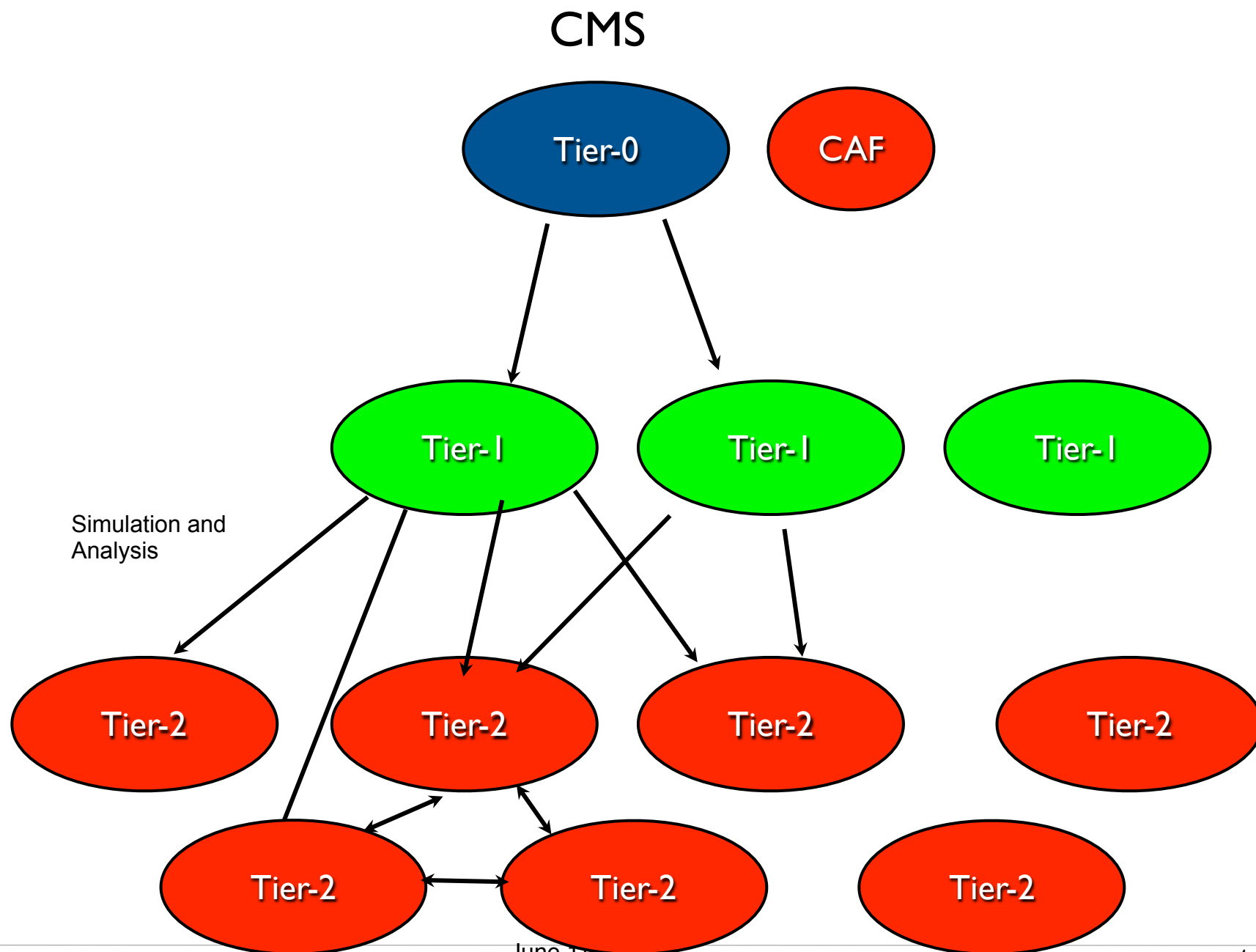




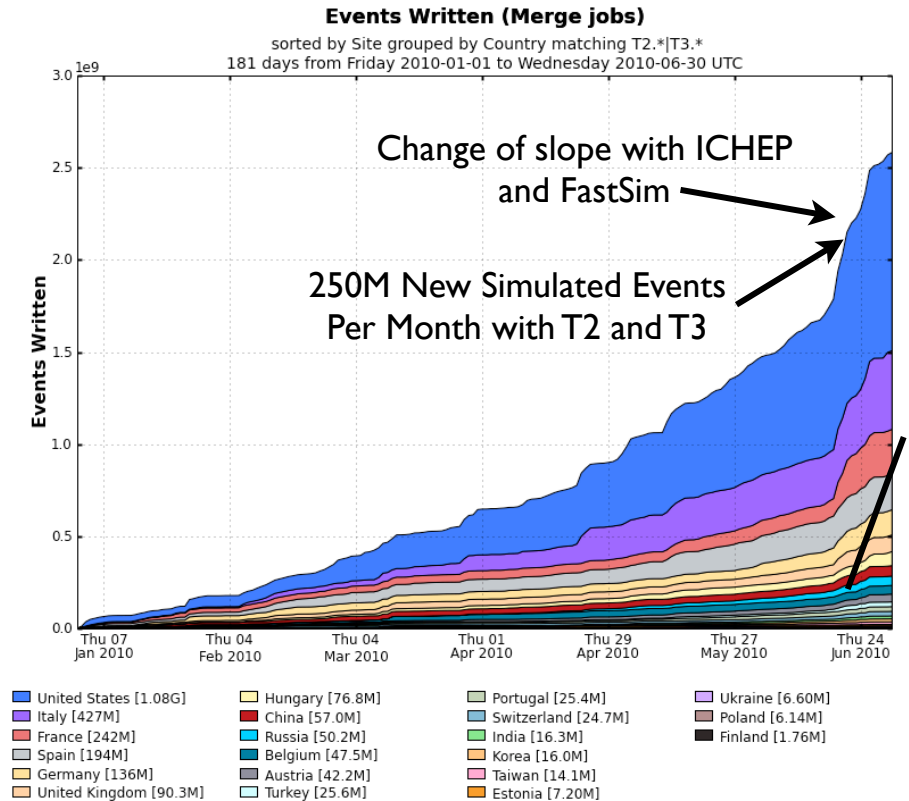
# CMS Data Distribution Model





# Simulation Activities

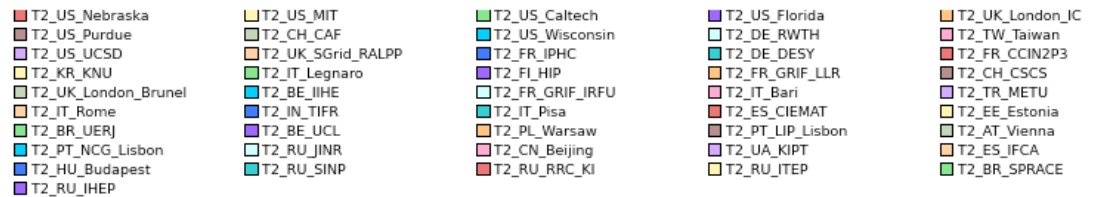
