



PONTUS-X

built by



deltaDAO

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

Implementation Forum - Catalogue

IF Catalogue Introduction Questions

What is the context of the project?

- Pontus-X has been started in 2021 as Minimal Viable Gaia-X.
- Pontus-X has been the first ecosystem demonstrating all Gaia-X Federation Services and has been continuously operated and maintained since then.
- Today Pontus-X is the largest publicly available and open ecosystem, powered by Gaia-X.
- Pontus-X is used as basis for four Gaia-X lighthouses and has been developed as digital service ecosystem beyond data sharing.

Pontus-X Digital Service Ecosystem

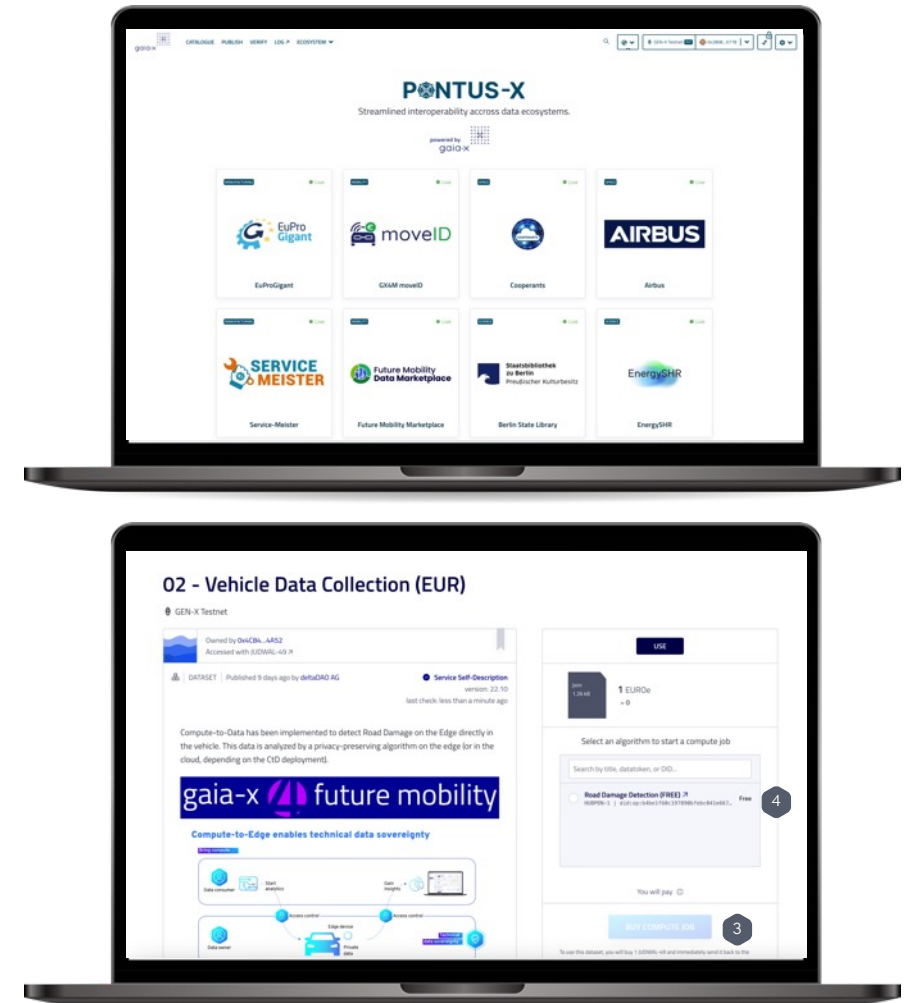
What is Pontus-X?



Digital Service Ecosystem for Data, AI, application and Infrastructure Providers

- 1 Share and monetize **applications** and **data + compute infrastructure**.
- 2 Search, discover, and consume applications and data + compute infrastructure for **data product generation**.
- 3 IAM, **contracting**, **access controls**, transaction **logging**, **payment** services **Gaia-X Compliance**.
- 4 **Collaborate** with various stakeholders in a unified digital market **across domains**.

