

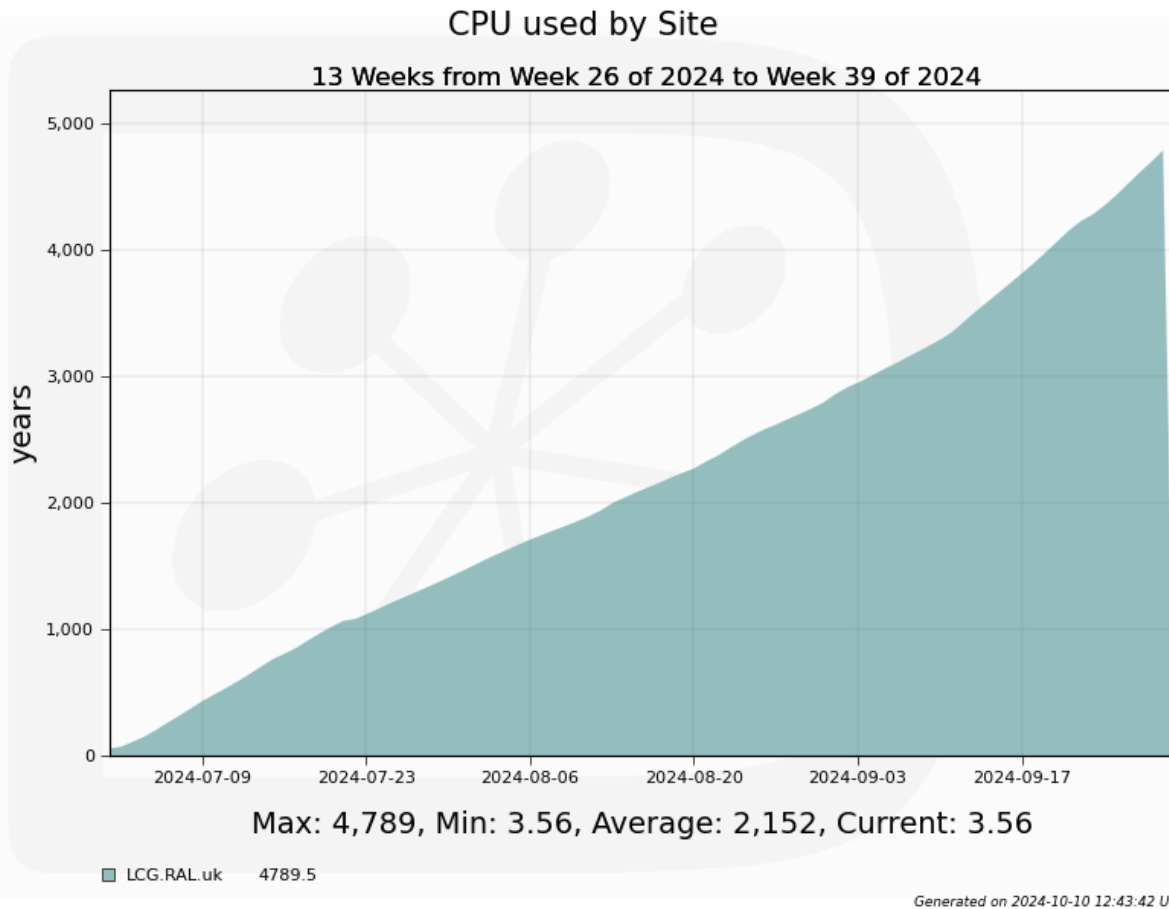
alexrg

Resource Review Meeting (2024 Q3)

Highlights

- Disk and tape pledges increased
 - Both by ~6PB
- CRL expiration issue in July
 - Caused major outage for a few hours
- Issues with direct access jobs
 - Due to xrootd bugs and misconfiguration, fixed by xrootd devs, to be deployed
- Load balancing issue
 - Bug in code, fixed
- A few file loss incidents
 - Some due to ECHO issues, some due to DIRAC problems

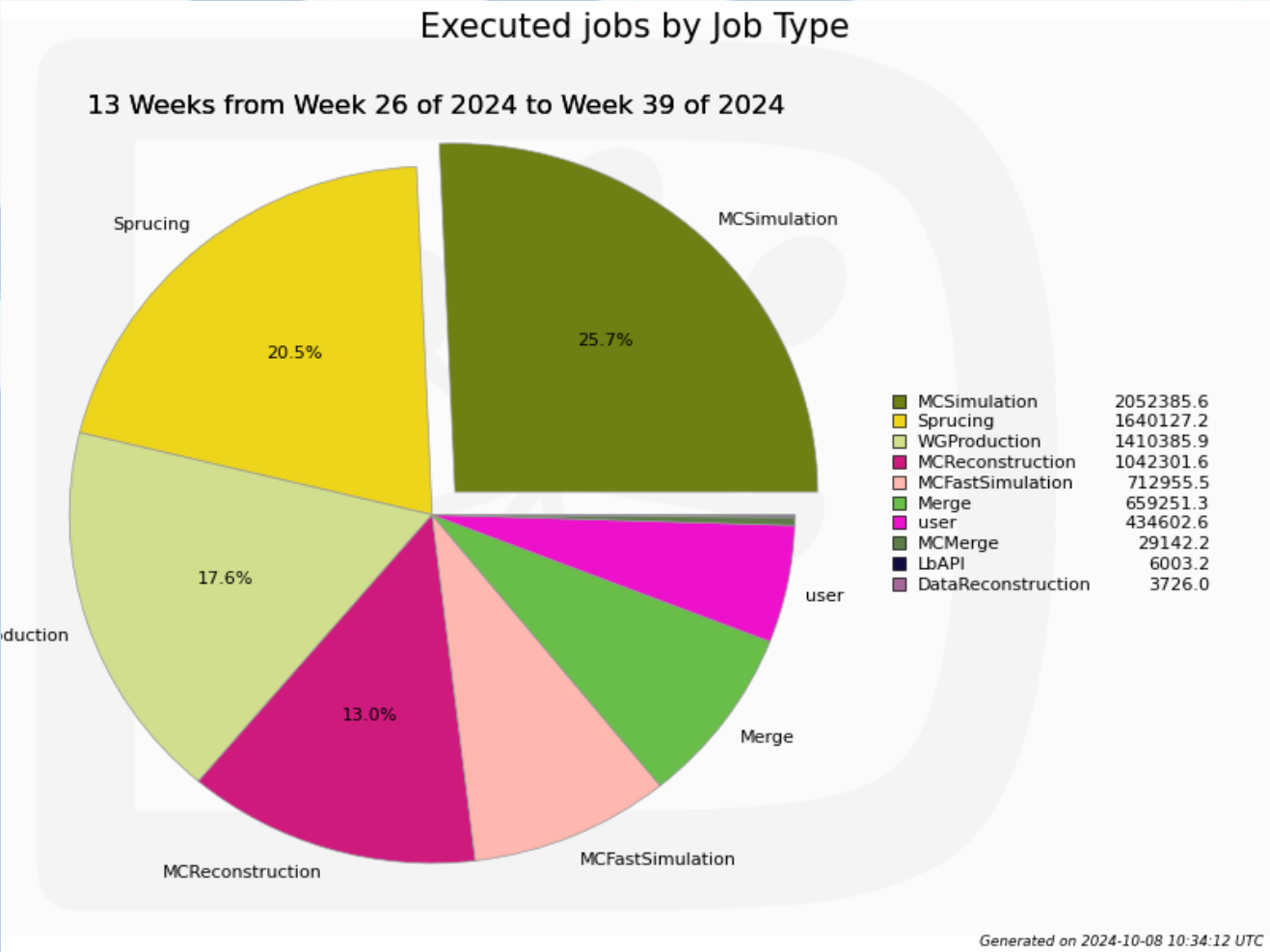
Computing resources



- Normalized values from LHCb can not be trusted
- Using raw cputime, we have:
 $4789.5 * 365 * 12.7 / 92 = 241323.1 \text{ HS23}$
 - 12.7 normalization factor is used, though it went up after the introduction of 2023 Gen in mid September, so the exact number is even higher
- Pledge is $180\text{kHS23} < 241\text{kHS23}$

Computing resources

Huge increase in Sprucing and WGProd jobs, due to the data taking.

