



PIGGY BACKING ON SUPPLY CHAIN VISIBILITY TO IMPROVE RISK ANALYSIS PROGRESS REPORT OF TWO CASES

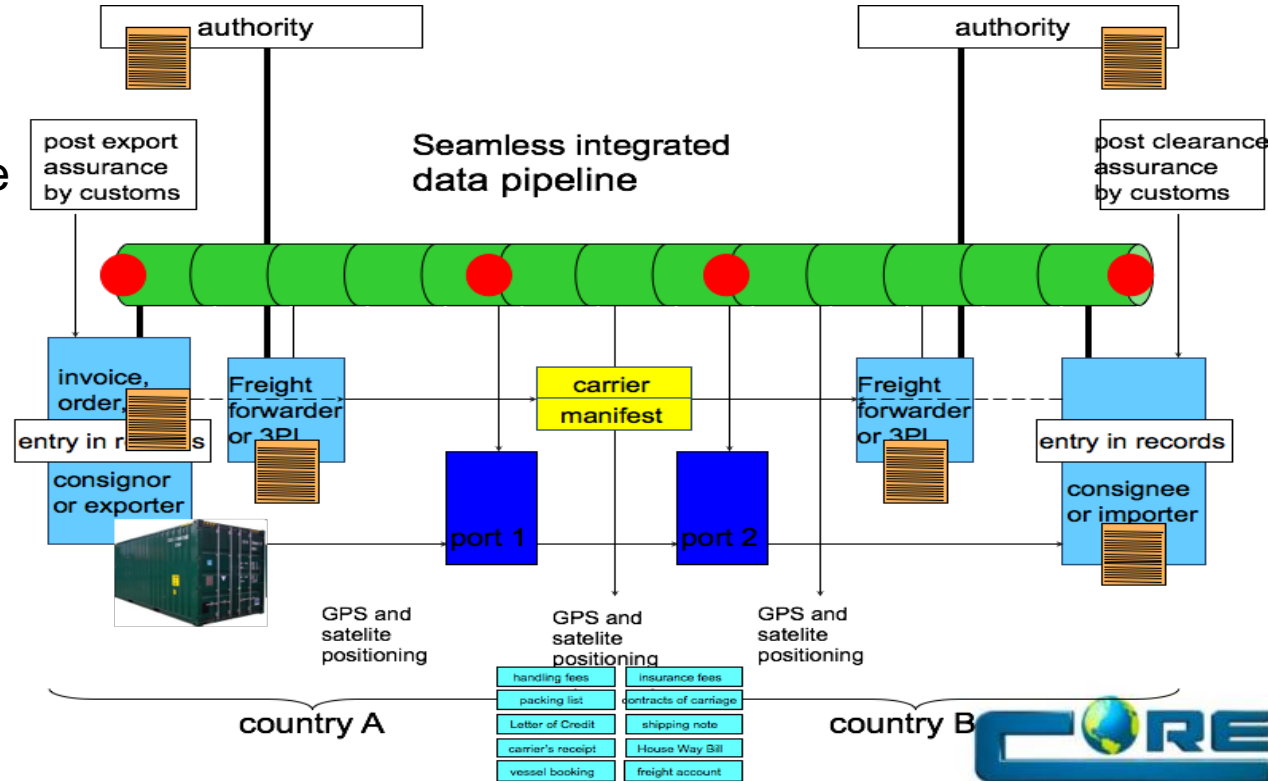


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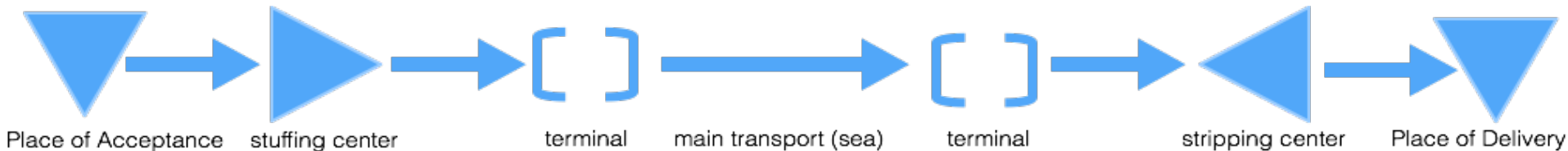
THIS PRESENTATION ...

- › Describe two cases for piggy backing on supply chain visibility for implementing the so-called data pipeline.
- › Two aspects:
 - › Data
 - › Technical infrastructure
- › Link to value models:
 - › Why share data?



