

X-Road 8 Spaceship Development Activities

12:10 – 12:40



- Petteri Kivimaki – NIIS



In partnership with



Nordic Institute for Interoperability Solutions (NIIS)



Ensures the development and strategic management of digital government solutions that allow its members to provide excellent digital public services.



Estonia



Finland



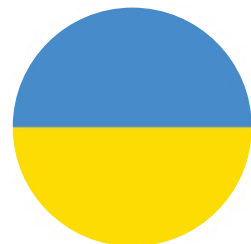
Iceland



Schleswig-Holstein



Québec



Ukraine



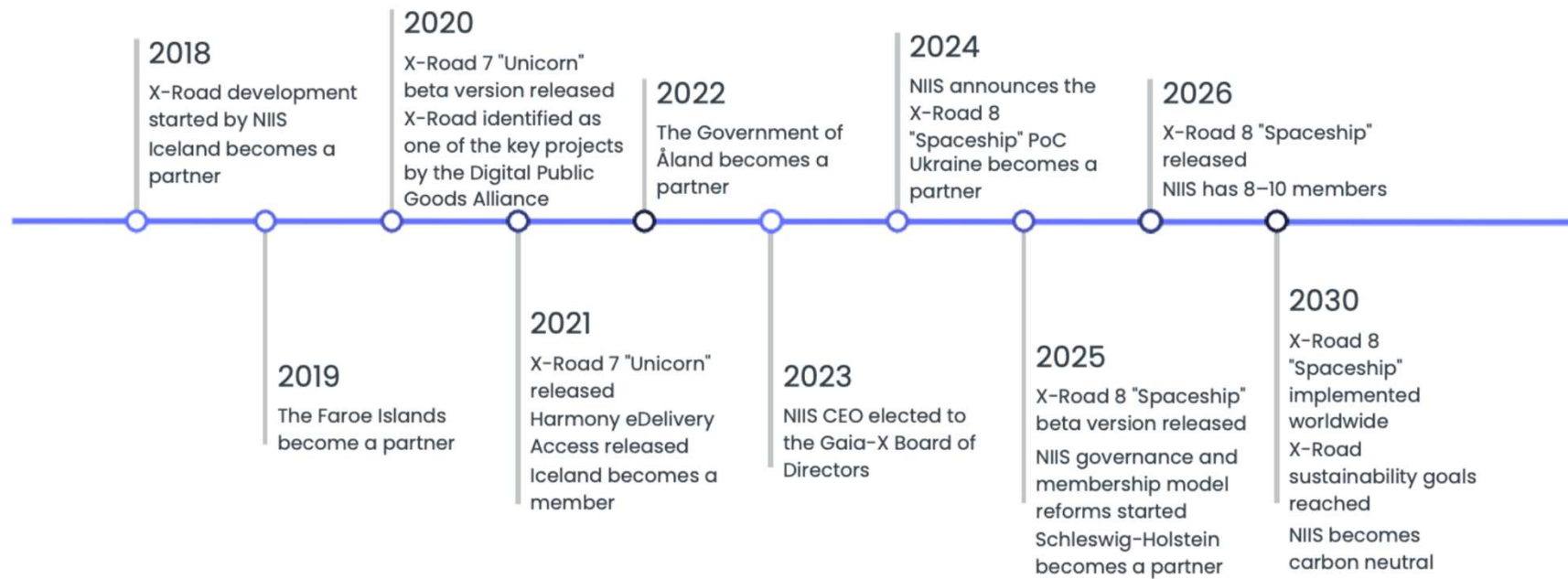
The Faroe Islands



Åland

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NIS Journey

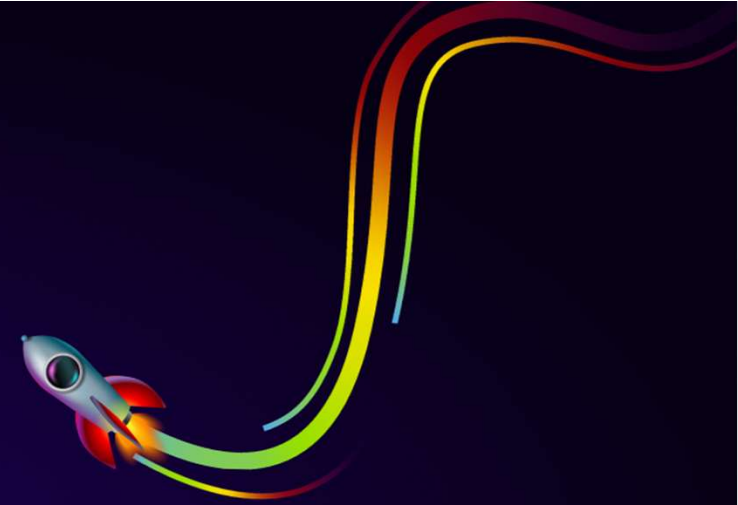


