



# CMS STEP09

## Data Transfer at CCIN2P3

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## CMS Transfer tests:



- **T0-T1:**  
stress T1 tapes: importing real cosmics data from T0  
from 6-9 June 2009
- **T1-T1:**  
50TB replicate (AOD synchronization) between all T1s  
two step:  
first 3-7 June,  
second 8-12 June 2009
- **T1-T2:**  
stress T1 tapes  
measure latency at transfers from T1 MSS to T2  
from 2-14 June 2009



## Test Objectivitis:



### Stress tapes at T1 sites.

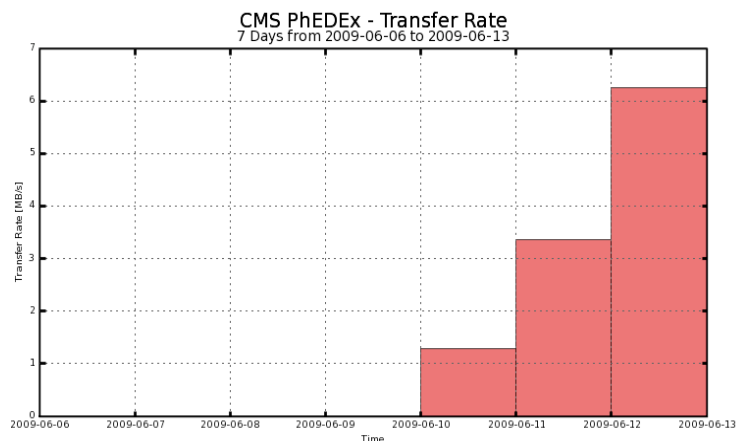
- **Writing test:** export data from T0 and writing to tape at all T1 sites, check latencies
- **Reading test:** transfer datasets from T1->T2 including stage from tape, investigate impact of tape system

### AOD synchronomization:

- Each T1 site has a full set of AOD on disk
- After each re-reconstruction pass, AOD produced at the custodial sites has to be synchronized between all T1 sites
- Test synchnization of 50TB of AOD data between all 7 T1 sites  
Starting of 50 TB AOD dataset at the T1 sites according to the custodial fractions

