



ALICE report

LHCC Referees meeting

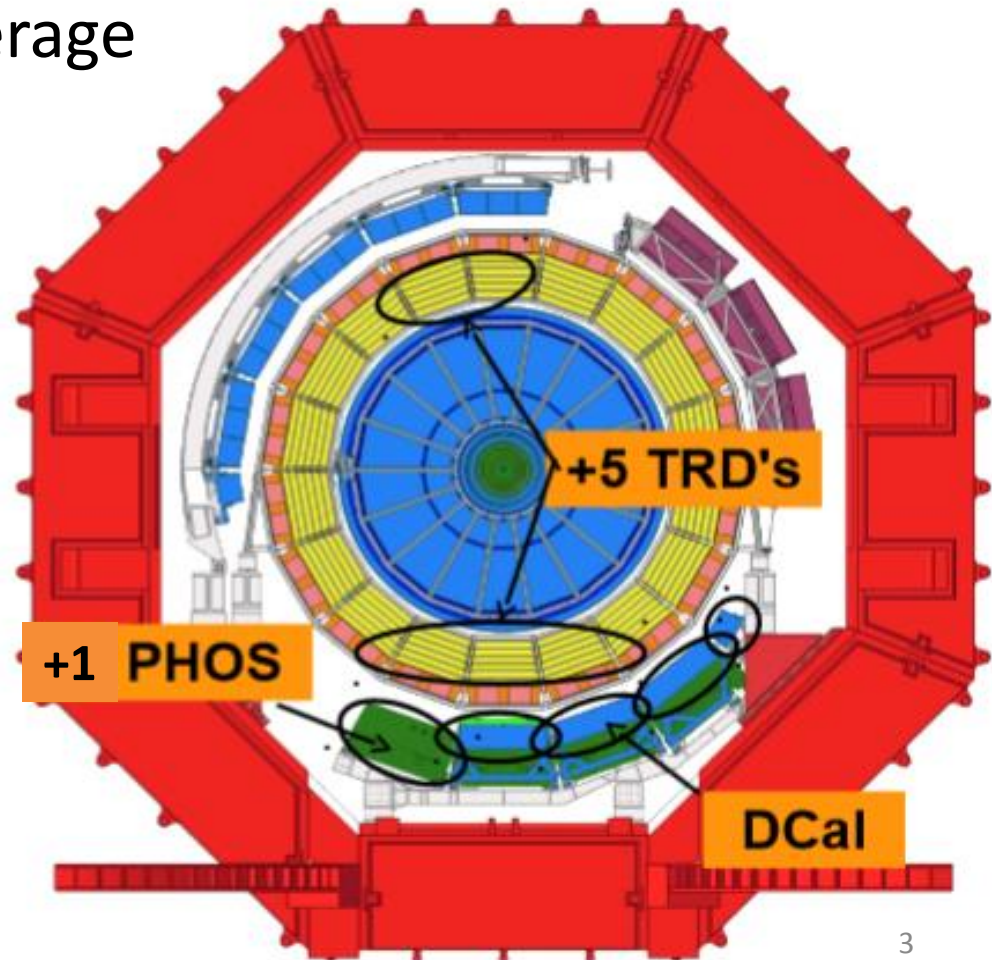
3 June 2014

RUN 2 physics programme and rates

- Target - integrated luminosity of 1nb^{-1} of Pb-Pb collisions (combined RUN 1+RUN 2)
 - Consistent with the ALICE approved programme
 - 4-fold increase in instant luminosity for Pb-Pb
- Double event rate of TPC/TRD
- Increased capacity of HLT system and DAQ
 - Rate up to 8GB/sec to T0

RUN 2 detector upgrades

- TPC, TRD readout electronics consolidation
- TRD full azimuthal coverage
(+5 modules)
- +1 PHOS calorimeter
module
- New DCAL calorimeter



RUN 2 resources considerations

- Same CPU power needed for reconstruction
- 25% larger raw event size
 - Additional detectors
 - Higher track multiplicity with increased beam energy and event pileup
- ALICE requirements for RUN2 were approved by CRSG in April 2014
- The CPU request growth is compatible with ‘flat’ budget, i.e. depends purely on technology development
- Major demand on resources towards the end of 2015 (Pb-Pb data taking)

