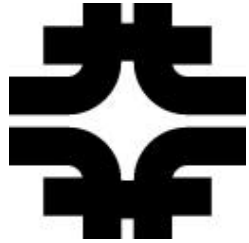


*Alternate paths -- USA
report*

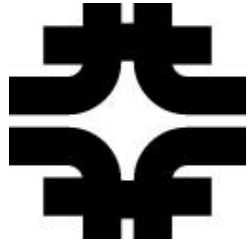
D. Petravick

Sept 12, 2006



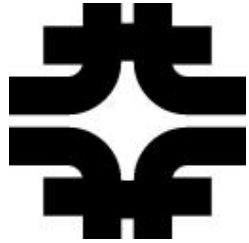
Definitions

- Backup -- Alternate capability that is at the ready.
 - Expected scenarios
 - Tested, Automated.
- Contingency -- Alternate capability, which is available to cope with the unexpected.
 - Perhaps thought-tested in a few scenarios.



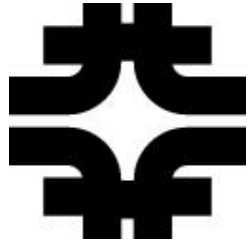
Backup links in US Context

- OPN is one component of LHC networking. Provides:
 - Sole means for T0 -> T1
 - Excess Capacity Available for T1 -> T1
- Primarily Provisioned by USLHCNET
- Other LHC provisioning is Primarily Esnet/GEANT/I2. (yet more T1->T1, *->T2, T2 ->*, others)



Link Backup within USLHCNET

- USLHCNET
 - currently has one Trans Atlantic link.
 - will soon have three links, and equipment to failover at layer 1.
- The assumption are that, given a shortage of internal resources USLHCNET will:
 - Treat Atlas and CMS equally.
 - Respect the experiments articulation of their priorities. CMS's priorities are:
 - 1) T0 ingest, 2) other production, 3) other.
 - These are assumptions, not, say MOU items. Afikt.



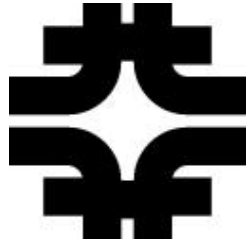
The larger networking US picture

- CMS relies on routed network for its *very significant GLOBAL* T1-T2 Transfers.
 - Any T2 can download data from Any T1.
 - The T1 at Fermilab is quite large.
 - European T2's have pledged the greatest amt of CPU.
- Routed networks are the obvious candidate to make up for a shortfall of T1 T1 bandwidth.



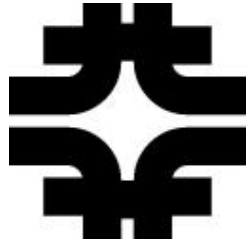
Other TA resources

- TA resources with an identified Role:
 - USLHCNET
 - GEANT resources
 - A few paths to Russia
- There are a number of other TA links.
 - Utilization levels indicate they may be available.
 - Surfnet has 2 links to Chicago and 2 to NY.
 - Fermilab has successfully used research links to the benefit of the its Run II experiments.



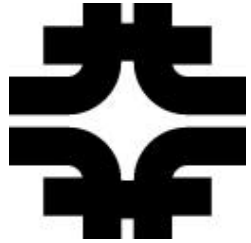
Given a shortage of capacity

- The current notion is that “scavenger service” in ESnet/GEANT used for OPN services.
- If invoked, inverted priorities possible!
 - T0-T1 would be scavenger
 - adhoc data transfers primary
- The best implementation would be
 - Fair to both CMS and ATLAS
 - Implement their priorities across all provisioning.
- It's evident this is ambitious and requires forethought.



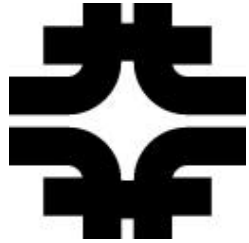
*One more requirement
-- Integrated backup
and contingency*

- US Contingency and backup has to integrate with Intra-Europe Contingency and Backup.
 - I understand this to be “Cross Border Fiber”



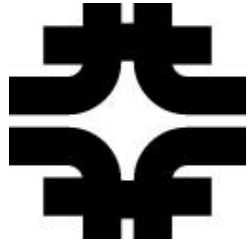
“box” level backup

- Detailed analysis.
- There are single points of failure, for example in Chicago.



Discussion points

- Identify concepts for TA OPN backup/contingency.
 - Do VLANS on Esent/GEANT help?
 - Where are the interchange points to integrated to Intra-Europe?
- What should we Implement and test?
- What work on contingency?



Failover needs continual assessment

- To ensure that the capability is available when needed.