



Helmholtz-Plattform HIFIS

Vom komplexen Zusammenspiel heterogener Forschungszentren und dem Ziehen an einem Strang

Uwe Jandt
für das HIFIS-Team

24. DINI-Jahrestagung
"Kooperationen - institutionell bis international"
Stuttgart, 2023-10-04

18 Helmholtz Research Centers – 6 Research Fields

- Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (AWI)
- CISPA – Helmholtz Center for Information Security
- Deutsches Elektronen-Synchrotron DESY
- Deutsches Krebsforschungszentrum (DKFZ)
- Deutsches Zentrum für Neurodegenerative Erkrankungen (DZNE)
- German Aerospace Center (DLR)
- Forschungszentrum Jülich (FZJ)
- GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
- GSI Helmholtz Center for Heavy Ion Research
- Helmholtz Munich
- Helmholtz-Zentrum Berlin für Materialien und Energie (HZB)
- Helmholtz Center Dresden Rossendorf (HZDR)



- Helmholtz Center for Infection Research (HZI)
- Helmholtz Center for Environmental Research – UFZ
- Helmholtz-Zentrum Hereon
- Helmholtz Center Potsdam – German Research Center for Geosciences GFZ
- Karlsruhe Institute of Technology (KIT)
- Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC)

Research Fields:

- (1) Energy, (2) Earth and Environment
- (3) Health, (4) Information
- (5) Aeronautics, Space and Transport, (6) Matter

18 Helmholtz Research Centers – 6 Research Fields



The Helmholtz Information & Data Science Incubator

Top-down?



Bottom-up?

- Homogeneous portfolio / appearance?
- Rapid implementation?
- Acceptance by users/scientists?
- Adaption to changing requirements?
- Flexibility to local “Sonderlocken”?
- Exploiting existing / local competences?
- Acceptance by local decision makers?
- ...

