

Atos Breakout session
11 09 2019 – 10.00

High Performance Computing and the public cloud

Scott L. Hamilton



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Abstract:

A study of the challenges faced when utilizing public cloud resources such as Google Cloud Platform, Amazon Web Services and Microsoft Azure for high performance computing workloads. Several workloads were tested on GCP and several conclusions were drawn about the performance metrics of these workloads. The impacts of cloud network architectures, storage architectures, and compute architectures on the performance of the various workloads will be discussed as well as some method to overcome the performance issues. Assumptions are made in the paper that similar issues will be faced utilizing AWS and Azure due to the nature of the basic public cloud infrastructure.

The study shows that embarrassingly parallel applications run extremely well in public cloud environments, but the more granular applications with high communication rates suffer performance issues as high as 75% degradation in performance, primarily due to the high latency of cloud based software defined networks.

High Performance Computing and the public cloud

Presenter: Scott L. Hamilton

Scott L. Hamilton is a foremost expert in High Performance Computing, High Throughput Computing, and Big Data Analytics. Scott has working the field of High Performance Computing since its infancy. He was credited with building one of the earliest Beewolf compute clusters at the NASA IV&V facility in the fall of 1998. This sparked a passion for leading edge computing research and he went on to work in other areas of HPC research and support. In 2004 he assisted Dr Eric Lamar in building one of the first GPU based clusters in existence. Originally designed for Extremely High Resolution data visualization, Scott converted LiDAR data extraction algorithms to the GPU and cut processing time from 5 days to 7 minutes and began researching technology that has become the modern CUDA programming language. Scott has completed several science and engineering research projects in his twenty plus years of research support. He is passionate about the support and utilization of HPC systems and educating others in their use. He is a Christian Pastor, Father of five, enjoys the outdoors, and has authored two books. You can find his books at <https://amazon.com/author/techshepherd>.

