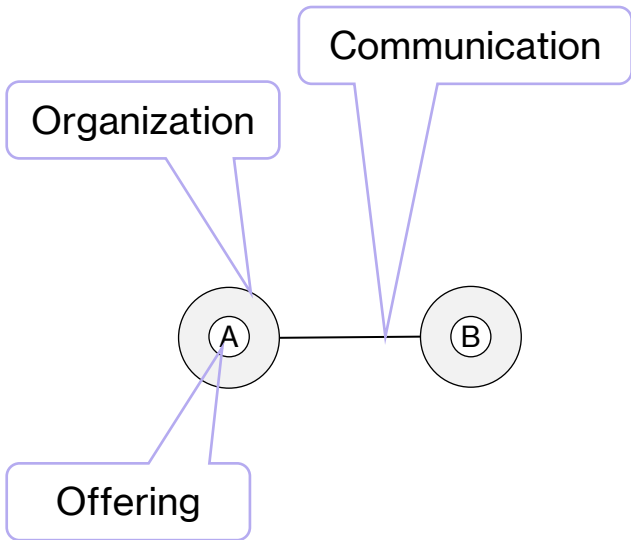




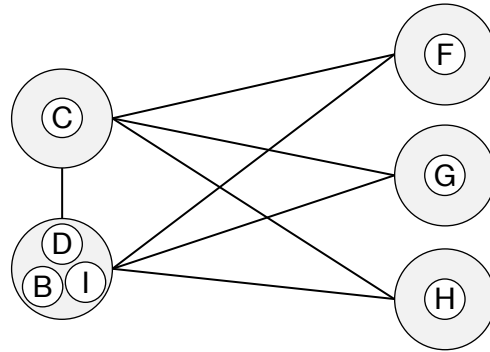
DATASPACES

ECLIPSE DATASPACE COMPONENTS

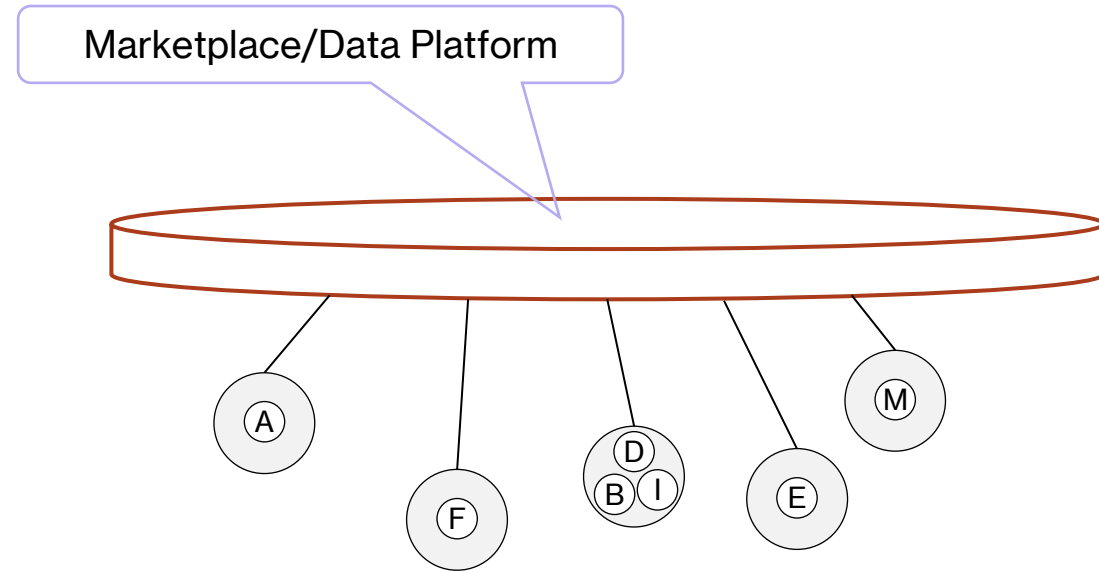
Data Sharing...1



Bilateral data exchange



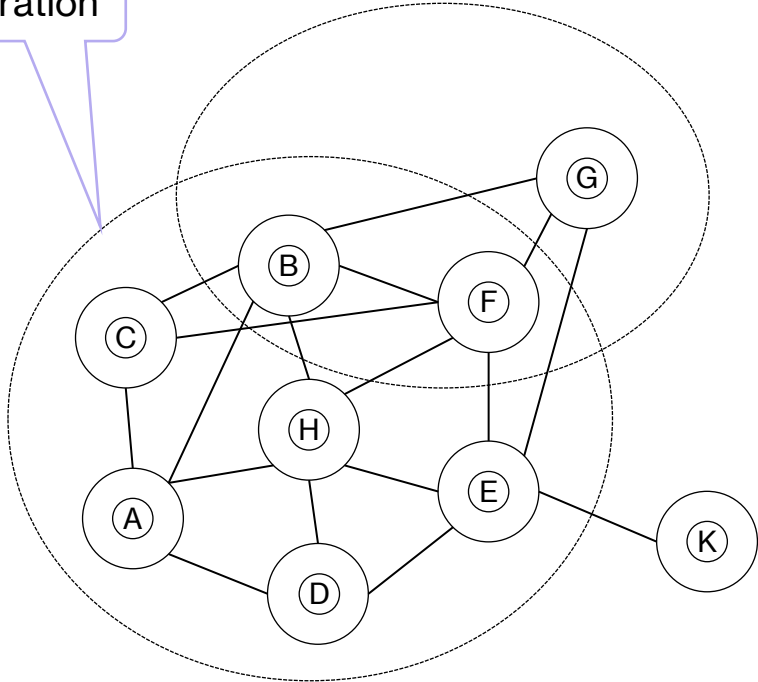
Closed group data exchange



Centralized Marketplace

Data Sharing...2

Federation



Open and dynamic data
exchange with
dataspaces

Dataspaces...

