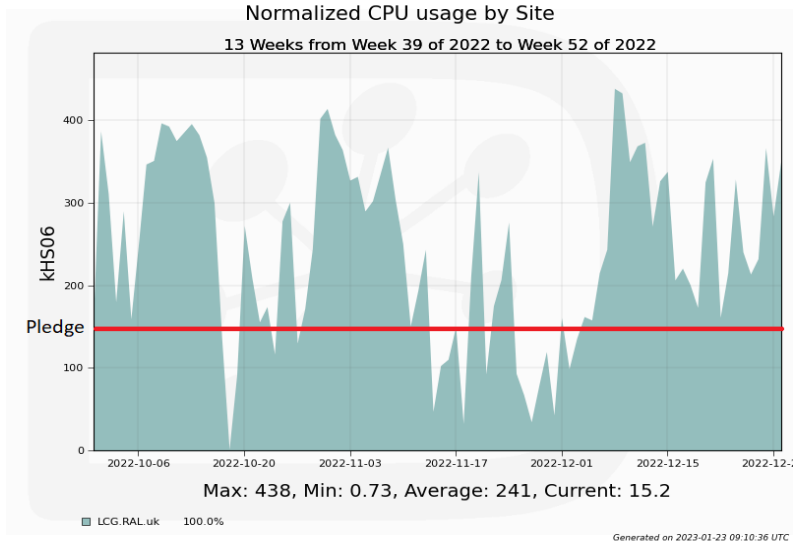
Science and Technology Facilities Council

