

Storage at CCIN2P3 SC Status

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CC-IN2P3

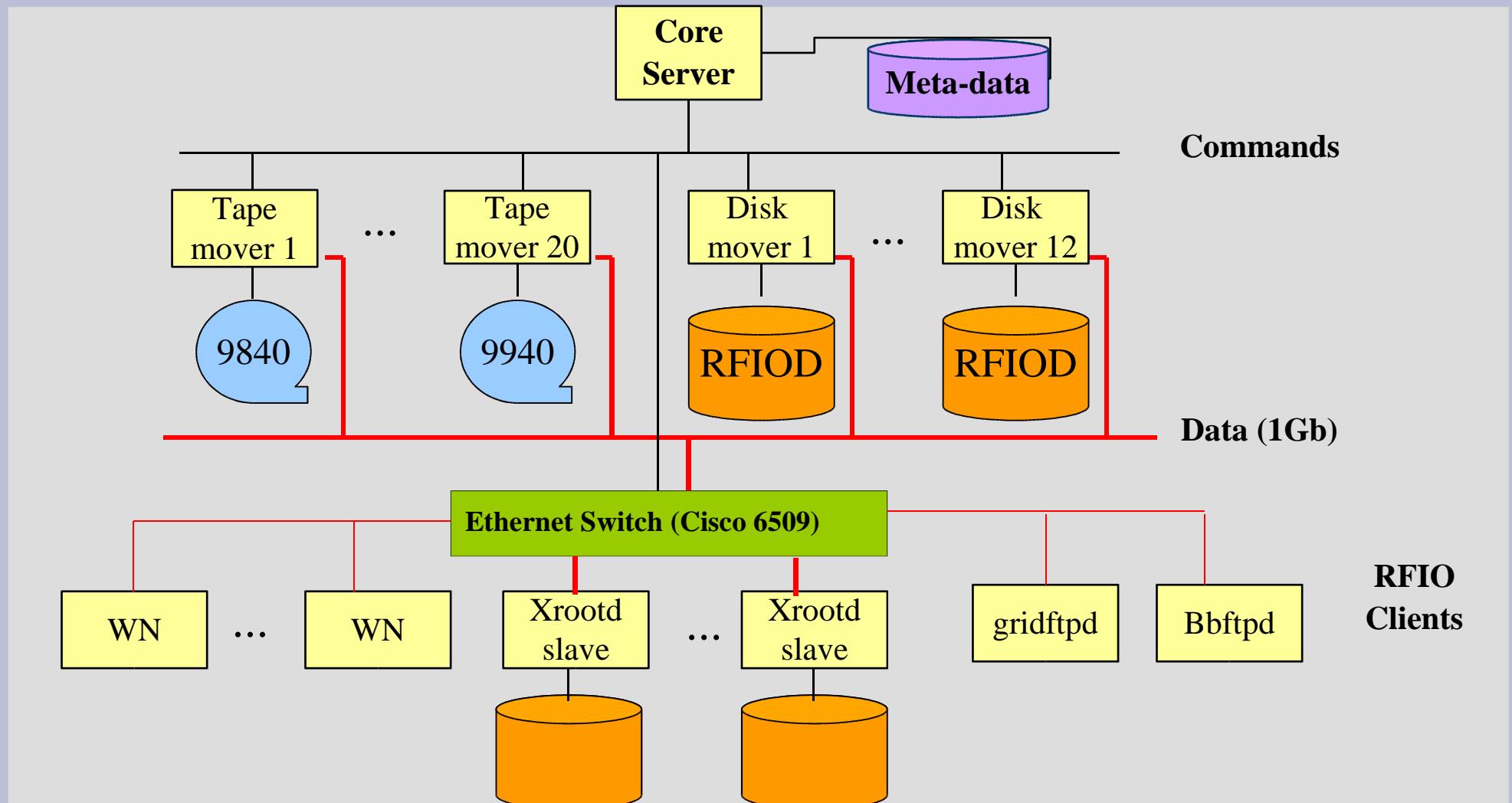
Centre de Calcul de l'Institut National de Physique Nucléaire et de Physique des Particules



