

High End Computing File System and I/O R&D Gaps Roadmap

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Unclassified

Announcements

- Wireless – NSF1 and GATech
- Presentations
 - Collected by Grant Mackey and Christopher Mitchell
 - Posted
- News or Announcements
- Selection of Presenters at 2009 HEC FSIO
- Cards for breakouts and comments

HEC FSIO Current Research Areas

- Categories of needed research:
 - Security
 - Metadata
 - Measurement and Understanding
 - Quality of Service
 - Next generation I/O architectures
 - Communication (and) protocols
 - Management and RAS
 - Archive

HEC FSIO 2009 Goals

- We also need to update roadmaps for each gap area with
 - Address gaps that are left or new gaps
 - Current/future/needed research
 - Current/future needed productization
 - Make it easy for Agencies to know what gaps they care about and what investment makes sense for them

2008 QoS Gap Area

Area	Researchers	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Rankings
End to End QoS in HEC	Brandt							 Good research, but much work needed to get a standards based solution. Scale and dynamic environments have to be addressed at some point in time.
	Chiueh							
	Ganger							
Standard Interfaces for QoS	SciDAC - PDSI							 Very partially addressed by proposed HEC POSIX Extensions. Will be driven by above "End to End QoS in HEC".
	POSIX HPC Extensions							

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|--|---|---|
|  Very Important |  Greatly Needs Research |  Greatly Needs Commercialization |
|  Medium Importance |  Needs Research |  Ready and Needs Commercialization |
|  Low Importance |  Does Not Need Research |  Not Ready for Commercialization |
|  Full Calendar Year Funding |  Partial Calendar Year Funding |  On-Going Work |

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2008 Measurement and Understanding Gap Area

Area	Researcher	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	Rankings
Understand system workload in HEC environment	Ampaci-Dusseau	■	■	■				 A comprehensive tool is nowhere in sight; problem is complex.
	Narasimhan	■	■	■				
	Reddy	■	■	■				
	Smimi	■	■	■	■	■		
	Zadok	■	■	■	■	■		
	SciDAC - PDSI	■	■	■	■	■		
	SciDAC - SDM	■	■	■	■	■		
Standards and common practices for HEC I/O benchmarks and trace formats	Zadok/Miller		■	■	■			 Danger of over simplifying problem and could drive vendors to incorrect solutions.
Testbeds for I/O Research	Ligon	■	■	■				 Simulators are being developed. No real testbeds being built. This problem will only get worse over time, i.e. as systems get bigger.
	Thottethodi	■	■	■				
Applying cutting edge analysis tools to large scale I/O	Reddy	■	■	■				 Data are becoming available from Labs including I/O traces. Many opportunities to evaluate this research.
	Zadok	■	■	■				
	LANL/CMU – Trace replay and Visualizer		■	■	■			

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Resources

- HEC FSIO planning site
 - <http://institute.lanl.gov/hec-fsio/>
- Send comments to:
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