New HPC users

A short orientation to the Cluster and what Tufts HPC is and is not

Many new users only know about Windows or Macs and the associated environment available. Often the mind set and expectations are not exactly aligned with the linux/unix typical experience as found at most High Performance computing facilities.

High Performance Computing(**HPC**) refers to the means of providing massive computing resources for tasks that are not suitable for desktops, laptops, iPads and portable devices. The Tufts Cluster is designed in a typical research cluster sense for resource scalability, redundancy and consistency with other **HPC** centers. Compute resources are shared amongst users and access to compute nodes are allocated by a job scheduling program(**slurm**) that provides different levels of service.

The typical use case:

There is no cluster desktop login support(**XDM**), similar to the Windows Remote Desktop service. Currently there is no web based access to the cluster, but some solution is expected in 2016. Account holders are able to login remotely or locally to the cluster with an ssh desktop client program. File transfers are supported by use of a desktop file transfer program. Cluster programs run on cluster compute nodes either while one is logged in or even while you are not logged into the cluster. Multiple tasks may be submitted to compute nodes through use of the various **slurm partitions**. Interactive use of a program, similar to desktop usage, is also supported. This may require a supported X11 server program(**cygwin**) to be installed on your computer so that you may receive and redisplay the user interface of the program you are using.

The Tufts cluster does not support the following:

- Microsoft Excel, Word processing, Microsoft Access, Microsoft compilers
- Web access, for example there is no Web interface for you to visit to use the cluster. But this might change in 2016.
- desktop integration: The cluster does not **see** any local devices on your computer such as printers,etc...
- Adobe products
- XDM logins and X11 Desktops(various graphical interfaces to the operating system)
- remote desktops
- Microsoft Compute Cluster
- email services
- web servers, or web development projects
- export of research storage to your desktop if already mounted on the cluster

The Tufts cluster does support the following:

- RedHat linux via a variety of command line environments know as shells(bash, csh, tcsh,...)
- public domain research codes written in C, C++, fortran, python, Perl, Java
- various compilers such as gnu C, C++, Portland compilers, Intel Compilers, python, Perl, Java, lisp
- popular commercial software packages such as Matlab, Ansys, Abaqus, Mathematica, Maple, Comsol, TecPLot, and others
- parallel computation involving several approaches: threads, MPI, GPU
- distributed computing tasks via the Simple Linux Utility for Resource Management (**Slurm**) job scheduler
- high performance network attached storage
- file transfer/connections programs using protocols: ssh, scp, sftp
- interactive and batch access to programs
- X11 graphics and forwarding for remote connections(compute on the cluster and view on your desktop)