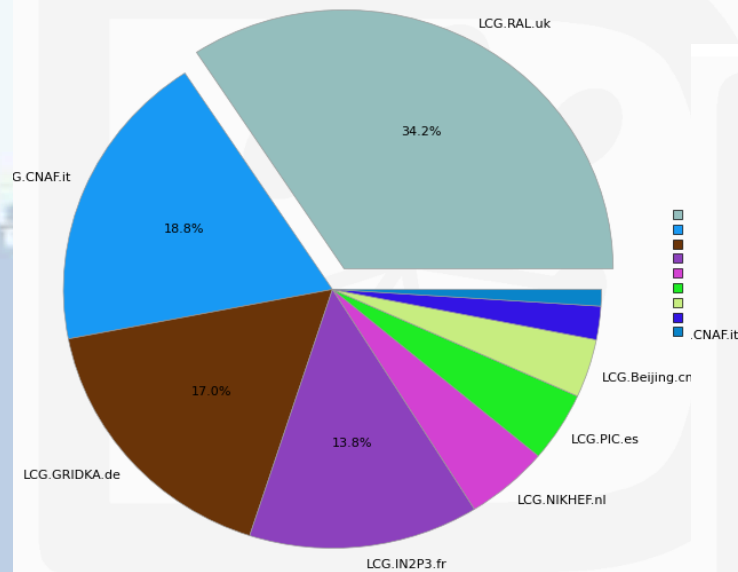


Comparison

RAL provided the most computing resources for LHCb among T1s (both in terms of Time [CPU/wall] and Number of Jobs), around 1/3 of all T1 contributions

