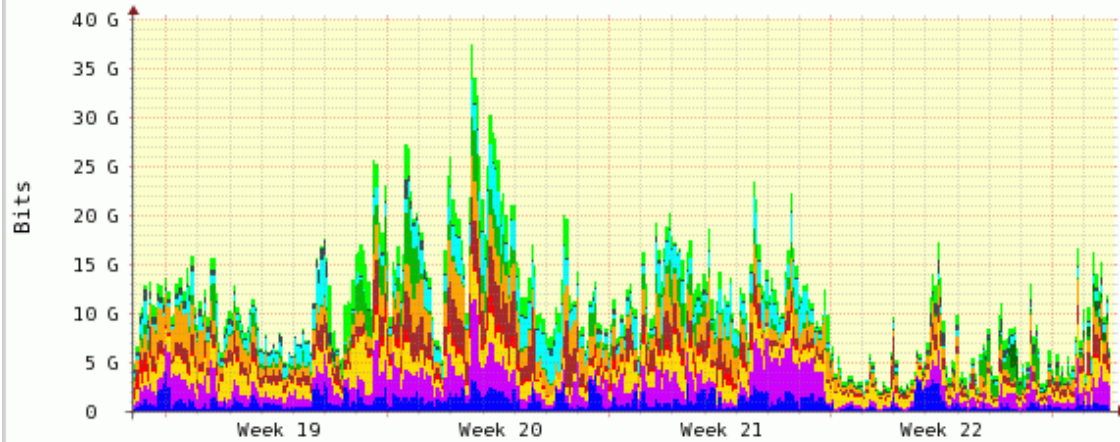


The Network & ATLAS

Workshop on transatlantic networking
panel discussion
CERN, June 11 2010

Kors Bos,
CERN, Geneva & NIKHEF, Amsterdam
(ATLAS Computing Coordinator)

LHCOPN TOTAL Traffic Flow (Out-bound)



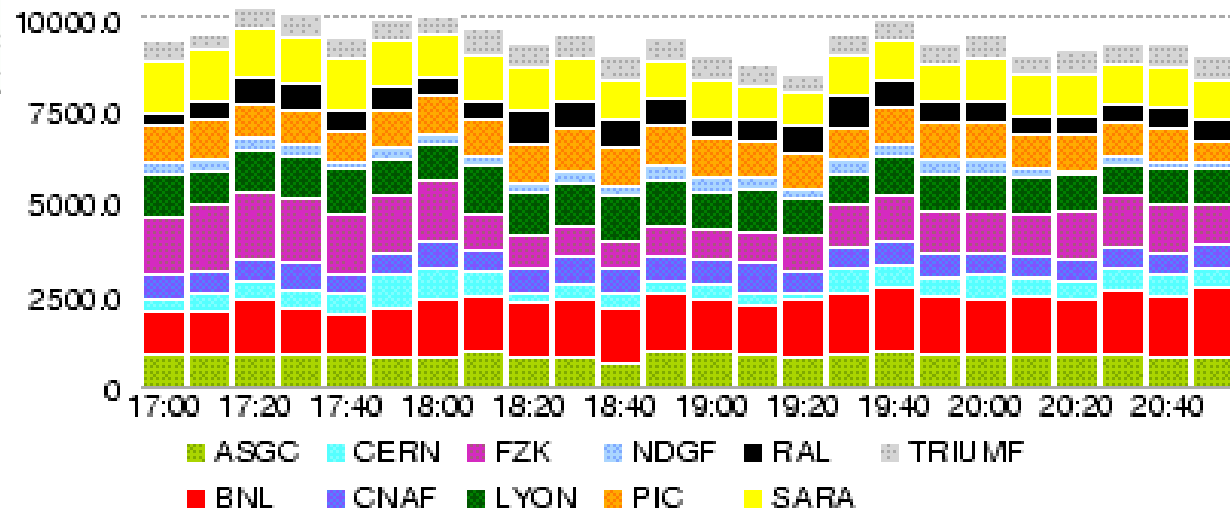
RBOOTOOL / TOBI OETIKER

To CNAF	Avg	1.11 G	Max	4.07 G	Peak	6.60 G
To DE-KIT	Avg	1.67 G	Max	8.31 G	Peak	9.53 G
To IN2P3	Avg	1.59 G	Max	5.34 G	Peak	8.00 G
To NDGF	Avg	329.53 M	Max	1.74 G	Peak	3.54 G
To ES-PIC	Avg	1.30 G	Max	6.56 G	Peak	7.55 G
To RAL	Avg	1.69 G	Max	4.86 G	Peak	7.90 G
To NLT1	Avg	799.06 M	Max	6.97 G	Peak	7.75 G
To TRIUMF	Avg	202.96 M	Max	2.62 G	Peak	3.26 G
To BNL	Avg	1.25 G	Max	5.08 G	Peak	5.75 G
To FNAL	Avg	311.08 M	Max	1.89 G	Peak	3.49 G
To ASGC	Avg	996.29 M	Max	4.76 G	Peak	6.71 G



