LHCb signoff

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Introduction

- Notes / information remain the same as from Jan 2020
  - Link to Andrew McNab's talk
  - This talk – essentially same as on 1 July, just with updated plots
- RAL is an essential part of LHCb activities
  - Continuing issues streaming data out of ECHO
    - Affects user jobs (and WG productions)
- Overall picture continues to be very good
  - Many thanks to the Tier-1 team!

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2

CPU used at RAL

- Dominated by MC Simulation
- Some dips in Sept Dec 2020
  - ARC issues
  - Fairshare
  - Some LHCb issues

Normalized CPU usage by JobType
26 Weeks from Week 26 of 2020 to Week 52 of 2020

Max: 149, Min: 51.4, Average: 121, Current: 71.0
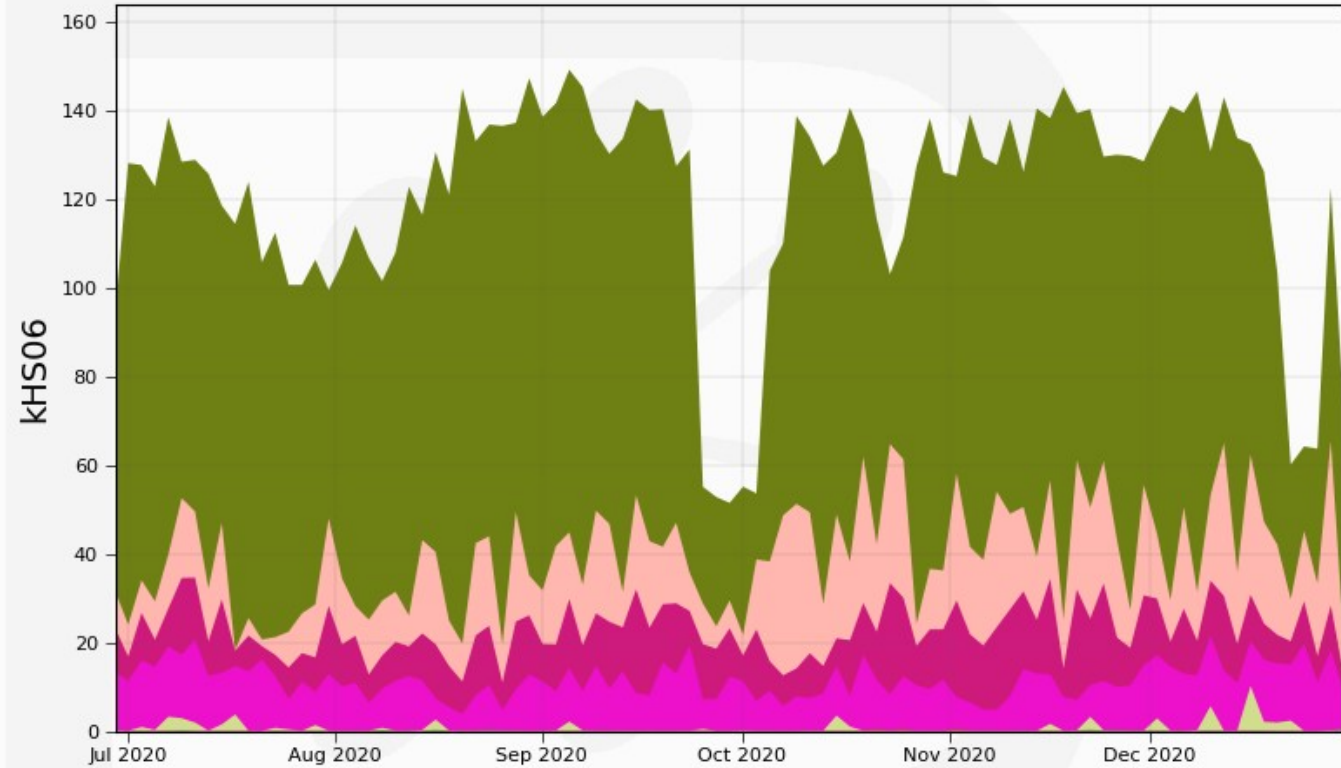
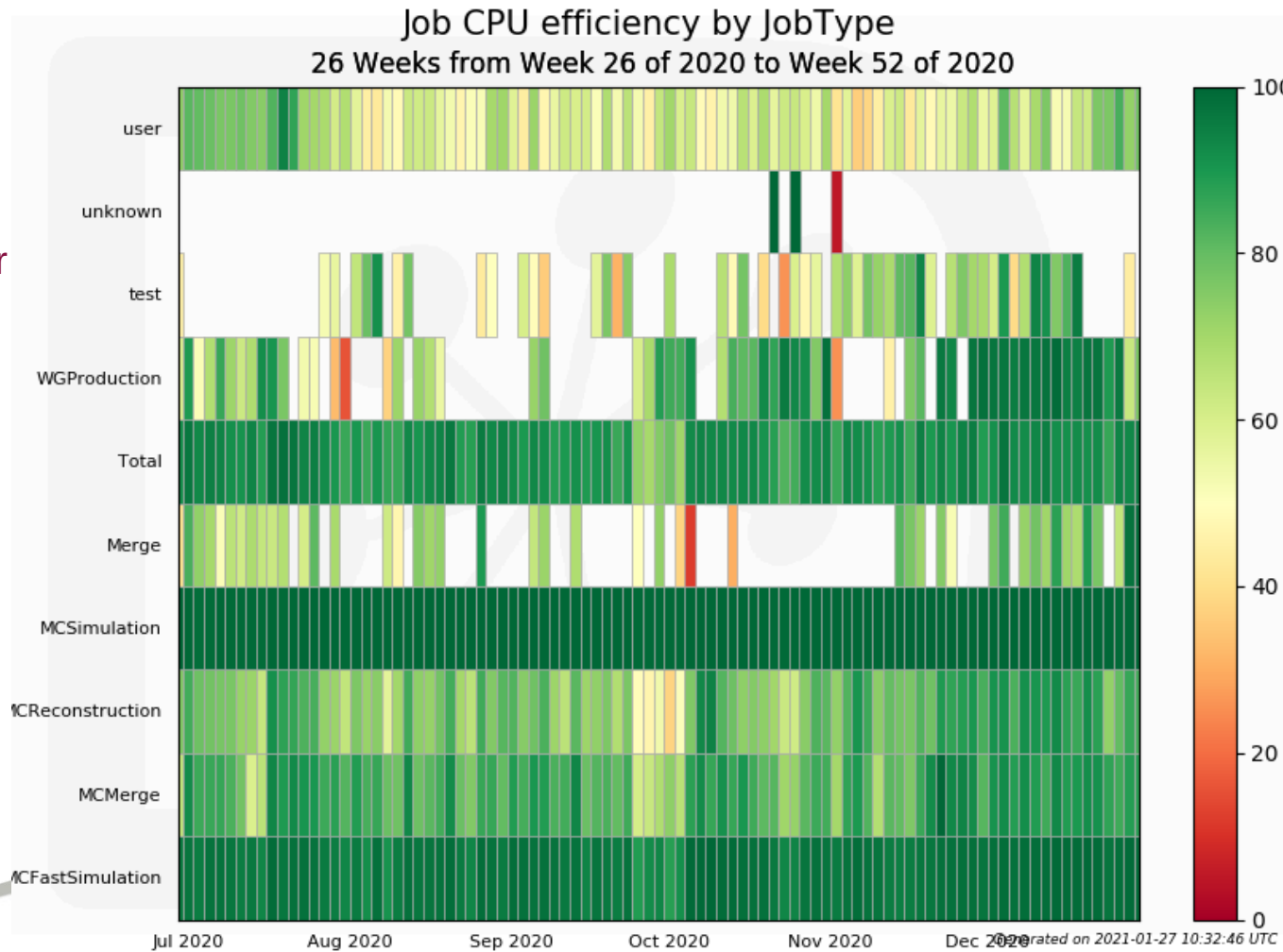|					
MCSimulation	67.2%	user	9.0%	Merge	0.0%
MCFastSimulation	13.9%	WGProduction	0.5%	test	0.0%
MCReconstruction	9.4%	MCMerge	0.0%	unknown	0.0%

