



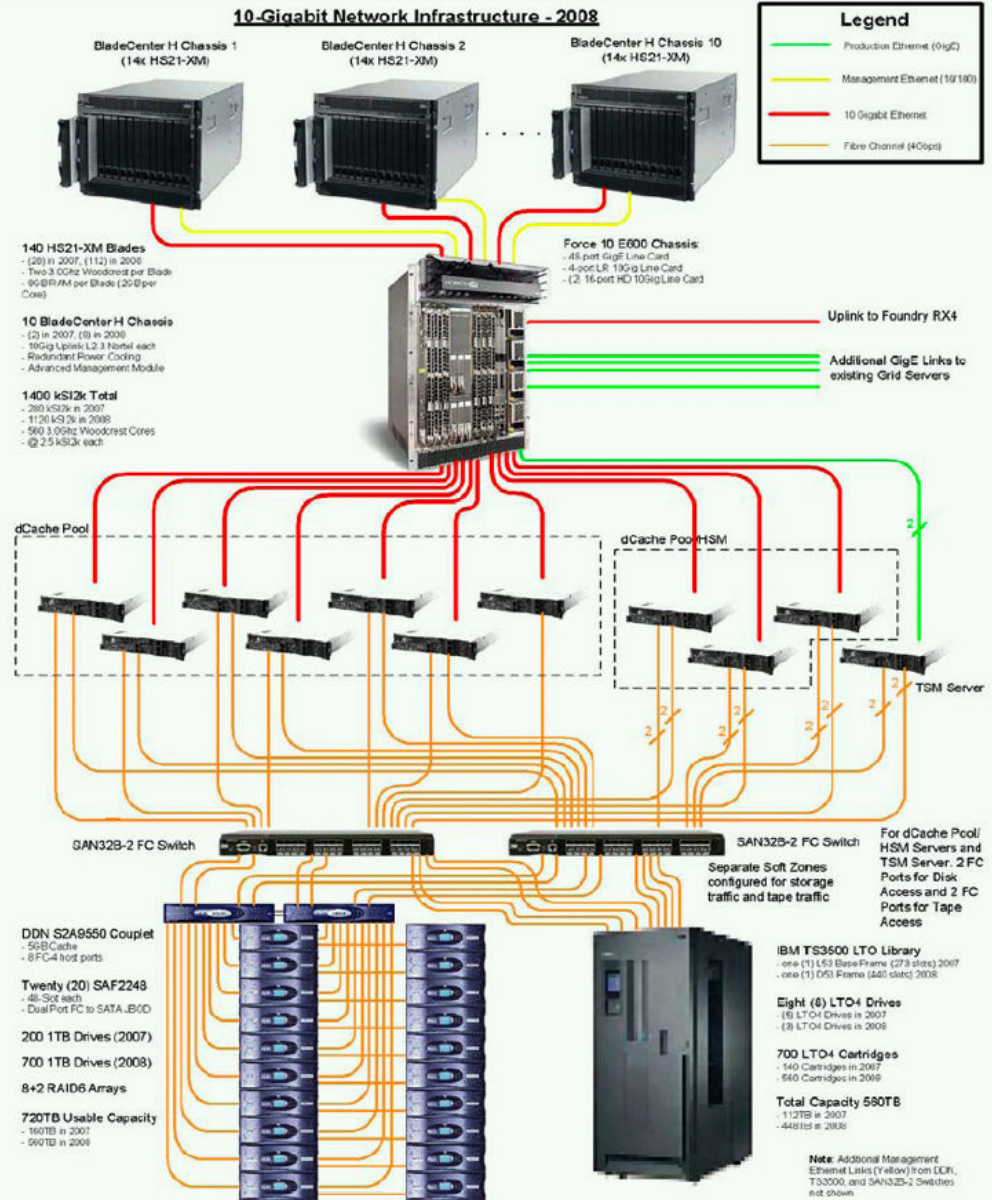
TRIUMF

LHCOPN update Aug 2009

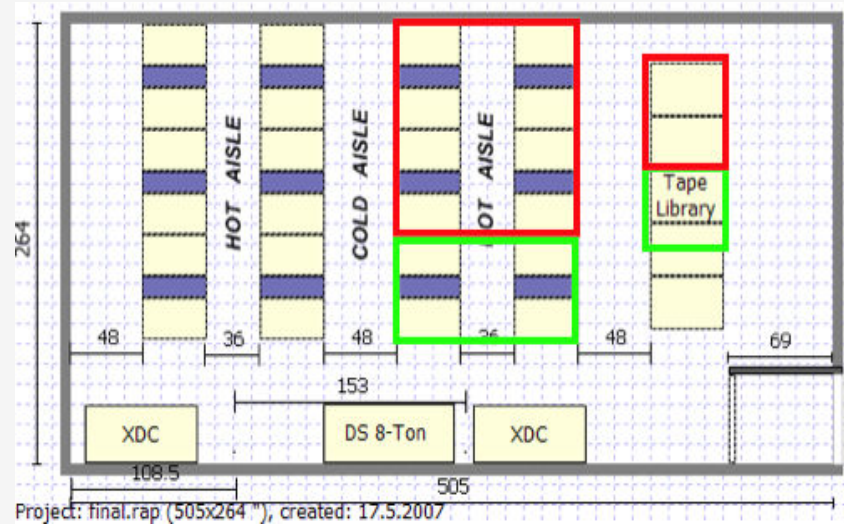
Steve McDonald



- 9 dedicate Tier 1 staff
 - 5 system – Network, DB Grid, Storage, Sys Admin
 - 3 user support
 - 1 tech
- Force10 E600
 - Storage & CPU Farm
- Foundry Rx4
 - Terminated all lightpaths
- CPU – all Blades (IBM)
 - ~120 blades (+~50)
- Storage – DDN fibre channel
 - ~720 TB (+700TB)
- Tape – IBM TS3500 LTO-4
 - ~600TB (+500TB?)



- Limited floor space 950sqft
- No False Floor
- Rack optimized for high density using hot & cold aisles
- Power estimate 0.4 MW
- Cooling Liebert XD system 340kW
- 225 kVA UPS
- Fortunately with increasing Disk and CPU densities we believe there is sufficient space until 2011-2012