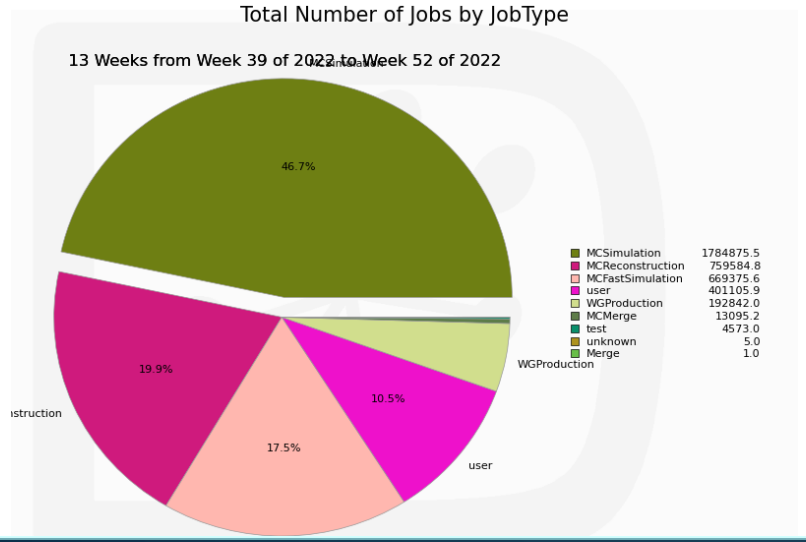
Rutherford Appleton Laboratory

RESOURCES REVIEW MEETING LHCB: 2022Q4

22.02.2023

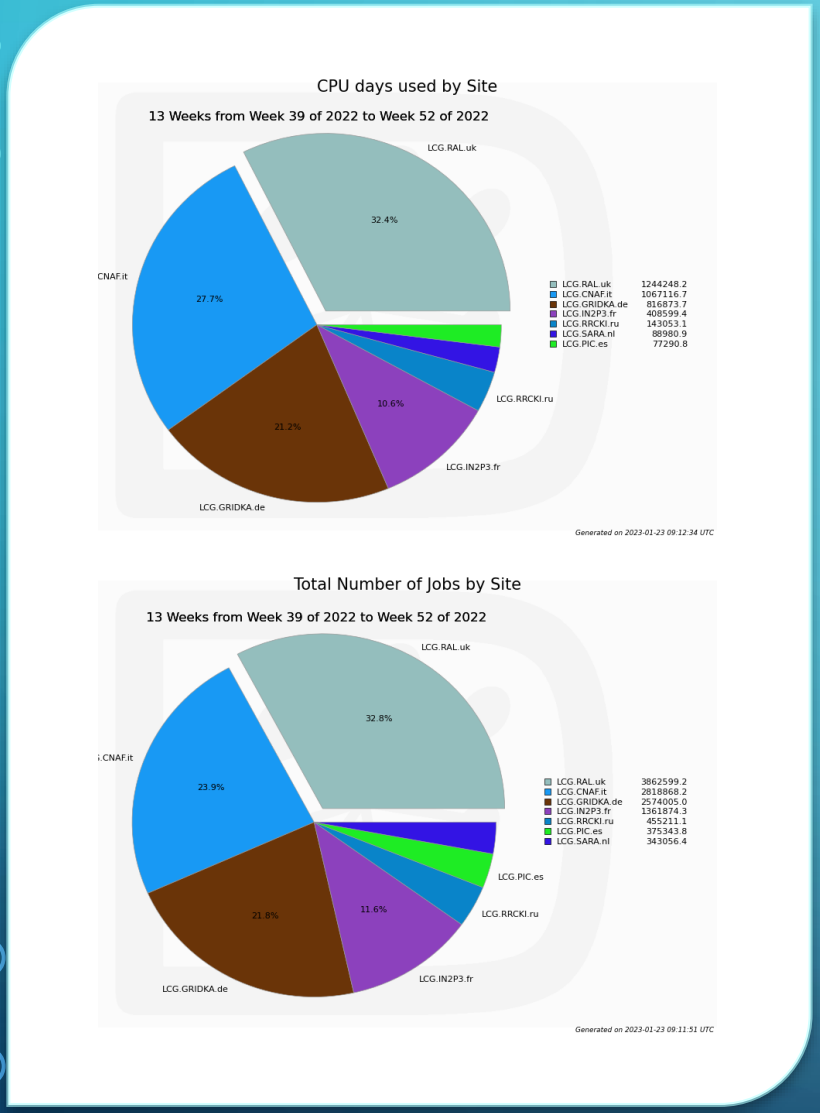
alexrg





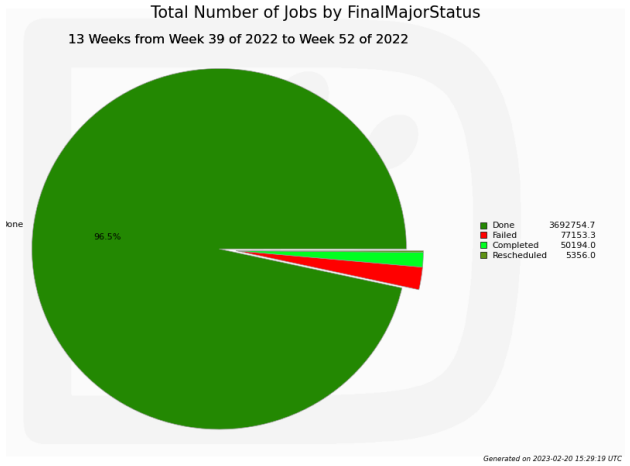
COMPUTING RESOURCES

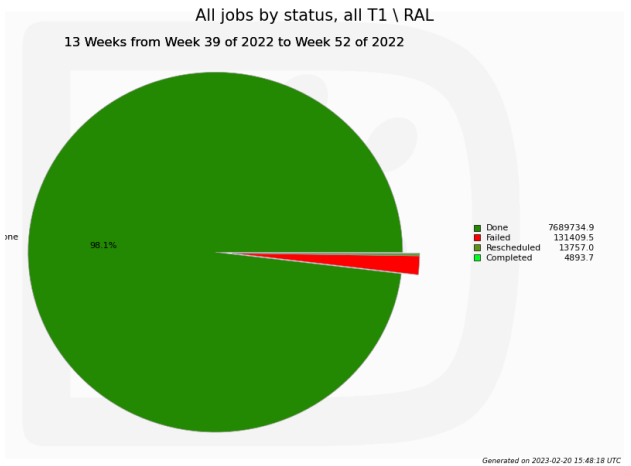
- On average consumed cpu time is above the pledge (146665 HS06)
- There were some periods with low computing activity, mainly because of the lack of production requests from LHCb side

