ARCHER SP Service Quarterly Report

Quarter 1 2020

Document Information and Version History

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1.0	16/04/20	Version for UKRI	Anne Whiting, Alan Simpson

1. The Service

1.1 Service Highlights

This is the report for the ARCHER SP Service for the Reporting Periods:

January 2020, February 2020 and March 2020.

- Utilisation over the quarter was 88% which is only a small decrease from the previous quarter where the utilisation was 89%.

- The ARCHER service had been planned to end on 18 February 2020. EPCC had been working closely with EPSRC to plan the end of service and to provide assistance to the user community to prepare for the shutdown and the break in service before ARCHER2. Webinars were run to provide assistance with data migration off ARCHER and the RDF, which was due to come to the end of service at the same time. However due to delays with ARCHER2, the ARCHER service was extended until at least June 2020, with a minimum of two weeks notice to be provided to the user community of the end of service. The ARCHER service continues to be run and supported as usual by EPCC and other service providers.

- EPCC were delighted to be awarded the ARCHER2 SP and CSE contracts. Preparations to implement and deliver the service commenced and continue. We now know that ARCHER2 will be hosted at the ACF, hardware provided and supported by HPE/Cray, and SP and CSE contracts delivered by EPCC.

- The ARCHER2 website went live as planned on 13 March and can be found at www.archer2.ac.uk. Details of the ARCHER2 Service can be found there, including the first ARCHER2 eCSE call, planned ARCHER2 training and details of the support arrangements. The website will continue to grow as we receive more information about ARCHER2.

- The RDF has had support extended until August 2020 for EPSRC users pending a more permanent replacement service being implemented.

- With the arrival of COVID-19, the ARCHER service moved to being run and supported primarily from home except for a skeleton staff at the ACF to provide essential systems administration and maintenance cover. Having carried out BCDR tests using scenarios involving home working and staff sickness has helped to provide EPCC with the processes and approach to support remote working. Support is being provided during the service normal working hours and we are meeting all normal service levels.

1.2 Forward Look

- The ARCHER service has currently been extended until 17 June 2020 and a normal support service will be provided until the service ends. A minimum of 2 weeks notice will be provided of the end of service. As usual, any updates on either the ARCHER service or its support will be communicated through the ARCHER website and through user mailings.

- Work will continue to plan, implement and deliver the ARCHER2 service. EPSRC continue to send out weekly updates on progress in delivering the ARCHER2 service via the service desk.

- In preparation for the commencement of the ARCHER2 service, the ARCHER2 service desk went live on 1 April 2020. Support hours have been increased to cover 08:00 – 18:00 on working days, with the ability to log support calls in the SAFE provided 24x7. Details can be found at https://www.archer2.ac.uk/support-access/. Support requests related to ARCHER should be sent to support@archer.ac.uk and for ARCHER2 to support@archer2.ac.uk.

- Work will continue to prepare the user community and the service for the end of the ARCHER service:

    - We are preparing a FAQ section for the ARCHER website to help answer user questions on the end of service and transition to ARCHER2. This will be updated as further information becomes available and additional questions are asked.

    - The Service Exit Plans will be activated as we approach the end of service.

    - Communication will be sent out to the user community as this is made available be EPSRC and NERC. EPSRC has been sending a weekly user update out to ensure the user community is aware of the current project status.

    - EPCC will continue to work with EPSRC and NERC to provide assistance to them in planning the transition of user data and projects from ARCHER to ARCHER2.

- The ARCHER and Cirrus services are being used to run COVID-19 research projects to contribute to the UK's response to the current pandemic.

- With the importance placed in ARCHER2 on having robust business continuity and disaster recovery plans and processes in place, EPCC is planning to start working towards obtaining ISO 22301 business continuity certification.

- Plans are underway for increasing the ACF external and internal network links to 100GB improving communication speeds for the user community.

2. Contractual Performance Report

This is the contractual performance report for the ARCHER SP Service.

2.1 Service Points and Service Credits

The Service Levels and Service Points for the SP service are defined as below in Schedule 2.2.

- **2.6.2 - Phone Response (PR):** 90% of incoming telephone calls answered personally within 2 minutes for any Service Period. *Service Threshold: 85.0%; Operating Service Level: 90.0%.*
- **2.6.3 - Query Closure (QC):** 97% of all administrative queries, problem reports and non in-depth queries shall be successfully resolved within 2 working days. *Service Threshold: 94.0%; Operating Service Level: 97.0%.*
- **2.6.4 - New User Registration (UR):** Process New User Registrations within 1 working day.

