



built by

Pontus-X Digital Service Ecosystem, powered by Gaia-X

Introduction to the data economy

deltaDAO Vision and Mission

We build the foundation for the European industrial AI & data economy and beyond.
We transform Data Act compliance obligations into scalable monetization opportunities.
Based on open-source software, located in the EU / Germany.



deltaDAO AG is a data economy software developer, integrator and consultant based in Hamburg founded in April 2021.



OUR VISION

Enabling a decentralized data economy with technical data sovereignty at its core.



OUR MISSION

Building scaling and privacy-preserving AI & data monetization solutions.

Providing trustworthy data space technology



Linking the largest sectors of the European industry **with the fastest growing ones.**



Leading IP- and privacy preserving technology at the core of Pontus-X.



First to deploy an **open and running ecosystem** of federation services since 2021.



We maintain a Pan-European test and staging network **aiming for production in 2024.**

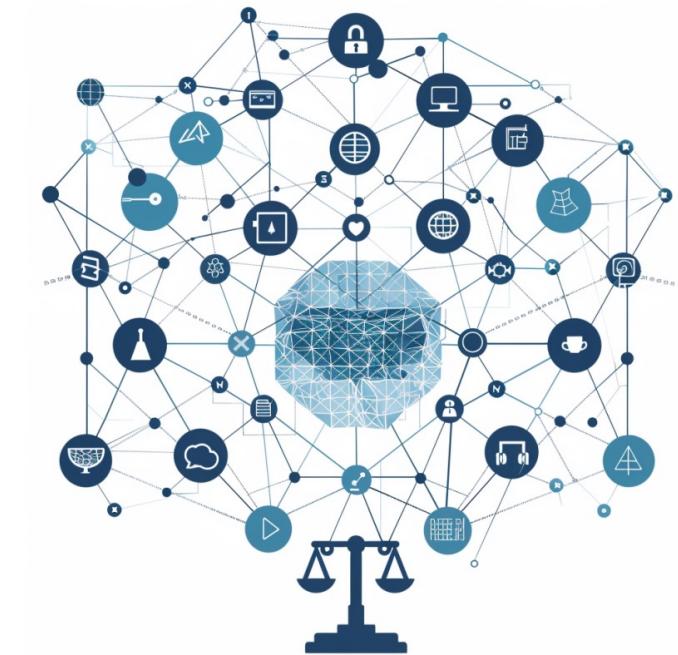
deltaDAO is involved in Gaia-X lighthouses and Gaia-X related projects



Data Spaces and Digital Service Ecosystems

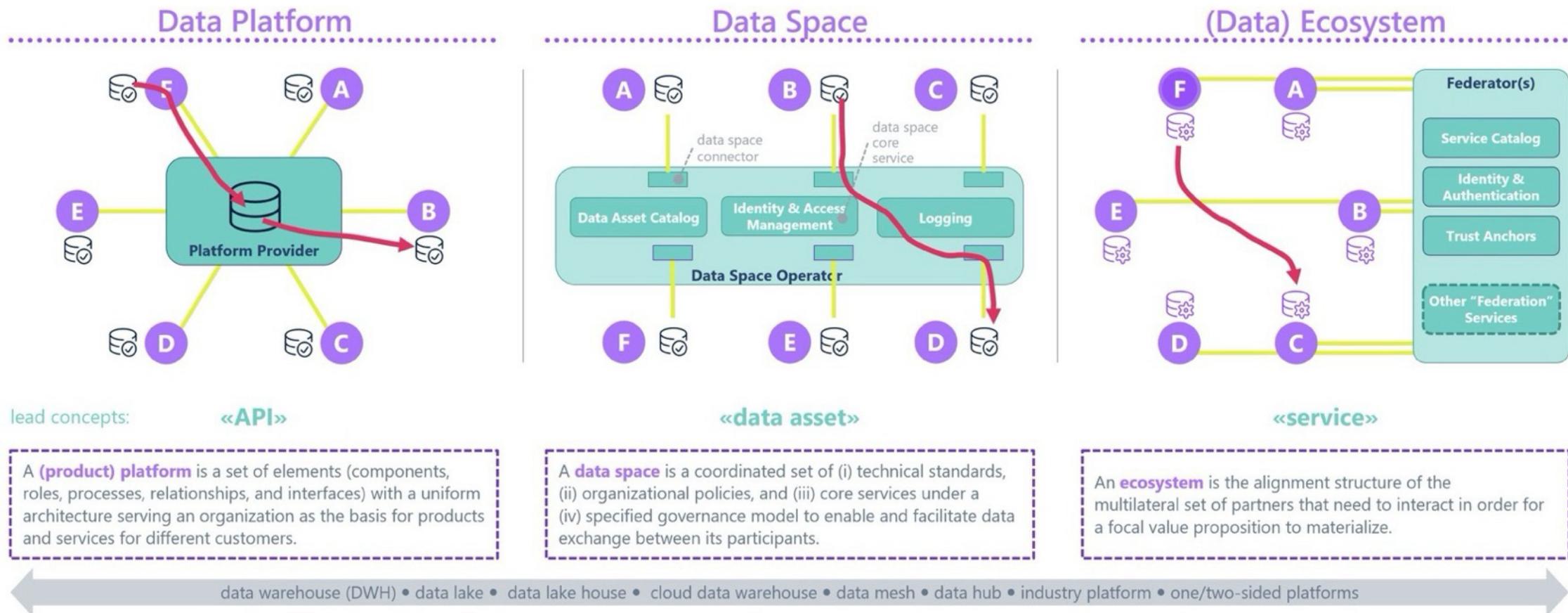
Secure Environments for Data Collaboration: Enabling Data Value Creation based on European principles

- Cooperative decentralized platforms for **data** and **digital service exchange**
- Upholds **data sovereignty** for all stakeholders
- Governed by agreed upon rules to ensure **trust** and **compliance**
- **Goal:** Creating a single market for data that will ensure Europe's global competitiveness and data sovereignty



