

**Automation in Transport: Digitalization and  
e-documents as enablers of growth and  
development**

**19 February 2019  
Geneva**

**AEOLIX pan-European logistics  
information exchange platform**

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# Content

- Background & needs
- AEOLIX project
- European Logistics Information exchange Platform
- Towards future federative platform for logistics services?
- Conclusions & next steps

# Background

- Many digital platforms on freight transport and logistics:
  - EC FP & H2020 Projects solutions
  - Port Community systems & Cargo Community System (CCS)
  - e-Customs platforms
  - Single Window platforms
  - Proprietary ICT /ITS Solutions
- Open standards and EU initiatives
  - UBL/XML, EDIFACT, GS1, Open Data Standards, DATEX II
  - ITS Directive, RIS, eMaritime
  - (ETPs), such as ALICE, ERTRAC, ERRAC, Waterborne

# Business Needs

## Needs at Hubs Ports, Terminal



### Management Needs

- Process control, customs clearance
- Capacity planning, scheduling

### Data needs

- Vessel Load
- Berthing schedule. Load plan, ETA, container location, customs clearance status

### Interface level needed

- Data availability, visibility
- Document transfer

## Visibility Needs at Supply chain



### Management Needs

- End to end visibility and exception management
- Vertical cooperation and mode conversion

### Data needs

- Load size, and format, origin, destination, asset availability, capacity availability, schedule, voyage reports, travel authorisation, shipment location, shipment status

### Interface level needed

- Data availability, visibility
- Document transfer
- Online-booking links, confirmation
- Intelligent agent, exception alerts

## Network Optimisation needs



### Management Needs

- Load factor, capacity optimisation
- Horizontal collaborations

### Data needs

- Combined demand
- Combined loads, combined locations,
- combined destinations
- Corridors
- Combined lanes, schedules

### Interface level needed

- Lane analysis
- Optimisation algorithms
- Cost analysis

# But new challenges appear...

Lack of interconnected systems

Process digitalisation and re-engineering

Data challenges:

- i. Data ownership, sharing, access to data, re-use of data
- ii. Lack of trust/data confidentiality
- iii. Data protection, cybersecurity
- iv. Big data, added value creation

Non-interoperable standards

Non-recognition of e-Transport documents

New business models

Governance

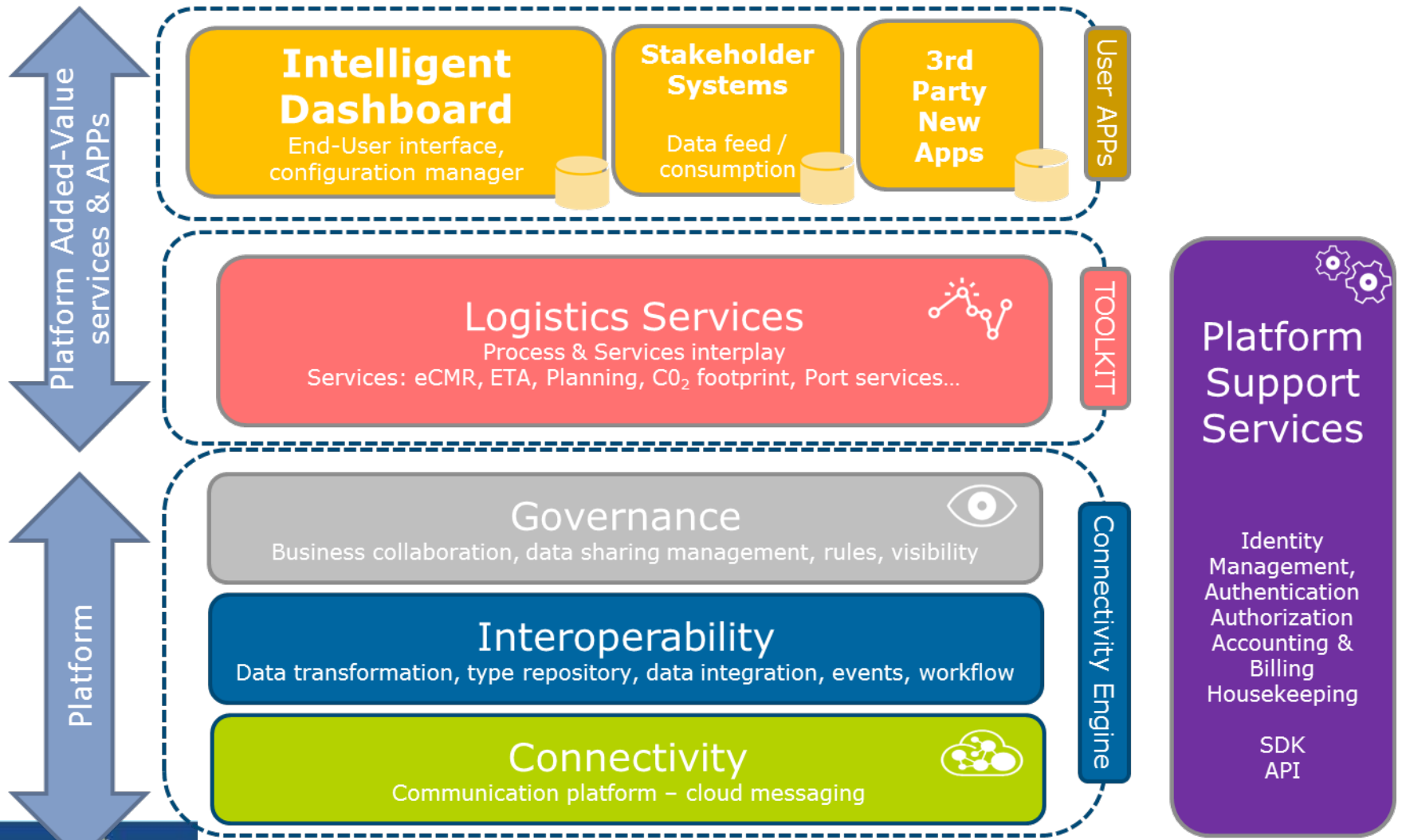
Low cost solutions, accessibility for SMEs



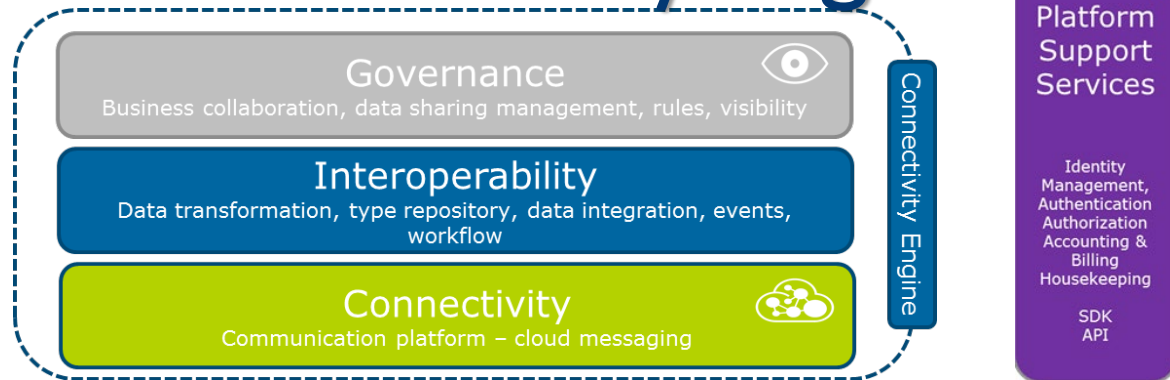
The AEOLIX Platform represents a critical way forward of supply chain interoperability through decentralised information sharing. AEOLIX is established **via cloud services where data, application, on-premises and cloud-based processes and services from multiple actors can be connected - enhancing collaboration and interoperability**, potentially across the entire freight transportation system



