

ICOM 6025/CIIC 5019 – High Performance Computing Programming Assignment #1: Virtualization

1. Environment set up

Use Chameleon resources to set to the following environments:

- No virtualization: Native Cent-OS
- Container based virtualization: Docker (Cent-OS)

2. Benchmarking set up

[Y-cruncher](#) is a multi-threaded benchmark for multi-core systems to calculate the value of Pi. Y-cruncher is able to compute Pi and other constants, performing as a stress-testing application for CPU. Deploy and run Y-cruncher benchmark on the two different environments and gather the computational time results.

[STREAM](#) software measures memory performance using very simple vector kernels operations. It produces results for four different operations: *Copy*, *Scale*, *Add*, and *Triad*. Deploy, run and collect results for STREAM benchmark.

3. Report

Submit a technical report addressing the following:

- a. Discuss the process to setup the required virtualization environments
- b. Describe the resources you used in the virtualization environments
- c. Discuss the challenges you faced deploying and executing the benchmarks on these virtualization environments
- d. Compare the performance of the benchmarks on each environment. Draw the results in a graph. Explain the performance of the three environments with regards to the benchmarks.