

FEDeRATED Node Prototype

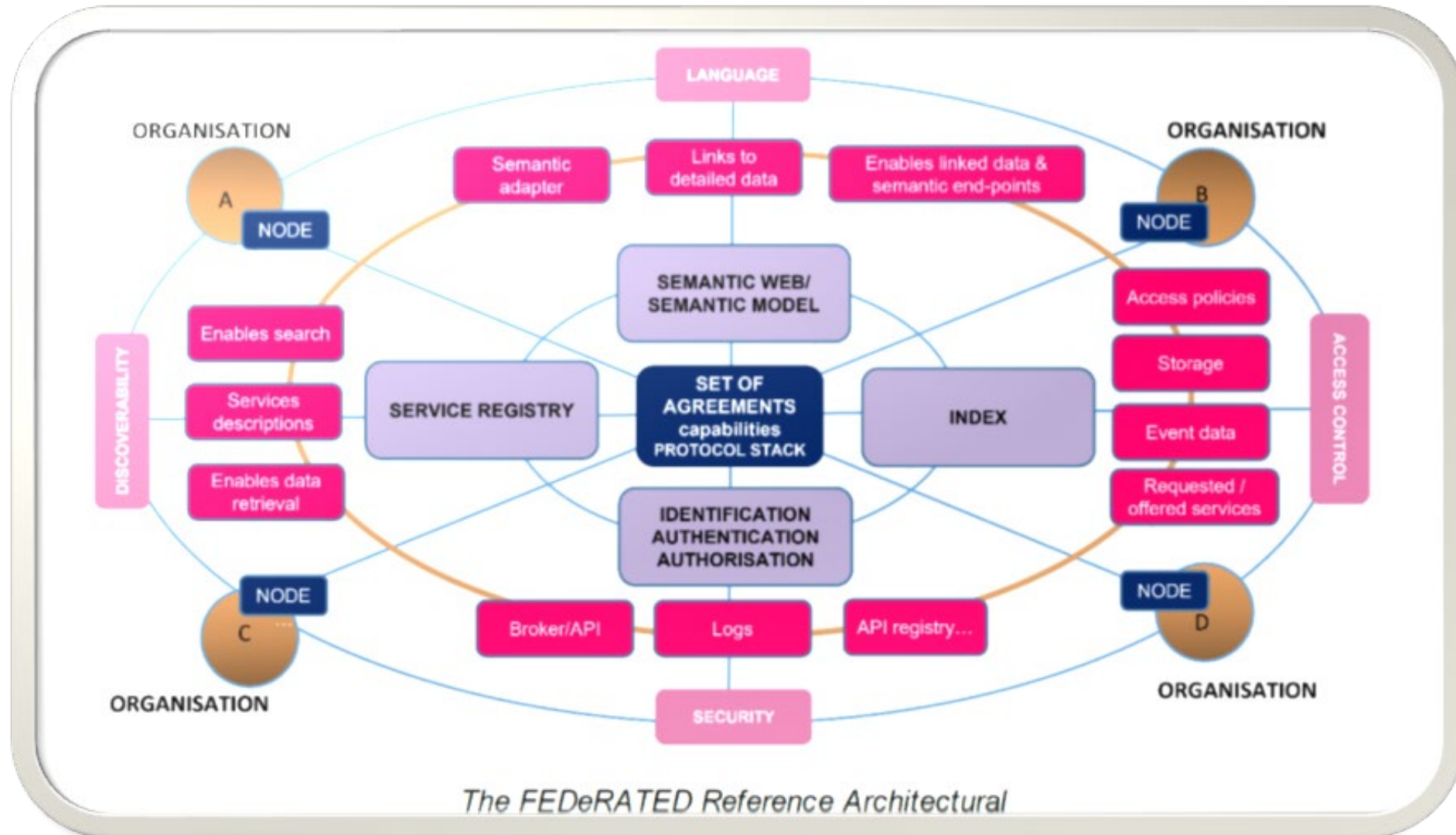
Common Living Lab(s)

Multimodal Visibility
Service

Architecture Board



Inside the machine - technical



Browsing through data



Sharing and accessing data



Sharing links:

- **Context for sharing – business relation/compliance**
- **Sending them to the proper recipient and receiving them from a trusted sender (Identity and Authentication)**
- **Events with user references and links to additional data**

