

Infrastructure services

SPHN Data Coordination Center and BioMedIT

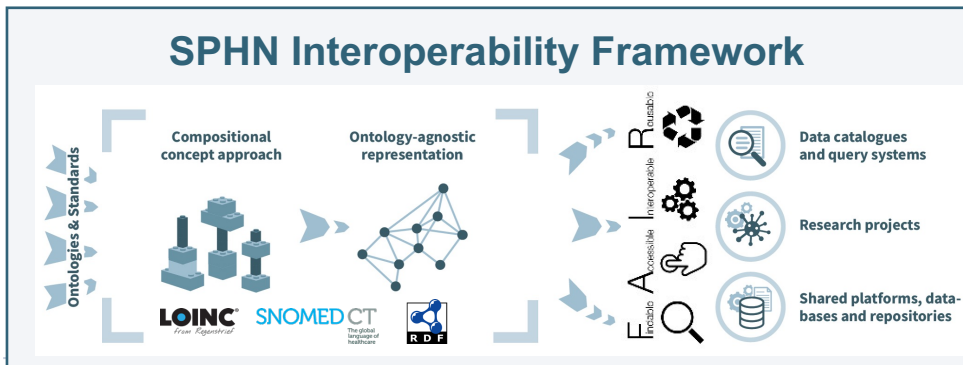
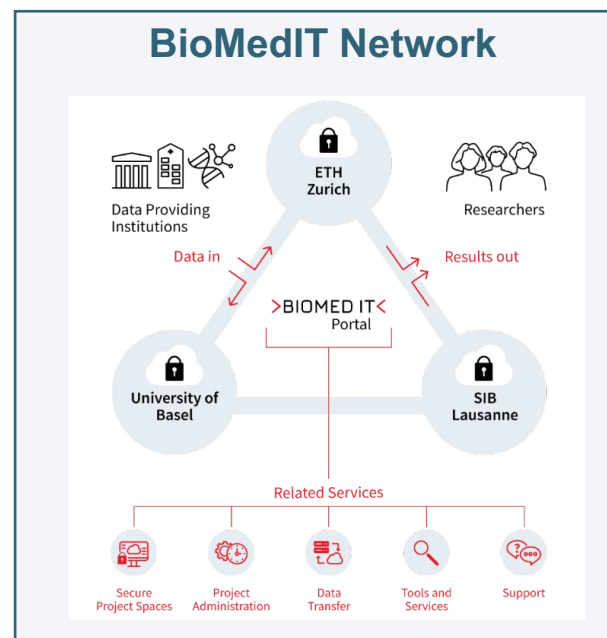
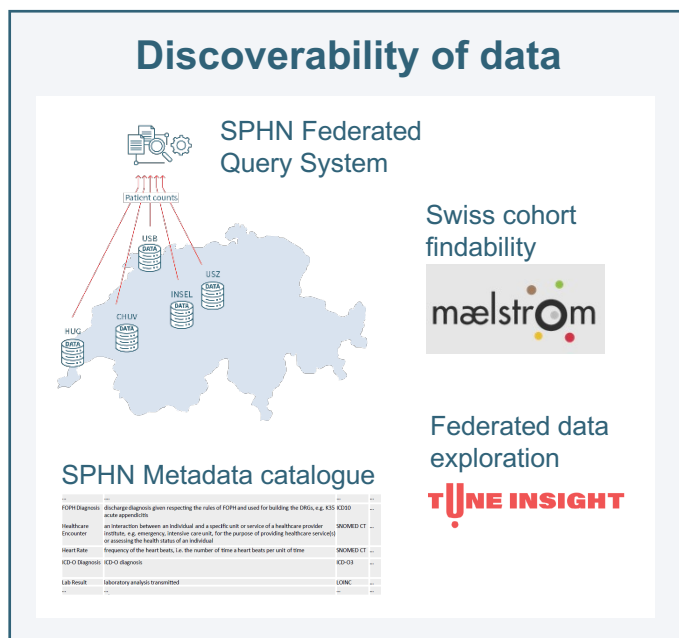
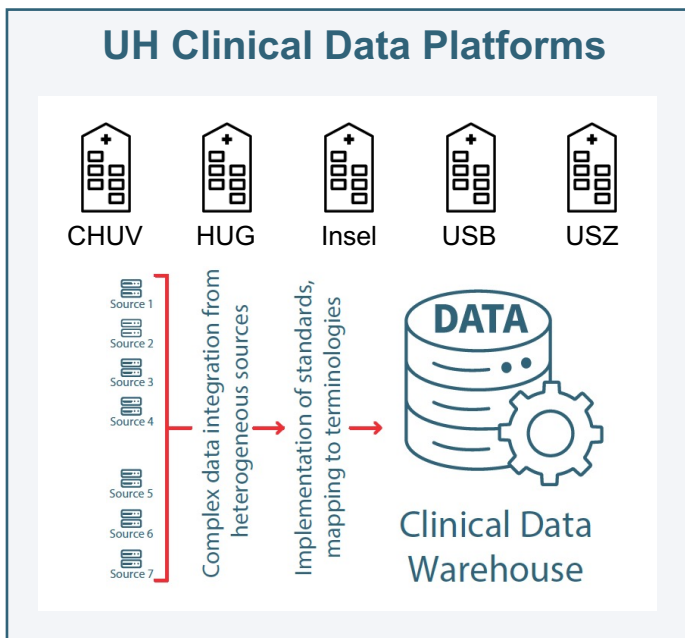
Dr. Katrin Cramer

