dCache Federations

Motivation and Realization

Patrick Fuhrmann, DESY at the
WLCG Workshop in Lisbon, Feb 2016
• WLCG: needs to reduce the cost of storage maintenance.

• So one solution would be ‘national federations’.
  – Remark 1: Would only reduce the cost seen from WLCG. Local site cost would of course still be the same.
  – Remark 2: Local cost might be reduced if SE is only operated in ‘cache mode’.
Russia wants to build federations for
- WLCG and
- possibly for XFEL (with DESY).
- Organized by Alexey Klimenko.
- For WLCG: are building a prototype with
  - EOS
  - dCache
dCache federations

• "Jiri Chudoba" from Czech Republic need to federate 3 national Centers.
• They talked to us during the WLCG workshop in Lisbon and asked for a possible collaboration.
dCache federation design

Storage only SITE with tape

Head Node

Headnode SITE
Plus storage

Request
dCache federation design

Storage only SITE with tape

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Request

Head Node

DATA
Features available

• Federation works for essentially all protocols
  – http/WebDAV
  – gridFTP
  – NFS4.1 / pNFS
  – dCap/xrootd

• Preferred write location depending on IP (location) or directory path (if requested)

• Preferred ‘local’ read access if data is available

• Replication
  – Automatic replication on write (to remote site)
  – Automatic lazy replication with ‘n’ copies.
  – Permanent replication based on data type.
  – Manual ‘scheduled’ data transferred for improved data location or hardware component decommissioning
Considerations

- Secure component communication between sites.
- Component upgrade compatibility within a major release.
- Trying the same between major releases but not always possible.
- Hot standby of headnodes possible.
- Upgrading headnode means ‘deadtime’ for the entire system.
- “Short downtime” mechanisms are possible but never tried out.
NDGF Tier 1

4 Countries

One dCache

Uni of Bergen
Uni of Oslo
PDC
Nordu Net
HPC Center North
CSC
National Supercomputer Center

Slide stolen from Mattias Wadenstein, NDGF