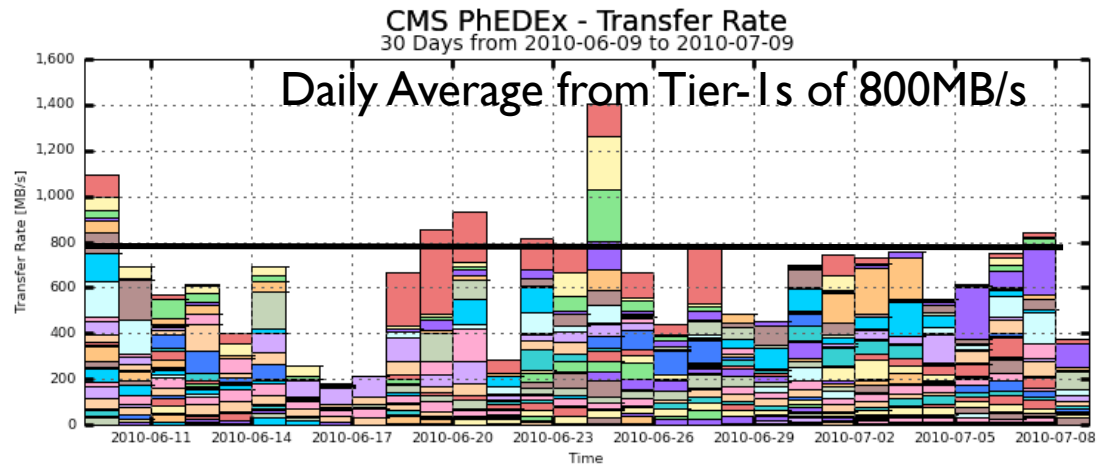
- ▶ Simulation going well
- ▶ Number of events processed roughly what was expected
- ▶ Large amount of reprocessing at Tier-1s





