



Enabling Grids for E-science

SA2 Assessment of Grid sites network's needs

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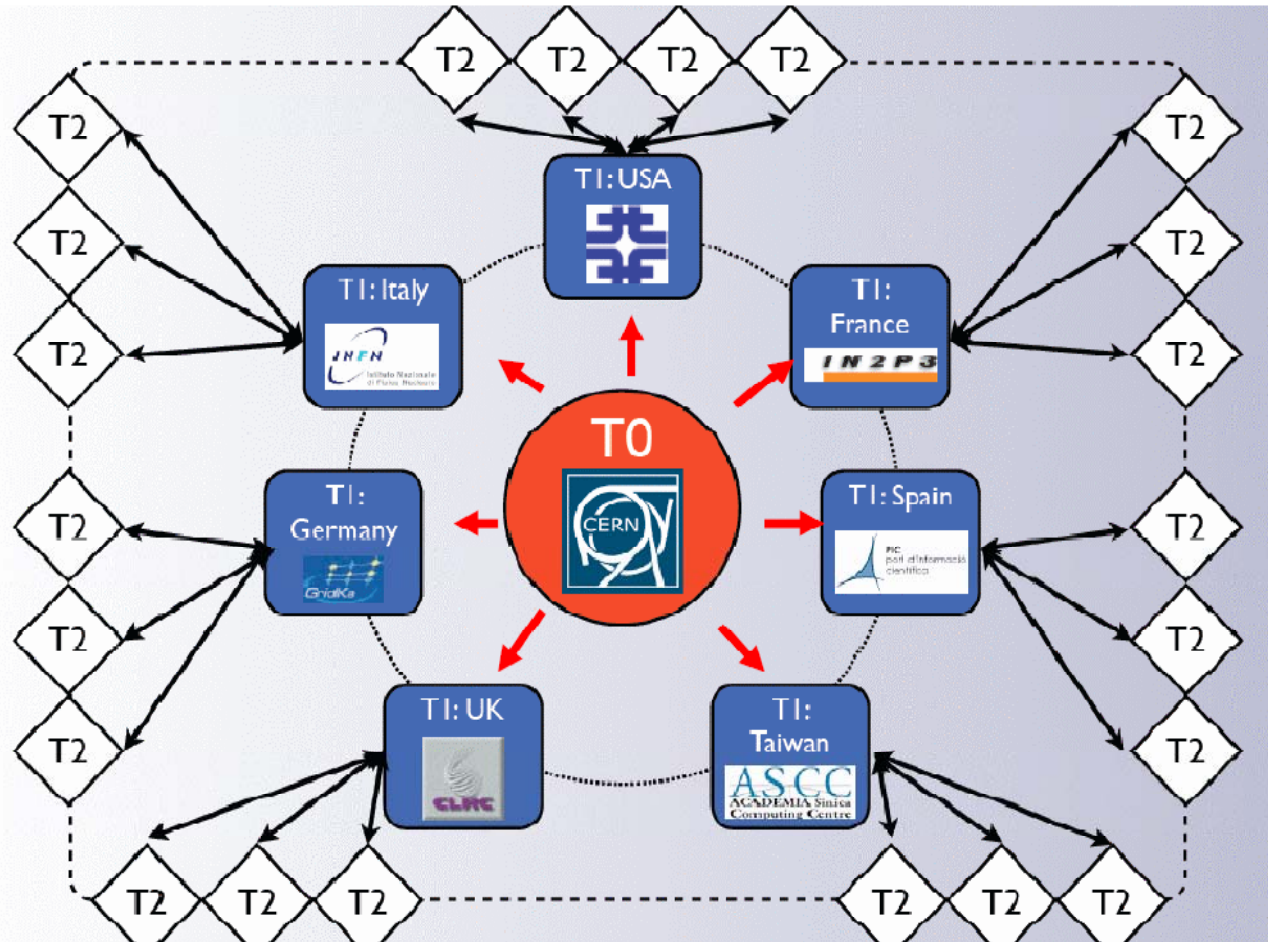
Thursday, March 26, 2009 – Rome – SA2 All Hands Meeting