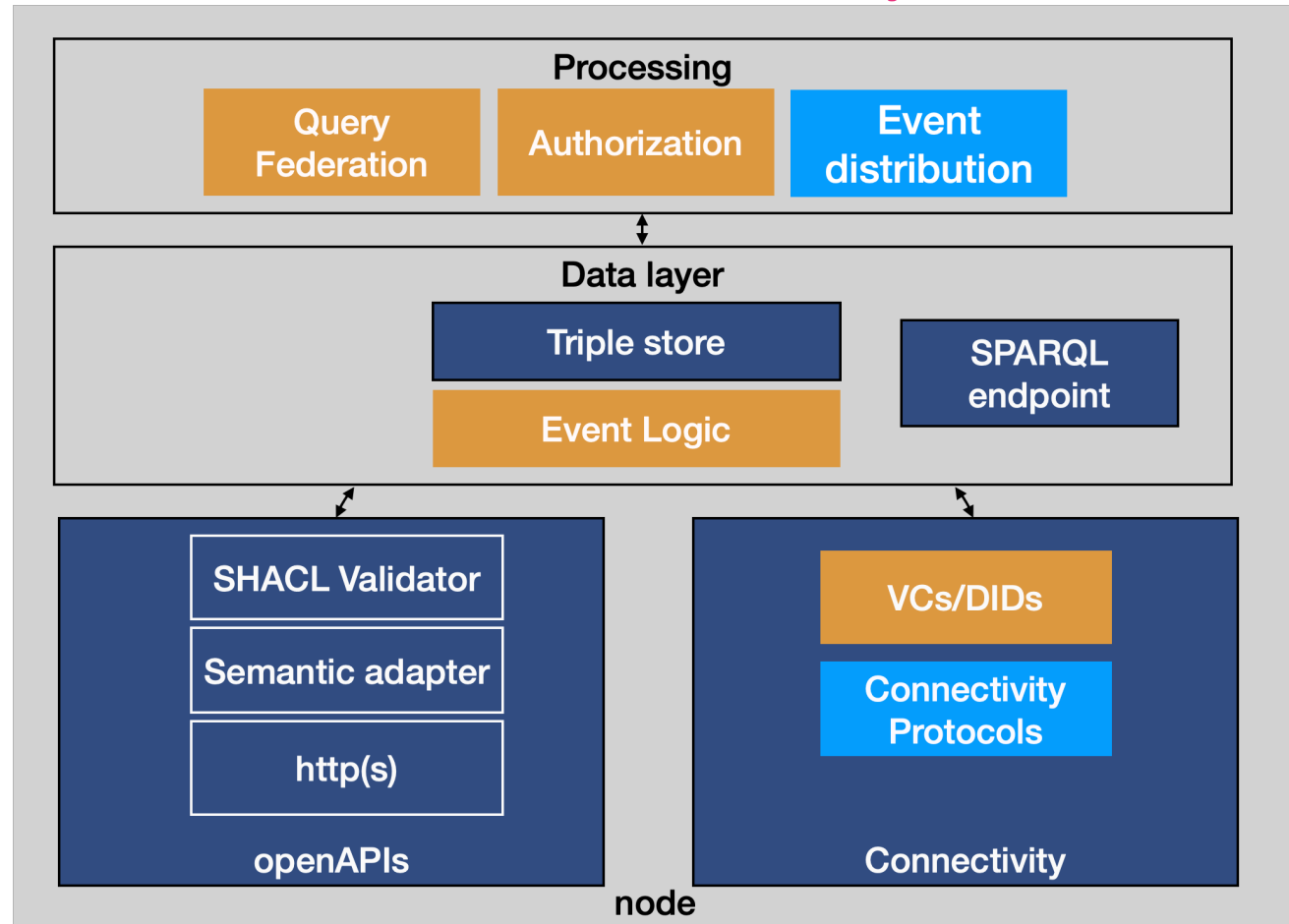
Link evaluation:

- **Access link(s) by recipient**
- **Trust in the identity of the data holder and – user (Identity and Authentication)**
- **Access control by data holder – based on shared link**
- **Accessible data – based on service implementation ('TIS profile')**



Components and their functionality

Service Registry
(prototype based
on Semantic
Treehouse)



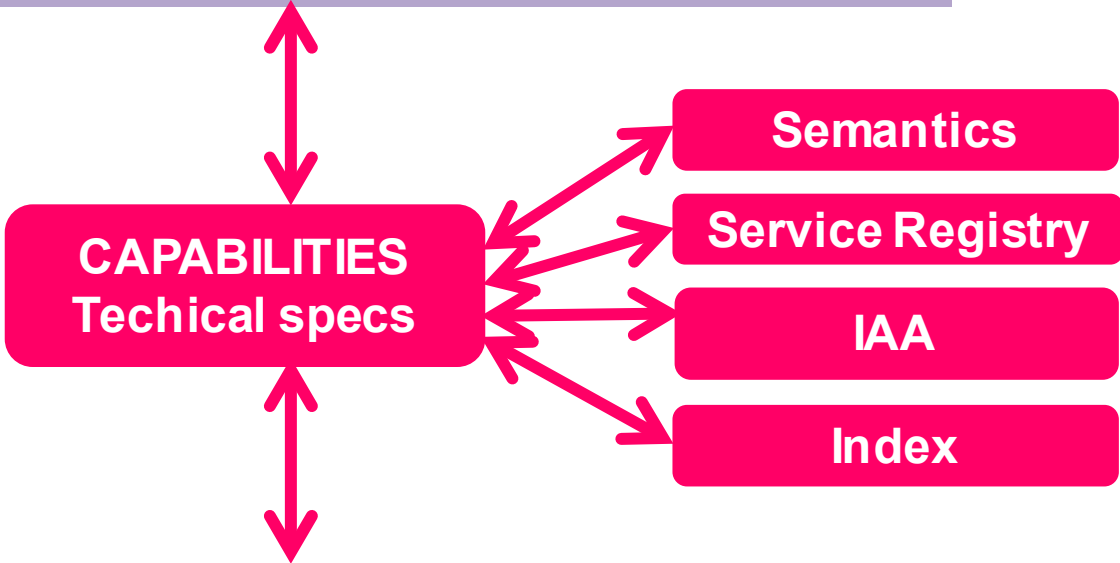
[FEDeRATED-BDI/docs at main](https://github.com/Federated-BDI/docs) · [TNO/FEDeRATED-BDI](https://github.com/Federated-BDI) · [GitHub](https://github.com/Federated-BDI/Docker-BDI-Node)
<https://github.com/Federated-BDI/Docker-BDI-Node>
<https://github.com/Federated-BDI/Kubernetes-BDI-Node>