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NIIS Dataspace Journey



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Introduction to X-Road®



X-Road®

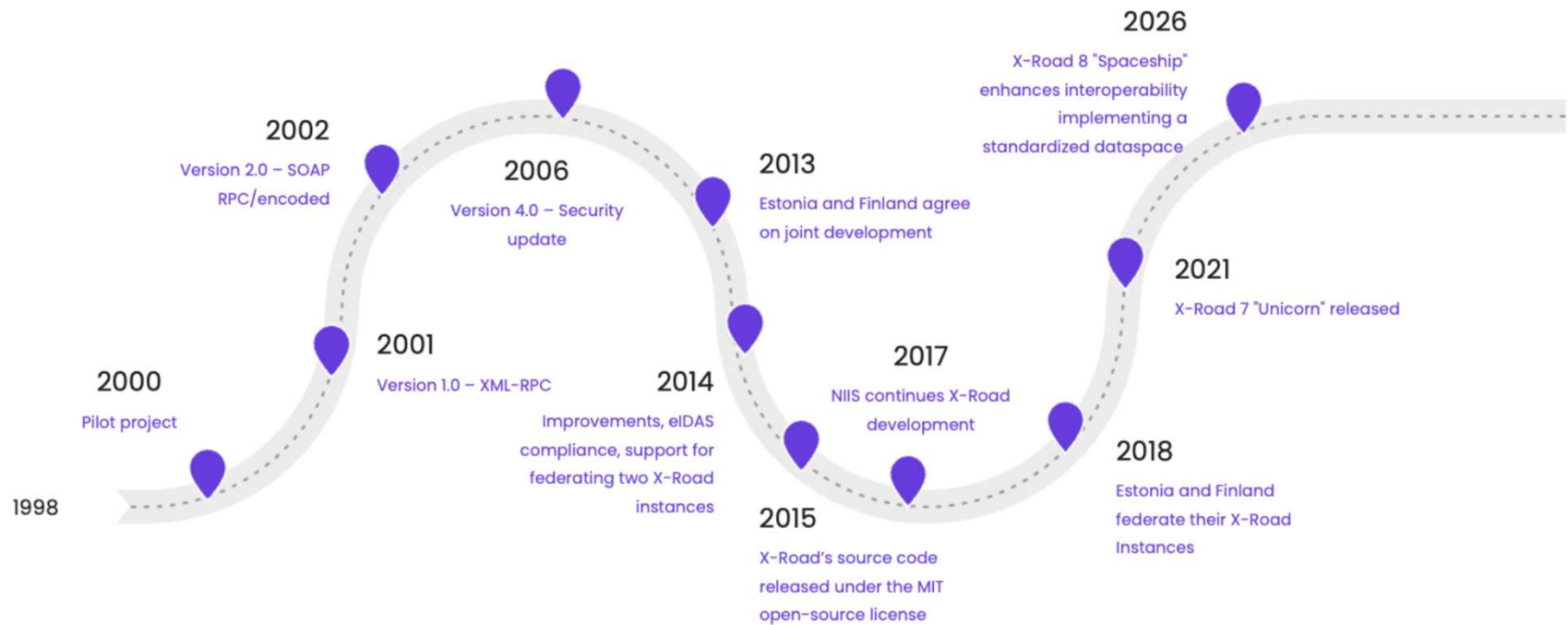


- A free and open-source data exchange solution
 - Open source software (MIT licence)
 - x-road.global
- Digital Public Infrastructure (DPI)
 - One of the most deployed DPIs worldwide
 - undp.org/digital/digital-public-infrastructure
- Digital Public Good
 - Recognised by the Digital Public Goods Alliance
 - digitalpublicgoods.net



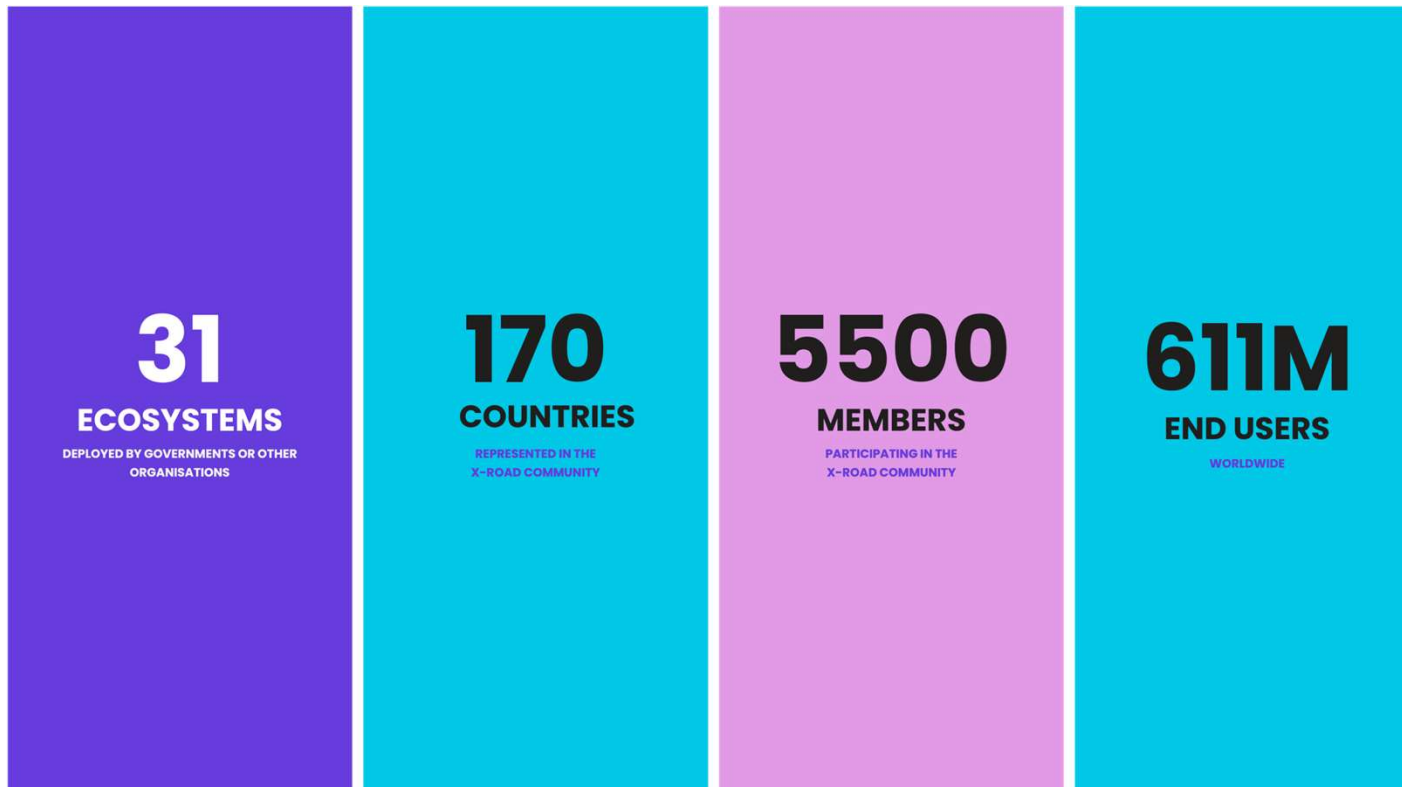
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X-Road Journey



