

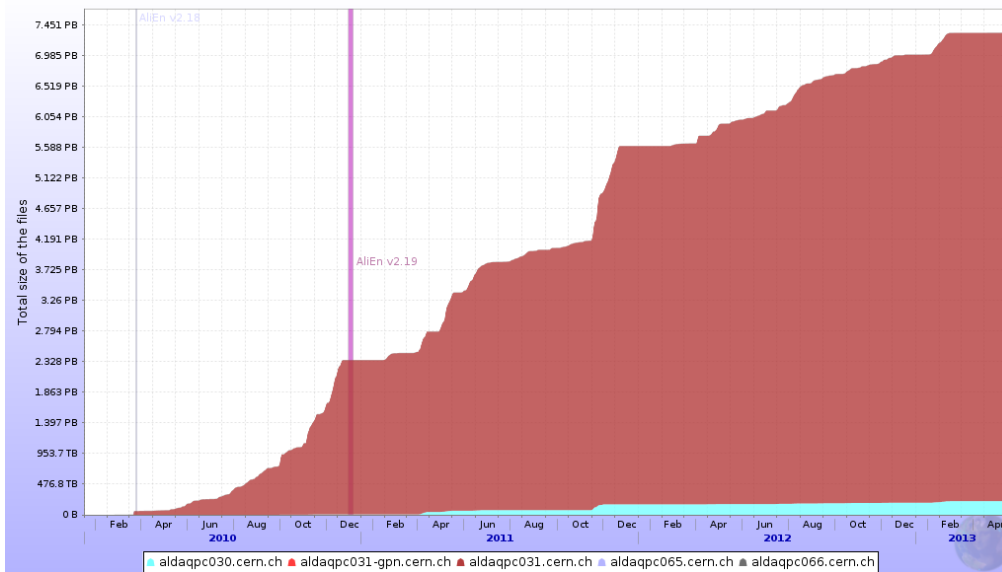
ALICE Grid Operations & Plans for 2016

US-ALICE Grid operations review

14 March 2016

RAW data collection and processing

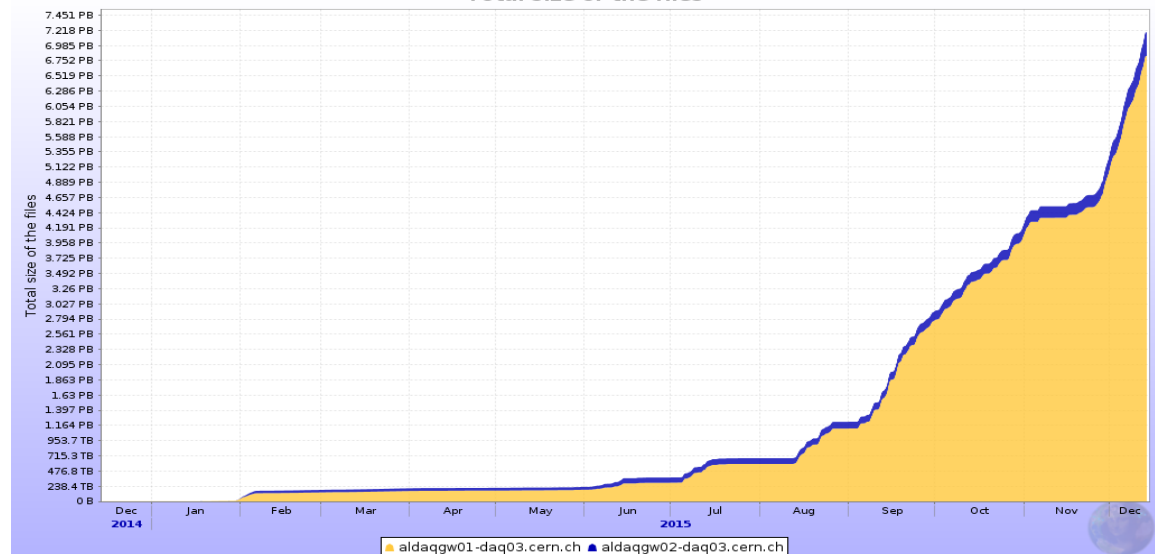
Total size of the files



2010-2013 – 7.3PB (one replica)
All data processed in final reconstruction pass

2015 – 7.2PB (one replica)

Total size of the files



Status of 2015 data processing

- Muon+Calo cycles (reduced detector set)
 - Good for muon analysis and calorimeter calibration
 - All p-p periods completed