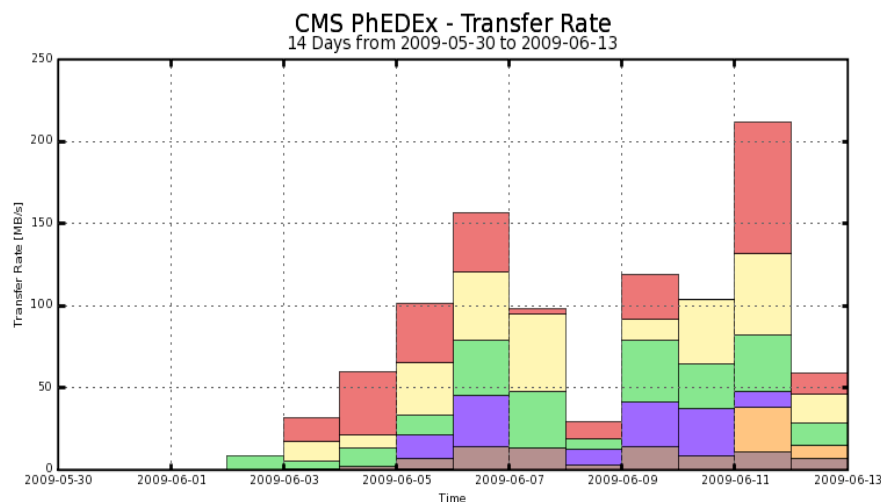


# STEP09 Data Transfer tests:



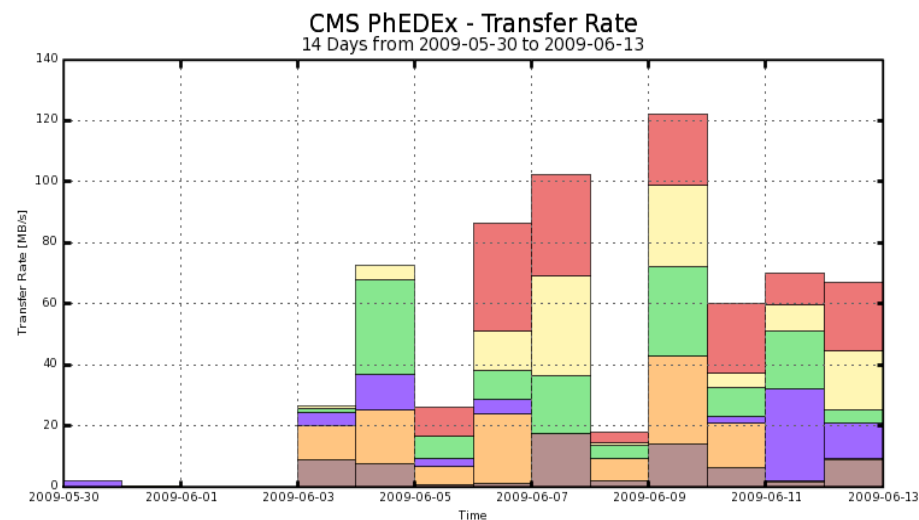
## Transfers

- CERN to CCIN2P3
- T1s to CCIN2P3
- CCIN2P3 to T1s



■ T1\_DE\_FZK\_Buffer to T1\_FR\_CCIN2P3\_Buffer  
 ■ T1\_US\_FINAL\_Buffer to T1\_FR\_CCIN2P3\_Buffer  
 ■ T1\_UK\_RAL\_Buffer to T1\_FR\_CCIN2P3\_Buffer  
 ■ T1\_CH\_CERN\_Buffer to T1\_FR\_CCIN2P3\_Buffer  
 ■ T1\_ES\_PIC\_Buffer to T1\_FR\_CCIN2P3\_Buffer  
 ■ T1\_IT\_CNAF\_Buffer to T1\_FR\_CCIN2P3\_Buffer  
 ■ T1\_TW\_ASGC\_Buffer to T1\_FR\_CCIN2P3\_Buffer

Maximum: 211.91 MB/s, Minimum: 0.00 MB/s, Average: 69.84 MB/s, Current: 58.99 MB/s



■ T1\_FR\_CCIN2P3\_Buffer to T1\_IT\_CNAF\_Buffer  
 ■ T1\_FR\_CCIN2P3\_Buffer to T1\_ES\_PIC\_Buffer  
 ■ T1\_FR\_CCIN2P3\_Buffer to T1\_TW\_ASGC\_Buffer  
 ■ T1\_FR\_CCIN2P3\_Buffer to T1\_UK\_RAL\_Buffer  
 ■ T1\_FR\_CCIN2P3\_Buffer to T1\_US\_FINAL\_Buffer  
 ■ T1\_FR\_CCIN2P3\_Buffer to T1\_DE\_FZK\_Buffer

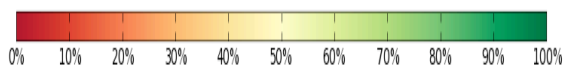
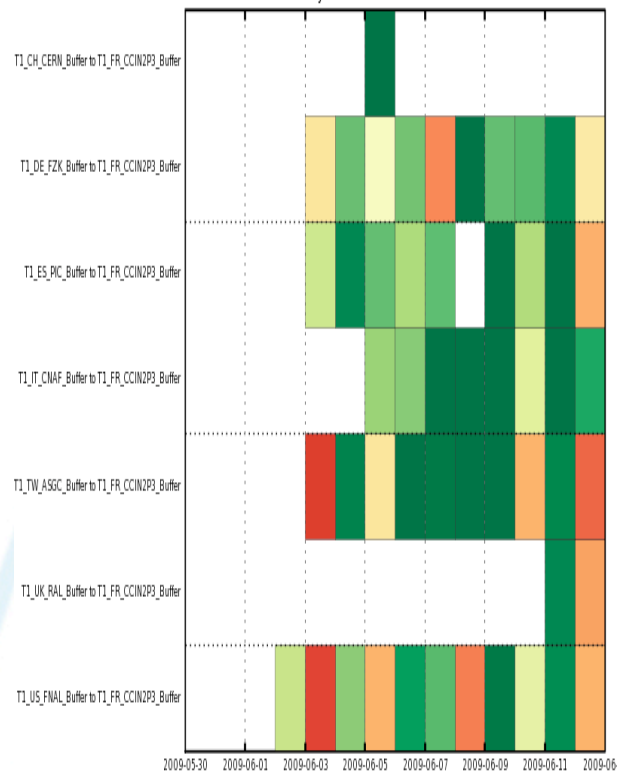
Maximum: 122.06 MB/s, Minimum: 0.00 MB/s, Average: 46.63 MB/s, Current: 66.79 MB/s

