US LHCNet update

Artur Barczyk
California Institute of Technology
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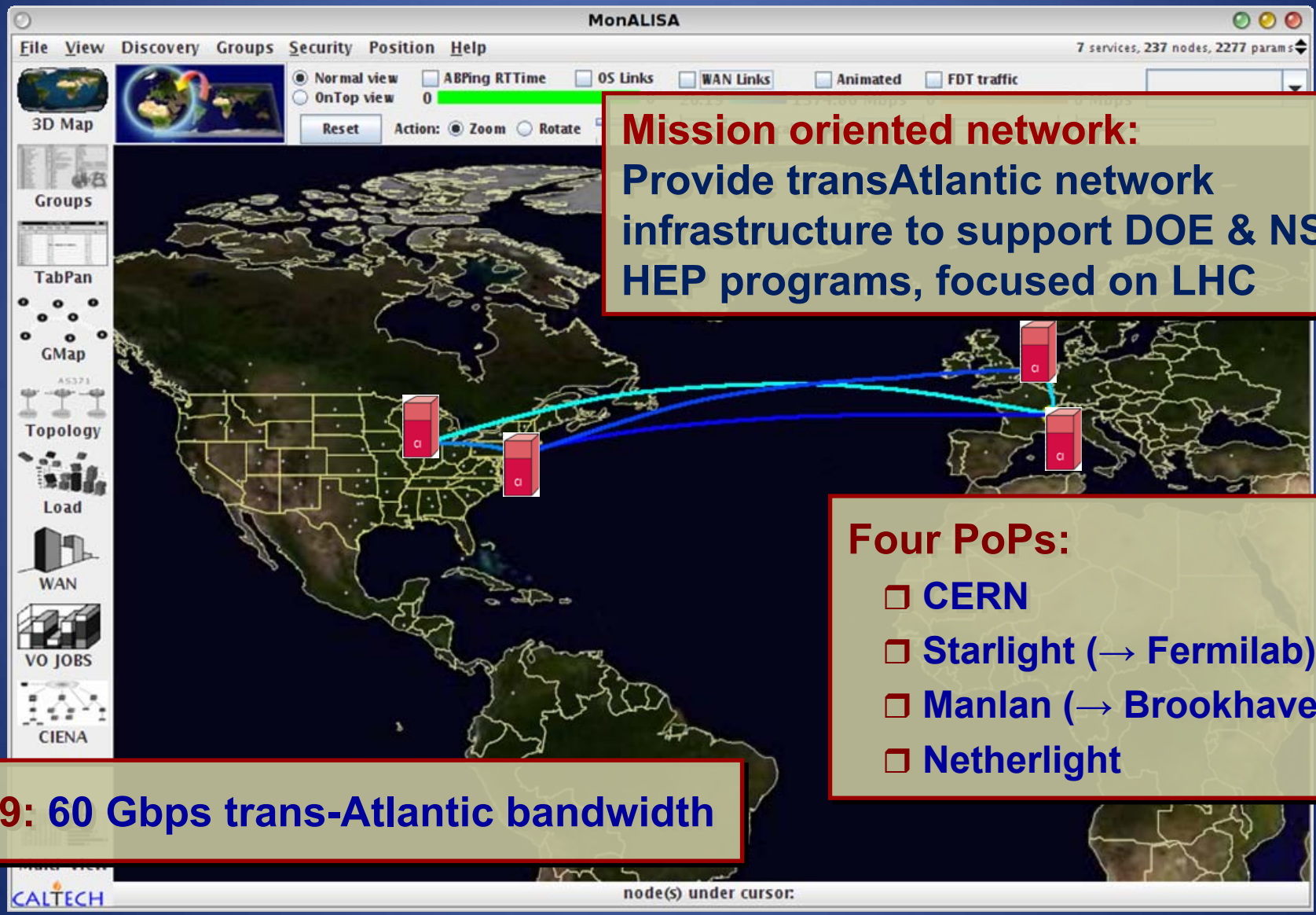
US LHCNet overview