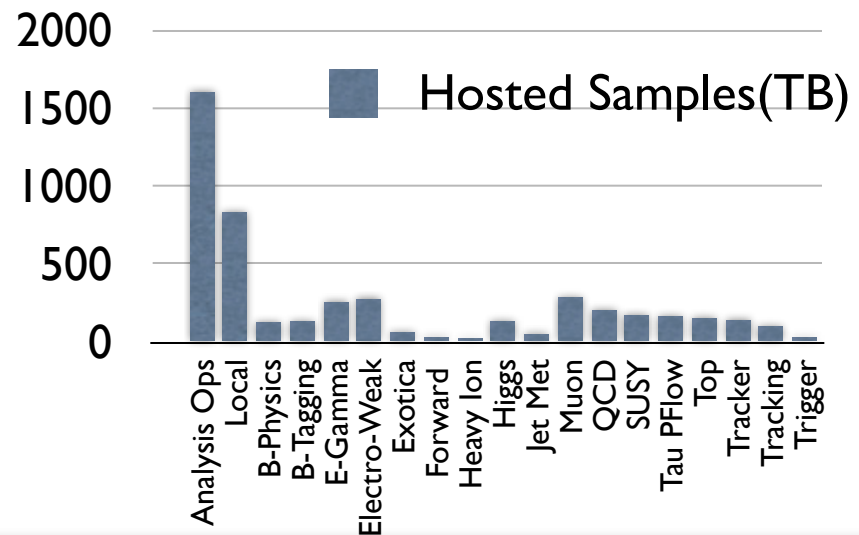
# Transfers and Data

- ▶ Tier-1 to Tier-2 Transfers
- ▶ Peaks correspond to reprocessing
- ▶ 50 Tier-2s Receiving Data



Maximum: 1,407 MB/s, Minimum: 180.23 MB/s, Average: 645.24 MB/s, Current: 376.65 MB/s