Digital Service Ecosystem owned by Participants

PONTUS-X

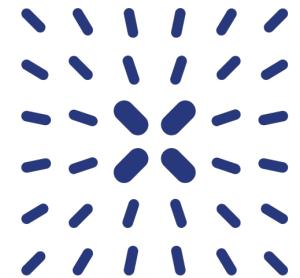


Source: Strnadl & Schöning (2023). Data platforms, Data Spaces, and (Data-) Ecosystems. in: Weber (Ed.), Data Governance. Springer

Gaia-X establishes trust in digital ecosystems

Gaia-X develops a digital governance that can be applied to any cloud/ edge technology stack

- Goal: Obtain transparency, controllability and interoperability across data and services
- The Gaia-X Framework describes rules and specifications necessary to be Gaia-X compliant
- The GXDCH are nodes of verification of the Gaia-X rules



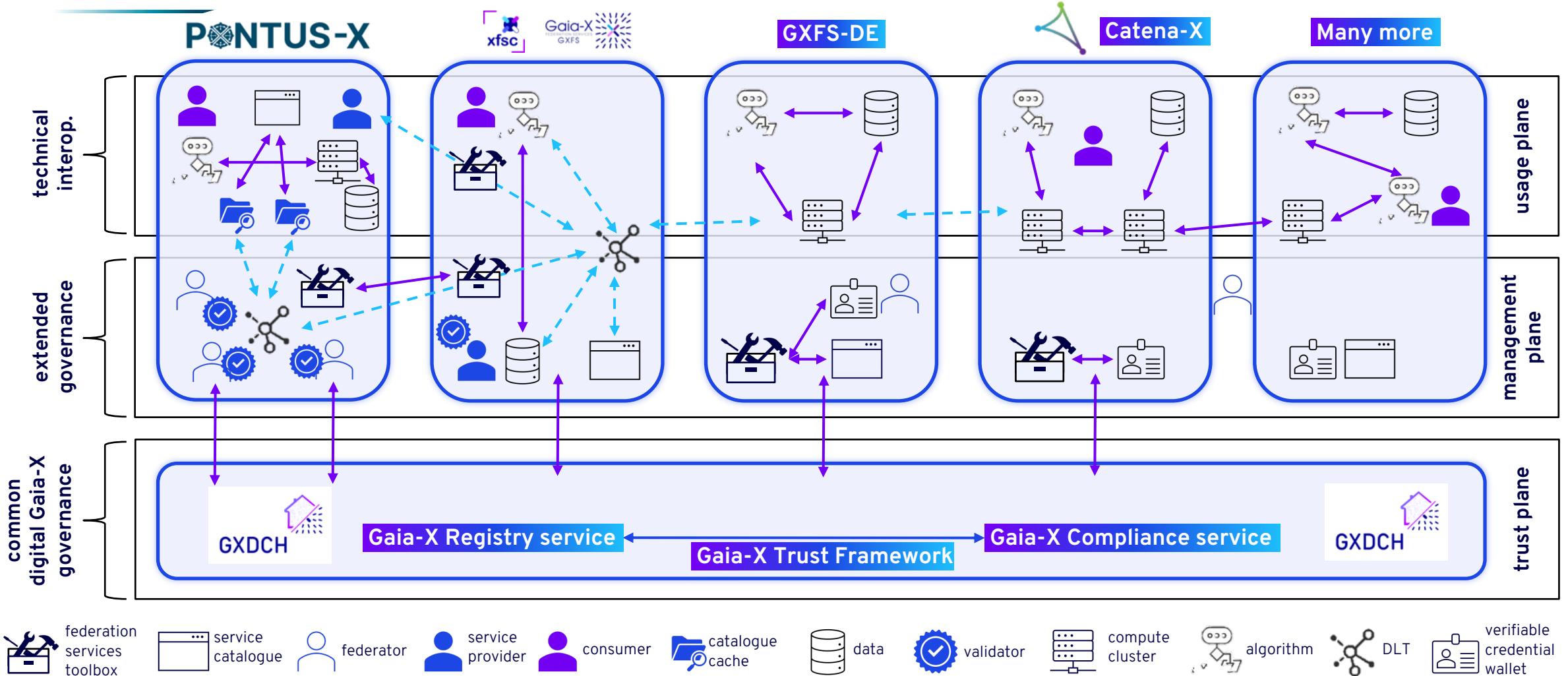
gaia-x

Gaia-X establishes trust in digital ecosystems

A large, semi-transparent rectangular overlay covers the middle portion of the slide. It features a dark blue gradient background with a faint, glowing network of nodes and lines, suggesting a complex digital ecosystem or blockchain network.

Discover Gaia-X,
for trustworthy data exchange

Gaia-X interoperable Ecosystem



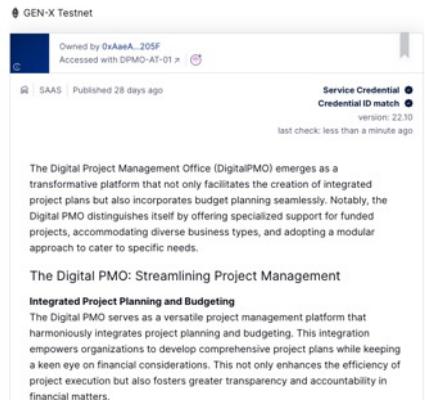
Gaia-X Compliance and GXDCH Integration

 Service Credentials are checked against the GXDCH since day 1.
deltaDAO follows the Trust Framework since 22.04.

