# ALICE report
LHCC Referees meeting

Predrag Buncic

ALICE @ RUN 2

- Target - integrated luminosity of 1nb^{-1} of Pb-Pb collisions (combined RUN 1+RUN 2)
  - Consistent with the ALICE approved programme
  - Double event rate of TPC/TRD
- New detectors installed
  - DCAL, +5 TRD modules, +1 PHOS module
- Increased capacity of HLT system and DAQ
  - Rate up to 8GB/sec peak rate to T0
- 25% larger raw event size
  - Higher track multiplicity with increased beam energy and event pileup
- Major demand on resources towards the end of 2015 (Pb-Pb data taking)
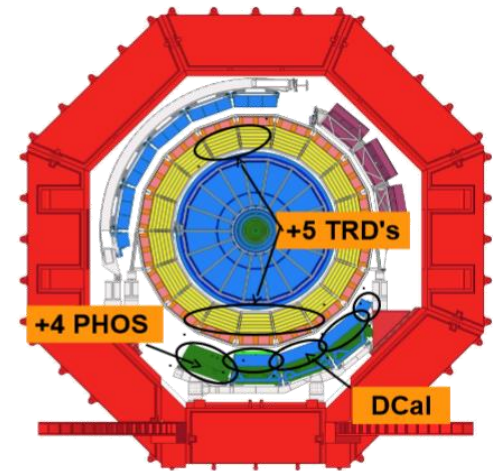
Reprocessing under way

| Production	Description	Status	Run Range	Runs	Chunks	Size	Chunks		Size		Events
LHC10g_pass4	LHC period LHC10g - Full production pass 4, ALIROOT-5311	Completed	135941 - 136193	10	5,158	13.17 TB	5,080	98%	1.069 TB	8%	18,997,194
LHC10f_pass4	LHC period LHC10f - Full production pass 4, ALIROOT-5311	Completed	133005 - 134304	26	32,502	85.78 TB	32,414	99%	8.709 TB	10%	106,718,037
LHC10e_pass4	LHC period LHC10e - Full production pass 4, ALIROOT-5311	Completed	127712 - 130850	166	108,038	282.4 TB	107,051	99%	30.8 TB	11%	318,274,433
LHC10d_pass4	LHC period LHC10d - Full production pass 4, ALIROOT-5311	Completed	122372 - 126437	107	66,827	174.6 TB	65,943	98%	19.53 TB	11%	246,680,781
LHC10c_pass4	LHC period LHC10c - Full production pass 4, ALIROOT-5311	Completed	118503 - 121040	91	37,843	98.47 TB	37,742	99%	16.15 TB	16%	162,593,210
LHC10b_pass4	LHC period LHC10b - Full production pass 4, ALIROOT-5311	Completed	114751 - 117222	83	10,526	25.63 TB	10,487	99%	2.807 TB	10%	47,628,576

- Work on software consolidation for Run2 is completed
  - Using TRD in track fit to improve high p_T track resolution, TPC dEdx improvements, ITS-TPC-TRD alignment, reduced memory usage
  - Validation in progress
- Period LHC10 pass 4 is completed
  - Very good job completion rate
- Goal is to process all Run 1 data with the *same* software

