How to build a trustworthy digital ecosystem through Gaia-X Federation Services

Thursday 9 June 2022
from 14:00 to 15:15 EEST (13:00–14:15 CEST)

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Programme

EEST

14:00	**Welcome and agenda** Antti Poikola, Leading Specialist, Gaia-X Finland, The Finnish Innovation Fund Sitra
14:15	**Gaia-X & GXFS: Project status and activities** Andreas Weiss, Head of Digital Business Models and Gaia-X project lead, eco, Association of the Internet Industry
14:40	**Q&A**
15:15	Event ends

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Welcome and agenda

Antti Poikola, Gaia-X Finland, The Finnish Innovation Fund Sitra

Gaia-X & GXFS:
Project status and activities

Andreas Weiss, ECO – Association of the Internet Industry

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Gaia-X
FEDERATION SERVICES
GXFS

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Gaia-X Federation Services

Andreas Weiss, Gaia-X Lead at eco Association of the Internet Industry

16 June 2022

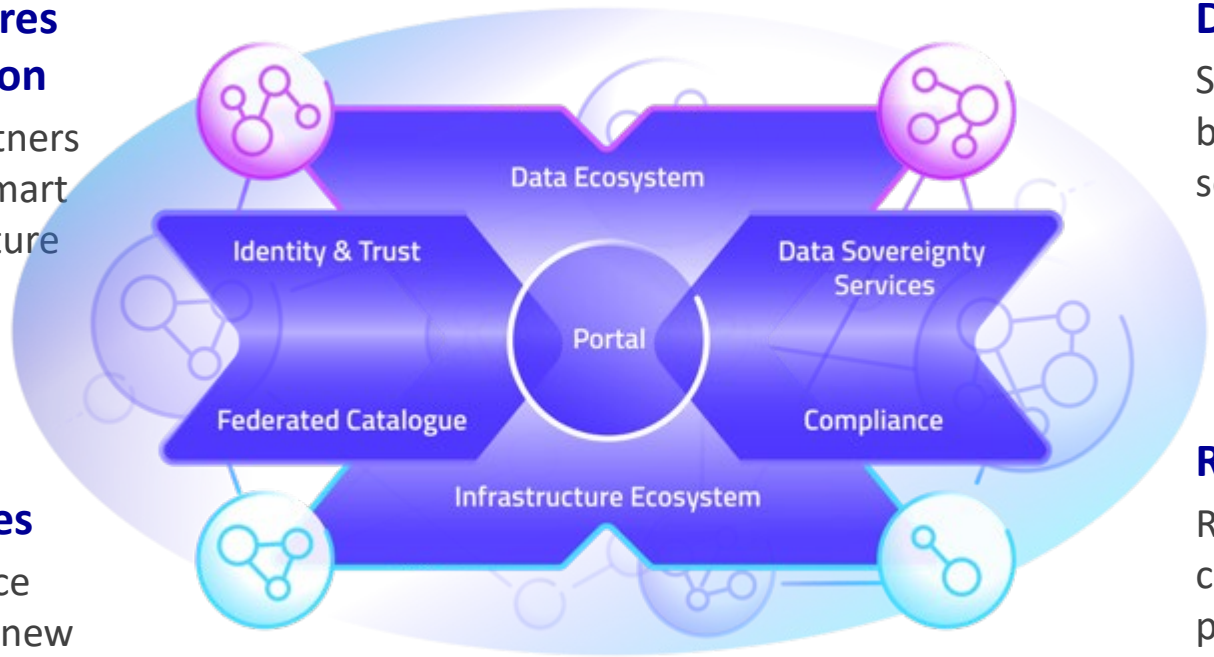
The Gaia-X Mission – Key objectives

Creation of digital infrastructures and an ecosystem for innovation

Trusted environment between partners and interoperable links between smart service applications and infrastructure services.

Increasing transparency and attractiveness of digital services

Reduce barriers to compliant service usage; enable the development of new services and products.



Data sovereignty

Strengthen the digital sovereignty of business, science, government and society.

Reduction of dependencies

Reduce private and business consumers' dependency of single providers; control over location and regulatory environment of stored data; reduce sector-specific dependencies.

The Gaia-X Value Proposition

- The aim is to overcome dependence on individual providers and to ensure **data sovereignty**.

- Gaia-X addresses this issue by implementing a higher-level **technical architecture** for building **data-based services and business models** in **highly complex environments.**