Everything-as-a-Service - joint goal across X-ecosystems



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



PONTUS-X

powered by
gaia-x



Identity Provider

T Systems

GXDCH



Operators



Spaces



gaia-x future mobility moveID



Flex4Res  Co-funded by the European Union

dione-x



AIRBUS



Future Mobility Data Marketplace

dynamo

Staatsbibliothek zu Berlin
Preußischer Kulturbesitz



EnergySHR

Acentrik

BIGCHAIN DB



EXOSCALE

AIRBUS

software AG



Staatsbibliothek zu Berlin
Preußischer Kulturbesitz



arsys



IONOS



Powered by



EUROe

Quick Demo. Ecosystem Portals



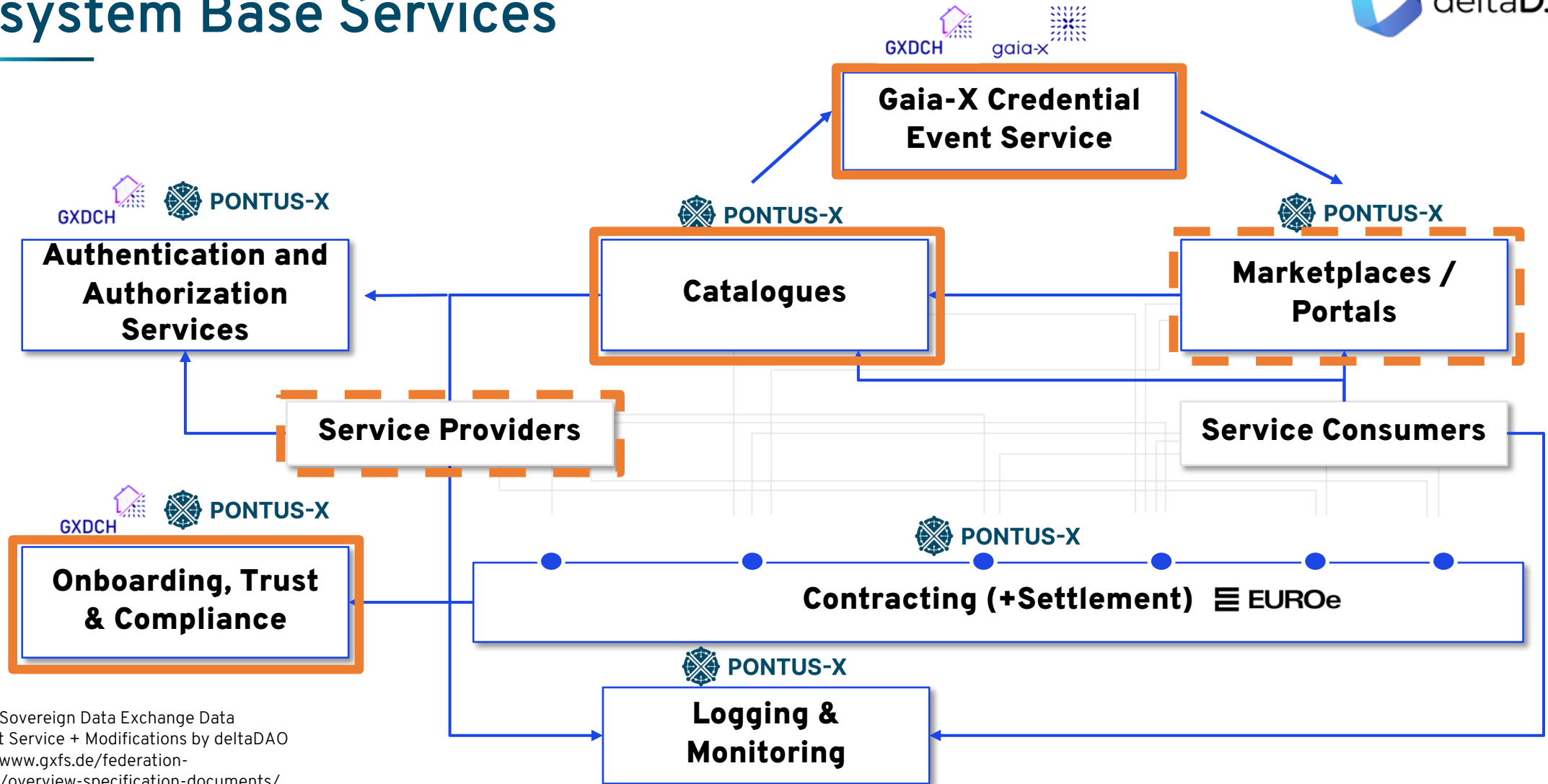
pontus-x.eu & docs.pontus-x.eu

