WLCG Workshop 2017 Report
Data Management Session

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Themes

- Data Steering Group
  - Overview of medium term priority topics
- Storage Resource Reporting
- Object Stores
- SKA Data Challenges
- Infrastructure architectures
  - Caches, Regional Federations, Multi-sites storages and Disk-less sites

Data Steering Group

- 7 strategic areas identified
  - Infrastructure diversity
  - Common global strategy
  - Quality of Service
  - Infrastructure Architecture
  - Operations
  - Analysis
  - AAI, Federated Identity
- https://twiki.cern.ch/twiki/bin/view/LCG/WLCGDataSteeringGroup

Data Steering Group: Priorities

- Infrastructure diversity
  - In particular, object stores (Atlas, CMS, xrootd)
- Archival storage implementations (disk/tape) and their optimal exploitation (Atlas, Alice, Castor/EOS)
- Caching storage (Atlas, CMS)
- post-X509 AAI, Federated identity (longer term)

Storage Resource Reporting

- Further iteration on proposal
  - Intended to enable storage accounting and experiment operations in the post-SRM era
- R1: provide used/free for spaces via a non-SRM protocol
- R2: provide a structured data file
- ~~R3: provide subdir resource reporting~~
- R4: provide storage dumps in a rationalised fashion (common to all experiments)
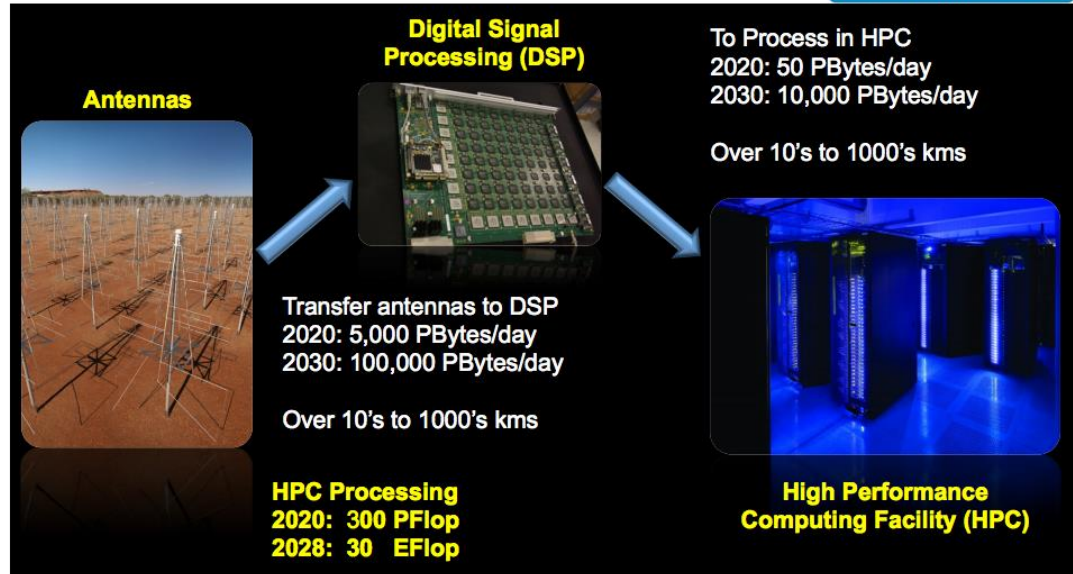
Object stores

- Distinguishing features of object stores
- Ceph
- Use in commercial cloud
- Replication, fault tolerance, erasure codes
- RAL experience (*Echo*)
  - Xrootd and gridftp plugins for Ceph
  - Issues with Xrootd direct I/O and requests for metadata

SKA Data Challenges

SKA: A Leading Big Data Challenge for 2020 decade

Antennas

Digital Signal Processing (DSP)

To Process in HPC
2020: 50 PBytes/day
2030: 10,000 PBytes/day

Over 10's to 1000's kms

Transfer antennas to DSP
2020: 5,000 PBytes/day
2030: 100,000 PBytes/day

Over 10's to 1000's kms

HPC Processing
2020: 300 PFlop
2028: 30 EFlop

High Performance Computing Facility (HPC)

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Infrastructure Architectures [1/2]

Caches in OSG

- Caches are (supposedly) easier than traditional storage (data loss vs eviction)

- Experience with Xrootd Cache proxy (Stash Cache)

- Integration with CVMFS - metadata from CVMFS (extended with X509 authz), data from Xrootd cache

Regional federations

- Canadian project involving federation of cloud/dav endpoints using Dynafed

- Info on integration into Rucio and deployment of the infrastructure

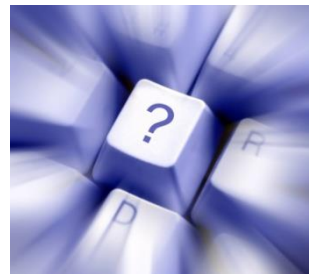# Infrastructure Architectures [2/2]

Multisite storage

- Distributed dCache as used in NDGF, midwest T2 and the Russian demonstrator

- Overview of benefits and challenges of this approach

Diskless sites

- Report on consolidation of a group of 4 Romanian T2s who moved all storage to one of the sites. (each site using DPM)

- Intended to reduce costs

- Two sites concentrated on event-generation and MC and moved their storage to their partner

Questions?

References:

https://indico.cern.ch/event/609911/sessions/238310/#20170620