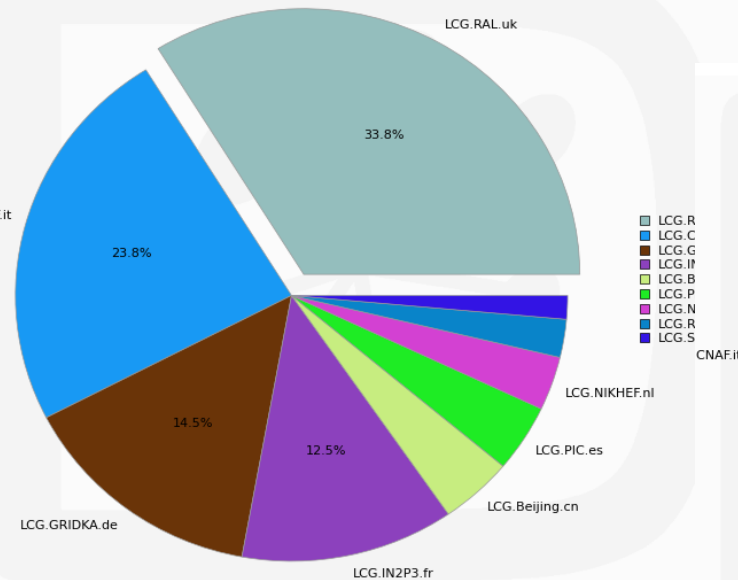
Executed jobs by Site

13 Weeks from Week 26 of 2024 to Week 39 of 2024



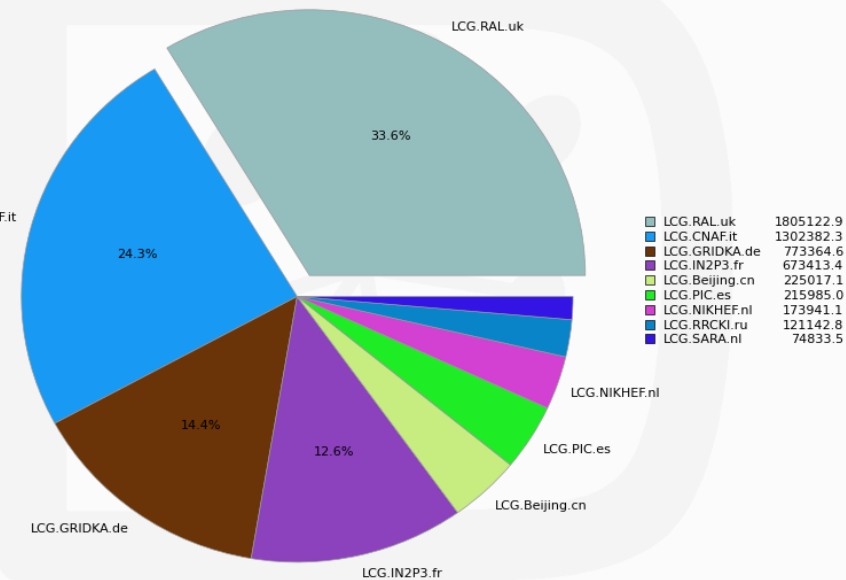
CPU time consumed by site

13 Weeks from Week 26 of 2024 to Week 39 of 2024



Wall time consumed by site

13 Weeks from Week 26 of 2024 to Week 39 of 2024

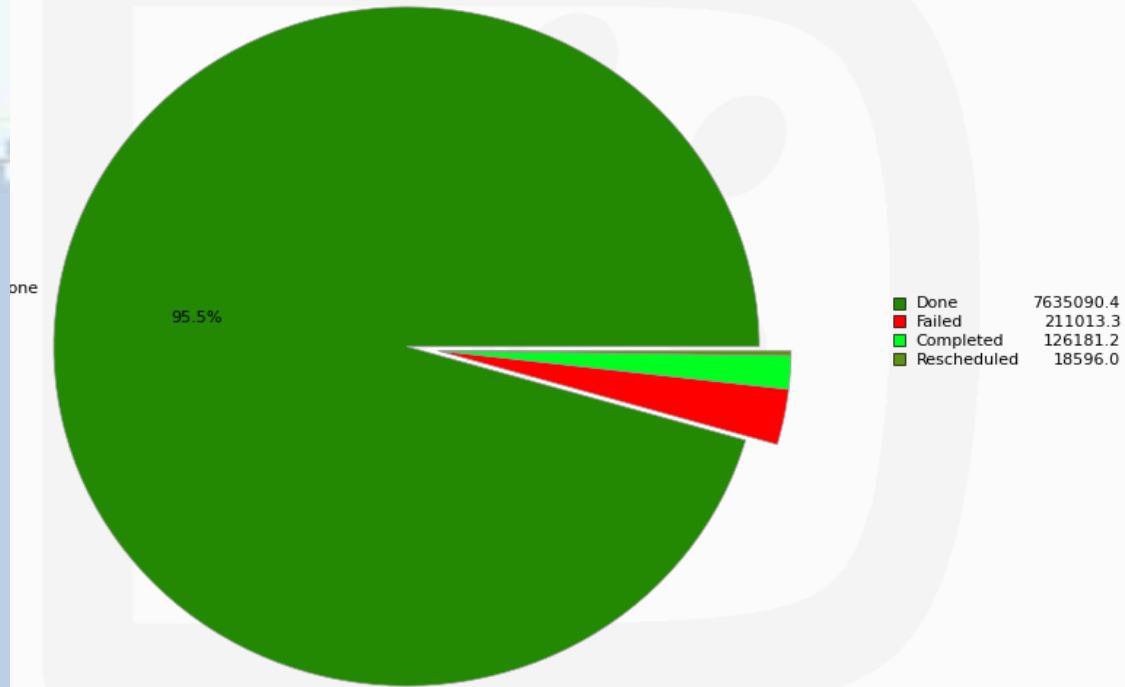


Comparison

- RAL Job failure rate is comparable to other T1s

RAL jobs by Status

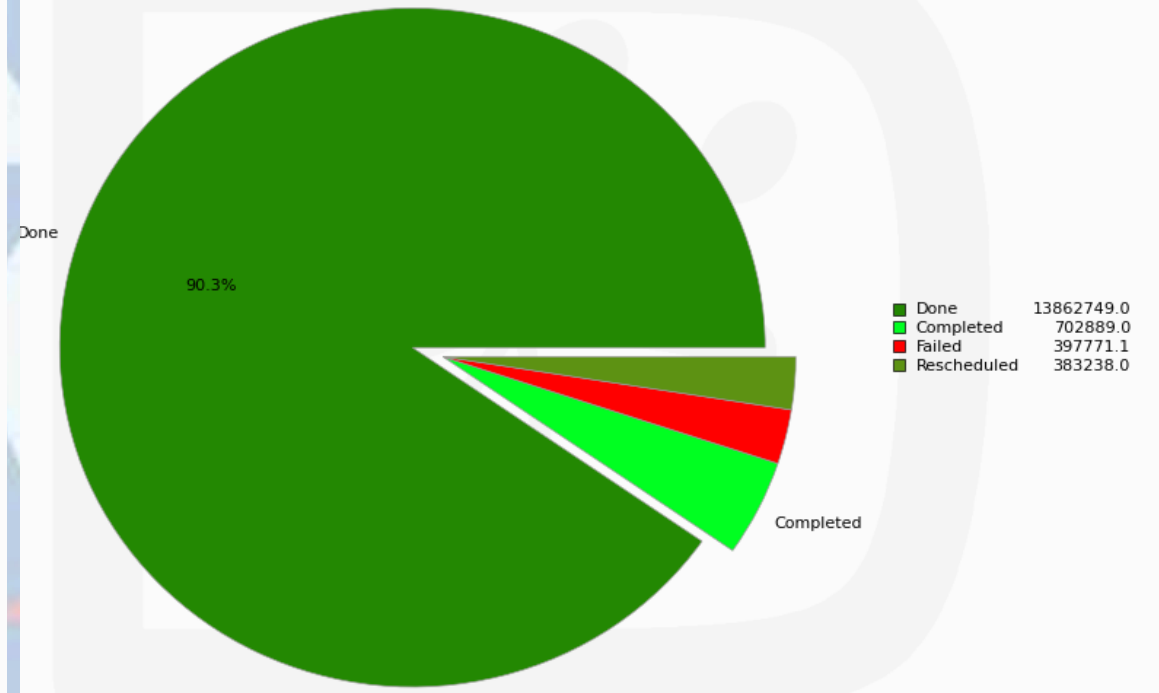
13 Weeks from Week 26 of 2024 to Week 39 of 2024



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Tier 1s except RAL jobs by Status

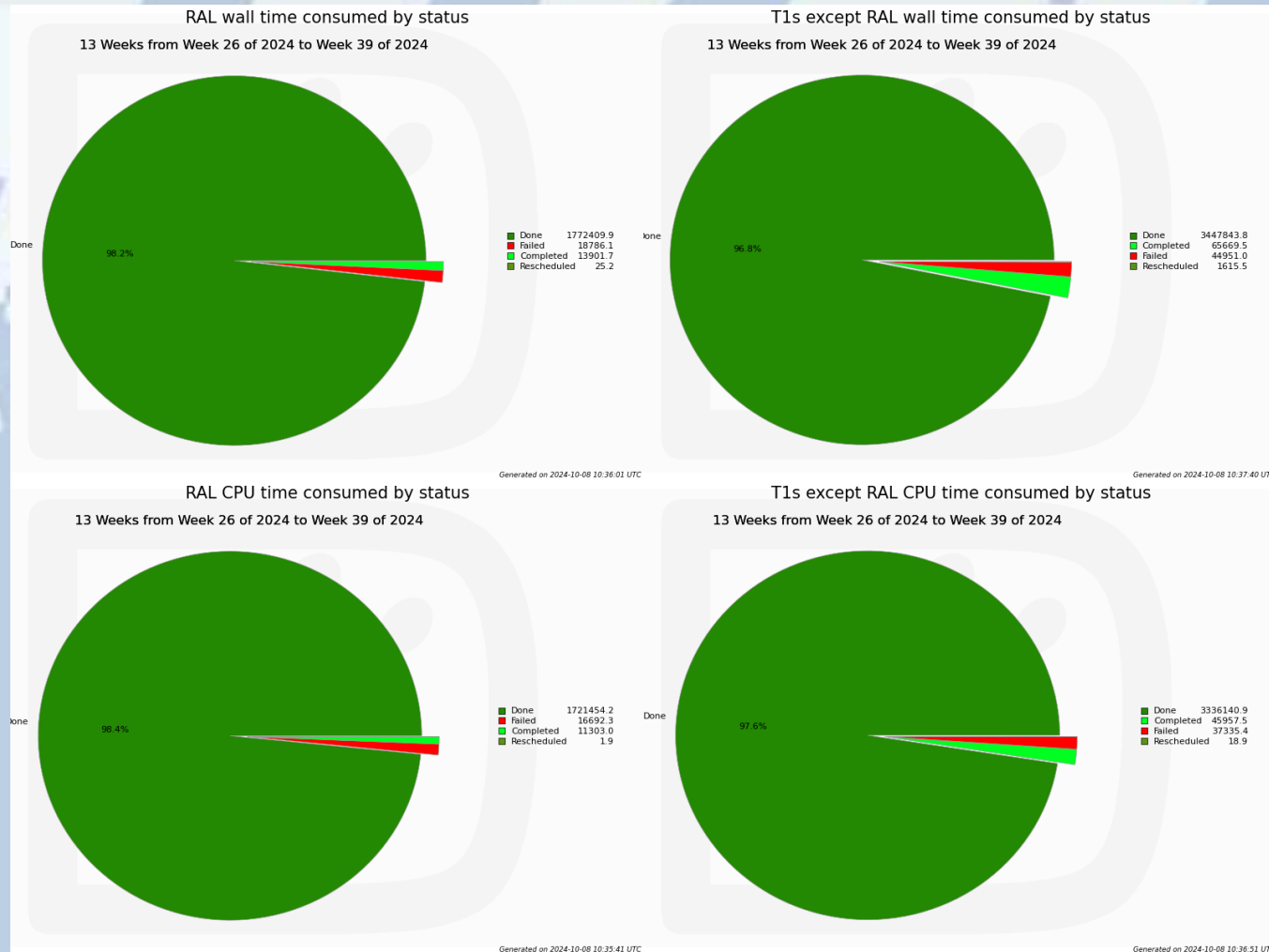
13 Weeks from Week 26 of 2024 to Week 39 of 2024



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Comparison

The same is true for “wasted” CPU Time/walltime

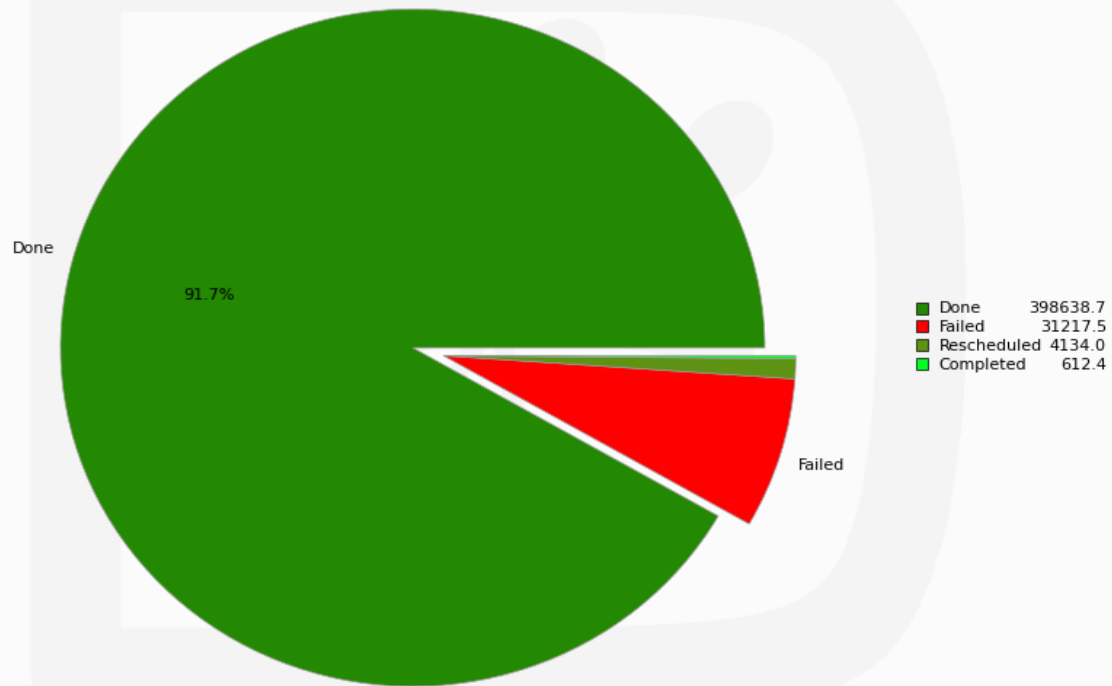


Comparison (User Jobs)

