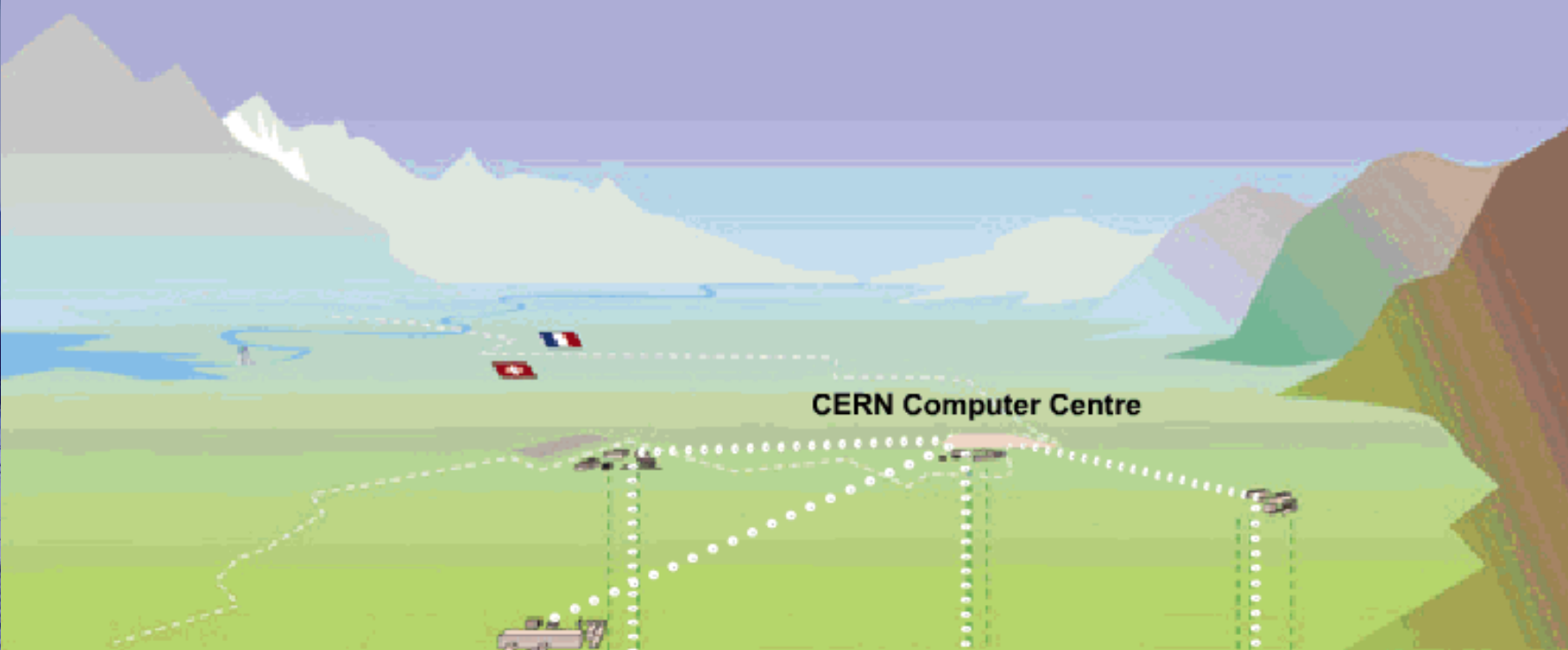


CERN Computer Centre Support for LHC Operations, Data Collection, Processing & Analysis

Frédéric Hemmer
IT Department Head - CERN
17th August 2009



CERN Computer Centre

LHCb ~ 50 MB/sec

ATLAS ~ 320 MB/sec

ALICE ~ 100 MB/sec

CMS ~ 220 MB/sec

1.25 GB/sec
(ions)

Computing Tasks



Scheduled work only!