www.eu-egee.org



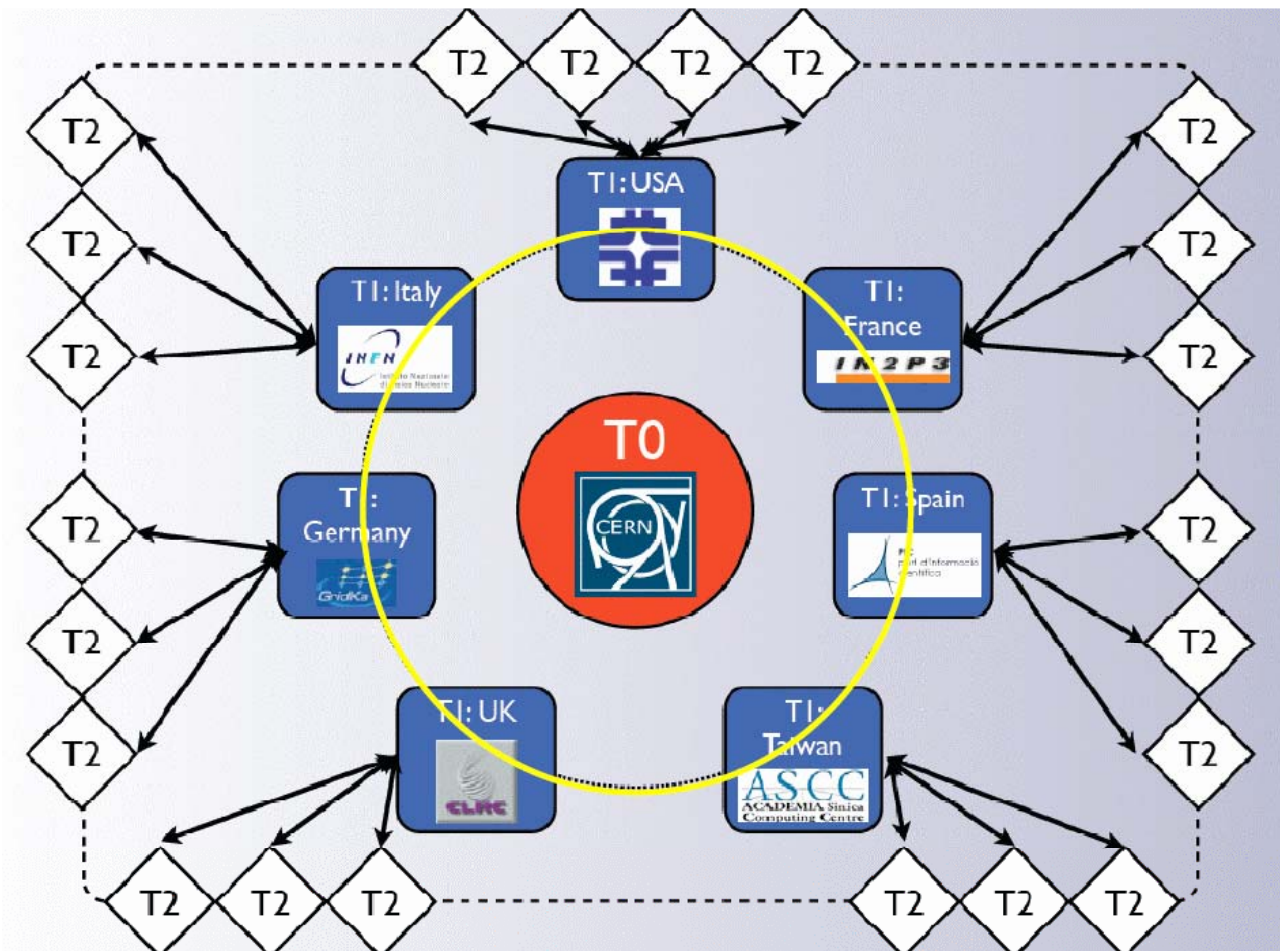
LHC Computing Model

- TIER 0 distributes a RAW copy of all the data to every TIER1