WHY SUPPLY CHAIN VISIBILITY?

- › Efficiency: synchronization of physical processes in a chain to plan resources (people, facilities, assets, etc.)
 - › ETA (Estimated Time of Arrival) prediction
 - › Required action (cargo handling)
- › Examples:
 - › Place of Delivery: know which goods are coming at what time (ETA)
 - › Terminal: know ETA for loading and discharging containers
 - › Stripping center: know which goods are stuffed in containers, when the containers arrive, and where the goods have to be shipped to



› Descriptive

- › ‘knowing where the goods are’
- › sensor data (Internet of Things)
- › Visualization of location and transport means (speed and direction) by overlays on maps



› Diagnostic

- › ‘knowing what happened to the goods’
- › Traceability: compare sensor data with transaction data (place, time)
- › Visualization of past behavior on maps, compared with expected behavior and potential causes for delays

› Predictive

- › ‘knowing what will happen with the goods’
- › Evaluating the diagnostics for future state of the goods (delays, etc.)
- › Might include accidents and incidents (supply chain resilience)
- › Visualization of any foreseen delays and calculating trace for goods flows

- › Parties involved:
 - › 'buyer/seller' or 'original shipper/consignee' and 'manufacturer'
 - › 'consolidator' and 'stuffing location' ('who packed the box')
 - › 'declarant' or 'importer'
- › Consignment(s) – 'what is in the box'
 - › Shipper/consignee (may differ from above mentioned)
 - › Individual items: HS-code, value, packaging
- › Equipment (containers) used ('the box')
 - › Relation with individual consignments
- › Vessel(s)
 - › 24 hours prior to loading (ENS)
 - › After departure ('actual boxes loaded')
 - › Before arrival ('transshipment of boxes')

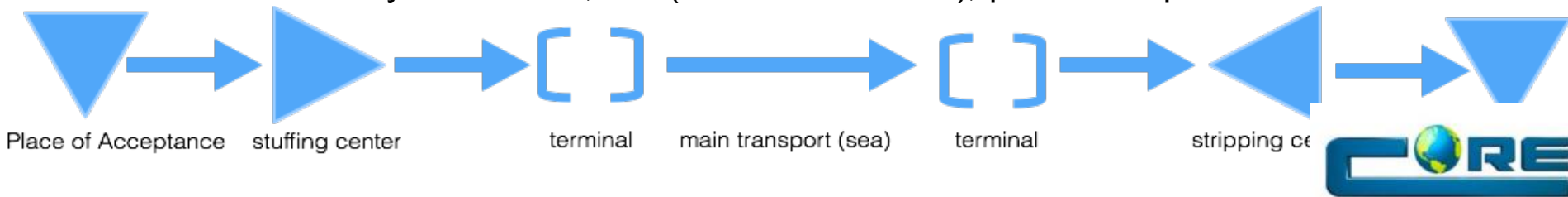
Sources:

- EU FP7 SEC Cassandra
- Importer Security Filing
- Union Customs Code/Import Control System

PHYSICAL CHAIN GENERATES THE SENSOR DATA

Each physical activity generates data

- › Place of acceptance – consignments of packed and shipped products
- › Stuffing center – packages of one or more consignments stuffed in containers
- › Terminal – containers loaded on vessel
- › Terminal – containers discharged
- › Stripping center - retrieving packages from containers for dispatching as consignments to final place of delivery
- › Place of Delivery – reception of packages and products
- › Roles
 - › Place of acceptance: warehouse, production plant
 - › Place of delivery: retail store, DC (distribution center), production plant



DOCUMENTS CONTAIN RISK RELEVANT DATA

Internal data

Production order/picking list
(order ID, line items with product IDs)

Packing list, consignment
(despatch ID, order ID, package lines
with product IDs)

Stuffing list
(container number, despatch ID, line
items with packages)

Shipment
(order number, container numbers)

Load list, manifest, stowage plan
(vessel, B/L numbers)

documents

seller/manufacturer/
exporter/LSP

Transport order
Bill of Lading (B/L)

forwarder

Transport order
Bill of Lading (B/L)

carrier/stevedore

Export (MRN, line items with
HS-codes,
packaging/container)

Customs
(at export)

