|  |  |
| --- | --- |
| A picture containing graphical user interface  Description automatically generated | Access to High Performance Computing:2023 Call 2 |

Technical Assessment Form

**Instructions:**

* Complete Section 1 below as fully as possible. If you have any questions or require clarification, please contact the Service which you would like to apply for resources on. Contact details for each service can be found in the Service Specification document at <https://www.ukri.org/publications/access-to-high-performance-computing-application-documents/>.
* Return the completed form (as a Word document) to the Service which you are applying to by using the appropriate contact found in the Service Specification document.
* The Service team will complete Section 2 and will contact you directly for more information if it is required. This may take up to 10 days from receipt of the completed form.
* The Service team will return the fully completed form to you so you can include it in your application.

**Notes for Applications:**

* Each Service may specific restrictions on the form of the applications it accepts. Details on these can be found in the Service Specification document.
* Applicants should supply quantitative evidence that the codes to be used scale to cpu/gpu/node counts requested. Details on the evidence required can be found in Section 1, Part 6. Please note this section is not mandatory for Service systems that have novel architectures.

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.

Section 1: HPC Resources and Case for Support

*(To be completed by the applicant)*

#  Project Information.

##  Project Title:

[Enter project title]

## Service applying to:

[ARCHER2/ Baskerville/ Cirrus/ Kelvin-2 (NI-HPC)/ Bede (NICE)/ Sulis.]

##  PI Name and Contact Details.

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

##  Contact details for application (if different from PI above)

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

##  Proposed start date of Service use:

[Enter start date]

##  Project length (months) of Service use:

[Enter project length]

## Brief Project Summary

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

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

#  Previous Use of HPC Resources.

##  Which other HPC services have you used?

[Enter list of other HPC services]

## If you have used other HPC services please provide a brief summary of the core/GPU/KNL node hours used (as appropriate) and the types of jobs run (codes, core/GPU/KNL node counts, typical job lengths):

[Enter summary of previous service usage]

#  Service Software and Support Requirements.

##  Summary of software requirements.

**What are the main codes you will be using?**

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

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

Please note that Service centres will expect users to build their own software but will provide support where possible. A selection of commonly used software will be maintained centrally.

[Enter list of software requirements to support your use of the Service resource]

**Support Requirements**

How do you plan to port and optimize your code on Service?

[Enter text about how you will port and optimize your code]

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

[Enter any other support requirements]

#  Proposed Use of Service Resources.

##  Job size mix for the project

Please see notes in the Service Specification document regarding the maximum amounts of time that can be applied for and technical specifications.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Largest Job | Typical Job | Smallest Job |
| Number of nodes | [Please Complete Table] |  |  |
| Number of cores/GPUs used per node |  |  |  |
| Wallclock time for each job\* |  |  |  |
| Number of jobs of this type |  |  |  |
| Memory per node required. |  |  |  |

\*The maximum permitted wallclock time per job is a function of local Service centre policy.

**Amount of compute resource:**

(Please indicate the amount of resource required in CUs, CPU hours, KNL hours or GPU hours)

**Notional Cost:**

(Please indicate notional cost in £)

##  Disk space requirements.

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

|  |  |
| --- | --- |
|  | Storage |
| Core source files and data sets | [e.g. 10 GB] |
| Working storage  | [e.g. 10 GB] |

#  Usage Breakdown

The total number of units requested above must be broken down into 3 month periods that span the length of access to Service that has been requested (e.g. if you have requested 1 year of access in total then the units must be split into four 3 month periods). Please add the correct number of rows to the table below for the total length of your project.

If your application is successful then these period allocations may be enforced on the Service centre in the following way:

* Any unused allocation at the end of a period may be lost
* You may not be able to move units between different allocation periods

|  |  |
| --- | --- |
| **Quarter 1 (months 0-3)** |  |
| **Quarter 2 (months 3-6)** |  |
| **Quarter 3 (months 6-9)** |  |
| **Quarter 4 (months 9-12)** |  |
| **Quarter 5 (months 13-15)** |  |
| **Quarter 6 (months 16-18)** |  |
| **Quarter 7 (months 19-21)** |  |
| **Quarter 8 (months 22-24)** |  |

# Evidence to Support Proposed Use of Service

## Justification of the number of jobs requested

It is important that the resource requested is appropriate to complete all the required simulations. Therefore, a justification must be provided for the jobs and resource 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.

[Enter Job Resource Justification]

## Quantitative evidence that the code scales efficiently

The number of units requested and the job sizes specified in 4.1 above must be backed up by quantitative evidence that the code scales efficiently to the job sizes requested.

The evidence must include a graph or table of the *speedup* for a similar problem using the code on another HPC system. The speedup should be provided relative to the smallest number of cores cores/gpus/nodes that can be used feasibly (see examples below).

If the application is developing new algorithms for which scaling data is not yet available then the proposed scaling should be justified with appropriate references and descriptions.

If you require help in evaluating the speedup of a code on a particular problem then please get in touch with the contact for the Service you are applying to, however, please note that access to help with code speed up may not be available due to limited resource.

For ARCHER2 requests, the justification must also include:

* justification that the project requires the technical capabilities of ARCHER2
* quantitative evidence of the parallel efficiency against number of nodes, using the code on ARCHER2 or another HPC system. The parallel efficiency axis should be plotted on a linear scale, not a log scale.

[Enter Resource Justification]

Example speedup table:

|  |  |  |
| --- | --- | --- |
|  | **Runtime / s** |  |
| **Cores** | **Run 1** | **Run 2**  | **Run 3** | **Mean** | **Speedup** |
| **96** | 625.7 | 613.4 | 634.6 | 624.6 | 1.00 |
| **192** | 318.5 | 312.5 | 323.1 | 318.0 | 1.96 |
| **384** | 159.7 | 161.2 | 157.4 | 159.4 | 3.92 |
| **768** | 81.2 | 81.4 | 81.1 | 81.2 | 7.69 |
| **1536** | 45.4 | 45.0 | 46.1 | 45.5 | 13.73 |

Example speedup graph:



# Data Management and Transfer

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

## 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?]

## How much data is read in by each job?

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

## How much data is produced by each job?

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

## What percentage of the produced data do you expect to transfer?

* To the Service’s storage facility? (if available) [Enter estimated percentage]
* Off Service? [Enter estimated percentage]

## How do you plan to transfer data from the Service to its storage facility (if available)?

[Please describe the mechanism by which you will move data from the Service to the Service’s storage facility. Will these transfers be manual or automated? 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).]

## How do you plan to transfer data off Service/Storage facility?

[Please describe the mechanism you will use to transfer data from Service/storage facility to external sites 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).]

N.b. Applicants are responsible for ensuring copies of all data. The Services are not liable for any data loss on the systems.

Section 2: Technical Assessment (To be completed by Service team).

**Date Received by Service centre:** [Enter received date]

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

|  |  |
| --- | --- |
| Is the software specified technically suitable for the Service machine requested? | 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 speedup to required job size for the software specified? | Yes/No |
|  |

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

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

|  |  |
| --- | --- |
| Does the project require the technical capabilities of this Service? | Yes/No |
| Would a different computing resource be more appropriate? If so, which one? | Yes/No |
|  |

**Name:** [Enter name]

**Position:** [Enter job title]

**Date:** [Enter date completed]