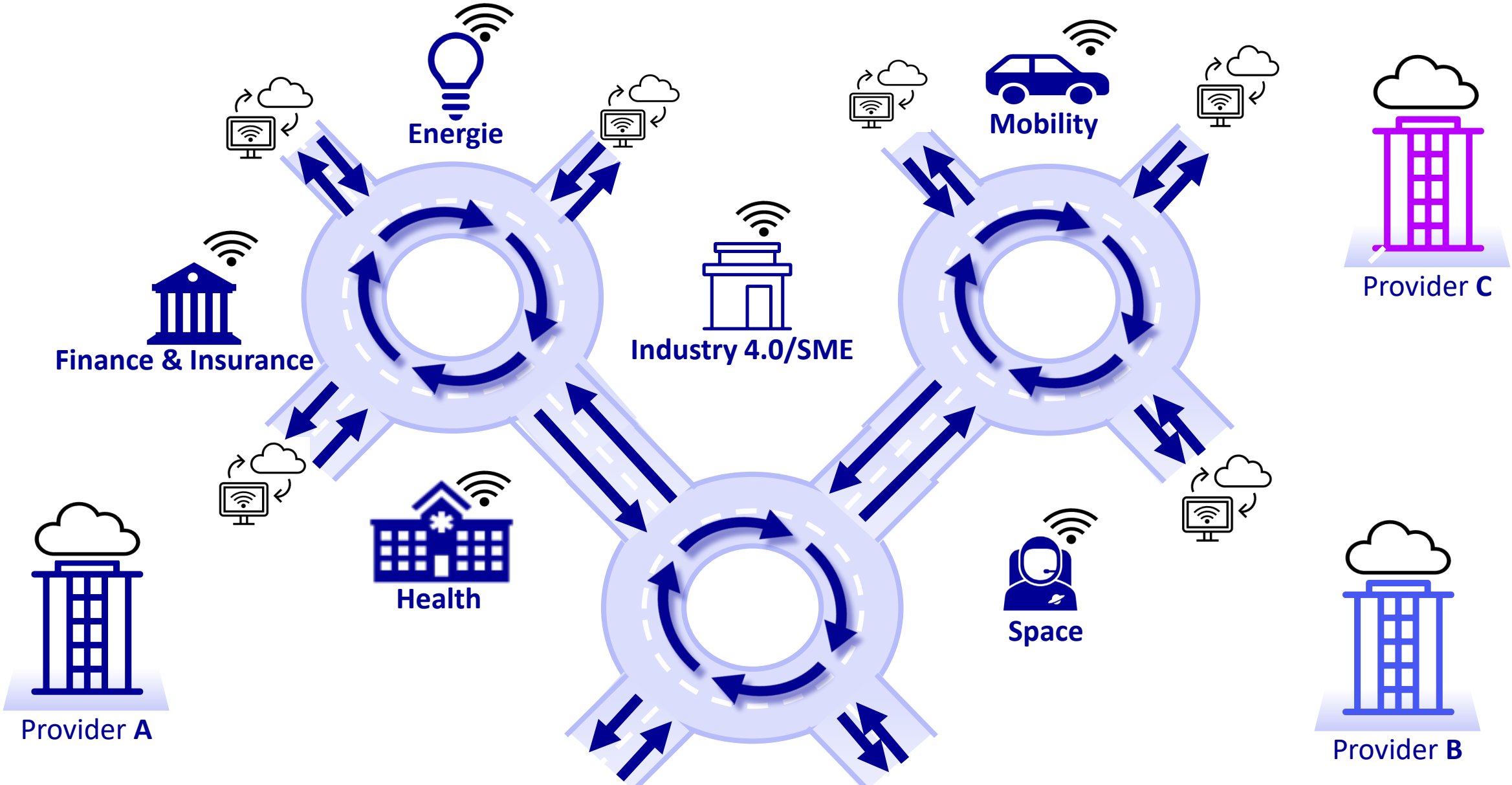
- To achieve this, the Gaia-X community is developing a **mix of functional and interoperable components** consisting of:
  - Federation services and other technical components
  - Regulatory framework
  - Establishment of a trust framework based on standards

The Gaia-X Value Proposition

- Gaia-X is **not a hyperscaler**, but a decentralised ecosystem for data infrastructures.

- Collaboration takes place in a **federated structure** in which all participants have equal rights.

Decentralize up to Edge



Gaia-X Data Space Lighthouse Projects started in 2021

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Catena-X
Automotive Network

https://catena-x.net/en/
Automotive Supply Chain,
Lead: Germany

agdatahub

https://agdatahub.eu/en/
Agriculture
Lead: France

EuPro Gigant

https://euprogigant.com/en/
Manufacturing, Industry 4.0
Lead: Austria

smart connected supplier network

https://smart-connected.nl/en
Electronics Supply Chain
Lead: Netherlands

Mobility Data Space
Data Sharing Community

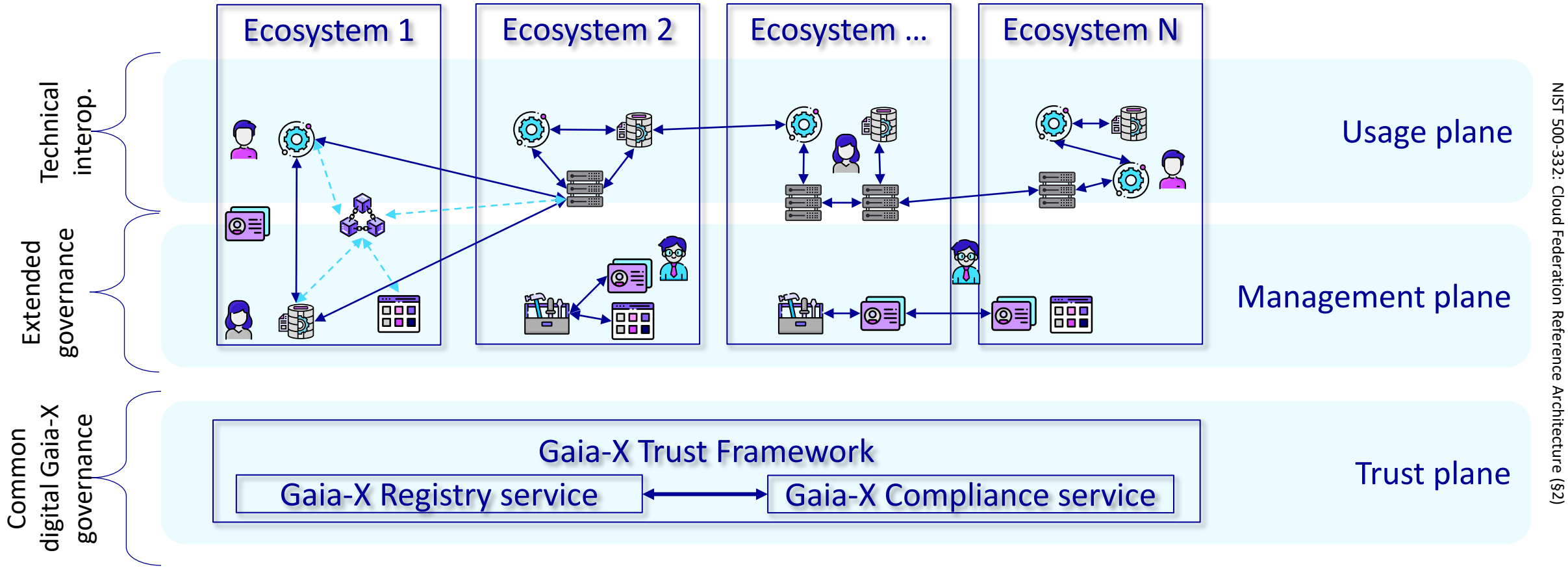
https://mobility-dataspace.eu/
Mobility
Lead: Germany

https://www.gaia-x.eu/news/structura-x-lighthouse-project-european-cloud-infrastructure-launched-concrete-implementation
Provider
Lead: Germany

and > 15 more started in 2022…

One **Gaia-X Ecosystem,** federating **interoperable autonomous ecosystems**.