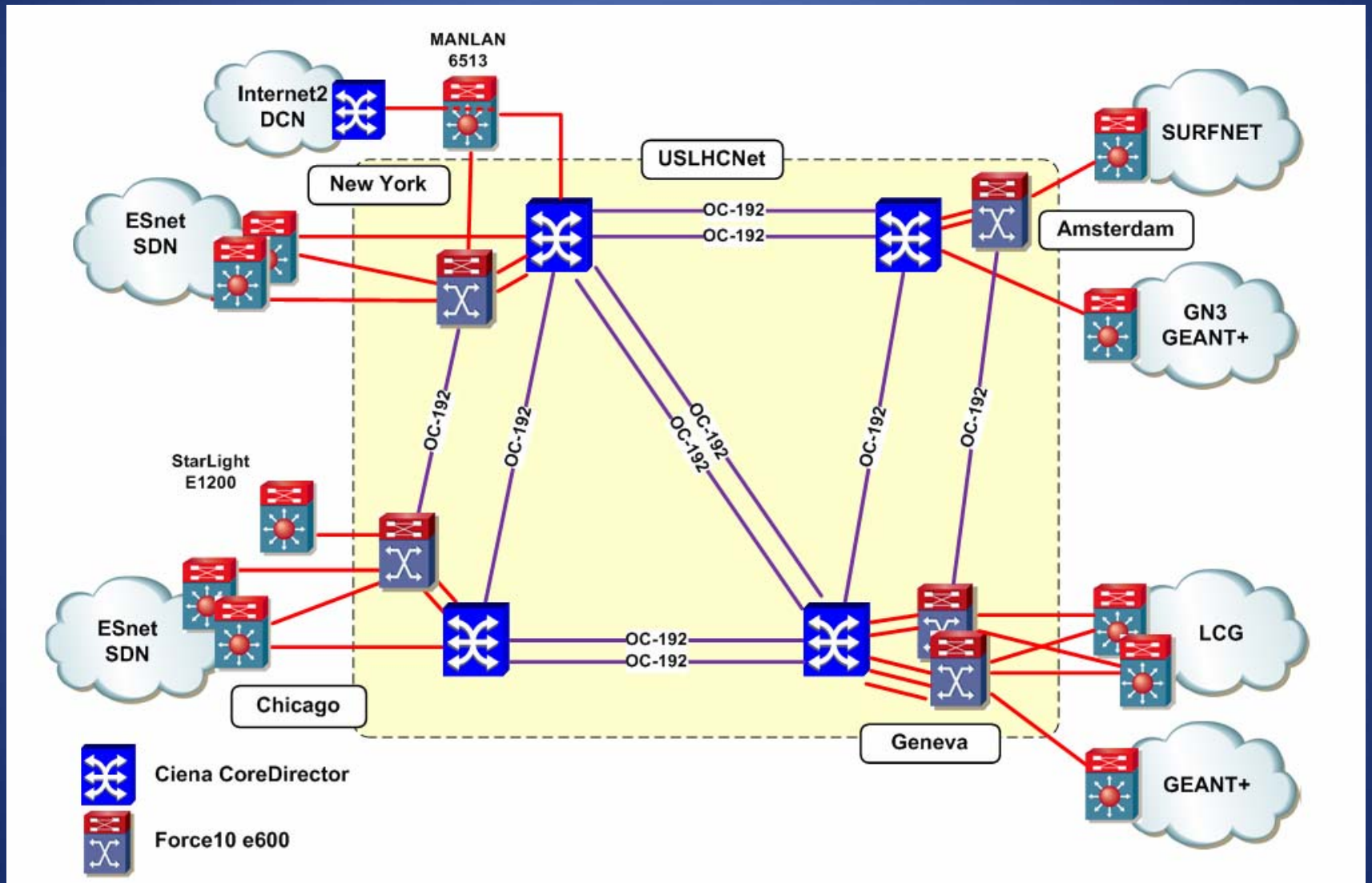
Mission oriented network:
Provide transAtlantic network infrastructure to support DOE & NSF HEP programs, focused on LHC

Four PoPs:

- CERN
- Starlight (→ Fermilab)
- Manlan (→ Brookhaven)
- Netherlight

2009: 60 Gbps trans-Atlantic bandwidth

US LHCNet topology



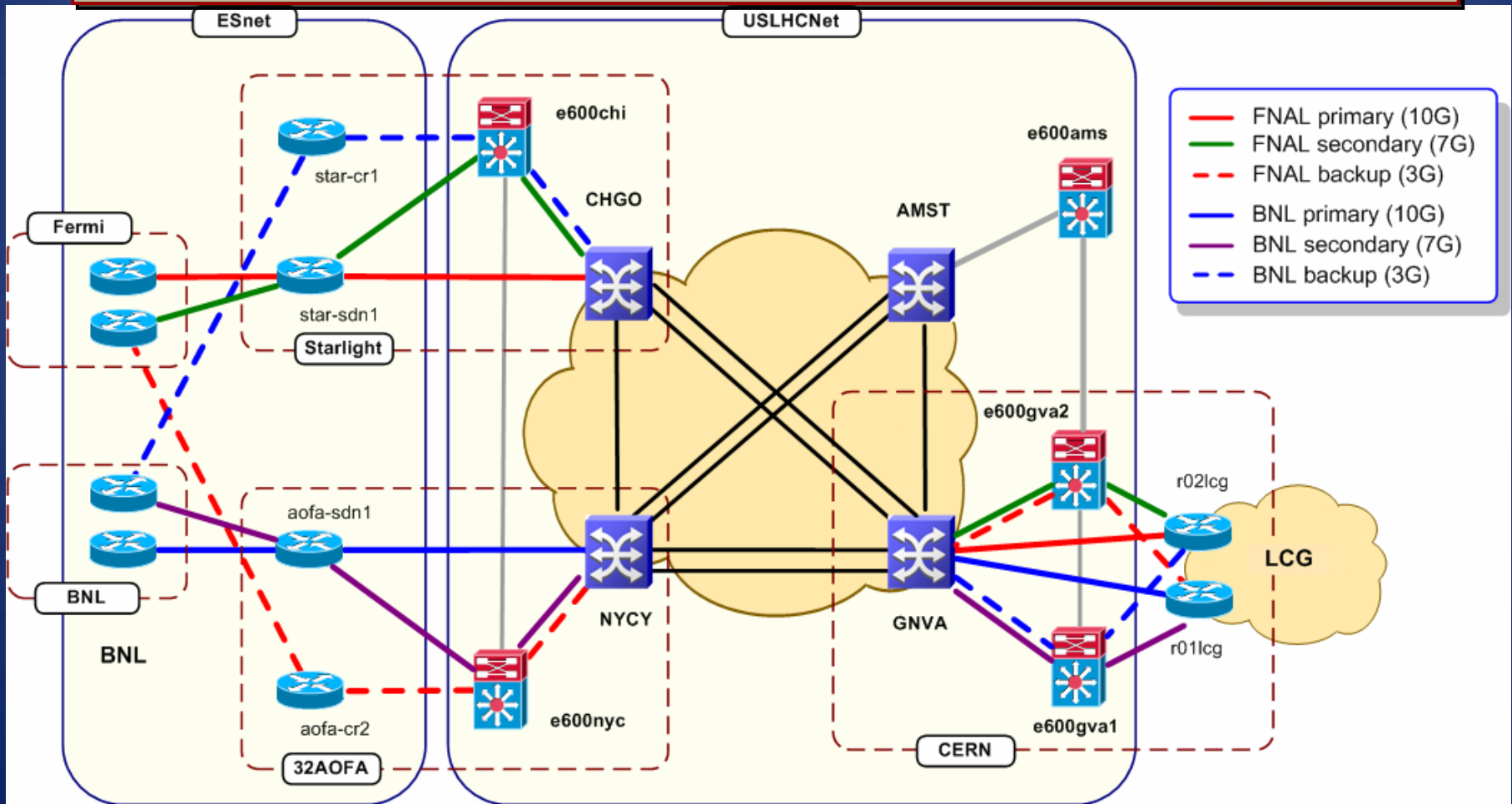
2009 Summer's activities

- RFP for all links concluded in May
- Transition to new providers during July 17 – August 10
  - Mostly as planned, i.e. within delay margins
  - Started with one new deployment as "spare"
- No major impact on production traffic
  - VCs rolled to new circuits after acceptance tests, only in-flight frames impacted.
- Ciena CoreDirectors at MANLAN, StarLight and CERN upgraded September 8 – 25.

All major interventions performed as planned, getting ready now for LHC startup!

Resiliency through path diversity

- Multiple (5) submarine cables used
- Path diversity on terrestrial segments
- PoP diversity for explicit backup paths to US Tier1s



More on resiliency

- Primary virtual circuits are mesh protected
- Use VCAT/LCAS to lower impact of a link failure
  - VCAT used for multipath Layer 1 connections
  - LCAS keeps the remaining SNCs operational during fail-over, lowers impact
- For US Tier1s, additional failover at Layer 3
  - Backup paths constructed with ESnet to be completely path/device diverse
  - Turned out very useful during CoreDirector HW upgrade

Services

- US LHCNet provides services to the HEP community at
  - Layer 1 / 1 .5
  - Layer 2
  - Layer 3
- Dynamic circuit capability between all PoPs
  - Deployed DCNSS (since spring 2008)
  - Interoperable with the Internet2 ION and ESnet OSCARS

Please come to see the FDT demonstration today!

  - Long term aim: connect dynamic circuit networks on both sides of the Atlantic
  - Short term: possibility of long-tail (static) extension in Europe

THANK YOU!

Artur Barczyk@cern.ch