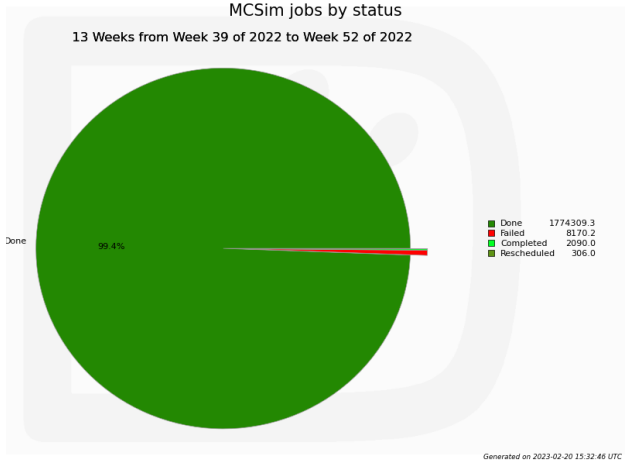


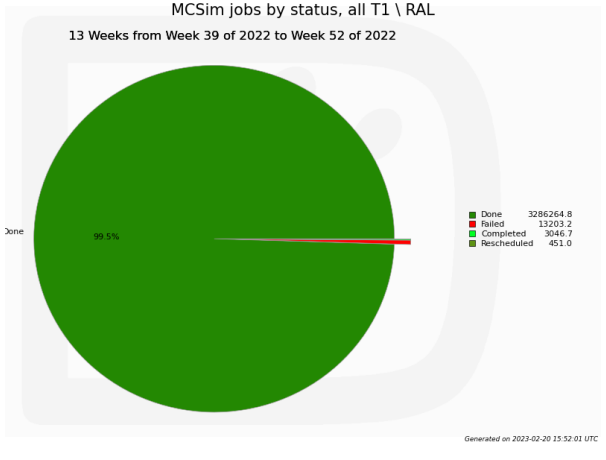
COMPARISON

- RAL provided the most CPU resources among all T1 sites, in terms of both CPU days and number of jobs