# High-level architecture view



# Connectivity Engine

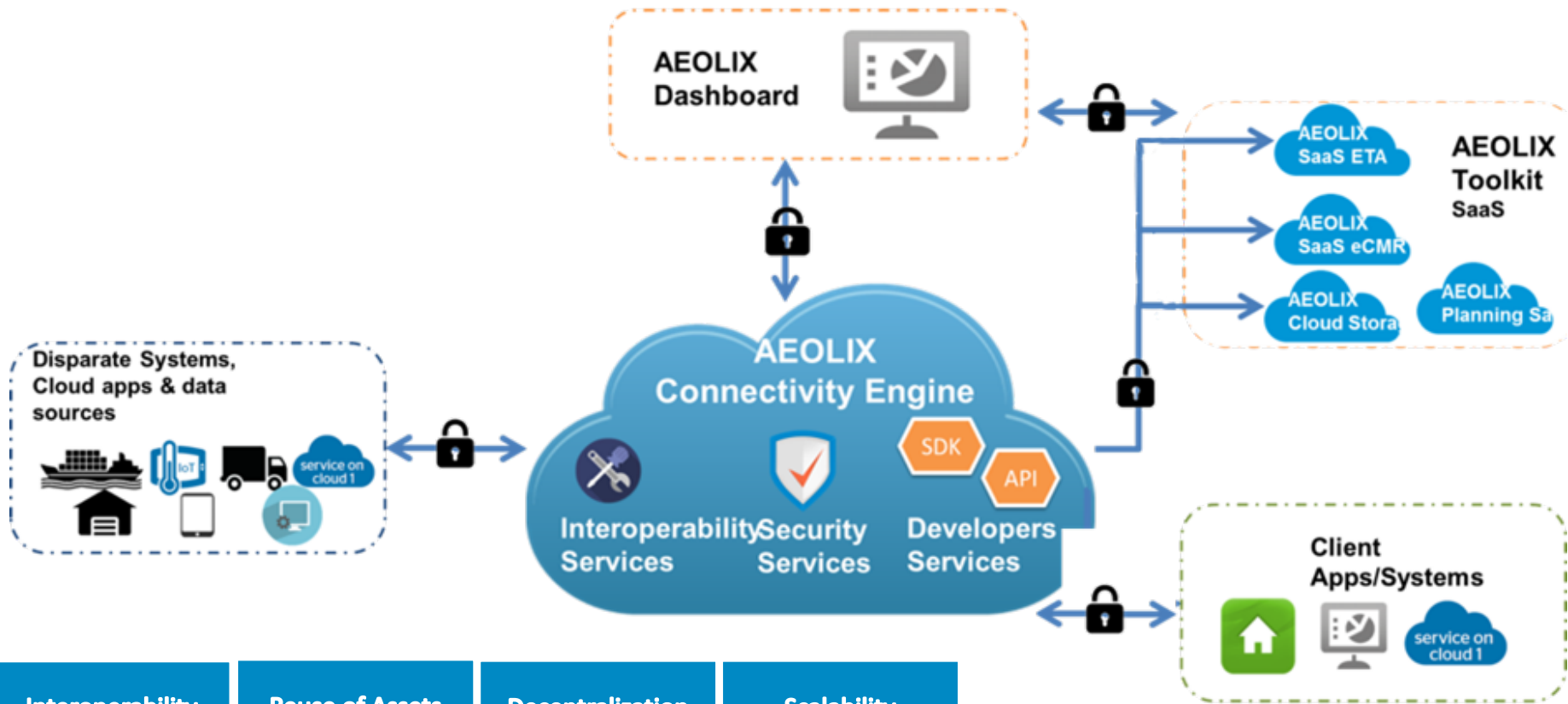


## ✓ Main Features

- **Ensure systems' connectivity:** a shared cloud-based connectivity layer message queueing framework, enabling messaging between various entities that wish to communicate with each other seamlessly and reliably
- **Interoperability services** to develop the data transformation before data pass to the connectivity layer
- **Governance services** in charge of the management of the data sharing rules between partners. Services that enables the visibility of information between stakeholders and/or services.
- **SDK/API:** develop/integrate SW solutions or services
- **Identity management:** management of digital entities of the actors/systems and access to the services



