

# GDB Meeting

## April 2008

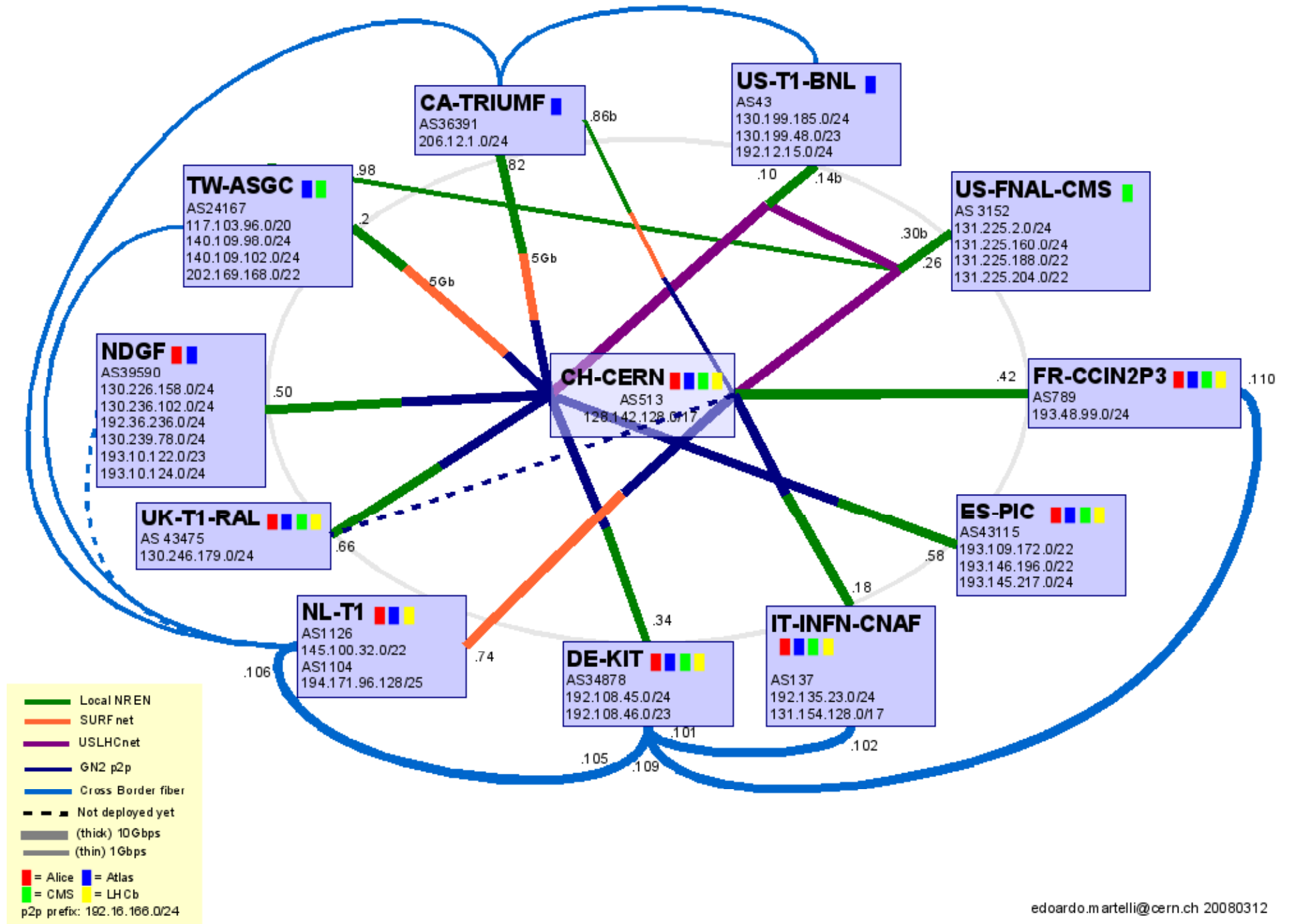
LHCOPN Status and Plans

A lot more detail at:

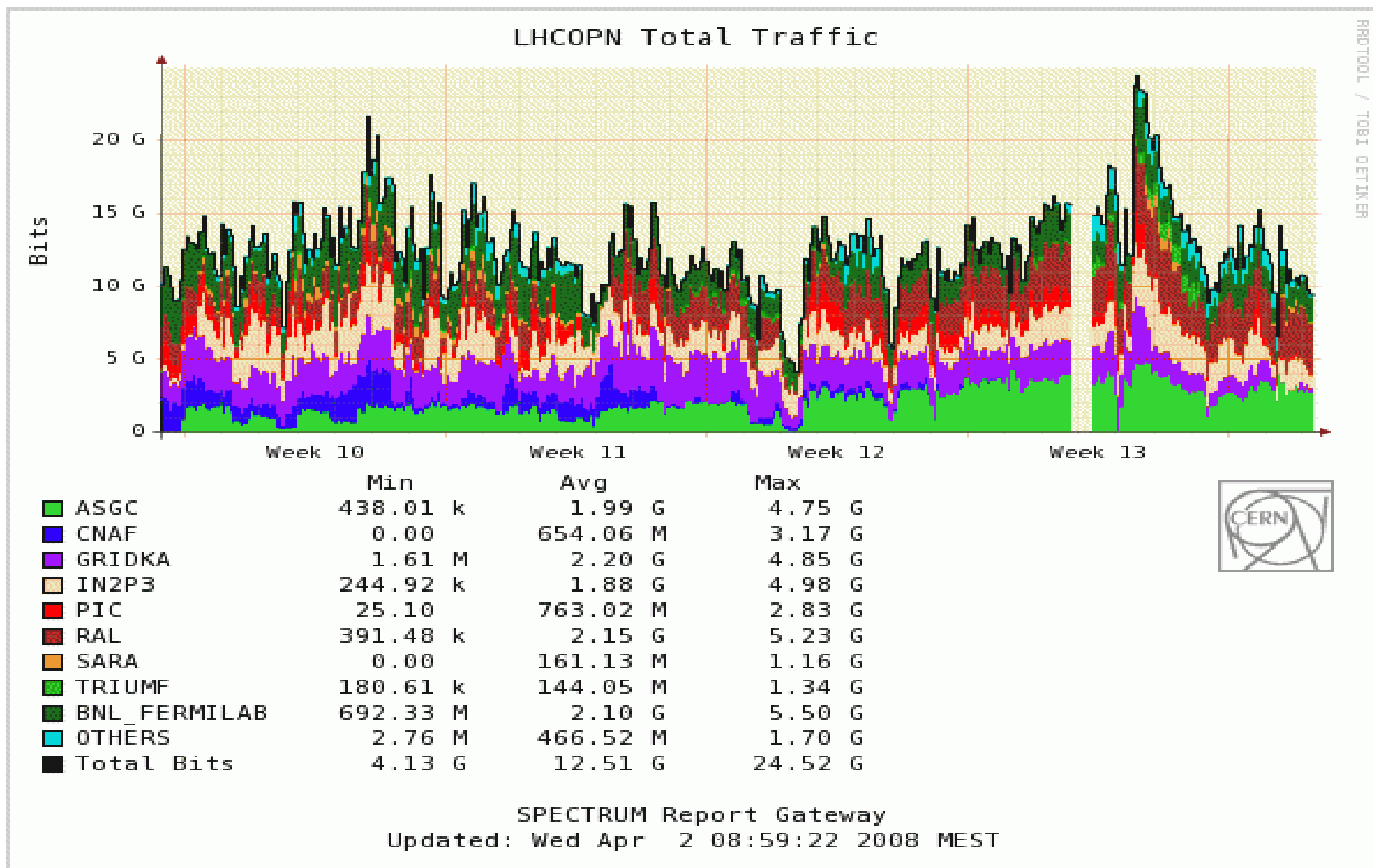
<http://indico.cern.ch/conferenceDisplay.py?confId=27585>

David Foster  
CERN

# LHCOPN - current status



# Traffic Statistics



# Situation

- Network is operational and stable.
  - But, “The first principle is that you must not fool yourself, and you're the easiest person to fool.” Richard Feynman
- Several areas of weakness
  - Physical Path Routing
  - IP Backup
  - Operational Support
  - Monitoring

# Physical Path Routing

- Analysis showed many common physical paths of fibers and wavelengths.
- Re-routing of some wavelengths has been done.
  - especially the path from Amsterdam -> CERN
  - 5x10G on this path.

