High Performance Storage System

Evolving HPSS

Status and Plans

HPSS Technical Committee

May 2004

Survey Time

What are the top three things about HPSS infrastructure that need to be changed?

The answers remain:

1. ~~***SFS***~~
2. ~~***SAMMI***~~
3. ***DCE***

Agenda

- ✓ Release Status
  - **Current**
    - 4.5
    - 5.1
  - **Near Future**
    - 6.1
    - 6.2
  - **Far Future**
    - 7.1
- ✓ NFS Status and Plans
- ✓ Update on Grid Activities

HPSS 4.5

Release 4.5: Status

4.5

- ✓ Released July 2002
- ✓ Content Summary
  - **DMAPI support for XFS***
  - **Duplicate tape copy support for Tape Hierarchies**
  - **SCSI-2 LBA Positioning**
  - **Linux Mover Support***
  - **RAIDZONE OpenNAS Support***
  - **New Device Types (IBM 3590H/STK 9940B)**
  - **NFS Enhancements**
  - **RAIT Mirroring**

  *** Requires field testing**

Release 4.5: Plans

4.5

- ✓ Patch
  - **Scheduled for 2Q04**
  - **Content**
    - Fixes already available
    - Other "required" fixes and changes
- ✓ Last SW Maintenance Patch Planned
  - **Critical fixes via e-fix process**
- ✓ HPSS 4.5 is the path to future versions of HPSS
  - **5.1 (available)**
  - **6.1 (no path planned)**
  - **6.2 (planned)**

HPSS 5.1 Role

5.1

- ✓ Released November 2004
  - **Following beta test program with ECMWF**
- ✓ Final DCE release
  - **Fully supported release for sites needing to retain DCE to end of service**
  - **Development and test release for sites wishing to move to DB2**
- ✓ Provides users the benefits of:
  - **Consolidated servers (simpler, faster)**
  - **More scalable, robust metadata management**
  - **Lower yearly cost with less infrastructure charges**

Release 5.1: Scope

5.1

- ✓ Server Consolidation
  - **Merges Name Server, Bitfile Server, Disk and Tape Storage Server, and part of Client API**
  - **Eliminates nested and distributed transactions**
- ✓ Major upgrade of HPSS infrastructure
  - **Even higher performance and scalability**
    - **DB2 replaces TXSeries/Encina and SFS**
  - **Easier installation and administration**
    - **Java replaces SAMMI***

  ***Higher performance locally on admin workstation or a VPN may be required**
- ✓ Device Updates
  - **LTO Gen 2 and 3592**

Release 5.1: Scope

5.1

- ✓ Licensed with and for HPSS: **(what we provide)**
  - **DB2 UDB 8.1**
- ✓ Prerequisites: **(what you provide)**
  - **AIX 5.1 ML3 or Solaris 9**
  - **DCE Version 3.2 for AIX, PTF Set 4**
  - **Java 1.4.1.2 JRE or SDK**
  - **Full details at:**
    - https://www4.clearlake.ibm.com/hpss/about/PrerequisiteSW.jsp#HPSS-5.1

Release 5.1: Plans

5.1

- ✓ Two SW maintenance updates available
  - **tar file update #1**
    - Mid-Feb.
  - **tar file update #2**
    - Cumulative with above
    - Currently in test with release schedule May/June
- ✓ One SW patch planned
  - **Scheduled for 3Q04**
    - Lower priority than the release of 6.1 and 6.2
  - **Content**
    - Cumulative of fixes above
    - Other fixes available
    - Other SSM updates
    - Other "required" fixes and changes
- ✓ No additional SW maintenance patches planned
  - **Critical fixes via e-fix process**

Release 5.1 Site Status and Plans

5.1

- ✓ **Current**
  - **ECMWF**
- ✓ **Planned**
  - **IN2P3**
  - **LANL**
  - **LLNL**

HPSS 6.1 Role

6.1

- A limited-function HPSS for new deployments
  - **No upgrade path for previous HPSS releases**
  - **Upgrade to HPSS for Linux 6.2 planned**
- DCE is not required
- Linux only
- Market-driven functions and features

HPSS 6.1 for Linux 6.1

- ✓ **Existing functions**
  - **From 5.1 and selective updates from 5.1 Patch**
  - **XFS**
  - **NFS via XFS**
  - **pftp client (pdata-push, GSI enabled)**
  - **HSI**
  - **htar**
  - **scrub**
  - **CLAPI**
  - **hpssadm (command line interface)**
  - **Utilities**
    - **repack, reclaim, recover, lsvol, dump_sspvs, dumpbf, dumppv_pvl, dumppv_pvr, hpssuser, shelf_tape, mkhpss, backup, rtmu, retire, remove**

