



European Factory
Platform



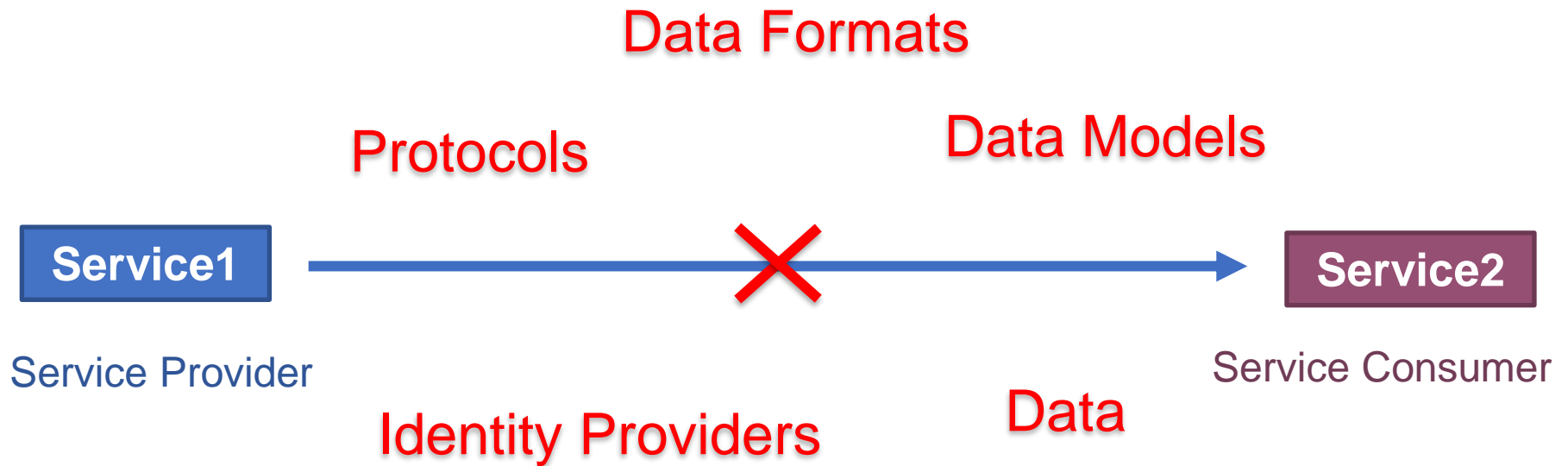
European Factory
Platform

Making platforms interoperable through the EFPF Data Spine

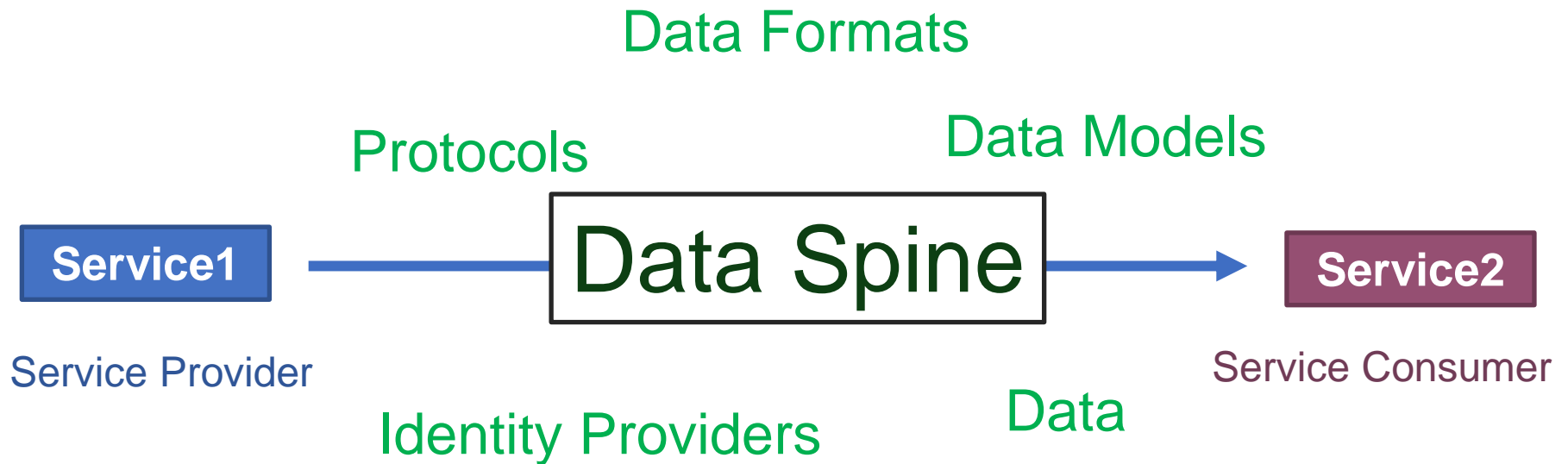
Open Call Telco, 13.01.2021

Alexander Schneider, Fraunhofer FIT

Why Data Spine?