Total to Tiers1 - average 6.46 G
Total to Tiers1 - maximum 17.21 G

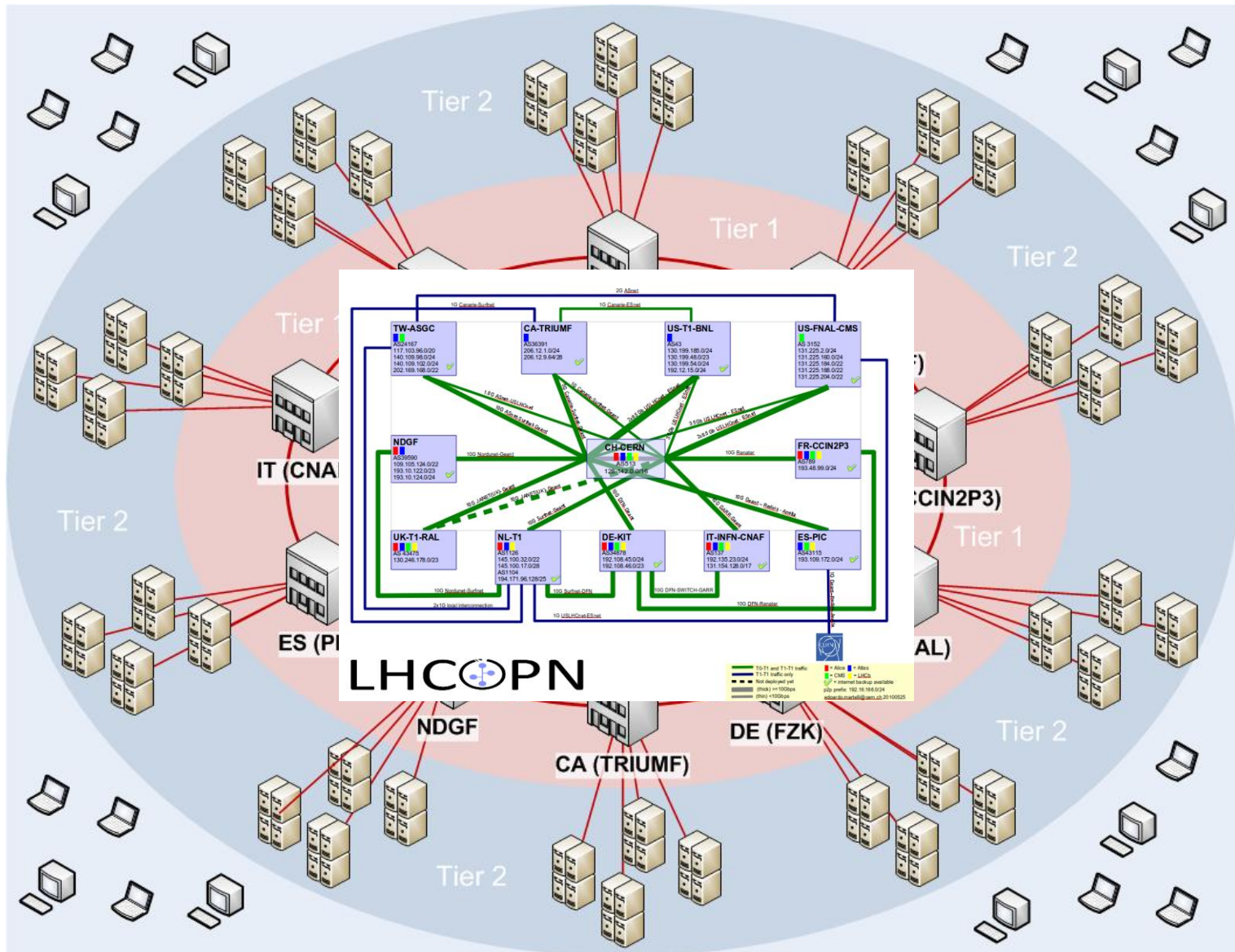
SPECTRUM Report Gat
Last Updated: Tue Jun 8 21



