CMS Tier-1 Experiment sign off for Q2 2024

Katy Ellis, 31st July 2024

Overview

- A good quarter for CMS at T1
- From last quarter: *“Good (job) performance relative to other T1s, especially when using the OPN on the farm. However, some recent signs that OPN is saturating.”*
  - Removal of Lazy-Download in May removed this saturation
  - Clear effect
- T1 and CMS computing staff upgrading systems from EL7 due to EOL

Completed jobs at Tier 1

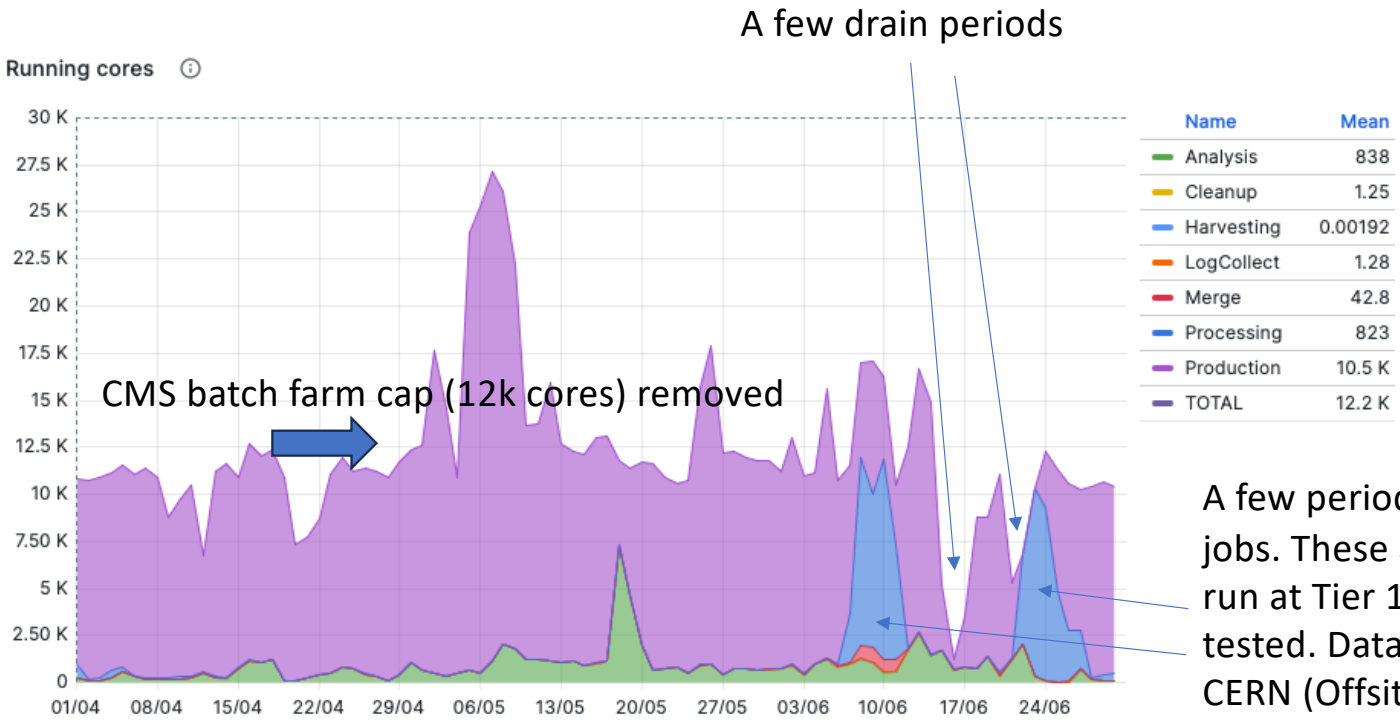
Total completed jobs

	total	percentage
T1_US_FNAL	6631335	44.6%
T1_RU_JINR	2161726	14.5%
T1_UK_RAL	2037448	13.7%
T1_DE_KIT	1358135	9.1%
T1_FR_CCIN2P3	1241619	8.4%
T1_IT_CNAF	986059	6.6%
T1_ES_PIC	447526	3.0%