Director, Personalized Health Informatics

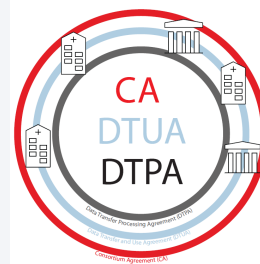
SIB Swiss Institute of Bioinformatics

A project of

SPHN Infrastructures, services and DCC support



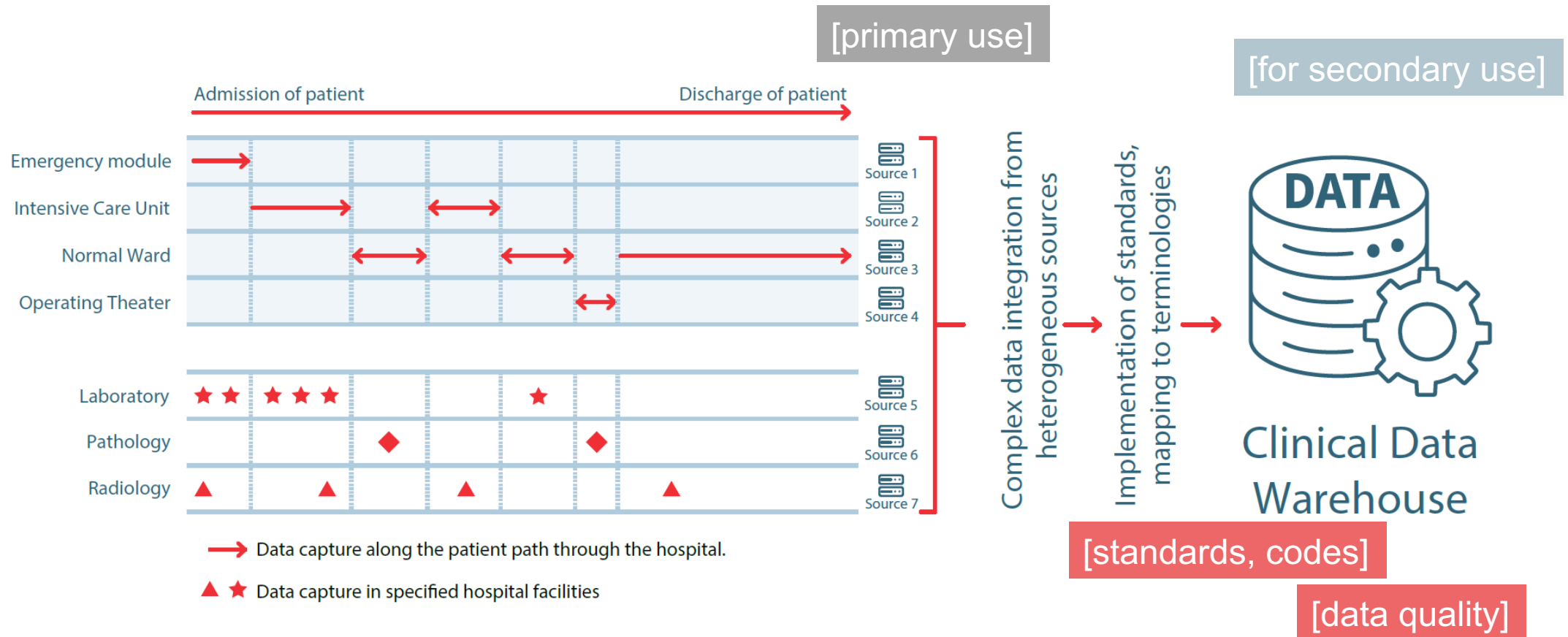
Legal Framework



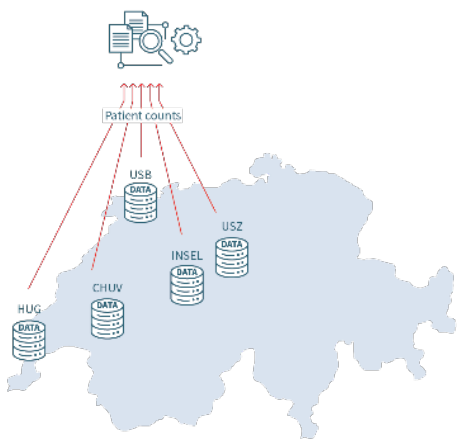
Outreach and Training

- Responsible Use of Health-Related Data for Research
- FAIR Health Data for Research
- Information Security
- BioMedIT: Research with Sensitive Data

Infrastructures at Swiss University Hospitals



Findability and discoverability of data



SPHN Federated Query System:

- Project feasibility, data from all 5 UH searchable with one tool
- > 0.5 million patients (consented data); > 100 million data elements

Swiss cohort data in the international Maelstrom Catalogue:

- Metadata of 10 Swiss population-based and disease-specific cohorts
- Full study descriptions searchable with > 145'000 annotated variables

