

# High Performance Storage System

## *Evolving HPSS*

Status and Plans

HPSS Technical Committee

June 2003



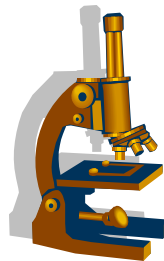
# Survey Time

***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 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

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

**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 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**

- ✓ 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**
  
- ✓ Device Updates (LTO Gen 2 and 3590-2)



# 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.**

# Release 5.1: Schedule

5.1

- ✓ Scheduled Completion : September 2003
- ✓ Status

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



**HPSS 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

- ✓ 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**



- ✓ 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**
- ✓ hpssadm (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



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

**HPSS 6**

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

- ✓ 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)

# Release 6: Schedule

# 6

- ✓ Scheduled Completion: 1Q04
- ✓ Status



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

# 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