IF Catalogue Introduction Questions

What is the main challenges regarding Participant, Services & Resource Descriptions?

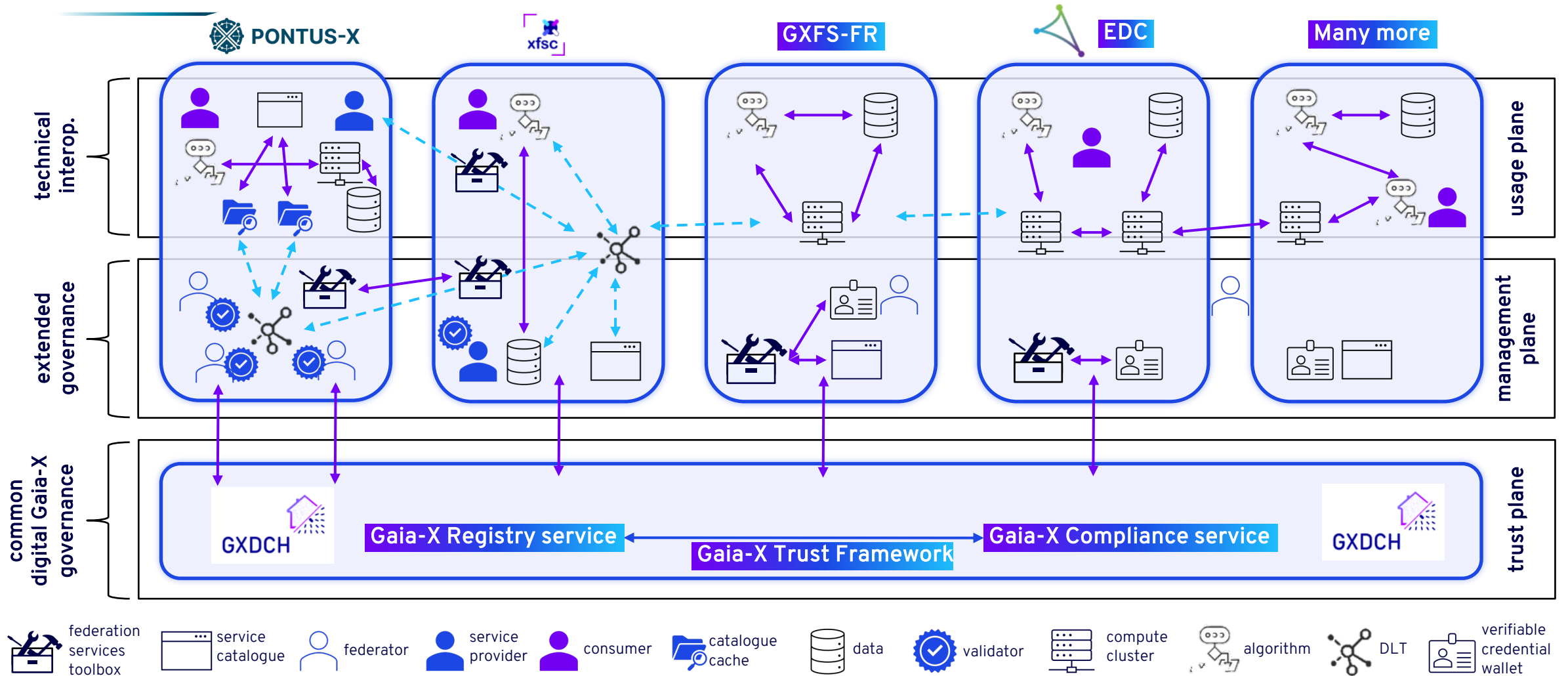
- Many participants are still unclear about the scope of Gaia-X credentials, their purpose and how Gaia-X compliance is reached.
- Contradicting statements have been made, not in scope of Gaia-X compliance. „Gaia-X ready“, „Gaia-X compliant connector“, „Gaia-X compliant data space“.
- Automatic and scalable tooling is not widely available.
- Participants struggle to connect their real service with Gaia-X Credentials
- Participants often are not sufficiently identified according to the Gaia-X Framework (KYC, EV SSL, eIDAS TSP)

