CMS Diskless T2s

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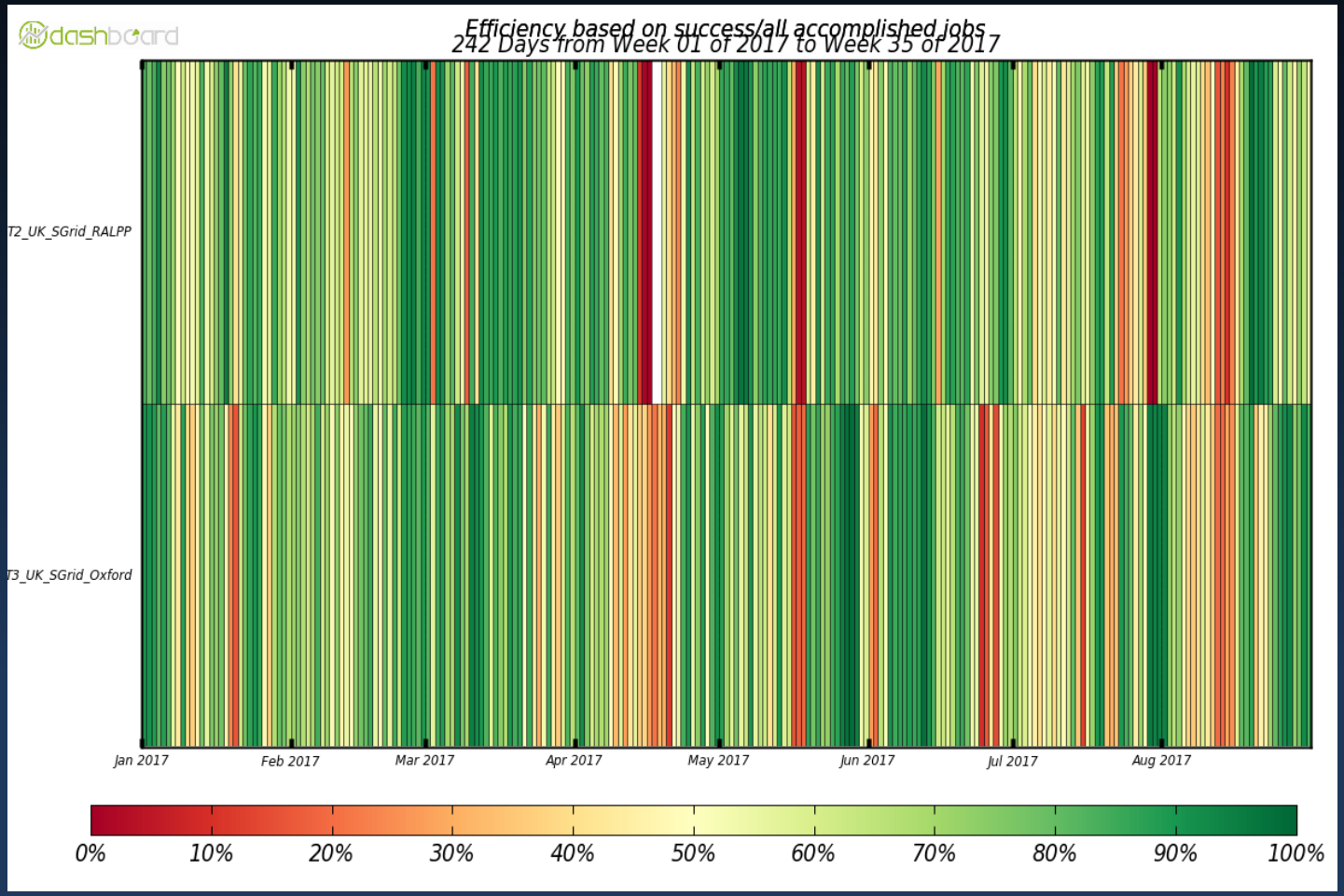
- Diskless Tier 2s are an important idea for simplifying smaller sites
- But are they fully useful or would we need to restrict the workloads to low bandwidth ones
- CMS jobs at Oxford reading from were an ideal place to test this.

Why CMS jobs at Oxford?

