ARCHER2
SP Quarterly Report

April – June 2022

EPCC
The University of Edinburgh

Document Information and Version History

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0.1	28/06/22	Template created	Jo Beech-Brandt
0.2	29/06/22	Added ISO and feedback info	Anne Whiting
0.3	04/07/22	Added graphs, statistics and narrative	Jo Beech-Brandt
0.4	04/07/22	Added narrative	Kieran Leach
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1.0	07/07/22	Version for UKRI	Jo Beech-Brandt, Alan Simpson

1 The ARCHER2 Service

This is the report for the ARCHER2 SP Service for the Reporting Period:
1st April – 30th June 2022.

1.1 Service Highlights

- A total of 69 pieces of query feedback were received this quarter, with all of them graded good, very good or excellent; 72% were rated as excellent. A donation of £69 has been made to Save the Children.

- The ARCHER2 Survey closed on 30th June after being open for six weeks. Detailed analysis will be performed but initial findings are that out of the 119 responses, 93% of respondents rated their overall experience of the ARCHER2 Service as Very satisfied or Satisfied with 63% giving the highest rating of Very Satisfied.

- We are pleased to announce that we have passed the Stage 1 external audit for our ISO 22301 Business Continuity certification. We are pursuing this to ensure that we are best prepared to prevent interruptions to the services we run for users, and that we have the tools in place to bring services back as quickly as possible and in the right order should something untoward happen.

- In response to the emergence of a critical vulnerability, we brought forward the planned upgrade of Slurm which is now at version 21.08.8-2. This upgrade will support the deployment of the burst buffer nvme file system and also allows us to track where nodes are "backfilling" for future jobs.

- During the rollout of the Slurm upgrade we were able for the first time to conduct a "rolling reboot" of the compute nodes on the service. This allowed us to conduct work which would previously have required a full system outage without any interruption to the running of work on the system.

- A new Programming Environment was successfully rolled out on the service using rolling reboots on the compute nodes. This allows users to make use of new features and resolved several user queries with the latest bug fixes contained in the PE release.

- Following the submission and acceptance of a paper titled "Automated service monitoring in the deployment of ARCHER2" to the Cray User Group, this was presented at both CUG and the HPC-SIG.

- The electrical upgrade work in Computer Room 3 is progressing well, and is on target to finish during July.

1.2 Forward Look

- HPE have informed us that we should imminently expect the handover of the ARCHER2 TDS. Following this handover we will work to configure the TDS in as close as possible a manner to the main system.

- We expect to shortly complete planned work to make the Home filesystem securely available to the Puma2 server. Following this work we will liaise with NCAS in to allow them to start making use of this resource.

- The annual round of internal audits and improvement work for our service delivery and information security will continue to ensure we deliver the services that users need and keep their data safe. In part, this work continues to prepare for our annual ISO 9001 quality and 27001 information security external audits, which are happening in September.

- Members of the ARCHER2 team will be attending the UK RSE Conference which will take place in Newcastle in September.

2 ARCHER2 Performance Report

This is the contractual performance report for the ARCHER2 SP Service for the Reporting Periods from 1 April 2022 until 30 June 2022.

2.1 Service Points and Service Credits

The Service Levels and Service Points for the SP service are defined by EPSRC in Schedule 2.2 of ARCHER2 SP Service Contract. The metrics are for OY3 and include the annual % Improvement p.a as defined in Schedule 2.2.

The Working Day (WD) for the ARCHER2 Service is 10 Working Hours (WH) as the Service operates from 0800-1800. The Median Time to Resolution is measured in WD.

- **Availability**: *Service Threshold: <=96.7%; Operating Service Level: >98.2%, ≤ 98.7%.*
- **ARCHER2_SP_Level1 (MTR)**: The Median Time to Resolution, of all SP queries falling within Level 1 resolved by the Contractor in the Reporting Period. *MTR Service Threshold: >0.98 WD; Operating Service Level: >0.28 WD, ≤ 0.43 WD.*
- **ARCHER2_SP_Level2 (MTR)**: The Median Time to Resolution, of all SP queries falling within Level 2 resolved by the Contractor in the Reporting Period. *MTR Service Threshold: >8 WD; Operating Service Level: >2 WD, ≤4 WD.*
- **ARCHER2_SP_Level3 (MTR)**: The Median Time to Resolution, of all SP queries falling within Level 3 resolved by the Contractor in the Reporting Period. *MTR Service Threshold: >25 WD; Operating Service Level: >12 WD, ≤16 WD.*
- **Initial Response to Queries (%):** The percentage of the total number of SP queries assigned to the Contractor in the Reporting Period responded to within 3 Working Hours. *Service Threshold: <96.00%; Operating Service Level: 98.00 – 98.99%.*
- **Query User Satisfaction (%):** The percentage of the total number of query satisfaction surveys completed in each Reporting Period, rating the quality of the resolution of Queries by the Contractor as "Good", "Very Good" or "Excellent". *Operating Service Level: 82.00 – 87.99%*

