



Towards a Shared European Logistics Intelligent Information Space



The SELIS Community Node



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IPIC 2019

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The SELIS case

A framework to promote collaboration

- Data sharing
- Infrastructure and technology sharing
- State-of-the art innovations

Streaming/Static Data in SELIS

- Logistics documents
- Sensor data (AIS, GPS)
- External sources of information (weather conditions, etc.)
- Business operation workflows

The objectives

- Streamline logistics workflows
- Introduce collaborative tools to improve planning
- Optimize resource management
- Increase supply chain visibility
- Measure quality and efficiency of services provided
- Optimize in terms of environmental impact – Green logistics

The challenges

- Significant discrepancies in technological adoption between stakeholders
- Cloud solution adoption barriers
-

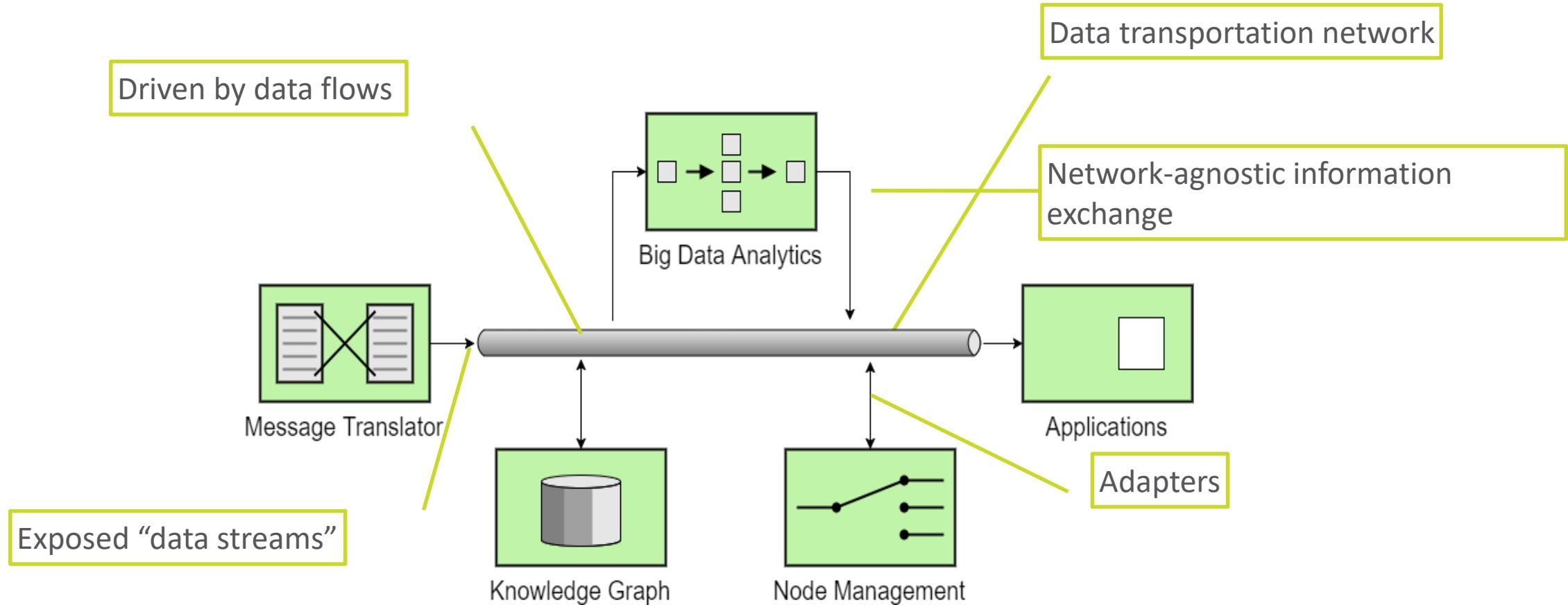
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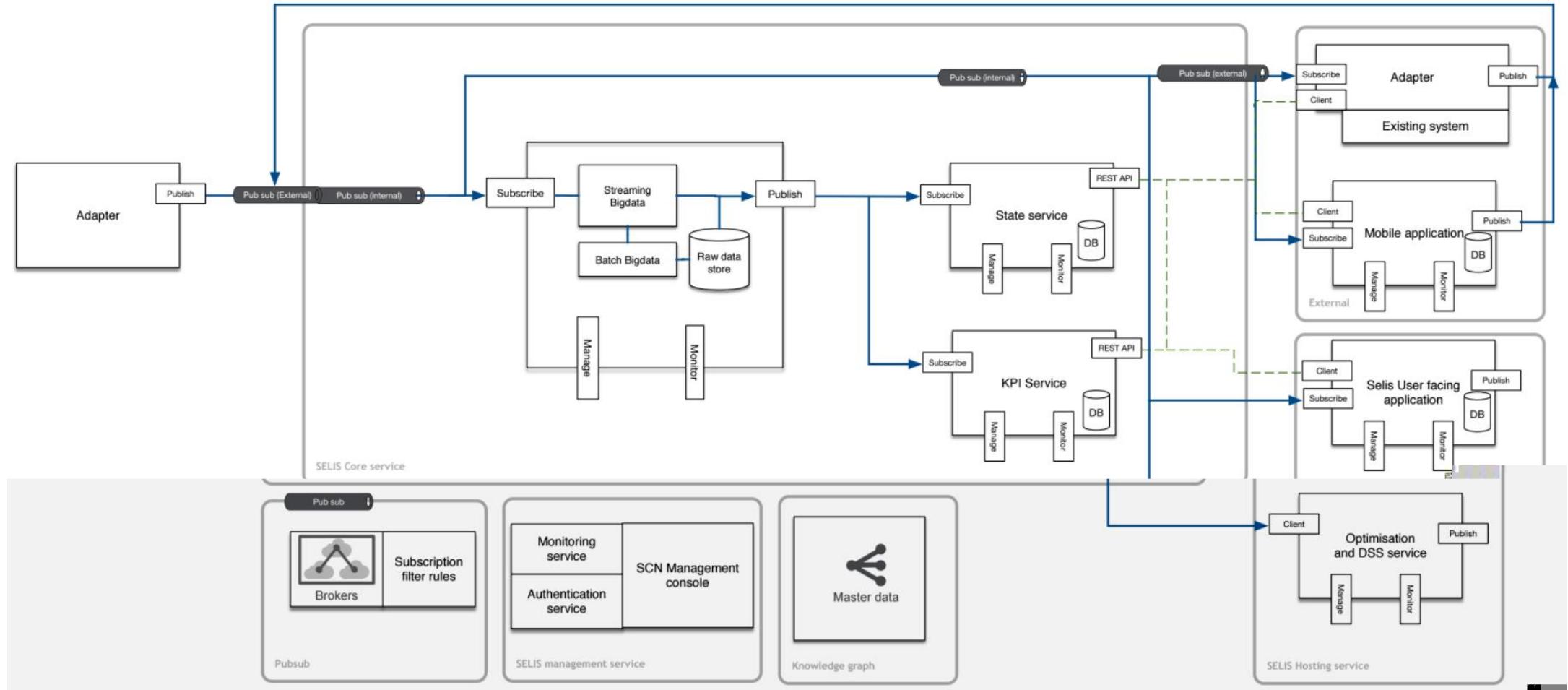
SELIS Data Sets Overview