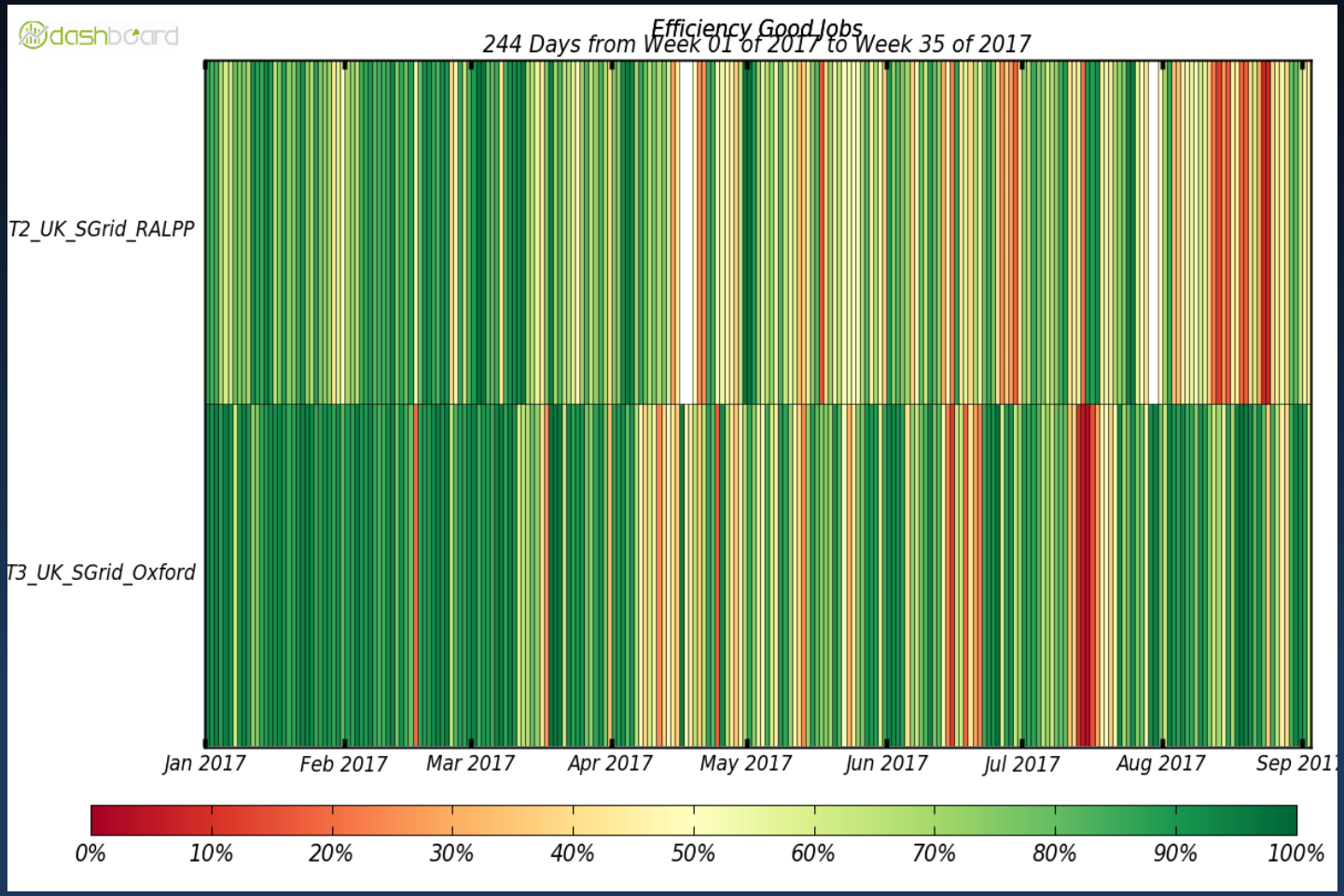
- CMS central config already supports the idea for diskless sites for special opportunistic sites
- CMS also already had the AAA infrastructure for WAN reads of data from within the code
- Oxford was already registered and set up as a CMS T3 site but was under utilised
- December 2016, we stopped CMS work at Oxford, decommissioned the storage and configured CMS jobs at the site to read from and write to Oxford