What we have realized, so far

**TOP
DOWN**

FUNCTIONAL REQUIREMENTS



**BOTTOM
UP**

BUSINESS CASES COMMON LIVING LABS

TECHNICALLY READY

	LOW	MEDIUM	HIGH
Semantics	58%		
Service Registry	58%		
IAA		78%	
Index	50%		

FUNCTIONAL REQs 57%

NON-FUNCTIONAL REQs 58%



Common LLs multimodal visibility node



NETHERLANDS

SWEDEN

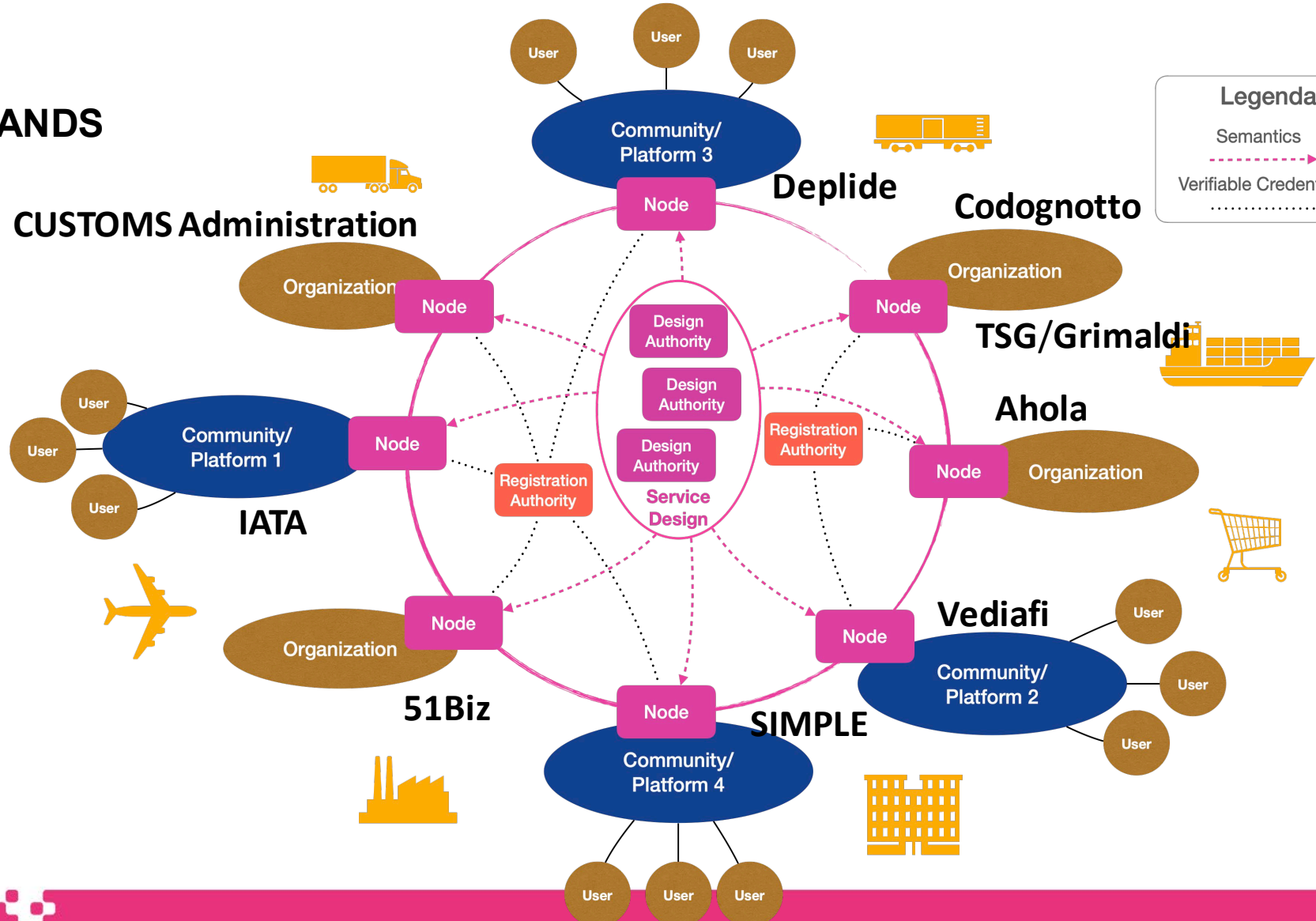
GLOBAL

ITALY

SPAIN

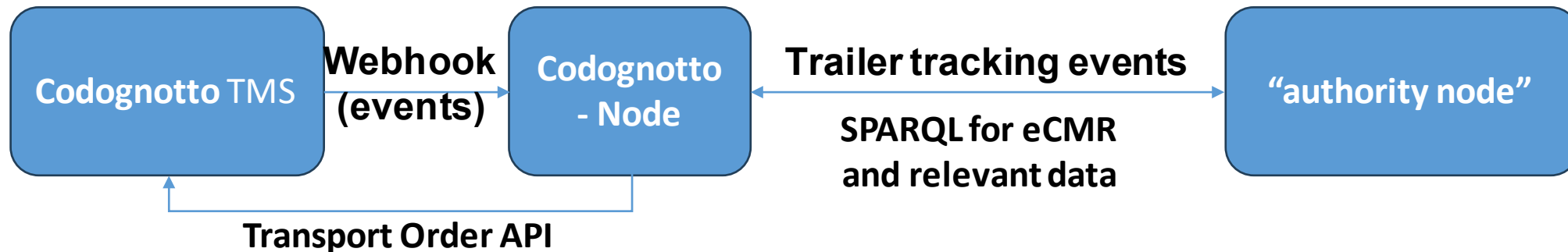
FINLAND / BALTIC

FINLAND



Codognotto (LL16) – Grimaldi (LL10) – Terminal San Giorgio (LL18) – terminal data