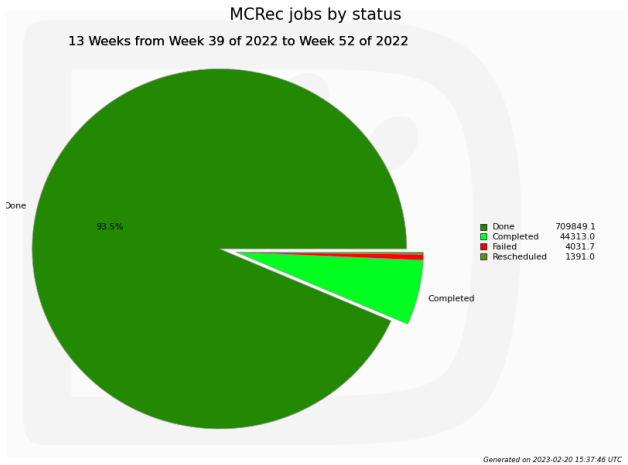


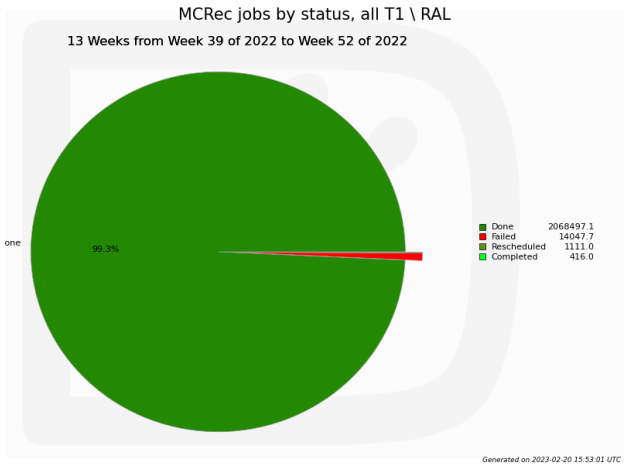


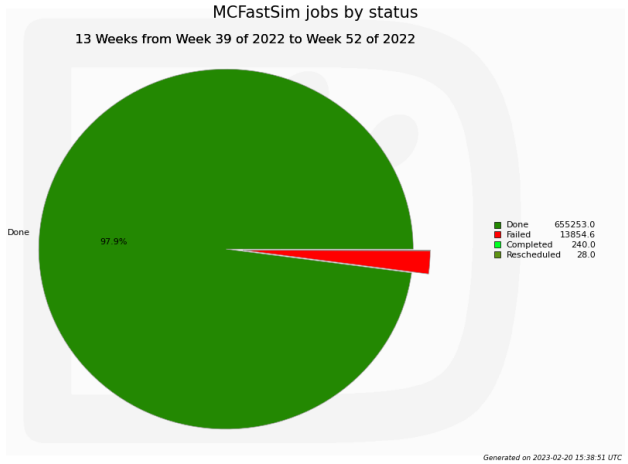


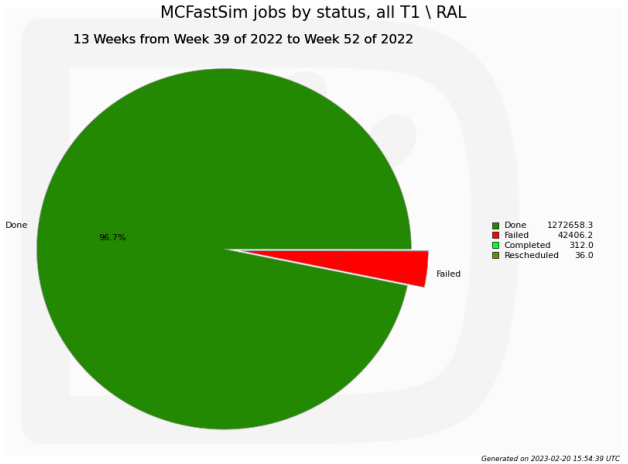
COMPARISON

- Failure rate at RAL is a little bit higher then across all other T1
  - MC Simulation jobs looks OK



