

Parallel Machine Learning and Artificial Intelligence

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Linux Fundamentals on Discovery Cluster

Documentation

- Almost all utilities have the --help option which shows what the options are
- man utility shows the manual page for the utility, or a system call or any concept.
 - h ? help
 - q ? quit

Filesystem navigation: viewing

- `ls` - list files
 - Options: `ls -[lat1d]` most common options
 - `-l`: long listing
 - `-a`: all files (including hidden files, (ones that begin with a .))
 - `-r`: show in reverse order (default sorting order is alphanumeric)
 - `-t`: sort by time modified
 - `-1`: show all in 1 column
 - `-d`: show directory names but not their content
 - `ls --help`

Directory

- Create a directory: `$ mkdir`
- Switch Directories: `$ cd`

File and Directory Manipulation

copy : `$ cp`

- Copy files: `$ cp file1 file2`
- Copy directories: `$ cp -r dir1 dir2`

move/rename: `$ mv oldpath/oldname newpath/newname`

Remove: `$ rm / rmdir`

- Files: `$ rm file1 file2 file3 ... filek filen`
- Directories: `$ rmdir dir1 dir2 dir3 ... dirk dirn`

Files Creation and Manipulation

- Create and Edit files: \$ vi/vim/gedit

Viewing file content

`cat`: print content of file to the stdout (more on streams later)

`more`: print content of file to the screen but pause between pages

`less`: like more but with more options

Find a file in your directory tree

I want to find all the files which end with .err:

```
find . -type f -name "*.c"
```

- Using `find --help` or `man find` to get more information

Check Disk Usage

- Check file system disk space usage: `$ df`
- Check files and directories disk usage: `$ du`

Download

- Download command: `$ wget`
- The `wget` is a free utility for non-interactive (i.e., can work in background) download of files from the Web.
- It supports HTTP, HTTPS, FTP protocols and HTTP proxies.

Archives

Sometimes it may be necessary to pack up an entire directory into a single file, for archiving, reducing the number of files in the filesystem, or easy transfer.

Create an archive from directory foo:

```
$tar cvf foo.tar ./foo
```

c: create, f: name of file to create

Unpack an archive:

```
$tar xvf foo.tar
```

x: xtract, v: verbose, f: filename of the archive

Archives

Often tar archives are compressed to form what is known in the Unix/Linux world as a “tarball”

To create or unpack a tarball, use the **z** option

```
$tar czvf foo.tgz ./foo
```

```
$tar zxvf foo.tgz
```

zip creates archives compatible with windows archives

File Permissions

- In Linux, each file is associated with an owner and a group and assigned with permission access rights for three different classes of users:
 - The file owner.
 - The group members.
 - Others (everybody else).
- There are three file permissions types that apply to each class:
 - The read permission.
 - The write permission.
 - The execute permission.

Using chmod

- Symbolic Method

- u - The file owner.
- g - The users who are members of the group.
- o - All other users.
- a - All users, identical to ugo.

- Numeric Method:

- r (read) = 4
- w (write) = 2
- x (execute) = 1
- no permissions = 0

Other Useful Commands

1. \$ uname
2. \$ history
3. \$ date
4. \$ whereis
5. \$ which
6. \$ alias
7. \$ echo
8. \$ top

- Stay safe!
- See you next class!

Next Lecture will Continue:

Slurm job management on Discovery