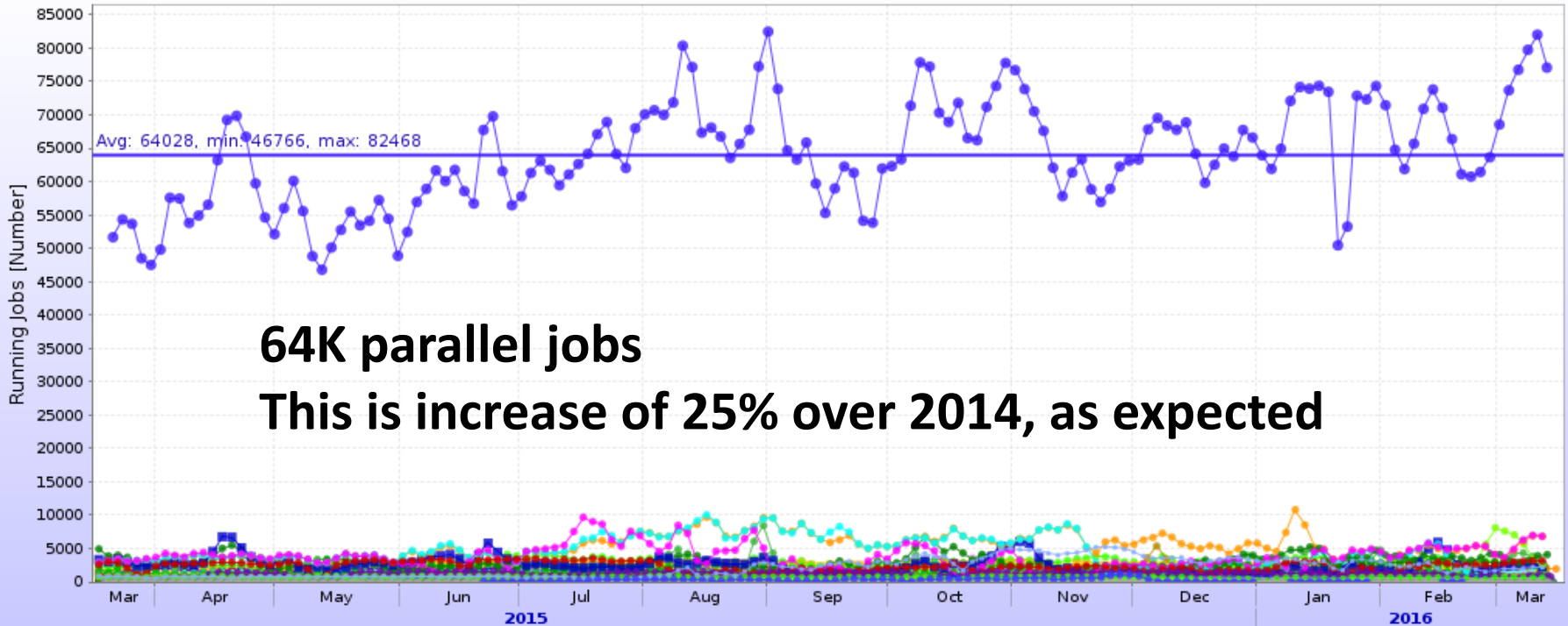
Description	Status	Run Range	Runs	Chunks	Size	Chunks	Size	Events		
LHC period LHC15o - Muon+Calorimeters reconstruction pass 1	Running	244917 - 246994	158	1,685,450	2.047 PB	1,625,183	96%	30.52 TB	1%	462,412,071
LHC period LHC15n - Muon+Calorimeters reconstruction pass 1	Completed	244340 - 244628	27	75,647	121.2 TB	75,436	99%	4.38 TB	3%	185,867,613
LHC period LHC15m - Muon+Calorimeters reconstruction pass 1	Completed	243374 - 244284	24	5,445	1.397 TB	5,174	95%	208.7 GB	15%	11,984,275
LHC period LHC15l - Muon+Calorimeters reconstruction pass 1	Completed	239319 - 241544	170	497,522	807.1 TB	460,504	92%	17.91 TB	2%	405,211,740
LHC period LHC15k - Muon+Calorimeters reconstruction pass 1	Completed	238682 - 239144	48	77,916	121.6 TB	77,906	99%	1.7 TB	1%	86,010,725
LHC period LHC15j - Muon+Calorimeters reconstruction pass 1	Completed	236892 - 238622	224	525,353	764.9 TB	524,572	99%	16.83 TB	2%	811,327,388
LHC period LHC15i - Muon+Calorimeters reconstruction pass 1	Completed	235196 - 236866	202	857,870	1.324 PB	847,062	98%	8.916 TB	0%	629,905,933
LHC period LHC15h - Muon+Calorimeters reconstruction pass 1	Completed	232465 - 234057	172	404,756	523.8 TB	394,648	97%	9.467 TB	1%	935,304,148
LHC period LHC15g - Muon+Calorimeters reconstruction pass 1	Completed	227750 - 231568	159	151,666	222.7 TB	148,503	97%	2.239 TB	1%	153,982,393
				4,281,625	5.874 PB	4,158,988		92.16 TB		3,682,006,286