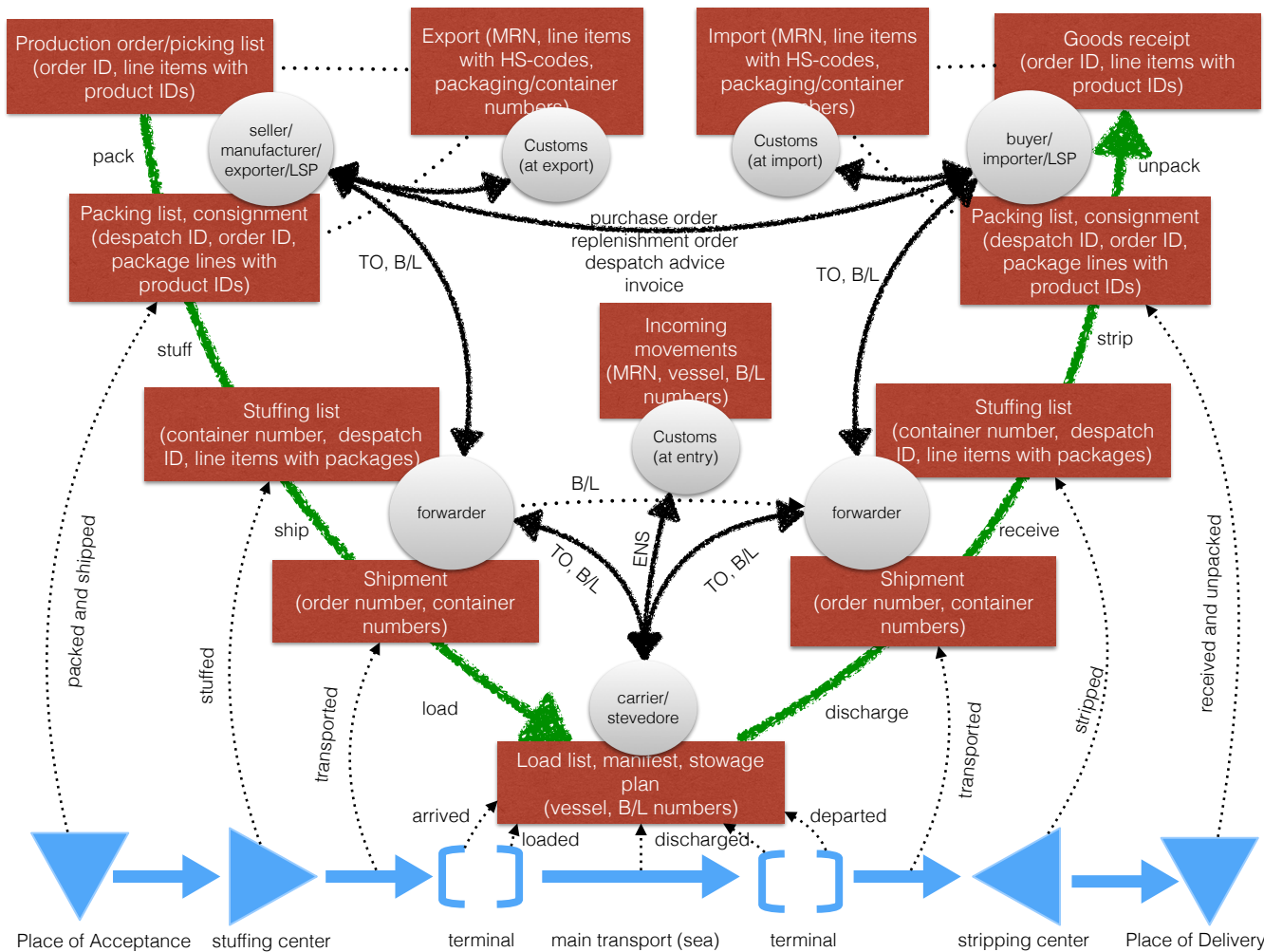
Customs
(at entry)

Incoming movements
(MRN, vessel, B/L numbers)

