

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)

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

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

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

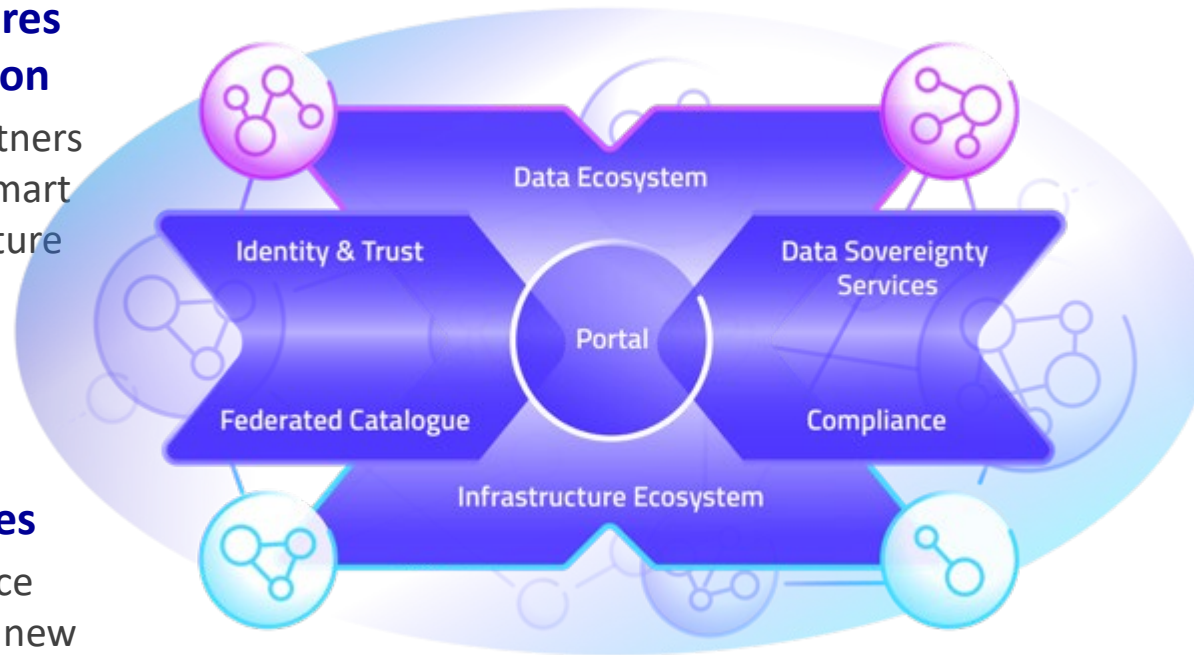


Creation of digital infrastructures and an ecosystem for innovation

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



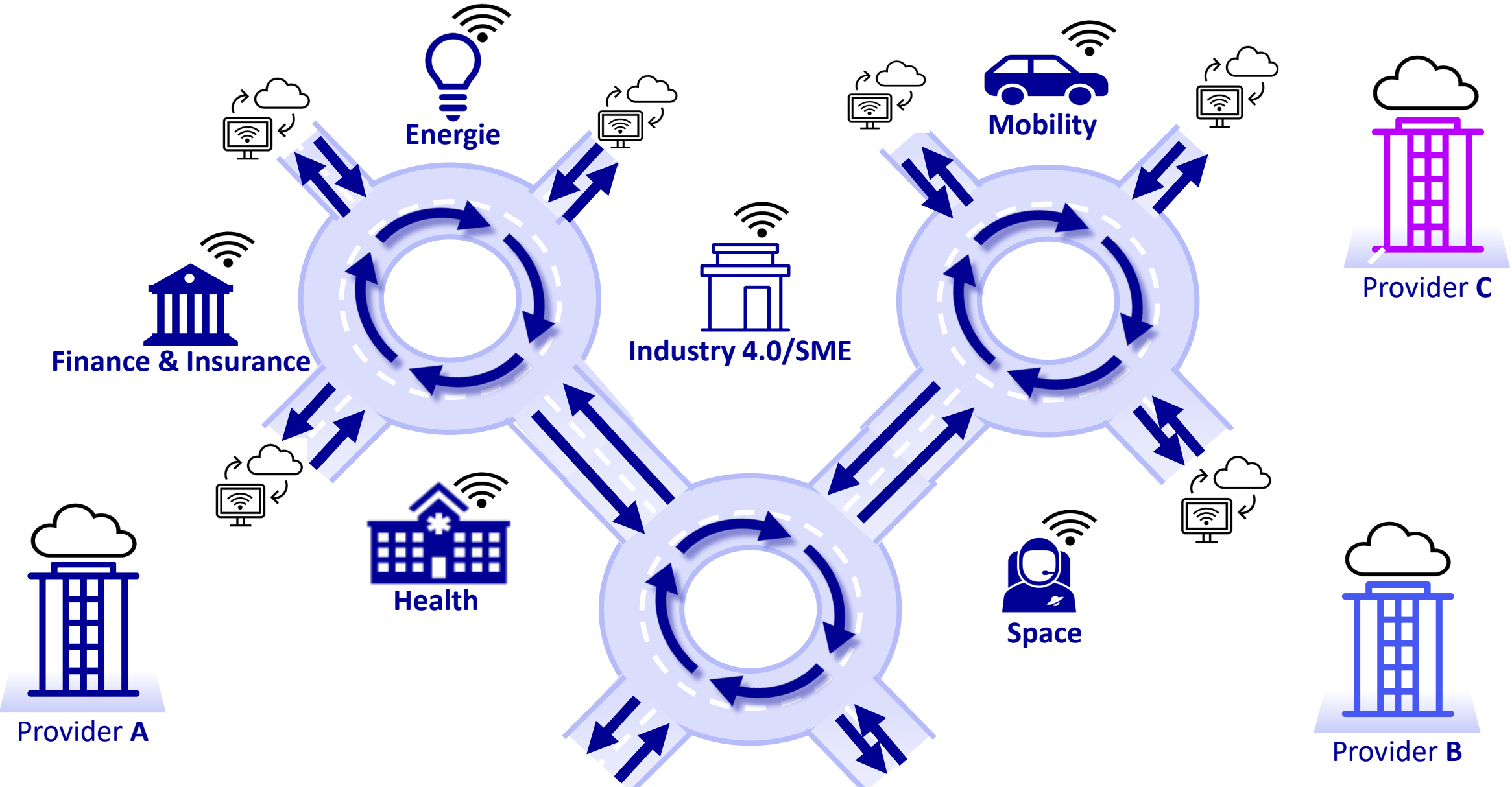
- The aim is to overcome dependence on individual providers and to ensure **data sovereignty**.
- Gaia-X addresses this issue by implementing a higher-level **technical architecture** for building **data-based services and business models** in **highly complex environments**.
- To achieve this, the Gaia-X 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



