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Freie Univ Evaluation System Framework for Scientific HPC Infrastructures in Earth System Modeling

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The Freie Univ Evaluation System Framework (Freva) is a software infrastructure for standardized data and tool solutions in Earth system science (e.g. www-miklip.dkrz.de, freva.met.fu-berlin.de, cmip-eval.dkrz.de). Freva runs on high performance computers to handle customizable evaluation or validation systems of research projects, institutes or universities. It combines different software technologies into one common hybrid infrastructure, including all features present in the shell and web environment.
The database interface satisfies the international standards provided by the Earth System Grid Federation (ESGF).This implemented meta data system with its advanced but easy-to-handle search tool supports users, developers and their plugins to retrieve the required information. A generic application programming interface (API) allows scientific developers to connect their analysis tools with the evaluation system independently of the programming language used. Users of the evaluation techniques benefit from the common interface of the evaluation system without any need to understand the different scripting languages. Facilitation of the provision and usage of tools and climate data automatically increases the number of scientists working with the data sets and identifying discrepancies. Plugins are able to integrate their e.g. post-processed results into the database of the user. This allows e.g. post-processing plugins to feed statistical analysis plugins, which fosters an active exchange between plugin developers of a research project. Additionally, the history and configuration sub-system stores every analysis performed with the evaluation system in a database. Configurations and results of the tools can be shared among scientists via shell or web system. Therefore, plugged-in tools benefit from transparency and reproducibility. Furthermore, if configurations match while starting an evaluation plugin, the system suggests to use results already produced by other users - saving CPU/h, I/O, disk space and time. The efficient interaction between different technologies improves the Earth system modeling science framed by Freva.

New features will be presented. For example novel frontends are added to this system for systematic overviews of scientific results. The handling of operational process chains for research environments will be presented too.