Distributed storage overview

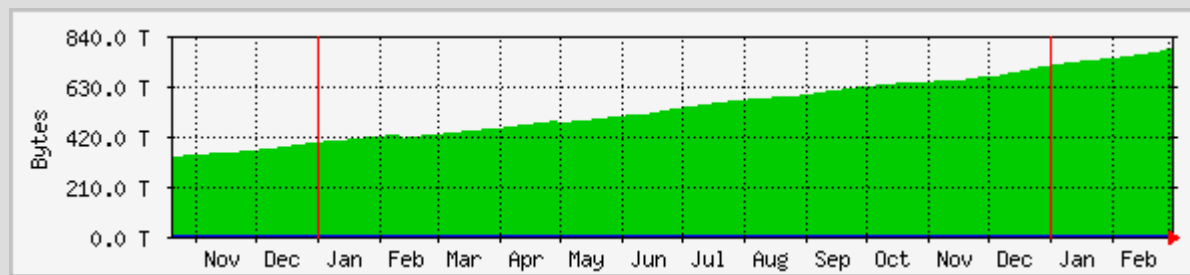
- AFS
 - users' homes
 - groups' repositories
- Mass Storage in HPSS (800TB by now)
- Xrootd connected to HPSS (40TB)
- “semi-permanent” storage served by 15 NFS servers (30TB)
 - Intensive I/O on relatively small files not well addressed by HPSS
 - But this solution is not scalable enough
- Backup in TSM

Mass Storage setup



HPSS use at CCIN2P3

- Classes of service (COS)
 - Customization: types of drives, dedicated cache disk...
 - COS 0: most suitable COS is dynamically used
 - COS 1 (tape-only): HPSS disk is not used
- Local access is done via RFIO (and not pFTP)
 - RFIO servers are “distributed” amongst experiments
 - `rftp /tmp/file cchpssatlas:/hpss/in2p3.fr/group/...`
- Remote access by bbFTP, GridFTP, SRB



Which SRM for HPSS ?

- We need an SRM that allows to:
 - Easily link with HPSS via RFIO
 - Use different COS
- We don't need disk management (HPSS has its own disk)

The dCache solution

- We have tested LBNL's HRM for HPSS v1.2
 - They use pFTP as the HPSS link
 - Difficult to integrate RFIO
- Why not writing our own SRM?
 - No human resources
- dCache appeared to be the only solution
 - It manages disk but we can use “tape-only” COS
 - It provides easy HSM link integration (shell script)
 - It allows many parameters to this link
 - It has been in production for a while
 - It is used by a large community

dCache and HPSS

- Files are stored with their physical names
 - File with logical name `"/dcache/atlas/afile"` is stored as `"/hpss/dcache/atlas/0001000000000000000000002AF0"`
- Files belong to a generic user per VO
 - `/dcache/atlas => su -c "rfcp ... " lcgatlas`
- COS and RFIO server depend on dCache path
 - `/dcache/atlas => RFIO server=cchpssatlas, COS=12`
 - `/dcache/dteam => RFIO server=cchpssccin2p3, COS=0`
- TODO
 - File deleted in dCache: need to be deleted in HPSS
 - File overwritten in dCache: old file to be deleted in HPSS