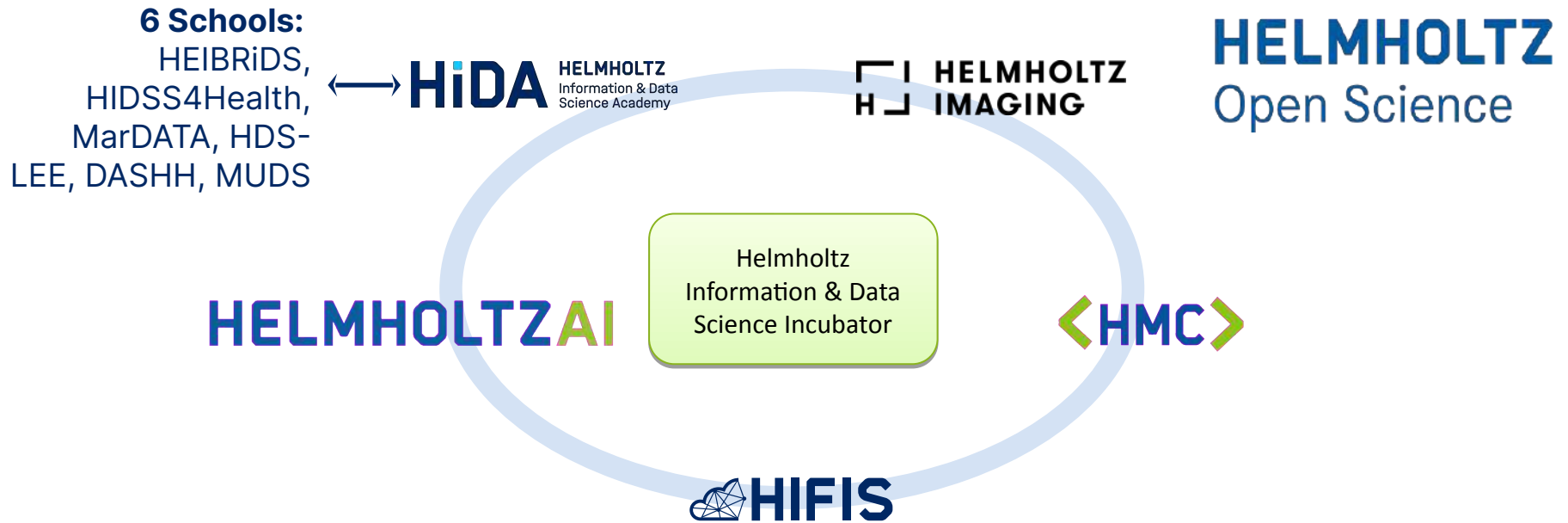
The Helmholtz Incubator: First ideas

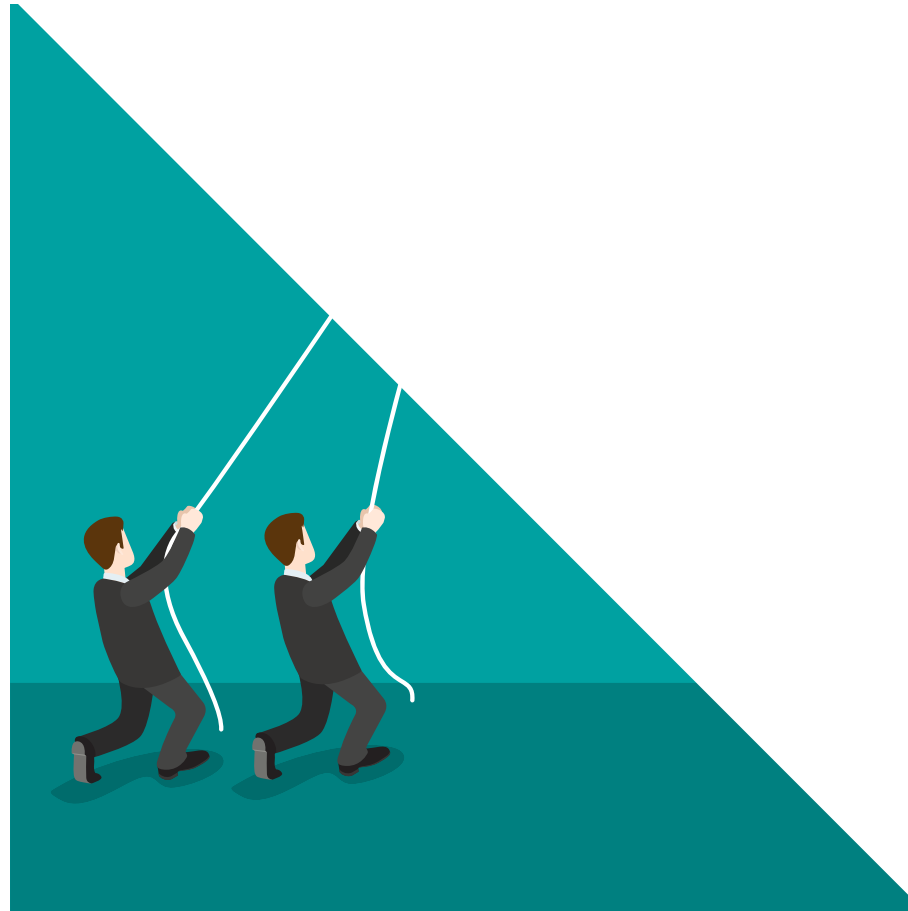
First draft from around 2016 →→→

Cross-centre platforms for:

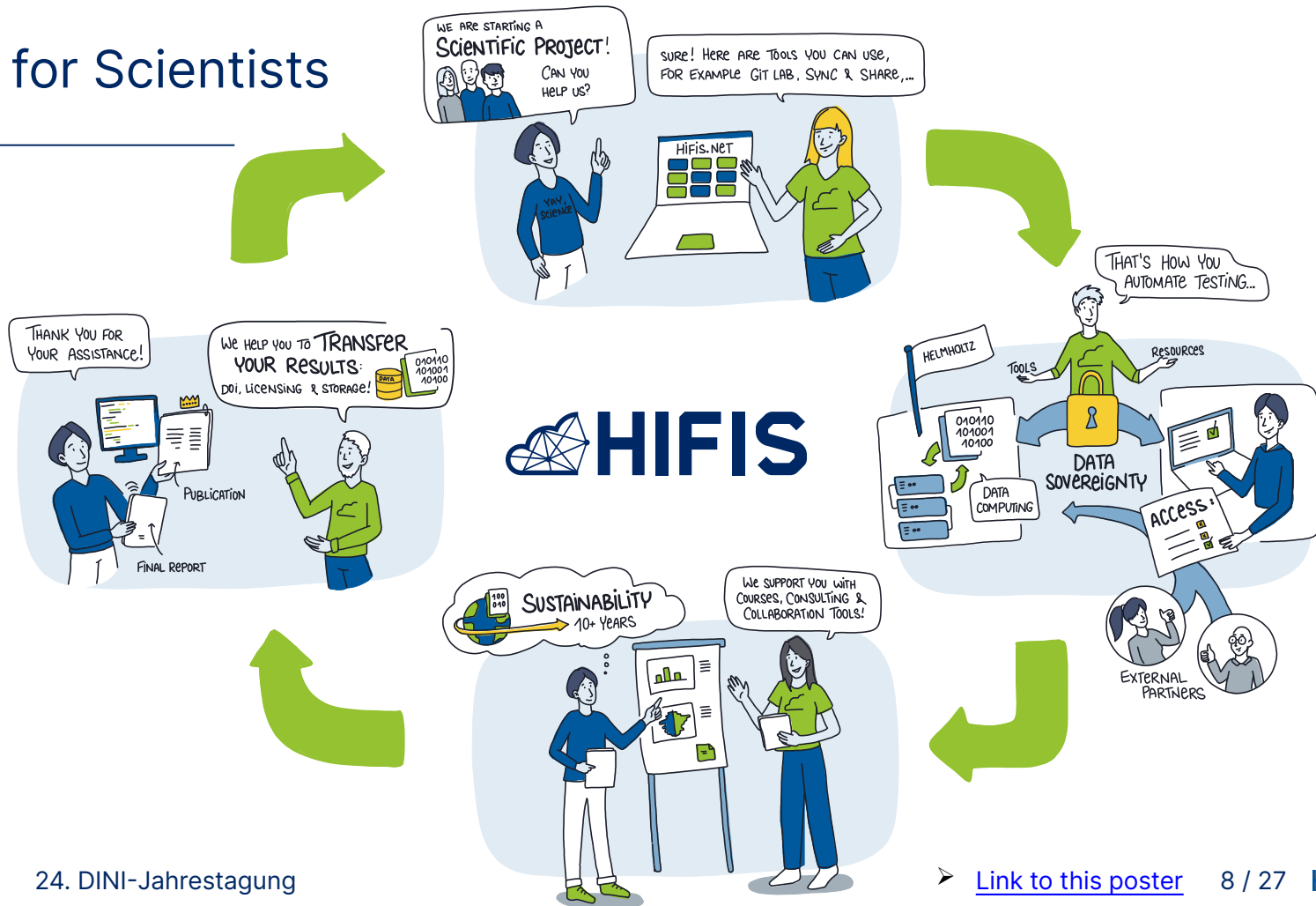
- Interdisciplinary Science,
- Digital Infrastructure,
- Training.
- De-central / federated,
- Continuous funding envisioned (thus: platforms not projects).