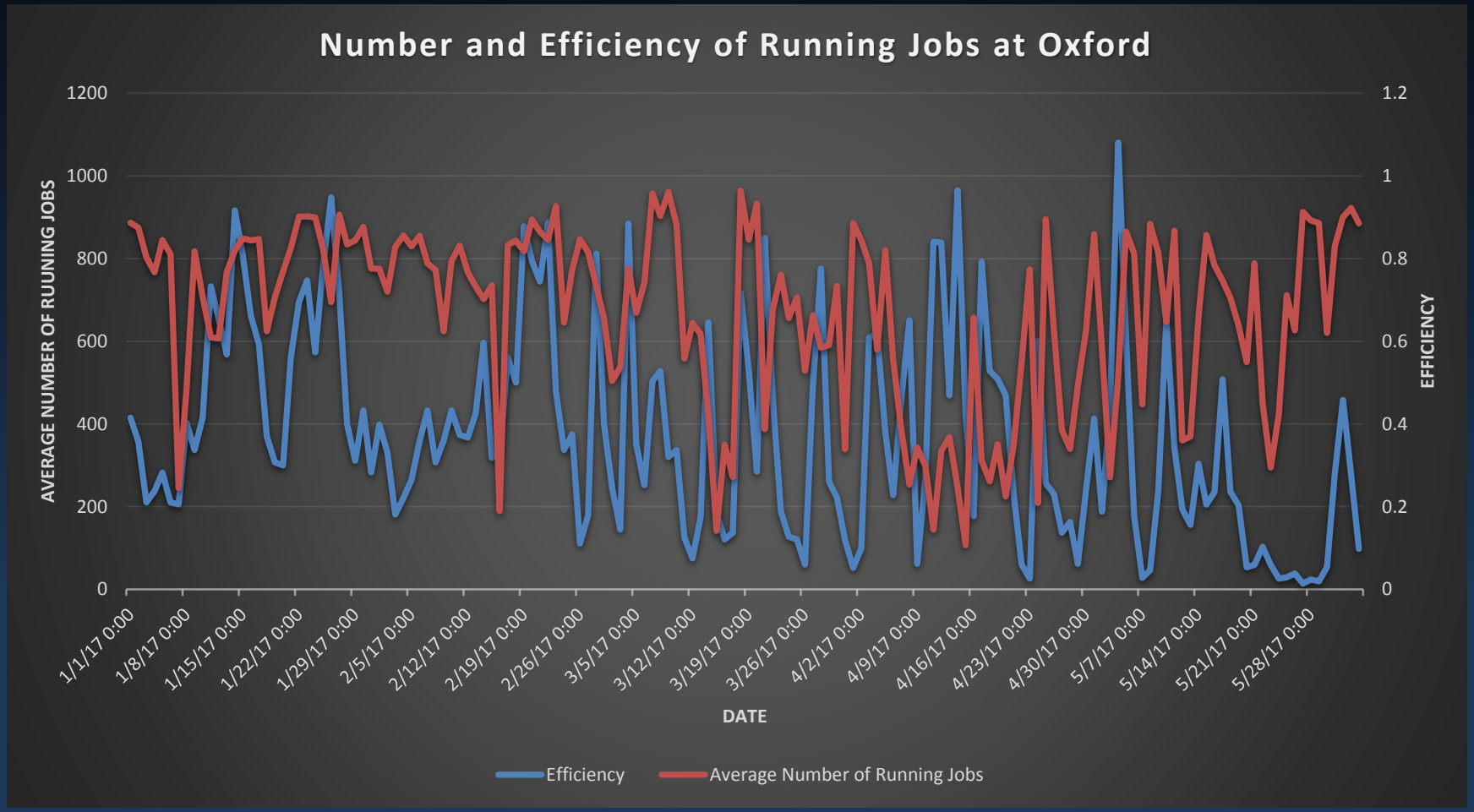
Can we run jobs?

