Basic Linux Command in the HPC Cluster

1. Login and manage your account

    - Remote login: ssh or HPC portal through browser
    - Check disk quota: showquota <username>
    - ~ is equivalent to HPC home directory /home/<username>
    - Check file system in the host: df –h
    - Disk usage for certain directory: du –sh

2. On line reference manual:

    - man -k <KEYWORDS>
    - apropos <KEYWORDS>
    - man <COMMAND>
    - whatis <COMMAND>

3. ls: check directory list

    - -l   List in long format
    - -a   List all entries
    - -t   Sort by time stamp instead of name.
    - -F   Put a slash (/) asterisk (*) an equal sign (=) (@)
    - -I   list the inode number

    *you can use multiple options at the same time. E.g. ls –ltr

4. Display the content of file

    - more: browse a text file in the command line terminal
    - less: the opposite of more and with search a pattern or forward or backward using /pattern or ?pattern.
    - cat: concatenate and print file onto the terminal.
    - vi(-R),   view: screen oriented display editor.
    - nano: simple text editor like a notepad in Windows.
    - tail: tail -n (from the end) +n (from the beginning) (only one file)
    - head: head -n (with more than 3 files here)

5. Directory management

    - mkdir: make a new directory
    - rmdir: remove directory
    - rm -r: recursively remove directory and the files inside
    - cd <Enter>: to user's home directory
    - cd .. : to one directory-level higher in the directory tree
    - cd / : to root directory
    - cd /home/<username>: to the user home directory from other directory

➢ cd /apps: directory for all application inside HPC
➢ pwd: show path of the current directory

6. Copy, move, remove files or directories

➢ mv -i file1 file2
➢ rm file (wildcat)
   ❖ -i turn interactive promoting (applicable to cp and mv)
   ❖ -f force to remove files
➢ cp file1 file2
   ❖ -i interactive
   ❖ -f force
   ❖ -r copy directories recursively
   ❖ -R recursively
   ❖ -p keep the date of the file

7. Change the attribute of files and directories

➢ chmod ugo+rwx filename
➢ chmod ugo-rwx filename
➢ chown user:group filename
➢ chgrp group filename
➢ Recursivlely change permission: chmod -R u+rwx dir

8. Meta-characters & Special Characters

➢ ?   one character except black and tab
➢ *   zero or more character
➢ [ ]   a range of characters
➢ $ used to print the value of a variables
➢ ~   abbreviation for a user's home directory

9. Redirect your output

➢ < >   redirection operator
➢ | pipe operator
➢ >>   to append
➢ >&   redirect the error message into the standard output
➢ >!   to overwrite the output file

10. Process monitor and session control

➢ top: most CPU-intensive processes currently running
➢ htop: detailed CPU-intensive processes currently running
➢ ps -ef |grep <STRING>: to check the status of a process
➢ kill -9 <PID>: kill a process
➢ time <COMMAND>: time a command execution

11. Link files and directory

   ➢ hard link: ln file1 (path)file2 (have the same inode, in same file system)
   ➢ soft link: ln -s file1 (path)file2
   ➢ list link information: ls –il
   ➢ first character is l for softlink
   ➢ link count for hard link is 2, soft link is 1

12. Find file in a directory

   ➢ find path-name-list options expression
      • -name: True if file matches the current filename
      • -user username: True if the file belongs to the user uname.
      • -print: always true; causes the current pathname to be printed.
      • -depth: always true; causes descent of the directory hierarchy to be done so that all entries in a directory are acted on before the directory itself.
      • -local: true if the file physically resides on the local system; causes the search not to descend into remotely mounted filesystems.
      • -mount: always true; restricts the search to the filesystem containing the current element of the path-name-list.

13. Repeat command and history

   ➢ The history will be stored in .history
   ➢ history [n]:   to list last n pieces of command history
   ➢ !comm: to repeat the last "commandx"
   ➢ !! :   to repeat the very last command
   ➢ !-4 (offset) :   to repeat the last but 4 command
   ➢ !m: repeat command with number m as show in the history list

14. Identify

   ➢ who: check who is login now.
   ➢ w: who is on and what they are doing.
   ➢ id: print the user name and ID, and group name and ID
   ➢ whoami: display the effective current username
   ➢ hostname: print name of current host system
   ➢ which: locate a program file including aliases and path (csh only)

15. Diff compare two files and display a list of the difference.

   ➢ diff file1 file2

16. Compress and uncompress files

   ➢ compress, uncompress: tar, gizp, gunzip, zcat, gzcat
   ➢ tar -cvf (create a tar file)
   ➢ tar -czvf (create a tar zipped file)
   ➢ tar -tvf (table)list the tarred files in the tar file
   ➢ tar -xvf (extract) files

   * don't specify the absolute directory, and use . to

17. Linux utilities

   ➢ date: show date and time
   ➢ cal: calendar

18. Search a pattern

   ➢ grep 'this pattern' filename (directory)
      • -l   print only the name of the file with matching lines once, rated by new line.
      • -n   procedes each line by its line number in the file.
      • -s   supresses error message. work silently., display nothing
      • -c   output only the count of the lines with the pattern.
      • -v   output the lines that don't contain the pattern.
      • -i   ignore uppercase/lowcase distinction during comparison.