Definitions:

Operating Service Level: *The minimum level of performance for a Service Level which is required by the Authority if the Contractor is to avoid the need to account to the Authority for Service Credits.*

Service Threshold: *This term is not defined in the contract. Our interpretation is that it refers to the minimum allowed service level. Below this threshold, the Contractor is in breach of contract.*

Non In-Depth: *This term is not defined in the contract. Our interpretation is that it refers to Basic queries which are handled by the SP Service. This includes all Admin queries (e.g. requests for Disk Quota, Adjustments to Allocations, Creation of Projects) and Technical Queries (Batch script questions, high level technical 'How do I?' requests). Queries requiring detailed technical and/or scientific analysis (debugging, software package installations, code porting) are referred to the CSE Team as In-Depth queries.*

Change Request*: This term is not defined in the contract. There are times when SP receives requests that may require changes to be deployed on ARCHER. These requests may come from the users, the CSE team or Cray. Examples may include the deployment of new OS patches, the deployment Cray bug fixes, or the addition of new systems software. Such changes are subject to Change Control and may have to wait for a Maintenance Session. The nature of such requests means that they cannot be completed in 2 working days.*

2.1.1 Service Points

In the previous Service Quarter, the Service Points can be summarised as follows:

Period	Jan 20		Feb 20		Mar 20		20Q1
Metric	Service Level	Service Points	Service Level	Service Points	Service Level	Service Points	Service Points
2.6.2 – PR	100.0%	-5	100.0%	-5	100.0%	-5	-15
2.6.3 – QC	99.3%	-2	99.9%	-2	100.0%	-2	-6
2.6.4 – UR	1 WD	0	1 WD	0	1 WD	0	0
Total		**-7**		**-7**		**-7**	**-21**

The details of the above can be found in Section 2.2 of this report.

2.1.2 Service Failures

There was one partial unplanned service failure this quarter. An unplanned outage for file system 2 of ARCHER occurred on the 9th March. This was due to the loss of power to one of the cabinet breakers which caused the filesystem to be unavailable for one hour. No user data was lost and all failed jobs were refunded.

Details of planned maintenance sessions, if any, can be found in Section 2.3.2.

2.1.3 Service Credits

As the Total Service Points are negative (-21), no Service Credits apply in 20Q1.

2.2 Detailed Service Level Breakdown

2.2.1 Phone Response (PR)

	Jan 20	Feb 20	Mar 20	20Q1
Phone Calls Received	14 (1)	16 (4)	9 (3)	**39 (8)**
Answered in 2 Minutes	14 (1)	16 (4)	9 (3)	**39 (8)**
Service Level	**100.0%**	**100.0%**	**100.0%**	**100.0%**

The volume of telephone calls remained low in 20Q1. Of the total of 39 calls received above, only 8 were actual ARCHER user calls that either resulted in queries or answered user questions directly.

2.2.2 Query Closure (QC)

	Jan 20	Feb 20	Mar 20	20Q1
Self-Service Admin	338	252	215	**805**
Admin	114	146	101	**361**
Technical	10	14	9	**33**
Total Queries	462	412	325	**1199**
Total Closed in 2 Days	459	410	322	**1191**
Service Level	**99.4%**	**99.5%**	**99.1%**	**99.3%**

The above table shows the queries closed by SP during the period.

In addition to the Admin and Technical queries, the following Change Requests were resolved in 20Q1:

	Jan 20	Feb 20	Mar 20	20Q1
Change Requests	1	0	2	**3**

2.2.3 User Registration (UR)

	Jan 20	Feb 20	Mar 20	20Q1
No of Requests	60	40	45	**145**
Closed in One Working Day	60	40	45	**145**
Average Closure Time (Hrs)	0.38	0.39	1.33	**0.70**
Average Closure Time (Working Days)	0.04	0.04	0.14	**0.07**
Service Level	**1 WD**	**1 WD**	**1 WD**	**1 WD**

To avoid double counting, these requests are not included in the above metrics for "Admin and Technical" Query Closure.

2.3.1 Target Response Times

The following metrics are also defined in Schedule 2.2, but have no Service Points associated.

Target Response Times	
1	During core time, an initial response to the user acknowledging receipt of the query
2	A Tracking Identifier within 5 minutes of receiving the query
3	During Core Time, 90% of incoming telephone calls should be answered personally (not by computer) within 2 minutes
4	During UK office hours, all non telephone communications shall be acknowledged within 1 Hour

1 – Initial Response

This is sent automatically when the user raises a query to the address helpdesk@archer.ac.uk. Users may choose not to receive such emails by mailing support@archer.ac.uk.

2 – Tracking Identifier

This is sent automatically when the user raises a query to the address helpdesk@archer.ac.uk. Users may choose not to receive such emails by mailing support@archer.ac.uk. The tracking identifier is set in the SAFE regardless which option the user selects.

3 – Incoming Calls

These are covered in the previous section of the report. Service Points apply.

4 - Query Acknowledgement

Acknowledgment of the query is defined as when the Helpdesk assigns the new incoming query to the relevant Service Provider. This should happen within 1 working hour of the query arriving at the Helpdesk. The Helpdesk processed the following number of incoming queries during the Service Quarter:

	Jan 20	Feb 20	Mar 20	20Q1
CRAY	3	4	1	**8**
ARCHER_CSE	46	27	12	**85**
ARCHER_SP	714	596	521	**1831**
Total Queries Assigned	763	627	534	**1924**
Total Assigned in 1 Hour	763	627	534	**1924**
Service Level	**100.0%**	**100.0%**	**100.0%**	**100.0%**

The Service Desk assigns queries to all groups supporting the service i.e. SP, CSE and Cray. The above table includes queries handled by the other groups supporting the service as well as internally generated queries used to manage the operation of the service.