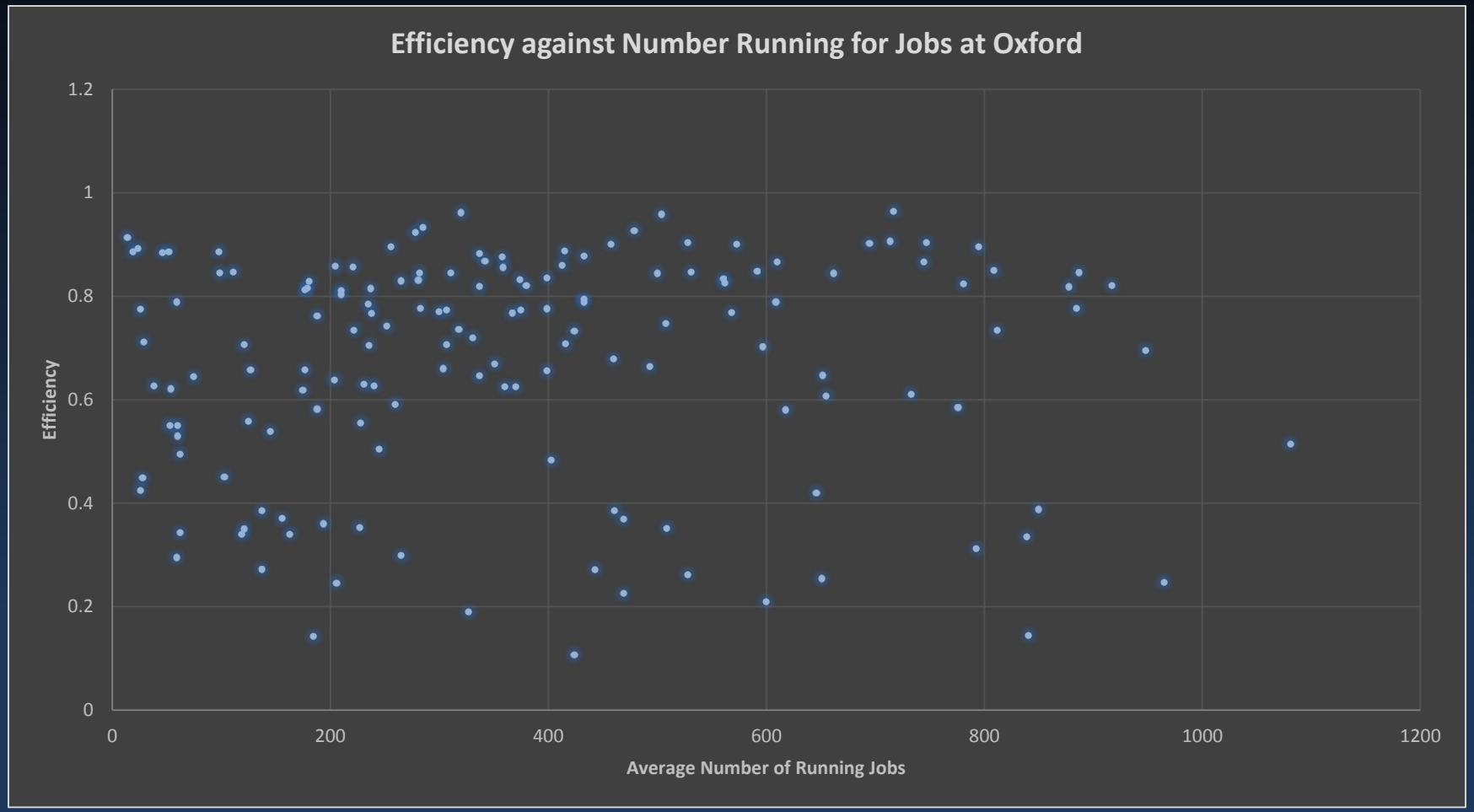