- TSG/Grimaldi – SPARQL endpoint to the external world

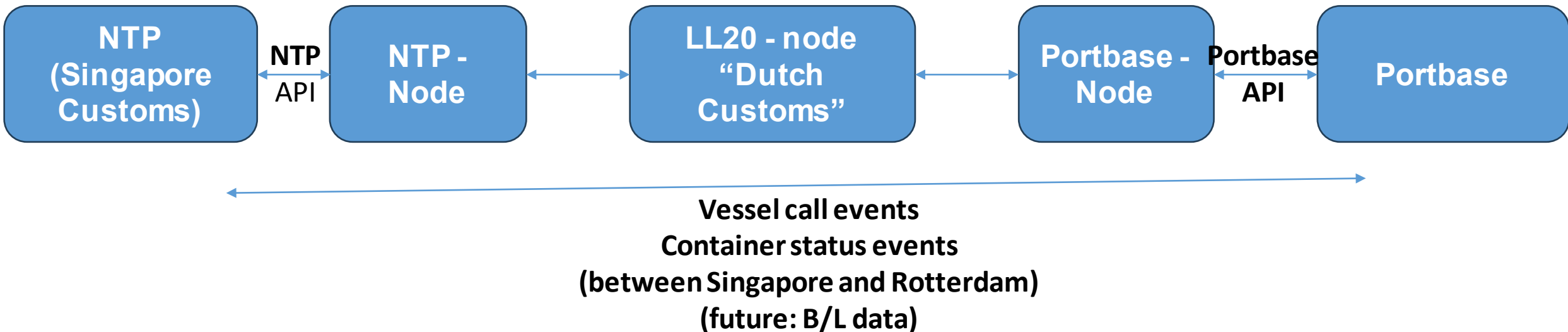
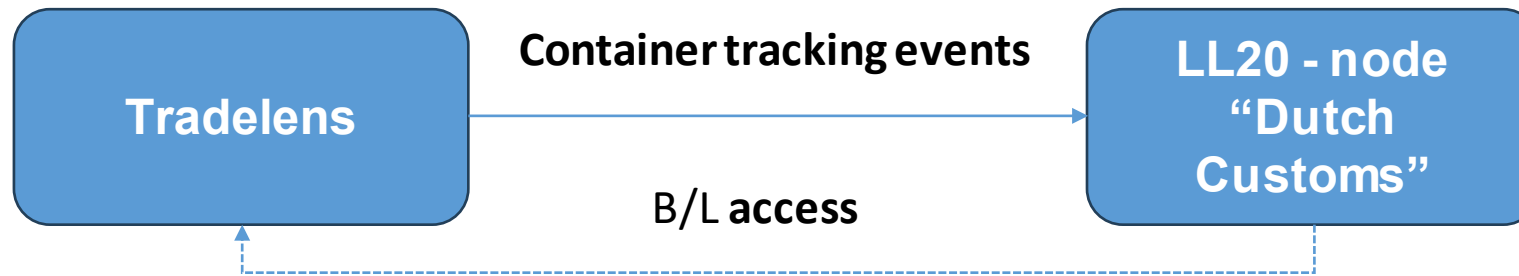


- Tradelane from Italy to UK
- Multimodal (road, rail, sea, road)



