**Center for Computational Sciences, University of Tsukuba**

**2023 Multidisciplinary Cooperative Research Project (MCRP-L)**

Date(YYYY/MM/DD):　 / /

(Carefully read “Call for proposals”.)

1. **Project name and representative**

|  |
| --- |
| **Representative (Surname, Given names):** **Affiliation:**  |
| **Project name (English):** **課題名(日本語)：(if available)** |

(You can enlarge the following spaces, up to the maximum 6 pages in total.)

1. **Scientific significance**

|  |
| --- |
| **2.1 Scientific background****2.2 Purpose of the Project****2.3 Expected achievements** |

1. **Past Research, Ongoing project, Project plan, and Requested resources**

|  |
| --- |
| **Research Achievements in the past**(Describe summary of your research achievements in the current subject. The publication list is not required here.)Provide the (hyper)link to your report for 2021 MCRP here, if you have.https://project.ccs.tsukuba.ac.jp/event/19/papers/\*\*\*/files/\*\*\*.pdf --------------------------**Reference** (if you have publications of MCRP results not written on MCRP2021 project report)[1] |
| **Ongoing MCRP**Do you currently have ongoing projects of MCRP2022? [Yes / No]If Yes, fill in the following:

|  |  |  |
| --- | --- | --- |
| Name of Computer | Wisteria-O | Cygnus |
| Project code | wo\*\*\*\*\*\* | \*\*\*\*\*\*\*\* |
| Initially approved resources (node×hour) |  |  |
| Used resources so far (node×hour) |  |  |

If No, provide your desired project code name for Cygnus (within 8 letters):Describe its relation to the present proposal (2023): |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Project Target and Plan for 2023.4 – 2024.3**

|  |  |  |  |
| --- | --- | --- | --- |
| Requested resources | Wisteria-O | Cygnus | Pegasus |
| node×hour (NH) |  |  |  |
| Maximum # of nodes |  |  |  |
| Requested budget |  [ =NH ] | [ =NH(Cygnus) + NH(Pegasus)×2 ] |
| Disk capacity |  TB |  TB |  TB |

**Utilization Plan for 2023.4 – 2024.3** |

**３. Preparation and Reason for Requested Resources**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Preparation Status** (Program development, Test operation, etc .)Provide the following information for each program.

|  |  |
| --- | --- |
| System | [ Cygnus / Pegasus / OFP / Wisteria-O / etc.] |
| Program name |  |
| Parallelization method | [ MPI / OpenMP / MPI+OpenMP / others( ) ] |
| Parallel efficiency measurement | Scaling | [ Strong / Weak ] |
| Total # of threads ($n\geq m$) | *m* =  | *n* =  |
| Execution time | *Tm* = sec | *Tn* = sec |
| Effective parallelism\*1 | *α* = % |
| Product run | Target # of threads | OFP: N=  | Cygnus: N=  |
| Parallel efficiency\*2  | *EN*=  | *EN*=  |

(If you use more than one program, copy and repeat this table. If you apply for resources of both Cygnus/Pegasus and Wisteria-O larger than the maximum limit of the MCRP-M category, you must show this for both.) |
| **Necessity and Reason of Requested Resources****Is the requested disk capacity beyond the standard value?** [ Yes / No ]If “Yes”, describe the reason of necessity (This MUST be given even if you have the same amount of allocation in MCRP2022): |
| **2023 HPCI application** (<http://www.hpci-office.jp/folders/english>)Have you applied for the 2023 HPCI application as a representative? [ Yes / No ]If Yes, provide the following:Name of computer:Project name (Japanese and/or English): |

Note: (You can delete this part when you submit the proposal.)

\*1 Effective parallelism (parallelization ratio) is given by, in case of strong scaling,

$$α=\frac{T\_{m}-T\_{n}}{\left(1-\frac{1}{n}\right)T\_{m}-\left(1-\frac{1}{m}\right)T\_{n}} ,$$

and in case of weak scaling,

$$α=\frac{nT\_{m}-mT\_{n}}{\left(1-m\right)T\_{n}-\left(1-n\right)T\_{m}} .$$

\*2 Parallel efficiency is given by

$$E\_{N}=\frac{1}{\left(1-α\right)N+α} .$$