GridPP
UK Computing for Particle Physics

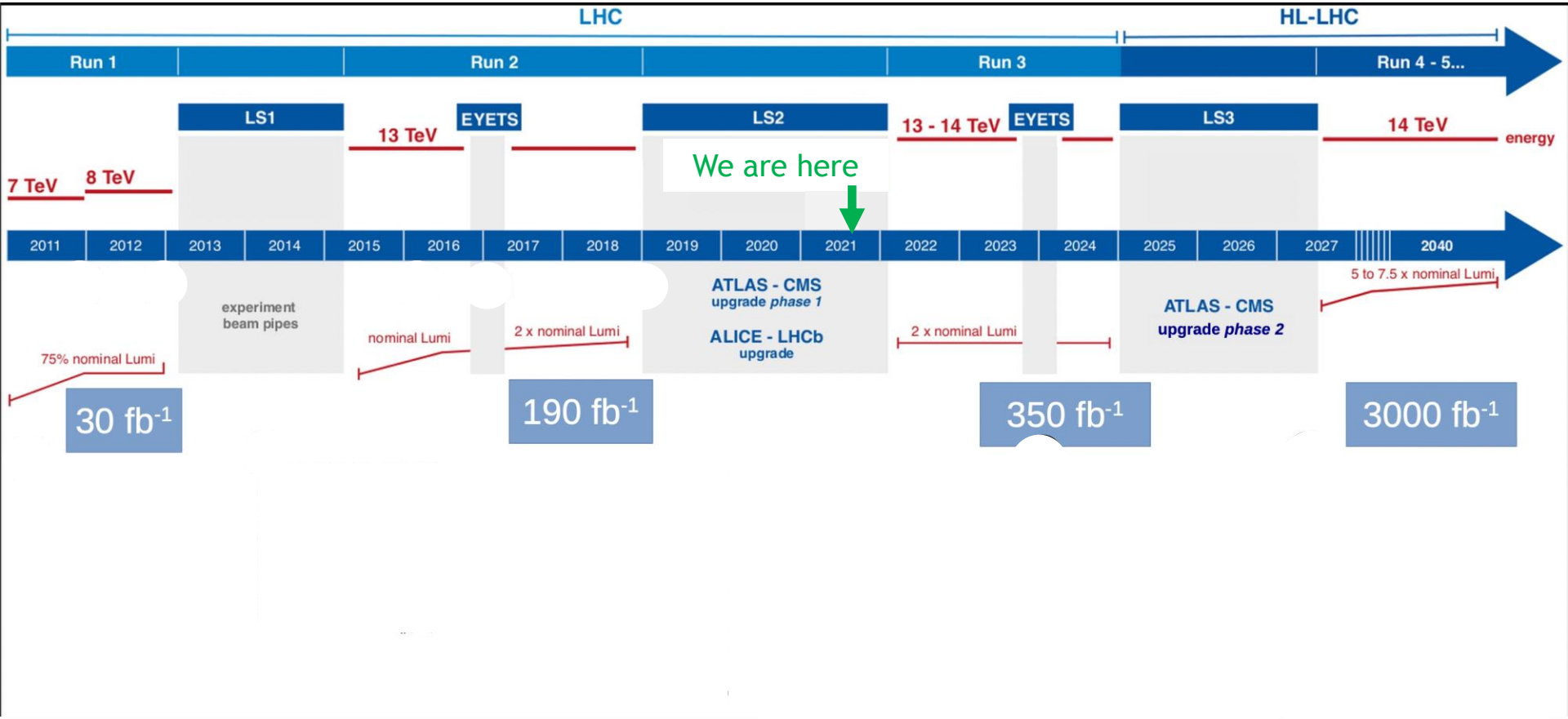
UNIVERSITY of GLASGOW

GridPP Status

GridPP46
1st September 2021

Prof. David Britton
GridPP Project leader
University of Glasgow

Timelines


LHC
HL-LHC
Run 1
Run 2
Run 3
Run 4 - 5...
LS1
EYETS
LS2
EYETS
LS3
7 TeV
8 TeV
13 TeV
13 - 14 TeV
14 TeV
energy
We are here
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2040
experiment
beam pipes
ATLAS - CMS
upgrade phase 1
ALICE - LHCb
upgrade
ATLAS - CMS
upgrade phase 2
75% nominal Lumi
nominal Lumi
2 x nominal Lumi
2 x nominal Lumi
5 to 7.5 x nominal Lumi
30 fb-1
190 fb-1
350 fb-1
3000 fb-1

LHC Dipole Training (24 Aug)

Latest progress of training:

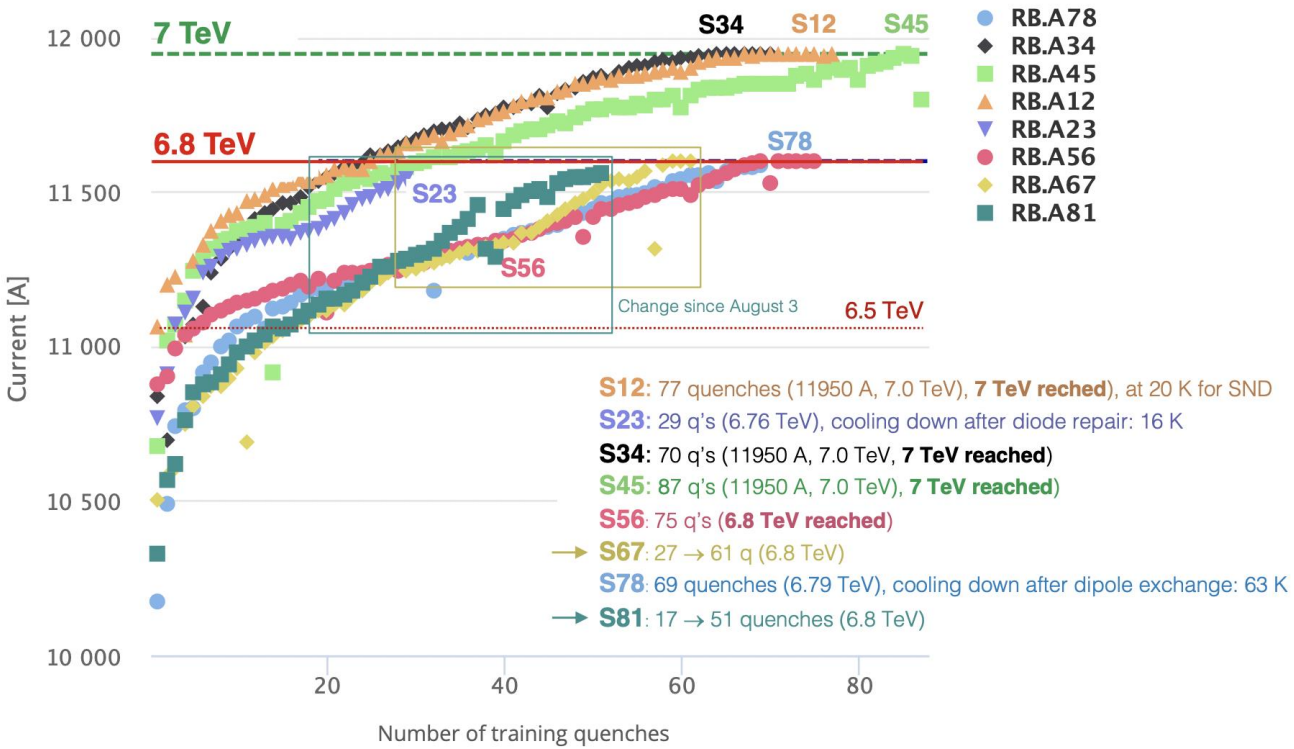
Main dipole training status (154 dipoles per LHC sector, 8 sectors)

