

# Sandia National Laboratories HPSS

---

## HUF 2013 Site Presentation

November 7, 2013  
Boulder, Colorado

Connie Sutton

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND NO. 2013-8725 C



# Agenda

---

- End-User Access to HPSS
- Fair Share User Access (N/A)
- Health Monitor of HPSS
- Current Hardware
- Migration Management to New Tape Technology
- Metrics Measurement Description
- Most interesting challenge
- Future Changes and Plans



# End-User Access to HPSS

---

- HPSS User Access is through our Data Transfer Clusters
- Data Transfer Tools
  - HSI/HTAR/PFTP/Transfer Agent (TA)/Filezilla (Windows solution)
- Platforms
  - Capability & Capacity Clusters



# Health Monitors

---

- Alarms and Events monitored hourly
- StorageTek Tape Analytics software for SL8500
- DB2 Database backups completion email daily
- File System usage for logs, archive logs, mirror logs, DB2 tablespace warnings, DB2 backup file system, all HPSS file systems
- WAN performance testing inter lab(LANL,SNL,LLNL)



# Current Hardware

---

- 2 RedHat Linux Core servers(32bit)
  - RHEL 5.5
  - 4 QC 2.13GHz 16GB memory
- 4 Disk Movers
  - RHEL 5.5
  - IBM X3650, 2 DC 3.0GHz, 6GB memory
  - Qlogic 2460
  - Chelsio S310 LR



# Current Hdwe Cont'd

---

- 20 Tape Movers
  - RH 5.5 Client (64)
  - Dell R610 4 QC 2.93GHz, 6GB memory (32bit HPSS)
  - Qlogic 2460?
  - Chelsio S310 LR
- 2 Oracle SL8500
  - 4 Expansions (6500 cells)
- 10 Titanium 10K A Tape drives
- 10 Titanium 10K C Tape drives
- 1 T200E Spectra tape library
- 1 T50E Spectra tape library



# Migration to new Technologies

---

- Migrated data on T10k A tapes to T10k C tapes
- Dual tape copy COS
  - T10k A, repurpose
- Disk cache – IS5500(128TB)
- LTO5(Spectra)





# Metrics used to Measure System

---

- Monthly accounting of user usage
- DB2 checks and re-orgs
- StorageTek tape analytics
- SL8500 capacity monitored



# Challenges in the Past Year

---

- **DB2 performance – DB2 hanging with no errors being flagged in db2diag.log – Problem solved by excluding system accounts from LDAP.**
- **Spectra Logic T200E integration into HPSS – Available devices both tape drives and volumes were not being properly enumerated, not able to get volume information from library**  
**Necessary change to HPSS code to accommodate this library.**



# Compute Platform Connectivity Transfer

---

- **Tri-lab Discom WAN Performance**
  - **Network Monitoring (e.g., Iperf)**
- **Partnered with LANL/LLNL to install and tune data transfer tools**
- **Increased storage requirements**



# Future

---

- 8Gb FC Disk Cache
  - Shifting away from direct to tape transfers
- Repurpose T10K A drives
- StorageTek SL3000 tape Library
- Investigation of RAIT, SAN3p
- Virtualization
- SNL partnering with GEL on Data Transfer Tools.  
Suggestions for exascale data transfer environment – [srmcree@sandia.gov](mailto:srmcree@sandia.gov)



---

# Questions

---



- Dedicated transfer cluster
  - Joint project with cluster admins
- Shared site global file systems
- Tuned HPSS/LAN/WAN performance
- Data Transfer tools in one location