

Gaia-X SUMMIT 2025



DIGITAL ECOSYSTEMS IN ACTION

Porto, Portugal | 20 & 21 November



In partnership
with



Tech Theatre | Friday | 21.11.2025



Time	Title	Presenter(s)
09:00 – 09:30	Danube 101	Christoph Strnadl , CTO, Gaia-X Yassir Sellami , Tech Team Lead, Gaia-X
09:30 – 09:45	Ontologies – Gaia-X, DSSC, and Danube	Vincent Henry , Ontology Engineer, Gaia-X
09:45 – 10:30	Danube – Implementation Examples	Delphine Claerhout , Software Engineer, Gaia-X Christoph Strnadl , CTO, Gaia-X
10:30 – 10:45	Danube Q&A	CTO Team
11:00 – 11:45	Networking Coffee & Expo Area	
11:30 – 11:45	EDC with Gaia-X Trust Framework	Christoph Strnadl , CTO, Gaia-X Julien Foliot , Software Engineer, Gaia-X
11:45 – 12:00	OS Awards (“Open Source Awards”)	Francisca Rubio , General Manager, Gaia-X Hub Spain
12:00 – 12:30	OSS Community Slot <ul style="list-style-type: none">▪ Onboarding Wizard and more – Demonstration▪ EF and data spaces (and other digital ecosystems) – Update	Kai Meinke , Co-Founder & Business Lead, deltaDAO AG Javier Valiño , Program Manager, Eclipse Foundation
12:30 – 12:45	Gaia-X Version X	
12:45 – 13:00	CTO Team Q&A	

#GaiaXSummit25

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Danube 101

Christoph Strnadl | CTO | Gaia-X

Yassir Sellami | Tech Lead | Gaia-X

Gaia-X European Association for Data and Cloud

#GaiaXSummit25

Gaia-X 3.0 “Danube” 101

Overall Architecture and other General Considerations

21 November 2025

Christoph F. Strnadl | CTO

| Gaia-X AISBL

Gaia-X 3.0 «Danube»

High level requirements



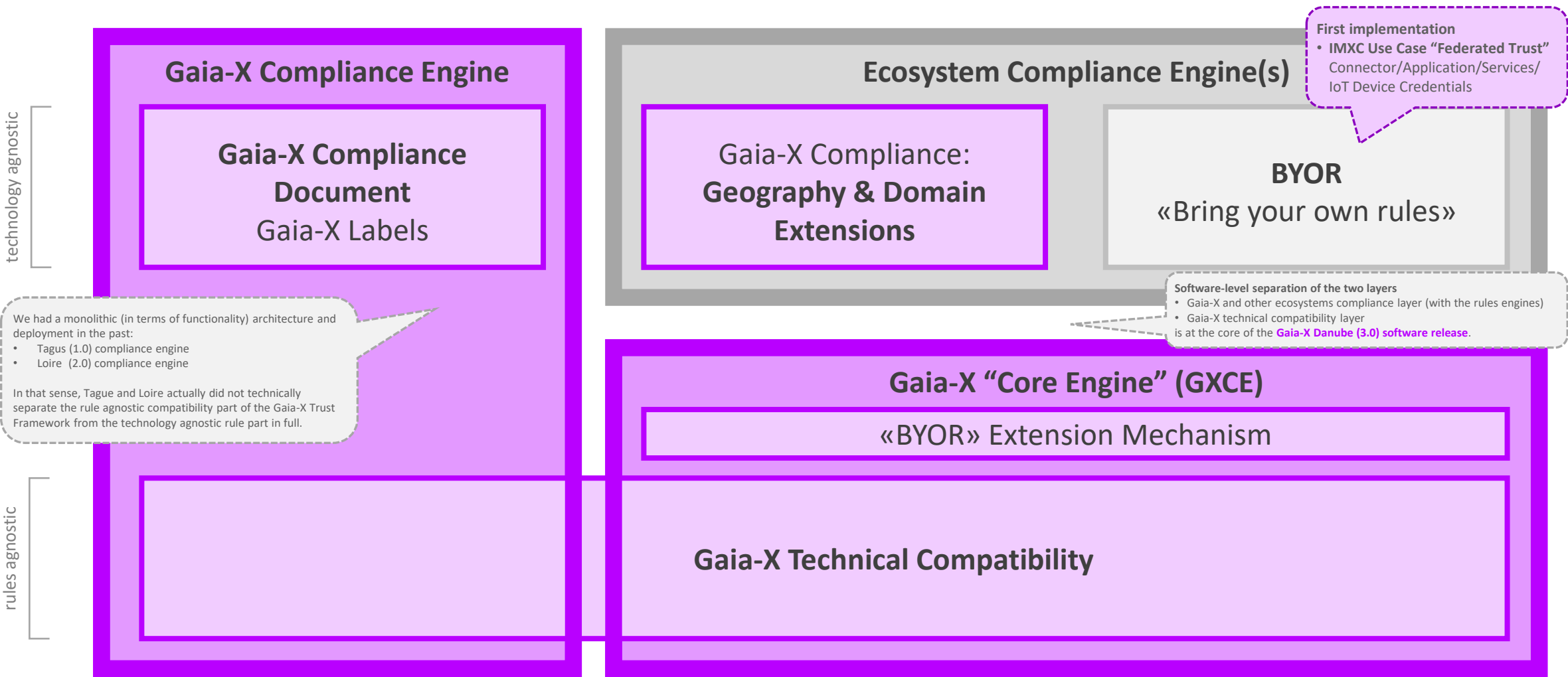
1. **Key focus** is on implementing an **extension mechanism** for the Gaia-X Trust Framework following the PRC's «Geography & Domain Extension White Paper». It will affect any (future) Gaia-X **Compliance Engine** and, possibly in the future but not now, the **Registry**.
This major step will enable ecosystems to add (almost) arbitrary compliance rules & criteria and individual implementations (engines). It will also include an extensible and re-usable Gaia-X **ontology**.
2. **Continuous support for «Loire» (2.0):**
 - Compliance criteria: «Loire» (2.0) Participant & Service Credentials
3. **Technical compatibility did not change:** VC-JWT (JOSE), VC DM 2.0, did:web, trust anchors (EV-SSL, eIDAS)
4. **Overall:** New subjects and features will be added without breaking changes to existing features and specifications ➔ versioning 3.0, 3.1 etc. to be expected

Note: There is NO «Danube» compliance (and Danube and Loire are BFF) because

- a) Compliance is relative to a version of the CD (25.05, 25.11) and not with an “architecture” like Loire/Danube
- b) There simply are no new «Danube»-like compliance criteria, just updates to «Loire»

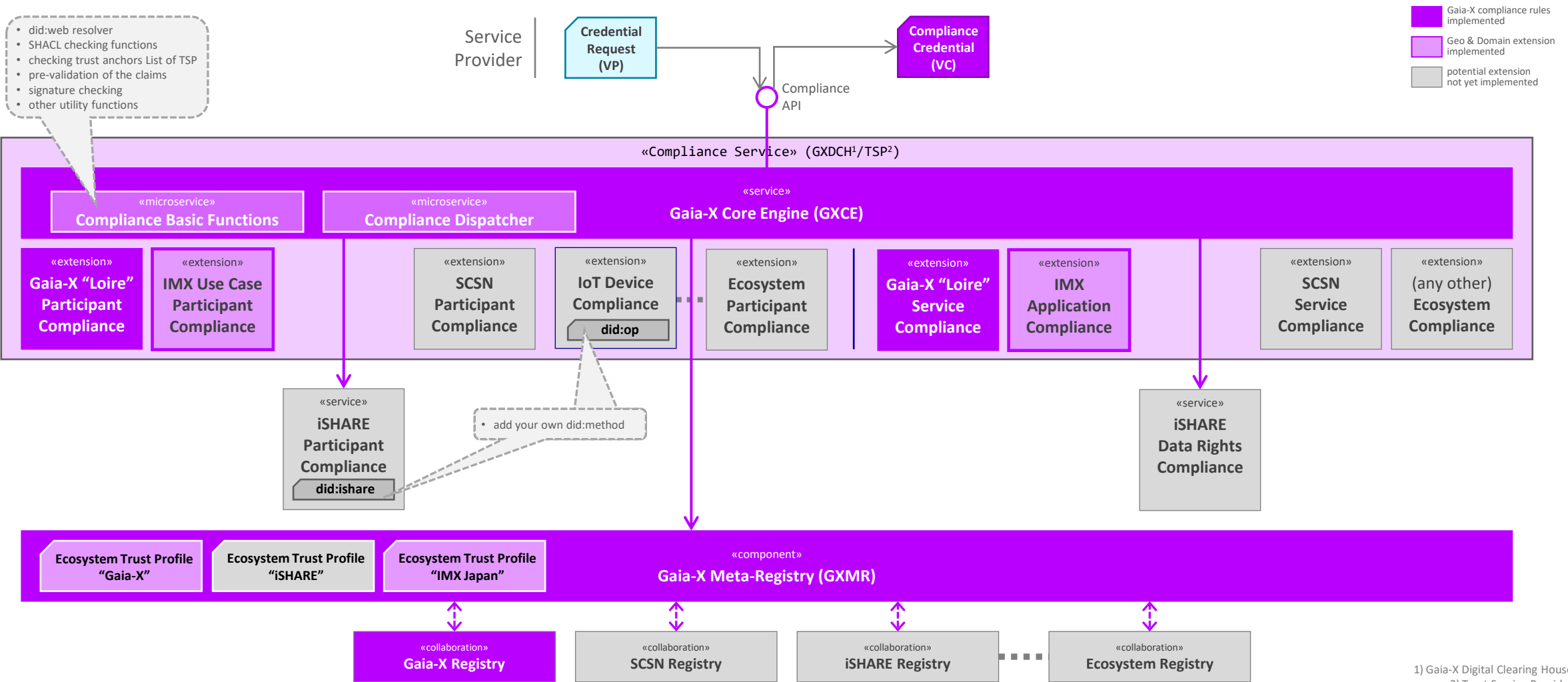
Gaia-X 3.0 «Danube»

High level requirements from the PRC



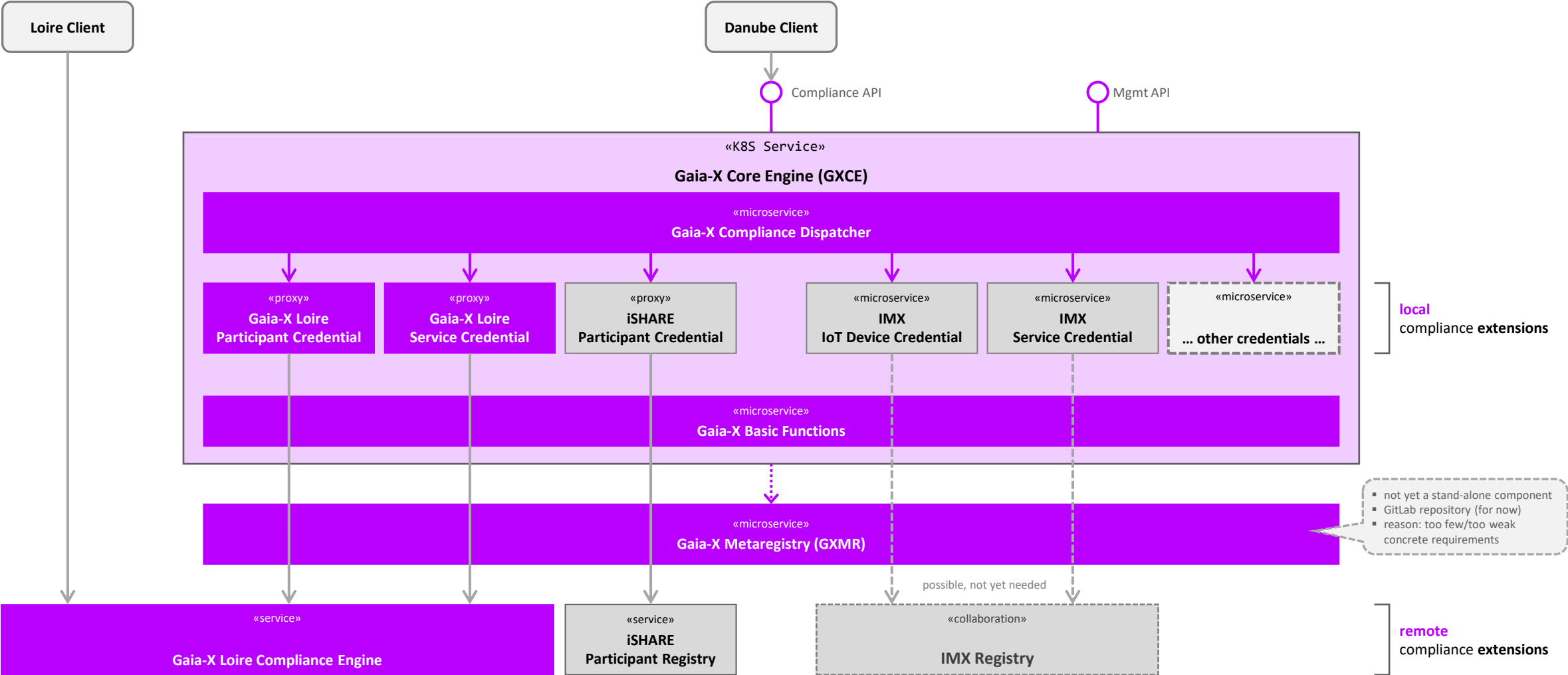
Gaia-X 3.0 «Danube»

Extension mechanism architecture



Gaia-X 3.0 «Danube»

Implementation architecture



Gaia-X 3.0 “Danube” Software Releases

Semantic versioning independent from 3.0



docs.gaia-x.eu/#/gxdch

PDF Sign DSSC DSSC Jira GX MP GX CRM GX MP Docs GX GitLab GX Jira GX Ontology GX Common CTO Office EDWG VG ChatGPT Danube Arch IMX

Specifications Framework Git structure Gaia-X Digital Clearing House (GXDCH)

Gaia-X Digital Clearing House (GXDCH)

Status
The following displays for each Gaia-X Digital Clearing house the status of each of the components as well as whether it is UP or DOWN
Each component version number is clickable and will lead you to the openAPI documentation of the component

v2: Loire (latest version)

	version	status
COMPLIANCE	2.9.0	UP
REGISTRY	2.10.2	UP
NOTARY	2.9.1	UP

deltaDAO
Gaia-X Compliant Participant

	version	status
COMPLIANCE	2.9.0	UP
REGISTRY	2.10.2	UP
NOTARY	2.9.1	UP

Pfalzkom
Gaia-X Compliant Participant

	version	status
COMPLIANCE	2.9.0	UP
REGISTRY	2.10.2	UP
NOTARY	2.9.1	UP

T-Systems
Gaia-X Compliant Participant

	version	status
COMPLIANCE	2.9.0	UP
REGISTRY	2.10.2	UP
NOTARY	2.9.1	UP

neusta aerospace
Gaia-X Compliant Participant

	version	status
COMPLIANCE	2.10.0	UP
REGISTRY	2.10.3	UP
NOTARY	2.9.3	UP

Arsys
Gaia-X Compliant Participant

	version	status
COMPLIANCE	2.10.0	UP
REGISTRY	2.10.3	UP
NOTARY	2.9.3	UP

CISPE
Participant Credential not provided

	version	status
COMPLIANCE	2.10.0	UP
REGISTRY	2.10.3	UP
NOTARY	2.9.3	UP

Aire Networks
Participant Credential not provided

	version	status
COMPLIANCE	N/A	DOWN
REGISTRY	2.10.2	UP
NOTARY	2.9.1	UP

v1: Tagus

T-Systems
Gaia-X Compliant Participant

	version	status
COMPLIANCE	1.15.1	UP
REGISTRY	1.10.5	UP
NOTARY	1.8.0	UP

Proximus
Gaia-X Compliant Participant

	version	status
COMPLIANCE	1.14.0	UP
REGISTRY	1.10.5	UP
NOTARY	1.7.0	UP

Pfalzkom
Gaia-X Participant Compliance failed

	version	status
COMPLIANCE	1.16.0	UP
REGISTRY	1.10.5	UP
NOTARY	1.8.0	UP

neusta aerospace
Gaia-X Compliant Participant

	version	status
COMPLIANCE	1.16.0	UP
REGISTRY	1.10.5	UP
NOTARY	1.8.0	UP

deltaDAO
Gaia-X Compliant Participant

	version	status
COMPLIANCE	1.15.2	UP
REGISTRY	1.10.5	UP
NOTARY	1.8.0	UP

Aruba
Gaia-X Compliant Participant

	version	status
COMPLIANCE	1.15.1	UP
REGISTRY	1.10.5	UP
NOTARY	1.8.0	UP

Gaia-X V1 & V2

- architecture, compliance, compatibility, and components all “integrated”
- GX Compliance Engine 1.x/2.x
- GX Registry 1.x/2.x
- 4 1.x/2.x

Gaia-X 3.0 “Danube” Architecture

- GX Compliance Dispatcher 1.0
- GX Basic Functions 1.0

Local Extensions

- imx-extension 1.0

Proxies (to remote extensions)

- loire-proxy 1.0 (module of GXCD)

Gaia-X 3.0 “Danube” Software Release

Naming & versioning conventions

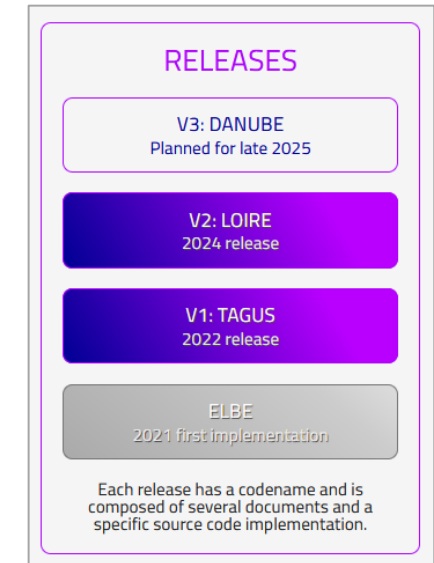


Current situation

- “Tagus” (V1) and “Loire” (V2) code names refer to concrete **software implementations** of a certain release of the Compliance Document (22.10, 24.11) conforming to certain versions of the Architecture Document.
- The numerals denote an (unofficial) “**Gaia-X Release**” version number.

Situation with the Gaia-X “Danube” software release

- “Danube” refers to a completely new “**Danube (software) architecture**” of how Gaia-X and ecosystem compliance will be operationalized, that is, implemented in suitable software “compliance engines” and supporting software components (e.g., Registry and Metaregistry).
- This architecture, for the first time, separates the Gaia-X technical compatibility layer from the operationalized (compliance) rules layer – a breaking change.
- Therefore, the Gaia-X Danube software (release) is the “**Gaia-X 3.0**” release.
- For software releases, we can speak of a “**Gaia-X 3.0 Danube**” **release or distribution**.
 - We expect **minor non-breaking updates** to the architecture (including technical compatibility) to Danube 3.0 resulting in **Danube 3.1, 3.2** releases or distributions.
 - A release or distribution will comprise individual software components (e.g., Compliance Dispatcher) – similar to the Tagus and Loire release. These components will carry stand-alone semantic versioning starting at 1.0.0. The components are chosen such that they all collaborate technically and form a coherent set of functionality for a given Danube “release” version.



Gaia-X 3.0 “Danube” 101

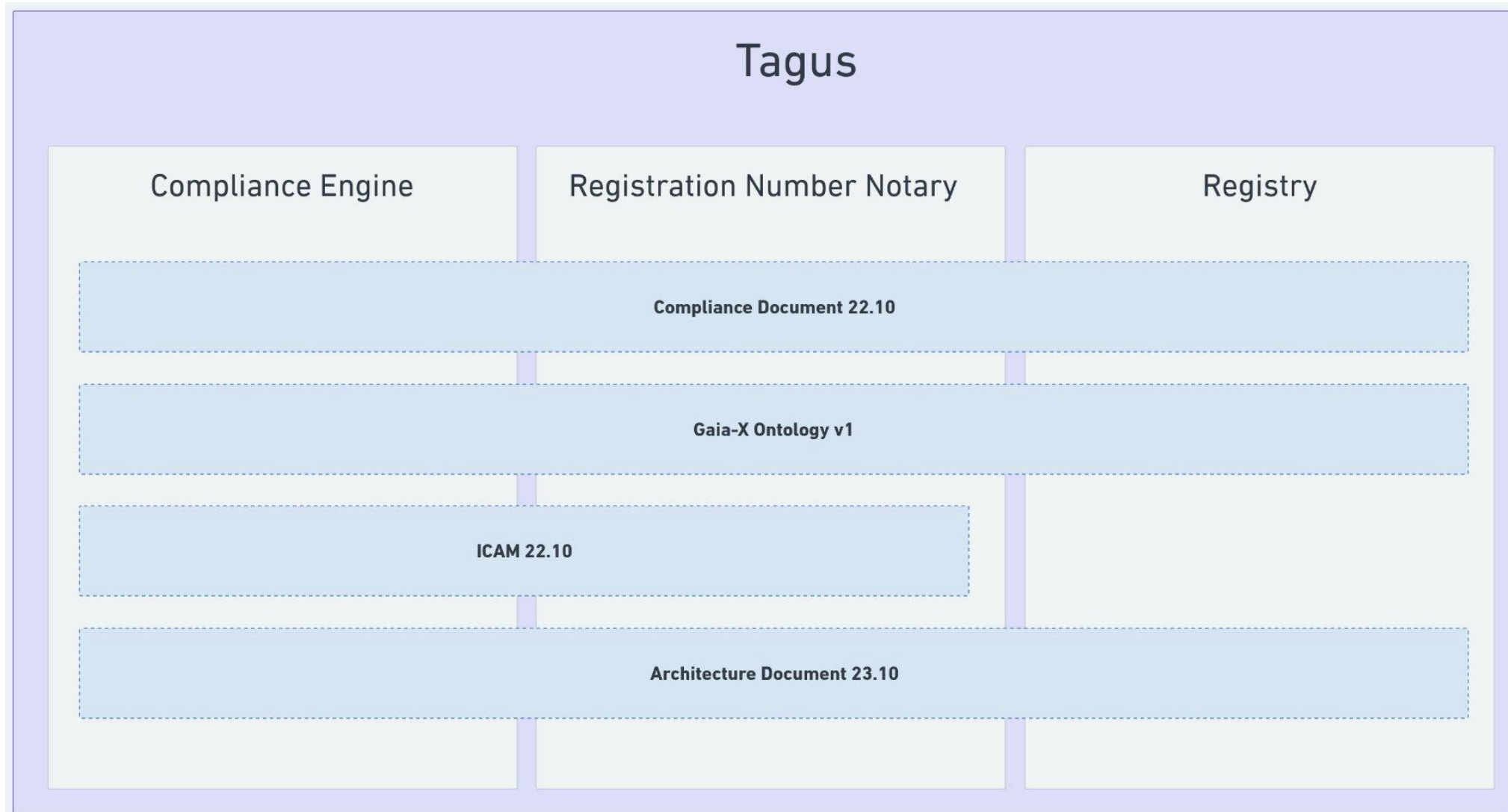
Technical Architecture & Standards Considerations

