

CSG Cluster Quick Reference

Guide to general **Linux (bash)** and **Slurm** commands

Accessing the CSG Cluster

Logging in from a terminal

ssh **username**@desired_gateway.sph.umich.edu

Transferring files between CSG and your system

```
scp input username@desired_gateway.sph.umich.edu:output  
scp -r input username@desired_gateway.sph.umich.edu:output  
scp username@desired_gateway.sph.umich.edu:input output
```

GUI Clients

PutTY SSH client for Windows

WinSCP SCP client for Windows

FileZilla FTP client for Windows, Mac, and Linux

Basic Linux file management

man **command** Display the manual page for **command**

pwd Print out the present working directory

ls List the files in the current directory

ls -lh Show long, human-readable listing

ls **dir** List files inside directory **dir**

rm **file** Delete **file**

mkdir **dir** Create empty directory called **dir**

rmdir **dir** Remove empty directory **dir**

rm -r **dir** Remove directory **dir** and **all contents**

cd **dir** Change working directory to **dir**

cd .. Change working directory to parent

cd Change working directory to home

ls List the files in the current directory

cp **file1 file2** Copy **file1** as **file2**

cp **file1 dir** Copy **file1** into directory **dir**

mv **file1 file2** Rename **file1** as **file2**

mv **file1 dir** Move **file1** into directory **dir**

~ (tilde) Home directory

. (period) Current (working) directory

.. (2 periods) Parent directory

wget **URL** Download a file from Internet **URL**

unzip **file.zip** Extract a ZIP file

tar xzf **file** Extract a gzip compressed tarball (common extensions: **.tar.gz** and **.tgz**)

Viewing and editing text files

cat **file** Print entire content of **file**

less **file** Prints content of file page by page

head **file** Print first 10 lines of **file**

tail **file** Print last 10 lines of **file**

nano Simple, easy to use text editor

vim Minimalist yet powerful text editor

emacs Extensible and customizable text editor

Advanced file management

chmod Change read/write/execute permissions

which **cmd** List the full file path of a command

whereis **cmd** List all related file paths (binary, source, manual, etc.) of a command

du **dir** List size of directory and its subdirectories

find Find file in a directory

Aliases and system variables

alias Create shortcut to command

env Lists all environment variables

export **var=val** Create environment variable **\$var** with value **val**

echo **\$var** Print the value of variable **\$var**

. bashrc File that defines user aliases and variables

Input and output redirection

\$(command) Runs **command** first, then inserts output to the rest of the overall command

< Standard input redirection

> Standard output redirection

2> Standard error redirection

2>&1 Standard error to standard output redirection

cmd1 | **cmd2** Pipe the output of **cmd1** to **cmd2**

Filters

wc Word, line, and character count

grep Find and print text matching a regular expression

sort Sort input

uniq Filter duplicate lines

cut Cut specific fields or columns

sed Stream editor for search and replace

awk Extensive tool for complex filtering tasks

Lmod

module keyword <i>string</i>	Search for module names or descriptions matching <i>string</i>
module spider <i>string</i>	Search for modules matching <i>string</i>
module avail	Show modules that can be loaded now
module load <i>module</i>	Load <i>module</i> in the environment
module show <i>module</i>	Show the help and variables set by <i>module</i>
module list	List currently loaded modules
module unload <i>module</i>	Remove <i>module</i> from environment
module purge	Remove all modules from environment
module save <i>collection</i>	Save all currently loaded modules to <i>collection</i>
module savelist	Return all saved module collections
module describe <i>collection</i>	Return all modules in <i>collection</i>
module restore <i>collection</i>	Restore all modules from <i>collection</i>

Slurm

sbatch <i>filename</i>	Submit a job script <i>filename</i>
squeue -u <i>user</i>	Show job queue for <i>user</i>
scancel <i>jobid</i>	Delete job <i>jobid</i>
scontrol hold <i>jobid</i>	Hold job <i>jobid</i>
scontrol release <i>jobid</i>	Release job <i>jobid</i>
sinfo	Cluster status
srun	Launch parallel job step
sacct	Display job accounting info

Slurm Environment Variables

SLURM_JOBID	Job ID
SLURM_SUBMIT_DIR	Job submission directory
SLURM_SUBMIT_HOST	Host from which job was submitted
SLURM_JOB_NODELIST	Node names allocated to job
SLURM_ARRAY_TASK_ID	Task ID within job array
SLURM_JOB_PARTITION	Job partition