



LHC analysis at CC-IN2P3

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Outline



- ◊ Analysis on batch resources
 - ▣ LHCb
 - ▣ ATLAS
 - ▣ ALICE
- ◊ Analysis on PROOF (LAF)
 - ▣ Activities
 - ▣ Setup and prospects



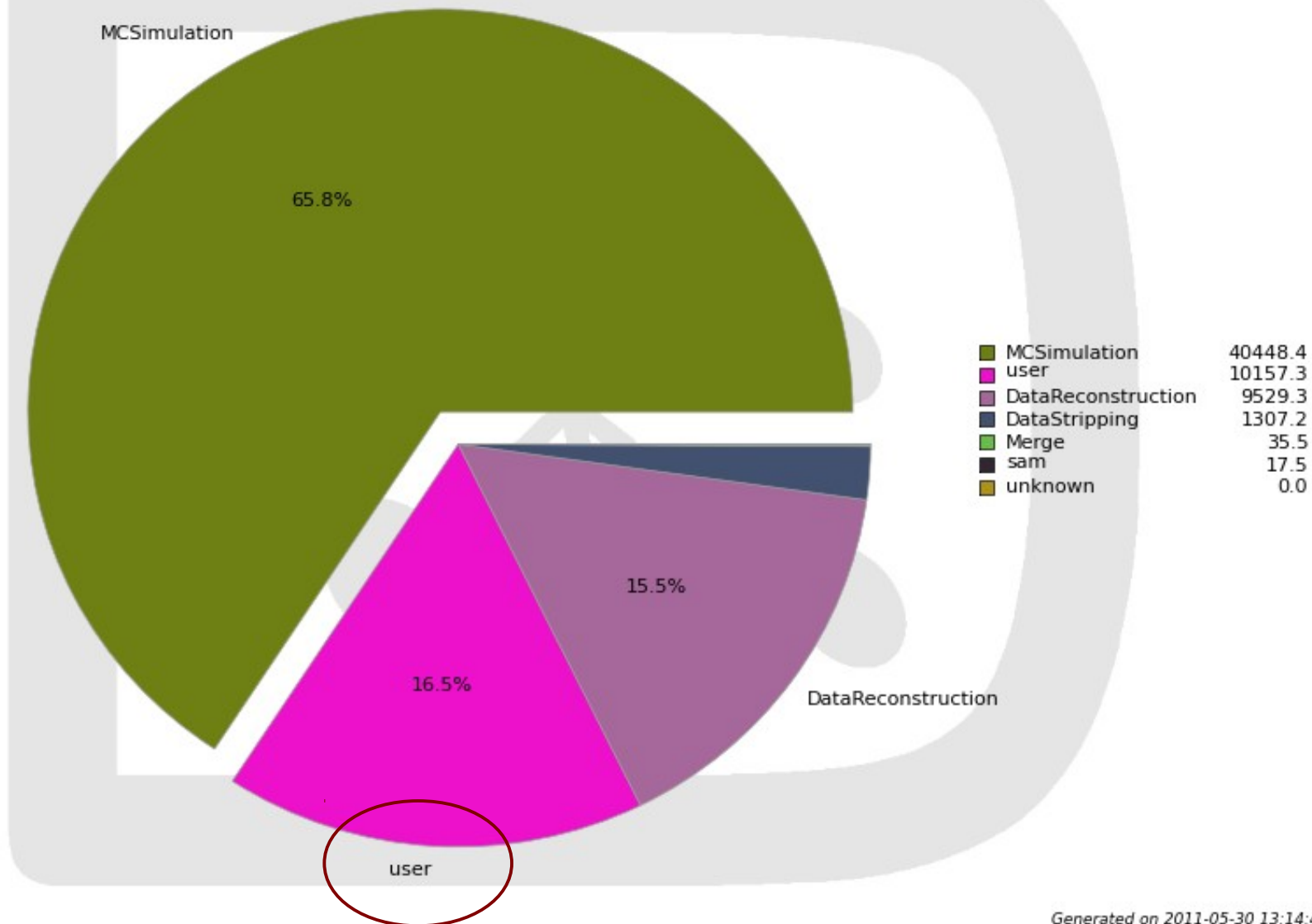
LHCb

