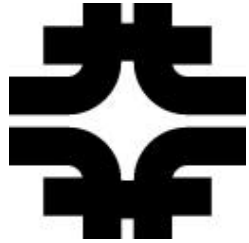# *Alternate paths -- USA report*
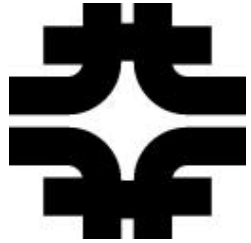
D. Petravick

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)

DLP -- Cambridge
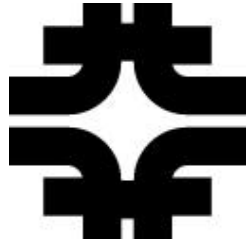
Link Backup within USLHCNET

- USLHCNET
  - currently has one Trans Atlanic 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.

DLP -- Cambridge
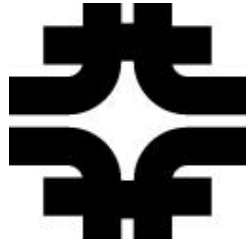
The larger networking US picture

- 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.
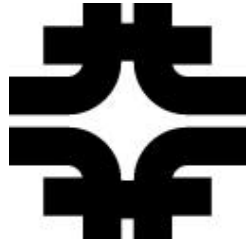
Other TA resources

- 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.
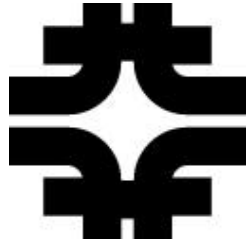
Given a shortage of capacity

- 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.
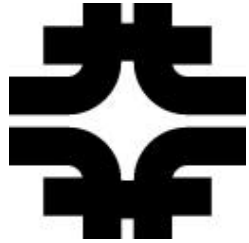
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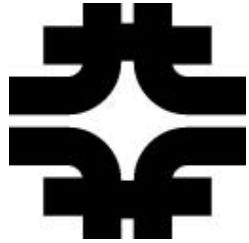
One more requirement -- Integrated backup and contingency

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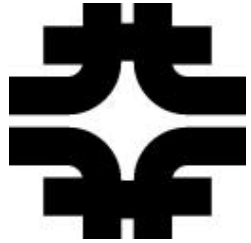 - I understand this to be "Cross Border Fiber"
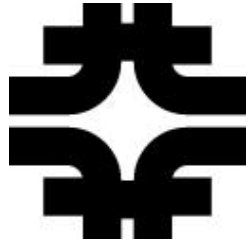
"box" level backup

- 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 avialbale when needed.