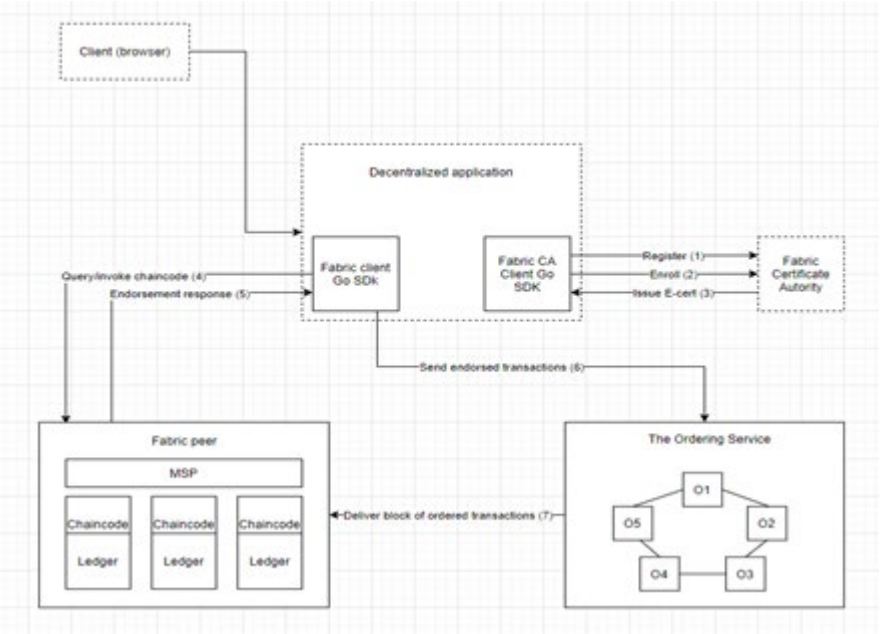
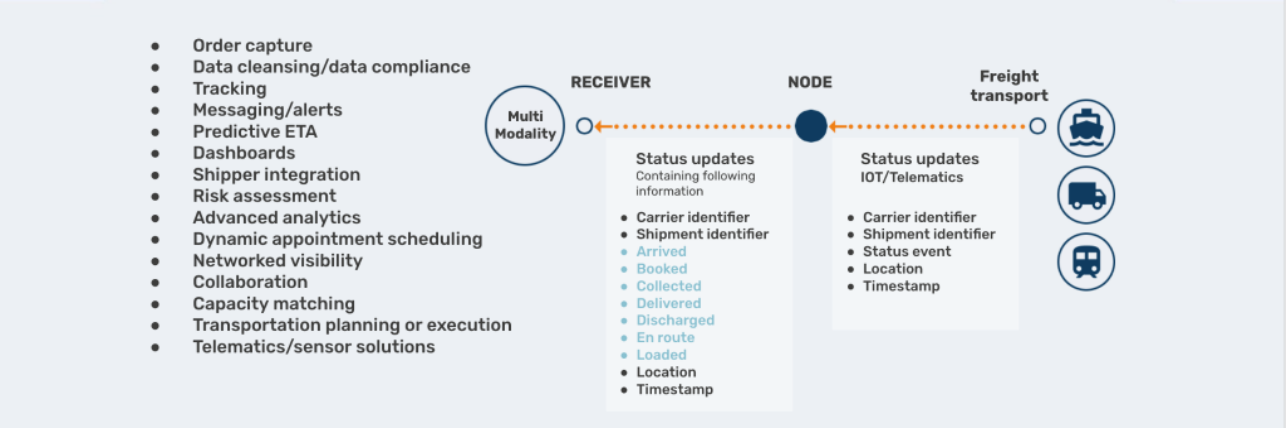
LL23 RealTimeMultimodal Transportation Visibility Platform Services/Ahola/Attracs