Higher than previous quarter

Failed jobs are included in all metrics

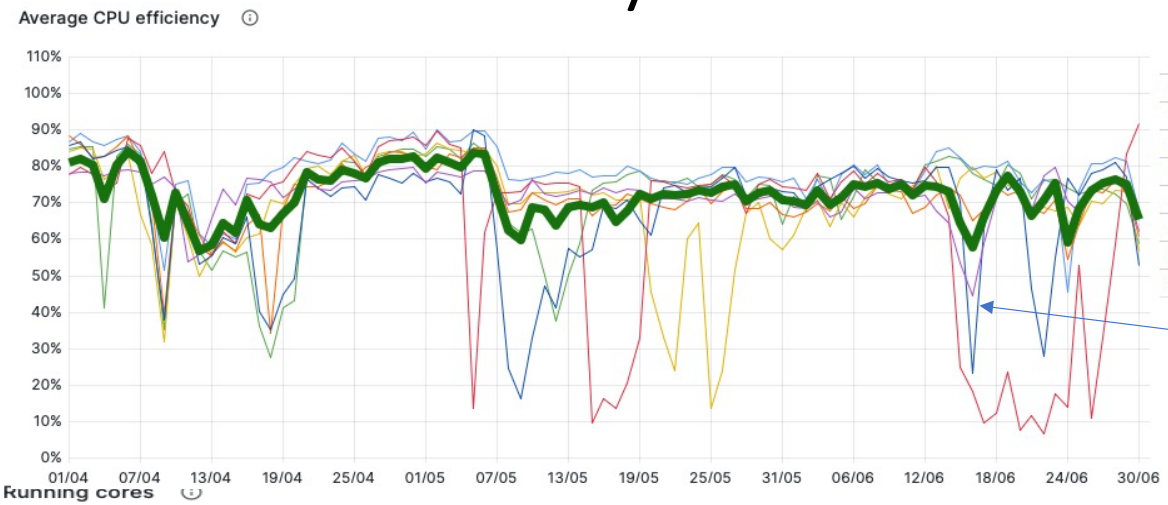
Running cores at RAL



A few periods of Processing type jobs. These are “Tier 0” jobs being run at Tier 1 sites as previously tested. Data is read directly from CERN (Offsite read of primary data).

Running cores was easily above pledge except during periods of drain.

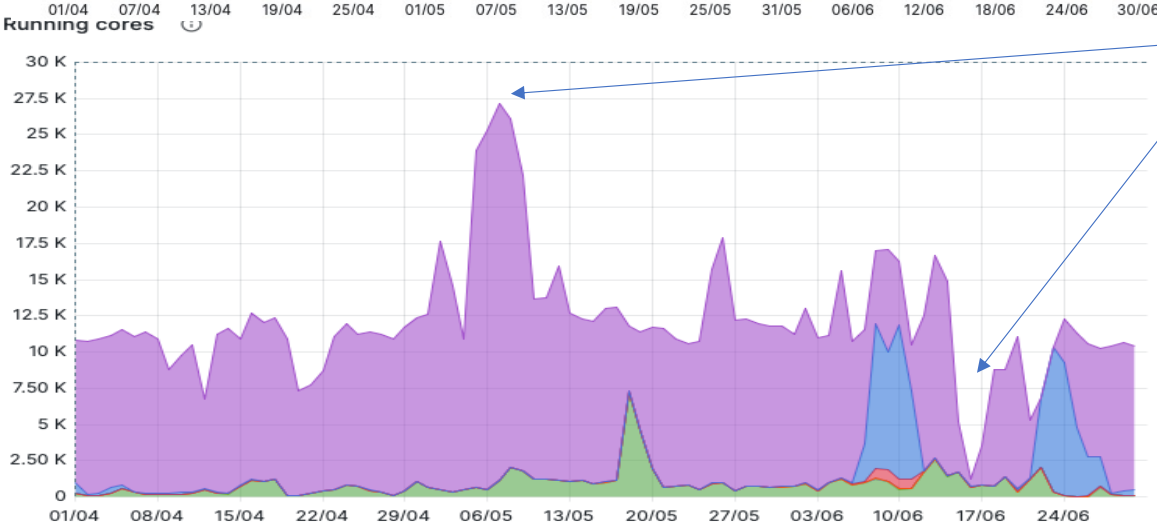
Job efficiency



Name	Mean
T1_DE_KIT	71.5%
T1_ES_PIC	69.3%
T1_FR_CCIN2P3	78.4%
T1_IT_CNAF	71.7%
T1_RU_JINR	64.2%
T1_UK_RAL	67.8%
T1_US_FNAL	72.4%
OverallCpuEff	72.3%

RAL T1 a bit low compared to other T1s

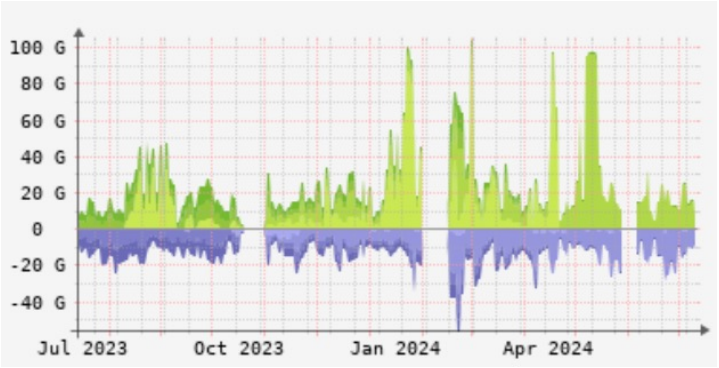
As usual, job efficiency can be lower when in drain, but the big drop in eff was during a period of high core usage