- Participants decide to trust based on many factors, including context and particular scenario
- Connections in a dataspace are always peer-to-peer
- Multiple participants can cooperate, but data is always exchanged 1:1
- Dataspaces are an example of a multi-cloud federated environment
- Participants can have multiple roles
 - E.g. data holder, data processor, data recipients
- Dataspaces can be completely decentralized

Dataspace Characteristics

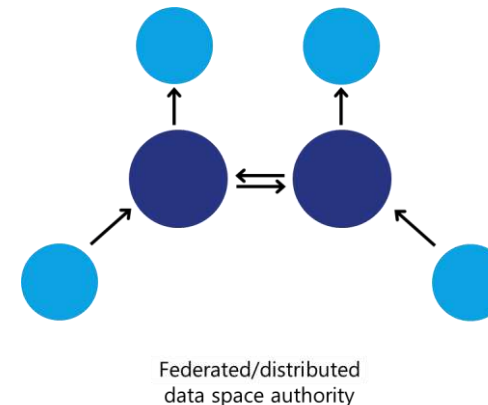
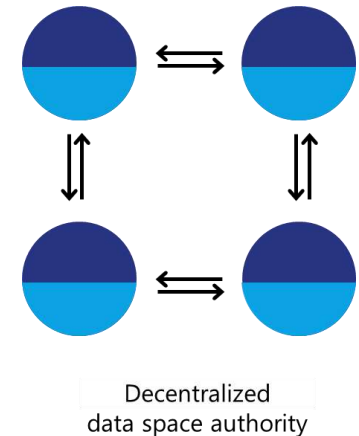
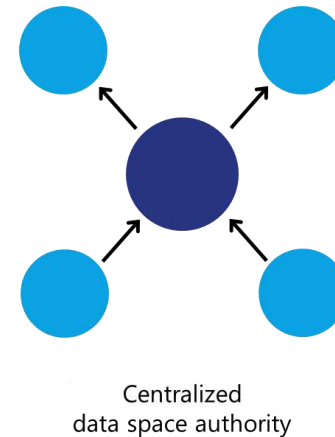
- Metadata is shared while **data remains stored at source**
- Connections in a dataspace are always **peer-to-peer**
- Data Transfer is always peer-to-peer
- Multiple participants can cooperate
- Dataspaces are an example of a multi-cloud federated environment
 - On Premises, Edge, Hyperscale Cloud, Multi-Cloud
- Participants can have multiple roles
 - Data Owner, Data Holder, Data Processor, Data Recipient, Algorithm Provider,...