700MB/s

420MB/s



700MB/s

(1600MB/s)



1120MB/s

(2000MB/s)



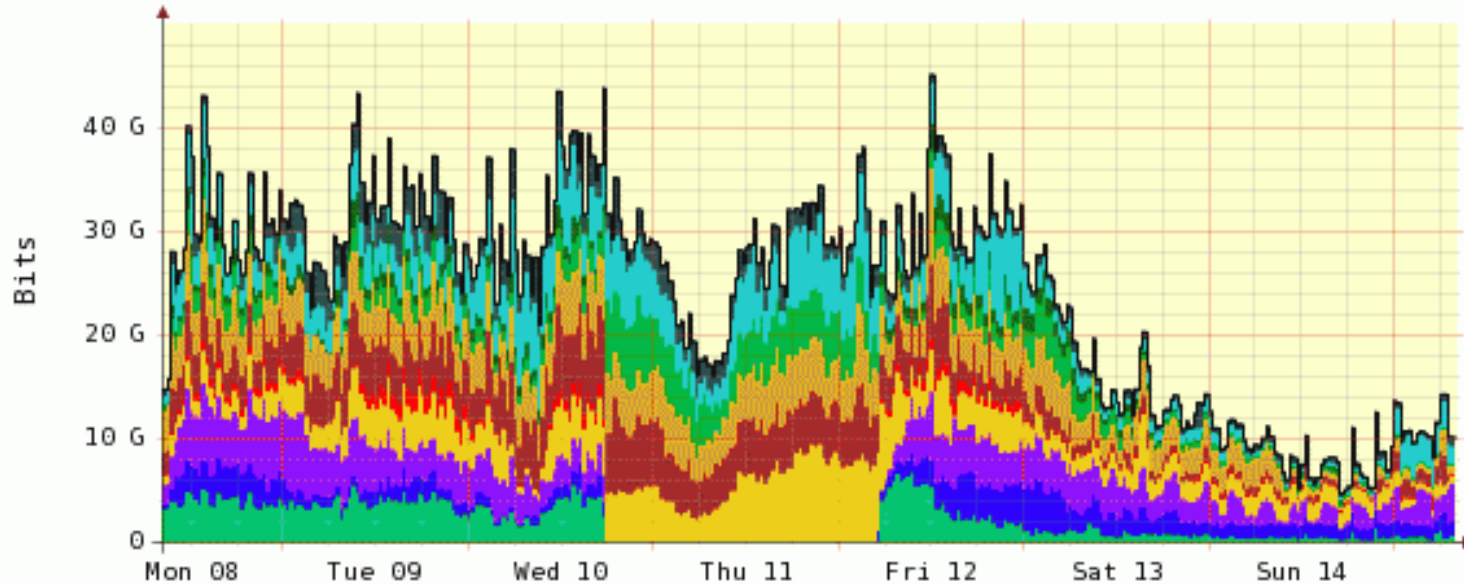
Averages! Need to be able to support 2x for recovery!

1430MB/s



Network Connectivity

LHCOPN Total Traffic



	Min	Avg	Max (avg)	Max (max)
ASGC	0.00	1.77 G	6.65 G	7.97 G
CNAF	0.00	1.49 G	5.03 G	6.01 G
KIT	0.00	2.72 G	7.75 G	10.27 G
IN2P3	204.57 M	3.27 G	9.46 G	9.87 G
NDGF	0.00	435.28 M	1.75 G	2.07 G
PIC	5.39 M	3.34 G	9.53 G	12.12 G
RAL	153.39 M	3.62 G	9.35 G	10.56 G
NLT1	26.03 k	1.93 G	7.20 G	8.29 G
TRIUMF	0.00	713.47 M	2.72 G	4.28 G
BNL	50.32 M	3.12 G	8.82 G	11.21 G
FNAL	166.72 M	1.67 G	5.80 G	8.41 G
Total Bits	4.67 G	24.08 G	45.10 G	64.74 G