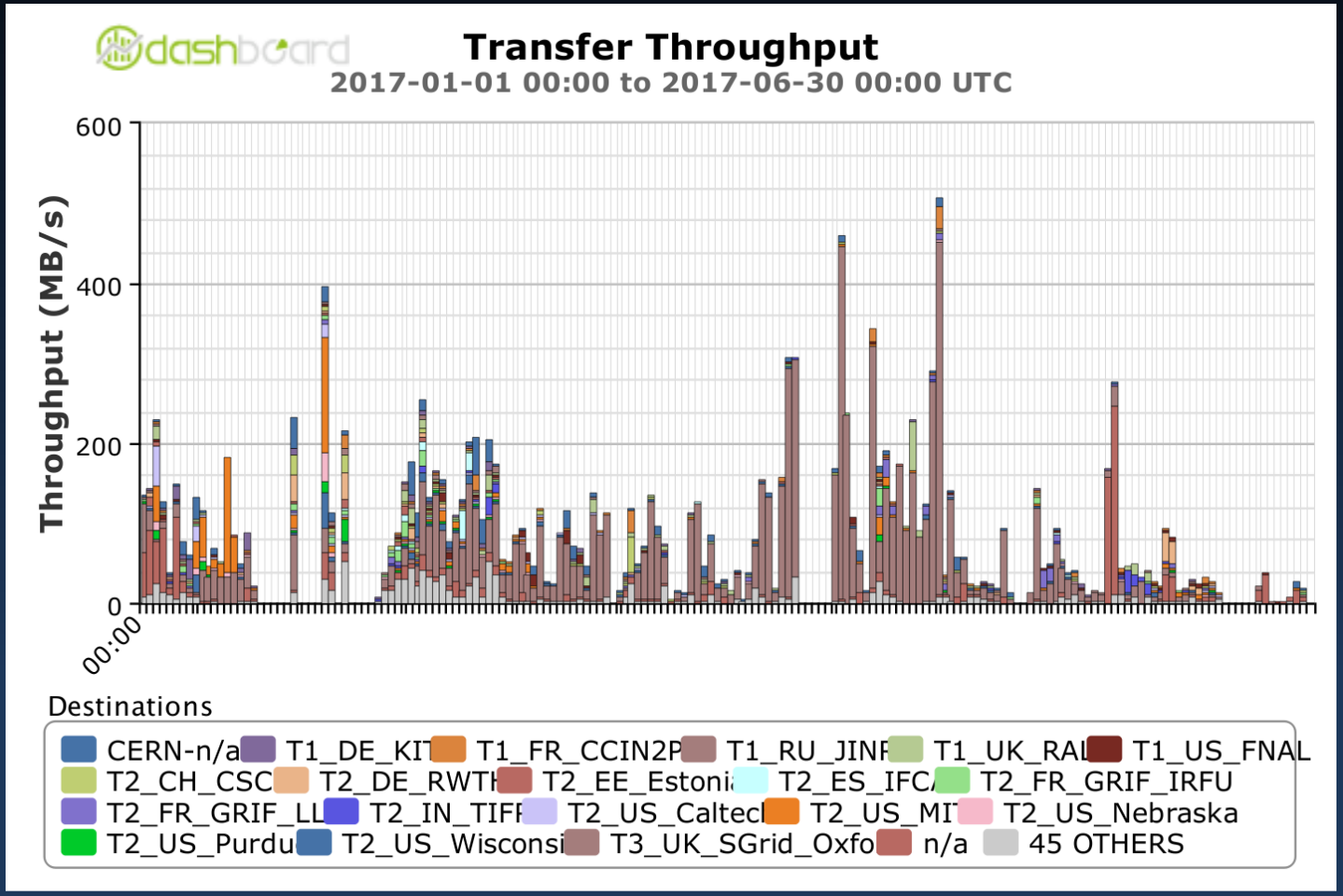
Can we run them efficiently?