Dataspaces maximize autonomy (sovereignty) of each participant

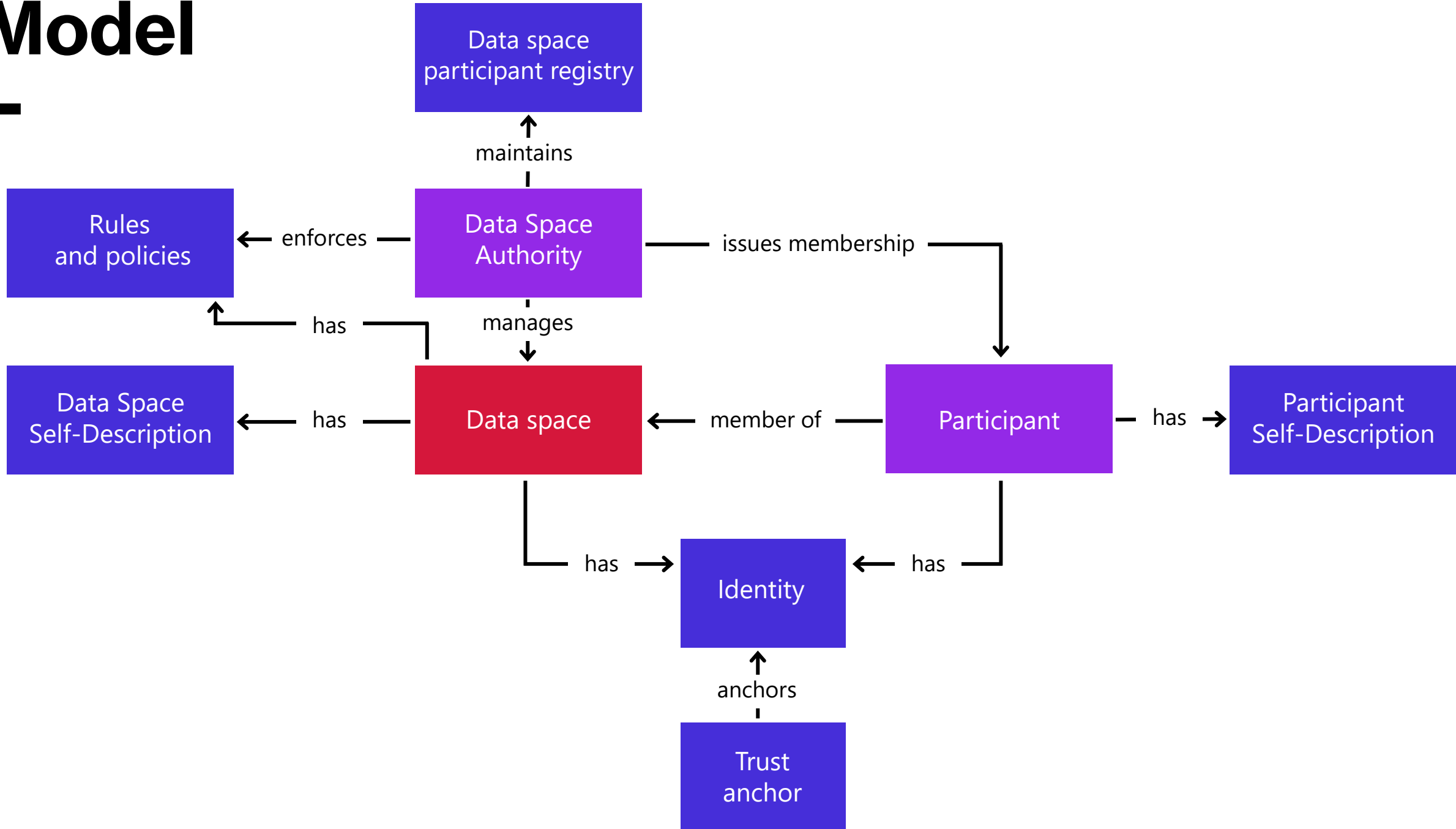
1. Participants of a dataspace must have **control** over which data they share with whom
2. Autonomy starts with controlling **identity**, if you are not in control of your identity you can't act autonomous
3. Participants need to decide who they **trust** on a case-by-case basis
4. Participation in a dataspace must be based on **rules** that apply to everyone
5. No central control system can make arbitrary **decisions** on individual participation
6. Decentralized systems are **resilient** and provide higher **availability**
7. No central system that holds the keys to the entire federation - to improve the **security**
8. **Interoperability** of heterogeneous environments with many different technologies and operating models
 - On Premises, Edge, Hyperscale Cloud, Multi-Cloud
9. Transitive trust based on common **trust anchors**

Operations of Data Spaces

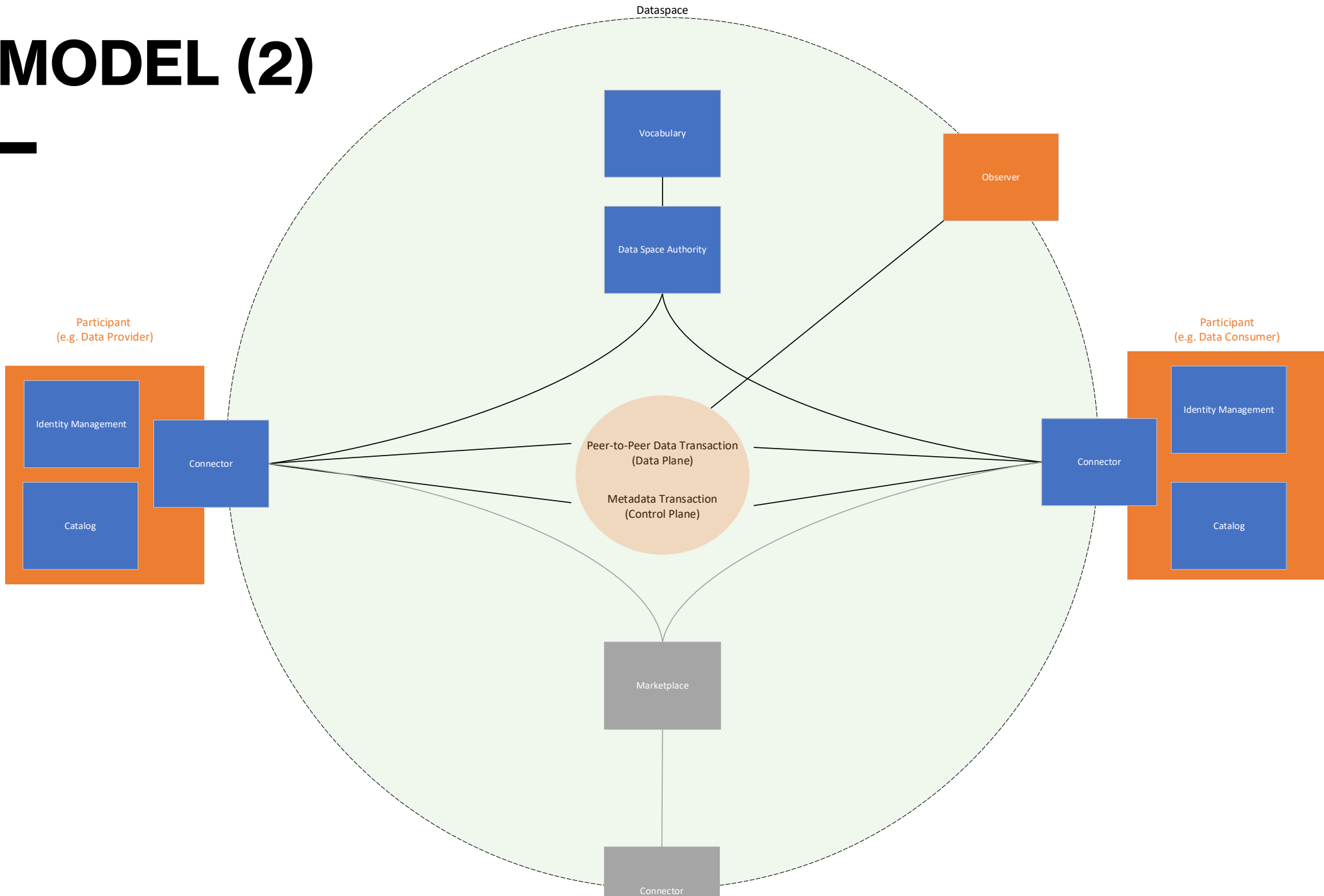
- A centralized authority manages a Data Space as an Operating Company
- In a decentralized network, the authority is created by the agreements of the members to the rules in a data space, no operator is required
- A federation of data spaces acknowledges the rules of other data spaces and manages (a subset of) common rules