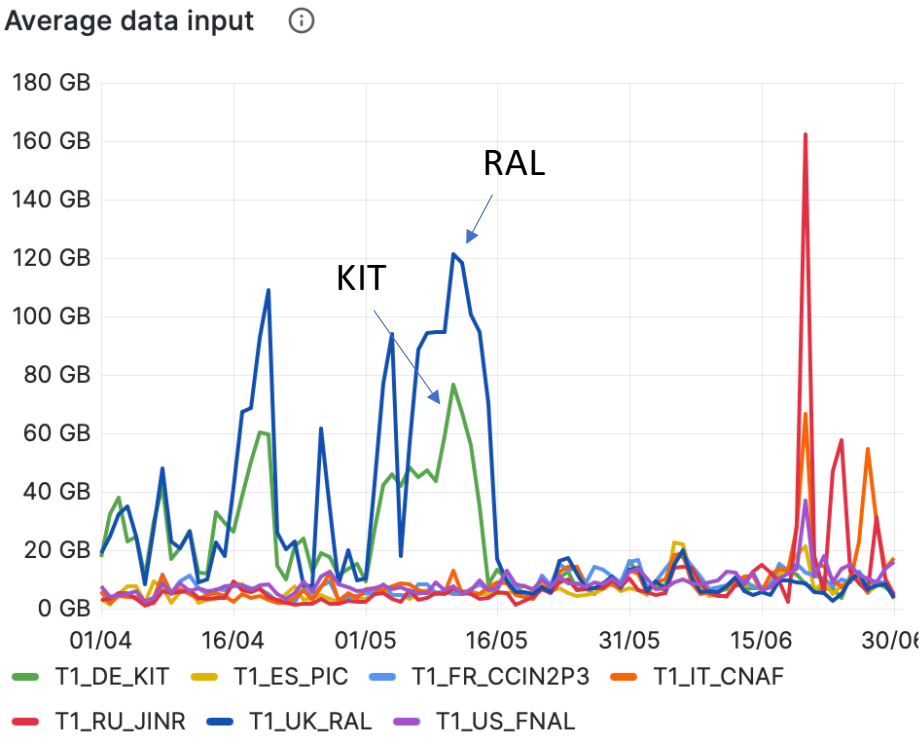


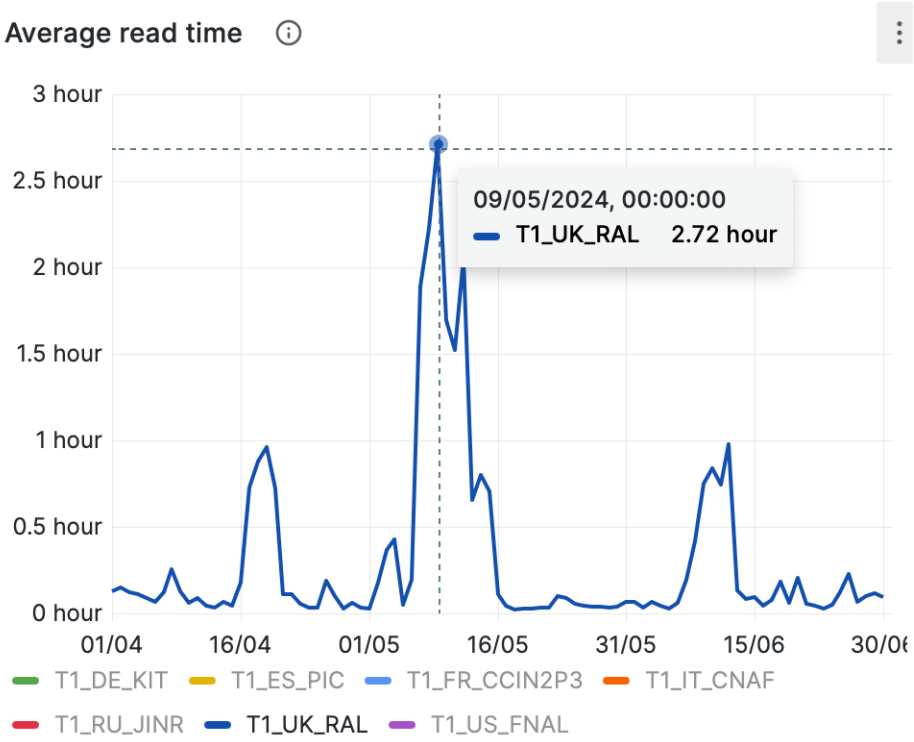
Name	Mean
Analysis	838
Cleanup	1.25
Harvesting	0.00192
LogCollect	1.28
Merge	42.8
Processing	823
Production	10.5 K
TOTAL	12.2 K