The Helmholtz Incubator Family

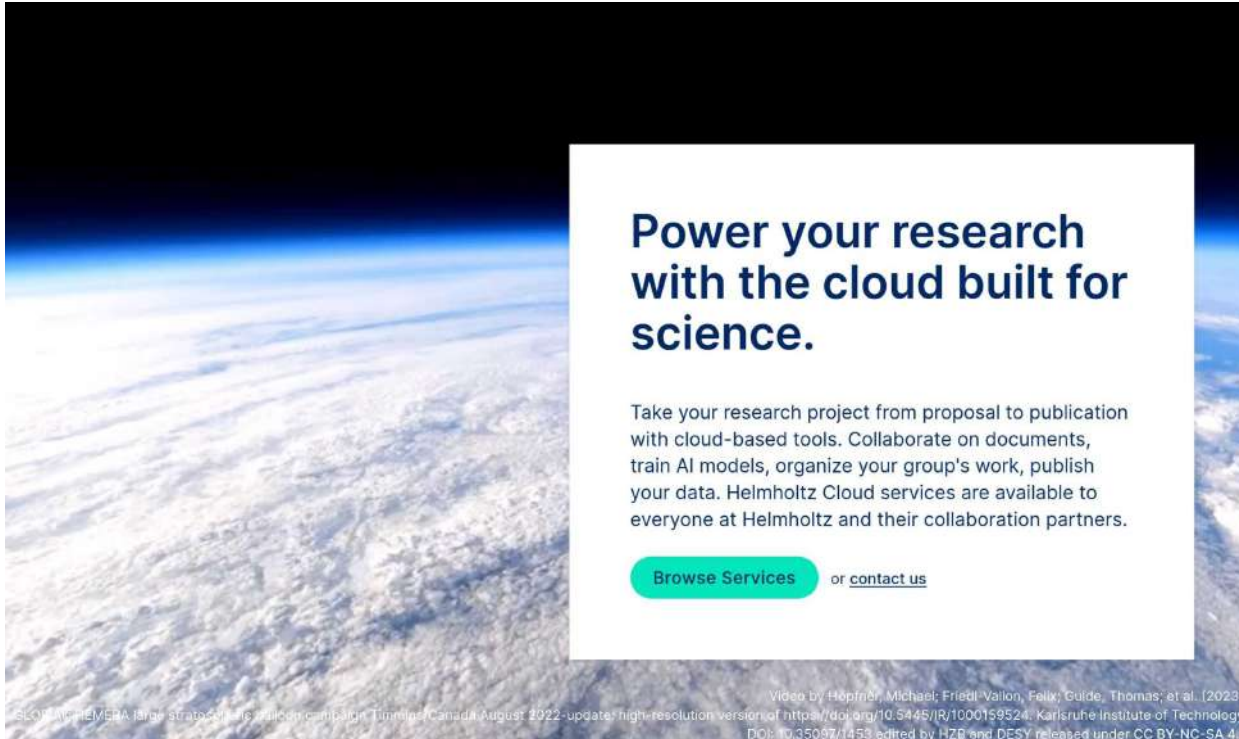




HIFIS for Scientists



1.) Infrastructure & Cloud Services

An advertisement for Helmholtz Cloud services. The background is a satellite view of Earth from space. A white box in the center contains the following text:

















Power your research with the cloud built for science.

Take your research project from proposal to publication with cloud-based tools. Collaborate on documents, train AI models, organize your group's work, publish your data. Helmholtz Cloud services are available to everyone at Helmholtz and their collaboration partners.