Ecosystem Base Services



Source: Sovereign Data Exchange Data
Contract Service + Modifications by deltaDAO
<https://www.gxfs.de/federation-services/overview-specification-documents/>

Gaia-X Ecosystem of Ecosystems



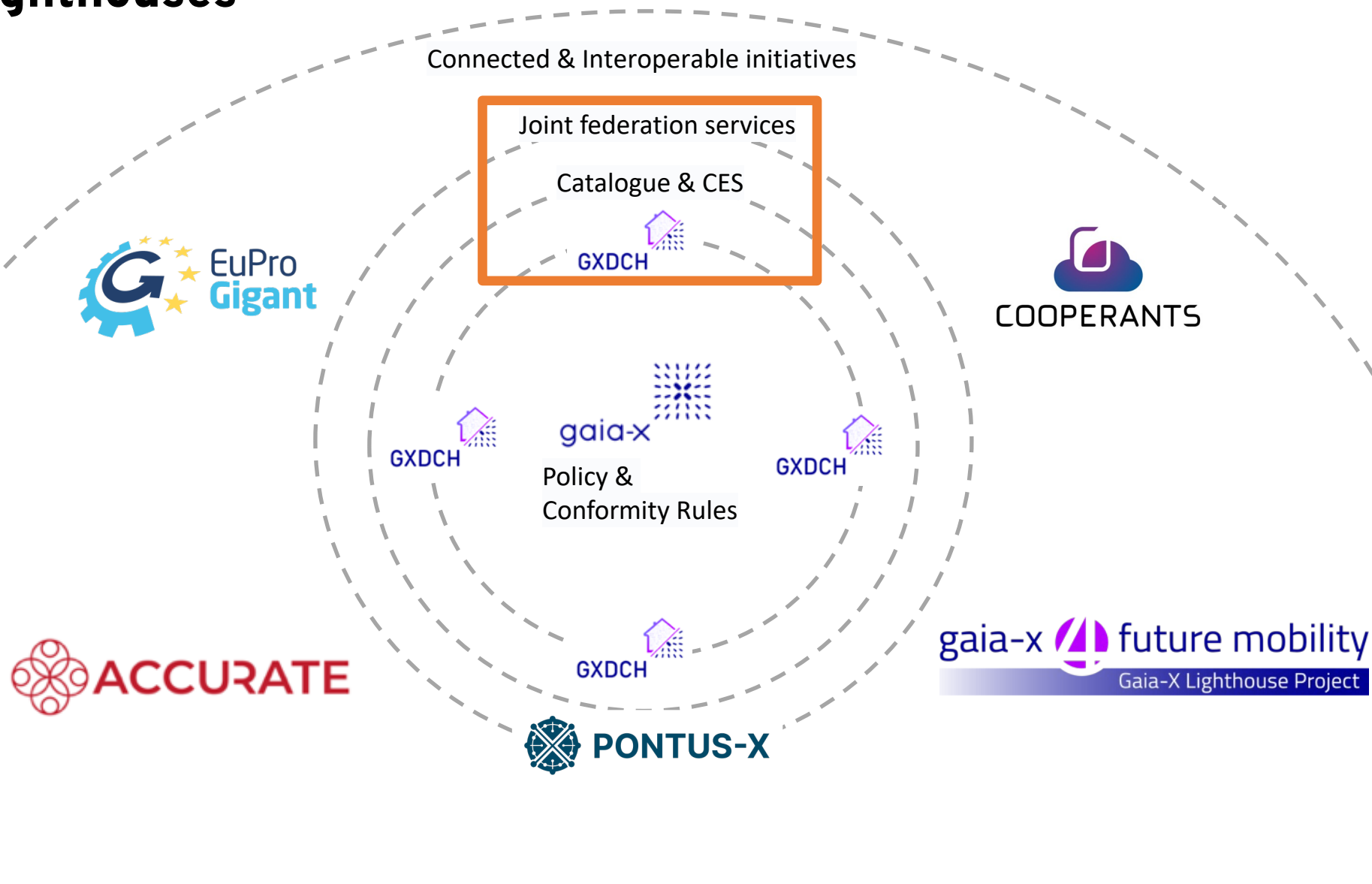