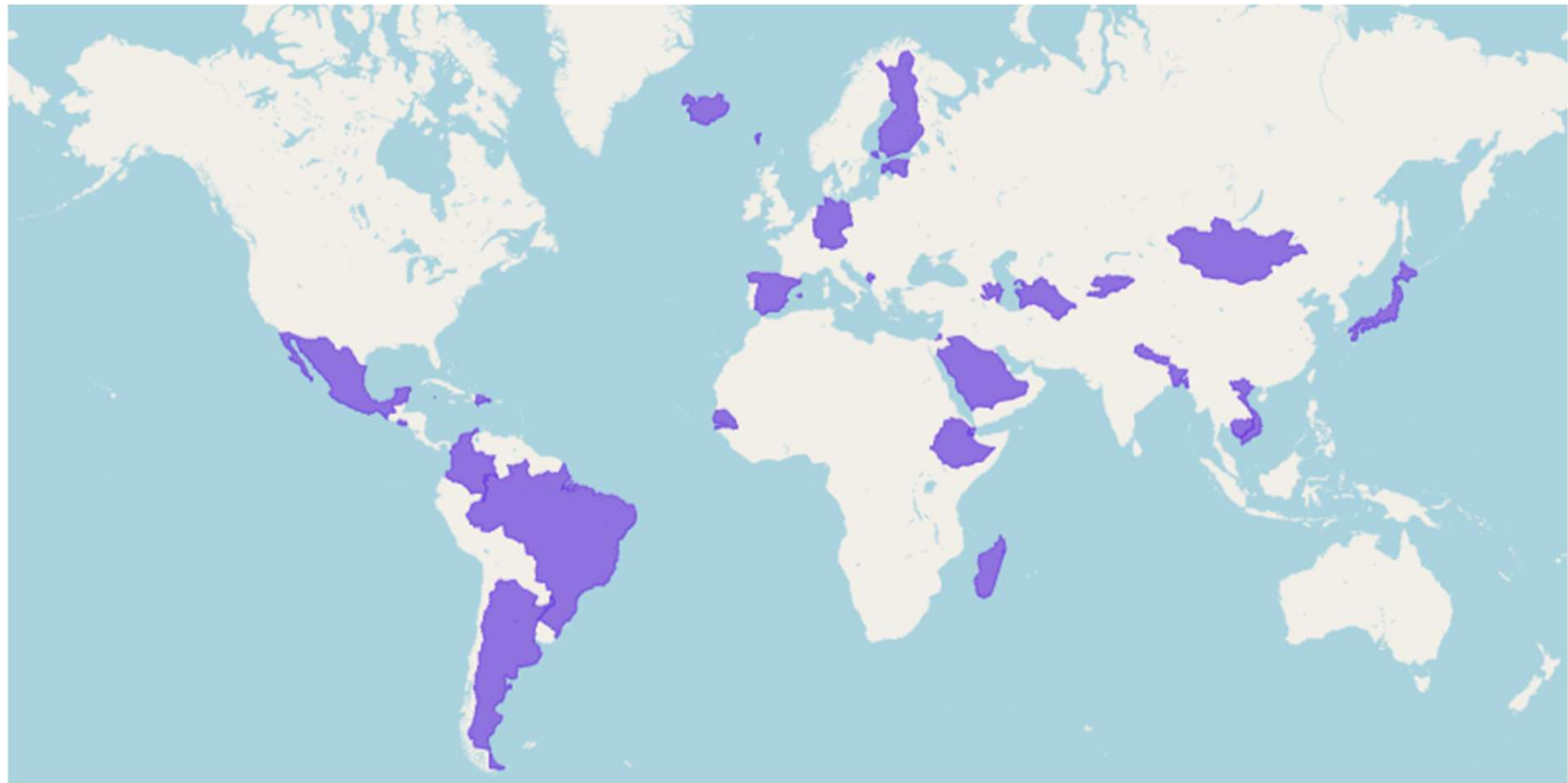
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X-Road in Numbers



