



# ARCHER and ARCHER2 SP Quarterly Report

January – March 2021

EPCC

The University of Edinburgh



## Document Information and Version History

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<b>Reviewer(s)</b>	Alan Simpson

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0.1	04/02/2021	ARCHER Information	Jo Beech-Brandt
0.2	01/03/2021	Added information and standard template for ARCHER2	Jo Beech-Brandt
0.3	29/03/2021	Added user feedback and impact highlights	Anne Whiting
0.4	08/04/2021	Added System Development highlights	Kieran Leach
0.5	12/04/2021	Review	Alan Simpson
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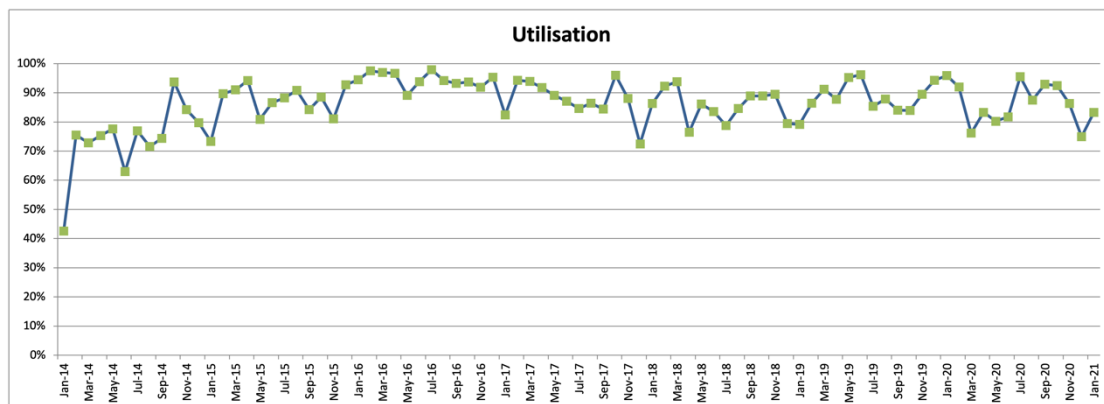
# 1. The ARCHER Service

## 1.1 Service Highlights

This is the report for the ARCHER SP Service for the final Reporting Period:  
1st January - 27th January 2021.

- Utilisation during the final month was 83% which is higher than the previous month where the utilisation was 75%. It should be noted that historically we have seen a dip in utilisation over the festive period and this is seen again for December.
- After 7 successful years, the ARCHER Service ended on 27<sup>th</sup> January 2021.
- A series of blog posts and tweets marked the final shutdown and the #FarewellARCHER tag was used.
- The ARCHER /home filesystem was copied and will be made available on ARCHER2.
- The RDF data is being migrated to the new RDFaaS (RDF as a Service) and this will also be available from ARCHER2.
- All contractual query metrics were bettered during the final month of the ARCHER Service.

The Utilisation plot over the duration of the ARCHER Service shows a steady increase in utilisation over the lifetime of the service to Dec 2015 and since then the service has effectively been operating around maximum capacity as shown by the generally steady utilisation value.