# AEOLIX IT Architecture



Interoperability

Reuse of Assets

Decentralization

Scalability

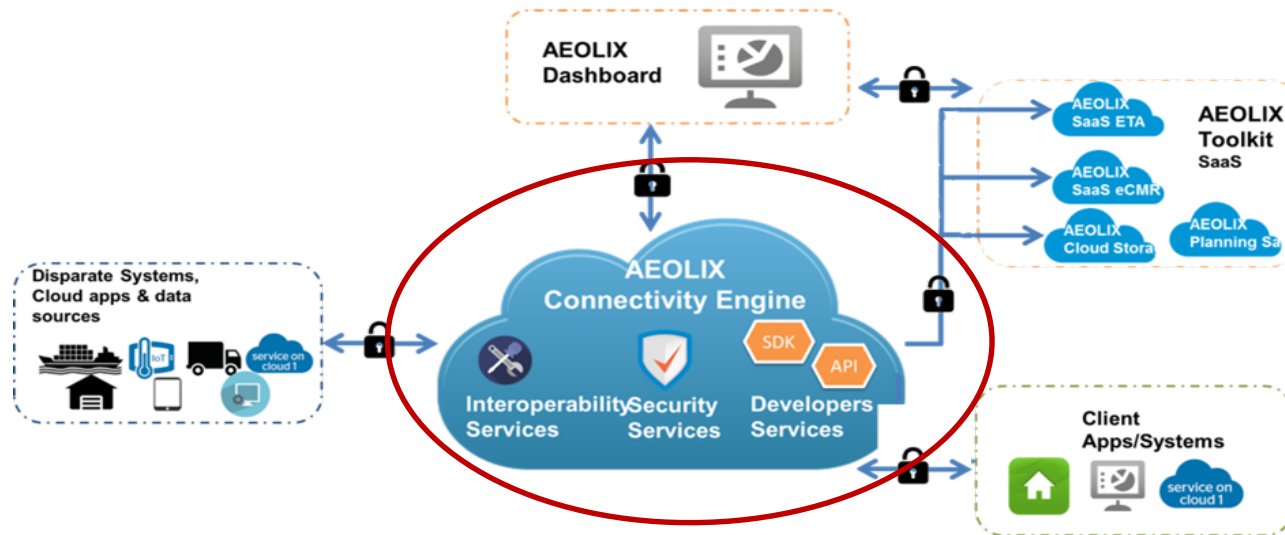
Real-Time /  
Responsiveness

Service Toolkit

Simplicity

Security

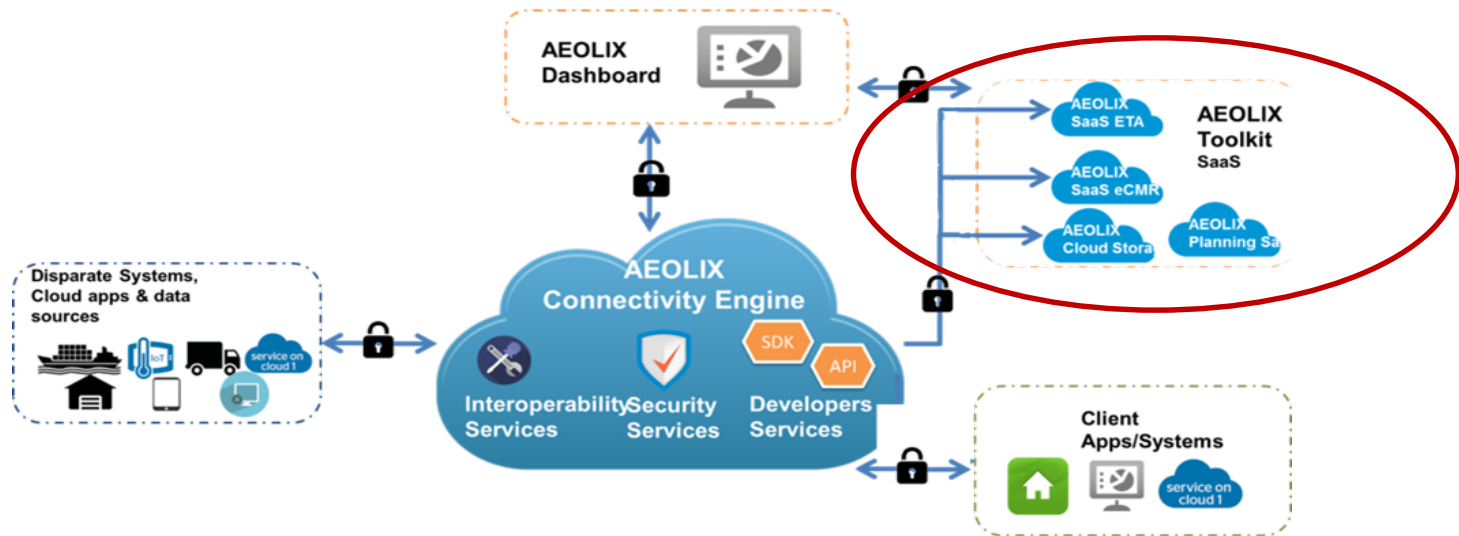
# AEOLIX IT Architecture – How It works?



## AEOLIX platform

- Ensure connectivity of systems >> AEOLIX Connectivity Engine: a shared cloud-based connectivity layer message queuing framework, enabling messaging between various entities that wish to communicate with each other seamlessly and reliably
- Interoperability >> repository of types
- SDK/API >> develop/integrate SW solutions or services

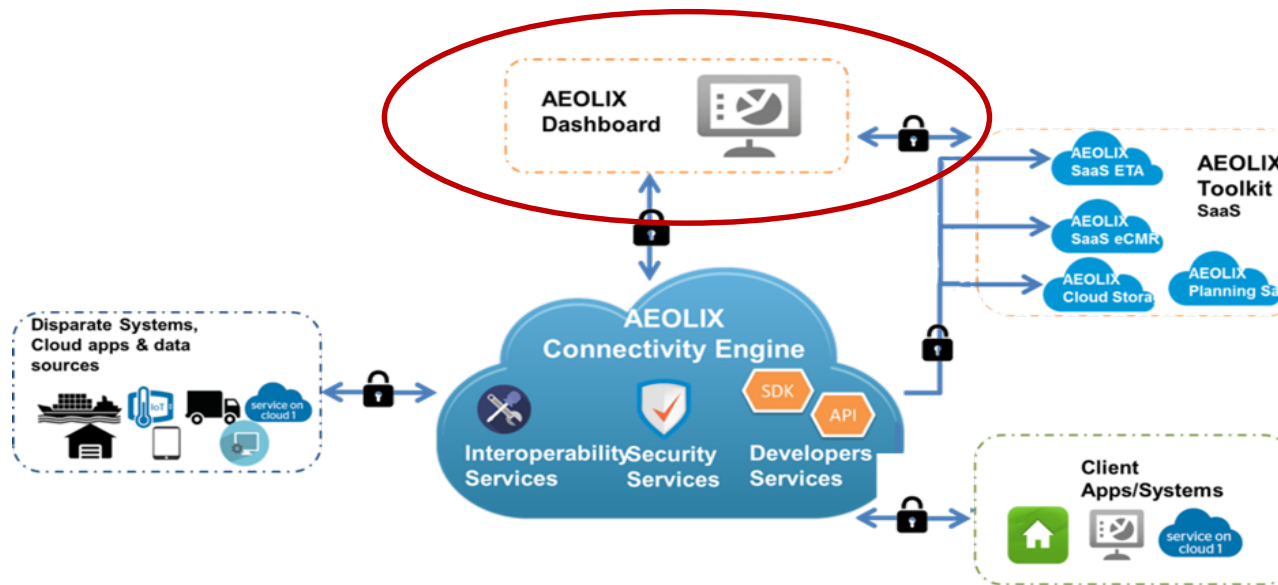
# AEOLIX IT Architecture – How It works?



## AEOLIX Toolkit

- AEOLIX toolkit is comprised of 3rd party services that will provide solutions that manage or improve specific logistics processes.
- Toolkit is available to all users in the platform aiming to use it.
- Some services identified in proposal + LLS
  - AEOLIX secure cloud storage
  - AEOLIX eDocumentation e-CMR
  - AEOLIX geographical toolkit, map and data
  - AEOLIX routing toolkit,
  - AEOLIX planning toolkit, planning services for road and intermodal service
  - AEOLIX ETA toolkit

# AEOLIX IT Architecture – How It works?



## AEOLIX Dashboard

- Front of the AEOLIX Platform, SW tool to actors enriching their supply chain visibility
  - In case actors has no system/tool, entry tool to the digital ecosystem
- Allow logistics stakeholders to share/collect data from the platform based on defined permissions
- Dashboard can be enriched with AEOLIX Toolkit / 3rd party services

# AEOLIX Living Labs

## Multi/syncromodal Transport

- Thessaloniki-Balkans & central Europe via rail/road
- Gothenburg-Hamburg, Bratislava load control centre, Trieste to three TEN-T corridors (Scandinavian-Mediterranean, Mediterranean, Baltic-Adriatic)
- Urban Bordeaux & Atlantic Corridor
- UK - Continental EU - China logistics
- Bucharest-Vienna: Inland waterway