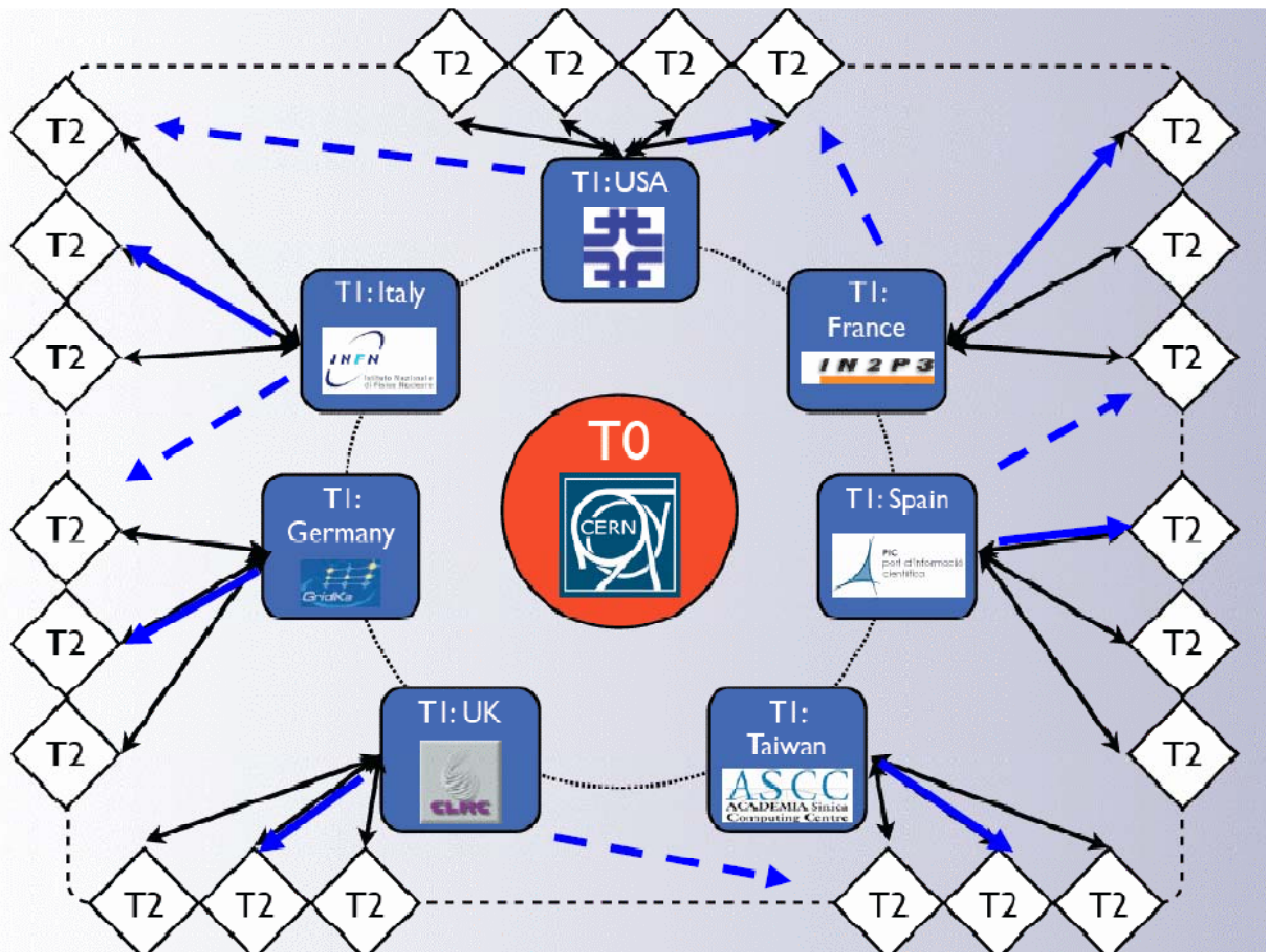


LHC Computing Model

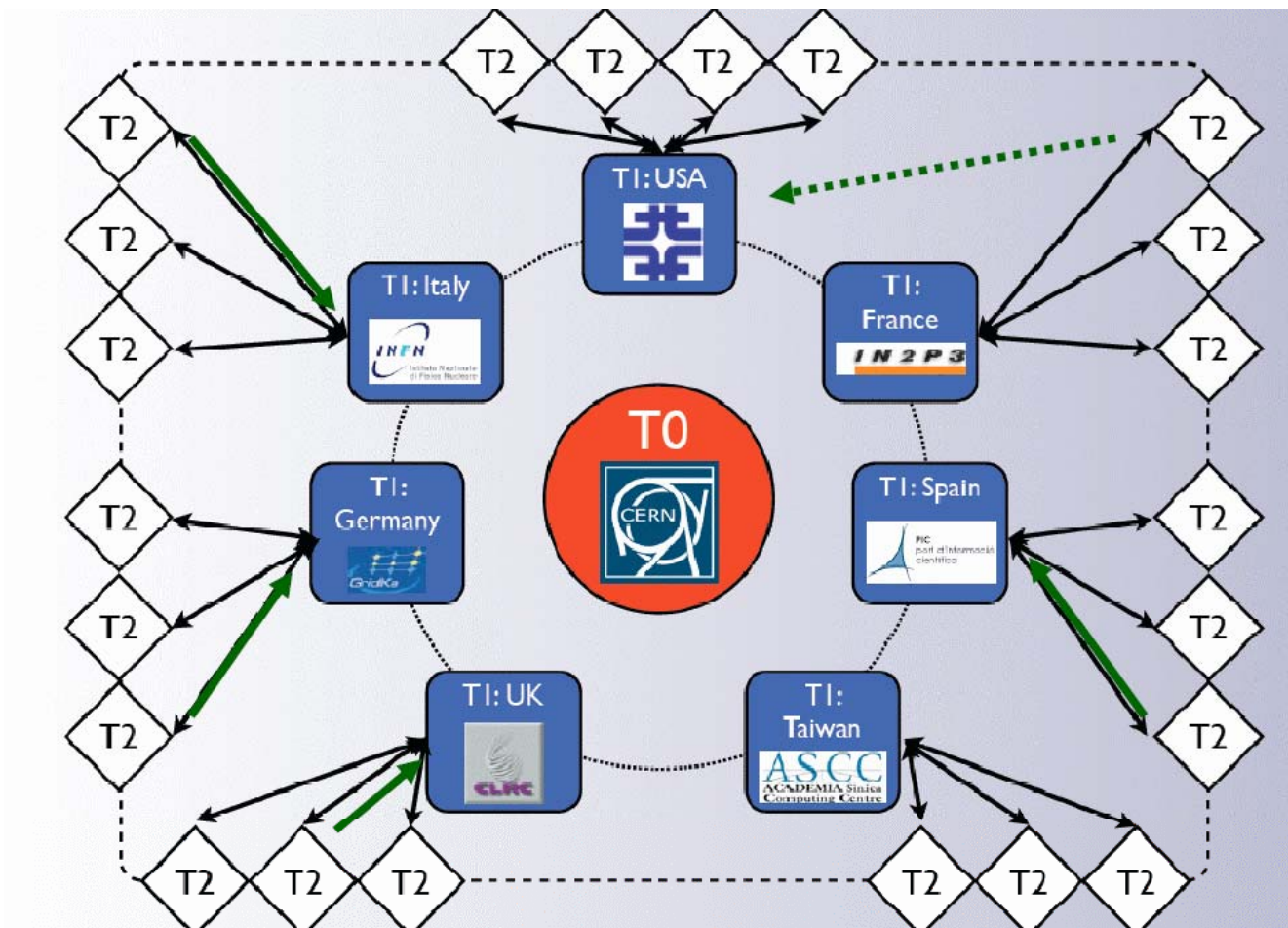
- TIER1 rebuild their correspondig part of RAW data received
- TIER1 generate reduced data and exchange them with other TIER1s