2.1.1 Service Points

Metric	Apr 2022		May 2022		Jun 2022		Q2 2022	
	Perf	Points	Perf	Points	Perf	Points	Perf	Points
Availability	100%	-3	100%	-3	98.3%	0	**99.5%**	**-6**
SP_Level1 (MTR)	0.00	-2	0.00	-2	0.00	-2	**0.00**	**-6**
SP_Level2 (MTR)	0.09	-2	0.07	-2	0.01	-2	**0.09**	**-6**
SP_Level3 (MTR)	4.57	-2	15.61	0	0.49	-2	**4.57**	**-4**
Initial Response (%)	100%	-1	100%	-1	100%	-1	**100%**	**-3**
Query Satisfaction (%)	100%	-2	100%	-2	100%	-2	**100%**	**-6**
Total		**-12**		**-10**		**-9**		**-31**

2.1.2 Service Credits

As the Total Service Points are negative (-31), no Service Credits apply in 22Q2.

2.2 SP Query Statistics

The metrics were specified by EPSRC in Schedule 2.2 of ARCHER2 SP Service Contract.

- **Assigned:** The number of SP queries assigned to the Contractor within each query resolution category in the Reporting Period.
- **Resolved:** The number of SP queries resolved by the Contractor within each query resolution category in the Reporting Period.
- **Backlog:** The number of SP queries assigned to the Contractor that remained unsolved within each query resolution category in the Reporting Period
- **Correspondence:** The average number of pieces of correspondence generated for SP queries in each query resolution category.
- **First Response:** The average time taken for the Contractor to first respond to the Originator of the SP query.

April 2022					
Service level	**Assigned**	**Resolved**	**Backlog**	**Correspondence**	**First Response**
SP_Level1	763	763	0	0.174	0:00:33
SP_Level2	62	69	18	8.623	0:18:21
SP_Level3	3	3	3	10	0:38:37
May 2022					
Service level	**Assigned**	**Resolved**	**Backlog**	**Correspondence**	**First Response**
SP_Level1	606	606	0	0.175	0:00:35
SP_Level2	94	85	27	7.459	0:18:13
SP_Level3	1	1	3	18	0:01:32
June 2022					
Service level	**Assigned**	**Resolved**	**Backlog**	**Correspondence**	**First Response**
SP_Level1	602	602	0	0.219	0:00:39
SP_Level2	88	81	34	7.827	0:18:53
SP_Level3	2	3	2	10.333	0:11:20
Q2 2022					
Service level	**Assigned**	**Resolved**	**Backlog**	**Correspondence**	**First Response**
SP_Level1	1971	1971	0	0.188	0:00:36
SP_Level2	244	235	34	7.928	0:18:29
SP_Level3	6	7	2	11.286	0:21:37

2.3 Query Resolution

Metric	**Apr 2022**		**May 2022**		**Jun 2022**		**Q2 2022**	
Service Level	**MTR**	**Resolved**	**MTR**	**Resolved**	**MTR**	**Resolved**	**MTR**	**Resolved**
SP_Level1	0:00:30	763	0:00:26	606	0:00:20	602	0:00:24	1971
SP_Level2	0:55:08	69	0:41:51	85	0:36:10	81	0:53:54	235
SP_Level3	45:43:03	3	156:09:47	1	0:00:00	3	45:43:03	7
Total		**835**		**692**		**686**		**2213**

A total of 2,213 queries were resolved by the ARCHER2 SP Service in the Reporting Period. The percentage of user queries responded to within 3 hours was 100%.

2.4 Query Feedback

During April, there were 19 feedback scores received during this period. 100% were Good, Very Good or Excellent with 84% given the highest score of Excellent.