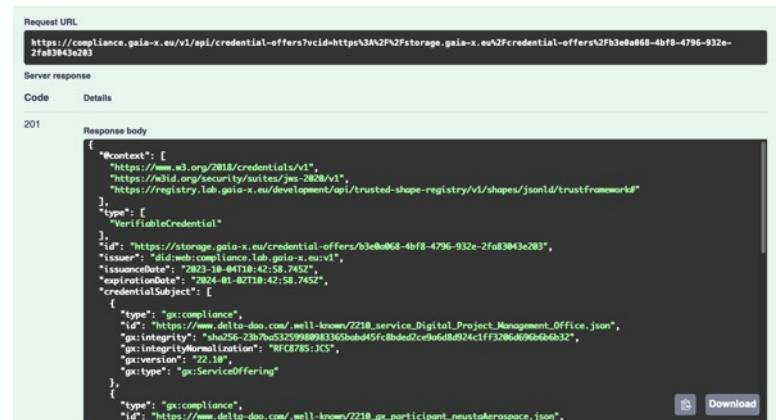
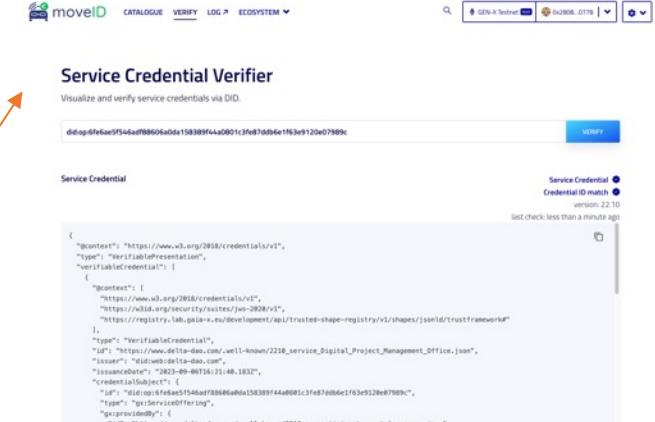
 We onboarded more than 100 institutions to the Gaia-X Trust Framework and integrated first services with the upcoming CES.



The Digital Project Management Office (DigitalPMO)



Service Credential 
Credential ID match 
version: 22.10
last check: less than a minute ago

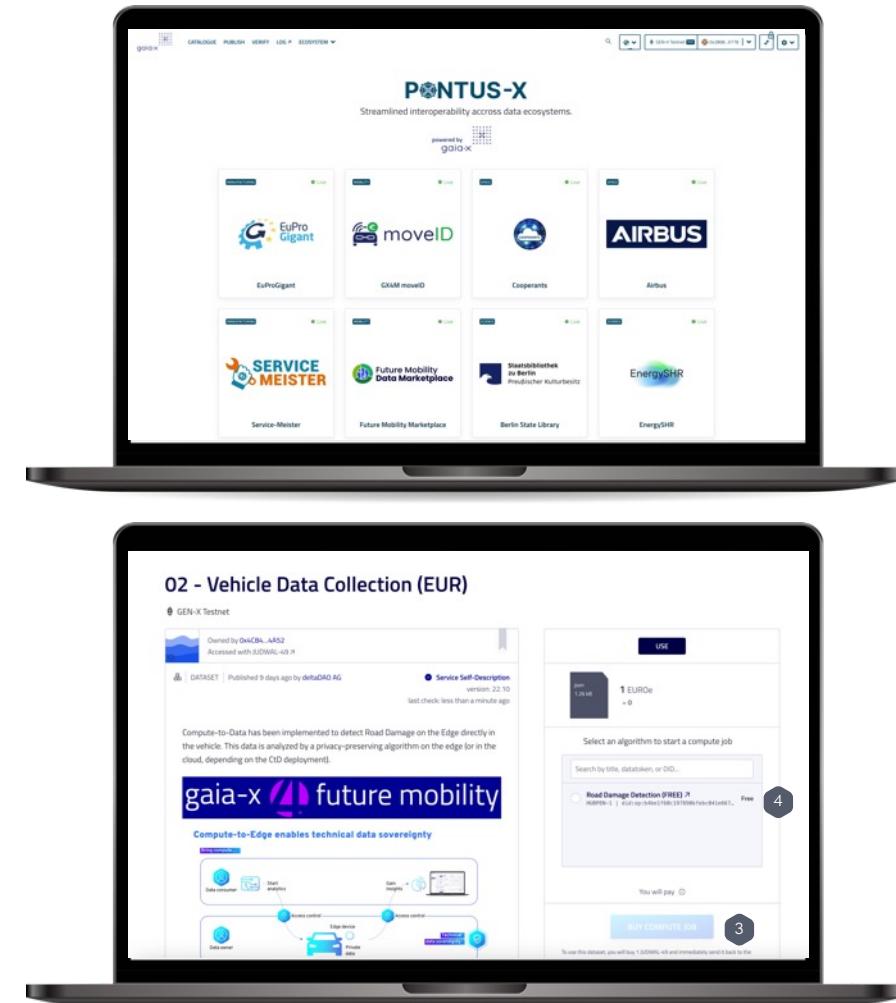


Example: <https://airbus.pontus-x.eu/asset/did:op:6fe6ae5f546adf88606a0da158389f44a0801c3fe87ddb6e1f63e9120e07989c>

What is Pontus-X?

Digital Service Ecosystem for Data, AI, and Infrastructure Providers

- 1 Share and monetize applications and data for training + cloud infrastructure for computation.
- 2 Search, discover, and consume AI applications and data for training + cloud infrastructure for computation.
- 3 IAM, automated access control, transaction logging, payment services, Gaia-X Compliance.
- 4 Collaborate with various stakeholders in a unified digital market across domains.