Currents to reach + margin

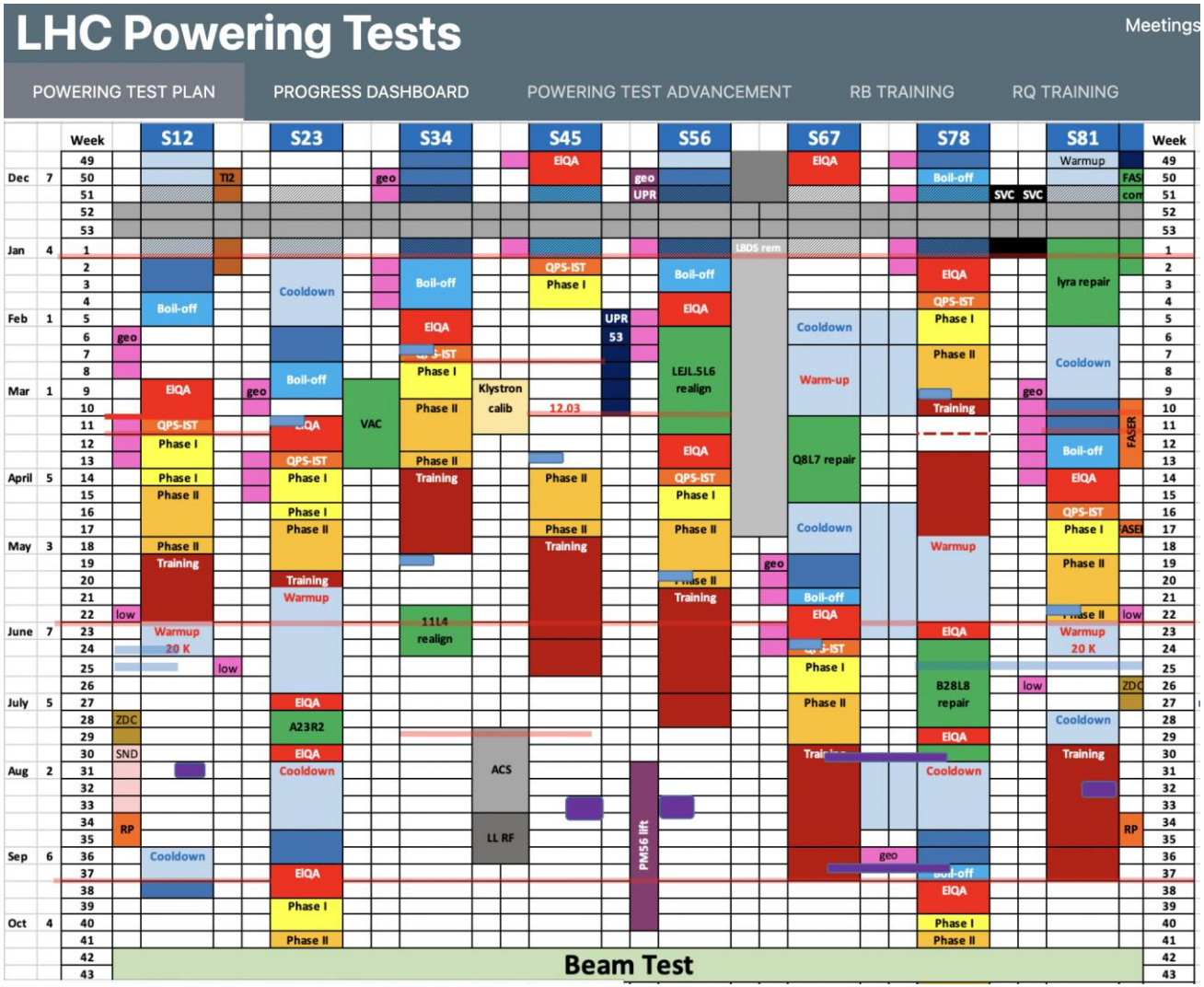
- 7.0 TeV = 11,850 A + 100 A
- 6.8 TeV = 11,500 A + 100 A
- 6.5 TeV = 10,980 A + 100 A

Total number of quenches: 519 (71 since August 3)

All **quadrupole circuits** have been successfully powered and trained to target currents (S23 and S78 to be redone)



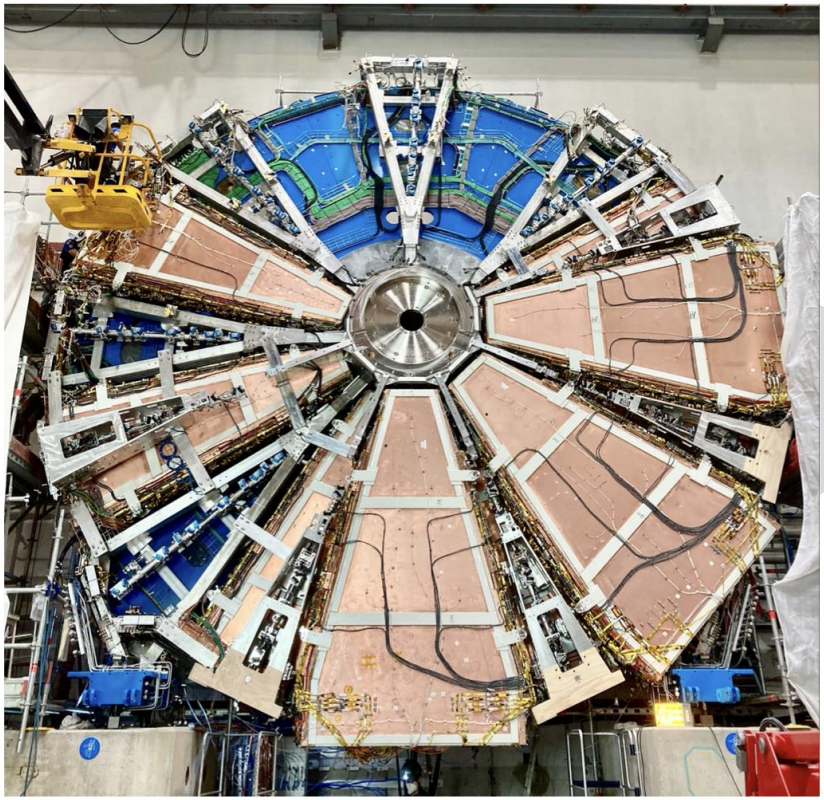
LHC Machine Schedule



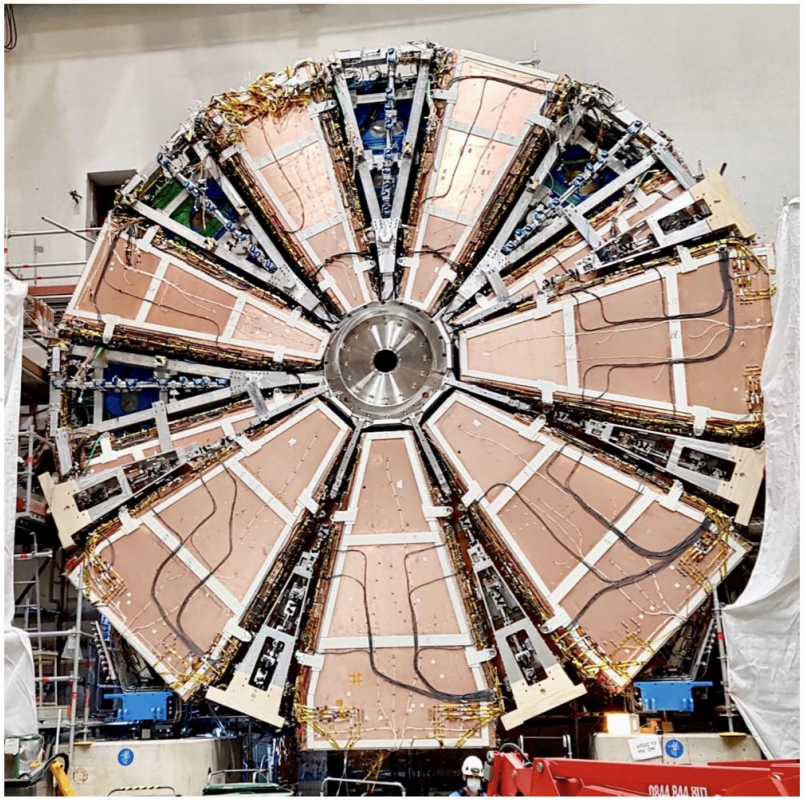
Schedule for the beam test is very tight for S23 and S78 in particular… but as of Aug 24th was still the plan.

ATLAS New "Small" Wheel

NSW-C in B191 on **9 August**



NSW-C in B191 on **23 August**



ATLAS NSW-C Status:

- Four large sectors still to be installed – scheduled by 14 September
- End of commissioning projected for 28 September
- Transport to P1 (SX1) October 11–14 (TBC)

Since Last Time

- GridPP6 Oversight Committee
- IRIS + other additional Funding
- Excalibur and SwiftHEP
- Ongoing delivery of resources

27th Oversight Committee

- Revamped committee chaired by Jeremy Yates
- Had requested (additional) input documents for March meeting on:
  - Brexit Risks
  - Security incidents
- New actions for October meeting on:
  - Pledging Process (done)
  - Network/DMZ @ RAL (done)
  - Security Activities (in progress)
  - Covid-related Hardware delays (done)
  - Site escalation procedures (in progress)

Funding

- End-of-year (FY20) Capital Injection from STFC of £3.03m, that needed to be spent very quickly.
- IRIS 4x4 capital of £1.3m in FY20 and £0.65m to be spent in FY21.