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CPU used at all Tier-1 sites

- ➢ RAL broadly in line with other Tier-1s
  - ➜ Listing in order of contribution
    - Ignoring CERN, HLT farm

Normalized CPU usage by Site
26 Weeks from Week 26 of 2020 to Week 52 of 2020

Max: 561, Min: 308, Average: 462, Current: 308

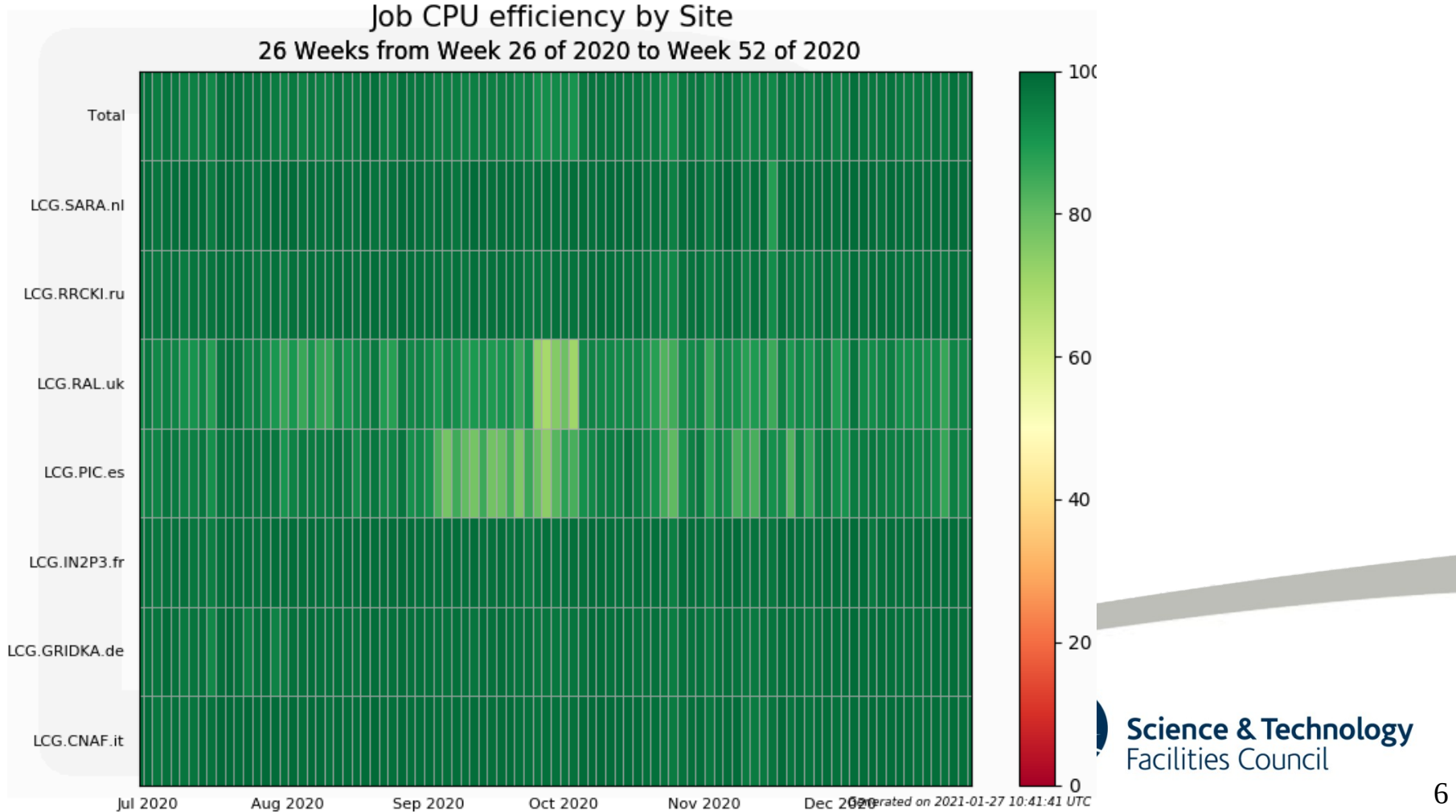|						
☐ LCG.RAL.uk	26.1%	☐ LCG.CNAF.it	20.2%	☐ LCG.SARA.nl	5.2%	☐ LCG.RRCKI.ru 4.3%
☐ LCG.GRIDKA.de	22.6%	☐ LCG.IN2P3.fr	17.3%	☐ LCG.PIC.es	4.3%	

