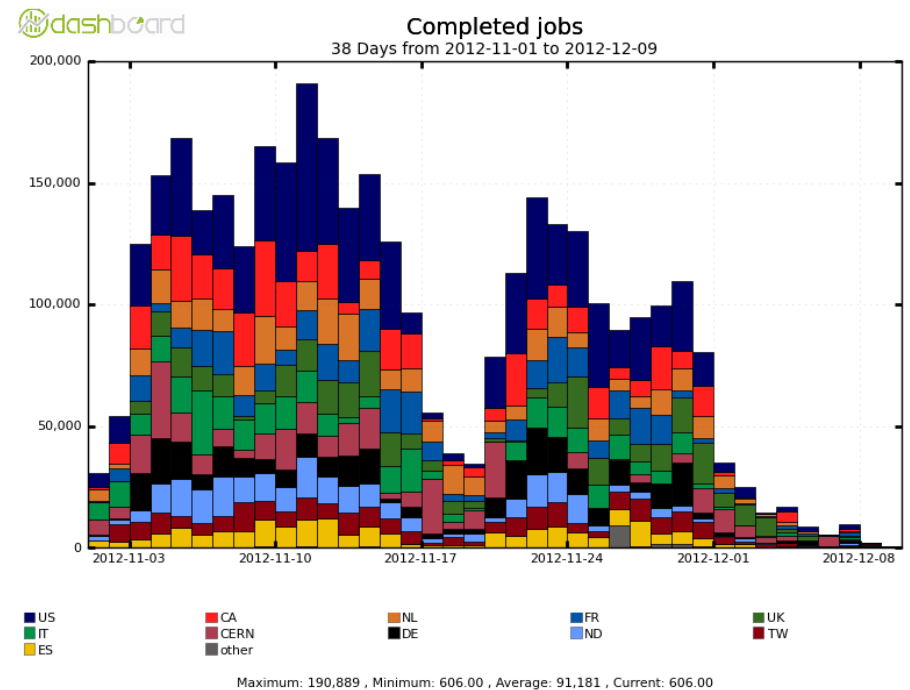# Grid Data Processing

Andrej Filipčič - Jožef Stefan Institute
Rod Walker - LMU
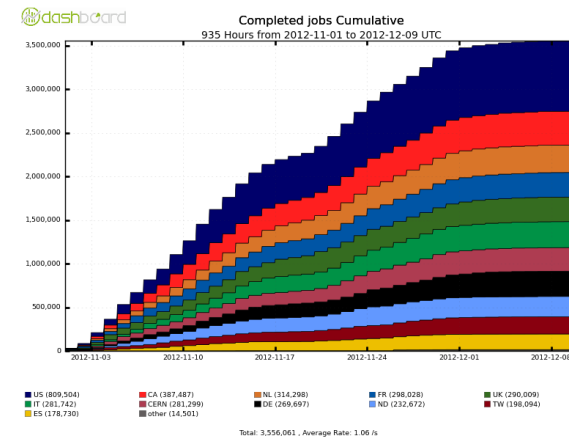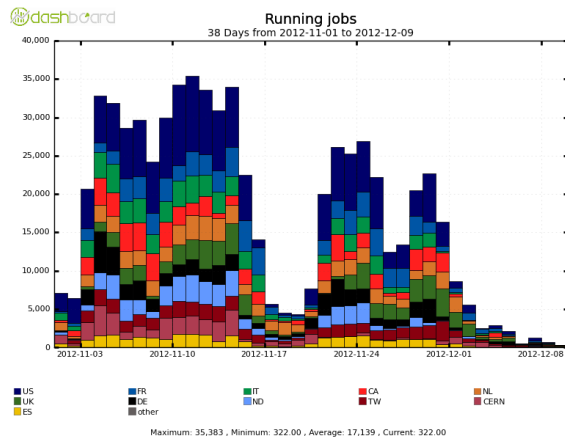
Reprocessing report