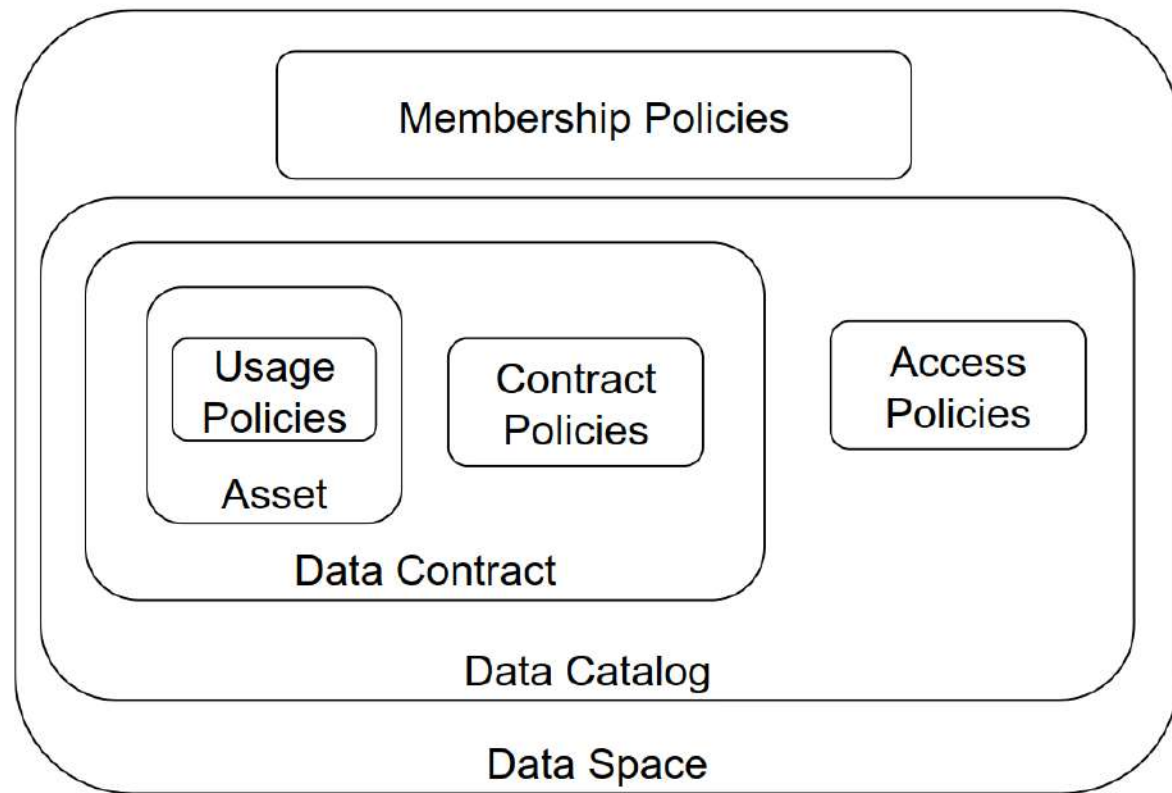
Model



MODEL (2)

