I/O Coordination to Improve HEC System Performance: a Marriage of Analytical Modeling, Control Theory, and Differentiated I/O Performance

Pls: Patricia J. Teller and Sarala Arunagiri
Department of Computer Science
The University of Texas-El Paso
El Paso, TX 79968-0518
Phone: 915.747.5480, Fax: 915.747.5030
pteller,sarunagiri@utep.edu

ISSUES, which are Challenges for Efficient Exascale Computing

- RESILIENCE / FAULT TOLERANCE
- I/O PERFORMANCE

Towards Solutions

I/O Coordination to Improve HEC System Performance

ANALYTICAL MODELING
- Reduction of number of defensive I/O operations
- Coordination of productive and defensive I/O of concurrently-executing HPC applications
- Analysis of failure data for model parameters

DIFFERENTIATED I/O SERVICE
- I/O workload performance isolation and I/O service proportional to designated workload weights
- I/O QoS with little affect on aggregate I/O throughput