- Among all job types, user jobs have one of the highest failure rates
- For RAL it is lower than for the other T1s

user jobs at LCG.RAL.uk

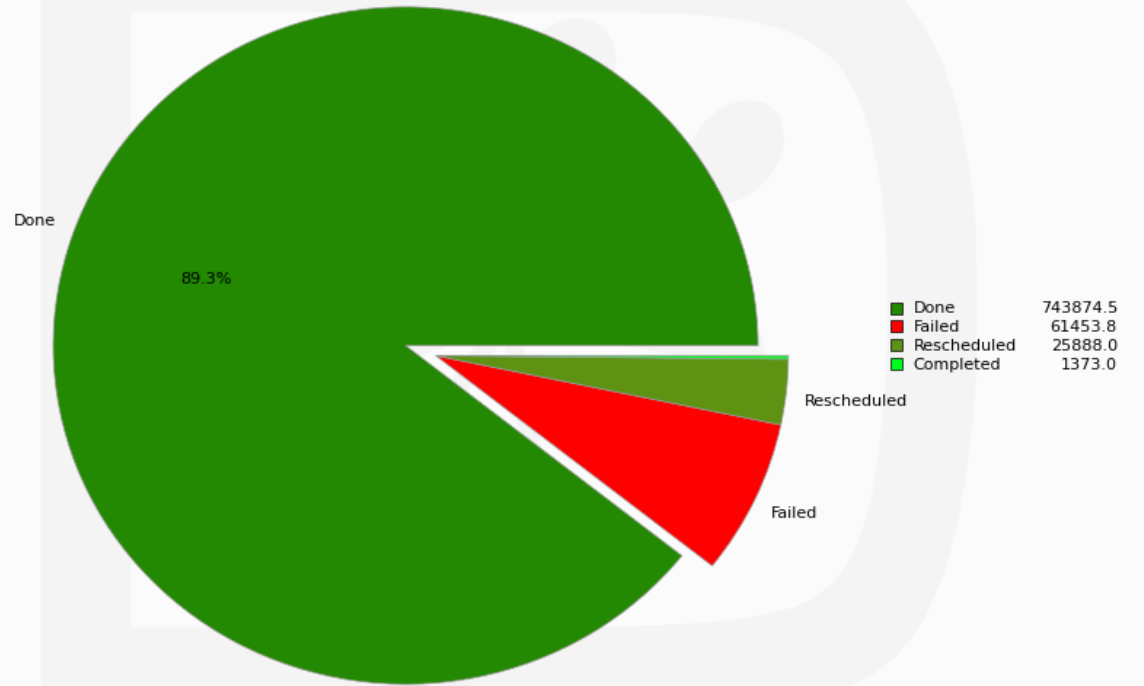
13 Weeks from Week 26 of 2024 to Week 39 of 2024



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user jobs at All T1s except LCG.RAL.uk

13 Weeks from Week 26 of 2024 to Week 39 of 2024



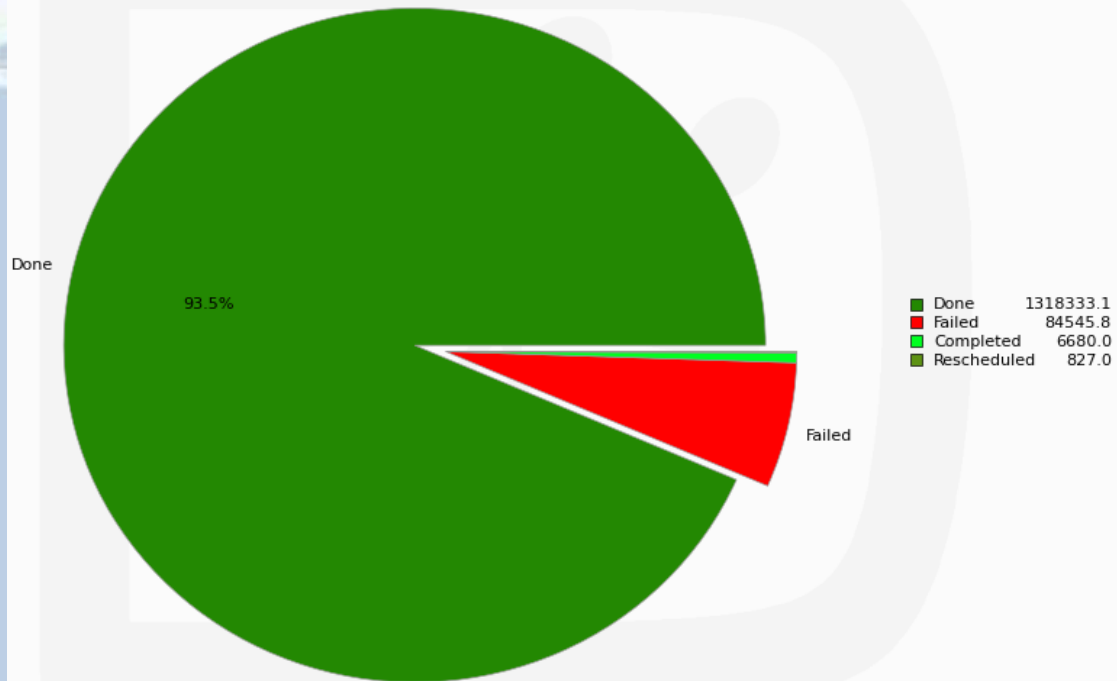
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Comparison (WG Prod)

- Same is true for WG Production jobs

WGProduction jobs at LCG.RAL.uk

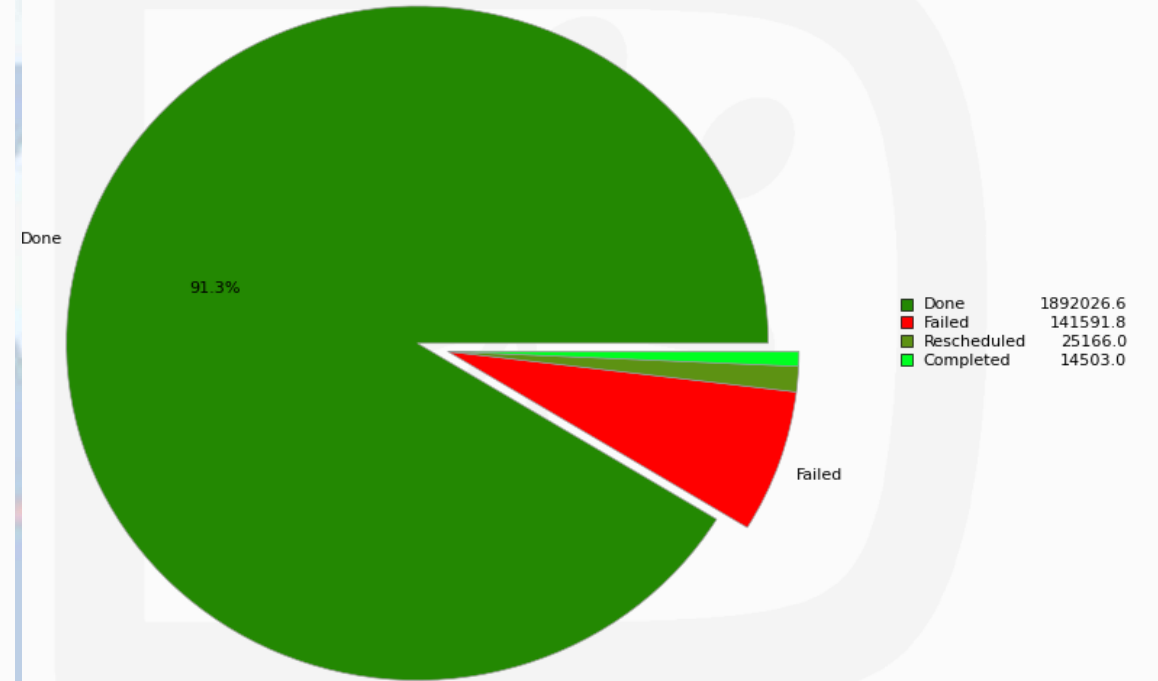
13 Weeks from Week 26 of 2024 to Week 39 of 2024



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WGProduction jobs at All T1s except LCG.RAL.uk

