



GridPP

UK Computing for Particle Physics



UNIVERSITY
of
GLASGOW

GridPP Status

GridPP48

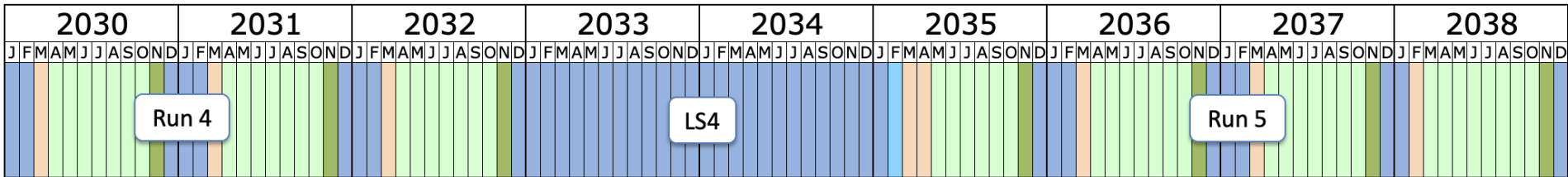
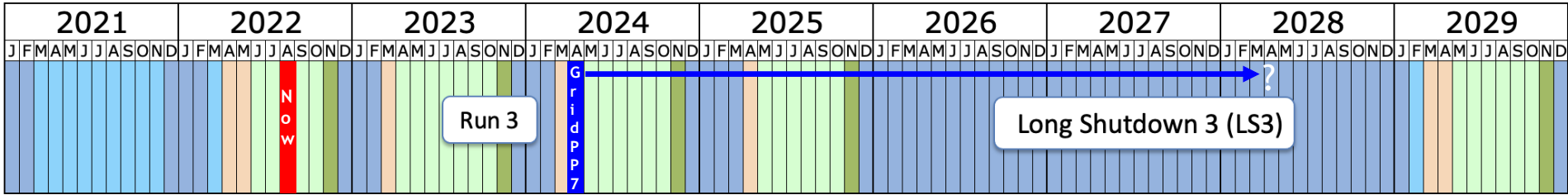
31st August 2022

Prof. David Britton
GridPP Project leader
University of Glasgow

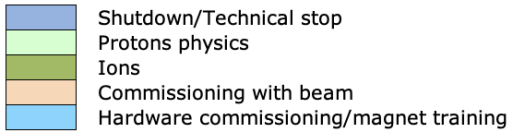


Timelines

In January 2022, the schedule was updated with long shutdown 3 (LS3) to start in 2026 and to last for 3 years.

