FIFE Workshop Database Distribution

TOPIC FOR DISTRIBUTED COMPUTING SERVICES

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Database Distribution

- Distribution of detector calibrations databases on the grid has a lot in common with software distribution
  - Every node needs to read a subset, with many common pieces read by hundreds or thousands of jobs run together at sites
  - Taking advantage of local http proxy caches is an excellent, low-maintenance method of scaling the data distribution
- A difference, however, is that in many cases the data changes more frequently than software does
  - Also there are often different views of the data desired that fit better with a database

Database Distribution using http caches

- The Frontier Distributed Database Caching System was first used for CDF calibrations
  - The Frontier name is now unfortunately used for many other things
  - Uses distributed http proxy (squid) infrastructure for caching
  - Plugin architecture enables flexible levels of abstraction
- CMS adopted (& forked) the CDF Frontier DDCS, made abstraction level be SQL queries
  - Added use of If-Modified-Since for efficiency, a standard http feature that enables only transferring data that has changed
  - Uses for all calibrations data access, both Offline and Online (DAQ)
- ATLAS later decided to share Frontier with CMS
  - Now distributes some large, slowly updated data over CVMFS

Other calibrations database systems

- Other calibrations database systems were invented for Intensity Frontier experiments
  - These are the IF Beams Conditions DB and MINERvA Conditions DB that Igor talked about this morning
  - Use higher level of abstraction than SQL
  - Use http, but so far have only served jobs run at Fermilab
  - Could probably be extended to grid by using the grid http proxy cache infrastructure and preferably supporting If-Modified-Since

Frontier DDCS & squid features coming soon

- More robust retry algorithm recently released to keep operating well with any number of proxy & server failures
  - Supports better having centrally-maintained backup proxies for when site proxies fail, without risking central servers
- Improved integration of squid monitoring into the WLCG configuration & monitoring systems
- Secure integrity checks on client to ensure calibrations were not tampered with on internet

More info

- http://frontier.cern.ch
- http://wlcg-squid-monitor.cern.ch