# STEP09 Data Transfer: Quality



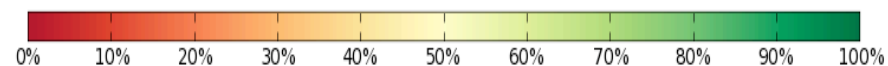
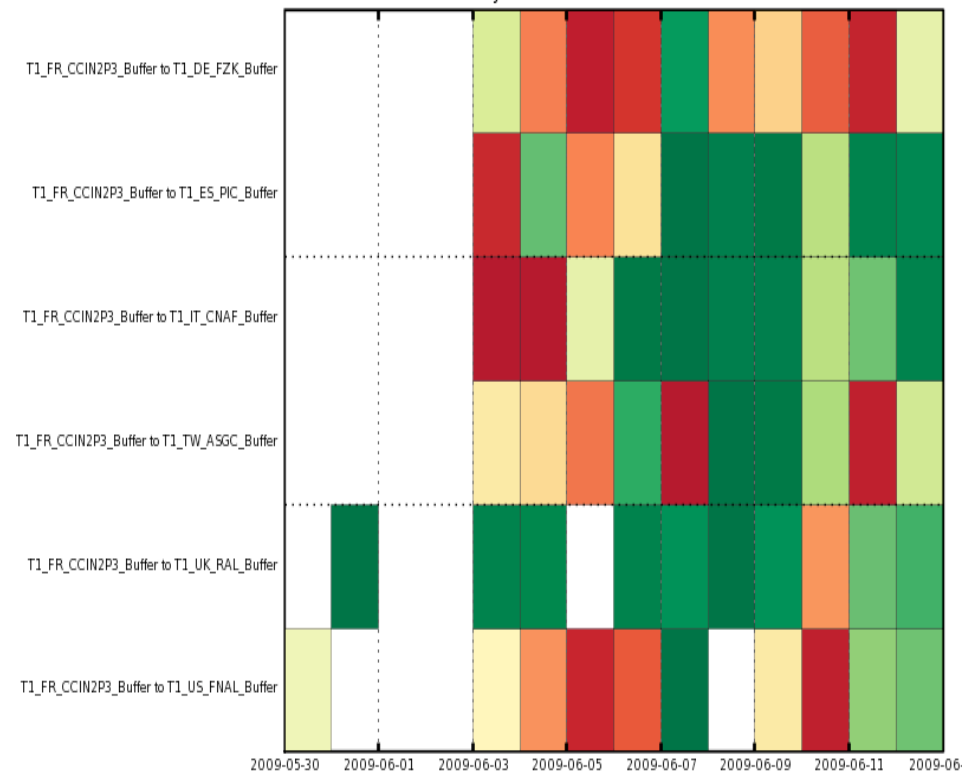
## T1s to CCIN2P3