Status of 2015 data processing (2)

- Full production (all detectors) – 6.5PB of data in Good physics runs
 - **LHC15e and LHC15f (low IR) with physics-OK passes**
 - Some low interaction runs from LHC15n (reference p-p) and LHC15o (Pb-Pb) periods are produced for First Physics
 - All periods are produced in CPass0/CPass1 – important for QA
 - All periods are produced for Muon + Calorimeter analysis (pass2 just completed)
 - **All high IR data still to be processed**
 - CPass0 for LHC15o (Pb-Pb) and LHC15i,j,n (p-p) processed- this is the basis for the distortion studies
 - The distortion correction software is almost done – expect to start full processing in the next week to 10 days

Grid performance

Running Jobs



- ◆ Altaria
 ◆ Athens
 ◆ Bandung
 ◆ Bari
 ◆ Birmingham
 ◆ BITP
 ◆ BITP_ARC
 ◆ Bologna
 ◆ Bratislava
 ◆ Cagliari
 ◆ Catania
 ◆ Catania-VF
 ◆ CBPF
 ◆ CCIN2P3
- ◆ CERN
 ◆ CERN-AURORA
 ◆ CERN-SIRIUS
 ◆ CERN-TRITON
 ◆ CERN-ZENITH
 ◆ CERN_HLT
 ◆ CERN_HLTDEV
 ◆ Cibinong
 ◆ Clermont
 ◆ CNAF
 ◆ CNAF-DUE
- ◆ COMSATS
 ◆ CondorCloud
 ◆ CondorSite
 ◆ CSC
 ◆ Cyfronet
 ◆ DCSC_KU
 ◆ FZK
 ◆ Grenoble
 ◆ GRIF_IPNO
 ◆ GRIF_IRFU
 ◆ GRIF_IRFU_ARC
 ◆ GSI
 ◆ GSI_2
- ◆ HIP
 ◆ Hiroshima
 ◆ ICYB
 ◆ ICYB_ARC
 ◆ IHEP
 ◆ IPNL
 ◆ ISMA
 ◆ ISS
 ◆ ISS_LCG
 ◆ ITEP
 ◆ JINR
 ◆ KFKI
 ◆ KISTI_GSDC
 ◆ KISTI_GSDC-T1
 ◆ KNU
- ◆ Kolkata-CREAM
 ◆ Kosice
 ◆ LBL
 ◆ Legnaro
 ◆ LLNL
 ◆ LUNARC
 ◆ Madrid
 ◆ MEPHI
 ◆ NECTEC
 ◆ NIHAM
 ◆ NIKHEF
 ◆ NIPNE
 ◆ ORNL
 ◆ Oxford
 ◆ PAKGRID
- ◆ pcalice92.cern.ch
 ◆ PNPI
 ◆ Poznan
 ◆ Prague
 ◆ RAL
 ◆ RAL_ARC
 ◆ RRC-KI
 ◆ RRC_KI_T1
 ◆ SaoPaulo
 ◆ SARA
 ◆ SNIC
 ◆ SPbSU
 ◆ Strasbourg_IRES
- ◆ Subatech
 ◆ Subatech_CCIPL
 ◆ SUT
 ◆ Torino
 ◆ Trieste
 ◆ TriGrid_Catania
 ◆ Troitsk
 ◆ Trujillo
 ◆ UF
 ◆ UIB
 ◆ UNAM
 ◆ UNAM_T1
 ◆ WONDERLAND
- ◆ Wuhan
 ◆ WUT
 ◆ Yerevan
 ◆ ZA_CHPC
 ◆ SUM