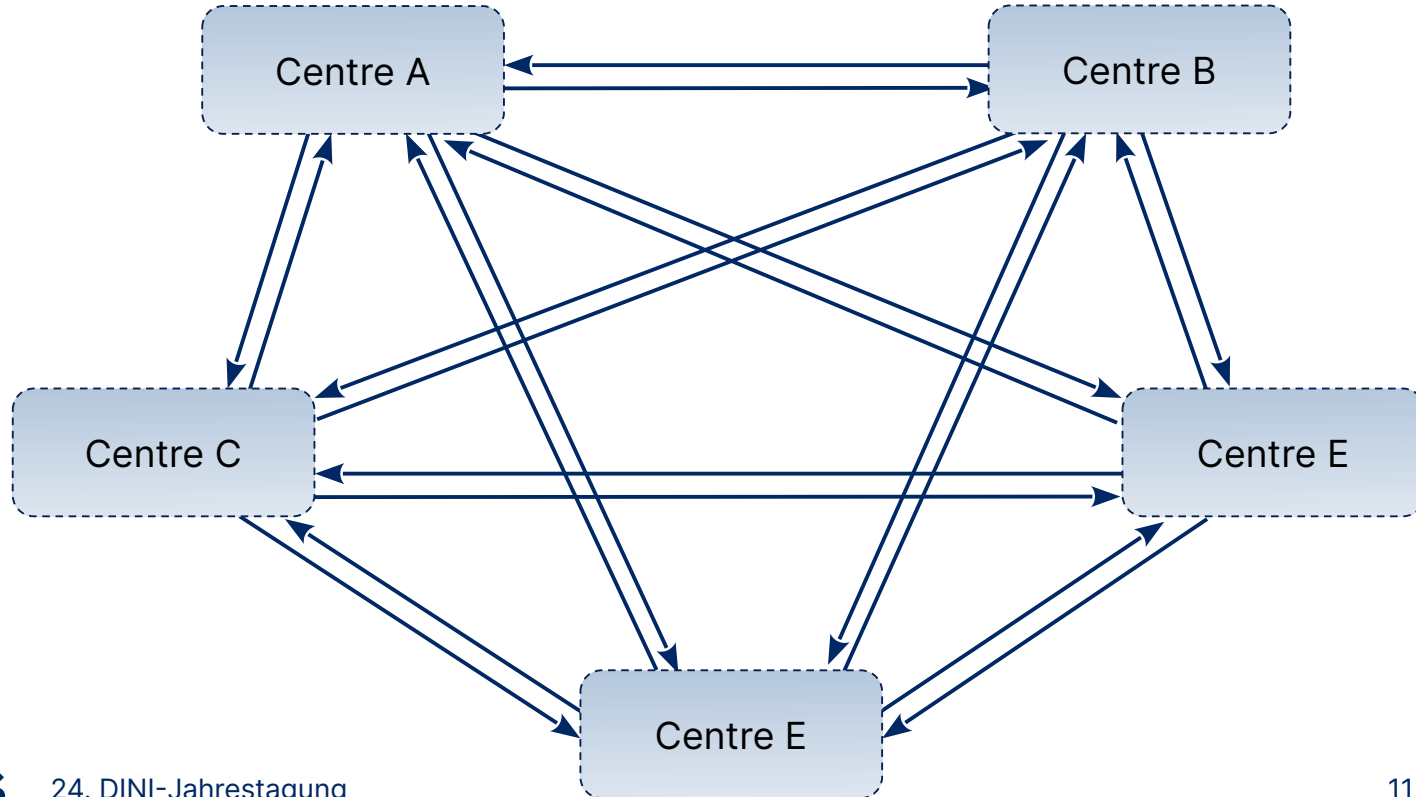
[Browse Services](#) or [contact us](#)

Video by Hepfner, Michael; Friebel-Vallon, Felix; Guide, Thomas; et al. (2023): SCLARIC-HEMERA large-scale scientific cloud computing. Toronto, Canada, August 2022-update: high-resolution version of <https://doi.org/10.5445/R/1000159524>; Karlsruhe Institute of Technology. DOI: 10.35097/1453 edited by HZB and DESY released under CC BY-NC-SA 4.0