## Intelligent Hubs

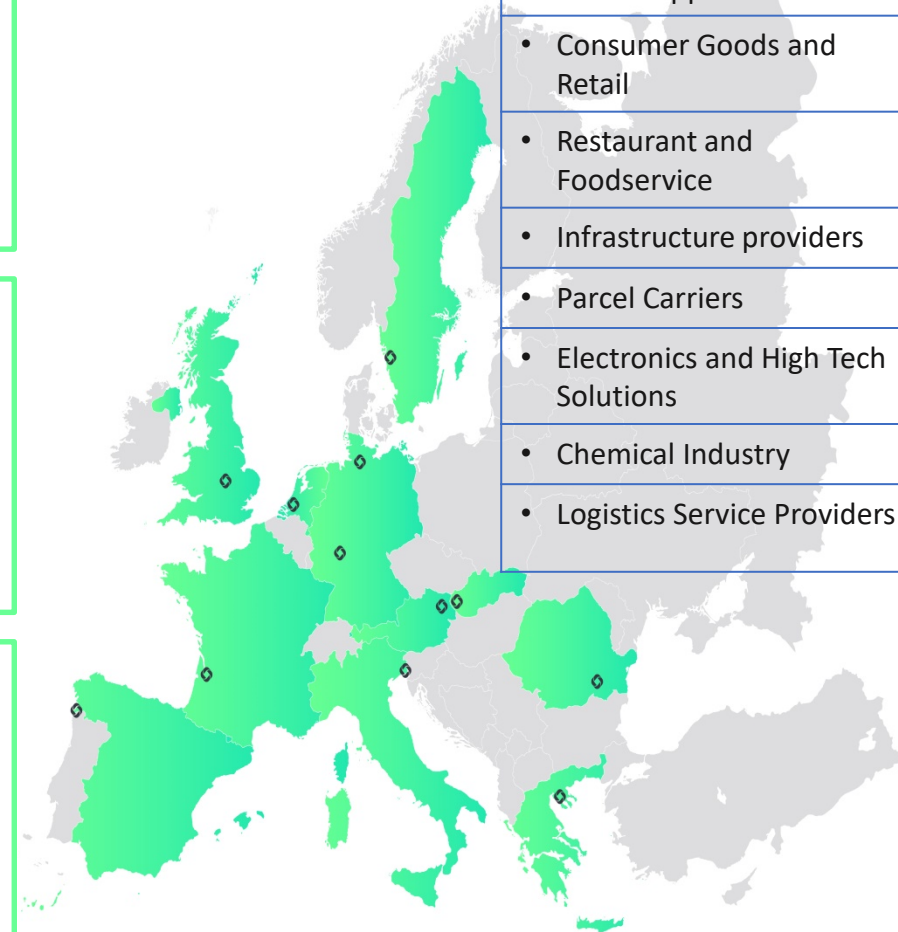
- Sea ports: Hamburg, Gothenburg, Bordeaux, Trieste
- Railway hubs: Hamburg, Trieste Northamptonshire
- Inland waterway (barge) terminals: Bucharest Vienna
- Cities: Bordeaux, Gothenburg
- Virtual freight centres: Thessaloniki Industrial Area

## Network Optimisation

- The whole logistics network, incl. ports, inland transport (road, train, barge) in The Netherlands, Germany and Spain
- All sites that will cover multi/ synchronomodal transport

## Customers (example)

- Automotive OEMS & tiered suppliers
- Consumer Goods and Retail
- Restaurant and Foodservice
- Infrastructure providers
- Parcel Carriers
- Electronics and High Tech Solutions
- Chemical Industry
- Logistics Service Providers

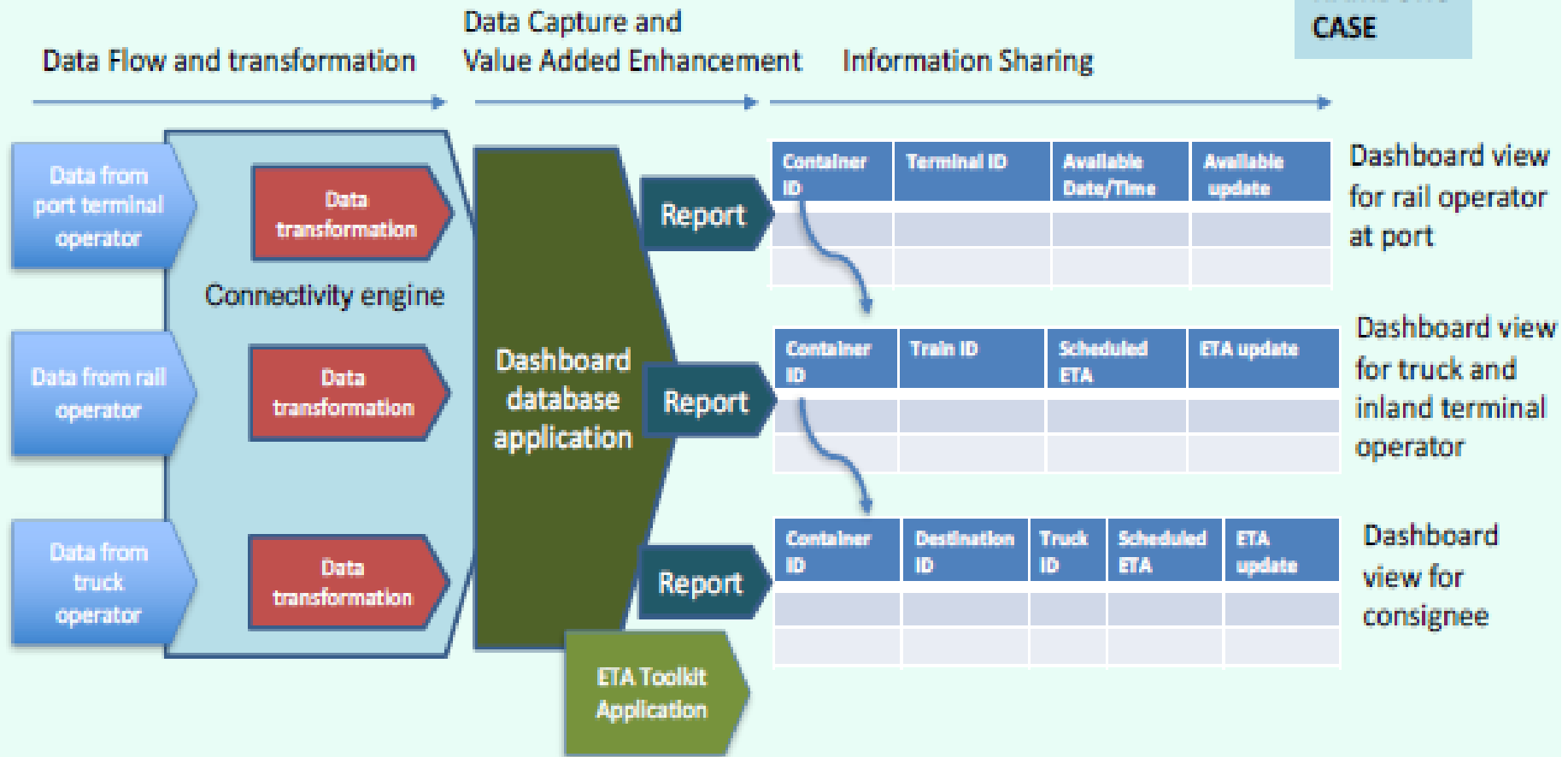


# AEOLIX e-CMR data flows and supply chain end-to-end visibility in multimodal case

*Dashboard provides a structured database for each user organization with linked data fields, enabling data from various operators to be combined into customized views for each role.*

