FEDeRATED – The Digitized Logistic Chain

Featuring
Grimaldi Euromed
Terminal San Giorgio
Codognotto Italia
Quadrante Europa – Zailog

FEDeRATED
NETWORK OF PLATFORMS

Co-financed by the Connecting Europe Facility of the European Union

LL#10 (Grimaldi Euromed)

Objectives:

- Enhanced ship tracking (own and chartered ships)
- Integrated service center for fleet management
- Added value services based on data sharing: enhanced planning horizons, forecast of carbon footprint (compliance monitoring).

Actors:

- Grimaldi Euromed (maritime carrier and LL coordinator)
- Terminal San Giorgio (maritime terminal operator)
- Circle Group (ICT service provider)

LL#18 (Terminal San Giorgio)

Objectives:

- Enhanced truck and trailer tracking
- Flexible terminal access policies
- Optimized asset and infrastructure use management

Actors:

- Terminal San Giorgio (maritime terminal operator and LL coordinator)
- Grimaldi Euromed (maritime carrier)
- Circle Group (ICT service provider, overall technological support and project management assistance)
- Luigi Cozza Trasporti (external support)

Collaboration between LLs: an evolutionary approach

Initial state:

- Two standalone Living Labs, each implementing its own use case(s)

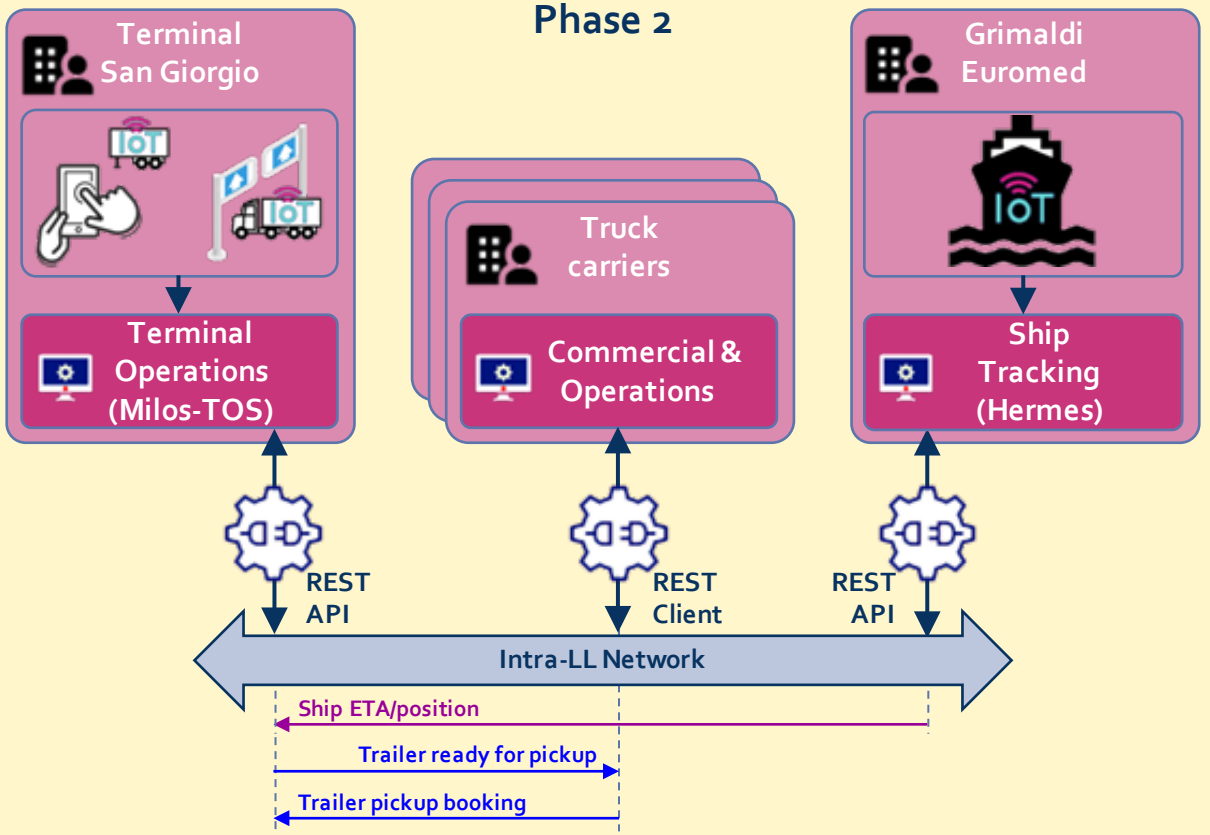
Evolution:

