International Cross-Industry Data Sharing for Realizing Carbon Neutral, Resource Recycling and SDGs

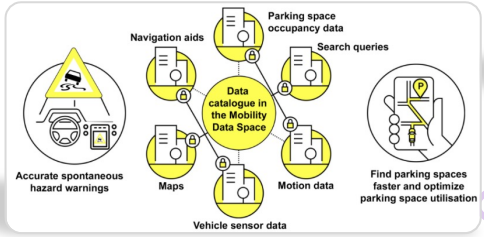
Koki Mitani

Data Spaces Need to Be Interconnected Globally

Data spaces enable trusted data sharing across global value chains while protecting data sovereignty.
To support a globally connected value chain, they must be interconnected based on rules and standards.

Mobility Data Space
Data Sharing Community

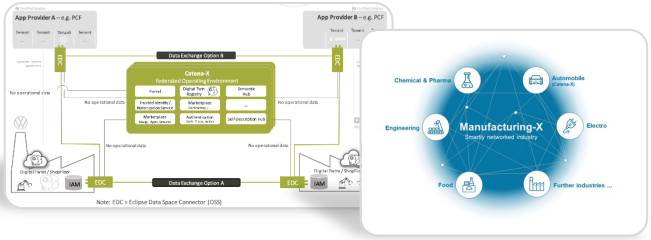
Mobility Data Space
(Mobility)



Catena-X
Automotive Network

MANUFACTURING-X

Catena-X / Manufacturing-X
(Automobile Supply Chain / Manufacturing)

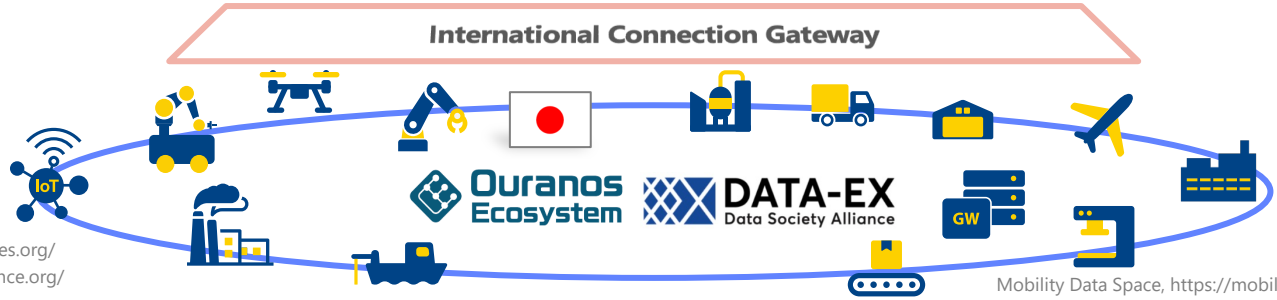


SCSN

Smart Connected Supplier Network
(Supply Chain of Precision Manufacturing Equipment)

gaia-x

INTERNATIONAL DATA SPACES ASSOCIATION



Gaia-X, https://www.gaia-x.eu/
IDSA, https://internationaldataspaces.org/
DATA-EX, https://data-society-alliance.org/

Catena-X, https://catena-x.net/
Manufacturing-X, https://www.plattform-i40.de/IP/Navigation/EN/Manufacturing-X/Manufacturing-X.html

Mobility Data Space, https://mobility-dataspace.eu/
Smart Connected Supplier Network, http://smart-connected.nl/

Ouranos Ecosystem, https://www.meti.go.jp/english/press/2023/0429_001.html

Challenges in Data Sharing Between Businesses

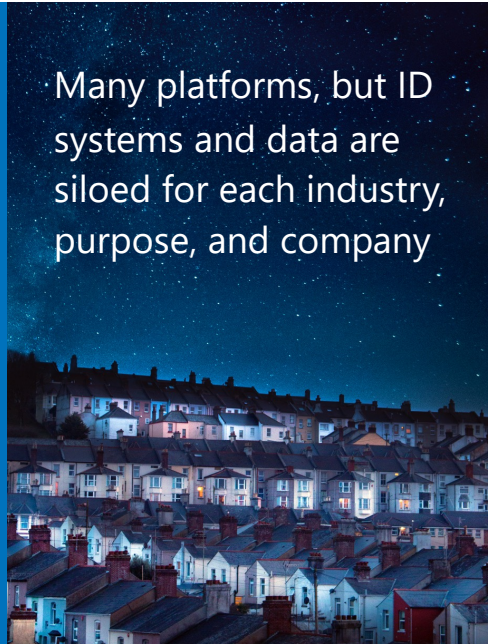
To share essential business data with partners,
companies must overcome the following challenges.