Production status

Running jobs per user

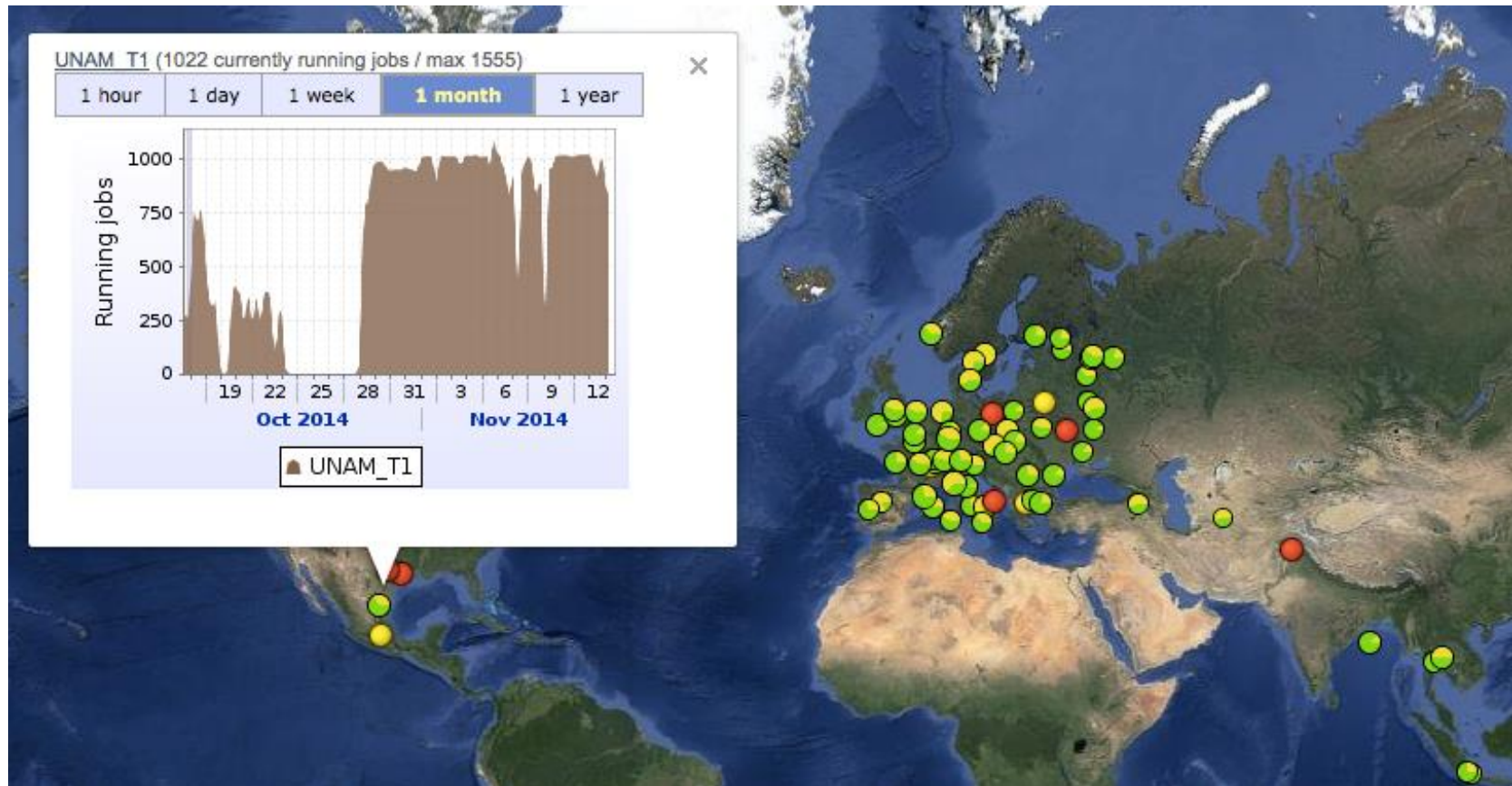Avg: 42703, min: 16586, max: 57796
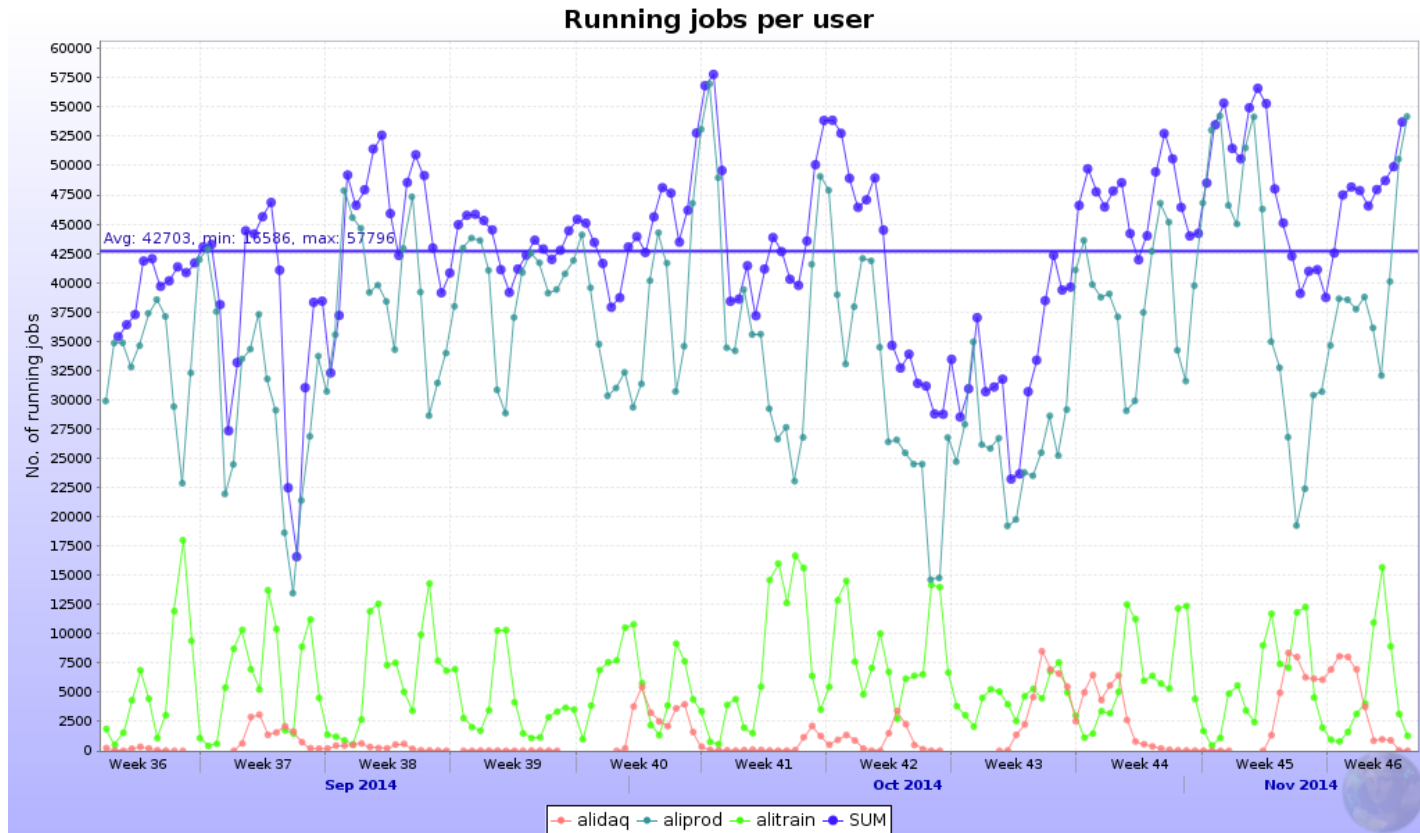
- Very good period, reaching all time highs in terms of running jobs (67k)
- Very short of list of MC production ready to run
- Steady analysis train and reconstruction activity