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



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



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



<https://euproigant.com/en/>
Manufacturing, Industry 4.0
Lead: Austria



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

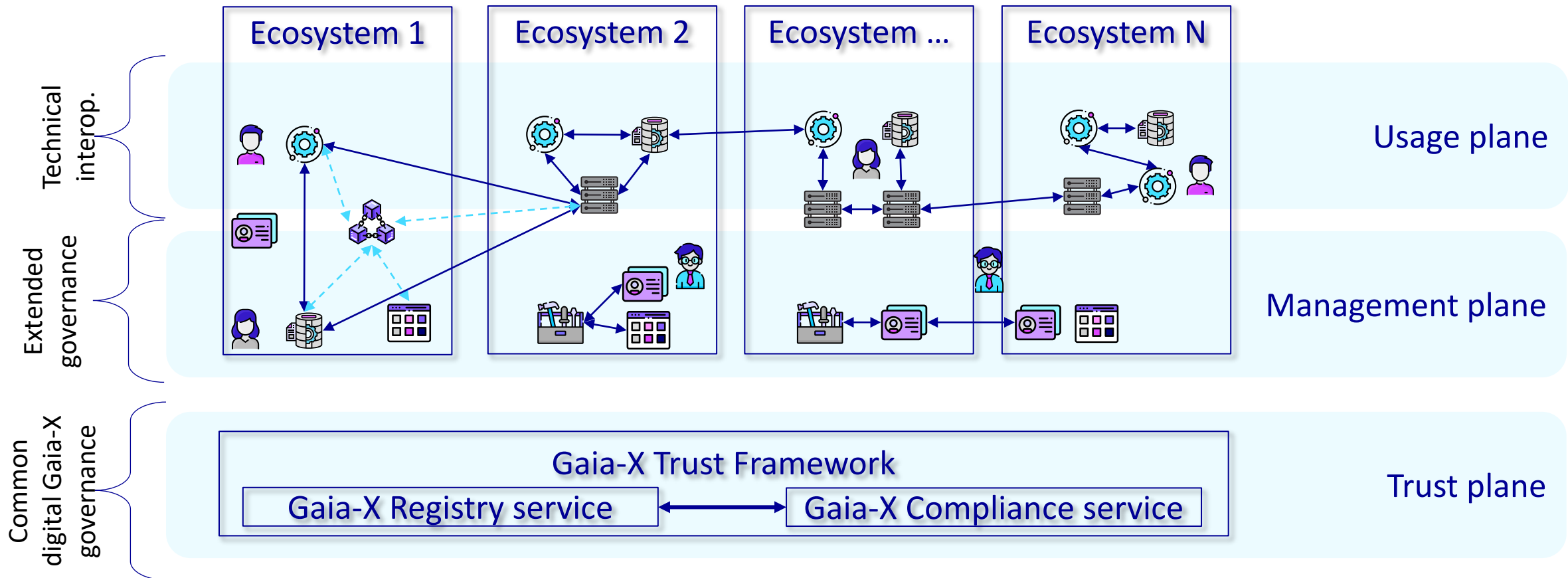


<https://smart-connected.nl/en>
Electronics Supply Chain
Lead: Netherlands

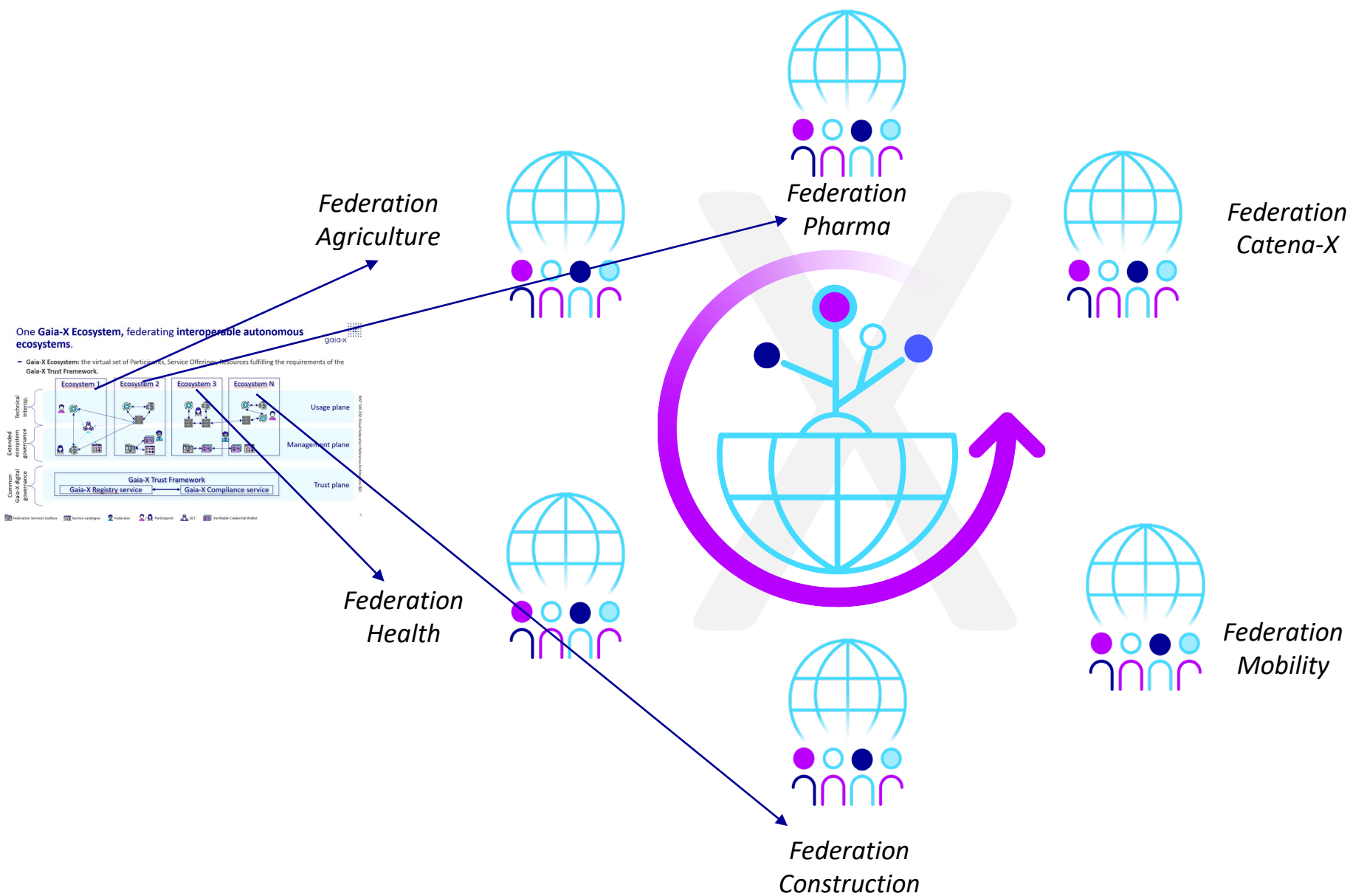
and > 15 more started in 2022...

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.