Software and process improvements

- Moving one calibration iteration to online
 - Software under tests
- Using HLT track seeds for offline reconstruction
 - Comparison of methods ongoing
- Improving performance of GEANT4 simulation for ALICE + development of fast and parameterized simulation
 - Speed-up of G4 simulation by factor 2 already achieved
- Collaborating with other experiments to explore contributed resources (i.e. spare CPU cycles on supercomputers)
 - Centres in US, leveraging existing PanDA development

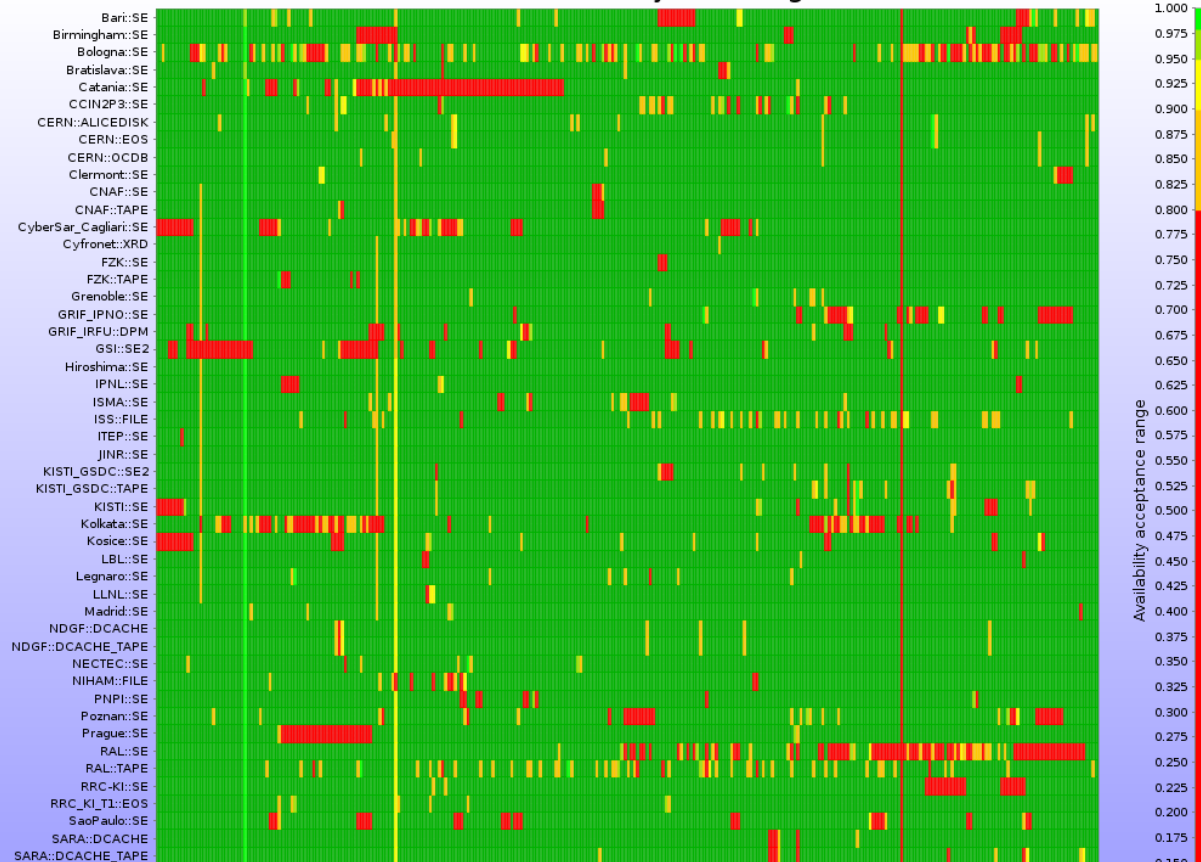
Software and process improvements (2)

- HLT farm for offline processing
 - Additional 3% CPU resources
- Improving the performance of organized analysis trains
 - Faster turnaround
- Speeding up and improving the efficiency of the analysis activities by active data management
 - Consolidation of datasets where applicable, introduction of smaller containers (nanoAODs) for specific analysis types