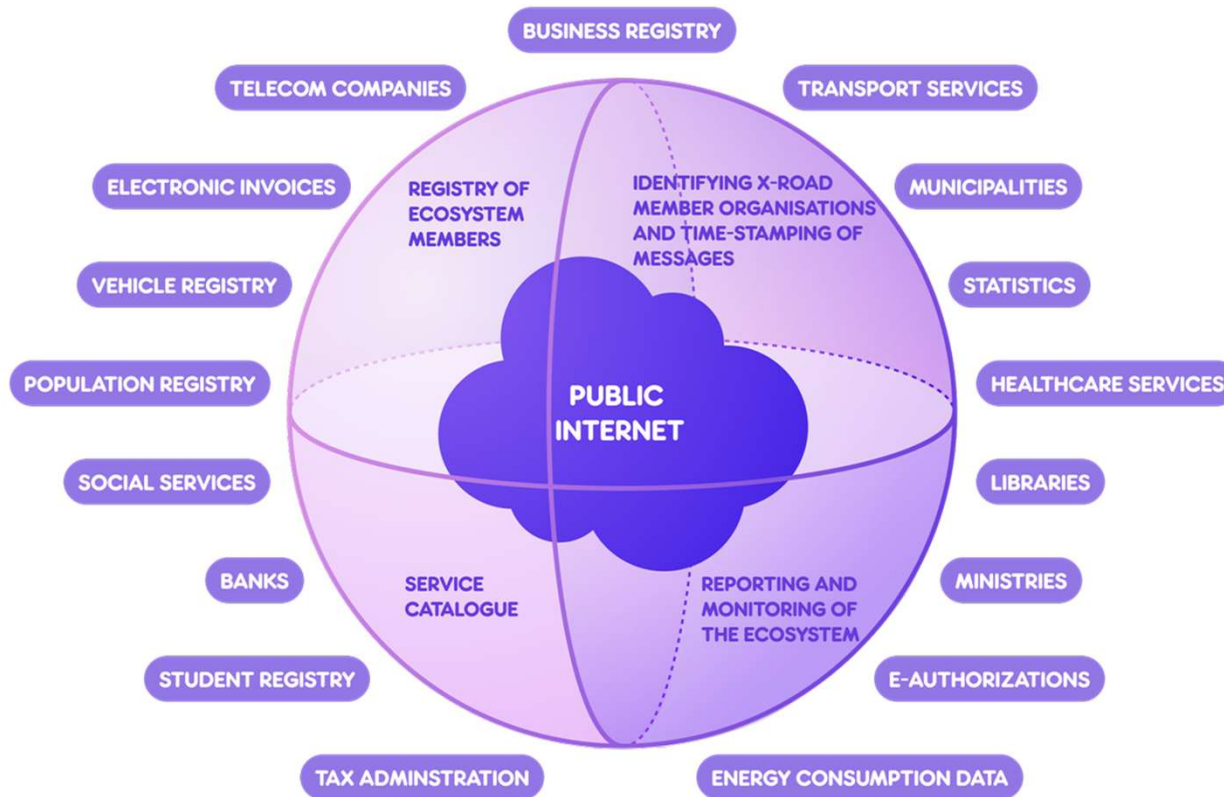
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X-Road Ecosystems on a Map



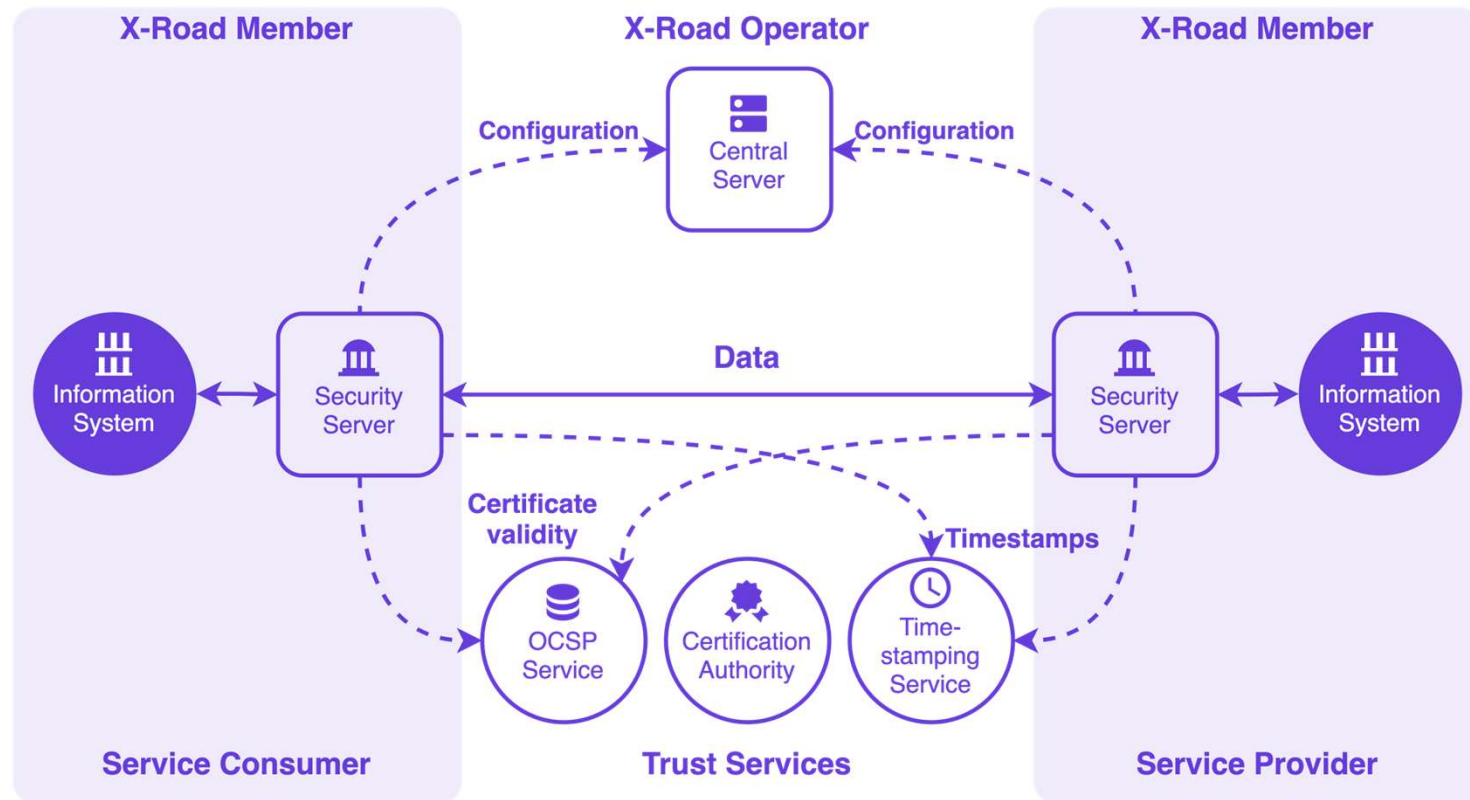
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X-Road Ecosystem



