Hints to Fill Out the Project Application Form

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1. Project Classification

The application for computing time on the HPC systems at PC² distinguishes between three classes of projects: tiny, small, and large projects.
The amount of applied resources determines the class of the project and the required information for the assessment.

Tiny Project

Purpose: Pre-work for applying computing time (feasibility tests, scalability tests, determination / estimation of program run times, trial calculations, etc.). Tiny projects are implemented by means of a *sniff account*.

- A sniff account has a maximum lifetime of 30 days and will be automatically removed. It is not possible to migrate a sniff account to a small or large project.
- The usage of resources is limited:
  - Noctua:
    - Max. 2 nodes, job runtime 1 day, low priority,
    - 50 GByte scratch directory.
  - OCuLUS:
    - Max. 256 cores, 1 GPU, job runtime 1 day, low priority,
    - 50 GByte scratch directory.
  - ARMINIUS:
    - Max. 64 cores, job runtime 1 day, low priority,
    - 50GByte scratch directory.
  - HTC:
    - Max. 64 cores, job runtime 1 day, low priority,
    - 50 GByte work directory.

Small Project

A small project has a project duration of at least 30 days and a maximum resource usage per year of 5% of the available core-hours of the small project contingent and at any time at most 20% of the overall system (OCuLUS: 2.5 Mio. core-hours per year and 2,056 cores). A small project fits well for university project groups, lecture exercises, and theses.

- The scientific leader has to apply for a small project with the application form. If necessary, a project adaptation can be applied informally at any time.
- The average time for processing the application is about two working days.
- The PC² staff checks the technical requirements.

Compared to a large project, a shortened scientific assessment is used.

Large Project

A large project has a resource usage above the maximum limits of a small project. The scientific person in charge has to apply for a large project with the application form.

- The “Commission of Computing Time Allocation” / “Kommission für Rechenzeitvergabe” of the University Paderborn / PC² is responsible for the assessment of applications.
- The average time for processing the application is about 2-3 weeks.

2. Rights and Obligations of the Project Leaders

- If the applicant is a member of the Paderborn University, then the project administrator is able to add and remove members to the project via the IMT service portal.
- Non-members of the Paderborn University must apply for an additional account with the PC² application form.
- The scientific leader and the project administrator are the only accredited contact persons for all communication regarding the project. E.g.:
  - Creation / adaptation of limits, quotas, group directories, etc.
  - User dependent adjustments.
- PC² sends project dependent information only to the scientific leader / project administrator, and only to the e-mail address associated to Paderborn University. The project leader and the project administrator are responsible for an appropriate forwarding within the project.
- The scientific leader and the project administrator are responsible for a project dependent briefing of all project members.
- The scientific leader is in charge to comply with the conditions of use for all project members.
- The project administrator receives an e-mail about the forthcoming end of the project. If necessary, the scientific leader can apply for a project term extension (s. section 4).

3. General Terms of Use

- PC² systems are only allowed to be used for research activities that are funded by the Paderborn University or related institutes, the “Deutsche Forschungsgemeinschaft” (DFG), or the state NRW / federal government or EU. Otherwise, a written consent from the PC² is required.
- The project duration is limited. An extension of the project term is possible on application.
- Members of a small or large project are obliged to report about the research activities in the project.
- All publications related to results obtained on a PC² system must contain the reference to the PC²:
  - *“Calculations leading to the results presented here were performed on resources provided by the Paderborn Center for Parallel Computing.”*
- Please send the publications related to results obtained on a PC² system and the corresponding bibliographical information to the PC².
- It is prohibited to transfer access data (login, password) to third parties.
- The PC² resources must not be used for other purposes than mentioned in the project application.

- The PC² systems have to be used in consultation with the PC² staff. Advisory about efficient use of the HPC system is provided by PC².

4. Project Life Cycle

Project Establishment

After set-up of the system access, the project administrator receives a welcome e-mail with information about the role as the head of the project and a short introduction to the resource usage.

In case of a tiny project only a web link to a short introduction is provided.

Project Adaptation

The scientific leader of an running small or large project can informally apply for an (temporary) increase of the project limits, no more than 50% of the initial limits.

An adjustment above 50% of the initial project limits must be approved by the “Commission of Computing Time Allocation”.

Project End

30 days before the end of the project, the project administrator receives an e-mail notification. The scientific leader/project administrator can informally apply for an extension of the project duration for a maximum of 3 months. An extension of more than 3 months or other major changes of the project require a new application of the project.

At the end of the project, the project administrator receives an e-mail that the resource usage is locked and that all stored data and the project accounts will be deleted after the next 30 days.

On the day of project elimination a final e-mail is sent to the project administrator.

A similar process is used for accounts of non-members of the University Paderborn. If an account ends before the end of the corresponding project, a first e-mail is sent to the appropriate account.

5. Hints to Fill Out the Form in Case of a Tiny Project

A: Organization

Fill in the name of the scientific organization, department, institute, and the postal address.

