

WORKING TOGETHER WITH SURF FOR EARTH OBSERVATION

ITC Big Geodata Talks (7 July 2021)



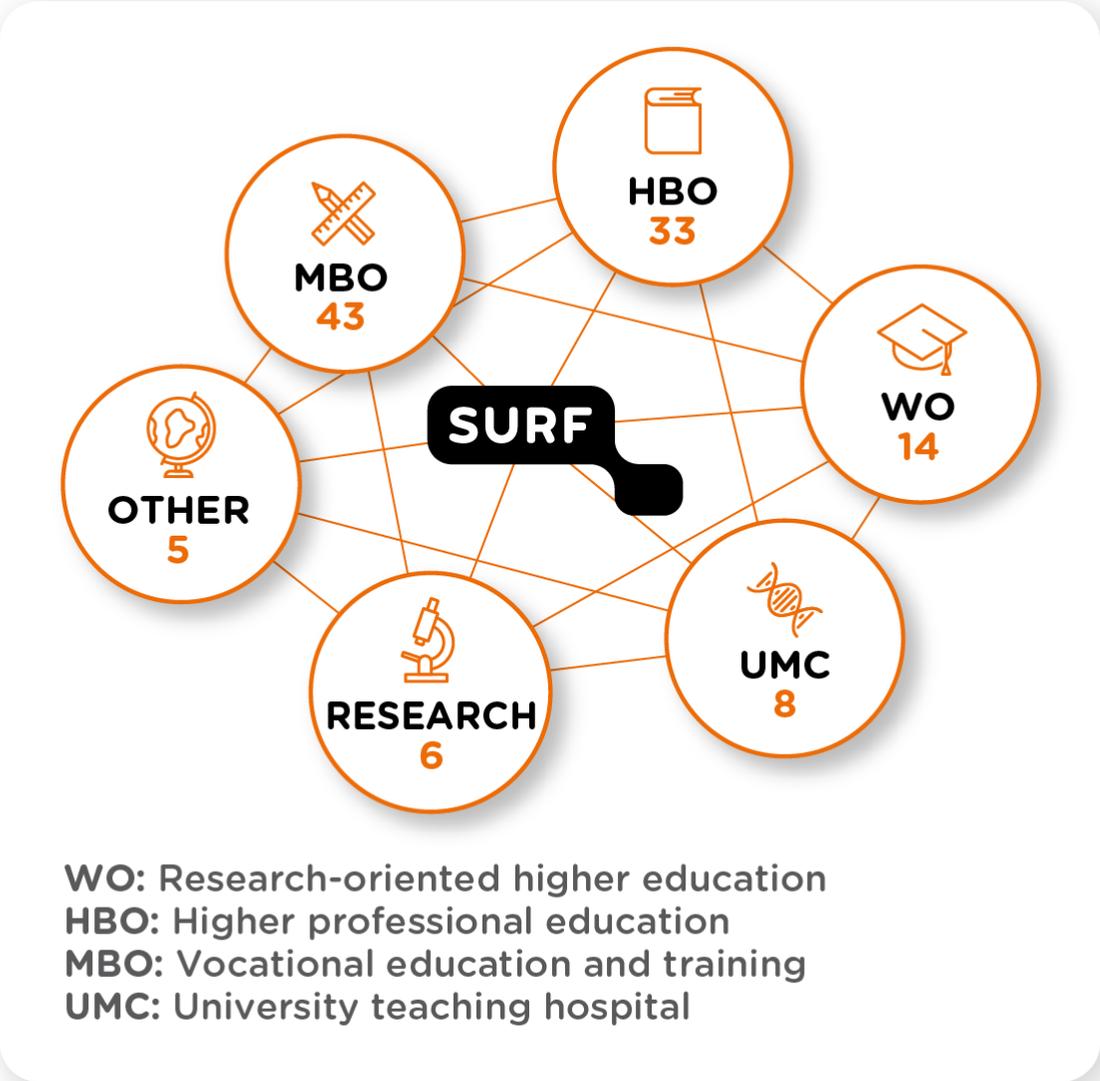
SURF

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We are SURF



SURF fields of work



Cooperative ICT facilities



Education



Research

Cooperative ICT Facilities

How do you offer the users of your institution the best ICT solutions? The SURF network provides a reliable and fast Internet connection, as well as access to all kinds of other ICT services for education and research. And all this is safe and privacy proof. See below how we can help you.



Network
infrastructure →



Data and server
services →



Security and
privacy →



Trust and identity →



Joint
procurement →



Sustainability and
CSR →

SURF

Education & ICT

Innovate education with ICT and benefit from the knowledge, experiences and services that SURF is building up together with education institutions. Learn more on our Dutch website.



Organising flexible education →



Digital learning environment →



Digital learning materials →



Digital testing →



Online and blended education →



Learning analytics →

SURF

Research & ICT

For your research, use computing power, superfast data transport, data management and analysis, and the expertise of SURF. For top-level research and innovation. Select one of our fields of expertise below.



Compute services



Data storage and management



Data processing and analysis



Open science



Apply for compute access



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SURF Research Building Blocks



HIGH-END COMPUTE SERVICES: High-end computing solutions, in different flavors



CUSTOM SERVICES & ANALYSIS: Process, analyse, or visualise complex research data or big data



DATA STORAGE & MANAGEMENT: Easily accessible storage on disk or tape, data management advice



TRUST & IDENTITY Secure & trusted access to many services with federated identity management



CONNECTIVITY: Fast end-to-end connections tailored to your data sharing research needs



Cloud & Market:

Collective procurement



SURF Open Innovation Labs:

Quantum computing, IoT and others



Knowledge sharing & consultancy

SURF provides access to all kinds of ICT infrastructure and services needed for **top-level research and innovation.**

In the next use cases we will discuss some building blocks in more detail and provide links to the relevant web pages.

Customised services : What solution, framework or cloud is best suited for my research project?

Custom Cloud Solutions

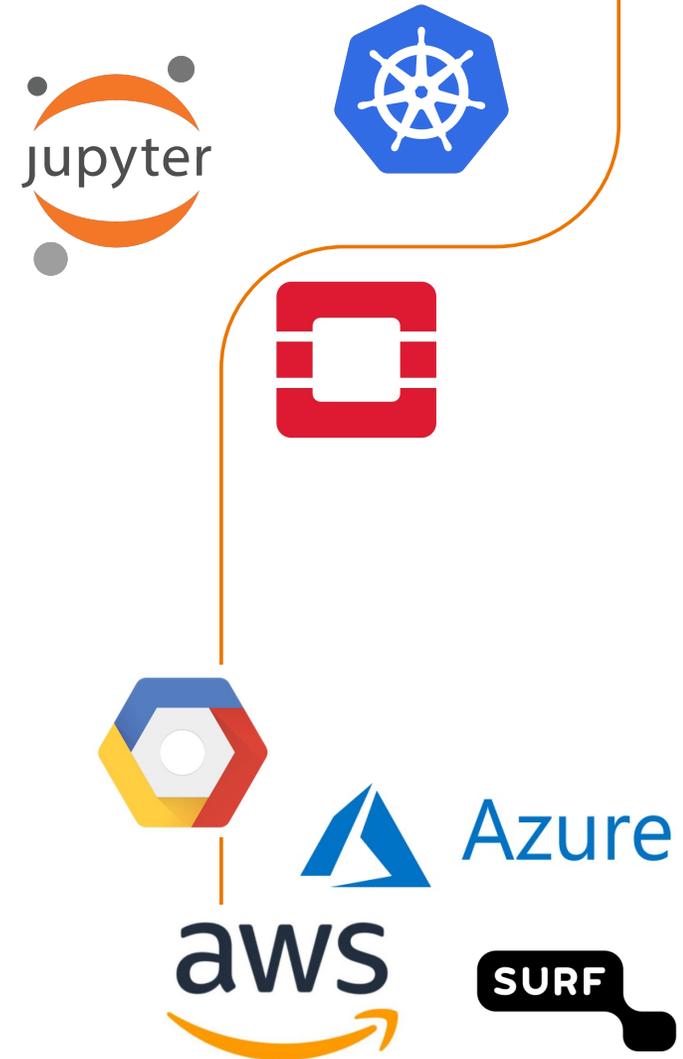
- [Tailor made, cloud based solutions](#)
- Scalable, cloud native, hybrid (combination public/private cloud)
- Consultancy and co-creation

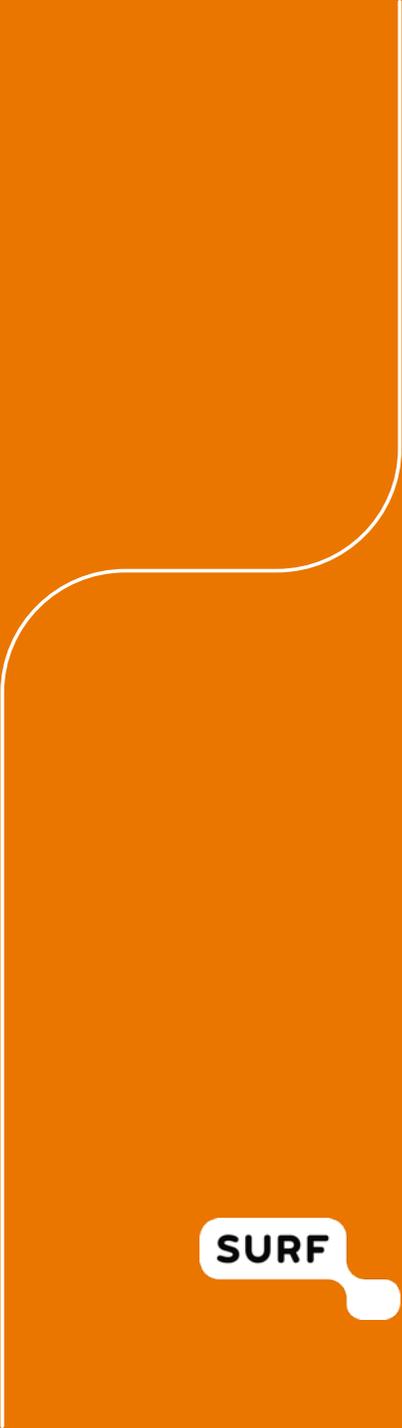
Visualisation Service

- [High end visualisation](#) of your data

Artificial intelligence and machine learning expertise

- [for research and education](#)