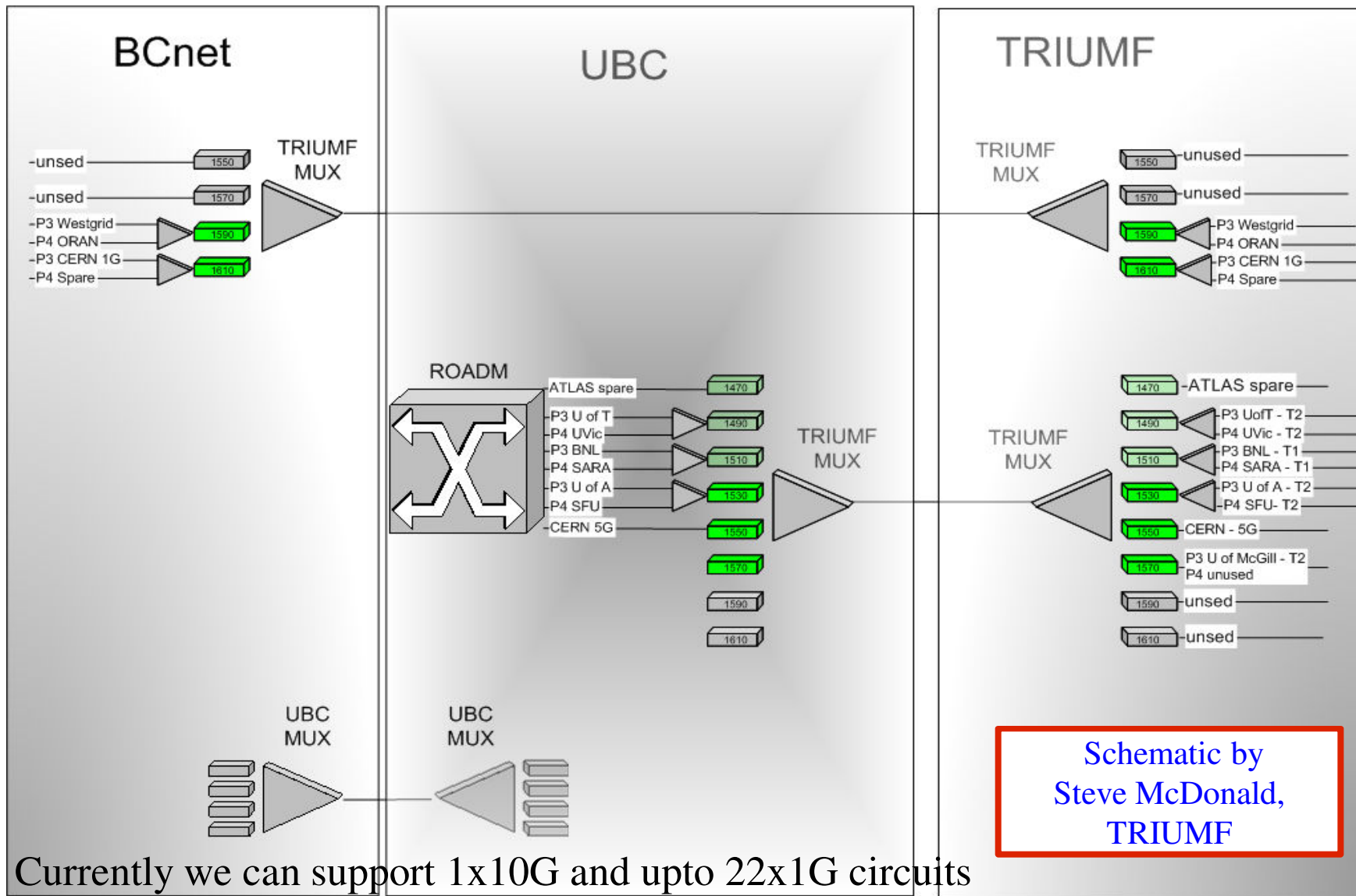


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3km

22km



Schematic by
Steve McDonald,
TRIUMF

Currently we can support 1x10G and upto 22x1G circuits

Problem is we can not support any more channels >1Gbps
with present fiber infrastructure