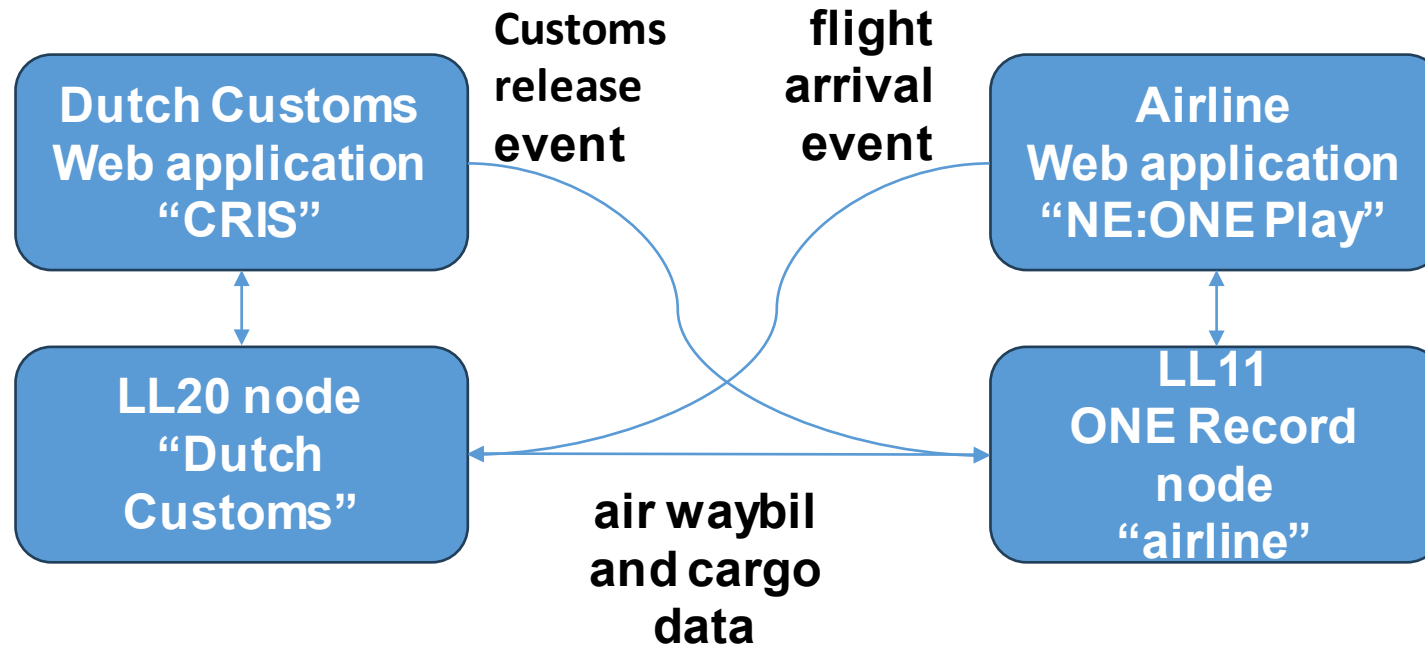
LL20 NL Customs -Tradelens – Singapore

Risk assessment based on maritime data

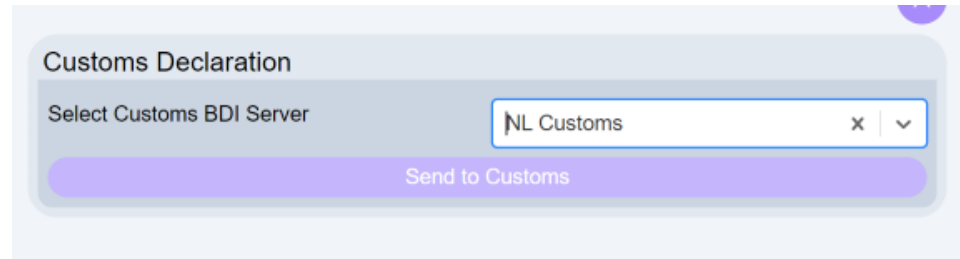
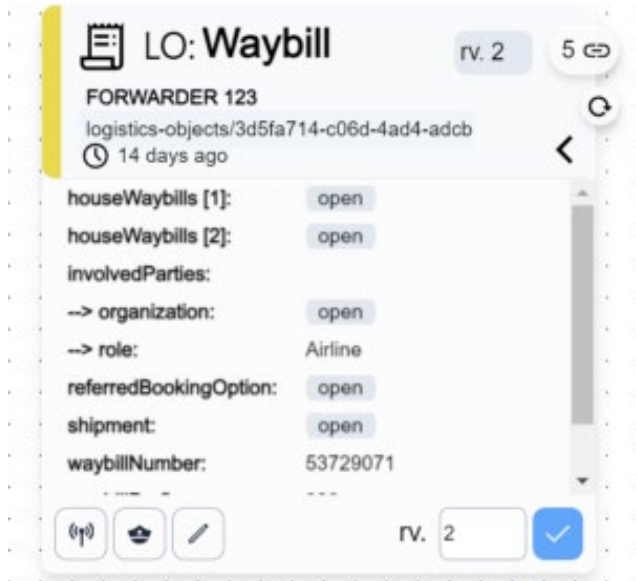


LL11 (IATA) - LL20 (NL)