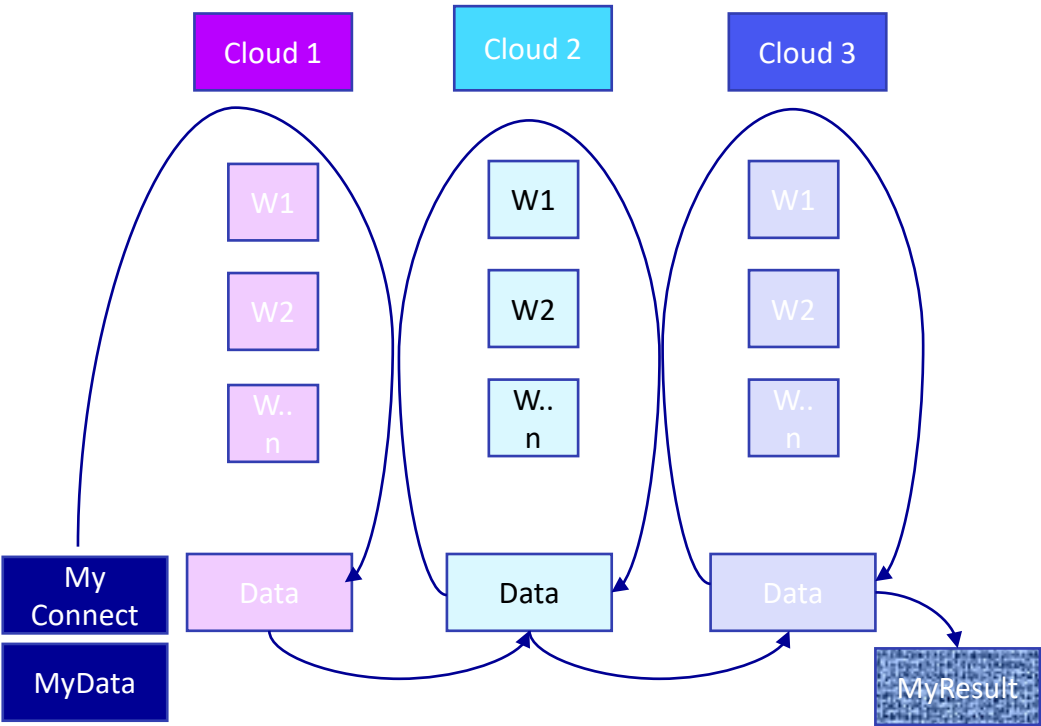
Federation Interoperability & Trust



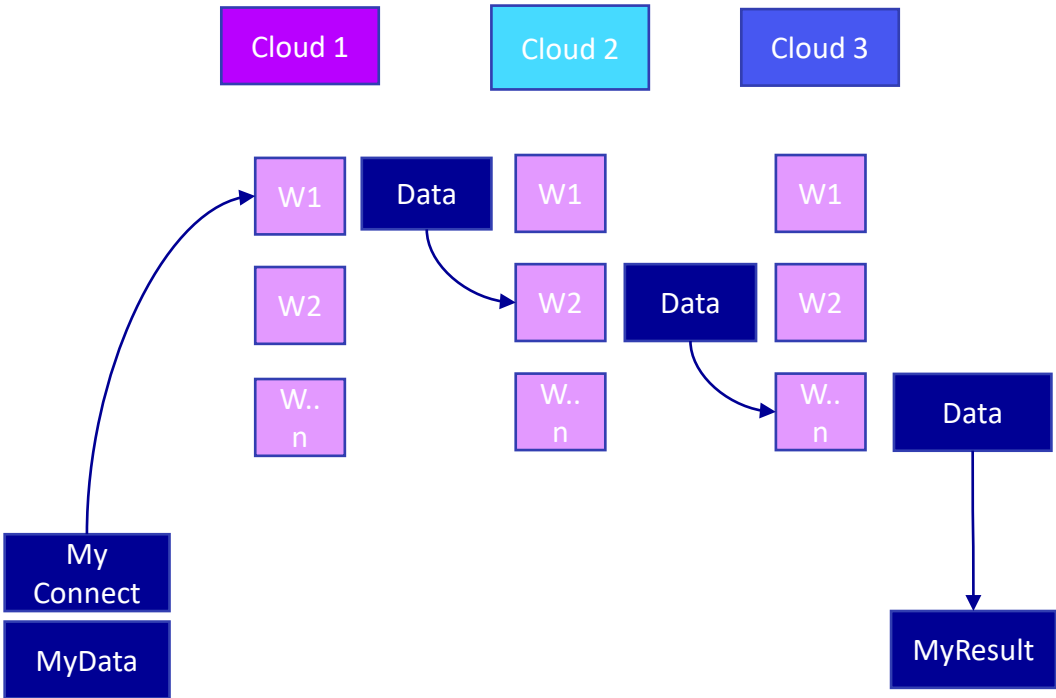
Data Pipeline via distributed Workloads



Cloud centric
Separated Computing stacks
Data Pipeline managed by customer



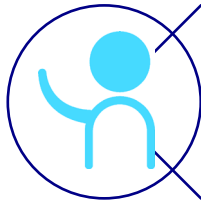
Use case centric
Interoperable Computing Stacks
Data Pipeline set by process



GXFS: Basic Principles of a Federation