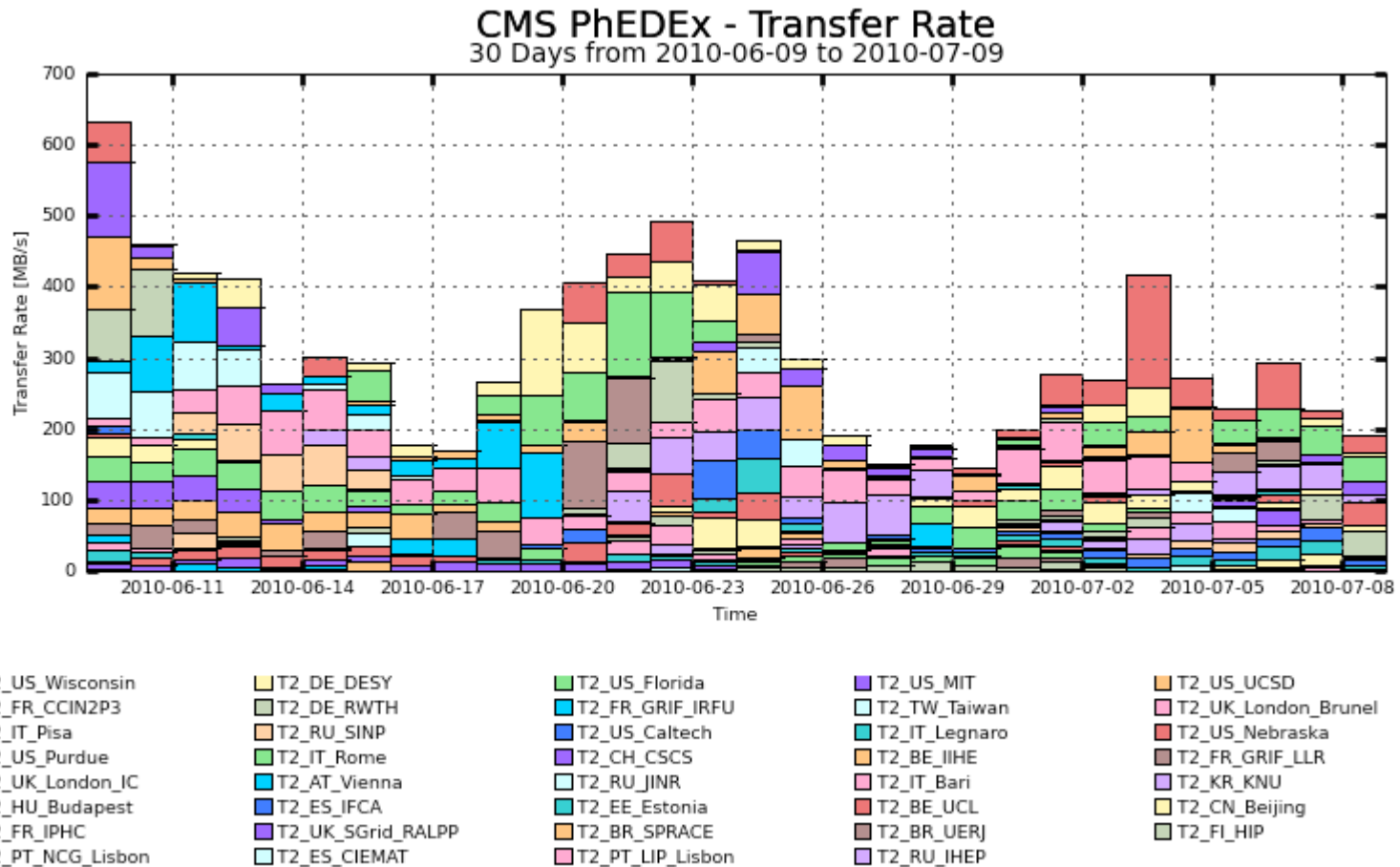
- ▶ CMS Analysis Operations has 1.6PB subscribed to Tier-2 centers for common samples
- ▶ Physics Groups are managing more than 2PB
- ▶ Local Communities are managing 0.8PB





