HPSS / GHI @ MPCDF

HPSS User Forum 2019
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Andreas Schmidt, MPCDF
Overview

- Tape Libraries
- HPSS Installation
- GHI Installations
- GHI Software-Environment Extensions
- Questions…
STK SL8500 (2, connected)

- Located in MPCDF main building, ground floor
- 20,000 slots, ~17200 tapes (14700 for TSM)
- ~1400 LTO7 tapes
- ~1100 LTO7M8 tapes
- 8 LTO8 drives for HPSS
- 73 drives for TSM
IBM TS4500 (2, separate libraries)

- Located in MPCDF main building, basement
- ~22,400 slots, ~20400 tapes
- ~11000 LTO5 tapes
- ~5800 LTO6 tapes
- ~1800 LTO7 tapes
- ~1800 LTO7M8 tapes
- 10 LTO7 drives
- 8 LTO8 drives
- ~11000 slots, ~1200 tapes
- ~1200 LTO7M8 tapes
- 10 LTO8 drives
IBM TS3500, IBM TS4500

- Located in machine rooms of LRZ (Leibniz Rechenzentrum)
- ~19,000 slots, ~16500 tapes (2500 for TSM)
- ~3200 LTO5 tapes
- ~8400 LTO6 tapes
- ~1400 LTO7 tapes
- ~1000 LTO7M8 tapes
- 4 LTO7 drives
- 8 LTO8 drives

- ~11000 slots, ~4800 tapes
- ~2100 LTO6 tapes
- ~2700 LTO7 tapes
- 14 LTO7 drives
IBM TS4300

- Located in machine room of GNZ in Berlin (Gemeinsames Netzwerkzentrum MPG)
- Rack mounted library
- 120 slots, 120 tapes
- 120 LTO7M8 tapes
- 2 LTO8 drives

- The remote TS4300 is not run by HPSS but TSM
  This library will be used for 3rd copies of very sensible data
HPSS @ MPCDF

- Hardware: IBM/Lenovo x3650 M3 / M4 / M5
- Core Server running HPSS version 7.4.3.2
- 10 local movers
  serving the local STK SL8500
  serving two IBM TS4500
- 2 remote movers at LRZ
  serving remote TS3500
  serving remote TS4500
GHI Clusters (1)

- **GHI#1**, installed 2011  
  for HPC users (large user base over Germany)  
  4 machines, 220 TB GPFS disk space, 116 mio files, 35 PB

- **GHI#2**, installed 2013  
  Max Planck Institute of Biochemistry  
  2 machines, 90 TB GPFS disk space, 0.7 mio files, 0.3 PB

- **GHI#3**, installed 2014, reinstalled 2018 (located 900km away)  
  Max Planck Institute for Plasma Physics  
  3 machines, 1200 TB GPFS disk space, 3.1 mio files, 1.2 PB

- **GHI#4**, installed 2014  
  Assorted smaller Research Groups all over the MPS  
  3 machines, 280 TB GPFS disk space, 12 mio files, 23 PB
GHI Clusters (2)

- **GHI#5.1**, installed 2016 (located 500km away)  
  Max Planck Institute for Biophysics  
  3 machines, 2400 TB GPFS disk space, 21 mio files, 2.5PB

- **GHI#5.2**, installed 2016, only for GHI backup  
  3 machines, 550 TB GPFS disk space, 27.6 mio files, 0.8PB

- **GHI#6**, installed 2016 (located 500km away), only for GHI backup  
  Max Planck Institute for Biophysics  
  3 machines, 960 TB GPFS disk space, 71.6 mio files, 1.8 PB

- **GHI#7**, installed 2017  
  Max Planck Institute for Brain Research  
  2 machines, 460 TB GPFS disk space, 12.4 mio files, 5.7 PB

- **GHI#8**, GHI installed 2019  
  Max Planck Institute for Biophysics  
  3 machines, 8000 TB GPFS disk space, 7.8 mio of 26 mio files, 1PB
GHI Software environment (1)

• **Extended backup / migration script**
  Lots of configurable options:
  – Script automatically restarts on configuration changes
  – Configure image, full, and incremental backuptimes
  – Configure „full“ migrations which need only a reduced amount of files for aggregates
  – Automatically adjust migration rules with the help of templates
  – After migrations: additional checks for incomplete migrations and other problems
  – Temporary deactivatable by an external configuration script

• **Automated deletion of backups**
  – Automatically deletes all backups exact 1 year old
  – Can be monitored on the HPSS core machine
GHI Software environment (2)

- **GRF – GHI Restore Framework**
  - Based on daily generated filelists of the GHI-filesystems, therefore has the ability to restore old versions of a file
  - Script to generate restore jobs, which define the files to get restored
  - Restore jobs are queued and worked on continuously until completion of all jobs
  - Files currently get restored using FUSE mounted HPSS on a dedicated server
  - Files get restored in a non-migration area of the GHI-filesystem
  - Temporary deactivatable by an external configuration script
  - In production and also used e.g. by the local administrators of GHI#5.1 / GHI#5.2
  - Nevertheless „work-in-progress“: e.g. notifications of progress are missing

- **GSF – GHI Staging Framework**
  - Tries to detect staging problems indicated in /var/log/messages
  - Automatically then re-issues staging of these files
  - Temporary deactivatable by an external configuration script
  - Working, but deactivated: notification of the file-owner is missing
Questions ?