- TIER 1 distribute to their associated TIER 2 the reduced data



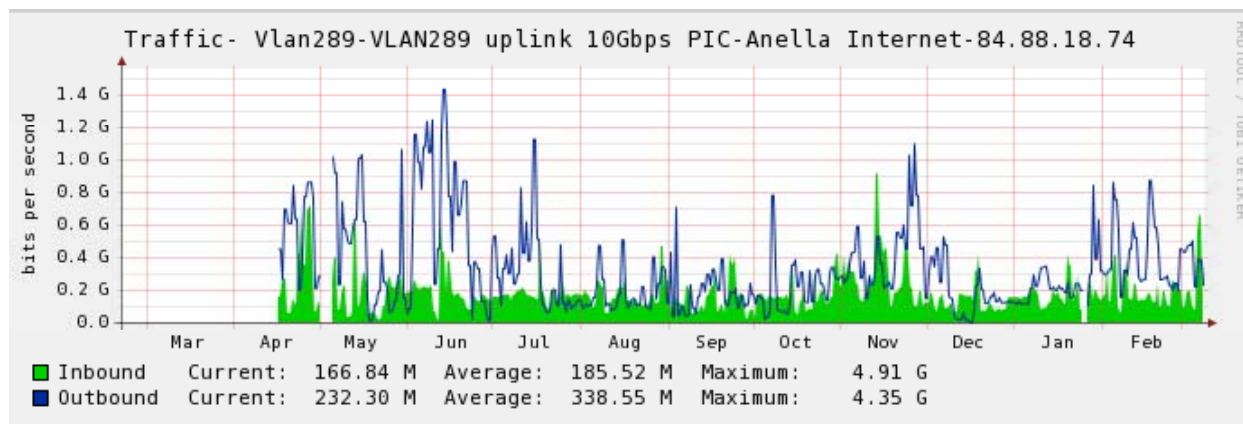
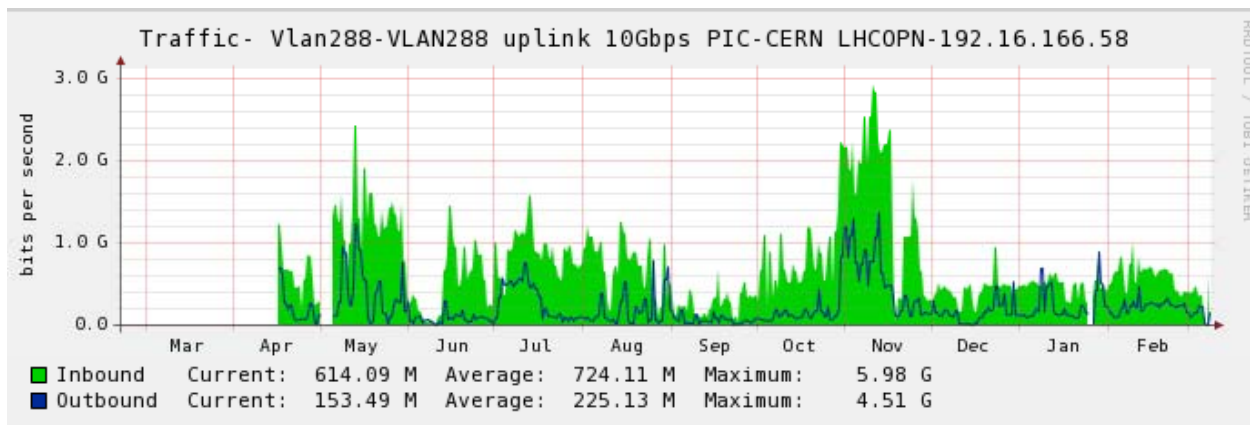
- TIER2 produce simulated and non-simulated data and transfer them to TIER 1 to store them



MB/s	ATLAS	CMS	LHCb
CERN → PIC	76	60	3,5
PIC → T1s	60	30	2
T1s → PIC	105	105	7
PIC → T2s	320*	35**	-
T2s → PIC	8,5	4	<1

- *ATLAS: PIC → T2s = 320 MB/s (160 MB/s ES + 160 MB/s PT)
 - 80 MB/s IFIC + 40 MB/s UAM + 40 MB/s IFAE
- **CMS: PIC → T2s
 - PIC → T2s (ES+PT) ~ 15 MB/s (13 MB/s ES + 2 MB/s PT)
 - PIC → T2s (non-regional) ~ 20 MB/s
 - ASGC(2.7), CERN(0.9), CNAF(2.9), FNAL(6.4), FZK(2.1), IN2P3(3),RAL(2,4))