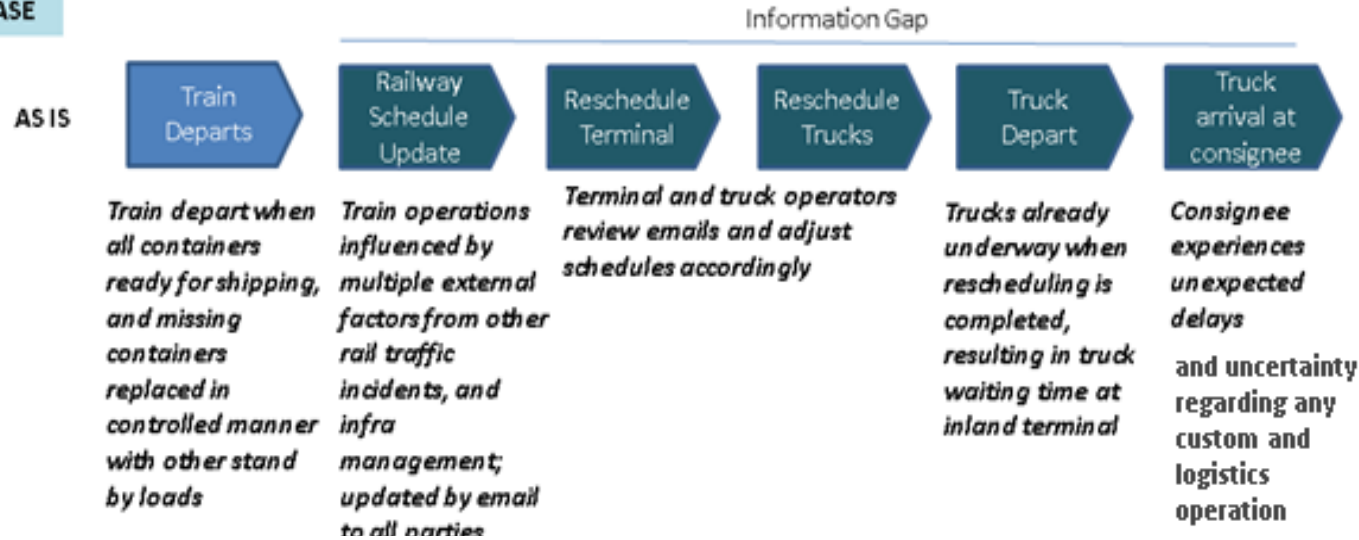
LL12 e-CMR

HAMBURG CASE

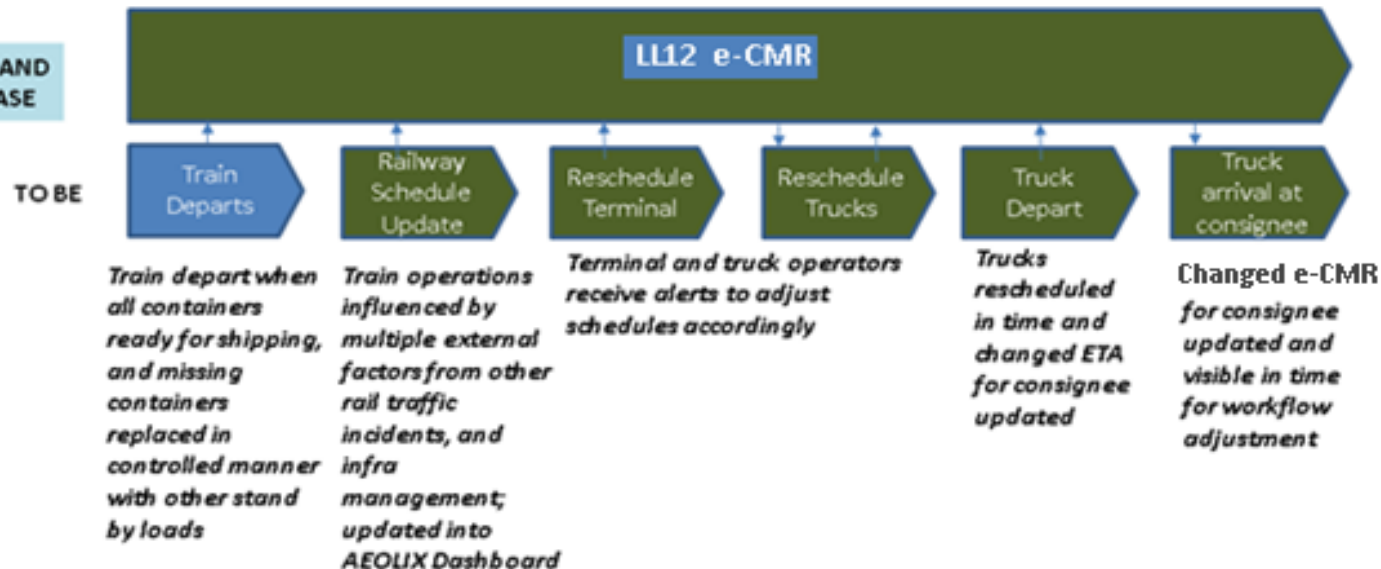


# Inland phase without/with AEOLIX

## INLAND PHASE

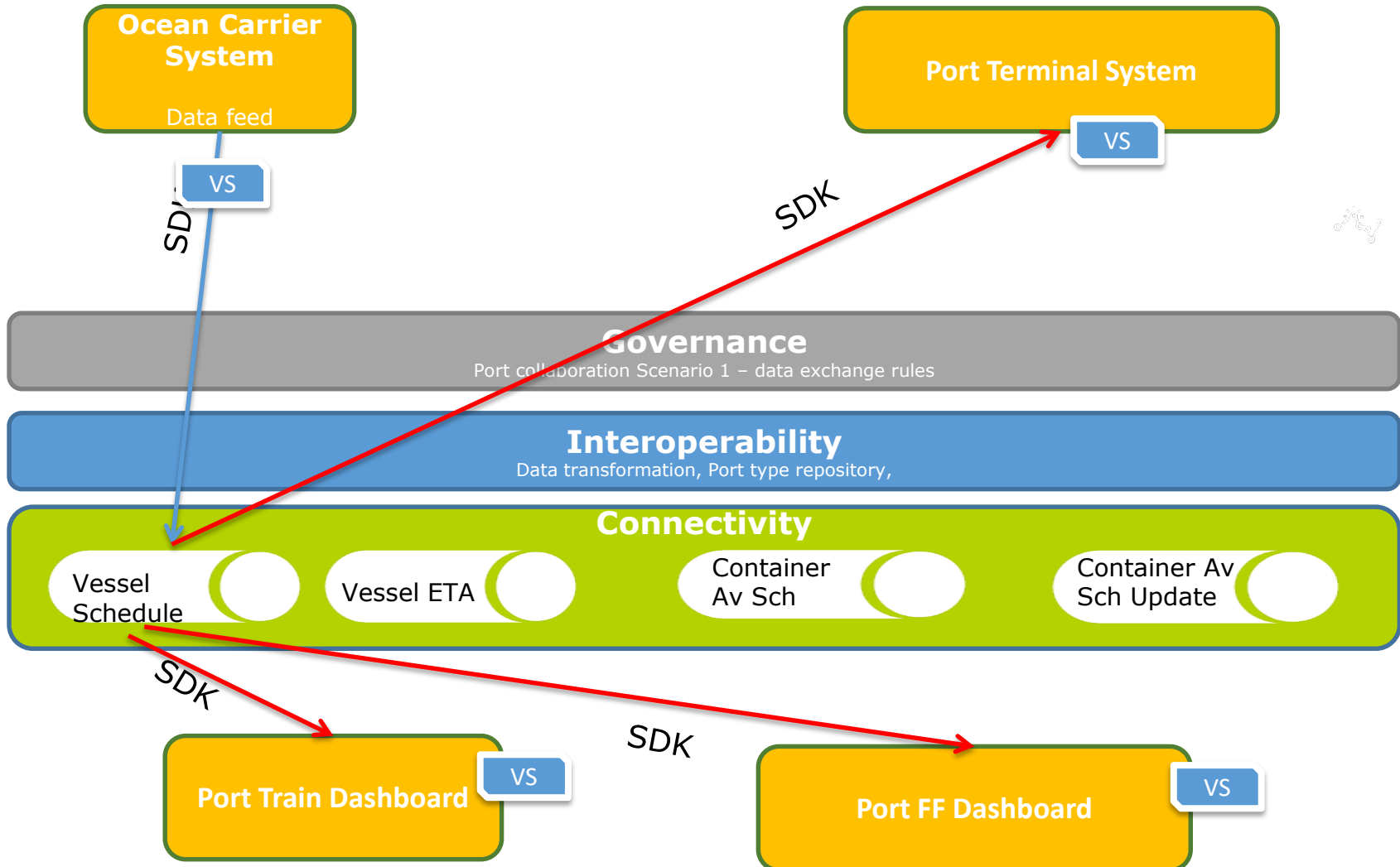