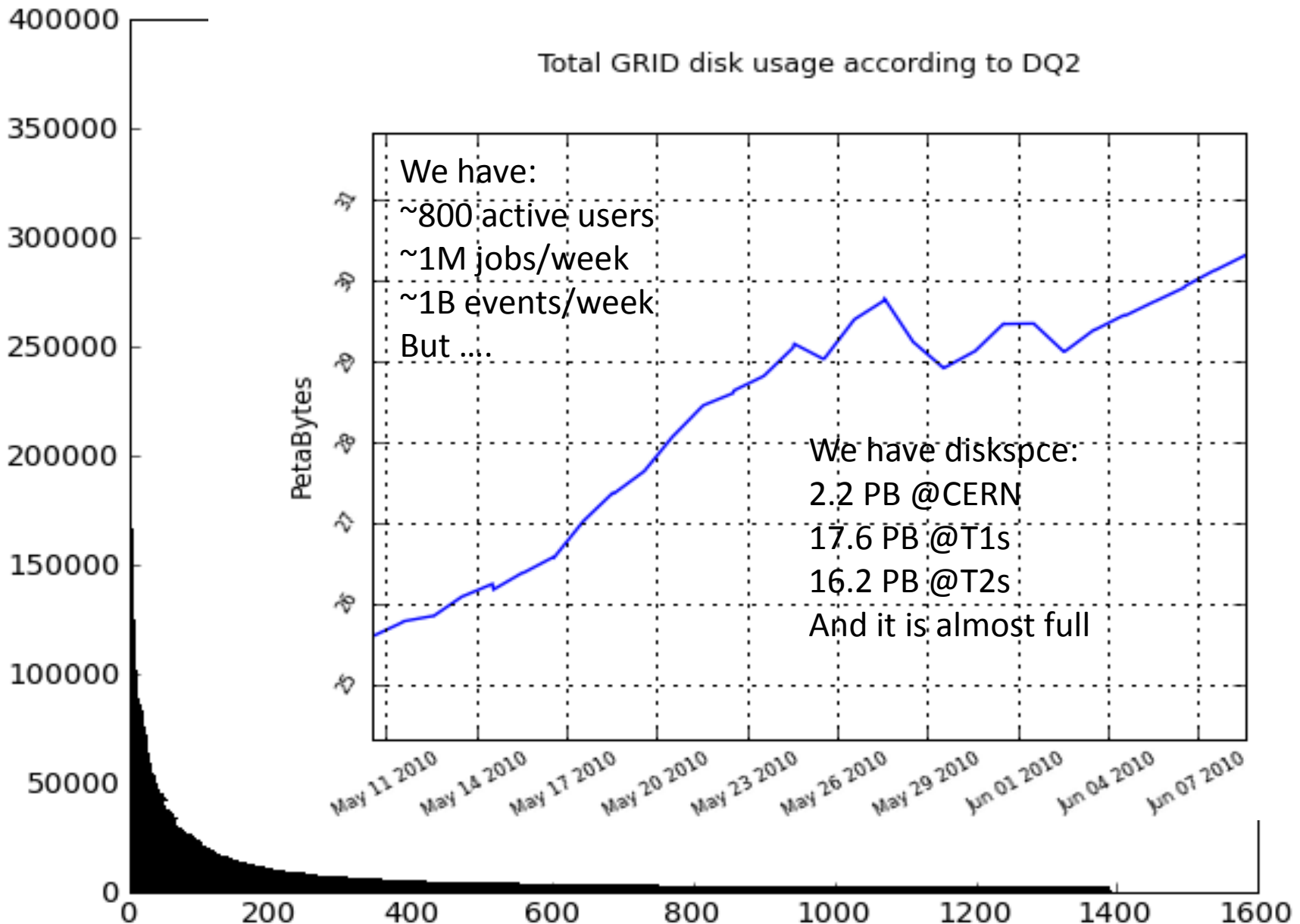
At present, institutes in Europe typically have a ~ 1 Mb/s access to CERN. In some places the available bandwidth is already as high as 622 Mb/s. We expect Gb/s networks to be available by the beginning of LHC operation. This assumes an increase of a factor of ~ 100 , which is typical of the improvements in the technology over a ten-year period. However, current price trends would imply that achieving this performance would require an increase in network funding.