Information based on previous input

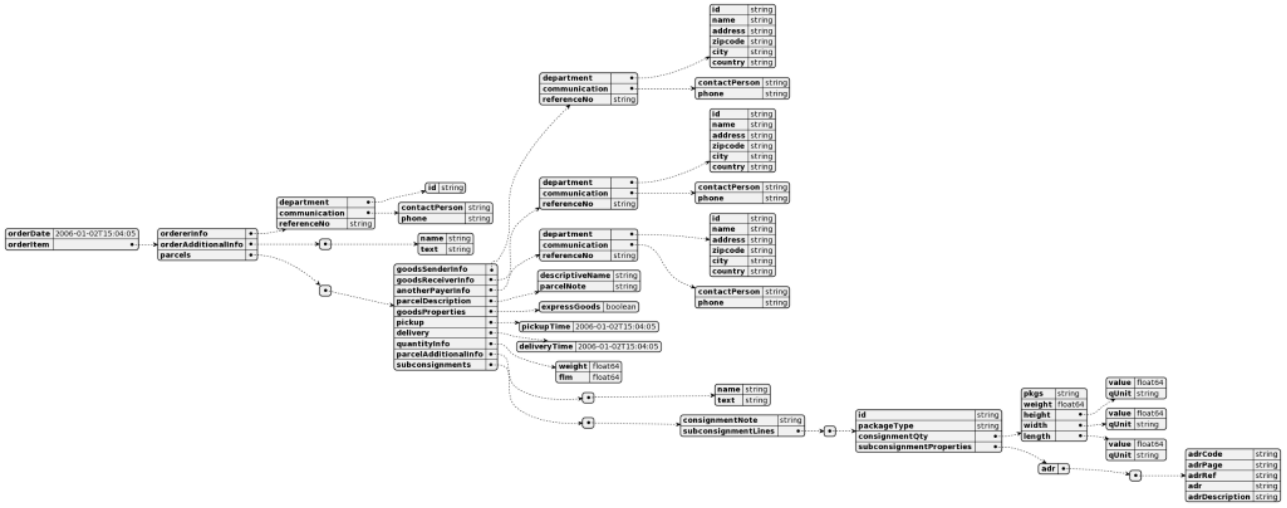
The platform services that are being developed are using web standards for the flow of data (exchange and visualization). In our services the data is exchanged directly among the involved parties of the logistics chain, without any intermediary and physical movement of freight. The image below illustrates the architecture of the platform.



The image bellow illustrates a simplified version of the shipment tracking status event message we utilize in our platforms. Our integration services (node) receive the events from the telematic systems of the vehicles and than broadcast them (using pubsub) to the applications that are interested in those events.



The schema below represents the uml-formatted order object. Each order holds the information about the sender, receiver, payer, pickup and delivery details, consignments, adr details.



When the trip is being planned, the trip object contains the carrier and order (shipment) identifiers. By combining these events with the data from the TMS systems we are than able to display the relevant, up-to-date statuses to the cargo owners and to the backoffices. When the integration service receives the status message, the status of the trip is being updated. As each order is assigned to the trip, the order's status is gets updated as well. Concept

What use is made of a common, FEDeRATED semantic model and how would you like to use it?

- Mapping of data flows to transaction patterns:
    i. The LL is aiming to create general services that can be easily adjusted to any customer, but the potential customer would still need to formulate its goals;
    ii. The requirements and the costs for performing a business service are the subject to discussion with each customer;
    iii. The developments might lead to the refinement of customers expectations
    iv. All the events of completion as well as possible adjustments are reported to the customers
- Mapping of data objects to the semantic model - covered by the semantic model.
- Interactions and their structure:
    The primary syntax for sharing the data is JSON and the data is being shared via the REST APIs. The data flows is covered by the semantic model. The graphql is currently evaluated as our semantic query model along with JSON-LD in later phase sparql could be used as well.

Identification of relevant functionality of the architecture:

- Identification and authentication – the standard that is being used is OAUTH2.0. Additionally, the X.509 certificates for authorization are being researched as part of Blockchain Apache Hyperledger and we have been analyzing W3C Decentralized Identifiers (DIDs).
- Service Registry – no specific service registry as of today under investigation of W3C Web of Things (WoT) and its architecture WoT-architecture .
- Visibility/index – this is a subject for further consideration based on the chosen FEDeRATED solution; the LL will adjust to the opted solution however we are investigating WoT Discovery;
- Access policies – each enterprise should be able to formulate its own acces policy, but this is a subject for further consideration based on the outcomes of cooperation between Living Labs;
- Data transformation (e.g. semantic adapter) – the data format is defined by the Living Lab but is a subject to adjustments based on the requirements of the carriers and cargo owners;
- Data storage – the data is stored by the Living Lab;