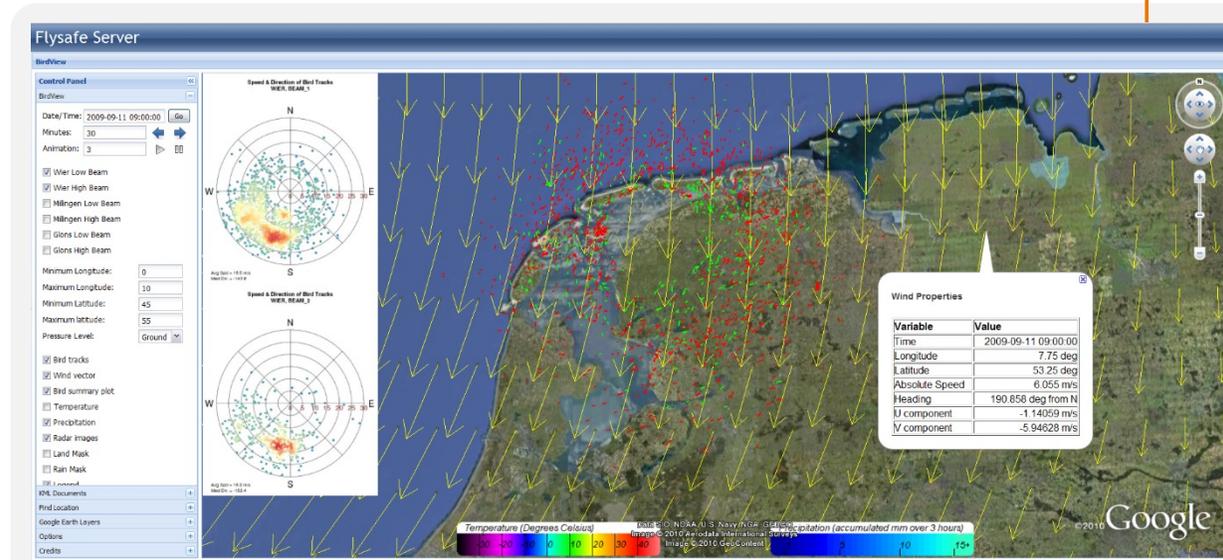
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Co-creation use case e-Ecology Bird migration research

Challenge

Scientists from all over the world want to collect, explain and predict birds' individual behaviour in relation to the local environmental conditions at a given time

Partners



UvA-BiTS: Virtual lab for Bird Movement Modelling



Remote System Control



Wiki & Manual



Dashboard

SURF contributes

- Expertise!
- Infrastructure development and related operations
- Visualisation applications



Tracker Calendar



Database



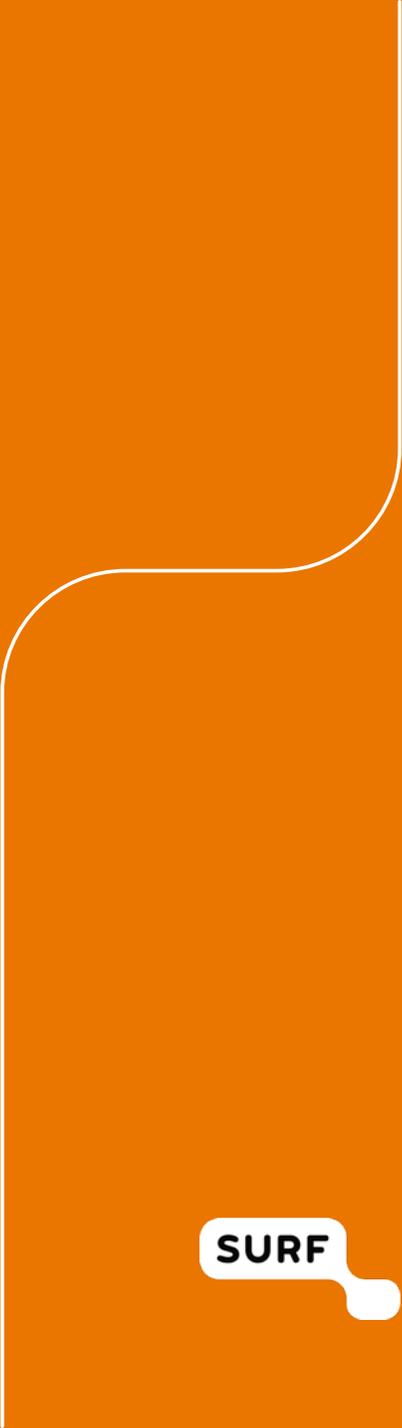
KMZ Generator



Flight Generator



BirdView



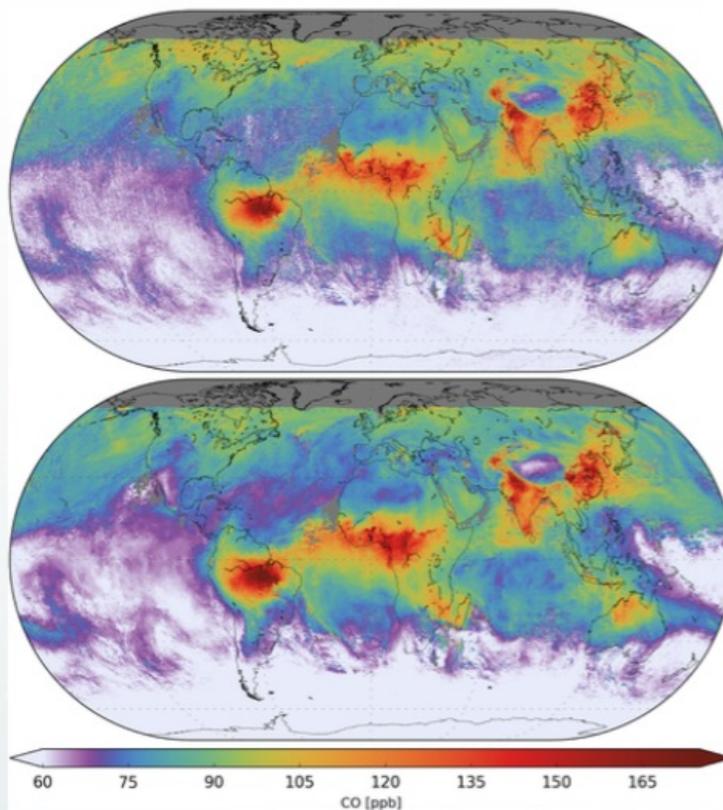
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SRON and SURF collaborate on the scientific interpretation of the data by processing of incoming daily Sentinel-5P data and additional reprocessing

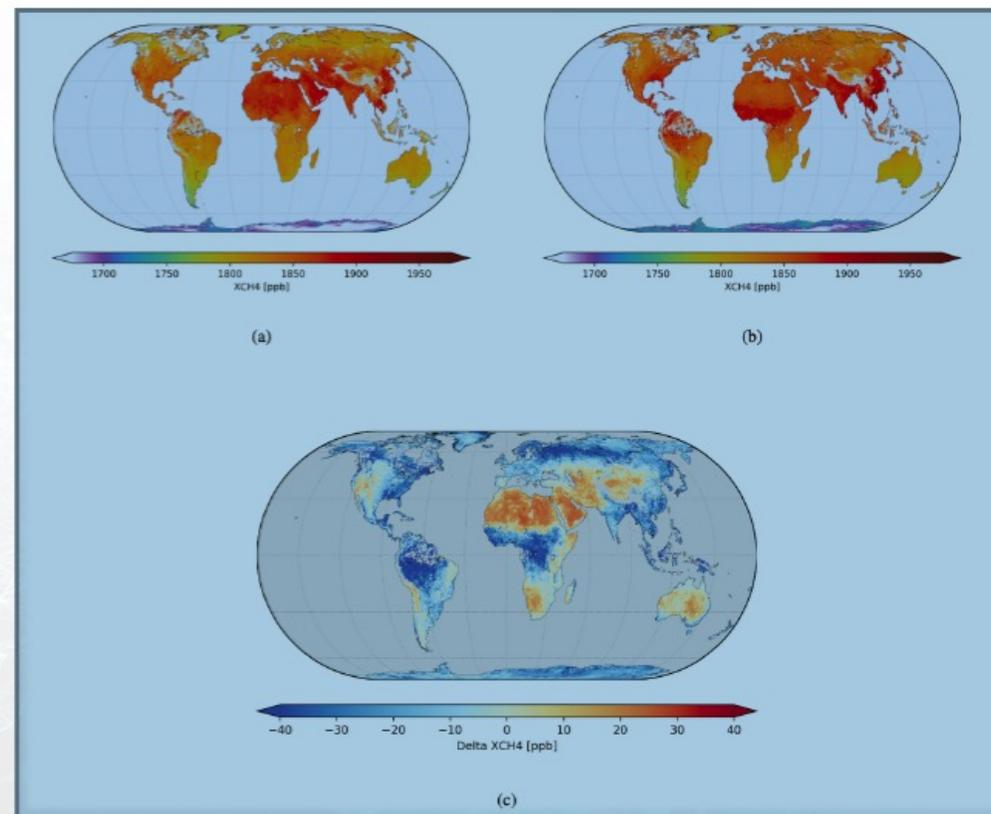
Extension of ESA products and extraction of as much scientific information as possible