Infrastructure improvements

- Focus on SE stability – major factor for successful analysis and high CPU efficiency

AliEn SEs availability for writing



Goal for all SEs
>98% availability

Infrastructure improvements (2)

- LHCone programme
 - Europe is largely covered, focus on South America and Asia
 - Larger data volumes, more to transfer between sites
 - Remote access to storage in certain analysis/reconstruction scenarios

Infrastructure improvements (3)

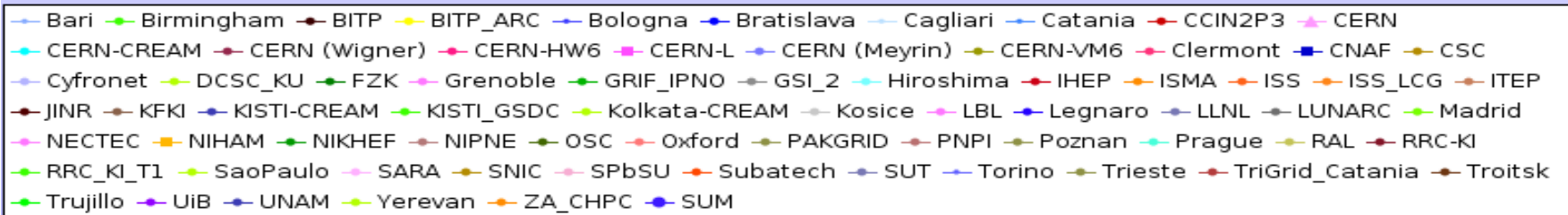
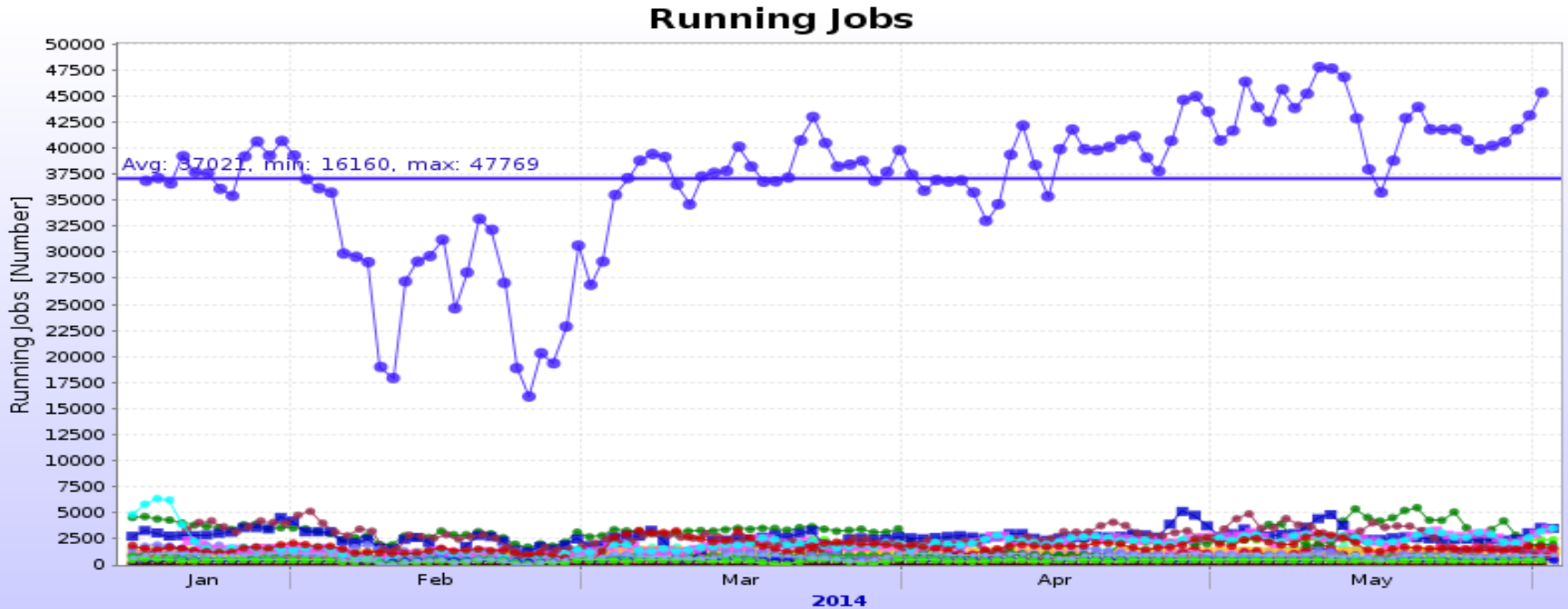
- IPv6 readiness
 - IPv4 address depletion is already a fact for new sites
 - ALICE services are IPv6 ready
 - xrootd v.4 should be IPv6 ready (release end of May)
 - Other services are being brought into compliance