(or as efficiently as CMS ever does)




Number and Efficiency of Running Jobs at Oxford
AVERAGE NUMBER OF RUUNING JOBS
EFFICIENCY
DATE
1200
1000
800
600
400
200
0
1.2
1
0.8
0.6
0.4
0.2
0
1/1/17 0:00
1/8/17 0:00
1/15/17 0:00
1/22/17 0:00
1/29/17 0:00
2/5/17 0:00
2/12/17 0:00
2/19/17 0:00
2/26/17 0:00
3/5/17 0:00
3/12/17 0:00
3/19/17 0:00
3/26/17 0:00
4/2/17 0:00
4/9/17 0:00
4/16/17 0:00
4/23/17 0:00
4/30/17 0:00
5/7/17 0:00
5/14/17 0:00
5/21/17 0:00
5/28/17 0:00
Efficiency
Average Number of Running Jobs

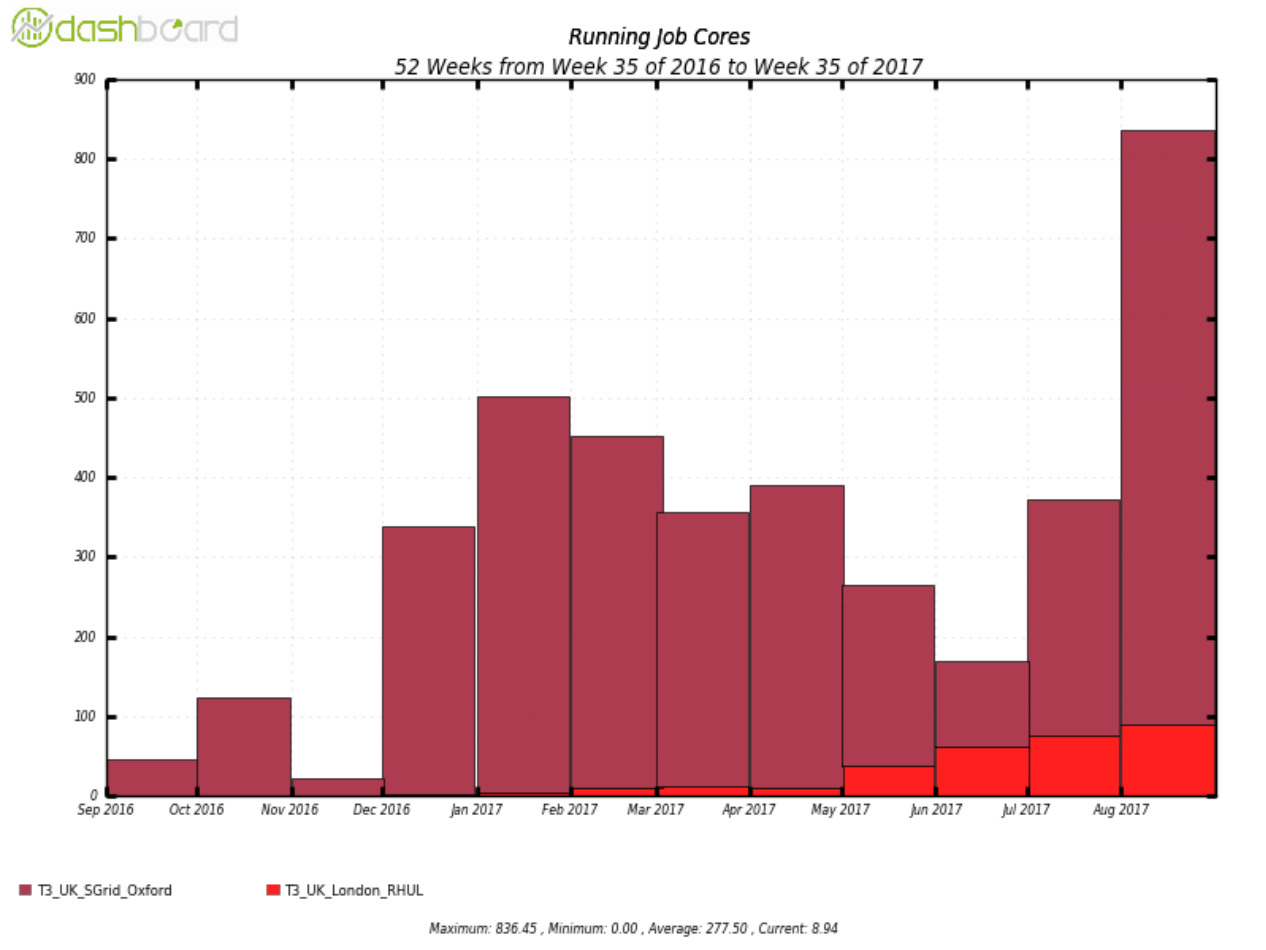

Efficiency against Number Running for Jobs at Oxford
Efficiency
1.2
1
0.8
0.6
0.4
0.2
0
0
200
400
600
800
1000
1200
Average Number of Running Jobs


dashboard
Transfer Throughput
2017-01-01 00:00 to 2017-06-30 00:00 UTC
Throughput (MB/s)
600
400
200
0
00:00
Destinations
CERN-n/a
T1_DE_KIT
T1_FR_CCIN2P
T1_RU_JINR
T1_UK_RAL
T1_US_FNAL
T2_CH_CSC
T2_DE_RWTH
T2_EE_Estonia
T2_ES_IFCA
T2_FR_GRIF_IRFU
T2_FR_GRIF_LL
T2_IN_TIFR
T2_US_Caltech
T2_US_MIT
T2_US_Nebraska
T2_US_Purdu
T2_US_Wisconsi
T3_UK_SGrid_Oxfo
n/a
45 OTHERS

Next Steps

- CMS jobs with remote IO work well, we continued with the setup after the tests
- We then set up RHUL as a satellite of IC