Removal of Lazy-Download

- 15th May 2024
- Applies to local reads, but importantly remote reads







SAM webdav tests – calmer than Q1

Q1

Q2

Summary table of jobs

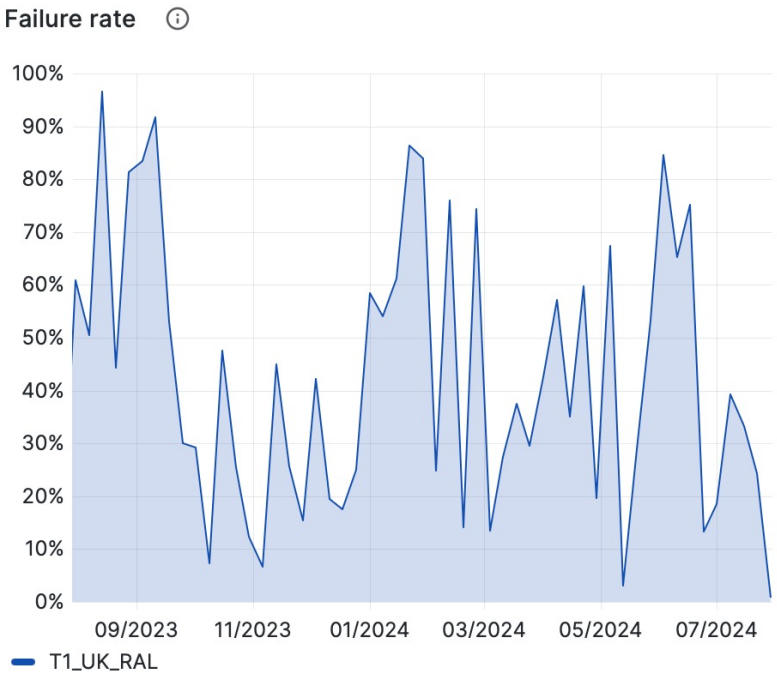
Site	Job Count	Failed jobs	CPU Eff	CpuTimeHr	CoreHr	Avg Queue time	Failure rate
T1_US_FNAL	7808468	1032447	72.5%	73248844.39	101039220.83	07:32:47	13.22%
T1_UK_RAL	2295263	239815	69.2%	18450600.93	26676975.21	06:08:45	10.45%
T1_RU_JINR	2287473	169027	74.4%	23391825.55	31454762.94	07:04:36	7.39%
T1_IT_CNAF	1288439	156420	73.6%	16078786.91	21852029.17	06:07:03	12.14%
T1_FR_CCIN2P3	1470587	163743	78.9%	13887635.06	17611894.70	06:08:20	11.13%
T1_ES_PIC	552142	114757	71.3%	3887247.42	5453617.95	05:37:28	20.78%
T1_DE_KIT	1692067	174619	72.5%	22403655.01	30895716.38	07:43:17	10.32%

Worst of the T1s with all sites lower than previous quarters (80/72% in Q4/1) due to CMS issues

10% failure rate, improvement on last quarter; one of the better T1s

LogCollect

- Long-standing problem with up to 100% of this CMS job type failing
- It became clear that newer campaigns were fine; older campaigns always failed due to XRootD version
- Decided to close the GGUS ticket (created in 2019) as I believe this will never be fixed! https://ggus.eu/index.php?mode=ticket_info&ticket_id=141120
- WMcore has its own ticket



Token status

- CMS VO not using tokens for production/FTS data transfers during Q2
  - Waiting for improvements from IAM
  - SAM tests on Echo and AAA machines remain green at RAL
- CMS moved to Tape REST API on Antares
  - Ready for tape tokens at RAL
- No progress on tokens for CEs – was waiting for Rocky8 and other delays

Misc. comments

- CMS continuing to use pilot overloading.
- Issue remains with consistency check on CMS side
- CMS removed usage of gridftp (inc. for stage-out from jobs to Echo and the CERN FTS instance)
- Batch farm went dual stack (except 18/19 generations)
  - CMS jobs using IPv6 were observed using the external Echo gateways to stage out rather than the WN gateways – now fixed
- CMS started submitting jobs via EL9
- CVMFS has problems but no obvious effect on CMS jobs
- Removal of VOMS-Admin

Summary

- Good performance for CMS at RAL again this quarter
  - Removal of Lazy-Download removed the risk of saturating LHCOPN
  - Improvement in number of job failures
  - Job efficiency affected by period of many cores/network struggling
- Stable performance despite the major upgrades from EL7
- Still waiting for tokens for CEs