Short Read Sequencing Analysis Workshop

Day 2

Learning the Linux Compute Environment

Review of Day 2 Videos

- **Video 1 – Introduction to linux**
  - Linux is a command-based OS; we connect and communicate with the server via typed/written commands
  - ssh command (Mac) and MobaXterm(Windows)
- **Video 2 – Working on a linux system**
  - Navigate the linux file system; full and relative path designations
  - Commands and tricks for navigating linux file system
- **Video 3 – Linux Commands for File Manipulation**
  - Learn to use additional linux commands aimed at manipulating file and directory content

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Review of Day 2 Videos

- **Video 4 – Remote RSYNC, reading files**
  - Access command manuals, use options to customize command functions
  - Command line I/O, capture STDOUT and STDERR, piping
- **Video 5 – More file manipulation**
  - Access command manuals, use options to customize command functions
  - Command line I/O, capture STDOUT and STDERR, piping
- **Video 6 - Permissions**
  - Exploring Unix Permissions
- **Video 7**
  - VIM Tutorial

Find a unix/linux cheat sheet

Unix/Linux Command Reference — FOSSwire.com

File Commands
ls – directory listing
ls -al – formatted listing with hidden files
cd dir - change directory to dir
cd – change to home
pwd – show current directory
mkdir dir – create a directory dir
rm file – delete file
rm -r dir – delete directory dir
rm -f file – force remove file
rm -rf dir – force remove directory dir *
cp file1 file2 – copy file1 to file2
cp -r dir1 dir2 – copy dir1 to dir2; create dir2 if it doesn't exist
mv file1 file2 – rename or move file1 to file2
if file2 is an existing directory, moves file1 into directory file2
ln -s file link – create symbolic link link to file
touch file – create or update file
cat > file – places standard input into file
more file – output the contents of file
head file – output the first 10 lines of file
tail file – output the last 10 lines of file
tail -f file – output the contents of file as it grows, starting with the last 10 lines

Process Management
ps – display your currently active processes
top – display all running processes
kill pid – kill process id pid
killall proc – kill all processes named proc *
bg – lists stopped or background jobs; resume a stopped job in the background
fg – brings the most recent job to foreground
fg n – brings job n to the foreground

File Permissions
chmod octal file – change the permissions of file to octal, which can be found separately for user, group, and world by adding:
- 4 – read (r)
- 2 – write (w)
- 1 – execute (x)

Examples:
chmod 777 – read, write, execute for all
chmod 755 – rwx for owner, rx for group and world
For more options, see man chmod.

SSH
ssh user@host – connect to host as user
ssh -p port user@host – connect to host on port port as user
ssh-copy-id user@host – add your key to host for user to enable a keyed or passwordless login

Searching
grep pattern files – search for pattern in files
grep -r pattern dir – search recursively for pattern in dir
command | grep pattern – search for pattern in the output of command
locate file – find all instances of file

System Info
date – show the current date and time
cal – show this month's calendar
uptime – show current uptime
w – display who is online
whoami – who you are logged in as
finger user – display information about user
uname -a – show kernel information
cat /proc/cpuinfo – cpu information
cat /proc/meminfo – memory information
man command – show the manual for command
df – show disk usage
du – show directory space usage
free – show memory and swap usage
whereis app – show possible locations of app
which app – show which app will be run by default

Compression
tar cf file.tar files – create a tar named file.tar containing files
tar xf file.tar – extract the files from file.tar
tar czf file.tar.gz files – create a tar with Gzip compression
tar xzf file.tar.gz – extract a tar using Gzip
tar cjf file.tar.bz2 – create a tar with Bzip2 compression
tar xjf file.tar.bz2 – extract a tar using Bzip2
gzip file – compresses file and renames it to file.gz
gzip -d file.gz – decompresses file.gz back to file

Network
ping host – ping host and output results
whois domain – get whois information for domain
dig domain – get DNS information for domain
dig -x host – reverse lookup host
wget file – download file
wget -c file – continue a stopped download

Installation
Install from source:
./configure
make
make install
dpkg -i pkg.deb – install a package (Debian)
rpm -Uvh pkg.rpm – install a package (RPM)

Shortcuts
Ctrl+C – halts the current command
Ctrl+Z – stops the current command, resume with fg in the foreground or bg in the background
Ctrl+D – log out of current session, similar to exit
Ctrl+W – erases one word in the current line
Ctrl+U – erases the whole line
!! - repeats the last command
exit – log out of current session

* use with extreme caution.
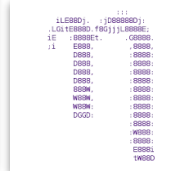
Make the terminal comfortable to work in:
- Make the windows large
- Open multiple windows and/or tabs
- Change font sizes etc. ((For Mac: Command + Plus/Minus, For Windows, find Text size in Preferences)

What is Vim ?

- Vim is a free, open source terminal based text editor
  - Edit content of human-readable files

- Several options exist for terminal text editors
  - Emacs
  - Nano
  - Sublime
  - Visual Studio Code

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The End

Questions??

Don't forget the homework.

Help session in JSCBB A108 from 1-3pm

Watch videos for Day 3