Contribution ID: **37** Type: **Presentation**

Architectural designs for data analytics at HPC

Wednesday, October 11, 2017 3:00 PM (30 minutes)

The efficient and intelligent handling of large, often distributed and heterogeneous data sets increasingly determines the scientific and economic competitiveness in most application areas. Mobile applications, social networks, multimedia collections, sensor networks, data intense scientific experiments and complex simulations generate nowadays a data deluge. But, processing and analyzing these data sets with innovative methods open up various new opportunities for its exploitation and new insights. The resulting resource requirements exceed the possibilities of state-of-the-art methods for the acquisition, integration, analysis and visualization of data. In recent years, many promising approaches have been developed and are available as community frameworks in the big data area to process large sets of data, which become increasingly interesting to be evaluated by domain scientists. The purpose of those frameworks spans from specialized implementations using deep learning approaches to the processing and analysis of large scale stream-based sensor data. Nowadays, sophisticated and specialized hardware options are available in the high performance computing area to provide architectures adjusted to the needs of different analytics workloads. In our contribution, we discuss methods to provide shaped computing environments for big data analytics and illustrate via real-world analytics scenarios requirements for efficient provisioning of computing environments to suit best individual needs of a given workload to achieve best performance.

Track

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Session Classification: Platforms