Quick Start Tutorial

Premise High Performance Computing (HPC) Cluster

UNH Research Computing Center
HPC Overview: What is cluster computing?

- Clusters of computers, or “nodes”, work on a task in unison to provide more power and speed than can be achieved by a single computer.

- HPC is for solving problems that are larger than any one computer can easily solve in a reasonable amount of time. [http://insidehpc.com/hpc-basic-training/what-is-hpc/](http://insidehpc.com/hpc-basic-training/what-is-hpc/)
About RCC’s Premise HPC Cluster

• Premise consists of a head node and 14 compute nodes, along with 225TB of usable storage.

• The Slurm Workload Manager is used to manage job requests. Jobs submitted by users are assigned to compute nodes by this queuing system based on the availability of idle compute nodes.
Is HPC for you?

- While Premise can run most Linux applications, it is best suited for:
  - Computational problems that can be divided into multiple independent tasks
  - Software designed for HPC (Multithreaded, MPI compatible, or GPU computing)
  - Tasks that require greater amounts of memory, storage, or runtime
  - Scenarios that allow for the potential wait time associated with shared resources
  - UNH research. For an academic classroom resource, we recommend XSEDE
Before you request an account

• Think about what software tools you will use to run your programs. These tools are generally field-specific. Many software packages are already available as “modules”.

• Make sure you have a SecureSHell (SSH) client program on your internet-connected computer so you can connect to Premise.

• See http://premise.sr.unh.edu for a list of installed modules and links to more information about each module.
How to request an account

• Email ops@sr.unh.edu with the following information:
  ○ Full name
  ○ Email & phone
  ○ Requested login ID
  ○ Research group
  ○ Expected use case/research area
Info to Include with your Account Request

- Include the following additional relevant information with your account request:
  - Planning to use Premise for my grants: (list them)
  - Doing preliminary work for a grant submission to X
  - I am working with Professor X on project Y
  - If possible, use my account from RCC system X
  - Please set up my account like user X
  - I plan to install software X in my home area
  - Can open source software package X (available from Y) be installed?
I have an account. Now what?

• Work with RCC to add source code or software that you’ll need that isn’t already available in the existing modules.

• Copy any required data to Premise in a subdirectory of your home area. Your same home area is shared between all the Premise nodes.

• Always submit jobs via Slurm. Never run programs directly on the login head node!
Submitting jobs

• The Slurm Workload Manager is the queuing system for Premise. You must use Slurm commands to submit your jobs.

• The `sbatch` command submits the job to the queue. Additional sbatch options allow the user to define the way the job will run, for instance:
  - Number of times the task will execute
  - Minimum number of nodes running the task
  - Maximum MB of RAM your tasks needs to run
Need more?

• Premise.sr.unh.edu for more detail about usage and Premise’s capabilities

• A list of common Slurm commands, options and additional resources can be found at http://premise.sr.unh.edu/slurm.html

• Email ops@sr.unh.edu for assistance

• For XSEDE assistance, contact the UNH Campus Champion, Grace Wilson Caudill (grace.wilsoncaudill