2.3.2 Maintenance

Maintenance now takes place on at most a single day each month (fourth Wednesday of each month). This is marked as a full outage maintenance session for a maximum of 8 hours taken. There are also additional "at-risk" sessions that may be scheduled for other Wednesdays. This reduces the number of sessions taken, which then reduces user impact since the jobs running on the service have to be drained down only once per month and not twice. It also eases the planning for training courses running on ARCHER. A 6-month forward plan of maintenance has been agreed with EPSRC.

Feedback has shown that the users would be happier if there were even fewer full outage maintenance sessions, and so we have been working to reduce these as much as possible. Some maintenance activities can only be done during a full outage (e.g., applying firmware updates), but for others the requirement to take a full outage can be evaluated on an individual basis based on potential risk.

The following planned maintenance took place this quarter:

Date	Start	End	Duration	Type	Notes	Reason
03/03/20	09:00	16:00	7 hours	Approved maintenance	Returned to service 1 hour before approved end time	Essential power work in computer room 3 at ACF

2.3.3 Quality Tokens and query feedback emails

No quality tokens were received this quarter.

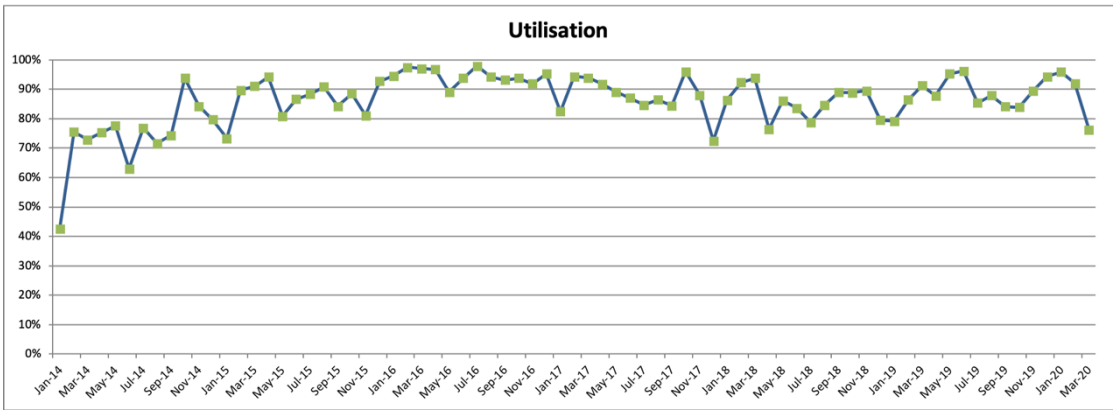
Three very positive feedback emails were received from users upon closure of their queries. No negative feedback emails were received.

3. Service Statistics

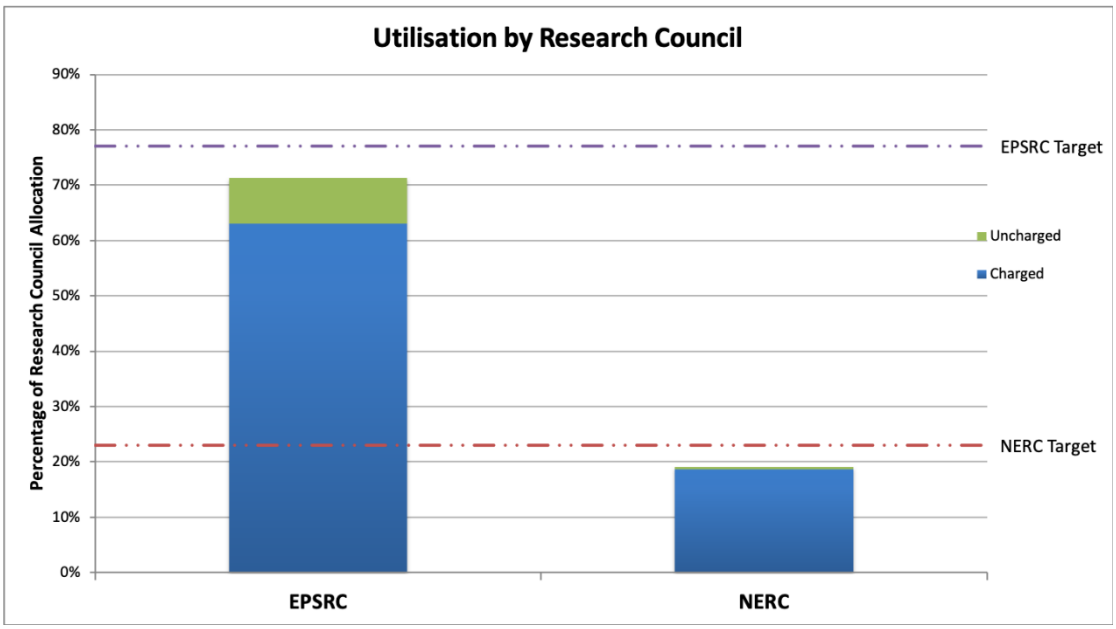
This section contains statistics on the ARCHER service as requested by EPSRC, SAC and SMB.

