CMS Tier-1 Experiment sign off for Q3 2024
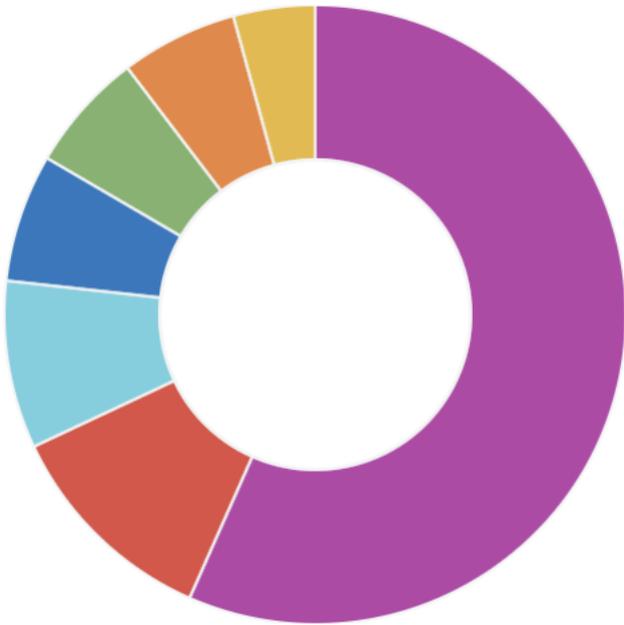
Katy Ellis, 16th October 2024

Overview

- Another good quarter for CMS at T1
- Effect of removing Lazy-Download is keeping RAL high (or highest) performing of CMS Tier 1s for job failures and efficiency
- Minimal report as Katy has covid!

