

Let's start simple – *Follow along as we go:*

Display a **list** of files:

```
ls
```

Display a **list** of files in a **long** listing format:

```
ls -l
```

Display a **list** of **all** files in a **long** listing format
with **human-readable** file sizes:

```
ls -alh
```

*do this! 😊

Some command examples cont.

Some equivalent ways to do “`ls -alh`”:

```
ls -lah
```

```
ls -l -a -h
```

```
ls -l -all --human-readable
```

Note that there is no double-dash option for “`-l`”.

You can figure this out by typing:

```
man ls
```

Or by typing:

```
ls --help
```

Where's the parameter?

We typed the “ls” command with several options, but no parameter. Do you think “ls” uses a parameter?

Q.) What is the parameter for “ls -l”?

A.) It is “.” -- our current directory.

“ls -l” and “ls -l .”

are the same. We'll discuss files and directories later.

A disconcerting Unix feature

If a command executes successfully there is no output returned from the command execution.
this is normal.

That is, if you type:

```
cp file1 file2
```

The result is that you get your command prompt back. *Nothing means success.*

Let's give this a try...

A disconcerting Unix feature cont.*

Try doing the following on your machine:

\$ cd	<i>[cd = change dir]</i>
\$ touch file1	<i>[touch = create/update]</i>
\$ cp file1 file2	<i>[cp = copy]</i>

- The “\$” indicates the command prompt for a normal user.
- A “#” usually means you are the *root* user.

Using pipes

In Unix it is very easy to use the result of one command as the input for another.

To do this we use the pipe symbol “|”. For example:

```
ls /sbin | sort
```

```
ls /sbin | sort | more
```

What will these commands do? Give it a try.
Press “q” to exit sort and more screen.

Stopping Command Output*

Stopping commands with continuous output:

Terminate foreground program: CTRL+C

```
$ ping yahoo.com
```

```
PING ds-any-fp3-real.wa1.b.yahoo.com (98.139.183.24) 56(84) bytes of data.  
64 bytes from ir2.fp.vip.bf1.yahoo.com (98.139.183.24): icmp_req=1 ttl=46 time=610 ms  
64 bytes from ir2.fp.vip.bf1.yahoo.com (98.139.183.24): icmp_req=2 ttl=47 time=541  
ms^C
```

← here press CTRL + C

Terminate paging like “less <filename>”

```
$ less /etc//ssh/sshd_config
```

```
# Package generated configuration file  
# See the sshd_config(5) manpage for details
```

```
# What ports, IPs and protocols we listen for
```

```
Port 22 (END)
```

← press the “q” key

Proper command line use

The command line in Unix is *much more powerful* than what you may be used to in Windows. ***You can...***

- ...easily edit long commands
- ...find and recover past commands
- ...quickly copy and paste commands.
- ...auto-complete commands using the tab key (in *bash* shell).

Edit long commands



!

Don't touch that keyboard!

Arrow keys are so very sloooooow...

- Use *Home* and *End* instead (ctrl-a, ctrl-e)
- Delete with *Backspace* not *Delete*.
- Press <ENTER> *as soon as the command is correct*. You *do not* need to go to the end of the command.
- Use “`history | grep string`”, then !NN instead of lots of up-arrows.

Find and recover past commands*

As noted on the previous slide. Use:

```
$ history | grep "less"
```

Find command number in resulting list.

Execute the command by typing:

```
$ !number
```

Quickly copy and paste commands

In Unix/Linux once you highlight something it is *already* in your copy buffer.

To copy/paste do:

- Highlight text with left mouse cursor. It is now copied (like *ctrl-c* in Windows).
- Move mouse/cursor where you want (any window), and press the *middle* mouse button. This is paste (like *ctrl-v*).

Doesn't work on a Mac...



Copy and paste commands

Do this!!!

Good system administrator

==

Lazy Person



Goal State

Don't try to type a long command if you can
copy / paste it instead.

Auto-complete commands using tab

Very, very, very powerful

“The tab key is good”, “the tab key is my friend”, “press the tab key”, “press it again”
- This is your mantra.

Tab works in the *bash* shell. Note, the *root* user might not use the *bash* shell by default.

Use the tab key! You'll thank us later ☺

Auto-complete commands using tab

Core concept:

Once you type something unique, press TAB. If nothing happens, press TAB twice.

- If text was unique text will auto-complete. A command will complete, directory name, file name, command parameters will all complete.
- If not unique, press TAB twice. All possibilities will be displayed.
- Works with file types based on command!

Auto-completion

We'll do this now:

```
$ cat /etc      (TAB twice quickly)
```

```
$ cat /etc/netw      (TAB)
```

```
$ cat /etc/network/in      (TAB)
```

Viewing files

Several ways to view a file:

1. `cat <filename>`
2. `more <filename`
3. `less <filename>`

- `cat` is short for *conCATenate*
- “less is more”

Viewing files*

Let's do this now:

```
$ cat /etc/ssh/sshd_config
```

```
$ more /etc/ssh/sshd_config
```

```
$ less /etc/ssh/sshd_config
```

- “q” to “q”uit from more, or less
- Less: “b” for back, “f” for forward, “/” to search
- Less: /term, then “n” for next, “N” for previous

Obtaining help*

To get help explaining commands you can do:

- `man <command>`
- `<command> --help`

man stands for “man”ual.

More on “man”

- `man man`

More on Linux directory structure:

- `man hier`

Installing Software (Linux)

From the command line you use either apt or aptitude (root privileges needed)

- `apt-get install <PACKAGE>`
- `aptitude install <PACKAGE>`

Equivalent on FreeBSD would be (root privs):

- `pkg_add -r <PACKAGE>`

Finding a package (root not needed):

- `apt-cache search <NAME>`

Installing Software (Linux)

Let's install two packages in Ubuntu:

```
$ sudo apt-get install postfix
```

Respond yes to all the defaults, then install another editor named "joe":

```
$ sudo apt-get install joe
```



Your mission

Should you choose to accept it...

- Pay close attention to options and parameters.
- Use “`man command`” or “`command --help`” to figure out how each command works.
- Use command line magic to save lots and lots and lots and lots of time.
- A command acts upon its parameters based on the options you give to the command...