Company’s data cannot be shared with other companies because of risk that important data and business secrets could be exposed

Impossible to check who will use the company’s data and how they will use it when sharing data with other companies

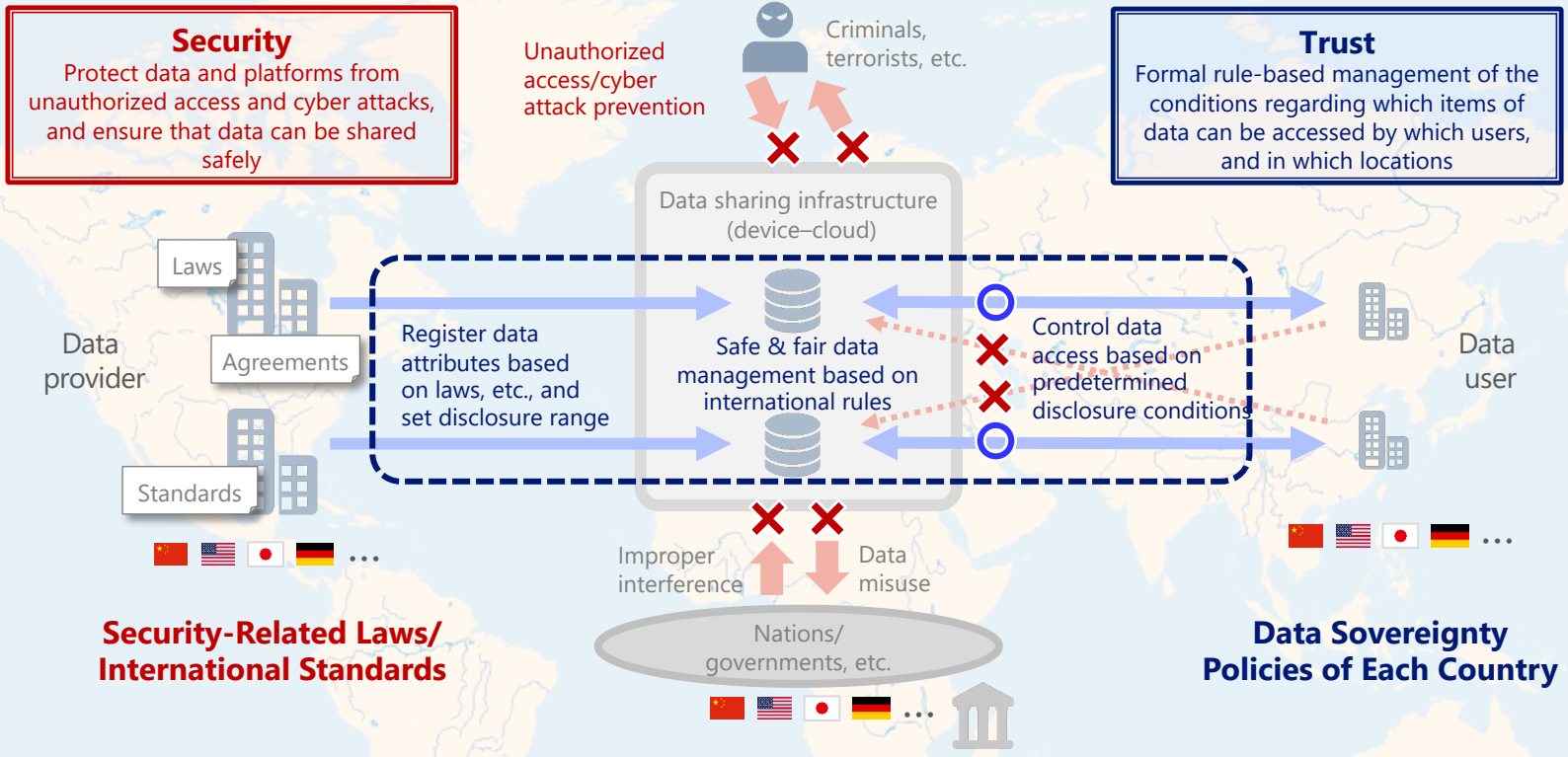
Impossible to check if data provided by other companies is accurate and generated by legitimate means or whether it benefits one’s own company

Many platforms, but ID systems and data are siloed for each industry, purpose, and company



