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Supercomputing in the Browser - Web-based interactive HPC-Access at JSC

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Interactive exploration and analysis of large amounts of data from scientific simulations, in-situ visualization and application control are convincing scenarios for explorative sciences. It is the task of High-Performance Computing (HPC) Centers to enable, support and, of course, simplify these workflows of our users of today's supercomputers. Especially technical work simplifications in dealing with HPC systems are of great importance to counteract the increasing complexity and requirements and to open up new application areas for HPC.

Based on the open source software JupyterLab, a way has been available for some time that combines interactive with reproducible computing and at the same time overcomes the challenges of supporting a wide variety of workflows. At the Jülich Supercomputing Center, users have interactive access to the HPC- and cloud resources via a pure browser-based web access based on JupyterHub + JupyterLab at https://jupyter-jsc.fz-juelich.de

The platform has been designed from the beginning so that future services/tools can be easily extended by both the HPC Center and the users themselves. New HPC systems and Kubernetes clusters can be added quickly and easily, and the service is designed to integrate in projects- and communities web-sites and -platforms. With the upstream secure authentication and authorization and the direct access to our compute resources (cloud and HPC, login- and also compute nodes), the possibilities to couple HPC with cloud techniques are given and used.

With hundreds of sessions per week Jupyter-JSC has been well received by users from different scientific domains and we are continuously working on improvements and new application areas. In this talk, we will introduce and show the technology behind the Jupyter-JSC web service, show the HPC-specific features and potential and venture a look into the future together in discussion.

JLESC topic

interactive hpc, service, jupyterlab

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