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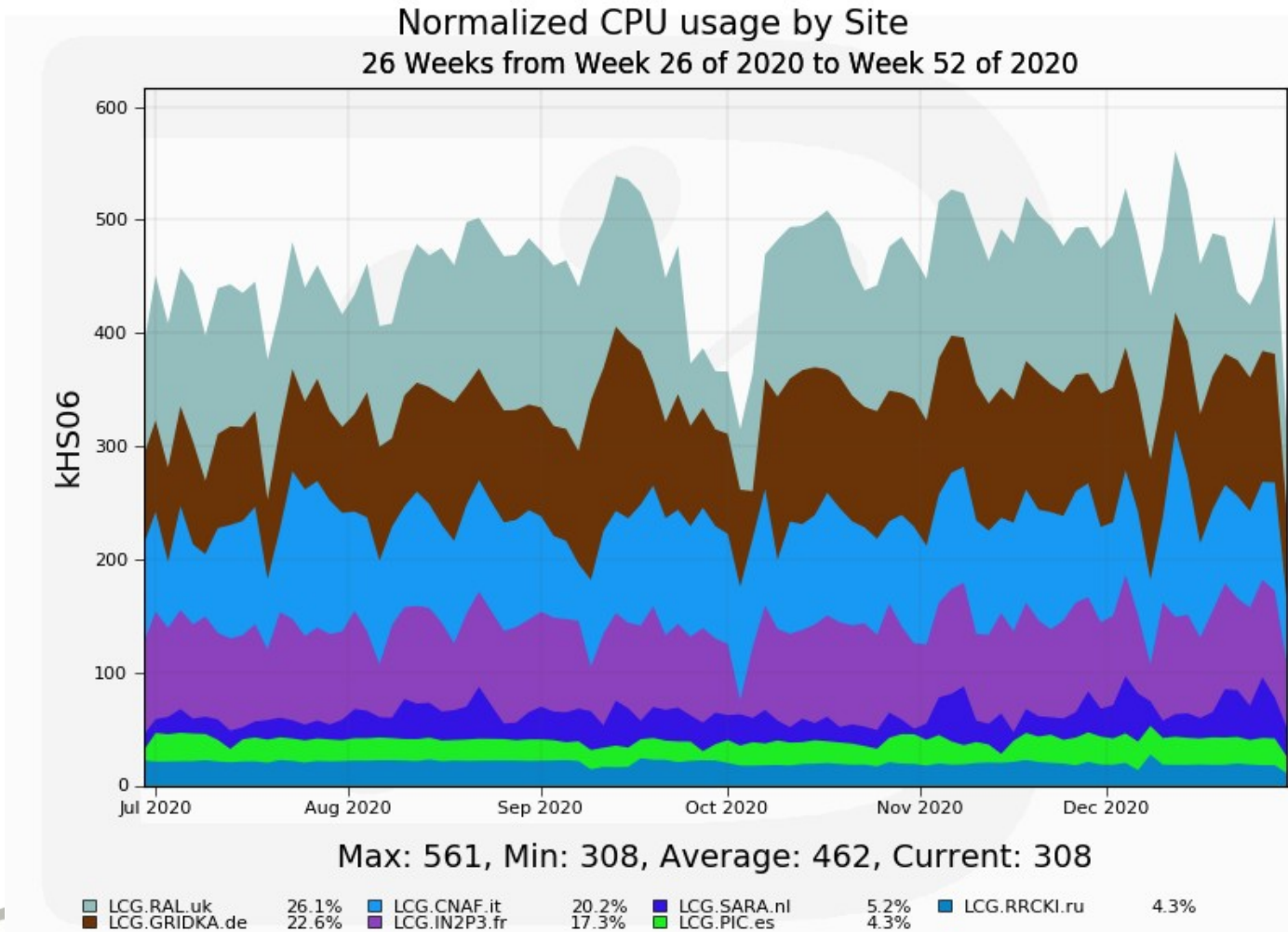
Job efficiency at RAL