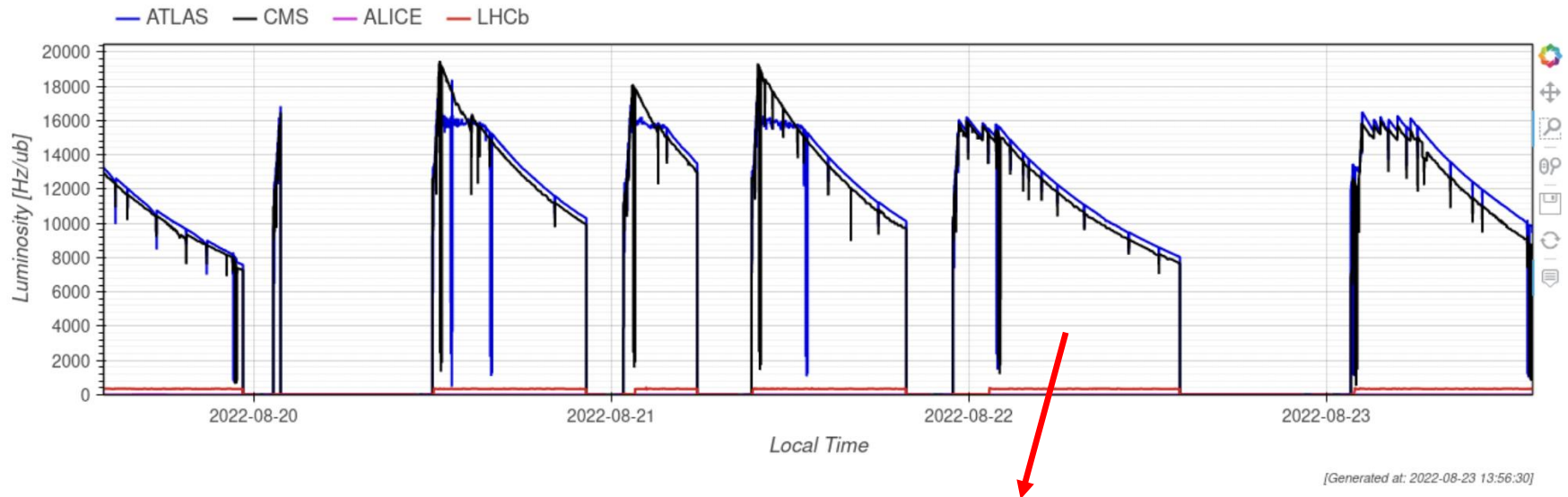


Last updated: January 2022





Luminosity



LHC at 2448 colliding bunches

Run 431914, Sun Aug 21 at 21:39 for 16 hrs, 36 min

Peak luminosity: $1.7 \times 10^{34} \text{ s}^{-1} \text{ cm}^{-2}$, μ levelled at ~ 47

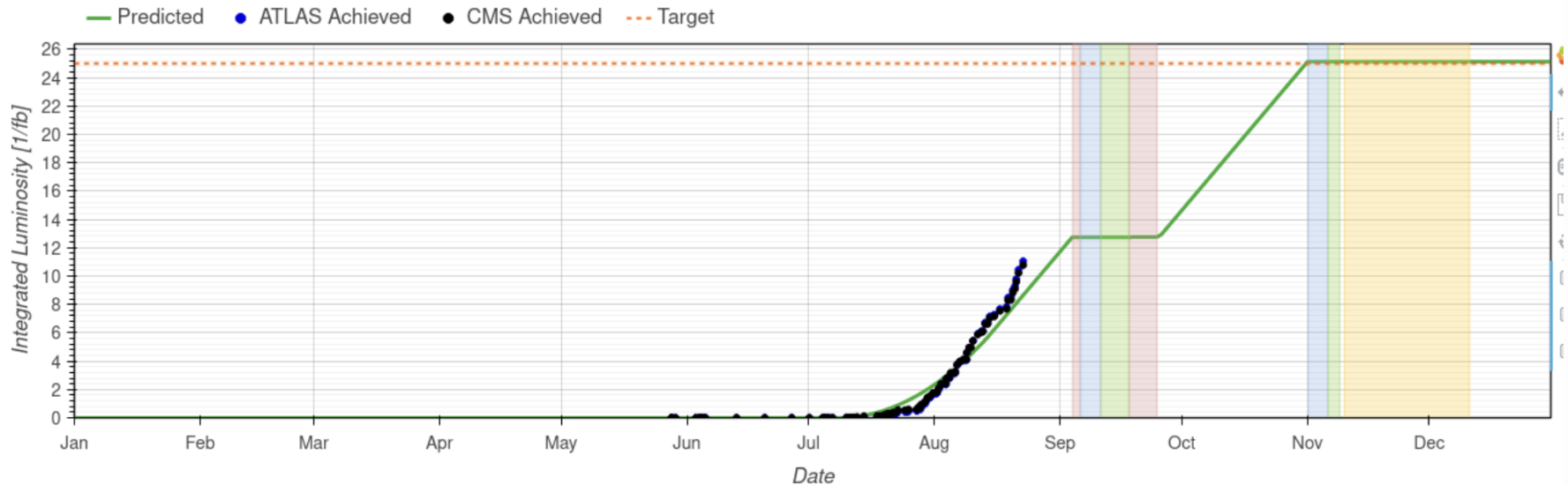
Delivered integrated lunniosity: 666 pb^{-1} (97.2% efficiency)



LHC 2022 Statistics

Schedule, Predicted and Achieved Luminosity

ATLAS / CMS LHCb Model Parameters



[Generated at: 2022-08-31 09:15:48]



Doh!