During May, there were 29 feedback scores received during this period. 100% were Good, Very Good or Excellent with 72% given the highest score of Excellent.

During June, there were 21 feedback scores received during this period. 100% were Good, Very Good or Excellent with 62% given the highest score of Excellent.

2.5 Maintenance and Outages

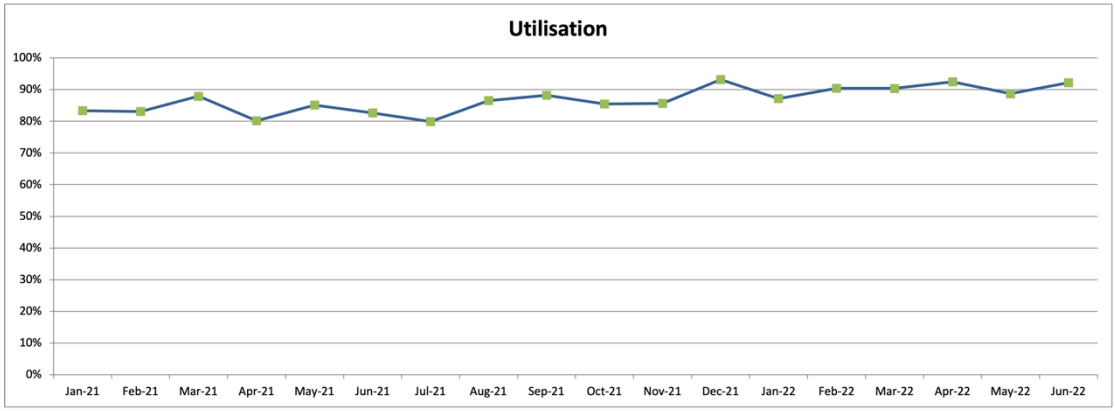
Type	Start	End	Duration	User Impact	Reason
Approved At Risk	11/5/22	11/5/2022	8 hours	Interruption to the starting of new jobs/submission of new jobs. No interruption to running work.	Slurm upgrade to 21.08.8-2
Approved At Risk	16/5/2022	23/5/2022	7 days	Rolling and round robin reboot of all nodes.	Slurm upgrade to 21.08.8-2
Partial: Compute nodes in cabinets 21-23	15/6/22 20:30	16/6/22 16:30	12 hours	There was a reduced number of compute nodes available. Users could still connect to ARCHER2, access the filesystems, submit jobs and running jobs continued on the other compute nodes.	Power issues with cabinets 21-23
Approved Partial: 4 Cabinets	29/6/2022 10:00	29/6/2022 12:00	2 hours	There was a reduced number of compute nodes available. Users could still connect to ARCHER2, access the filesystems, submit jobs and running jobs continued on the other compute nodes.	Testing the phased approach to future planned work

During this quarter, there was a single outage which will count against the availability metric as the other outages were performed At-Risk, were pre-approved and did not cause significant user impact. The one outage due to a power issue to site lasted for 12 hours.