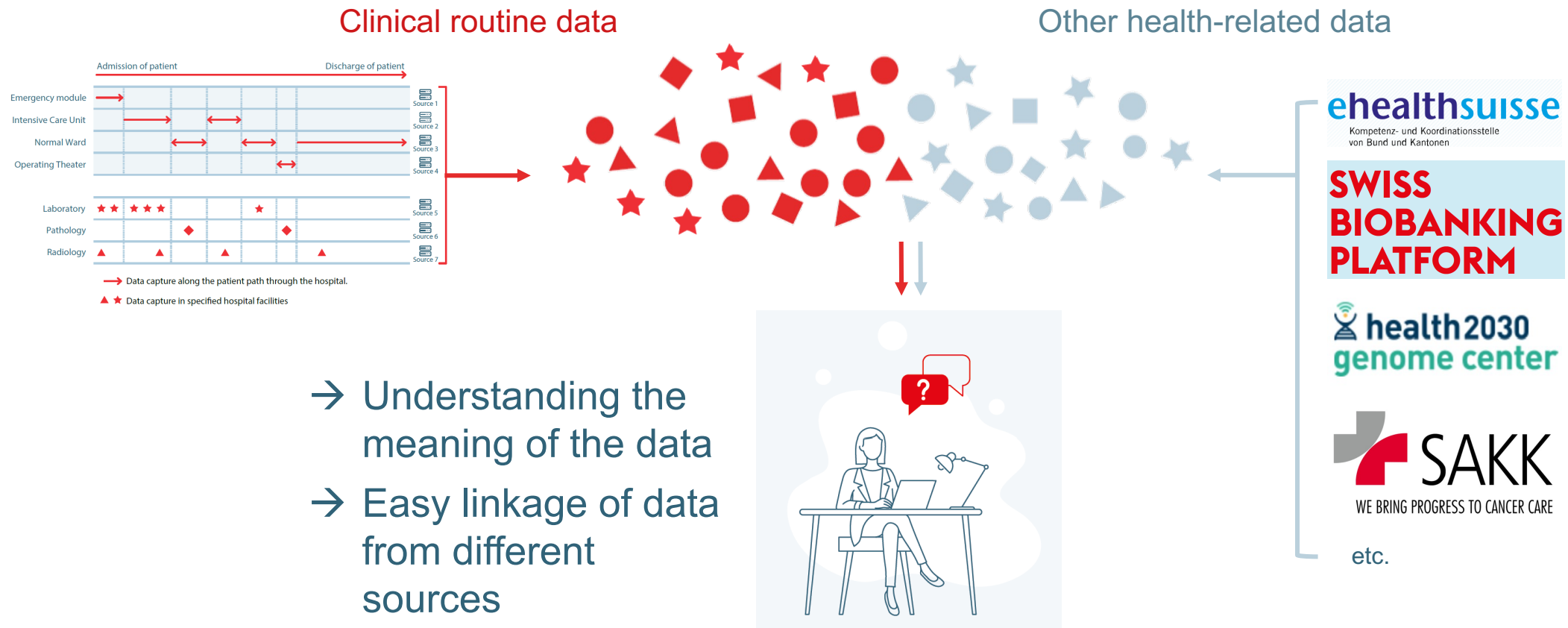


Federated confidential data exploration and computing (pilot phase):



- TI4Health in Swiss BioRef: Personalized lab reference ranges
- TI4Health in SPO: Oncology data exploration and survival analysis

The need for data interoperability (at the source)



The SPHN Interoperability Framework: Making sense of data and adding value

