NFS Extensions for Parallel Storage

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Introductions

- **Organizers**
  - Garth Gibson
  - Peter Honeyman

- **Local arrangements**
  - Charles Antonelli
  - Karen Kitchen
Introductions

- CITI NFSv4 experts
  - Andy Adamson
  - Bruce Fields
  - Jim Rees
- NFSv4 WG chairs
  - Brian Pawlowski
  - Spencer Shepler
Goals

- Extend NFS to enable seamless, high-performance access to parallel storage
- Strawman architecture
- Prototype implementations
- Standards process
- Interoperability testing
Agenda

- This morning: presentations
- This afternoon: discussions
- This evening: seminars
- Tomorrow: heir of the dog (@ CITI)
- This month: comprehensive workshop report will be widely circulated
Lessons learned

- By recapitulating the mechanism of underlying storage we can not help but run slower than the underlying storage
- Complex interference patterns depending on implementation details of NFS and underlying storage state management
The state

- Client name
- Client verifier
- Client IP address
- File ID
- State owner ID
- Access bits
- Deny bits
- Lock type
- Start byte
- End byte
Server-to-server protocol

- DISTRIBUTE SHARE STATE ARGS
- DISTRIBUTE LOCK STATE ARGS
- DISTRIBUTE DELEGATION STATE ARGS
- INVALIDATE STATE ARGS
File location

- FILE_LOCATIONS attribute
  - List of data servers
  - Time-to-live parameter
  - Per data server root pathname
  - Per data server supported operations
  - Per data server lease maintenance indicator

- Extends FS_LOCATIONS
Thank you for your attention! Questions?!

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