Calibration and further refinement of numerical models and algorithms

Feedback to ESA proposing changes to the standardised data-processing algorithms



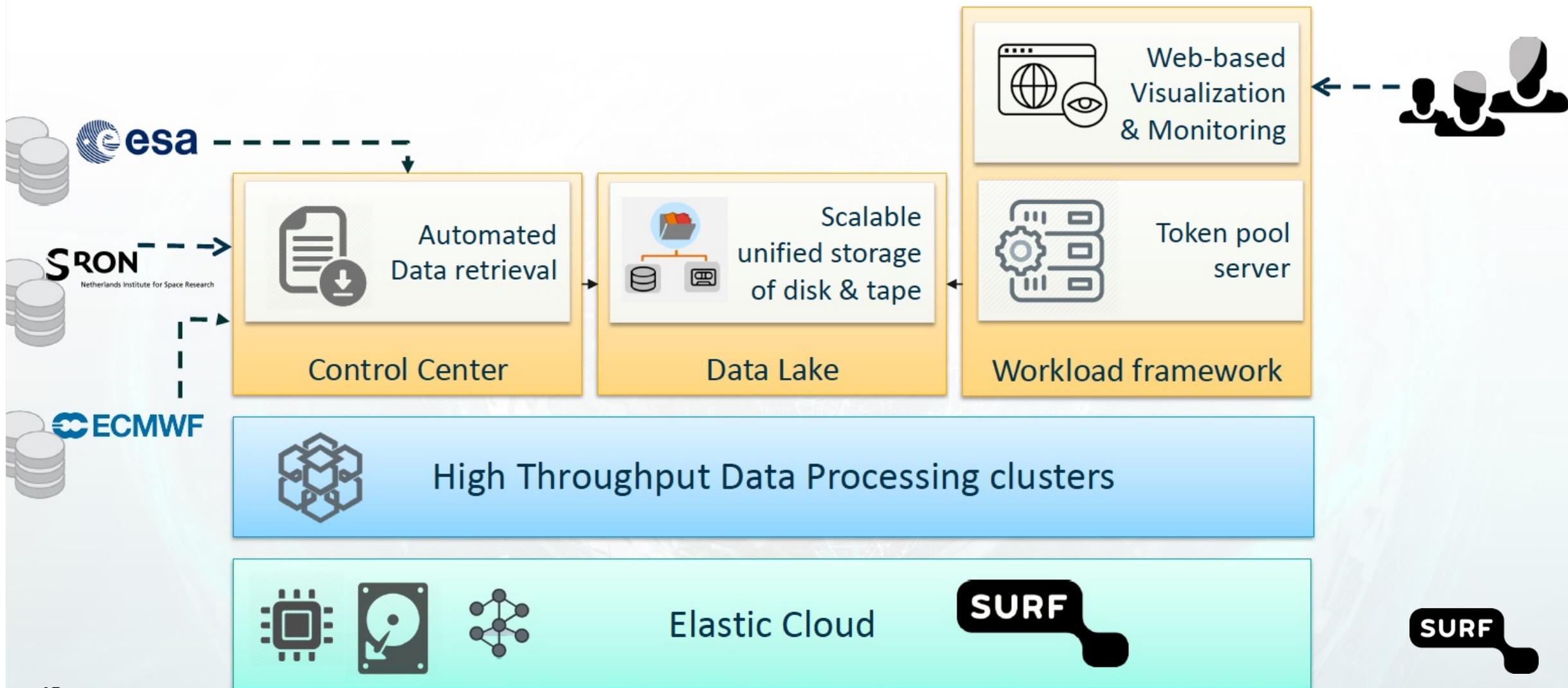
T. Borsdorff et al.: *Measuring Carbon Monoxide With TROPOMI: First Results and a Comparison With ECMWF-IFS Analysis Data, 2018*



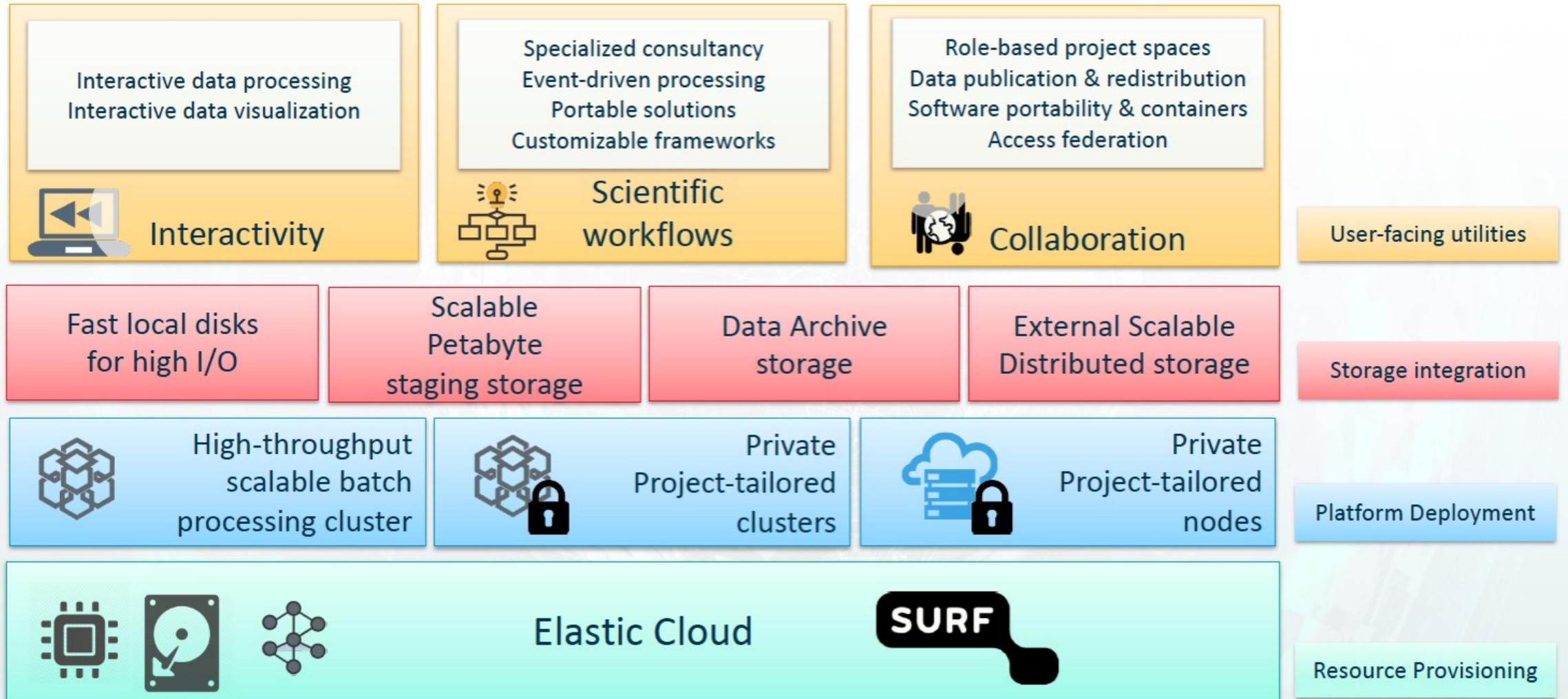
A. Lorente et al.: *Methane retrieved from TROPOMI: improvement of the data product and validation of the first two years of measurements, 2020*

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Tropomi processing framework



Development and service delivery model



Benefits of dynamic data-processing platforms for Open Science communities

Processing sheer volumes of satellite data to extract useful science

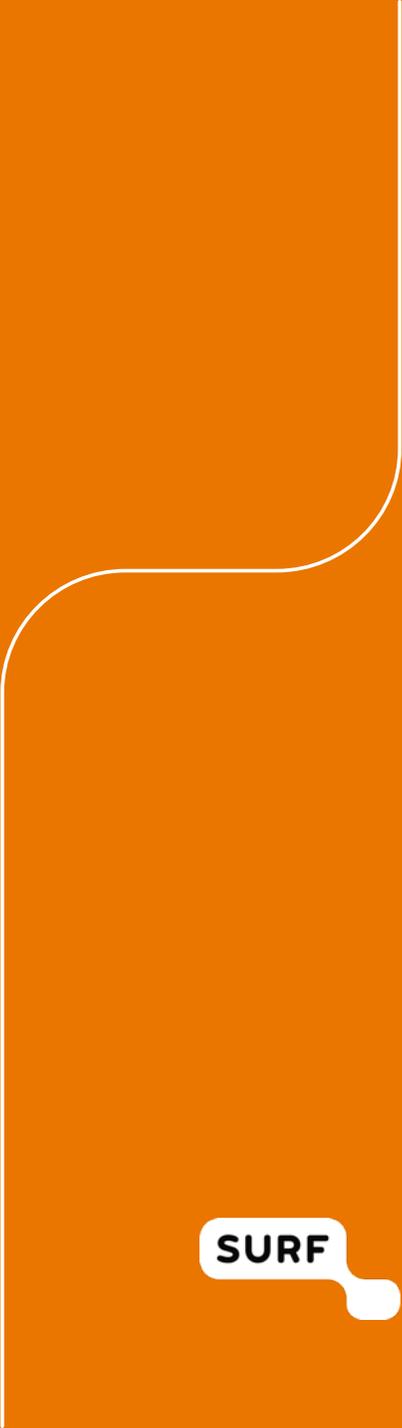
Scaling up easily & delivering solutions quickly on reliable infrastructures