LHCb: activity since January

IN2P3

CPU days used by JobType

21 Weeks from Week 00 of 2011 to Week 22 of 2011

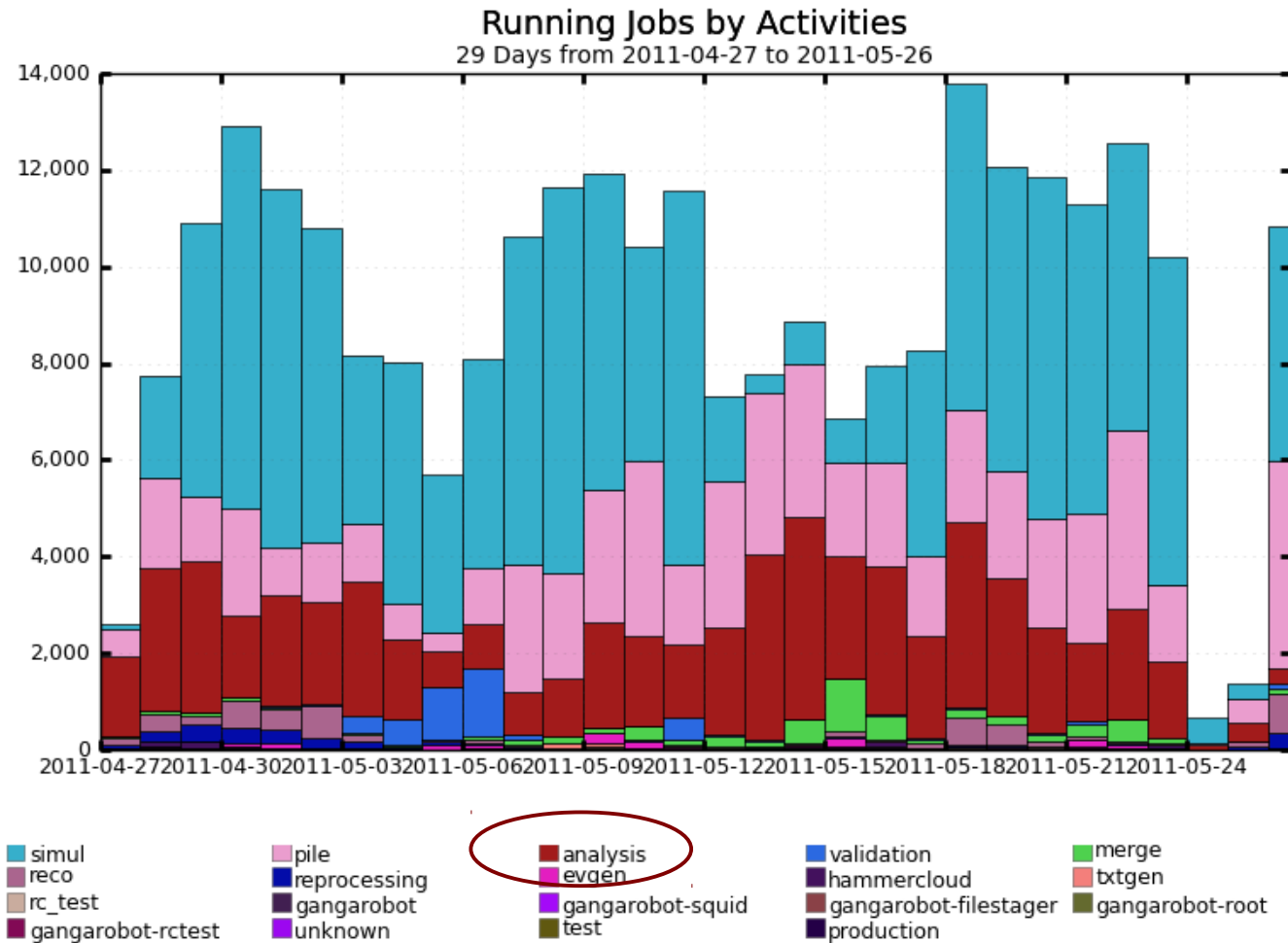


Generated on 2011-05-30 13:14:47 UTC



ATLAS

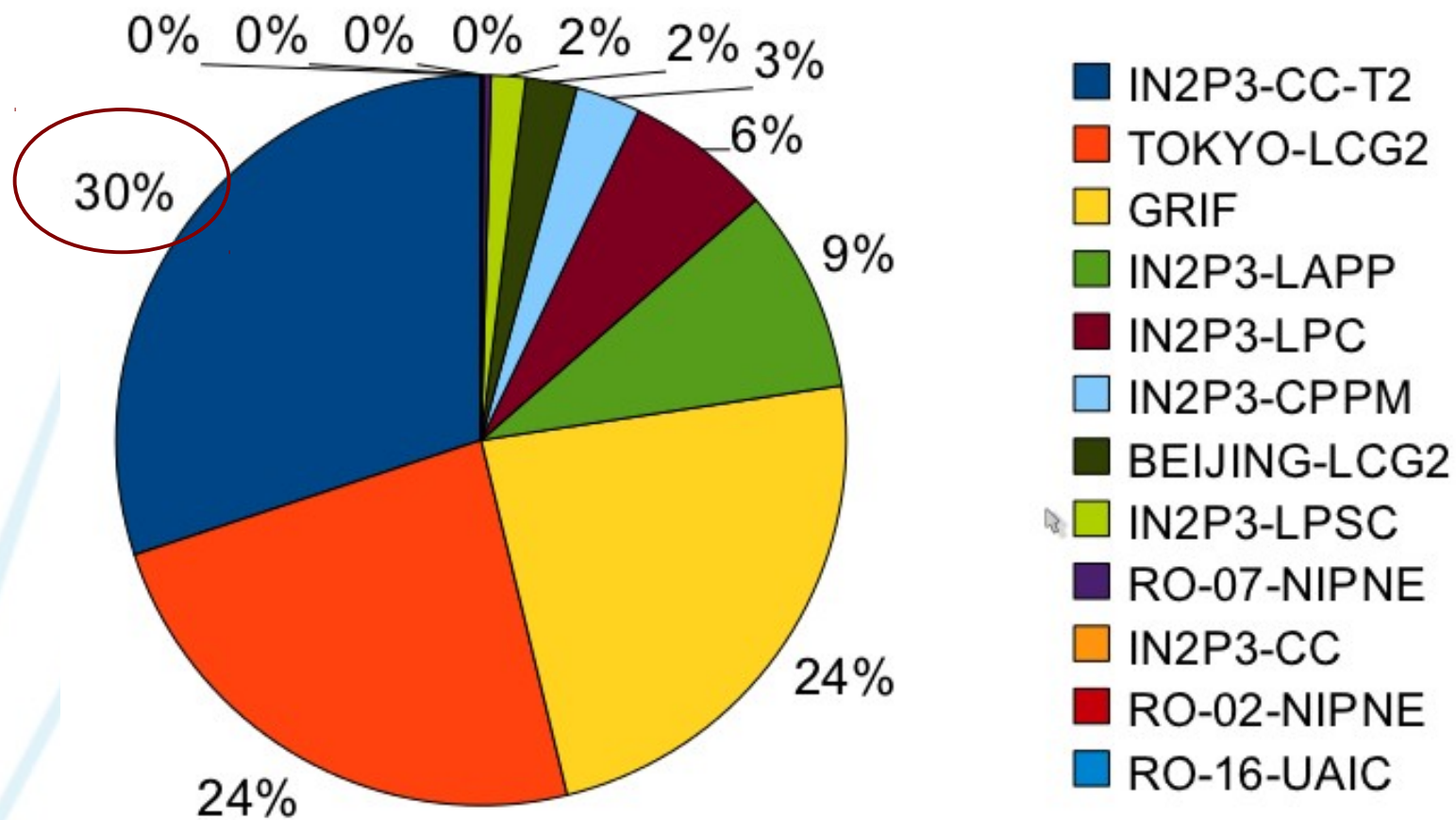
ATLAS: analysis part (March → May)



