Mako Primer

This document outlines the use of the SHARCNET mako cluster for teaching activities.

About mako

This cluster is installed at the University of Guelph. The login node contains a dual core Intel Xeon CPU @2.33GHz with 2GB of RAM, and the 14 compute nodes each contain 2 quad core Intel Xeon CPUs @3.00GHz with 8GB of RAM. All nodes in the cluster are connected via gigabit Ethernet. There is ~6TB of disk-space available on the cluster, which is shared between the `/work` and `/scratch` file-systems, and it also mounts the SHARCNET-wide shared `/home` file-system.

Support

Mako is not a production cluster and as such it is not supported at the same level as our other systems. Users should not expect immediate administration assistance to rectify problems with the system, for example, the Friday night before an assignment is due the following Monday. Being a training system, it is shared amongst several groups and prone to unintended abuse. As such, users should not expect a particular level of service or exclusive access to the system.

Any problems with mako should be reported via the SHARCNET web portal problem ticket system.

Accessing the System

This cluster can be reached on the SHARCNET network as `mako` or remotely as `mako.sharcnet.ca`

Upon logging into the system via ssh, users will find themselves on `mako2`. This is the login node for the cluster, and all work (editing files, compiling, submitting jobs) should be done on this node. Users should not have to ssh any further into the cluster.

Compiling

The GCC compiler collection is installed on the system. This includes C (`gcc`), C++ (`g++`) and Fortran (`gfortran`). These compilers should be found in the users default path.

To compile OpenMP code with these compilers, one should specify the `–openmp` compiler flag.

The OpenMPI MPI implementation is installed on the system to support MPI applications. To compile code with MPI support, one should use the MPI wrapper compilers that are found on the default path, ie. C (`mpicc`), C++ (`mpiCC`), F77 (`mpif77`) and F90 (`mpif90`).

Submitting Jobs

This cluster uses the Sun Grid Engine (SGE) job scheduler and resource manager. Users must submit all their work to the cluster through this system – it is inappropriate to run applications on the login node. Jobs are typically submitted to the system for execution within a batch script.
For further documentation on SGE one can consult the `ROCKS 5.1 SGE Usage Guide`.

MPI example

To execute an MPI program located at `/work/user/mpi/test.exe` with 32 processes, one would issue the following `qsub` command: