Breakout 1A

File Systems Research

Session Coordinators: Lee Ward, Rob Ross

Session Scribes: Buff Miner

Session Presenter:

Session Writeup:

Current High Level Topics

- *Parallel file systems that scale for*
    - *Aligned data operations*
    - *Symmetric NFS*
- *User space file systems*
- *Beginning engineering and early research for other scalability dimensions*
    - *Metadata storage and access*
    - *Security*
- *Object-based storage*
- *Identifying core file system services for HEC*
    - *Moving functionality into middleware*

Focus Areas

- *Tracing and trace analysis*
- *Simulation of file systems and all major subsystems*
- *Benchmarking tools that reflect HEC I/O workloads*
- *User space parallel file systems for research*
- *Scalable FS metadata*
- *Extensible metadata*
- *Alternative namespace organizations*
- *Small and unaligned accesses*
- *Performance diagnosis tools for I/O*
- *Enhanced and access-aware interfaces*
- *File system research to leverage VM advances*
- *Performance predictability/insulation, QoS*
- *QA tools for correctness and fault tolerance at scale*

Rough Consensus

- *Scalable FS metadata (60/24) (short/long)*
- *Measurement and understanding (short/long)*
  - *Benchmarking tools that reflect HEC I/O workloads (43/9)*
  - *Tracing and trace analysis (34/5)*
    - *Disagreement from gov't*
  - *Performance diagnosis tools for I/O (24/11)*
  - *Simulation of file systems and all major subsystems (23/5)*
    - *Disagreement from gov't*
- *Extensible metadata (28/13) (long)*
- *Performance predictability/insulation, QoS (21/7) (long)*
- *Academia really valued (#4 for academia)*
  - *User space parallel file systems for research (14/3) (continuous)*