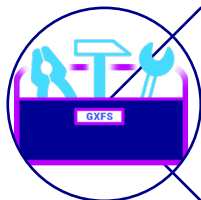
Joined group of stakeholders to cooperate for business objectives
(by Business, Domain, Production, Supply Chain, ...)



Participants agree on joined rules, objectives, technology



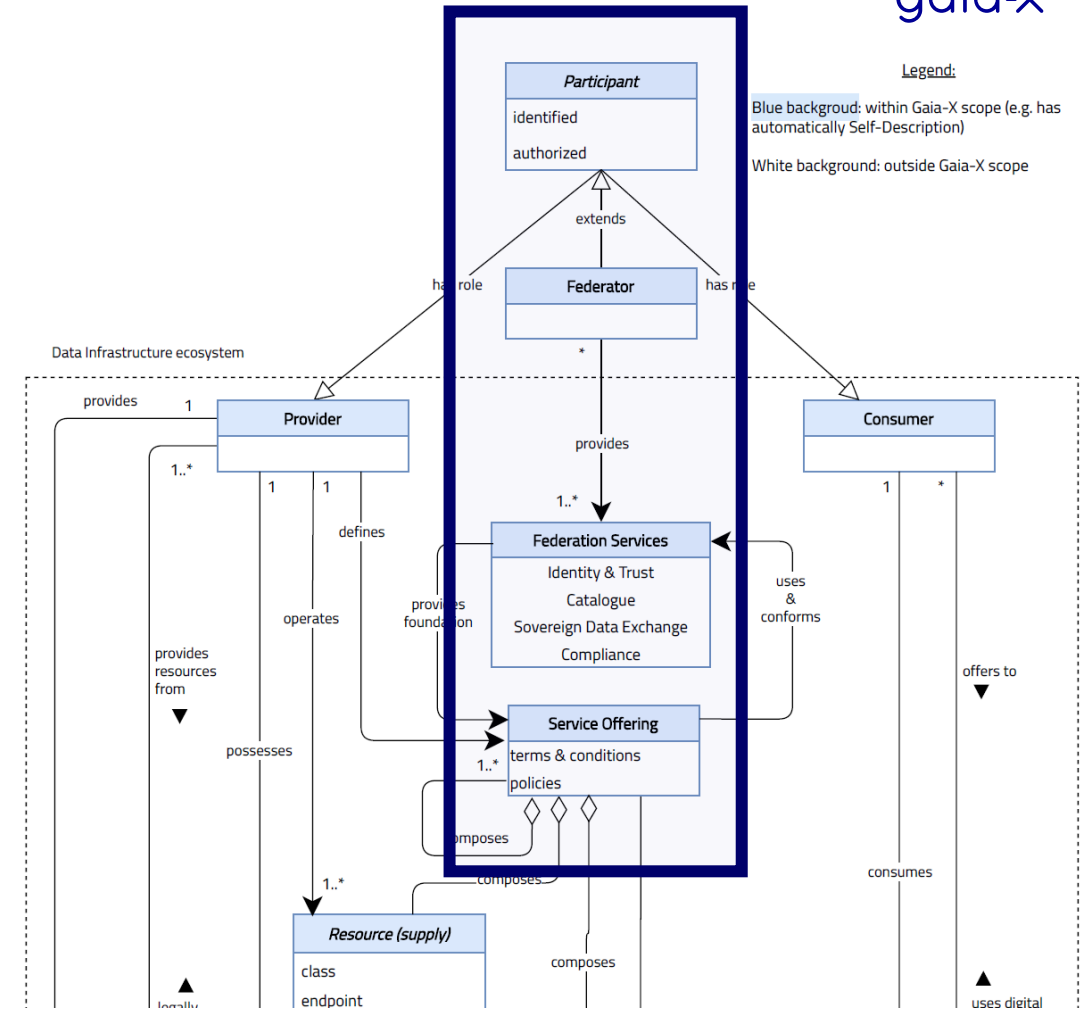
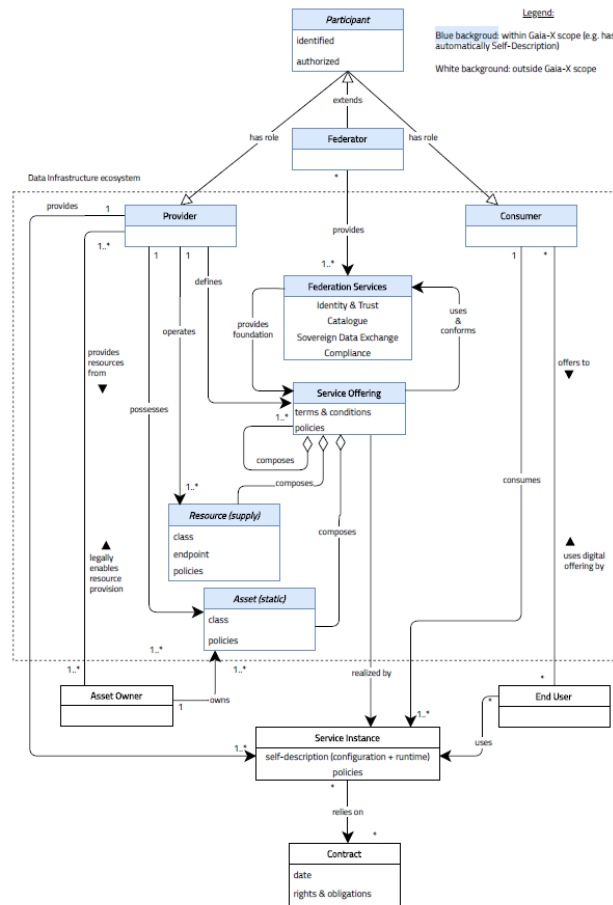
Federators are entities to operate the Federation and is assigned
by the Federation