→ 20% analysis

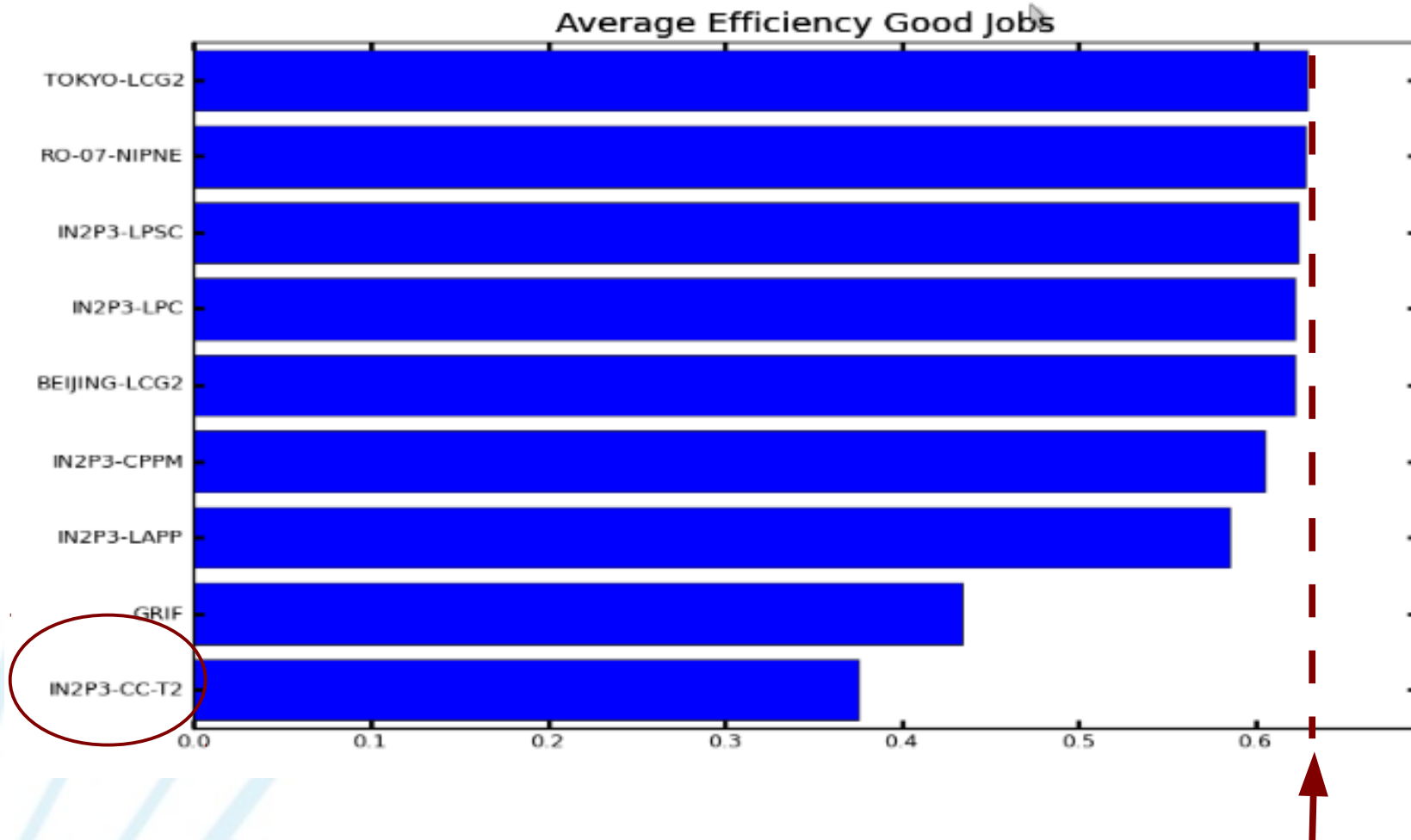
Maximum: 13,784 , Minimum: 665.00 , Average: 9,145 , Current: 10,846

ATLAS: analysis (March → May)