Abstract Data Flow Architecture

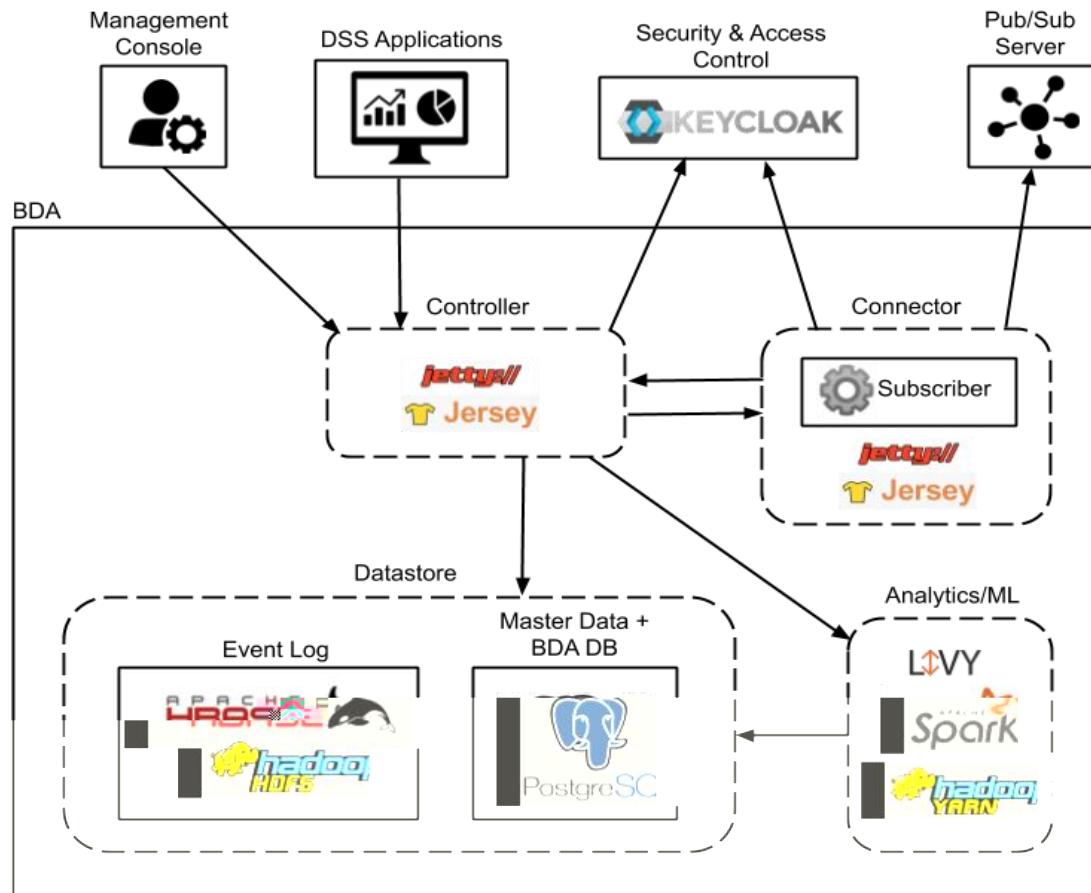
● Abstract Architecture



Detailed SELIS Community Node Architecture



Big Data Enabled Architecture



- BDA (Big Data Analytics) Module
- Includes various subcomponents
- Communicates with external systems
- Docker Image for each sub-component

Data Storage (I)