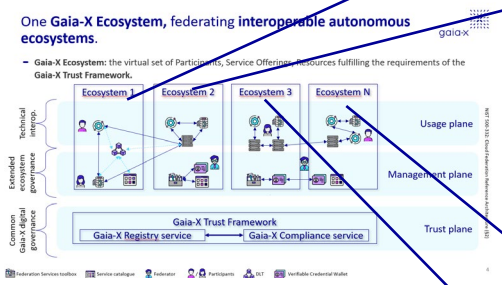
- **Gaia-X Ecosystem:** the virtual set of Participants, Service Offerings, Resources fulfilling the requirements of the **Gaia-X Trust Framework.**



Federation Services toolbox | Service catalogue | Federator | / Participants | DLT

NIST 500-332: Cloud Federation Reference Architecture (§2)

Federation Interoperability & Trust



Federation Agriculture

Federation Pharma

Federation Catena-X

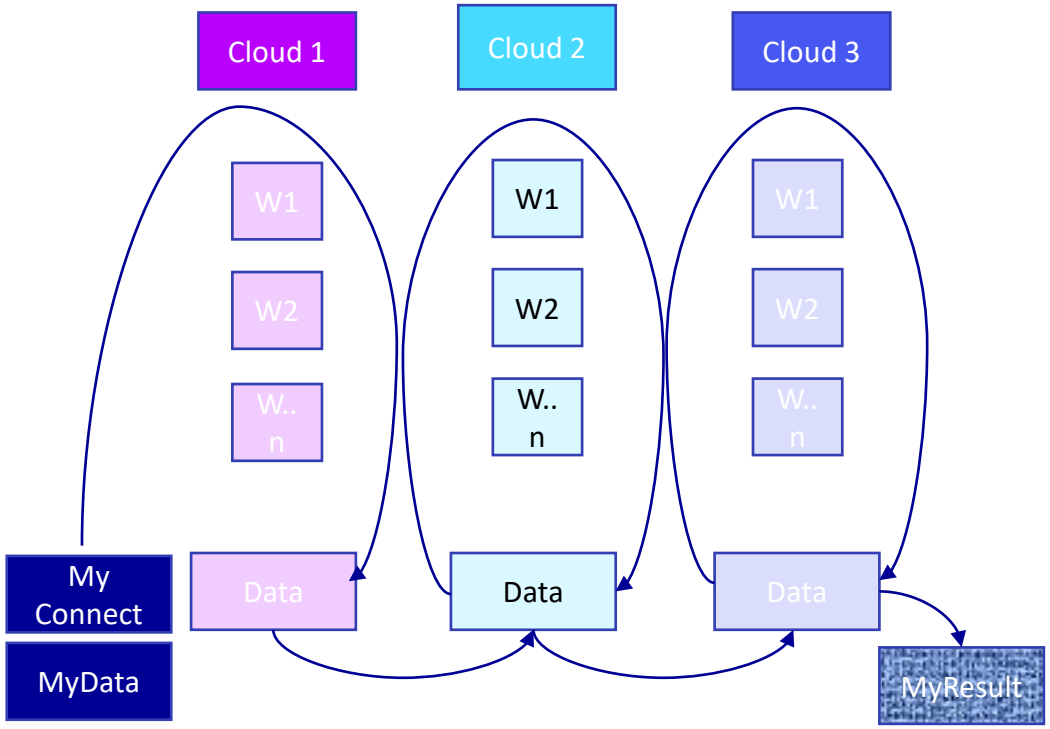
Federation Health

Federation Mobility

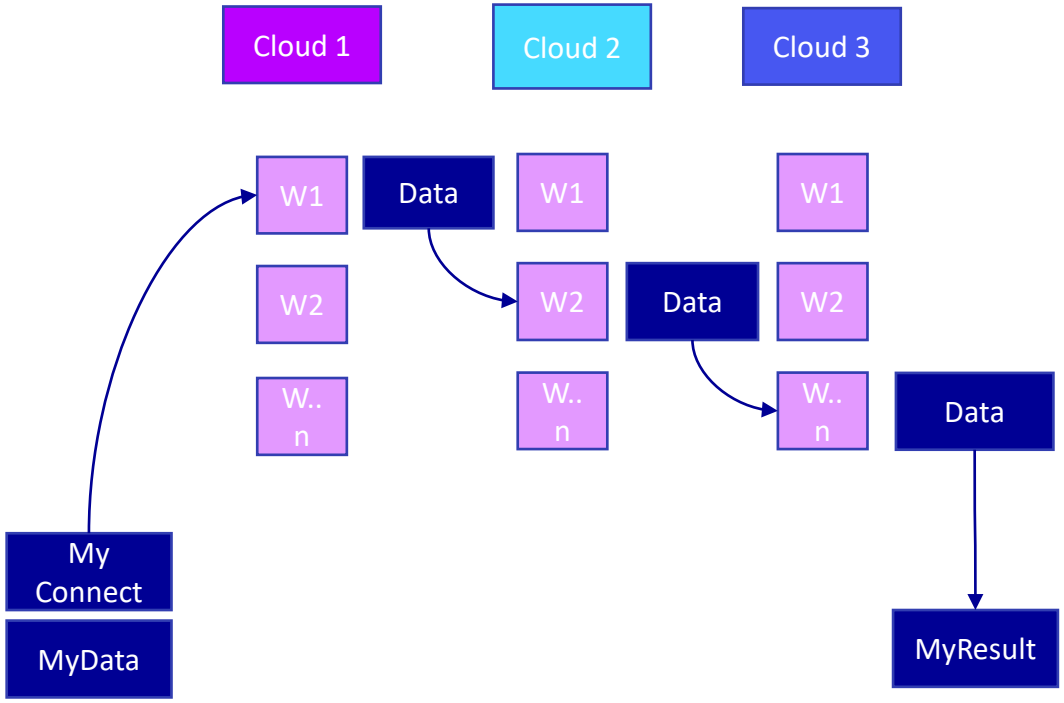
Federation Construction