Resources share

	Series	Last value	Min	Avg	Max
1.	aliproduct	46582	0	43385	90121
2.	alitrain	6154	0	8828	47922
3.	alidaq	10955	0	4889	38142
4.	users	3950	0	3765	38476

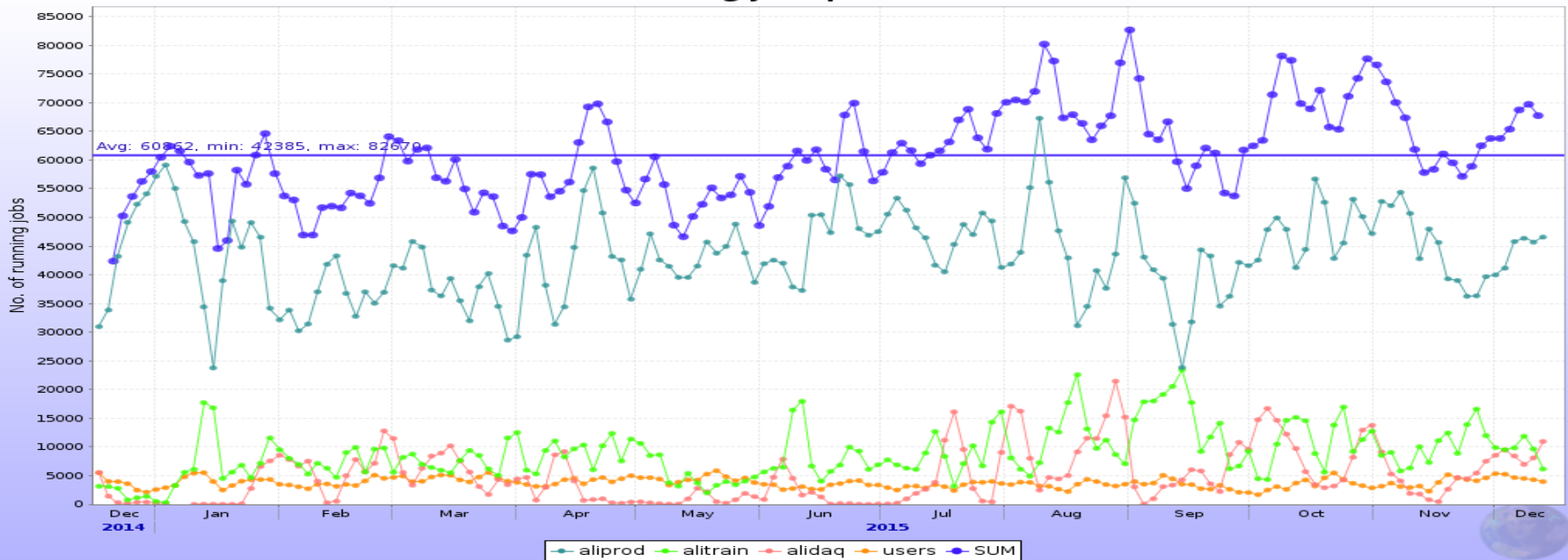
71% - MC

14% - Organized analysis

9% - RAW data reconstruction

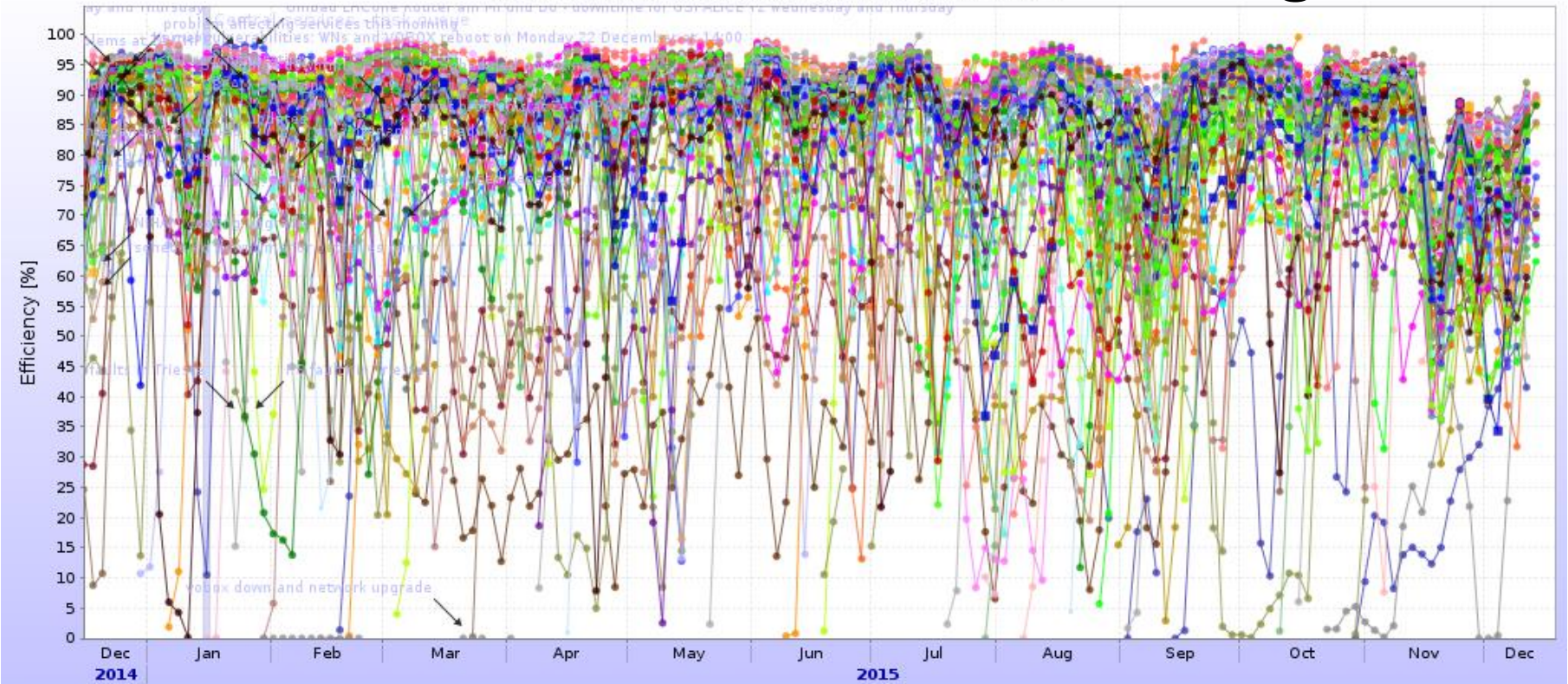
6% - user analysis

Running jobs per user



Efficiency

Jobs efficiency (cpu time / wall time) **Average – 84%**



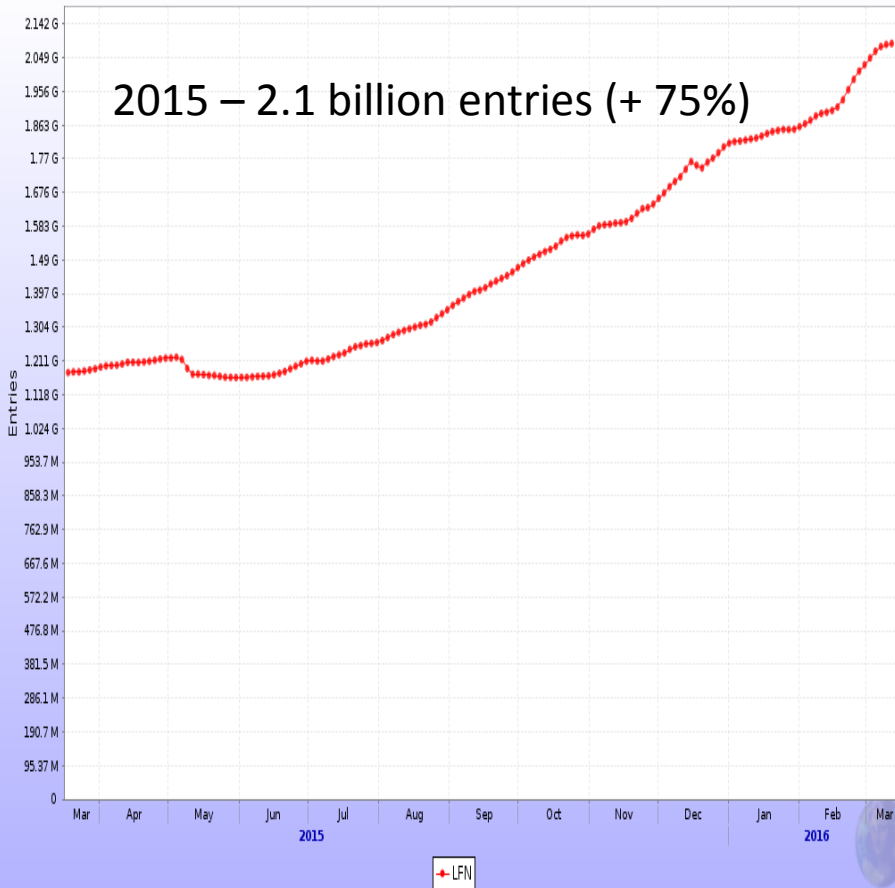
- Altaria Athens Bandung Bari Birmingham BITP Bratislava Cagliari Catania Catania-VF CBPF CCIN2P3 CERN-AURORA
- CERN-SIRIUS CERN-TRITON CERN-ZENITH Cibinong Clermont CNAF COMSATS CSC Cyfronet DCSC_KU FZK Grenoble
- GRIF_IPNO GRIF_IRFU GRIF_IRFU_ARC GSI GSI_2 HIP Hiroshima ICYB IHEP IPNL ISMA ISS ITEP JINR KFKI KISTI_GSDC
- Kolkata-CREAM Kosice LBL Legnaro LUNARC MEPHI NIHAM NIKHEF NIPNE ORNL Oxford PAKGRID PNPI Poznan Prague
- RAL_ARC RRC-KI RRC_KI_T1 SaoPaulo SARA SNIC SPbSU Strasbourg_IRES Subatech SUT Torino Trieste TriGrid_Catania
- Troitsk Trujillo UiB UNAM UNAM_T1 Wuhan WUT Yerevan ZA_CHPC

