HELMHOLTZ

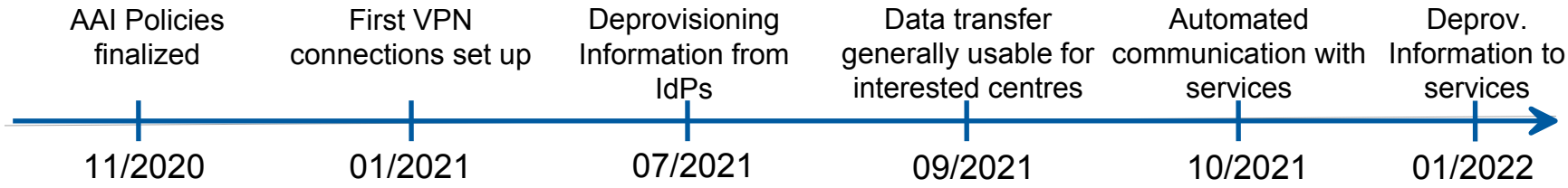
RESEARCH FOR
GRAND CHALLENGES

HIFIS | HELMHOLTZ FEDERATED IT SERVICES

Backbone Services (Overview)

Uwe Jandt

Backbone Services for Helmholtz



Helmholtz Backbone
Building a Helmholtz-wide trusted network

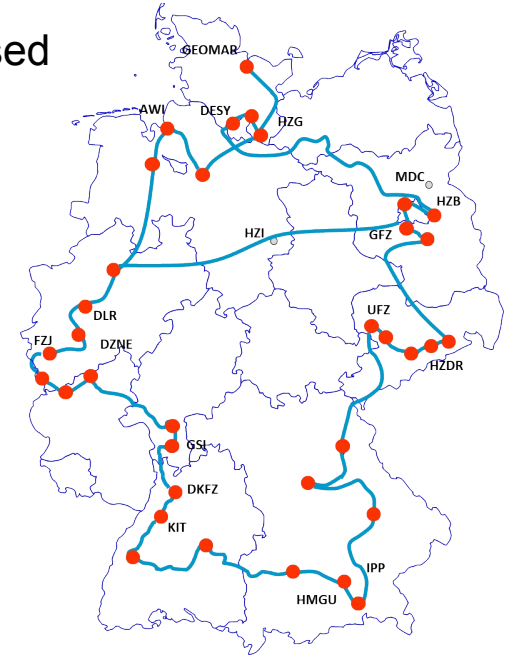
HIFIS Core Services: HTS
Comfortable and reliable Helmholtz / HIFIS Transfer Service @ FTS3

Helmholtz AAI
Seamless Access to Cloud Services for Helmholtz & Friends.

1. Helmholtz Trusted Network (Backbone)

Motivation and global aims

- Establish high bandwidth network with **mutual trust** and increased overall security
- Reduce latency, increase throughput and simplify access
- Allow separation from WAN access
- E.g., direct connection between private IP adresses between two sites (i.e. not accessible from WAN)

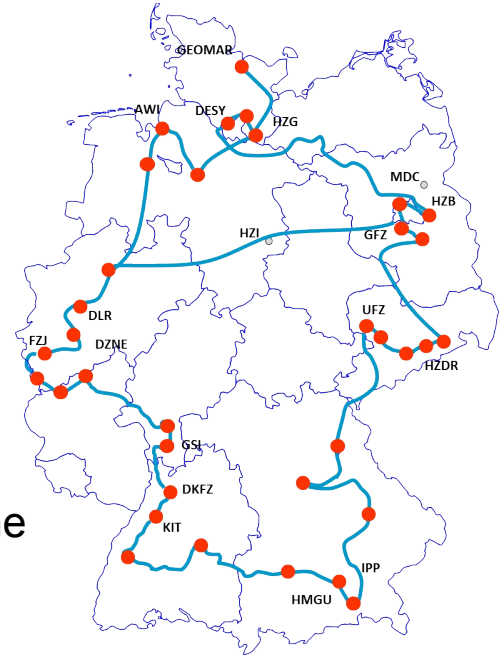


➢ https://hifis.net/news/2020/09/01/VPN

1. Helmholtz Trusted Network (Backbone)

Contract and first setup

- Contract finalized in late summer 2020
- Realization as an overlay on the DFN X-WiN:
  Uses existing X-WiN connections, no new links or additional bandwidth at the beginning
- Implemented for 6 sites so far, more to follow!