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

Gaia-X Architecture

Figure 2: Gaia-X conceptual model

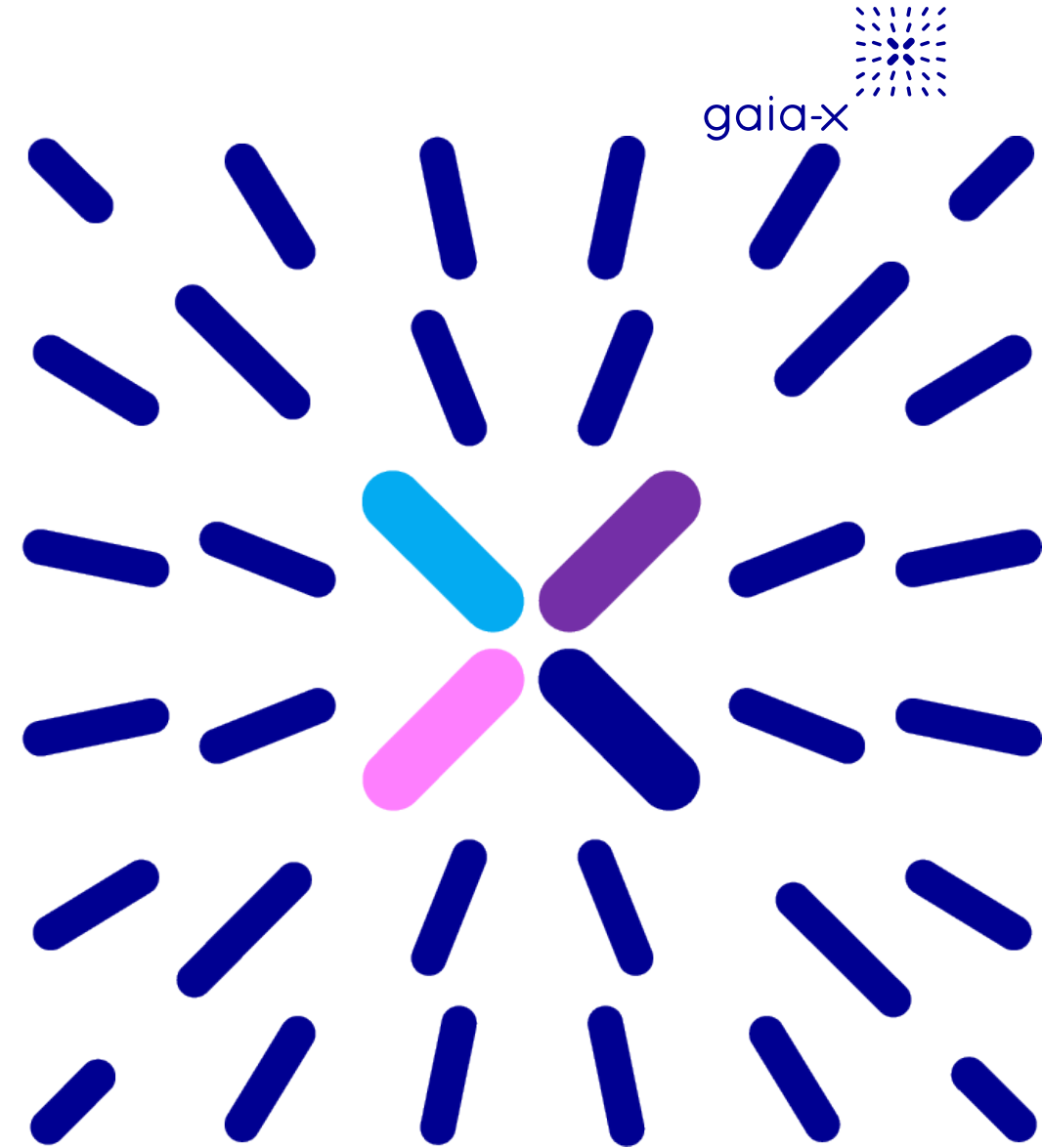


<https://www.gaia-x.eu/architecture-document>

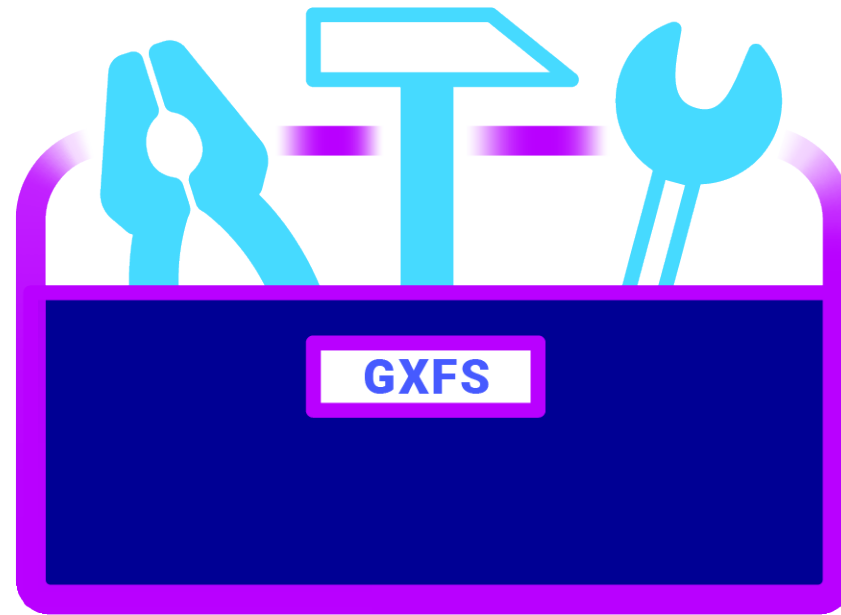
Gaia-X

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

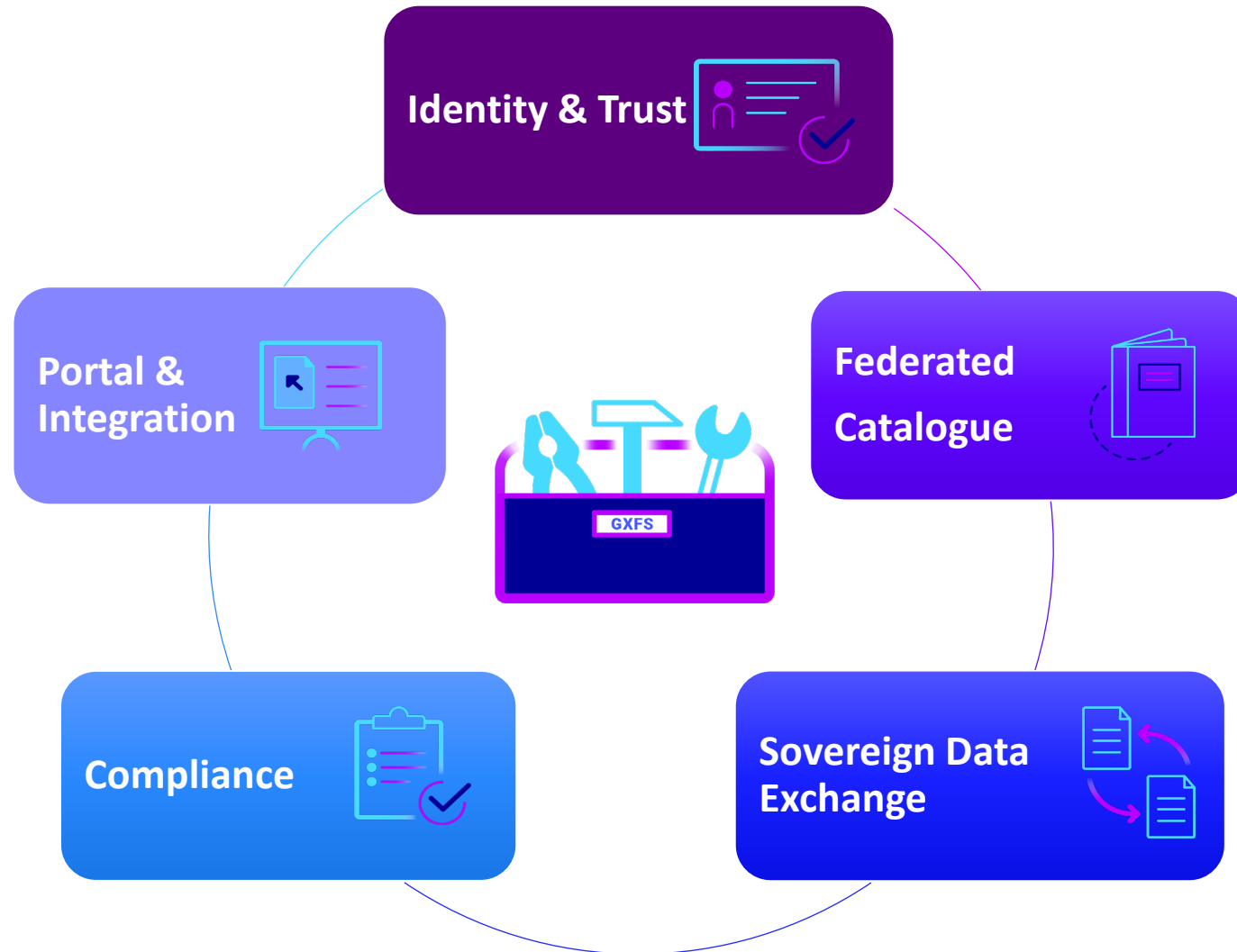


Open Specifications – maximum transparency and community engagement

Open Standards – don't reinvent the wheel

Reference Implementation – multitude options to build a federation

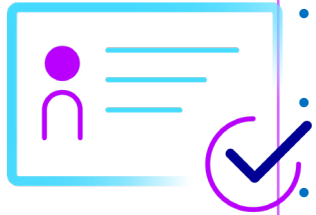
GXFS-DE: 5 Work Packages



GXFS-DE: Deliverables by Q3/2022



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



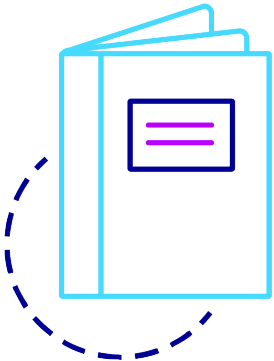
- Authentication/Authorization (AAU)
- Organization Credential Manager (OCM)
- Personal Credential Manager (PCM)
- Trust Services (TRU)