ENS



WE CAN DISTINGUISH AN EXPORT AND IMPORT SIDE - OVERVIEW

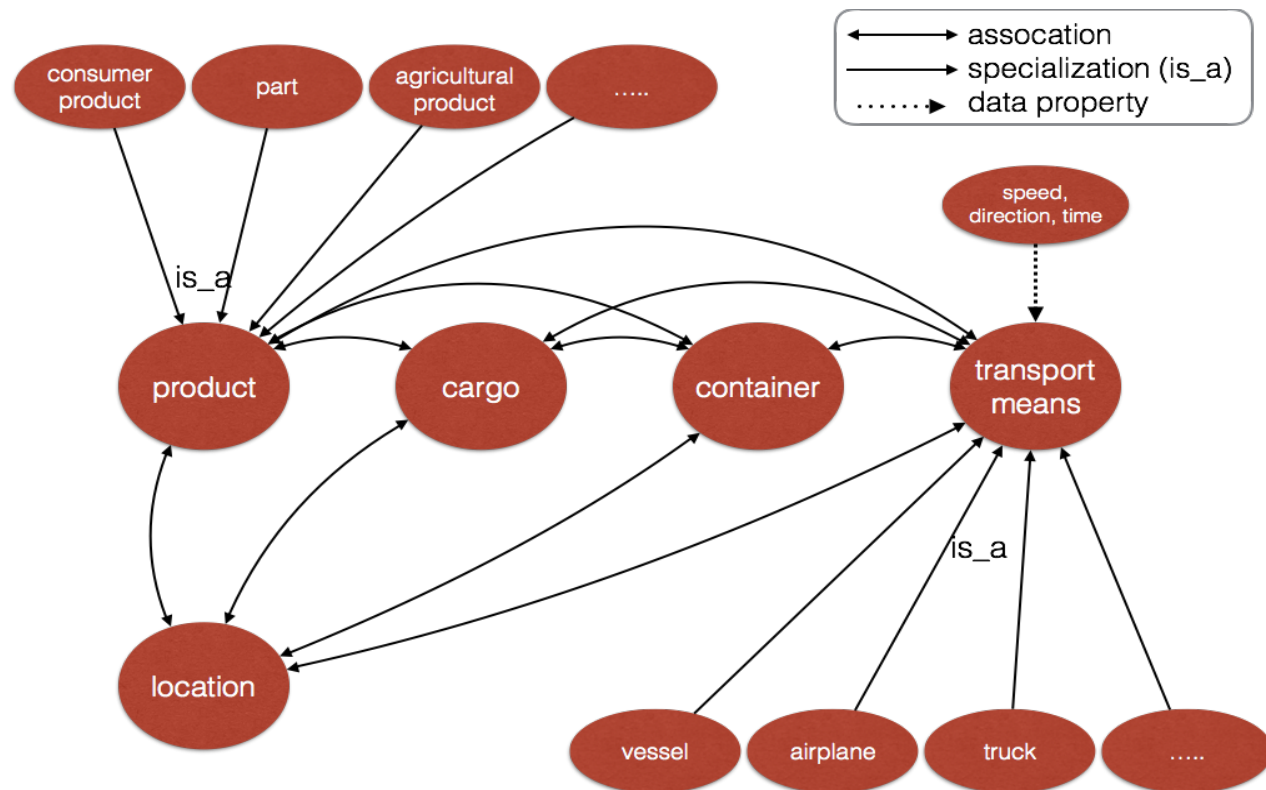


Two issues cause lack of visibility

- Lack of stuffing data
- Intermediate transshipment of containers

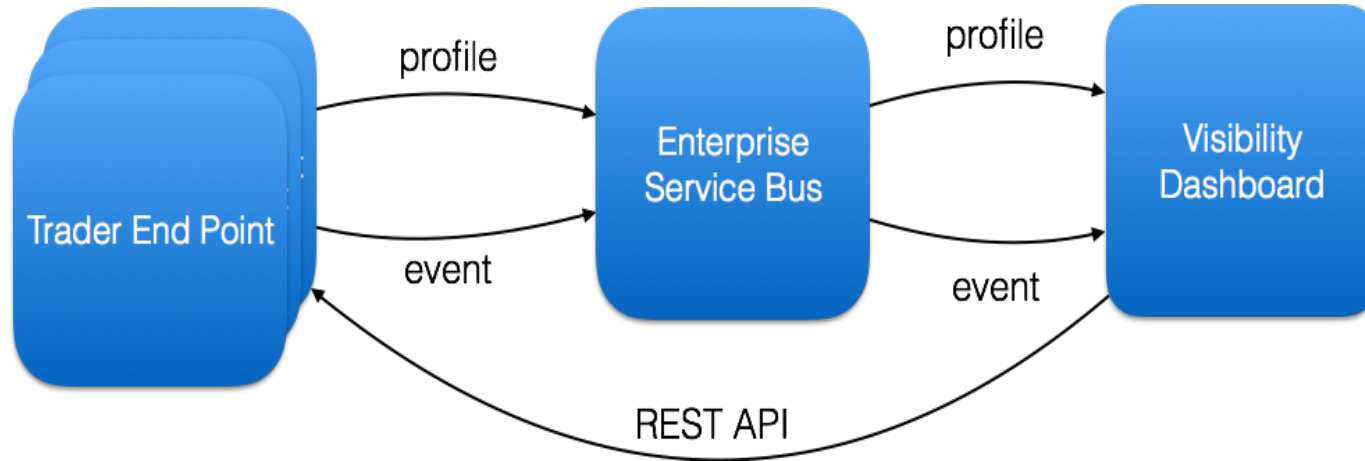
- › Conceptual data structure
- › Technical implementation
 - › Event Driven Architecture – a visibility dashboard subscribes to events indicating a change of a logistics system
 - › Trader End Point: the URL where the data can be retrieved
 - › Sensor data: streaming data stored at a Trader End Point (e.g. AIS data for vessels, truck data generated by On-board Units of for instance Transics or Astrata, train position known to Rail Net Europe)