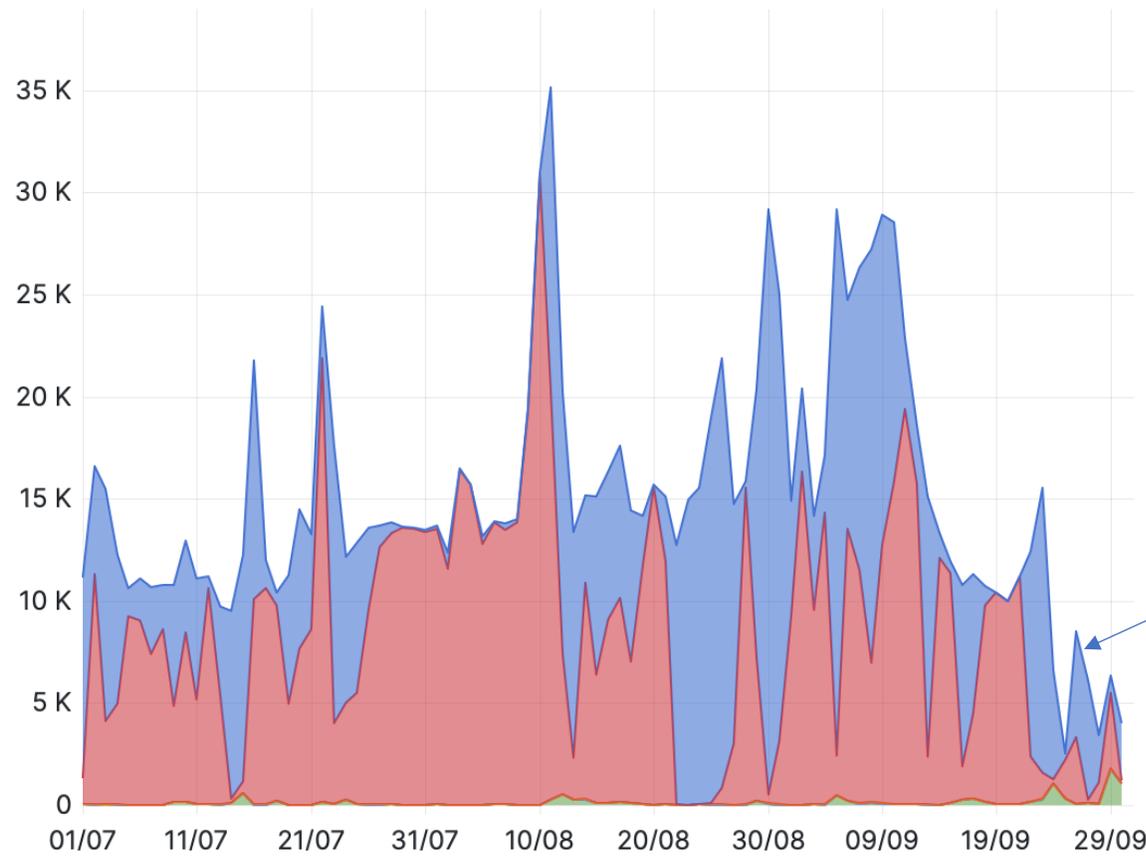# Completed jobs at Tier 1

Total completed jobs ⓘ

	total ▼	percentage ▼
▬ T1_US_FNAL	11426458	56.6%
▬ T1_RU_JINR	2296784	11.4%
▬ T1_FR_CCIN2P3	1766847	8.8%
▬ T1_UK_RAL	1348339	6.7%
▬ T1_DE_KIT	1259474	6.2%
▬ T1_IT_CNAF	1226834	6.1%
▬ T1_ES_PIC	857079	4.2%

⬅ About expected, but FNAL dominate due to running many more short (analysis) jobs

Failed jobs are included in all metrics

Running cores at RAL

Running cores ⓘ

Name	Mean
● Analysis	128
● Cleanup	0.508
● LogCollect	0.522
● Merge	8.18
● Processing	8.57 K
● Production	6.47 K
● TOTAL	15.2 K

Cores dedicated to Processing jobs higher than Production for the first time (in many years)

One period going into drain (errors on Antares due to buffer filling)

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

Job efficiency

Average CPU efficiency ⓘ

Name	Mean
T1_DE_KIT	77.7%
T1_ES_PIC	71.1%
T1_FR_CCIN2P3	81.7%
T1_IT_CNAF	75.9%
T1_RU_JINR	73.8%
T1_UK_RAL	81.8%
T1_US_FNAL	73.3%
OverallCpuEff	75.6%

First full quarter with Lazy-Download removed; RAL T1 has best CMS T1 efficiency for first time

Summary table of jobs

Site	Job Count	Failed jobs	CPU Eff	CpuTimeHr	CoreHr	Avg Queue time	Failure rate
T1_US_FNAL	13254361	2905072	72.9%	67782914.12	92997553.03	09:03:38	21.92%
T1_UK_RAL	1822171	94019	83.3%	27238924.91	32692909.26	07:50:18	5.16%
T1_RU_JINR	2908455	338961	75.7%	22219118.39	29340663.04	07:15:01	11.65%
T1_IT_CNAF	1594989	170113	78.4%	21327095.77	27211171.23	06:18:27	10.67%
T1_FR_CCIN2P3	2255804	553713	83.9%	14051583.78	16748065.93	05:40:40	24.55%
T1_ES_PIC	940111	409379	72.1%	4176711.25	5793953.91	06:20:16	43.55%
T1_DE_KIT	1725124	144526	78.6%	18924033.58	24088164.30	08:56:13	8.38%

Virtually best of the T1s
with all sites improved on
previous quarters (RAL
72/69% in Q1/2)

5% failure rate,
improvement on
last quarter; best
of the T1s

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Token status

- CMS VO now using tokens for some production/FTS data transfers since September
  - About 30% of transfers currently
  - A lot of transfers are currently to tape (not yet supported with tokens in FTS)
  - Token only used if *all possible sources* and destination are token-enabled
- CMS moved to Tape REST API on Antares in Q2
  - Ready for tape tokens at RAL – has this work been scheduled?
- RAL T1 now ready for token tests on ARC-CEs…but they are broken at the CMS/ETF end

Summary

- Very good performance for CMS at RAL this quarter, best of T1s
  - Full effect of removal of Lazy-Download is clear on job performance, alongside other improvements
  - More stable system and fewer interventions in the summer months meant a relatively strong period for SAM tests, few periods of drain, etc.
- Tokens in production for Rucio disk transfers since Sept; work to be done at RAL and by FTS for tape
- Tokens for ARC-CEs continues to be problematic