Risk assessment based on air data



Send AirWayBill link to Customs node



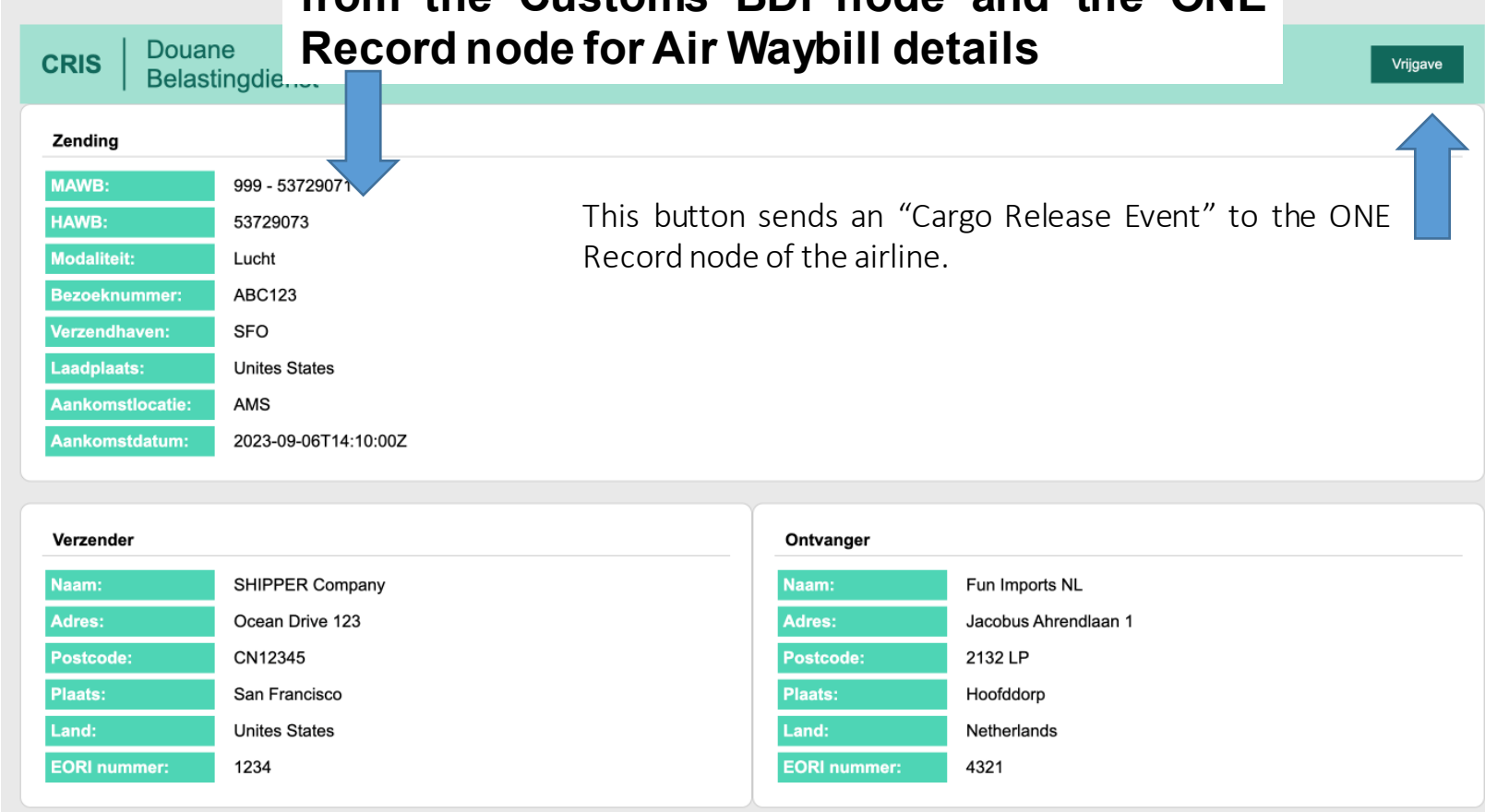
```
{
  "UUID":"6a435d44-e63a-46ae-afcb-fbcd255cfc13",
  "involvesTimeClassification":"Estimated",
  "involvesTimestamp":"2023-10-25T13:44:06+02:00",
  "involvesBusinessIdentifier":"https://ne-one-forwarder1-310e540cd5dc.herokuapp.com/logistics-objects/3d5fa714-c06d-4ad4-adcb-03c95a481fc3"
}
```

Waybill Identifier



Customs access of AWB data

Data in this screen is automatically retrieved from the Customs BDI node and the ONE Record node for Air Waybill details



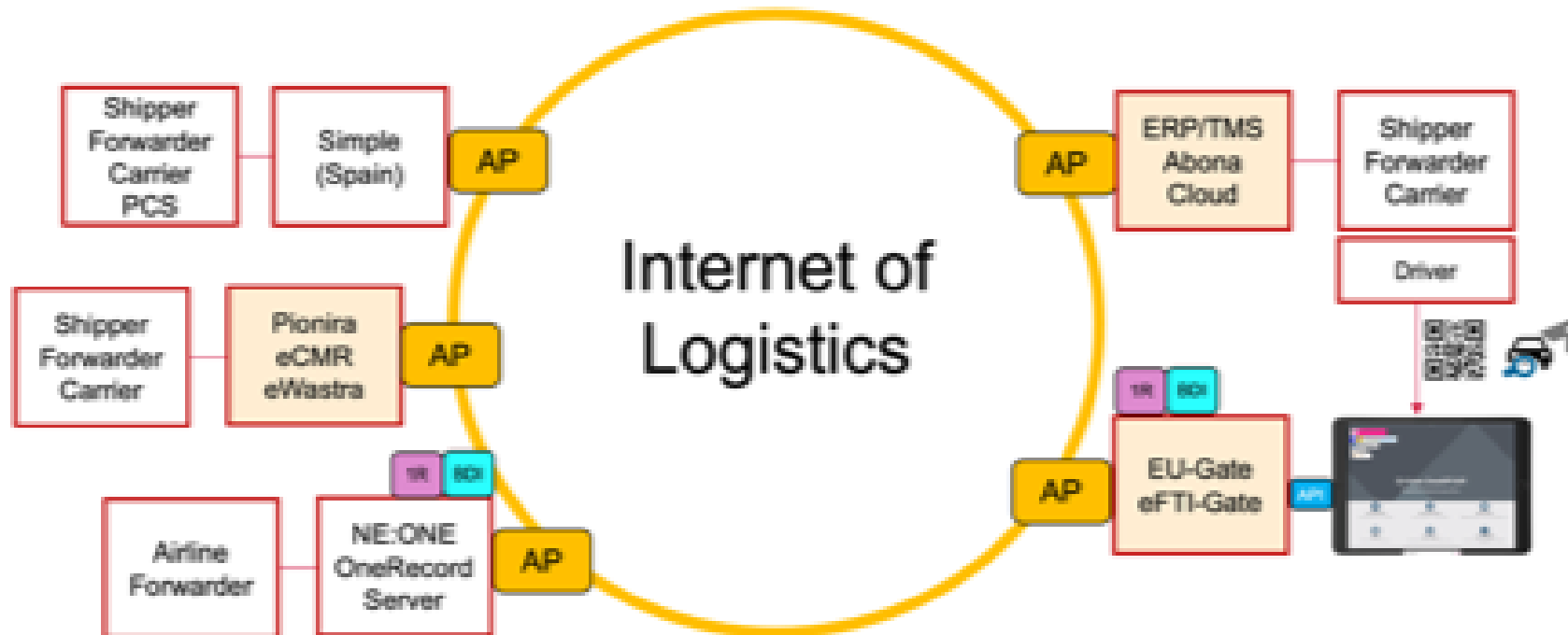
The screenshot shows a web interface for customs data. At the top left, there is a header with 'CRIS' and 'Douane Belastingdi...'. At the top right, there is a green button labeled 'Vrijgave'. Below the header, there is a section titled 'Zending' containing a list of fields: MAWB: 999 - 53729071, HAWB: 53729073, Modaliteit: Lucht, Bezoeknummer: ABC123, Verzendhaven: SFO, Laadplaats: Unites States, Aankomstlocatie: AMS, and Aankomstdatum: 2023-09-06T14:10:00Z. Below this, there are two sections: 'Verzender' and 'Ontvanger'. The 'Verzender' section includes: Naam: SHIPPER Company, Adres: Ocean Drive 123, Postcode: CN12345, Plaats: San Francisco, Land: Unites States, and EORI nummer: 1234. The 'Ontvanger' section includes: Naam: Fun Imports NL, Adres: Jacobus Ahrendlaan 1, Postcode: 2132 LP, Plaats: Hoofddorp, Land: Netherlands, and EORI nummer: 4321. A blue arrow points from the text above to the 'Vrijgave' button, and another blue arrow points from the 'Vrijgave' button to the text below.