## INLAND PHASE



# Example – AEOLIX scenarios

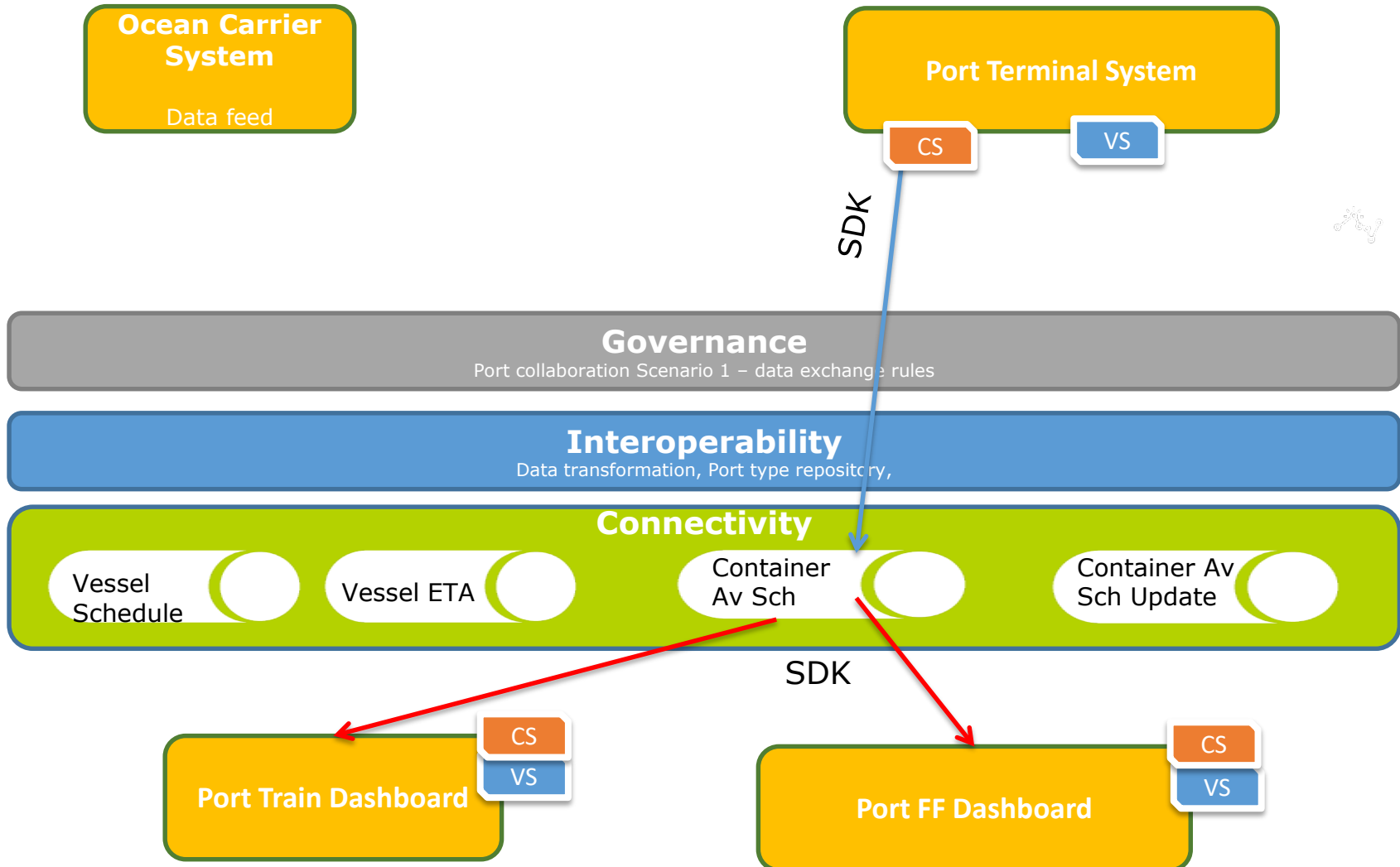
Port – Scenario 1: reduce lost business and waiting time for the train due delays of ocean carrier