Infrastructure improvements (4)

- Refurbishment of SAM/SUM tests
 - WLCG monitoring consolidation project in advanced status
- Site tests will reflect more and more the VO tests
 - In the ALICE case – provided by MonALISA

Operations in 2014

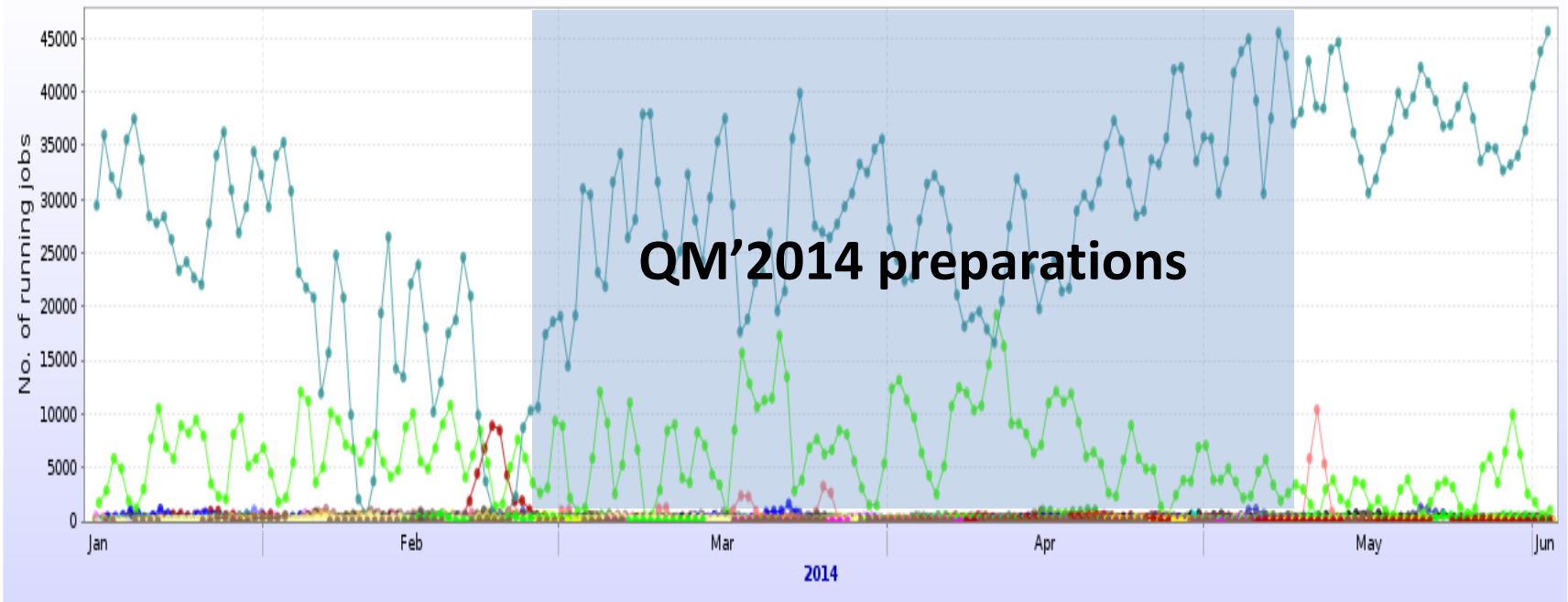