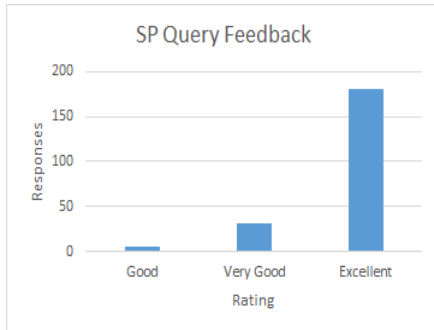




# 1 The ARChER2 Service

## 1.1 Service Highlights

- Ahead of the end of the ARChER Service on 27<sup>th</sup> January, all projects with active ARChER allocations were migrated to the ARChER2 4-Cabinet system. Users were asked to apply for ARChER2 accounts and they have now transitioned to the new service. There are now 1544 active ARChER2 user accounts.
- A copy of the ARChER /home filesystem was taken and has been made available on ARChER2 so that users can access and copy their data if required.
- A copy of the RDF data has been taken and the data has moved to the RDFaaS hardware. This will soon be made available to users on ARChER2. An alternative access mechanism will also be provided for non-ARChER2 users.
- As users have started to use the 4-cabinet system, changes have been more restrained. Over the past quarter the following changes have been made:
  - Worked with user groups to enable workflow transition from ARChER to ARChER2, including a licence server deployment
  - Epilog script developed and deployed to counter problems seen with shared memory errors
  - 'largescale' QoS created for jobs over 256 nodes in order to prevent these jobs swamping the system.
- Work continues with UKRI to agree a set of benefit realisation metrics which will be used in the business case for future National Services to help demonstrate the positive impact of the ARChER2 service including the science generated by its users. The majority of these metrics will be collected in the SAFE and will involve more input from the user community than previously. User communication has commenced to stress the importance of the information on the provision of future services.
- 10 blog articles have been published this quarter with highlights being the video documenting the end of the ARChER service and the video of the installation of the majority of the ARChER2 cabinets at the ACF. We plan to continue to publish regular blogs on all aspects of the service, technical and otherwise. We also hope to feature blog articles from the user community on the exciting science being created on ARChER2 once the full service goes live, and from UKRI on their role in the service.
- Users submitting queries to the service desk with a SAFE account have been asked for feedback on the handling of their query. From the 649 SP user logged queries received, 219 feedback responses have been received, or 34%.



A donation of £1 per user feedback response has been made to our selected charity, Save the Children. This quarter a total donation of £374 has been made, with £219 from the SP Query feedback.

- Data generated showing queue duration and utilisation is analysed on a weekly basis. Based on the findings, changes to the queue layout are proposed and implemented where necessary to help alleviate the queue and ensure fair-share across the user communities.

## 1.2 Forward Look

- The remaining cabinets were shipped from the USA and have now arrived in Edinburgh. Work is progressing with the installation of the additional hardware.
- The full ARCHER2 system is planned to be deployed to users during the next quarter. Reallocation of space within the /work directories will take place, but users will continue to use their existing ARCHER2 accounts to access the full system.
- A programme of internal audits is being carried out to ensure that our Quality Management Systems and Information Security Management System are operating well and that the improvements we are making are effective.
- RDFaaS deployment to the ARCHER2 UANs is currently in the final testing stage and will be deployed following successful completion of this testing.
- EPCC development time on the ARCHER2 main system is expected to start shortly and the team will prepare the main system for user deployment.
- The new 200 Gbps Data Centre Network providing 100 Gbps connectivity to JANET will be deployed.

## 2 ARCHER2 Performance Report

This is the contractual performance report for the ARCHER2 SP Service for the Reporting Periods from 1<sup>st</sup> January 2021 until 31<sup>st</sup> March 2021.

### 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 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: <=96.5%; Operating Service Level: >98.0%, ≤ 98.5%.*
- **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: >1 WD; Operating Service Level: >0.3 WD, ≤ 0.45 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	Jan 2021		Feb 2021		Mar 2021		Q1 2021	
	Perf	Points	Perf	Points	Perf	Points	Perf	Points
Availability	-	-	-	-	-	-	-	-
SP_Level1 (MTR)	0.00	-2	0.00	-2	0.00	-2	<b>0.00</b>	<b>-6</b>
SP_Level2 (MTR)	0.05	-2	0.07	-2	0.07	-2	<b>0.05</b>	<b>-6</b>
SP_Level3 (MTR)	5.79	-2	5.60	-2	12.97	0	<b>5.99</b>	<b>-4</b>
Initial Response (%)	100%	-1	100%	-1	100%	-1	<b>100%</b>	<b>-3</b>
Query Satisfaction (%)	100%	-2	100%	-2	100%	-2	<b>100%</b>	<b>-6</b>
<b>Total</b>		<b>-9</b>		<b>-9</b>		<b>-7</b>		<b>-25</b>

#### 2.1.2 Service Credits

As the Total Service Points are negative (-25), no Service Credits apply in 21Q1.