PONTUS-X

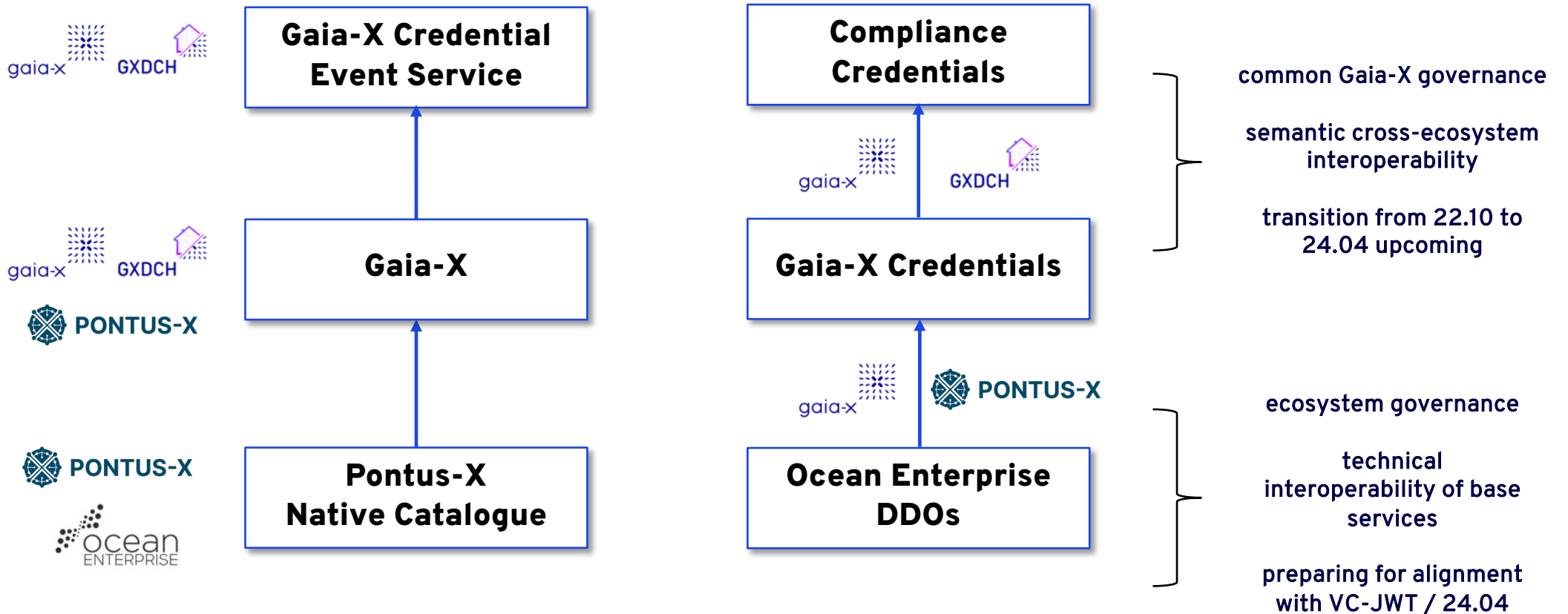
Gaia-X Lighthouses



Powered by



Self-Description / Credential Layers



Self-Description / Credential Layers



Ocean Enterprise DDOs / Credentials

open and extensible
with custom use case
metadata (data plane)

