

# High Performance Storage System

## *Evolving HPSS*

Status and Plans

HPSS Technical Committee

June 2003



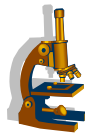
## Survey Time

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

*Hint: The things I'm looking for are each 3-letters long (sort of).*

***The answers remain:***

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



# Agenda

- ✓ Release Status
  - **Current**
  - **Future**
- ✓ Grid Plans



# HPSS 4.5

## Release 4.5: Status

4.5

- ✓ Release announced 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**
- ✓ HPSS 4.5 is the path to future versions of HPSS

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## HPSS Sites Using 4.5

4.5

**BNL, ECMWF, IN2P3,  
LANL, LLNL, NCDC,  
NCEP, RIKEN, SDSC,  
and SNL!!!**

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# HPSS V5

## Getting to HPSS 6 – The Transformed HPSS

- ✓ HPSS V5: two transitional releases
  - **5.1 – The last DCE release and the first DB2 release**
  - **5.2 – A Linux-only subset that is the first non-DCE release**
  - **Highly parallel effort with 5.1 and 5.2 released within months of each other**
- ✓ Two year development schedule
- ✓ Over 60 years of development and testing effort
- ✓ Larger effort than the original Release 3 of HPSS
- ✓ Positions HPSS for the next decade

***HPSS 6 represents the completion of the transformation.***

# HPSS 5.1

## HPSS 5.1 Role

5.1

- ✓ HPSS 5.1 implements the first phase of the infrastructure transformation
  
- ✓ The ultimate 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 DCE 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**
    - **Java replaces SAMMI**
  - **Easier installation and administration**
    - **Java replaces SAMMI**
  
- ✓ Device Updates (LTO Gen 2 and 3590-2)



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## Release 5.1: Scope

5.1

- ✓ Licensed with and for HPSS: (what we provide)
  - **DB2 8.1**
  - **Java 1.4**
  
- ✓ Prerequisites: (what you provide)
  - **AIX 5.1 or Solaris 9**
  - **DCE 3.2**
  - **Optionally for Movers:**
    - RedHat Linux 7.2, Irix, Solaris



**Prerequisites are subject to change.  
Release numbers reflect a minimum level.**

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## Release 5.1: Schedule

5.1

- ✓ Scheduled Completion : September 2003
- ✓ Status

<u>Milestone</u>	<u>Scheduled Completion</u>
Unit Test Complete	May 23 (A)
R5.1 for AIX Beta Release	June 30
System Test Complete	August 29
Distribution Test Complete	September 26
R5.1 GA for AIX and Solaris	September 30



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# HPSS 5.2

## HPSS 5.2 Role

5.2

- ✓ A limited-function HPSS for new customers
- ✓ DCE is not required
- ✓ Linux only
- ✓ First release with SAN-enabled capabilities
- ✓ Developed in parallel with 5.1
- ✓ Release date shortly after 5.1

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## Release 5.2: Scope

5.2

- ✓ DCE Replacement
- ✓ SAN3P (formerly known as IRMs (I/O Redirect Movers))
  - **Tape mover communicates via FibreChannel directly with disk**
  - **Eliminates Disk Mover from data flow from disk to tape**
  - **Testing underway in LLNL testbed**
  - **LLNL integrating into 5.2**
- ✓ Linux
  - **Tested with IA32**
  - **Targeted for Intel® Xeon™ processors MP**
  - **Target Red Hat Linux 9.0**



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- ✓ Supported HPSS Servers:
  - **Core Server**
  - **Mover (SCSI and Fibre Channel drives)**
  - **Raidzone Movers with block I/O**
  - **PVL (3580, 3590, 9840, 9940)**
  - **PVR (operator, 3584, 3494, STK)**
  - **Location Server**
  - **Startup Daemon**
  - **Migration Purge Server**
  - **Gatekeeper**
  - **Log Daemon and Log Client**
  - **FTPD (with limitations, see following pages)**
  