Data semantics

- Use of **controlled vocabulary** for concepts, valusets and data
- **Data standards**: ATC, SNOMED CT, ICD-10-GM, CHOP, UCUM, LOINC, NANDA, ICD-O, MedDRA...
- Multi-level coding and mappings

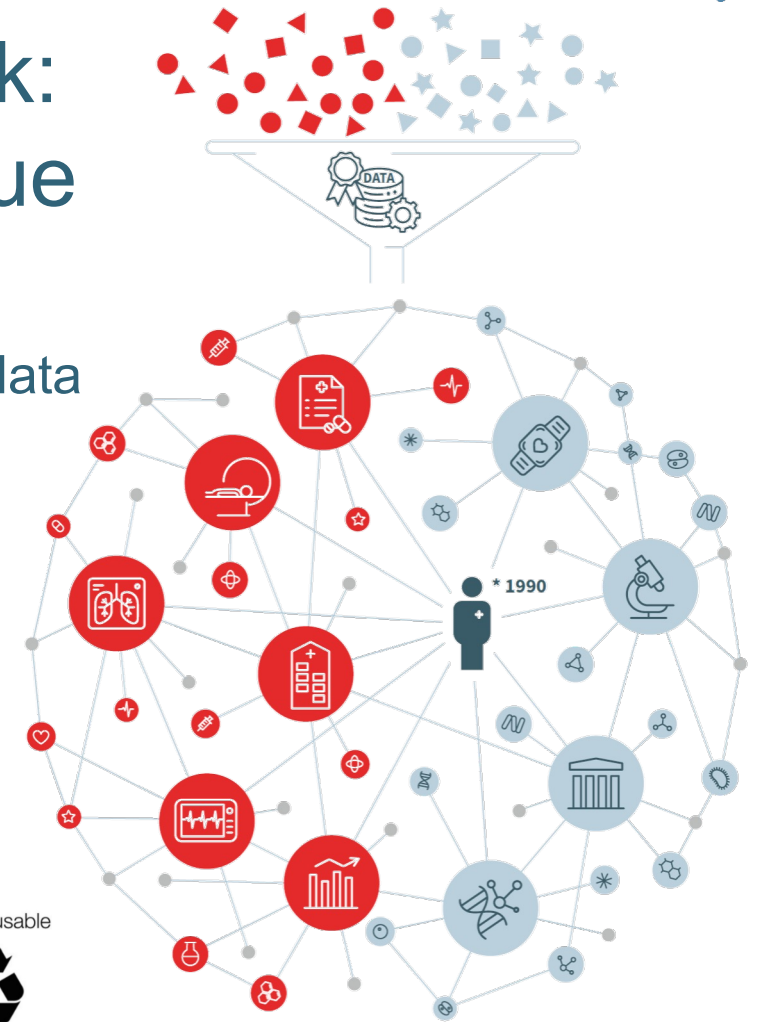
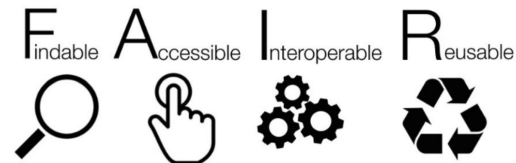
Language for knowledge representation