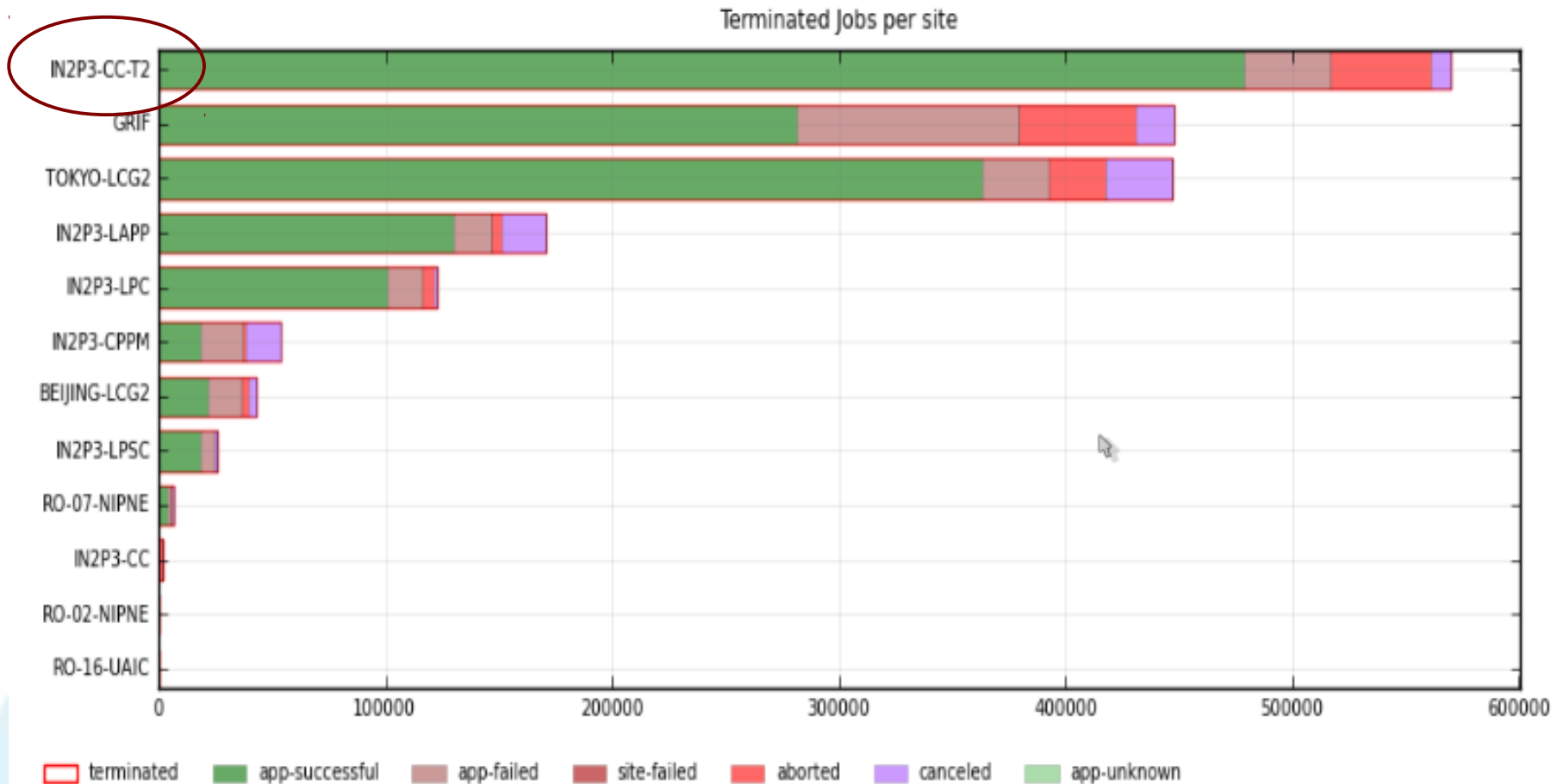
→ Large fraction of analysis done at CC-IN2P3

ATLAS: analysis (March → May)



→ more overhead at CC-IN2P3 than in other French sites ?

ATLAS: analysis (March → May)