lightweight, stable since
2021

<https://docs.oceanprotocol.com/developers/ddo-specification>



Gaia-X Credentials

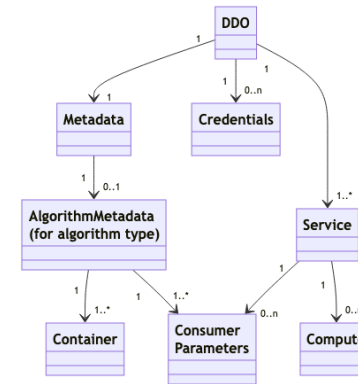
not freely extensible
with custom use case
metadata

stable since 2022-23

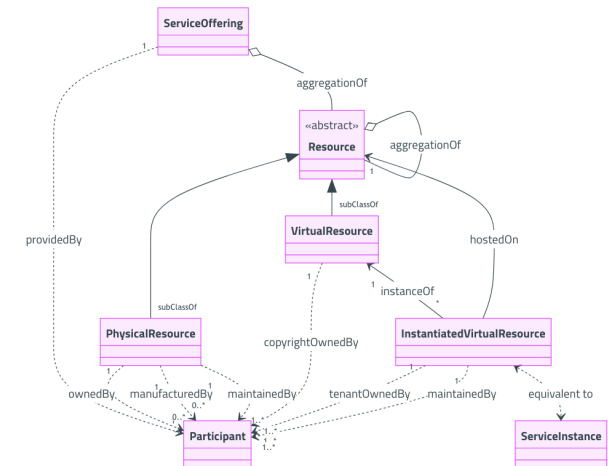
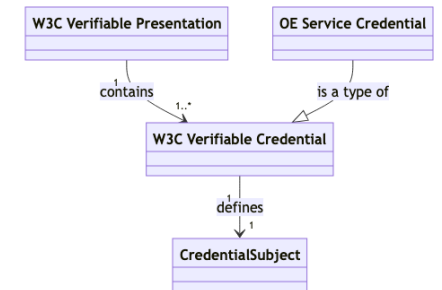
<https://docs.gaia-x.eu/policy-rules-committee/trust-framework/22.04/service/>

<https://docs.gaia-x.eu/policy-rules-committee/trust-framework/22.10/service/>

DDO High Level Diagram



OE Verifiable Presentation



Quick Demo. Catalogue, Discovery, Credentials, CES



PONTUS-X
Streamlined interoperability across digital service ecosystems.

powered by **gaia-x**

EuProGigant
Gigant

gaia-x future mobility
moveID

COOPERANTS

AIRBUS
Airbus

SERVICE-MAISTER
Service-Meister

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Flex4Res
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Future Mobility Marketplace

EnergySHR
EnergySHR

Clinical Insights Exchange

Universitat de Lleida
UdL Research Data Space

Dione-X
Under Construction: Dione-X

ACCURATE
Under Construction: ACCURATE

deltaDAO
deltaDAO AI marketplace

Coarse Earth Sun Sensor Interface Control Document (ICD) v1
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Coarse Earth Sun Sensor":...
5 EUROe
3 sales
Pontus-X Testnet

Global Navigation Satellite System Interface Control Document (ICD) v2
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Global Navigation Satellite ...
5 EUROe
3 sales
Pontus-X Testnet

Gyroscope Interface Control Document (ICD) v1.2
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Gyroscope": Key informatio...
5 EUROe
3 sales
Pontus-X Testnet

Magnetometer Interface Control Document (ICD) v3
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Magnetometer": Key infor...
5 EUROe
3 sales
Pontus-X Testnet