TRIUMF ATLAS Tier-1

June 11, 2008

1510 To be purchased
1590 Already purchased

Chris Payne

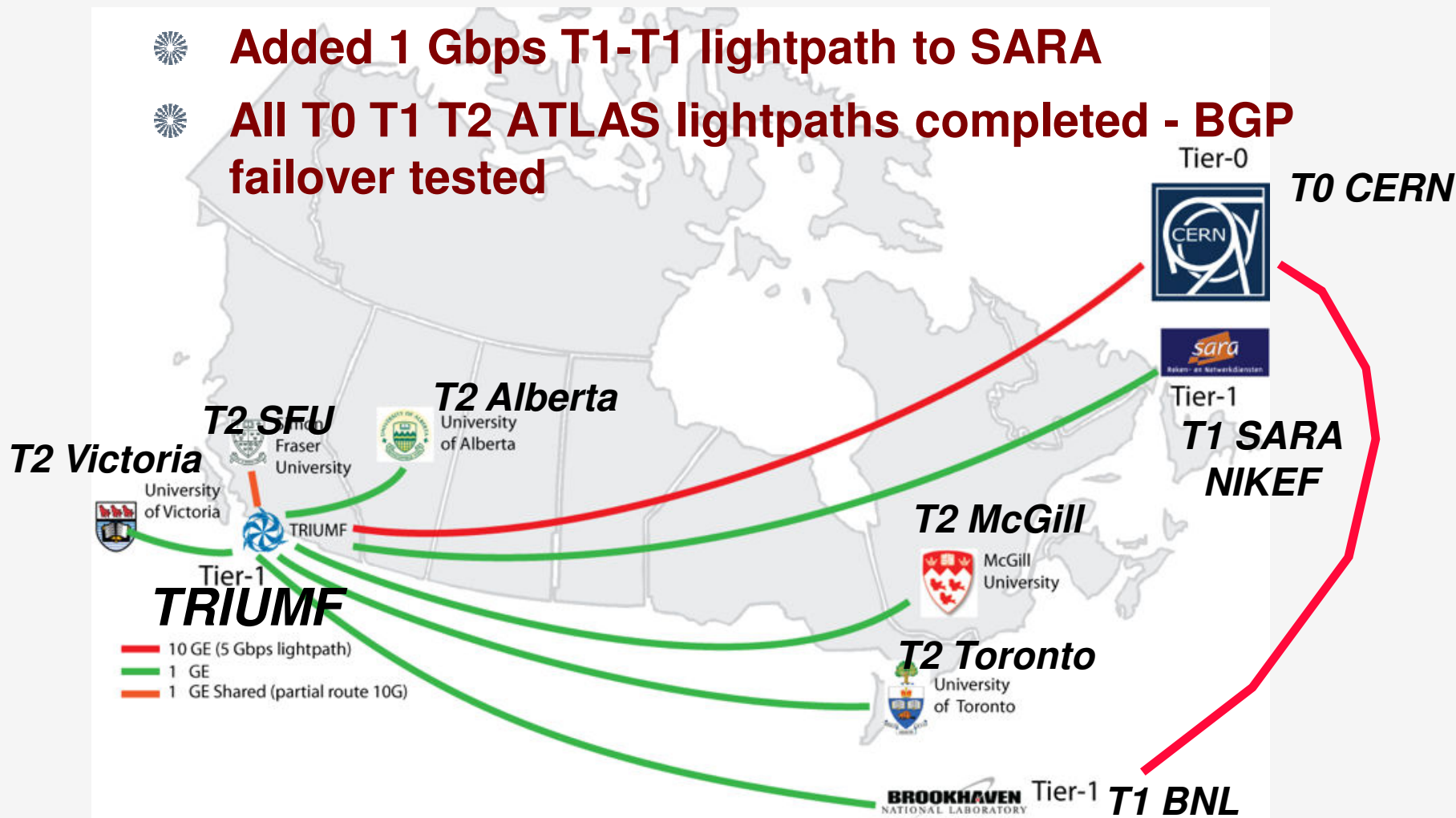
chris.payne@triumf.ca

Atlas Tier1 Network