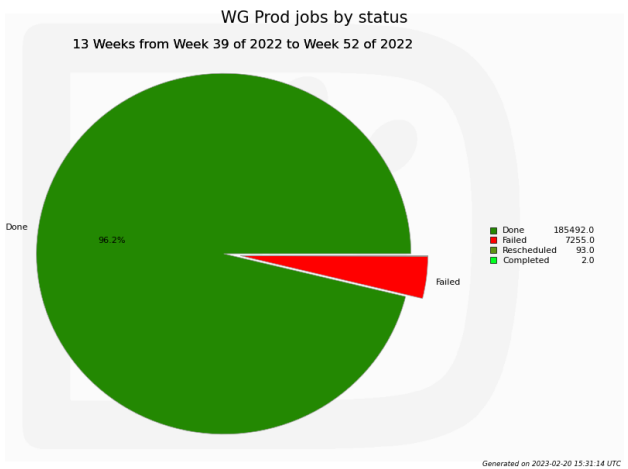


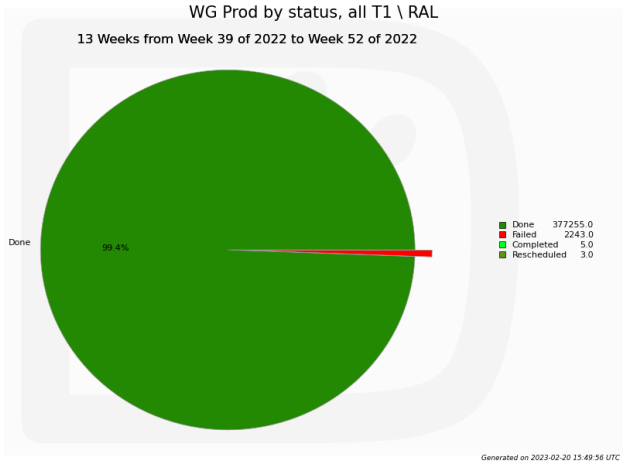


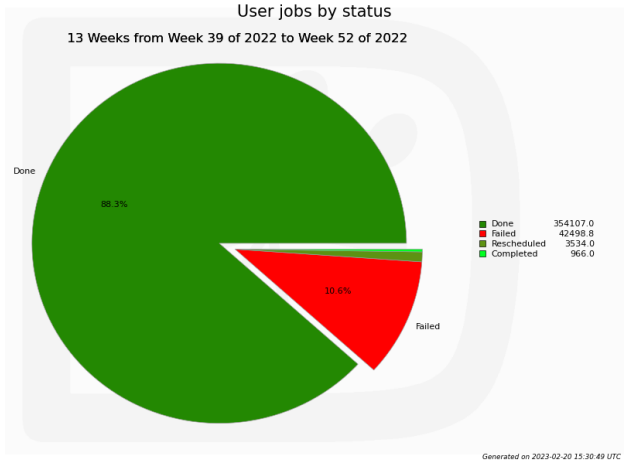


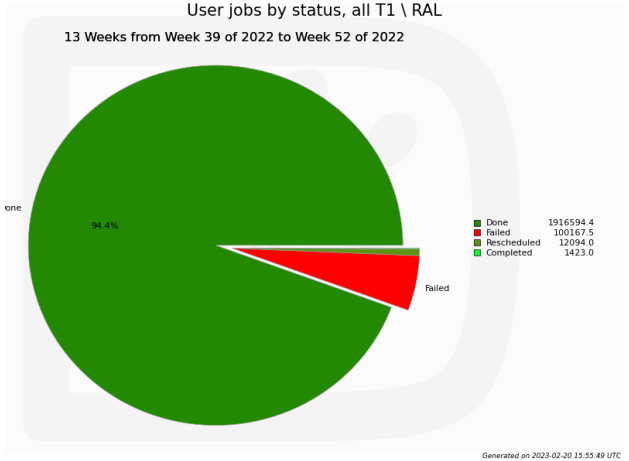
COMPARISON

- A lot of completed jobs for MC Reconstruction
  - Most of the completed jobs are from the middle of October, due to deletion failures
  - Echo gateways seem to be not well at that time