# Tier-2 to Tier-2 Transfers

- Tier-2 to Tier-2 mesh is ramping up and becoming an important source of data

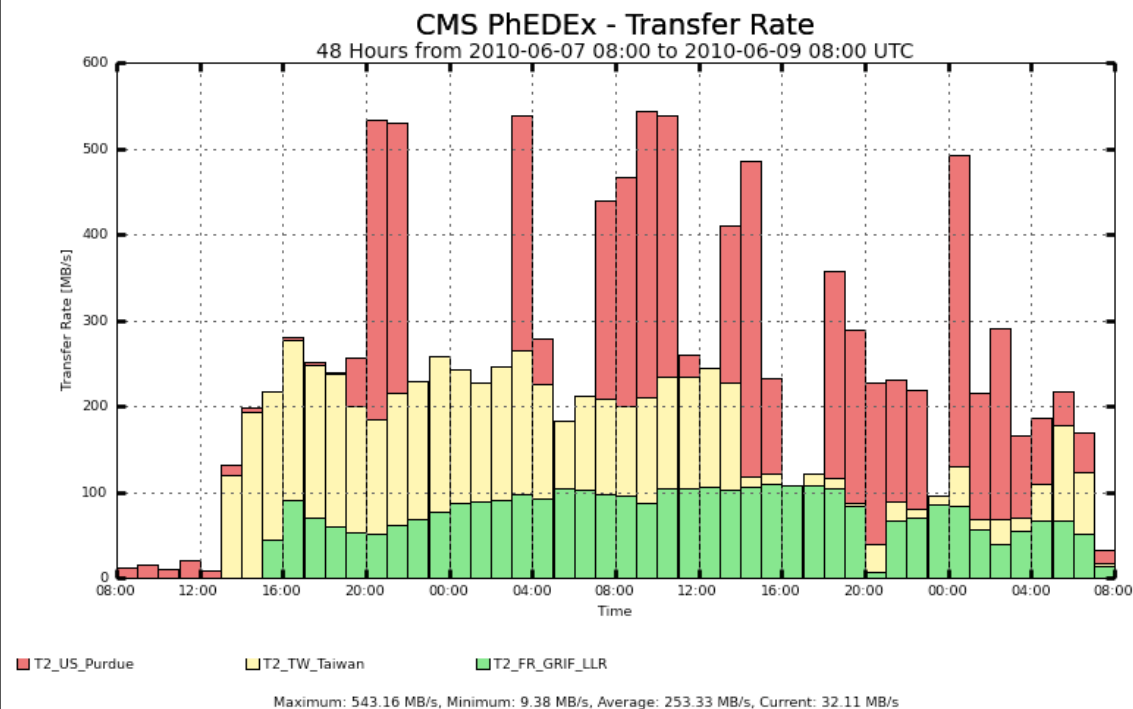


Maximum: 632.14 MB/s, Minimum: 145.72 MB/s, Average: 310.84 MB/s, Current: 192.46 MB/s

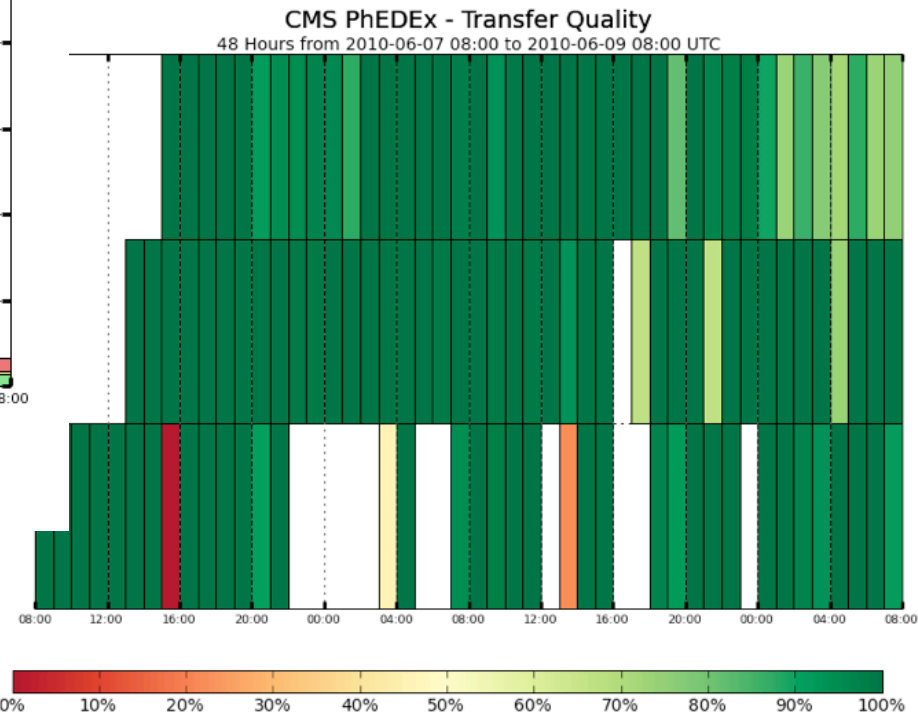


# Beginning of June: a case study

- CMS produced a 35TB skim of the data sample after a reprocessing pass
  - Skim took about 36 hours to produce
  - Data is then subscribed to analysis users