→ These funds went to Tier-1 and large Tier-2s.

Future:

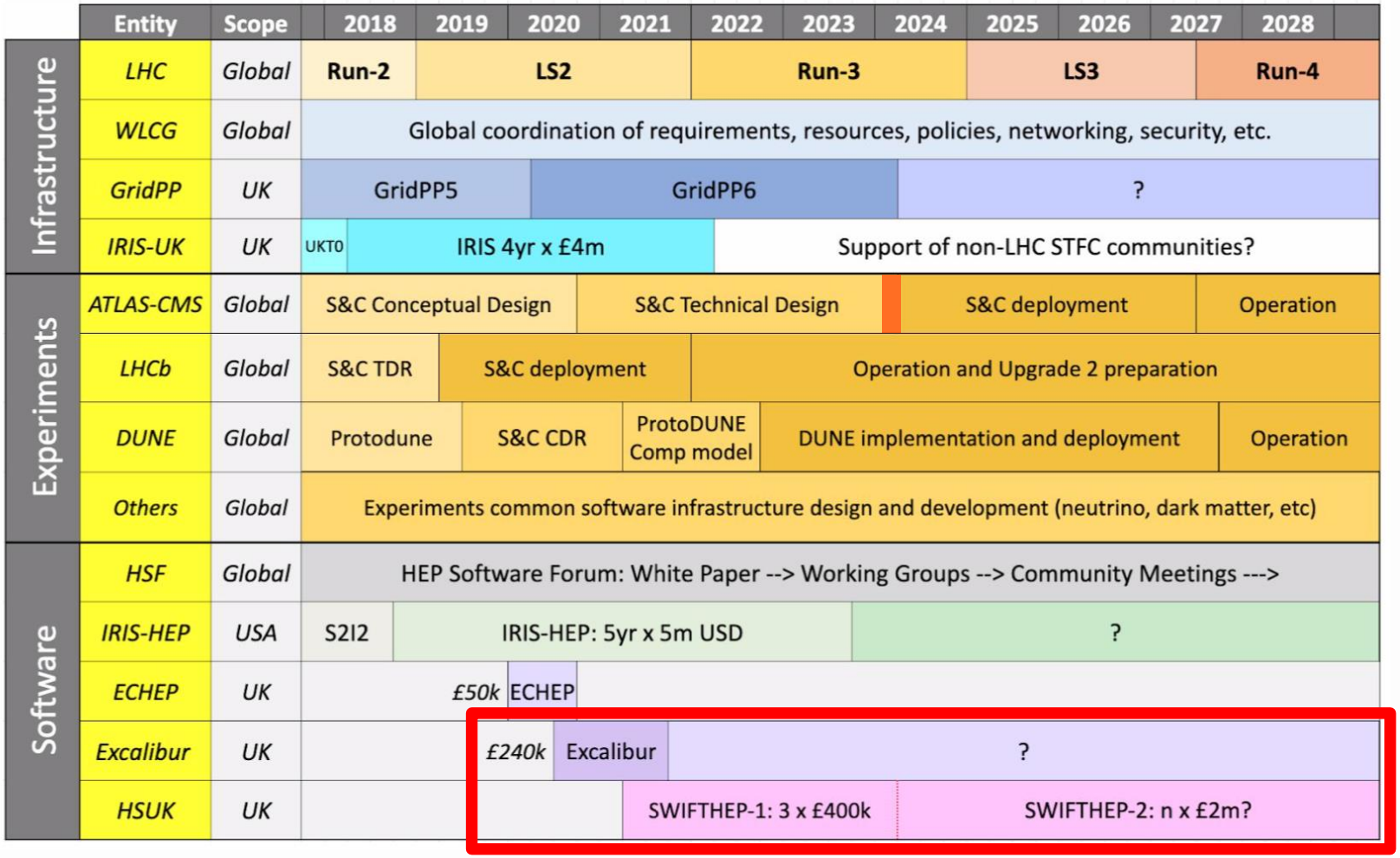
- GridPP6 Tier-2 hardware funding of £1.5m expected in FY 2022/3 (plus ongoing annual Tier-1 hardware funding)

→ Expect* distribution to a wider set of Tier-2s.

Status:

- GridPP6 has now had additional capital funding ~£5m which, together with Run-3 delays and much better CPU costs than expected, means that the original £9m capital shortfall, is now significantly reduced.

GridPP6: The big Context



Excalibur

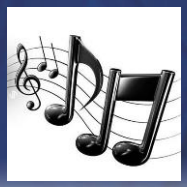
GridPP45 Slide

- Excalibur was an EPSRC call for “exascale software development” which (now we are all UKRI) was also open to STFC. Originally directed at developing code for HPC machines but the STFC bid successfully managed to get an exascale-data project funded.
- Scale: £240k over 15months (underway), four focus-areas. Led by Davide.
- GridPP connection: Exascale Data Organisation and Management [RAL SCD, 0.4 FTE. Lead Alastair Dewhurst]
- Defines a ”Data transport service node”, something that helps get data from A to B (e.g. GridFTP, XrootD, Xcache, Webdav: Apache servers, S3-endpoints, Squids, Service nodes like FTS, DynaFed or Rucio daemons). A and B could be different sites, different types of storage at the same site, or B could be a job.
- Objectives:
  - Deploy data transport service nodes automatically via Kubernetes
  - Perform a study of current data access patterns and make predictions for how this will evolve.
  - Prototype the intelligent deployment of data transport service nodes based on the observed usage.
  - Produce a report describing the work and setting out areas for further work/improvement.

Excalibur phase 1b:

- Only open to groups who were initially funded and expects to fund ~3 projects (out of the 10).
- UKRI encourages groups to merge. The gist of Excalibur is to fund RSE to develop algorithms/tools for future exascale machine(s).
- Deadline end of September.
- Plan is to submit a joint proposal with the Exalat team, lattice QCD theorists.
- A work package on "data management" optimising resources for parallel transfers.