21 November 2025

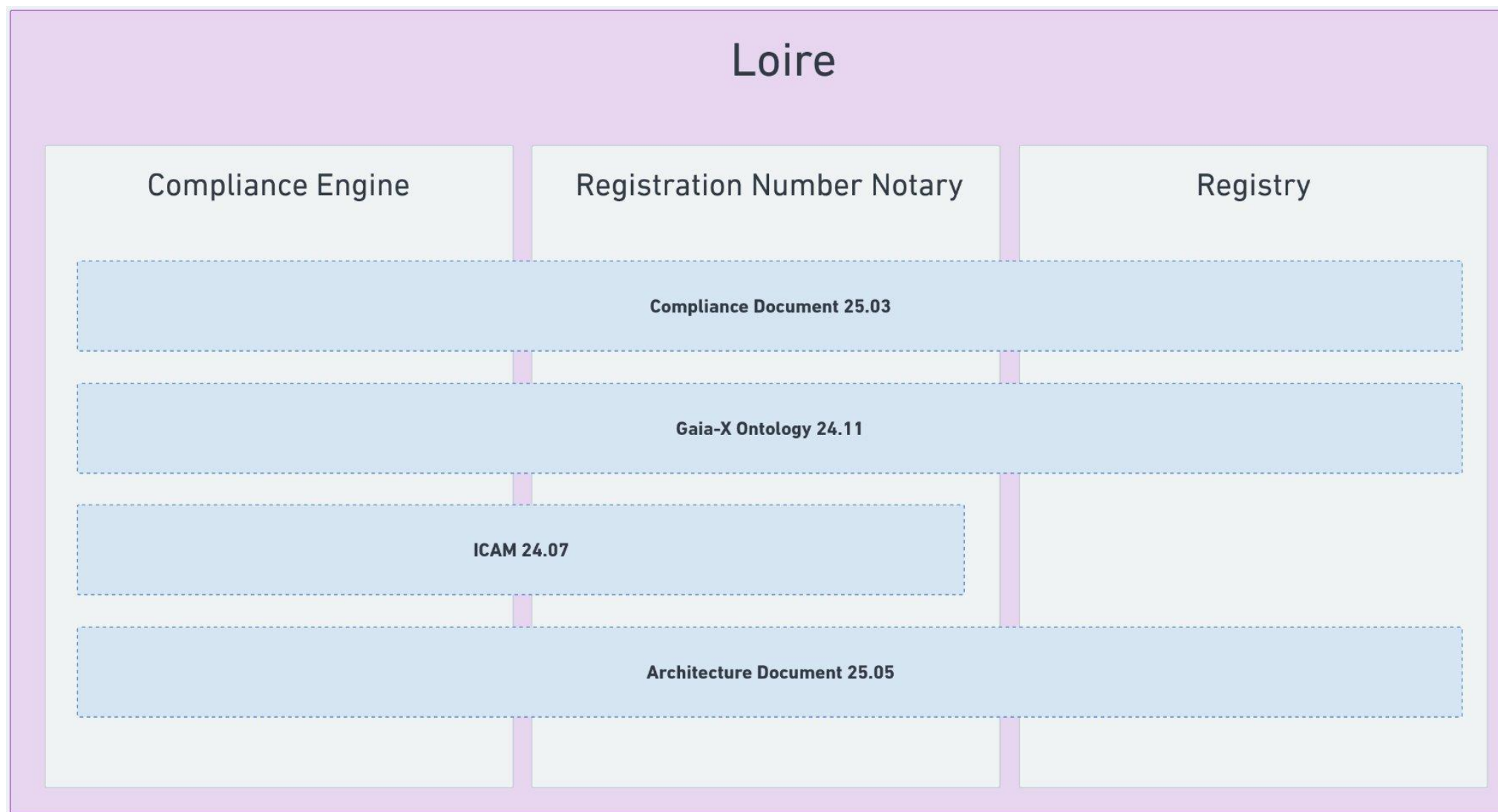
Yassir SELLAMI

| Tech Lead | Gaia-X AISBL

Tagus Components + Specifications Mapping



Loire Components + Specifications Mapping



Loire Compliance



Criterion P1.1.2: The Provider shall have an option for each legally binding act to be governed by EU/EEA/Member State law.

Standard Compliance	Label Level 1	Label Level 2	Label Level 3
declaration	declaration	declaration	declaration



Criterion P1.1.2

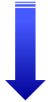
The Provider shall have an option for each legally binding act to be governed by EU/EEA/Member State law.

Standard Compliance	Label L1	Label L2	Label L3
declaration	declaration	declaration	declaration
implemented	implemented	implemented	implemented

[View in Compliance Document](#)

Checks that the `ServiceOffering` has at least one `LegallyBindingAct` in its `LegalDocuments` that is governed by an EEA country referenced in its `governingLawCountries`.

Implemented by `ServiceOfferingLegallyBindingActsHaveGoverningLawCountry`



Declaration: Using the Gaia-X Ontology, the declaration shall contain the list of ISO 3166-2 codes indicating the EU/EEA/Member States whose law may be applied as governing law for the legally binding act.

Permissible Standards:

- SecNumCloud: 19.1.c
- CISPE (GDPR, Infrastructure & IaaS): 4.2
- EU Cloud CoC (GDPR, XaaS): 5.1.A, 5.1.B, 5.1.C, 5.1.F, 5.4.F

Example Standards:

- BSI C5: BC-01
- CSA CCM: STA-09
- SWIPO IaaS: FR1, FR2

```
verifyLegalDocuments(vpUUID: string, contextVersion: string, results: ServiceOfferingLegalDocuments[]): FilterValidationResult {
  this.logger.debug('Checking that service offerings have legally binding acts that can be governed by EEA for VPUUID ${vpUUID}...')

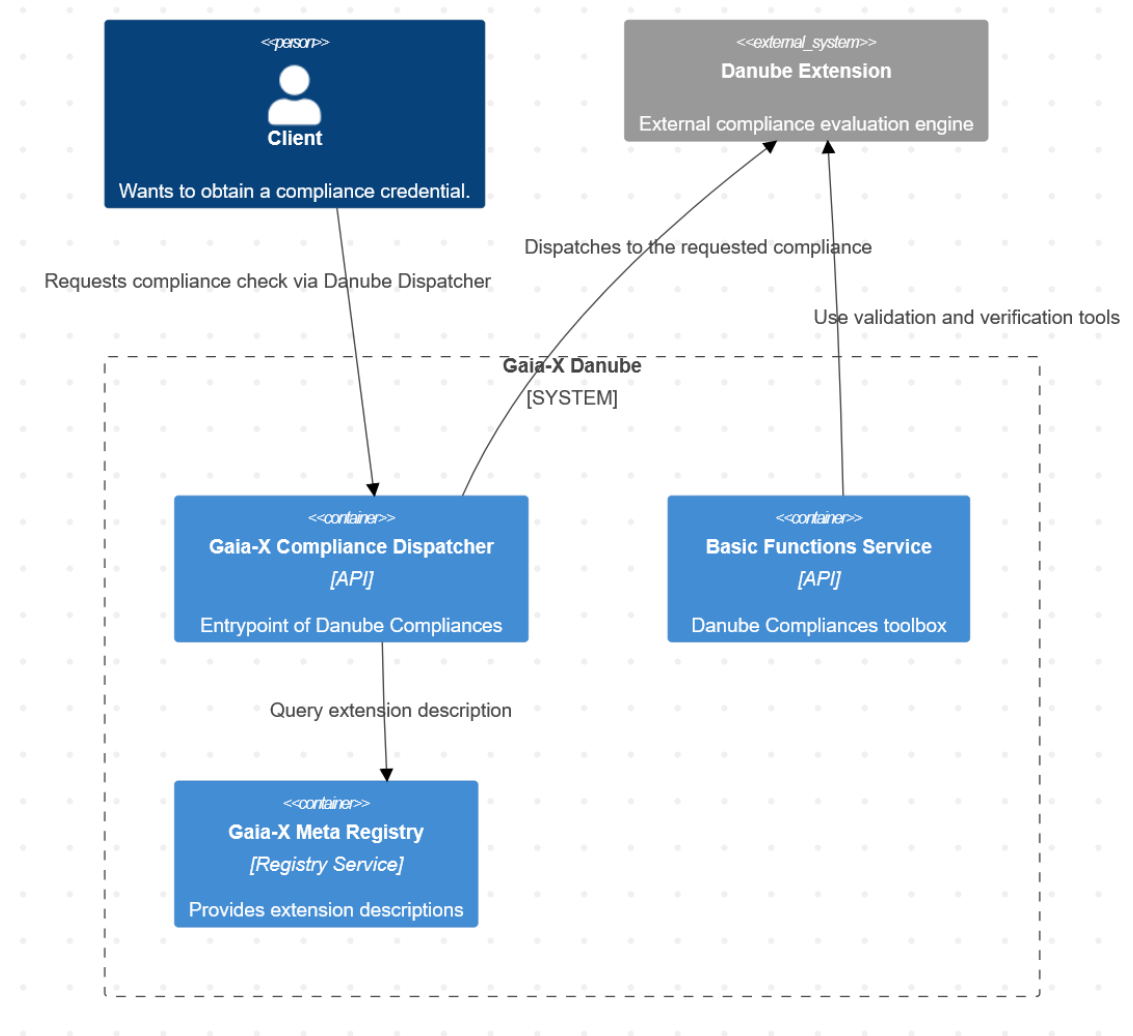
  const errorMessages: string[] = []
  let isP115Valid = true
  let isP112Valid = true
  for (const result of results) {
    const legallyBindingActs: LegalDocument[] = result.legalDocuments.filter(
      legalDocument => legalDocument.type === `w3id.org/gaia-x/${contextVersion}#LegallyBindingAct`
    )

    for (const legallyBindingAct of legallyBindingActs) {
      if (!legallyBindingAct.governingLawCountries.length) {
        this.logger.error(
          `P1.1.5 - Service offering ${result.serviceOfferingId} does not have a governing law country for legally binding act ${legallyBi
        )
        errorMessages.push(
          `P1.1.5 - Service offering ${result.serviceOfferingId} does not have a governing law country for legally binding act ${legallyBi
        )
        isP115Valid = false
      } else if (!legallyBindingAct.governingLawCountries.some(governingLawCountry => EEA_COUNTRY_NAME_ALPHA2.includes(governingLawCountry
        this.logger.error(
          `P1.1.2 - Service offering ${result.serviceOfferingId} with legally binding act ${legallyBindingAct.url} must have at least one
        )
        errorMessages.push(
          `P1.1.2 - Service offering ${result.serviceOfferingId} with legally binding act ${legallyBindingAct.url} must have at least one
        )
      }
    }
  }

  return {
    isValid: isP115Valid & isP112Valid,
    errorMessages: errorMessages
  }
}
```

One Compliance to
Rule them all
One Compliance to
find them
One Compliance to
Bring them all
and in the Interoperability
Bind them

C4 Model

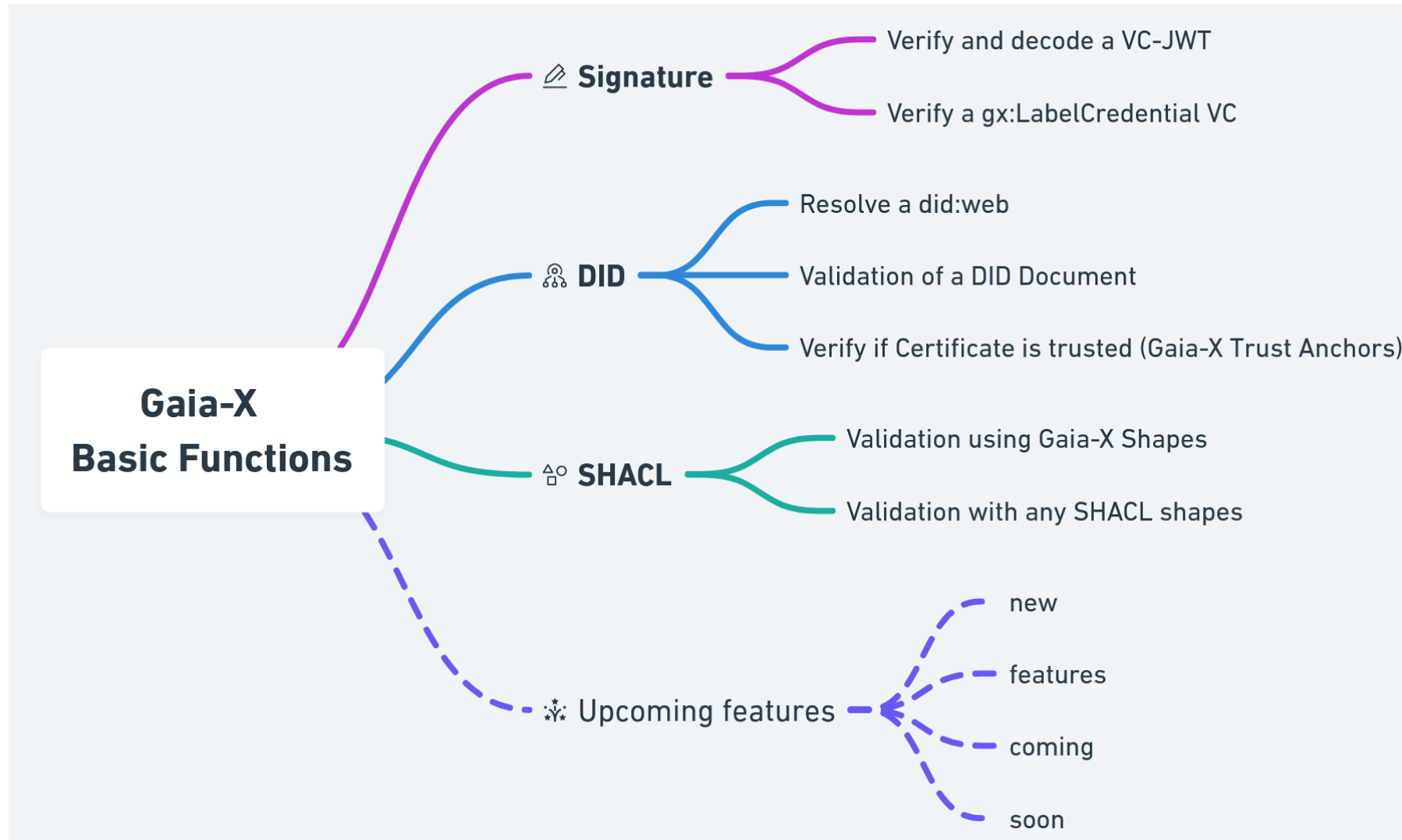


Basic functions



- Your go-to toolbox, for useful functions
- Lower the barrier of entry for newcomers
- Can either be used directly or extended
- Works as a showcase/sandbox for the latest standards implementation
- Open to contributions and community driven

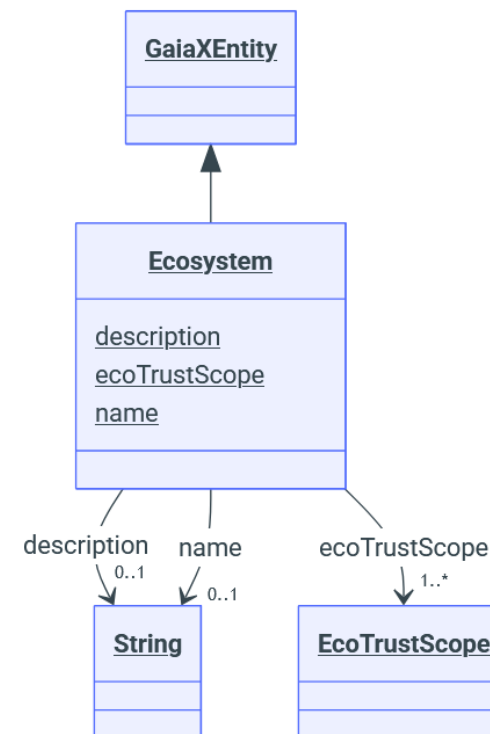
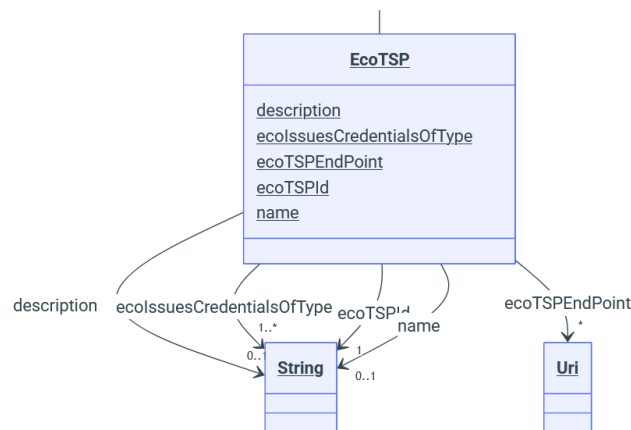
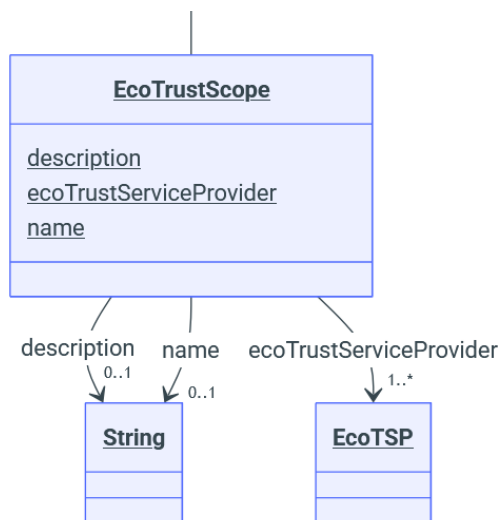
Basic functions – Current features



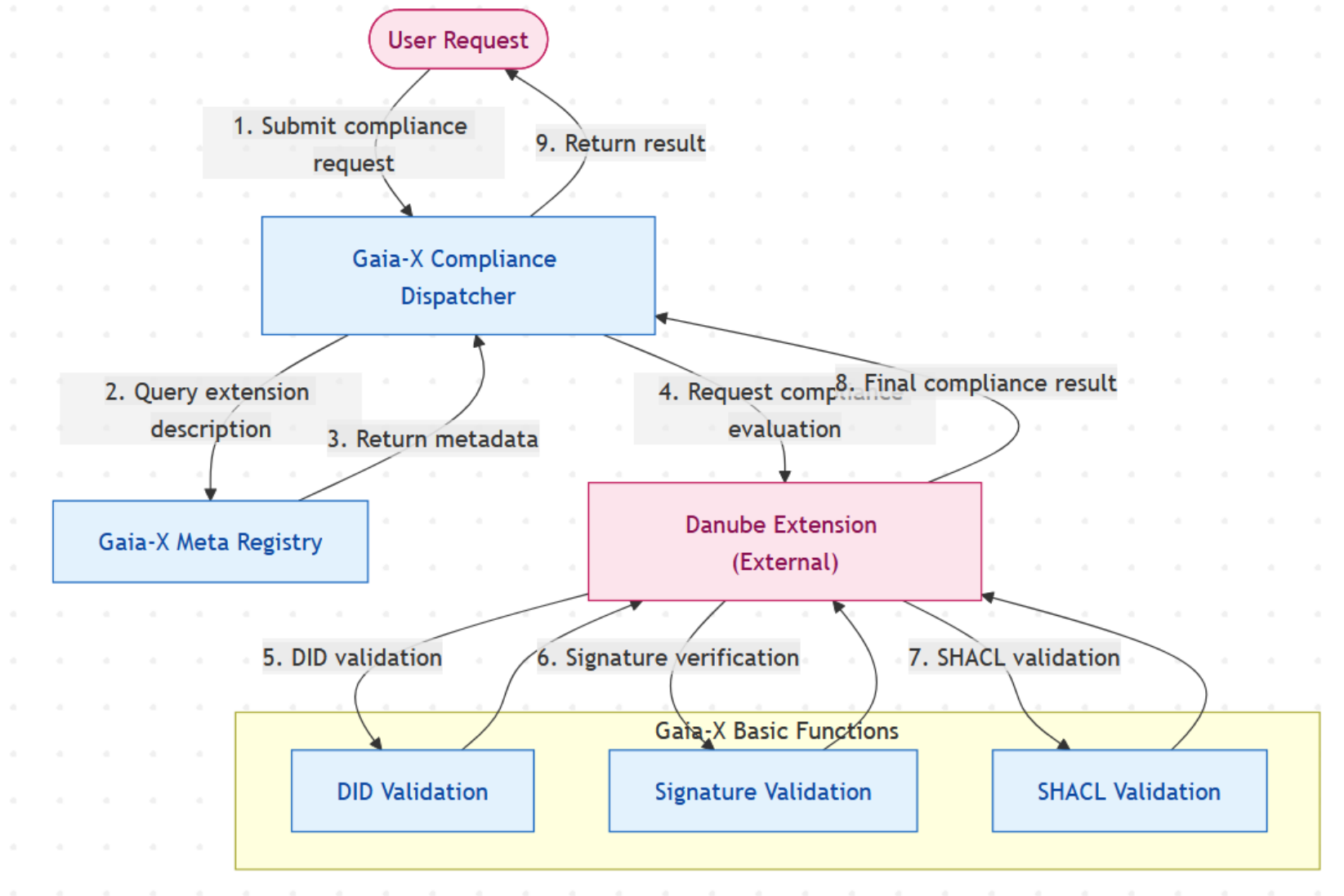
Gaia-X Meta Registry



- FAIR (Findable, Accessible, Interoperable and Reusable)
- Open Source and open for contributions
- Transparent and cross-ecosystem



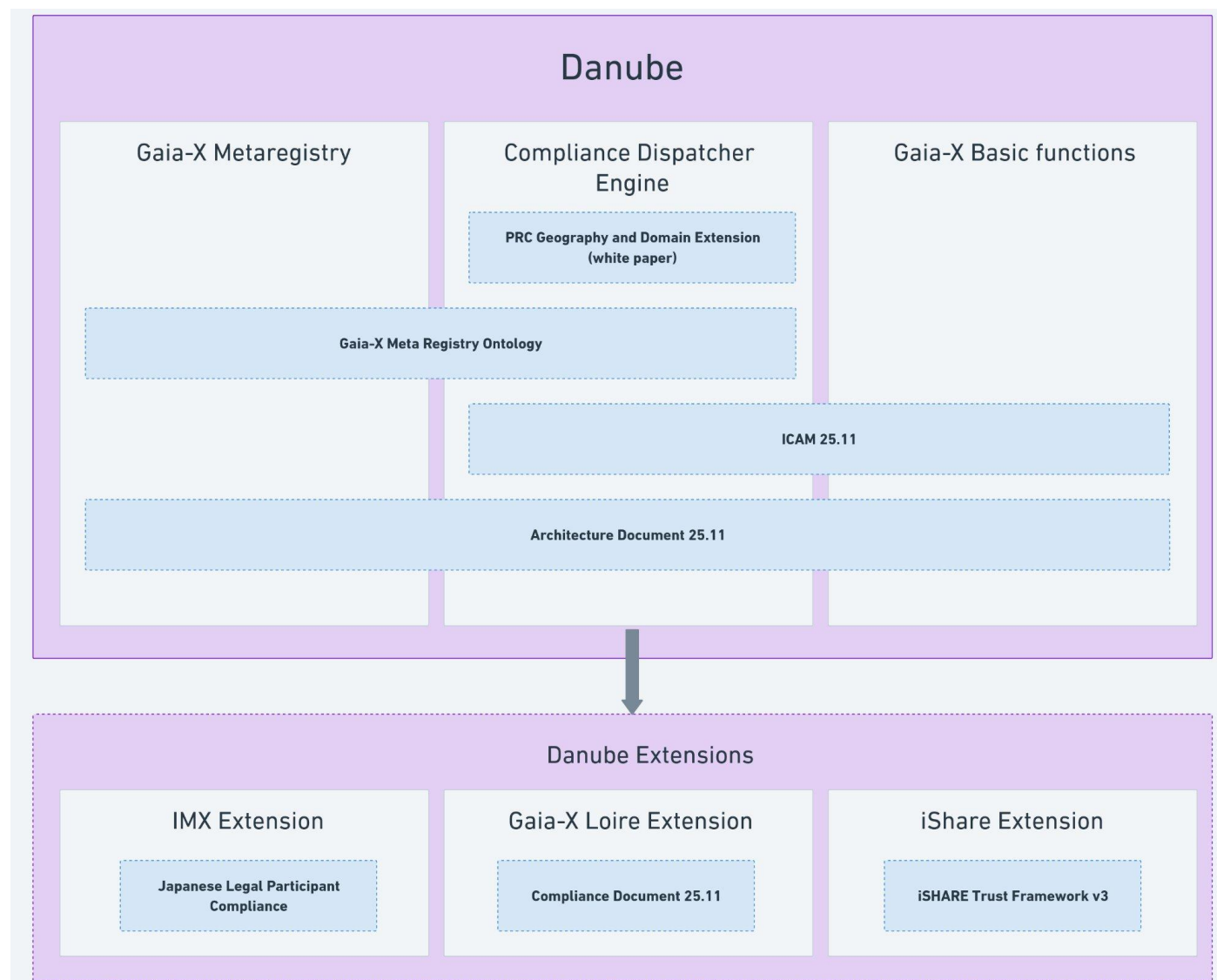
Compliance Dispatcher



Based on standards

	GXDCH Services	Technical stack
Loire (25.03)	Compliance*	VC-JWT, VC Data Model 2, SHACL
	Legal Registration Number Notary*	VC-JWT, VC Data Model 2
	Registry service*	w3id.org/gaia-x , Linkml, x509
	IPFS Pining Service	ETSI TS 119 612, Trust Anchors, Ontology
	Credential Event Service	Cloud Events
Danube	Compliance Dispatcher*	VC-JWT, VC Data Model 2, SHACL, OID4VC _(incoming)
	Basic Functions*	VC-JWT, VC Data Model 2, SHACL
	Meta Registry	w3id.org/gaia-x , Linkml, OWL, SHACL, JSON-LD
	Basic Compliance Engine	VC-JWT, VC Data Model 2, SHACL

Danube Components + Specifications Mapping



Thank you!