- ## Started on 2012.11.2

- ## Not quite finished yet, but most on 2012.12.1

- ## Inputs: mostly from disk, some from tape

- ## Remaining jobs:
  - Athena failures
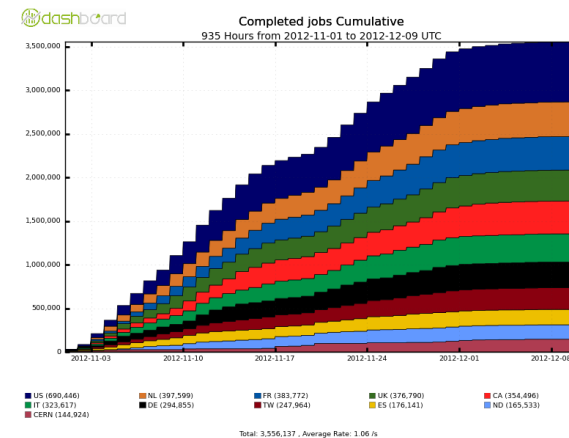 - Site failures (lost files)

Jobs per processing cloud

Reprocessing statistics

Processing cloud

Destination cloud

- 30k simultaneous jobs
- Second part lower due to lower no of running jobs on T1s
- Multi-cloud processing extensively used – many sites ran foreign jobs
- Few T2Ds added to speed up reprocessing – not all to let MC pile-up and group production progress
- Job types:
  - 2.7M Reconstruction
  - 0.8M merging....

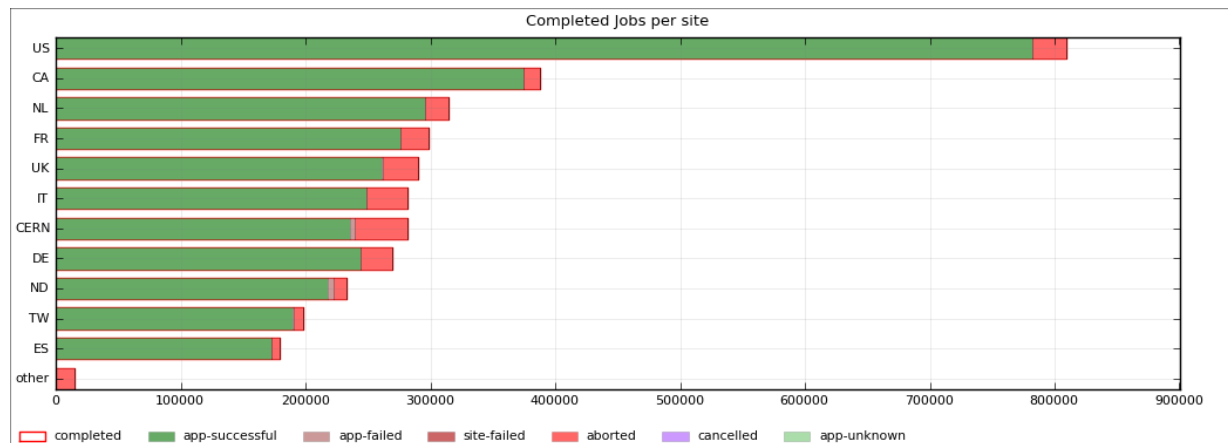# Problems

- Tier-1 downtimes
  - Power outage at RAL
  - Tape performance issues at FZK
- Full DATADISK at several sites
  - Need to balance the number of activated reprocessing tasks
  - Finish with period and cleanup temporary datasets before the next period was activated

Reprocessing and resources

T2s

T0+T1s
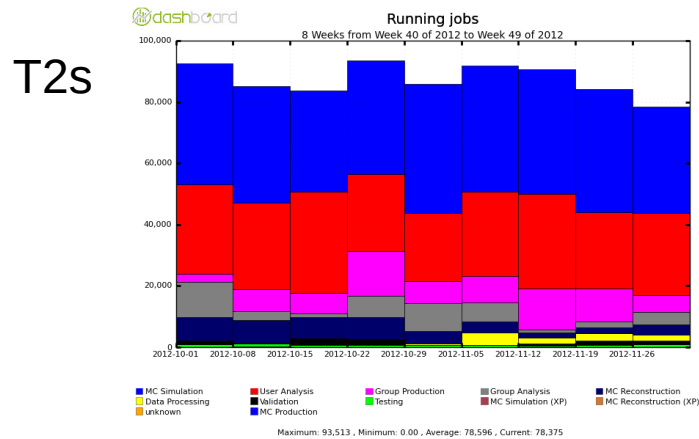
- Reprocessing mostly took MC simulation slots at T1s