  - **Not included : HDM and DMAPi Gateway**

- ✓ **FTP/PFTP**
  - **PFTP clients on AIX, Linux, Solaris, and IRIX**
  - **PFTP Kerberos authentication**
  - **GSI Grid PFTP client & server**
  - **site** commands supported:
    - Specifying Class of Service (setcos)
    - Change group by ID (chgid)
    - Change group by name (chgrp)
    - Change permissions (chmod)
    - Change owner by name (chown)
    - Change owner by ID (chuid)
    - Staging a file (stage)
    - Setting the desired wait options for migrated files (wait)
    - Creating a symbolic link (symlink)
    - Allocating space for files (allo64)
  
  - **Not included: Multi-Node support**

- ✓ **PFTP site** commands supported:
  - **Parallel append (pappend)**
  - **Parallel file store (pput)**
  - **Multiple parallel file store (mpput)**
  - **Parallel file retrieval (pget)**
  - **Multiple parallel file retrieval (mpget)**
  - **Get current protocol mode (getprot)**
  - **Get tuning parameters (gettuningparams)**
  - **Set the PDATA-ONLY protocol (pdata)**
  - **Set the PDATA\_AND\_MOVER protocol (pmover)**
  - **Set the socket buffer size (setsockbufsize)**
  - **Set the transfer buffer size (setxferbufsize)**

- ✓ Client Applications
  - **pftp\_client**
  - **scrub**
  - **htar**
  - **CLAPI**
- ✓ **hpsadm** (command line interface)
- ✓ **Java GUI**
- ✓ **Utilities:** repack, reclaim, recover, lsvol, dump\_sspvs, dumpbf, dumppv\_pvl, dumppv\_pvr, hpssuser, shelf\_tape, mkhpss, hacl, backup, rtmu, retire, remove
- ✓ **Documentation** (partial)

## Release 5.2: Schedule

# 5.2

✓ Scheduled Completion: 4Q03



✓ Status

<u>Milestone</u>	<u>Projected Date</u>
Integration Test Complete	07/30/2003
System Test Complete	09/15/2003
HPSS 5.2 for Linux Release	4Q03

# HPSS 6

## HPSS 6.0 Role

6

- ✓ HPSS 6.0 completes the infrastructure transformation
- ✓ Consolidates functions of 5.1 and 5.2
- ✓ The basis of future releases

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## HPSS 6

6

- ✓ AIX, Solaris, and Linux Core Server
- ✓ AIX, Solaris, Linux, Irix, and RAIDZONE Movers
- ✓ Complete device and drive support
- ✓ Full PFTP capabilities
- ✓ All 5.1 capabilities
- ✓ Documentation (complete)

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# Release 6: Schedule

# 6

✓ Scheduled Completion: 1Q04



✓ Status

<u>Milestone</u>	<u>Projected Date</u>
Code Complete	09/15/2003
Unit Test Complete	09/29/2003
Integration Test Complete	12/22/2003
System Test Complete	03/04/2004
HPSS 6 for AIX/Solaris/Linux Release	1Q04

# HPSS: Grid Support

- ✓ **Short-term plans include GSI FTP**
  - LBL/NERSC has prototyped and KEK tested a GSI-enabled HPSS PFTP client and daemon; SDSC has expressed interest
  - Changes integrated into 4.5 and 5.1, target for 5.2, too
- ✓ **Long-term plans include HPSS-compatible GridFTP**
  - ANL is designing and implementing
  - Target is 6.0 but no plan finalized
  - Draft of collaboration requirements provided
- ✓ **Additional topics for analysis**
  - Authorization services
  - Data channel authentication
  - Credential lifetimes
  - Support for web services-based protocols (e.g., SOAP)
  - Multi-node and multi-interface support
  - On-going support
- ✓ **Need LBL/NERSCs leadership for strategy and plans of HPSS Grid support.**
  - With help from CalTech and SDSC (and others?)



**The End**