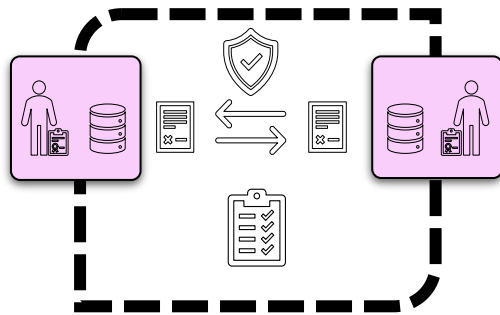


POLICIES

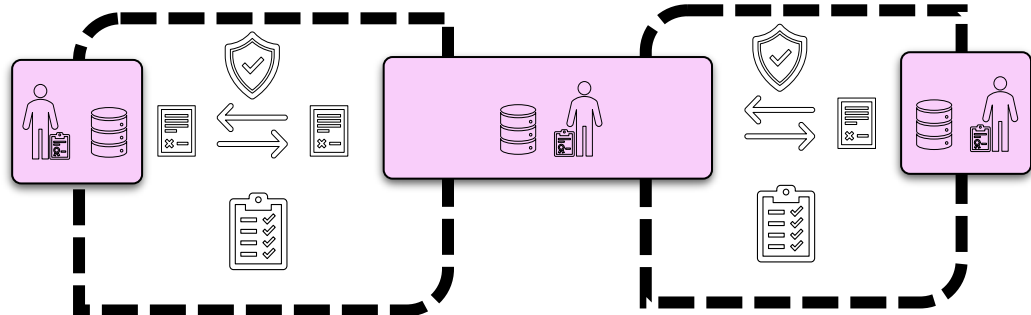


Interoperability Models

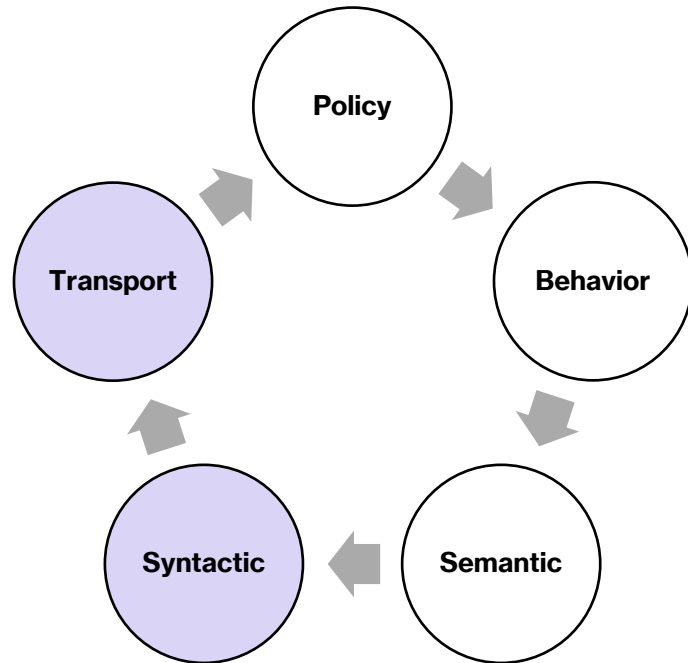
- Intra-Dataspace



- Inter-Dataspace



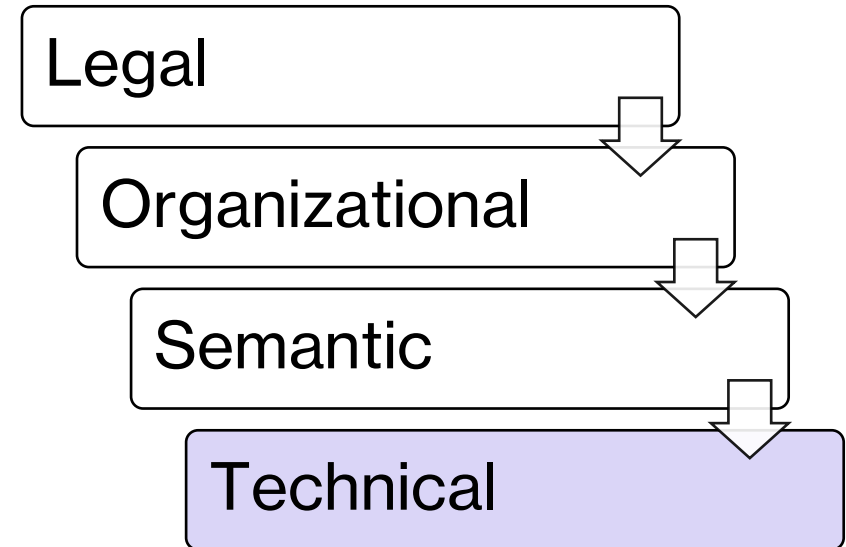
INTEROPERABILITY STANDARDS



ISO 19941 –
Cloud
Computing
Interoperability
and Portability

-referenced in EU
Data Act

- European Interoperability Framework
- -creating a digital single market
- -improving interoperability
- -boasting internet trust and security
- -encouraging investment in R&D



<https://www.iso.org/obp/ui/#iso:std:iso-iec:19941:ed-1:v1:en>

https://standards.iso.org/ittf/PubliclyAvailableStandards/c066639_ISO_IEC_19941_2017.zip

<https://joinup.ec.europa.eu/interoperable-europe>

https://ec.europa.eu/isa2/sites/default/files/eif_brochure_final.pdf

Interoperability Layers in Dataspaces

LEGAL

Are contractual statements legally equivalent?

IDSA Legal Task Force

ORGANIZATIONAL

Are business procedures compatible?

IDSA Rule Book v2

SEMANTIC

Do policies and attributes express the same meaning?

Dataspace Authority Policies

Semantic Models

TECHNICAL

Can different connectors communicate with each other?