<https://pontus-x.eu/>

Data Sharing Challenges

The fear of losing data and control

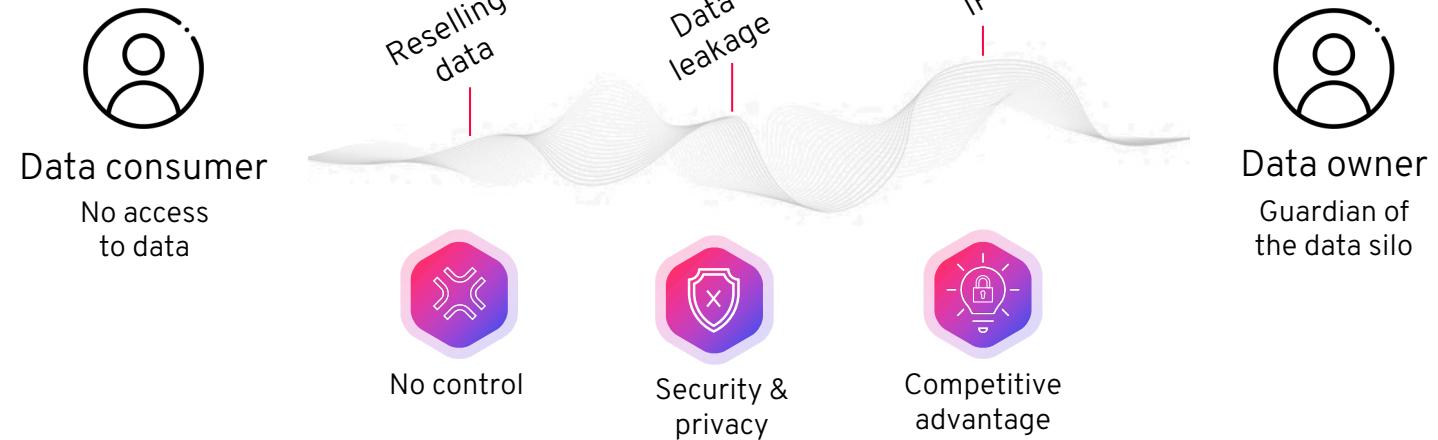
Tight regulations on sensitive data and the fear of losing intellectual property (IP) results in data silos.

Siloed data is dead data

Access to essential data is needed to unlock AI's full potential.

Siloed data does underperform

Business value is generated from data-driven products, not data.



Additional Challenges

New **regulatory requirements** on data sharing and AI
(Data Act, Data Governance Act, AI Act).

Solving compliance issues is complex and introduces **significant costs**.

Business models need to be adapted to the new environment.

Businesses are unaware of the value of their data and don't realize the **opportunities for monetizing data assets**.

The Data Act

- **Addresses the challenges and unleashes the opportunities presented by data in the EU**
- Connected products will have to be designed and manufactured in a way that empowers users (businesses or consumers) to easily and securely access, use and share the generated data.
- will enable a **fair distribution** of the value of data by establishing clear and fair rules

The data act was issued in January 2024, and will be fully applicable by September 2025.

Every business, participating in the European data market will be required to meet this regulation.

238,000

data supplying companies
in Europe in 2023

600,000

data using companies
in Europe in 2023

Enabling Services for AI and Data Business Models



Sell & combine the limitless possibilities of **software, AI, incl. Federated Learning.**



KYB/KYC based on **eIDAS / Trust Service Providers for legal persons / eID for natural persons.**



Monetize ANY data source & service.
Edge, on-prem, cloud, data streams, AI.



Contracting based on digital signatures as part of Terms & Conditions and data use agreements.



Participation in and/or operation of Pan-European network **infrastructures.**



Voluntary carbon-offsetting and **environmental impact & traceability** of interactions and orchestration.



Instant settlement with EU-regulated **digital EURO** (e-money) "EUROe".



Preserving IP and GDPR-compliance with **Compute-to-Data**

PONTUS-X

powered by
gaia-x



Spaces



gaia-x future mobility moveID



ACCURATE

Flex4Res

Co-funded by the European Union

Dione-X



AIRBUS



SERVICE MEISTER

Staatsbibliothek zu Berlin
Preußischer Kulturbesitz

Future Mobility Data Marketplace



EnergySHR

Acentrik

Federators



Universitat
de Lleida

exaion
GROUPE EDF



IONOS



arsys



Staatsbibliothek
zu Berlin
Preußischer Kulturbesitz

BIGCHAIN DB



TU WIEN



EXOSCALE



AIRBUS

software AG

Powered by



EUROe



Gaia-X Lighthouses

powered by
gaia-x

Powered by



Connected & Interoperable initiatives

Joint federation services

Catalogue & CES



gaia-x

Policy &
Conformity Rules



PONTUS-X

gaia-x future mobility
Gaia-X Lighthouse Project

Sustainable Business Models for all Participants

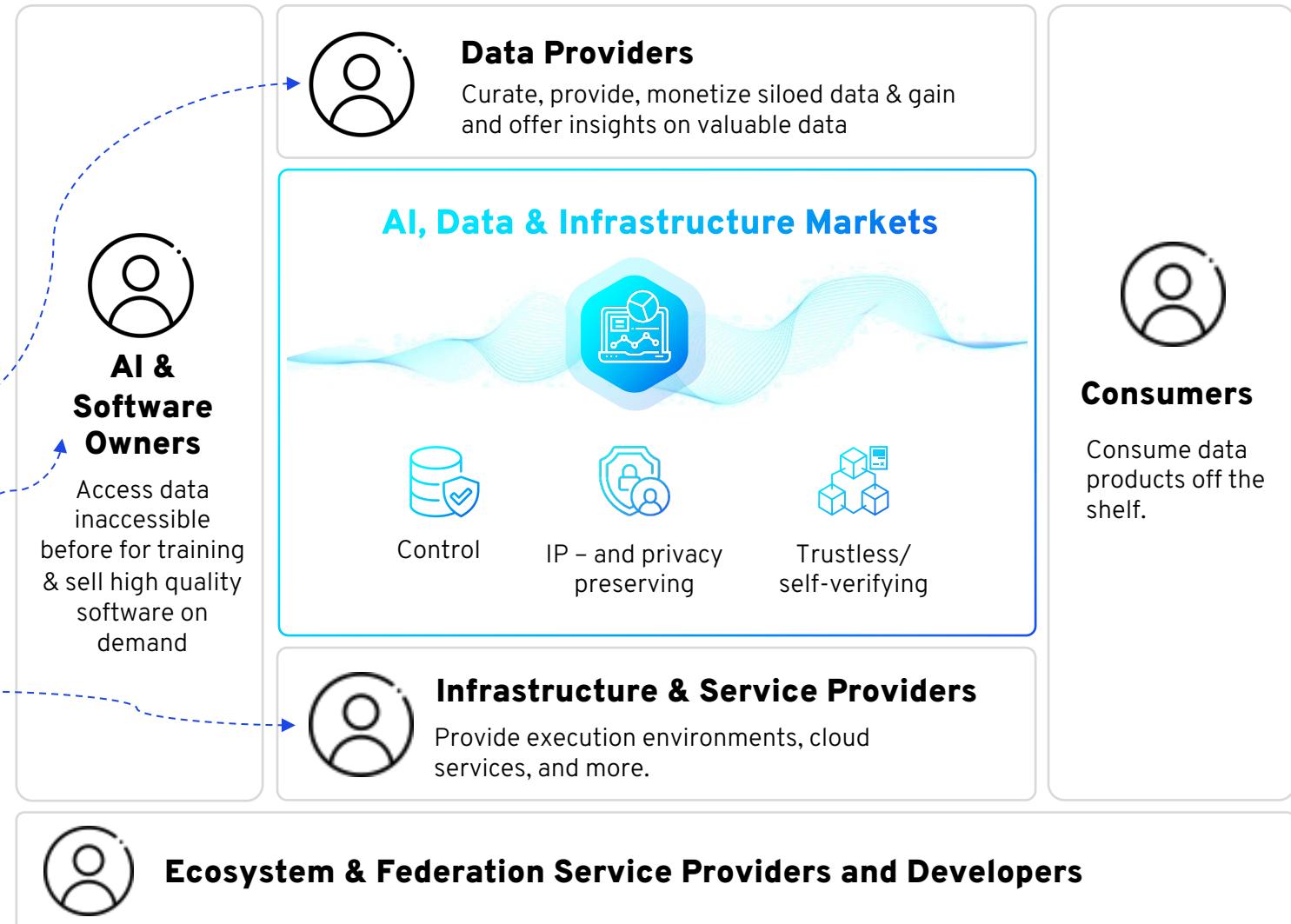
Settle transactions instantly in Euro. Pay per use and subscription models for data, AI applications and infrastructure.