Data Pipeline via distributed Workloads

Cloud centric
Separated Computing stacks
Data Pipeline managed by customer



Use case centric
Interoperable Computing Stacks
Data Pipeline set by process

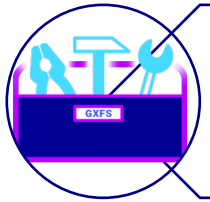


GXFS: Basic Principles of a Federation

Joined group of stakeholders to cooperate for business objectives
(by Business, Domain, Production, Supply Chain, …)

Participants agree on joined rules, objectives, technology

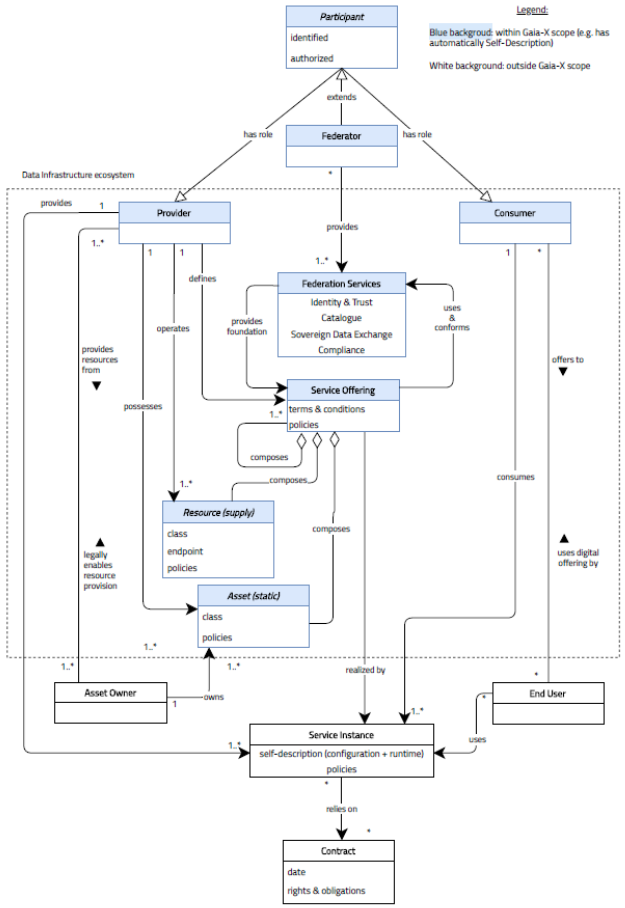
Federators are entities to operate the Federation and is assigned by the Federation