CMS PhEDEx - Transfer Quality  
14 Days from 2009-05-30 to 2009-06-13



## CCIN2P3 to T1s

CMS PhEDEx - Transfer Quality  
14 Days from 2009-05-30 to 2009-06-13

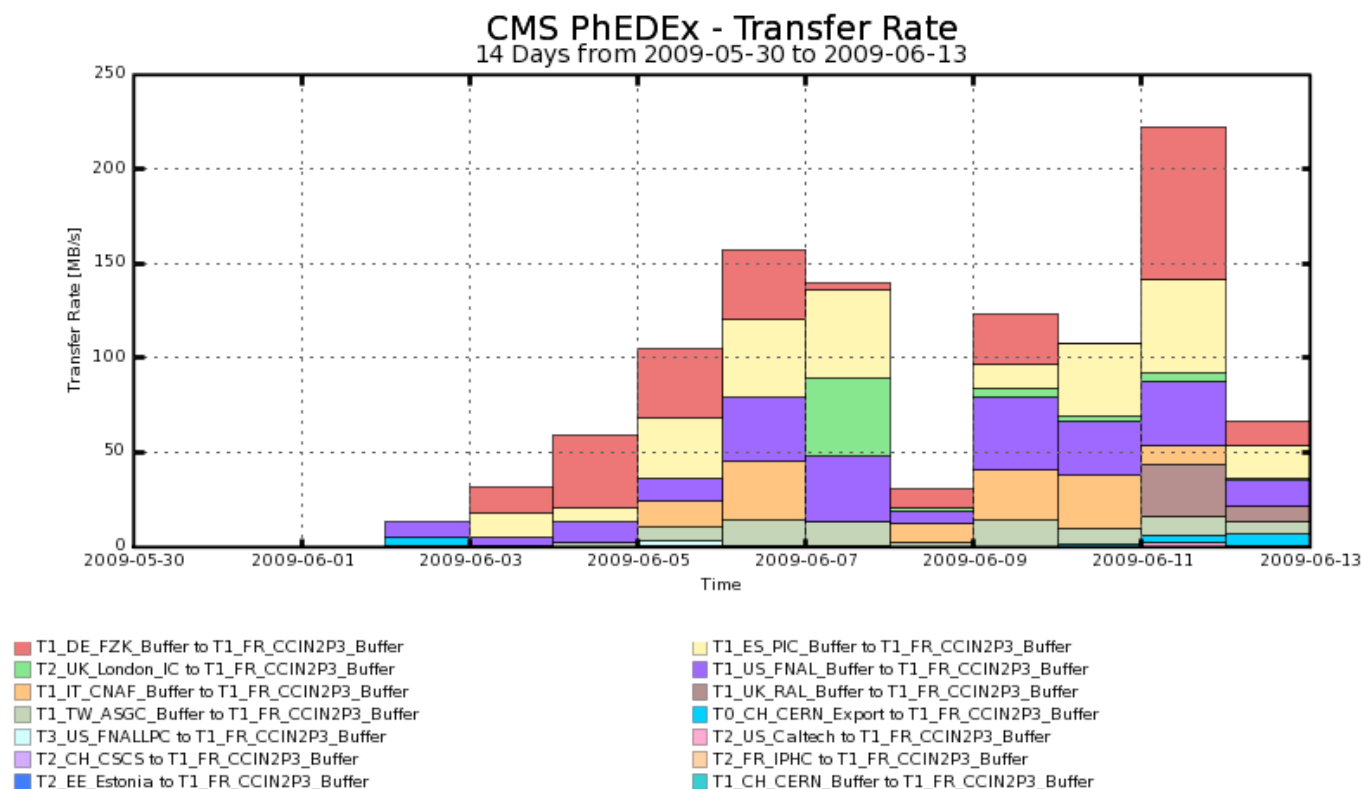




## STEP09 Data Transfer: data IMPORT



From 14 CMS sites