- **Semantic Web** (RDF Schema)

Quality control framework

- **Semantic Web** (SHACL, SPARQL)

→ FAIR research data



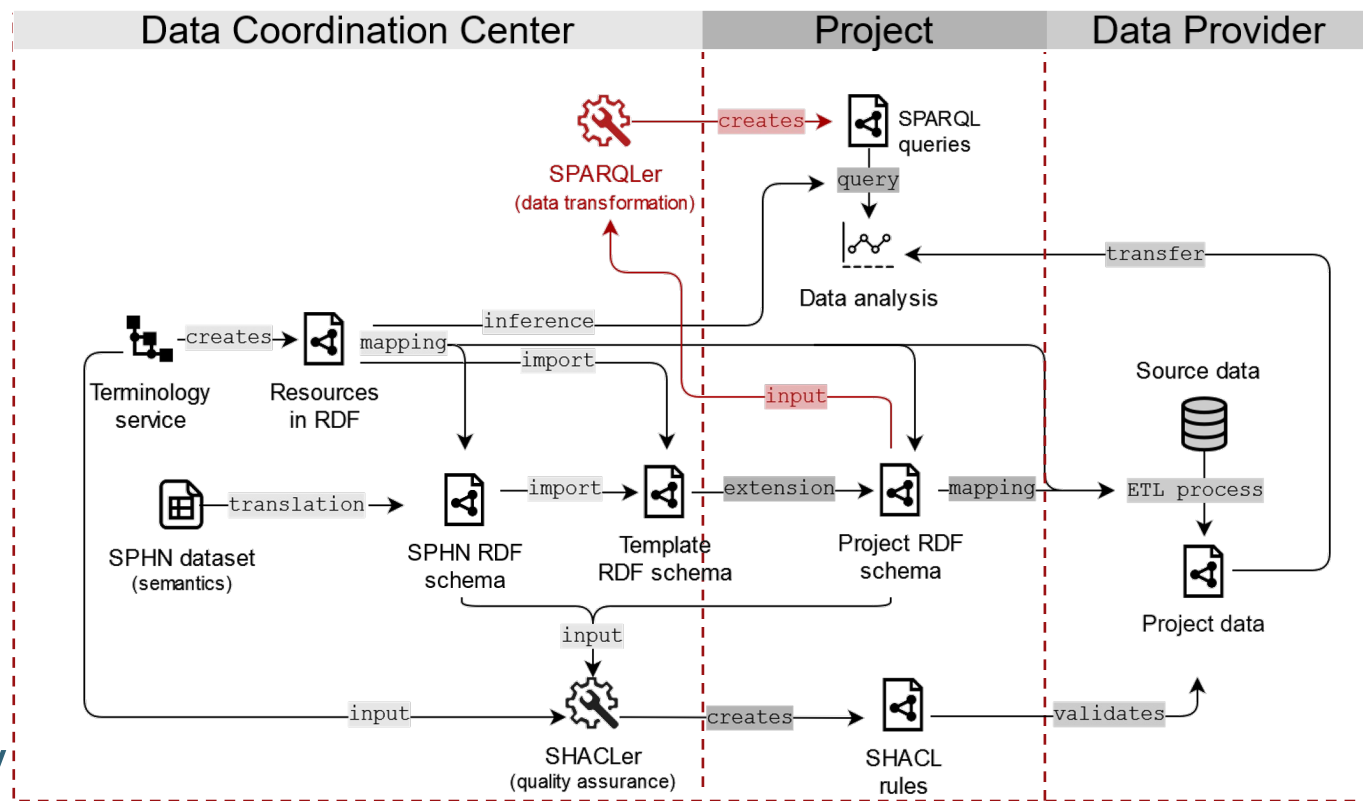
The SPHN ecosystem towards FAIR data

DCC Infrastructure components and services:

- SPHN Dataset (>80 concepts)
- SPHN Data Schema (RDF)
- Templates and guidelines
- Terminology Service
- Quality Assurance Framework