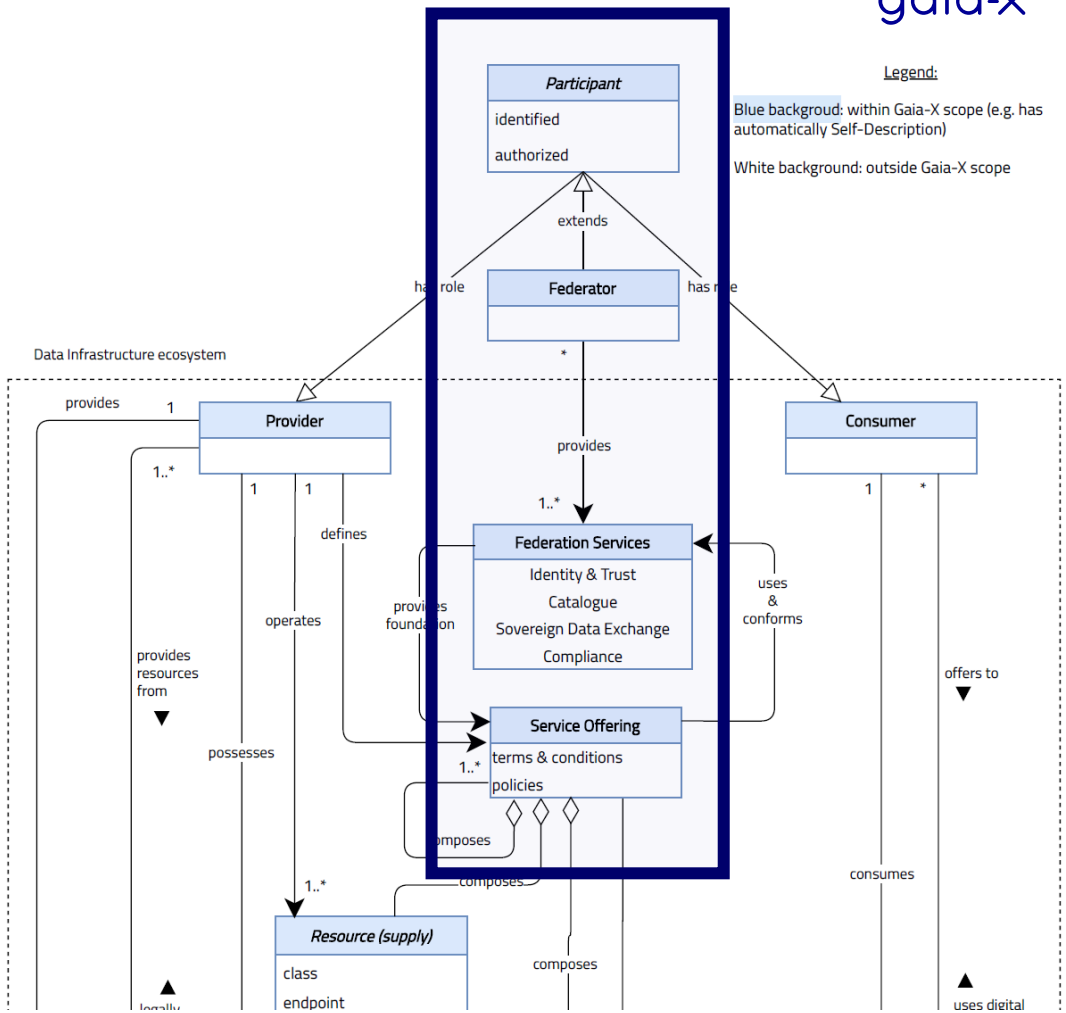


GXFS core services are optional reference implementations according to Gaia-X rules

Gaia-X Architecture

Figure 2: Gaia-X conceptual model





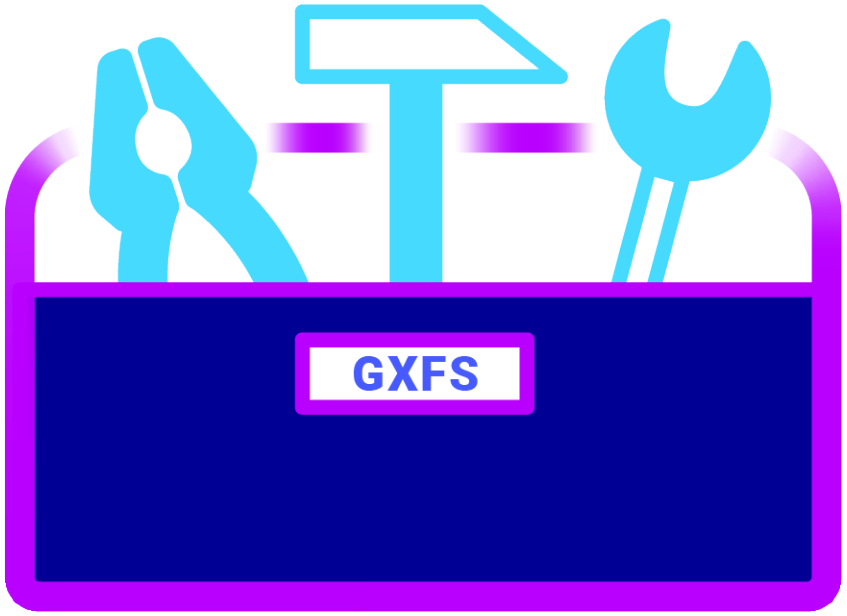
https://www.gaia-x.eu/architecture-document

Gaia-X

FEDERATION SERVICES

GXFS

GXFS-DE: The toolbox for Federations



Gaia-X Federation Services

State of play GXFS

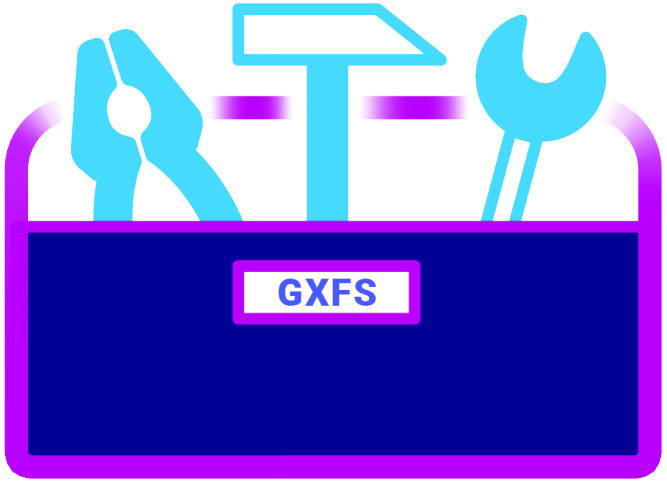
What is GXFS?

- Minimum set of services, necessary to operate Gaia-X Federations
- Output will be technical specifications and baseline open-source code
- After initial promotion continuous improvement through community-driven work on the open-source code via Gitlab
- The Gaia-X Association will maintain the developer repository during initiation
- Further hand over to Eclipse Foundation as Community Project is planned

What is GXFS not?

- A ready to go product
- A set of services operated and monitored by the Gaia-X Association