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



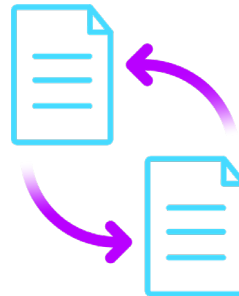
- Onboarding and Accreditation Workflow (OAW)
- Continuous Automated Monitoring (CAM)
- Notarization Service API (NOT)

- **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

- **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

➤ SSI core requirements:

- **W3C DID-Core Model**
- **W3C Verifiable Credentials**
- **JSON-LD**
- For the interoperability it is considered 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

Identity & Trust



➤ **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**

Federated Catalogue



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

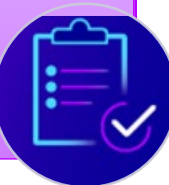
Sovereign Data Exchange



➤ Established conformity assessment standards from the **ISO** and **ISAE**

- The verifiable credentials issued during the process are based on an open **W3C** standard

Compliance

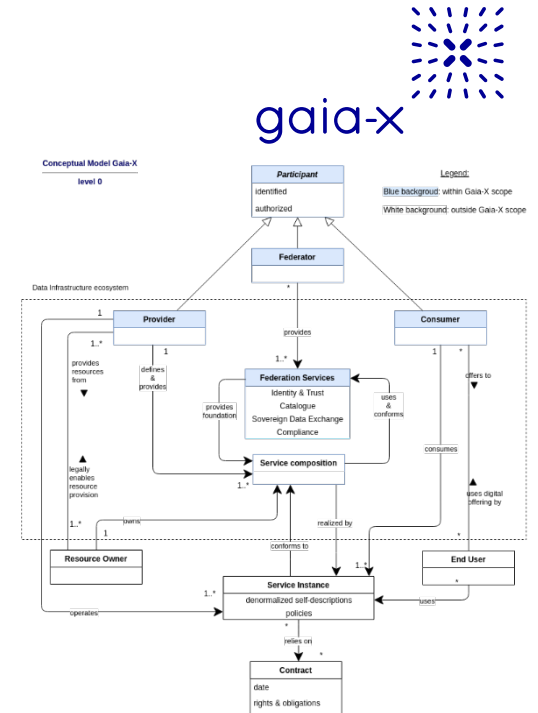


Gaia-X Trust Framework

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.

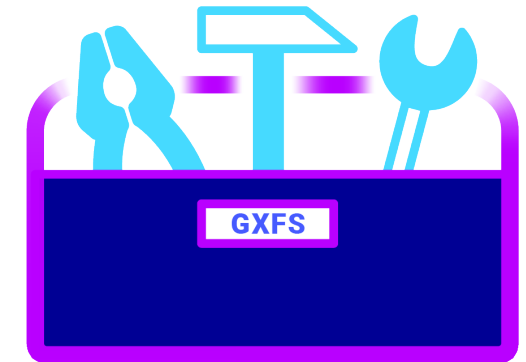
Label examples:

- 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

```

@context:
  0: {}
  1: "https://w3id.org/security/suites/ed25519-2020/v1"
  cred:id: "vc.gaia-x.eu/membership/pierre.gronlier@gaia-x.eu"
  cred:type:
    0: "VerifiableCredential"
    1: "ParticipantCredential"
  cred:issuer: "did:web:vc.gaia-x.eu:issuer"
  cred:issuanceDate: "2022-01-17T22:42:34Z"
  cred:expirationDate: "2022-01-28T22:42:34Z"
  cred:credentialSubject:
    @context: {}
    @type: "schema:ProgramMembership"
    schema:id: "mailto:pierre.gronlier@gaia-x.eu"
    schema:programName: "Gaia-X AISBL"
  proof:
    0:
      type: "JsonWebKey2020"
      created: "2022-01-17T22:42:34Z"
      jws: "eyJhbGciOiJIUzUzIiwiOiIuXG...2aTnA5O6tmK0do0u0Q8A"
      proofPurpose: "assertionMethod"
      verificationMethod: "did:web:vc.gaia-x.eu:issuer#JwsWebKey2020-RSA"
    1:
      type: "Ed25519Signature2020"
      created: "2022-01-17T22:42:34Z"
      verificationMethod: "did:web:vc.gaia-x.eu:iss...5519VerificationKey2020"
      proofPurpose: "assertionMethod"
      proofValue: "z5A5FwCvpmVQT3M79d5Gdyx...qbDY61njZ5yhQX4hAEgRUT5"
    
```

GXFS-DE: Timeline



GXFS-DE Dissemination Update



GXFS

GXFS-DE

Media & Events

FAQ

Contact

Shaping the future data infrastructure together – secure, open and transparent

Innovation through digital sovereignty – that's the goal of Gaia-X. This is achieved by establishing an ecosystem in which data is made available, collated and shared in a trustworthy environment where users always retain sovereignty over their data. What emerges is not a cloud, but a federated system that links many cloud services providers and users together.

Website

Check out our GXFS YouTube Playlist!

On the Gaia-X YouTube account you can find a dedicated GXFS playlist where we regularly upload explainer videos about the services being developed.