Bye Bye Mr. BDII…



VO	T1	Imp	QMUL	RHUL	Lan	Liv	Man	Shef	Dur	Ed	Gla	Bris	Ox	PPD	#sites	VO
Gluex	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	1	Gluex
alice	Y	N	N	N	N	Y	N	N	N	N	N	N	Y	Y	4	alice
atlas	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	11	atlas
bes	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	1	bes
biomed	Y	N	N	N	Y	Y	Y	N	N	N	Y	N	N	Y	6	biomed
calice	N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	2	calice
camont	N	N	N	N	N	N	N	N	Y	N	N	N	N	Y	2	camont
cdf	N	N	N	N	N	N	N	N	Y	N	N	N	N	Y	2	cdf
cepc	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	2	cepc
cernatschool.org	N	N	Y	N	N	Y	N	N	N	N	N	N	Y	N	3	cernatschool.org
clas12	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	1	clas12
cms	Y	N	Y	N	Y	Y	Y	N	Y	N	Y	N	Y	Y	9	cms
comet.j-parc.jp	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	1	comet.j-parc.jp
dteam	Y	N	Y	N	Y	Y	Y	Y	Y	N	Y	N	Y	Y	10	dteam
dune	Y	N	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	Y	9	dune
enmr.eu	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	enmr.eu
epic.vo.gridpp.ac.uk	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	2	epic.vo.gridpp.ac.uk
esr	N	N	N	N	N	Y	N	N	N	N	N	N	Y	Y	3	esr
fermilab	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	2	fermilab
fusion	N	N	N	N	N	Y	N	N	N	N	N	N	Y	Y	3	fusion
geant4	Y	N	N	N	N	Y	N	N	N	N	N	N	N	Y	3	geant4
glast.org	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	glast.org
gridpp	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	11	gridpp
hone	N	N	N	N	N	N	Y	N	N	N	N	N	N	Y	2	hone
hyperk.org	Y	N	Y	N	Y	Y	N	N	N	N	Y	N	Y	Y	7	hyperk.org
icecube	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	2	icecube
ilc	Y	N	Y	N	N	N	Y	N	Y	N	N	N	Y	Y	6	ilc
lhcb	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	N	Y	Y	10	lhcb
lsst	Y	N	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	Y	9	lsst
lz	N	N	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	Y	9	lz
magic	N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	2	magic
mice	N	N	N	N	N	Y	N	N	N	N	Y	N	Y	Y	4	mice
mu3e.org	N	N	N	N	Y	Y	N	N	N	N	N	N	Y	N	3	mu3e.org
na62.vo.gridpp.ac.uk	Y	N	N	N	Y	Y	N	N	N	N	Y	N	Y	Y	6	na62.vo.gridpp.ac.uk
ops	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	11	ops
osg	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	1	osg
pheno	Y	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	Y	8	pheno
planck	N	N	N	N	N	Y	N	N	N	N	N	N	N	Y	2	planck
skatelescope	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	1	skatelescope
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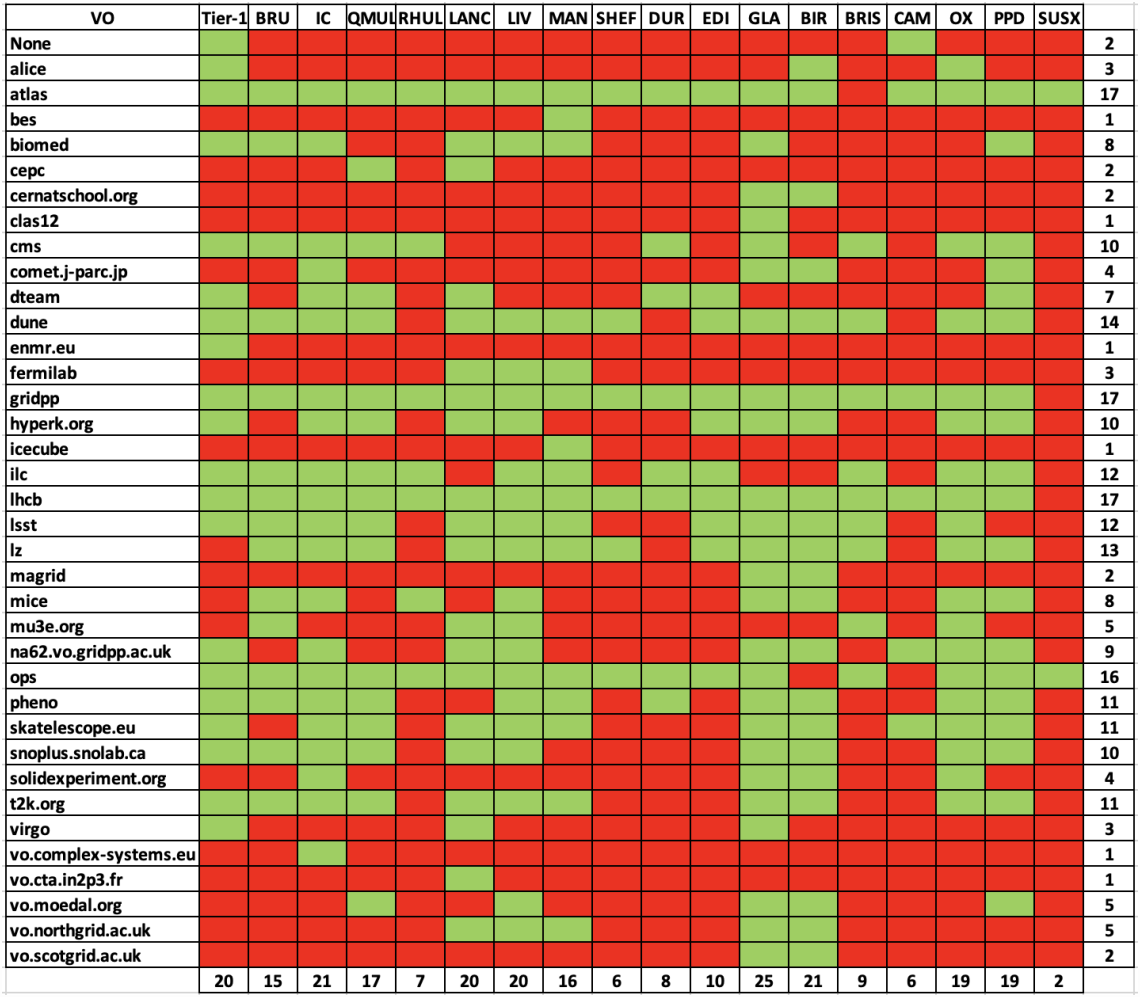
snoplus.snolab.ca	Y	N	Y	N	Y	Y	N	N	N	N	Y	N	Y	Y	7	snoplus.snolab.ca
solidexperiment.org	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N	2	solidexperiment.org
superbvo.org	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	1	superbvo.org
t2k.org	Y	N	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	Y	9	t2k.org
virgo	N	N	N	N	Y	N	N	N	N	N	Y	N	N	N	2	virgo
vo.cta.in2p3.fr	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	1	vo.cta.in2p3.fr
vo.moedal.org	N	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	3	vo.moedal.org
vo.northgrid.ac.uk	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	3	vo.northgrid.ac.uk
vo.northgrid.ac.uk/manchester	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	1	vo.northgrid.ac.uk/manchester
vo.scotgrid.ac.uk	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	2	vo.scotgrid.ac.uk
vo.southgrid.ac.uk	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	2	vo.southgrid.ac.uk
zeus	N	N	N	N	N	Y	N	N	Y	N	N	N	Y	Y	4	zeus
	T1	Imp	QMUL	RHUL	Lan	Liv	Man	Shef	Dur	Ed	Gla	Bris	Ox	PPD		

Our “Steve Lloyd” metrics page on what sites support which VOs should presumably be retired…

Accounting Portal



VO	Tier-1	BRU	IC	QMUL	RHUL	LANC	LIV	MAN	SHEF	DUR	EDI	GLA	BIR	BRIS	CAM	OX	PPD	SUSX	
None																			2
alice																			3
atlas																			17
bes																			1
biomed																			8
cepc																			2
cernatschool.org																			2
clas12																			1
cms																			10
comet.j-parc.jp																			4
dteam																			7
dune																			14
enmr.eu																			1
fermilab																			3
gridpp																			17
hyperk.org																			10
icecube																			1
ilc																			12
lhcb																			17
lsst																			12
lz																			13
magrid																			2
mice																			8
mu3e.org																			5
na62.vo.gridpp.ac.uk																			9
ops																			16
pheno																			11
skatelescope.eu																			11
snoplus.snolab.ca																			10
solidexperiment.org																			4
t2k.org																			11
virgo																			3
vo.complex-systems.eu																			1
vo.cta.in2p3.fr																			1
vo.moedal.org																			5
vo.northgrid.ac.uk																			5
vo.scotgrid.ac.uk																			2
	20	15	21	17	7	20	20	16	6	8	10	25	21	9	6	19	19	2	

Look at where VO jobs have run in the past year. Simply binary yes/no plot.

E.g. Lancaster:

BDII – 21

Here - 20

E.g. Glasgow:

BDII - 22

Here – 25

Important VOs for Sites

0	VO	Tier-1	BRU	IC	QMUL	RHUL	LANC	LIV	MAN	SHEF	DUR	EDI	GLA	BIR	BRIS	CAM	OX	PPD	SUSX	Sites	VO
1	None	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2	None
2	alice	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	0%	10%	0%	0%	3	alice
3	atlas	46%	10%	9%	52%	70%	54%	54%	67%	86%	68%	41%	78%	30%	0%	19%	66%	17%	100%	17	atlas
4	bes	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1	bes
5	biomed	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8	biomed
6	cepc	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2	cepc
7	cernatschool.org	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2	cernatschool.org
8	clas12	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	1	clas12
9	cms	25%	64%	66%	11%	9%	0%	0%	0%	0%	0%	0%	10%	0%	40%	0%	5%	53%	0%	10	cms
10	comet.j-parc.jp	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4	comet.j-parc.jp
11	dteam	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7	dteam
12	dune	1%	3%	1%	1%	0%	1%	2%	0%	1%	0%	0%	0%	0%	6%	0%	1%	4%	0%	14	dune
13	enmr.eu	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1	0
14	fermilab	0%	0%	0%	0%	0%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3	fermilab
15	gridpp	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%	17	gridpp
16	hyperk.org	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10	hyperk.org
17	icecube	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1	icecube
18	ilc	0%	6%	0%	0%	4%	0%	6%	6%	0%	9%	0%	0%	0%	0%	0%	2%	1%	0%	12	ilc
19	lhcb	24%	16%	20%	36%	18%	25%	30%	26%	8%	14%	58%	8%	9%	54%	81%	11%	23%	0%	17	lhcb
20	lsst	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12	lsst
21	lz	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13	lz
22	magrid	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2	magrid
23	mice	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8	mice
24	mu3e.org	0%	0%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5	mu3e.org
25	na62.vo.gridpp.ac.uk	0%	0%	2%	0%	0%	0%	3%	0%	0%	0%	0%	1%	0%	0%	0%	4%	2%	0%	9	na62.vo.gridpp.ac.uk
26	ops	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16	ops
27	pheno	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	11	pheno
28	skatelescope.eu	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11	skatelescope.eu
29	snoplus.snolab.ca	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10	snoplus.snolab.ca
30	solidexperiment.org	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4	solidexperiment.org
31	t2k.org	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11	t2k.org
32	virgo	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3	virgo
33	vo.complex-systems.eu	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1	vo.complex-systems.eu
34	vo.cta.in2p3.fr	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1	vo.cta.in2p3.fr
35	vo.moedal.org	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5	vo.moedal.org
36	vo.northgrid.ac.uk	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5	vo.northgrid.ac.uk
37	vo.scotgrid.ac.uk	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2	vo.scotgrid.ac.uk
0	SUM	33%	2%	10%	4%	5%	7%	3%	11%	1%	5%	1%	5%	1%	2%	1%	4%	7%	0%	0	0

Shows which VOs are important to which sites.

Important Sites for VOs

	VO	Tier-1	BRU	IC	QMUL	RHUL	LANC	LIV	MAN	SHEF	DUR	EDI	GLA	BIR	BRIS	CAM	OX	PPD	SUSX	Sites	VO
1	None	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	2	None
2	alice	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	0%	0%	23%	0%	0%	3	alice
3	atlas	32%	0%	2																	
4	bes	0%	0%	0																	
5	biomed	27%	0%	0																	
6	cepc	0%	0%	0																	
7	cernatschool.org	0%	0%	0																	
8	clas12	0%	0%	0																	
9	cms	37%	7%	30																	
10	comet.j-parc.jp	0%	0%	14																	
11	dteam	0%	0%	61																	
12	dune	29%	7%	5																	
13	enmr.eu	100%	0%	0																	
14	fermilab	0%	0%	0																	
15	gridpp	1%	1%	1																	
16	hyperk.org	49%	0%	16																	
17	icecube	0%	0%	0																	
18	ilc	1%	8%	1																	
19	lhcb	34%	2%	9																	
20	lsst	3%	0%	2																	
21	lz	0%	1%	86																	
22	magrid	0%	0%	0																	
23	mice	0%	16%	31																	
24	mu3e.org	0%	1%	0																	
25	na62.vo.gridpp.ac.uk	18%	0%	31																	.uk
26	ops	13%	10%	6																	
27	pheno	2%	1%	1																	
28	skatelescope.eu	1%	0%	0																	
29	snoplus.snolab.ca	21%	1%	27																	
30	solidexperiment.org	0%	0%	82																	org
31	t2k.org	71%	6%	3																	
32	virgo	7%	0%	0																	
33	vo.complex-systems.eu	0%	0%	100																	ms.eu
34	vo.cta.in2p3.fr	0%	0%	0																	
35	vo.moedal.org	0%	0%	0																	
36	vo.northgrid.ac.uk	0%	0%	0%	0%	0%	1%	2%	32%	0%	0%	0%	3%	2%	0%	0%	0%	0%	0%	3	vo.northgrid.ac.uk
37	vo.scotgrid.ac.uk	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	36%	0%	0%	0%	0%	0%	2	vo.scotgrid.ac.uk
	SUM	33%	2%	10%	4%	5%	7%	3%	11%	1%	5%	1%	5%	1%	2%	1%	4%	7%	0%		

VO Id Card : vo.magrid.ma

Update

1. General Information
2. Aknowledgement statement
3. Resources
4. Mailing List
5. Contact List
6. Registry Server
7. VOMS Group/Role

Validation date	2016-05-27
Discipline	• Support Activities ◦ Miscellaneous
Enrollment Url	https://voms.magrid.ma:8443/voms/vo.magrid.ma
Homepage Url	http://www.magrid.ma
Support Procedure Url	
GGUS dedicated user support	No
VOMS setup support	Yes (N.A)

Description

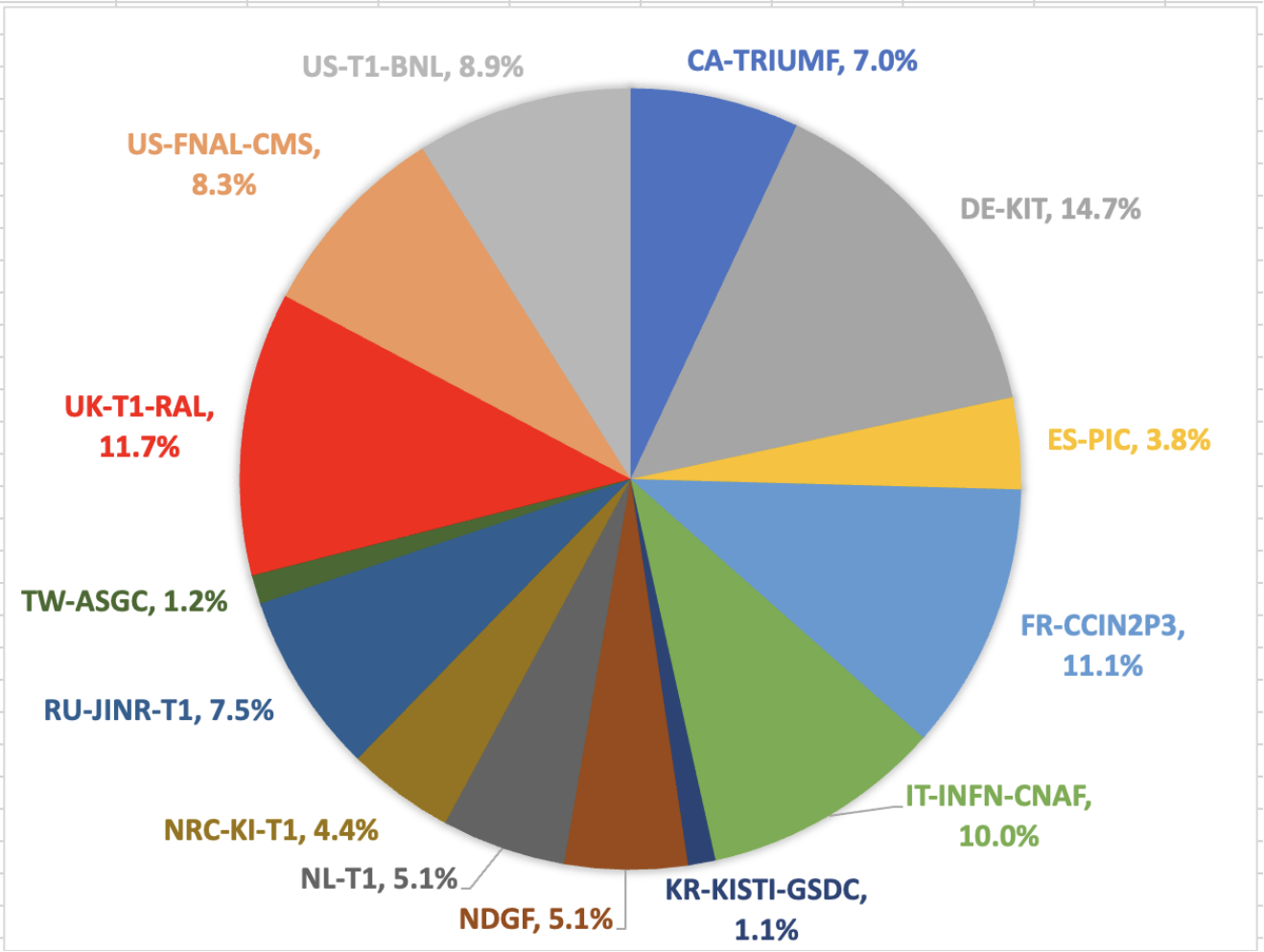
VO vo.magrid.ma is a multidisciplinary VO providing general grid services and support to Moroccan scientific community

Acceptable Use Policy

N.A

Shows which sites are important to which VOs. Does NOT show which VOs are biggest site users!