GXFS: The toolbox for Federations

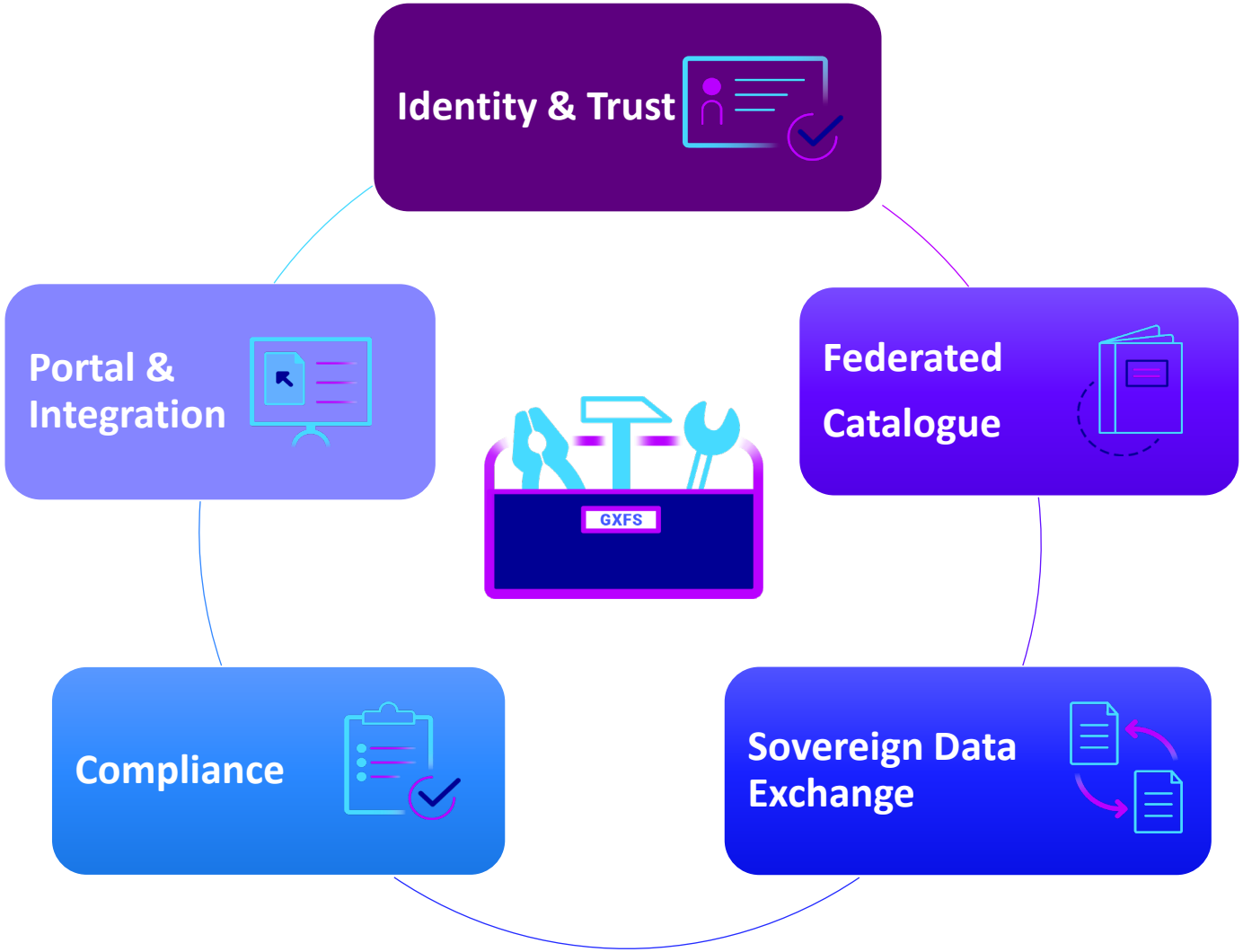


Open Specifications – maximum transparency and community engagement

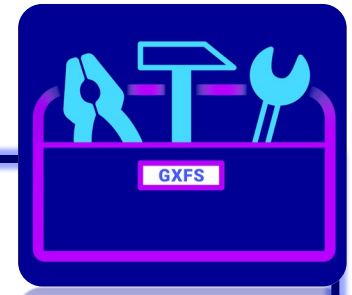
Open Standards – don´t reinvent the wheel

Reference Implementation – multitude options to build a federation

GXFS-DE: 5 Work Packages



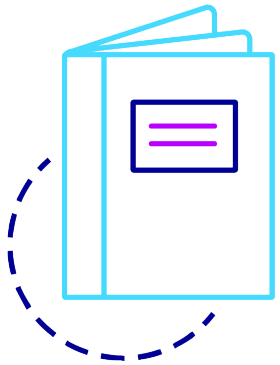
GXFS-DE: Deliverables by Q3/2022



➢ ***Identity and Trust Services:*** *b*ased on a Self-Sovereign Identity (SSI) Concept provides the ability to handle decentralized identities and digital trust establishments

- Authentication/Authorization (AAU)
- Organization Credential Manager (OCM)
- Personal Credential Manager (PCM)
- Trust Services (TRU)

➢ ***Federated Catalogue:*** repository where participants can find other participant's information, service offerings in the shape of self-descriptions

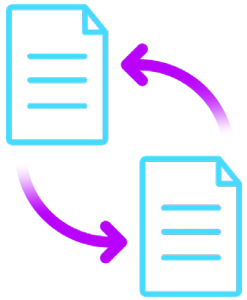


- Core Catalogue Functions
- Self-Description of Participants and Services

➢ ***Compliance:*** Legal Regulation & Policies framework

- Onboarding and Accreditation Workflow (OAW)
- Continuous Automated Monitoring (CAM)
- Notarization Service API (NOT)

➢ ***Sovereign Data Exchange:*** enable transparency and control over how data is used



- Data Contract Transaction (DCT)
- Data Exchange Logging (DEL)

❖ ***The Portal:*** serves as a sample integration layer

- Portal
- Orchestration
- Compliance Documentation Service

GXFS: Based on Open Standards and Technologies

Identity & Trust

- SSI core requirements:
  - **W3C DID-Core Model**
  - **W3C Verifiable Credentials**
  - **JSON-LD**
- For the interoperability it is conisdered the **OIDC** standard with the upcoming **SSI Extension**
- The solution requirements respecting standard technologies like:
- **Container, Microservices, Git, BDD, Open API** and other standards around CNC Cloud-Native

Federated Catalogue

- **W3C RDF** (Resource Description Framework)
  - Query language:
- **GQL** (OpenCypher as a workaround the standard is released)
  - Self-Descriptions:
- **Verifiable Credentials (VCs)**
- **JSON-LD and ND-JSON**
  - Definition of the public REST API: **OpenAPI**

Sovereign Data Exchange

- **W3C LDP** (Linked Data Platform)
- **W3C LDN** (Linked Data Notification)
- **W3C RDF** (Resource Description Framework)
- **W3C ODRL** (Open Digital Rights Language)