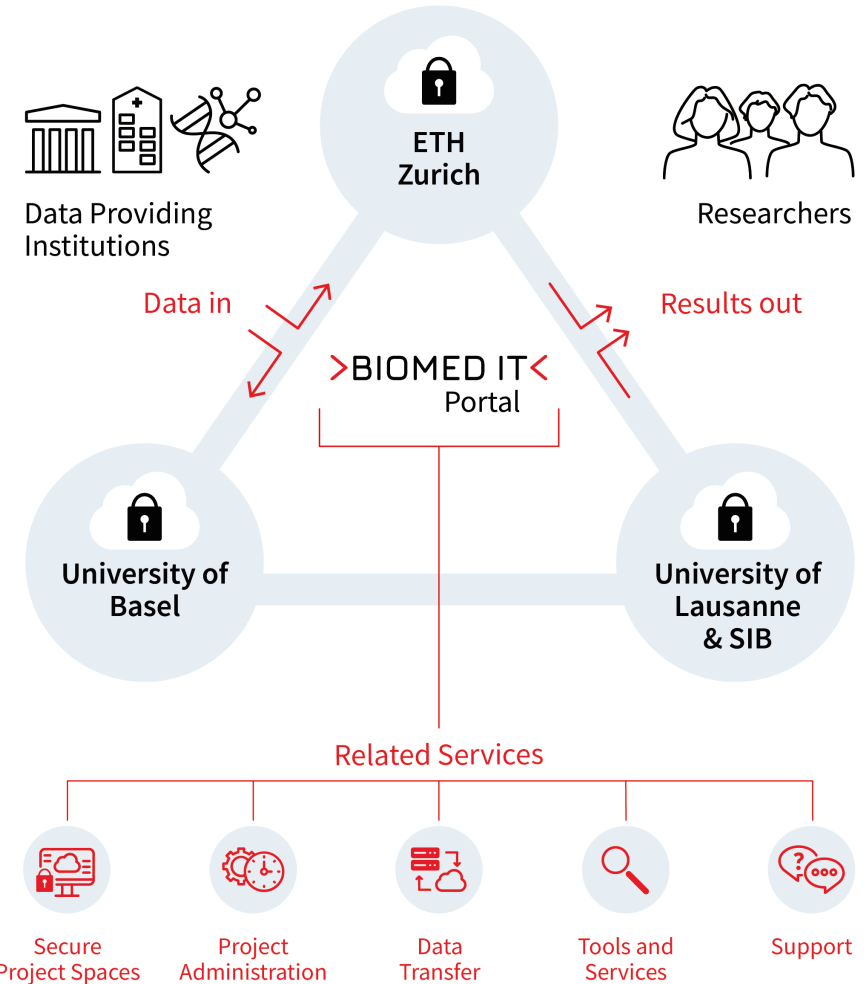
In coll. with IT Architecture WG:

- SPHN Connector
- Research Core Data Repository



The BioMedIT network

- Switzerland’s secure IT environment for research using sensitive data
- Allows for the mobilization, processing and storage of health data
- End-to-end encrypted data transfers
- > 60 local, national and international projects
- 28 data providers on-boarded, > 340 users