LHC Tier-1 CPU Delivery



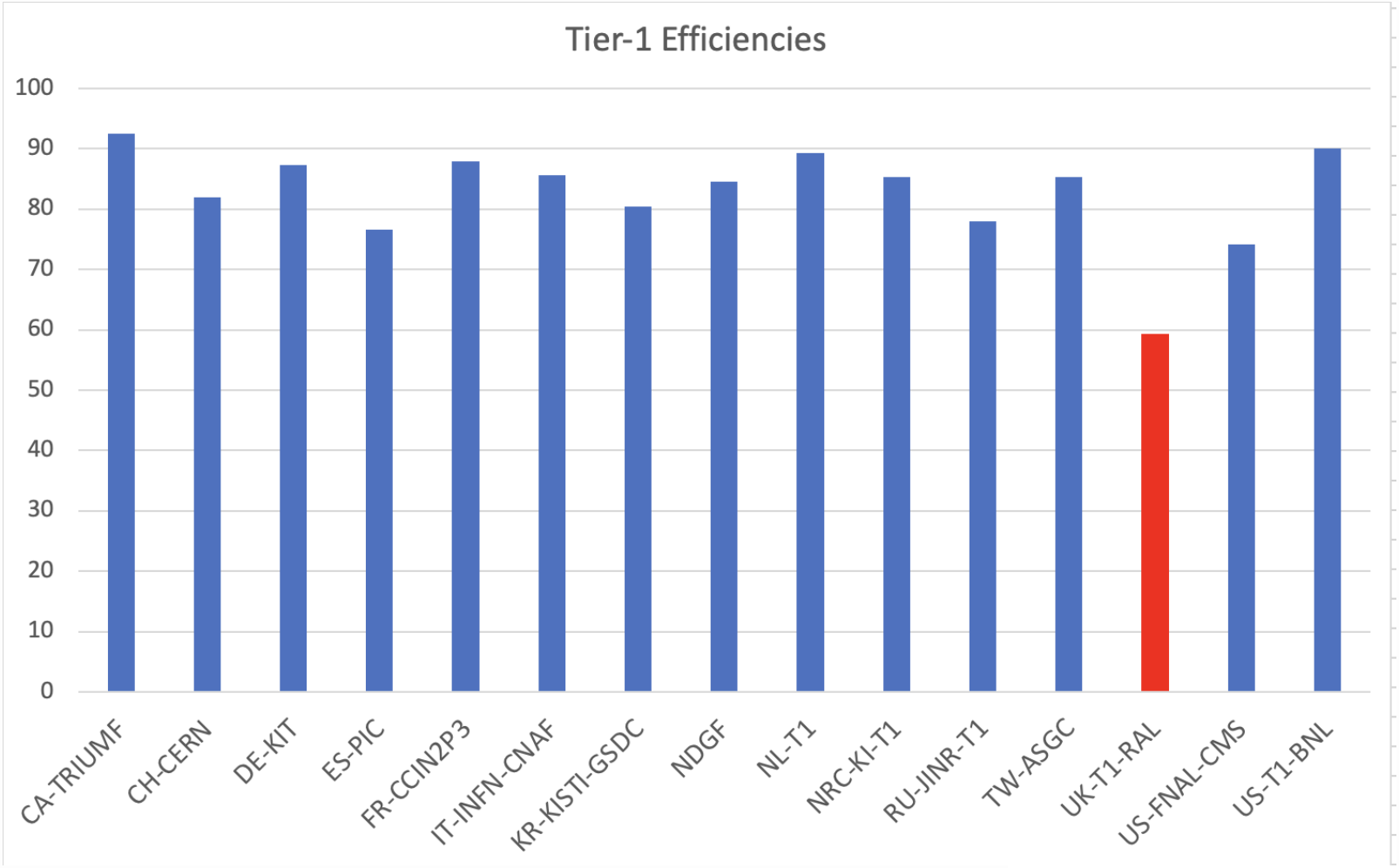
Sum Wallclock Work (HS06) by Tier-1 for LHC VOs;
August 2020 – July 2021

The Fine Print:

We pledge 12.6% of the Tier-1 requirements based on our M&O authorship fraction, but other countries use different metrics to pledge and may also over-deliver, or deliver more Tier-1 and less Tier-2 type resources. In absolute terms, we deliver what we pledge:
2020 Pledge was 369.25 KHS06
2020 Delivery was 374.45 KHS06

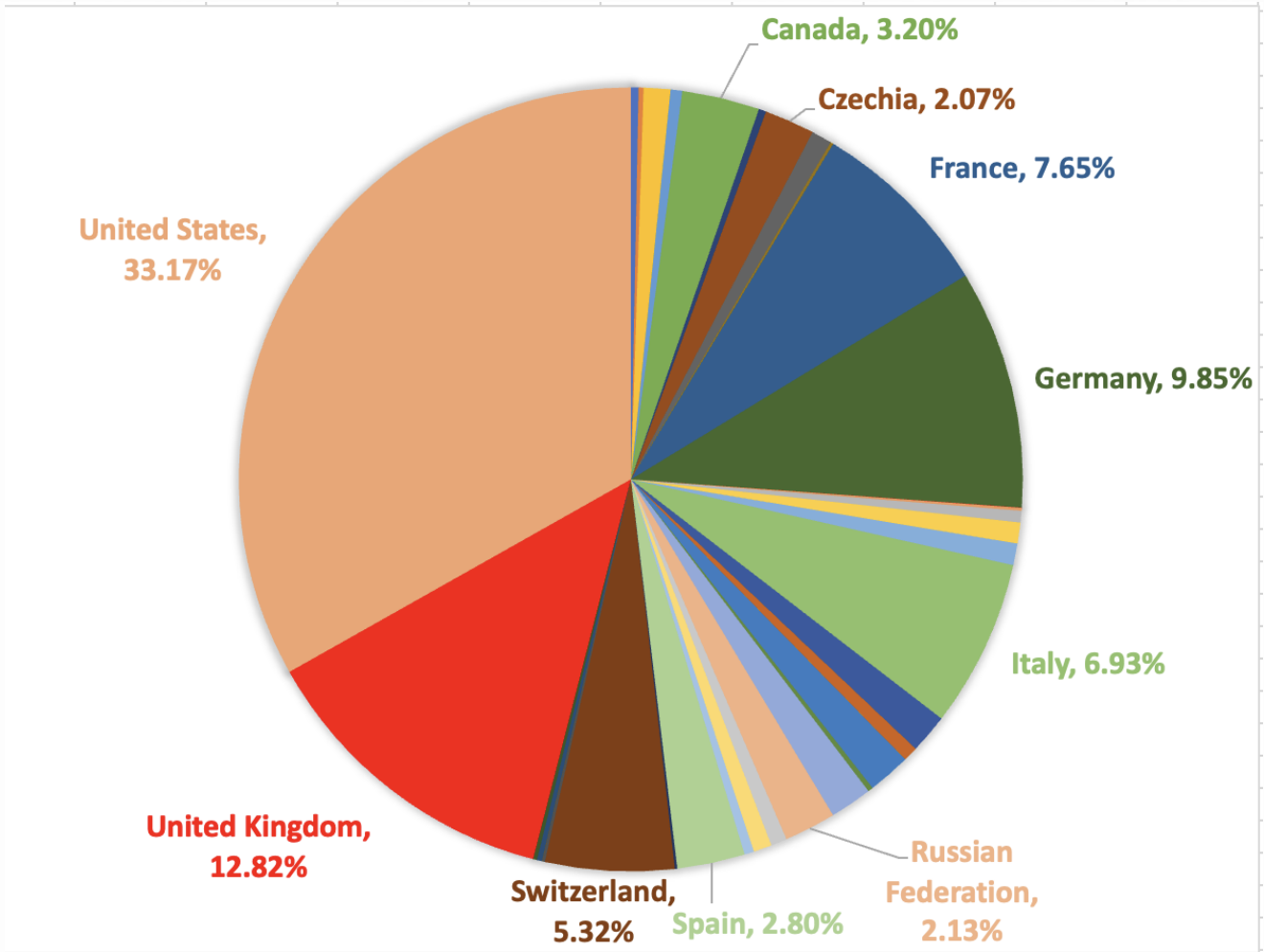
(Wall clock)

LHC Tier-1 Efficiencies*



* CPU-Time / Wallclock

LHC Tier-2 CPU Delivery



Tier-2 Sum Wallclock Work (HS06) by country for LHC VOs.
August 2020 – July 2021

We pledge 8.3% of the Tier-2 requirements based on our M&O authorship fraction but there are significant additional resources owned by Institutes and IRIS

LHC Tier-2 Efficiency?