Standardise solutions with APIs and industry standard protocols

Sustainable research with lower maintenance cost

Open access, open data, open software without sacrificing performance & traceability

Increase science output and reproducibility



SURF

KNMI (I)

- Project-based research groups, migrating to Research Cloud

The image shows a screenshot of the SURF Research Cloud interface. At the top right, the logo 'SURF Research Cloud' is visible. Below it, there are icons for a group of people and a building. A window titled 'My Workspace' is open, containing three columns: 'Application', 'Dataset', and 'Cloud solution'. Each column has a list of items with checkboxes and a vertical slider on the right. The 'Application' column has 10 items, with the first and fourth checked. The 'Dataset' column has 10 items, with the second and third checked. The 'Cloud solution' column has 6 items, with the second checked. Some items in the 'Cloud solution' column have small icons of flags (Germany, Italy) and a link icon. A mouse cursor is pointing at the close button of the 'My Workspace' window.

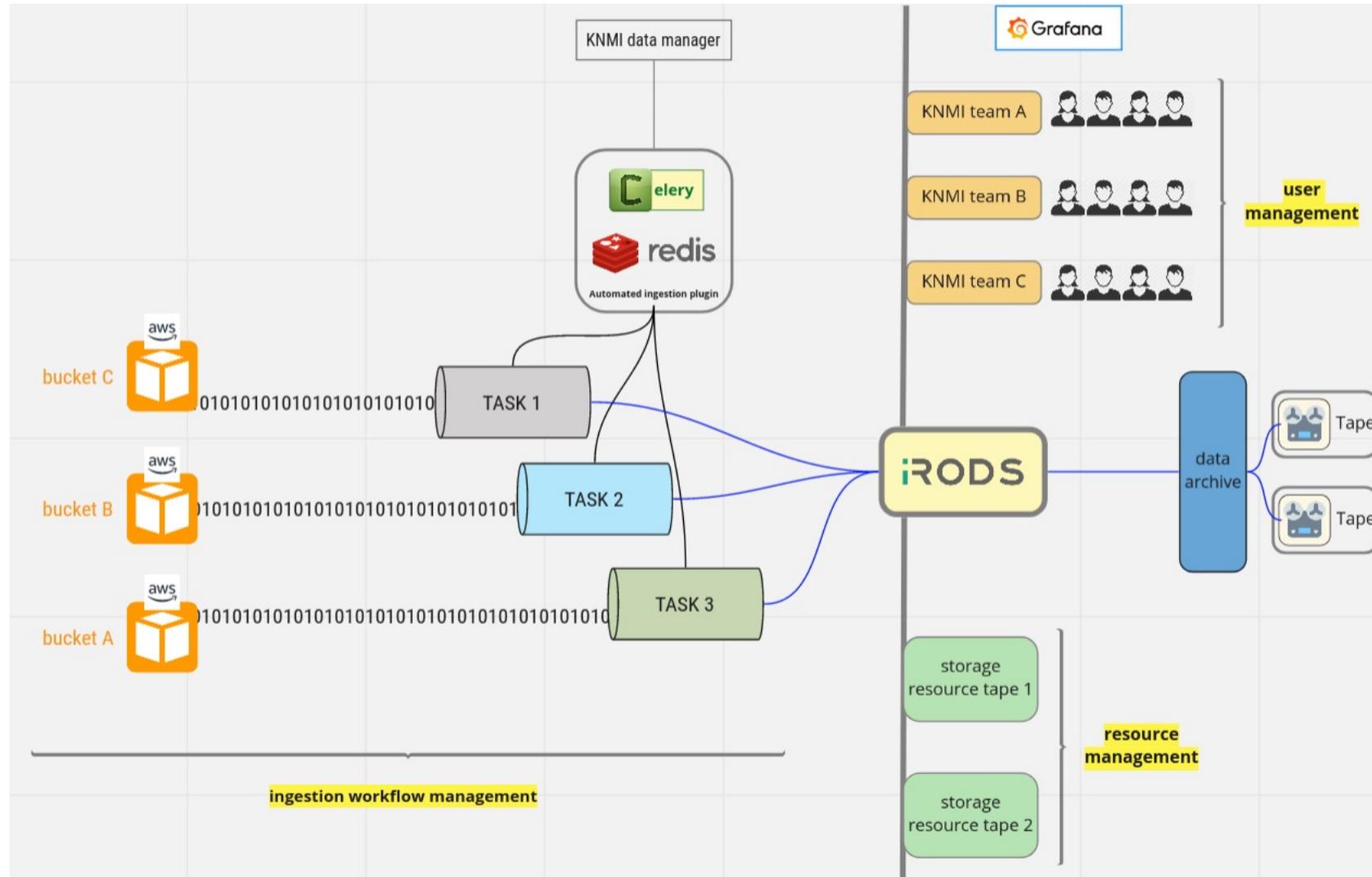
KNMI (II)

- Migrating from on-premise archive to SURF Data Archive
- Physical cartridges
- 6 PB

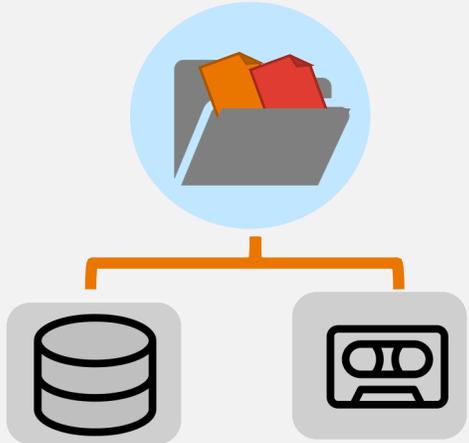


KNMI (and III)

- Ingesting S3 buckets



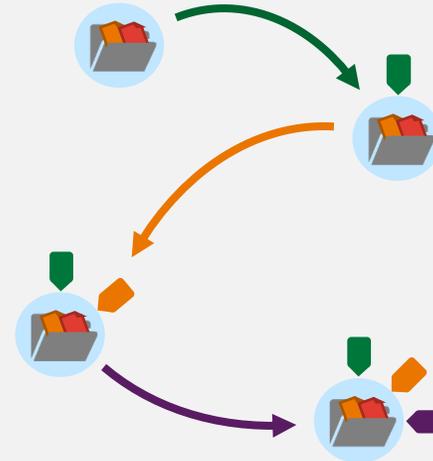
What is iRODS?



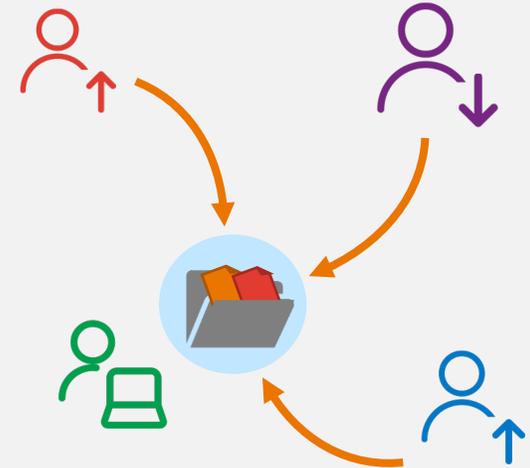
Unified storage of disk and tape



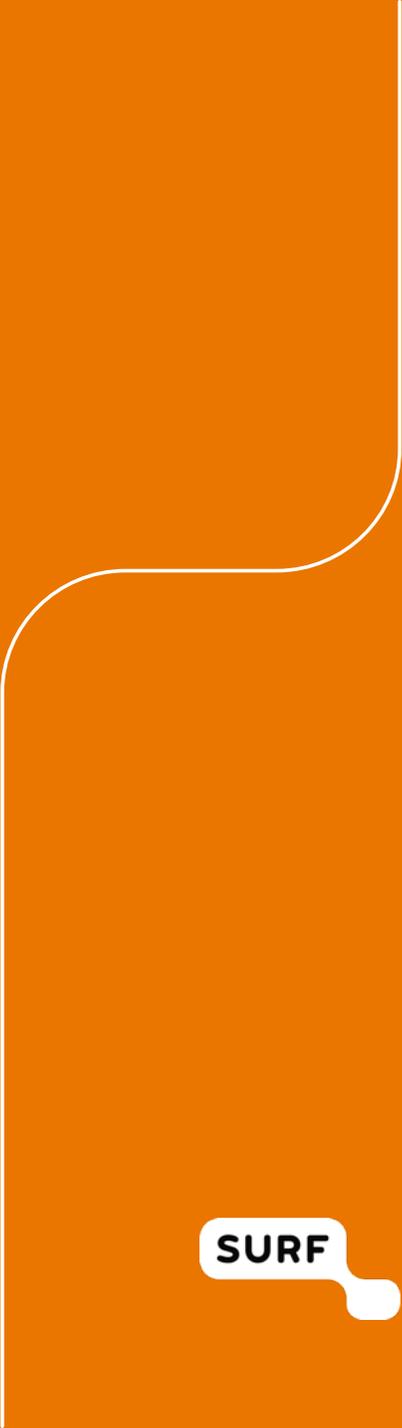
Metadata for data discovery



Rule engine to automate policies



Secure collaboration and auditing



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SURF is more... than just big systems