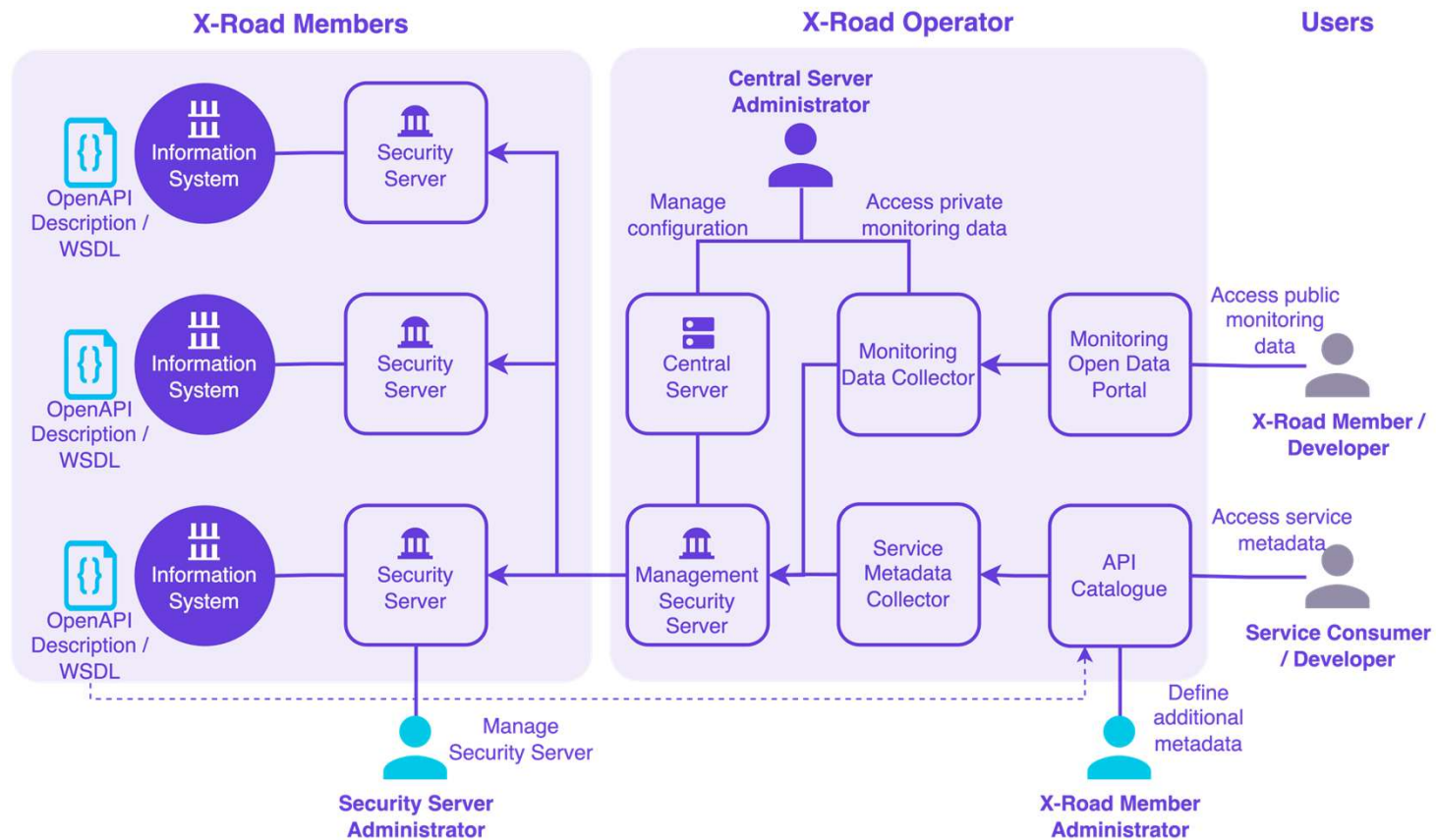
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Data Exchange in X-Road



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Monitoring and Data Discovery

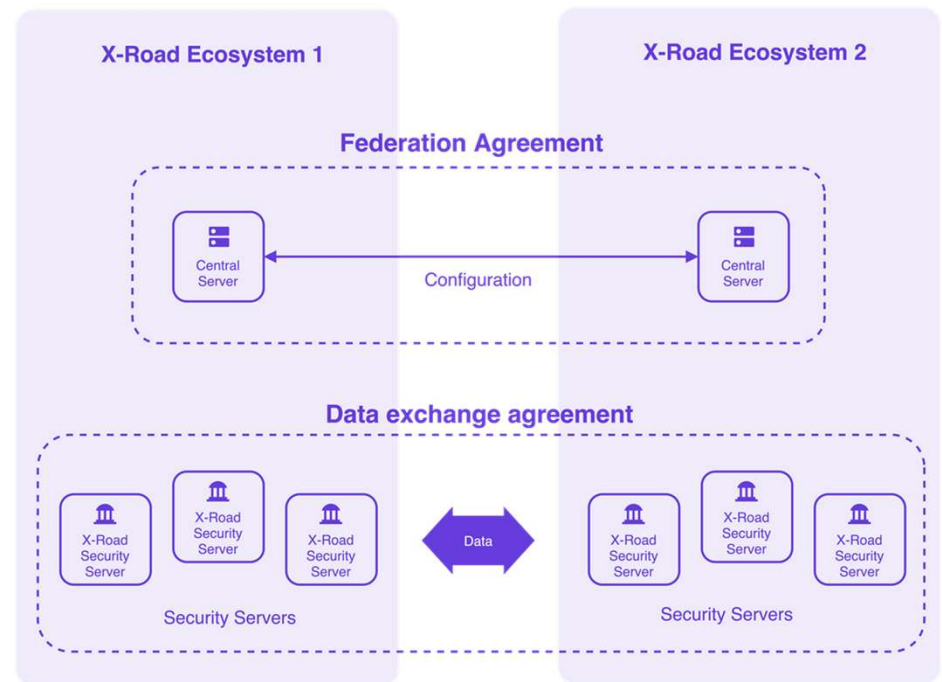


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X-Road Federation

Available since 2014 (X-Road 6.0-)

- Federation is a **one-to-one relationship between two ecosystems**.
- Members of the federated ecosystems can publish and consume services with each other as if they were members of the same ecosystem.
- Federation is not only about technology – agreements are also needed between X-Road operators and user organisations.