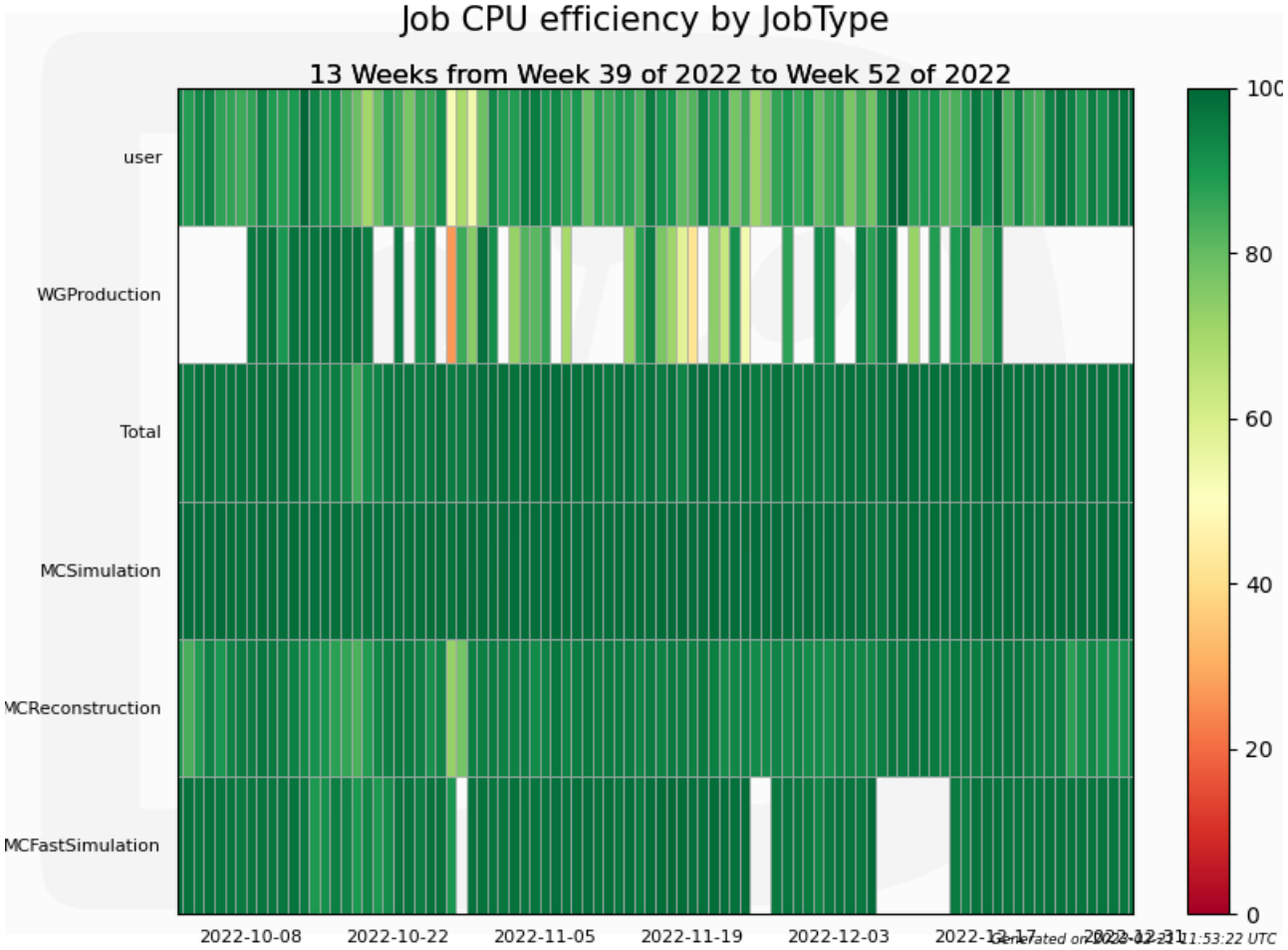






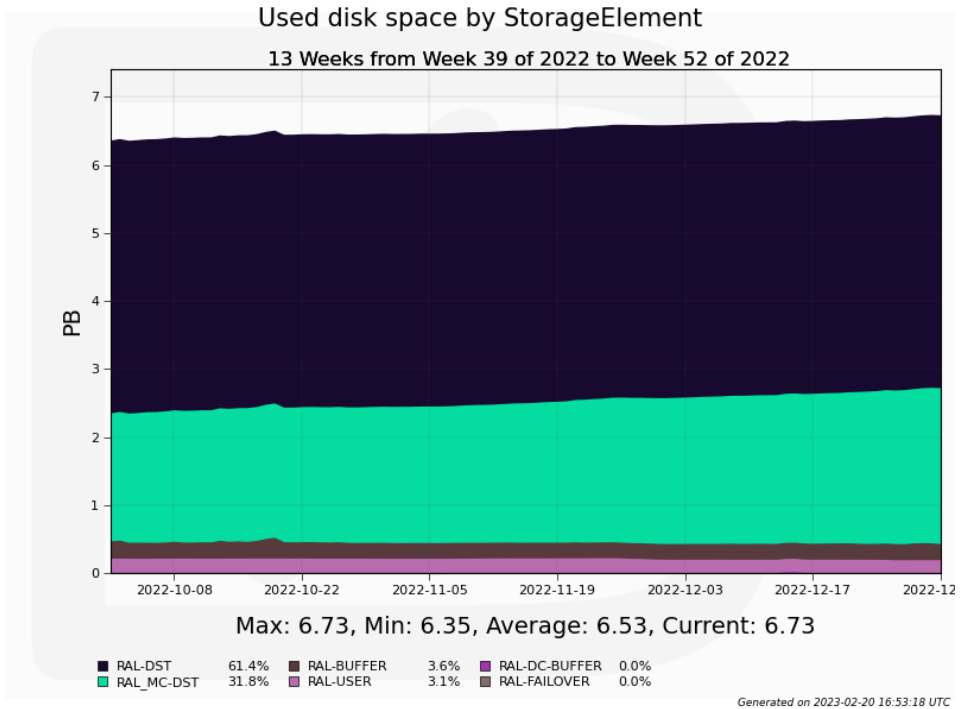
COMPARISON

- Failure rate for User and WG Production jobs are higher at RAL
  - The most probable cause for this is vector read issue
  - Some user prefer other sites instead of RAL because of this issue



JOB EFFICIENCY

- Production MC jobs are highly efficient
- Analysis jobs, especially user ones, have lower efficiency
  - Slow vector reads may affect the performance