Consultancy



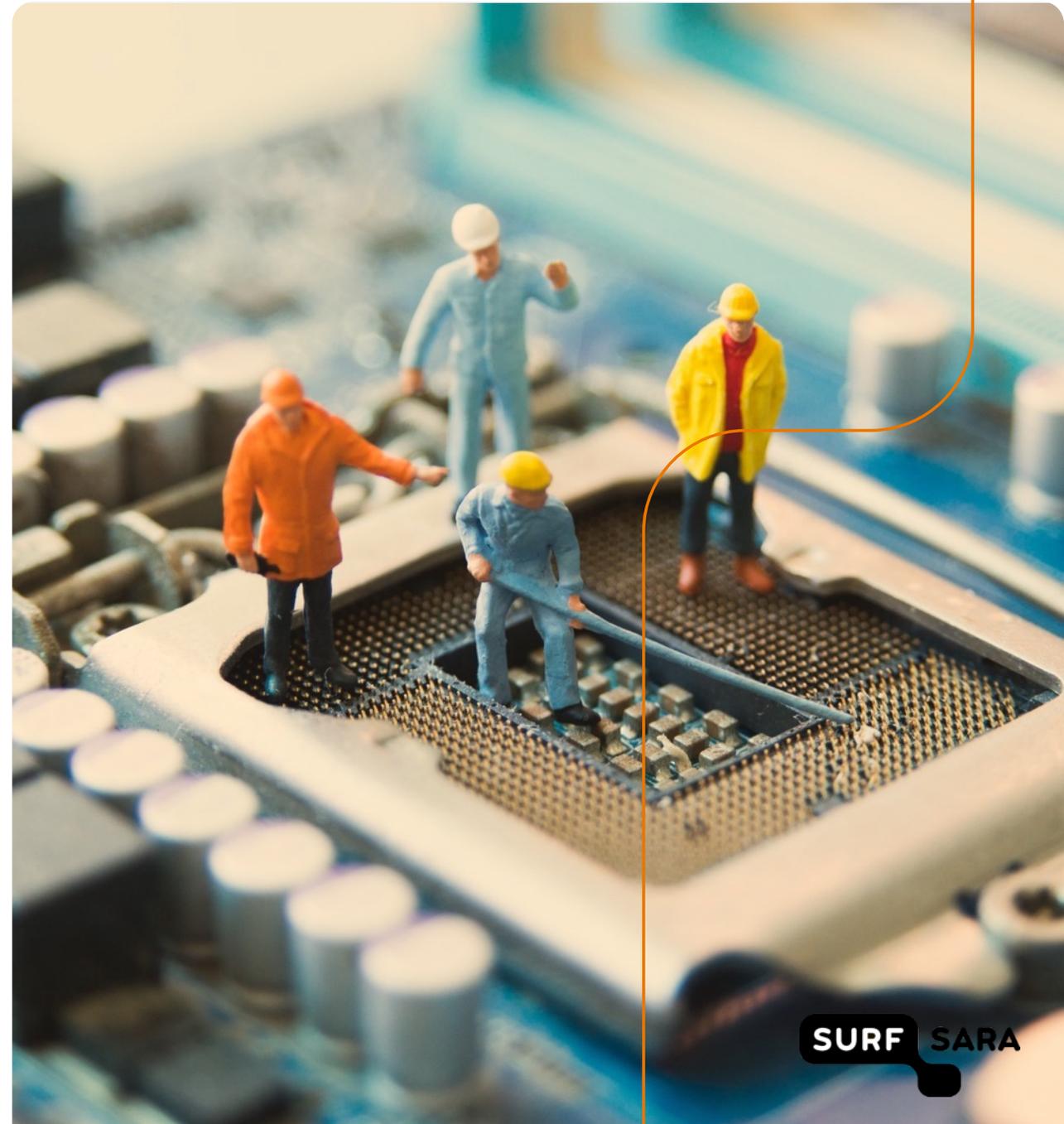
Training



Innovation



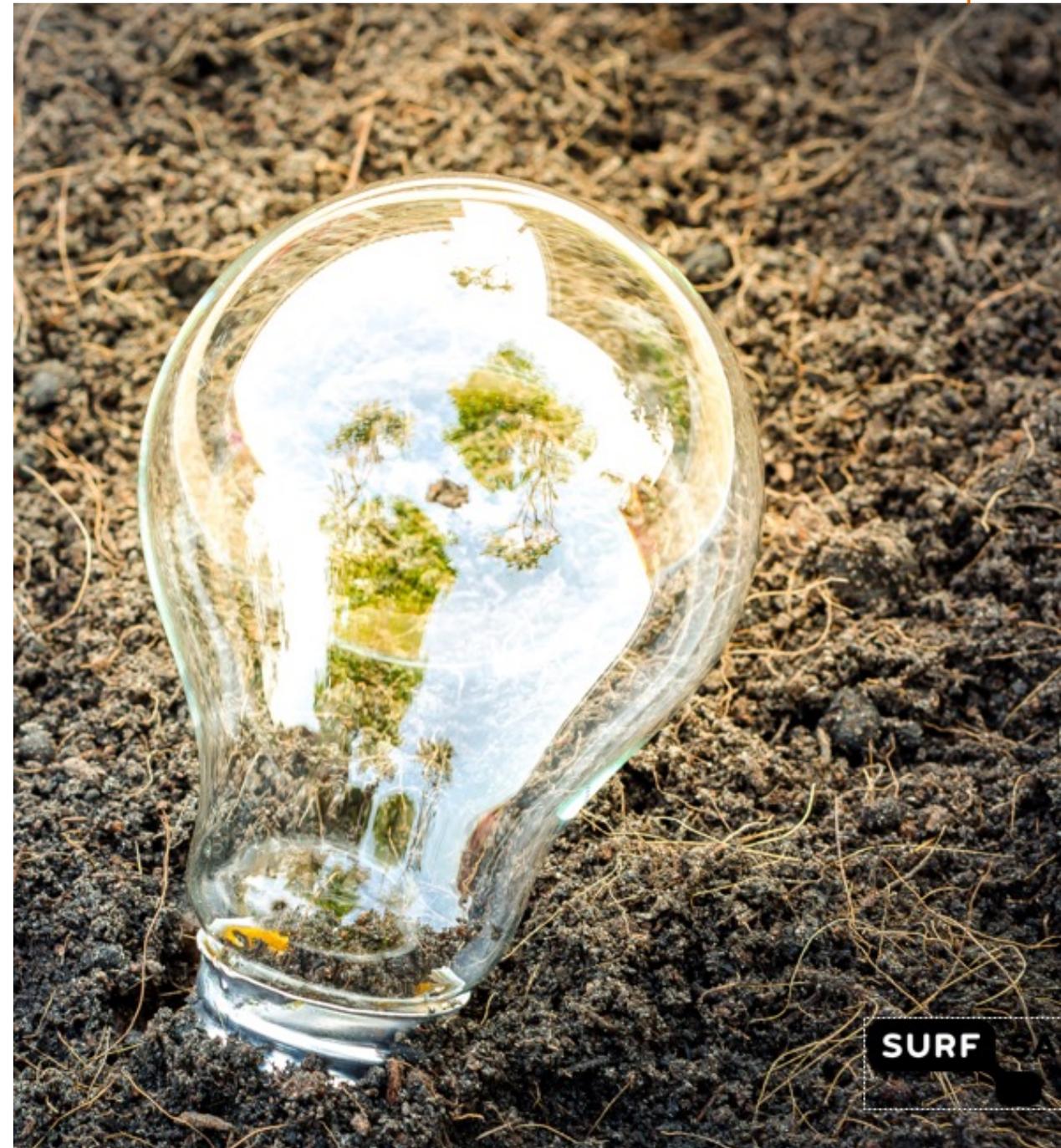
Knowledge Exchange



SURF Open Innovation Lab (SOIL)

- eXploRing VR, AR and MR
- 3D printing for scientific visualisation (finished)
- Machine learning enhanced HPC applications
- Scalable deep learning
- Quantum computing
- Trusted Data Exchange
- Scalable internet-of-things-platform (finished)
- Serverless computing
- Energy Efficient Computing
- Technology assessments processors & components

<https://www.surf.nl/en/the-surf-cooperative/surf-open-innovation-lab>



SURF Training, Knowledge exchange



1st edition
13/14/15
04-2021

FAST FORWARD

SCIENCE AND TECHNOLOGY



Training

Introduction to SURF Research Cloud

Do you want to create and manage your own work environment and run powerful applications on it? The SURF Research Cloud is a gateway that opens the door to cloud computing on several platforms. During this training, your workload will run on the SURF HPC Cloud platform, located in Amsterdam.