- Added 1Gbps T1-T1 BNL with transit capabilities to CERN

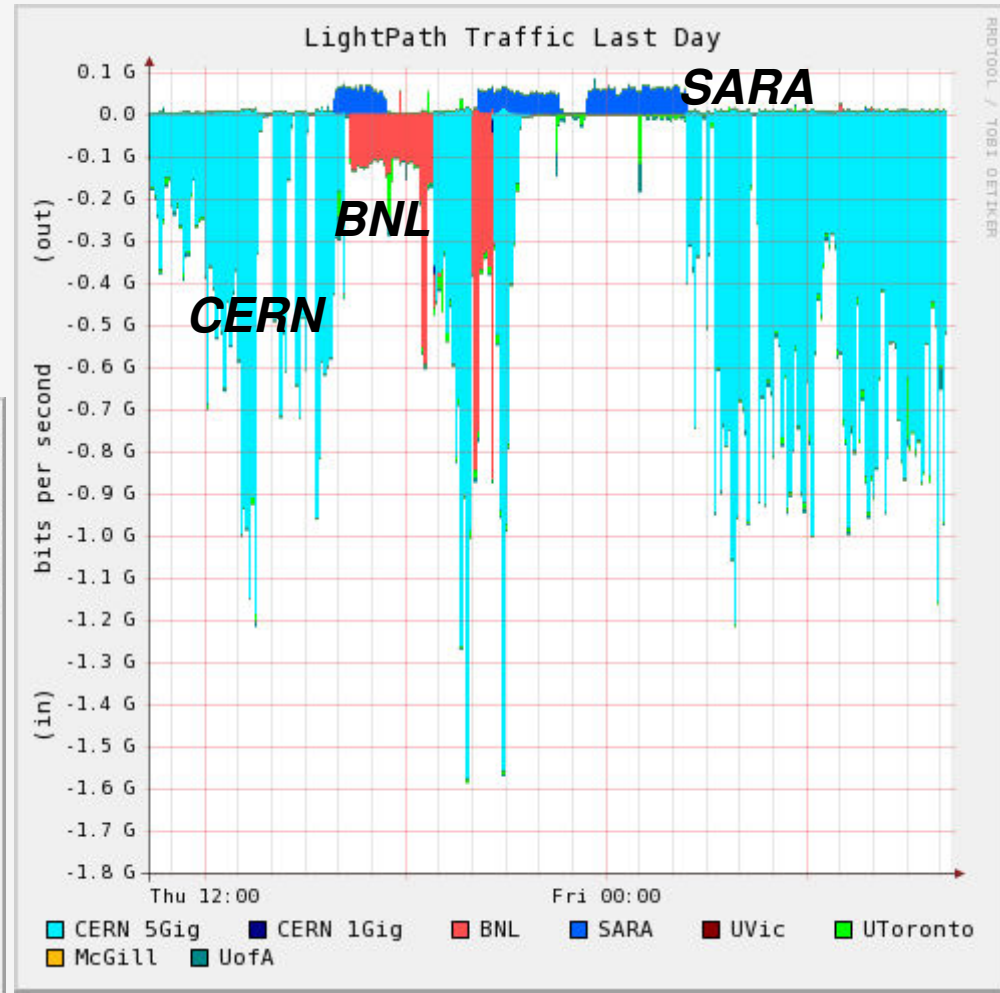
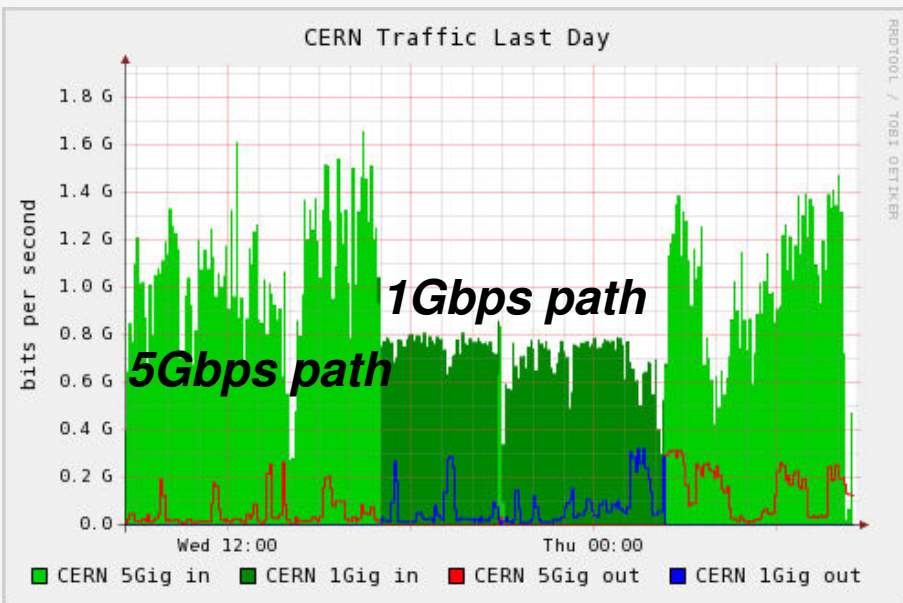
- Added 1 Gbps T1-T1 lightpath to SARA