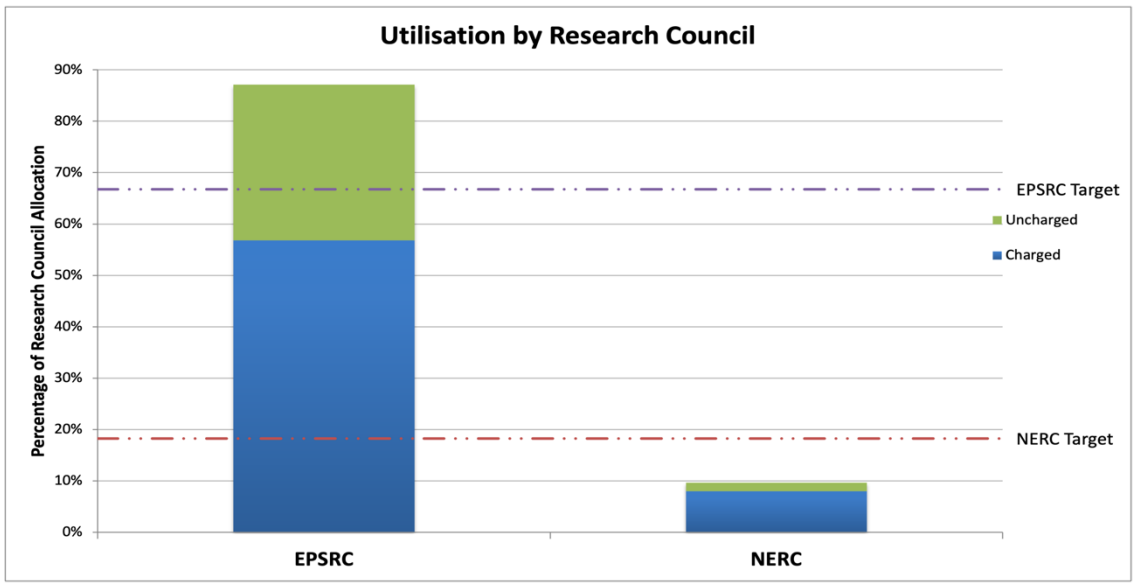
3 ARCHER2 Service Statistics

3.1 Utilisation

Utilisation from 1 April – 30 June is 91% which is slightly increased from 89% the previous quarter. Utilisation for April was 92%, for May 89% and for June 92%.

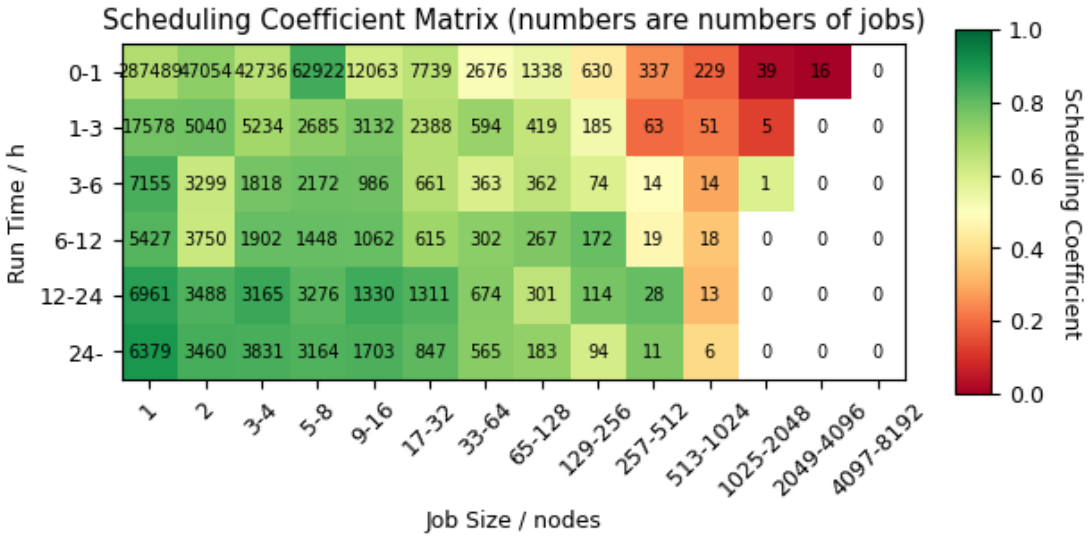


The utilisation by the Research Councils, relative to their respective allocations, is presented below. This bar chart shows the usage of ARCHER2 by the two Research Councils presented as a percentage of the total Research Council allocation on ARCHER2. It can be seen that EPRSC exceeded their target this quarter with their usage being at 87% (against their target of 66.8%) but NERC missed their target with utilisation being 10% (against their target of 18.2%).



3.2 Scheduling Coefficient Matrix

The colour in the matrix indicates the value of the Scheduling Coefficient. This is defined as the ratio of runtime to runtime plus wait time. Hence, a value of 1 (green) indicates that a job ran with no time waiting in the queue, a value of 0.5 (pale yellow) indicates a job queued for the same amount of time that it ran, and anything below 0.5 (orange to red) indicates that a job queued for longer than it ran. As may be expected, the system is very busy and users are having to queue for longer than on ARCHER2. Measures were introduced to try to alleviate the queue such as limiting the large, long jobs and placing limits on the number of jobs that one user can run at any time.



The usage heatmap below provides an overview of the usage on ARCHER2 over the quarter for different job sizes/lengths. The colour in the heatmap indicates the number of CUs expended for each class, and the number in the box is the number of jobs of that class.