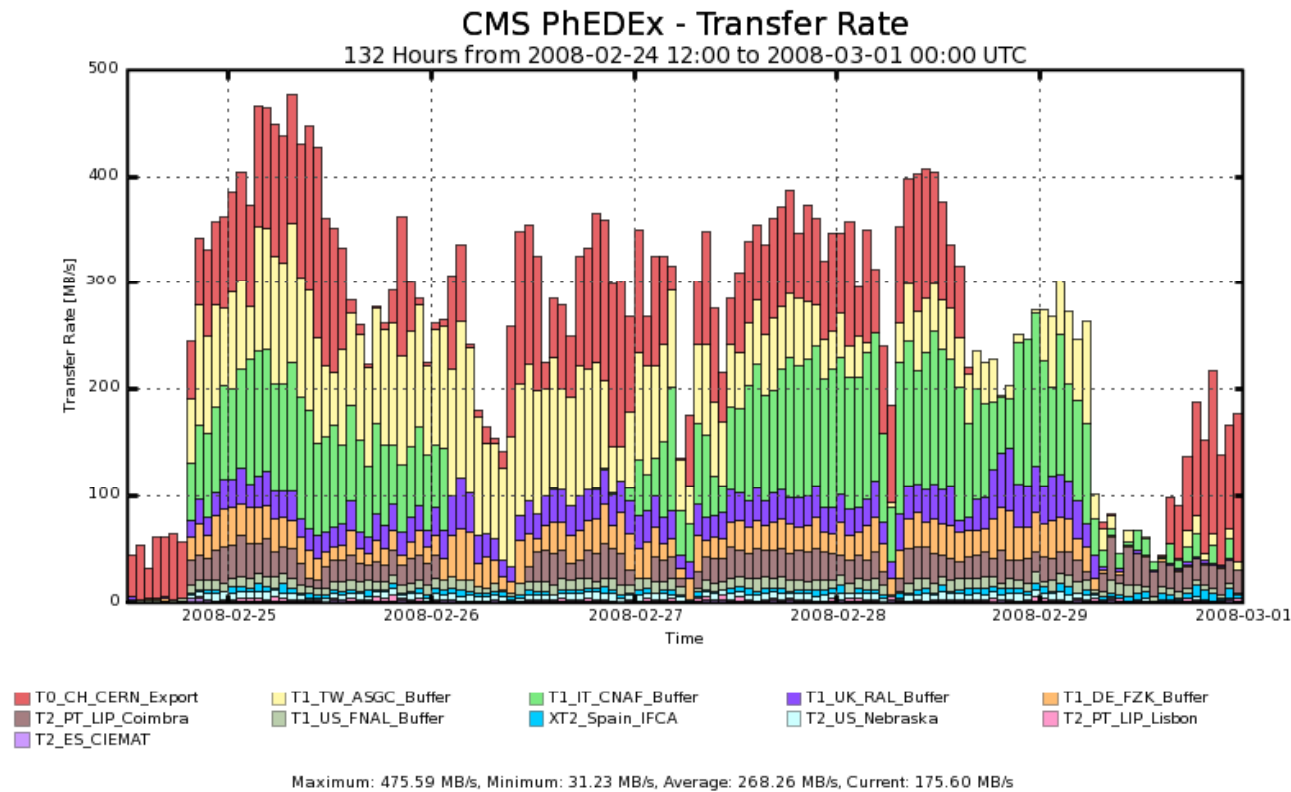
- Tests of the system transferring simulated and non-simulated data.
- Generate a quantity of traffic as realistic as possible.
- Graphs for OPN and non-OPN from April 2008 to Feb 2009



- DATA imported in megabytes per second for each experiment (marked in blue color)

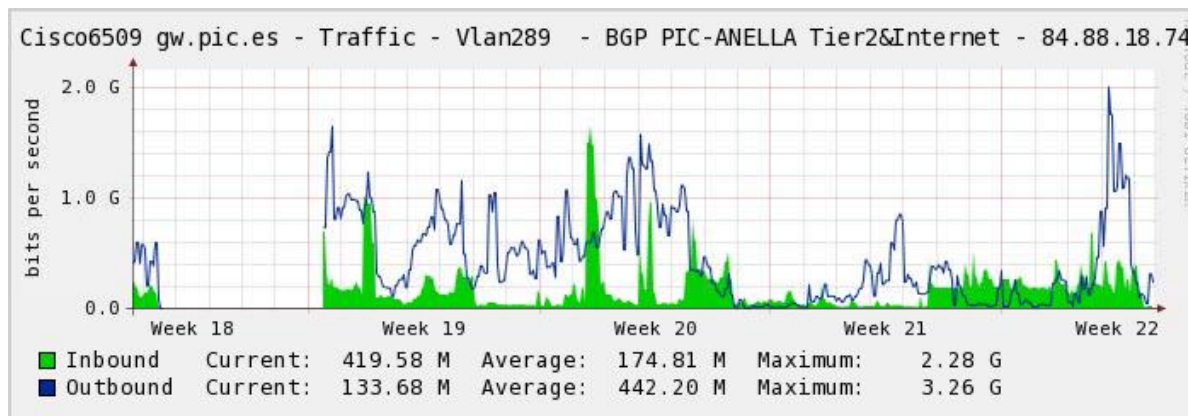
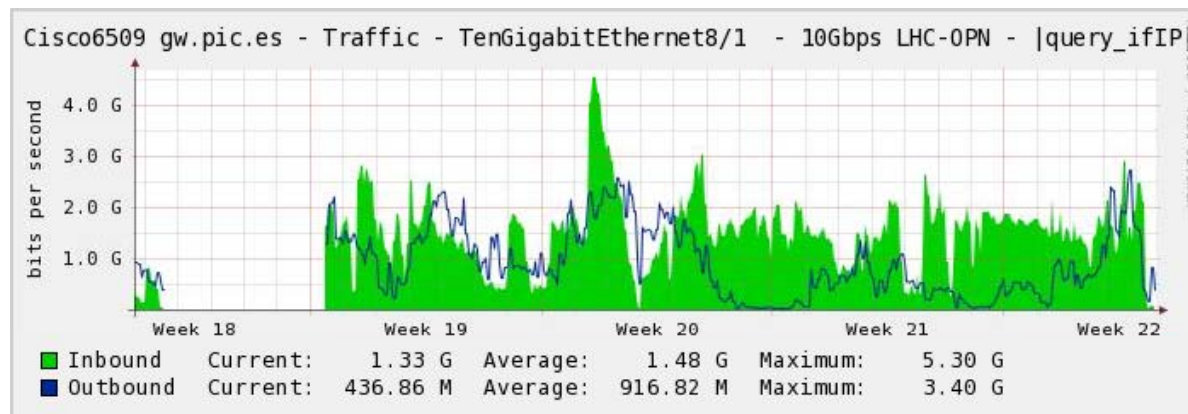
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- In february 2008 several transfers were tested towards PIC from CMS experiment
- 250 – 450 megabytes per second (2 – 3.6 Gigabit per second) during several days were achieved



