Grid Deployment Board - GDB

Tier 0/1 Network Meeting

Opening Session

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Acknowledgements

Before I forget ….

- Many thanks to all participants for attending.
- Many thanks to Kors Bos for all the hard work to prepare this meeting so early in January ☺

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Purpose of the Meeting

- There are a number of high-level goals that are desirable outcomes from the meeting. We may not achieve everything!!
- Information
  - To "level set" everyone to the same level of understanding concerning the network expectations, current state and issues for the LHC.
- Planning
  - To gather input for the LCG technical design report and provide a common understanding of how the network for LHC computing (2007-2008) could be realistically implemented.
  - To gather input in the network evolution foreseen so that the planning for the "Service Challenges" that are in progress so that planning towards LHC startup can be completed.
- To decide what form this "standing body" should take and how often it should meet.

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Format of the Meeting

- Experiments
  - The experiments will explain the networking implementations of the recently published computing models
- LCG
  - The milestones of the service challenges will be presented.
- International Networking
  - A number of key international initiatives in networking will be presented and how they are providing resources for LHC computing.

- The meeting is planned as a number of presentations followed by time for discussion.

- Any other logistics Kors?

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World Wide Networking

- Many initiatives underway to provide research networks demonstrating feasibility of high speed wide area networking.
  - International projects, NSF, DOE, EU funded
  - National Networks, NRENS
- Large scale acquisition of dark fiber is increasing and creating network opportunities of many 10's Gb/sec.
- DWDM and other encoding techniques generating more "colours"/fiber and higher speeds (40Gb/s).
- Cheaper 10Gb/s campus infrastructures becoming available
  - NIC's (internal bus and memory bandwidth now the main problem to performance)
  - Routers and Ports. Multi-Tbit capable routers becoming available.
- Bringing many opportunities in the coming years but we need to master a "production" network for the 2007 timescale for LHC startup.

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LHC Requirements

- LHC requirements for networking are not easy to specify
  - T0-T1 can be more or less created through a "bottom up" analysis.
  - T1-T1 and T1-T2 are hard to specify with accuracy as they depend on usage patterns.
    - In reality the usage patterns will evolve through experience.
- LHC startup needs "enough" connectivity.
  - The "economic unit" of connectivity is 10Gb/s.
  - Will be enough for T0-T1 connectivity (CERN centric view)
  - But T1's need enough "general" connectivity to deal with T1-T1 and T1-T2 interactions which may turn out to dominate over the T0-T1 part.
    - How can this be provisioned and managed?

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T1's

- T1s have a Challenge
  - T1's need to ensure enough connectivity to CERN somehow:
    - Direct Links
    - International Projects
    - Via GEANT-2 circuits
  - CERN is terminating requested/required circuits today
    - 10Gb/s to GEANT (planned 80-100Gb/sec but who pays?)
    - 10Gb/s to Surfnet (Paid by Surfnet)
    - 10Gb/s direct to Chicago (Starlight) (Paid by Consortium)
  - Many operational issues to work out
    - Who is responsible for the "end-end" service?
      - May be T1-MAN-NREN-GEANT-NREN-MAN-T1
  - Will the campus infrastructures cope?
- Economic Model
  - Unclear which is the best for a T1
    - Private Link to CERN or through a project (e.g. GEANT)
    - Different subsidy models and financing.

Is there a Problem?

- Who pays for what ?
- Who ensures the service – operations – evolution ?
- Who ensures the funding – longevity ?
- How do we manage security, firewalling, especially at high speed (10Gb/sec)?

- Some pricing models (GEANT) not yet clear.

- Seems we will use a mixture of funding and models
  - We will not have a static physical infrastructure with clean budgeting and financing, not even for T0-T1.
  - Creates a complex set of issues for guaranteeing the service

- So there are a number of issues and the answers are not clear at least to me.

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