

# Issues for Intercontinental Connections

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# HEP Trans Atlantic Networking

- The Trans Atlantic aspects of the service challenges are demanding, because the paths have the largest bandwidth\*delay.
- The Highest rate demonstrations have run in an environment that is (or approximates) “lightpaths”
  - The main path has been T0 -> T1.
  - There are other interesting data points.

# HEP trans-Atlantic networking

- It is accurate to speak of HEP trans Atlantic network because DOE/OS/HEP has funded LHCnet
  - DOE/OS/HEP manages their contribution directly.
    - Not through, the LHC projects.
  - DOE management includes a current review (whose status seems hard to obtain).
- I do not understand that this funding implies the exclusion of any other relevant resources.
- DOE/HEP is not the sole funder for LHCnet, is envisioned that others will use elements of the capacity

# LHC Commissioning

- Our experience to date is Circuit oriented and not oriented towards understanding the state of general, or packet-switched networks (at large bandwidth\*delay) in the context of our systems.
  - Their intrinsic limitation.
  - Acquire our own experience
  - Evaluate the current usability.
  - Issues and problems that might be resolvable, which would require prototyping to discover

# A rich LHC Networking environment

- Seeks to be performant and adequate starting (basically) now.
  - There are many issues in commissioning LHC systems
  - Needs to accommodate and exploit all the resources that can be brought to bear, even if they have not been used to-date.

# Short term TA agenda

- Accommodate the organized service challenges.
- Extend if possible
- Prototype T1-T1 transfers exercising diverse TA paths.
- Combine with T1-T1 to Asia and S. AM.

# US National LHC Networking

- Is thought of as an overlay network, with a rich composition
  - Needs to accommodate ESNet, and Abilene.
  - Needs to accommodate national scale efforts such as Ultralight, and regional connectivity
- Needs to exploit the services offered.
  - “Lightpaths” are envisioned.
- Needs to be integrated with international networking.

# Long term agenda

- LHC science will remain a showcase for systems development, LHC systems will not be frozen.
- Wide area connectivity is an important aspect of such systems



# Summary:

- LHC system integration depends on having performant networking in place (basically) now.
  - US sites have seen large bandwidth\*delay
- Short term agenda must support integration of the system, and the development of facilities and staff.
- Long term agenda supports
  - On going development
  - Development and exploitation of rich WAN environment.
  - US Hep overlay network prototypes this.
- Close liaison seems important.