IDSA Dataspace Protocol

Eclipse Dataspace Components as a reference framework

Many different Connectors as Products/services

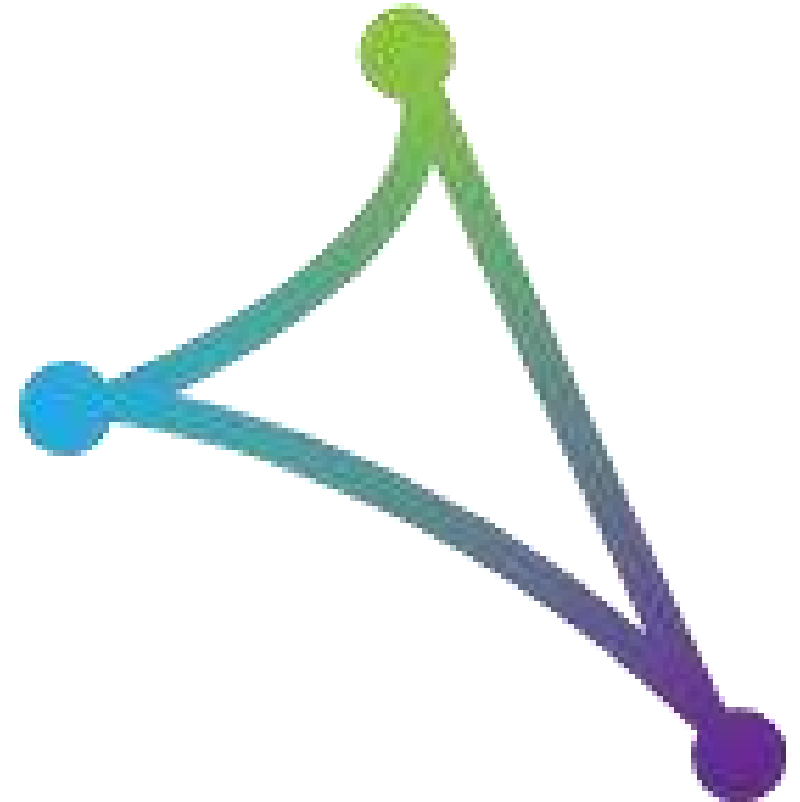
Eclipse Dataspaces Components

- A reference implementation for IDSA RAM 4.0, **GAIA-X**
- Community driven Open Source project under **Eclipse foundation** on GitHub
- Free of intellectual property rights under **Apache 2.0** license
- Used by many **Dataspaces** projects
- Modular / Extendable Based on **Java SPI**



Components

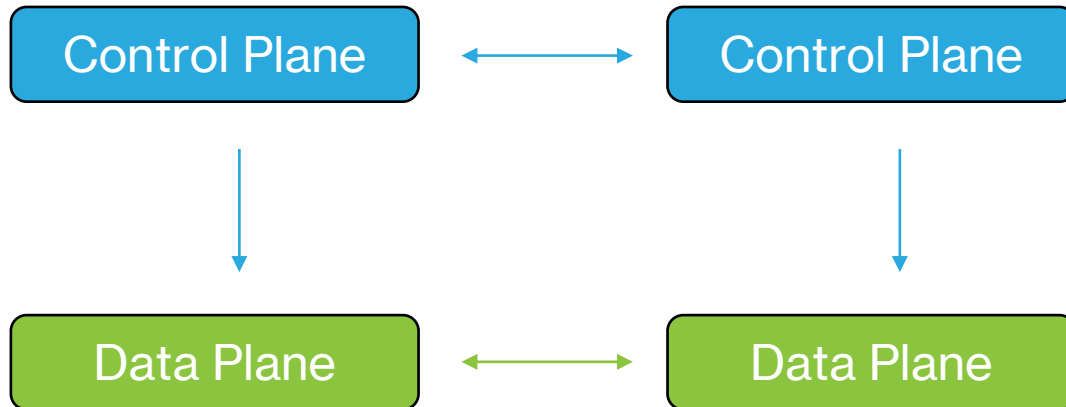
- DataSpaceConnector
 - Control Plane
 - Data Plane
- FederatedCatalog
- Identity Hub
- RegistrationService
- DataDashboard
- MinimumViableDataspace