- All T0 T1 T2 ATLAS lightpaths completed - BGP failover tested

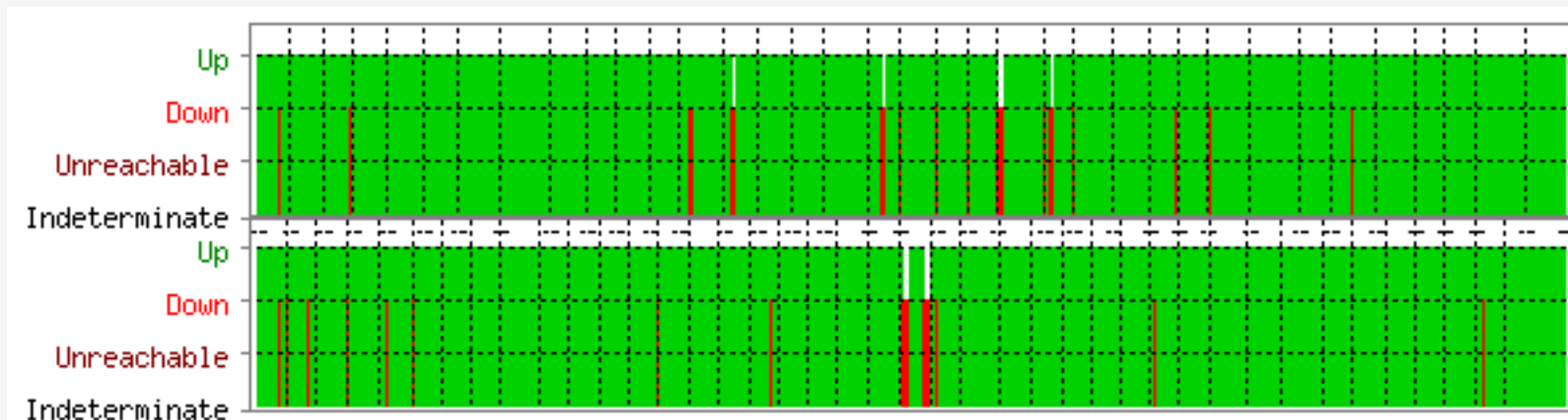


Ihcopn network fail-overs

Tier0-Tier1 Network tests performed in April verified all fail-over paths for TRIUMF performed as expected.