Operation outtakes

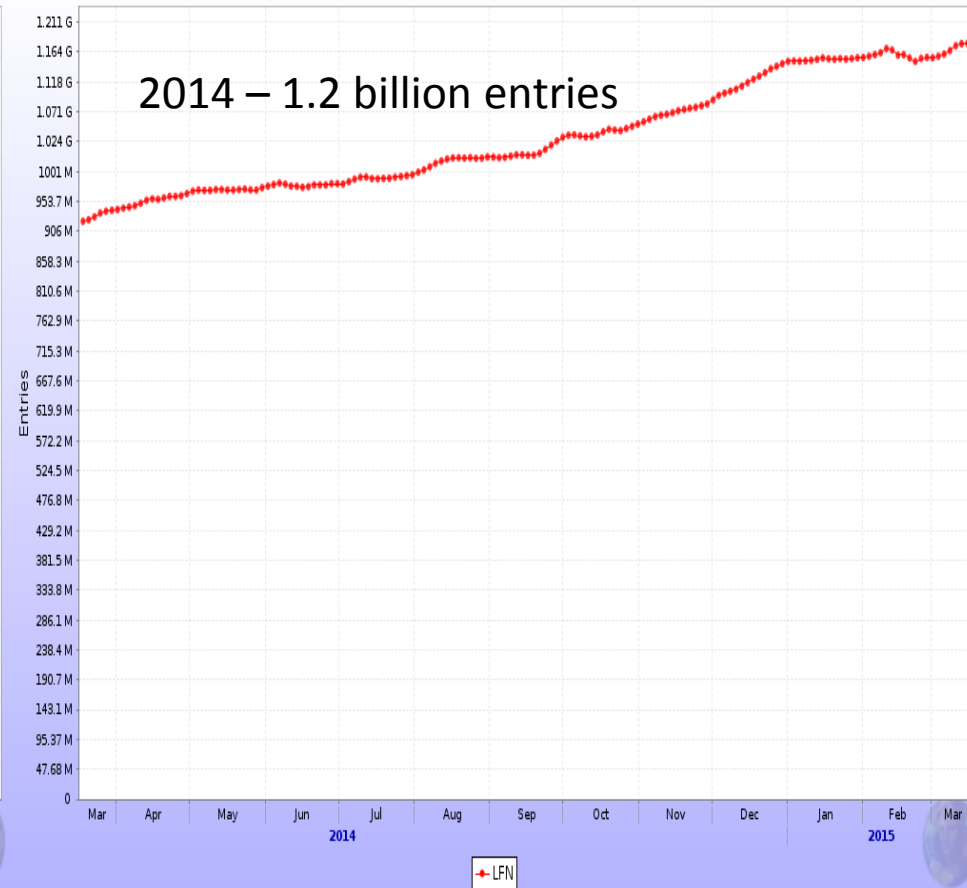
- Nothing special to report – the operation was smooth throughout 2015, despite the increased (and anticipated) load
- That does not mean that no work was done, but we know how to do it
 - Central services upgraded
 - Site services upgraded – change of CE types at many sites – move from CREAM to HTCondor and ARC