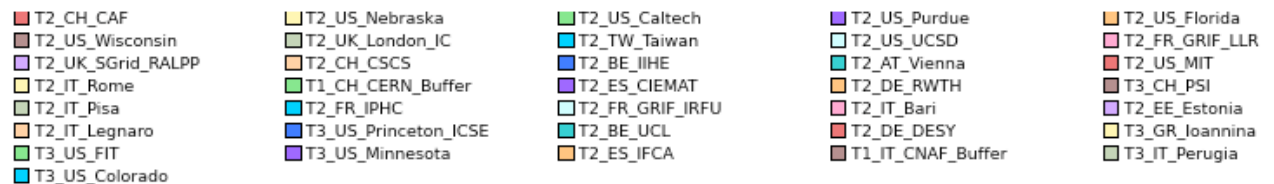
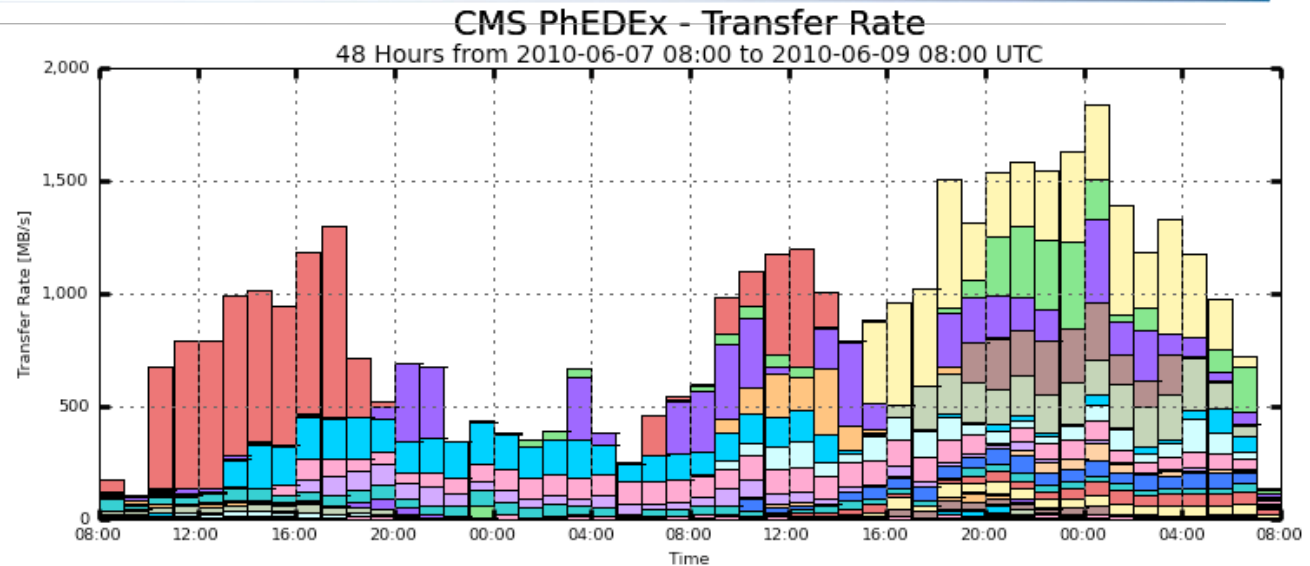
Maximum: 543.16 MB/s, Minimum: 9.38 MB/s, Average: 253.33 MB/s, Current: 32.11 MB/s