ETH zürich

Unil

UNIL | Université de Lausanne

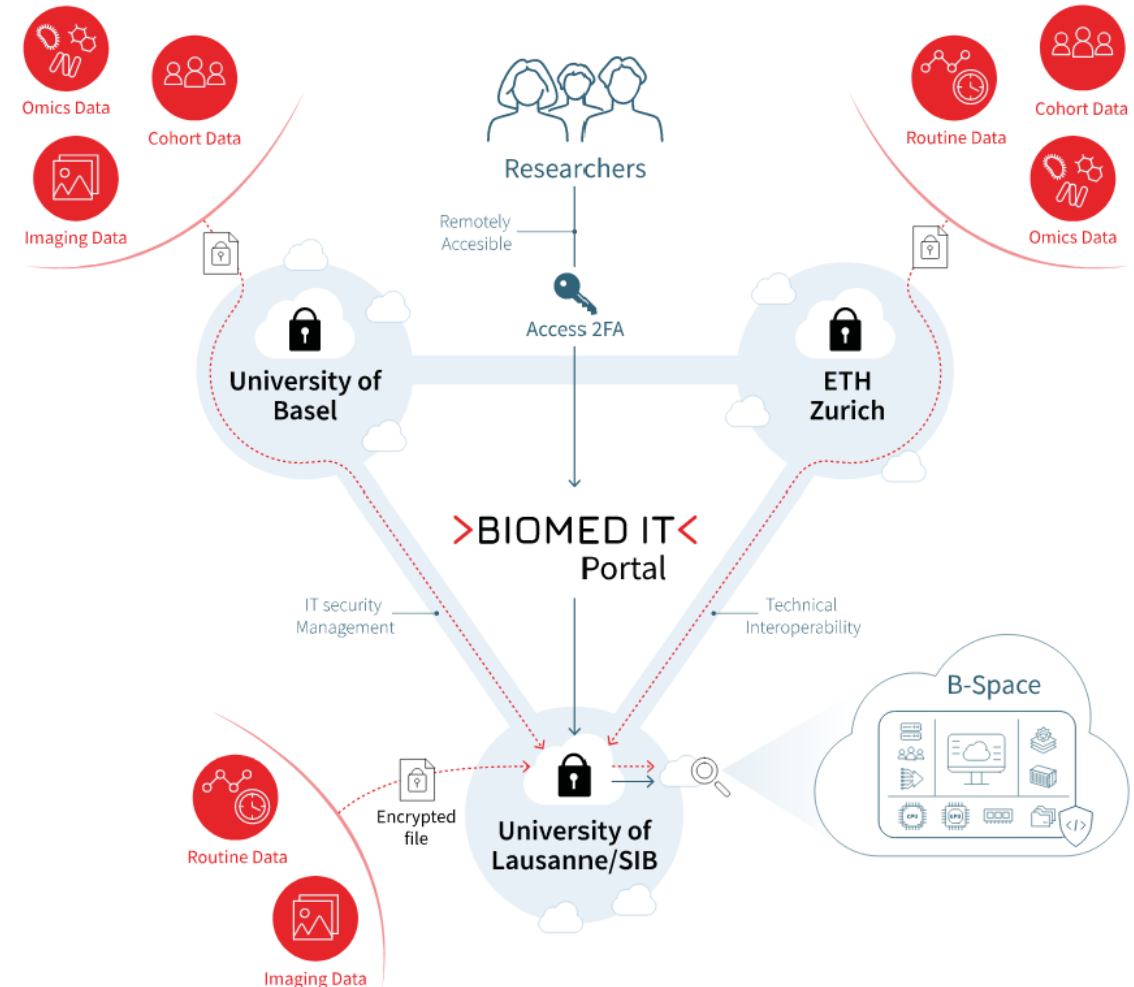


Swiss Institute of Bioinformatics

BioMedIT: Secure IT environment for sensitive data

BioMedIT Nodes

sciCORE	SENSA	SIS
<p>Universität Basel</p>	<p>UNIL Université de Lausanne Swiss Institute of Bioinformatics</p>	<p>ETH zürich</p>
<p>OpenStack 1.0 PB Storage Compute Capacity: •500 CPUs •8 GPUs •5 TB RAM HPC Scheduler: SLURM File System: CEPH, GlusterFS</p>	<p>OpenStack 400TB Storage Compute Capacity: •800 CPUs •6 GPUs •3 TB RAM HPC Scheduler: SLURM File System: Weka, CEPH, Scality</p>	<p>OpenStack 2.0 PB Storage Compute Capacity: •4400 CPUs •424 GPUs •41 TB RAM HPC Scheduler: SLURM File System: Luster file storage</p>



Acknowledgements

The PHI Group:

Owen Appleton, Jan Armida, Katrin Cramer, Patricia Fernandez Pinilla, Kristin Gnodtke, Simone Guzzi, Petar Horki, Shubham Kapoor, Julia Maurer, Michael Müller-Breckenridge, Sabine Österle, Christian Ribeaud, Vasundra Touré, Deepak Unni

Urs Frey, President SPHN

The **SPHN NSB** and **NAB**, **Task Forces** & **WGs**

The **BioMedIT Board** and **workforces** @ ETHZ, Unibas, Unil/SIB; **SIB Management**

The **Hospital workforces** @ USZ, USB, CHUV, Insel, HUG

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