This button sends an “Cargo Release Event” to the ONE Record node of the airline.



LL17 – LL21 – LL11: road/ eFTI - air

LL17 EU-Gate/OneAPP for Authorities



LL21 (rail) - LL17 (road, eFTI) – LL5 Deplide (rail)



<https://movaports.indra.es:25443>

FEDeRATED
NETWORK OF PLATFORMS

BDI Node

Welcome to this FEDeRATED Node! Please try out the API using the Swagger UI listed below.

Name	URL
Version	0.3.8-dev
Open API specification / Swagger UI	/swagger-ui/index.html

Documentation

Documentation for this FEDeRATED node is available on github.com, please follow the links below for more details.

Name	URL
Technical documentation	https://github.com/TNO/FEDeRATED-BDI/tree/main/docs
Source code	https://github.com/TNO/FEDeRATED-BDI/
Kubernetes installation / Helm charts	https://github.com/Federated-BDI/Kubernetes-BDI-Node

CORDA NETWORK

SIMPLE Lab Node – Event Exchange



We have tested the reception of an event

```
Logs [corda-BDI-node]
--- Corda Community Edition 4.9.2 (0818c20) -----
2023-10-25 08:57:22.921823015Z
2023-10-25 08:57:22.921823015Z
2023-10-25 08:57:22.921827599Z
Logs can be found in      : /opt/corda/logs
! ATTENTION: this node is running in development mode! This is not safe for production deployment.
Advertised P2P messaging address : movaports.lndra.es:10005
RPC connection address       : 0.0.0.0:10006
RPC admin connection address  : 0.0.0.0:10046
Loaded 2 Cordapp(s)          : Contract Cordapp: Template Contracts version 4 by vendor Corda Open Source with licence Apache License, Version 2.0, Work
flow Cordapp: Template Flows version 4 by vendor Corda Open Source with licence Apache License, Version 2.0
Node for "SimpleHkton" started up and registered in 14.69 sec
Running P2PMessaging loop
[ERROR] 09:25:51+0000 [nioEventLoopGroup-2-1] netty.AMQPChannelHandler. - Provided certificate subject OU=BDI, O=SimpleHkton, L=Madrid, C=ES not in expected set [O
U=NODE1, C=FEDI, L=Den Haag, C=NL] [allowedRemoteLegalNames=OU=NODE1, C=FEDI, L=Den Haag, C=NL, localCert=OU=BDI, O=SimpleHkton, L=Madrid, C=ES, remoteAddress=127
.0.0.1:10005, remotePort=OU=BDI, O=SimpleHkton, L=Madrid, C=ES, serverMode=false]
[ERROR] 09:25:51+0000 [nioEventLoopGroup-2-1] netty.AMQPClient. - Blocking future connection attempts to 127.0.0.1:10005 due to bad certificate on endpoint.
[ERROR] 09:25:52+0000 [nioEventLoopGroup-2-2] netty.AMQPClient. - No targets have presented acceptable certificates for [OU=NODE1, C=FEDI, L=Den Haag, C=NL]. Halti
ng retries
```

...And the state of the events

The screenshot shows a REST client interface for the endpoint `GET /corda/vault/EventState`. The parameters section shows `page=1` and `size=10`. The response body is a JSON array containing event details, including fields like `event`, `participants`, and `contractId`.