- More Group production done T2s in December

- MC pile-up was reduced on T1s but also on T2s
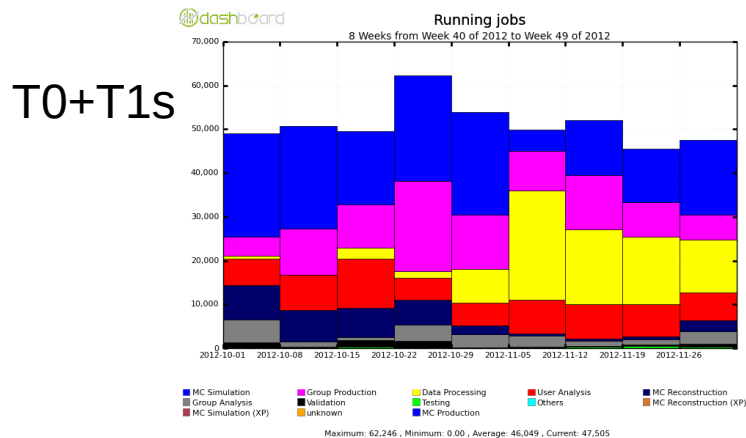
PRODDISK issues

- ## PRODDISK used for
  - On T1: Multi-cloud processing
  - On T2/T3: for all production jobs

- ## Fat jobs (many inputs, large outputs):
  - 35-50TB on large sites → significant fraction of disk space
  - "permanent" space reservation → smaller DATADISK
  - Wildly varying usage pattern: from 10 to 100%

PRODDISK removal

- Goal: use DATADISK for temporary datasets

- Inputs datasets: migrated already on 5 T1s

  - Needs a change in panda server only

  - 90% of PRODDISK was used by inputs

  - PRODDISK space reservation lowered on 2 T1s and given to DATADISK

  - Continue with the rest of the T1s after reprocessing is complete

- Output datasets:

  - A change in the pilot code is needed

  - Testing in January

- After all T1s are migrated, continue with the rest of the sites and remove PRODDISK completely.

Downtime handling

- Two mechanisms:
  - Offline: a site does not receive new jobs
  - Brokeroff: a site (cloud) does not receive new tasks
- Problem with recovery:
  - Takes a long time (several hours) to run and complete the functional tests
  - When brokeroff, new tasks are not assigned, after downtime it takes a long time for new tasks to fully activate
- Changes:
  - Brokeroff/offline handling (see Jarka's slides) → Short downtimes should affect the production/analysis for much shorter period (check)

AGIS/Schedconfig

- **AGIS will become the ultimate information system for ATLAS → a unique source for all the site settings, capabilities**

  - All the services will migrate to AGIS as primary source of information/configuration

- **Schedconfig:**

  - Up to now, the site/queue settings stored in svn

  - AGIS and Schedconfig in sync

  - Schedconfig will use AGIS as the source of information

- **svn access will be disabled → web api/interface for site settings/configuration (will be announced when ready)**

Site parameters

● Memory: requirement still 2GB/core (physical)

➡ Memory: 2GB, but sometimes more is used, up to 4GB vmem. Even the newest hardware rarely capable of more than 2GB/core.

➡ Sites/queues are requested to publish maxmemory settings

➡ If the sites can provide more memory for special tasks, this should be published

➡ New mechanisms to limit physical memory (slurm/cgroups), potentially useful later, or ulimit through pilot (see Alessandras's slides)

● Walltime/cputime:

➡ 2 days, not enough for many tasks (long evgens, long pile or group production jobs)

➡ Prodsys: scout job (10) walltime is used to set the walltime of the bulk

➡ Long jobs only assigned to sites with maximum walltime long enough

➡ VO card: cputime 3120 min, walltime 5760

➡ ATLAS jobs typically use up to 2 days of cputime, scaling in SPECs to as low as 1 day on some sites does not make sense

● Hospital queues: queues with 96h limit, used for jobs which do not fit default queue walltime

● Recommendation:

➡ Set longer cputime/walltime for production jobs (2.2 days at least, 4 days if possible at least in T1s)

➡ Keep it short for analysis jobs (2 days?)

● Local disk size:

➡ Some jobs use much more than foreseen 20GB

➡ Maxwdir (in addition to maxinputsize): maximum space available to a job (default site setting: maxinputsize + 2GB)

· Some jobs need much more space for outputs than assumed default of 2GB

Conclusions

- Reprocessing ran smoothly in spite of some site outages

- The tape copies were mostly not used, the availability of those is unclear

- The ATLAS VO card needs a revision, mostly for job time limits

- Activities to reduce the spacetoken related limits on-going

- DATADISK is in crisis. Data placement strategy needs a revision.