dCache : open issues

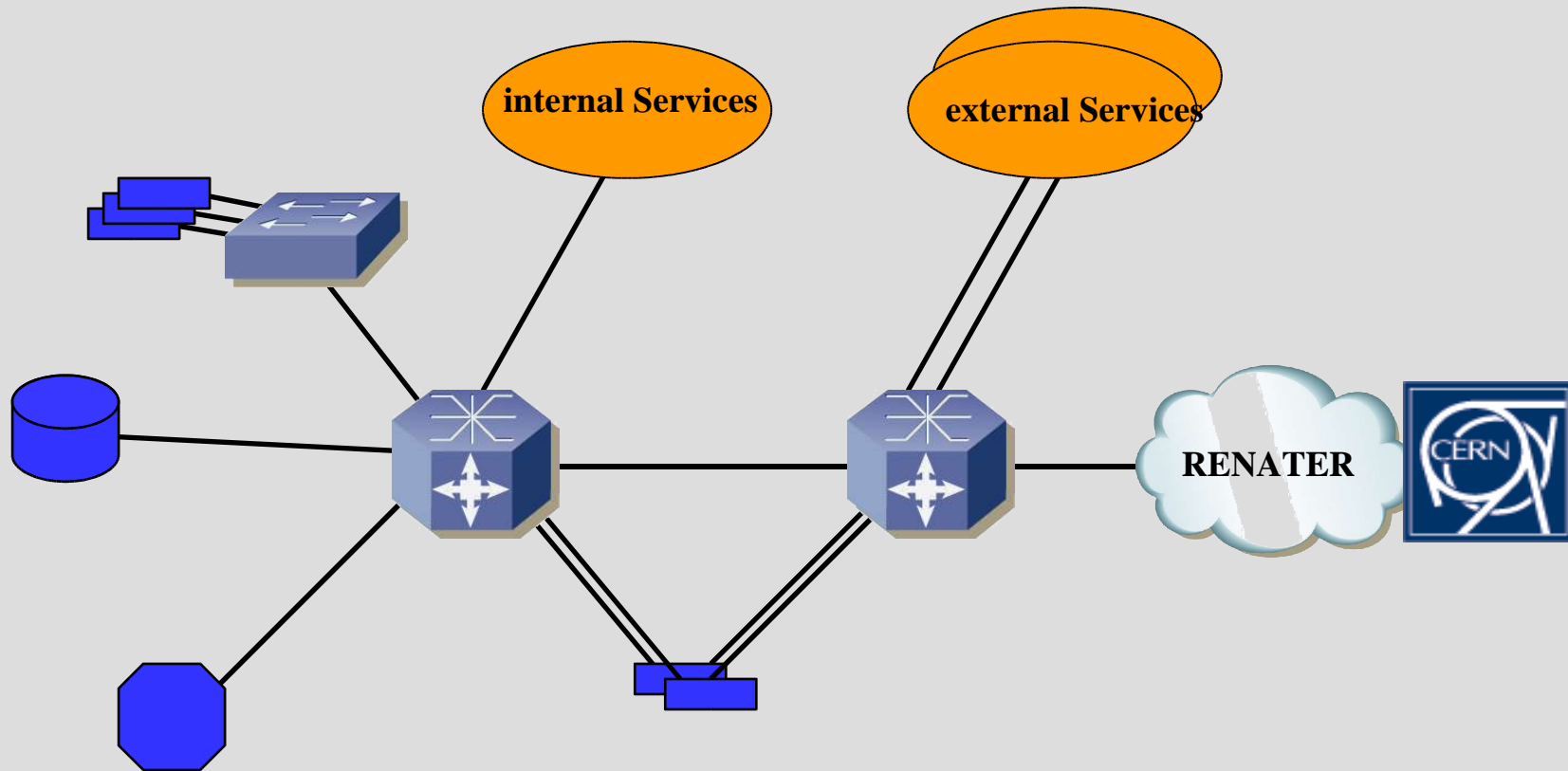
- We estimate it needs 1FTE for daily operations
 - We have already invested much in HPSS and Xrootd to get good expertise
- Not easy to install
 - Lots of config files
 - Documentation for 'by default' setup only
- Which release to use in LCG?
- Not easy to debug
 - We don't have sources but dCache support is good
- Web monitoring is basic
 - But we haven't tried Java GUI yet