Christoph F. Strnadl | CTO | Gaia-X AISBL

Yassir SELLAMI | Tech Lead | Gaia-X AISBL

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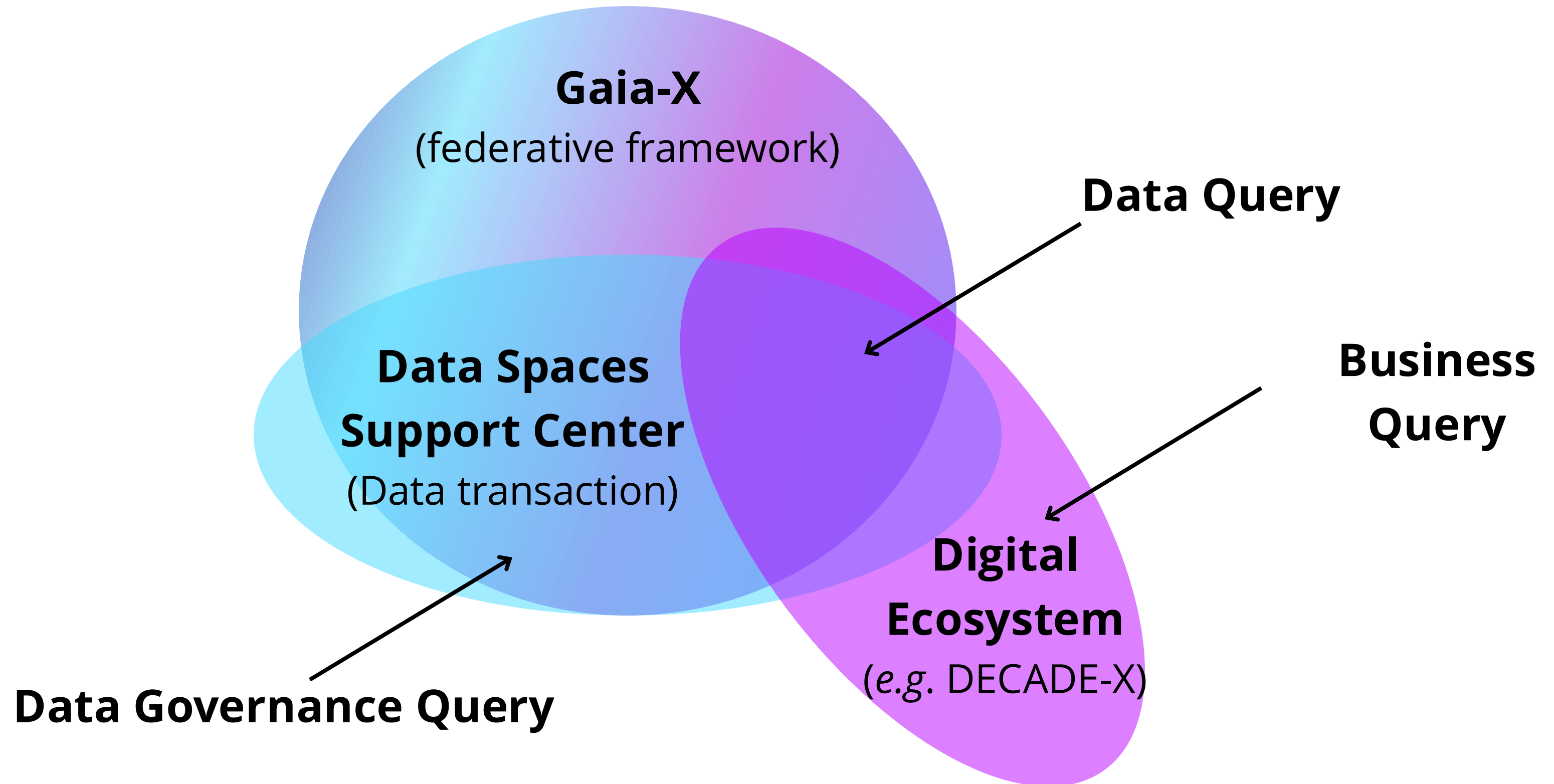
Ontologies – Gaia-X, DSSC, and Business Data in Action

21 November 2025

Vincent Henry | Ontology Engineer | Gaia-X AISBL

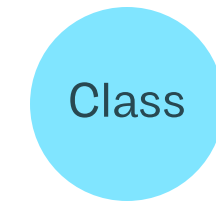
Gaia-X conceptual univers

From regulated-data Transaction framework to Business use case



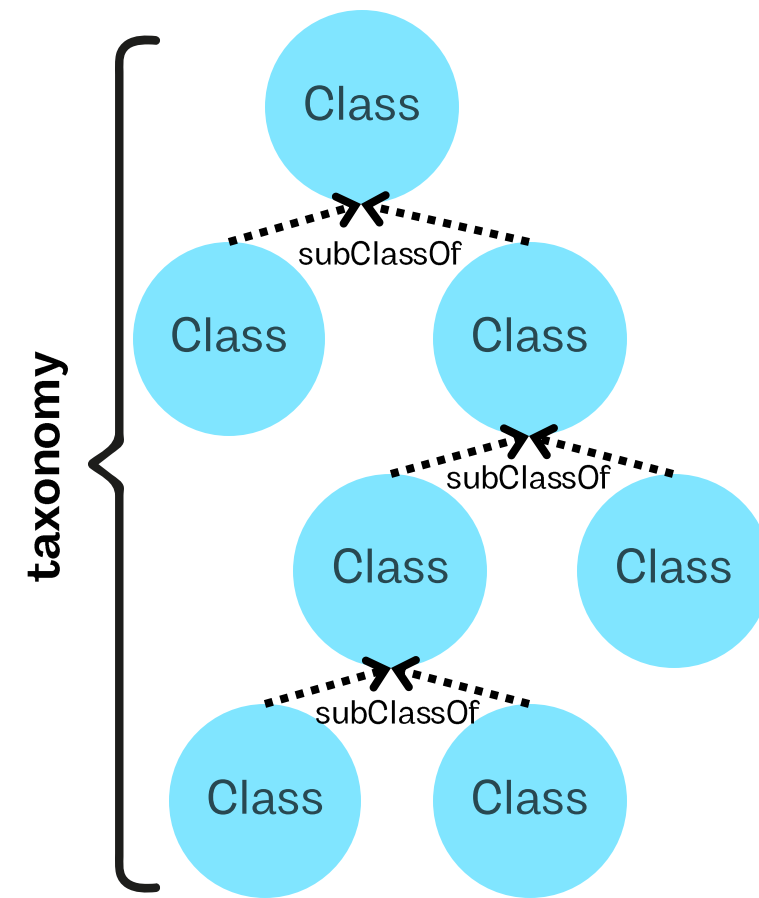
A common interoperable framework

W3C Ontology approach



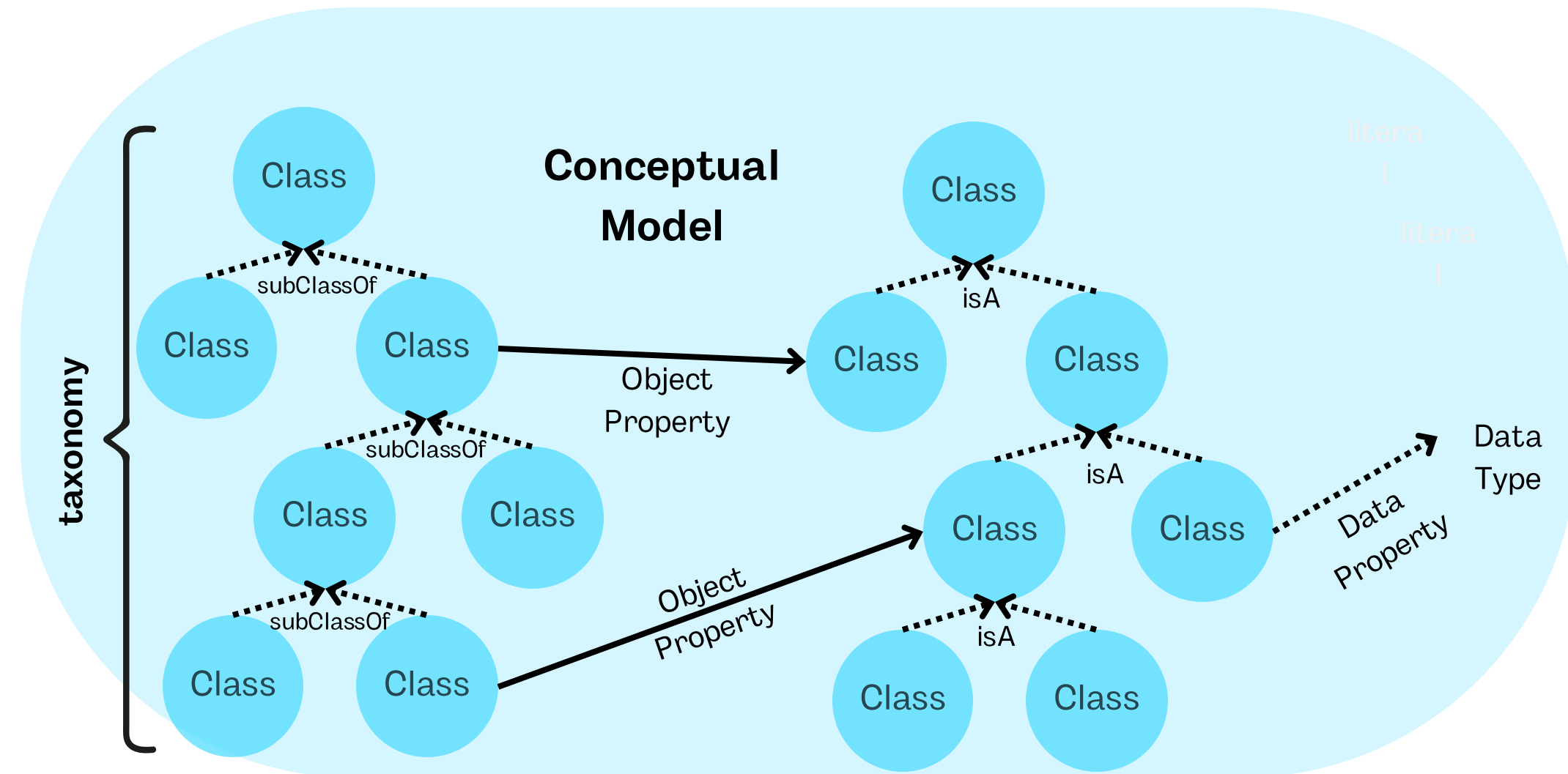
A common interoperable framework

W3C Ontology approach



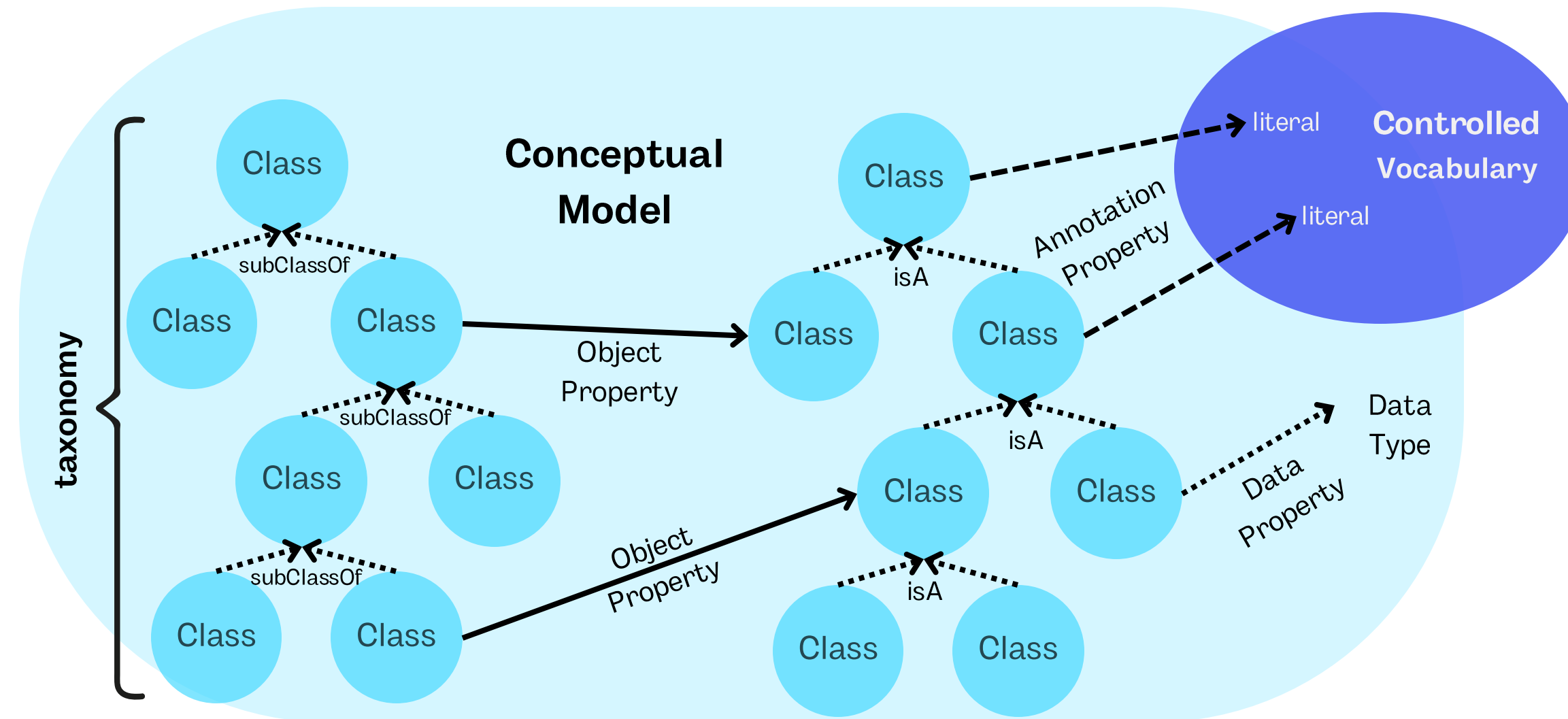
A common interoperable framework

W3C Ontology approach



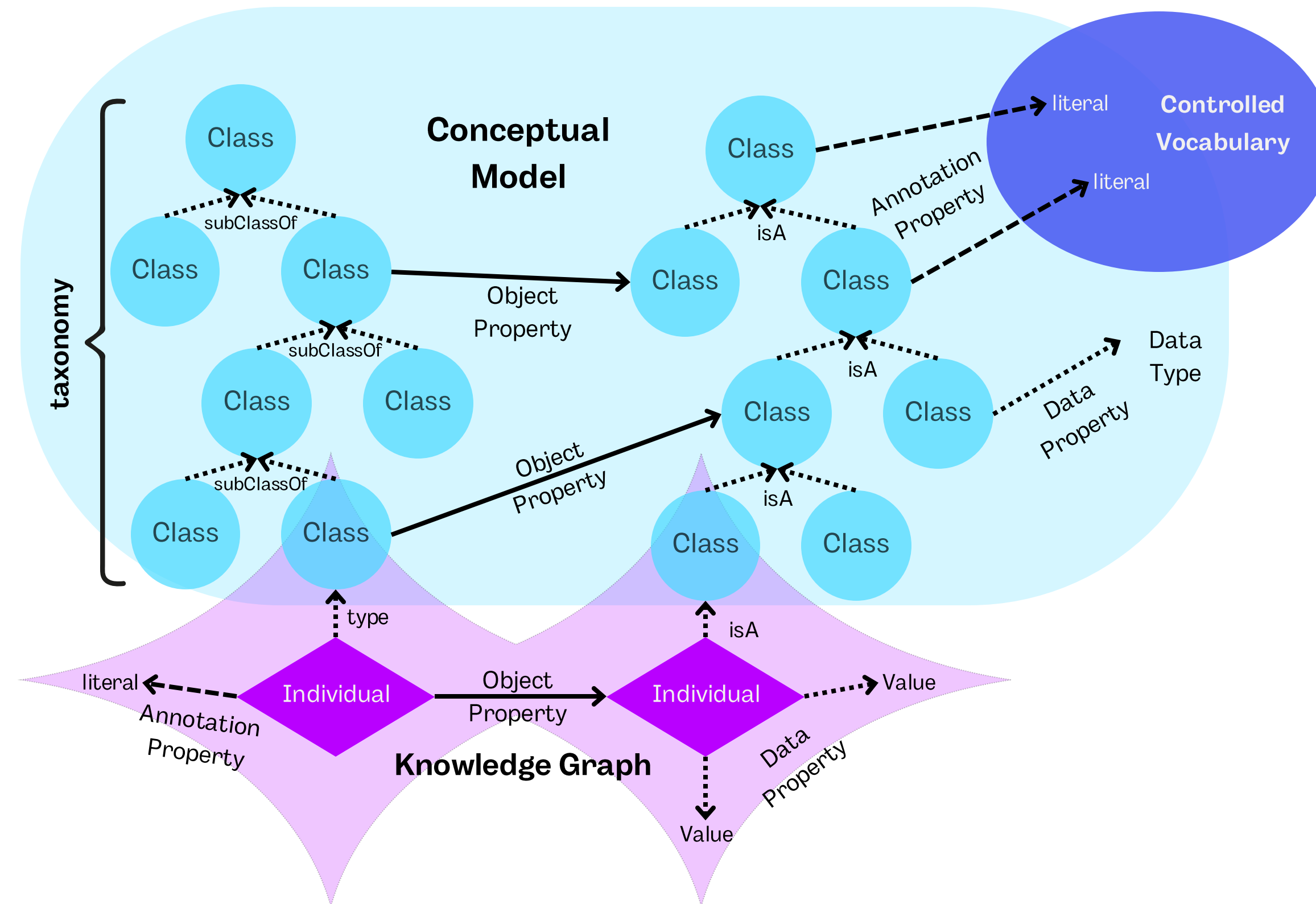
A common interoperable framework

W3C Ontology approach



A common interoperable framework

W3C Ontology approach



Use case: Data Transaction in the Gaia-X Univers



How a data space shared among industry players could play ?

The story: 3 aerospace companies decide to share their data in a secure environment to better monitor engine health.

By using ontologies and smart rules, their DataSpace becomes capable of:

- Automatically spotting at-risk engines & Proposing preventive maintenance.
- Verifying that sovereignty and confidentiality rules are respected.

The data space Participant:

Data Provider#1-**EngineWorks**: Provides performance data for the turbines: temperatures, vibrations, fuel flow, etc..

Data Provider#2-**AeroParts**: Provides maintenance histories: parts changed, anomaly codes, severity, dates.

Data User-**MaintenanceHub**: Consumes this data to propose a predictive maintenance service to airlines.

Governance Authority-**Governance Body**: Defines the transaction rules (who has the right, in which country, and for what use?)

The location; A unify ontology integrating:

Gaia-X Entity: <https://w3id.org/gaia-x/development>

Data Space Support Center: <https://w3id.org/dataspace/V1>

DECADE-X Entity: <https://w3id.org/decade-x>

Ontology representation

Protégé View



Annotation properties

Datatypes

Individuals

Classes

Object properties

Data properties

Class hierarchy: data product provider

Asserted

owl:Thing

data governance

data product

data space

data transaction

DECADE-X Entity

Anomaly

Engine Asset

Flight Operations Snapshot

High Risk Engine

Maintenance Event

Performance Measurement

Turbine Asset

functionality

Gaia-X Entity

party

Participant

data space participant

data space governance authority

data user

data product consumer

data product provider

trust service provider

services

Data Space Service

federation services

participant agent services

value creation service

usage control

use case

data product provider — https://w3id.org/dataspace/v1#DataProductProvider

Annotations

Usage

Annotations: data product provider

Annotations

skos:prefLabel [language: en]

data product provider

skos:definition [language: en]

A party that acts on behalf of a data product owner in providing, managing and maintaining a data product in a data space.

DSSCGlossarySource [language: en]

NA

Description: data product provider

SubClass Of

'data user'

provides some 'data product'

General class axioms

SubClass Of (Anonymous Ancestor)

name max 1 rdfs:Literal

name min 0 rdfs:Literal

description min 0 rdfs:Literal

description max 1 rdfs:Literal

name only xsd:string

description only xsd:string

'adheres to' some rulebook

'entity identifier' some xsd:string

Instances

'AeroParts Manufacturing Inc.'

'EngineWorks Aviation Ltd.'

IRI

Controlled Vocabulary

Class

taxonomy

Conceptual Model

Individual

Description: AeroParts Manufacturing

Types

'data product provider'

Property assertions: AeroParts Manufacturing Inc.

