

HIFIS - Helmholtz Federated IT Services

Setting

Initiated in 2018 by the [Helmholtz Incubator Information & Data Science](#) as one of five platforms, the [HIFIS](#) platform will build a secure and easy-to-use collaborative environment with performant IT services that are connected seamlessly and efficiently accessible from anywhere. HIFIS aims to ensure an excellent information environment for outstanding research in all Helmholtz research fields by connecting knowledge from all centres. HIFIS also works on support for the development of research software with a high level of quality, visibility, and sustainability. HIFIS is shaped and advanced by 11 Helmholtz Centres: AWI, DESY, DLR, DKFZ, FZJ, GFZ, HMGU, HZB, HZDR, KIT, UFZ.

HIFIS operates three Competence Clusters:

The [Cloud Services Cluster](#) aims to provide a federated cloud platform with services for the whole scientific community and its partners that can be used on a broad level, regardless of specific research topics, data types, applications, and so on. Focus is to identify and link already existing and highly demanded cloud services that are provided by the involved HGF centres in the first place, but as well by other institutes or even commercial companies. The cluster will define and build a common meta-level abstraction layer in allow users to access the provided services in an easy, harmonized, and integrated way. The initial service portfolio will be gradually expanded in the future, according to the users' needs. In this way, the cluster will support not only a few selected large-scale projects, but the long tail of science instead. (AWI, DESY, DKFZ, FZJ, HGMU, HZB - Lead, KIT)

The [Backbone Services Cluster](#) works on a stable network infrastructure and jointly usable core services to meet the increasing demand for interconnection of research and the increasing volume of data in the Helmholtz Association. This will enable collaborative access and use of the services supplied within the Cloud Services Cluster. Based on existing physical networks already connecting the individual Helmholtz centres, a private overlay network inspired by CERN's LHCONE has been installed to ensure the provision of high bandwidths, increase the levels of mutual trust and overall security, and deliver a guaranteed level of service quality. The network will provide the central basic services necessary for collaborative work, including, above all, a uniform Identity & Access Management (IAM). (AWI, DESY - Lead, DKFZ, FZJ, HGMU, KIT)

The [Software Services Cluster](#) considers software an essential basis for the modern research process. Software lays the foundation for the long-term, stable operation of research infrastructures, and at the same time represents a major driver of innovation and contributes significantly to the acquisition of knowledge and the creation of value. Finally, software itself is an important result of the research process. The cluster supports the Helmholtz centres in the sustainable use of research software through practical offerings and services. Specifically, it offers trainings to enable researchers to develop and publish software of high quality that can be sustainably maintained and used. In addition, the re-use of existing software by researchers is promoted by providing tools for finding and using suitable software solutions, by providing contact persons and experts, and by providing support in building communities for specific research software. (DLZ, DKFZ, GFZ, HZDR - Lead, UFZ)

HIFIS carries on what has been begun with the provision of infrastructures in the context of [HDF](#). However, instead of building infrastructures which is the primary focus of HDF, HIFIS concentrates on harmonized usage scenarios and concepts that help to ensure a sustainable collaborative research environment in the long run.

Achievements so far

In a process of three steps, the members of the **Cloud Cluster** identified cloud services that are either needed or provided by the partners, including service offerings by non-HIFIS centres or even commercial companies.

In the first step, a wide range of possible services has been collected, e. g.,

- Infrastructure: on-demand storage and compute, large data transfer service, analytics, web servers, virtual desktops, ...
- Community: software development/catalogues, sensor/sample management, data management plans / workflows / DOIs, R, Jupyter Hub, Apache spark, ODV, GIS, ...
- Collaboration: sync&share, cloud office, project/event management, voting, surveys, chat, discussion, web conferences, e-learning, literature management, reservation systems, ...

In the second step, possible service providers have been identified and actual needs have been assessed. For example, AWI offers containerized /virtualized applications and WebODV in this context. According to the expressed needs, the services have been prioritized. In the final step, the [initial service portfolio](#) of HIFIS has been defined from the results collected so far.

During 2021, these initial services will be made consecutively available, building up the [Helmholtz Cloud Portal](#). An assessment and possible extensions of the service portfolio are planned for 2022.

In the **Backbone Cluster**, a framework contract with the DFN-Verein was signed to establish a HIFIS VPN on top of the existing X-Win. At low yearly cost, HIFIS members benefit from improved mutual trust, easier implementation of services, and high bandwidth. In addition, the federated Authentication and Authorization Infrastructure (AAI) and its standards developed by HDF have been adopted, further developed and implemented by HIFIS in order to make the cloud, network, and software services accessible on a common basis and by using the credentials of one's home institution. Because of its general applicability to a wide range of services and identity providers, this AAI is now considered and named the *Helmholtz AAI*.

The **Software Cluster** has conducted a survey on software development practices, software management services and technologies, and software frameworks to compile an inventory of what is used or needed by the community. From this, an initial service portfolio has been compiled. According to the results of this survey, a [training catalogue](#) and a series of regular training events have been set up, like software carpentries and hackathons which respectively focus on basic skills and current issues, e. g., Covid-19 and Machine Learning. [GitLab](#) and Continuous Integration services have been established, and a [software helpdesk](#) went into operation at HZDR. Access to the various resources is, again, possible by means of the Helmholtz AAI.

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