

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

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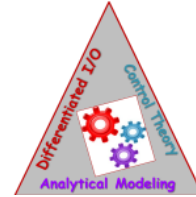
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## ISSUES, which are Challenges for Efficient Exascale Computing

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