Object property assertions

'adheres to' 'Aerospace Data Space Rulebook'

provides 'Turbine Performance Data Product'

Data property assertions

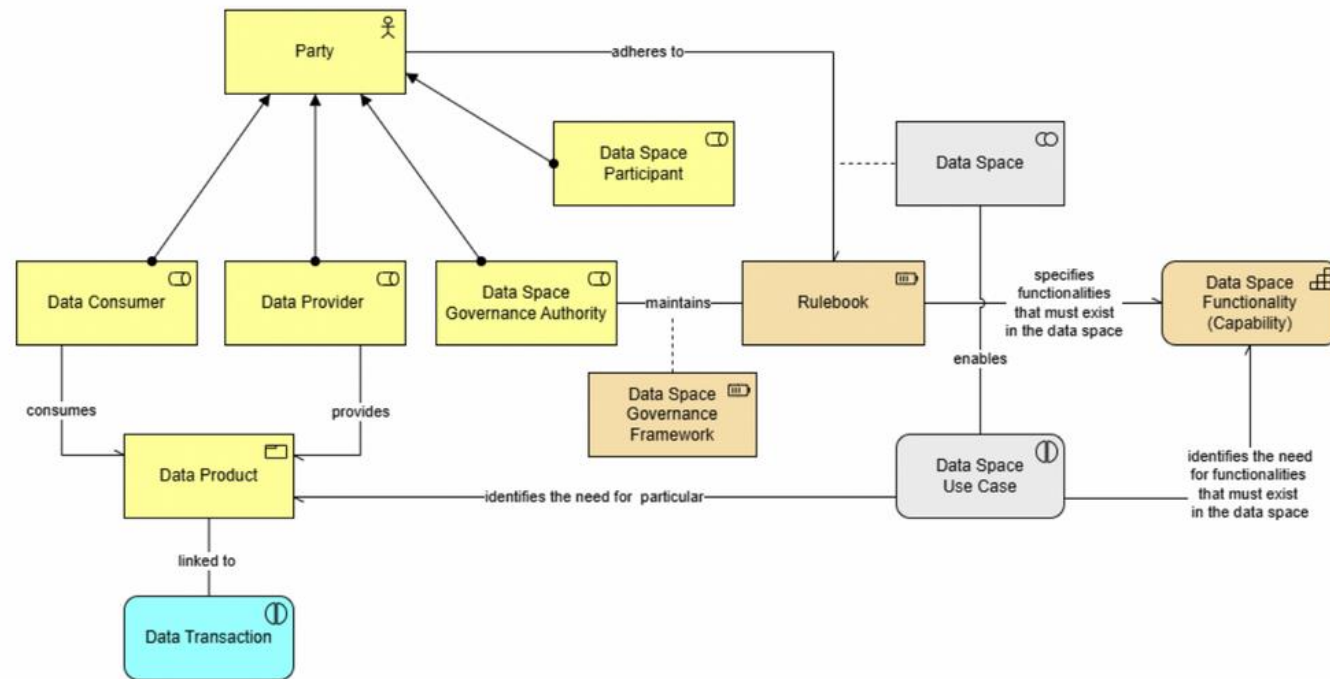
'entity identifier' "ORG-AP-001"

'jurisdiction code' "EU"

name "AeroParts Manufacturing Inc."

Knowledge Graph

Ontology representation



data product provider

 data product provider ^{en}

Types:

owl:Class

owl:Thing

RDF Rank:

0

<http://www.w3.org/2004/02/skos/core#definition>

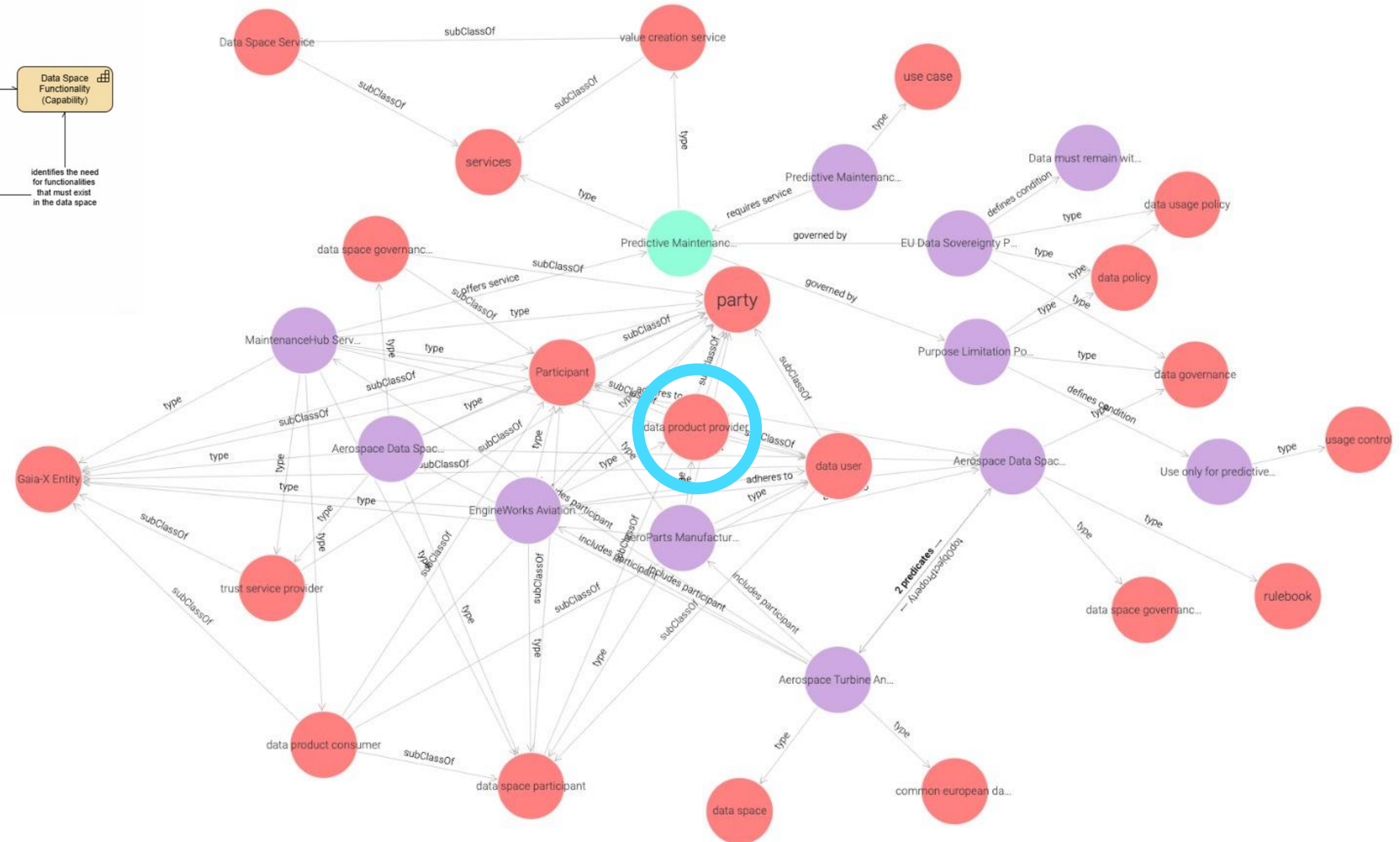
A party that acts on behalf of a data product owner in providing, managing and maintaining a data product in a data space. ^{en}

<http://www.w3.org/2004/02/skos/core#prefLabel>

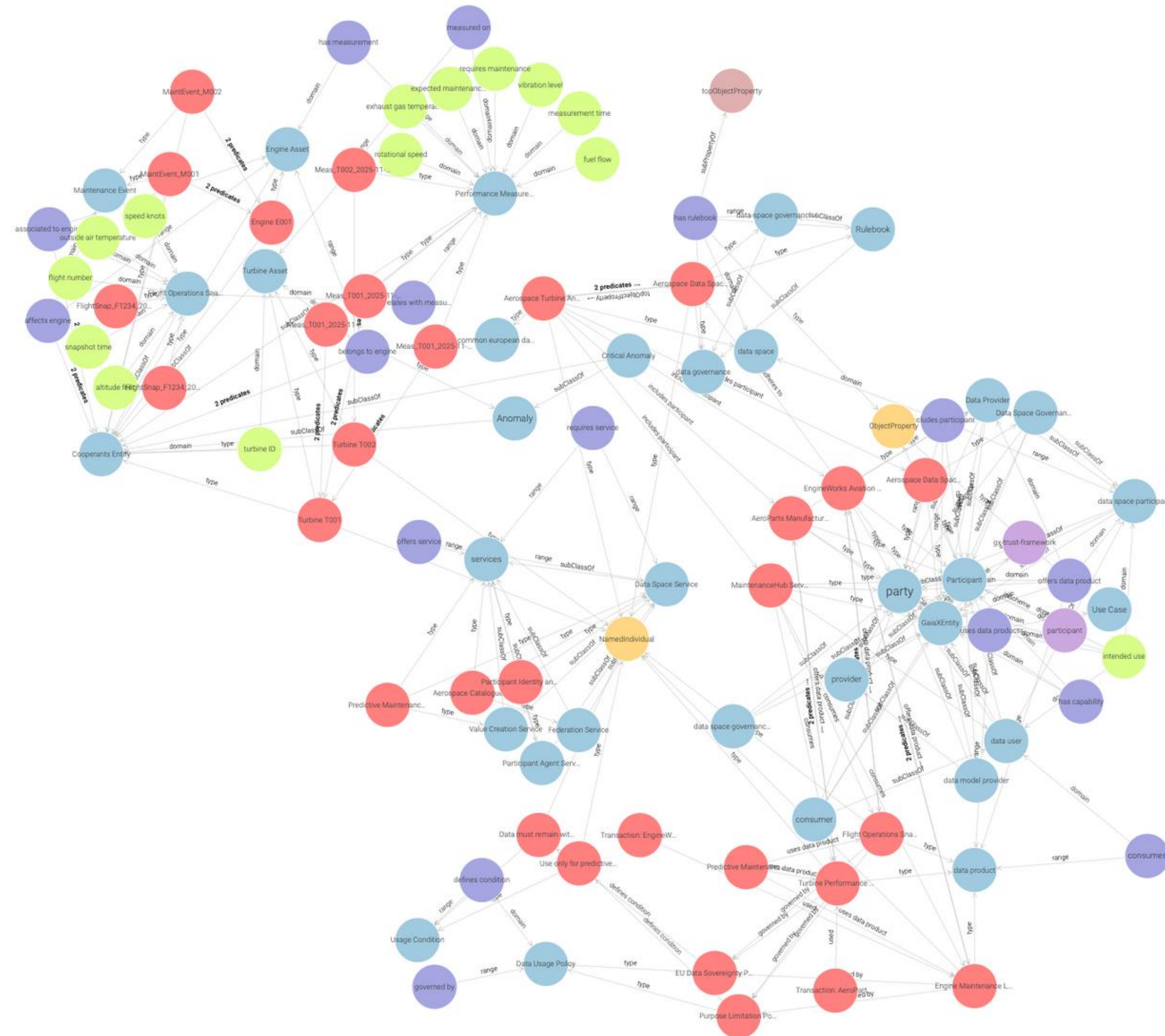
data product provider ^{en}

<https://w3id.org/dataspace/v1#DSSCGlossarySource>

NA en



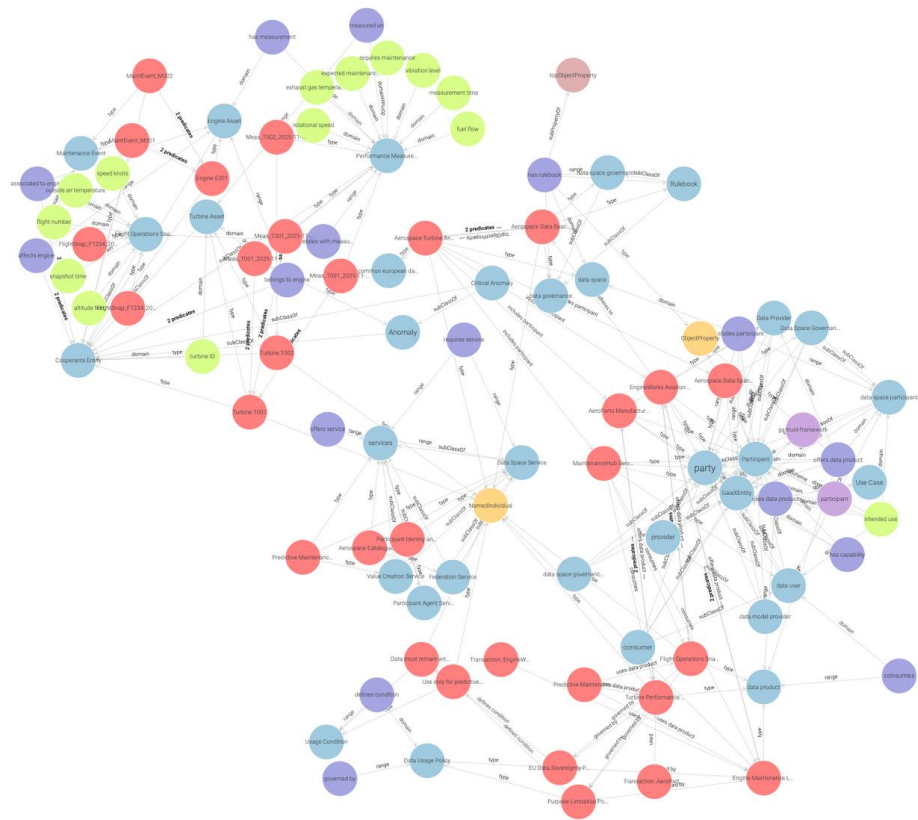
Extension to Business Domain (ex. DECADE-X)



Query Abilities: SPARQL

Data Governance query:

Which are the transaction between participant ?



SPARQL Query & Update ?

Editor only Editor and results Results only ☰

Unnamed × Unnamed 1 × Unnamed 2 × Unnamed 3 × +

1 ▾

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

2 ▾

SELECT ?transaction ?from ?to ?dataProductLabel WHERE {

3

?transaction a <https://w3id.org/dataspace/v1#DataTransaction> ;

4

<http://www.w3.org/ns/prov#used> ?dataProduct ;

5

<http://www.w3.org/ns/prov#wasAssociatedWith> ?to .

6

?dataProduct rdfs:label ?dataProductLabel .

7

?from <https://w3id.org/dataspace/v1#offersDataProduct> ?dataProduct .

8

}

📁

📁

🔗

➡

🔗

Run

keyboard shortcuts

📊 Table 📄 Raw response 📈 Pivot Table 📉 Google Chart

Download as ▾

Filter query results Compact view ☐ Hide row numbers ☐

Showing results from 0 to 2 of 2. Query took 0.1s, moments ago.

	transaction	from	to	dataProductLabel
1	:TX_AP_MH_001	:AeroParts	:MaintenanceHub	"Turbine Performance Data Product"@en
2	:TX_EW_MH_001	:EngineWorks	:MaintenanceHub	"Engine Maintenance Log Data Product"@en

Query Abilities: SPARQL

Business query:

What are the values of aircraft engine performances ?



1

PREFIX : <https://w3id.org/dataspace/cooperants/aerospace#>

2

PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

3

SELECT ?measurement ?vibrationLevel ?tempEGT ?fuelFlow ?rotationalSpeed ?measurementTime WHERE {

4

?measurement a :PerformanceMeasurement ;

5

:vibrationLevel ?vibrationLevel ;

6

:tempEGT ?tempEGT ;

7

:fuelFlowKgPerH ?fuelFlow ;

8

:rotationalSpeedRPM ?rotationalSpeed ;

9

:measurementTime ?measurementTime .

10

?measurement <http://www.w3.org/ns/prov#wasAssociatedWith> :Turbine_AP_T001 .

11

} ORDER BY DESC(?measurementTime) LIMIT 5

Run

keyboard shortcuts

Table

Raw response

Pivot Table

Google Chart

Download as

Filter query results

Compact view ☐ Hide row numbers ☐

Showing results from 0 to 3 of 3. Query took 0.1s, moments ago.

	measurement	vibrationLevel	tempEGT	fuelFlow	rotationalSpeed	measurementTime
1	:Meas_T001_2025-11-01T10_10	"3.1"^^xsd:decimal	"672.2"^^xsd:decimal	"1298.0"^^xsd:decimal	"9732.7"^^xsd:decimal	"2025-11-01T10:10:00Z"^^xsd:dateTime
2	:Meas_T001_2025-11-01T10_05	"2.3"^^xsd:decimal	"660.5"^^xsd:decimal	"1262.3"^^xsd:decimal	"9715.2"^^xsd:decimal	"2025-11-01T10:05:00Z"^^xsd:dateTime
3	:Meas_T001_2025-11-01T10_00	"2.1"^^xsd:decimal	"650.0"^^xsd:decimal	"1250.0"^^xsd:decimal	"9700.0"^^xsd:decimal	"2025-11-01T10:00:00Z"^^xsd:dateTime

Query Abilities: Natural Language Processing



Lets connect Ontology with Gen AI to avoid complex SPARQL Query

Which are all the data space participants and which roles do they play (data provider, data user, governance authority) ?



Technical Summary

Here are the interactions between the participants through data transactions:

Details

- **AeroParts Manufacturing Inc. → MaintenanceHub Services**
 - Data Product: Turbine Performance Data Product
- **EngineWorks Aviation Ltd. → MaintenanceHub Services**
 - Data Product: Engine Maintenance Log Data Product

These transactions illustrate the flow of data products from providers to users within the data space.

Would you like to:

1. Explore more about a specific data product?
2. Verify compliance with other aspects of the Data Space Rulebook?
3. Analyze another aspect of the data space?



Hint: you can also ask the model, for example [How did you derive this answer?](#)

Called SPARQL: Direct query

```
SELECT ?transaction ?from ?to ?dataProductLabel WHERE {
  ?transaction a <https://w3id.org/dataspace/v1#DataTransaction> ;
               <http://www.w3.org/ns/prov#used> ?dataProduct ;
               <http://www.w3.org/ns/prov#wasAssociatedWith> ?to .
  ?dataProduct rdfs:label ?dataProductLabel .
  ?from <https://w3id.org/dataspace/v1#offersDataProduct> ?dataProduct .
}
```



RDF analysis in progress... extracting entities, policies, events, and measures... structured response:

Technical Summary

Identifying data space participants and their roles.

Details

1. **AeroParts Manufacturing Inc.**
 - Role: Data Product Provider, Data User, Data Space Participant
2. **EngineWorks Aviation Ltd.**
 - Role: Data Product Provider, Data User, Data Space Participant
3. **Aerospace Data Space Governance Authority**
 - Role: Data Space Governance Authority, Trust Service Provider, Data Space Participant
4. **MaintenanceHub Services**
 - Role: Data Product Consumer, Data User, Trust Service Provider, Data Space Participant

△ DataSpace Compliance

Governance respected: All participants adhere to the AeroRulebook.

Query Abilities: Natural Language Processing



Operationnal Business Query

Explore data measure associated to explain your diagnostic please

Which engine is at the highest risk in the next 20 flights and what preventative actions do you recommend?



RDF analysis in progress... extracting entities, policies, events, and measures... structured response:

Technical Summary

The engine identified as "Engine E001" is classified as a High Risk Engine due to anomalies detected in its performance measurements.

Key Indicators

Engine E001 | High Risk | 100%

Details

- Engine ID: ENG-EW-E001
- Anomalies detected: High vibration levels, EGT drift
- Recent maintenance events: Bearing and sensor replacements

DataSpace Compliance

Governance respected: Yes Policies applied: EU Data Sovereignty, Purpose Limitation Possible violations: None



RDF analysis in progress... extracting entities, policies, events, and measures... structured response:

Technical Summary

The diagnostic for "Engine E001" is based on recent performance measurements indicating anomalies.

Details of Recent Measurements

1. Measurement at 2025-11-01T10:10:00Z

- Vibration Level: 3.1 mm/s
- Exhaust Gas Temperature (EGT): 672.2 °C
- Fuel Flow: 1298.0 kg/h
- Rotational Speed: 9732.7 RPM

2. Measurement at 2025-11-01T10:05:00Z

- Vibration Level: 2.3 mm/s
- EGT: 660.5 °C
- Fuel Flow: 1262.3 kg/h
- Rotational Speed: 9715.2 RPM

3. Measurement at 2025-11-01T10:00:00Z

- Vibration Level: 2.1 mm/s
- EGT: 650.0 °C
- Fuel Flow: 1250.0 kg/h
- Rotational Speed: 9700.0 RPM


These measurements show increasing trends in vibration levels and EGT, which are indicative of potential anomalies.

Query Abilities: Multi-Namespace Query

Data Governance and global KPIs



Does this diagnostic comply with the DataSpace policies and which participants have the right to access it ?

 RDF analysis in progress... extracting entities, policies, events, and measures... structured response:

DataSpace Compliance

- **Governance Respected:** The diagnostic complies with the AeroRulebook, adhering to data sovereignty and purpose limitation policies.
- **Policies Applied:**
 - **EU Data Sovereignty Policy:** Ensures data remains within EU jurisdiction.
 - **Purpose Limitation Policy:** Data is used solely for predictive maintenance, not for resale.




Details

Participants with access rights:

1. **AeroParts Manufacturing Inc.**
 - Role: Data Product Provider
 - Access: Provides turbine performance data
2. **EngineWorks Aviation Ltd.**
 - Role: Data Product Provider
 - Access: Provides engine maintenance logs and flight operations data
3. **MaintenanceHub Services**
 - Role: Data Product Consumer
 - Access: Consumes turbine performance, engine maintenance, and flight operations data
4. **Aerospace Data Space Governance Authority**
 - Role: Governance Authority
 - Access: Oversees compliance and governance




Key Performance Indicators (KPIs)

1. Engine Risk Assessment

High Risk Engines |  78%
Medium Risk Engines |  19%
Low Risk Engines |  3%





2. Data Product Utilization

Turbine Performance Data Product Usage |  85%
Engine Maintenance Log Data Product Usage |  75%
Flight Operations Snapshot Data Product Usage |  60%






3. Policy Compliance

EU Data Sovereignty Compliance |  100%
Purpose Limitation Compliance |  100%





4. Anomaly Detection

High Vibration Anomalies |  30%
High Temperature Anomalies |  20%
Critical Anomalies |  10%



5. Maintenance Events

Scheduled Maintenance |  70%
Unscheduled Maintenance |  30%



Recommendations for Gaia-X Members

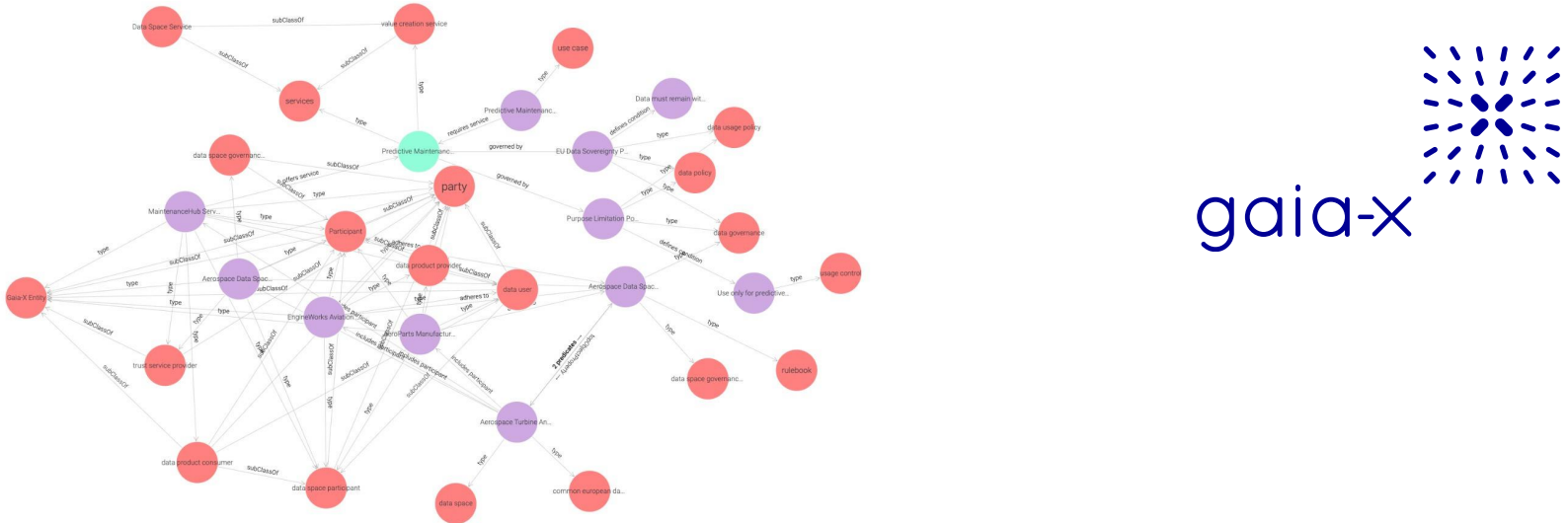
- **Enhance Predictive Analytics:** Improve anomaly detection and predictive maintenance capabilities.
- **Strengthen Data Sharing:** Encourage more data product exchanges to enrich the data space.
- **Regular Compliance Audits:** Ensure ongoing adherence to data policies through periodic audits.
- **Collaborative Workshops:** Facilitate knowledge sharing and innovation among members.