DATASET	5 EUROe for 1 hour
+ COMMUNITY FEE	0.01 EUROe
+ ALGORITHM	10 EUROe for 1 day
+ COMMUNITY FEE	0.02 EUROe
+ INFRASTRUCTURE RESOURCES	0.998 EUROe for 600 seconds
=	16.028 EUROe
& CO2 COMPENSATION	0.25 EUROe

Curated and trusted data

Applications , & AI models

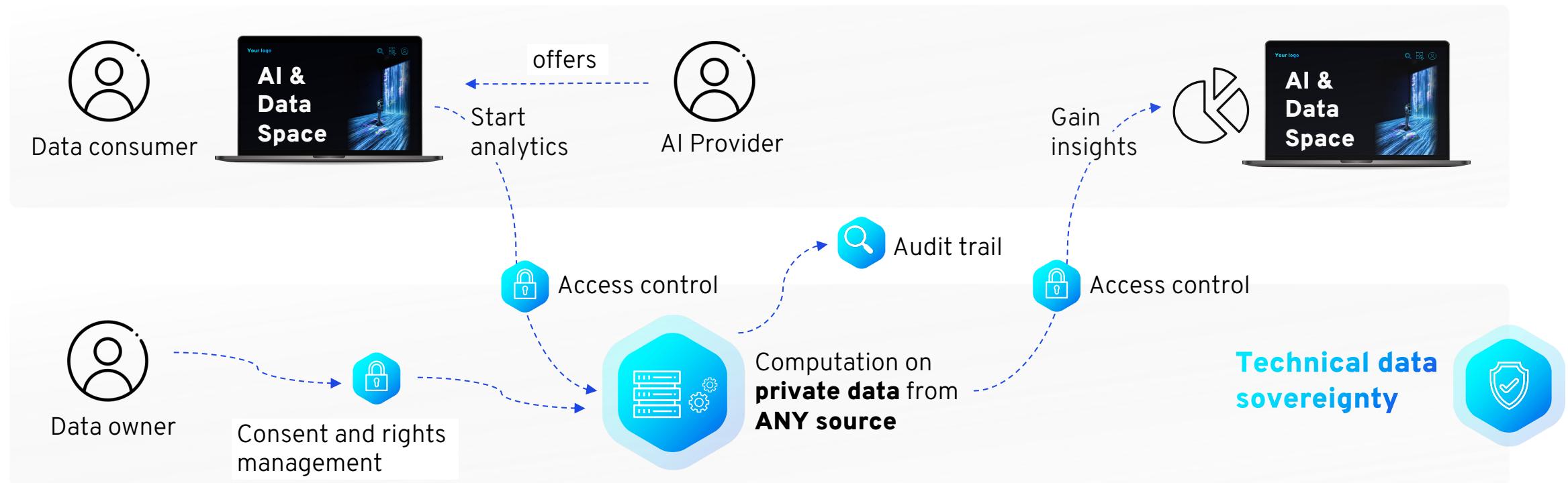
Infrastructure Resources



A safe & compliant environment for AI & data with CtD

Compute-to-Data is a technology that allows computations to be performed directly on data **without moving or exposing the raw data itself**, thereby preserving privacy and data sovereignty. **Only trusted applications are allowed** to perform computation on trusted infrastructure.

Bring compute...



... to where data is

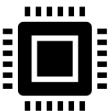
Reuse of Existing Infrastructure & Services



Automated data transfer with access controls and SSI



Compute-to-Data preserves IP, privacy and the right of economic exploitation without adding third-party risks



Compute-to-Edge brings privacy-preserving computation to the edge (infrastructure, vehicles, machines)



Federated Analytics and Training across a fleet of devices using CtD and CtE



Leverage data directly from any database or API incl. Compute-to-Data orchestration with GraphQL / Rest APIs



Access to any digital or infrastructure service (machines, AI, SaaS) through the contracting service and subscription verifier.



PostgreSQL



Amazon RDS



aiven



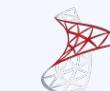
amazon ATHENA



AzureDB Postgres



Google BigQuery



Microsoft SQL Server



NEON



elasticsearch

Example Implementations



Industry 4.0 - Predictive Maintenance

- 1 Collection of manufacturing data for early identification of **maintenance** needs.
- 2 IP-preserving data **analytics & monetization**.
- 3 Manufacturers can proactively address potential equipment failures, resulting in **reduced downtime**, increased operational **efficiency**, **lowered maintenance costs** & **extended asset lifespan**.