### 2.2 SP Query Statistics

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

- **No. of Assigned:** The number of SP queries assigned to the Contractor within each query resolution category in the Reporting Period.
- **No. of 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
- **Avg No. of Correspondence:** The average number of pieces of correspondence generated for SP queries in each query resolution category.
- **Avg Time of First Responses:** The average time taken for the Contractor to first respond to the Originator of the SP query.

January 2021					
Service level	Assigned	Resolved	Backlog	Correspondence	First Response
SP_Level1	7930	7929	1	0.17	0:03:11
SP_Level2	270	228	53	7.39	2:33:44
SP_Level3	5	6	1	18.5	0:16:58
February 2021					
Service level	Assigned	Resolved	Backlog	Correspondence	First Response
SP_Level1	2650	2650	1	0.219	0:22:57
SP_Level2	248	247	54	7.947	0:25:06
SP_Level3	4	1	4	26	0:07:17
March 2021					
Service level	Assigned	Resolved	Backlog	Correspondence	First Response
SP_Level1	1550	1550	1	0.263	0:0:50
SP_Level2	152	166	40	7.741	1:39:12
SP_Level3	2	2	4	15.5	0:07:51
Q1 2021					
Service level	Assigned	Resolved	Backlog	Correspondence	First Response
SP_Level1	12130	12129	1	0.193	0:06:54
SP_Level2	668	640	39	7.706	0:49:21
SP_Level3	11	9	4	18.667	0:13:52

## 2.3 Query Resolution

Metric	Jan 2021		Feb 2021		Mar 2021		Q1 2021	
	MTR	Number Resolved	MTR	Number Resolved	MTR	Number Resolved	MTR	Number Resolved
SP_Level1	0:00:26	7929	0:00:21	2650	0:00:21	1550	0:00:24	12129
SP_Level2	0:32:42	228	0:39:21	247	0:40:43	166	0:35:07	641
SP_Level3	57:56:42	6	55:59:41	1	129:42:10	2	59:53:51	9
<b>Total</b>		<b>8163</b>		<b>2898</b>		<b>1718</b>		<b>12779</b>

There were 0 queries that failed the maximum completion time during this period.

A total of 12,779 queries were resolved by the ARCHER2 SP Service in the Reporting Period. There was a large number of SP\_Level1 queries in January and this was due to the migration of users from ARCHER to ARCHER2. The percentage of user queries responded to within 3 hours was 100%.

## 2.4 Query Feedback

During January, there were 83 feedback scores received during this period. 100% were Good, Very Good or Excellent with 90% given the highest score of Excellent.

During February, there were 96 feedback scores received during this period. 100% were Good, Very Good or Excellent with 74% given the highest score of Excellent.

During March, there were 53 feedback scores received during this period. 100% were Good, Very Good or Excellent with 87% given the highest score of Excellent.

## 2.4 Maintenance and Outages

Thursday 4<sup>th</sup> February 0800-1400: 6 hours

HPE Cray: High Speed Network (HSN) rebooted to allow the return of failed links which were causing job failures.