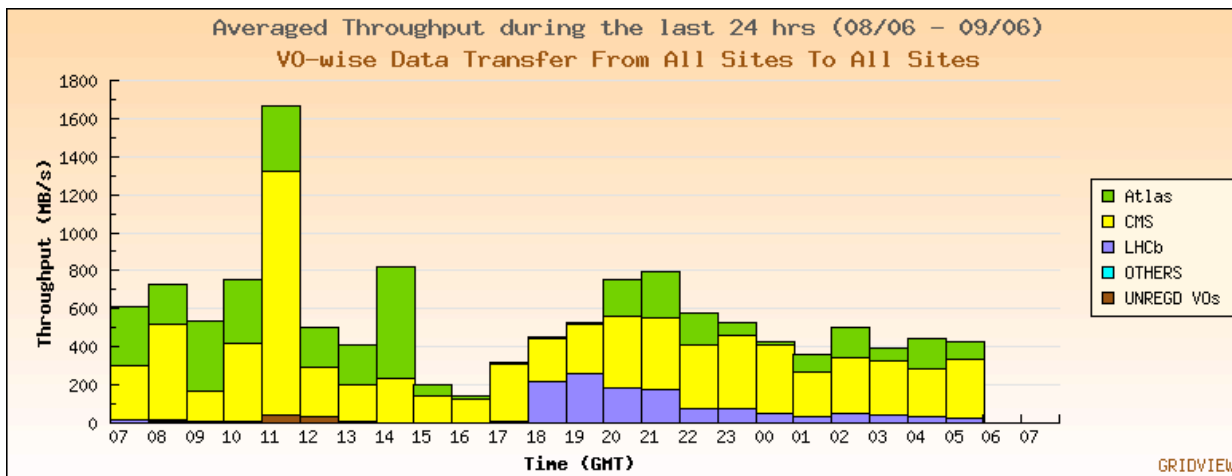


# Total Export Rate

- Source site is exporting data at more than 1.5GB/s (12Gb/s)
- Higher than CERN for all 4 VOs



Maximum: 1,835 MB/s, Minimum: 105.52 MB/s, Average: 884.14 MB/s, Current: 134.62 MB/s