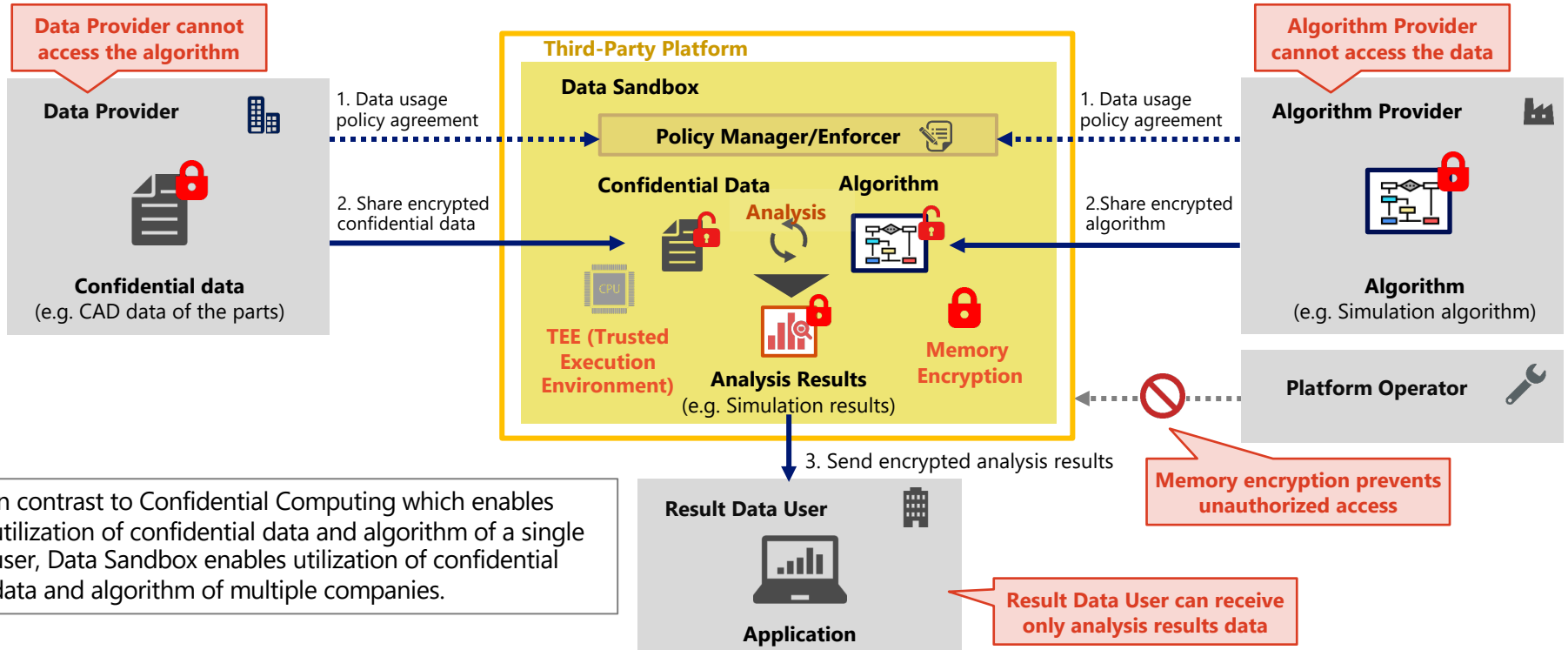
Mechanisms to Ensure Security and Trust

For data sharing between businesses, it is essential to have security features that protect against cyberattacks, as well as mechanisms that protects the data sovereignty of providers in compliance with relevant laws and regulations.



Data Sandbox Technology for Data Usage Control

NTT is developing a technology to enforce data usage conditions and protect data sovereignty.
Data Sandbox enables value creation by allowing multiple companies to use each other's confidential data and algorithms without actually sharing them.



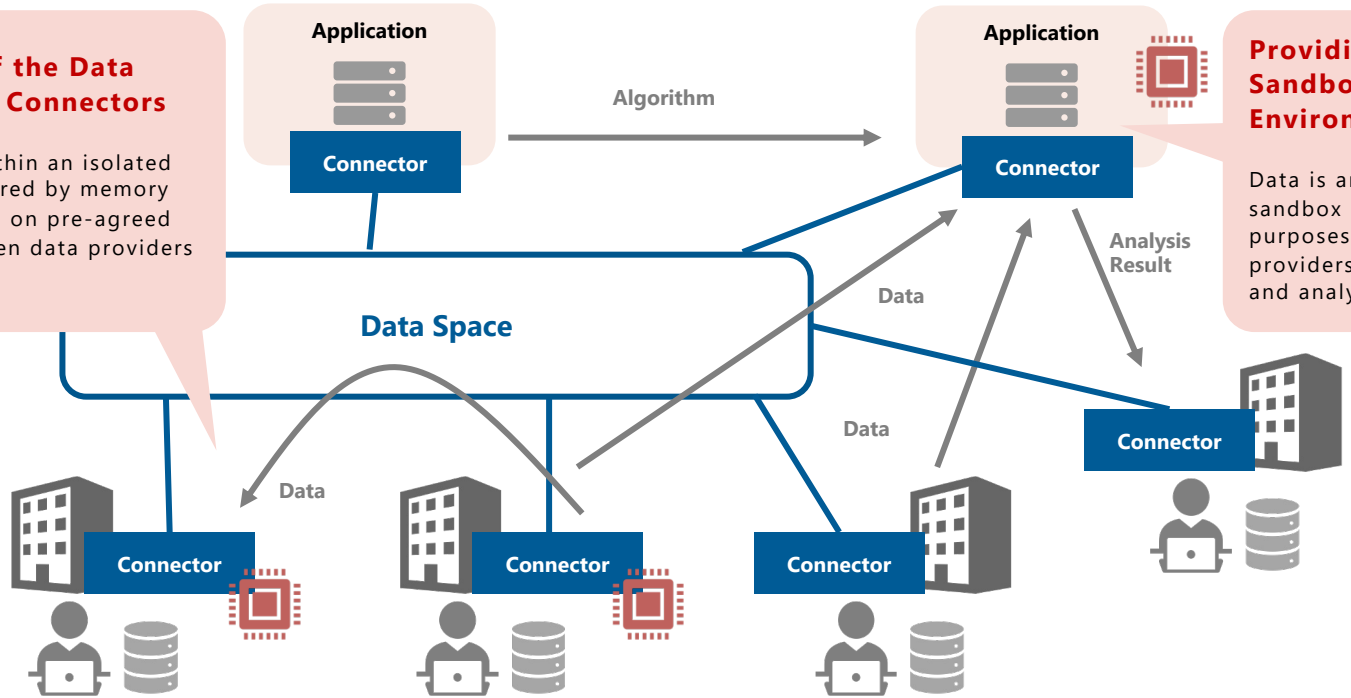
In contrast to Confidential Computing which enables utilization of confidential data and algorithm of a single user, Data Sandbox enables utilization of confidential data and algorithm of multiple companies.

Data Sandbox Technology in Data Spaces

Data Sandbox can be integrated with connectors and serve as a platform for analysis applications within data spaces.

Integration of the Data Sandbox with Connectors

Data is shared within an isolated environment secured by memory encryption, based on pre-agreed conditions between data providers and data users.