Magnetorquer Interface Control Document (ICD) v1
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Magnetorquer": Key infor...
5 EUROe
3 sales
Pontus-X Testnet

Reaction Wheel Interface Control Document (ICD) v2
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Reaction Wheel": Key infor...
5 EUROe
3 sales
Pontus-X Testnet

Star_Tracker 100 Interface Control Document (ICD) v2
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Star_Tracker 100": Key info...
5 EUROe
3 sales
Pontus-X Testnet

Star_Tracker 100 Interface Control Document (ICD) v3
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Star_Tracker 100": Key info...
5 EUROe
3 sales
Pontus-X Testnet

Star_Tracker 100 Interface Control Document (ICD) v4
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Star_Tracker 100": Key info...
5 EUROe
3 sales
Pontus-X Testnet

Star_Tracker 100 Interface Control Document (ICD) v5
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "Star_Tracker 100": Key info...
5 EUROe
3 sales
Pontus-X Testnet

HEATER R100 Interface Control Document (ICD) v1
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "HEATER R100": Key inform...
5 EUROe
2 sales
Pontus-X Testnet

THERMISTOR_1K Interface Control Document (ICD) v2
0x81c3...1Be2
This dataset contains information about the (electrical) design of the equipment "THERMISTOR_1K": Key inf...
5 EUROe
3 sales
Pontus-X Testnet

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

IF Catalogue General Questions

What had to be implemented to develop a suitable solution?

- Gaia-X Credential requirements need to be understood.
<https://docs.gaia-x.eu/>
- A Gaia-X Credential issuer has been developed by Gaia-X AISBL.
<https://wizard.lab.gaia-x.eu/>
- A Gaia-X Credential verifier has been developed, the GXDCH.
- The GXDCH APIs needed to be integrated with the ecosystem.
<http://docs.gaia-x.eu/framework/?tab=clearing-house>
- Pontus-X native credentials needed to be extended to enabled Gaia-X Credentials.

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 services with the CES.



The Digital Project Management Office (DigitalPMO)

GEN-X Testnet

Owned by GxAAA_205F
Accessed with DPMO-AT-01

SAAS | Published 28 days ago

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

The Digital Project Management Office (DigitalPMO) emerges as a transformative platform that not only facilitates the creation of integrated project plans but also incorporates budget planning seamlessly. Notably, the Digital PMO distinguishes itself by offering specialized support for funded projects, accommodating diverse business types, and adopting a modular approach to cater to specific needs.

The Digital PMO: Streamlining Project Management

Integrated Project Planning and Budgeting

The Digital PMO serves as a versatile project management platform that harmoniously integrates project planning and budgeting. This integration empowers organizations to develop comprehensive project plans while keeping a keen eye on financial considerations. This not only enhances the efficiency of project execution but also fosters greater transparency and accountability in financial matters.

5.01 EUROe

SUBSCRIBE FOR 1 DAY

To use this asset, you will buy 1 DPMO-AT-01 and immediately send it back to the publisher.

Access allowed

15 sales

Related Assets

No results found

Service Credential
Credential ID match

version: 22.10

last check: less than a minute ago

moveID CATALOGUE VERIFY LOG ECOSYSTEM

Service Credential Verifier

Visualize and verify service credentials via DID.

did:op:6fe6ae5f546adf88606a0da158389f44a0801c3fe87ddb6e1f63e9120e07989c

Service Credential

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

```
{
  "context": "https://www.w3.org/2018/credentials/v1",
  "type": "VerifiablePresentation",
  "verifiableCredential": [
    {
      "context": [
        "https://www.w3.org/2018/credentials/v1",
        "https://w3id.org/security/suites/jws-2020/v1",
        "https://registry.lab.gaia-x.eu/development/api/trusted-shape-registry/v1/shapes/jsonld/trustframework"
      ],
      "type": "VerifiableCredential",
      "id": "https://www.delta-dao.com/well-known/2218_service_Digital_Project_Management_Office.json",
      "issuer": "did:web:delta-dao.com",
      "issuanceDate": "2023-08-08T13:21:48.183Z",
      "credentialSubject": {
        "id": "did:op:6fe6ae5f546adf88606a0da158389f44a0801c3fe87ddb6e1f63e9120e07989c",
        "type": "gx:ServiceOffering",
        "gx:providedBy": {
          "id": "https://www.delta-dao.com/well-known/2218_gx_participant_neustarospace.json"
        }
      }
    }
  ]
}
```