# IP Backup

- In case of failures, degraded service may be expected.
  - This is not yet quantified on a “per failure” basis.
- The IP configuration needs to be validated
  - Some failures have indeed produced successful failover.
  - Tests are planned for this month (9<sup>th</sup> April)
    - Final test plan in preparation.
- Some sites still have no physical backup paths
  - PIC (difficult) and RAL (some possibilities)

# Operational Support

- EGEE-SA2 providing the lead on the operational model
  - Much initial disagreement on approach, now starting to converge. Last OPN meeting concentrated on “points of view”
    - The “network manager” view
    - The “user” view (“Readiness” expectations)
    - The “distributed” view (E2ECU, IPCU, GGUS etc)
    - The “grass roots” view (Site engineers)
    - The “centralised” view (Dante)
  - All documentation is available on the Twiki. Much work remains to be done.
- Proposal by Dante to manage all network operations but required changing the underlying architecture.
  - Many issues implied by this.
  - Rejected by all concerned T1’s

# Operational Model

- Need to identify the major operational components and formalise their interactions including:
  - Information repositories
    - GGUS, TTS, Twiki, PerfSonar etc.
  - Actors
    - Site network support, ENOC, E2ECU, USLHCNet etc.
    - Grid Operations.
  - Processes
    - Who is responsible for which information?
    - How does communication take place?
      - Actor <-> Repository
      - Actor <-> Actor
    - For what purpose does communication take place?
      - Resolving identified issues
      - Authorising changes and developments
- A minimal design is needed to deal with the major issues
  - Incident Management (including scheduled interventions)
  - Problem Management
  - Change Management



# In Practical Terms ....

(provided by Dan Nae, as a site managers view)

- An end-to-end monitoring system that can pin-point **reliably** where most of the problems are
- An effective way to integrate the above monitoring system into the local procedures of the various local NOCs to help them take action
- A centralized ticketing system to keep track of all the problems
- A way to extract performance numbers from the centralized information (easy)
- Clear dissemination channels to announce problems, maintenance, changes, important data transfers, etc.
- Someone to take care of all the above
- A data repository engineers can use and a set of procedures that can help solve the hard problems faster (**detailed circuit data, ticket history, known problems and solutions**)
- A group of people (**data and network managers**) who can evaluate the performance of the **LHCOPN** based on experience and gathered numbers and can set goals (**target SLAs for the next set of tenders, responsiveness, better dissemination channels, etc**)

# Monitoring

- Coherent (active) monitoring is an essential feature to understand how well the service is running.
  - Many activities around PerfSonar are underway in Europe and the US.
- Initial proposal by Dante to provide an “appliance” is now largely accepted.
  - Packaged, coherent, maintained installation of tools to collect information on the network activity.
  - Caveat: Service only guaranteed to end of GN2 (March 2009) with the intention to continue in GN3.

# Initial Useful Metrics and Tools

(From Eric Boyd I2)

## Network Path characteristics

- Round trip time (perfSONAR PingER)
- Routers along the paths (traceroute)
- Path utilization/capacity (perfSONAR SNMP-MA)
- One way delay, delay variance (perfSONAR owamp)
- One way packet drop rate (perfSONAR owamp)
- Packets reordering (perfSONAR owamp)
- Achievable throughput (perfSONAR bwctl)

## Responses of Tier-0/1 Sites to the DANTE/GÉANT2 proposal for a managed perfSONAR MDM service

Site	Response	Reason/comment
IN2P3	Positive	
RAL	Positive	Require some discussions
GRIDKA	Positive	Reservations?
FNAL	Positive	Would like direct access to the own data
BNL	?	Michael Ernst assumes that yes
ASGC	Positive	
CERN	Positive	
CNAF	?	Issues due to security
NDGF	Positive	Wishes to see approach evolve towards a federated model
PIC	Positive	One installation must suffice
SARA	?	Require info on cost, issue with security
TRIUMF	?	ask <a href="mailto:Chris.Payne@triumf.ca">Chris.Payne@triumf.ca</a>

# Issues, Risks, Mitigation

- OPN is fundamental to getting the data from CERN to the T1's.
- It is a complex multi-domain network relying on infrastructure provided by:
  - (links) NREN's, Dante and commercial providers
  - (IP) T1's and CERN
  - (operations) T1's, CERN, EGEE and USLHCNet
- Developing a robust operational model is a major ongoing piece of work.
  - Need to separate design from implementation