3.1 Utilisation

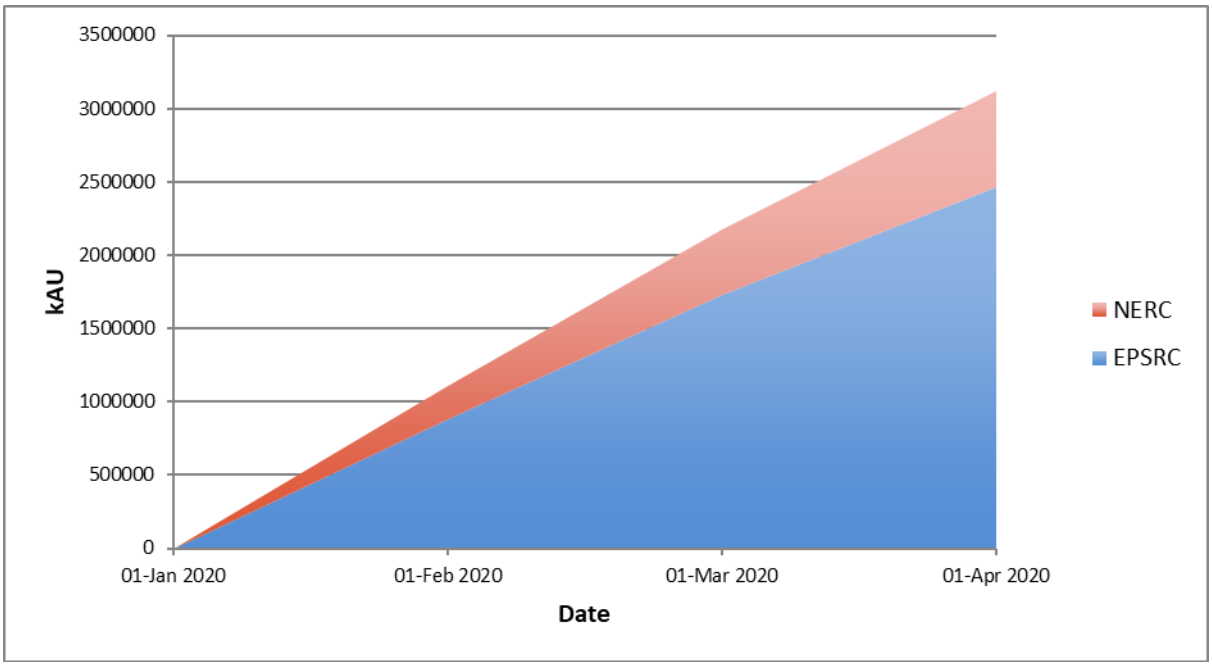
Utilisation over the quarter was 88%, slightly down from 89% the previous quarter. Utilisation for January was 96%, for February 92% and for March 76%. The plot below shows a steady increase in utilisation over the lifetime of the service to Dec 2015 and since then the service has effectively been operating around maximum capacity as shown by the generally steady utilisation value. There is a decrease in utilisation for March but this could be due to the extension of service and users waiting for new allocations to be put into place.



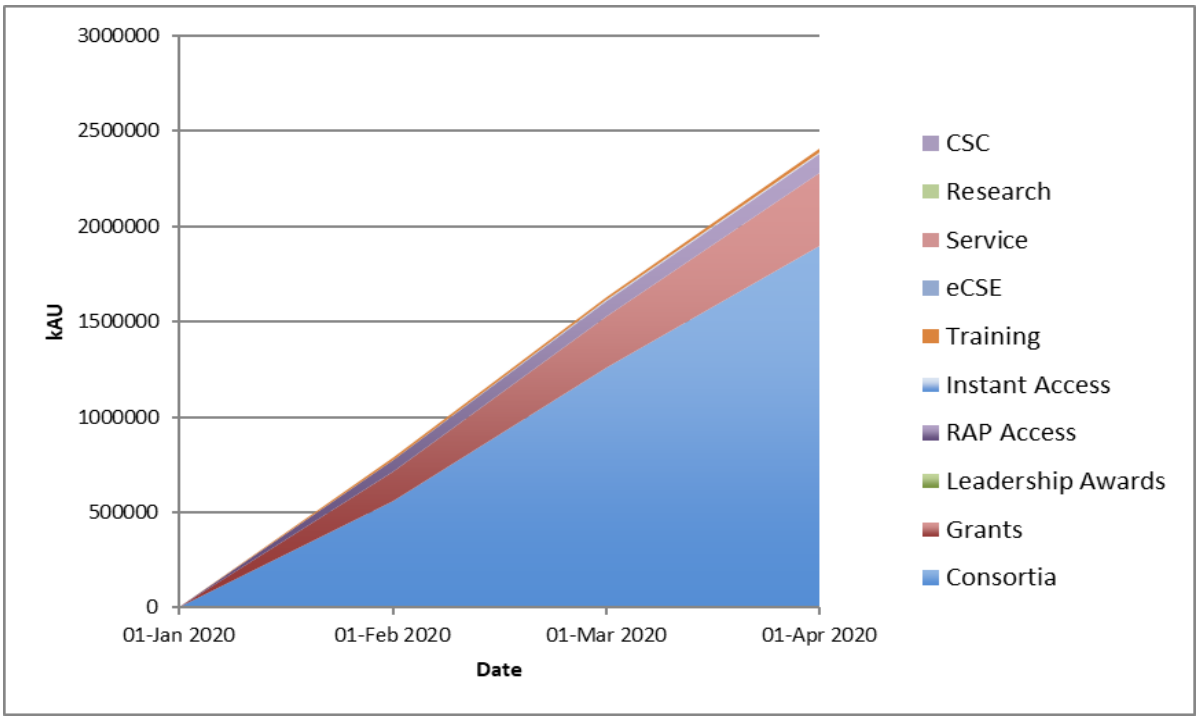
The utilisation by the Research Councils, relative to their respective allocations, is presented below. This bar chart shows the usage of ARCHER by the two Research Councils presented as a percentage of the total Research Council allocation on ARCHER. It can be seen that EPRSC did not meet their target this quarter with their usage being at 71% (against their target of 77%) and NERC also missed their target with utilisation being 19% (against their target of 23%). This compares with 67% for EPSRC and 22% for NERC for the previous quarter.