CONCEPTUAL DATA STRUCTURE FOR VISIBILITY



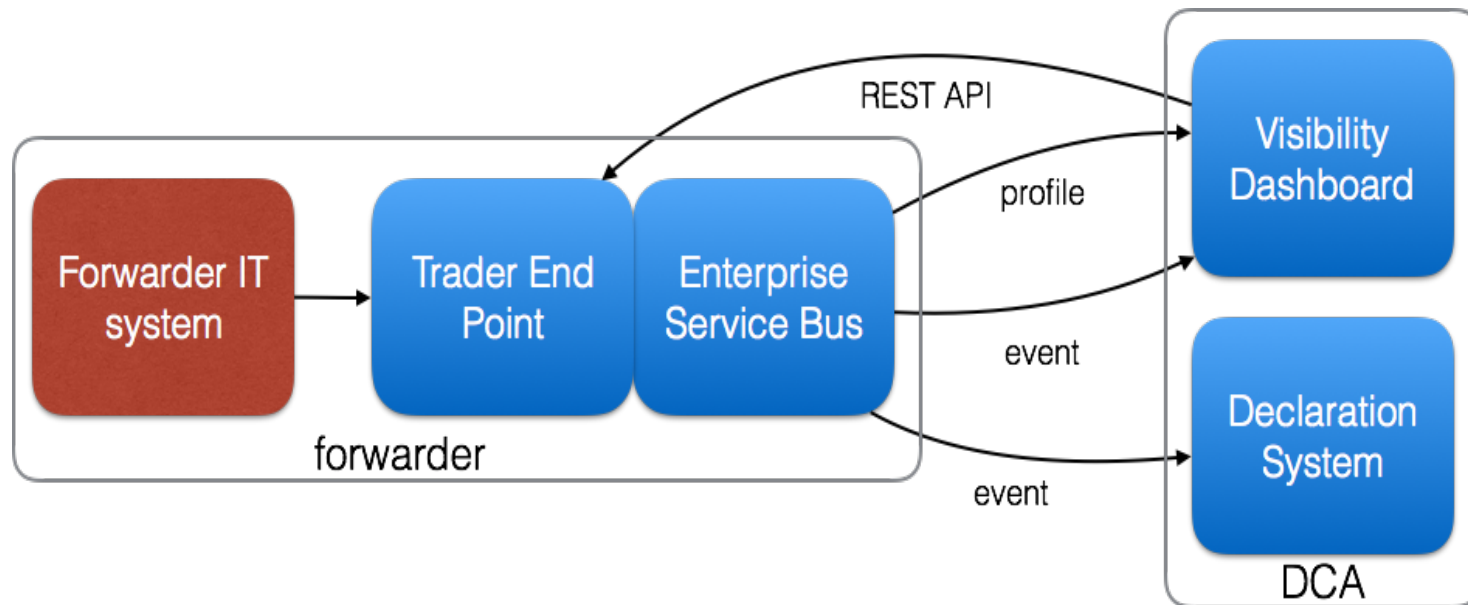
- › Each trader provides part of the data:
 - › seller/buyer – product and packaging
 - › Stuffing/stripping center – cargo packed in containers
 - › Terminals – containers on transport means (vessel, truck, train, airplane, barge)
- › Action is always at a location
- › Times
 - › Expected – customer
 - › Estimated – provider, carrier
 - › Actual – when the action took place (sensor) – provider, carrier.