HPSS 6.1 for Linux 6.1

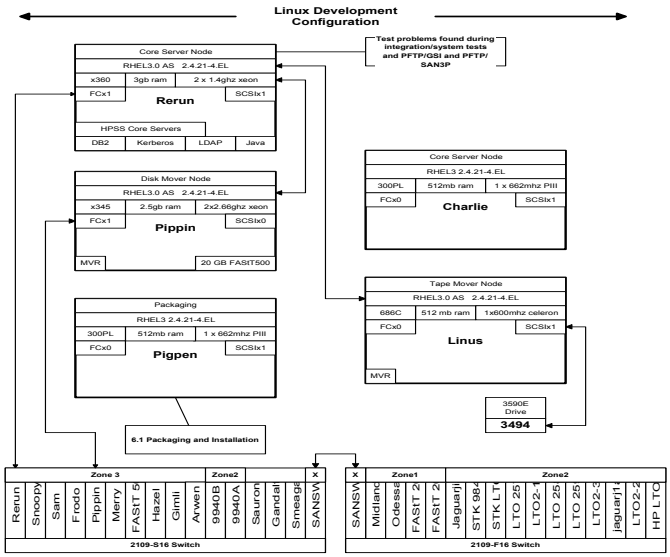
- ✓ New Features
  - **SAN3P**
  - **GSI PFTP**
  - **Net100**
  - **VFS (6.1.x)**
  - **Auto configuration utility (6.1.x)**

- ✓ HPSS Light based on 6.1.1 and 6.1.2
  - **Limited number and types of servers, devices, subsystems, libraries**
  - **Limited number of user concurrent connections**
  - **No limit on number of files**
  - **New price model based on a streamlined service approach**
  - **Specification, license and SOW to be published this summer**

HPSS 6.1 for Linux - Not 6.1

- ✓ Functions deferred to 6.2:
  - **ACCT**
  - **GK**
  - **HA**
  - **HACL**
  - **LDAP support**
  - **NFS**
  - **PVR-AML**
  - **PFTP – IDENT**
  - **Cross Realm and Multinode support**
  - **Multiple subsystems**
  - **Conversion/Upgrade**
  - **lscos**

Development Environment 6.1



Release 6.1: Schedule

6.1

- ✓ Scheduled Completion: 2Q04

- ✓ Status

Milestone	Projected Date
Start of Integration Test	02/02/2004 (A)
Start of System Test	04/28/2004 (A)
General Availability	06/21/2004

HPSS 6.2

HPSS 6.2 Role

6.2

- ✓ **HPSS 6.2 completes the transformation**
  - **Consolidates functions of 5.1 and 6.1**
- ✓ **AIX, Solaris, and Linux Core Server**
- ✓ **AIX, Solaris, Linux, Irix Movers**
- ✓ **Complete device and drive support**
- ✓ **Full PFTP capabilities**
- ✓ **All HPSS 5.1 and 6.1 capabilities +**
  - **New requirements based on release schedules/needs**
- ✓ **Documentation**
- ✓ **The basis of future releases**

Release 6.2: Schedule

6.2

- ✓ Target Completion: 1 – 2Q05

- ✓ Status

Milestone	Projected Date
Requirements Complete	TBS
Design Complete	TBS
Code Complete	TBS
Unit Test Complete	TBS
Integration Test Complete	TBS
System Test Complete	TBS
HPSS 6.2 for AIX/Solaris/Linux Release	1 - 2Q05 (T)

HPSS 7.1 Scope Considerations

7.1

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**

HPSS: NFS Support Plans

- ✓ Client and daemon available in 4.5
- ✓ Client access in 6.1 via Raidzone OpenNAS
- ✓ Client access in 6.2 via VFS
- ✓ Other options for availability
  - **Collaborative NFS V4 development and support**

HPSS: Grid Support

- ✓ **Short-term plans include GSI FTP**
  - **From LBL/NERSC, a GSI-enabled HPSS PFTP client and daemon have been integrated into 4.5 and 5.1, and will follow in 6.1 and on**
- ✓ **Long-term plans include HPSS-compatible GridFTP**
  - **Work continues with ANL, LANL, and LBNL**
    - ANL is designing and implementing
    - HPSS 6.1 test bed available at LBNL
  - **Target is integration with HPSS 6.1 / 6.2**
    - Exploit HPSS features (e.g., pdata push)
  - **Preliminary integration started**
    - Control channel stuff
    - Single stream transfers
  - **Schedule (in review)**
    - To be available via Globus

The End