Go to YouTube

Explainer videos

March 3, 2022

Gaia-X Blog Series

Does Europe need another Cloud?

Despite initial reservations, Gaia-X could become the next-generation cloud infrastructure. If successful, the initiative will provide a sustainable boost to the data economy in Europe. But what exactly do the initiators want to achieve with Gaia-X? An analysis. Europe is building its digital infrastructure for the data age. Cloud computing...

February 7, 2022

Gaia-X Blog Series

A European ecosystem for creating value from data

At the heart of the European idea is the conviction that there is strength in unity. This also applies to industrial policy: In the 1970s, for example, the Europeans founded Airbus, a continental aircraft manufacturer that grew to rival the U.S. giants Boeing and McDonnell Douglas. Fifty years later, with...

Blogseries

Upcoming events

CONFERENCE
Model of a fair data economy in Germany and Europe
The innovation-oriented dialogue on a fair data economy will take place virtually on March 15, from 09:30 to 15:00. Led by Federal Research Minister Bettina Stark-Watzinger and the Fraunhofer ICT Group. Participants during the event will learn more for the design of a data economy based on fair principles. The event will be held in German. For the participation please fill in the registration form here: fairdata.expo-ip.com/registrieren

Date: 15.03.2022

NATIONAL WORKSHOP
Deep dive GXFS Work Package "Identity & Trust"
The "Deep Dive Work Package Identity & Trust" will take place virtually on March 23, from 10:30-12:00. Participants will benefit from an in-depth introduction to the Work Package "Identity & Trust" and the relevant GXFS components currently being developed by external implementation partners. The event is aimed at technology experts (software architects, data scientists, programmers, etc.) from the German Gaia-X projects. The event will be held in German. If you would like to receive more information, please contact: gaia-x-hub@acatech.de

Date: 23.03.2022

Events

GXFS Newsletter

Gaia-X Federation Services – the Gaia-X toolbox for developing an open, trustful, transparent and secure data infrastructure.

Why should you subscribe?

- Stay up-to-date
- Don't miss anything important
- Get first hand information

Let's shape the future of data infrastructure together – Welcome to our GXFS community!

First Name *

Last Name

First Name

Last Name

Organisation

Position

Organization

Position

Location

Country

City

Select Country

Email *

Email Address

☐ Yes, I would like to receive the GXFS newsletter also developments, services, past and upcoming events, related topics and for marketing purposes such as c and offers from GXFS and our partners. The newsletter monthly. My data may only be passed on within the privacy policy. I can withdraw my consent at any of the future by sending an email to info@gfx.de "unsubscribe" link in every email.

Newsletter

News

March 3, 2022

Gaia-X Blog Series

Does Europe need another Cloud?

Despite initial reservations, Gaia-X could become the next-generation cloud infrastructure. If successful, the initiative will provide a sustainable boost to the data economy in Europe. But what exactly do the initiators want to achieve with Gaia-X? An analysis. Europe is building its digital infrastructure for the data age. Cloud computing...

January 26, 2022

Press release

Panel discussion on digital responsibility and Gaia-X

24 February 2022 – At the occasion of the publication of the Digital Responsibility Goals, Identity Policy and Eco-Association of the Internet Industry e.V. hosted a virtual panel discussion. In addition to the presentation of a strategy paper on the Digital Responsibility Goals, a first analysis of the European...

February 23, 2022

Events

Gaia-X Hackathon #3

Take on the challenge! Join our Developer Community – Code Gaia-X into the Future! Hackathon #3 will focus on Self-Descriptions, Verifiable Credentials and Identity Management. Additionally, sessions addressing the Eclipse Database Connectors, bootstrapping of a Gaia-X compliant provider and application deployment on Gaia-X compliant infrastructures are planned. Furthermore, a newsletter...

Press releases

#4 Gaia-X Hackathon

20 + 21 June 2022

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



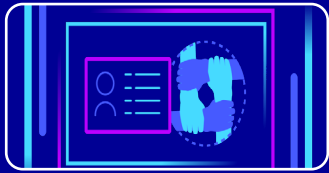
- Coe repository @ Gaia-X gitlab
 - Spezifications GXFS-DE: <https://gaia-x.gitlab.io/technical-committee/federation-services/federation-service-specifications/>
 - Runtime Code GXFS-DE: <https://gitlab.com/gaia-x/data-infrastructure-federation-services>
- Demo Self Descriptions
 - <https://gaia-x.fit.fraunhofer.de/> (draft prototype)
- Overview 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>

A screenshot of the GitLab interface for the "Data-Infrastructure Federation Services" group. The page shows a list of subgroups and projects. The table below represents the data visible in the screenshot.

Subgroups and projects		Shared projects	Archived projects	Search by name	Name
>	Data Contract Transaction	0	1	14	
>	Data Exchange Logging	0	1	11	
>	Federated Catalogue	0	1	7	
>	Notarization Service	0	1	16	
>	Orchestration	0	2	6	
>	Organization Credential Manager	0	10	23	
>	Personal Credential Manager	0	2	22	
>	Portal	0	13	14	
>	Trust Services	0	5	23	
	Authentication/Authorization	3		3 days ago	
	Continuous Automated Monitoring	4		1 day ago	

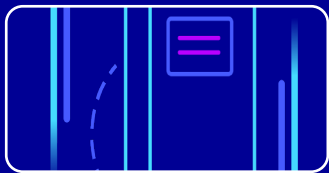
- Timeline:
 - Identity & Trust and Compliance – QA-Ready 07/2022
 - Authentication/Authorization (AAU)
 - Organization Credential Manager (OCM)
 - Personal Credential Manager (PCM)
 - Trust Services (TRU)
 - Notarization Service API (NOT)
 - Continuous Automated Monitoring (CAM)
 - Sovereign Data Exchange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



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



Thank You!

Q&A

RISE TO SHINE!