Sign up

07 Jul 2021

Sign up

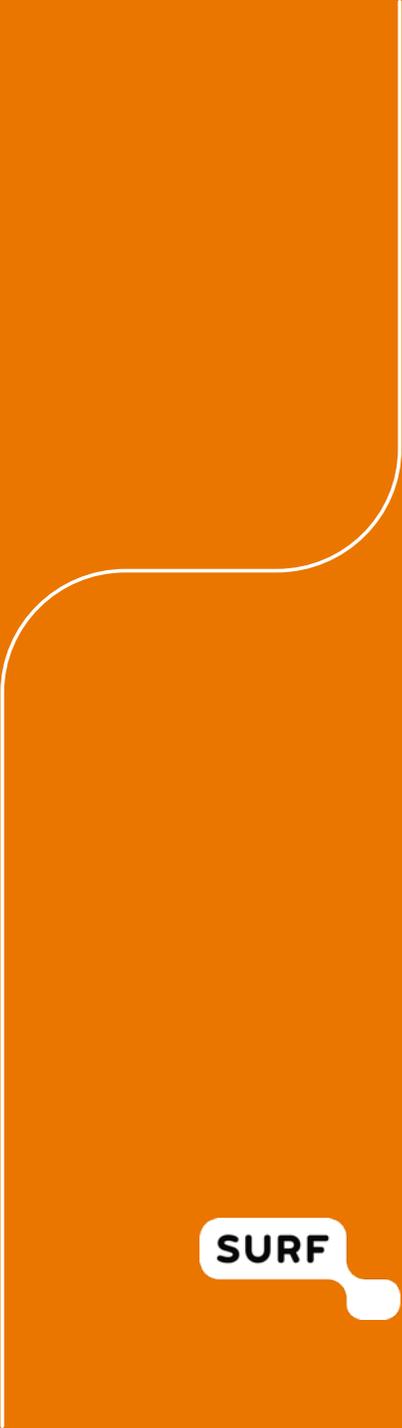
9:00-12:00

Online

Event type
Training

Prerequisite knowledge
No prior knowledge required

Costs
Free



SURF

Common challenges in Earth Observation research

Data management

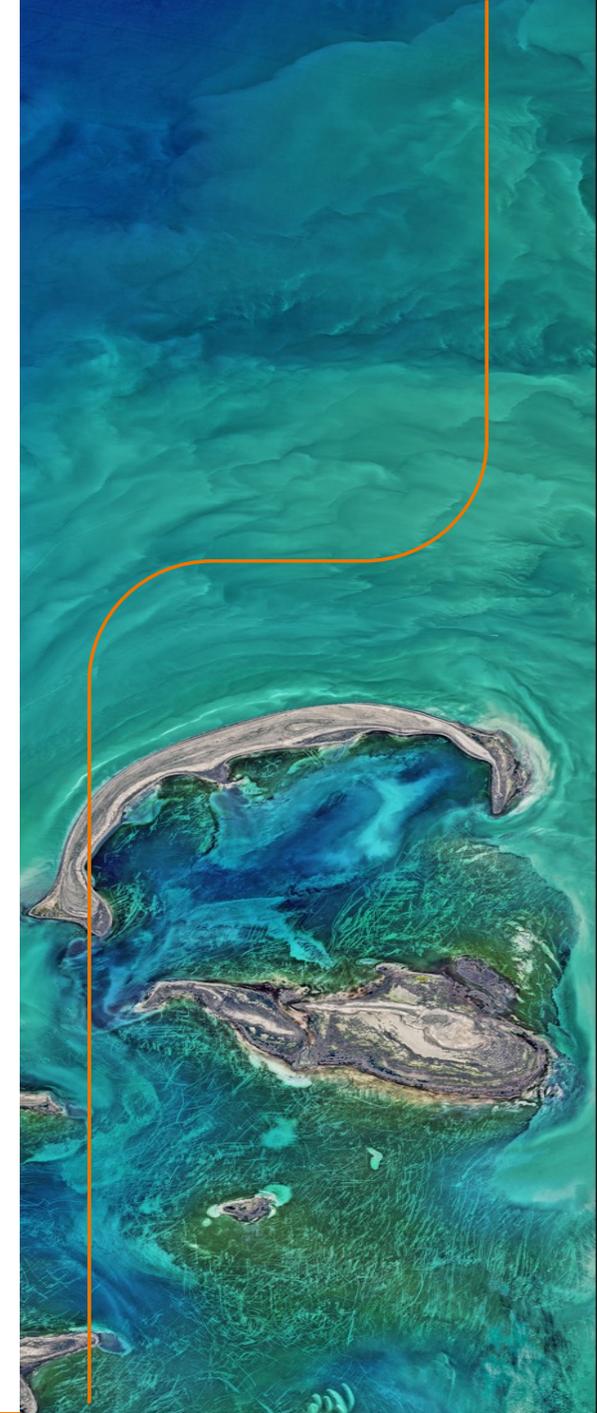
- Storage
- Access to long time series
- Bulk data retrieval
- Lots of data replication

Data processing

- Expertise for scaling
- Resources for on-demand re-processing
- Few options for interactive analysis & visualisation

Collaboration

- Sharing data, products and scientific workflows
- Integrate tools and packages to existing frameworks
- Portability over infrastructures
- Expensive access to large-scale cloud based platforms



SURF Earth Observation Focus group: Improve national support for EO research

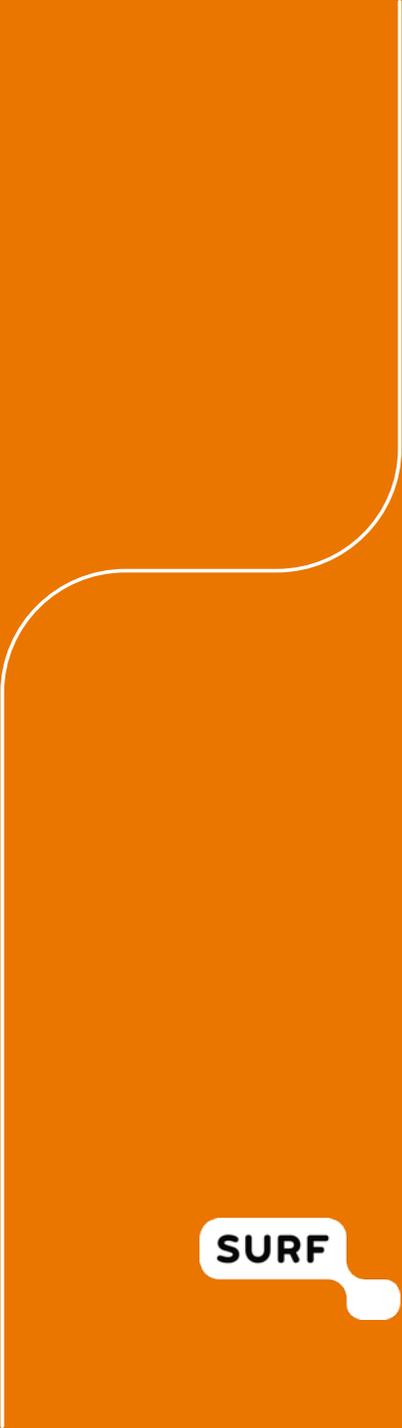
Think of:

- Make scientific EO data more FAIR (findable, accessible, interoperable, and reusable)?
- Facilitate access to (inter)national EO data?
- Collaboration with researchers in (inter)national projects (e.g., Horizon Europe, Digital Europe, EOSC)?
- Community building, knowledge exchange?
- Organise trainings for young EO researchers in (high performance) IT?

Currently: Stakeholder interviews

Ensure that SURF is aligned with the medium/long-term strategy for NL EO research



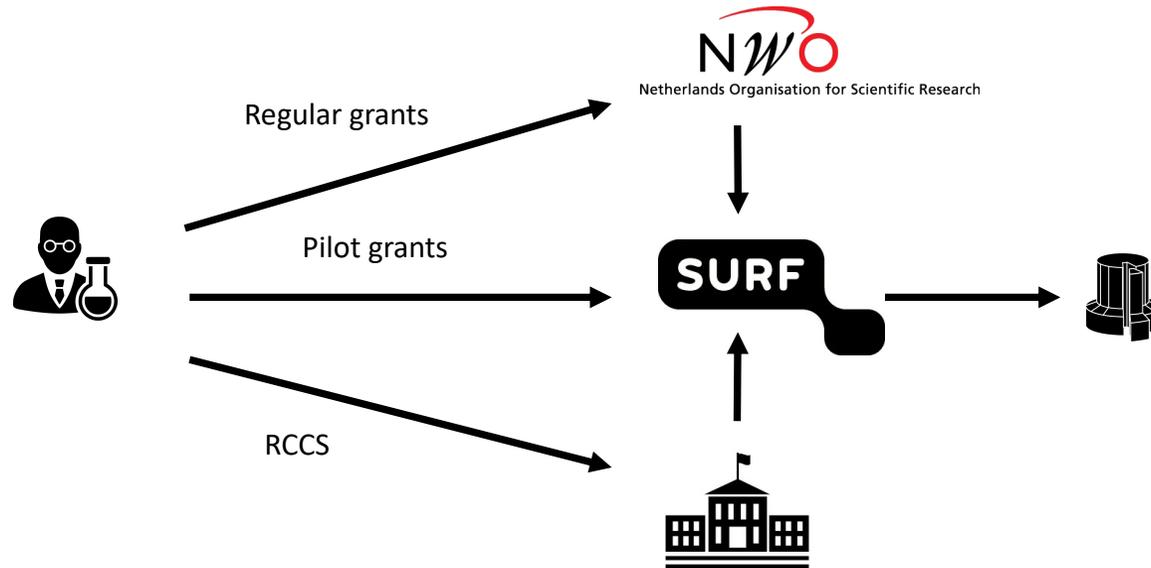


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Access Routes to Research (compute) Services

- [Regular Grants](#): Large scale* research projects need to apply via NWO.
- [Pilot Grants](#): To run a pilot project (1/year), you can apply for limited amounts of compute, storage and support directly via SURF.
- [Research Capacity Computing Service \(RCCS\)](#) Gives organisations direct access to SURF compute facilities on a contract basis.
- Tailor made contracts

***Large Scale Defined:**
+50,000 SBU on HPC Cloud and /or 2 TB online storage;
+100,000 SBU Custom Cloud Solutions and/or +2 TB online storage;
+100,000 SBU on cluster Lisa;
+500,000 SBU on Cartesius and/or +50 TB project space and/or more than 50 TB offline storage;
+500,000 SBU Data Processing (Spider and Grid) and/or more than 200 TB online storage and/or more than 300 TB offline storage.
SBU = System Billing Unit



There are a number of different **routes to get access** to the compute and data infrastructure...