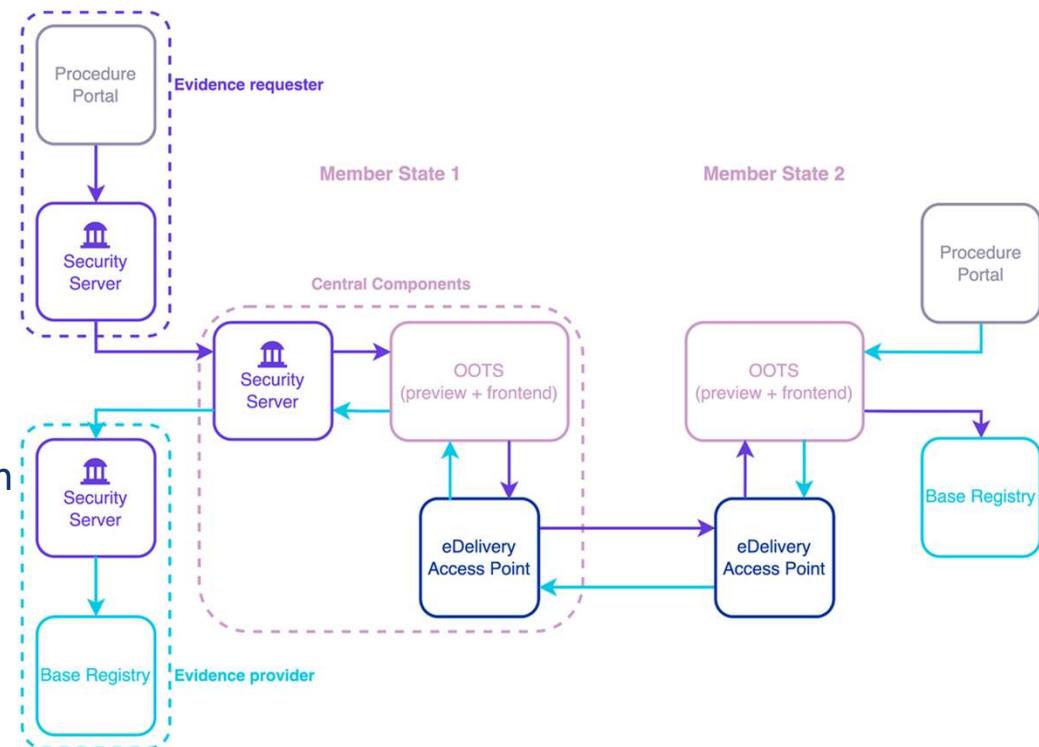


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Enabling the Once Only Principal

National OOTS solution compatible with the European Union OOTS


- A national X-Road ecosystem can be connected to the European Union OOTS.
- Existing interfaces and integrations used at the national level can be reused for cross-border data exchange.
- Estonia and Finland have adopted this approach in their EU OOTS implementations.




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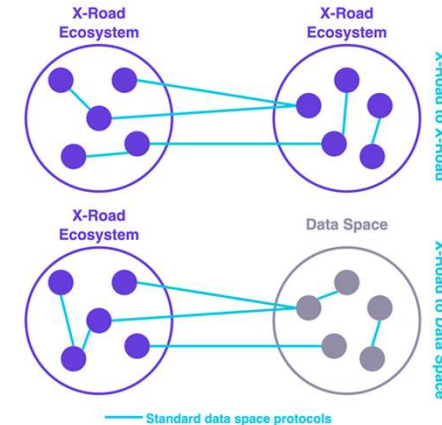
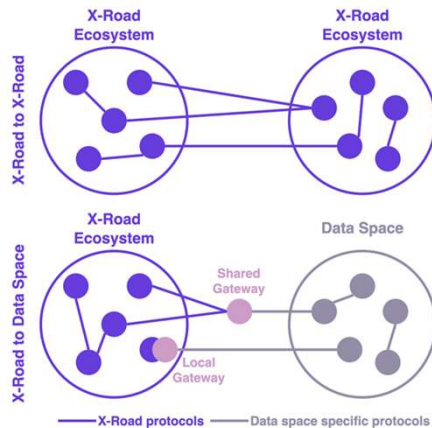


X-Road 8 "Spaceship"

Nurtures the proven ecosystem model and security while it takes X-Road to the next level by providing a solid data space infrastructure. 



Transition to a Dataspace Solution



Current state

- X-Road has its own **custom protocol stack** and being interoperable with other data exchange ecosystems requires building and maintaining custom ecosystem-specific gateway solutions.
- **NIIS is primarily responsible** for maintaining and developing X-Road.