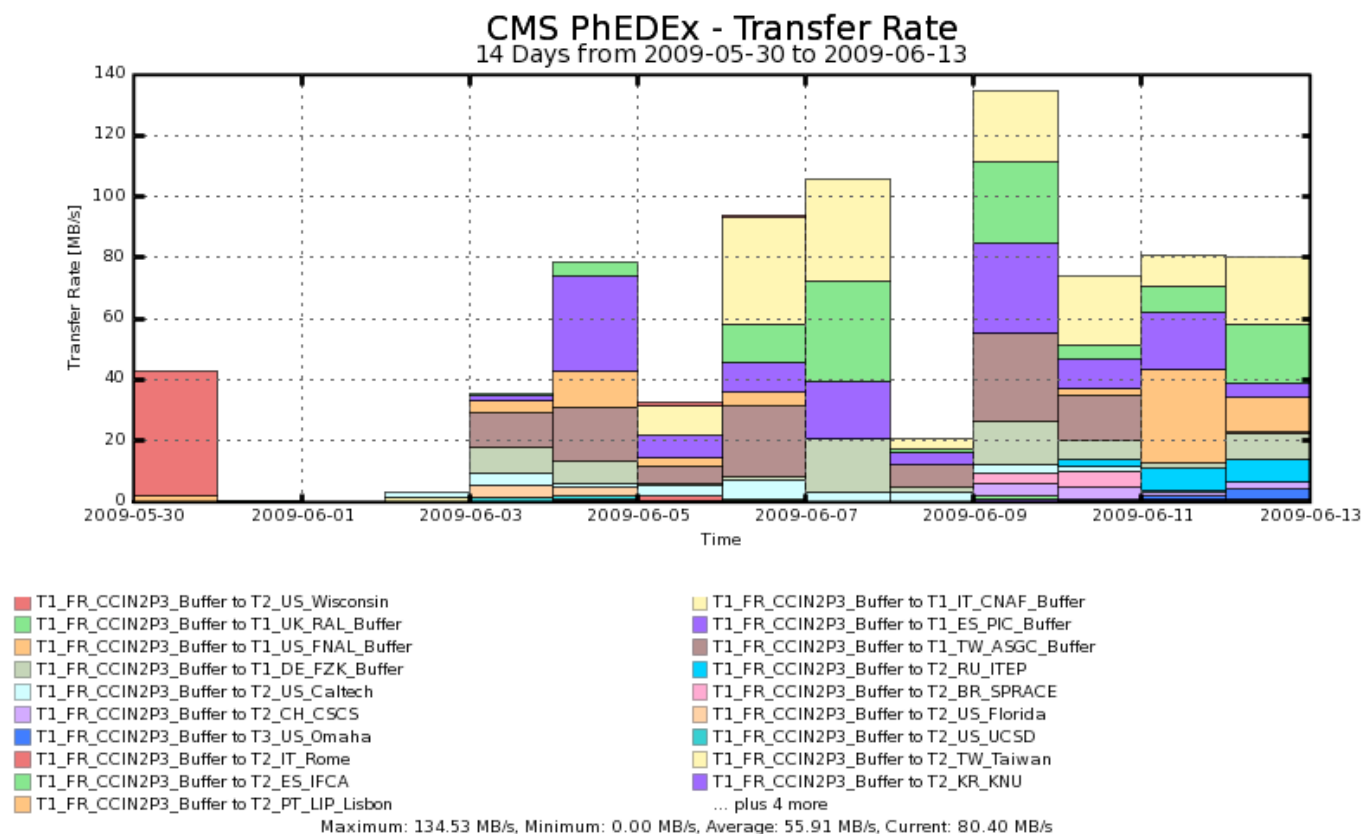
Maximum: 221.70 MB/s, Minimum: 0.00 MB/s, Average: 75.35 MB/s, Current: 66.28 MB/s



## STEP09 Data Transfer : data EXPORT



To 23 sites

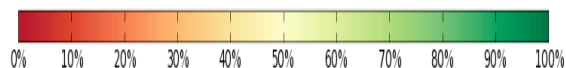
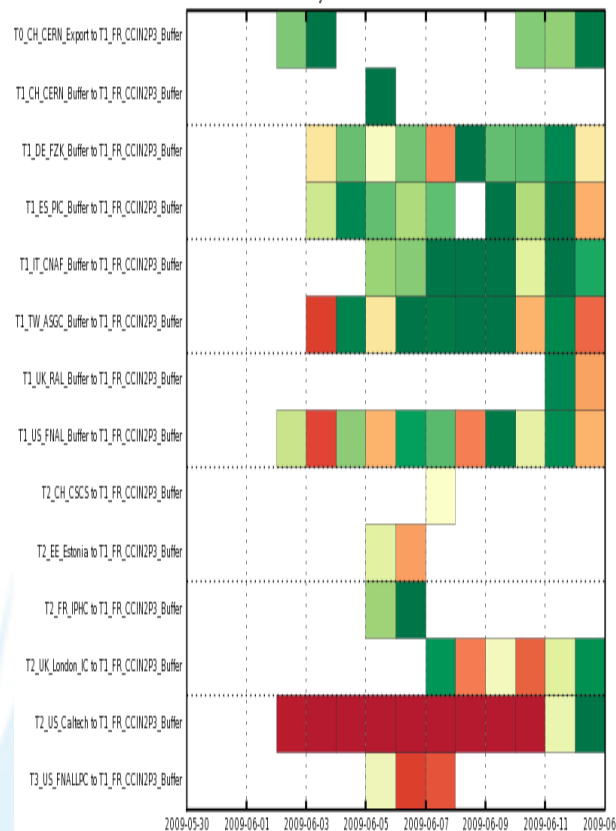