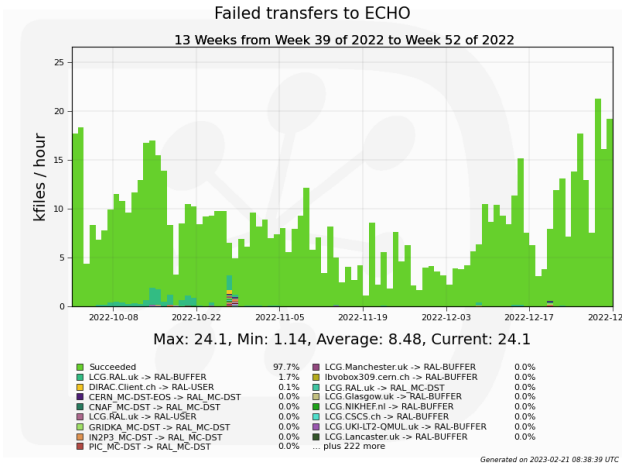
Disk Space - TBytes

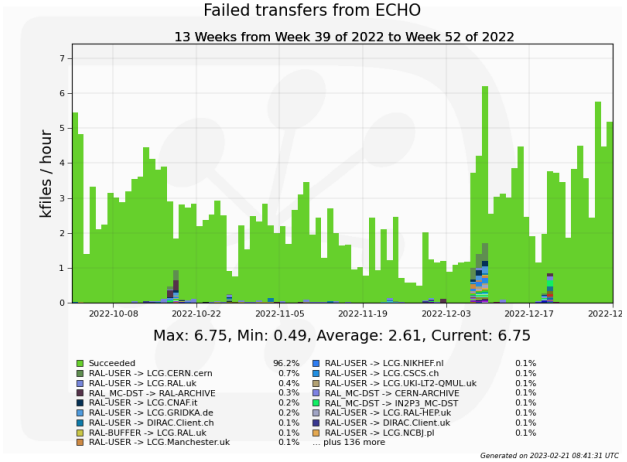
Search:

Disk Space - TBytes	Oct 2022	Nov 2022	Dec 2022	Total	% MoU
LHCB allocated	12,474	12,474	12,474	37,422	
LHCB used	7,359	7,476	7,608	22,443	
Total allocated	**12,474**	**12,474**	**12,474**	**37,422**	**100%**
Total used	**7,359**	**7,476**	**7,608**	**22,443**	**60%**
installed capacity	0	0	0	0	
MoU pledge	12,474	12,474	12,474	37,422	

DISK RESOURCES

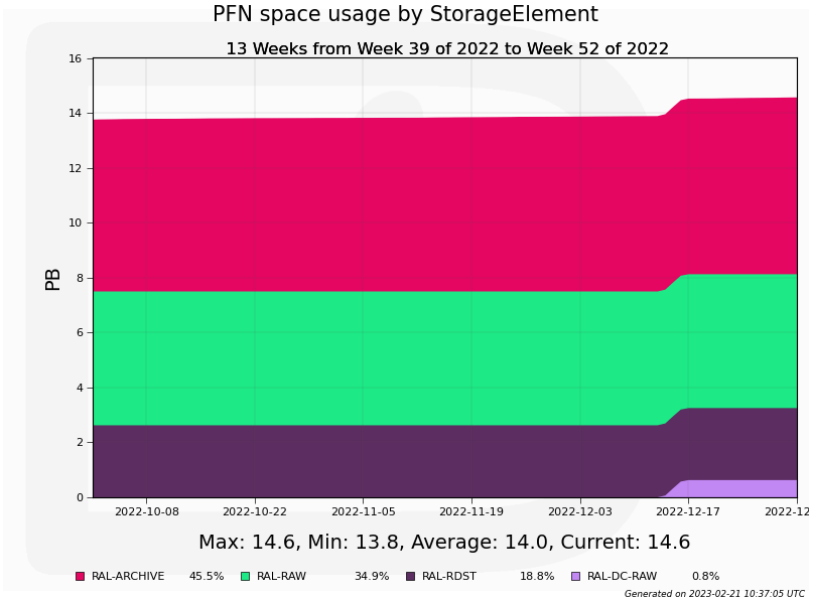
- According to LHCb accounting, ~6.7 PB are used on ECHO
- According to WLCG accounting, ~7.6 PB are used
- The difference (at least its major part) is due to huge amount of dark data present on the storage
  - Some of it resulted from migration
  - The origin of the other part is unknown (deletion problems?)