Industry 4.0 predictive maintenance demo



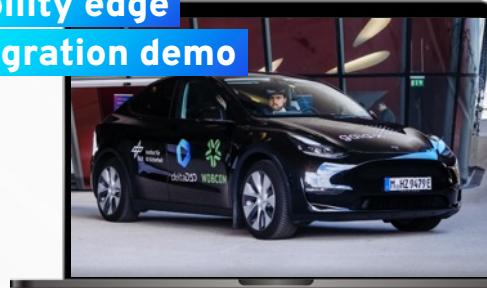
<https://youtu.be/5439iMCoF10>



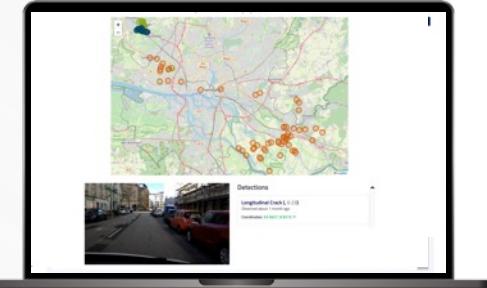
mobility - Digital Twins & Smart Services

- 1 Collection data on a **fleet of vehicles/ smart & roadside infrastructure**.
- 2 Advanced **federated analytics** to gain insights.
- 3 Fleet data can be collected and combined to meaningful data products, resulting in **accurate digital twins** and **smart mobility services**. Results in safer streets, lower maintenance costs and enables autonomous driving and routing.

Mobility edge integration demo



<https://youtu.be/W8PuM0ISm4s>



Fleet Analytics & Learning

Example Implementations



Aeronautics and Space

- 1 Sharing of **sensitive information**, specification documents, and **supply-chain data**.
- 2 **Facilitate collaboration** through **standardization**, data transformation and **specialized software services**.
- 3 Enable streamlined **data product orchestration** and **data supply chain** across participants.

Software as a Service Demonstrator

<https://cooperants.pontus-x.eu>

Digital Design Processes



Agriculture - Smart Farming and Supply Chain

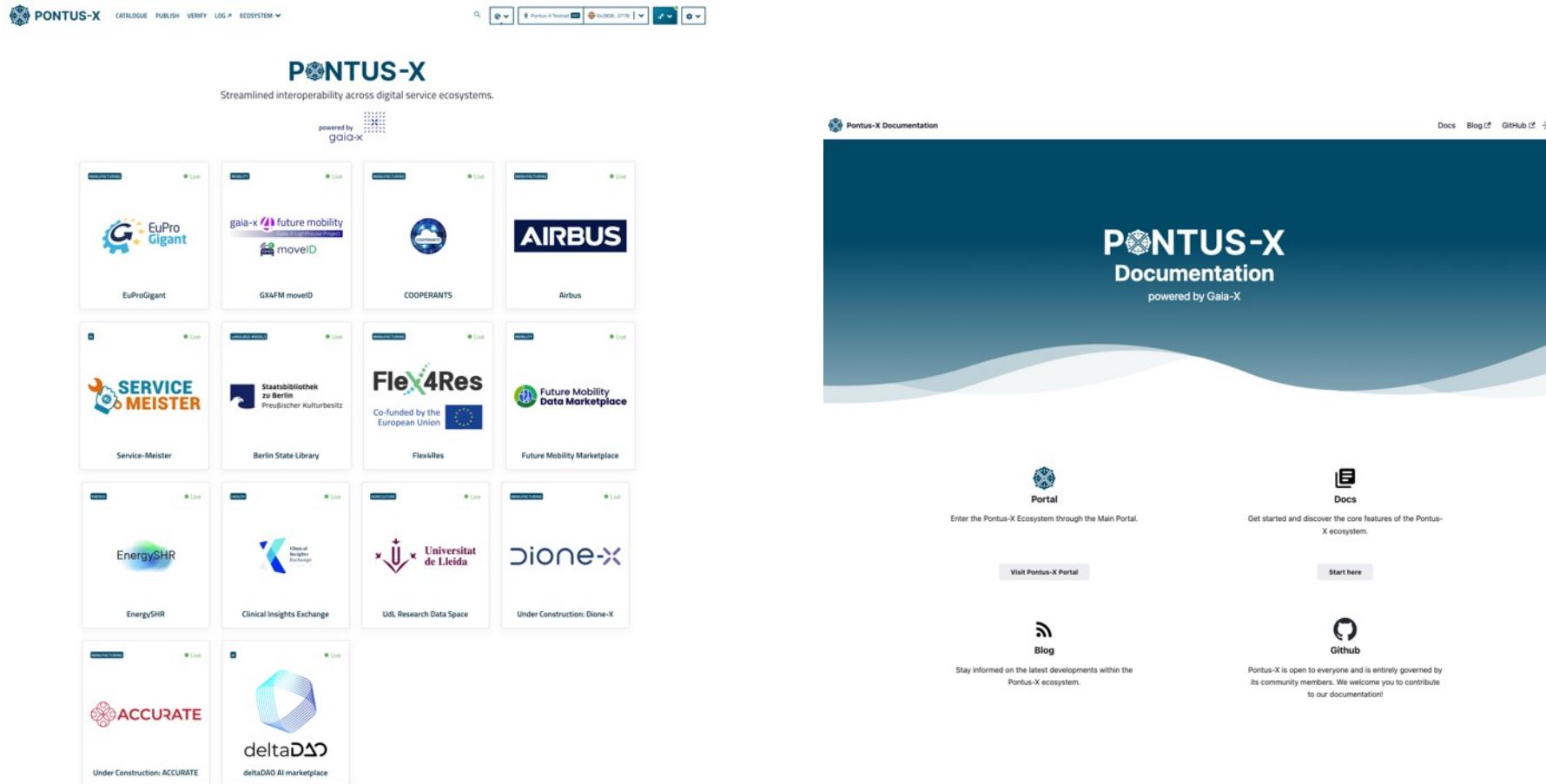
- 1 Analysis of data of farmers, the agricultural supply-chain, and livestock.
- 2 Advanced **insights and predictions** on the **environmental footprint & optimal conditions**.
- 3 **Increased efficiency in agriculture** and optimal conditions for agricultural producers and along the food supply-chain, supported by ML/AI applications **without compromising on IP**.