Frequency of Primary & Secondary network path failures

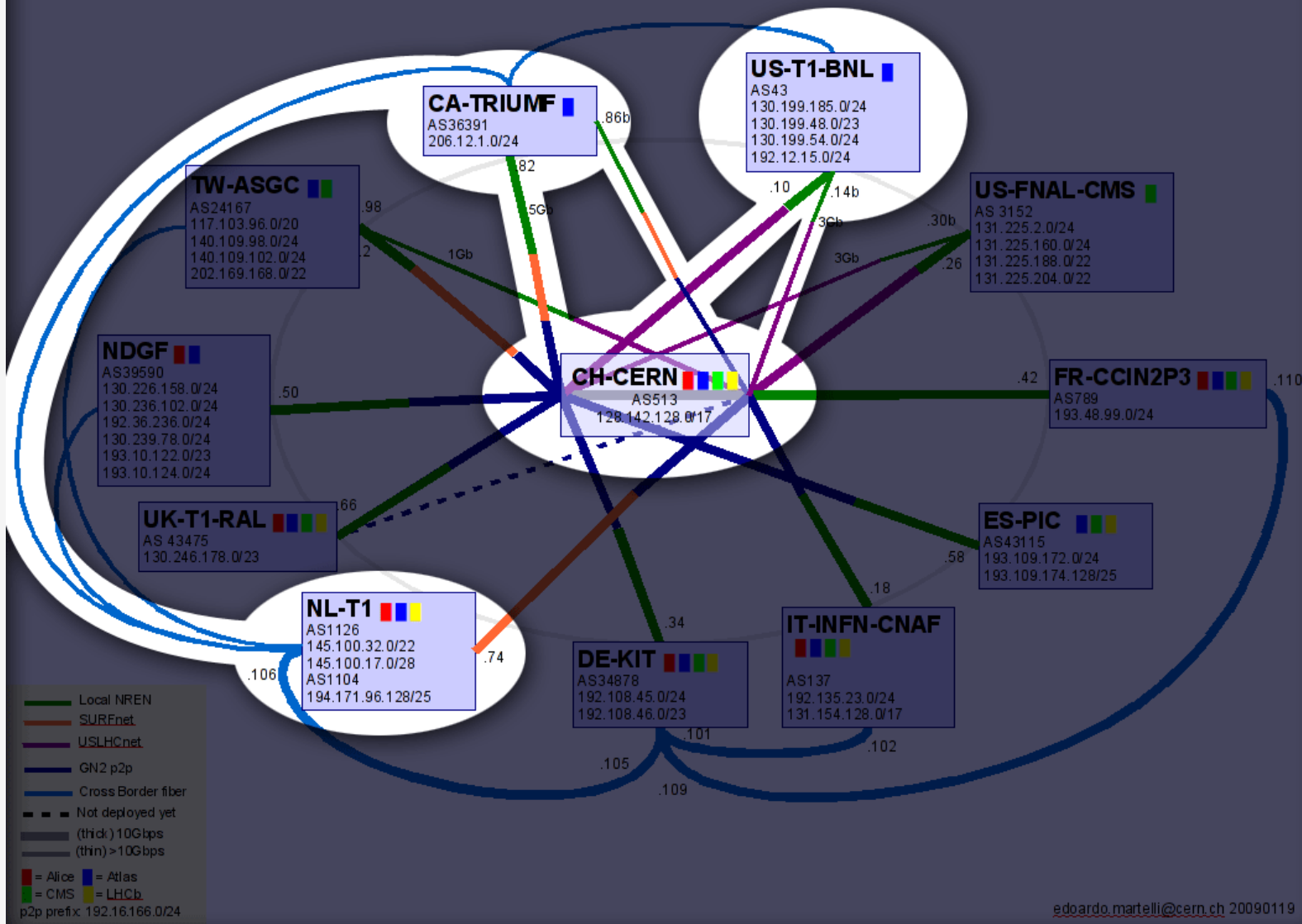


Graph of primary & secondary path availability 2008

- Almost never happen at the same time! *Or do they?*
- Last time this graph was presented both of TRIUMF's primary and secondary paths to CERN were interrupted within one hour.
- Failover through BNL, BNL also provides a redundant path in Europe via France, rather than the heavily populated path through Basel.
- Lot of work gone into making paths physically diverse and redundant