13 Weeks from Week 26 of 2024 to Week 39 of 2024



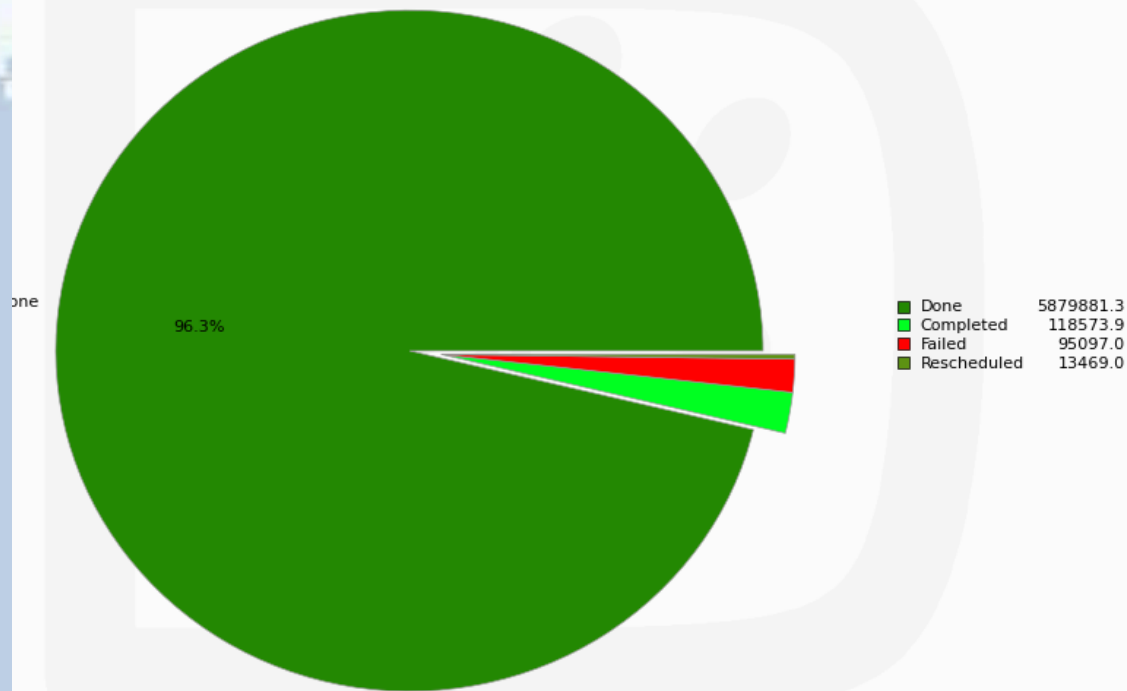
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Comparison (Sim+data proc)

- For prod jobs failure rate is higher than usual
- But comparable with others

Prod jobs at LCG.RAL.uk

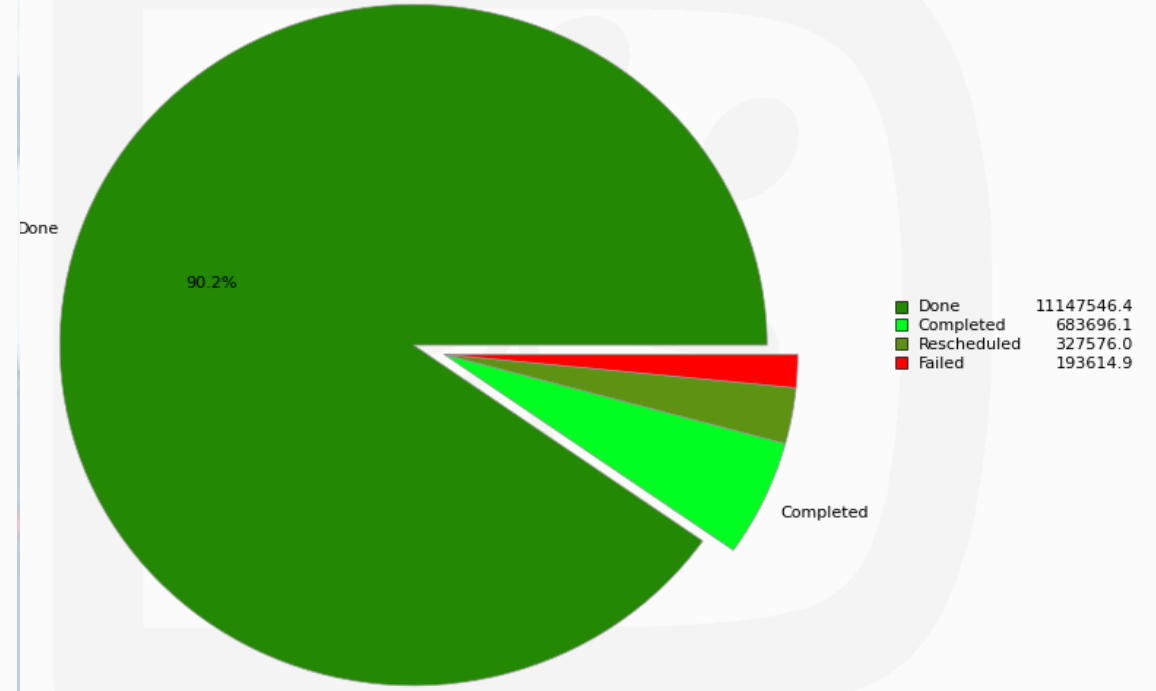
13 Weeks from Week 26 of 2024 to Week 39 of 2024



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Prod jobs at All T1s except LCG.RAL.uk

13 Weeks from Week 26 of 2024 to Week 39 of 2024



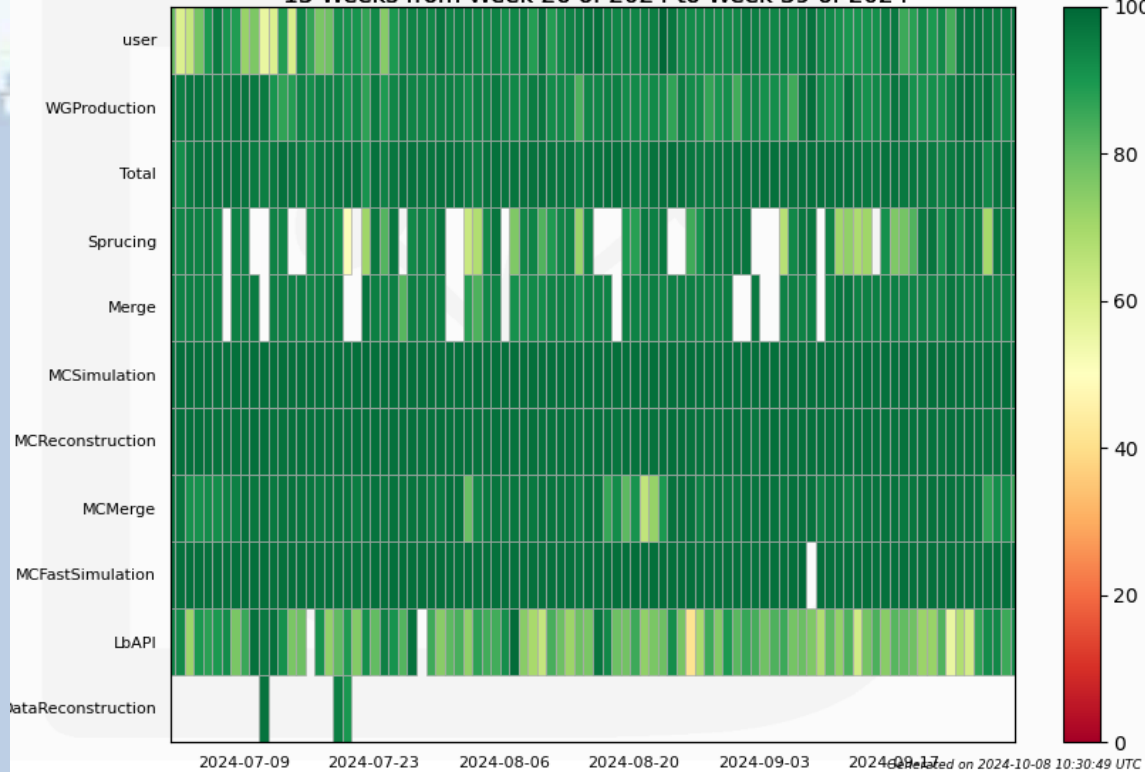
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Efficiency