● PostgreSQL Database

› BDA DB

- Execution engines
- Shared recipes
- SCN info

› Metadata schema for each LL DB

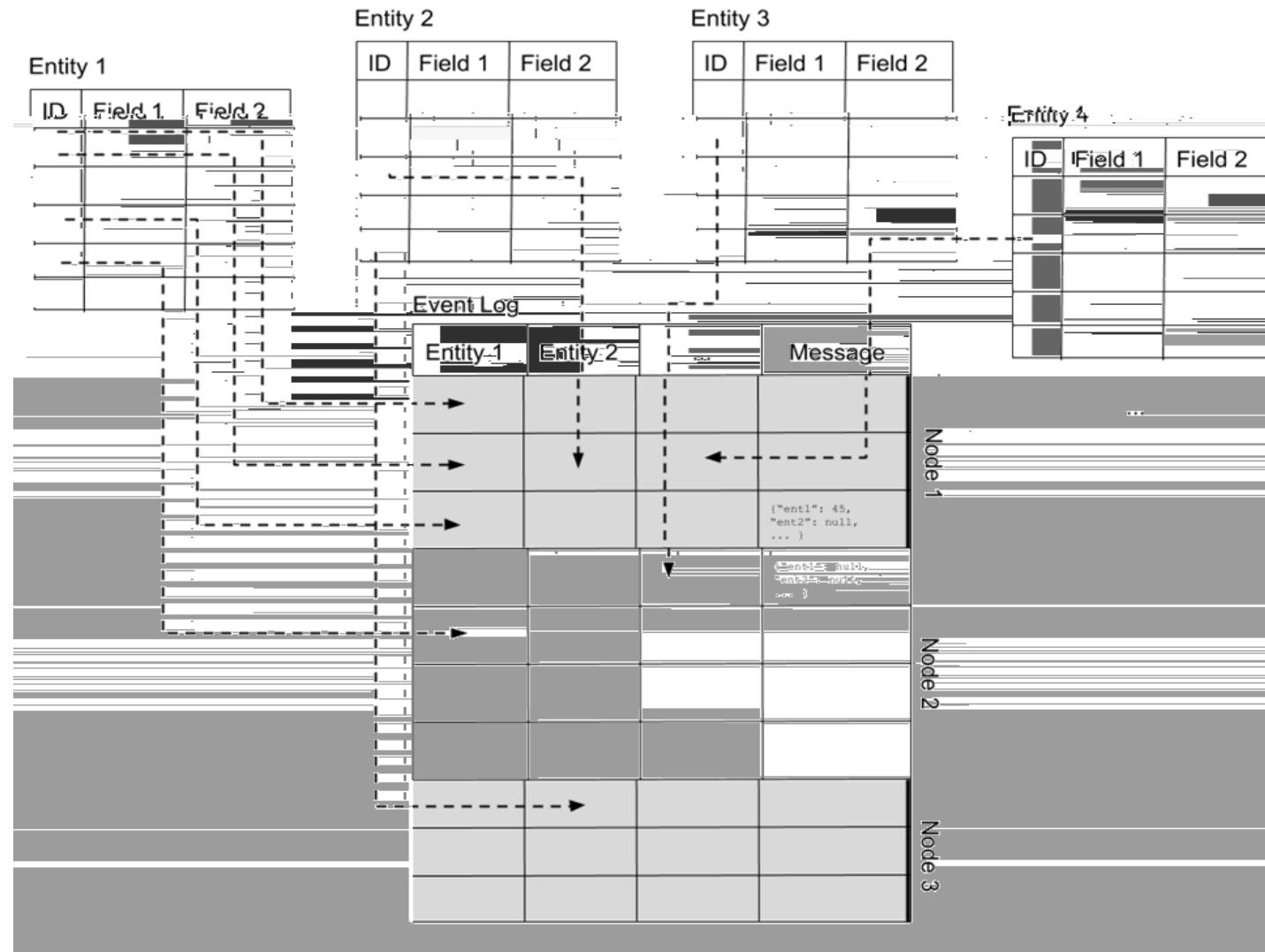
- Message Types
- Jobs
- Recipes



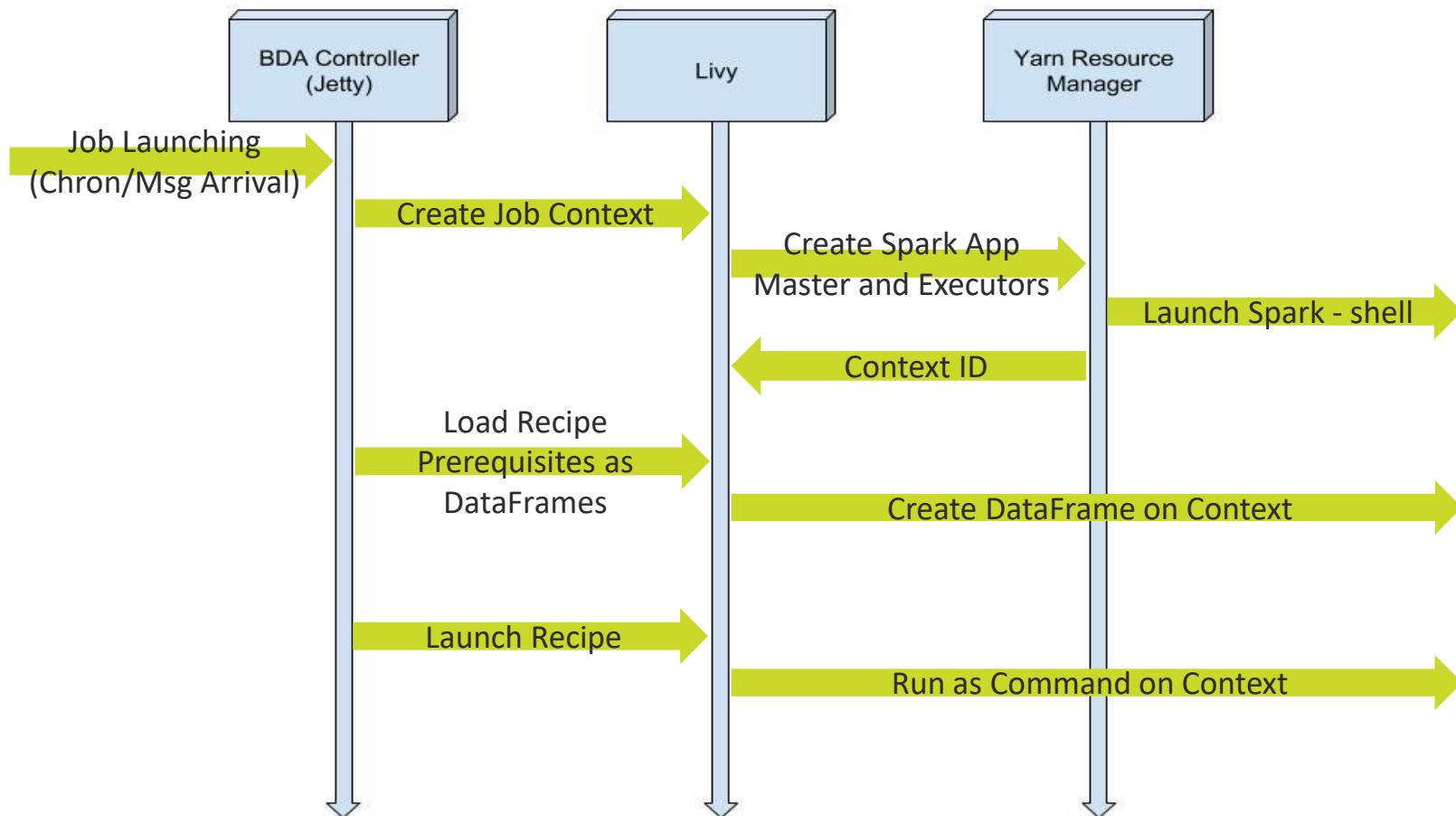
Data Storage (II)

- Generic Approach Supporting many LLs
- Different DB for each LL . Contains:
 - › Metadata Schema
 - › Dimension Tables (Generally static LL Data)
- Messages Stored on HBase Table (Event Log)
 - › Different Namespace for each LL
- Can be created dynamically using BDA REST API at LL Bootstrapping
 - › Internally using Java Connectors to create HBase/Postgres Tables
 - › Developers can use custom Java connectors for other Systems (e.g. Cassandra, MySql, ...)
 - › REST Calls for Message Type, Recipe, Job creation

SELIS Star Schema



Recipe Execution



BDA Code Location

- Java code organized in 2 Gitlab projects with various submodules

<https://selis-gw.cslab.ece.ntua.gr/gitlab/selis/bda>

Big Data Analytics and Machine Learning System  0  0  git@selis-gw.cslab.ece.ntua.gr:selis/bda     Global