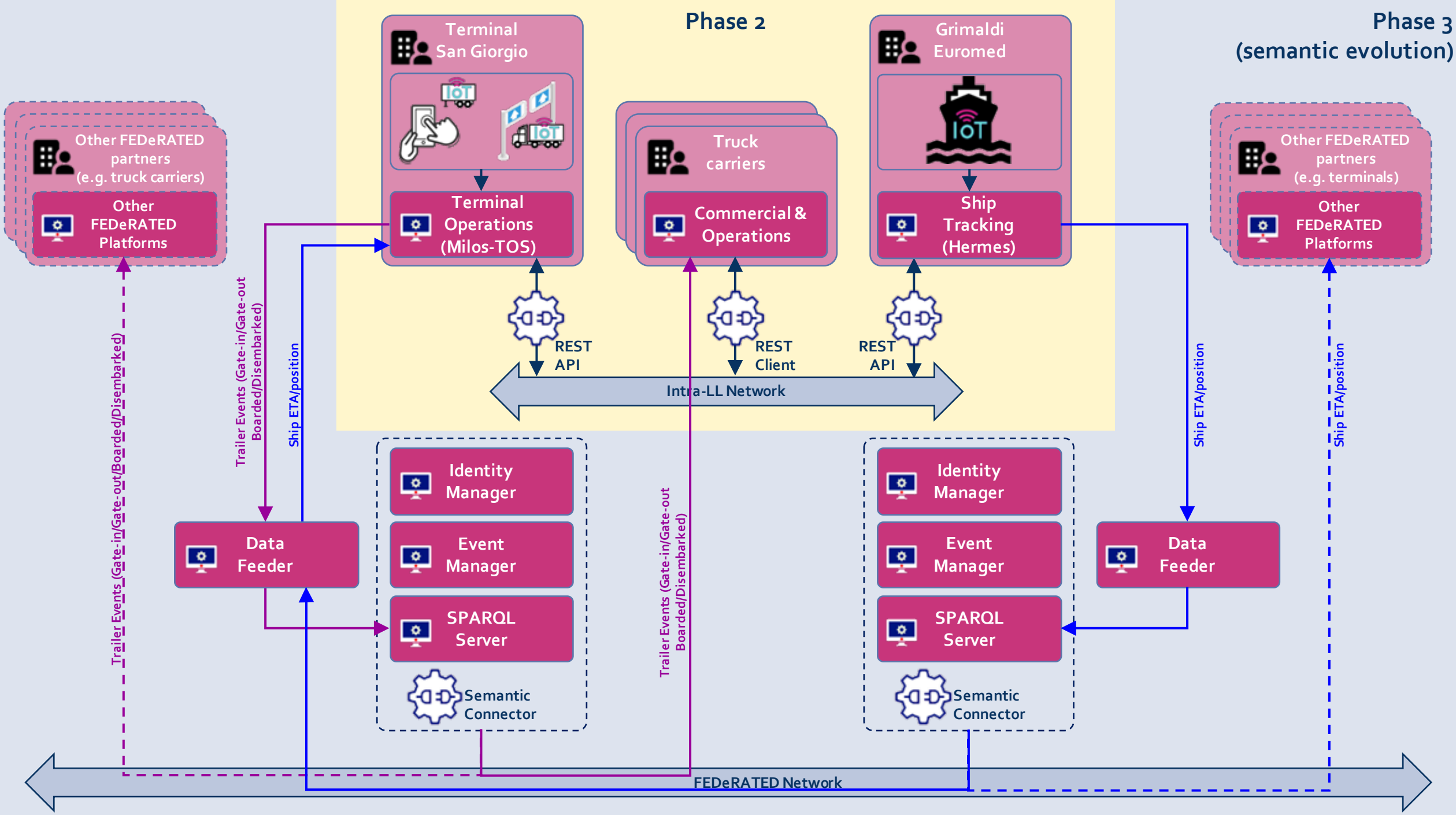
- Phase 1: identification of common use cases, workflow harmonization, legacy system adaptation, etc.
- Phase 2: first level of bilateral interoperability based on REST APIs
- Phase 3 – semantic evolution: true federative interoperability, complying with all the operating principles of FEDeRATED