SC status at CCIN2P3

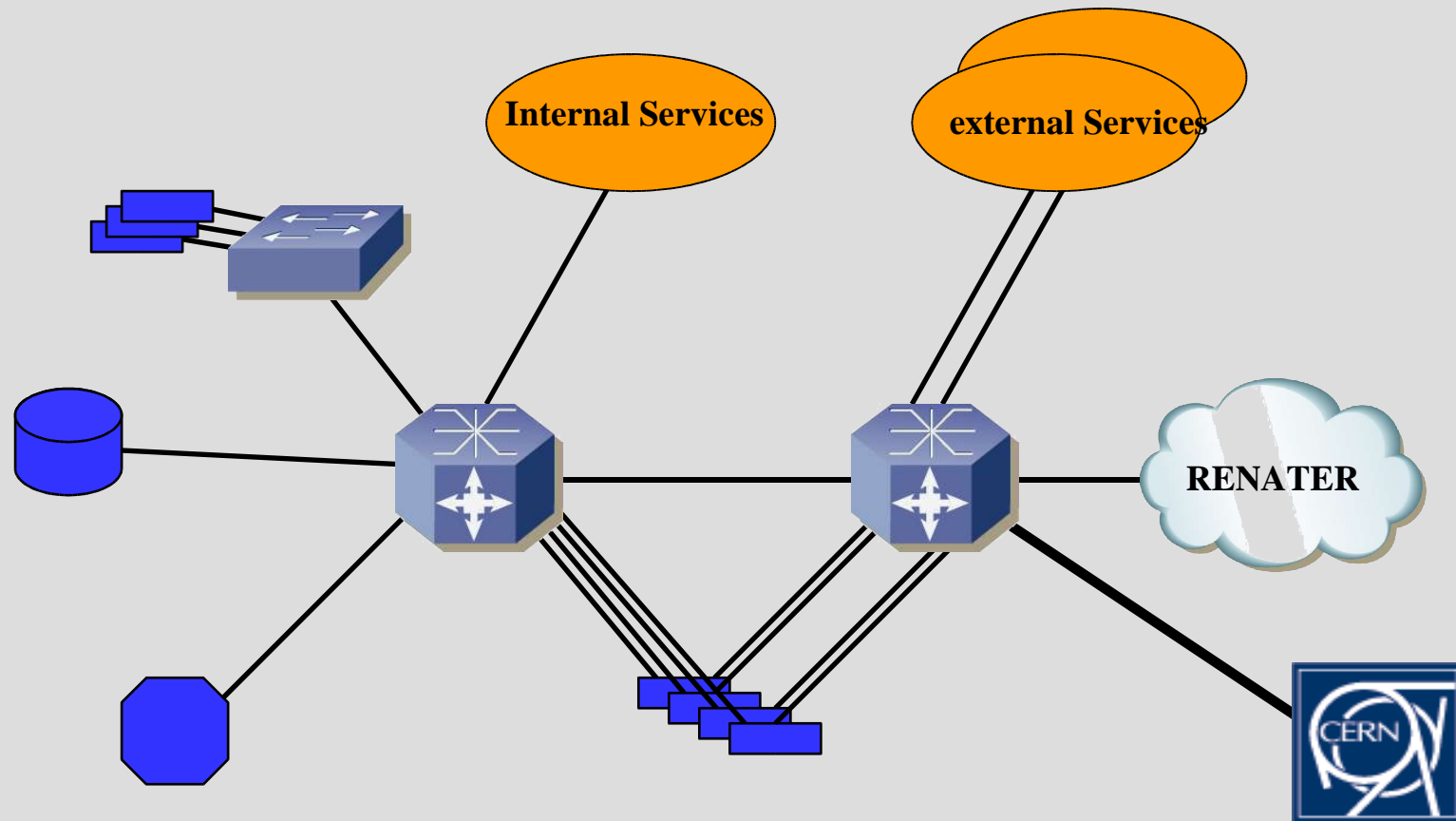
SC2	March 21-April 3
Single site validation	✓

SC3	July 4-July 30
Network reconfiguration	After SC2
Head Node (dCache core + SRM): setup	✓
2 Pool nodes (dCache pool + GridFTP): setup	✓
HPSS configuration (Tape-only COS)	✓
Transfers Client CCIN2P3 – SRM CCIN2P3	✓
Performances and tuning	In progress
Transfers Client CERN – SRM CCIN2P3	End April