Technical Proposal
for a
General-Purpose pp Experiment
at the
Large Hadron Collider at CERN

Data Placement Hierarchy



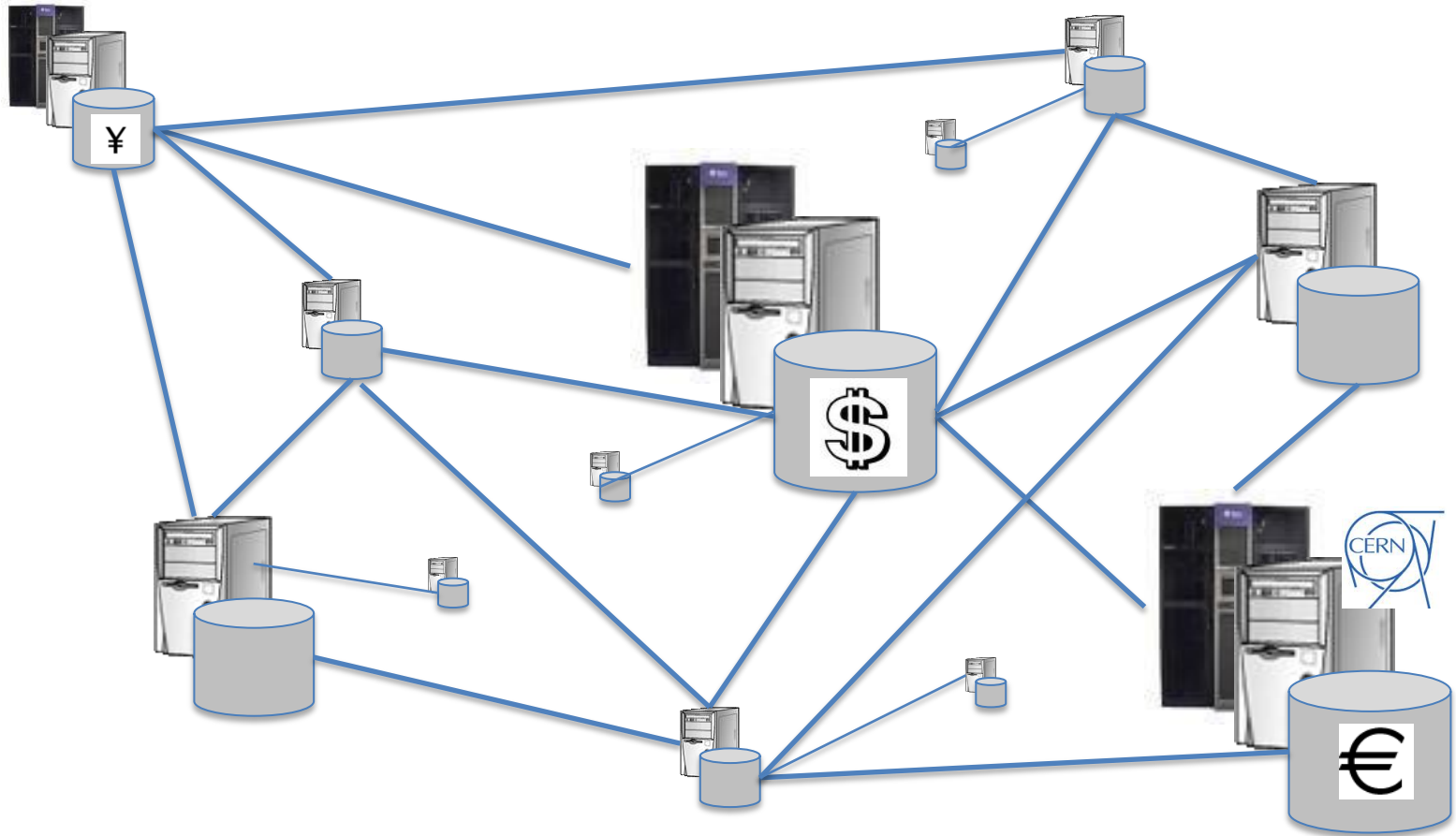
Data placement & usage



Alternative: more caching and less pre-placement

- Pull needed data to where there is free CPU power
- Get the data from the “best” site(s)
 - Network should know what is “best”
- Retire least frequently used data
- Dynamically makes most popular data available
- Across cloud boundaries

Network of sites with a big cache
Few sites equipped to archive data
Latency may favor continents view



Evolution of requirements

- No longer T0-1-2-3 hierarchy
- T1 and T2 will become equivalent in the network (OPNng)
- Traffic between countries as much as within
- No longer disk space but network bandwidth will scale with #users and #data
- More analysis-user demand driven traffic pattern rather than the DC of pre-placement
- We must have intelligent layer for data brokering
- Bandwidth between each of the sites must be at least what we now have between a T1 and T2 site within a cloud