B: Scientific Leader

- voluntary statement

C: Project Administrator

This person applies for the tiny project.
Only an official e-mail address of the organization / institute is accepted.

D: Project Description

- voluntary statement

E: Project Funding

- voluntary statement

F: Classification of the Field of Application

- voluntary statement

G: Project Duration

- not needed

H: Resource Requirements

- Which cluster(s) do you want to use.

6. Hints to Fill Out the Form in Case of a Small Project

A: Organization

Fill in the name of the scientific organization, department, institute, and the postal address.

B: Scientific Leader

The scientific leader is in charge of all scientific and legal affairs of the project. Typically, this person is a professor or a junior professor.
Only an official e-mail address of the organization / institute is accepted.

C: Project Administrator

The project administrator is the contact person of the PC² for all project relevant issues. Typically, this person is a scientific assistant. Only an official e-mail address of the organization / institute is accepted.

D: Project Description

- Maximum of 2048 characters.

E: Project Funding

Fill in the funding organization and the identification number / support code / contract number.

F: Classification of the Field of Application

Is it a research activity or is it an activity for / with students?
Please select **only one** field.

G: Project Duration

- Begin and end date of the project.

H: Resource Requirements

- Job Size
  - Maximum / typical values for
    - Number of nodes or processor cores.
    - Size of main memory per node or core (GB RAM / virtual mem).
    - Runtime of a single job.
- Core-Hours
  - Estimated number of core-hours needed, alternatively number of jobs.
- Efficiency / Scaling
  - voluntary statement
- Parallel Paradigm
  - Does your application use MPI, OpenMP, POSIX Threads, Global Arrays? Or are you using an open source or commercial program?
- Storage Capacity
  - Capacity needed for persistent and temporary files.
  - The features of our file systems are described on our web site: https://wikis.uni-paderborn.de/pc2doc

- Special Hardware
  - Type and number of special devices (e.g. FPGA, GPU, or many core).
- Software Requirements
  - Which software packages are required? A list of already installed software and available licenses is shown on our website.
  - Please ask for missing and needed software.

7. Hints to Fill Out the Form in Case of a Large Project

A: Organization

Fill in the name of the scientific organization, department, institute, and the postal address.

B: Scientific Leader

The scientific leader is in charge of all scientific and legal affairs of the project. Typically, this person is a professor or a junior professor.
Only an official e-mail address of the organization / institute is accepted.

C: Project Administrator

The project administrator is the contact person of the PC² for all project relevant issues. Typically, this person is a scientific assistant. Only an official e-mail address of the organization / institute is accepted.

D: Project Description

- The description should expose the target of the project and the used methodology to simplify the review process. A short overview of the project (approx. 2048 characters) will be published on the list of supported projects on our website.

Additionally, a more specific description is required. Please pay attention to the following points:

- Problem definition, project objective, and discipline-specific importance.
- Mathematical and information technological aspects (used algorithms, numerical methods, models and solvers).
- Impact and appropriateness of using the HPC system (degree of parallelism).
- Expected performance improvement (scalability).

Own preliminary work and references to the last publications. The written proposal (English or German) should not exceed 10 pages.

E: Project Funding

Fill in the funding organization and the identification number / support code / contract number.

F: Classification of the Field of Application

Is it a research activity or is it an activity for / with students?
Please select **only one** field.

G: Project Duration

- Begin and end date of the project.

H: Resource Requirements

An in-depth discussion and **comprehensible** approximation of the requested amount of resources must be provided. The evaluation of the numbers should base on test runs on a similar system configuration. Enclose a project plan for the resource usage.

Please pay attention to the following points:

- Job Size
  - Maximum / typical values for
    - Number of nodes or processor cores.
    - Size of main memory per node or core (GB RAM / virtual mem).
    - Runtime of a single job.
- Core-Hours
  - Estimated number of core-hours needed, alternatively number of jobs.
- Efficiency / Scaling
  - Provide information about the efficiency and performance scaling of your application.
- Parallel Paradigm
  - Does your application use MPI, OpenMP, POSIX Threads, Global Arrays? Or are you using an open source or commercial program?
- Storage Capacity
  - A description of the I/O behavior of your application
    - Data management: typical number and size of files generated during the execution of a single job.
    - I/O strategy: global or task local I/O, MPI I/O, netCDF, HDF5, etc.
  - An estimation of data transfer capacity in the project life time between temporary and permanent storage and between the storage system of the PC² and storage system of your institute.
  - Capacity needed for persistent and temporary files.
  - The features of our file systems are described on our web site: https://wikis.uni-paderborn.de/pc2doc
- Special Hardware
  - Type and number of special devices (e.g. FPGA, GPU, or many core).
- Software Requirements
  - Which software packages are required? A list of already installed software and available licenses is shown on our website.
  - Please ask for missing and needed software.

Appendix

- Short project description (1st part of section D)
- More specific description (2nd part of section D)
- Statement for the requested resource requirements and the project plan (section H)