Sunday 7<sup>th</sup> February 2115 – Tuesday 9<sup>th</sup> February 0930 : 36 hours

Accommodation: Power outage affecting SE Scotland

Thursday 18<sup>th</sup> February 0830-1400: 5.5 hours

HPE Cray: Updated the system to software v1.3.3, this included patched for the critical 'sudo' vulnerability

Thursday 18<sup>th</sup> March 0900-1230: 3.5hours

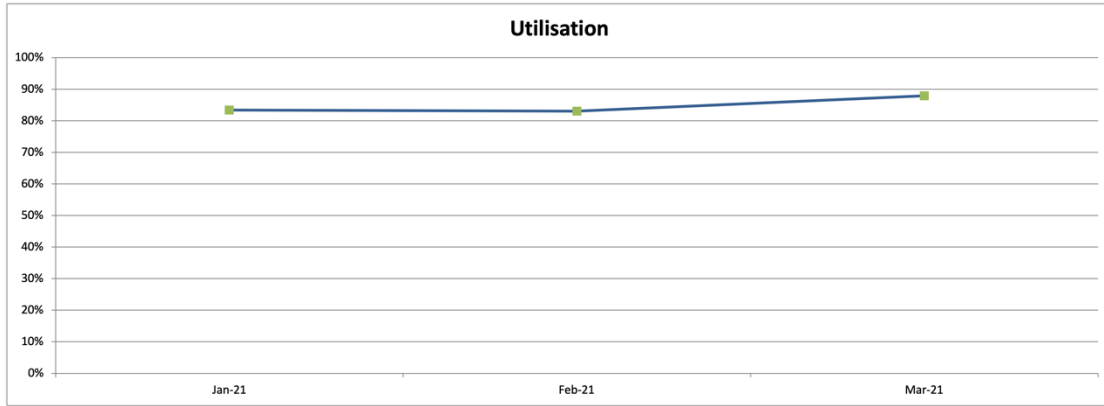
HPE Cray: High Speed Network (HSN) rebooted to allow the return of failed links which were causing job failures.

# 3 ARCHER2 Service Statistics

## 3.1 Utilisation

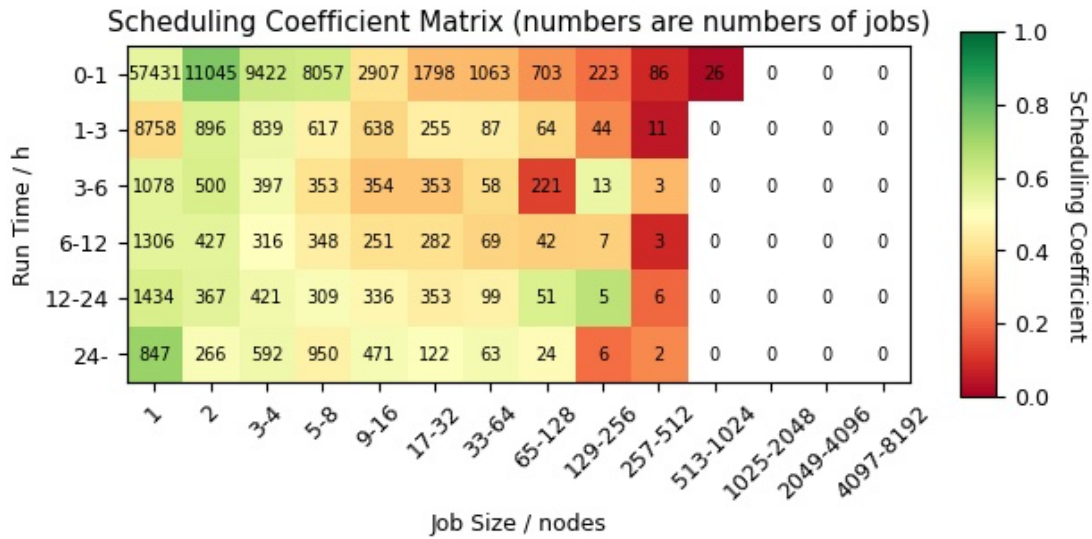
Utilisation during the early access period from January – March was 85%. It can be seen that the utilisation over the quarter has been high and is positive that users were able to port codes onto ARCHER2 quickly and get jobs running on the new system successfully. It should be noted that charging has not been active during this period. UKRI agreed that charging will start on ARCHER2 from 1<sup>st</sup> April 2021.





### 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 ARCHER. 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 ARCHER 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.

