

Documentation

Welcome to IT4Innovations documentation pages. The IT4Innovations national supercomputing center operates supercomputers Salomon and Anselm. The supercomputers are available to academic community within the Czech Republic and Europe and industrial community worldwide. The purpose of these pages is to provide a comprehensive documentation on hardware, software and usage of the computers.

How to read the documentation

1. Read the list in the left column. Select the subject of interest. Alternatively, use the Search box in the upper right corner.
2. Read the CONTENTS in the upper right corner.
3. Scan for all the yellow bulb call-outs on the page.
4. Read the details if still more information is needed. **Look for examples** illustrating the concepts.

The call-out. Focus on the call-outs before reading full details.

- Read the Changelog to keep up to date.

Getting Help and Support

Contact support [at] it4i.cz for help and support regarding the cluster technology at IT4Innovations. Please use **Czech**, **Slovak** or **English** language for communication with us. Follow the status of your request to IT4Innovations at support.it4i.cz/rt.

Use your IT4Innotations username and password to log in to the support portal.

Required Proficiency

You need basic proficiency in Linux environment.

In order to use the system for your calculations, you need basic proficiency in Linux environment. To gain the proficiency, we recommend you reading the introduction to Linux operating system environment and installing a Linux distribution on your personal computer. A good choice might be the Fedora

distribution, as it is similar to systems on the clusters at IT4Innovations. It's easy to install and use. In fact, any distribution would do.

Learn how to parallelize your code!

In many cases, you will run your own code on the cluster. In order to fully exploit the cluster, you will need to carefully consider how to utilize all the cores available on the node and how to use multiple nodes at the same time. You need to **parallelize** your code. Proficiency in MPI, OpenMP, CUDA, UPC or GPI2 programming may be gained via the training provided by IT4Innovations.

Terminology Frequently Used on These Pages

- **node:** a computer, interconnected by network to other computers - Computational nodes are powerful computers, designed and dedicated for executing demanding scientific computations.
- **core:** processor core, a unit of processor, executing computations
- **corehours:** wall clock hours of processor core time - Each node is equipped with **X** processor cores, provides **X** corehours per 1 wall clock hour.
- **job:** a calculation running on the supercomputer - The job allocates and utilizes resources of the supercomputer for certain time.
- **HPC:** High Performance Computing
- **HPC (computational) resources:** corehours, storage capacity, software licences
- **code:** a program
- **primary investigator (PI):** a person responsible for execution of computational project and utilization of computational resources allocated to that project
- **collaborator:** a person participating on execution of computational project and utilization of computational resources allocated to that project
- **project:** a computational project under investigation by the PI - The project is identified by the project ID. The computational resources are allocated and charged per project.
- **jobscript:** a script to be executed by the PBS Professional workload manager

Conventions

In this documentation, you will find a number of pages containing examples. We use the following conventions:

Cluster command prompt

\$

Your local linux host command prompt

local \$

Errata

Although we have taken every care to ensure the accuracy of our content, mistakes do happen. If you find a mistake in the text or the code we would be grateful if you would report this to us. By doing so, you can save other readers from frustration and help us improve subsequent versions of this documentation. If you find any errata, please report them by visiting <http://support.it4i.cz/rt>, creating a new ticket, and entering the details of your errata. Once your errata are verified, your submission will be accepted and the errata will be uploaded on our website.