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CPU Efficiency (T1s)

Jobs efficiency (cpu time / wall time)
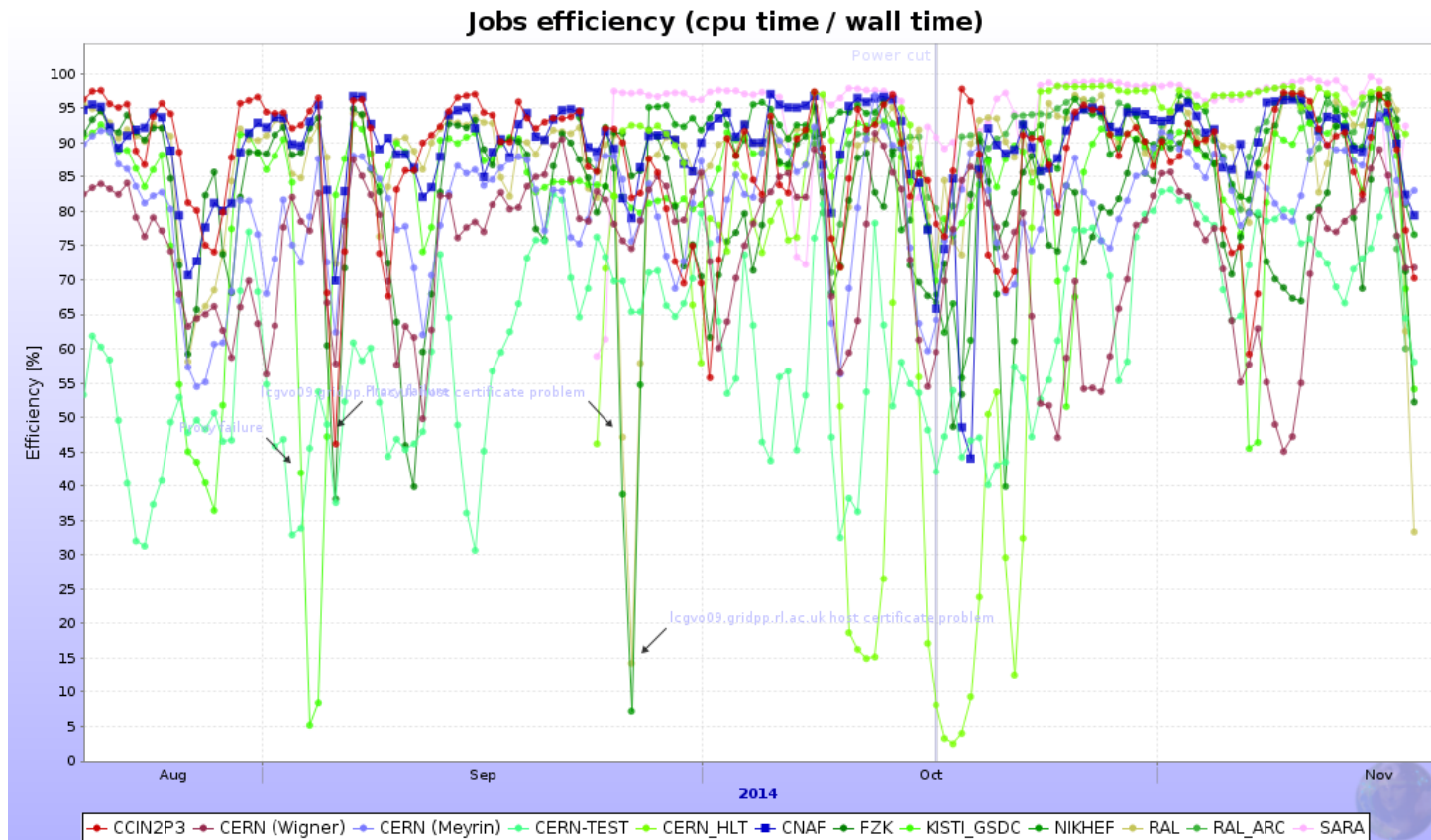
- Average CPU/wall time efficiency in past 3 months remains over 82%

