ARCHER2 Technical Assessment Form: Grant, Access to HPC, Pioneer Project Applications

**Note: this form is for grant (e.g. UKRI, ERC, Wellcome Trust, Royal Society), Access to HPC and Pioneer Project applications. Technical Assessment forms for other access routes can be found on the ARCHER2 website at** [**http://www.archer2.ac.uk/support-access**](http://www.archer2.ac.uk/support-access)**.**

**Instructions:**

1. Complete Section 1 below as fully as possible. If you have any questions or require clarification, please contact the ARCHER2 service desk (support@archer2.ac.uk).
2. Return the completed form (as a Word document) to the ARCHER2 service desk (support@archer2.ac.uk) along with a draft of your Case for Support.
3. The ARCHER2 CSE team will complete Section 2 and will contact you directly for more information if it is required. This may take up to 8 working days from receipt of the completed form.
4. The CSE team will return the fully completed form to you so you can include it in your grant/Access to HPC application.

**Notes for EPSRC Grant Applications:**

* You can apply for ARCHER2 resources for the lifetime of your grant. If additional resource is needed to meet the objectives of the grant then this can be applied for via the ARCHER2 Grant Top Up process.
* You must supply quantitative evidence that the codes to be used scale to the core counts requested. More details on the evidence required can be found in Section 1, Part 6.

**Notes for non-UKRI Grant Applications:**

* If eligible, access costs for ARCHER2 should be included in the grant application on basis of the rate for **non-partner organisations**.
* You must supply quantitative evidence that the codes to be used scale to the core counts requested. More details on the evidence required can be found in Section 1, Part 6.

**Notes for Access to HPC Applications:**

* You can apply for ARCHER2 resources for a maximum of 1 year through the Access to HPC calls.
* You must request at least 4000 CU.
* You must supply quantitative evidence that the codes to be used scale to the node counts requested. Details on the evidence required can be found in Section 1, Part 6.
* Further notes can be found at: <https://archer2.ac.uk/support-access/>.

**Notes for Pioneer Project Applications:**

* You can apply for ARCHER2 resources for a maximum of 2 years for Pioneer Projects.
* You must supply quantitative evidence that the codes to be used scale to the core counts requested. Details on the evidence required can be found in Section 1, Part 6.
* Further notes can be found at: <https://archer2.ac.uk/support-access/>.

Completion of this form implies permission for user details to be stored in the Service Partners’ and UKRI’s databases and to be used for mailing, accounting, reporting and other administrative purposes. Please also see the ARCHER2 service policies at <https://www.archer2.ac.uk/about/policies/>.

# Section 1: HPC Resources and Case for Support (*To be completed by the applicant*)

1. **Project Information.**
	1. **Project Title:** [Enter project title]
	2. **Application Type:** [Grant]/[Access to HPC]/[Pioneer Project]/[non UKRI Funding Body]
	3. **PI Name and Contact Details**

|  |  |
| --- | --- |
| **Name:** | [Please Complete Table] |
| **Department:** |  |
| **Institution:** |  |
| **Position Held:** |  |
| **Address:** |  |
| **Postcode:** |  |
| **e-Mail:** |  |
| **Telephone:** |  |
| **Nationality:** |  |

* 1. **Contact details for application (if different from PI above)**

|  |  |
| --- | --- |
| **Name:** | [Please Complete Table] |
| **Department:** |  |
| **Institution:** |  |
| **Position Held:** |  |
| **Address:** |  |
| **Postcode:** |  |
| **e-Mail:** |  |
| **Telephone:** |  |
| **Nationality:** |  |

* 1. **Proposed start date of ARCHER2 use:** [Enter start date]

* 1. **Project length (months) of ARCHER2 use:** [Enter project length, max. 1 year for Access to HPC, max. 2 years for Pioneer Project, max. duration of the grant for EPSRC grants, no limit for non-UKRI grants]
	2. **Brief Project Summary**

Please note that this summary may be made available on the ARCHER2 web site if the project is successful in receiving ARCHER2 time.

|  |
| --- |
| [Please insert a brief and high-level description of the aim of your computational project/work, one paragraph only and keeping within the space provided] |
|  |