Would you like to:

1. Explore detailed performance measurements for specific engines?
2. Review the compliance conditions for each policy in detail?
3. Investigate additional data products that could be integrated into the data space?

Conclusion

Gaia-X federative ontology



Allows:

- A **fully operational demonstration** of the **Gaia-X Data Space Blueprint 2.0** applied to a real industrial domain, showcasing federated semantics, interoperable data products, and cross-organization collaboration.
- **End-to-end transparency** through **explainable reasoning**: sensor → component → anomaly → alert → recommendation, all governed by machine-readable Rulebook and Usage Policies.
- **Business acceleration through knowledge-driven** operations, enabling earlier detection of failures, reduced downtime, optimized maintenance planning, and significant cost avoidance across the value chain.

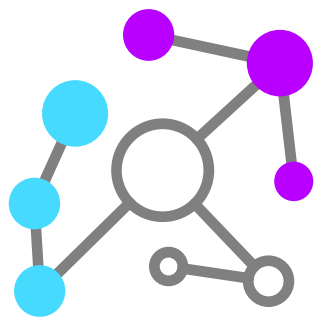
Ensure:

- **Compliance-by-design**: automatic enforcement of consent, purpose limitation and EU jurisdiction through explicit policies and inference.
- **Trust, sovereignty, and accountability across participants, with auditability** built into the graph itself.
- **A measurable return on collaboration**, enabling **safer operations, higher asset availability**, and **new cross-sector business models** grounded in trusted data ecosystems.
- **A replicable, sector-agnostic reference model** that can be extended to additional European Data Spaces.

The Promise of the Ontological DataSpace

A well-designed DataSpace is not just for exchange data.

It is capable of reasoning about the data, automatically respecting the rules and helping humans make better decisions.



Thank You

Gaia-X European Association for Data and Cloud AISBL

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Danube – Implementation examples



Delphine Claerhout

Software engineer

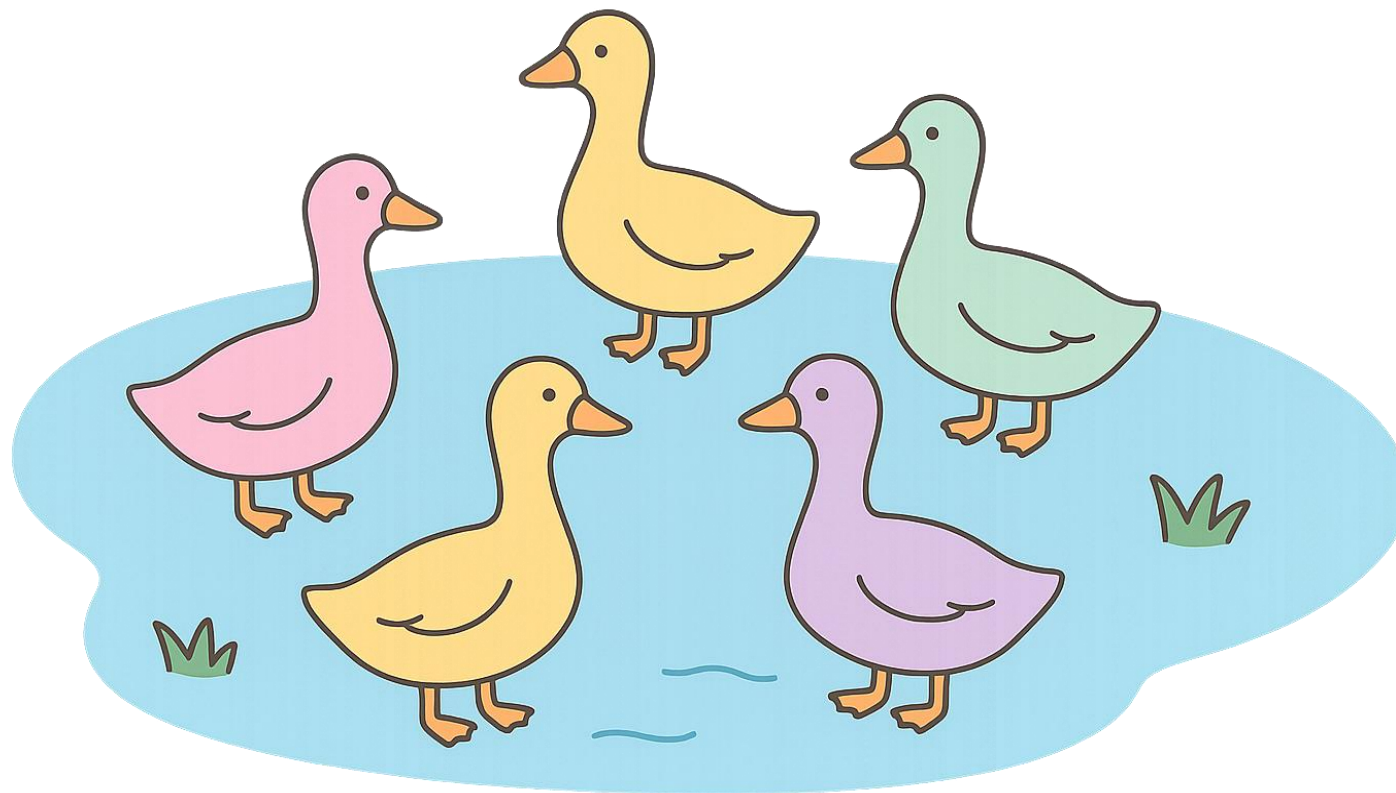
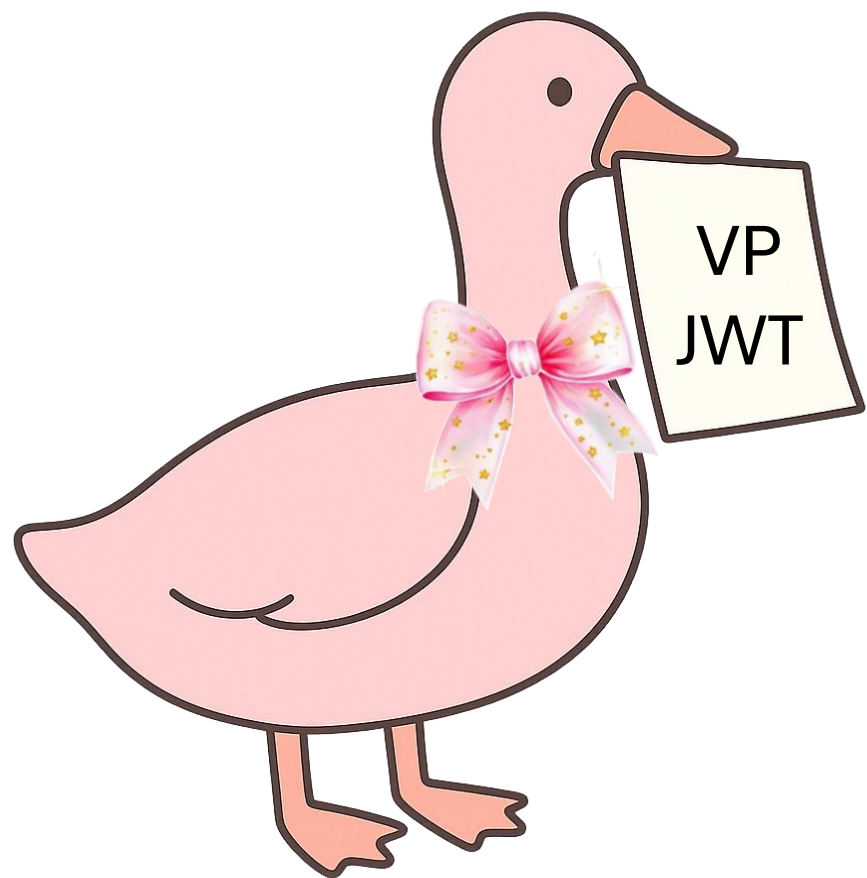
Gaia-X

#GaiaXSummit25

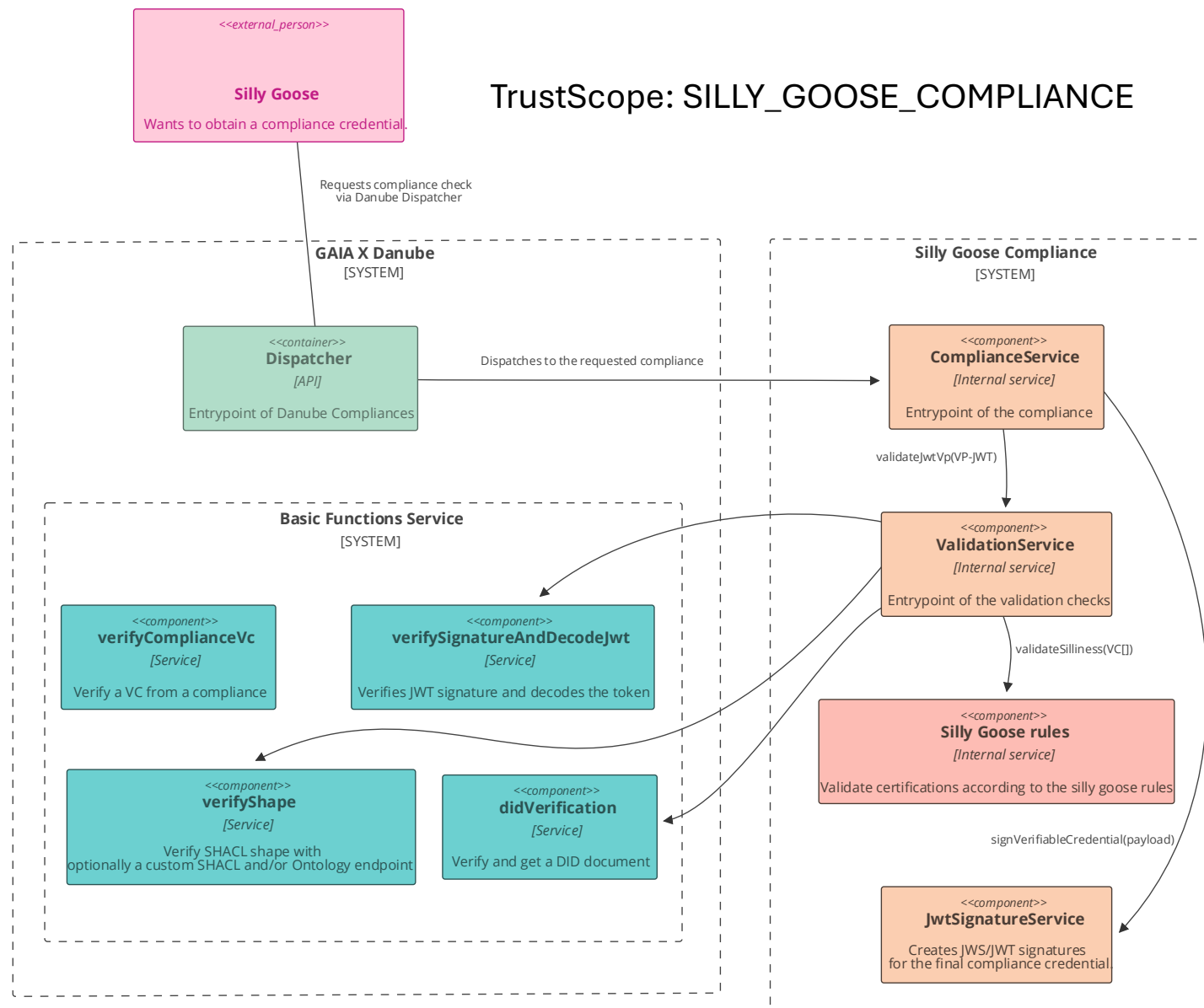
Intro



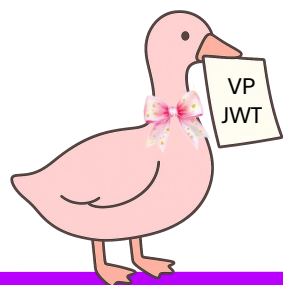
```
{
  "@context": [
    "https://www.w3.org/ns/credentials/v2",
    "https://w3id.org/gaia-x/development#",
    { sg: 'http://w3id.org/sillyGeese', schema: 'https://schema.org/' }
  ],
  "@id": "ex:SillyGooseLevel",
  "type": [ "VerifiableCredential", "sg:SillyGooseLevel" ],
  "issuer": "did:web:sillygooseassociation.org",
  "credentialSubject": {
    "@id": "ex:SillyGooseLevel#cs",
    "sg:sillyLevel": { @value: 94, @type: "xsd:decimal" },
    "sg:involvedParties": { "@id": "ex:CTO_Team#cs" }
  }
}
```

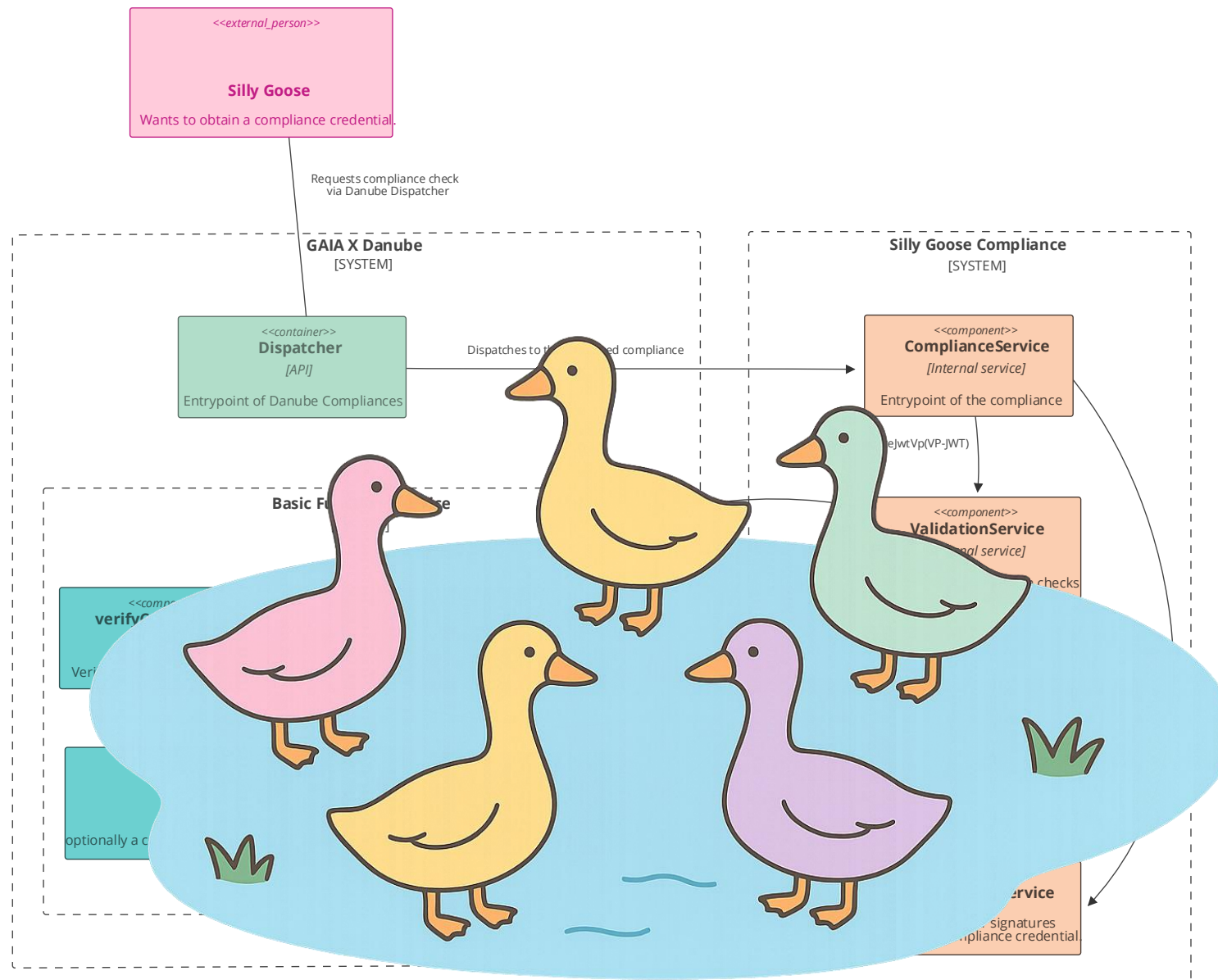


TrustScope: SILLY_GOOSE_COMPLIANCE

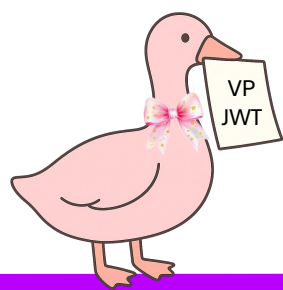


SillyLevel > 70%





SillyLevel > 70%



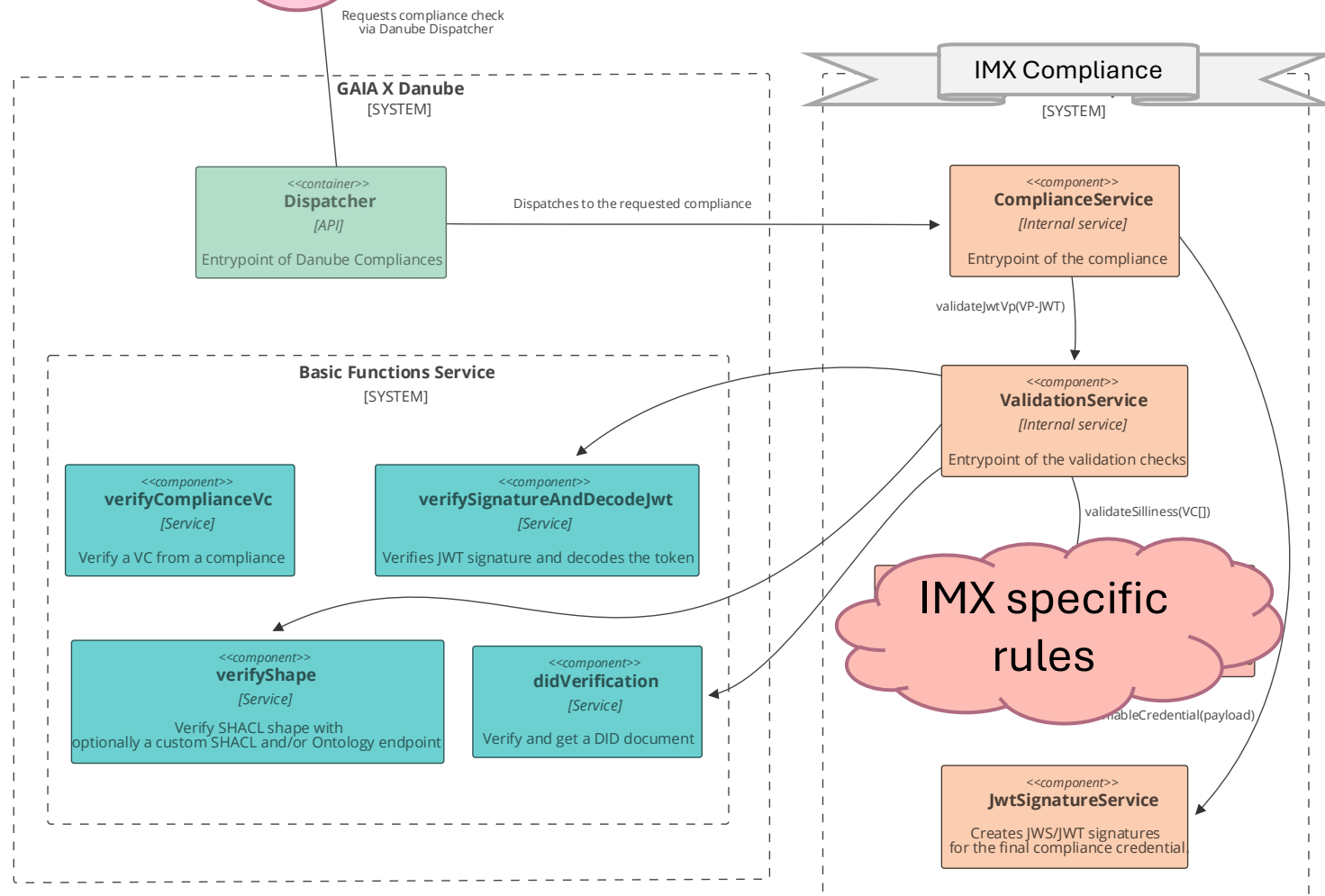
Wait a second... Those are just silly geese!

<https://gitlab.com/gaia-x/lab/gaia-x-danube-components/basic-compliance-engine>

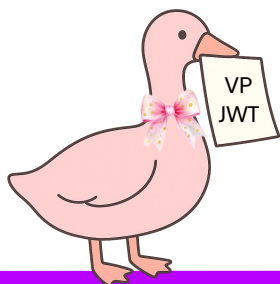
So... what about a real-life implementation?



TrustScope: IMX_COMPLIANCE



verifyJapaneseRegistration
Number



Can we check it out?



https://compliance-dispatcher.lab.gaia-x.eu/development/docs/#/Compliance/DispatcherController_verifyCompliance

https://imx-extension.lab.gaia-x.eu/development/docs#/Imx/ImxController_ValidateJwtVp

#GaiaXSummit25

Thank you!

