Questionaire answers

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FNAL/T1 issues

- ## In interpreting the T0/T1 document how do the T1s foresee to connect to the lambda?

  - We expect LHCnet will provide the network infrastructure for our LHC traffic to/from CERN. We anticipate LHCnet to operate a three node ring (CERN, StarLight, MANLAN), which is logically & physically diverse, including vendor-diversity across the Atlantic. We expect to connect our site to this ring at the Starlight facility in Chicago. Initially, we expect to connect directly to LHCnet via a switch in the FNAL rack at Starlight. Later, we will utilize the ESnet Chicago MAN to connect to LHCnet, when the MAN is completed.

Which networking equipment will be used?

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

- The connection at CERN will be specified by LHCnet

- The connection at Starlight between LHC and FNAL will be 10 gigabit Ethernet (LAN_PHY).

- The connection via the ESNet MAN is TBD, but expected to 10 gigabit Ethernet (LAN_PHY).

How is local network layout organized?

- The local network is organized into a network core and workgroup LANs, including a CMS computing facility LAN. Both the network core and the CMS computing facility LAN are based on 10 gigabit Ethernet (10GE) technology, with 10GE links aggregagated,   To the extent the OPN transports only data flows, we expect that flows will normally terminate in the CMS dcache system in the CMS workgroup LAN at Fermilab. We anticipate for backup and redundancy purposes, flows may also terminate in the general-use STKen workgroup LAN (tape storage).

How is the routing organized between the OPN and the general purpose internet?

- We expect to forward LHC traffic from the CMS (backup: STKEN) workgroup to LHCnet, via an alternate off-site network path, using policy routing. (Note that this model may be somewhat at odds to a model that assumes all FNAL/CERN traffic is carried across the LHCnet channel(s).)

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What AS number and IP Prefixes will they use and are the IP prefixes dedicated to the connectivity to the T0?

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

- No prefixes are dedicated solely to the T0. The CMS dCache and STKEN prefixes are:

- 131.225.206.0/23 (CMS dCache)

- 131.225.I3.0/25 (STKen)

- The AS number will be the FNAL AS 3152

What backup connectivity is foreseen?

- LHCnet will provide a ring structure. If one of the trans-Atlantic links is broken, bandwidth will be shared by the US CMS T1 (FNAL) and the US ATLAS T1 (BNL) via the other path in the ring. The Starlight facility and CERN facility are single points of failure in the ring. We expect to be able to exploit a tertiary backup path via ESnet and GEANT2 to work around that vulnerability.

What is the monitoring technology used locally?

- WAN monitoring is based on use of SNMP MIB objects and L3 flow records. These will serve as building blocks for LHC network monitoring. We anticipate migrating to SNMP V3 with MD5 authentication & ACL-restricted access for LHC monitoring. We expect to make use of MonAlisa. Experience has shown that we need vector-driven monitoring tools, not just scalar-driven tools.

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How is the operational support organised?

- 24x7 coverage of the local network, including WAN access channels is provided. Off-hours coverage is via pager list, remotely contactable at +1 630 840 2345.

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What is the security model to be used with OPN? How will it be implemented?

- Our LHC network traffic will utilize an alternate path for into & out of the facility LAN for high impact data traffic. The alternate path utilizes a high performance router with ACLs to control access. The ACL model will be default deny, with exceptions for permitted LHC traffic. The ACLs will be maximally restrictive, to the extent practicable.

What is the policy for external monitoring of local network devices, e.g. the border router for the OPN

- We will comply with any reasonable policy for read-only access to our perimeter network infrastructure that is established for the OPN.