- WG productions and user jobs are affected by the ECHO streaming issue
  - Partial workaround : limiting number of input files to alleviate job failure rate
  - Problem with old versions of LHCb applications
    - Authentication issue / old versions of xrootd client - thanks @Tom Byrne
    - (Partial) fix on LHCb end in Jan 2021
    - Many edge cases still there
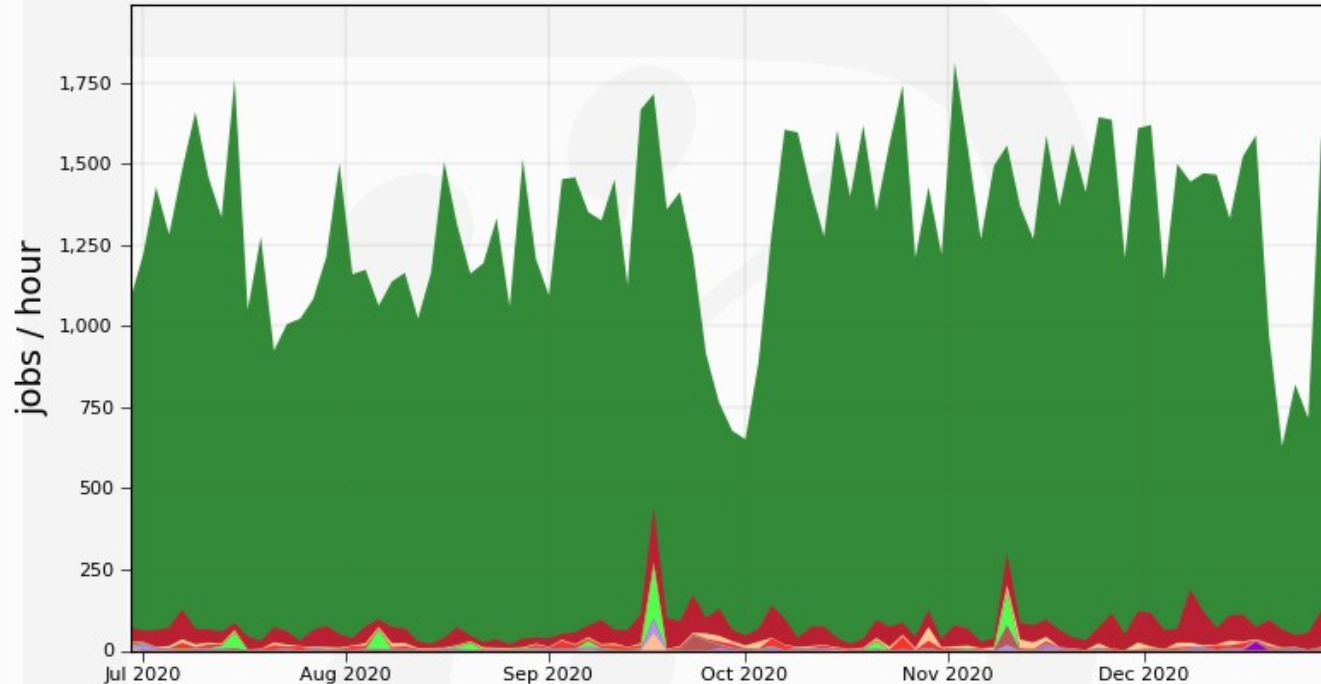- Simulation is obviously the best

