SEMINAR REPORT

SEMINAR TITLE: Leveraging and Using High-Performance, Advanced, and Cloud Computing Resources

PRESENTER: Paul Preney

DATE: September 30, 2022

TIME: 11:00am-12:00pm

SUBMITTED BY (student name): Cole Fuerth

*The **Summary + Questions** sections together should be 200-300 words. Use **10pt** Times New Roman font with **single** line spacing for all items.*

Summary:

Mr. Paul Preney is a double major undergraduate in Biology and Computer Science, and later returned to campus to complete his Master's degree in Computer Science. He was unofficially involved in starting SHARCNET Canada for high performance computing. He is also the SHARCNET representative on campus. Today, Paul provides support for people doing high performance computing, including cloud and storage devices.

SHARCNET is the Shared Hierarchal Academic Research Computing NETwork, which is an association of 19 universities and colleges in Canada. Qualifying applicants can use the compute services for free.

Full compute specifications can be found at alliancecan.ca for the Graham cluster. This cluster has over 50,000 CPUs, many terabytes of RAM, a few hundred GPUs, and petabytes of storage. Data can be sent to and from this server over FTP, SFTP, rsync, and more. The entire cluster is liquid cooled, allowing for constant load across the life span of the cluster.

The cluster is available for use through a Jupyter Hub, at jupyterhub.sharcnet.ca. This interface offers access through the web to a terminal interface, as well as hundreds of modules on the cluster you happen to be logged onto. Some of these modules include icpc, gcc, python, MATLAB, and more. It should be noted that jobs should not be run on the login node, as the admins will kill the job and send an email warning.

Using a web interface, jobs can be queued for running. For a job to be queued, compute resources (CPU count, RAM, GPUs, and time) need to be specified. More resources requested means more time spent in the queue, and if too many resources are requested than the cluster can provide, the job will remain queued indefinitely. Jobs cannot take more than their allotted time, so overestimation of time requirements is recommended.

Questions:

1. What is the minimum job time for a job to be considered worth putting onto the cluster?
2. Would the Electrical Engineering department and its research projects be able to request access to this cluster, or are research projects running on these computers limited to computer science-based projects?