Architecture

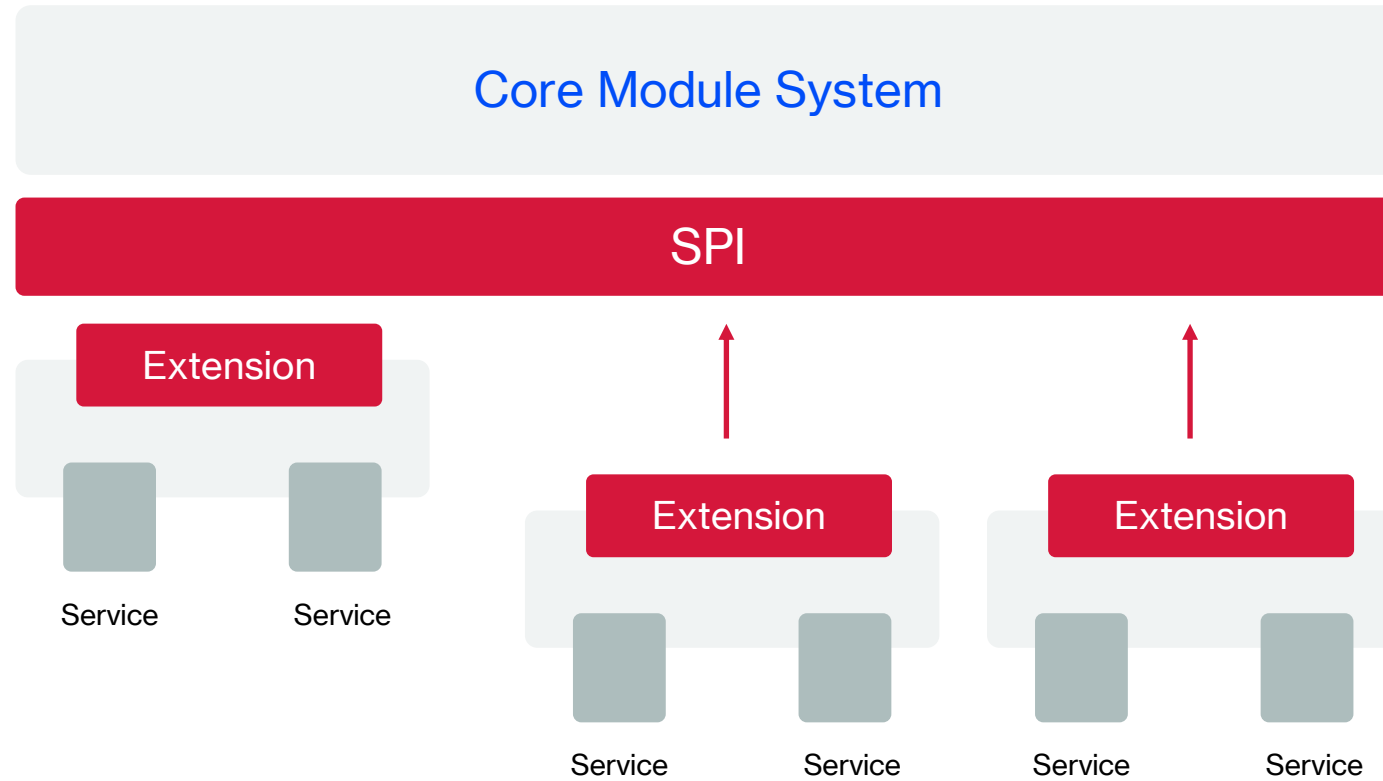
- Separation of Control and Data Plane
- Extensible through Java SPI
- Acts as an orchestrator for data transfer
- Asynchronous processing for maximum scalability
- Decentralized Identity Management with customizable Trust Anchors

Control and Data Plane



- Verification
 - Contract negotiation
 - Oversee policy enforcement
 - Manages provisioning
-
- Moves bits
 - Big Data
 - Streaming
 - Events

EDC design: The Foundation



Minimum Viable Dataspace

- The Minimum Viable Dataspace (MVD) is a sample implementation of a dataspace that leverages the Connector and other components.
- The main purpose is to demonstrate the capabilities of the EDC,
- make dataspace concepts tangible based on a specific implementation, and to serve as a starting point to implement a custom dataspace.
- The MVD allows developers and decision makers to gauge the current progress of the EDC and its capabilities to satisfy the functionality of a fully operational dataspace.
- serves the purpose of demonstrating how decentralization can be practically implemented.

MVD-Deployments

- MVD will be deployable on various infrastructures
- Blueprint for projects and companies
- Bundles for compliance with initiatives (e.g., Gaia-X)
- Scripts for Azure as well as local scenarios already available
- AWS, GCP, and others in progress (in cooperation with CSPs)

- Flows
- 0. Start Page
- 1. Manage My Dataspaces
- 2. Discover Data Shared by Others
- 3. Negotiate a Data Contract
- 4. Create a new Policy
- 5. Create a new Data Asset
- 6. Create Data Contract
- 7. Review existing Data Contract and ...

No description

Dataspaces Management Vision Demonstrator

- DATA CONTRACTS
- Data Shared by Others
- Data Offered by Me
- DATA MANAGEMENT
- Policy Store
- Asset Index
- Identity Hub
- MY DATASPACE
- Manage My Dataspaces
- Energy Dataspace
- Education and Skills Dataspace
- Finance and Insurance Dataspace
- Health Dataspace
- Industry 4.0 Dataspace
- Mobility Dataspace
- Space Dataspace

Home >

Manage My Dataspaces

Here you can see all the dataspaces, where you are participating. This list is being populated based on Verifiable Credentials of membership which are saved in your Identity Hub. If you are missing a dataspace, where you are already a member, please check your Verifiable Credentials in the Identity Hub. If you want to join a new dataspace - you are welcomed to do that here!

All Dataspaces (7) Joined (7) Pending (0) Saved (0) + Join Dataspace + Create Dataspace