Target state

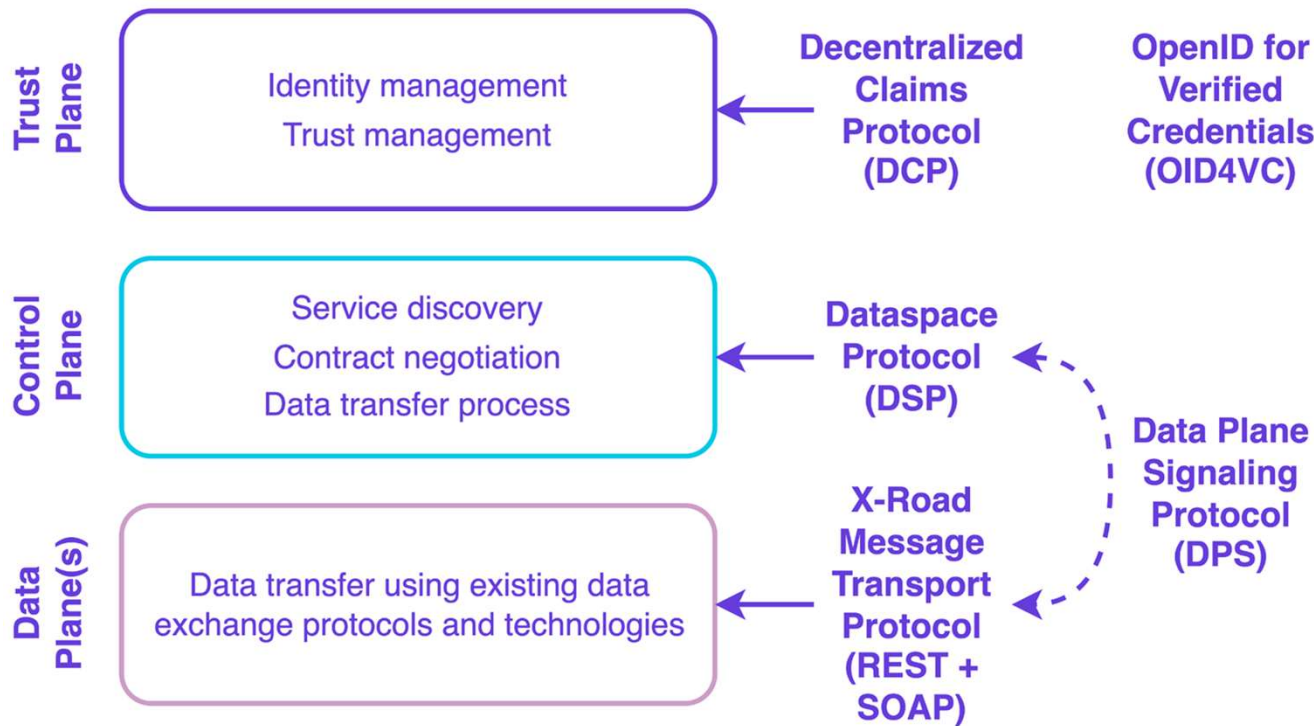
- X-Road uses the **standard dataspace protocol stack** and is interoperable with other data exchange ecosystems that follow the same standards and specifications.
- X-Road is **built on existing open-source components** maintained by international developer communities. NIIS contributes to their maintenance, but its **main focus is developing new business features**.

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X-Road's Dataspace Protocol Stack



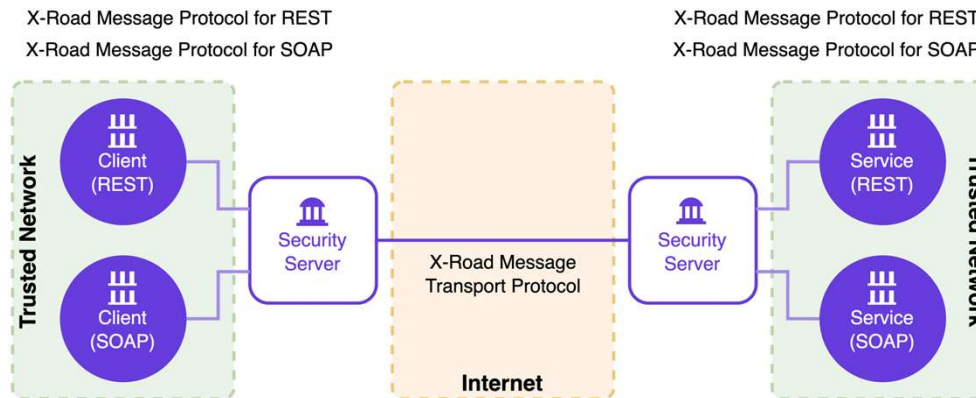
Dataspace Protocol Layers



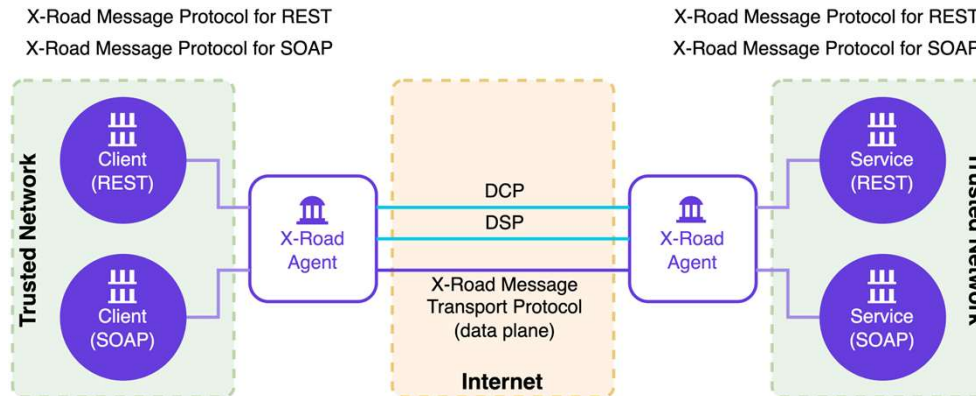
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X-Road Protocols