The cumulative allocation utilisation for the quarter by the Research Councils is shown below:

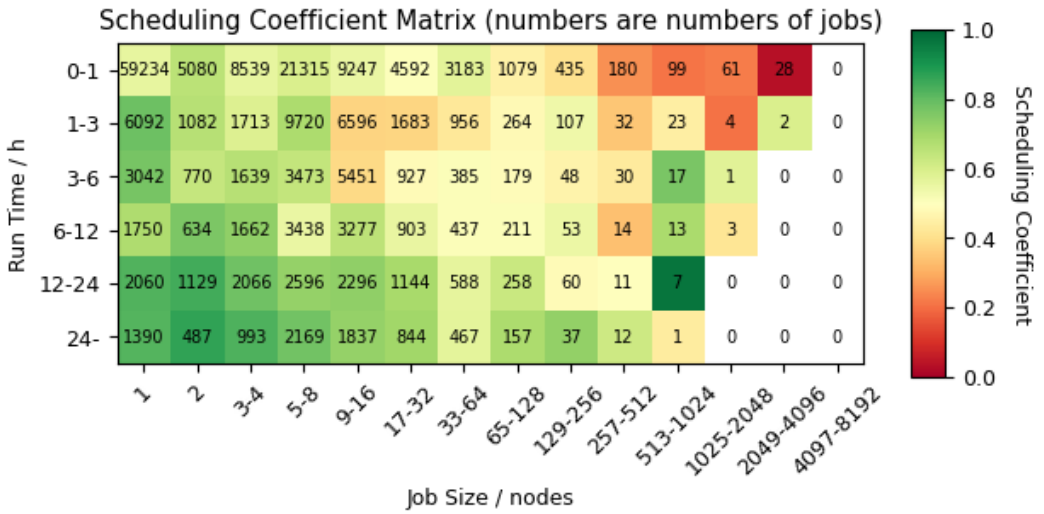


The cumulative allocation utilisation for the quarter by EPSRC broken down by different project types (see below) shows that the majority of usage comes from the scientific Consortia (as expected) with significant usage from research grants and ARCHER RAP projects. The total time used by Instant Access projects is very small.



3.2 Scheduling Coefficient Matrix

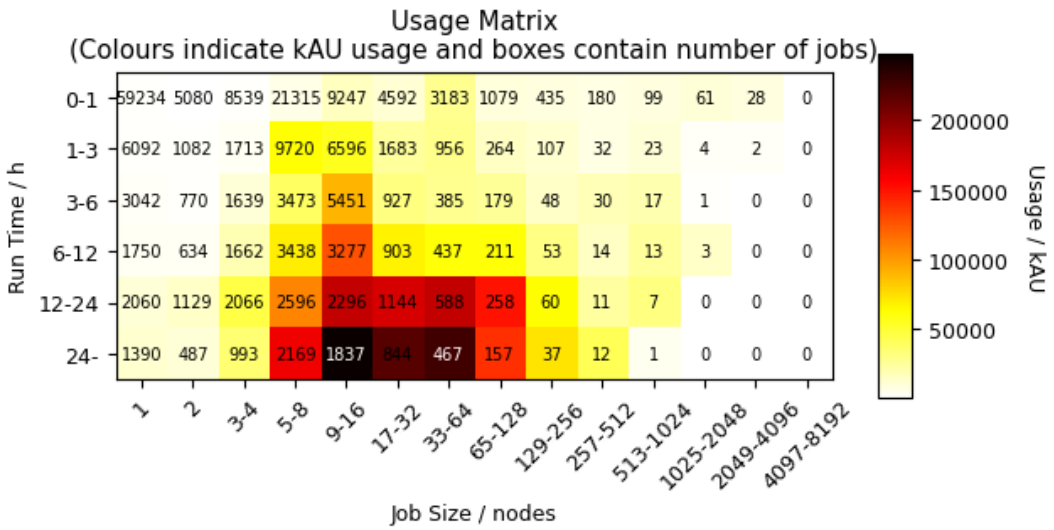
The colour in the matrix indicates the value of the Scheduling Coefficient. This is defined as the ratio of runtime to runtime plus wait time. Hence, a value of 1 (green) indicates that a job ran with no time waiting in the queue, a value of 0.5 (pale yellow) indicates a job queued for the same amount of time that it ran, and anything below 0.5 (orange to red) indicates that a job queued for longer than it ran.