- Steady running: 37K jobs



Jobs by user since January 2014

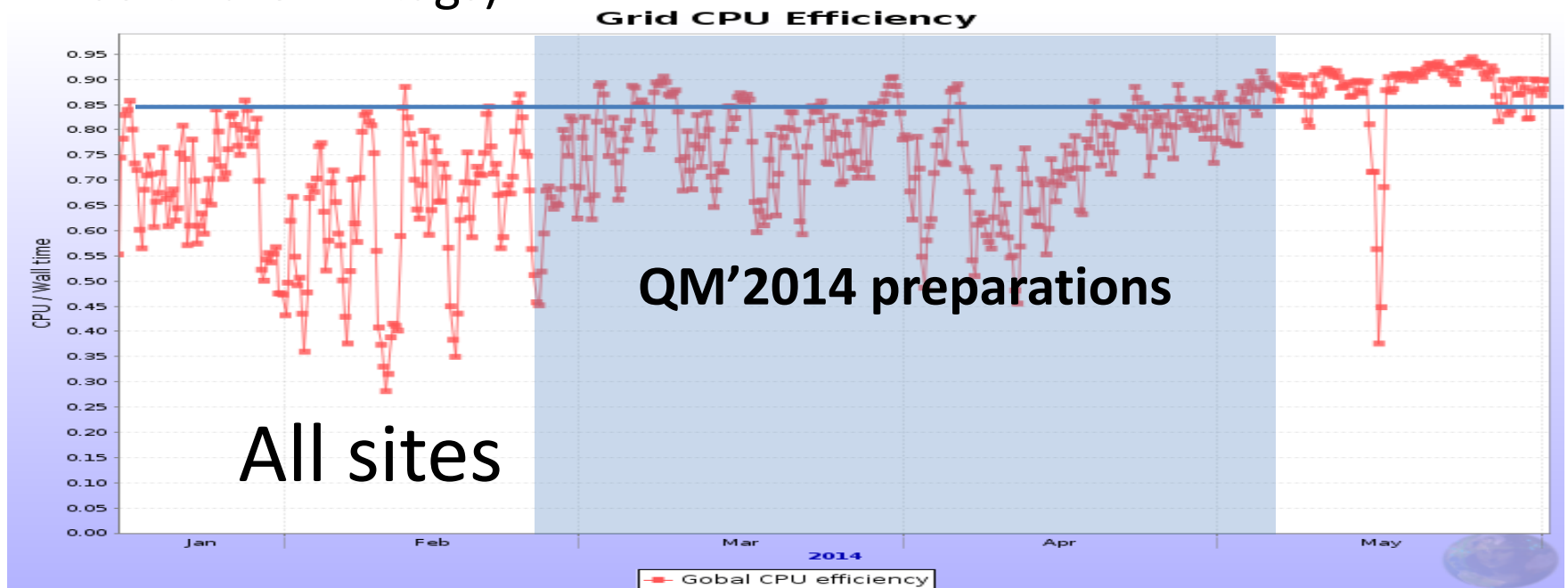
- 76% MonteCarlo (unchanged)
- 16% Organised analysis in trains (+6%)
- 2% RAW data reconstruction (-8%, software upgrades)
- 6% Individual user analysis (-6%)