→ however good success rate



ALICE

▶ **ALICE: analysis (April → May)**

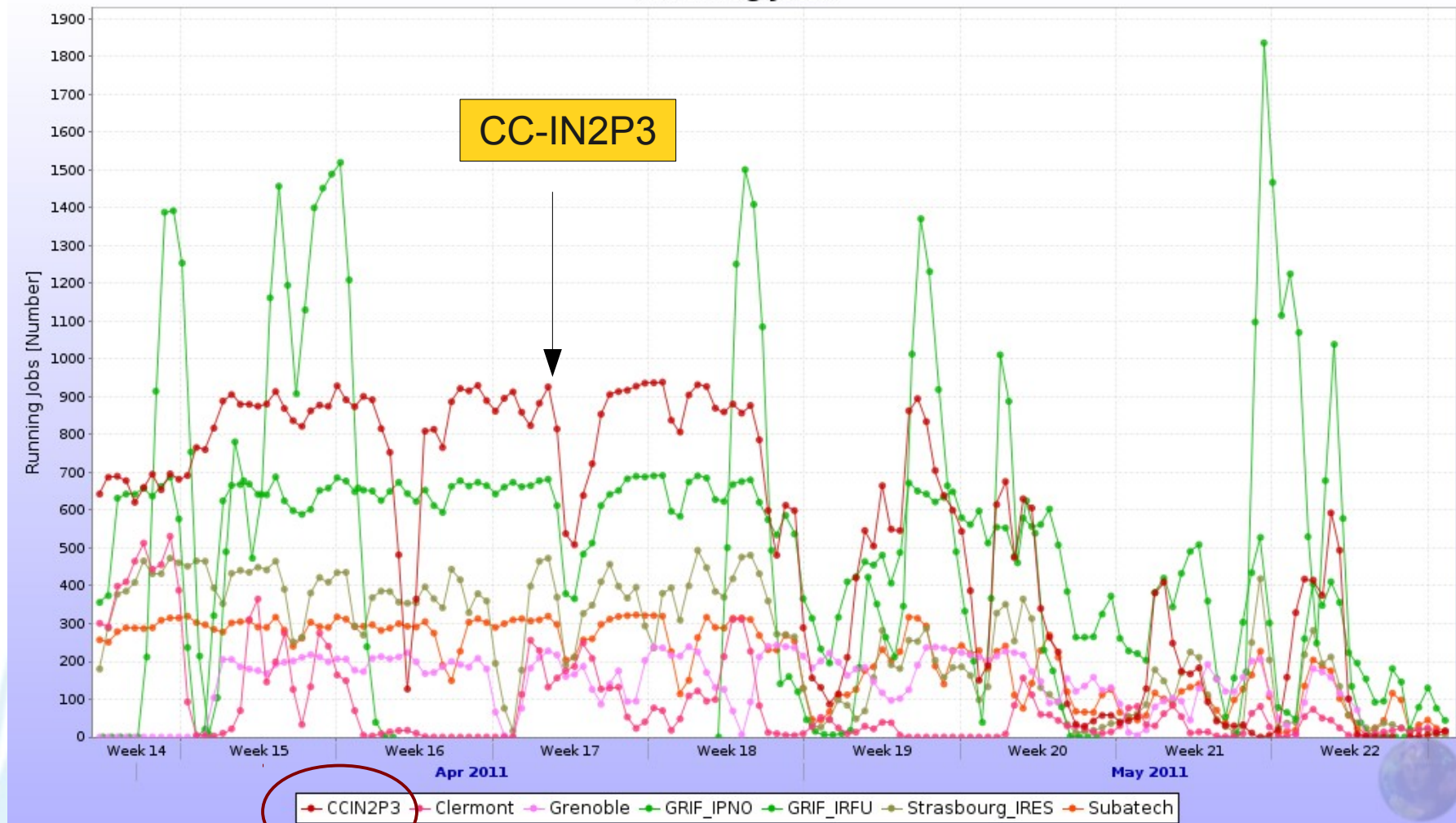


- ⇒ THE heavy ion conference (Quark Matter) took place last week in Annecy
 - ▣ Last month was a real stress test for ALICE computing model
 - ▣ Up to 30k simultaneous jobs (all sites)
 - ▣ 90% analysis jobs last month !
- ⇒ Quite convenient for analysis diagnostic
 - ▣ (no easy differentiation between analysis jobs vs all jobs in ALICE...)

ALICE jobs in France (April → May)



Running Jobs

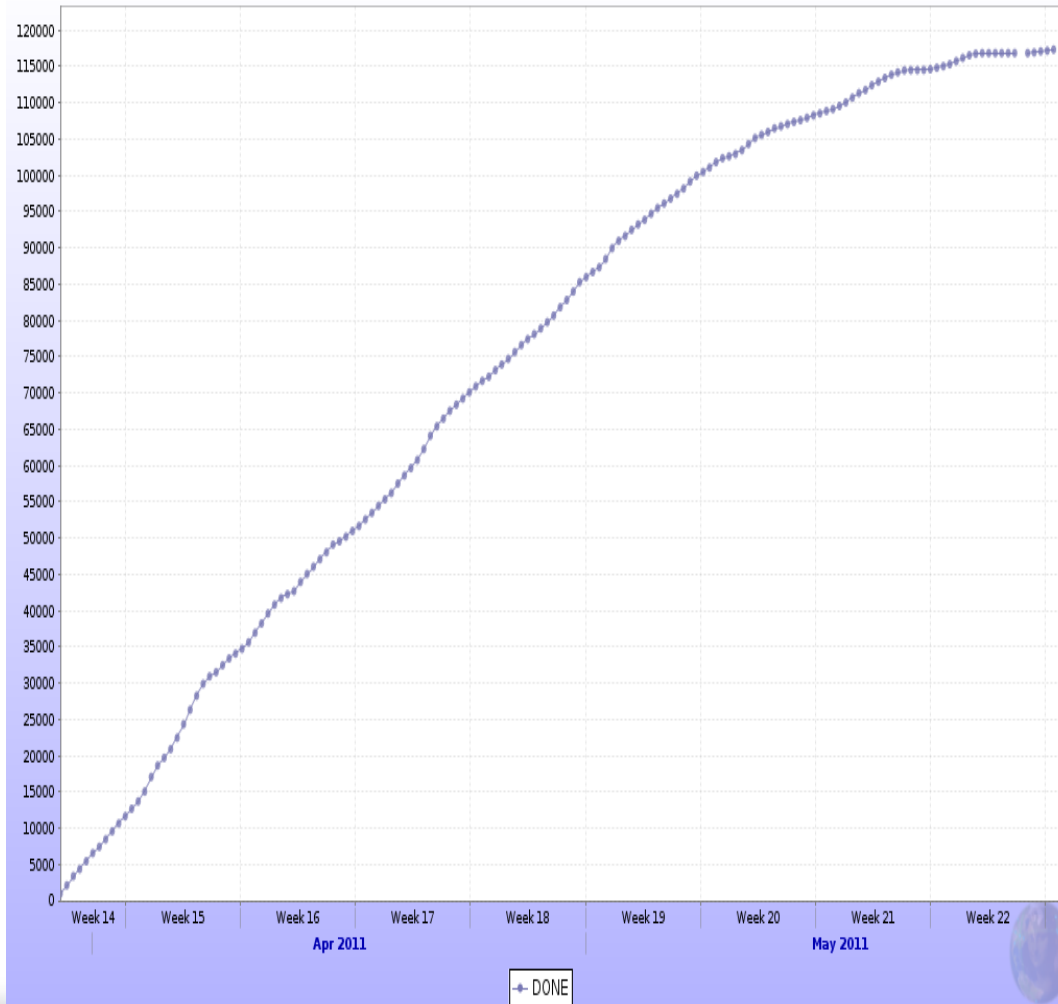


ALICE: done vs errors (April → May)