On the entry level there are the **Pilot Grants**. If you need more you need to submit a **Regular Grant** application through NWO. Lastly, the **RCCS contract**, this option allows organisations to directly buy compute time and data infrastructure at SURF.



Examples tailor made contracts UTwente

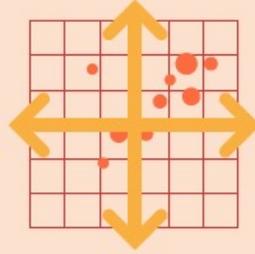
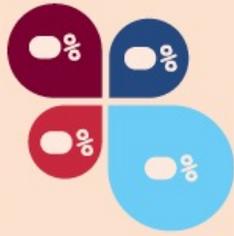
- **Data Archive**
Library, ICT Services and Archive (LISA)
- **Research Drive** (community version)
Faculty of Engineering Technology (ET)
- **RDM storage scale-out**
Faculty of Electrical Engineering, Mathematics and
Computer Science (EEMCS)
- **Trusted data Respository**
Design and Analysis of Communication Services (EEMCS)



[HTTPS://WWW.SURF.NL/EN/ABOUT-SURF/SERVICES-OFFERED-BY-SURF](https://www.surf.nl/en/about-surf/services-offered-by-surf)

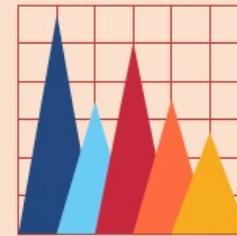
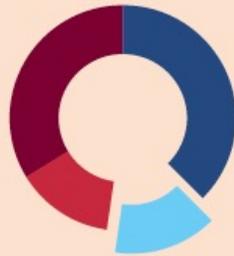
And... how do you handle Research Data?