Final state:

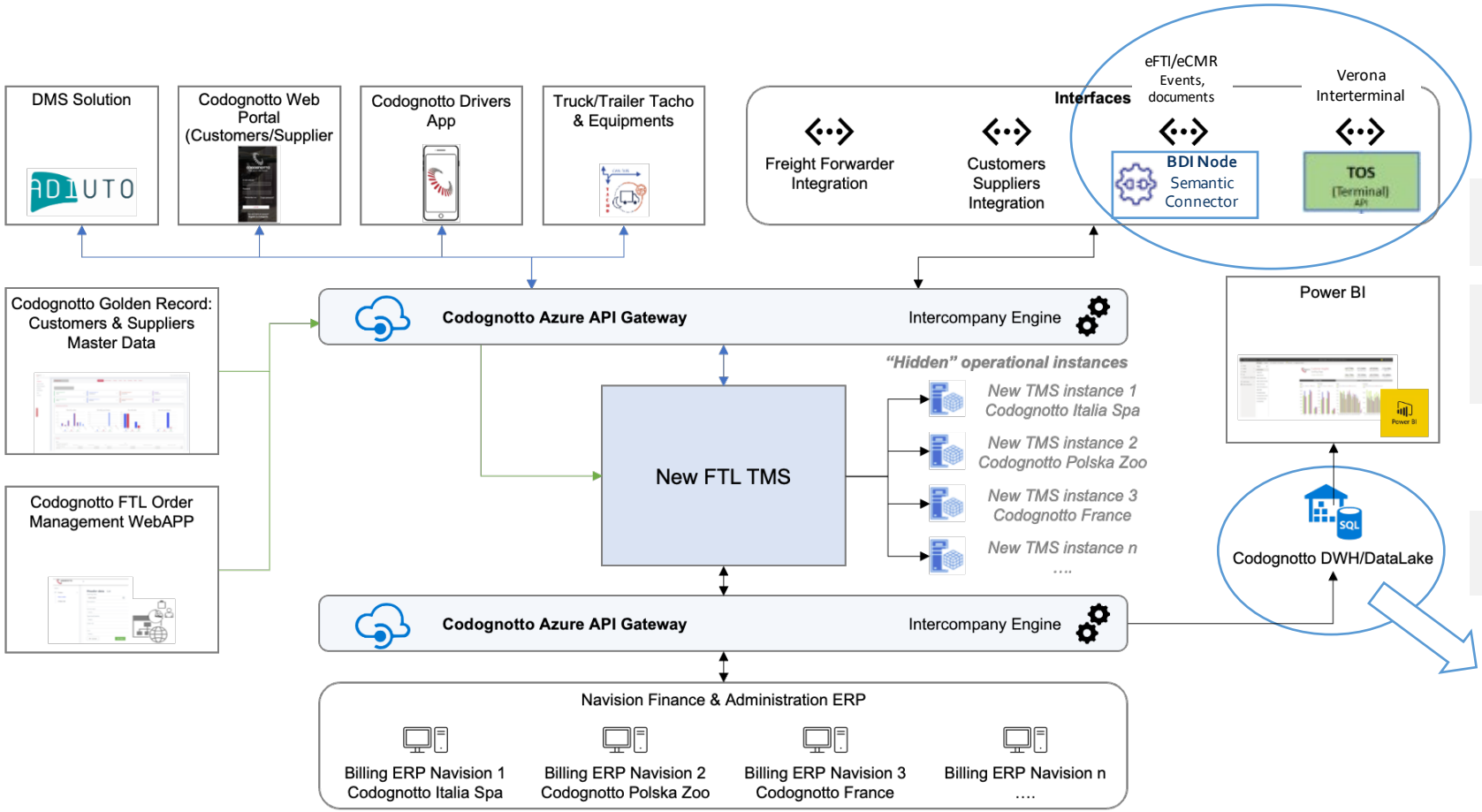
- Joint-LL services available to all other FEDeRATED nodes (and beyond)