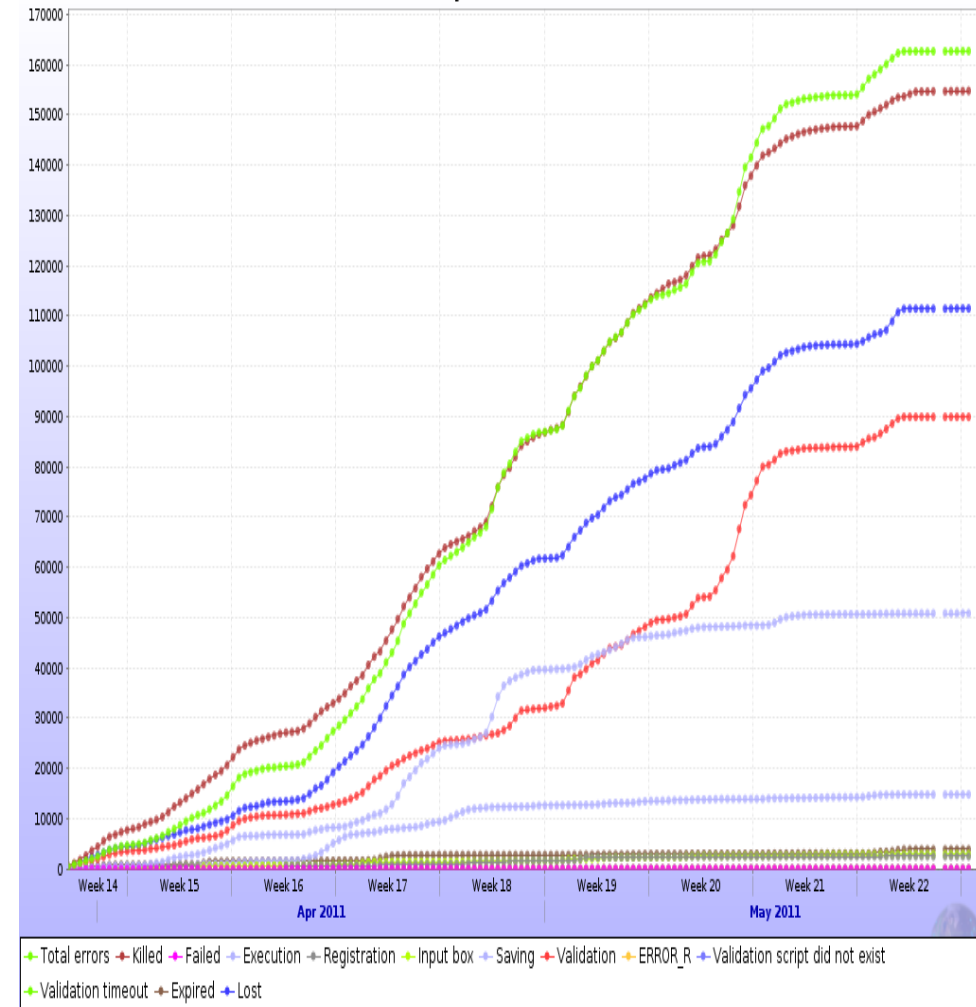
120k

Done jobs in CCIN2P3



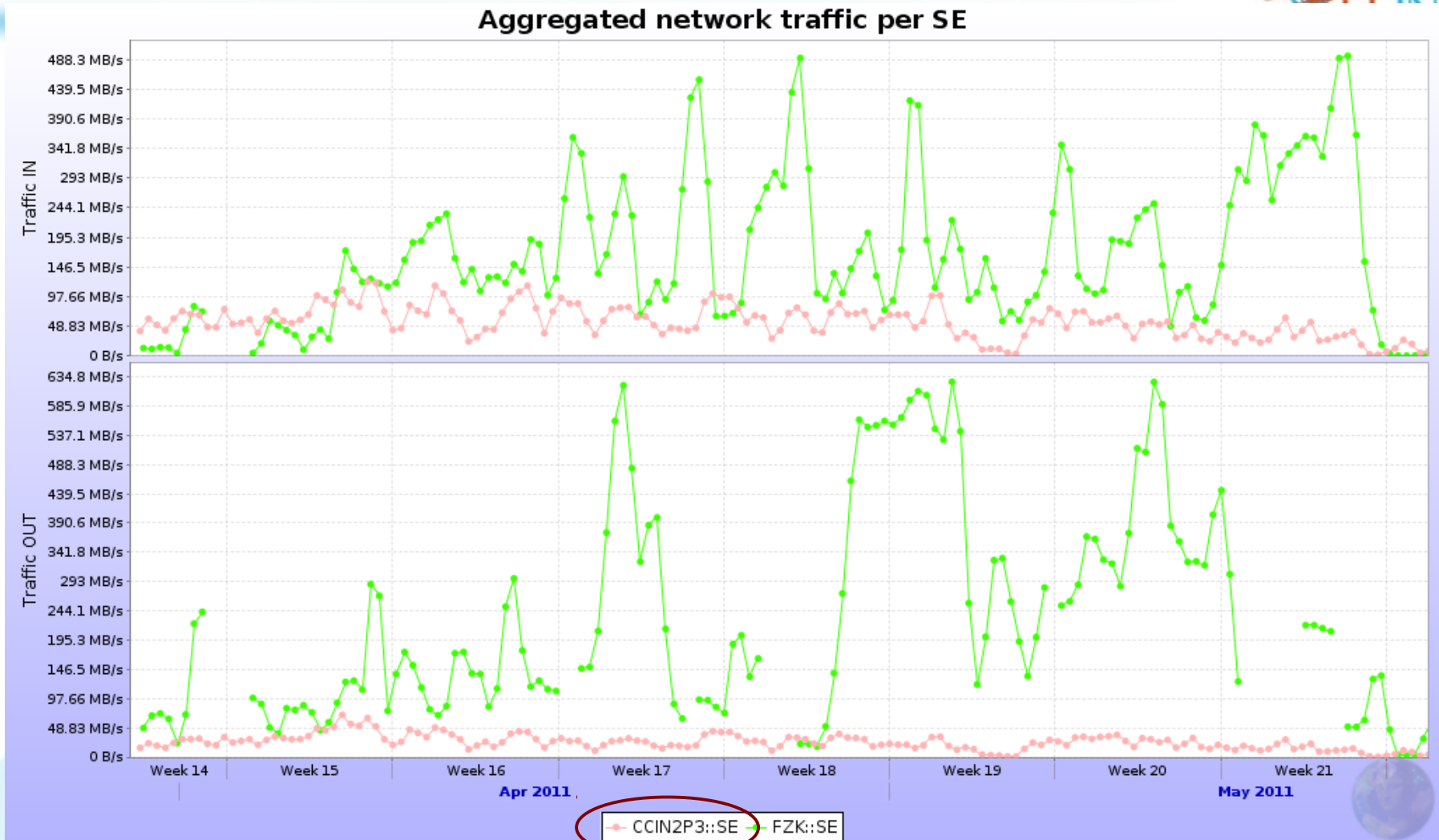
170k

Error jobs in CCIN2P3



→ user jobs show high failure rate
→ not much we can do about it...