SURF



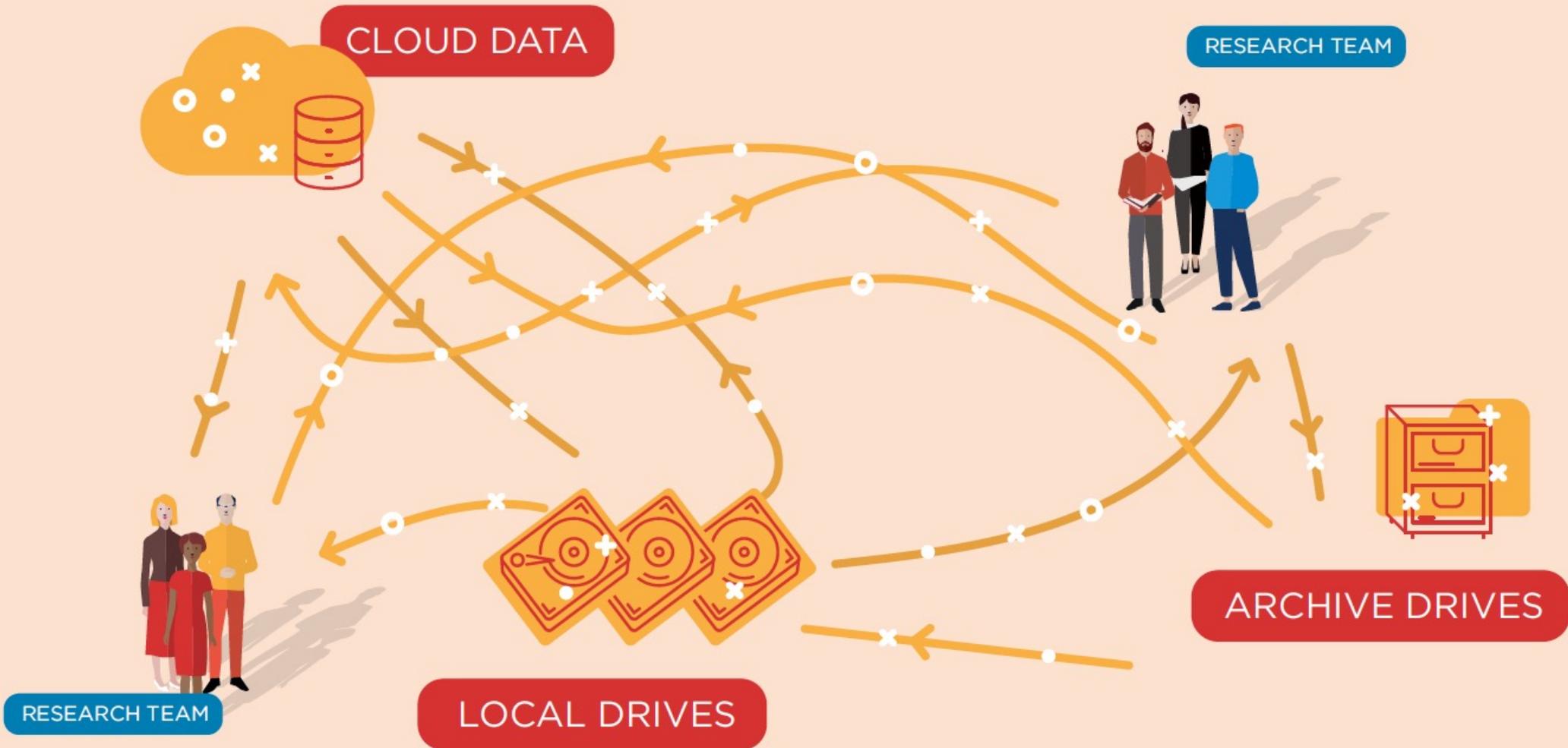
RESEARCHTEAMS

DATASETS



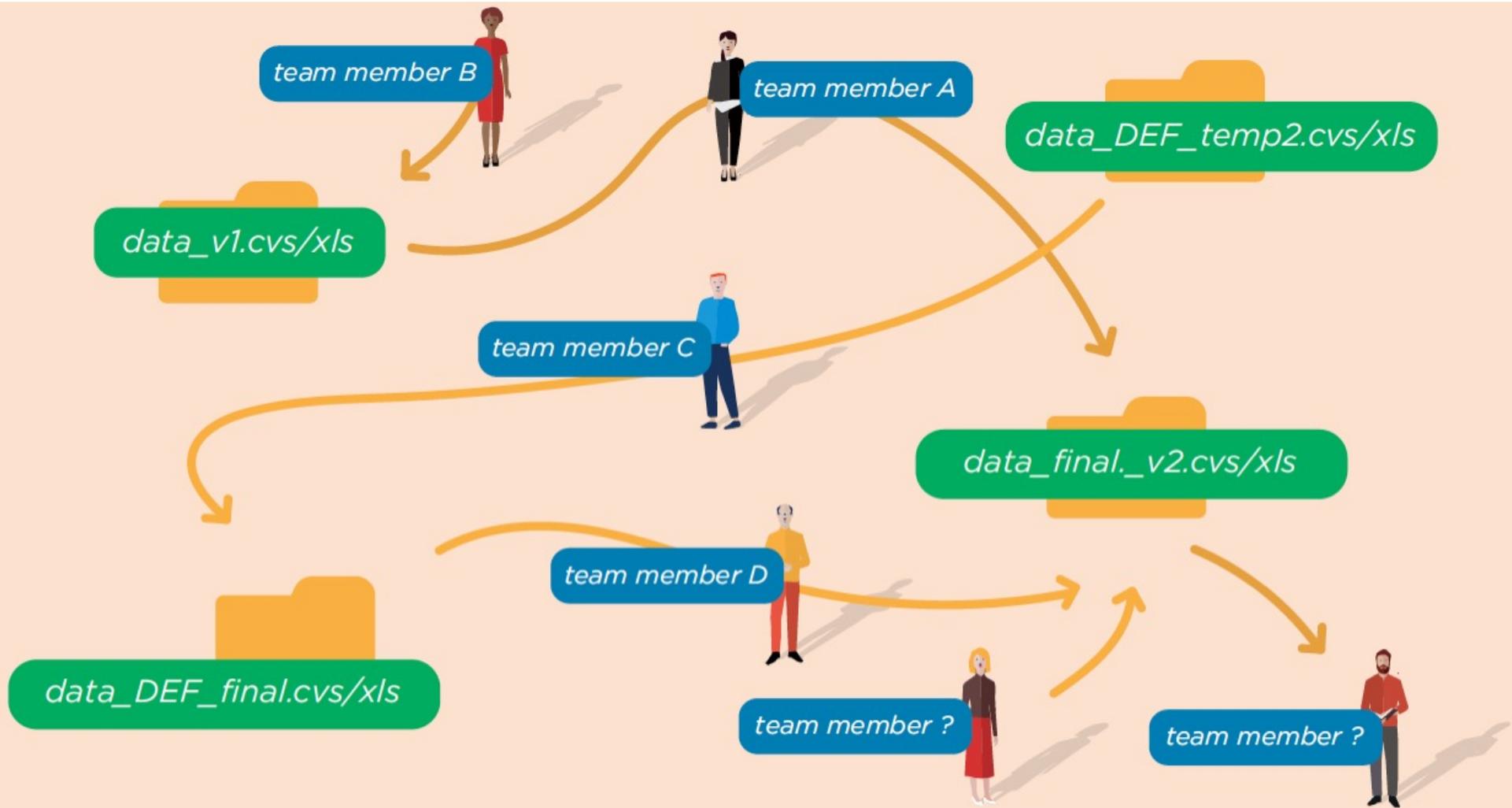
RESEARCH TEAMS WITH DATASETS





PROBLEM
DIFFICULTY SHARING DATA

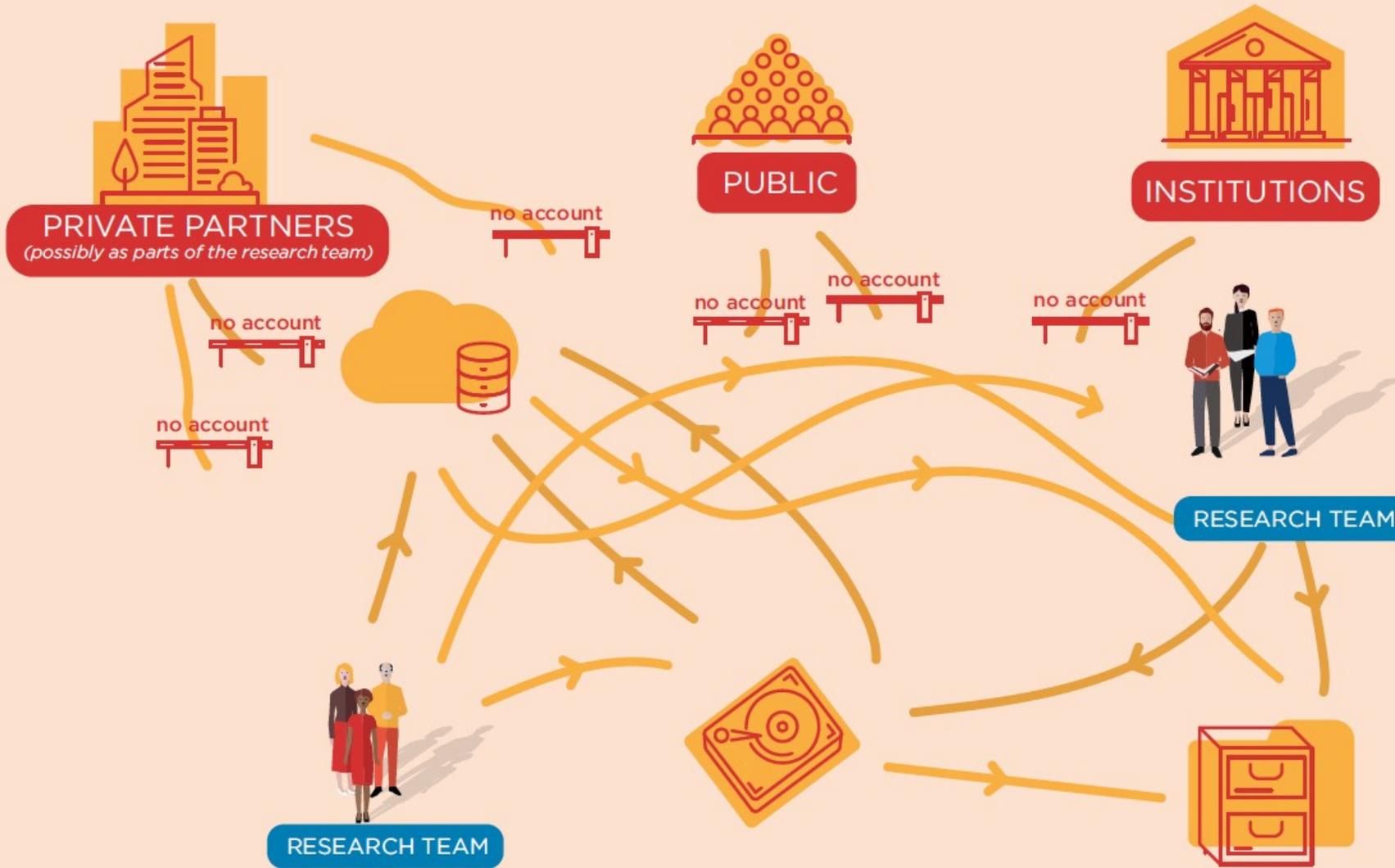




PROBLEM

UNORGANIZED FILE AND USER ACCESS MANAGEMENT

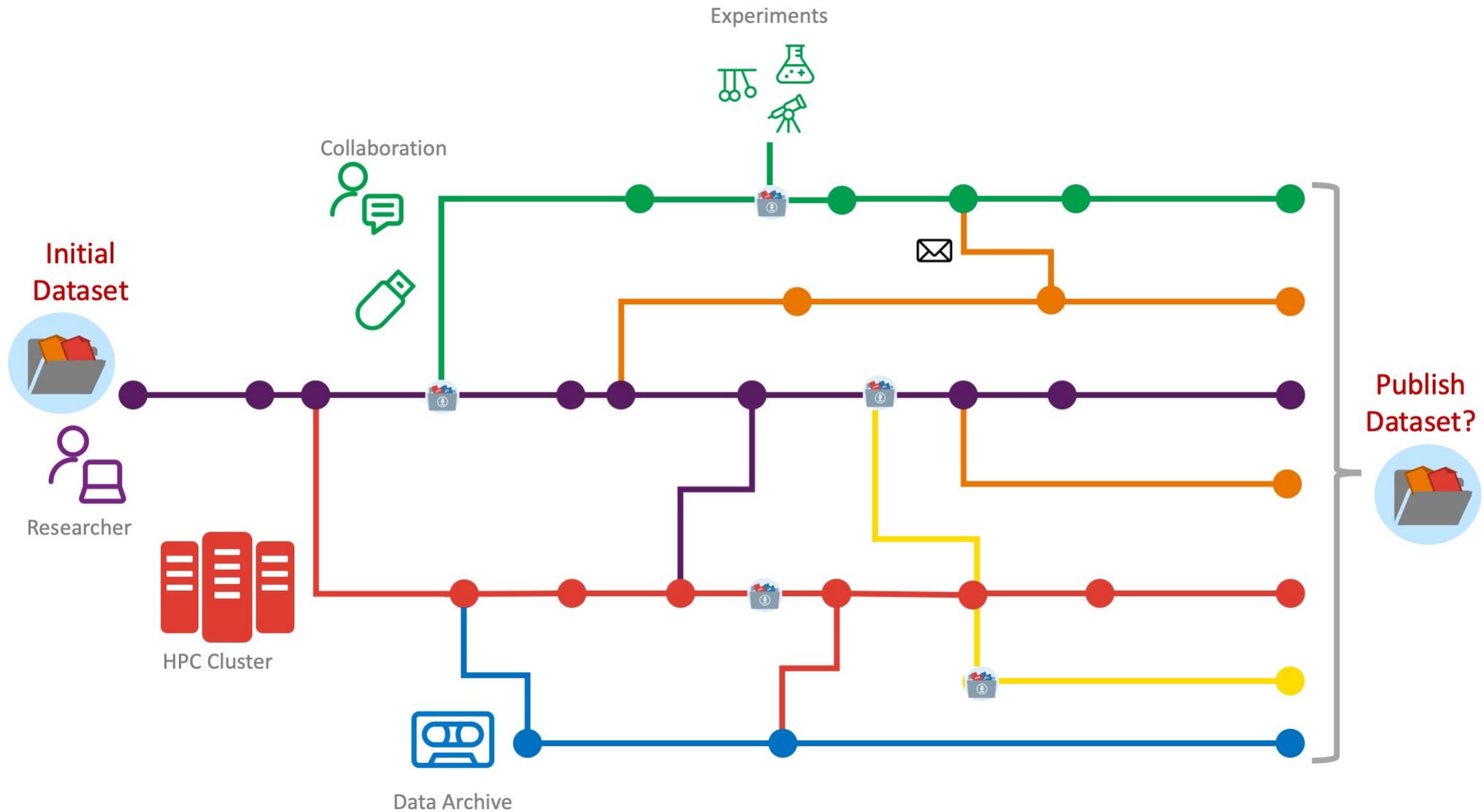




PROBLEM
 ACCESS IS DIFFICULT FOR EXTERNAL PARTNERS



Data, what's the problem?





Thank you!

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annette.langedijk@surf.nl

Driving innovation together

SURF