HPC basics

Tomasz Mądry

2025-07-08

Useful shell (bash) commands I

Browse the directory structure

`pwd`	tells you where you are
`ls`	list the content of the current directory
`ls <directory name>`	list the content of a directory
`cd <directory name>`	go to the specified directory
`cd ~` (or `cd`)	go to your home directory
`cd ..`	go to the parent directory
`mkdir <directory name>`	creates specified directory

Useful shell (bash) commands II

View the content of a file

`less`, `more`	view text with paging
`head`	prints first lines of a file
`tail`	prints last lines of a file
`cat`	print content of a file into the screen
`zcat`	print content of a `gzip` compressed file

File manipulations

`rm <file name>`	remove file
`cp <file1> <file2>`	copy file1 into file2
`mv <file1> <file2>`	rename file1 to file2

Useful shell (bash) commands III

Some other useful commands

`man <command>`	show command's manual page
`grep <pattern>`	show lines of text containing a given pattern
`grep -v <pattern>`	show lines of text not containing a given pattern
`sort`	sort lines of text files
`wc`	counting words, lines and characters
> (output redirection)	allows to redirect the output to a file
| (pipe)	allows to send output from one program to another
`echo`	input a line of text and display it on standard output
`cut`	to extract portion of a file by selecting columns

AWK commands

AWK - UNIX shell programming language. A fast and stable tool for processing text files.

`awk '/exon/ { print $0 }' <file>`	search for the pattern 'exon' in the each line of the file
`awk '$3=="gene"' <file>`	search for pattern 'gene' in the third column of the file
`awk 'length($0) > 80' <file>`	print every line in the file that is longer than 80 characters
`awk 'NR % 2 == 0' <file>`	print even-numbered lines in the file
`awk -F'\t' '{print $1}' <file>`	separate fields by <tab> and display 1st column
`awk '!seen[$3]++{print $3}' <file>`	display only unique values of the 3rd column

More info: https://www.grymoire.com/Unix/Awk.html

tmux

`tmux` is a terminal multiplexer that allows users to manage multiple terminal sessions within a single window. It's useful for running multiple programs, managing remote sessions, and organizing the workspace more efficiently.

`tmux new-session -s mysession`	Start a new session with the name *mysession*
`tmux attach -t mysession`	Attach to a session with the name *mysession*
`tmux ls`	Show all sessions
`exit`	Quit current session
`ctrl` + `b` then: `d`	Detach from session
`ctrl` + `b` then: `[`	Enter copy mode (press `q` to exit)

More info: https://tmuxcheatsheet.com/

Generating ssh keys

ssh-keygen -t ed25519

1. Create account from invitation link;
2. Generate public-private key pair:

```
cd ~/.ssh/
ssh-keygen -t ed25519
```

   Enter `user_name` as the file name in which to save the key.
   When asked for passphrase, just press `ENTER` twice.

3. Copy the whole content of your public key file. To display its content, type:

```
cat /home/tomasz/.ssh/user_name>.pub
```

4. Paste it on the website -> account -> SSH public key
5. Log in using ssh protocol:

```
ssh <user_namee>@eagle.man.poznan.pl
```

Using already existing key

- Download key-file;
- Type `ssh-add` and path-to-key-file e.g.:

```
ssh-add ~/Desktop/<key_name>
```

- Log in using command:

```
USER@eagle.man.poznan.pl
```

First steps

Check the content of your `$HOME` directory:

```
klug3@eagle:/mnt/storage_3/home/klug3$ ls
```

```
README.md    pl0534-01
```

Navigate to grant directory and check its content:

```
klug3@eagle:/mnt/storage_3/home/klug3$ cd pl0534-01/
klug3@eagle:/mnt/storage_3/home/klug3$ ls
```

```
archive    project_data    scratch
```