ALICE network usage (3 xrd servers)



<out> ~ 25 MB/s

max(out) ~ 150 MB/s



ALICE: summary

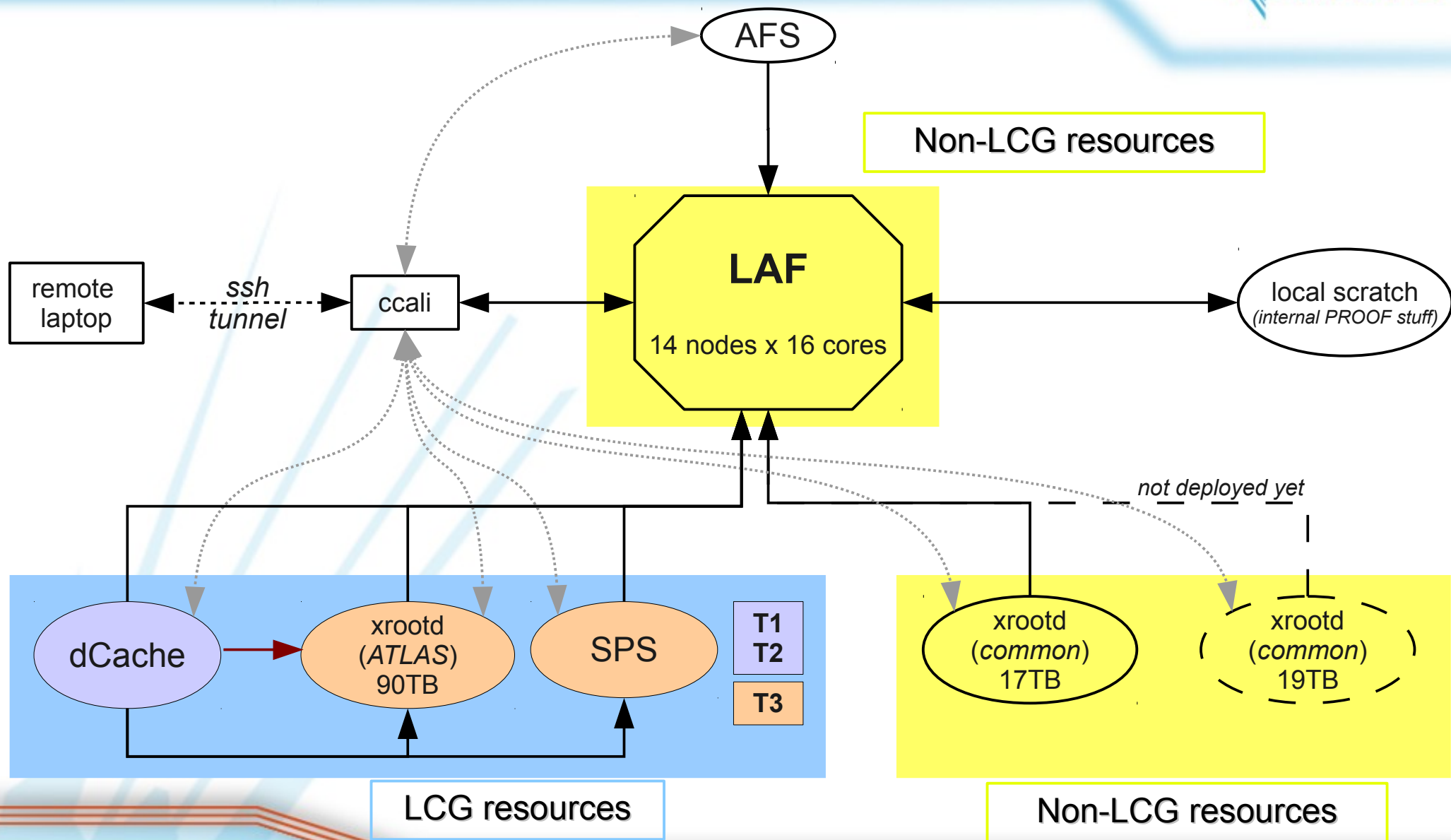


- ◊ CC-IN2P3 is a small Tier-1 in ALICE
 - ▣ resources ~ LHCb
 - ▣ Requires lots of resources though...
- ◊ CPU resources are used
 - ▣ AFS stress issues prevent from using more CPU than pledged
 - ▣ Max # jobs is limited
- ◊ Storage (native xrootd only)
 - ▣ Not much data on disks (<100 TB)
 - ▣ And disks are full !
 - ▣ Smooth migration Solaris → Linux started
 - ▣ Hope to put more servers soon

Lyon Analysis Facility

(PROOF @ CC-IN2P3)

LAF and services at CC-IN2P3





Access



- ◊ Authentication by GRID certificate
- ◊ + account at CC-IN2P3 required
- ◊ Restricted to LHC French labs at the moment
 - → open to other institutions may be addressed (?)