Status: all Favorites: all Members: all Filter for any field

Showing 0 to 7 out of 7 records

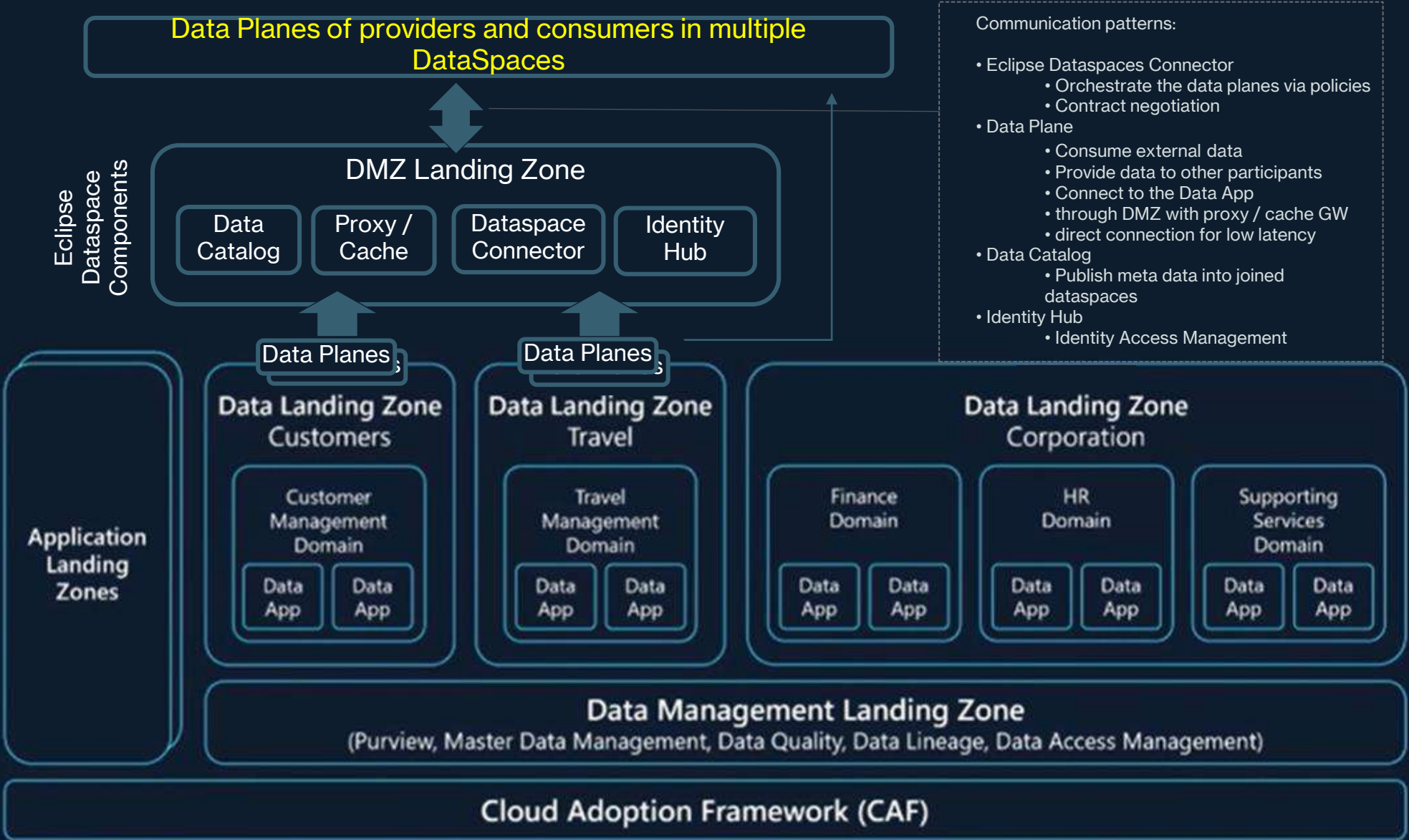
Group by: No grouping Sort by: State

<p>Participating ★</p> <p>Energy Dataspace</p> <p>This trusted dataspace is supporting energy service providers and fostering collaboration between all stakeholders. It is a cornerstone of the decarbonization of the energy sector.</p> <p>210 Data Shared by Others 0 Data Shared by Me</p>	<p>Participating ★</p> <p>Education and Skills Dataspace</p> <p>The Education and Skills Dataspace (ESDS) will create a trusted space for the benefit of the educational community.</p> <p>14 Data Shared by Others 2 Data Shared by Me</p>	<p>Participating ★</p> <p>Finance and Insurance Dataspace</p> <p>The Finance and Insurance dataspace was founded by French and German banks, European cloud service providers. Other countries are equally welcomed to join.</p> <p>17 Data Shared by Others 0 Data Shared by Me</p>	<p>Participating ★</p> <p>Health Dataspace</p> <p>The Health Data Space is working to build a consortium of public bodies and private companies to promote the use of digital technologies and cloud solutions that will...</p> <p>102 Data Shared by Others 1 Data Shared by Me</p>
<p>Participating ★</p> <p>Industry 4.0 Dataspace</p> <p>More than 250 participants have joined the Industry 4.0 dataspace, which is steadily growing.</p> <p>51 Data Shared by Others 0 Data Shared by Me</p>	<p>Participating ★</p> <p>Mobility Dataspace</p> <p>The Mobility Dataspace will reduce congestion, CO2 emissions and pursue positive climate action goals, while creating new business opportunities for its members.</p> <p>85 Data Shared by Others 0 Data Shared by Me</p>	<p>Participating ★</p> <p>Space Dataspace</p> <p>A dataspace focusing on Space Data. Many lives depend on space data, it is crucial that this data can be handled securely and efficiently, ensuring European data sovereignty.</p> <p>3 Data Shared by Others 5 Data Shared by Me</p>	

Vision Demonstrator

- FIGMA
- <https://www.figma.com/proto/1CE1zFY0qIRhk0etiHYN0O/Dataspaces?page-id=15%3A167&node-id=15-2330&viewport=906%2C653%2C0.05&scaling=min-zoom&starting-point-node-id=15%3A2330>

Implement data landing zones with Data Mesh and Data Spaces





Peter Koen

- Principal Cloud Standards Architect, Microsoft
- Co-Chair Architecture Working Group, IDSA
- Co-Chair Rule Book Working Group, IDSA
- Committer, Eclipse Dataspace Components
- <https://www.linkedin.com/in/pkoen/>