Running jobs per user



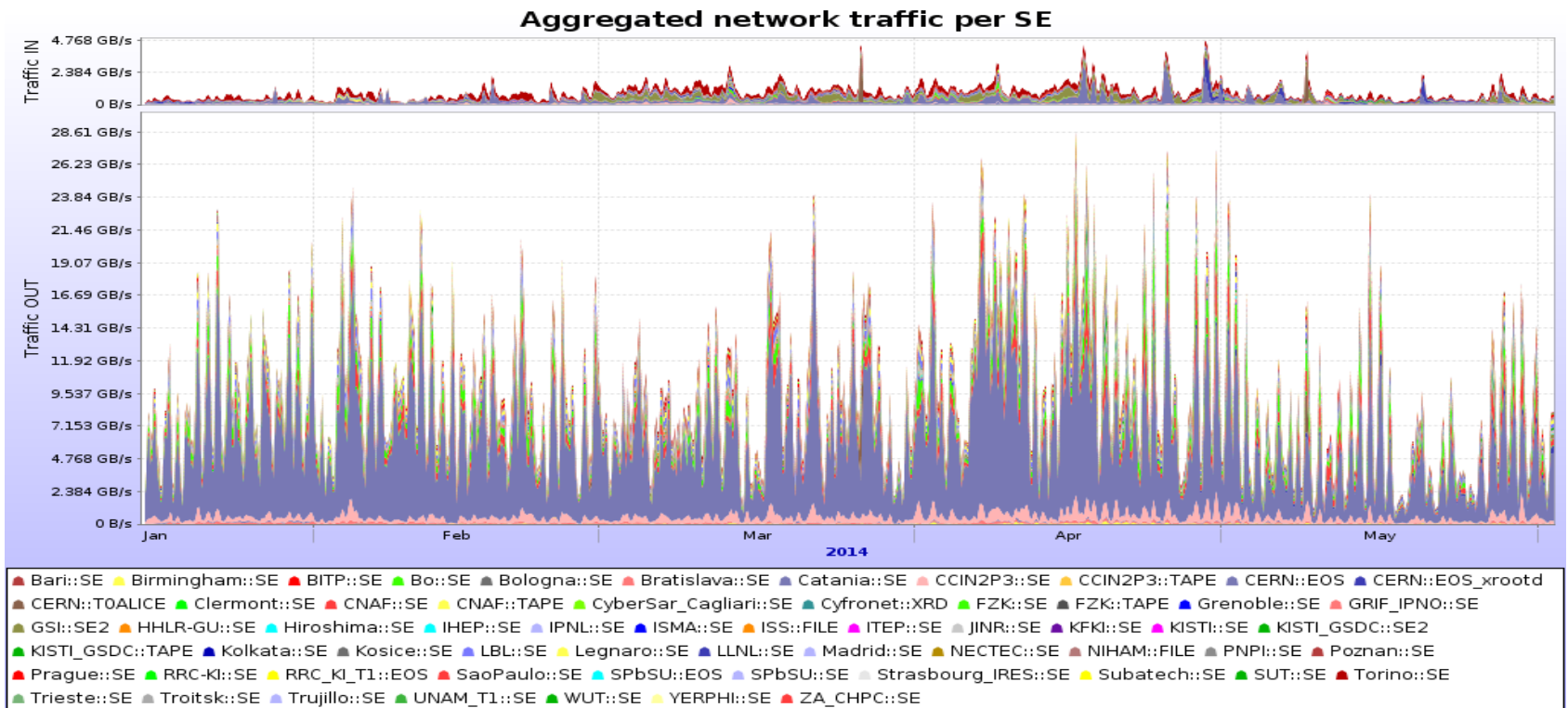
Efficiency since January 2014

- Small effect due to high volume user activities
- A fix in replica access algorithm (bug discovered in April) further increases the overall analysis efficiency
- Continue pushing for larger share of organized analysis (daily software AN tags)



Data volumes since January 2014

- 111.4 PB read, 10.5 PB written
- Regular 'inactive data sets' cleanups, popularity service being put in production



Plans for the next 6 months

- Pass 2/3 of 2011 p-p data and associated MC
 - Full detector recalibration, 2 years of software updates
- Pass 2 of LHC12 p-p, Pass3 of p-Pb data
- From August/September – start cosmics trigger data taking
 - Upgraded detectors readout, Trigger, DAQ, HLT
 - Data will be reconstructed Offline
- No special plans for Grid data challenges
 - All data processing aspects are covered by daily activities