Files (5 MB)	Commits (356)	Branches (14)	Tags (0)	Readme	Add Changelog	Add License	Add Contribution guide	Set up CI
Name	Last commit			Last update				
└ bda-analytics-ml	fix compilation errors			2 weeks ago				
└ bda-controller	fix subscription info for external connectors			a day ago				
└ bda-datastore	added new rest call to create message service and added m...			2 weeks ago				
└ common	set external properly in the bean.			2 weeks ago				
└ conf	use external subscriber for messages that need to be sent to...			2 weeks ago				
└ docker	use external subscriber for messages that need to be sent to...			2 weeks ago				
└ examples	Merge branch 'bda_external_connectors' of selis-gw.cslab.ec...			2 weeks ago				
└ kpi-db	update kpi table schema to use correct message columns			a month ago				
└ .gitignore	ignore bin folders			9 months ago				
└ README.md	move properties file and create template			9 months ago				
└ compile.sh	added mvn clean command to avoid errors appearing on st...			5 months ago				
└ pom.xml	refactor analytics and ml modules with one runner class			4 months ago				
└ run.sh	Separate hadoop, spark, hbase containers working.			3 months ago				

<https://selis-gw.cslab.ece.ntua.gr/gitlab/selis/bda-subscriber>

BDA Subscriber  0  0  git@selis-gw.cslab.ece.ntua.gr:selis/bda-subscriber     Global

Files (1.9 MB)	Commits (6)	Branches (4)	Tags (0)	Readme	Add Changelog	Add License	Add Contribution guide	Set up CI
Name	Last commit			Last update				
└ bda-subscriber	work with public and secure pubsub server			a day ago				
└ conf	initial on aeolix forwarder.			a month ago				
└ docker	work with public and secure pubsub server			a day ago				
└ .gitignore	first commit of bda subscriber			4 months ago				
└ README.md	first commit of bda subscriber			4 months ago				
└ compile.sh	first commit of bda subscriber			4 months ago				
└ pom.xml	first commit of bda subscriber			4 months ago				
└ run.sh	first commit of bda subscriber			4 months ago				

Different connectors developed in different branches!

BDA Code Execution (I)

- Steps for a complete local containerized BDA deployment:

1. Clone the code

```
> git clone git@git@gw.cslab.ece.ntua.gr:selis/bda.git
```

```
> cd bda
```

```
> git clone git@git@gw.cslab.ece.ntua.gr:selis/bda-subscriber.git
```

```
> cd bda-subscriber
```

2. Create the configuration based on the provided templates

```
> cp conf/bda.properties.template conf/bda.properties
```

```
> cp conf/bda-subscriber.properties.template conf/bda-subscriber.properties
```

3. Launch the containers

```
> cd docker
```

```
> ./sls.sh run all
```

```
> cd docker
```

```
> ./sls.sh run subscriber
```

After this we are logged in inside the selis-controller and the selis-subscriber containers that contain the code.

4. Compile the code and run the servers (inside the containers)

```
> ./compile.sh && ./run.sh
```

```
> ./compile.sh && ./run.sh
```

The BDA controller API is available on localhost:9999

BDA Code Execution (II)

- Curl examples exist in the bda/examples folder for using the BDA REST API:

2. Create the databases for a new SCN: _____ . _____ / _____ . _____ / _____
_____ | _____ // _____ . _____ / _____ / _____ / _____

3. Create a message type to subscribe to: _____ . _____ / | _____ . _____ / |
| _____ | _____ . _____ / | /n _____ / }

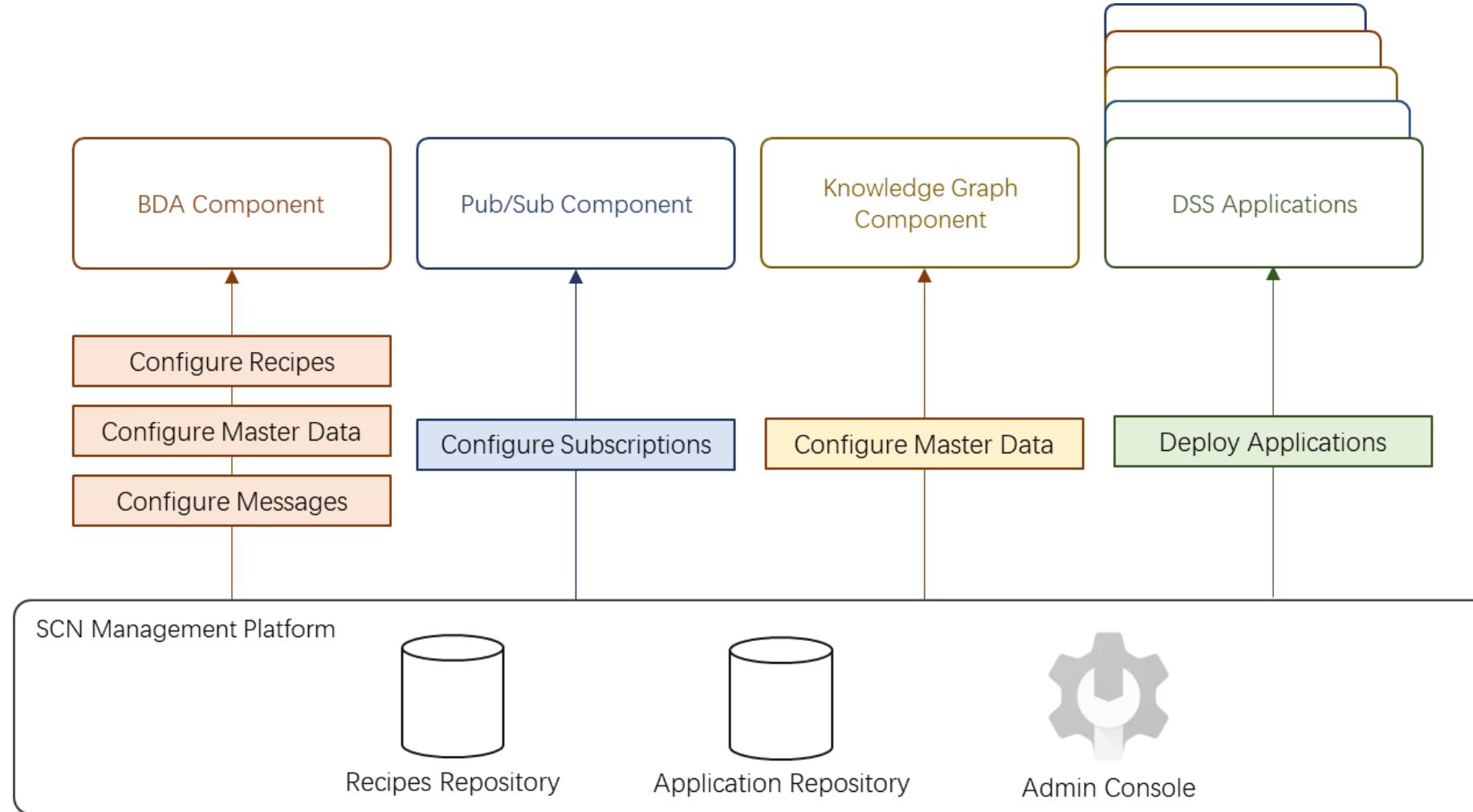
4. Create a recipe:

_____ . / n c
// . / / / } / / } /

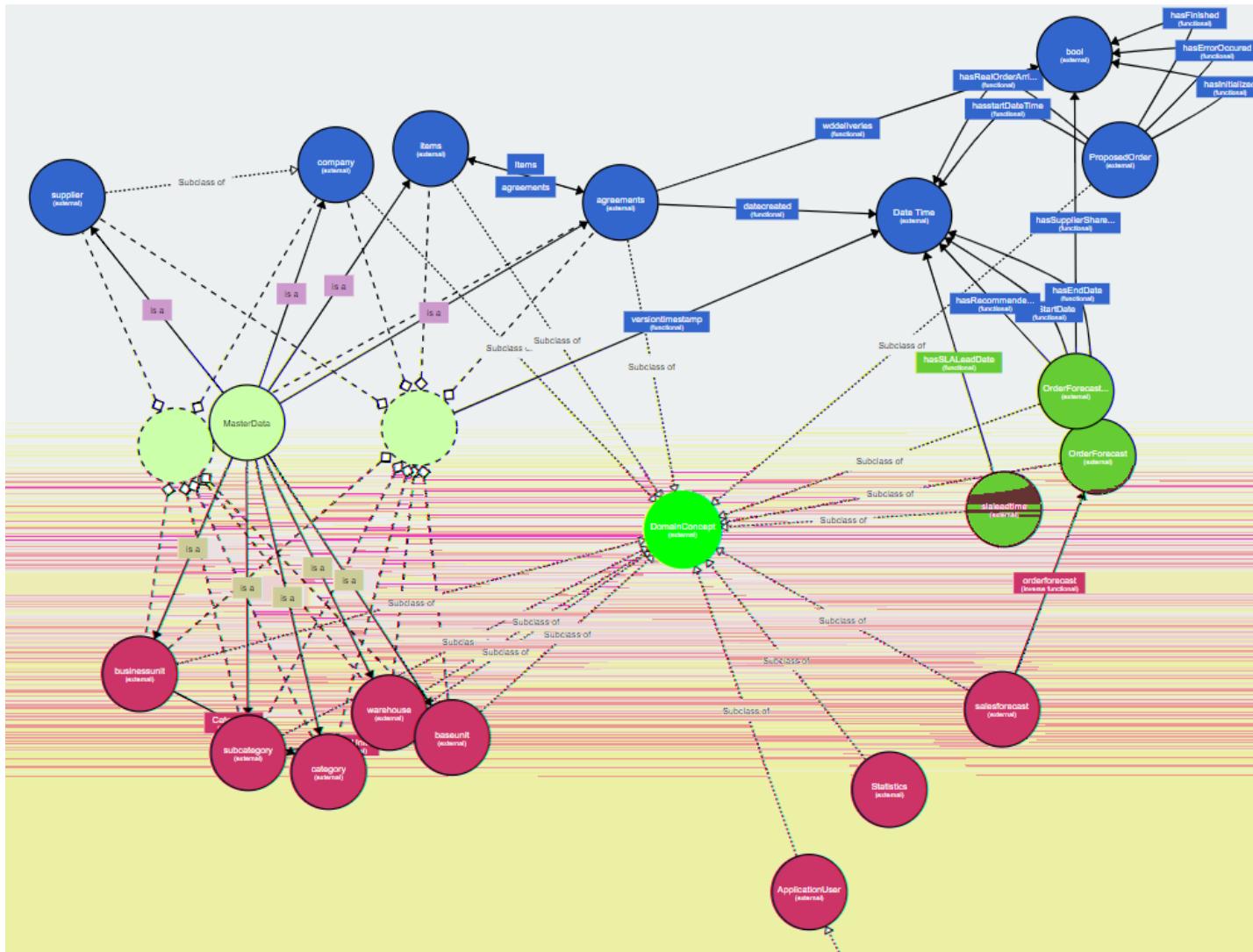


SCN Management – GUI

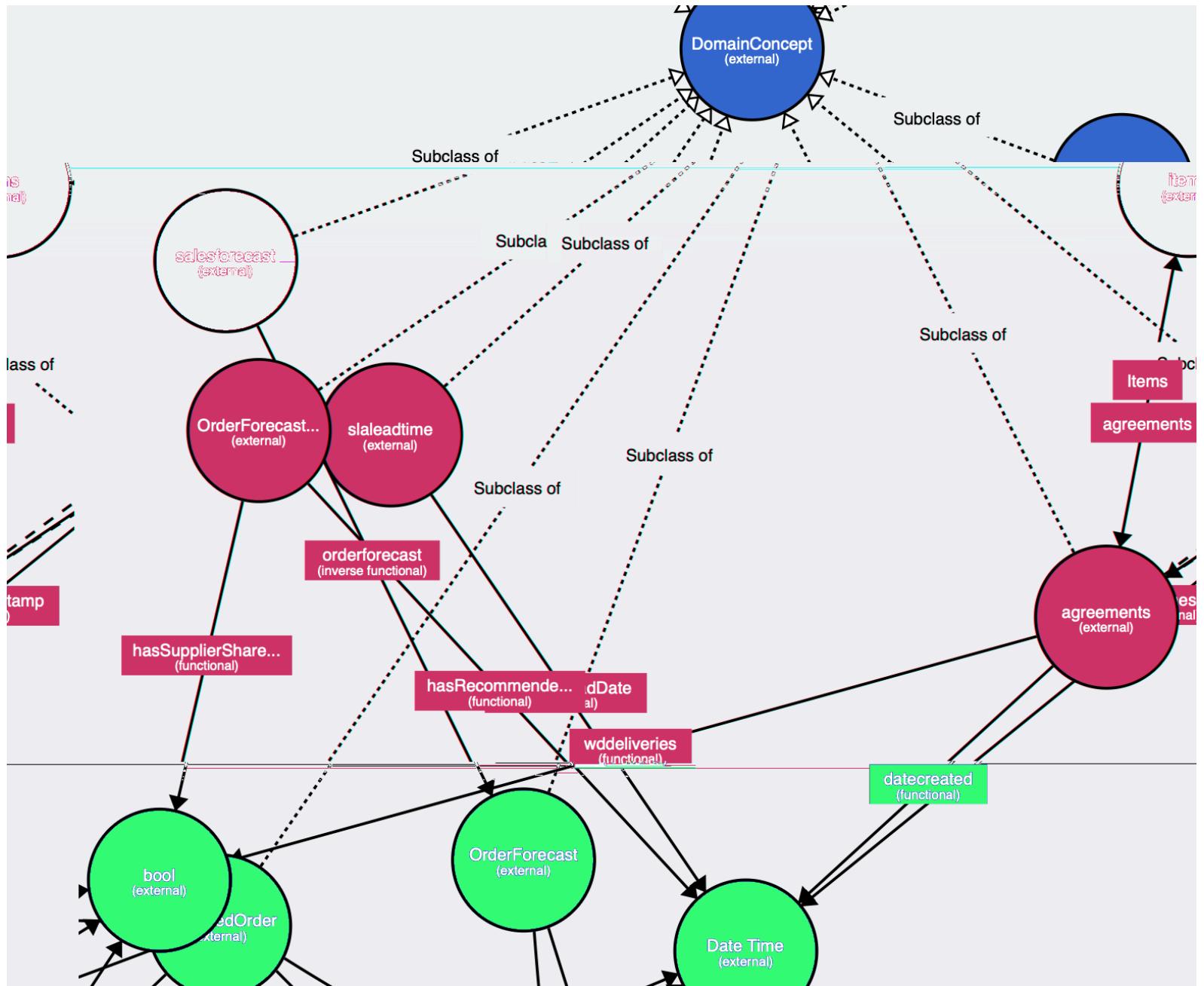
SELIS Community Node – Extensible Model



SELIS Community Node – Extensible Model



SELIS Community Node Extensible Model



SCN Management Platform – Main Control Panel

SELIS - Node Management Application

Inspecting SONAE

SELIS - Node Management

Current State

Participants

Master Data

Messages

Active Recipes

Active Applications

Authorization

Data Explorer

Open

Info

+

zAppDev Community

© Copyright CLMS

SONAE

Deployed

SARMED

Deployed

Adria Kombi

Deployed

PORLL2UC1

Deployed

PORLL2UC2

Deployed

SELIS-AEOLIX

Deployed

SELIS - Node Management

SCN Management Platform – Node Overview

SELIS - Node Management

SONAE

Inspecting SONAE

Current State

Participants

Master Data

Messages

Active Recipes

Active Applications

Authorization

Data Explorer

Participants

Node should have at least one Participant

Master Data

Master Data are required for the configuration of the node

Messages

Could select some of the available messages from the ontology

Recipes

Select some Recipes from the recipes repository

Node Participants

SCHREIBER FOODS PORTUGAL

IBERIAN SALADS

CD FOODS SPAIN

Retailer SONAE

View All

Deployed

Node Master Data

deliveryschedule

View All

Deployed

Node Messages

Delivery Schedules Message

View All

Deployed

Node Recipes

sonaeorderforecast

View Repository

Active Recipes

Deployed

SONAE

Deploy

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SCN Management Platform – Participants

The screenshot shows the SELIS - Node Management Platform interface. The left sidebar lists navigation options: Current State, Participants, Master Data, Messages, Active Recipes, Active Applications, Authorization, and Data Explorer. The main content area is titled 'Update' and shows fields for a participant named 'Exporter A'. The fields are: Name (Exporter A), Username (exporter-a), Password (*****), Client (6779ef20e75817b79602), Secret (f2a1ed52710d4533bde25be6da03b6e3), Last Deployment (03/04/2019), and Last Update (03/04/2019). A 'Save' button is at the bottom. The top right corner shows 'Inspecting SELIS-AEOLIX' with a gear icon. The bottom of the screen shows the zAppDev Community logo and a copyright notice for CLMS.

