Comments on Data Management
for the CERN prototype test

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Overview

Staging of the data:

- Current plans call for staging raw data at CERN (on disk). From that staging area, the data will be committed to tape at CERN and also replicated to data centers in the US.
- FNAL will be the primary location where all of the data will be replicated. Comments from Stu Fuess: projected volumes of the data according to the proposal - which are ~O(PB) - are "scary", and we need to converge on the most realistic number asap. Planning must start well in advance.
- Partial (or complete, TBD) replicas may be stored at NERSC and BNL.

Replication:

- Are there turn-key solutions available at CERN already? The LHC experiments (and their predecessors) have been operating at scale for a long period of time.
- Right now, we assume that most of production will be taking place at regional data centers (FNAL/NERSC/BNL etc + ...) with processed data (smaller in volume) handled by XRootD.

Metadata:

- An assumption that we'll use SAM at FNAL as a well supported and (sufficiently) flexible system.
- Alternatives?

Data Transport

LHC:

- ATLAS - currently deployed data movement machinery is experiment-specific and various couplings exist that will make reuse very difficult (metadata design reflects specific workflow patterns in ATLAS and is split between at least two different databases).
- CMS - being investigated, awaiting feedback from CMS contacts, initial impressions are roughly similar to the above.
- Both would be impossible to use without a massive rewrite if we were to utilize a different metadata system (e.g. SAM).
- Substantial “external” expertise needed to deploy and operate either.

What else?

- There is a proposal to utilize Spade (IceCube, Daya Bay) - current and recent “in-house” expertise available, deployment is described as light-weight. Plug-ins can be utilized to interface an external metadata system. Well suited to the domain (i.e. is used to transport raw data from DAQ to remote storage). Choice of transport layer.
- SAM+IFDH: a choice of language binding, flexibility with protocols, "SAM batteries" included.

Summary

- It is important to get crucial information such as projected data volume and rate to principals at FNAL so proper planning can take place. What's in the proposal is a starting point.
- Same logic applies to CERN and what needs to be provided there.
- Given the schedule, technology choices need to be made relatively soon so there is time for prototype integration testing (meaning software). Reuse of ATLAS or CMS data movement systems does not seem realistic at this point.
- We aim to create/evaluate a prototype on the scale of a few months.