

Future HPSS Features and Functions



June 2003

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Presentation Objectives

- ☛ Review *some* of the new features and functions of interest to HPSS developers and users.
- ☛ Review *some of the candidate requirements* for HPSS 6.1 development.
- ☛ Note: HPSS Release 6.1 development planning will commence after team members complete 5.1 commitments.

Candidate Requirements

- ☛ Small File Enhancements
- ☛ Base GPFS DMAPI Port (AIX/Linux)
- ☛ MDMs
- ☛ Ultra RAIT
- ☛ PFTP Globus Authentication
- ☛ PFTP Multi-Node Change

Candidate Requirements

- ☛ Family based migration counts (IN2P3)
- ☛ GPFS DMAPI parallel transfers on AIX & Linux
- ☛ GPFS HDM HACMP support on AIX
- ☛ Dynamic device add / delete
- ☛ SAN capability

Small file enhancements

- ☛ Aggregation of small files during tape migration.
- ☛ Address small file insertion performance.
- ☛ Address metadata footprint for small files.
- ☛ Several possible approaches have been proposed.

Multiple Distributed Movers

- ☛ Manage each device with multiple movers.
- ☛ Select movers based on client/device affinity.
- ☛ Fail over to alternate mover following admin action.
- ☛ Load balancing of movers.
- ☛ SAN support using SCSI-3 Extended Copy commands.

Ultra RAIT

- ☛ Ultra has a Rait device that supports a 4+1 RAIT capability.
- ☛ Needs upgrade to support 2x Fiber Channel and high speed devices such as 9940B.
- ☛ Requires software work in HPSS to do the virtualization, etc.
- ☛ LLNL leading this investigation.

PFTP Enhancements

- ☛ Globus authentication. LBL has developed this for HPSS release 4.3 and 4.5.
- ☛ Multi-node capability. Current pftp multi-node capability is not sufficient. Multi-node capability required to remove limitations on transfer performance.
- ☛ Work is in progress with Argonne to provide a true Grid FTP capability.

Family Based Migration Counts

- ☛ Request Count in migration policy applies to the storage class.
- ☛ May result in files within a family being spread across more tapes than desired.
- ☛ Change would add a Request Count that applied to families.
- ☛ Fairly involved modification to MPS.

SAN Capability

- LLNL expected to deliver SAN3P capabilities for deployment with HPSS 5.2.
- Uses protocol similar to old IPI3 protocol to allow passing of device addressing information from mover owning a device to a second mover or client.
- Using device information, device can be read to or written to directly over the SAN.

SAN Capability

- ☛ Security limitations. Does provide limiting access to devices based on host IP addresses.
- ☛ Due to security limitations, client access to SAN would only be reasonable in a restricted, controlled environment.
- ☛ Most effective usage is in mover-to mover operations such as migration, stage where switch zoning can be used to control access.

Candidate Requirements Post R5.2

1. **Small File Enhancements**
2. PFTP Globus Authentication
3. PFTP Multi-Node Changes
4. Serverless disk-to-tape
5. Full Command Line Interface
6. Grid PFTP
7. **SAN - Dynamic device add / delete**
8. **SAN – Multiple Dynamic Movers**
9. **SAN – Client Affinity**
10. **SAN – Mover Load Leveling**
11. **SAN – Alternate Mover Control**
12. Undelete
13. Quotas
14. Import/Export
15. **Small File Tape Aggregation**
16. HPSS/XFS mirroring
17. **Unix stdio interface**
18. Unattended Monitoring
19. Simpler install
20. Self-healing (auto correct)
21. Deterministic error messages
22. Check in / Check out / Versioning
23. **NFS V4**
24. RAIT/Parity
25. Ops/Admin Task-oriented GUI
26. Simple monitoring screens
27. Pdata/push protocol in FTP
28. Alternative multi-node ftp solution (support for Q)
29. Bulk Data (HPSS-to-HPSS) Transfers
30. **Integration with strategic enterprise-wide parallel and cluster file systems considering as candidates Lustre, CXFS, SNFS, GPFS, and Storage Tank**
31. Disk Allocation Algorithm
32. Enhance change owner capability
33. Client side purge indicator
34. Access command on behalf of another user
35. File Lifetimes
36. Give/Take
37. **Quotas (non-realtime)**
38. Metadata Consistency Checker
39. SDM/DRM
40. Family based migration counts
41. **ADIC Scalar PVR**