Catalogue performance

ALICE Catalogue usage statistics - no. of entries (estimated by mysql)

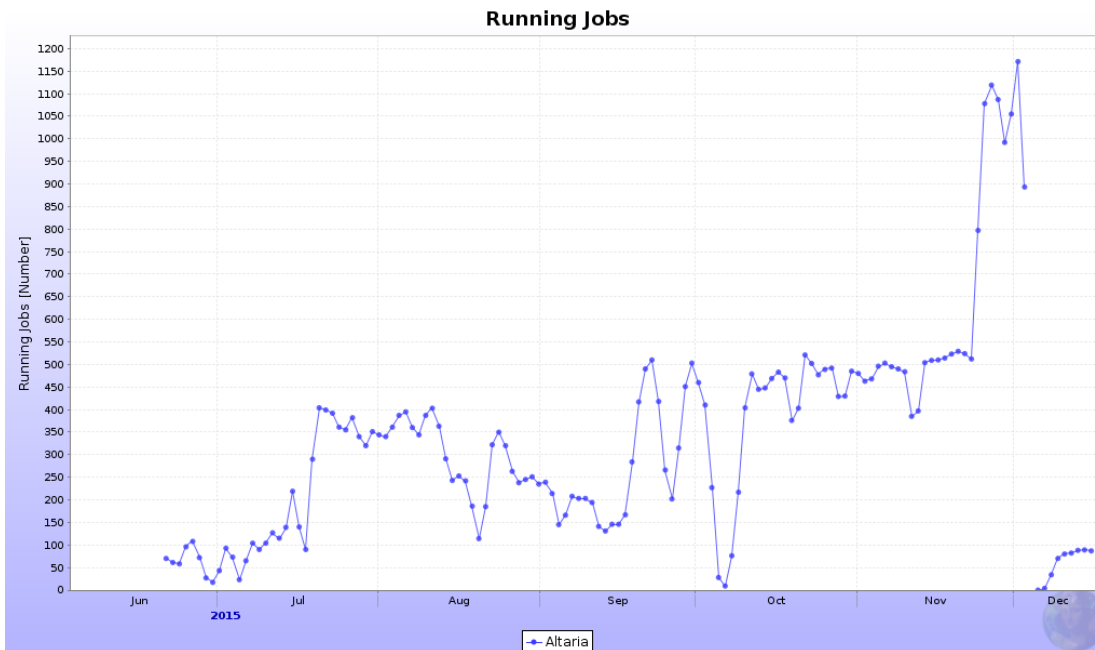


ALICE Catalogue usage statistics - no. of entries (estimated by mysql)



New resources

- Cloud resources (EU clouds) pilot run in 2015
 - Resources are ‘hidden’ behind a CE, tested MC workflow – all successful
 - In June this year – more resources and different workflows (RAW + analysis)



What else

- Titan integration
 - Finally got access to Titan for the developer
 - Preliminary development on a ‘Titan-like’, i.e. ‘no network’ simulation cluster
- CORI integration
 - Marcus’ work for local use
 - To be generalized for central Grid use
 - Define boundary condition for successful integration on the Grid (this meeting)
 - Potential use as analysis facility (this meeting)

Storage

- 20% increase (as expected)
- Nothing special to discuss
 - Move to EOS is slow, but ongoing
 - Storage resources continue to be the domain of established computing centres, i.e. no cloud resources (yet) foreseen
- Consolidation of storage
 - Cloud-like (NDGF-like) single interface to group of SEs
 - Functional test with EOS successful
 - Data location penalty to be evaluated further

Summary

- Processing tasks
 - Calibrate and process a large portion of 2015 data
 - To start imminently and keep us busy until mid-May
 - Data taking for 2016 starts in May
- Grid tasks
 - Keep the machinery running at 100%
 - New resources types integration to continue – not on the critical path, but important nonetheless
 - Some steps toward ‘Cloud consolidation of resources’
 - very carefully and after substantial tests in real conditions