1. **Previous Use of HPC Resources.**
	1. **Are you an existing ARCHER2 user?** [Yes/No]
	2. **Which other HPC services have you used?**

[Enter list of other HPC services]

* 1. **If you have used other HPC services please provide a brief summary of the number of core hours used and the types of jobs run (codes, core counts, typical job lengths):**

[Enter summary of previous service usage]

1. **ARCHER2 Software and Support Requirements.**

##  Summary of software requirements.

**Research Software Packages**

What are the main codes you will be using? A description of available research software on ARCHER2 is given at <https://docs.archer2.ac.uk/research-software/overview.html>. Please provide links to codes/software not presently available on ARCHER2.

[Enter list of codes with links to descriptions if possible]

 **Software requirements (e.g. compilers, libraries, tools):**

A description of available software libraries on ARCHER2 is given at <https://docs.archer2.ac.uk>. Please provide links to codes/software not presently available on ARCHER2.

[Enter list of software requirements to support your use of ARCHER2]

## Support RequirementsDo you require support from the ARCHER 2 CSE service to port and optimize your code on ARCHER2? If yes, please briefly describe the support required. Yes/No

[Enter a description of the ARCHER2 support required, if required]

**Please summarise any other support requirements for this project:**

[Enter any other support requirements]

1. **Proposed Use of ARCHER2 Resources.**
	1. **Job size mix for the project**

You may find it easier to complete this section after completing section 6 below.

**There are 128 cores per node on ARCHER2**.

**Please see notes at beginning of this document regarding the maximum amounts of time that can be applied for and consult any call guidelines.**

|  |  |  |  |
| --- | --- | --- | --- |
|   | Largest Job | Typical Job | Smallest Job |
| Number of nodes | [Please Complete Table] |  |  |
| Number of cores used per node (usually 128) |  |  |  |
| Wallclock time for each job (Max. 48h) |  |  |  |
| Number of jobs of this type |  |  |  |
| Total memory required. |  |  |  |

**Total CU:** [Enter total CU required, 1 CU equates to 1 node hour on ARCHER2 ]

**Notional Cost:** [Enter total notional cost, each CU costs £0.20 for EPSRC and NERC remit projects and £0.39 otherwise]

* 1. **Disk space requirements.**

You may find it easier to complete this section after completing Section 7 (Data Management and Transfer) below.

/home: Small, backed-up. For project critical files (e.g. source code).

/work: Large, high-performance, not backed-up. For input and output from calculations.

|  |  |
| --- | --- |
|  | Storage |
|  /home (required) | [e.g. 10 GB] |
|  /work (required) | [e.g. 1 TB] |

1. **Usage Breakdown by 6-month Periods**

The total number of CU requested above must be broken down into 6-month *periods* that span the length of access to ARCHER2 that has been requested (e.g. if you have requested 1 year of access in total then the CUs must be split into two 6 month periods). Please add the correct number of rows to the table below for the total length of your project (e.g. for a 60 month project you would need 10 rows).

If your application is successful then these period allocations will be enforced on ARCHER2 in the following way:

* Any unused allocation at the end of a period is lost
* You cannot move CU between different allocation periods

|  |  |
| --- | --- |
| **Period 1 (months 0-6)** | [e.g 1000 CU] |
| **Period 2 (months 7-12)** |  |
| **Period 3 (months 13-18)** |  |
| **Period 4 (months 19-24)** |  |
| **Period 5 (months 25-30)** |  |
| **Period 6 (months 31-36)** |  |
| **Period 7 (months 37-42)** |  |
| **Period 8 (months 43-48)**  |  |
| **Period 9 (months 49-54)** |  |
| **Period 10 (months 55-60)** |  |

1. **Evidence to Support Proposed Use of ARCHER2**

The number of CUs requested and the job sizes specified in 4.1 above must be backed up by:

* quantitative evidence that the code performs well to the job sizes requested
* a justification of the number and size of jobs requested
* justification that the project requires the technical capabilities of ARCHER2.
	1. **Quantitative evidence that the code scales efficiently**