- Good efficiency for almost all job types

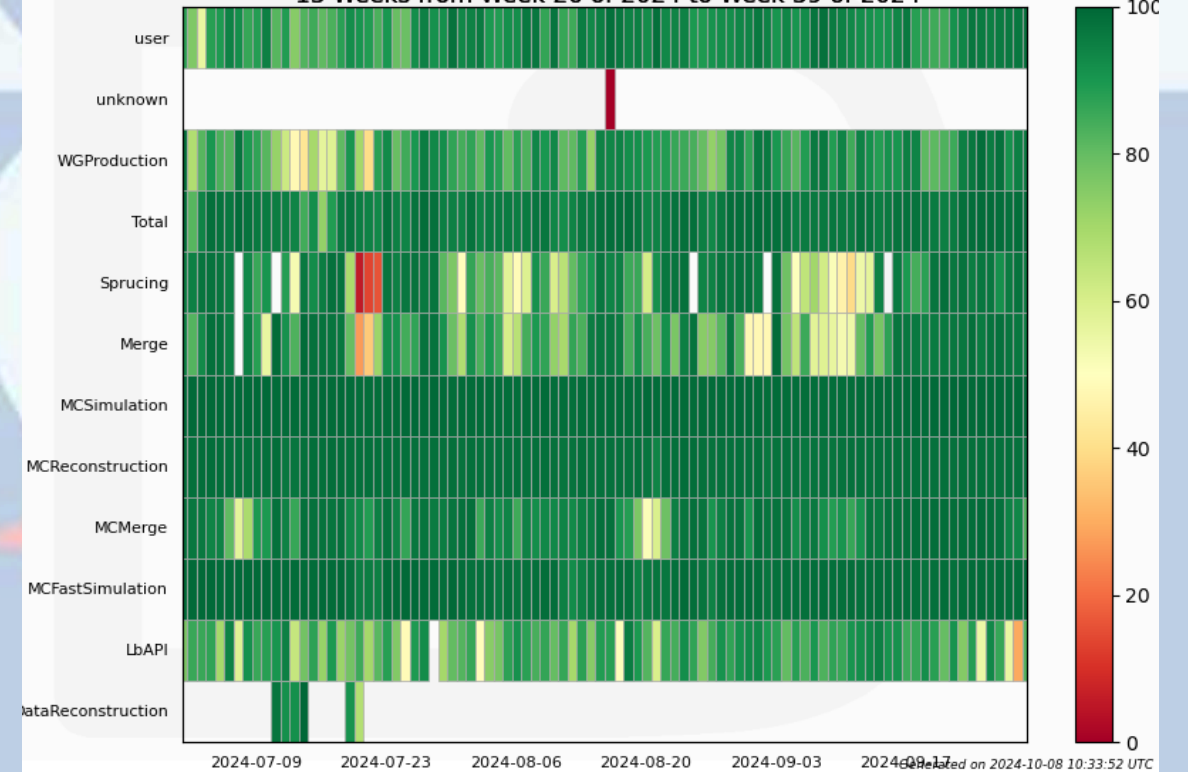
CPU efficiency (RAL)

13 Weeks from Week 26 of 2024 to Week 39 of 2024



CPU efficiency (T1s except RAL)

13 Weeks from Week 26 of 2024 to Week 39 of 2024

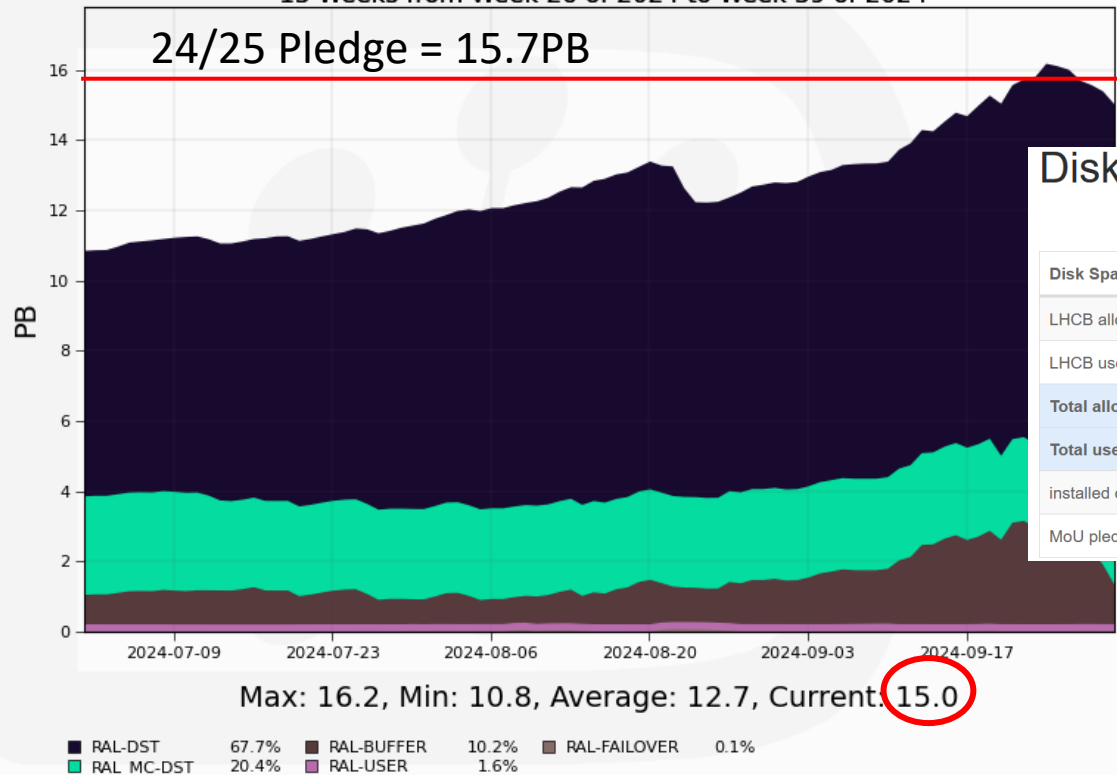


Disk Usage

- Increased usage due to Data Taking
 - 25/26 pledge released to LHCb in September
 - 24/25 pledge then was exceeded
- Good match between DIRAC and CRIC accounting

PFN space usage by StorageElement

13 Weeks from Week 26 of 2024 to Week 39 of 2024



Disk Space - TBytes

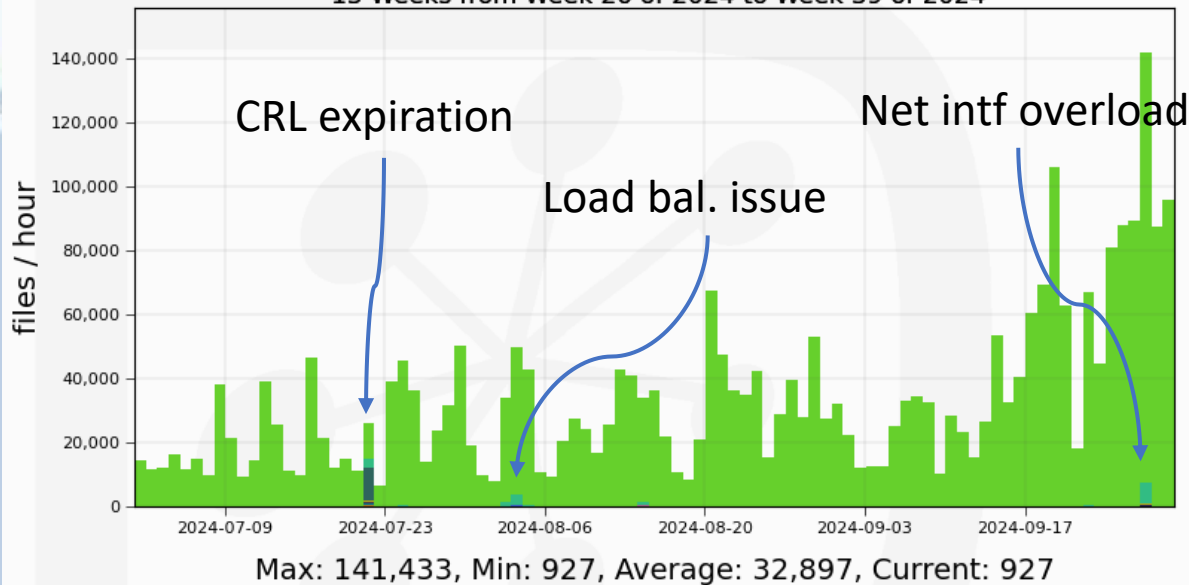
Disk Space - TBytes	Jul 2024	Aug 2024	Sep 2024	Total	% MoU
LHCB allocated	15,720	15,720	20,090	51,530	
LHCB used	11,174	12,670	15,040	38,884	
Total allocated	15,720	15,720	20,090	51,530	109%
Total used	11,174	12,670	15,040	38,884	82%
installed capacity	0	0	0	0	
MoU pledge	15,724	15,724	15,724	47,172	