DISK TRANSFERS EFFICIENCY

- Upload failure peaks correspond to
  - Network outages in October
  - Gateway problems(?) prior to the outage
- Download failures correspond to
  - Network outage in October
  - Problems with accessing single file by many clients



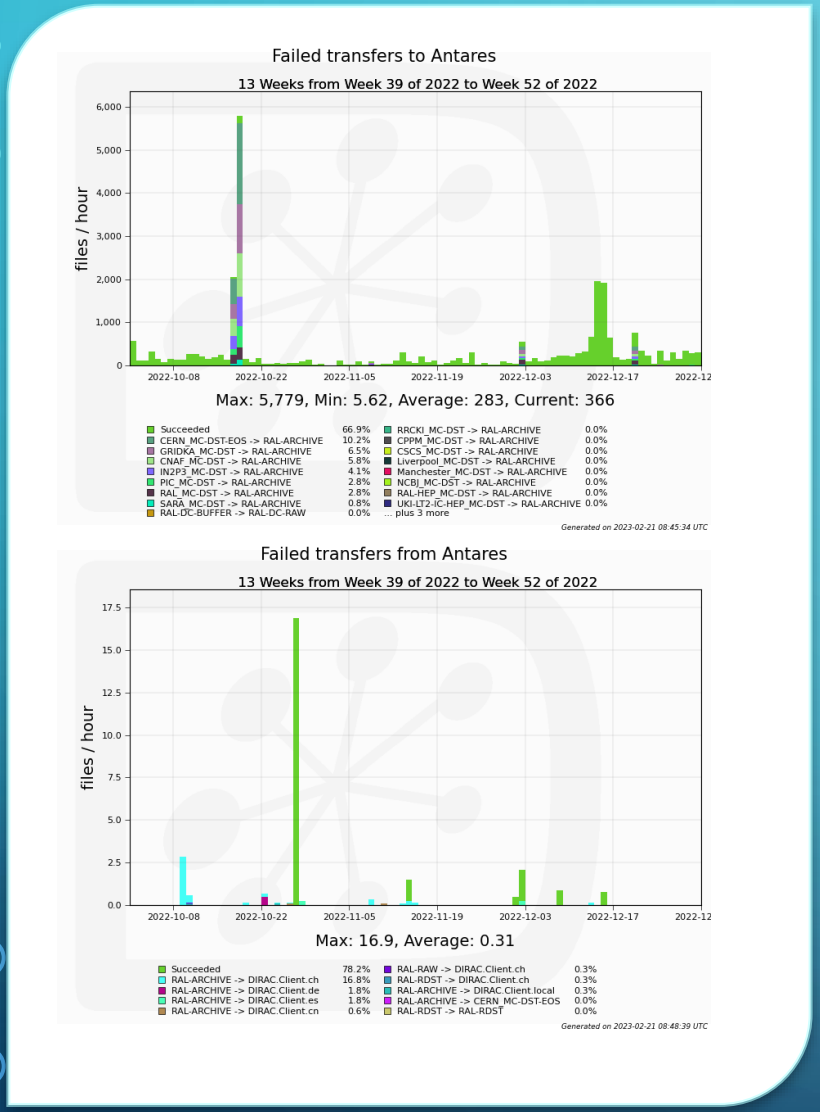
Tape Space - TBytes

Search:

Tape Space - TBytes	Oct 2022	Nov 2022	Dec 2022	Total	% MoU
LHCB	13,800	13,870	14,550	42,220	
Total	**13,800**	**13,870**	**14,550**	**42,220**	**43%**
installed capacity	0	0	0	0	
MoU pledge	32,776	32,776	32,776	98,328	

TAPE RESOURCES

- Good match between LHCb accounting data and WLCG accounting
- Data challenge can be seen on the plot



TAPE TRANSFERS EFFICIENCY

- Limited activity
- Peak of upload failures correspond to network outage in October
- Other two peaks corresponds to downtimes (the downtimes were not properly picked up by LHCb Software)
- Failed downloads correspond to user activity (probably incorrect)

SUMMARY

- RAL T1 provided the biggest amount of CPU resources for LHCb, way above the pledge
  - Failure rate is tolerable
  - These resources were used with good efficiency
  - Efficiency can be improved even further by solving RAL's storage issues
- RAL's disk storage has several issues which decreases its usage efficiency a little bit
- RAL's tape storage used less frequently, with very little issues