Quantitative evidence should be provided to show that the code achieves good performance to the job sizes requested. The evidence must include two graphs (or tables):

* Table of runtime (or performance) against number of nodes or a plot of the performance against number of nodes (a plot of runtime is not acceptable). This should utilise data for the code on ARCHER2 or another HPC system. The performance axis should be plotted on a linear scale, not a log scale.
* Parallel efficiency against number of nodes, again using the code on ARCHER2 or another HPC system. The parallel efficiency axis should be plotted on a linear scale, not a log scale.
* For projects planning to make use of a single node (or less) only, please supply a description of the single node performance, rather than the two points above.

This evidence should be provided on a problem similar in nature to the problem(s) planned for ARCHER2 unless this project will utilise ARCHER2 for workloads that are larger than have currently been run. In which case, some discussion of how the proposal workloads correspond to the scaling evidence provided is required.

Plots/tables should be provided relative to the smallest number of nodes that can feasibly be used. If the application is developing new algorithms for which performance data is not yet available then the proposed performance should be justified with appropriate references and descriptions.

If you require help in evaluating the performance of your code on a particular problem then please contact the ARCHER2 service desk (support@archer2.ac.uk).

[Enter Quantitative Evidence]

* 1. **Justification of the number of jobs requested**

It is important that the number of CUs requested is appropriate to complete all the required simulations. Therefore, a justification must be provided for the jobs and CUs requested in Section 4. This should include a justification for the number of jobs requested, the wall clock time required and the number of nodes requested. If you cannot use all cores on a node please also explain why.

[Enter Job Resource Justification]

* 1. **Justification for the technical capabilities of ARCHER2**

ARCHER2 is part of a UK HPC ecosystem that includes Tier 2 resources and regional systems. Please explain why the project requires the technical capabilities of ARCHER2, rather than a different system in the UK HPC ecosystem.

[Enter ARCHER2 Capability Justification]

1. **Data Management and Transfer**

This section asks some basic questions about the data generated on ARCHER2 by the proposed calculations.

**7.1 How many files are typically produced by each job?**

[Enter the estimated number of files. This does not need to be exact, order of magnitude is sufficient here. For example, 1000 files per job. You should also state how these files are organised; for example, are they all stored in one directory or is there a hierarchy of directories?]

**7.2 How much data is read in by each job?**

[Enter estimated total size in kB/GB/TB]

**7.3 How much data is produced by each job?**

[Enter estimated total size in GB/TB/PB]

**7.4 What percentage of the produced data do you expect to transfer off ARCHER2?**

[Enter estimated percentage]

**7.5 How do you plan to transfer data from ARCHER2 to elsewhere?**

[Please describe the mechanism you will use to transfer data from ARCHER2 to other systems for further analysis or archive. Please also state the sites that you will be transferring data to. You should also state roughly the amount of data that will be transferred in each transfer instance (i.e. how will the transfers be batched up).]

# Section 2: Technical Assessment (*To be completed by CSE team).*

**Date Received by CSE:** [Enter received date]

|  |  |
| --- | --- |
| Do the applicants have the technical expertise required for the proposed work? | Yes/No |
|  |

|  |  |
| --- | --- |
| Is the software specified technically suitable for ARCHER2? | Yes/No |
|  |

|  |  |
| --- | --- |
| Is the compute time requested reasonable and has the job breakdown been technically justified? Are the storage requests reasonable? | Yes/No |
|  |

|  |  |
| --- | --- |
| Has scaling evidence been provide that shows appropriate scaling performance to required job size for the software specified? | Yes/No |
|  |

|  |  |
| --- | --- |
| Is the data management and transfer plan reasonable and technically sound? | Yes/No |
|  |

|  |  |
| --- | --- |
| Does the project require the technical capabilities of ARCHER2? | Yes/No |
| Would a different computing resource be more appropriate? | Yes/No |
|  |  |

**Is the application, as outlined above, suitable for access to the ARCHER2 service?** **Yes / No**

**Name:** [Enter name]

**Position:** [Enter job title]

**Date:** [Enter date completed]