Livestock Analysis and Monitoring

<https://dataspace.angliru.udl.cat>

Fleet Analytics & Learning

How does it look like? Quick Demonstration.

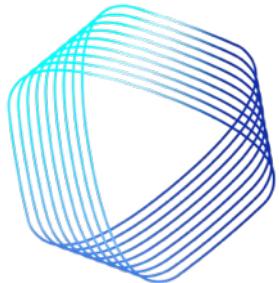


The image displays two screenshots of the Pontus-X platform. On the left is the 'ECOSYSTEM' section of the catalogue, featuring a grid of service cards. Each card includes the service name, a small icon, and a status indicator (green dot for 'Live'). The services listed include EuProGiant, GX4FM moveID, COOPERANTS, AIRBUS, SERVICE-MEISTER, Berlin State Library, Flex4Res, Future Mobility Marketplace, EnergySHR, Clinical Insights Exchange, Udl. Research Data Space, ACCURATE, and deltaDAO. The deltaDAO card indicates it is 'Under Construction'. The top of the catalogue has a navigation bar with links for CATALOGUE, PUBLISH, VERIFY, LOG-IN, and ECOSYSTEM. On the right is the 'Pontus-X Documentation' landing page, which has a dark blue header with the Pontus-X logo and 'powered by Gaia-X'. Below the header is a large banner with the text 'PONTUS-X Documentation' and 'powered by Gaia-X'. The page features several call-to-action buttons: 'Portal', 'Docs', 'Blog', and 'Github'. There is also descriptive text about the ecosystem and links to visit the portal or start exploring the documentation.

pontus-x.eu & docs.pontus-x.eu

Resources and References

- Pontus-X Ecosystem Portal
<https://pontus-x.eu/>
- Pontus-X Logging Service / GEN-X Explorer
<https://explorer.pontus-x.eu/>
- Pontus-X Network Documentation
<https://docs.pontus-x.eu/>
- EuProGigant Demonstrator
<https://portal.euprogigant.io/>
<https://youtu.be/5439iMCof10>
- Gaia-X 4 Future Mobility moveID Demonstrator
<https://portal.moveid.eu/>
<https://youtu.be/W8PuM0lSm4s>
- COOPERANTS Demonstrator
<https://cooperants.pontus-x.eu/>
<https://airbus.pontus-x.eu/>
- Service-Meister Demonstrator
<https://servicemeister.pontus-x.eu/>
- Pontus-X and deltaDAO Repositories
<https://github.com/deltaDAO>
- Ocean Protocol Documentation
<https://docs.oceanprotocol.com/>
- Gaia-X Trust Framework
<https://gaia-x.gitlab.io/policy-rules-committee/trust-framework/>
- Gaia-X Credential Wizard: <https://wizard.lab.gaia-x.eu/>
- Gaia-X Compliance Service: https://compliance.lab.gaia-x.eu/v1/docs/#/credential-offer/CommonController_issueVC
- Gaia-X Registry: <https://registry.lab.gaia-x.eu/v1/docs/>
- Credential Event Service (CES) aka Federated Catalogue Sync
<https://ces-v1.lab.gaia-x.eu/q/swagger-ui/>



deltaDAO

data economy solutions – GDPR compliant

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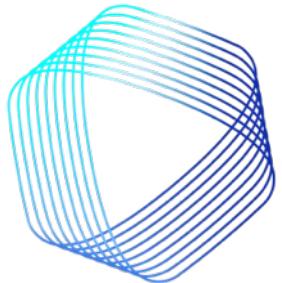
LinkedIn [deltadao](https://www.linkedin.com/company/delta-dao/)

YouTube [deltaDAO](https://www.youtube.com/channel/UCtPjyfXWzJLcOOGvDwzgA)

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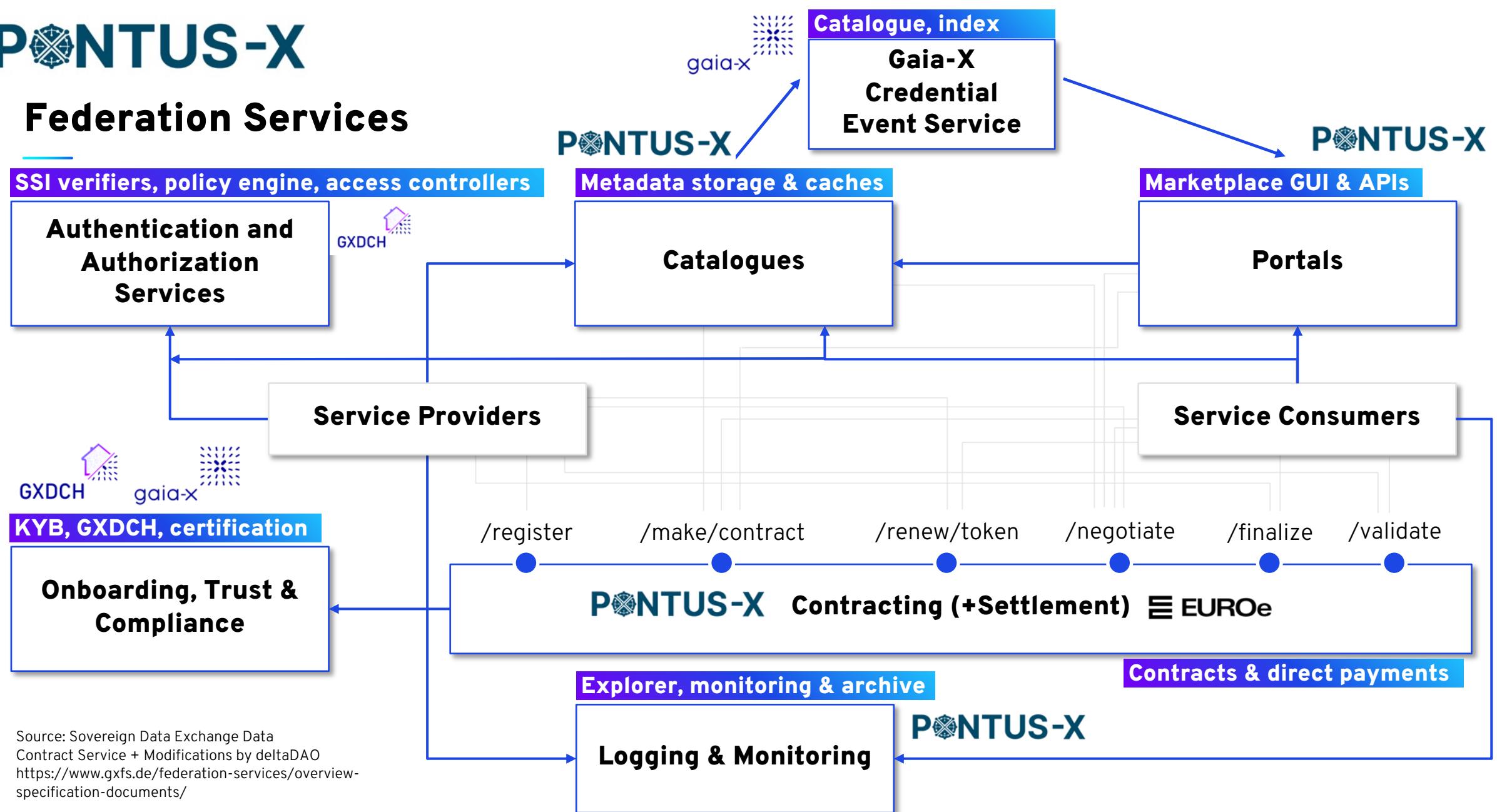
LinkedIn [deltadao](https://www.linkedin.com/company/delta-dao/)