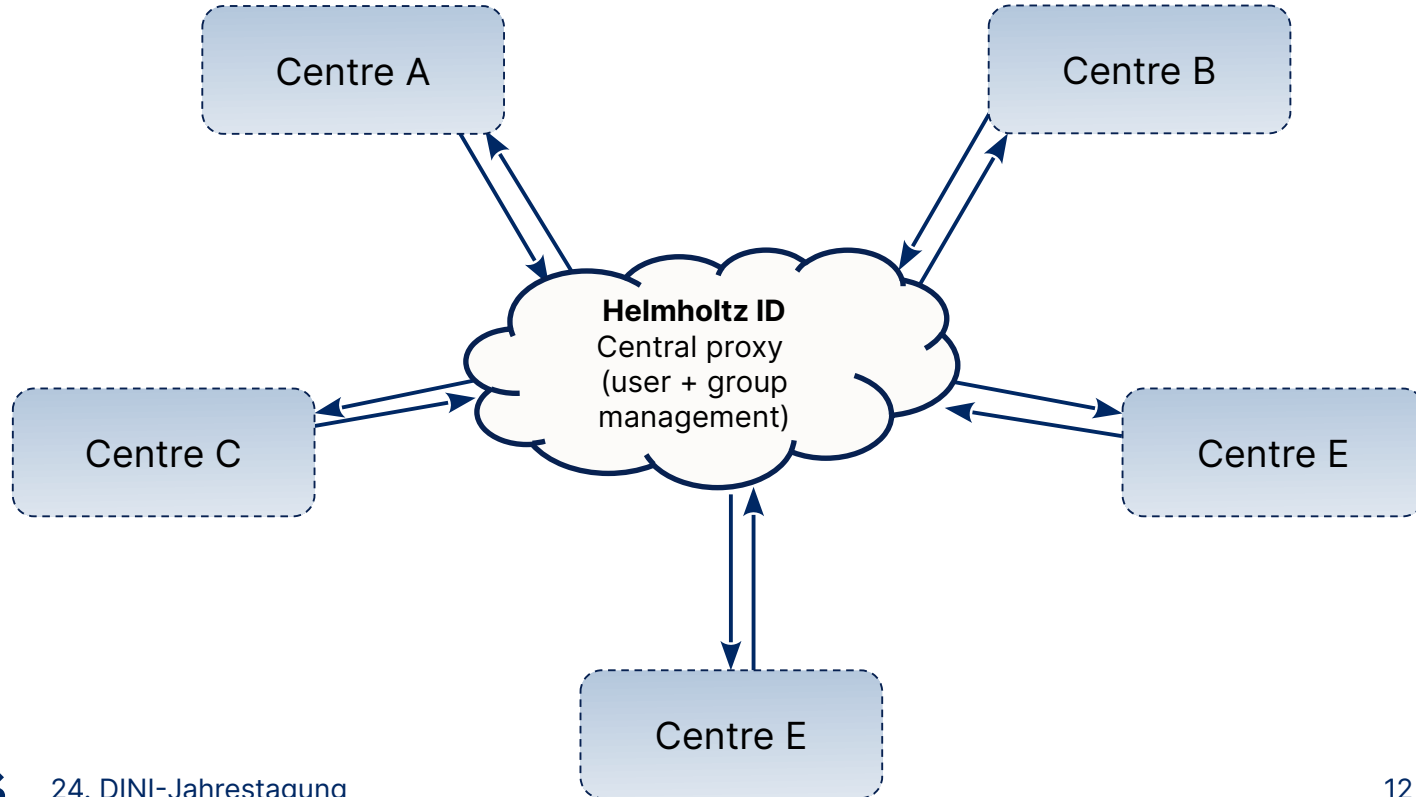
1.) Infrastructure & Cloud Services

Sensor Management System  Sensor Management System Manage metadata for devices, platforms & measurement configurations.  : Description → Go to service	Collaboration Database Earth and Environment (Earth) Science	Helmholtz RSD ● RSD Research Software Directory Promote and discover research software of the Helmholtz Association. 	Collabtext  Overleaf Collaborative document writing with LaTeX 	Collaboration Information : Description → Go to service	
nubes  Nextcloud Sync&Share based on Nextcloud with Office for Web and Calendar function. 	Collaboration Sync & Share	Mattermost  Mattermost A hosted chat service for everyone within HZDR based on Mattermost. 	: Description → Go to service	 : Description → Go to service	
HIFIS Helpdesk  Zammad HIFIS Helpdesk Ticketing System based on Zammad. 	Collaboration	Collabtext  Overleaf Collaborative document writing with LaTeX 	Collaboration Information : Description → Go to service	Singularity on HAICORE  Singularity Container runtime environment on KIT HAICORE HPC systems. 	Infrastructure : Description → Go to service

1.) Infrastructure: Unified User Management



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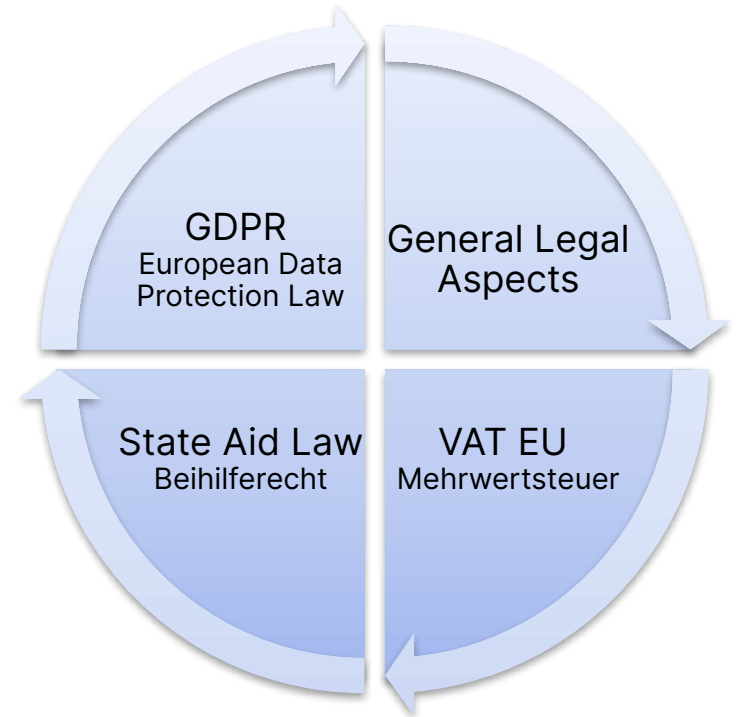
1.) Infrastructure: Procedures & Legal Aspects

Processes

- Management of the service portfolio
- Brokering of (cloud) services
- Coordination and partial operation of User Support

Finance

- HIFIS funding by Helmholtz Association
- Use of services is free of charge
- Provision of services by the centres



2.) Helmholtz Software

Best-practices for sustainable Research Software Engineering on multiple levels:

Education & Training

Courses, material and workshops for getting you started or boosting your software engineering practice.