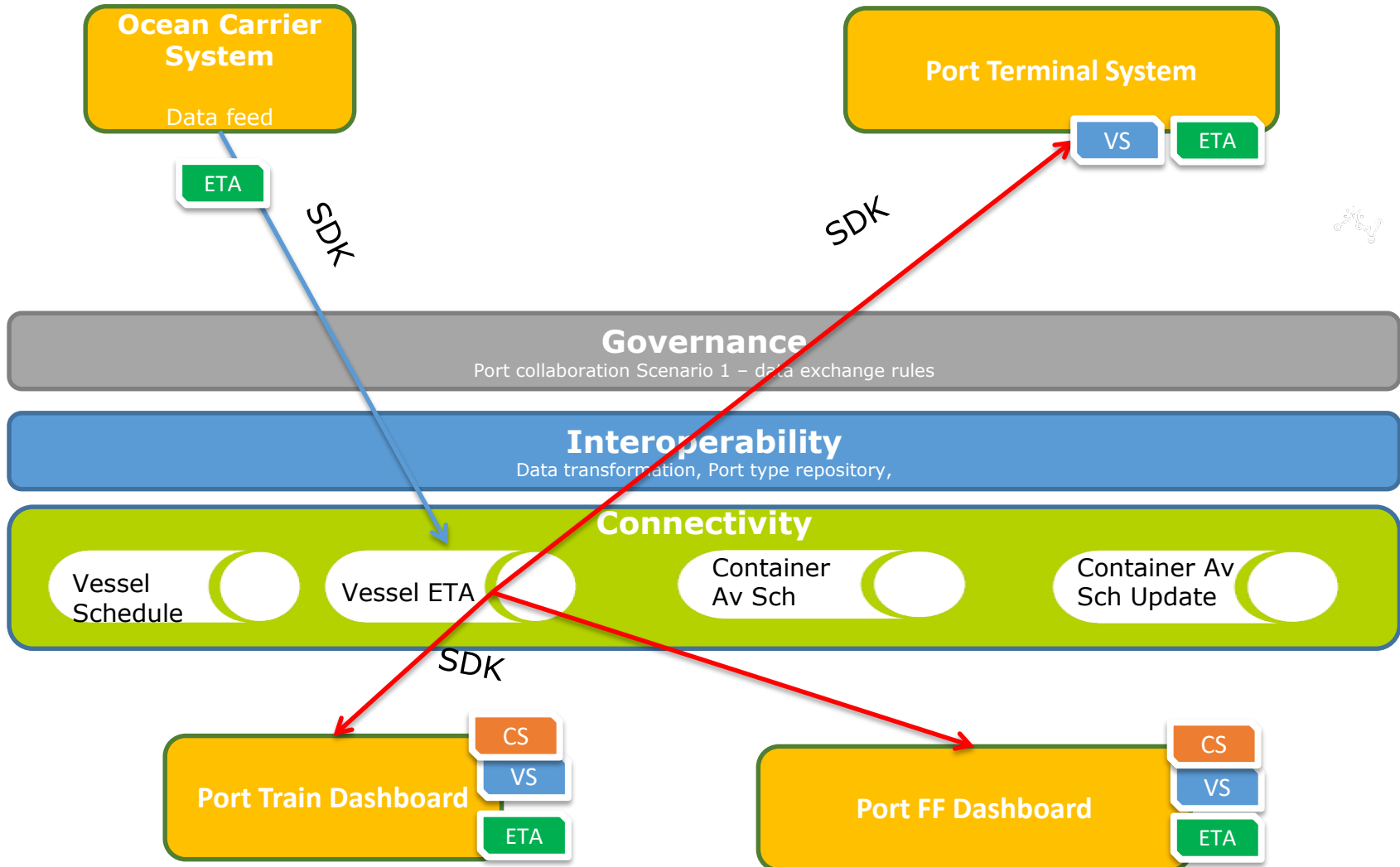
# Example – AEOLIX scenarios

Port – Scenario 1: reduce lost business and waiting time for the train due delays of ocean carrier



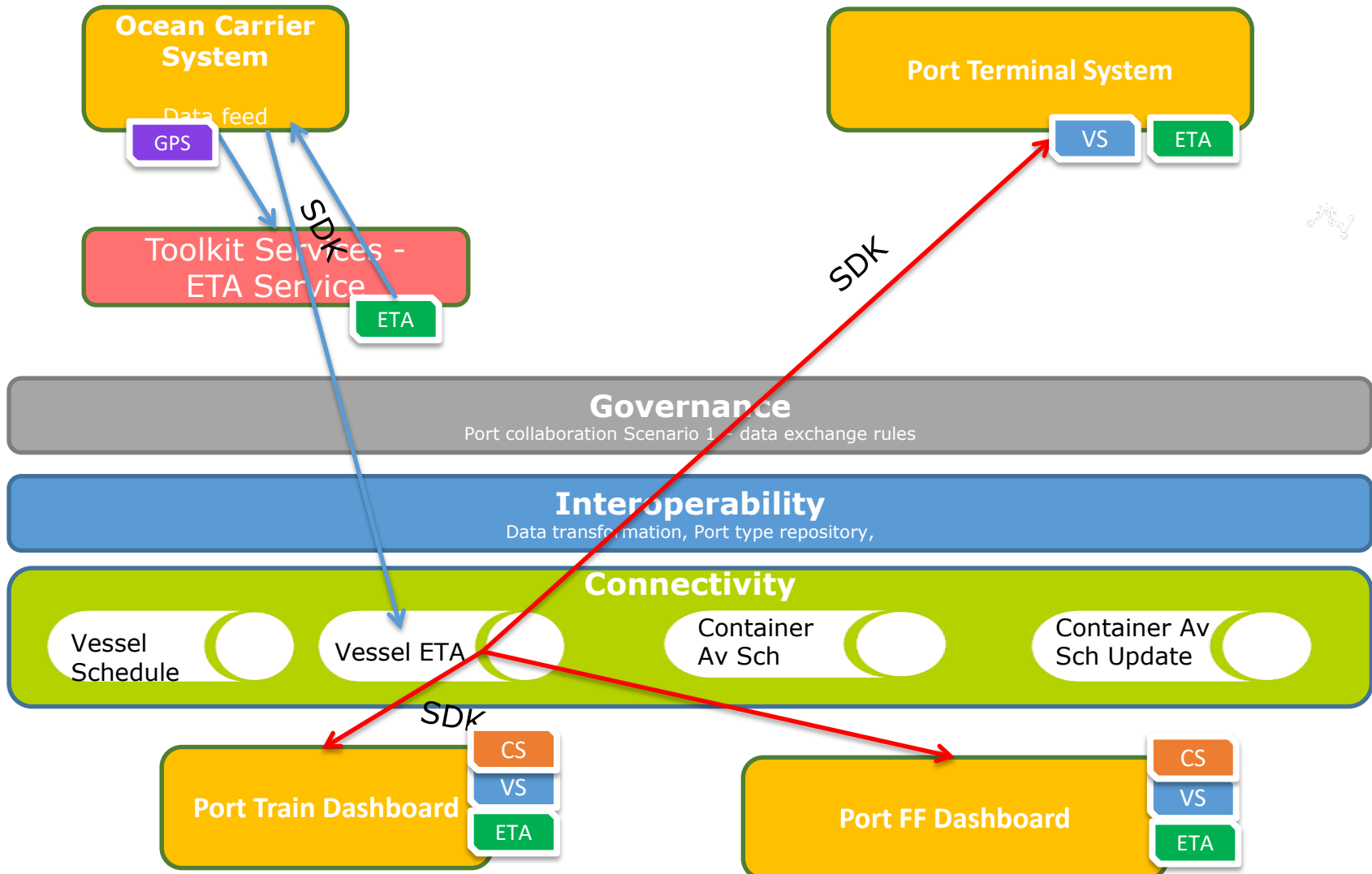
# Example – AEOLIX scenarios

Port – Scenario 1: reduce lost business and waiting time for the train due delays of ocean carrier