Before X-Road 8

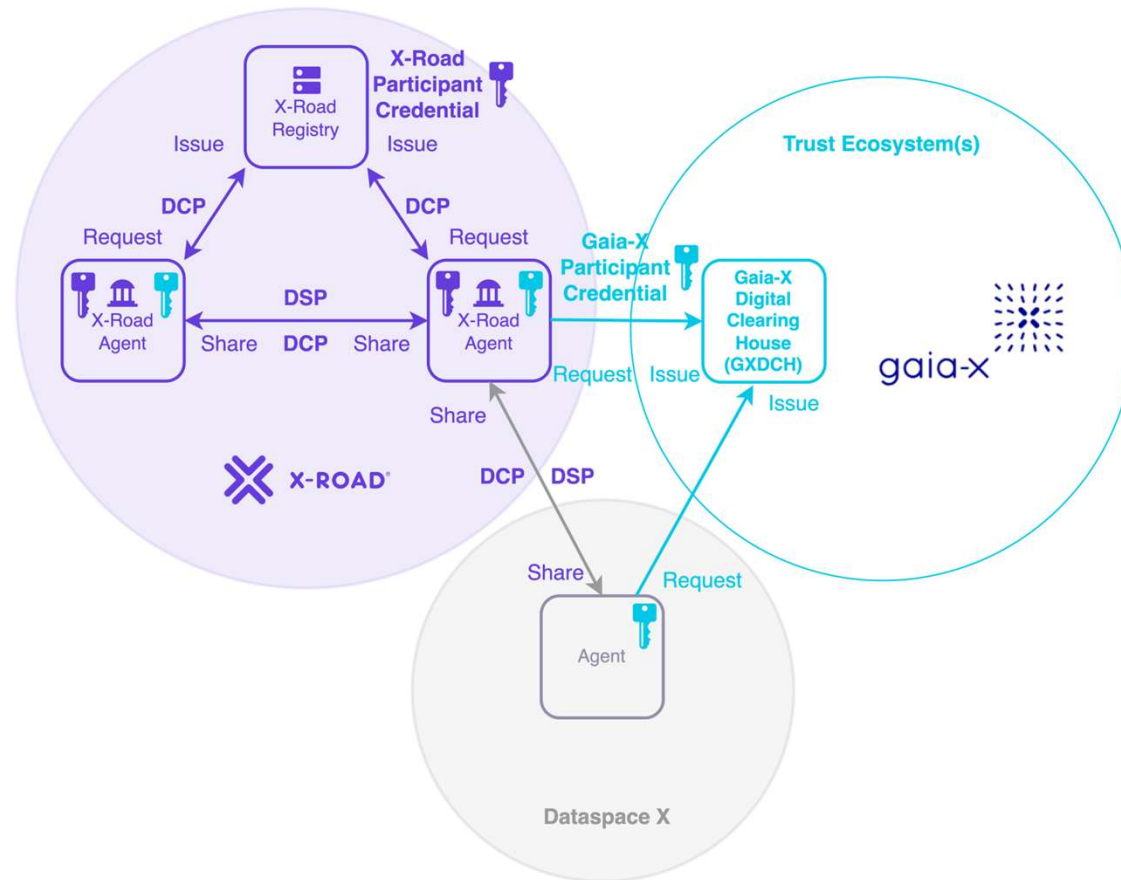


Starting from X-Road 8



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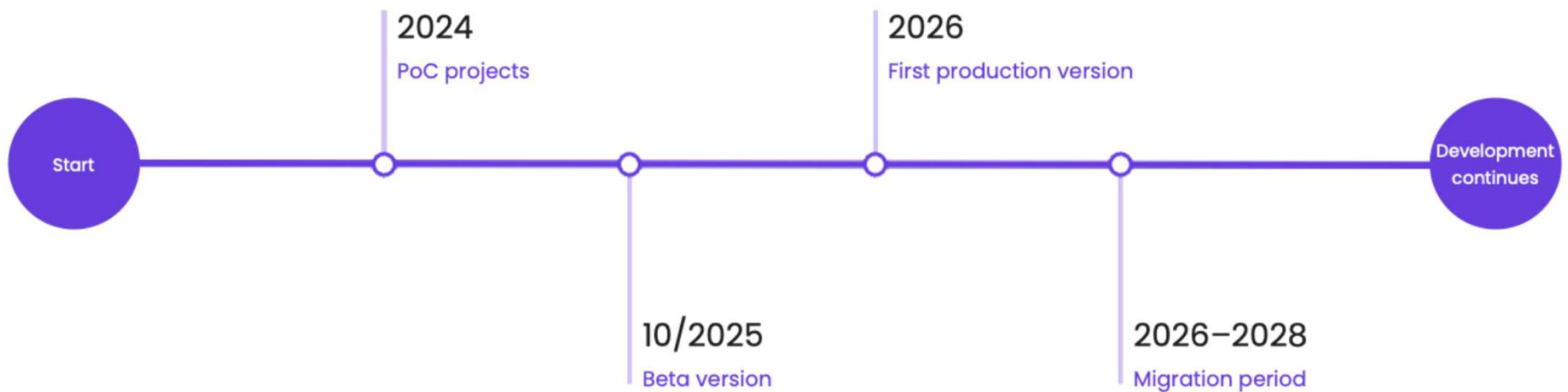
Technical Interoperability with the Gaia-X Trust Framework



Decentralised Claims Protocol (DCP), Data Space Protocol (DSP)

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X-Road 8 Timeline



X-Road 8 is implemented iteratively using agile software development methods.

All the changes are not included in the first production version, but they will be introduced one by one over time in various X-Road 8 minor versions.

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Some Implementation Challenges

- Maintain protocol-level backwards compatibility
- Continue supporting the current multi-tenancy model
- Manage DID and credential lifecycles for participants operating multiple agents
- Map and synchronize existing access control policies to ODRL-based policy models
- Support multiple parallel service description models (OpenAPI, WSDL, DCAT)
- Align X-Road terminology, APIs, and component architecture with dataspace concepts and standards

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Thank you!

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