LHC Page1 Fill: 8152 E: 0 GeV 25-08-22 13:49:50

PROTON PHYSICS: NO BEAM

Comments (24-Aug-2022 23:42:27)

RF will be warmed up to room temperature following the cooling tower fault in point 4

no beam for the next ~4 weeks

BIS status and SMP flags		B1	B2
Link Status of Beam Permits		false	false
Global Beam Permit		false	false
Setup Beam		true	true
Beam Presence		false	false
Moveable Devices Allowed In		false	false
Stable Beams		false	false

PM Status B1 **ENABLED** PM Status B2 **ENABLED**

AFS: Single_12b_9_1_3_BSRT_2018_pilot



Last Tuesday 23 Aug evening the cooling tower in P4 (SF4) failed

- Similar event as on 18 March this year, chronology
- 18:07: Loss of communication with cooling tower SF4 due to PLC fault, causing stop of primary water circuit and thus loss of both cryo-plants at P4:

Iced venting pipe (left), good and broken rupture disk (right)





2022 Schedule

LHC restart on ~19 September (lost two weeks of pp running + machine setup and MD1)

First Stable beams at 6.8 TeV

Collisions with 1200 bunches

pp running + machine setup and MDI

Sep

Oct

Wk	27	28	29	30	31	32	33	34	35	36	37	38	39	
Mo	4	11	18	25	1	2160 coll b	15	22	OP tests (NO access)	29	5	12	19	26
Tu	13.6 TeV		590 coll b					Incident	★	OP tests (NO access)				
We	ICHEP				1922 coll b				TS#1 Ph1		TS#1 Ph2	Special Run (LHCf)		
Th		Interleaved commissioning & intensity ramp up								LHC tunnel closed				
Fr			974 coll b	1241 coll b		2400 coll b		OP tests (NO access)		OP tests (NO access)			Program TBD	
Sa								LHC tunnel closed	LHC tunnel closed	LHC tunnel closed				
Su	Scrubbing			1538 coll b										

Nov					Dec									
Wk	40	41	42	43	44	45	46	47	48	49	50	51	52	
Mo	3	ATLAS	10	17	24	31	7	14	21	28	5	12	19	26
Tu		Week				TS2			MD 3					
We		Lisbon										YETS		
Th														
Fr														
Sa														
Su														



Since Last Time

- GridPP6 Oversight Committee
- Russian Resources
- Pledges
- Single Source of Truth
- Other VOs
- GridPP7



- Met in May 2022
- Positive and supportive.
- Feedback and Actions:

GridPP7:

The timeline for the next GridPP proposal, GridPP7, was discussed and it was agreed that PD will clarify the timings for the proposal submission and review with the Collaboration. The GridPP6 project is scheduled to complete in March 2024 and so it is expected that the next proposal will be submitted in early-2023 for panel review.

ACTION: PD to clarify the timetable for GridPP7 with the Collaboration.



- Met in May 2022
- Positive and supportive.
- Feedback and Actions:

GridPP7:

The OsC wished to understand the Collaboration's vision for the future GridPP7 project and requested a short summary document is provided to outline this vision.

ACTION: Collaboration to provide a short document (a few pages) outlining the vision for GridPP7 by the end of July.

We submitted a 3-page vision document in early June (before receiving the action!)



Value Statement

The core value of GridPP is the expertise embedded in its people; their extensive collaboration in international communities; and their engagement in the local and national contexts. Around half this expertise is concentrated at RAL, including the Tier-1, LHC Experiment Liaison, and additional specialities such as Security and accounting. This “critical mass” enables the UK to provide an internationally recognised Tier-1 site and leading contributions to the global federation (WLCG). The other half of the expertise is distributed across 12 University sites but concentrated at 5 “Core Tier-2” centres. This enables local support and engagement; it leverages large financial contributions from the institutes in terms of electrical power, space, hardware, and effort; it has resulted in the delivery of vastly more resources than pledged (upon which all LHC experiments absolutely depend) at no direct cost to the project; and underpins the operation of the UK Grid and extensive international contributions.



Summary

GridPP7 would:

- Support computing for the LHC experiments from 2024-2027 (or longer if possible).
- Support the relatively small non-LHC Particle Physics experiments that can be accommodated within a 10% non-LHC share of GridPP resources.
- Provide an infrastructure, including hardware, services, software, security and support, that can be expanded in a cost-effective way to meet the needs of larger PPAN communities with appropriate additional funding.
- Work closely with IRIS as a provider of resources and as an STFC infrastructure collaborator.



- Met in May 2022
- Positive and supportive.
- Feedback and Actions:

ACTION: Collaboration to provide brief, narrative information on data recovery processes in the report for the next OsC meeting.

ACTION: Collaboration to provide narrative in the OsC report on the process that is used to determine the networking costs for GridPP6 for the next OsC meeting.