Community

Build and foster communities to support the **cultural change** when dealing with research software. Maintain a SW Directory

Consulting

Contact points for researchers for questions and problems in the context of RSE.

Technology

Provide a sustainable, well integrated and easy to use **technology infrastructure** for research software development.

2.) Fostering scientific practices in software engineering

Supporting the whole software development lifecycle



Dependabot

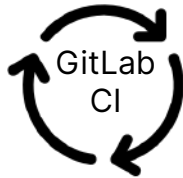
Security: Automate dependency updates

Deployed and made available with

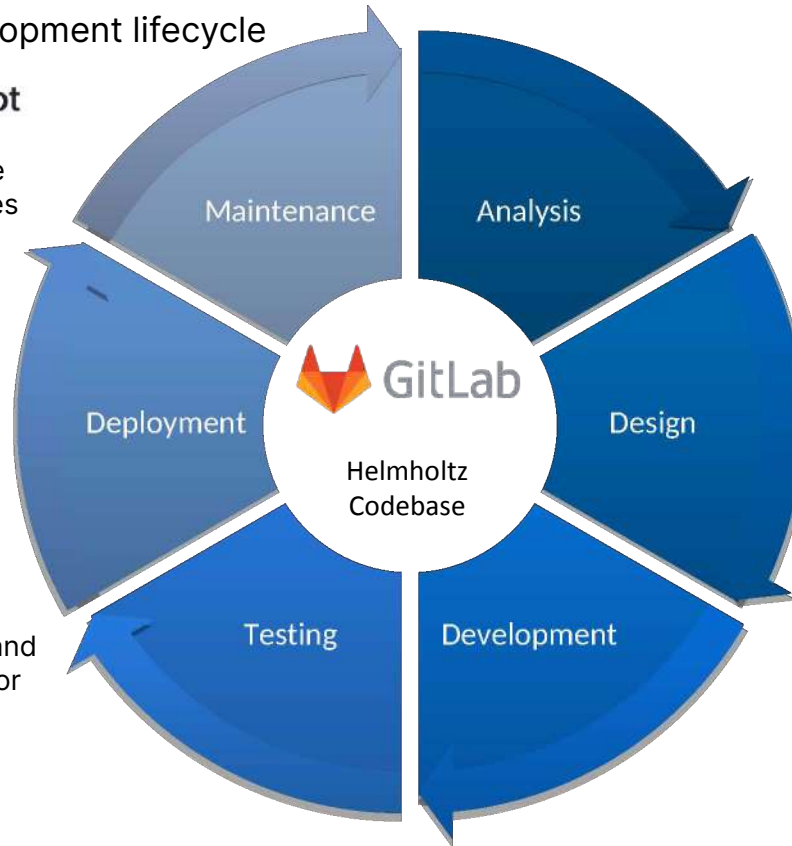


ANSIBLE

<https://github.com/hifis-net>



Continuous Integration and Deployment available for everyone by default



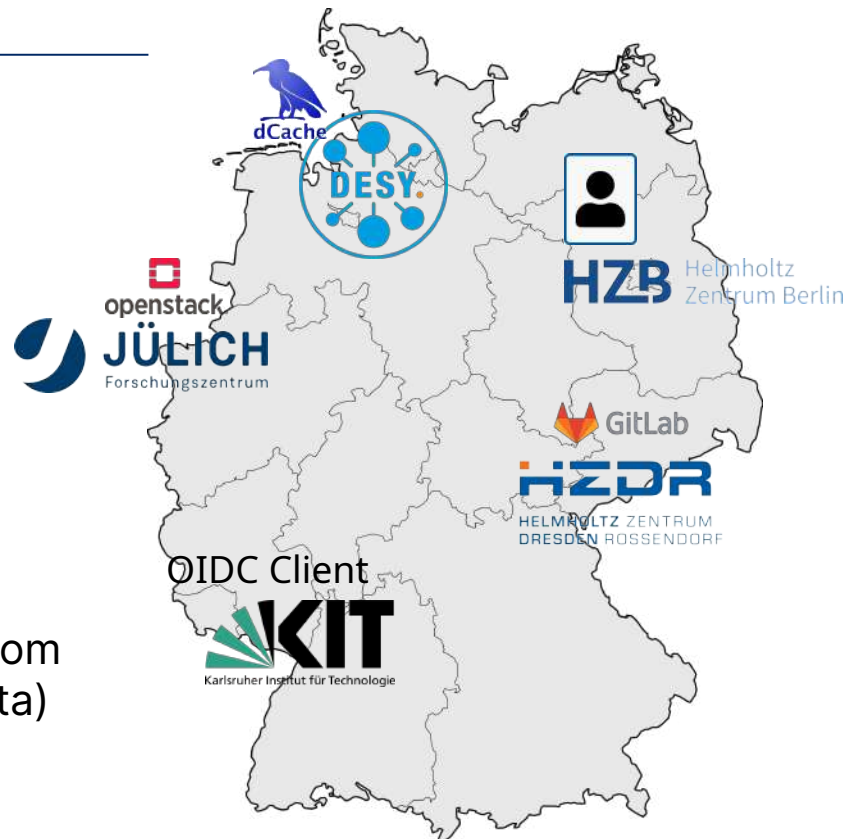
Kroki
Diagram creation

Mattermost

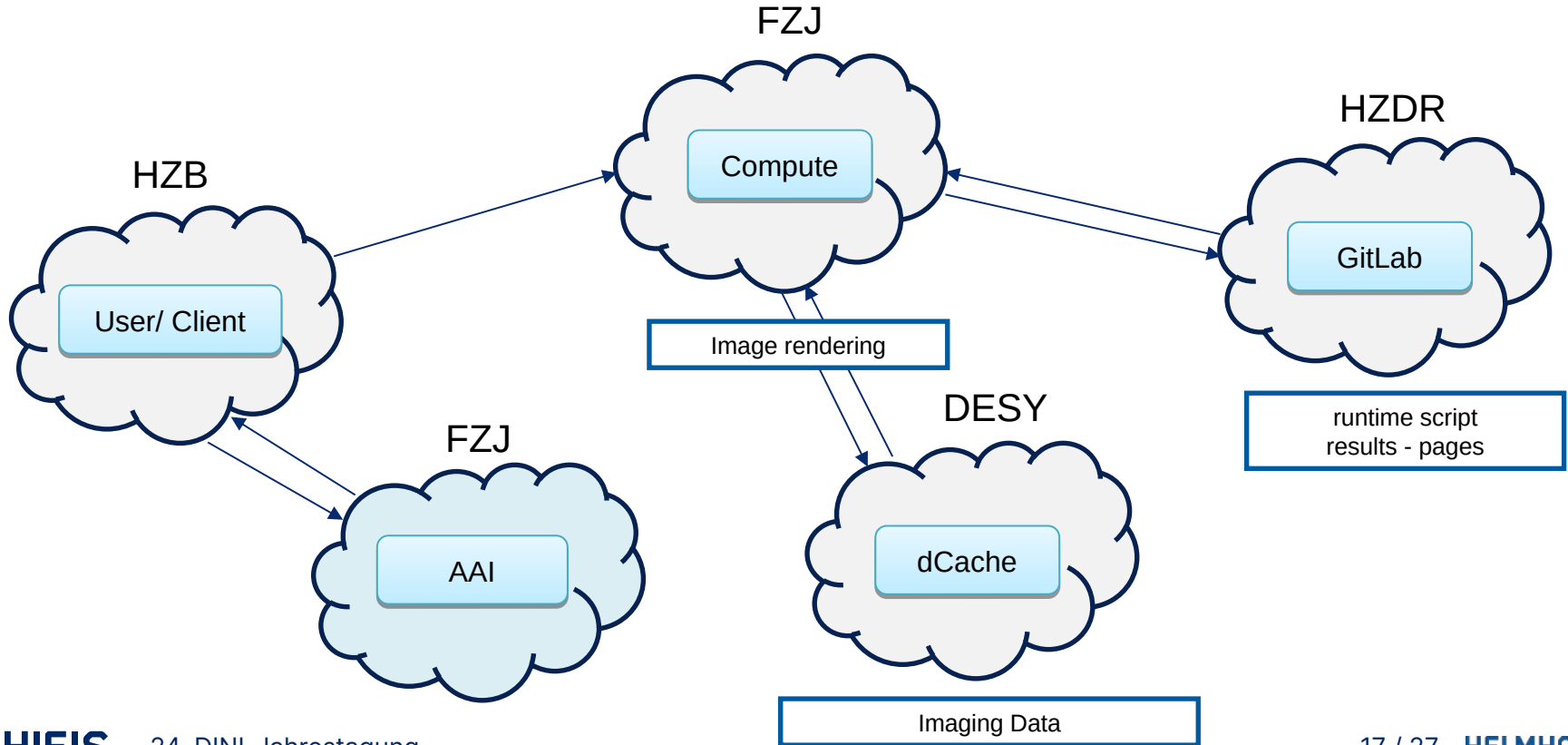
Team communication

Example: Distributed Cloud Services 4 Science

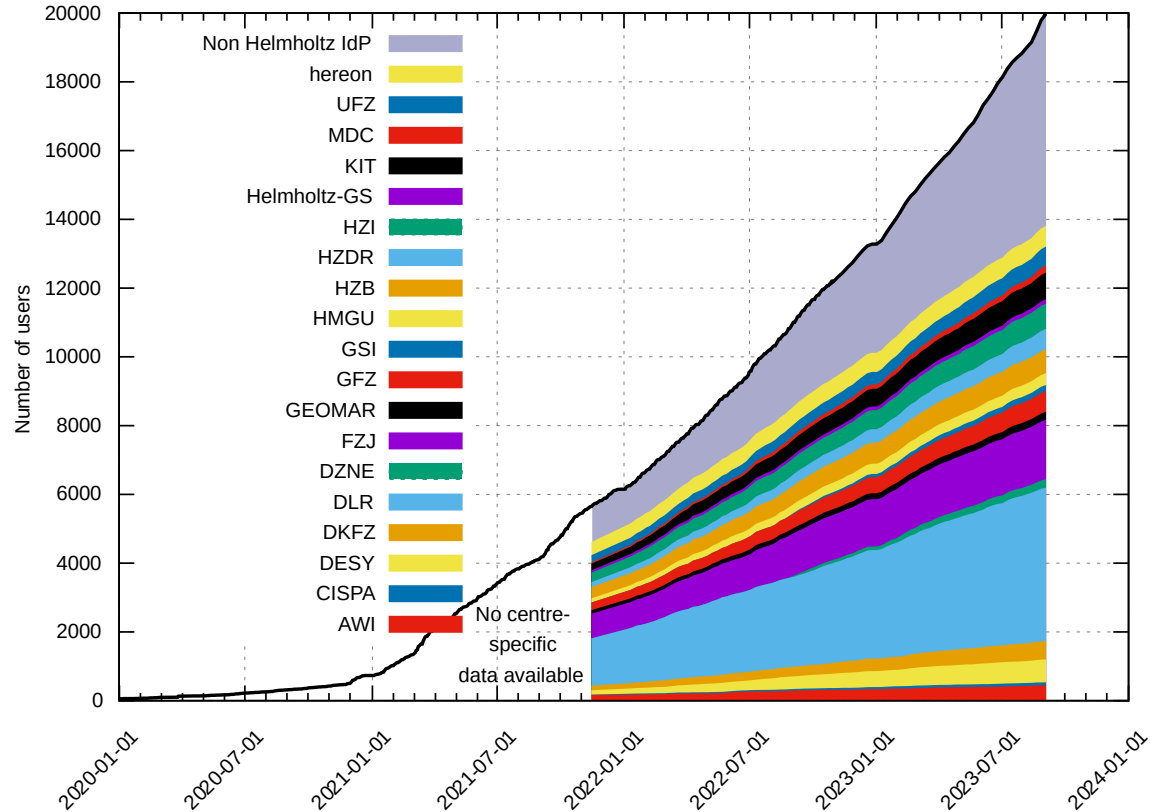
- **5 Sites involved:**
 - 3 Cloud Services Sites,
 - 1 Component provider,
 - 1 using centre
- **Thanks to AAI, transparent access possible:**
 - After first login, no further credentials required
 - Efficient and transparent transfer of data from service to service between sites (Code, data)



Example: Distributed Cloud Services 4 Science



Some Numbers