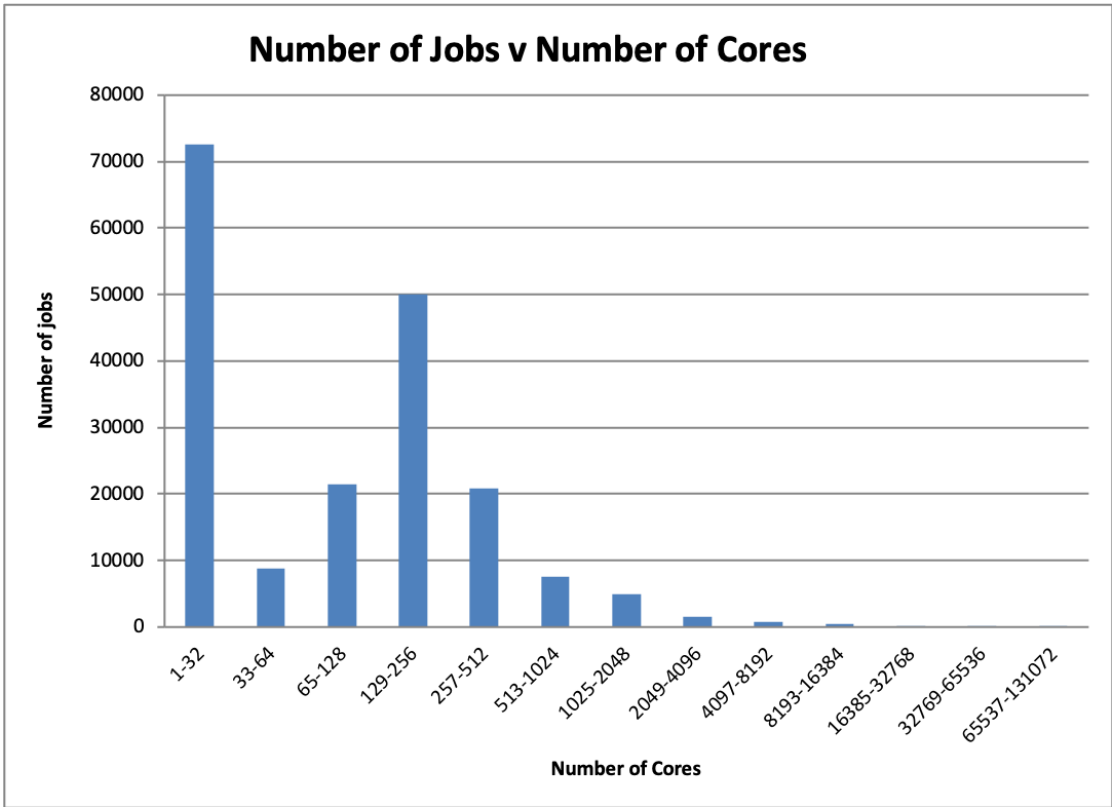
3.3 Additional Usage Graphs

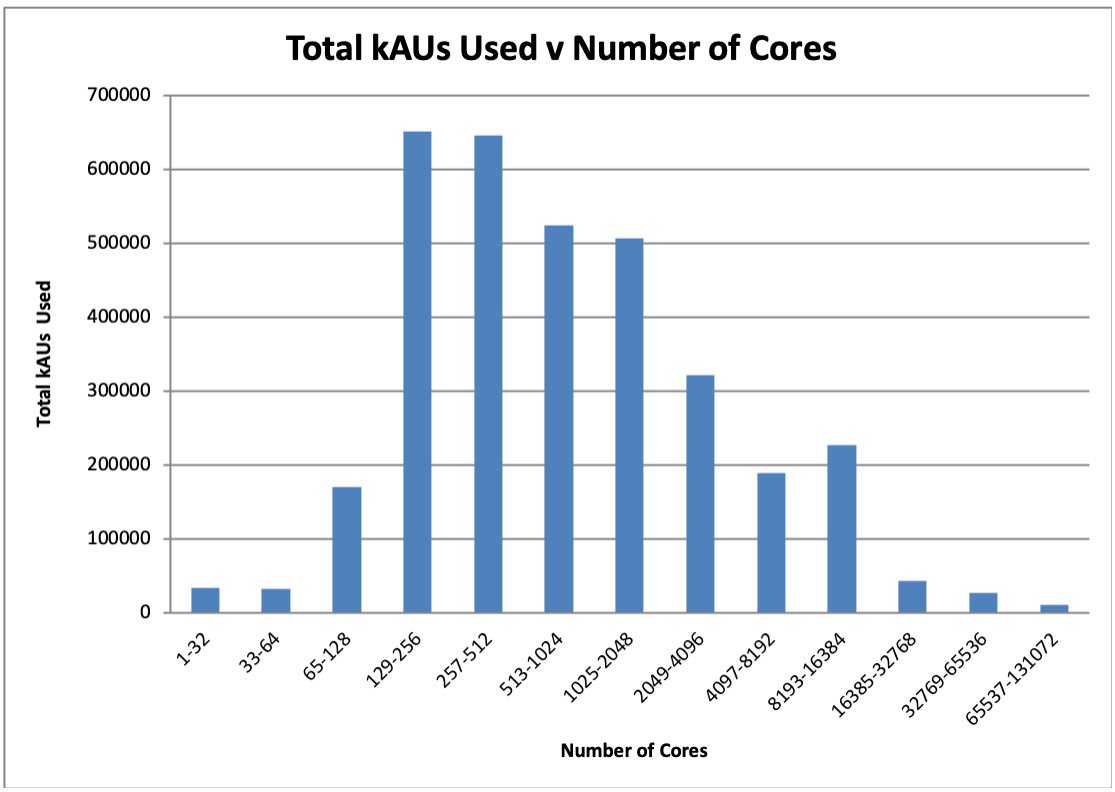
The following charts provide different views of the distribution of job sizes on ARCHER.