ACTION: Collaboration to request a user report from the ALICE experiment for all future OsC reports.

ACTION: Collaboration to explore GridPP taking part in IRISCAST and if possible, provide a status report for the next OsC meeting.



- IRISCAST - IRIS Carbon Audit SnapshoT (PI: Jon Hays, Co-I: Nic Walton, Adrian Jackson)
- Funded as part of the UKRI DRI NetZero Scoping project.
- Will conduct a carbon audit of selected IRIS resources as far up the chain as is feasible within the time available - pulling in as many of the embodied costs as possible - using snapshots of activity.
- The QMUL GridPP Tier-2 site will be included.
- It's goal is to provide UKRI with evidence as to what are the important metrics and key drivers of carbon costs across heterogeneous digital research infrastructures, as well as insights and lessons learned into how this kind of process might be applicable to the broader range of UKRI DRI.



General Context:

- CERN Council has declared after the 16/17 June 2022 meeting its intention to terminate the International Cooperation Agreements (ICA) with Russia and Belarus at their expiration dates in 2024, and to review the ICA with JINR.
- No additional UK policy has been issued by UKRI or STFC.
- Some UK Universities have established their own (general) policies (which don't translate well to Grid).



EGI Position:

- The EGI Foundation is bound by EU Council rulings on sanctions that apply to the export of any potential DUAL USE technology (*such as providing or supporting computing facilities*).
- The 6th sanction package - Official Journal L 153 of the EU, 02 June 2022 - amends Regulation (EU) No 833/2014 concerning restrictive measures, includes extensions to Annex IV 'List of legal persons, entities and bodies referred to in Articles 3(7), 3a(7), and 3b(1)' that name ITEP and IHEP data centres.
- The EGI EB (will be) asked to decide on the temporary suspension of the ITEP and IHEP resource centres from the EGI Federation on the 22nd of August.
- To be clear, the affected computing facilities in the context of the EGI Federation are:
 - SU-Protvino-IHEP (certified, in production)
 - ITEP - already suspended since May due to lack of response to critical vulnerabilities



WLCG Position:

- WLCG has examined the impact of the EGI suspension and concluded that (technically) the experiments would be able to use suspended sites opportunistically if they decide to, with some limitations and some changes in the operations flow.
- WLCG does not know whether there will be pledges from Russia this year.
- WLCG notes that all access to Russian resources might be suspended at any time due to other factors (eg 3rd party software restrictions).



GridPP Considerations:

- Russian resources are most significant for CMS and then ALICE. The UK's resources are more focused on ATLAS and LHCb.
- Obviously it is the Experiment's decision (not GridPP's) on whether or not to use Russian resources (pledged or opportunistic).
- We will pledge at the level originally planned and be prepared to respond as far as we can (*) to any difficulties that arise if/when use of Russian resources stops.

* Tier-1 procurements for 2023 considered this possibility and UK Tier-2 resources are already sufficient to respond if necessary.



GridPP Considerations (continued):

- Use of Russian resources is primarily an issue for the the Experiments. I believe UK users can request that their work does not get run on such resources.
- Use of UK resources by users affiliated with Russian Institutes is closer to the GridPP domain but is probably primarily an issue for sites. Here we believe it is more difficult to cleanly determine the origin of workloads.

In summary - there is currently no legislative restriction on GridPP, as far as we understand. Ethical considerations are equally important. Access to Russian resources may stop - in which case we will try to help.



Draft Pledges

(Work in progress)

- Global VO requirements from CRIC.
- UK contribution calculated for each VO from M&O authorship numbers.
- UK pledges (Tier-1 and four Tier-2s) are built up by looking at Site-VO affiliations and volume of resources at each site.