Job CPU efficiency by JobType
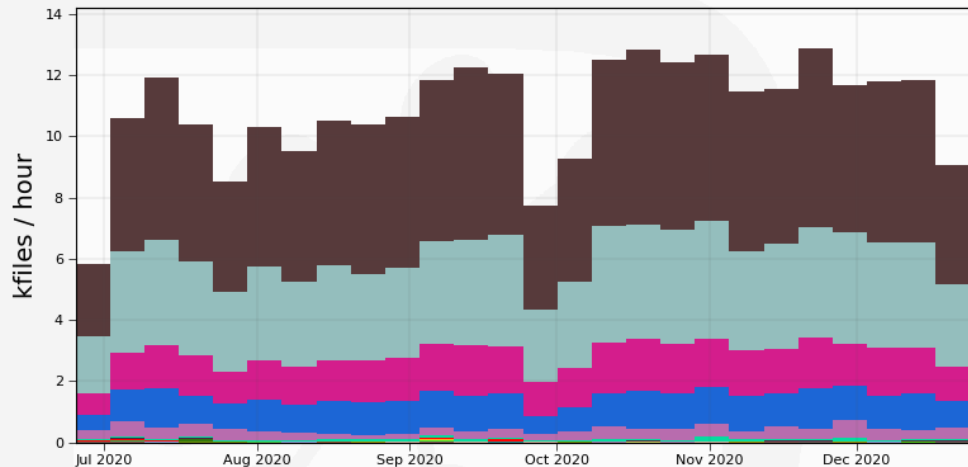26 Weeks from Week 26 of 2020 to Week 52 of 2020

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Job efficiency at Tier-1 sites

Job CPU efficiency by Site
26 Weeks from Week 26 of 2020 to Week 52 of 2020

Jobs by outcome

Succeeded Transfers by Destination
26 Weeks from Week 25 of 2020 to Week 51 of 2020

Max: 12.9, Min: 1.57, Average: 10.5, Current: 1.57

|					
■ RAL-BUFFER	44.1%	■ NCBJ-BUFFER	0.0%	■ IN2P3-USER	0.0%
■ LCG.RAL.uk	29.5%	■ RAL-DST	0.0%	■ CERN-USER	0.0%
■	12.8%	■ IN2P3-BUFFER	0.0%	■ CNAF-USER	0.0%
■ LogSE-EOS	9.7%	■ SARA-BUFFER	0.0%	■ RRCKI-USER	0.0%
■ RAL-USER	2.9%	■ CERN-BUFFER	0.0%	■ IN2P3-FAILOVER	0.0%
■ RAL_MC-DST	0.5%	■ RRCKI-BUFFER	0.0%	■ RAL-FAILOVER	0.0%
■ CERN-DEBUG	0.2%	■ CNAF-BUFFER	0.0%	■ SARA-FAILOVER	0.0%
■ Failed	0.1%	■ PIC-BUFFER	0.0%	■ PIC-FAILOVER	0.0%
■ CERN-HIST-EOS	0.0%	■ GRIDKA-BUFFER	0.0%	... plus 14 more	

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Transfers into RAL SEs by source

Transfers out of RAL WNs

Succeeded Transfers by Source
26 Weeks from Week 25 of 2020 to Week 51 of 2020
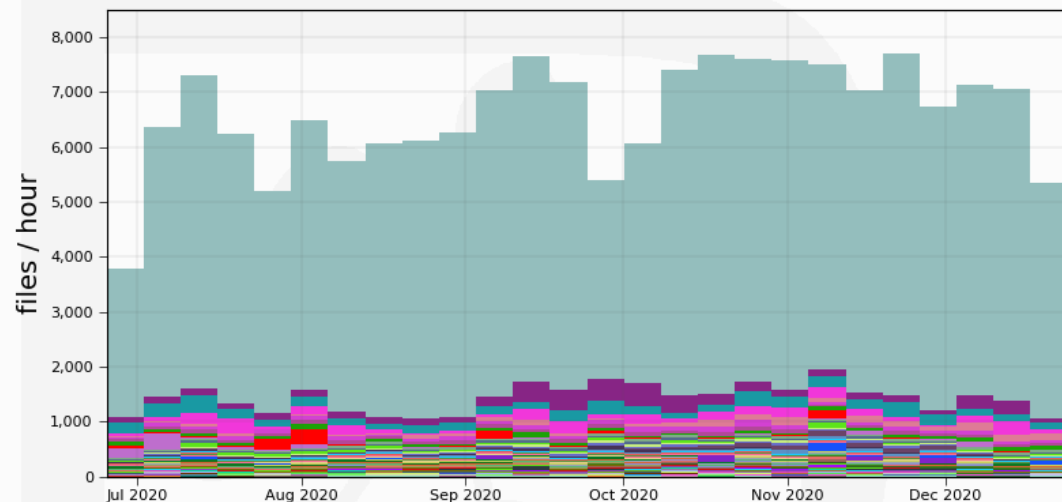
Max: 7,710, Min: 955, Average: 6,363, Current: 955