Phase 2


Terminal
San Giorgio
IoT
IoT
Terminal
Operations
(Milos-TOS)
Truck
carriers
Commercial &
Operations
Grimaldi
Euromed
IoT
Ship
Tracking
(Hermes)
REST
API
REST
Client
REST
API
Intra-LL Network
Ship ETA/position
Trailer ready for pickup
Trailer pickup booking


Phase 2
Phase 3
(semantic evolution)
Terminal
San Giorgio
Terminal
Operations
(Milos-TOS)
Truck
carriers
Commercial &
Operations
Grimaldi
Euromed
Ship
Tracking
(Hermes)
Other FEDeRATED
partners
(e.g. truck carriers)
Other
FEDeRATED
Platforms
Other FEDeRATED
partners
(e.g. terminals)
Other
FEDeRATED
Platforms
REST
API
REST
Client
REST
API
Intra-LL Network
Trailer Events (Gate-in/Gate-out/Boarded/Disembarked)
Ship ETA/position
Trailer Events (Gate-in/Gate-out
Boarded/Disembarked)
Ship ETA/position
Ship ETA/position
Trailer Events (Gate-in/Gate-out
Boarded/Disembarked)
Data
Feeder
Identity
Manager
Event
Manager
SPARQL
Server
Semantic
Connector
Identity
Manager
Event
Manager
SPARQL
Server
Semantic
Connector
Data
Feeder
FEDeRATED Network

Living Lab #16 (D4You - Codognotto)

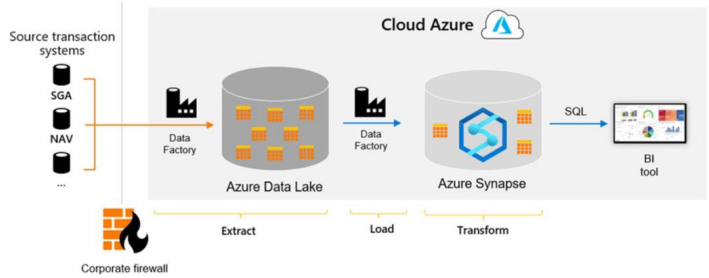


Azure API Gateway to achieve two main goals:

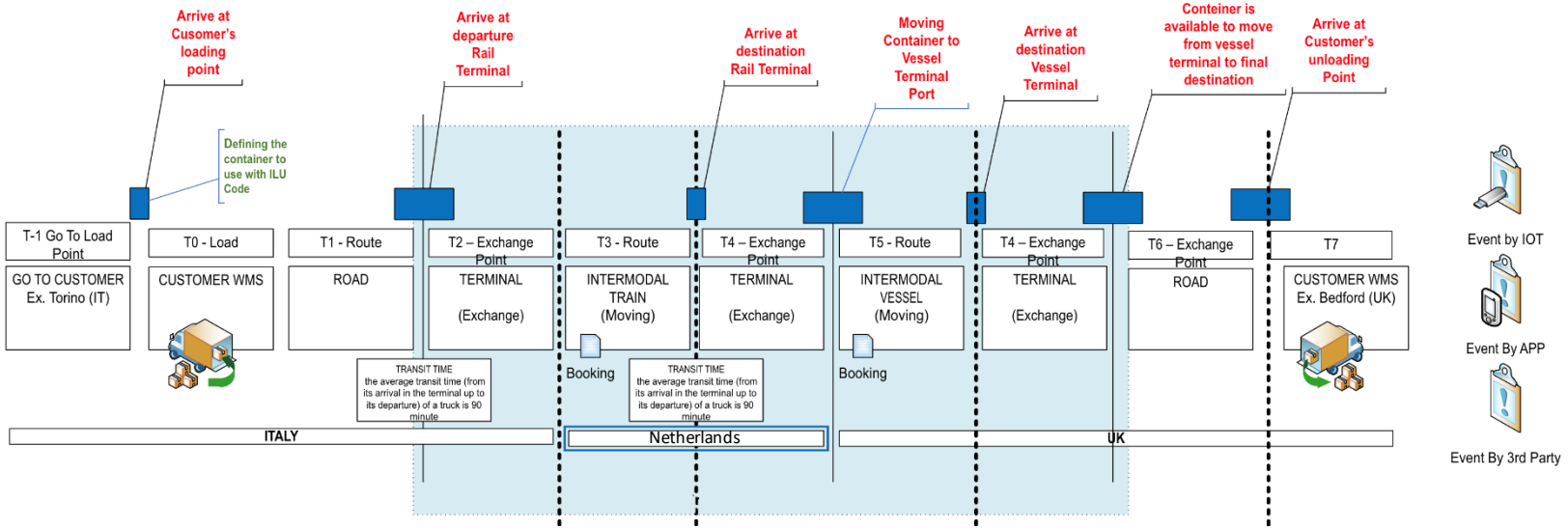
- Federate existing and new internal services and platforms
- Federate data with some external actors (like Customers and Carriers) in order to automate processes and extend the collaboration

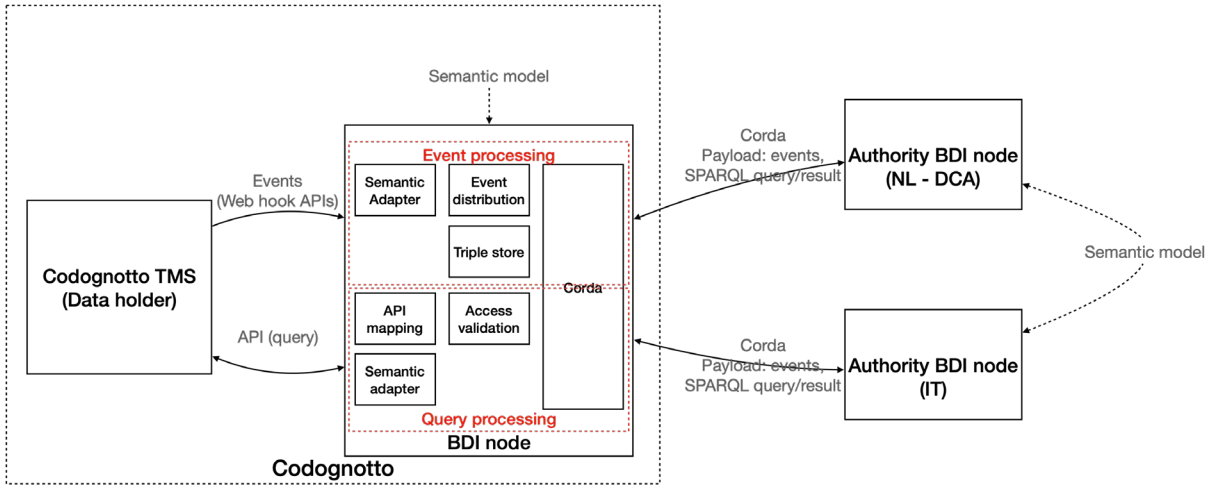
Datalake:

- Use standard FEDeRATED semantic to collect and share data for internal and external purpose