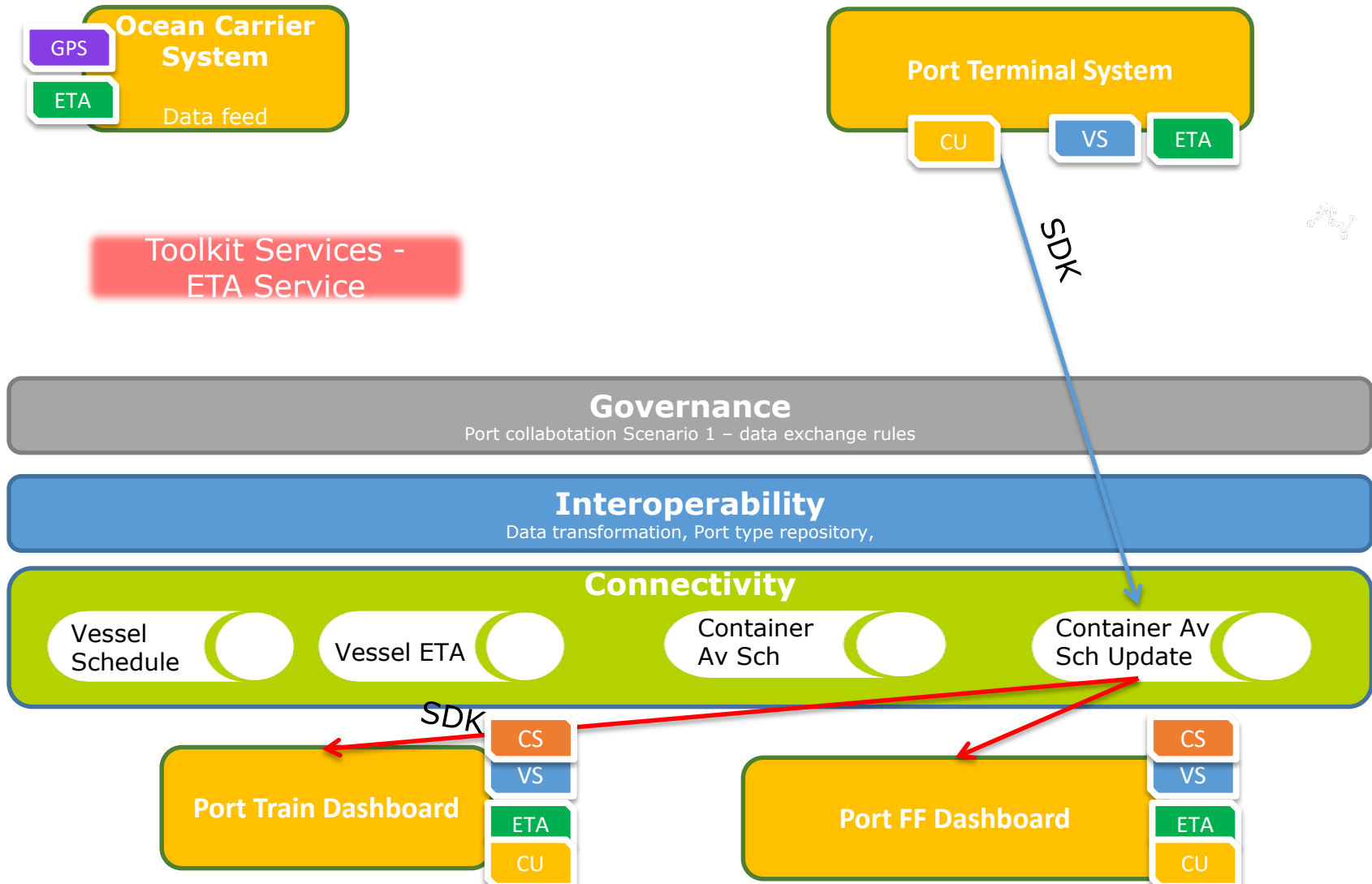
# Example – AEOLIX scenarios

Port – Scenario 1: reduce lost business and waiting time for the train due delays of ocean carrier



# Example – AEOLIX scenarios

Port – Scenario 1: reduce lost business and waiting time for the train due delays of ocean carrier



# AEOLIX → Future

Logistic Service Provider asks ...

Container #? Vessel #? Geo Position? Schedule? Origin? Destination? Living Lab 1



AEOLIX provides  
realtime information  
for all participants

LL12 e-CMR



Targets: solve any uncertainty regarding any custom and logistics operation

# AEOLIX Total counter (18.02.2019 21:00)

AEOLIX Total counter

4,742,890



a few seconds ago



Last 24h Counter

568,690



a few seconds ago



AEOLIX Dashboard counter

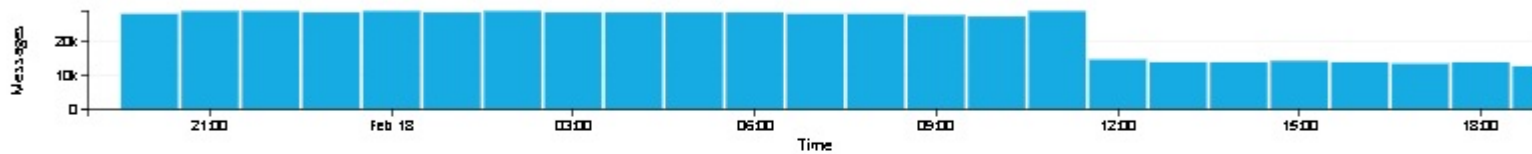
1,642,365



a few seconds ago



Last 24h Histogram



a few seconds ago



LL1 Total Operation

2,852,159



a few seconds ago



LL2 Total Operations

46,108



a few seconds ago



LL3 Total Operations

291



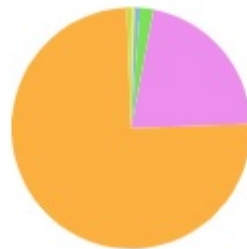
a few seconds ago



LL1 operation distribution



LL2 operations



LL3 Operation distribution



# AEOLIX benefits



*Enhanced supply chain visibility*



*More efficiency and better resilience*



*Fewer costs, less administrative burden*



*New business opportunities*



*Optimised choice of transport services*



*Better transport and event management*



*Increased load factors*



*Fewer CO2 emissions*

# Conclusions

Challenges: technical, security, new use cases,  
new business models

Innovate:

## Interoperability

Interfaces with any logistics information systems

Support continued development of standardized formats

## Technical

Distributed open system through configurable plugin APIs.

Demand driven from users rather than supply driven

## Legal

Data access, privacy, identification, authentication

Secure, Resilient and Trusted environment procedures

## Business

Enable low-complexity and low-cost connectivity

Business models and public-private governance

## Communities

Open to all stakeholders across modes, within and across related supply chains.

Towards an EU Single European Transport Area



# Next AEOLIX events

Brussels: 4<sup>th</sup> April 2019

Port de France: 2<sup>nd</sup> May 2019

Eindhoven: 5<sup>th</sup> June 2019

Hamburg: 26<sup>th</sup> June 2019

**Thank you for your attention!**

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