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 kAUs expended for each class, and the number in the box is the number of jobs of that class.



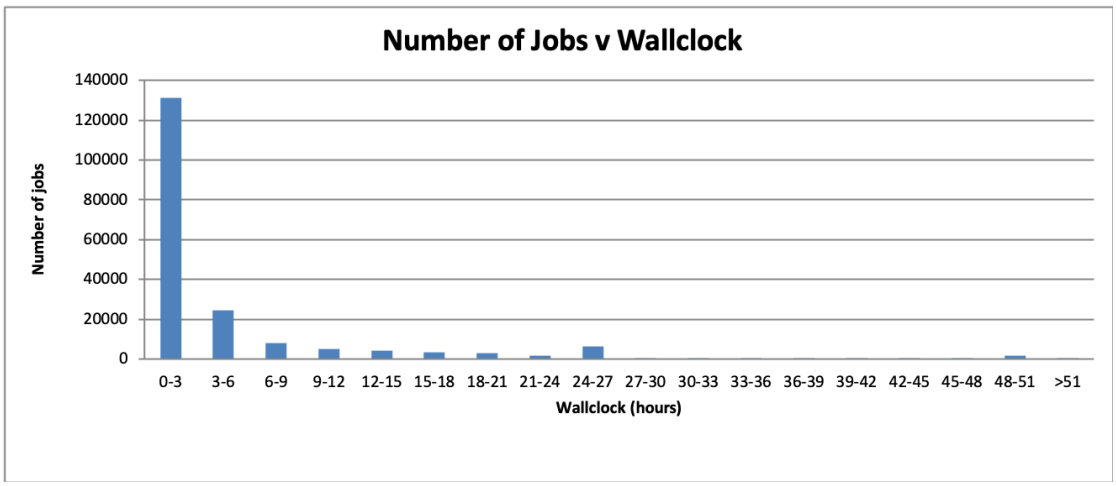
Analysis of Job Sizes

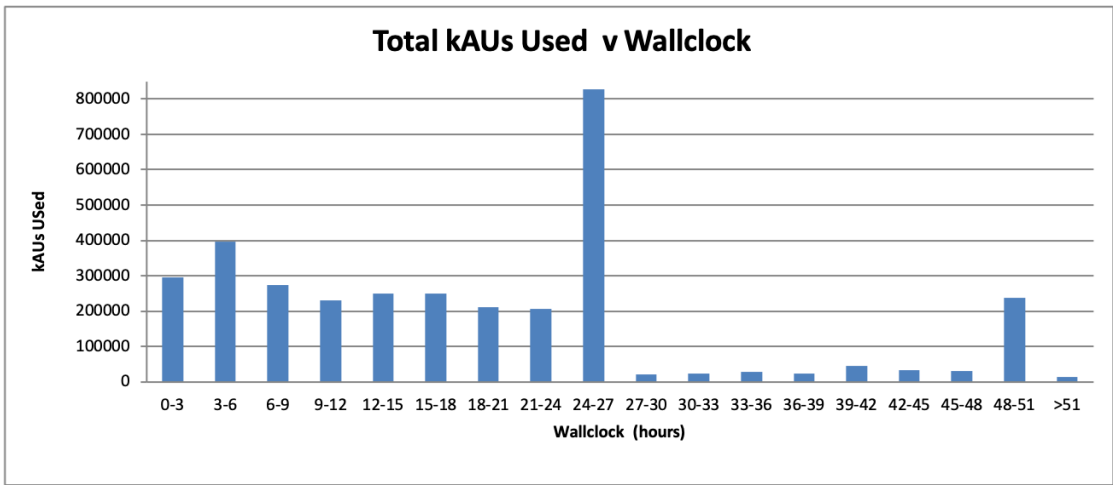




The first graph shows that, in terms of numbers, there are a significant number of jobs using no more than 512 cores. However, the second graph reveals that most of the kAUs were spent on jobs between 129 cores and 16384 cores. The number of kAUs used is closely related to money and shows better how the investment in the system is utilised.