Compliance

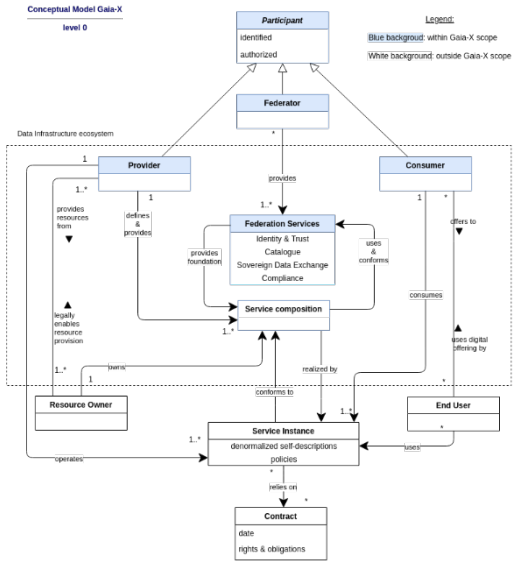
- Established conformity assessment standards from the **ISO** and **ISAE**
- The verifiable credentials issued during the process are based on an open **W3C** standard

Gaia-X Trust Framework

To ensure **Trust** the Gaia-X Trust Framework is:

- Automated by Gaia-X specific components part of decentralized technology framework
- Versioned, i.e. bound to a specific version in time of the Compliance rules set
- Applied to the self-description file of all entities implied in the Gaia-X conceptual model (*)
- Aimed to verify the existence and veracity of the attributes and not judging their value

(*) as defined as part of the Gaia-X Conceptual model described in the Gaia-X Architecture document



The content
Verify if the mandatory attributes are filled in and if the values are verified.

Set of claims

attribute: value
attribute: value
attribute: value
.....

The envelop
Verify the keypair issuers and cryptographic signatures

Claims
Machine readable or plain English

- Trust Framework example:
  - All cars must have a color
  - All Datasets must have a location
  - All Services must identify their provider with its legal country of jurisdiction.
- Label examples:
  - cars level 1 are red, cars level 2 are blue, …
  - My dataset must be located in EU
  - My services must be non-subject/immune to non-EU laws

GXFS-DE: Timeline

May 2021
Publication GXFS-DE Specifications

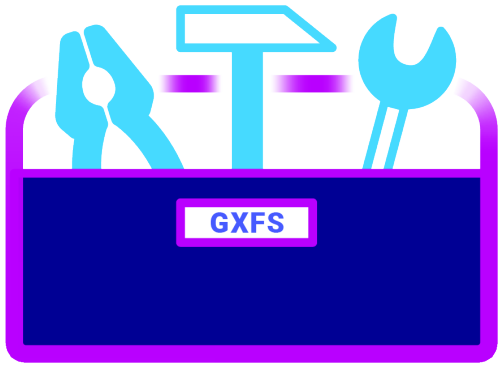
June-November 2021
Public EU Tender

December 2021
Asignment Code Implementation

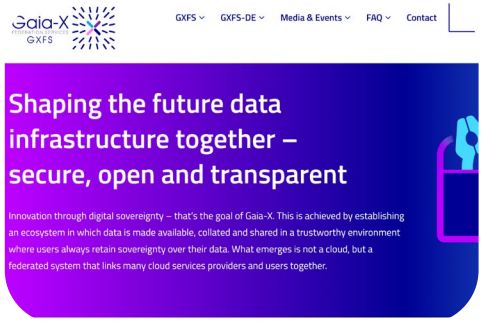
Q1/Q2 2022
Development GXFS-DE

Q2 2022
Start Specification 2 and Extension by GXFS-FR

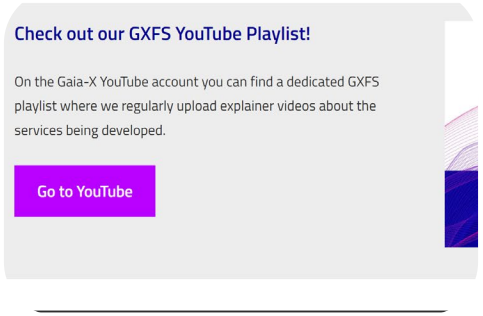
Handover Community as Eclipse Foundation Project