Request URL

https://compliance.gaia-x.eu/v1/api/credential-offers?cid=https://storage.gaia-x.eu/2f63843e283

Server response

Code Details

201

Response body

```
{
  "context": [
    "https://www.w3.org/2018/credentials/v1",
    "https://w3id.org/security/suites/jws-2020/v1",
    "https://registry.lab.gaia-x.eu/development/api/trusted-shape-registry/v1/shapes/jsonld/trustframework"
  ],
  "type": [
    "VerifiableCredential"
  ],
  "id": "https://storage.gaia-x.eu/credential-offers/63843e283-4bf8-4796-932e-2f63843e283",
  "issuer": "did:web:compliance.lab.gaia-x.eu/v1",
  "issuanceDate": "2023-10-04T18:42:58.745Z",
  "expirationDate": "2024-01-02T18:42:58.745Z",
  "credentialSubject": {
    "type": "gx:compliance",
    "id": "https://www.delta-dao.com/well-known/2218_service_Digital_Project_Management_Office.json",
    "gx:integrity": "sha256-23b7b5325998083365b4b45f8b4d2c4b6d8d924c1ff3206d09d6b632",
    "gx:integrityMethod": "JCS",
    "gx:version": "22.10",
    "gx:type": "gx:ServiceOffering"
  },
  "type": "gx:compliance",
  "id": "https://www.delta-dao.com/well-known/2218_gx_participant_neustarospace.json"
}
```

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

IF Catalogue Introduction Questions

Did the solutions satisfy your requirements? No, not yet.

- Credential Issuance to wallets through OIDC4VCI is not comfortable, yet.
- Credential Exchange for participants is not comfortable, yet.
- Building on X.509 certificates and RSA is a bit too legacy.
- Compliance Credentials validation is not publicly available, yet.
- Elliptic Curves need to be supported, soon.
- GXDCH distribution lacks a consensus mechanism / stability.
- Wizard and automation are not comfortable enough, yet.

The next Gaia-X release 24.04 aims to address many of these issues.

IF Catalogue General Questions

What are your next steps?

- Continued onboarding of participants.
- Alignment with 24.04 Gaia-X specifications with Ocean Enterprise.
- Deeper integration of available SSI components meeting Gaia-X requirements.
- Pontus-X going to production end of 2024.

Resources and References

- Pontus-X Ecosystem Portal
<https://pontus-x.eu/>
- Pontus-X Logging Service / GEN-X Explorer
<https://explorer.dev.pontus-x.eu>
- Pontus-X Network Documentation
<https://docs.pontus-x.eu/>
- EuProGigant Demonstrator
<https://portal.euprogigant.io/>
<https://youtu.be/5439iMCof10>
- Flex4Res Demonstrator
<https://flex4res.pontus-x.eu/>
- 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/>
- Pontus-X and deltaDAO Repositories
<https://github.com/deltaDAO>
- Nautilus Library
<https://nautilus.delta-dao.com/>
Examples: <https://github.com/deltaDAO/nautilus-examples>
- Pontus-X Docs
<https://docs.pontus-x.eu>
- Ocean Enterprise Repositories
<https://github.com/OceanProtocolEnterprise>
- Gaia-X Docs
<http://docs.gaia-x.eu/>
- Gaia-X Compliance Document 22.10
<http://docs.gaia-x.eu/policy-rules-committee/trust-framework/22.10>
- Gaia-X Wizard: <https://wizard.lab.gaia-x.eu/>
- Credential Event Service (CES) aka Federated Catalogue Sync
<https://ces-v1.lab.gaia-x.eu/q/swagger-ui/>



data economy solutions – GDPR compliant

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