Contract and first setup

- Routing policies have to be defined when services start to use the HGF-Backbone, e.g. Firewall Rules / ACLs
- First Use Case being evaluated: Connect HZDR equipment at the European XFEL via DESY to the HZDR networks

➢ https://hifis.net/news/2020/09/01/VPN

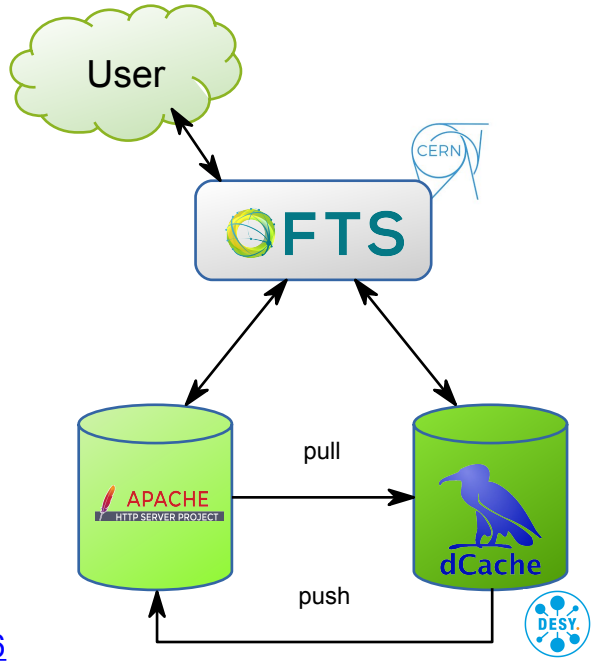
2. Core Services: HIFIS Transfer Service

Why?

- Large data sets in collaborative research projects, e.g. **HIP** and **Helmholtz AI** platforms.
- Data analysis often sensitive to latency / Data locality
- Collaborating centres distributed over Germany
- **Comfortable and reliable transfer service needed**

Technology

- HIFIS Core Service: CERN‘s **FTS3** as backend, **webFTS** as comfortable WebUI
- Apache httpd in VM/Docker container:
  - Easily deployable, **lightweight** storage endpoint
  - Suitable for **ad-hoc transfers** at smaller sites



- ISGC‘21: https://indico4.twgrid.org/indico/event/14/session/10/contribution/46
- https://hifis.net/use case/2021/06/07/use-case-hts

2. Core Services: HIFIS Transfer Service

Outcome

- Transfer rates of **40-120 MiB/s** (overall) reached in tests
- **Negligible overhead** from virtualization
- Fast retrieval of instance digests thanks to **caching**

Plans and Outlook

- Use of **third-party copy** / **TPC** planned and in development, in cooperation with KIT
- Pilots with EGI & WLCG
- RUCIO for policy driven transfers

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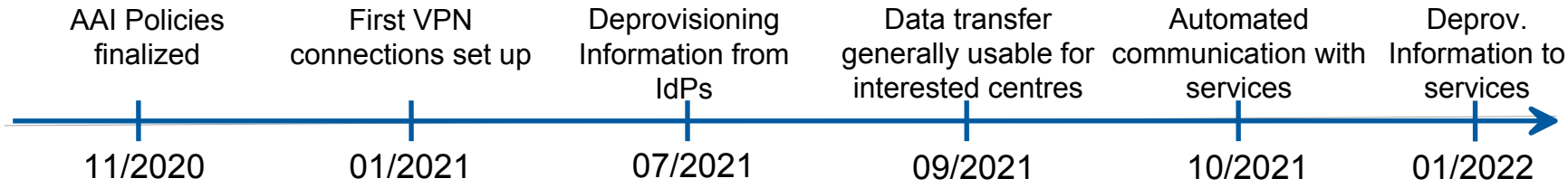
3. Backbone AAI / Helmholtz AAI

- Marcus Hardt, KIT

SPARE SLIDES

Backbone Services for Helmholtz



- ✓ More than **3000 Helmholtz AAI / Cloud (pilot) users** from Helmholtz. **Increasing!**
- ✓ Close collaboration with European / Int'l Initiatives
  ➢ AARC Initiative ➢ EOSC ➢ WLCG ➢ Open Storage Network (OSN) ➢ NFDI ➢ EGI
- ✓ **Helmholtz Backbone / Trusted Network:** First centres connected.
  Scientific use case with HZDR / Helmholtz AI in preparation.
- ✓ **HIFIS Transfer Service** demanded and in use for Helmholtz AI projects

Next steps

- Framework to query **deprovisioning** information from IdPs to allow automatic deprovisioning in Helmholtz AAI.
- Easy usage of HIFIS transfer service: Any combination of interested centres shall be able to participate using a lightweight client

Helmholtz Trusted Network (Backbone)

Why?

- LHCONE: Blueprint for Helmholtz Backbone
- Worldwide overlay network for analysis of LHC data on the infrastructures of the respective NRENs
- Routing protocols allow for high scalability and redundancy
- High trust level through coordinated routing policies
- Scalable connection via point-to-point lines or packet tagging on existing access ports