

# ACCRE Cheat Sheet

## Guide to Linux, Lmod and SLURM commands

### Accessing ACCRE

#### Logging in from a terminal

ssh [vunetid@login.accre.vanderbilt.edu](#)

#### Transferring files between ACCRE and your system

scp [source vunetid@login.accre.vanderbilt.edu:destination](#)

scp [vunetid@login.accre.vanderbilt.edu:source destination](#)

#### Windows/Mac clients:

PuTTY SSH client for Windows

WinSCP SCP client for Windows

FileZilla FTP client for Linux, Windows, Mac

Xming/XQuartz X11 server for Windows/Mac

### Basic Linux file management

man *command* Displays the manual page for *command*

pwd Prints out the present working directory

ls Lists the files in the current directory

ls -lh Show long listing of files

ls -a Show hidden files as well

ls *dir* Lists files inside directory *dir*

rm *file* Deletes *file*

mkdir *dir* Creates empty directory called *dir*

rmdir *dir* Removes empty directory *dir*

rm -r *dir* Removes directory *dir* and **all of its content**

cd *dir* Changes directory to *dir*

cd .. Changes working directory to parent

cd Changes working directory to home

cp *file1 file2* Copy *file1* into *file2*

cp *file dir* Makes a copy of file *file* inside directory *dir*

mv *file1 file2* Renames file *file1* as *file2*

mv *file dir* Moves file *file* inside directory *dir*

cp -i, mv -i Display a warning before copying or moving to an existing file path

rm -i Display a warning before removal

~ (tilde) Home directory

. (period) Current directory

.. (double dot) Parent directory

wget *URL* Downloads a file from *URL* in Internet

unzip *file.zip* Extract a ZIP file

tar xzf Extract a gz compressed tarball  
*file.tar.gz*

### Viewing and editing text files

cat *file* Print entire content of *filename*

more *file* Incrementally display content of *filename*

less *file* Similar to more, but with additional features

head *file* Display file header

tail *file* Display file footer

emacs Extensible and customizable text editor

vim Minimalist yet powerful text editor

nano Simple text editor

### More advanced file management

chmod Changes read/write/execute permissions

which cmd Lists the full file path of a command

whereis cmd Lists possible file paths of a command

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

find Finds files in a directory

### Aliases and system variables

alias Automatically replace one command with another

env Lists all system variables

export *var=val* Create environment variable *\$var* and set value to *val*

echo Print text to the screen

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

. bashrc Define default aliases and system variables

### Input and output redirection

\$(*command*) Runs the command inside  $\$( )$  first, then inserts the output to the rest of the command. Same as putting grave marks ( ` ` ) between the command

< Standard input redirection

> Standard output redirection

2> Standard error redirection

2>&1 Standard error and output redirection

*cmd1* | *cmd2* Pipe command; redirects output of command *cmd1* to input of *cmd2*

### Filters

wc Word count

grep Gets a regular expression and prints it

sort Sort input

uniq Filter duplicate lines

cut Cuts specific fields or columns

sed Stream editor for search and replace

awk Extensive tool for complex filtering tasks

## Cluster directories

/home GPFS, backed up nightly

/data GPFS, backed up nightly

/dors GPFS, backed up nightly

/scratch GPFS, higher quotas, not backed up

/tmp Temporary local storage for I/O intensive tasks

## Lmod

module avail Shows all available modules

module load *module* Loads *module* in the environment

module spider *string* Searches for module names matching *string*

module keyword *string* Searches for modules containing *string* in name or description

module list List currently loaded modules

module unload *module* Removes *module* from environment

module purge Removes all modules from environment

module save *collection* Saves currently loaded modules to *collection*

module savelist Returns all saved modules collections

module describe Get modules in a saved collection

module restore Restore modules from *collection* *collection*

## SLURM

sbatch *filename* Submits a job script *filename*

squeue -u *vunetid* Show job queue for user *vunetid*

scancel *jobid* Deletes the job with *jobid*

scontrol hold *jobid* Hold job *jobid*

scontrol release *jobid* Release job *jobid*

sinfo Cluster status

salloc Starts an interactive job

xalloc Starts an interactive job with X window support

srun Launch parallel job step

sacct Display job accounting information

## #SBATCH directives

--nodes=*count* Number of nodes

--tasks-per-node=*count* Processes per node

--ntasks=*count* Total processes

--cpus-per-task=*count* CPU cores per process

--nodelist=*nodes* Preferred nodes

--exclude=*nodes* Nodes to avoid

## #SBATCH directives (continued)

--time=*min* Time limit; either min or dd-hh:mm:ss

--mem=*count* RAM per node; e.g. 5G

--output=*file* Standard output; defaults to slurm-jobid.out if omitted

--error=*file* Write standard error to file

--array=*arrayspec* Define job array

--gres=gpu:*cores* GPUs per process

--mail-user=*email* Email for job alerts

--mail-type=*type* Email alert types: BEGIN, END, FAIL, QUEUE, ALL

--account=*account* Account to charge

--depend=*state:jobid* Job dependency. *state* = after, afterok, afterany, afternotok

--job-name=*name* Job name

--constrain=*attribute* Request CPU type: westmere, sandy\_bridge, haswell, eight, twelve, sixteen

--partition=*name* Submit to partition: production, debug, maxwell, pascal

## SLURM Environment Variables

SLURM\_JOBID Job ID

SLURM\_SUBMIT\_DIR Job submission directory

SLURM\_SUBMIT\_HOST Name of host from which job was submitted

SLURM\_JOB\_NODELIST Names of nodes allocated to job

SLURM\_ARRAY\_TASK\_ID Task id within job array

SLURM\_JOB\_CPUS\_PER\_NODE CPU cores per node allocated to job

SLURM\_NNODES Number of nodes allocated to job

## ACCRE-specific utilities

accre\_storage Check storage quota usage

rtracejob *jobid* Check resources utilization for job *jobid*

q3 Get recent jobs by user, group and account

qSummary -g *group* Queue summary for *group* and its users

showLimits -g *group* Get resource limits for specific *group*

SlurmActive Show cluster's CPU/node utilization

gpustate Show GPU cluster utilization

sinfofeatures Get node availability based on features

slurm\_groups List your SLURM group membership