June 11/Ian Fisk

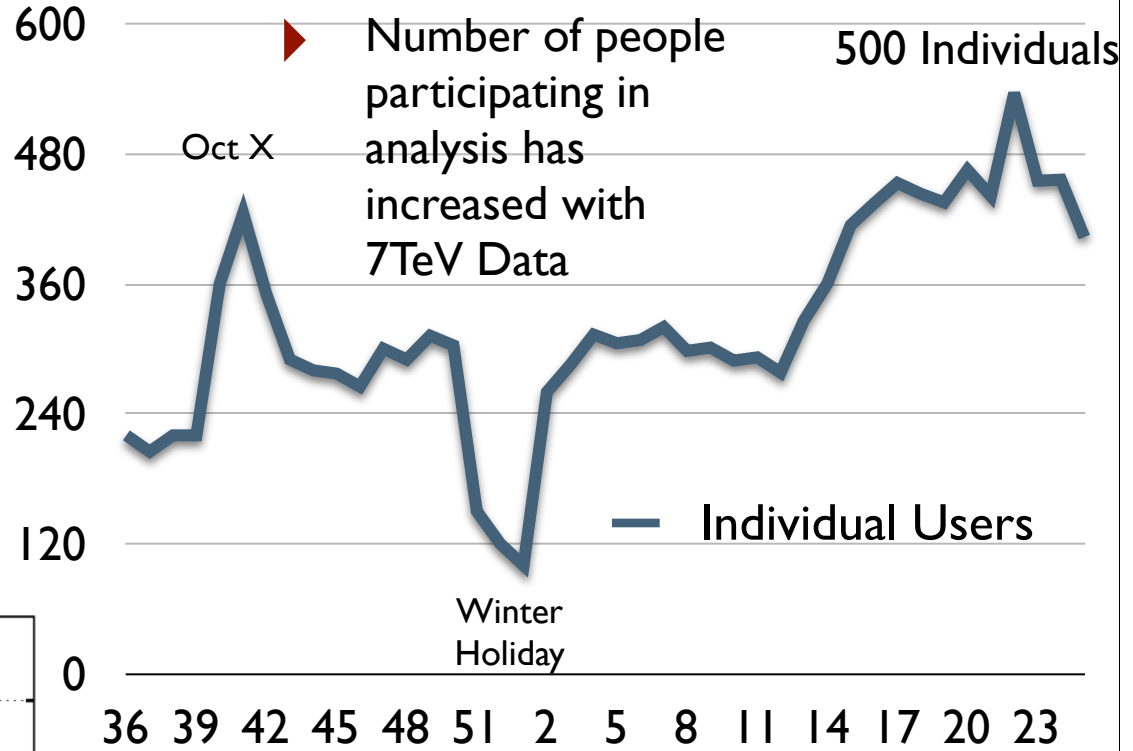
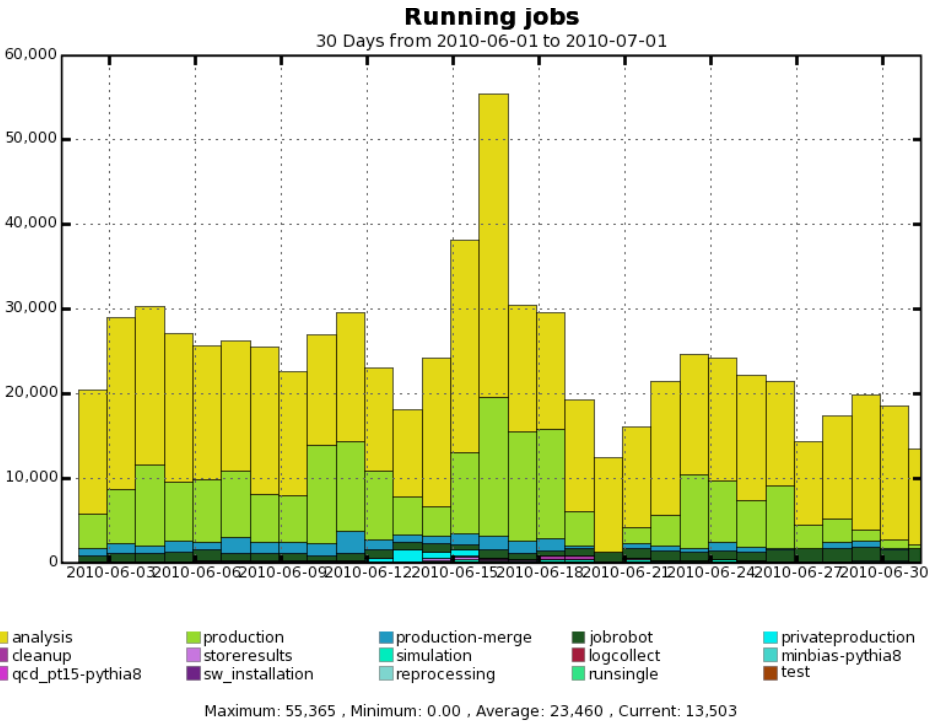
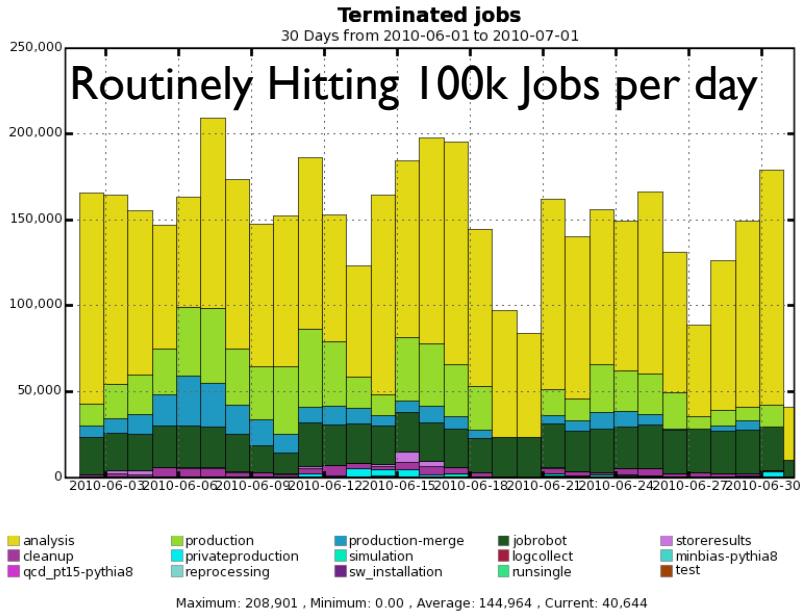


# Tier-1 to Tier-2

- **In CMS Tier-1 to Tier-2**
  - **Driven by group and user requests**
  - **Already we have a 35TB sample users are trying to replicate and access**
    - **Somewhat unwieldy generally**
    - **Full mesh topology is challenging because there are oceans and heterogeneous environments in the way**
- **Data is refreshed frequently and even large samples may need to refreshed**
  - **500MB/s is already demonstrated**
    - **Hardest use case is going to be refreshing data after reprocessing**
      - **Typically comes from one place and needs to go to many**



# Analysis Activity



▶ 10-20k Analysis submissions running on Tier-2s continuously for June