Providing the Data Sandbox as an Analysis Environment

Data is analyzed within the sandbox based on pre-agreed purposes among multiple data providers, algorithm providers, and analysis result users.

IOWN Privacy Enhancing Technologies (IOWN PETs)

NTT Group is developing IOWN to build next-generation communications infrastructure.
This includes a new approach that combines the All-Photonics Network with Privacy-Enhancing Technologies.

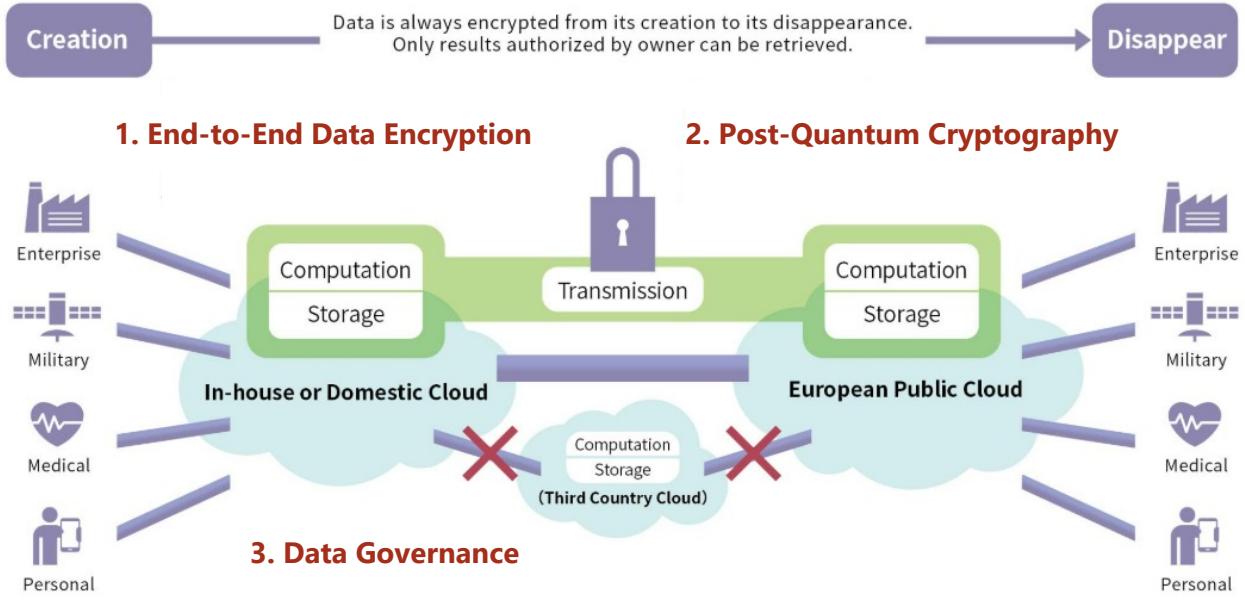
Innovative Optical and Wireless Network (IOWN)
Target Performance by FY 2030+

Low-Power Consumption
Power efficiency[1]
100-times

High-Capacity/ High-Quality
Transmission capacity*[2]
125-times

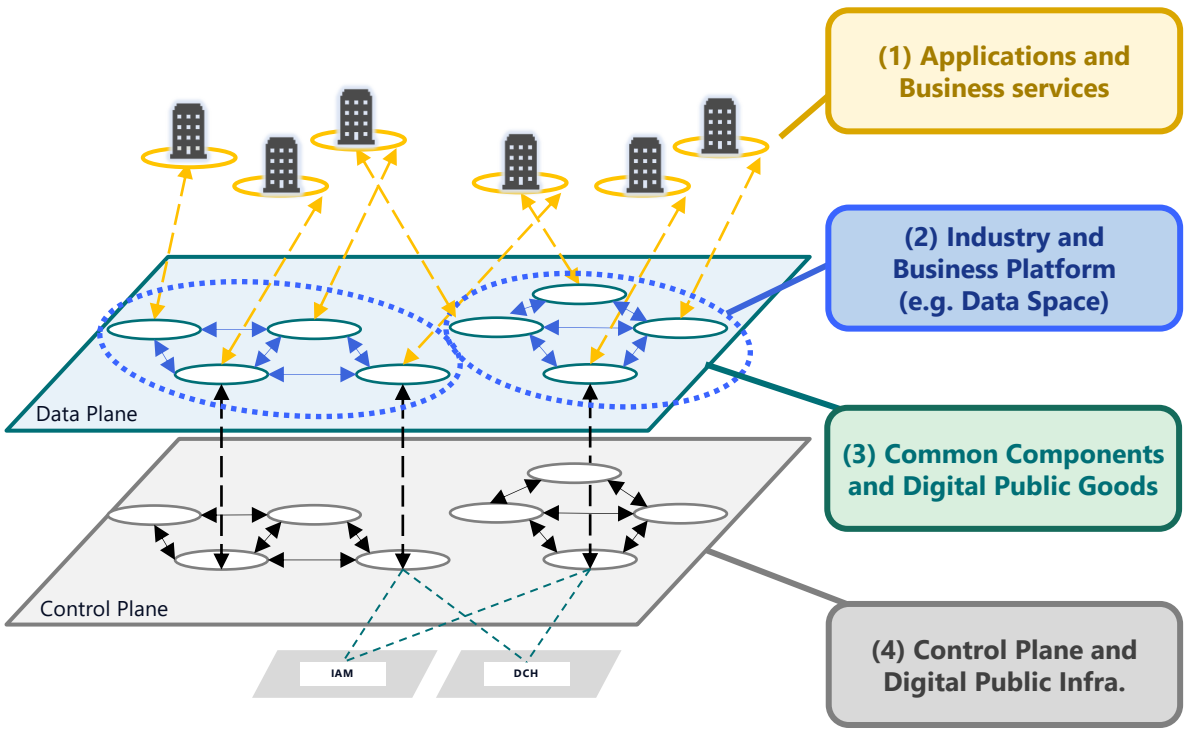
Low Latency
End-to-end latency*[3]
1/200