Network for SC2 and SC3

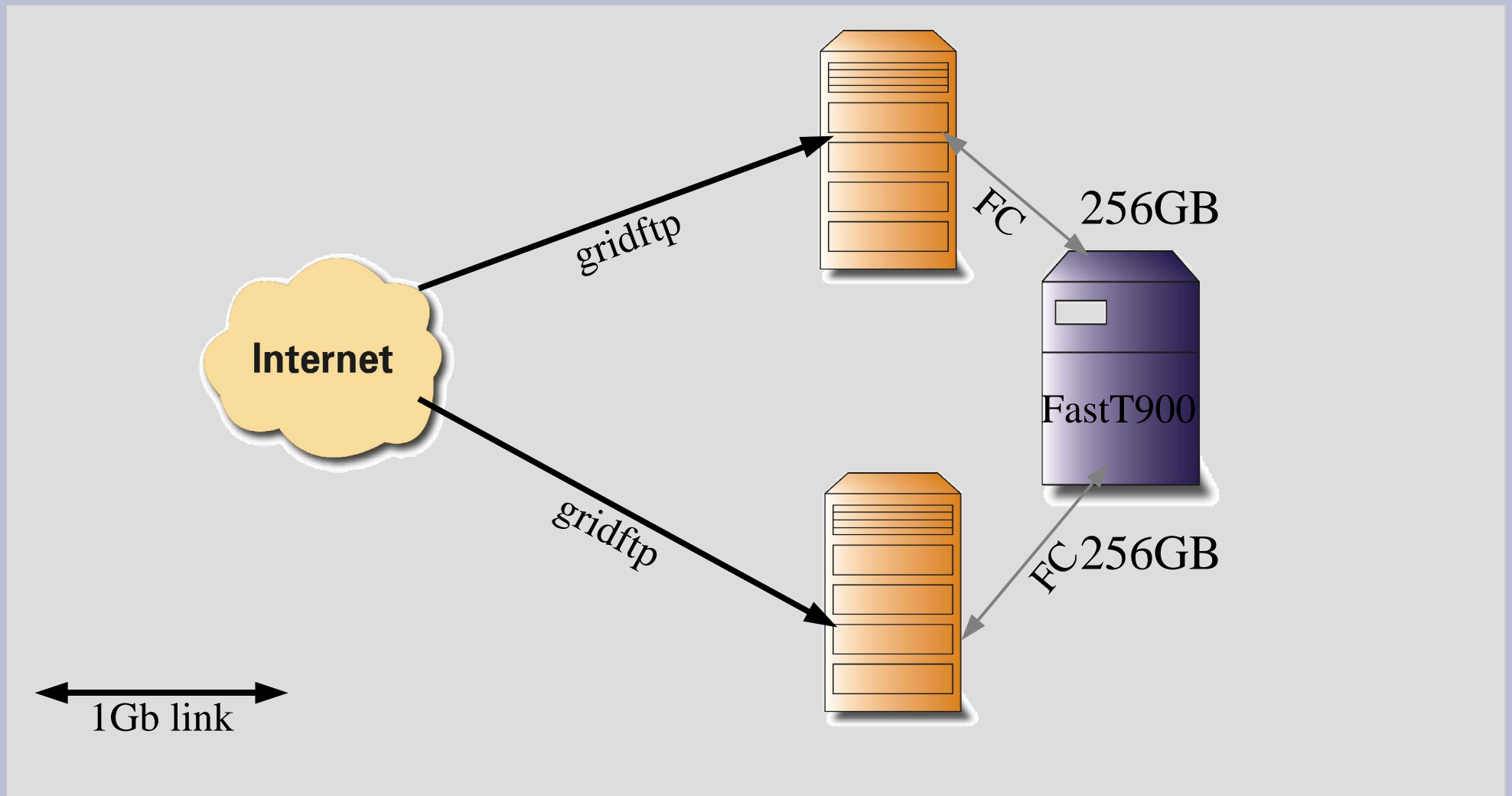


Network after SC3

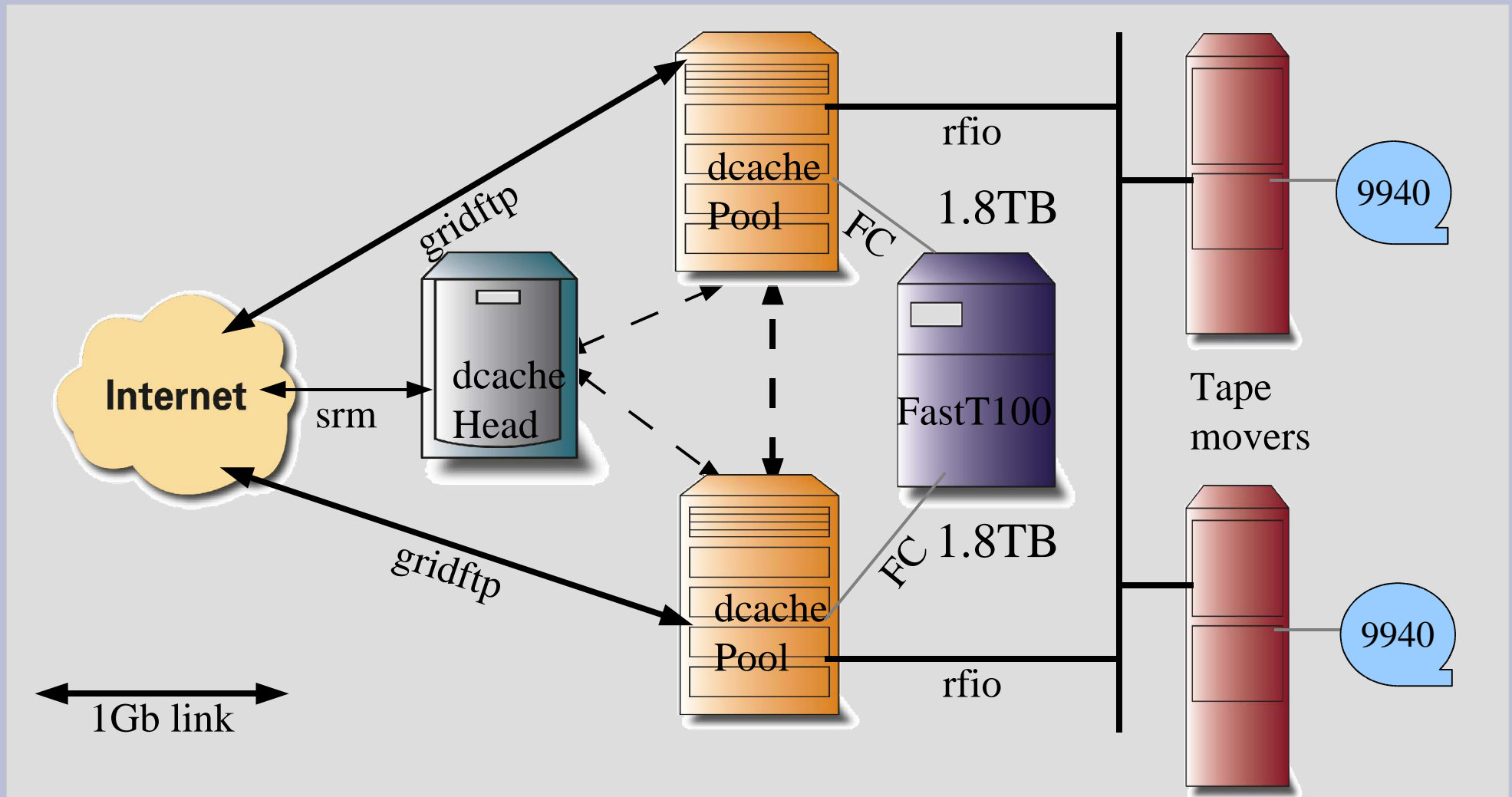


Direct 10Gbps link to CERN provided by RENATER4

SC2 storage setup



SC3 storage setup



SC3 status

- Hardware and software installed
 - Will need network reconfiguration
- Direct link to tape for VO dteam validated
- Performances tuning in progress
 - Current rate: 20-25MB/s on each tape mover
- Open issues
 - Does SC3 software overwrite existing files?
 - How many 9940 tapes (max 500; probably 200)
 - Compatibility between SC3 software and SRM-dCache
 - We need to start CERN-CCIN2P3 test transfers ASAP
 - Specification document (file size, overwriting, firewall conf, VOs, certificates...) sent to all T1