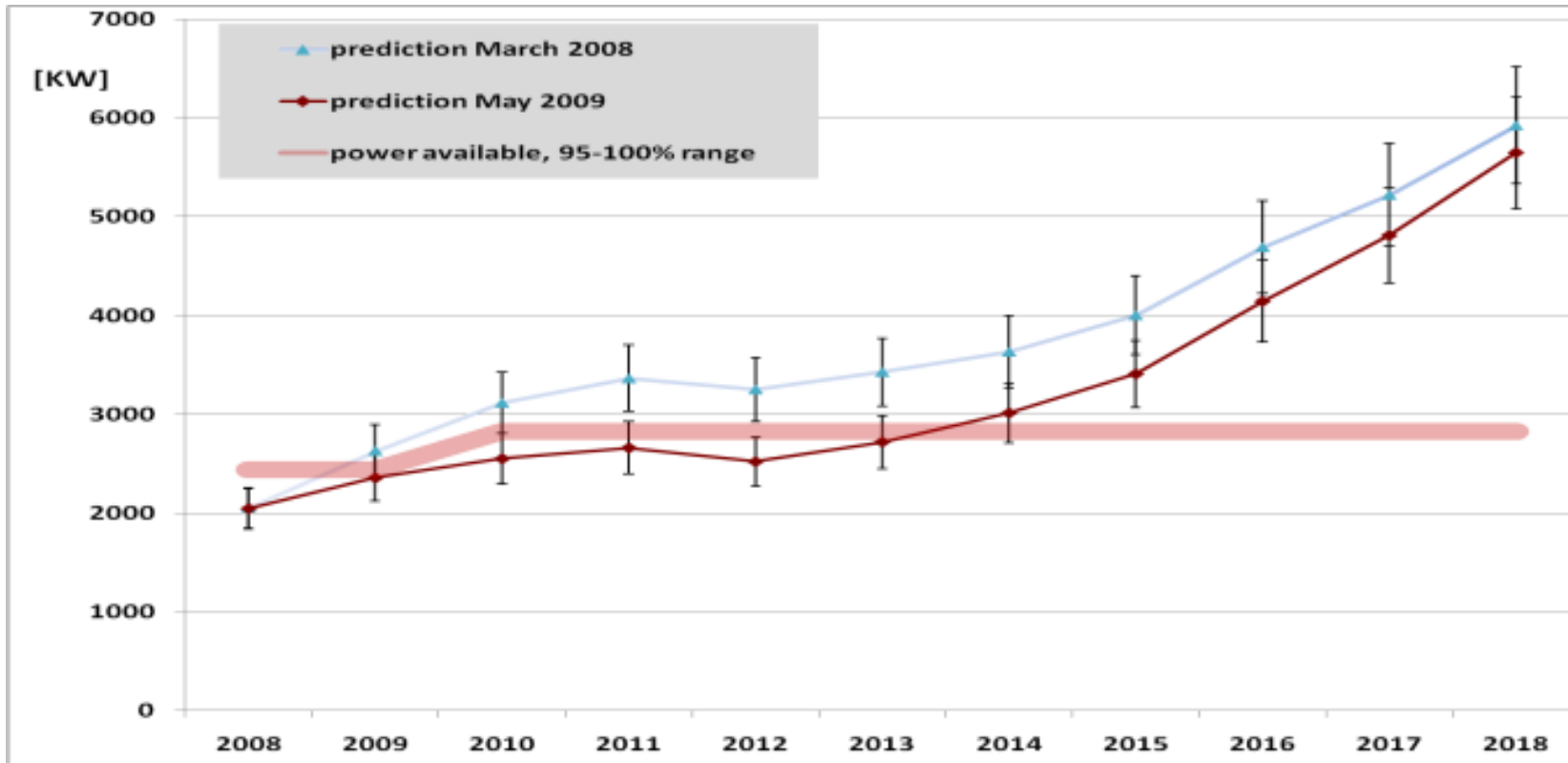
- Alice
- Atlas
- CMS
- LHCb
- OTHERS
- compass

GRIDVIEW

- 5700 systems, 34600 processing cores
 - CPU servers, disk servers, infrastructure servers
 - 2008: 3000 systems moved out, 1800 moved in
- 13900 TB usable on 41500 disk drives
 - ~2.5% yearly failure rate, i.e. ~1000 interventions
- 34000 TB on 45000 tape cartridges (56000 slots), 160 tape drives
- Orders in preparation (est.)
 - 3000 systems, 20000 processing cores
 - 19000 TB usable on 21000 disk drives