YouTube [deltaDAO](https://www.youtube.com/channel/UCtPjyfXWzJLcOOGvDwzgA)



t.ly/GObBi

Federation Services



Pontus-X Digital Service Ecosystem

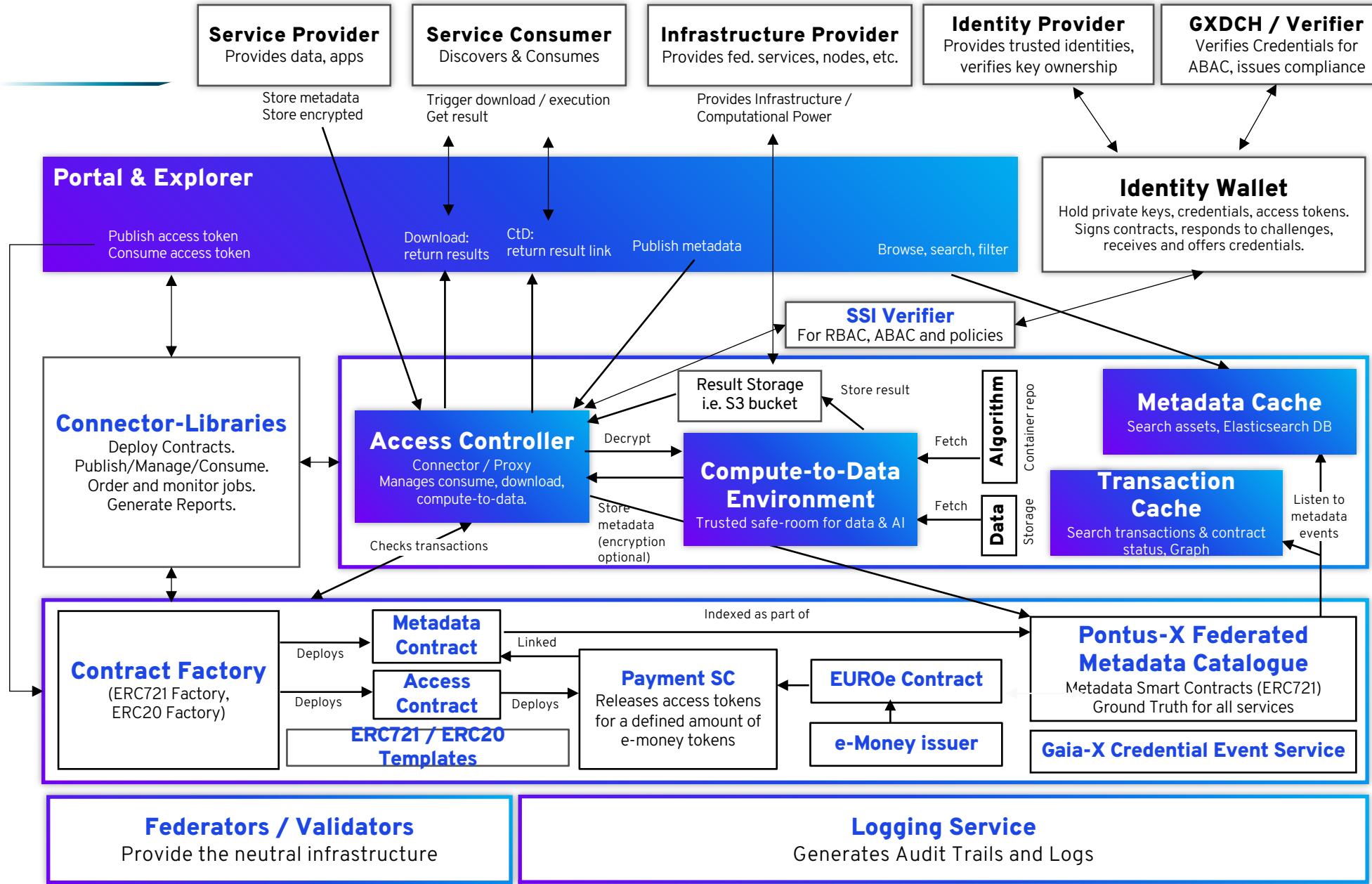


Frontend

Middleware

EVM / Smart Contracts

DLT



Portals / APIs

Libraries & K8s

Catalogue Cache
ES Database
Access Controller
Compute-Cluster

Smart Contract & DLT Layer

Catalogue, Contracting & Payment, Exchange Log, Federation