	Pledged Resources	LHC related SITE CPU [HS06] pledges to GridPP						LHC related SITE Disk [TB] Pledge to GridPP					
		ALICE	ATLAS	CMS	LHCb	Total	Site Frac	ALICE	ATLAS	CMS	LHCb	Total	Site Frac
London	Brunel	0	0	9,413	2,649	12,062	34%	0	0	909	0	909	52%
	Imperial	0	0	37,948	12,459	50,406	30%	0	0	3,262	300	3,562	16%
	QMUL	0	28,236	0	6,202	34,437	42%	0	4,618	0	300	4,918	76%
	RHUL	0	14,269	0	2,204	16,472	42%	0	0	0	0	0	
	UCL	0	0	0	0	0		0	0	0	0	0	
North	Lancaster	0	34,726	0	6,129	40,855	38%	0	5,616	0	0	5,616	59%
	Liverpool	0	6,234	0	3,594	9,828	36%	0	0	0	300	300	21%
	Manchester	0	39,206	0	9,226	48,432	40%	0	4,007	0	300	4,307	63%
	Sheffield	0	2,790	0	287	3,078	40%	0	0	0	0	0	
	Durham	0	17,115	0	2,819	19,934	27%	0	0	0	0	0	
Scot	Edinburgh	0	4,162	0	2,742	6,904	38%	0	0	0	0	0	
	Glasgow	0	47,668	0	11,218	58,886	40%	0	5,850	0	300	6,150	62%
	Birmingham	9,191	1,035	0	284	10,510	70%	1,304	0	0	0	1,304	76%
	Bristol	0	0	2,993	2,948	5,941	38%	0	0	0	0	0	
	Cambridge	0	0	0	0	0		0	0	0	0	0	
South	Oxford	4,236	11,877	0	1,398	17,511	47%	0	0	0	0	0	
	RAL PPD	0	4,264	13,370	878	18,512	40%	0	602	1,351	300	2,253	63%
	Sussex	0	3,607	0	0	3,607	46%	0	0	0	0	0	
	London	0	42,504	47,361	23,513	113,378	35%	0	4,618	4,172	600	9,389	30%
	NorthGrid	0	82,955	0	19,237	102,192	38%	0	9,624	0	600	10,224	57%
SouthGrid	ScotGrid	0	68,944	0	16,779	85,723	35%	0	5,850	0	300	6,150	62%
	SouthGrid	13,427	20,783	16,363	5,508	56,081	46%	1,304	602	1,351	300	3,557	67%
	Total Tier-2	13,427	215,188	63,724	65,036	357,375	38%	1,304	20,693	5,523	1,800	29,320	46%

**These are not quite the UK pledges to WLCG (these numbers include 10% group resources); nor are they the full site commitment to GridPP, because they don't include non-LHC and IRIS.

...but let me know if there is something obviously wrong for your site



- One thing we need to do better going into GridPP7 is to keep on top of all these number in a better way.
- (I've initiated a project called SSoT - "Single Source of Truth")
- Site capacities are *supposed* to be provided as part of the quarterly reporting process...
 - Obvious that some of the numbers were not up-to-date (shall we say...)
 - I looked at CPU delivered according to EGI accounting and found discrepancies (shall we say...)
 - So to derive the previous table, I estimated site capacities from looking at accounting data... using $\text{SiteCapacity} = \text{MAX}(\text{Avg}(\text{last 3months}), 80\% \text{ Max-of-last-12months})$, which I arrived at by trial-and-error. The 80% accounts for possible decommissioning of old kit.
 - We will be monitoring QR data more closely going forward - entering it into our SSoT sheet and x-checking the accounting data!



- It is worth noting that over the last year we have taken on more responsibility for non-LHC VOs than we might have imagined when we wrote the GridP6 proposal.
- Many more smaller HEP experiments.
- Consolidated support for larger HEP experiments like DUNE.
- Nuclear physics CLAS12 @ JLAB.
- EUCLID use of IC cloud and GridPP in general.
- A clear plan for Rubin (LSST) to use GridPP for its DRP processing through IRIS.
- A likely similar close synergy with SKA support for use of LHC technology.
- Firstly, thanks to all for responding so positively to in all cases.
- Secondly, this is very germane to the GridPP7 proposal



- We have been raising this with STFC since January 2022.
- We have raised this with our Oversight Committee
- We have not yet received a brief but did receive a DRAFT timeline last week that suggests submission of a proposal and JeS forms in January 2023.
- This means the proposal will need to be substantially complete before Christmas.



Summary

- LHC Run-3 has started; the LHC and experiments were ramping up well, but there is now a 4-week delay.
- GridPP is supporting ever more non-LHC experiments and non-HEP activities.
- We must write the GridPP7 proposal over the next 4-months.
- Well done to everyone for running an efficient ship which stands us in very good stead for the future.



- Next GridPP Collaboration meeting in Spring 2023:
 - Cosener's House has been suggested.
 - We are happy to consider other proposals before end of September.
- GridPP50 in late summer 2023:
 - Should we see if Ambleside if it is available?