Country	alice	atlas	cms	lhcb	Total
Slovenia	0%	104.96%	0%	0%	104.96%
Switzerland	0%	101.87%	101.29%	100.08%	101.29%
Portugal	0%	101.55%	100.05%	0%	100.88%
Slovakia	98.52%	102.4%	0%	0%	100.7%
Poland	99.14%	100.13%	100.29%	100.13%	100.01%
Latin America	88.29%	101.57%	78.65%	99.22%	98.92%
Estonia	0%	0%	98.48%	0%	98.48%
Canada	0%	98.42%	0%	0%	98.42%
Japan	0%	92.82%	0%	0%	92.82%
Australia	0%	91.11%	0%	0%	91.11%
Israel	0%	90.41%	0%	96.47%	90.47%
France	87.09%	90.6%	73.21%	97.04%	88.28%
Spain	0%	90.26%	81.68%	98.34%	87.58%
United Kingdom	87.53%	92.54%	71.81%	88.68%	87.35%
Czechia	78.93%	89.75%	0%	0%	85.84%
Germany	0%	88.56%	75.79%	98.72%	83.94%
China	0%	86.65%	61.73%	87.99%	81.66%
Thailand	80.69%	0%	0%	0%	80.69%
Russian Federation	64.54%	92.21%	68.72%	97.39%	79.95%
Taiwan	0%	89.58%	70.4%	0%	79.42%
Belgium	0%	0%	77.89%	0%	77.89%
"Korea, Republic of"	0%	0%	77.35%	0%	77.35%
Romania	69.1%	84.91%	0%	94.76%	77.33%
India	82.27%	0%	67.6%	0%	76.44%
Sweden	53.73%	91.14%	0%	0%	75.93%
United States	39.37%	86.88%	70.29%	97.53%	75.68%
Hong Kong SAR	0%	75.62%	0%	0%	75.62%
Hungary	72.71%	0%	75.25%	0%	73.93%
Italy	77.96%	90.3%	58.33%	63.44%	73.91%
Ukraine	94.04%	0%	68.69%	0%	68.79%
Brazil	0%	0%	66.67%	0%	66.66%
Finland	0%	0%	64.32%	0%	64.32%

Faster than light...

Resource Centre UKI-SCOTGRID-GLASGOW — CPU Efficiency (%) by VO and Quarter (LHC VOs)

VO	Aug 2020 — Oct 2020	Nov 2020 — Jan 2021	Feb 2021 — Apr 2021	May 2021 — Jul 2021	Total
atlas	87.27%	90%	90.73%	86.15%	88.18%
cms	19.05%	88.79%	61.02%	61.48%	62.87%
lhcb	98.75%	98.64%	98.06%	96.72%	98.05%
Total	89.25%	90.82%	87.42%	82.62%	86.29%

Resource Centre UKI-NORTHGRID-MAN-HEP — CPU Efficiency (%) by VO and Quarter (LHC VOs)

VO	Aug 2020 — Oct 2020	Nov 2020 — Jan 2021	Feb 2021 — Apr 2021	May 2021 — Jul 2021	Total
atlas	88.15%	91.43%	88.2%	90.45%	89.63%
lhcb	12.29%	32.36%	94.48%	95.4%	64.27%
Total	65.52%	76.48%	89.07%	92.1%	82.75%

Resource Centre UKI-NORTHGRID-LANCS-HEP — CPU Efficiency (%) by VO and Quarter (LHC VOs)

VO	Aug 2020 — Oct 2020	Nov 2020 — Jan 2021	Feb 2021 — Apr 2021	May 2021 — Jul 2021	Total
atlas	89.87%	92.51%	93.61%	92.36%	92.09%
lhcb	97.84%	95.12%	57.96%	81.22%	88.56%
Total	92.95%	93.51%	89.82%	88.42%	90.99%

Resource Centre UKI-LT2-IC-HEP — CPU Efficiency (%) by VO and Quarter (LHC VOs)

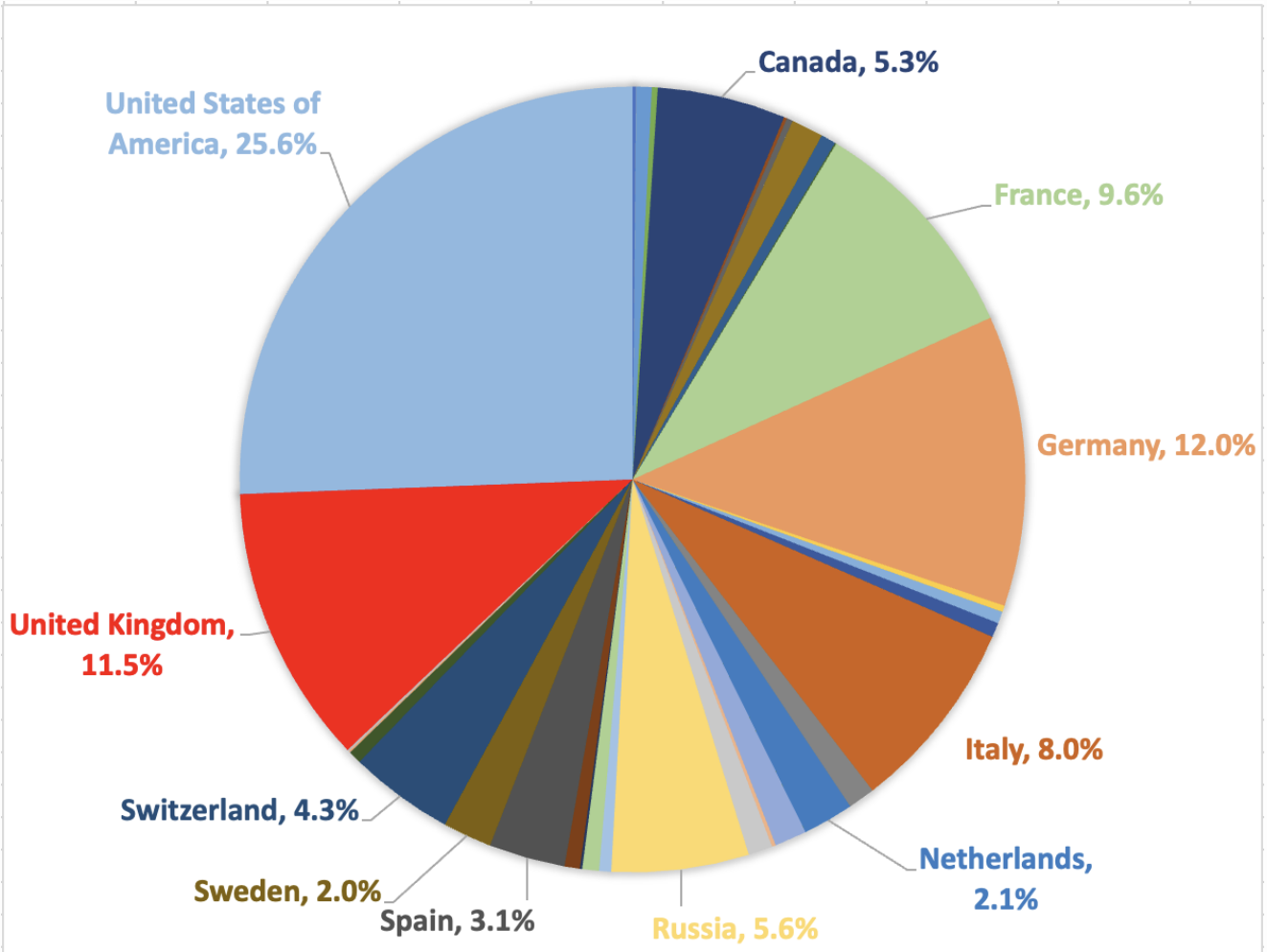
VO	Aug 2020 — Oct 2020	Nov 2020 — Jan 2021	Feb 2021 — Apr 2021	May 2021 — Jul 2021	Total
atlas	96.54%	95.91%	97.71%	97.47%	97.08%
cms	73.45%	69.99%	67.63%	69.55%	70.04%
lhcb	98.03%	98.28%	98.1%	96.55%	97.75%
Total	81%	77.19%	76.64%	78.47%	78.23%

1 - 3 of 3 results ‹ 1 › Number of rows per page 30

Resource Centre UKI-LT2-QMUL — CPU Efficiency (%) by VO and Quarter (LHC VOs)

VO	Aug 2020 — Oct 2020	Nov 2020 — Jan 2021	Feb 2021 — Apr 2021	May 2021 — Jul 2021	Total
atlas	107.35%	107.51%	106.15%	106.85%	106.93%
cms	105.78%	104.69%	103.86%	103.74%	104.47%
lhcb	100.76%	107.43%	106.5%	108.09%	106.37%

LHC: Overall UK



Sum CPU Work* (HS06) by country for LHC VOs. August 2020 – July 2021

UK pledge is 10.3% for 2021.