1 Target power efficiency of the parts to which photonics technology is applied.
2 Target communication capacity per optical fiber cable
3 Target latency for video traffic within the same prefecture, requiring no compression processing.

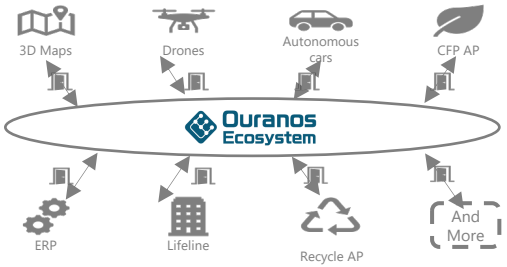


NTT Group's Initiatives for Cross-Domain Data Sharing

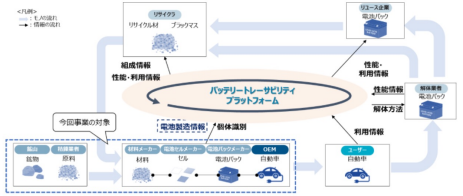
NTT Group is focusing on four key areas to ensure trusted and interoperable data sharing across companies.



JMDS (Japan Mobility Data Space)



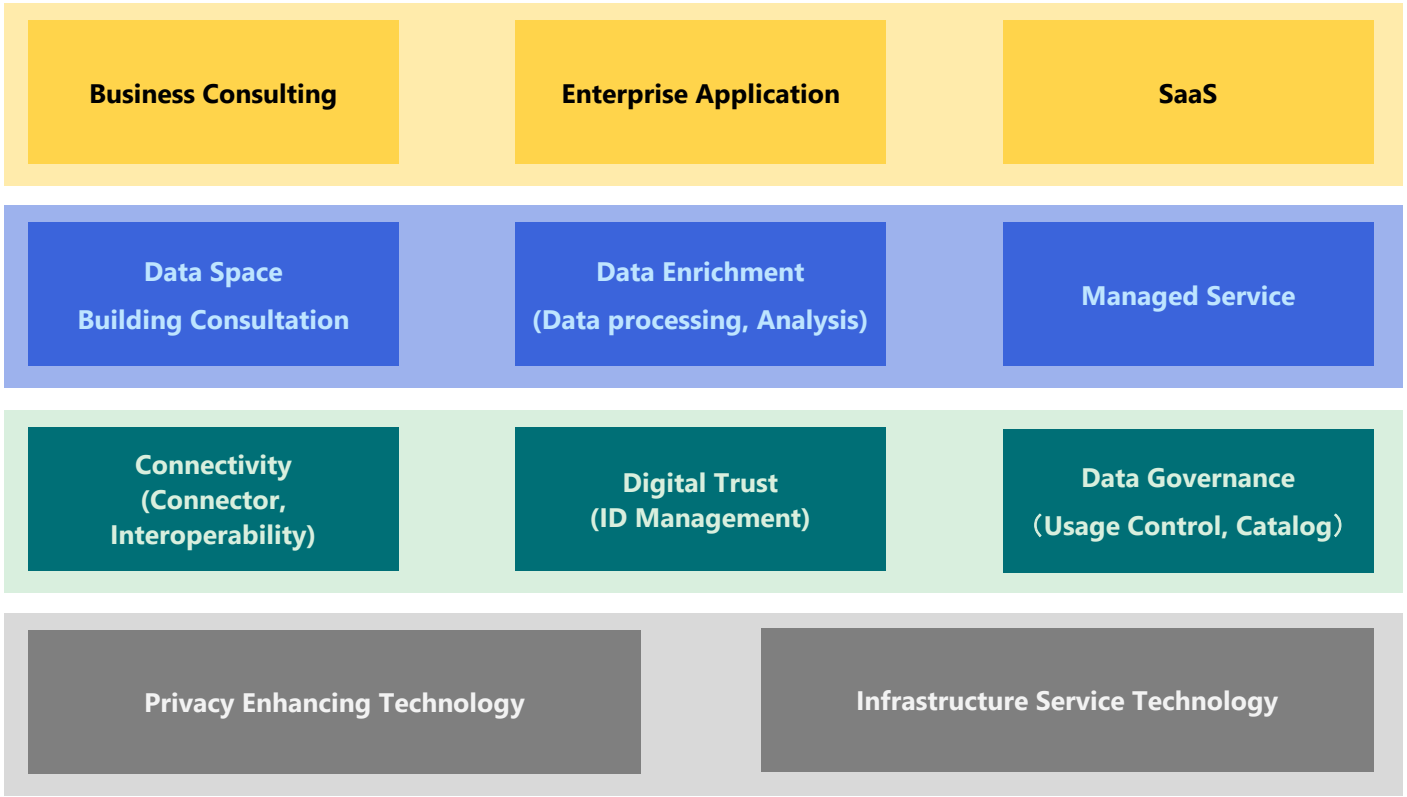
Battery Traceability Management System



* This concept is provided by NTT DATA.