Living Lab #16 collaboration with LL #20





Case:

- Transport of a trailer with a customer order (FTL – Full Truck Load) from Italy by train to port of Rotterdam, followed by ferry transport of the trailer to the UK.
- It consists of four transport legs road, rail, sea, road

BDI Node Setup scenario:

- Setup with two authority nodes reflecting available data and events produced by Codognotto with the following data flows:
  - Initiation event – the trip with the four legs is shared.
  - Operation events – during operation, each milestone generates an event.
  - Border crossing event – border crossing events for the rail transport
  - eFTI (SPARQL) query to a single API to the customer orders in the TMS.

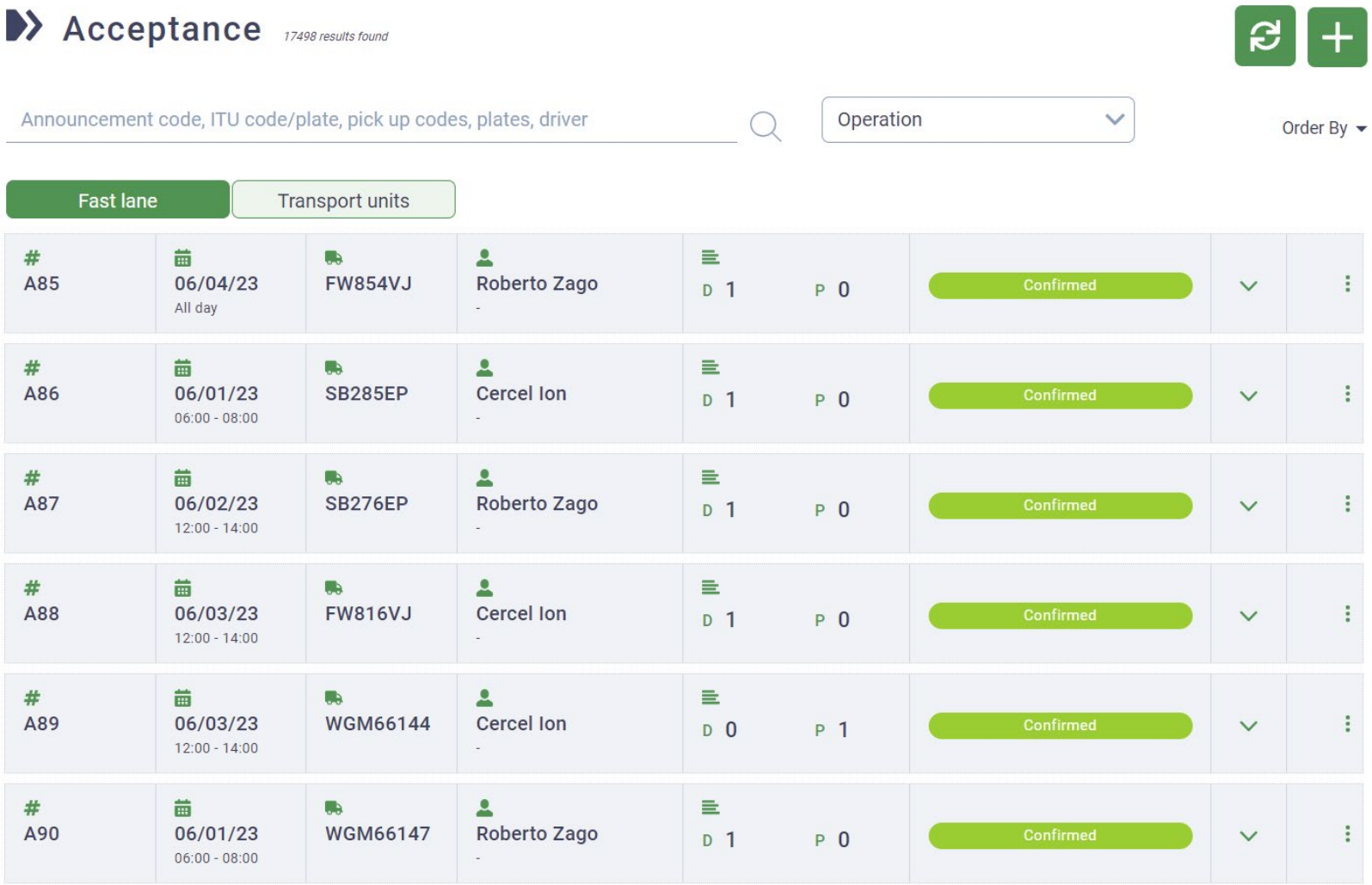
Verona freight village overview

- The Verona freight village is one the most important freight hubs in Europe.