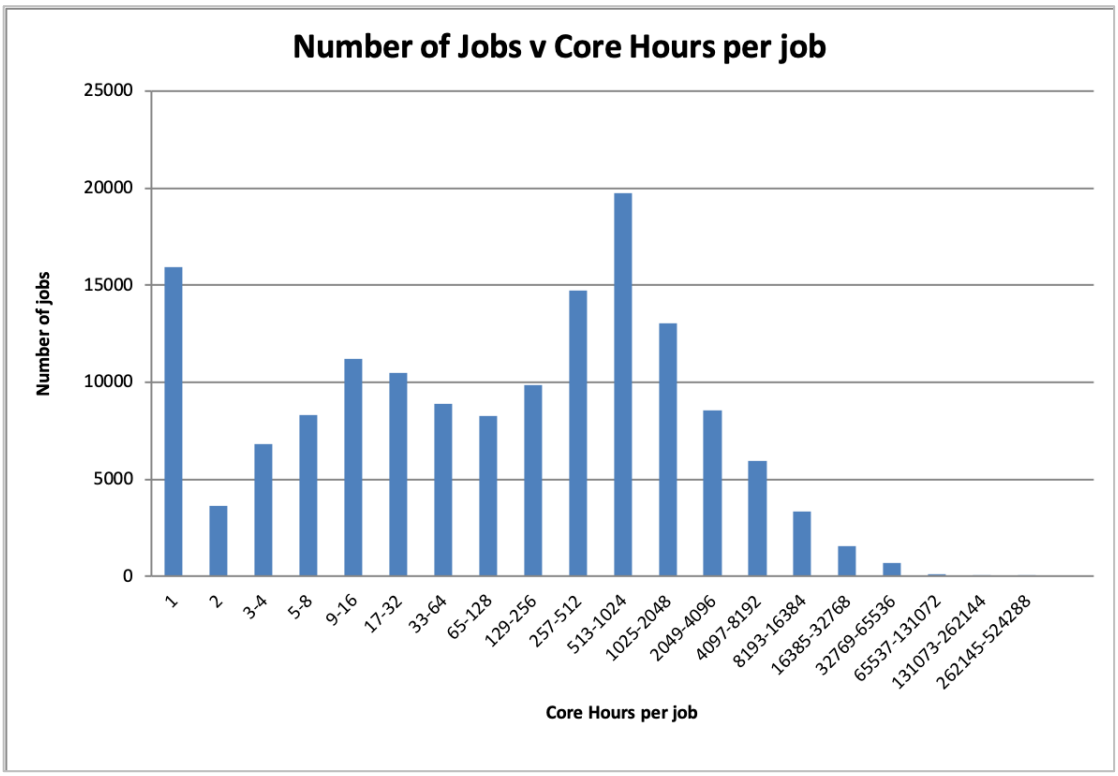
Analysis of Jobs Length

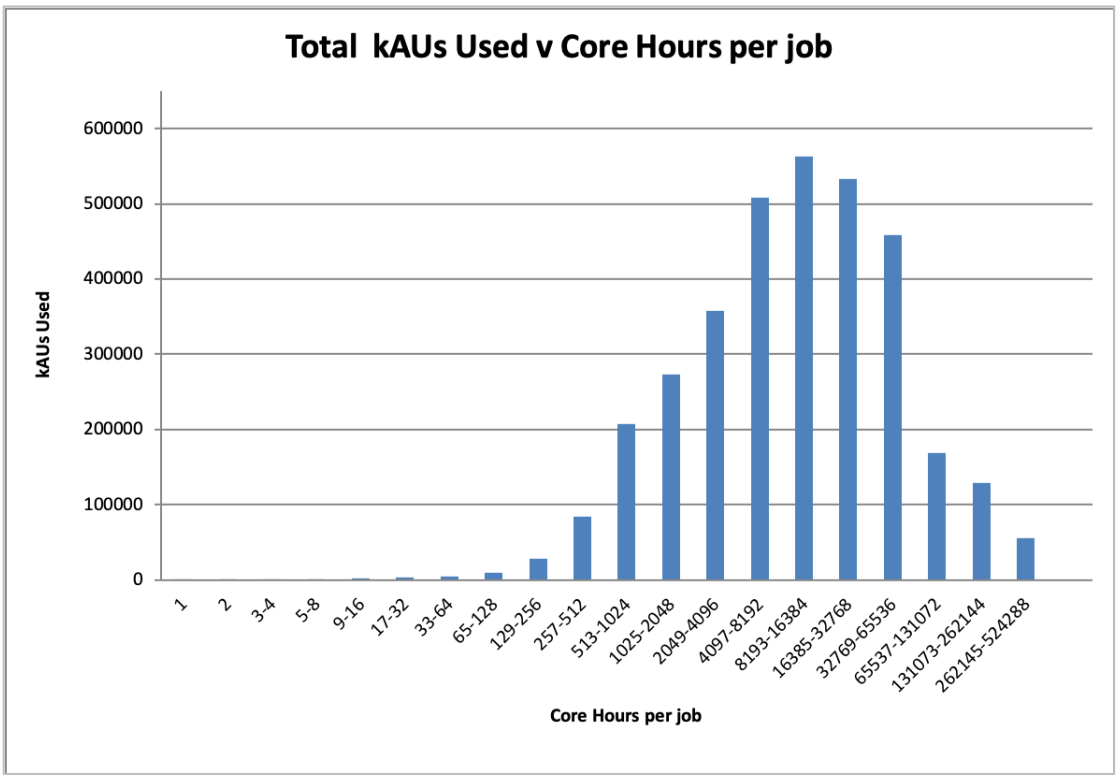




From the first graph, it would appear that the system is dominated by short jobs. However, the second graph shows that actual usage of the system is more spread and dominated by jobs of around 24 hours with a second peak for jobs around 48 hours.

Core Hours per Job Analysis





The above graphs show that, while there are quite a few jobs that use only a small number of core hours per job, most of the resource is consumed by jobs that use tens of thousands of core hours per job.