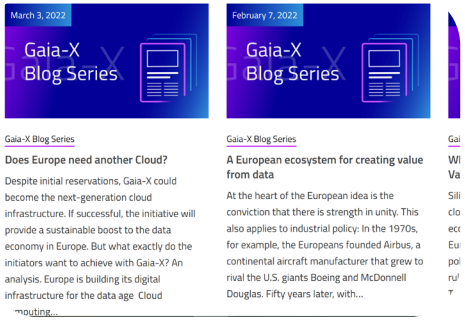
GXFS-DE Dissemination Update



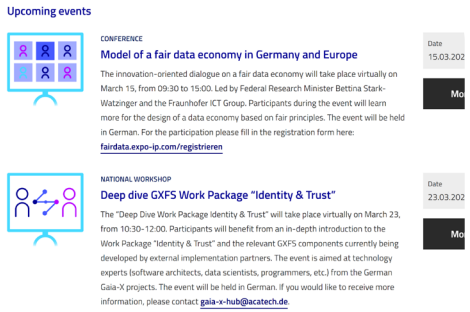
Website



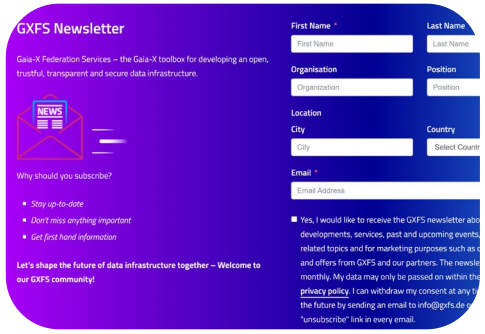
Explainer videos



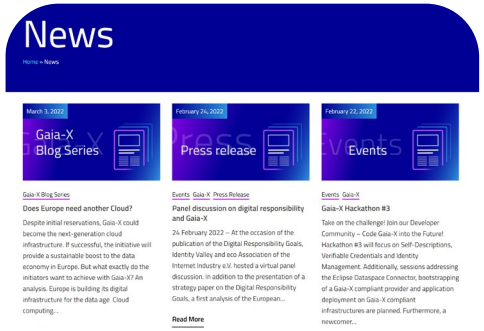
Blogseries



Events



Newsletter



Press releases

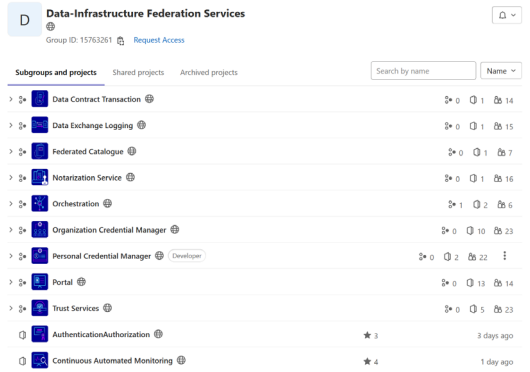
Hackathon

Core Gaia-X Deliverables

- Gaia-X Trustframework
  - https://gaia-x.gitlab.io/policy-rules-committee/trust-framework/
  - https://compliance.gaia-x.eu/
  - https://registry.gaia-x.eu/
- Gaia-X Label document
  - https://gaia-x.eu/sites/default/files/2022-04/Gaia-X%20labelling%20criteria%20v22.04_Final.pdf
- Self Description Life Cycle
  - https://gitlab.com/gaia-x/gaia-x-community/gaia-x-catalogue/catalogue-document
- Service Characteristics
  - https://gitlab.com/gaia-x/technical-committee/service-characteristics

Status GXFS

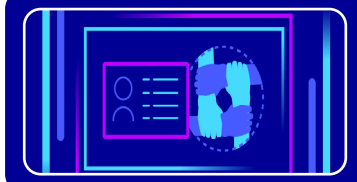
- Coe repository @ Gaia-X gitlab
  - Spezifications GXFS-DE: https://gaia-x.gitlab.io/technical-committee/federation-services/federation-service-specifications/
  - Runtime Code GXFS-DE: https://gitlab.com/gaia-x/data-infrastructure-federation-services
- Demo Self Descriptions
  - https://gaia-x.fit.fraunhofer.de/ (draft prototype)
- Ovewrview Hackathon #3
  - https://gitlab.com/gaia-x/gaia-x-community/gx-hackathon/gx-hackathon-3/-/wikis/GX-Hackathon-3
- Next Hackathon #4 20/21.6 2022
  - https://gaia-x.eu/news/events/hackathon-4



Status GXFS

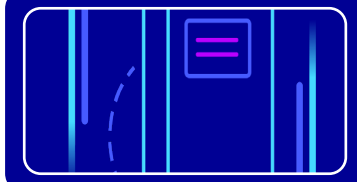
- Timeline:
  - Identity & Trust and Compliance – QA-Ready 07/2022
    - Authentication/Authorization (AAU)
    - Organization Credential Manager (OCM)
    - Personal Credential Manager (PCM)
    - Trust Services (TRU)
    - Notarization Service API (NOT)
    - Continuous Automated Monitoring (CAM)
  - Sovereign Data Exchange – QA-Ready 08/2022
    - Data Contract Transaction (DCT)
    - Data Exchange Logging (DEL)
  - Federated Catalogue – QA Ready 09/2022

Key targets Specification II



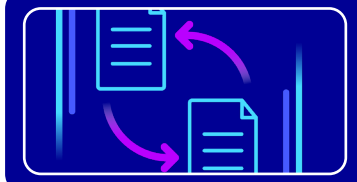
Identity & Trust

- Extension Aries IOP für Lot 2,3,4
- OpenID Connect Flow Authentication Lot 1
- Link TSA (Lot 4) with Gaia-X Trust Framework



Federated Catalogue and Self Description

- Enhancement SD Tool and Preparation Portal Integration
- Catalogue Service Self Description Lifecycle
- VC Landscape Analysis and Interoperability requirements



Sovereign Data Exchange

- Contract API Usage Policies and Service Endpoints

Compliance

- OAW Alignment PRC-Trustframework and Onboarding Federation based on Gaia-X Label
- Integration Notarization API
- CAM configuration EU CSC samples

Portal

- Catalogue UI
- Trust Framework UI

GXFS-DE Team

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Gaia-X Association

- https://www.gaia-x.eu/publications
  - https://gaia-x.eu/sites/default/files/2021-12/Vision%20%26%20Strategy.pdf
  - https://gaia-x.eu/publication/gaia-x-architecture-document-22-04-release/
  - https://gaia-x.eu/sites/default/files/2022-01/Gaia-X_Federation_Services_White_Paper_1_December_2021.pdf
  - https://gaia-x.eu/wp-content/uploads/2022/05/Gaia-X-labelling-criteria-v22.04_Final.pdf
  - https://gaia-x.eu/publication/gaia-x-policy-rules-document/
  - https://gaia-x.eu/publication/trust-framework-gaia-x-trust-framework-22-04-release/

Gaia-X Architecture Document 22.04 Release

Trust framework - Gaia-X Trust Framework - 22.04 Release

SSI Whitepaper

Contact Gaia-X AISBL: info@gaia-x.eu

Contact PMO GAIA-X Federation Services: pmo@gxfs.de

Landing page Gaia-X Association www.gaia-x.eu

Landing page GXFS www.gxfs.de

Landing page Gaia-X Germany www.daten-infrastruktur.de

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Thank You!

Q&A

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