# STEP09 Data Transfer: Quality



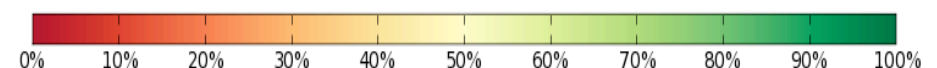
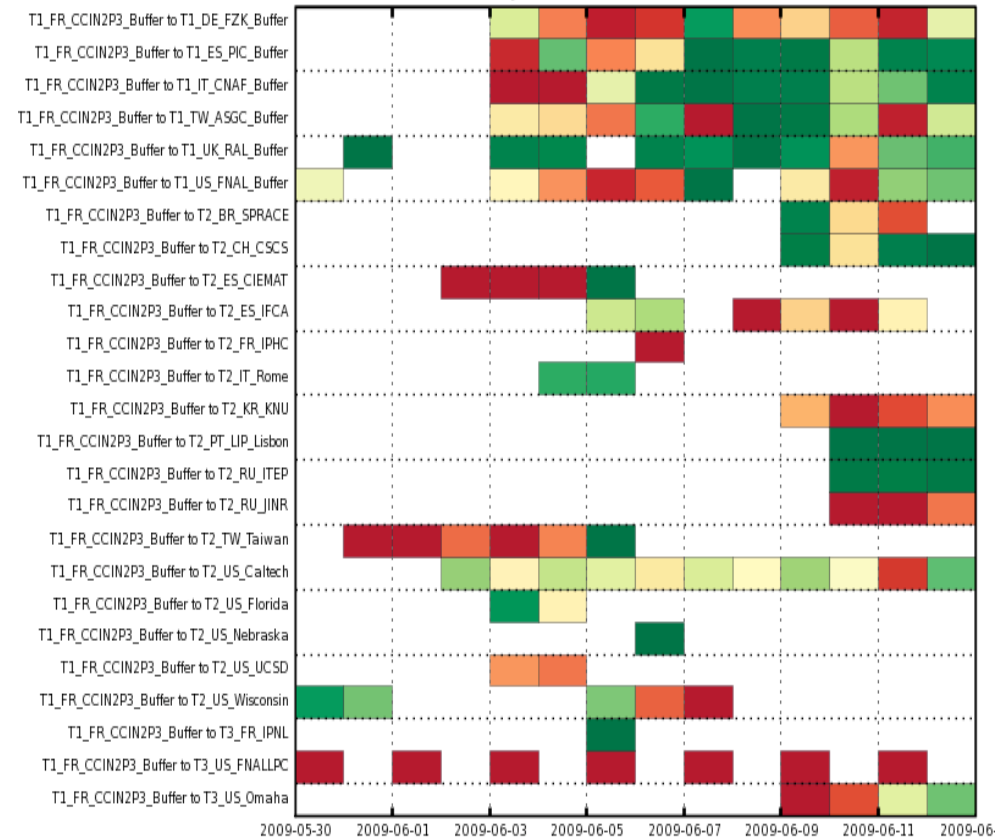
## From all to CCIN2P3