Disk transfers

- Good transfer efficiency, with with some known issues
 - CRL expiration
 - Load balancing issue
 - ECHO network interfaces overload
 - Other sites' issues

Transfers to ECHO

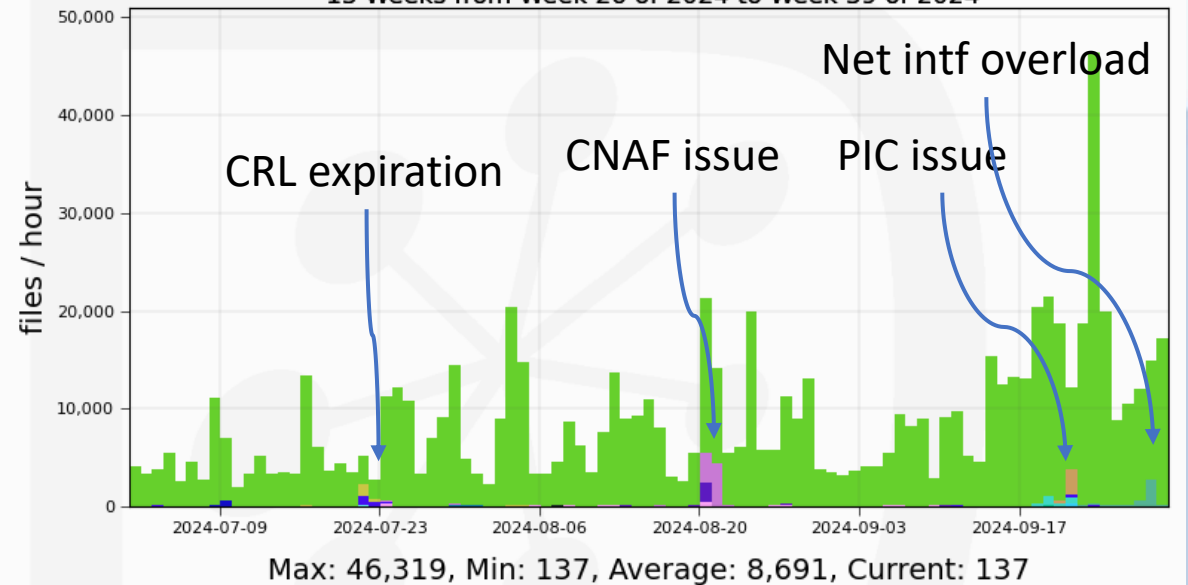
13 Weeks from Week 26 of 2024 to Week 39 of 2024



Succeeded	99.0%	lbvobox310.cern.ch -> RAL-BUFFER	0.0%
LCG.RAL.uk -> RAL-BUFFER	0.5%	CNAF-DST -> RAL-DST	0.0%
CERN-DAQ-EXPORT -> RAL-BUFFER	0.3%	LCG.RAL.uk -> RAL-USER	0.0%
lbvobox309.cern.ch -> RAL-BUFFER	0.0%	LCG.CSCS.ch -> RAL-BUFFER	0.0%
LCG.CNAF.it -> RAL-FAILOVER	0.0%	LCG.Beijing.cn -> RAL-USER	0.0%
LCG.RAL.uk -> RAL-DST	0.0%	LCG.CNAF.it -> RAL-BUFFER	0.0%
LCG.Beijing.cn -> RAL-BUFFER	0.0%	LCG.Manchester.uk -> RAL-BUFFER	0.0%
LCG.RAL.uk -> RAL-FAILOVER	0.0%	LCG.JINR.ru -> RAL-BUFFER	0.0%
LCG.Glasgow.uk -> RAL-BUFFER	0.0%	... plus 247 more	

Transfers from ECHO

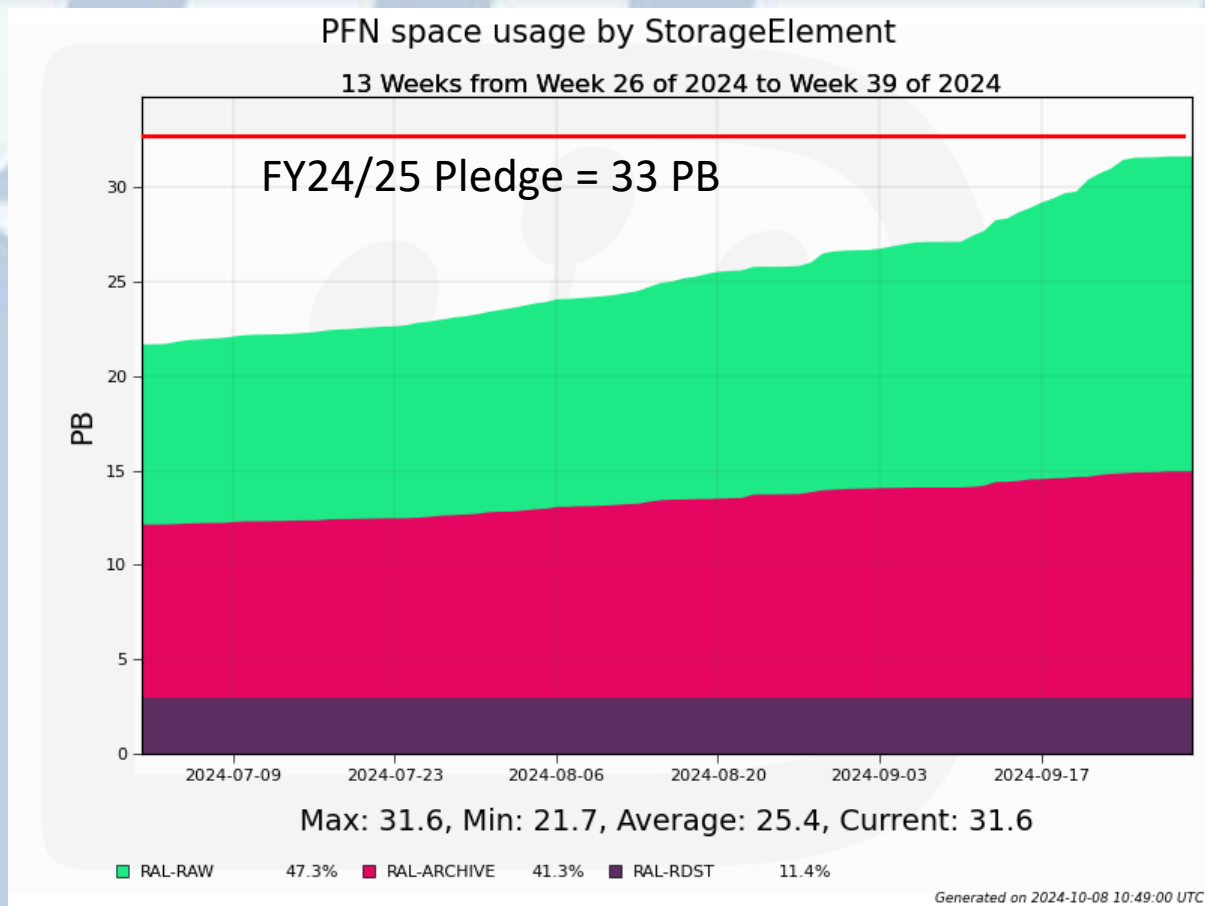
13 Weeks from Week 26 of 2024 to Week 39 of 2024