SELIS - Node Management

Update

Inspecting SELIS-AEOLIX

Current State

Participants

Master Data

Messages

Active Recipes

Active Applications

Authorization

Data Explorer

Name
Exporter A

Username
exporter-a

Password

Client
6779ef20e75817b79602

Secret
f2a1ed52710d4533bde25be6da03b6e3

Last Deployment
03/04/2019

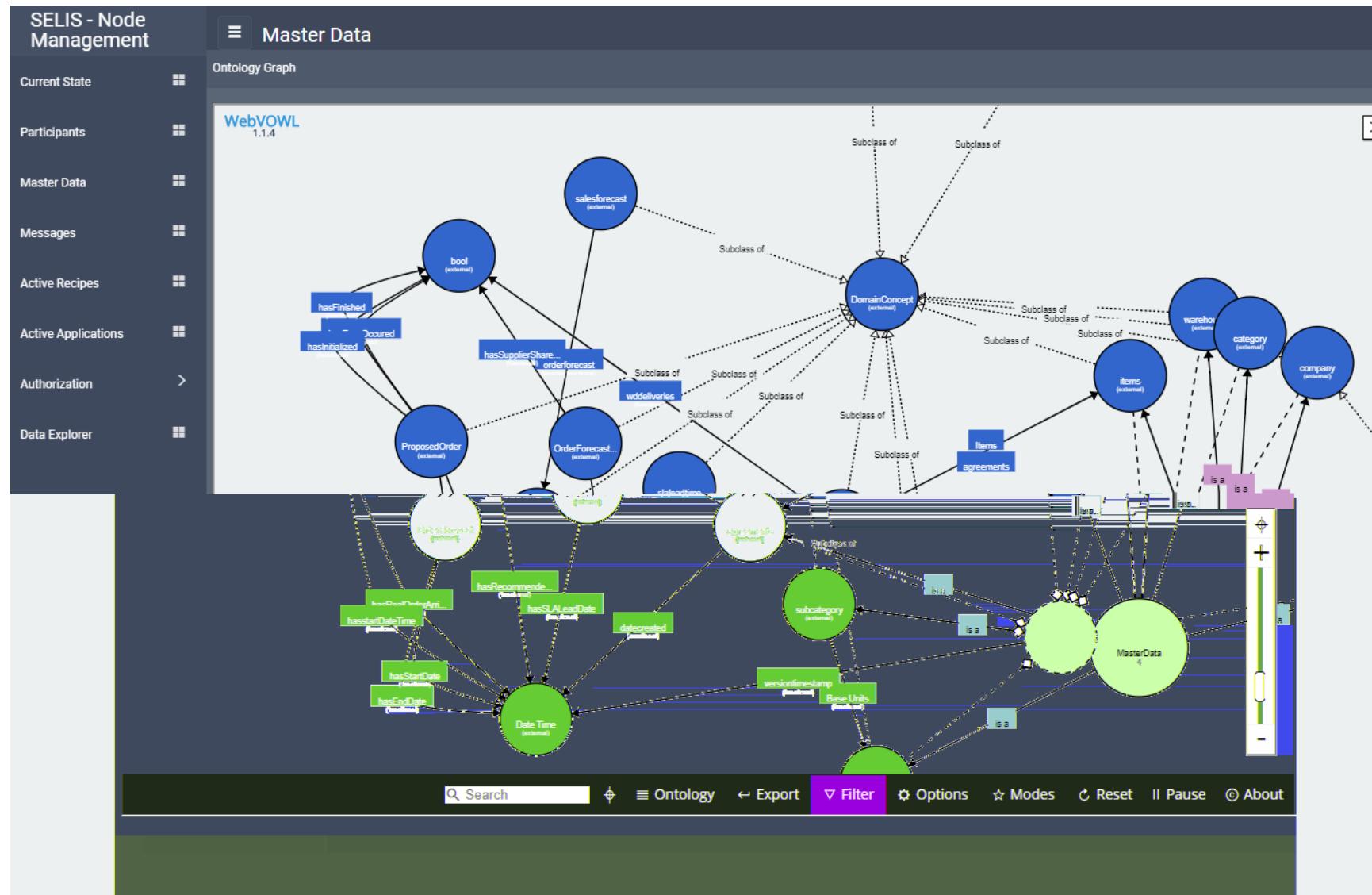
Last Update
03/04/2019

Save

zAppDev Community

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SCN Management Platform – Master Data



SCN Management Platform – Messages

SELIS - Node Management

Inspecting SELIS-AEOLIX 

Current State

Participants

Master Data

Messages

Active Recipes

Active Applications

Authorization >

Data Explorer

Edit Message

Message

Name: Cargo Transport Request

Description:

Uri:

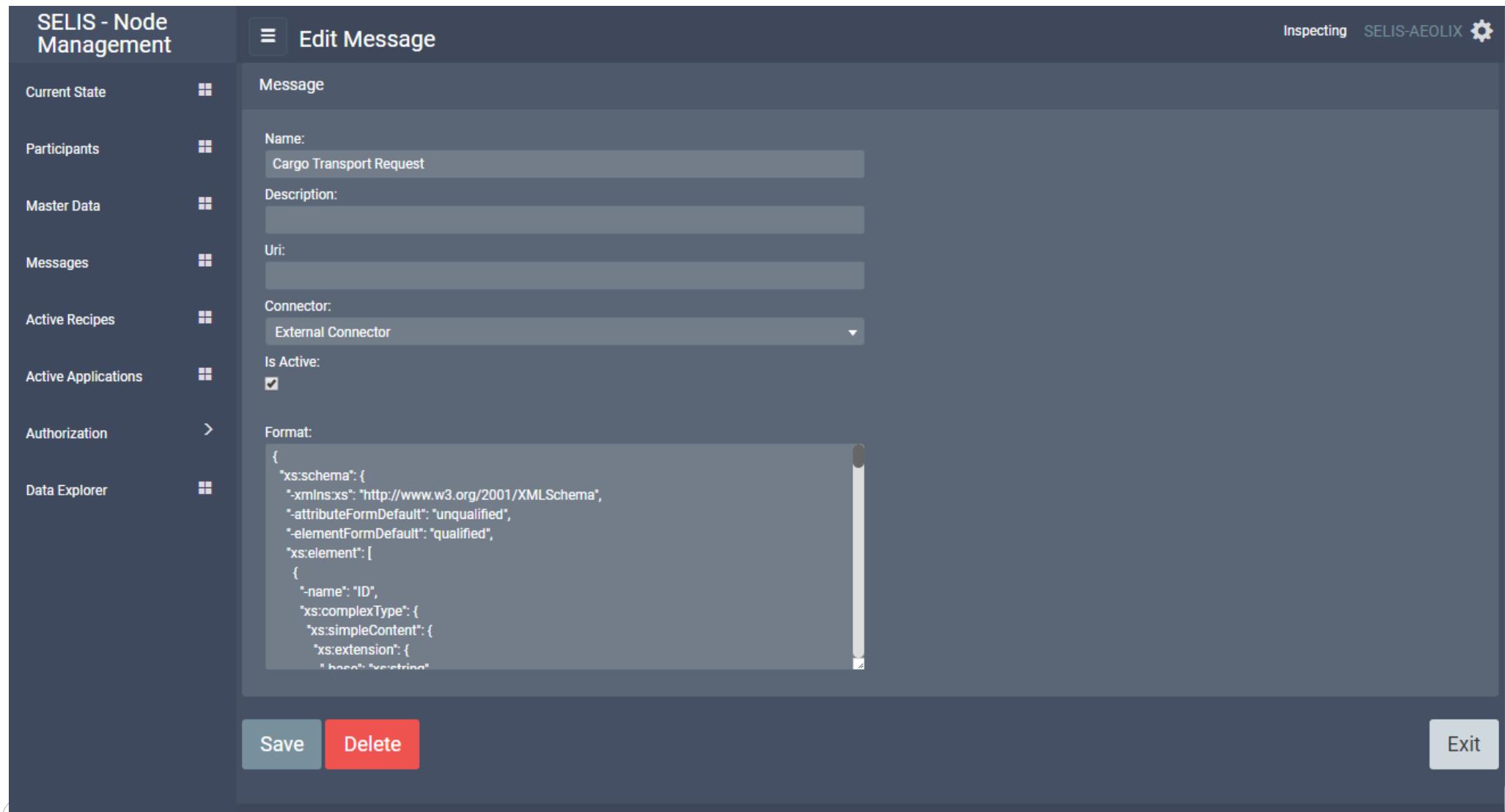
Connector: External Connector

Is Active:

Format:

```
{
  "xs:schema": {
    "-xmlNs:xs": "http://www.w3.org/2001/XMLSchema",
    "-attributeFormDefault": "unqualified",
    "-elementFormDefault": "qualified",
    "xs:element": [
      {
        "-name": "ID",
        "xs:complexType": {
          "xs:simpleContent": {
            "xs:extension": {
              "base": "string"
            }
          }
        }
      }
    ]
  }
}
```

Save Delete Exit



SCN Management Platform – Recipes and Jobs

The screenshot shows the SELIS Management Platform interface. The left sidebar contains navigation links: SELIS - Node Management, Current State, Participants, Master Data, Messages, Active Recipes, Active Applications, Authorization (expanded), and Data Explorer. The main area is titled 'Add Recipe' and contains the following fields:

- Name: Loading Delivery Time
- Recipe: Calculate Avg Delivery Time
- Message: Truck Loading List
- Is Active:

Below these fields is a 'Message Format' section containing the following XML schema definition:

```
{  
  "xs:schema": {  
    "-xmlns:xs": "http://www.w3.org/2001/XMLSchema",  
    "-attributeFormDefault": "unqualified",  
    "-elementFormDefault": "qualified",  
    "xs:element": [
```

At the bottom of the form is a 'Save' button.