Data Imported in May 2008

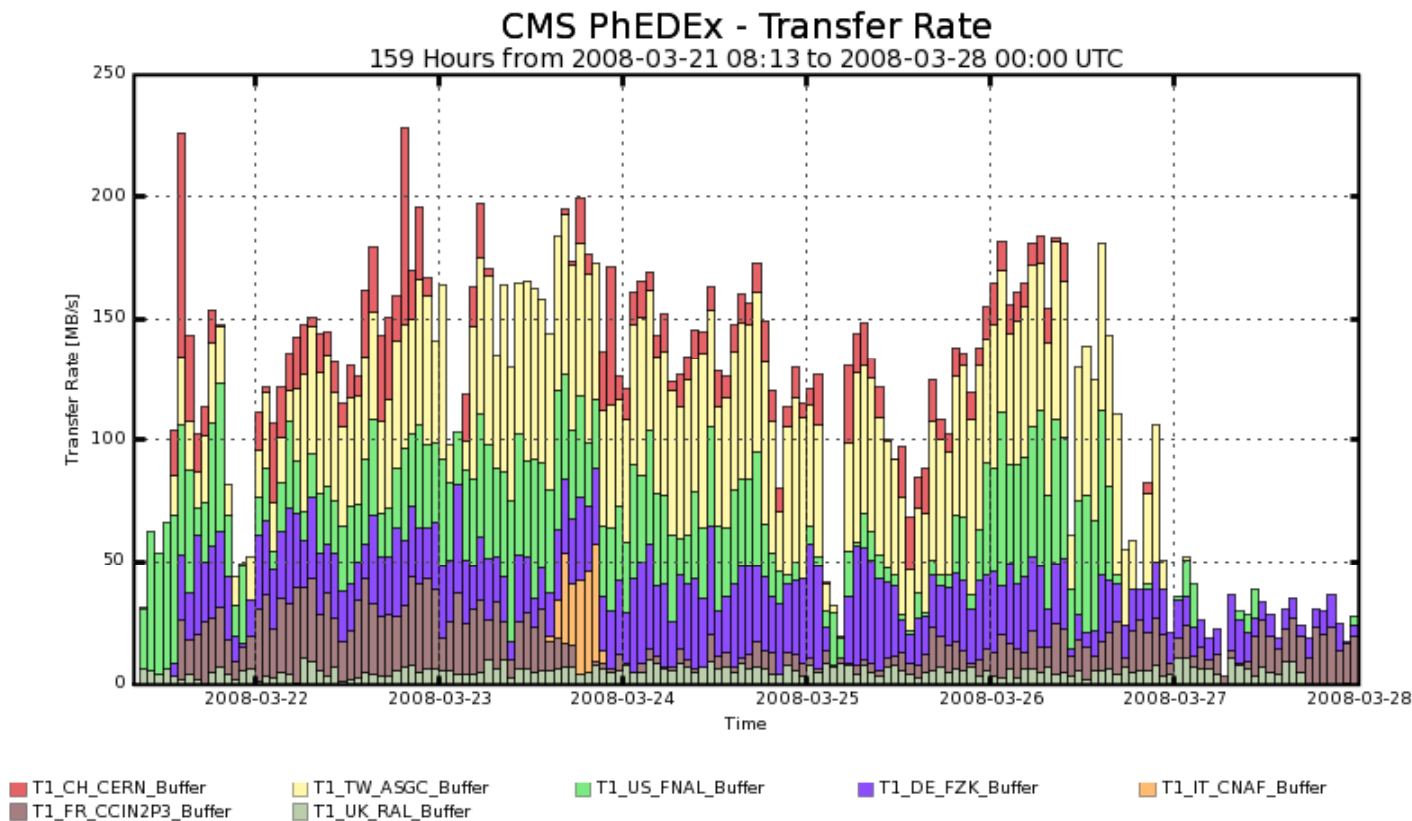
- Programmed exercise transferring data T1 to T1 and with CMS experiment transfers at the same time
- 500 Megabyte per second (4 Gigabit per second) from T1s were imported towards PIC during 1 day