ALICE Grid keeps growing

- This month UNAM (Mexico) signed WLCG MoU as T2

Use of HLT farm for Offline processing

- ALICE HLT is relatively small compared to other experiments
  - Additional 3% CPU resources
  - OpenStack on top of HLT farm at P2
    - Side by side operation with HLT
    - HLT has priority, VMs are suspended if needed
  - Using CernVM, CernVM Online and CVMFS to configure virtual cluster running Condor
  - Dedicated VOBOX acts as a gateway between HLT and public network

- Similar approach successfully used to create on-demand release validation cluster on CERN Agile Infrastructure

CERN_HLT (62 currently running jobs / max 79)

| 1 hour | 1 day | 1 week | 1 month | 1 year |
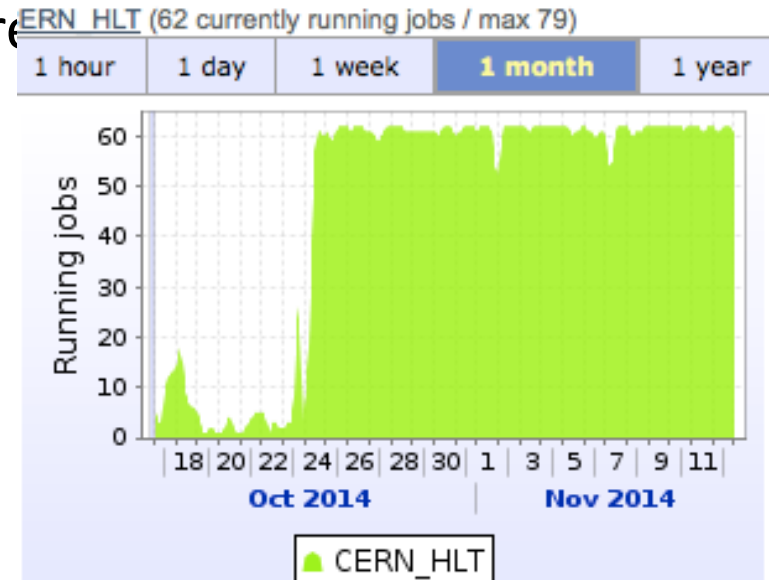
Simulation with Geant4

- Two prong approach
  - Physics Validation with AliRoot
    - Geant4 interfaced via Virtual Monte Carlo (VMC)