LHCOPN

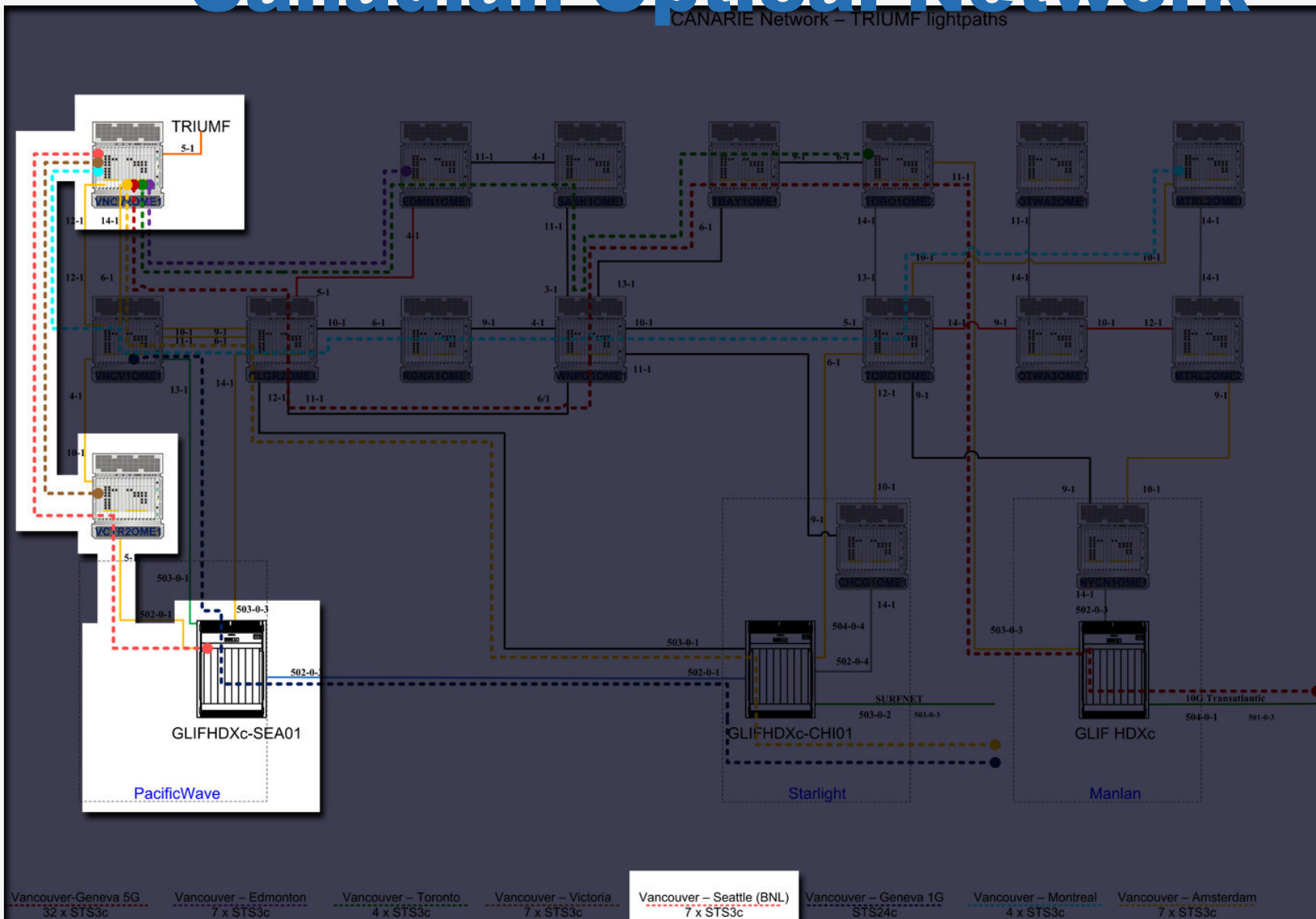
LHCOPN – current status



edoardo.martelli@cern.ch 20090119

Canadian Optical Network

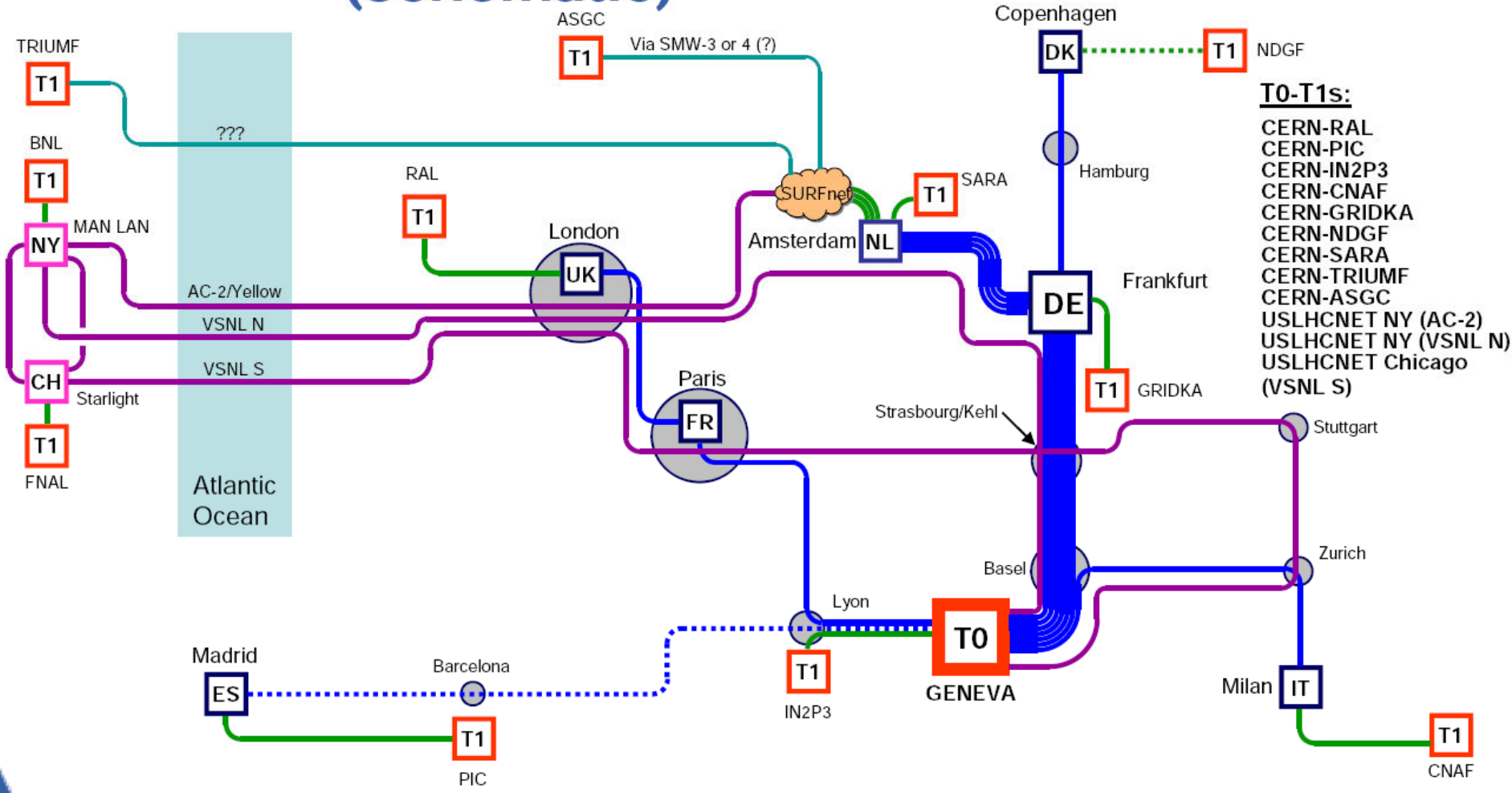
CANARIE Network – TRIUMF lightpaths



T0-T1 Lambda routing (schematic)



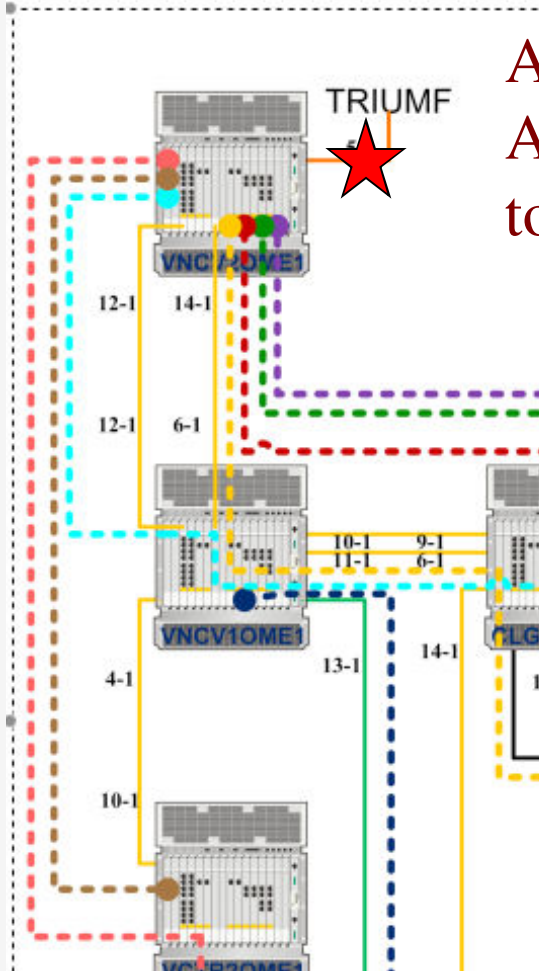
Connect. Communicate. Collaborate



LHC Networking T0-T1 Status and Directions
 David Foster (HEPiX 2008)



However ... best laid plans can not thwart University Development



All of TRIUMF external network connection and ATLAS lightpaths pass through this shack. Destined to be the entrance to a large supermarket.



Thank you



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Merci