WSU GRID BASIC CHEAT SHEET

To apply for a Grid Account

Go to the grid website and fill out the account application page. You will need your WSU AccessID and password, as well as the AccessID of your sponsor. (Professors and Research Leads may sponsor themselves.)

https://www.grid.wayne.edu/accounts/account_apply.cgi

To get started

https://www.grid.wayne.edu/WSU_Campus_Grid/FAQ/index_html#start

https://www.grid.wayne.edu/WSU_Campus_Grid/Tutorials/PBS

To connect to the Grid

To access the Grid via SSH-2 use:
   PuTTY, OpenSSH, or SecureCRT
   Hostname: grid.wayne.edu
   Protocol: SSH
To transfer files to and from the grid using SFTP use:
   WinSCP, OpenSSH, or SecureFX
   Hostname: grid.wayne.edu
   Protocol: SFTP
Use your WSU Access ID and password to logon.

Tutorials regarding each client are available online:

https://www.grid.wayne.edu/WSU_Campus_Grid/Tutorials/

Architecture

64bit code will not run on 32bit machines, 32bit code should be compiled interactively on a 32bit machine. CPU architecture, CPU speed, memory, and networking may also be important factors. Use the list of queues while making decisions about where to run jobs.

$TMPDIR

When a job script is submitted PBS creates a shell to run the job on the assigned nodes. User home directories are located on a network file system and are accessible from all of the nodes. PBS creates a temporary directory on the assigned node that may be identified by the environment variable $TMPDIR. When running jobs you must run them from the local hard drive. To do this files must be placed in and run from $TMPDIR.

To find open nodes

To find out which nodes have at least one core free, type: freenodes

freenodes -c	minimum cores
freenodes -m	minimum memory
freenodes -h	help

To view information about a node

To get detailed information about a node, type: pbsnodes <nodename>

To start an interactive job

qsub -I -q ajsq -l ncpus=12 nodes=6:ppn=2

-I	starts an interactive job
-q	specifies a queue
-l ncpus	number of CPUs needed by a job
-l nodes=#:ppn=#	number of nodes and cores per node needed by a job

(The user requests 12 cores, 2 cores per node and that the job be run on AJSQ. This will open a shell on the first node assigned. This is useful for jobs that have graphical interfaces or setting up job scripts.)

To create a job script

A job script is a list of instructions that tell PBS how to run your job. You can modify a job script in a text editor, such as Vim or nano.

https://www.grid.wayne.edu/WSU_Campus_Grid/Tutorials/Vim/
https://www.grid.wayne.edu/WSU_Campus_Grid/Tutorials/nano/

```
#!/bin/bash

#PBS -q ajsq
#PBS -l ncpus=4
#PBS -l nodes=4:ppn=1
#PBS -m ea
#PBS -M xx1234@wayne.edu
#PBS -o /home/xx/xx12/xx1234/jobs/cpi-out
#PBS -e /home/xx/xx12/xx1234/jobs/cpi-error

cd $TMPDIR
cp /wsu/home/xx/xx12/xx1234/pbs/job_name/script_file
cp /wsu/home/xx/xx12/xx1234/pbs/job_name/data_file

/wsu/arch/i386/mpich-1.2.7/gcc/ch_p4/bin/mpirun -machinefile
   ↳  $PBS_NODEFILE -np 4  $TMPDIR/script_file

mv $TMPDIR/* /wsu/home/xx/xx12/xx1234/pbs/job_name/
   ↳  completed/.
```

#!/bin/bash	selects the bash shell
#PBS -q	selects AJS as the queue
#PBS -l ncpus	specifies the number of cpus
#PBS -l nodes=#:ppn=#	specifies the number of nodes and cores per node
#PBS -m ea	sends you an email when the job ends
#PBS -M	email address to send the email to
#PBS -o	where to save the output file
#PBS -e	where to save the error file
cd $TMPDIR	moves you to the local/temp directory
cp ...	copies the files to $TMPDIR
/wsu/arch/...	directory of the executable to run the job
mv ...	moves the files from $TMPDIR

(The user requests four cores, one core per node, and that the job be run on the ASJQ. The user then specifies where to send output and error files. The user moves script files and data files to the $TMPDIR directory. The user executes 'script_file'. The user moves all files in $TMPDIR to their home directory and the job ends.)

To submit a job

To submit a job in PBS, type: qsub <name of script>

To view running jobs

For a list of running jobs and the nodes that they are on: qstat -n1

For a list of your jobs: qme

To contact staff for help

If you have any problems using the Grid, feel free to contact the staff for assistance.

Email: advcomp@wayne.edu
https://www.grid.wayne.edu/WSU_Campus_Grid/Contact/