  - Multi Threading Performance tests with thread safe VMC application
    - Based on standard geant4_vmc example
    - Use reduced set of AliRoot features allowing for realistic performance tests:
      - full AliRoot geometry imported from file
      - realistic magnetic field
      - realistic event generator
      - Basic TPC response (hit) generation and I/O

  - All tests and validation based on Geant4 v10

Simulation status

- ## Physics Validation
  - Main problem TRD response
  - Too high mean energy loss leads to unrealistic cluster per tracklet distribution
 - testing now simple rescaling

- ## Multi Threading
  - Testing suite implemented and running
  - performance tests ongoing
  - Collaborating with ATLAS to explore contributed resources (i.e. spare CPU cycles on supercomputers)

AliceO2 Framework

https://github.com/AliceO2Group/AliceO2

- Re-use the existing building and testing infrastructure in FairRoot

- Use the transport layer and Dynamic Deployment Service from AlFa

- ITS simulation is implemented in AliceO2

- More detectors will follow

Panda ROOT · · · · · · · Cbm ROOT AliceO2

FairRoot

AlFa

Libraries and tools
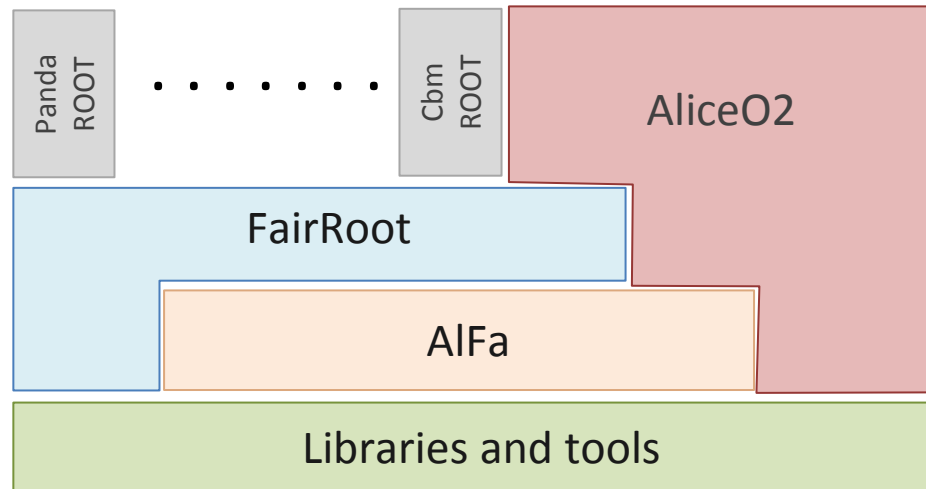
O2 TDR Schedule

- November '13: Table of Contents, Editorial Committee (EC) membership
- December '13: List of contributions from the CWGs
- Feb '14   List of all plots, tables and text skeleton
- Apr '14:   Draft 0 of the text for review inside CWGs
- May '14:   Draft 1 for review inside EC
- 4th July '14: Draft 2 for review inside EC
- 1st Sep '14: Draft 3 for review inside EC (week 22 September)
- 24th -26th Sep '14: EC review
- Jan '14:   Draft 4 for review inside O^2
- Feb '14:   ALICE internal review
- Mar' 15: early: Final version for editing
                        mid : Circulate TDR to the ALICE collaboration
- Apr '15: end: Submission TDR to LHCC 29 (1 month before)
- Jun '15 :   LHCC meeting

Plans for the next 6 months

- Data processing
  - Continue RAW data reconstruction on 2011 and 2012/2013 data (p+p and p+Pb)
  - Run associated MC – general and PWG specific
  - The reprocessing campaign will be completed by April 2015

- September 2014 onward – ALICE re-commissioning
  - Test of upgraded detectors readout, Trigger, DAQ, new HLT farm
  - Full data recording chain, with conditions data gathering
  - November-December - cosmics trigger data taking with Offline processing

Summary

- Steady operations in the past 3 months
- Gradual software and computing infrastructure commissioning leading up to Run2
  - Software tuning and tests, close the books on Run 1 data processing
  - Test of upgraded detectors readout, Trigger, DAQ, new HLT farm
- Resources are adequate to cover the ALICE needs
  - Resources request 2015-2017 endorsed by CRSG
- Preparations for the ALICE upgrade
  - Ongoing work on system design and simulations, software demonstrators
  - New software framework for Run 3 is taking shape
  - Upgrade TDR for O2 project on track