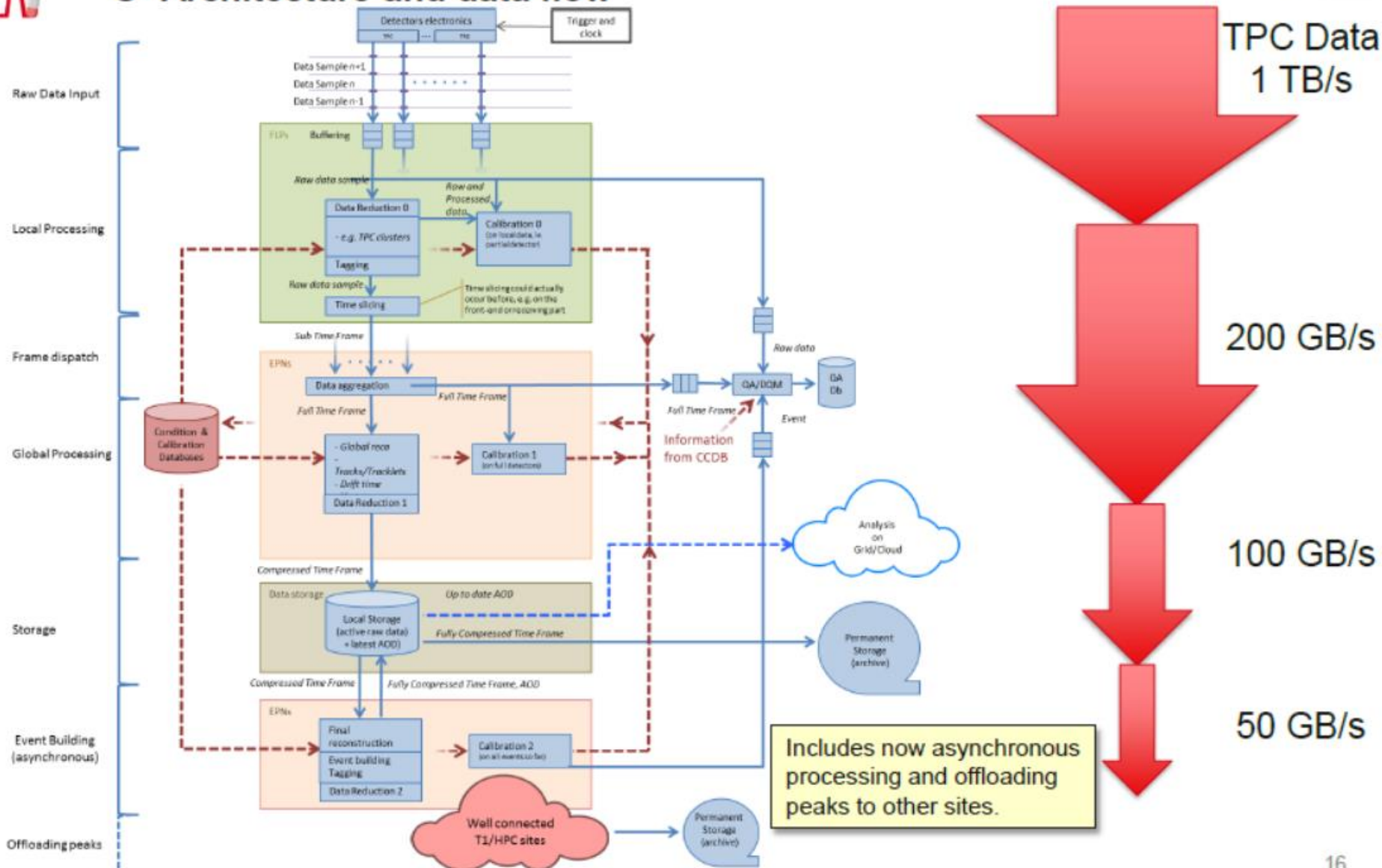
ALICE upgrade

- 13 Computing Working Groups (see last LHCC report for a list and tasks)
- Particulars
 - Data flow simulation
 - Data transport model
 - FLP (first level processors)/EPN (event processing nodes) traffic shaping, buffers and system scalability
 - Computing platforms
 - Software framework development (ALFA)
- Computing TDR writing in progress
 - Detailed report: [Status of O2 project and TDR](#)



Architecture

O² Architecture and data flow



Summary

- Steady operations in the past 6 months
 - Emphasis on increasing the share of organized analysis and overall efficiency
- Gradual software and infrastructure upgrade plans leading up to Run2
 - No dramatic changes of computing and operations model
- Resources will be adequate to cover the ALICE physics programme
 - Resources request 2015-2017 endorsed by CRSG
- Preparations for the ALICE upgrade
 - Ongoing work on system design and simulations, software demonstrators and Computing TRD