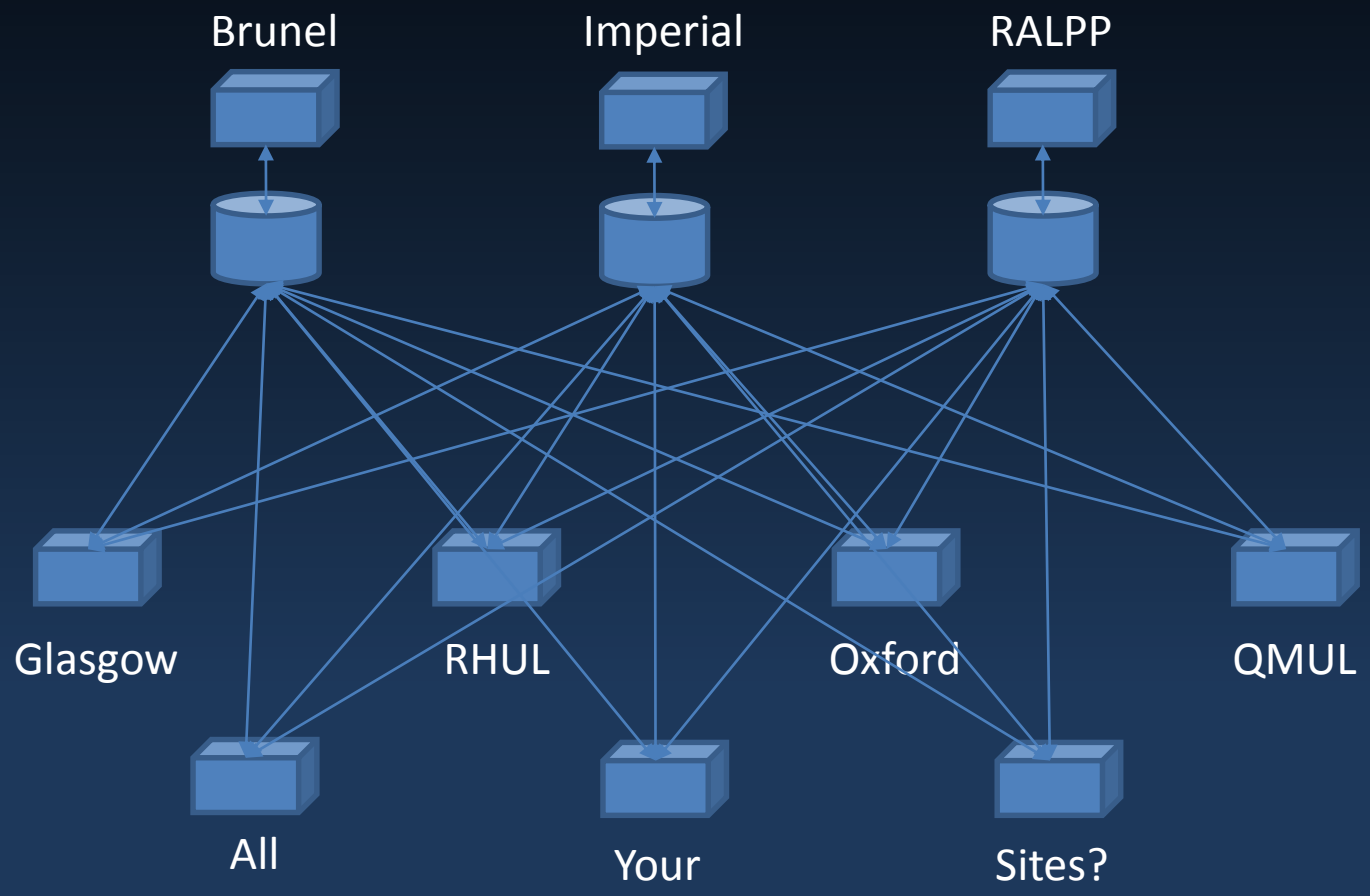
Oxford and RHUL Usage



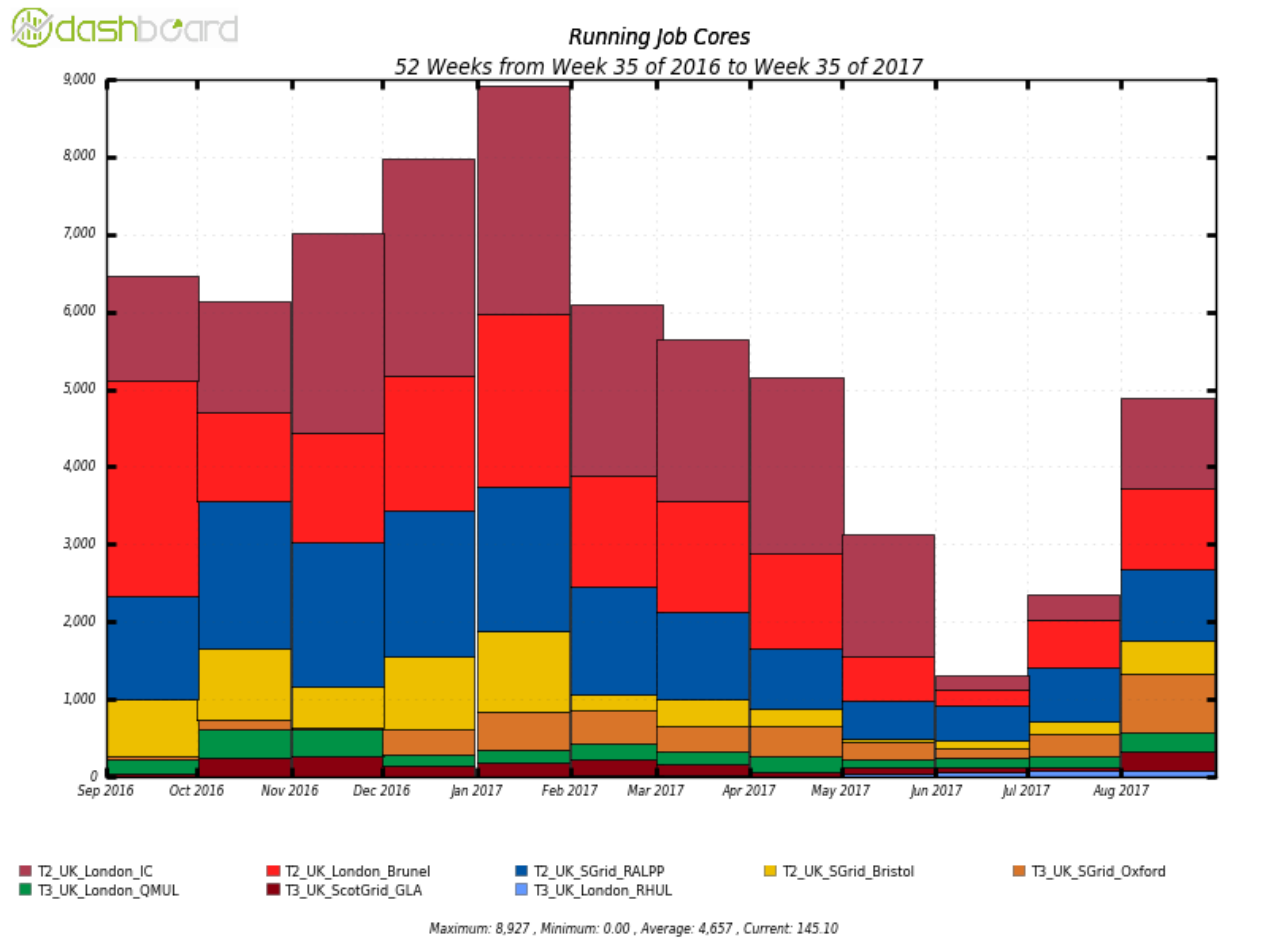
But…

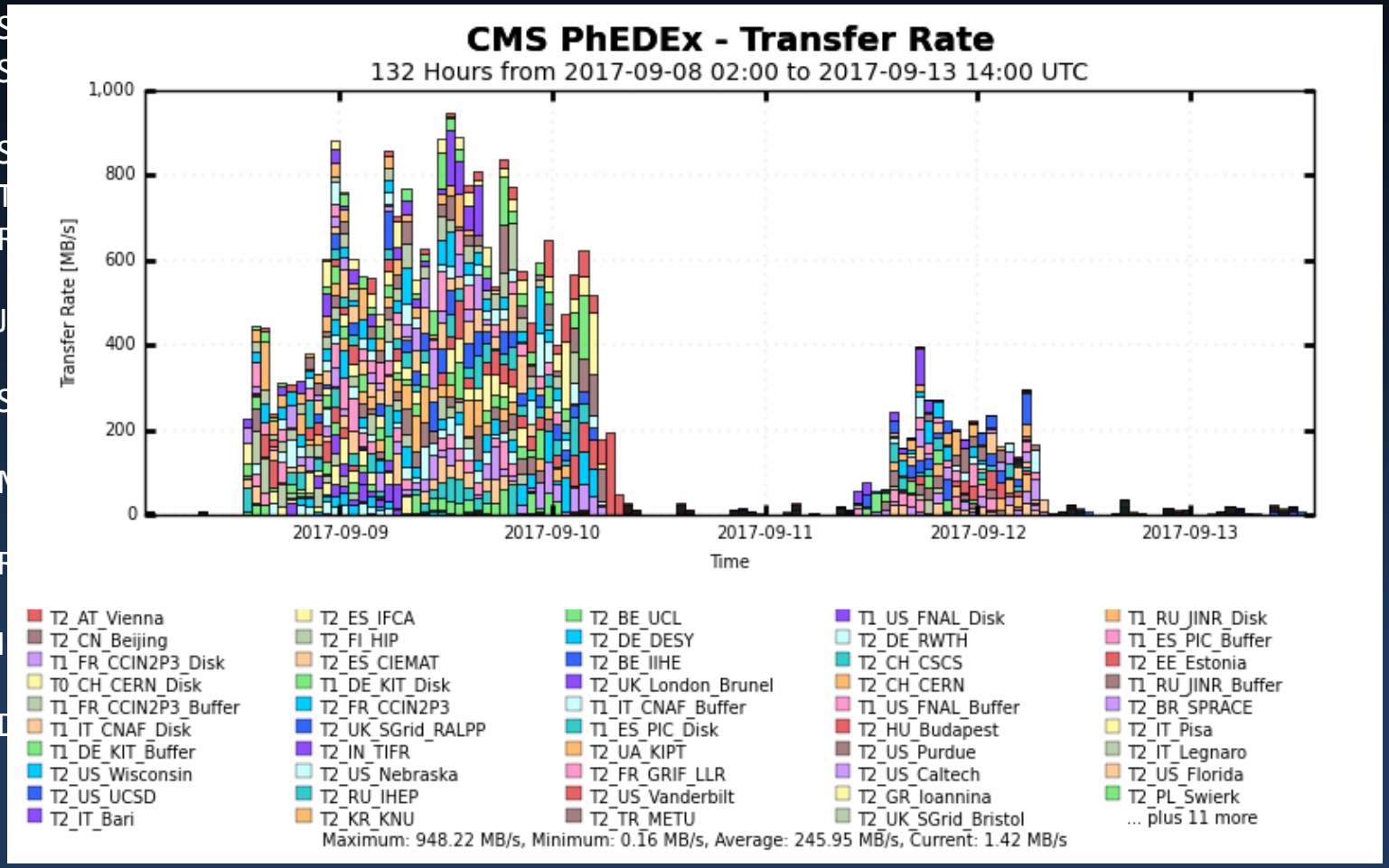
- CMS site config supports a many-to-many mapping between storage and compute as long as the software can resolve the data location
- So we set up a UK xrootd redirector and registered the RALPP, IC and Brunel AAA endpoints with it

CMS UK T2/T3 Mesh



CMS UK T2 and T3 Usage



CMS Testing Plan for Echo

- S
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- D