SCN Management Platform – Publications and Subscriptions

The screenshot shows the SELIS - Node Management interface with the following details:

- Current State:** Shows 'Cargo Transport Request Subscription'.
- Participants:** Shows 'Master data' and 'AEOLIX' as subscribers.
- Subscription Name:** 'Cargo Transport Request Subscription'.
- Pub/Sub Host:** 'selis-pubsub'.
- Port:** '20000'.
- Pub/Sub WebSocket port:** 'selis-pubsub'.
- Message Format:** XML Schema definition (XSD) for a 'Cargo Transport Request' message.
- Filters:** Two filters are defined:
 - 1: Field 'slug' (Equal) Value 'selis-aeolix'
 - 2: Field 'sender' (Equal) Value 'aeolix-group'
- Agreement:** A section for managing agreements.
- Buttons:** 'Save' and 'Delete'.

Data Governance in SELIS

Architecture decisions and Information Governance

- SELIS Community Node architecture specifics:
 - Access Control through Node Management: Transient resources are tagged based on the owner and content and are accessible only as permitted by rules set during setup of the Node.
 - Authorized consumers: Data is never accessed directly by consuming applications. All requests are handled by the SCN services that handle client authorization accordingly.

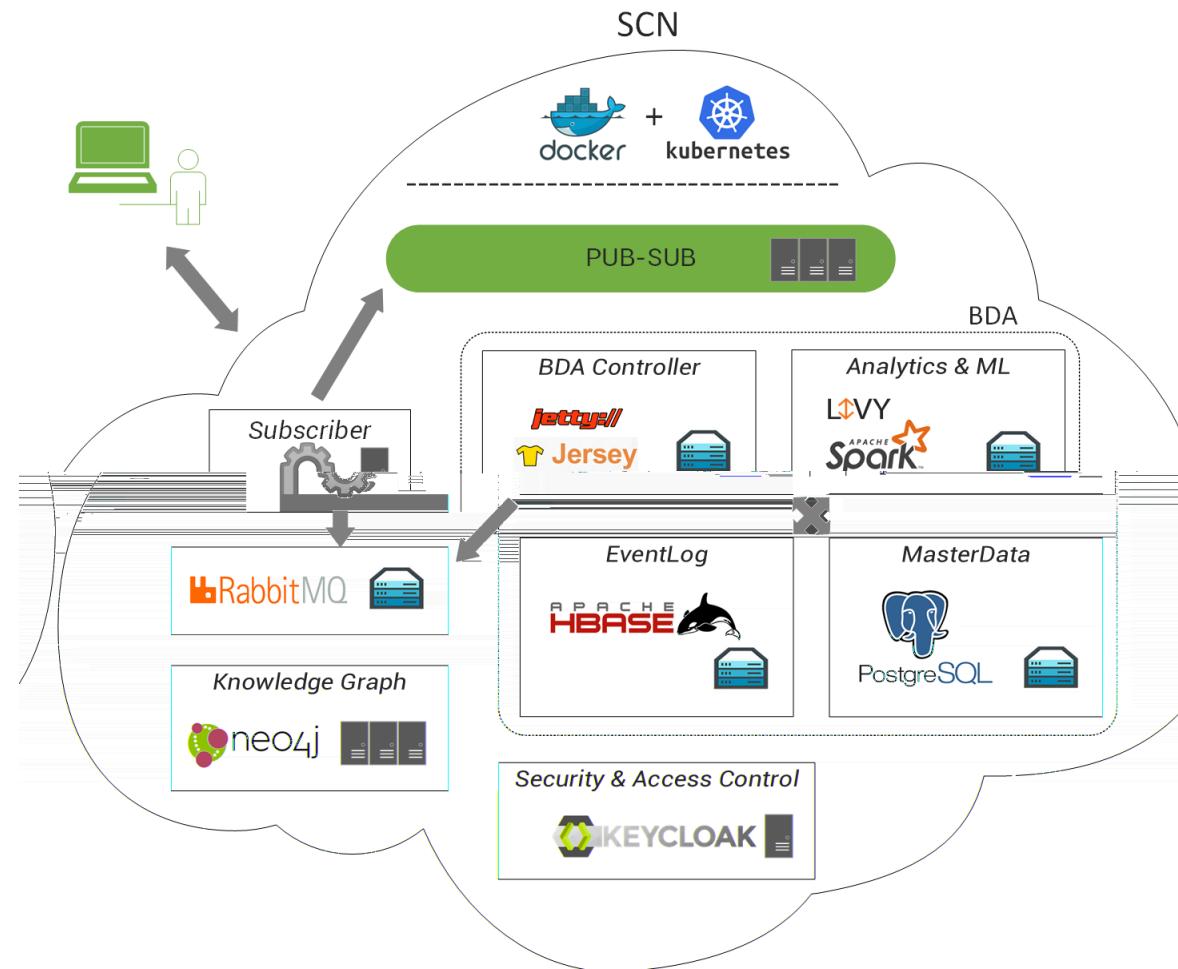
Data Governance in SELIS

Aligning individual corporate policies in a multitenant platform

- Dynamic and of every stakeholder's
 - › Protecting digital assets is a top priority.
 - › SELIS supports the definition of generic role and permission-based DG processes and policies.
 - › SELIS uses content-based message delivery, which can support more complex DG configurations.
 - › A flexible ontology-based model is used to tackle Real-life application scenarios which often result in complex, potentially conflicting workflows

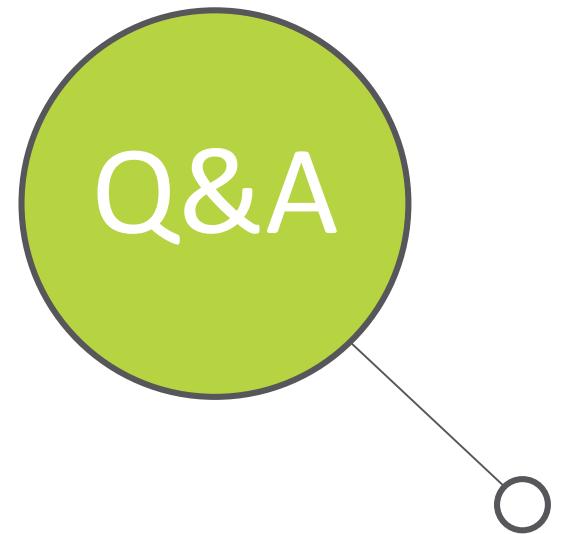
Build on Open Technologies

- Based on open-source technologies
- Cloud-ready over Docker containers and Kubernetes
 - Easy install on both on-prem and public cloud
- Scalability and elasticity
- To be released as open-source



Let's Put everything to the cloud!!!!





Contact Details

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