

Storage Services @CC-IN2P3 November 25, 2019

Gino Marchetti





- Storage questions: What? Why? When?
 - Computing landscape (shared filesystem)
 - Mass storage
 - Distributed storage



Storage questions

- WHAT do I have to store?
 - Is it script and/or software?
 - Inputs, outputs, log files?
 - Scientific data
 - Documents?

- WHY?
 - Computing or other treatments
 - Sharing
 - Archive

- WHEN will I need the stored data again?
 - Today, tomorrow, during this week
 - Two, three months tops
 - A couple of years and no more
 - •
 - For my grandchildren 🙂

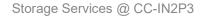


Computing landscape

- PBS: Permanent Backed up Storage
 - Snapshot every 12 hours, backup on tape every 24 hours
 - \$HOME (20G personal space)
 - \$THRONG (100G shared space within the group)
- \$TMPDIR (/scratch)
 - Shared file system ONLY on interactive (cca) machines

25/11/2019

- Local file system on worker nodes
- Limited to job lifetime



Computing landscape

- SPS: Semi-Permanent Storage
 - High throughput file system for working data
 - NO backup, NO snapshot
 - Space quota varies depending on the group resources request
 - Limited time?

Mass storage

- HPSS: High Performance Storage System
 - Tape storage
 - NOT an archive (single copy only, no life cycle management)
 - Scientific data only
 - Raw data
 - Long term usage
 - Suitable for files >1GiB



Mass storage

- TSM: Tivoli Storage Manager
 - Tape backup system
 - Spectrum protect
 - Server backup for IN2P3 labs and DSI
 - No archive



Distributed storage

XRootD

Efficient read-only storage for HPSS retrieval

(internal scheduling mechanism)

- Large disk cache (5 PiB)
- Local copy or remote access
- High scalability



Distributed storage

- iRods: Integrated Rule-Oriented Data System
 - Storage middleware
 - Need of a specific account
 - Management of metadata
 - Migration to tape



Namespaces

/hpss	HPSS + XRootD namespace	Not mounted on machines, only remote access
/scratch	Temporary workspace (\$TMPDIR)	Local disk on workernode. Shared filesystem on interactive machine
/sps	SPS namespace	
/pbs/home	\$HOME	
/pbs/throng	\$THRONG_DIR	
/pbs/software	Installed software namespace	
/in2p3	iRods namespace	

Summary table

https://doc.cc.in2p3.fr/en:stockage-et-transfert

Where is the Data <i>before</i> the job?	File type / format	Access	Files / dataset types shared concurrently by jobs	Working dataset size
dCache	Any / ROOT (data)	read AND write	read	> 10MiB
		non posix (dCap, ROOT, local copy)		
HPSS	Any (data)	read OR write	read	> 1GiB
		non posix (local copy)		
iRODS	Any (data)	read OR write	read	Any
		non posix (local copy)		
SPS	Any + binaries + logs	read AND write	read AND write	\leq 8GiB : direct access
		posix OR local copy		> 8GiB : local copy
XRootD	ROOT (any)	read (non posix)	read	Any
		write (ALICE) (ROOT, local copy)		



This support is shared under the Creative Commons license: <u>Attribution-NonCommercial-ShareAlike (CC BY-NC-SA)</u>



EN: This license lets others to remix, tweak, and build upon this work non-commercially, as long as they credit the authors and license their new creations under identical terms.
FR: Cette licence permet à d'autres personnes de remixer, d'ajuster et de développer ce travail de manière non commerciale, à condition qu'elles créditent les auteurs et accordent une licence à leurs nouvelles créations aux mêmes conditions.