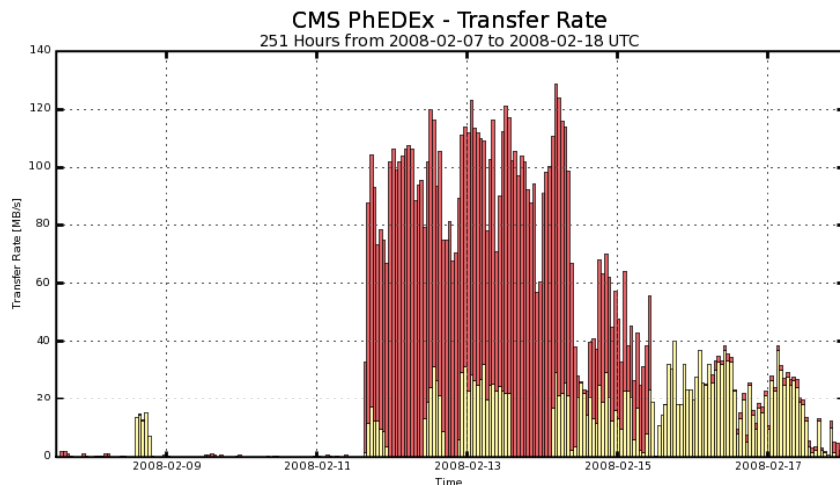


- DATA exported in megabytes per second for each experiment (marked in blue color)

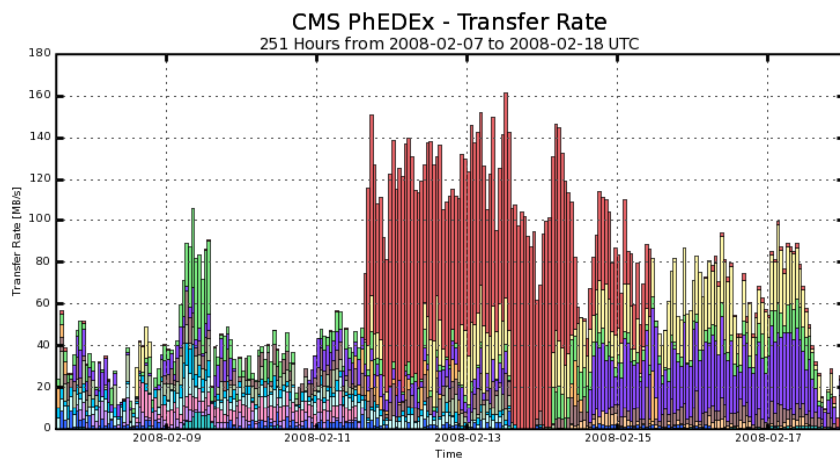
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- March 2008 CMS exporting data from PIC to TIER 1s
- DATA transfer rate 150 Megabytes per second several days





- 80–100 megabytes per second PIC → CIEMAT



- 20–40 megabytes per second PIC → T2s out of Spain



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- Imported data from CERN and other T1s to PIC have been tested and reached 200-500 megabytes per second
- Exported data transfers from PIC towards another T1s have been tested and reached 100-150 megabytes per second
- Transfers from PIC towards T2s will be bursted

Questions?