NTT Group's Global Data Space Solutions

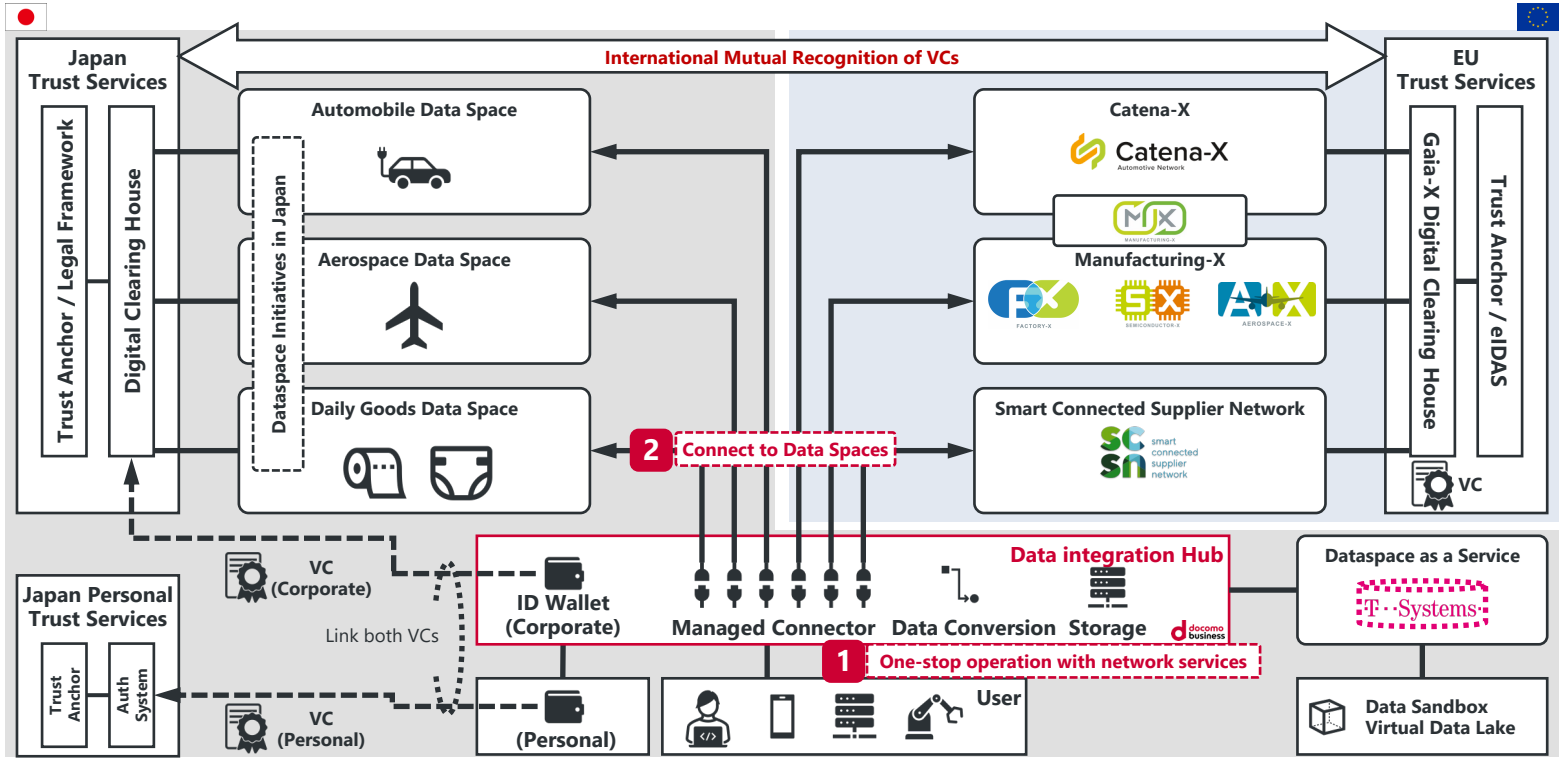
NTT Group offers comprehensive global data space solutions in four strategic areas.



* This concept is provided by NTT DATA.

Solution Concept: Data Integration Hub

NTT Communications is planning to provide a solution that enables companies to securely share sensitive data and protect data sovereignty through globally interconnected data spaces.



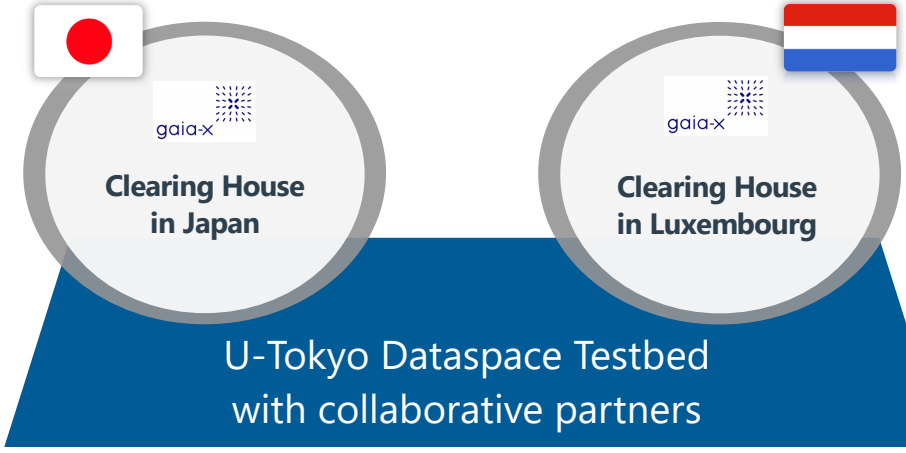
* This service will be provided by NTT Communications.