Delphine Claerhout
delphine.claerhout@gaia-x.eu

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«Danube» - Implementation

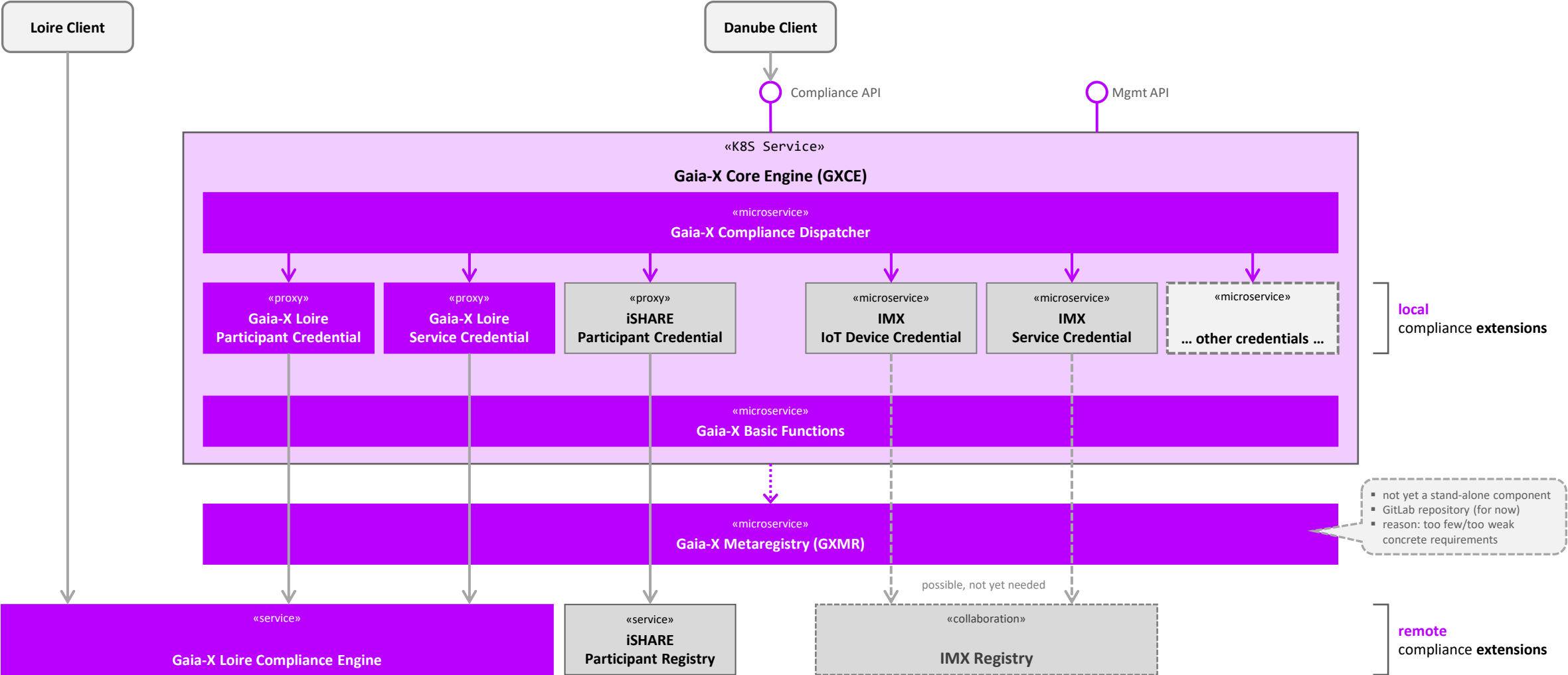
Gaia-X Meta-Registry (GXMR), Ecosystem Trust Profiles and its ontology

21 November 2025

Christoph F. Strnadl | CTO | Gaia-X AISBL

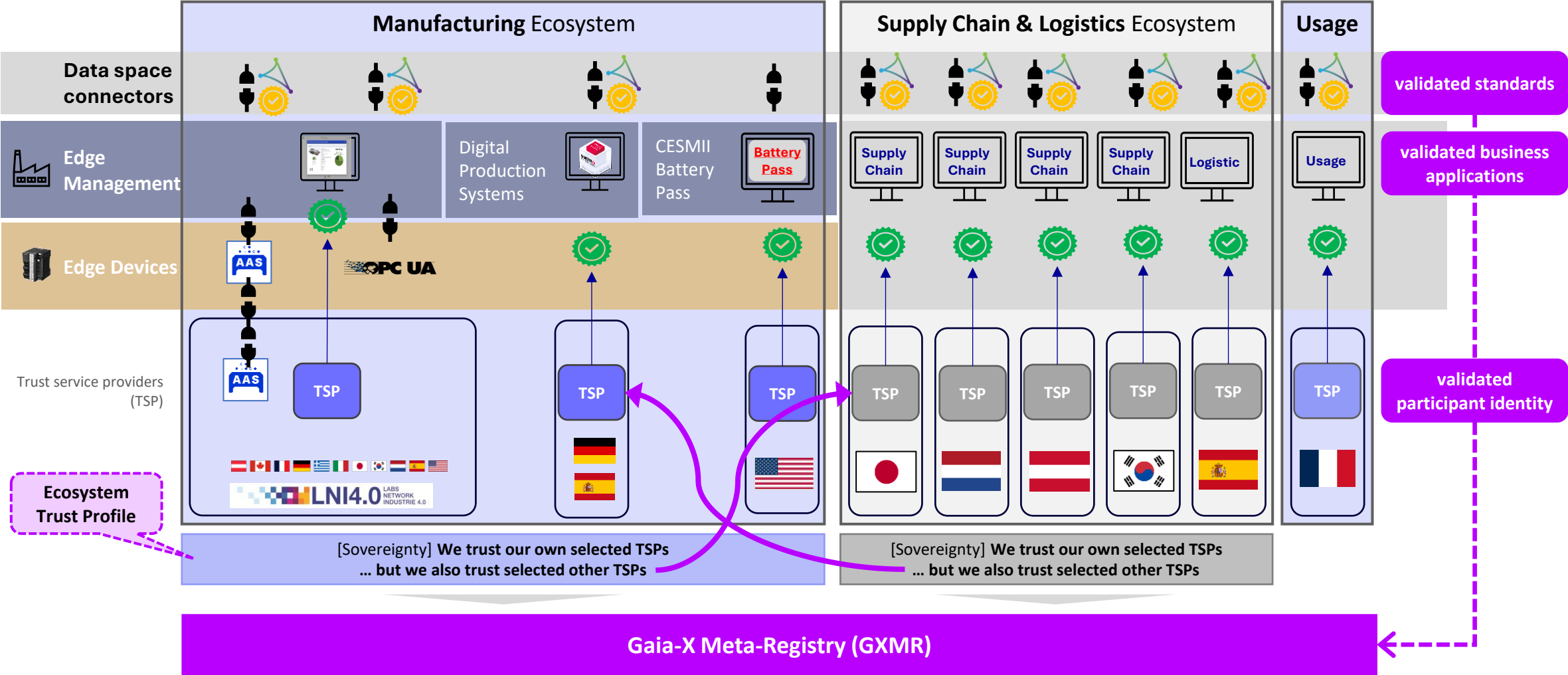
Gaia-X 3.0 «Danube»

Implementation architecture



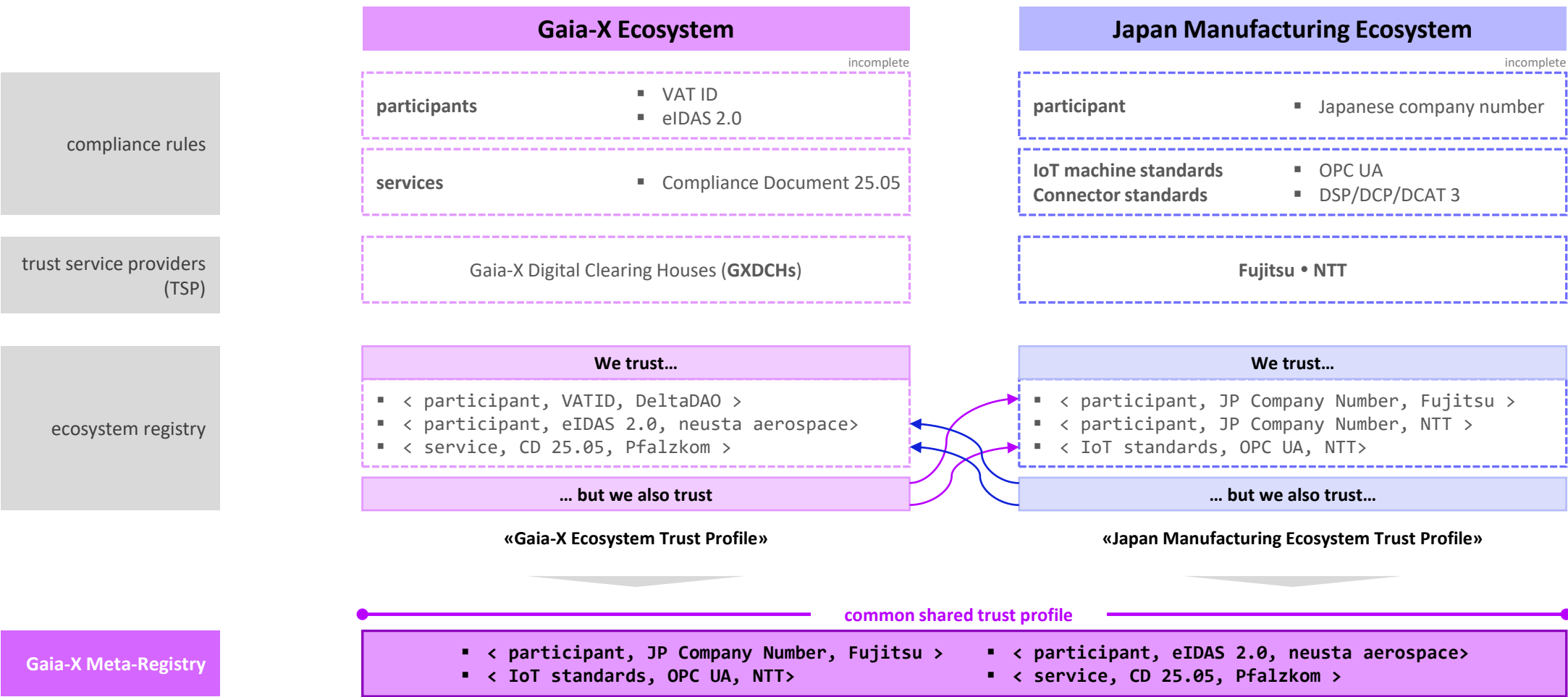
Gaia-X “Danube”

Solving the cross-ecosystem trust dilemma



Gaia-X Meta-Registry

«Ecosystem Trust Profiles» for federated/cross-ecosystem trust



Ecosystem Trust Profiles

Christoph F. Strnadl*

Definition 1 (Ecosystem trust profile). Let $P \subseteq \mathcal{P}$ be a set of trust service providers issuing credentials $c \in \mathcal{C}$ for a scope $s \in \mathcal{S}$ and let $T \subseteq \mathcal{T} = \mathcal{S} \times \mathcal{P} \times \mathcal{C}$ be a set of trust propositions. Then the structure $E = \langle P, T \rangle$ is called an ecosystem trust profile.

We further fix the following abbreviations:

1. The set $S = S(E) = \{s \mid \exists (s, p, c) \in T\}$ is called the (trust) scopes accepted by E .
2. The set $C = C(E) = \{c \mid \exists (s, p, c) \in T\}$ is called credentials accepted by E . Because S and C are uniquely defined for a fixed E , we will write $s \in E$ or $c \in E$ when, in fact, $s \in S(E)$ or $c \in C(E)$.
3. The set P is called the set of domestic trust service providers of E .
4. All non-domestic trust service providers $p' \in \mathcal{P} \setminus P$ are called foreign trust service providers for E .

In order to simplify our language we will often equate E with "an ecosystem characterized by ecosystem trust profile E ".

Based on our previous work, we derive a fragile relationship between ecosystems are unstable unless endowed with an additional coordination or governance mechanisms on top of (and outside to) the ecosystem trust profiles.

Keywords: ecosystems, trust, trust frameworks, data spaces, Gaia-X

*Gaia-X European Association for Data and Cloud AISBL, Brussels, Belgium; christoph.strnadl@gaia-x.eu; ORCID: 0000-0003-4173-656X

Definition 6 (Credential equivalence - Version 2). Let $\mathcal{E} = \{E_1, E_2, \dots, E_N\}$ be a set of ecosystems $E_i = \langle P_i, T_i \rangle$ with credentials \mathcal{C} . Define T_0 to be the set of trust propositions accepted by every ecosystem in \mathcal{E} , that is

$$T_0 = \bigcap_{i=1}^N T_i. \quad (11)$$

Then the relation $\cong_s \subseteq \mathcal{C} \times \mathcal{C}$

$$c_1 \cong_s c_2 \Leftrightarrow \exists (s, p, c_1) \in T_0 \wedge \exists (s, p', c_2) \in T_0 \quad (12)$$

has the (informal) meaning of credential c_1 being equivalent to credential c_2 , that is: $c_1 \cong_s c_2$. Note that this equivalence does not extend equivalence beyond the borders of trust scopes.

Again, this definition has a nice property as the following proposition shows.

Proposition 2. (Credential equivalence Version 2 - equivalence relation) The relation \cong defined in definition 6 is an equivalence relation.

Definition 2 (Ecosystem trust relation). Let \mathcal{E} be a set of ecosystem trust profiles and let $E_i = \langle P_i, T_i \rangle \in \mathcal{E}$ and $E_j = \langle P_j, T_j \rangle \in \mathcal{E}$. Then the (ecosystem trust) relation "ecosystem E_i trusts ecosystem E_j regarding trust scope s ", written as $E_i \sqsubseteq_s E_j \in \mathcal{E} \times \mathcal{E}$, is defined as follows:

$$E_i \sqsubseteq_s E_j \Leftrightarrow \exists s, c \exists p_j \in P_j \setminus P_i : (s, p_j, c) \in T_i \cap T_j. \quad (1)$$

The key point here is that ecosystem E_i trusts a foreign trust service provider p_j of ecosystem E_j which issues a credential c .

Gaia-X Meta-Registry

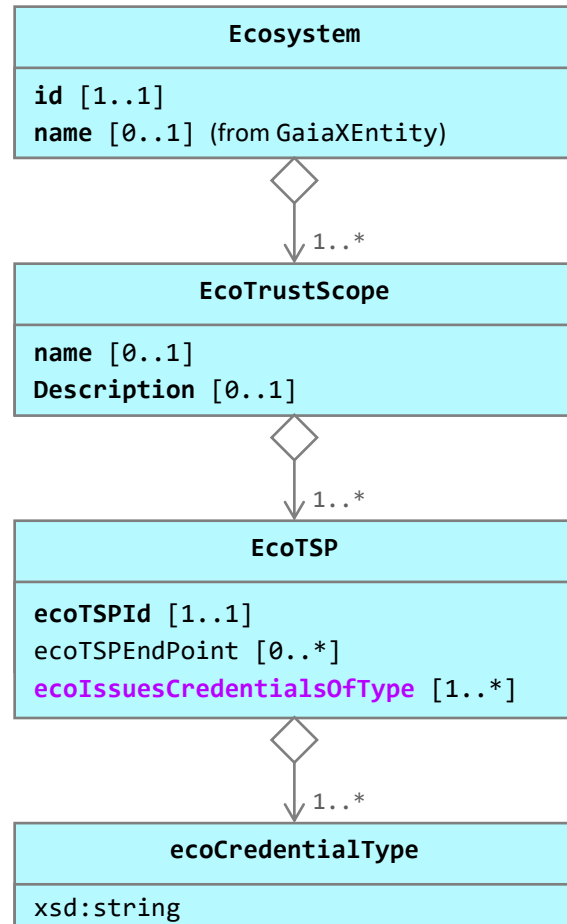
Output is used in the IMX catalogue



Trust Scope	Ecosystem ID ¹	VC Type ¹	TSP (operator/provider)	Component	Environment
imxc:Identity	imxc ² :RealmJP ³	imxc:JPCompany	NTT/Fujitsu	IDYX-TI	TABLE IS INCOMPLETE
	imxc:RealmEU	imxc:LegalParticipant	T-Systems	Sandbox (?)	
	imxc:RealmEU	gx ⁴ :LegalPerson	AIT (?)	GX OSS	
	imxc:RealmEU	gx:LegalPerson	GXDCH	GX Loire v ?	
imxc:Standard	imxc:RealmGlobal	gx:LabelCredential	SQS (?)	GX OSS	
imxc:Endpoint	imxc:RealmDE	imxc:EndPointValidation	LNI Testbed	GX OSS	
	imxc:RealmJP	imxc:EndPointValidation	JP Testbed		
	imxc:RealmGlobal	imxc:EndPointValidation	CA Testbed		
	imxc:RealmUS	imxc:EndPointValidation	US Testbed		
	imxc:RealmGlobal	imxc:EndPointValidation	CX/ES Testbed		
	imxc:RealmGlobal	imxc:EndPointValidation	KR Testbed		

Notes:

- 1) Ecosystem IDs are – at this point in time – arbitrary and have not been validated or checked with any participant. The Gaia-X 3.0 “Danube” architecture requires (i) a unique Ecosystem ID and (ii) the VC Type to characterize any ecosystem and its TSPs. This also allows a very efficient and scalable implementation of a Gaia-X technical compatibility (the “Gaia-X Core Engine”).
- 2) “imxc” is the prefix to turn any identifier used into a globally unique CURIE (“compact URI”). The prefix should be something resolvable (typically it would be a HTTP URI) to provide more information.
- 3) This identifier is just an example. We did not yet check whether singling out the JP and other “realms” makes sufficient business sense.
- 4) “gx” points to “https://w3aid.org/gaia-x/development#”



Definition: For the Gaia-X Metaregistry, an «ecosystem» is *anything* with an **id** and a (non-null) set of **EcoTrustedScopes** with one or more **TSPs** (**EcoTSP**) issuing one or more **VCs** (ecoCredentialType).

Why do we need the «Trust Scope»

- Technically, we don’t really need them.
- It’s just a convenient means for “sorting” the VCs and the TSPs which provide them.
- Accreditations also typically have a «scope» (even if it’s just a flat list)

Notes

- We do not require that an ecosystem recognizes “participation” as one of its core “properties”.
 - Many ecosystems will indeed issue «Participant Credentials” like Catena-X or Gaia-X itself.
 - Nevertheless, our approach allows «ecosystems» of IoT device credentials or Digital Twins or DPPs – as long as one or more TSPs issue VCs to that effect.
- Currently, semantics of the ecoTSPEndPoint property are not defined or constrained at all. In view of the many different VCs and implementations, any such standardization effort may also be futile.
- EcoTrustScope identifiers are currently not constrained in any way
 - as long as they are unique within a single ecoSystem. Maybe we see some standardization here like for trustedRegistries, trustedIdentityProviders,...



<https://docs.gaia-x.eu/ontology/development/classes/Ecosystem/>

Gaia-X Meta-Registry

Example: Gaia-X ecosystem (of GXDCHs) itself



Our own globally unique identifier for our Gaia-X ecosystem.

Open topic: **Any versioning** needed?

additional objects (properties,...) **may extend** the current “Ecosystem Profile” here – not limiting itself to a “trust profile”.

... with the idea to make this identifier **the** universal trust scope for any type of “participant credential”

Semantics of optional **EcoTSPEndPoint** currently not defined.

This could be a reasonable first version taken from the Gaia-X Registry. Only works for **POST**, though

This is actually **not** the case.

Currently (CD 25.11), “Participant Credentials” are also issued as a VC of type “LabelCredentials”.

Additional trust scopes go here

E.g., `gx:EcoServiceAttestationScope`
-- see next slide

```
{
  "@context": {
    "gx": "https://w3id.org/gaia-x/development#",
    "schema": "https://schema.org/"
  },
  "@id": "gx:GaiaXEcoTrustProfile",
  "schema:name": "Gaia-X Ecosystem Trust Profile",
  "gx:ecoTrustedScope": [
    {
      "@id": "gx:EcoParticipantScope",
      "schema:name": "Ecosystem participation scope",
      "gx:ecoTrustServiceProvider": [
        {
          "@id": "https://delta-dao.com/.well-known/2503_gx_legalperson_deltaDAO.json",
          "schema:name": "DeltaDAO AG",
          "gx:ecoTSPId": "https://delta-dao.com/.well-known/2503_gx_legalperson_deltaDAO.json",
          "gx:ecoTSPEndPoint": [
            "https://www.delta-dao.com/compliance/v2/api/credential-offers/standard-compliance"
          ],
          "gx:ecoIssuesCredentialsOfType": [
            "gx:ParticipantCredential"
          ]
        }
      ]
    },
    { (* ... other trusted scopes follow here *) }
  ]
}
```


Gaia-X Meta-Registry

Example: Gaia-X ecosystem (of GXDCHs) itself



This is the **same ecosystem @id** as before
Technically, one puts both trust scopes (participants and services) into a single Ecosystem (Trust) Profile (... but you won't be able to read anything then)

Lists all TSPs which issue credentials under this trust scope.
The example contains only a single TSP for readability reasons, but you understand the JSON-LD list syntax ;-)

Semantics of optional **EcoTSPEndPoint** currently not defined.
This could be a reasonable first version taken from the Gaia-X Registry. Only works for **POST**, though

Contrary to the "ParticipantCredential" this is really the case.

```
{
  "@context": {
    "gx": "https://w3id.org/gaia-x/development#",
    "schema": "https://schema.org/"
  },
  "@id": "gx:GaiaXEcoTrustProfile",
  "schema:name": "Gaia-X Ecosystem Trust Profile",
  "gx:ecoTrustedScope": [
    {
      "@id": "gx:ServiceAttestationScope",
      "schema:name": "Ecosystem - Gaia-X attestation of services scope",
      "gx:ecoTrustServiceProvider": [
        {
          "@id": "https://delta-dao.com/.well-known/2503_gx_legalperson_deltaDAO.json",
          "schema:name": "DeltaDAO AG",
          "gx:ecoTSPIId": "https://delta-dao.com/.well-known/2503_gx_legalperson_deltaDAO.json",
          "gx:ecoTSPEndPoint": [
            "https://delta-dao.com/compliance/v2/api/credential-offers/standard-compliance",
            "https://delta-dao.com/compliance/v2/api/credential-offers/label-level-1",
            "https://delta-dao.com/compliance/v2/api/credential-offers/label-level-2",
            "https://delta-dao.com/compliance/v2/api/credential-offers/label-level-3"
          ],
          "gx:ecoIssuesCredentialsOfType": [
            "gx:LabelCredential"
          ]
        }
      ]
    }
  ]
}
```

Gaia-X Meta-Registry

Current implementation



- Gaia-X Meta-Registry (GXMR) currently realized as a **GitLab project**
- **rationale**
 - only requirement known with some confidence: storing «Ecosystem Trust Profiles» (→ different directories for every ecosystem)
 - need(ed) a quickly available, very flexible, very low effort implementation
 - store ecosystem profiles of any kind
 - support for individual and collective coordinated action (→ MRs)
 - potential means for enforcing ontologies checking (→ GitLab CI/CD: not used yet)
- **strategic options**
 - dynamic retrieval of ecosystem (trust) profiles directly from Ecosystem Registries (no manual data entry)
 - realization in a more federated or decentralized way (DLT?)
 - further investigate [TRQP](#) (Trust Registry Query Protocol) and [TRQL](#) (Query Language) of the [Ayra Forum](#)
- **current approach**
 - closely work with early adopters in a co-innovation/co-development way (→ **IMXC Hannover Fair** Use Case)
 - We **won't implement** theoretically possible “nice” things without any concrete member/ecosystem demand (!)