- It is crossed by 2 railway lines and the same goes for the motorways (Milan-Venice and Brenner).
- There are 3 intermodal terminal and 8 railway undertakings operating in the area.
- The core business is represented by the intermodal transport that is composed by a long haul by train and the last mile by road. The aim is to connect most of the companies to the Verona terminals.

Some figures

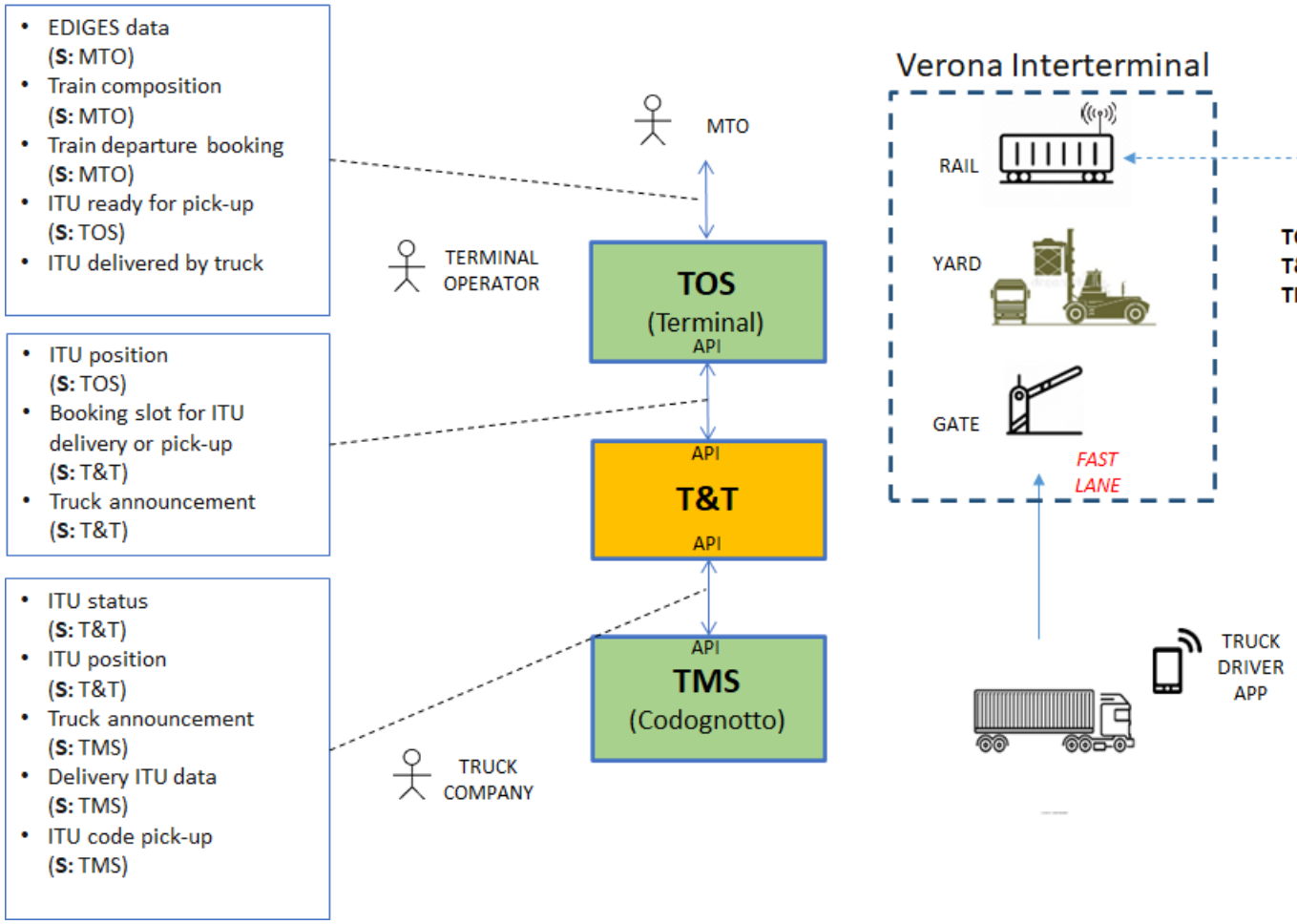
- 30 million tons handled in 2022, of which 22 by road and 8 by rail.
- 15,010 of freight trains managed in 2022, of which 13,814 are intermodal trains.
- The railway connections are to Germany (69%), Italy (19.5%), Denmark (3.5%), The Netherlands (2.5%), Belgium (2.5%) and Czech Republic (3%).
- The daily traffic of loading units handled in the terminals is composed by trailers (75%), swap bodies (15%) and containers (10%).