*This now includes the efficiency factor – i.e. despite lower efficiency, the actual delivered cycles are above pledge from the UK as a whole.

GridPP and IRIS

- GridPP provides resources to IRIS VOs in return for funding. Some IRIS VOs were already non-LHC GridPP users before IRIS existed.
- IRIS VOs (roughly):

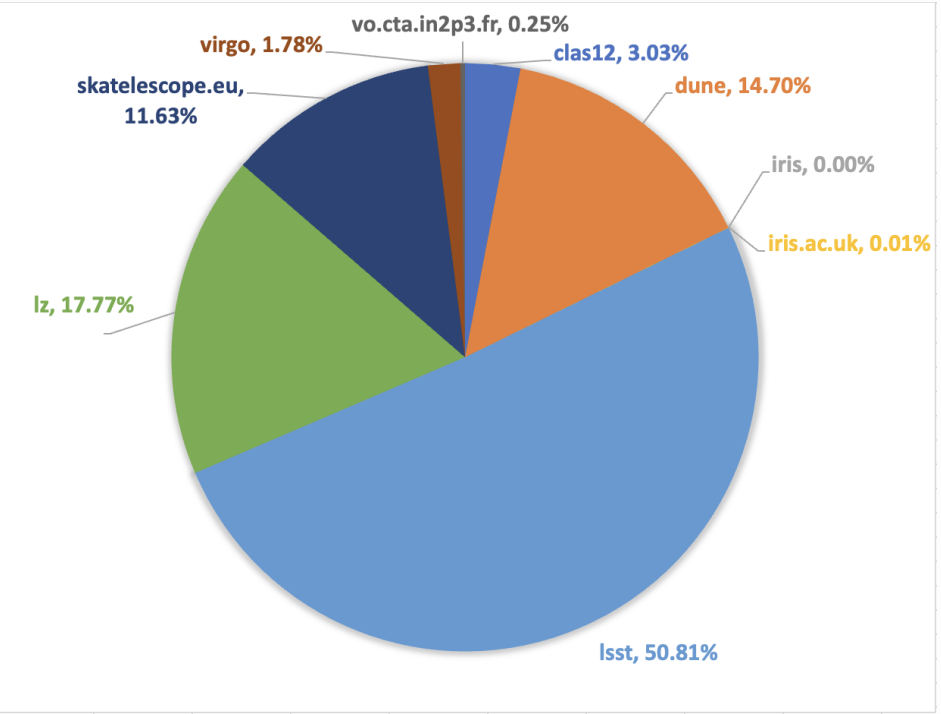
  Dune, LSST, LZ, EUCLID, SKA, CLAS12, VIRGO, CTA ,JINTRAC ,CCFE
- The commitment to deliver resources is formally from "GridPP" and not from the individual site that receives IRIS funds… though of course, the funds have been distributed with certain (and sometimes very explicit) expectations.
- We have a brief (1.5 page) policy document that covers this.
- There is a GridPP - IRIS MoU.
- GridPP tries not to micro-manage sites: Once funds are allocated then it's up to the site to spend them in a way that best allows the site to:
  - Help meet contributions to WLCG MoU commitments (circulated each Autumn)
  - Help meet commitments to IRIS (specific and general)
  - Contributions to other non-LHC non-IRIS VOs (the notional 10%)
  - Contributions to site-specific priorities.

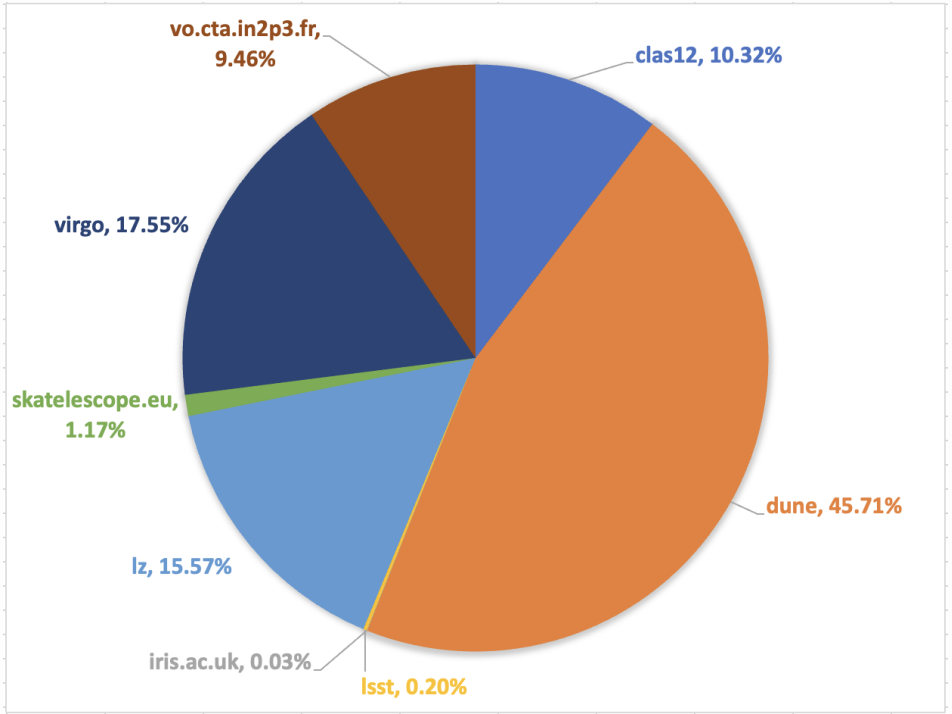
IRIS MoU

IRIS MOU										
CPU expectations in terms of CORES DELIVERED, assumming hyperthreading factor of 1.6x physical cores; 4-year lifetime; and 90% allocatable fraction										
Year of Resource Delivery	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**
UKT0 2017	1536	1536	1536	1536						
IRIS 4x4 Year-1		1664	1664	1664	1664					
IRIS 4x4 Year-2			3992	3992	3992	3992				
IRIS 4x4 Year-3/WCL				4100	4100	4100	4100			
IRIS 4x4 Year-4					3000	3000	3000	3000		
Insert Row										
RAW CORES	1536	3200	7192	11292	12756	11092	7100	3000	0	0
ALLOCATABLE CORES	**1382**	**2880**	**6473**	**10163**	**11480**	**9983**	**6390**	**2700**	**0**	**0**
DISK expectations in TB assuming 90% allocatable and a 4-year lifetime										
Year of Resource Delivery	**FY18**	**FY19**	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**
UKT0 2017	1000	1000	1000	1000						
IRIS 4x4 Year-1		2326	2326	2326	2326					
IRIS 4x4 Year-2			2250	2250	2250	2250				
IRIS 4x4 Year-3/WCL				4000	4000	4000	4000			
IRIS 4x4 Year-4					1200	1200	1200	1200		
Insert Row										
RAW DISK (TB)	1000	3326	5576	9576	9776	7450	5200	1200	0	0
ALLOCATABLE DISK (TB)	**900**	**2993**	**5018**	**8618**	**8798**	**6705**	**4680**	**1080**	**0**	**0**

Historically, IRIS VOs have not always fully used these resources. We need to start keeping a slightly closer eye on this to ensure its “didn’t use” and not “couldn’t use”.

IRIS Usage





2019: 115% of MoU commitment used

2020: 23% of MoU commitment used

And what about Storage?

… that chapter is for another day!

Summary

- LHC Run-3 is on-track to start in the new year.
- GridPP continues to operate as an integral part of a complex and evolving national and international context.
- Our capital funding situation is much improved, and we can be reasonably confident of meeting pledges for remainder of GridPP6.
- We are, overall, delivering resources to WLCG at the appropriate level, though we would like to improve the Tier-1 efficiency.
- We support IRIS VOs and deliver resources to them as required but we should perhaps monitor this more closely.