■ LCG.RAL.uk	78.2%	■ DIRAC.Client.uk	0.5%	■ LCG.BEER.cern	0.3%
■ LCG.RAL-HEP.uk	2.7%	■ LCG.CPPM.fr	0.5%	■ LCG.LAPP.fr	0.3%
■ LCG.UKI-LT2-IC-HEP.uk	2.7%	■ LCG.LAL.fr	0.5%	■ LCG.NIPNE-07.ro	0.3%
■ DIRAC.Client.ch	2.0%	■ CERN_MC-DST-EOS	0.5%	■ DIRAC.UZH.ch	0.3%
■ LCG.CSCS.ch	1.1%	■ LCG.Beijing.cn	0.4%	■ LCG.JINR.ru	0.2%
■ LCG.NIKHEF.nl	1.1%	■ LCG.Lancaster.uk	0.4%	■ DIRAC.Client.es	0.2%
■ LCG.MIT.us	0.9%	■ LCG.Azure.cern	0.4%	■ DIRAC.Client.local	0.2%
■ lbvobox309.cern.ch	0.8%	■ LCG.ECDF.uk	0.3%	■ LCG.Liverpool.uk	0.2%
■ Failed	0.7%	■ LCG.UKI-LT2-QMUL.uk	0.3%	... plus 93 more	

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Streaming out of ECHO

- https://ggus.eu/?mode=ticket_info&ticket_id=142350

- Lots of work on it with Tom Byrne

  - https://wiki.e-science.cclrc.ac.uk/web1/bin/view/EScienceInternal/LHCbJobFailure

  - And support from xrootd developers

    - https://github.com/xrootd/xrootd/issues/1259

  - Problem identified in xrootd-ceph interface

- Development of fix to xrootd-ceph interface

  - Is it on schedule for production?

- Other methods of alleviation being tested

  - Some retuning of blocksizes in production already

    - Has helped some ATLAS workflows

  - Other parameters under testing

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Summary

- ➤ Many thanks to Tier-1 team!
  - ➜ RAL a critical part of LHCb computing
  - ➜ Great help in debugging a subtle xrootd issue
    - Related to client version
    - Fixed offline within LHCb (mostly)
  - ➜ Ongoing issue with streaming (slide 8)
- ➤ Looking forward from LHCb
  - ➜ Expect multi-core jobs from LHCb
    - Currently under testing
  - ➜ Also another round of reprocessing
    - Later this year

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Backup – Jobs by final status : CNAF

- ➢ **~ similar size to RAL**
  - ➜ up to a point (slide 4)

- ➢ **Note : Application finished with errors = 1.9%**
  - ➜ 4% at RAL

  (slide 7)

Jobs by FinalMinorStatus
26 Weeks from Week 26 of 2020 to Week 52 of 2020

Max: 1,445, Min: 484, Average: 867, Current: 538

■ Execution Complete	96.0%	■ Input Sandbox Download	0.1%	
■ Application Finished With Errors	1.9%	■ Output Data Uploaded	0.1%	
■ Stalled	0.5%	■ JobWrapper execution	0.1%	
■ Received Kill signal	0.5%	■ Uploading Job Outputs	0.0%	
■ Pending Requests	0.4%	■ Exception During Execution	0.0%	
■ Input Data Resolution	0.2%	■ Job has insufficient disk space to continue	0.0%	
■ Watchdog identified this job as stalled	0.1%	■ Job has exceeded maximum wall clock time	0.0%	

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