Status



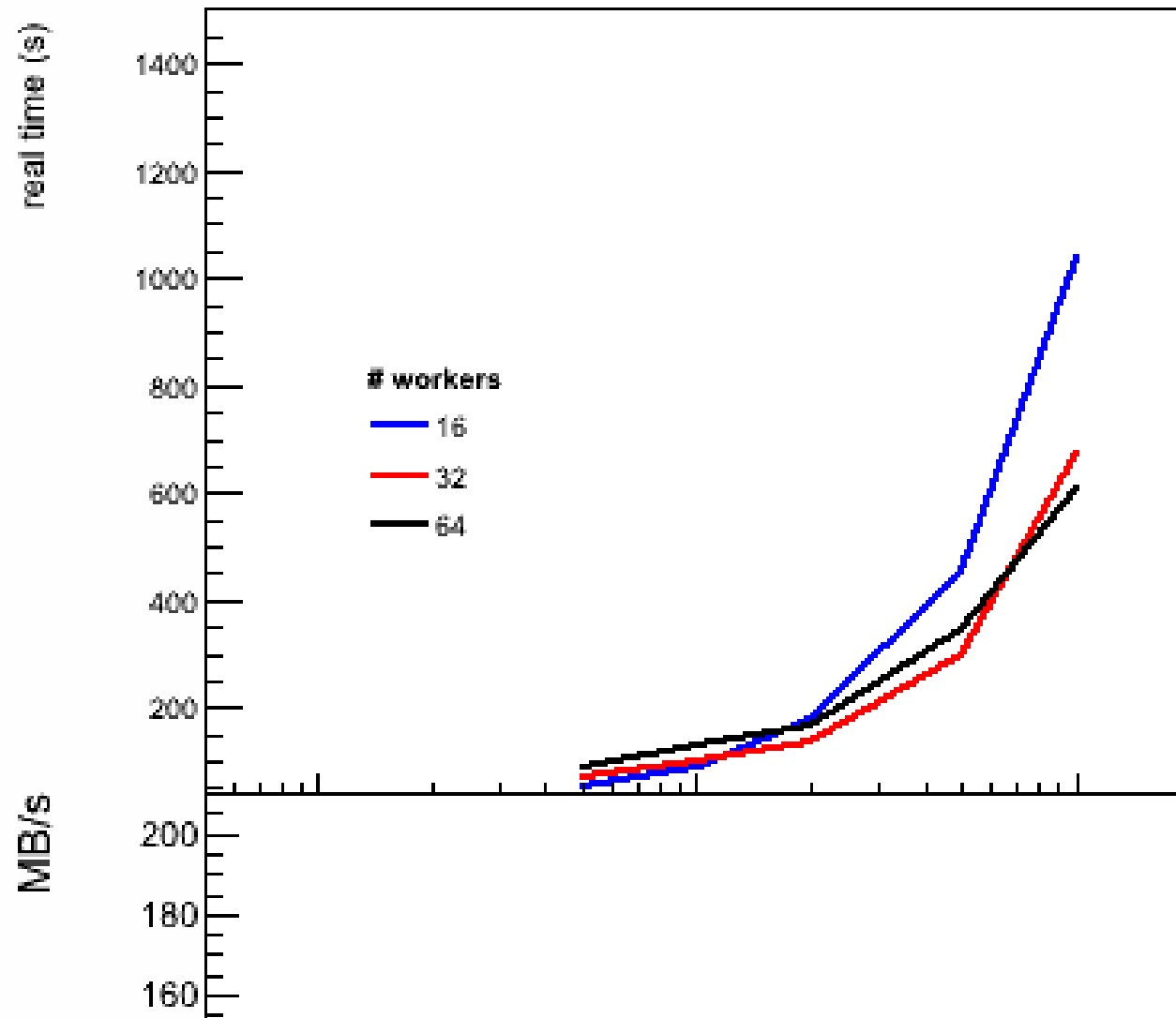
- ◊ Stability : very good
 - ▣ If not, usually user problem
 - ▣ one user can create problems affecting all users
 - ✓ solved quickly most of the time
- ◊ Xrootd disk servers:
 - ▣ Common (17TB) : full
 - ▣ ATLAS (96TB) : full
 - ▣ Purged automatically at 99% usage
- ◊ CPU activity on slaves : low
 - ▣ <10%
- ◊ Analysed data flow
 - ▣ > 1TB / day (peaks) – 10 MB/s average last 2 months

→ activity increasing
→ CPU use much below available power
→ network cannot scale a possible large raise of CPU activity



- ◊ SPS mounted on all LAF workers
- ◊ dCache access plug-in in ROOT successfully tested
- ◊ → datasets can be created from :
 - Grid SE's
 - Xrootd
 - dCache
 - SPS
- ◊ → no systematic staging to xrootd required

CPU activity vs dataset size



- increase of # workers does not scale with processing speed
- good balance must be decided by user



Data staging



ALICE

- ALICE jobs cannot (should not) decide which SE the output goes to
 - ✓ Output stored wherever on the Grid
 - ✓ Copy to local xrootd server has to be done manually
- Home-made staging script works, not perfect though
 - ✓ → user reluctant to do it by himself sometimes
- No storage quota policy applied yet
 - ✓ Storages are full, users regularly contacted for cleanup and suggestions

ATLAS

- Grid output can be saved directly to target SE (dCache, SPS)
 - ✓ → no manual copy needed, PROOF can read such data

→ life seems to be actually easier for ATLAS :
Ideally data arrive at CC-IN2P3,
no manual staging needed



Conclusions



- ⇒ CC-IN2P3 is an important platform for analysis
 - ▣ Biggest analysis site for ATLAS, but low efficiency
- ⇒ ALICE storage
 - ▣ Issues to be solved (ongoing work with CERN)
- ⇒ LAF
 - ▣ Underused CPU power
 - ▣ All storage full
 - ▣ Staging mechanisms not optimal but work
 - ▣ Request from ALICE to accept non-French users
 - ✓ Question to be addressed in the support group