SIMPLE Lab Node – Data in SIMPLE



The image displays four screenshots of the SIMPLE platform interface, illustrating various data points and features:

- Top Left:** "Gestión de Envíos" (Shipment Management) showing a table of shipments with columns for Estado, ID Envío, Registro, Modo, Origen, Destino, and Entidades.
- Top Right:** "Detalle del envío" (Shipment Detail) showing a timeline of milestones (Trazabilidad) and a list of actors (Actores).
- Bottom Left:** "Detalle del envío" (Shipment Detail) showing a map of the route and a list of events (Eventos) such as "Planificación de transporte" and "Confirmación de carga".
- Bottom Right:** "Confirmación de carga" (Cargo Confirmation) showing a table of "Lista mercancías de carga" (Cargo List) with columns for Id. Vagón, Tipo, Identificador, Tamaño, Peso bruto, Id. Piezo, MIMP, Descripción, País de destino, and Ciudad de destino.

We can see here the original data in SIMPLE Platform

- A railway transport
- The item detail with origin, destination and intermediate stops
- Transport planification, milestone event and freight loading
- Wagon detail and loading data

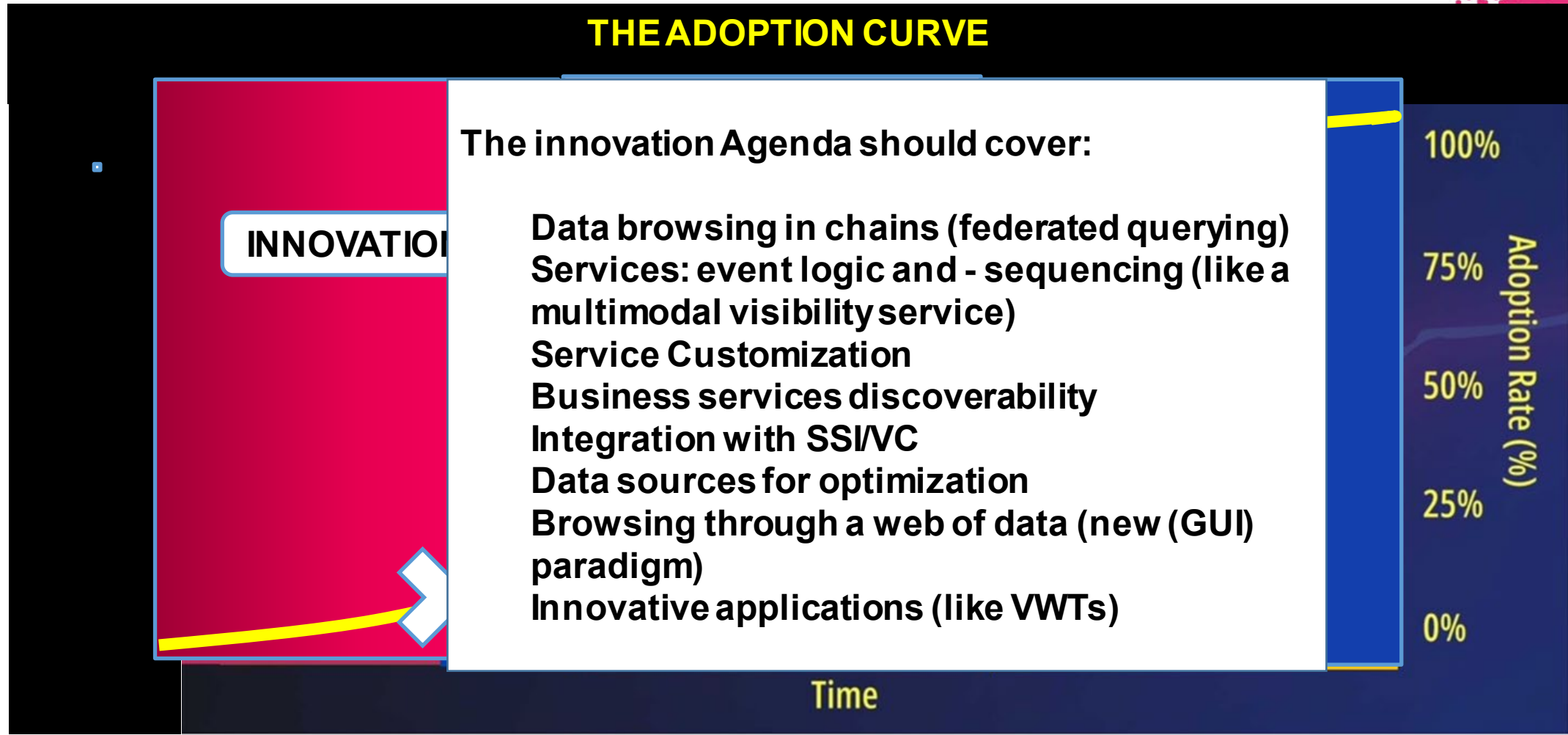
A FEDeRATED node solution makes sense



- **A node provides scalability and supports rapid on-boarding (network effect)**
- **Semantics with a Service Registry (tool support) crucial**
- **More stakeholder engagement required:**
 - **Collaboration with Industry for validation**
 - **Additional use cases to demonstrate the network effect!**
 - **Shippers/consignees – from visibility to resilience**
 - **Logistics Service Providers – improved capacity utilization**
 - **Different modalities and cargo types**
 - **Authorities – supervision of goods flows from various perspectives**
- **An innovation agenda based on the current insights should be pursued**



We have only just begun—What's next?



Network development from concepts – technology follows



We need a coordinative approach

Thank you for your attention



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