Some Numbers

~20k users

of which are ~5k non-Helmholtz

18 Centres

One Login

~190

Institutions with
users in AAI

33

Helmholtz Cloud Services
from 9 centres

>75

Cross-centre
Collaborating groups
(VO)

>1.000

Support tickets in
2022

~ 15

Crossover Events, incl HIDA:
Hackathons, Summer Academy...

>1.800

Software course
participants

>950

Monthly active projects in
the Helmholtz Codebase

Overall Benefits for Science & Helmholtz

HIFIS



Added value for Science

- Facilitate **scientific research**
- Enable modern **Research Software Engineering**
- Intensify and expand **partnerships**
- **Single Point of Contact** for Helmholtz Digital Services

Collaboration made easy

- **Connecting Helmholtz**: AAI, Backbone
- Trusted **Collaboration** Platform
- Consistent **Communication** Forums
- **Simple Access**, minimal formalities

Sustainable Services

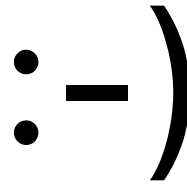
- **Digital Sovereignty**
- **Resilience** and Cyber Security by Redundancy
- **Standards** for Federated Services
- **Synergy** by Consolidation of Services

Evaluation



- **Excellent progress** setting up initial structures and services in all clusters
- **Uptake** of services good and **increasing**
- **Enthusiastic, well working team**, full of motivation and engagement.
- **Building trust** among all 18 centres: HIFIS is a **catalyst** here
- Now turning from build-up to operation phase: **Adapt!**
- HIFIS can be a **role-model** for similar activities elsewhere
- **Strongly recommend to continue the platform!**

Evaluation



Ongoing Works & Plans

- **Awareness:** Branding of HIFIS services to make researchers aware what they are using, even beyond Helmholtz.
- **Coverage:** Make HIFIS services commonly accepted and practically used by all Helmholtz centres.
- **Interaction with users:** Increase where possible interaction with end users.
- **Cyber security:** Coordination and increased resilience of core components
- **International collaboration:** Further promote federated technologies and cooperation on resource sharing.
- **Scale Effects:** Exploit increased weight of all Helmholtz vs single centres; improved specialization and consolidated use cases

So this goes hand in hand...



Base4NFDI

Partners



Helmholtz Digital Services for Science — Collaboration made easy.

I. Just try it!

- Most Software and Cloud Services readily available for Helmholtz + Partners
- User-oriented workflows will be integrated continuously

II. See what's there & Spread the word!

- <https://hifis.net> → HIFIS for Scientists
- <https://helmholtz.cloud>
- <https://hifis.net/newsletter>

III. Consult us:

- support@hifis.net



Thank you!



Questions?