Succeeded	96.4%	RAL-FAILOVER -> MIT-BUFFER	0.1%
RAL-DST -> CNAF-ARCHIVE	1.0%	RAL-USER -> DIRAC.Client.ch	0.0%
RAL-DST -> NCBJ-ARCHIVE	0.5%	RAL-FAILOVER -> PIC-DST	0.0%
RAL-DST -> PIC-DST	0.4%	RAL-FAILOVER -> CNAF-DST	0.0%
RAL-DST -> CNAF-DST	0.3%	RAL_MC-DST -> Beijing_MC-DST	0.0%
RAL-BUFFER -> LCG.RAL.uk	0.3%	RAL-DST -> PIC-ARCHIVE	0.0%
RAL-BUFFER -> RAL-RAW	0.3%	RAL-USER -> DIRAC.Client.cn	0.0%
RAL-FAILOVER -> PIC-BUFFER	0.3%	RAL_MC-DST -> NCBJ-ARCHIVE	0.0%
RAL-FAILOVER -> CNAF-BUFFER	0.2%	... plus 198 more	

Tape usage

- Almost all 24/25 (Q1?) pledge is used
- Pledge increased in September alongside with the disk one

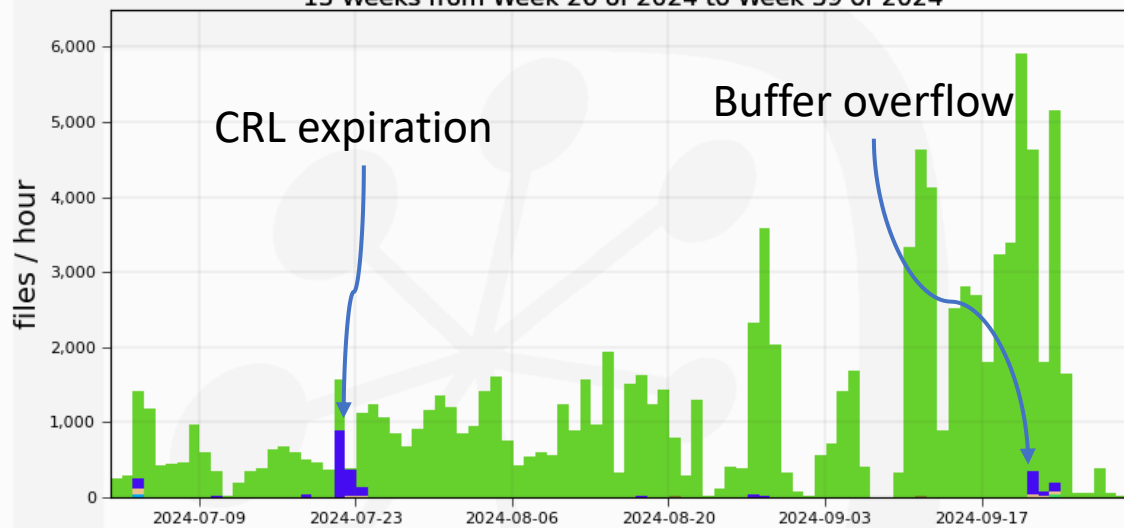


Tape transfers

- Good transfer efficiency, with a few known issues
- Very few tape recalls (expected)

Transfers to Antares

13 Weeks from Week 26 of 2024 to Week 39 of 2024



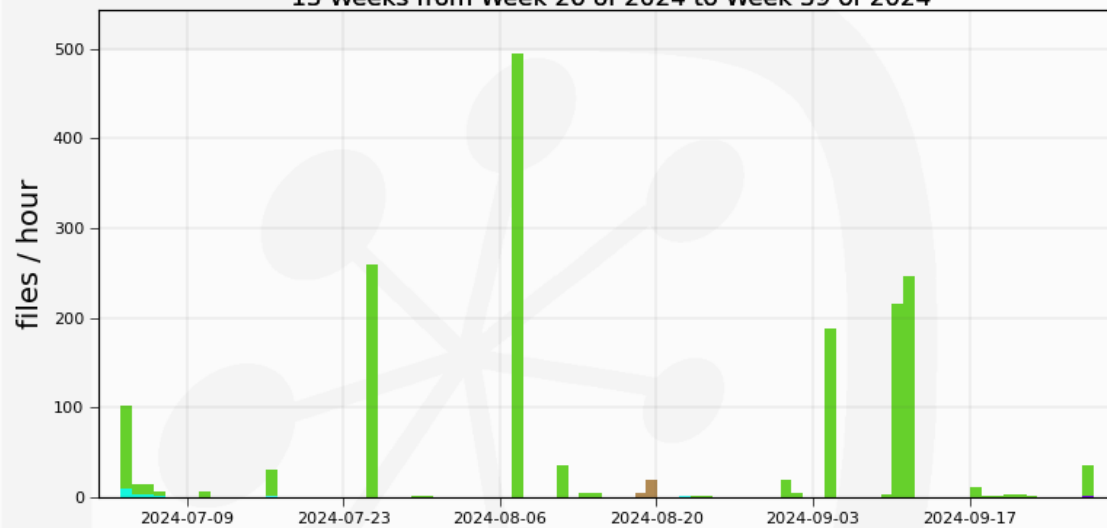
Max: 5,902, Average: 1,180, Current: 0.20

■ Succeeded	97.7%	■ RAL_MC-DST -> RAL-ARCHIVE	0.0%
■ RAL-BUFFER -> RAL-RAW	1.9%	■ CERN_MC-DST-EOS -> RAL-ARCHIVE	0.0%
■ CERN-DAQ-EXPORT -> RAL-RAW	0.2%	■ PIC_MC-DST -> RAL-ARCHIVE	0.0%
■ GRIDKA-DST -> RAL-ARCHIVE	0.0%	■ GRIDKA_MC-DST -> RAL-ARCHIVE	0.0%
■ RAL-DST -> RAL-ARCHIVE	0.0%	■ IN2P3_MC-DST -> RAL-ARCHIVE	0.0%
■ CNAF-DST -> RAL-ARCHIVE	0.0%	■ CNAF_MC-DST -> RAL-ARCHIVE	0.0%
■ SARA-DST -> RAL-ARCHIVE	0.0%	■ NCBJ_MC-DST -> RAL-ARCHIVE	0.0%
■ CERN-DST-EOS -> RAL-ARCHIVE	0.0%	■ PIC-DST -> RAL-ARCHIVE	0.0%
■ IN2P3-DST -> RAL-ARCHIVE	0.0%	■ ... plus 15 more	0.0%

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Transfers from Antares

13 Weeks from Week 26 of 2024 to Week 39 of 2024



Max: 494, Average: 19.2

■ Succeeded	97.0%	■ RAL-ARCHIVE -> RAL-ARCHIVE	0.0%
■ RAL-ARCHIVE -> DIRAC.Client.cn	1.4%	■ RAL-ARCHIVE -> CSCS-DST	0.0%
■ RAL-RAW -> RAL-BUFFER	1.1%	■ RAL-ARCHIVE -> GRIF-DST	0.0%
■ RAL-ARCHIVE -> DIRAC.Client.ch	0.2%	■ RAL-ARCHIVE -> RAL-HEP-DST	0.0%
■ RAL-RAW -> DIRAC.Client.ch	0.1%	■ RAL-ARCHIVE -> Beijing-DST-TMP	0.0%
■ RAL-ARCHIVE -> DIRAC.Client.uk	0.0%	■ RAL-ARCHIVE -> CNAF-DST	0.0%
■ RAL-ARCHIVE -> DIRAC.Client.local	0.0%	■ RAL-ARCHIVE -> Glasgow-DST	0.0%
■ RAL-RAW -> DIRAC.Client.local	0.0%	■ RAL-ARCHIVE -> CSCS_MC-DST	0.0%
■ RAL-ARCHIVE -> CERN_MC-DST-EOS	0.0%	■ RAL-ARCHIVE -> Beijing_MC-DST	0.0%

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The background of the slide features a large, semi-transparent watermark of the LHCb logo in a blue serif font. The logo is oriented horizontally across the top half of the slide. On the left side, there is a vertical orange bar. A thin vertical line is positioned to the right of the orange bar, and a diagonal orange line crosses the bottom right portion of the slide.

Summary

- RAL saved LHCb Data Taking campaign by provisioning additional space
 - Thanks a lot!
- Good performance during the third quarter of 2024
- Issues addressed in a timely manner