Living Lab #12



- The living lab #12 has focused on implementation of virtual fast lane concept at Interterminal, the intermodal terminal of Quadrante Europa in Verona.
- Developed a middle layer for automated exchange of TMS data with TOS.
- Road announcement to anticipate the truck, driver and ITU data (goods and seals) in order to speed up the entry operations to the terminal.
- Truck company receive an assigned arrival time slot according to ETA.

Track&Trace Architecture



- Use of the Representative State Transfer (REST) as client-server architectural style that uses the HTTP protocol in a simple and effective way, has enabled and ease integration with Truck Company.
- Any truck company (or transport provider) can access T&T's API. To obtain valid access credential it has to request to Interterminal Quadrante Servizi.
- In future T&T can act as dispatcher to each TOS used in Verona Freight Village.

Final Results

- Truck driver and ITU data are received by the terminal via the Truck and Trace API, consequently the gate operations are speeded up (fast-lane).
- The dwell time is reduced, so hauliers can save time for next deliveries.
- Clear vision of expected vehicle flow (in/out) in Verona terminal area.
- Verona Interterminal has mapped its buffer area, identifying the average storage time, size and capacity of each slot (e.g. number of units/hours, operative means availability, etc.) to guarantee that each drop-off and pick-up activity can be managed as fast as possible.
- Truck and Trace system guarantees the efficient management of delivery and pick-up activities according to proximity ETA communicated by the TMS system as well as the slots availability.
- Real time update about goods, drivers, and vehicles in the terminal area.
- Supply chain visibility over operations at the terminal.
- Reliable proof of delivery/pick-up of ITU.
- Reduction of gate congestion with a consequent adequate availability of personnel and infrastructures based on operational capability.

Interterminal TOS at a Glance

The following video shows the upgrades of the Verona TOS (Terminal Operating System) realized thanks to the implementation of the Living Lab 12. Specifically, Zailog developed a Track & Trace system that permits to receive data from the road operator before its entrance to the terminal gate, allowing a reduction of the timing for the gate-in phase. At the same time, the terminal manager can share the information received from the railway undertaking with the road operator that will be able to control in real time the actual time of arrival of the train. In this way, it will be possible an optimal management of the truckers' routes. Therefore, the data sharing in real time allows a better management of the terminal yard and of the overall terminal operations, with the aim to reduce costs, dwell times and emissions.

THANK YOU

www.federatedplatforms.eu
@FeRated (Twitter)
#FEDeRATED (LinkIn)

FEDeRATED
NETWORK OF PLATFORMS

Co-financed by the Connecting Europe Facility of the European Union