<https://gitlab.com/gaia-x/lab/gaia-x-danube-components/gaia-x-meta-registry>



Gaia-X 3.0 Ontologies

Ontology extensions: Strategy



Conceptual Remarks

- Under the **OWA**'s (Open World Assumption) “AAA” mantra (“Anyone can say anything about any topic”) there is **no controlled definition** of the concept of an “**ontology extension**”: Anyone can add, link, copy, extend, enrich, or otherwise make use of any ontology out there in the wild.
- **Gaia-X will not be able to restrict** ecosystems how they define themselves or their concepts (Scenario 3 & 4) – so the Loire CWA (Closed World Assumption) will not hold.

Gaia-X Aspiration

- Gaia-X should concentrate on creating a **minimal and otherwise arbitrarily extensible ontology**
 - 1) allowing ecosystems **to establish areas of common trust** with other ecosystems, i.e., make visible domains where one ecosystem chooses to trust other ecosystems
 - 2) enabling the **Gaia-X 3.0 “Danube” software** implementation to identify and route incoming verifiable credentials to the correct compliance engine(s) of the various ecosystems
 - 3) implemented in a first version (3.0) in a new **Gaia-X Metaregistry** function
- First version developed for the IMXC project and its requirements for SPS (11/25)
- Continuation with IMXC and more elaborate use cases for the Hannover Fair (04/26)

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EDC & Gaia-X Trust Framework Integration



Christoph F. Strnadi | CTO | Gaia-X

Julien Foliot | Software Engineer | Gaia-X

—
Gaia-X European Association for Data and Cloud AISBL

v1.00

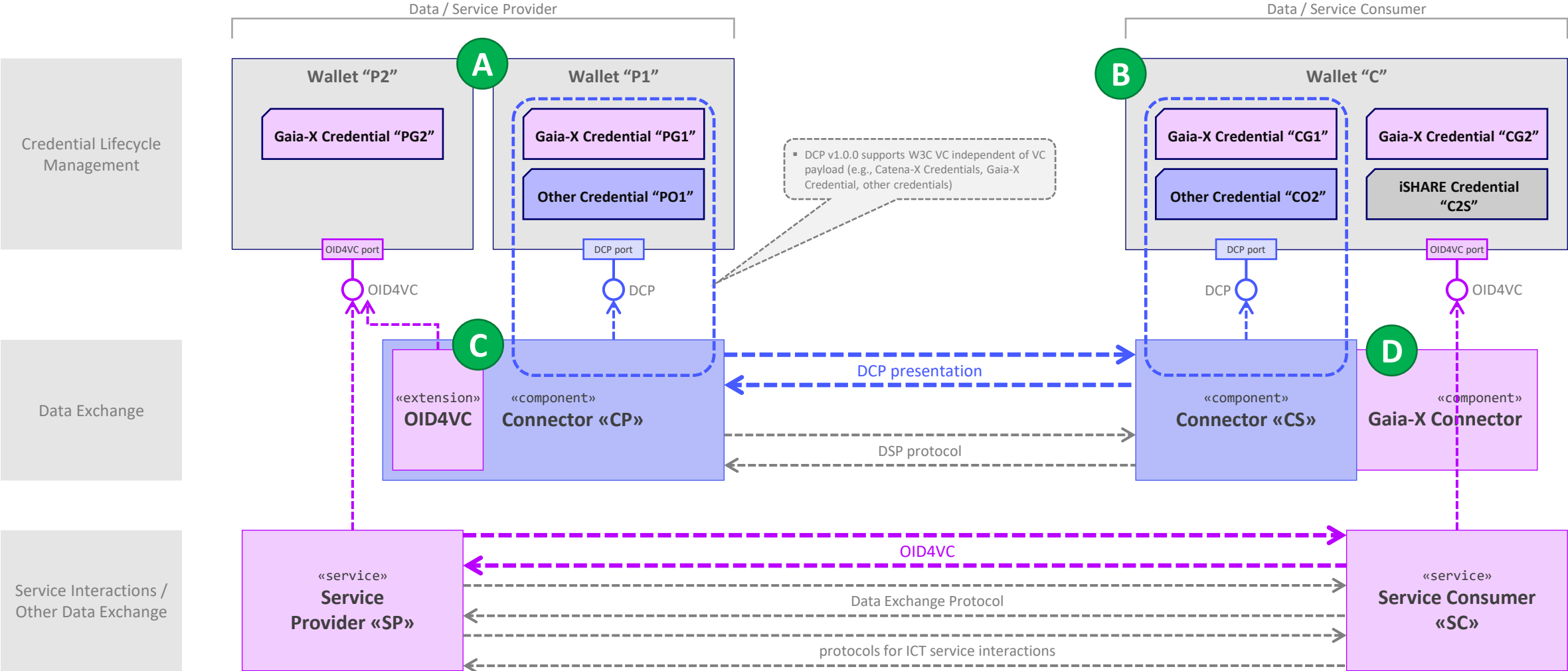
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01

Architecture Considerations

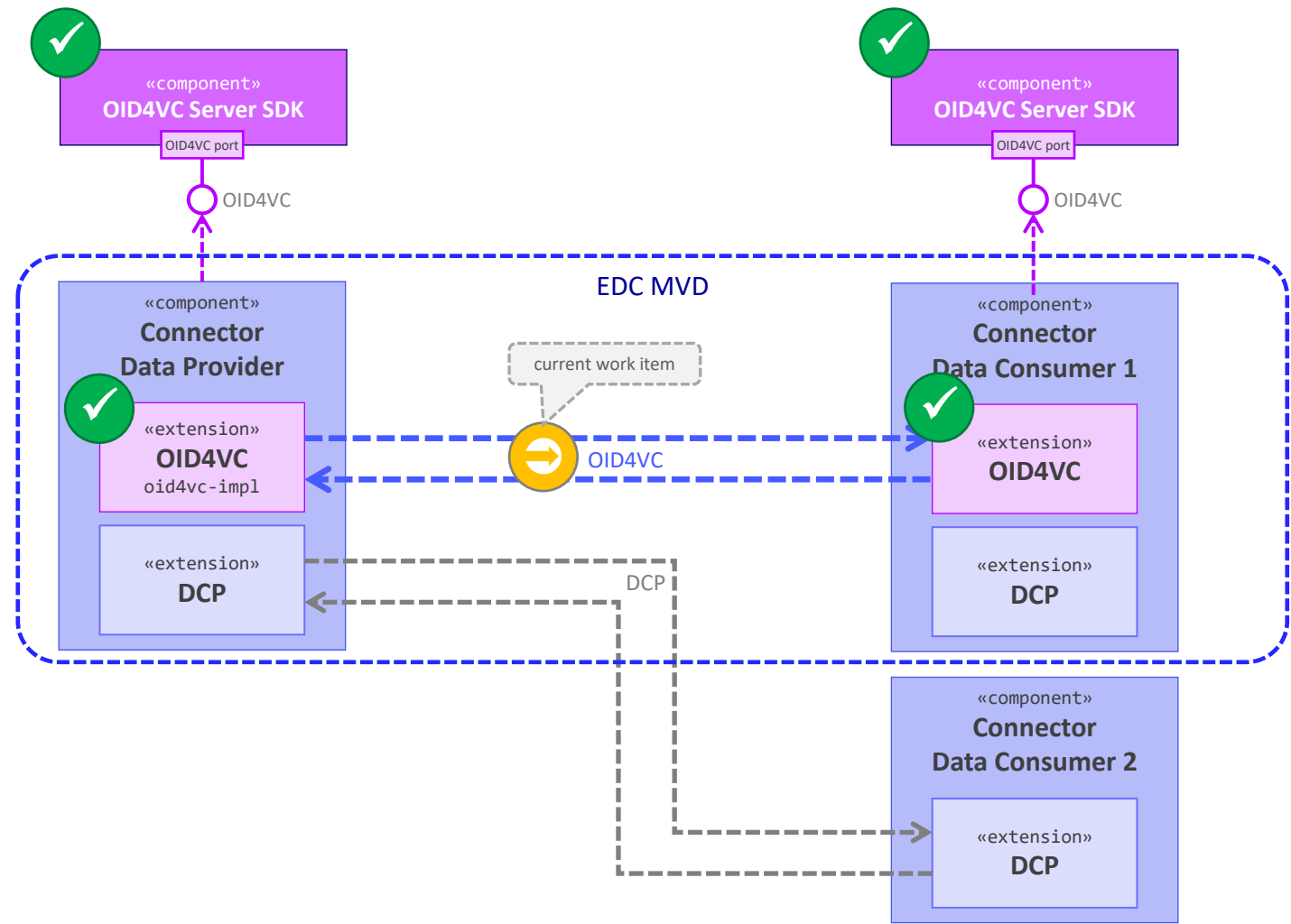
Data Space Protocols & Gaia-X Trust Framework

4 potential integration points



Gaia-X Trust Framework Integration in EDC

Development architecture v1.0



02

OID4VC & DCP Synopsis and Overview

OID4VC and DCP

Non-technical vignettes

Property	OID4VC	DCP
Proper Name	pronounced “Open ID for VC”	Decentralized Claims Protocol
“Working” SDO	Open ID Foundation Digital Credentials Protocols (DCP) WG	Eclipse Dataspace Working Group (EDWG) DCP Specification Project
International SDO	N/A	ISO (via PAS Transition)
Target domain	to develop OpenID specifications for the Issuer-Holder-Verifier -Model use-cases to enable issuance and presentations of the Digital Credentials of any format and pseudonymous authentication from the End-User to the Verifier .	Dataspaces require the ability to communicate participant identities and credentials to secure data access. This specification defines a set of protocols for <ul style="list-style-type: none"> - asserting participant identities, - issuing verifiable credentials, and - presenting verifiable credentials using a decentralized architecture for verification and trust

OID4VC and DCP

Technical vignettes

Property	OID4VC	DCP
Self-issuance protocol	SIOPv2 (draft 13)	BIP (Base Identity Protocol)
VC issuance protocol	OID4VCI (v1.0)	CIP (Credential Issuance Protocol)
VC presentation protocol	OID4VP (v1.0)	VPP (Verifiable Presentation Protocol)
Additional protocols	HAIP (High Assurance Interop Profile) Open ID4VP for BLE OpenID Connect UserInfo VCs	Consent for access to resources
supported VC formats	agnostic	agnostic since v1.0-RC3
Initial/legacy orientation	H2M	M2M
supports H2M	yes	no
supports M2M	yes	yes
wallets needed	yes	yes

Projects need to identify **which wallets they want to use** in conjunction with their «Participant Agent Service». Critical NFRs, amongst others, are: availability, compatibility, interoperability, costs, maintainability

This is a highly contentious subject with active discussions around fundamental questions:

1. It can't be done at all.
2. If it can be done, it does not fulfill the standard
3. If it can be done, it uses areas which are not (yet) properly standardized (affects interoperability)
4. There is no standardized way to do that.
5. In any case, there is no working implementation as of today, especially not over DSP.

OID4VC and DCP

Aspects worth considering



- **Commonalities**

- Both DCP and OID4VC protocols have the **same mission**: to securely enable the exchange of W3C VCs¹

- **Interoperability**

- While both protocols do it slightly differently, both protocols can be used to **exchange the same VCs**.
- **Example**: W3C VCs exchanged in Manufacturing-X with one protocol can be exchanged with participants outside of Manufacturing-X with another protocol

- **Requirement in data spaces/digital ecosystems: high performance end-to-end traceability**

- data transaction regulatory & policy compliance + performance (high-frequency credential exchange)
- credential exchange protocols need to support an end-to-end traceability of the policies, claims and evidence being exchanged: This needs both **human-in-the-loop** and **machine-to-machine** support in the full picture

- **Architecture Patterns**

- a) multi-protocol approach** (also called “co-existence”) using multi-protocol capable participant agent services (including wallets): implementation and maintenance of a **dual-stack IT infrastructure**
- b) standardized single protocol approach**: **not available as of to-date**; market expectations/market forces,...

1) There are other “digital credential” formats besides W3C VCs such as IETF SD-JWT VCs, ISO/IEC 18013-5, etc.

03

EDC & OID4VC Deep dive

OID4VC and DCP

Eclipse EDC: The Essentials



- **Goal**

- **Eclipse EDC** is an open-source framework for creating **dataspaces**, enabling sovereign and secure data sharing between organizations.

- **How does it work**

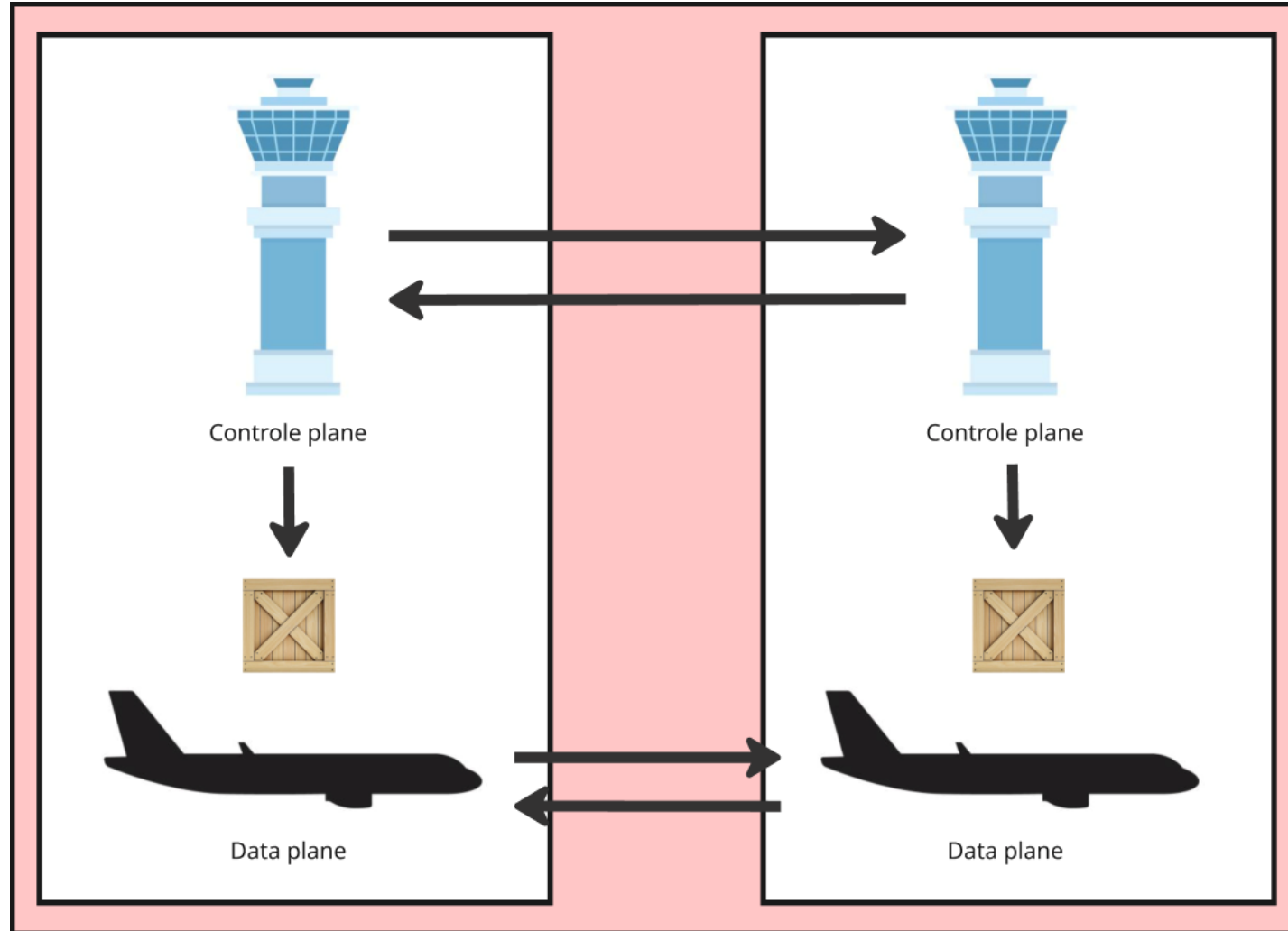
- Its key component, the Connector, uses the **Dataspace Protocol (DSP)** for communication. It separates the **control plane**, which manages contract negotiation and policies, from the **data plane**, which executes the **physical data transfer**.

- **The process is as follows**

- **Connectors** negotiate a contract that defines the rules of use.
 - The **control plane** verifies that the policies are respected.
 - If everything is compliant, the transfer is authorized and executed by the **data plane**.
 - The main objective is to **ensure** that data owners always maintain full control over the use of their data.

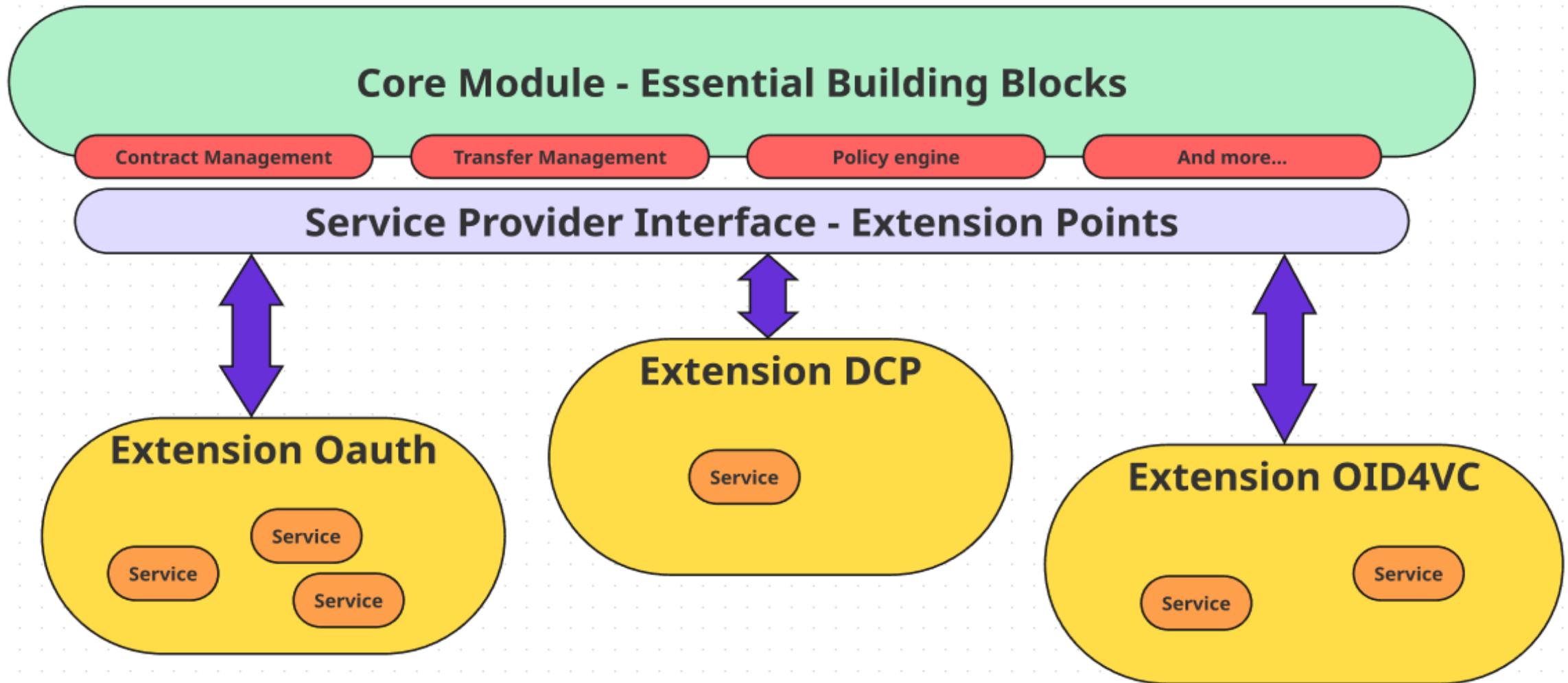
OID4VC and DCP

DSP protocol inside EDC



OID4VC and DCP

EDC extension



OID4VC and DCP

OID4VC



– Description

- Around the **Eclipse Dataspace Components (EDC)** and Data Spaces, we will explore a major advancement that strengthens trust and sovereignty in these ecosystems: the integration by Gaia-X of an **OpenID for Verifiable Credential (OID4VC)** extension into EDC.

– Gaia-X and decentralized trust

- Gaia-X, the European initiative for a federated data **infrastructure**, aims to build a digital ecosystem where **sovereignty, transparency**, and trust are guaranteed.[1] Digital identities and the verification of participant attributes are **fundamental**, and this is where **Verifiable Credentials (VCs)** and the OID4VC protocol come into play.

OID4VC and DCP

Verifiable Credentials (VCs) and OID4VC



- **Description**

- **Verifiable Credentials (VCs)** are cryptographically secure, tamper-proof, and privacy-respecting digital attestations. They **certify** facts or attributes about an entity (person, organization, object) – for example, a professional license, a **certification**, or **proof** of membership. VCs allow for **selective disclosure**, giving the holder control over the information shared.

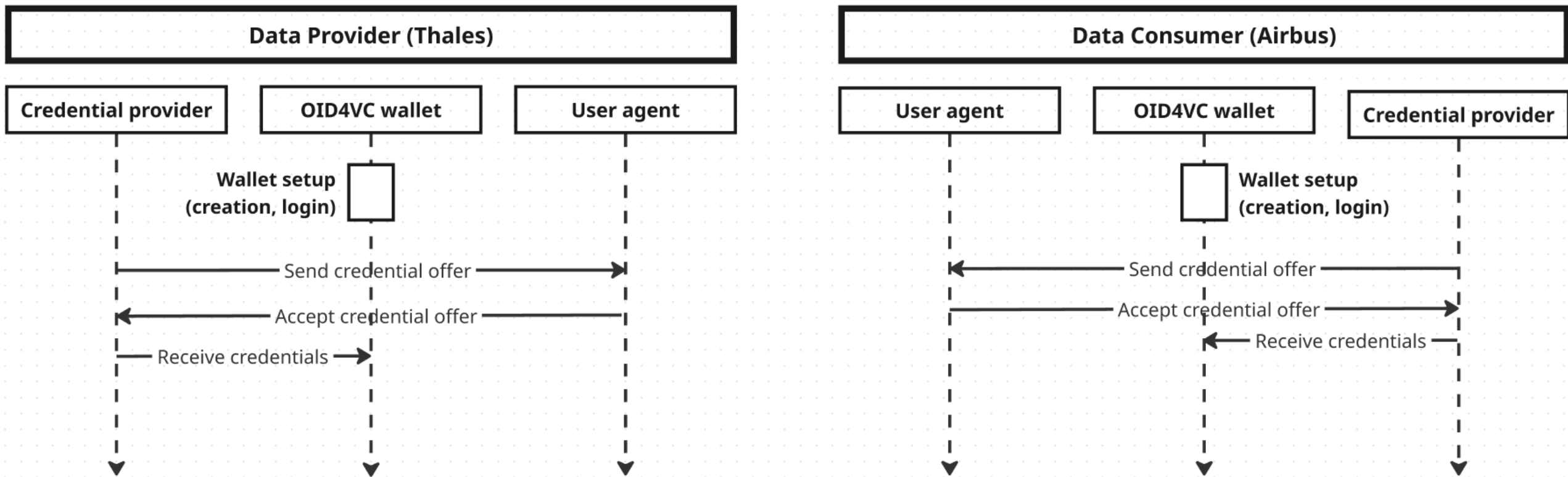
- **Goal**

- **OpenID for Verifiable Credential (OID4VC)** is a specification from the **OpenID** Foundation. It defines a standardized and secure API, based on OAuth, for issuing these **VCs**. It describes how an **issuer** delivers a VC to a holder (often via a **digital wallet**), and how this holder can then present it to a **verifier**.