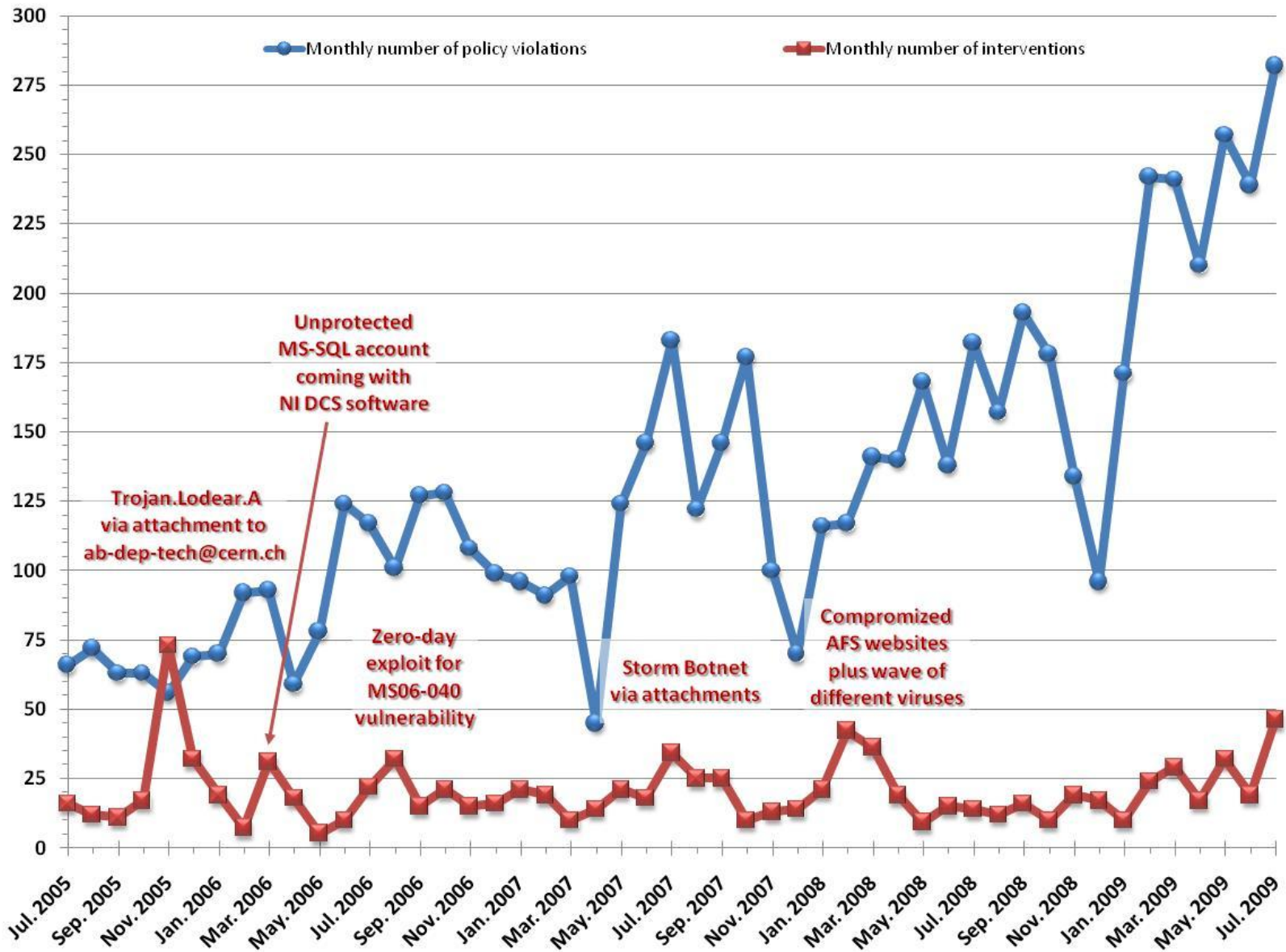


Power demand estimates



LHC Tier-0/CAF only

Computer Security



- Computing in CERN Computer Centre is now an integral part of
 - LHC Machine operation
 - Experiments Data Taking
- Some challenges ahead
 - Unprecedented data rates, volumes & retention time
 - 24x7 Worldwide operation
 - Power consumption/dissipation & rapid technology changes
 - Computer Security