TECHNICAL IMPLEMENTATION – EVENT DRIVEN



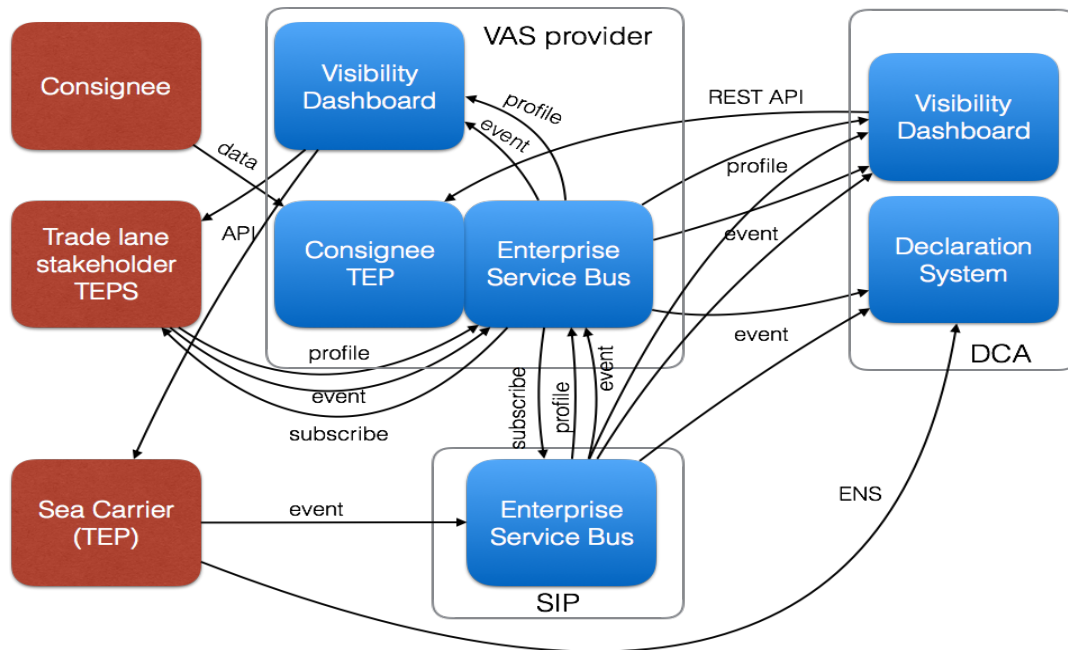
- › A visibility dashboard subscribes to data from different sources
- › Sources are represented as Trader End Points representing traders, sensors, ...
- › A trader authorizes a subscription
- › Three options to implement the functionality
 - › In the private domain
 - › Trader
 - › Value Added Service Provider
 - › Public domain – Single Window with customs dashboard

1. FORWARDER CASE



- › Forwarder provides visibility to his customers
- › Forwarder implements stores all relevant data on behalf of its customers (documents, sensor data)
- › Customers authorize forwarder to make data available to customs
- › Customs implements visibility dashboard additional to the declaration system for ENS data

2. CONSIGNEE CASE



- › Consignee uses Value Added Service provider to create visibility
- › Visibility requires data/events of all tradelane partners
- › Two tradelanes of the consignee
 - › Air – via the VAS provider
 - › Sea – via the ESB called Shipping Information Pipeline of carriers

- › ‘Piggy backing’ of customs on commercially motivated supply chain visibility depends on:
 - › Availability of a federated infrastructure with open standards (events, profile, APIs)
 - › Federated: trader, commercial solutions (VAS provider), and community (carrier) solutions
 - › Willingness of traders to collaborate for optimizing processes by sharing (access to) data

- › Completeness of data for risk analysis – to be validated
 - › Basically all data is available in supply chains
 - › Deal with different data sets and formats (XML, PDF, EDI, CSV, ...)
 - › Data extraction from data sets provided by one or more TEPs to construct UCC/ICS data set
 - › Data extraction is a service of a trader (e.g. forwarder) or is performed in the public domain (piggy backing)

- › Data completeness – an option is to prescribe the way data is provided (HMRC CORE demo)
 - › Four way points: stuffing center, after departure of a vessel from the last port of call, before arrival prior to the first port of call in the EU, stripping center
 - › Push: predefined message structures

**CONSTRUCT A FEDERATED INFRASTRUCTURE
WITH OPEN STANDARDS FOR LARGE SCALE
IMPLEMENTATION**

**VALIDATE PIGGY BACKING
ON SUPPLY CHAIN VISIBILITY**

**COMBINE DIFFERENT APPROACHES (PREDEFINED MESSAGE
FORMATS AND EVENTS GENERATED BY TRADERS)**



› THANKS FOR YOUR ATTENTION

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