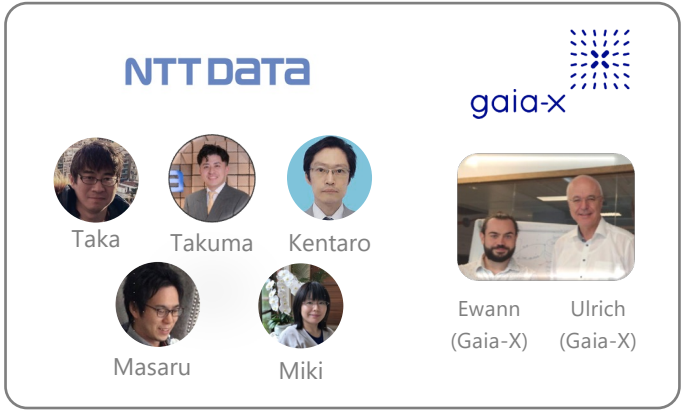
Experiments on Global Deployment of Trust Frameworks

NTT DATA is integrating connectors with trust mechanisms like the Gaia-X Digital Clearing House, which is implemented on the University of Tokyo testbed with Gaia-X.

October 8, 2024

NTT DATA and Gaia-X Expand Global Reach with Deployment of Gaia-X Digital Clearing House in Japan





* This experiment is performed by NTT DATA

Pilot Projects on Cross-Jurisdictional Data Transaction

NTT Com, Fujitsu, and T-Systems have tested a “Cross-Jurisdictional Data Transaction Scenario with Federated Identities and Trust Anchors”, supported by the University of Tokyo and NTT DATA.

IOFDS
INTERNATIONAL OPEN FORUM ON DATA SOCIETY

Establishing global trust framework initiative for data spaces

Our vision

- Establish technical federation of trusts across countries (e.g. trust anchors and trust services)
- Foster interoperability among dataspace initiatives worldwide
- Ensure secure and efficient data collaboration
- Prepare to establish a governance body

Technical pilot overview

Phase 1 Prototype the trust anchor on a testbed in Japan for broad participation.

Phase 2 Integrate Tractus-X sandbox to test interconnectivity with the prototype of the trust anchor and identify technical gaps

Phase 3 Deploy cross-regional use cases with partners to assess interoperability

Phase 4 Develop tools for technical mutual recognition and international interoperability of trust services and anchors

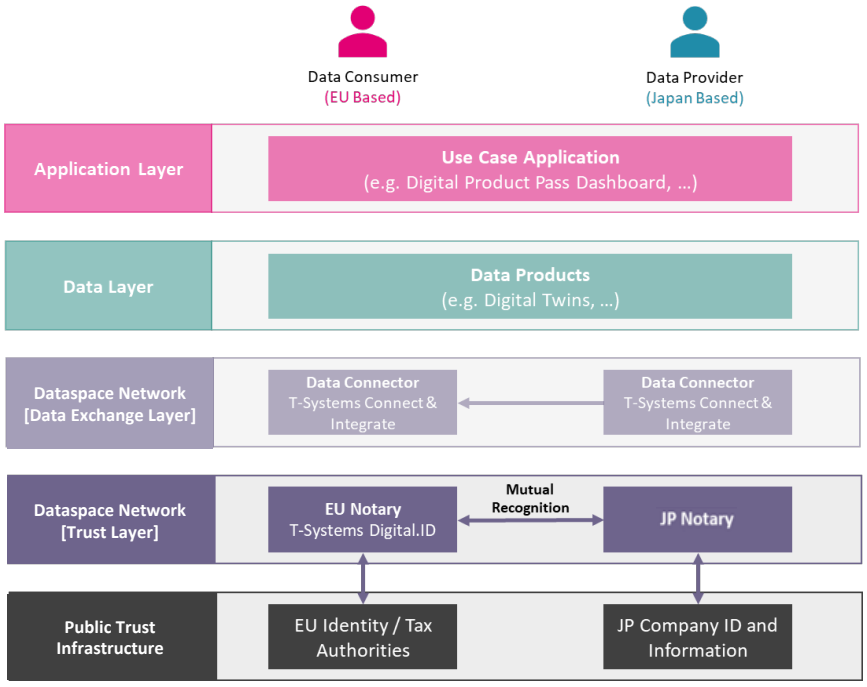
Technical infrastructure

Use existing components and knowledge, examples are:

Gaia-X solutions
Leverage Digital.ID and Gaia-X Digital Clearing House by T-Systems and NTT

Federation expertise
Use Fujitsu & NTT's trust service and trust anchor federation knowledge and technology

Catena-X / Tractus-X Sandbox
Use T-Systems' IDSA & Gaia-X compliant testbed at University of Tokyo



