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

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 *collection*	Restore modules from *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, REQUEUE, 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