CMS PhEDEx - Transfer Quality  
14 Days from 2009-05-30 to 2009-06-13



## From CCIN2P3 to all

CMS PhEDEx - Transfer Quality  
14 Days from 2009-05-30 to 2009-06-13







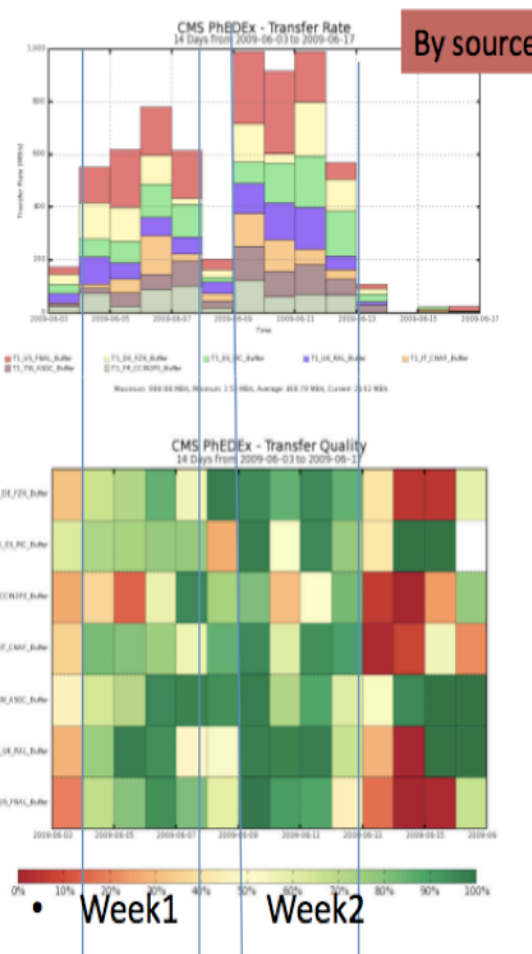
# All CMS T1s:



## TI→TI transfers



- ▶ Populated 7 datasets at 7 TIs with individual size proportional to custodial fraction of AOD and total size 50 TB
- ▶ Subscribed to all other TIs and unsuspended simultaneously
- ▶ Transfer goal:
  - ▶ Complete redistribution of 50 TB to all 7 TIs in 3 days
  - ▶ Requires 1215 MB/s global sustained
- ▶ In week 1 sites were working on configuration
  - ▶ Adaption of existing configurations to test conditions
- ▶ Week 2: reached 989 MB/s





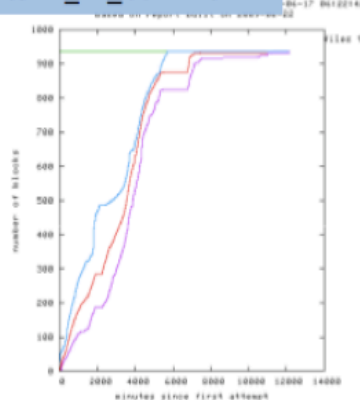
# All CMS T1s:



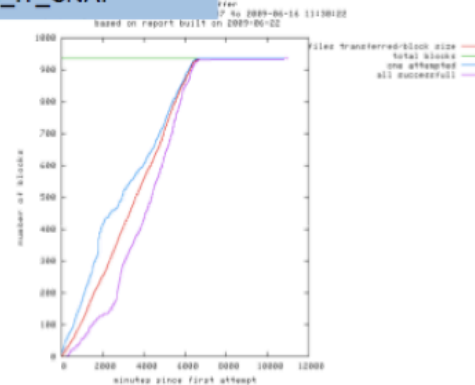
## T1→T1 latencies



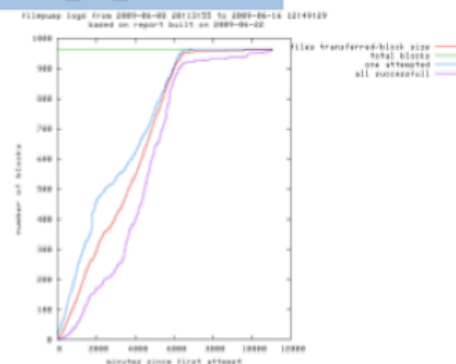
Imports to T1\_FR\_CCIN2P3



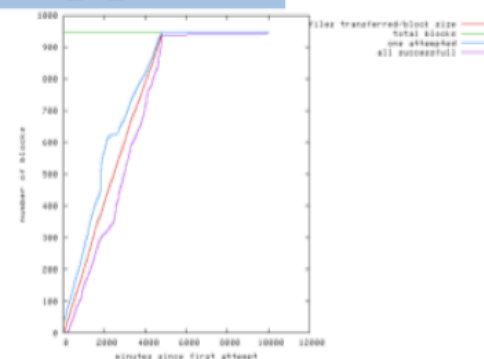
Imports to T1\_IT\_CNAF



Imports to T1\_UK\_RAL



Imports to T1\_ES\_PIC



► General feature: smooth import rates, long tails by few blocks/files

The full STEP09 post-modern  
will be available on mid-July

Questions?