OID4VC inside EDC

Diagram overview

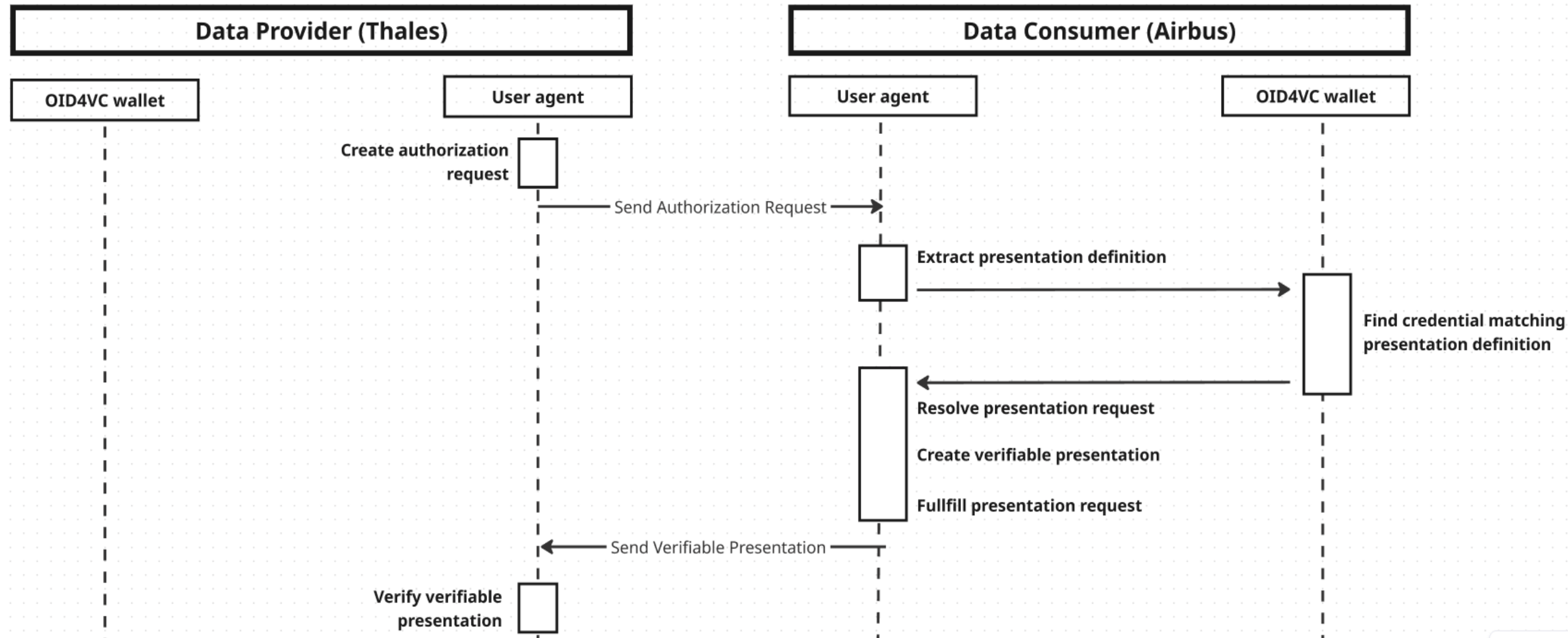
OID4VC SETUP



OID4VC and DCP



OID4VC EXCHANGE



- The Gaia-X team has worked to provide you with a suite of software components, allowing you to take advantage of OID4VC directly in your dataspace.
- We are making the following available as open source:
 - A complete **OID4VC authentication server** (working with WaltId tools)
 - A **client library** to import into your projects for **easy connection** to the server.
 - An **EDC (Eclipse Dataspace Components) connector** that implements the client to get OID4VC in your connector.
 - A **demo** of the **connector** in an **MVD** (Minimum Viable Dataspace) fork of EDC.



Updates to our GitLab repositories will be released soon

Stay tuned for more details !

Gaia-X SUMMIT 2025



DIGITAL ECOSYSTEMS IN ACTION

Porto, Portugal | 20 & 21 November



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European Open Source Academy

Recognising excellence in open source

Francisca Rubio

— presentation prepared by:

Consortium members of [OSAwards.eu](https://www.osawards.eu)
Tecnalia Research and Innovation

What is the European Open Source Academy?



*The European Open Source Academy has been established and funded at its outset by the European Commission in the period from **2024-2027**, with the aim to become an independent and **self-sustaining legal entity by 2027**. The Academy shall serve as Europe's **premier institution for the advancement and recognition of European excellence in open source software and hardware**.*



OSAWards.eu Consortium

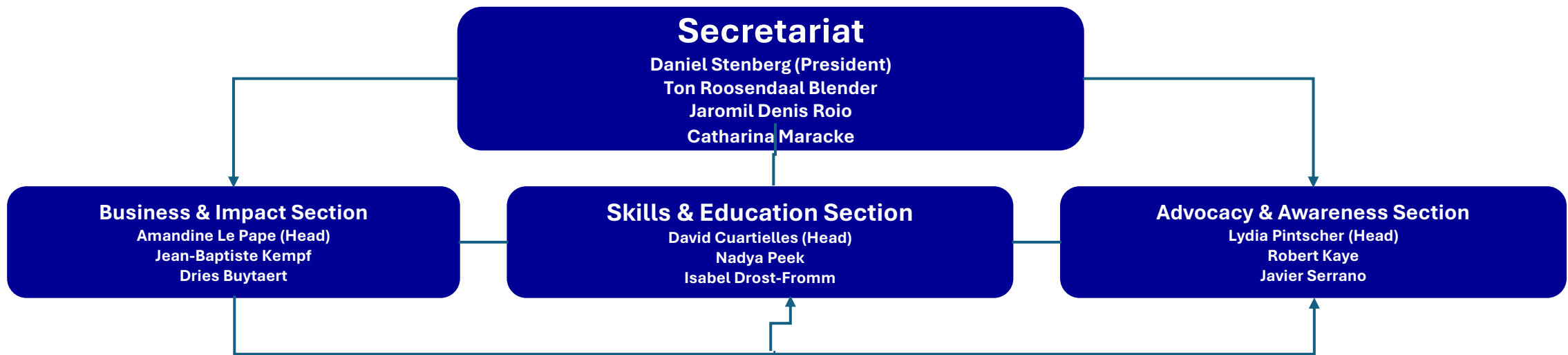


The European Open Source Academy was formed to:

- **Provide Public Recognition of those individuals and organisations contributing to the advancement of the European Open Source and Open Hardware ecosystems**
- **Advocate for and communicate the interests of the Open Source Software and Open Hardware ecosystem by serving as a lighthouse for Open Source Software and Open Hardware excellence in Europe**
- **Support initiatives that enhance Open Source Software and Open Hardware skills and education across Europe, as well as promote the adoption of open source principles in educational curricula, training materials, and public discourse**

Academy Structure

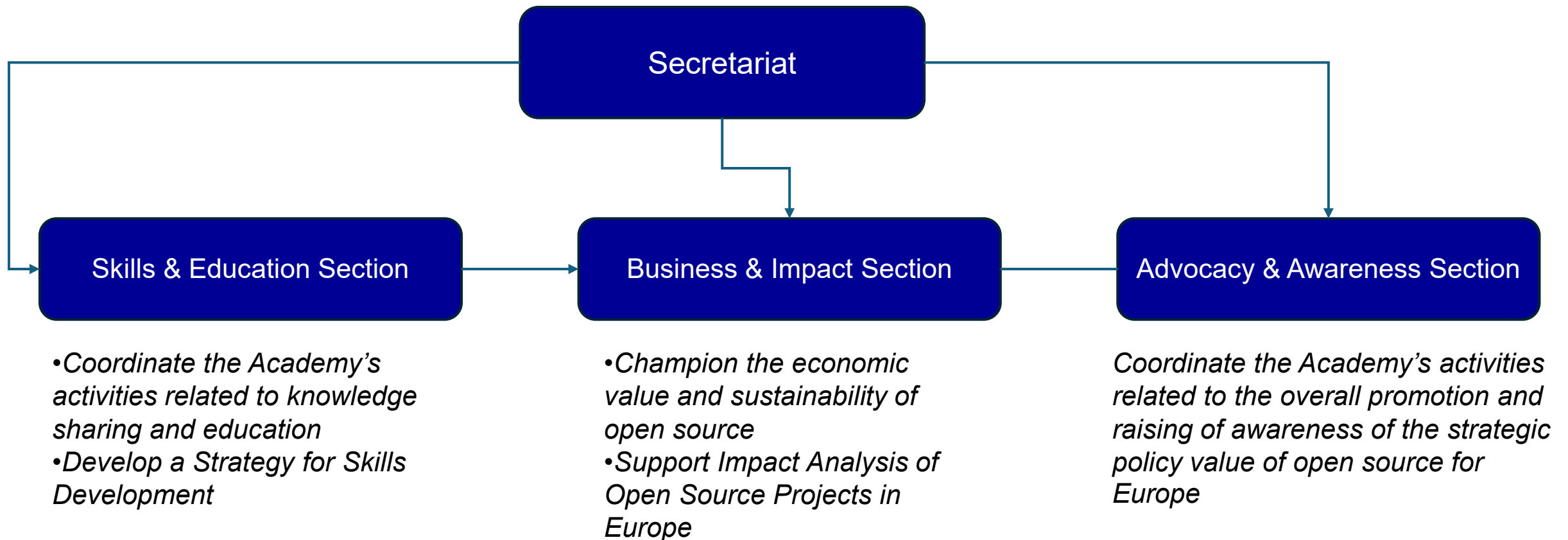
- The Academy is to be designed on the model of leading Academies of Sciences, such as the Royal Swedish Academy of Sciences (Nobel Prizes) or the Académie Française.*



Members are responsible for the leadership of the Academy, and also act as external representatives of the Academy when required. Currently the four founding members were appointed in the Inaugural Awards Ceremony. Academy Members were appointed through peer-to-peer nomination by the end of year 1, and divided equally across the sections.

Roles and Responsibilities

- *Overall Coordination of the Academy's activities*
- *External Representative*
- *EOS Awards Selection and Nomination Process for 2026*





European
Open Source
Academy



European
Open Source
Awards

What to expect from the European Open Source Awards?



From an idea, an alternative, to the main discourse. Celebrating the work of over 20 years.

The inaugural European Open Source Awards, which honour outstanding achievements to the Open Source Software and Hardware community throughout Europe, were proudly presented by the European Open Source Academy in January 2025. The Awards winners became the founding members of the Academy.

Save the date for the EOSAwards26 : 29th January, 2025



Follow us on LinkedIn, Mastodon, Bluesky for more updates about the EOSAwards Ceremony!

#GaiaXSummit25

Be a part of the community today and join us in amplifying the voices and work of Open Source.

Scan the QR Code and Let's Connect!

Thank you!

TBA by Tecnalia





OPEN COMMUNITY
EXPERIENCE

21-23 April 2026
Brussels, Belgium



“

WE'D LOVE TO GET YOUR SUPPORT!

Building on the incredible success of our inaugural OCX event, I'm thrilled to invite you to be part of OCX 26, where we aim to welcome over 600 open source professionals. This dynamic gathering will once again connect leading developers, contributors, and innovators to drive forward the future of open collaboration.

Sponsorship at OCX 26 offers a unique opportunity to align your brand with the cutting edge of open source technologies. By joining us, you'll increase your visibility, build valuable connections, and showcase your support for the community that powers countless industries.

We look forward to partnering with you to make OCX 26 even bigger and better!

Gaël Blondelle
Chief Membership Officer



WELCOME TO BRUSSELS!

Open Community Experience 2026 will be held at [The Egg Brussels](#), a dynamic space where creativity and technology intersect. Located in the heart of the city, it's the perfect venue for developers and open source enthusiasts to connect, share ideas, and shape the future.

Why Brussels? As the heart of Europe, Brussels boasts a vibrant tech ecosystem and plays a central role in the EU. It's a hub for developers, innovators, and tech enthusiasts, making it an ideal location for OCX 26. As a European-based foundation, hosting the event here is a natural next step for our community.



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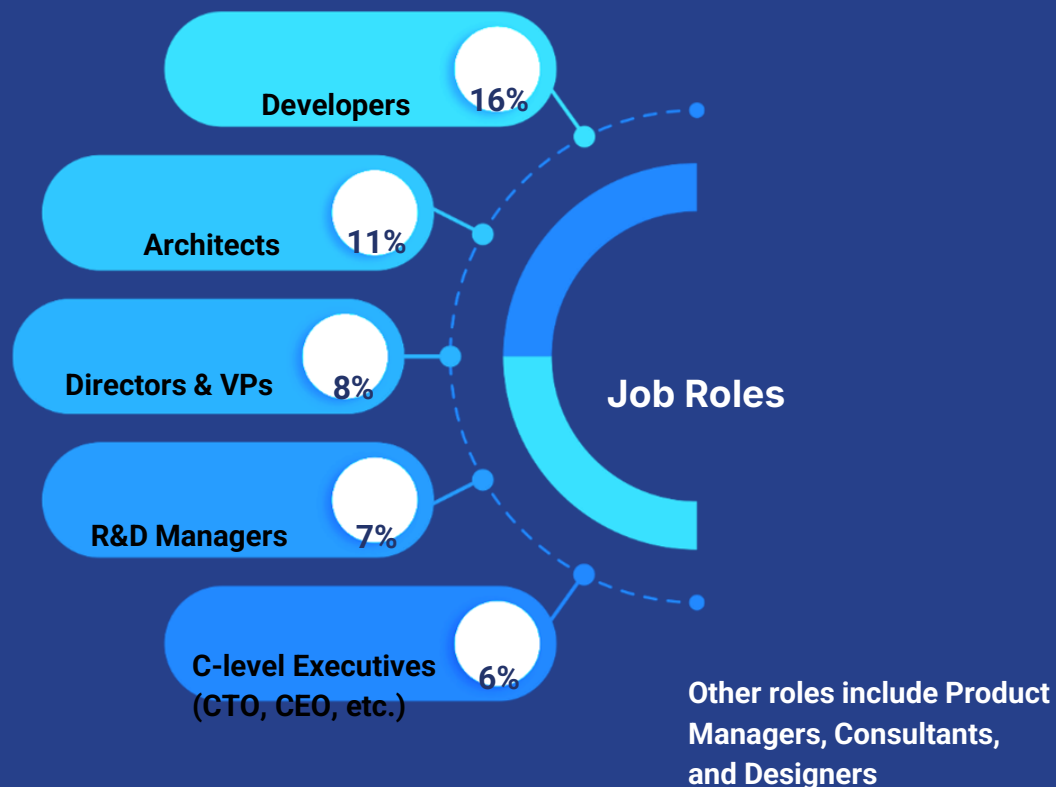


WHO YOU'LL REACH AT OCX26

Open Community Experience (OCX) attracts an international audience of 700+ professionals, decision-makers, and innovators from across open source and technology ecosystems. Here's a snapshot of who attended OCX 24:

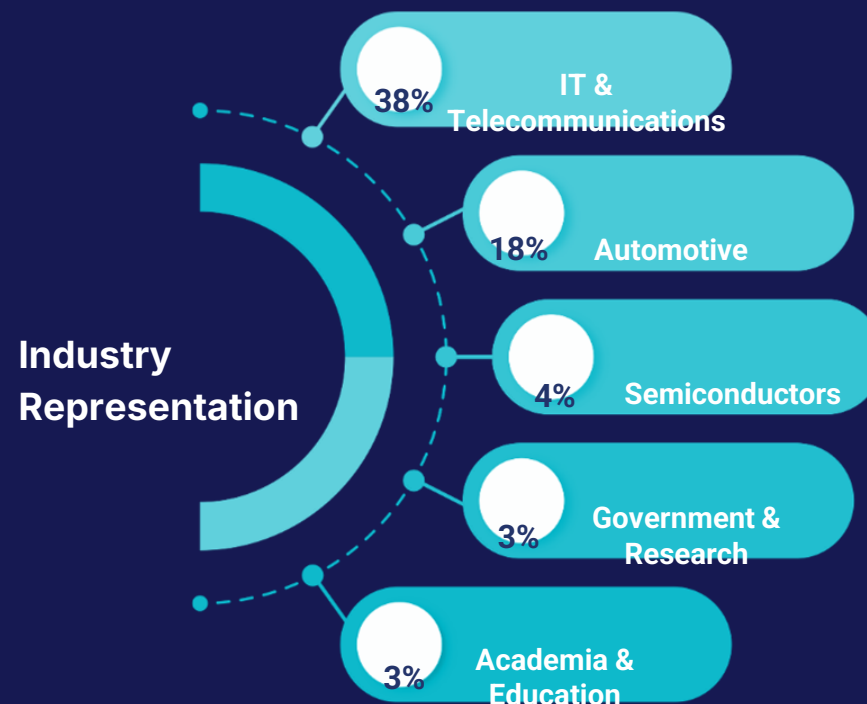
Job Roles

Our audience includes both technical contributors and strategic decision-makers:



Industry Representation

OCX 24 attendees came from a diverse mix of sectors, reinforcing its role as a cross-industry platform for collaboration:





Relive the magic of OCX 24!
Watch the aftermovie!

WHAT IS OCX?

At the Eclipse Foundation, we're constantly exploring new ways to drive innovation. As part of this, we're excited to host Open Community Experience (OCX) 2026, a bold evolution of our flagship conference. More than just an event, OCX is a vibrant, cross-industry gathering where diverse communities come together to shape the future of open source.

Beyond the OCX Main Track, covering Java, embedded systems, open source security, and collaboration practices, OCX features collocated events:

- **Open Community for Tooling** – Formerly EclipseCon, this track will focus on open source developer tools and the Eclipse IDE.
- **Open Community for Automotive** – A dedicated space for collaboration on automotive software and software-defined vehicles.
- **Open Community for AI** – Exploring the transformative power of artificial intelligence, fostering collaboration on open source AI frameworks, and tools.
- **Open Community for Compliance** – Addressing cybersecurity challenges and regulations impacting open source communities.
- **Open Community for Research** – Advancing open source projects that turn research outcomes into real-world impact.
- ...with more to be announced!

Open Community for AI topics

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5. Data Sharing and Dataspaces





Multiple regions, including Europe, have entered a period of instability, which is forcing them to reconsider their digital agendas. Data ownership and proper usage have become paramount, while the consensus is also on the need to establish the mechanisms to unlock trusted data sharing. Moreover, it is precisely these trusted data transactions that would greatly benefit AI applications, as they are demanding more and more quality data and the ability to discover new datasets. Example topics:

- Federated dataspace architectures for AI: interoperability, protocols, and governance
- From silos to sharing: enabling cross-domain data exchange for AI innovation
- Trust and sovereignty in AI-driven ecosystems: identity, credentials, and policy enforcement in dataspaces
- Data quality for AI: curating, discovering, and accessing reliable datasets through dataspaces
- Open source building blocks for AI-ready dataspaces: connectors, brokers, and reference implementations
- Regulatory drivers for AI and dataspaces: Data Act, Data Governance Act, and global policy frameworks
- Business models for AI-enhanced data sharing: incentives, marketplaces, and sustainability
- Cross-cutting AI use cases powered by dataspaces: industry, mobility, health, energy, and public services




Eclipse Dataspaces Working Group in a nutshell

Data Act Chapter VIII

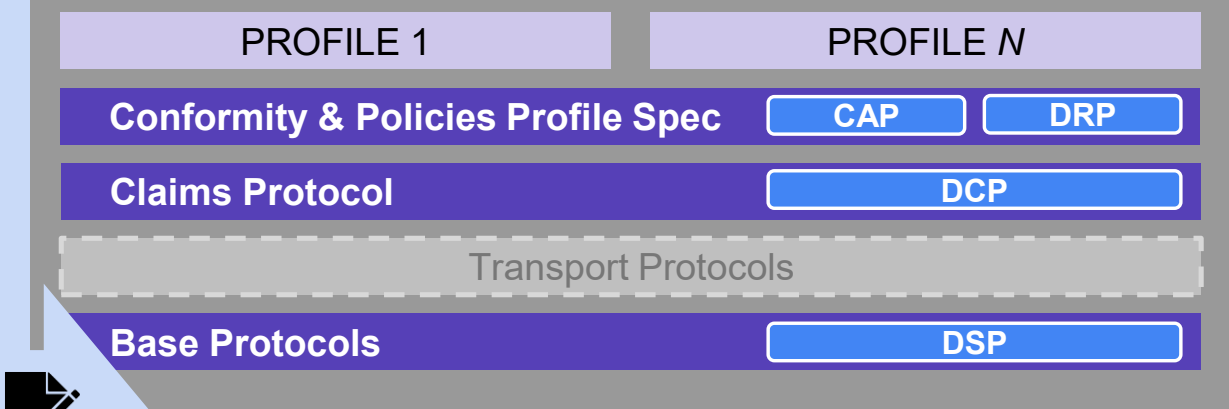
Interoperability - Article 33

-  Automatic access & transmission
-  Open formats & vocabularies
-  Find, access & use
-  Smart contracts

Interoperability - Article 36

-  Consistency
-  Safe termination/interruption
-  Robustness & access control

Open-Source Specification: Standardization



Projects connected
or affiliated with EDWG



Open-Source Implementation: Adoption



The value of EDWG membership

Standard supervisor



Be part of the decision making process regarding the specifications and eventual standardisation of Dataspace protocols

Interoperability master



Contribute on the way specifications/standards are globally harmonised for Dataspaces

First to know



Be well informed strategically about what is happening on OSS projects for Dataspaces and evaluate potential impact

My work matters



Be recognised as a thought leader in Dataspace implementation/specification
Contact other thought leaders

Giving back to the community



Support the coordination of the Dataspace OSS projects financially because you rely on them

Trusted developer



Certify your Dataspace modules to prove its compatibility with OSS specifications/standards

Implementation business advisor



Be part of the strategy facilitation for OSS implementation projects in Dataspaces



We can't wait to collaborate!

OCX 26 will deliver inspiring connections, memorable experiences, engaging speakers, and high-value content; all in one place. Don't miss your chance to be part of it!

Be at the forefront of the Dataspace standardization. Help us build the strategy for the Dataspace ecosystem. Join the adopter community of Dataspace OSS solutions

Contact fo OCX event.sponsor@eclipse.org

Contact fo EDWG javier.valino@eclipse-foundation.org

Gaia-X SUMMIT 2025



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