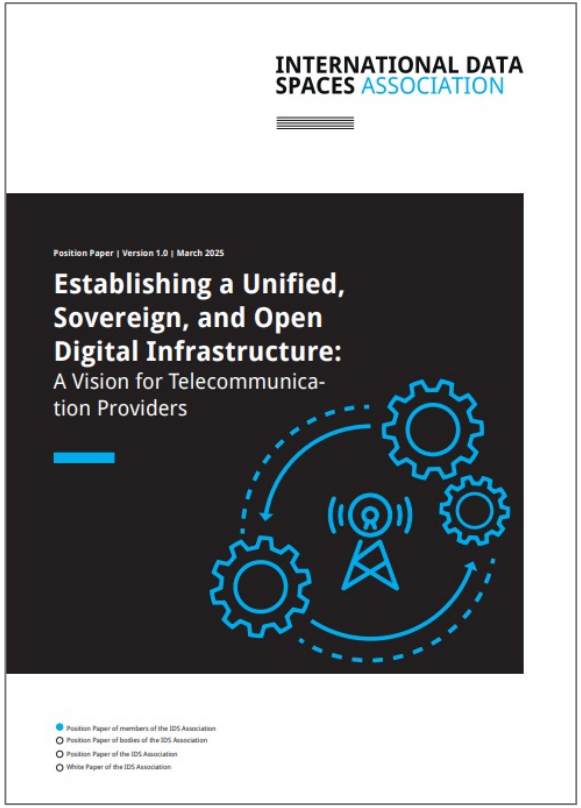
INTERNATIONAL DATA SPACES ASSOCIATION gaia-x UTokyo NTT Communications NTT DATA FUJITSU T-Systems

* This experiment is performed by NTT, NTT Communications, and NTT DATA

Published in March 2025

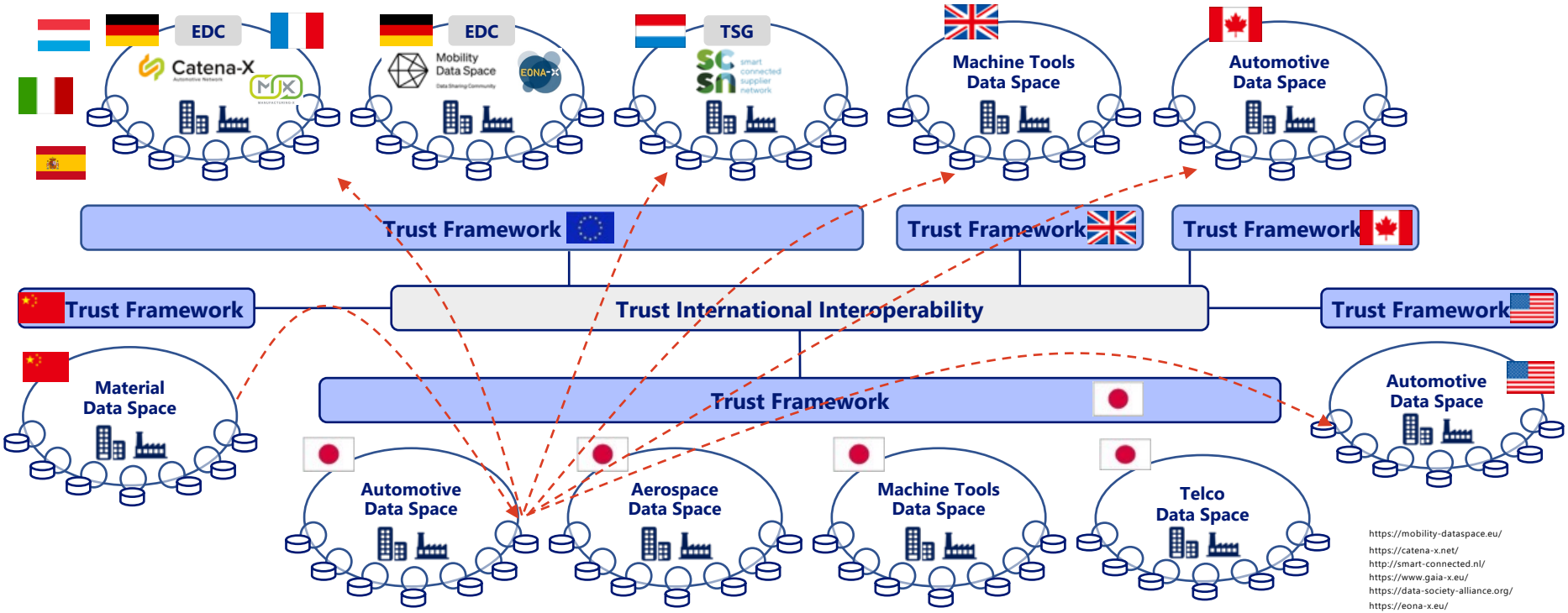
Joint Position Paper: A Vision for Telecom Providers

NTT Com and NTT DATA are collaborating with other global telecom providers to establish a unified, sovereign, and open digital infrastructure.



Towards the International Interconnection of Data Spaces

Let’s work together on a joint study to build an ecosystem for trusted data sharing across global value chains.



https://mobility-dataspace.eu/
https://catena-x.net/
http://smart-connected.nl/
https://www.gaia-x.eu/
https://data-society-alliance.org/
https://eona-x.eu/
https://www.plattform-i40.de/IP/Navigation/EN/Manufacturing-X/Manufacturing-X.html

Your Value Partner