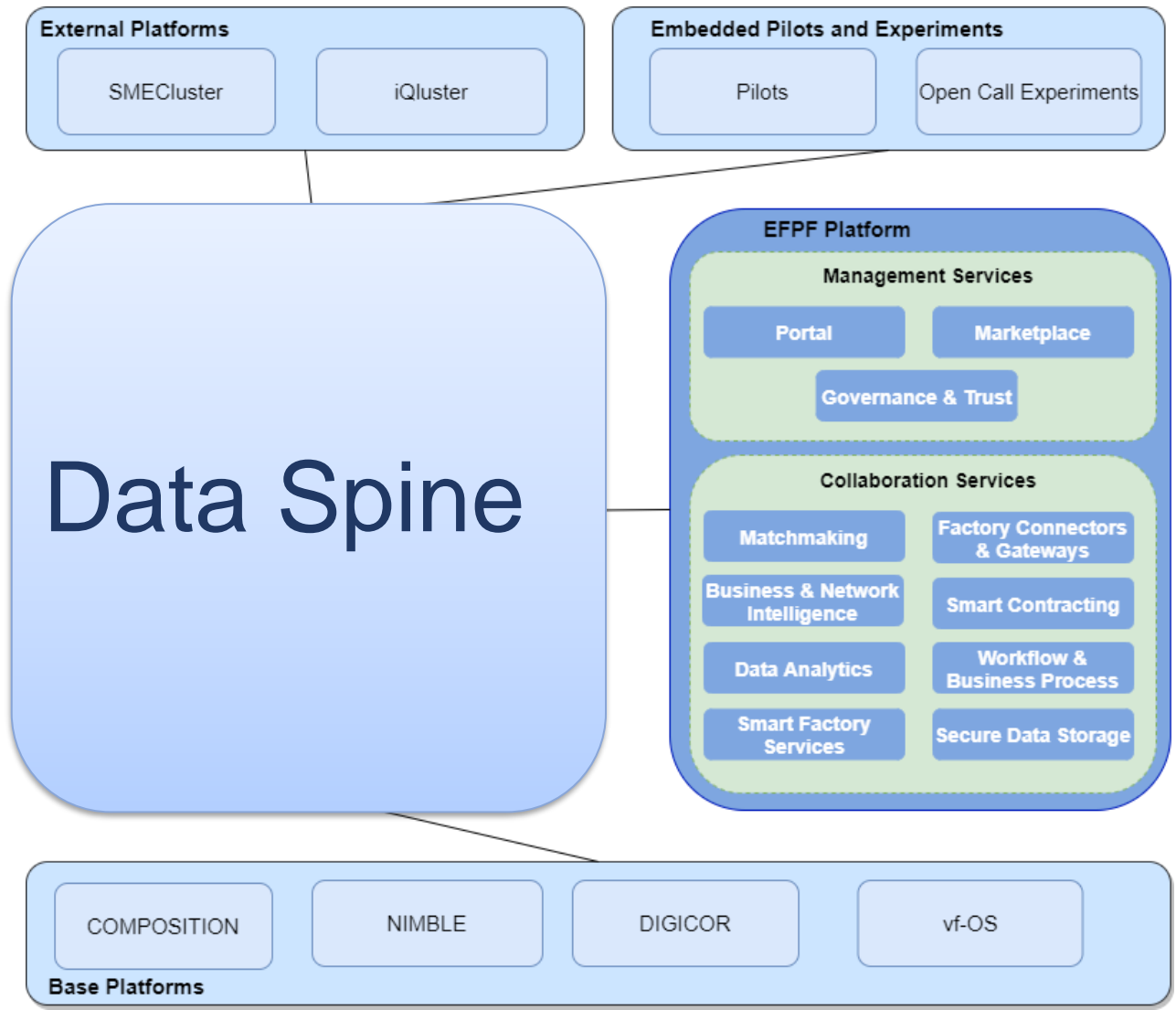
Why Data Spine?



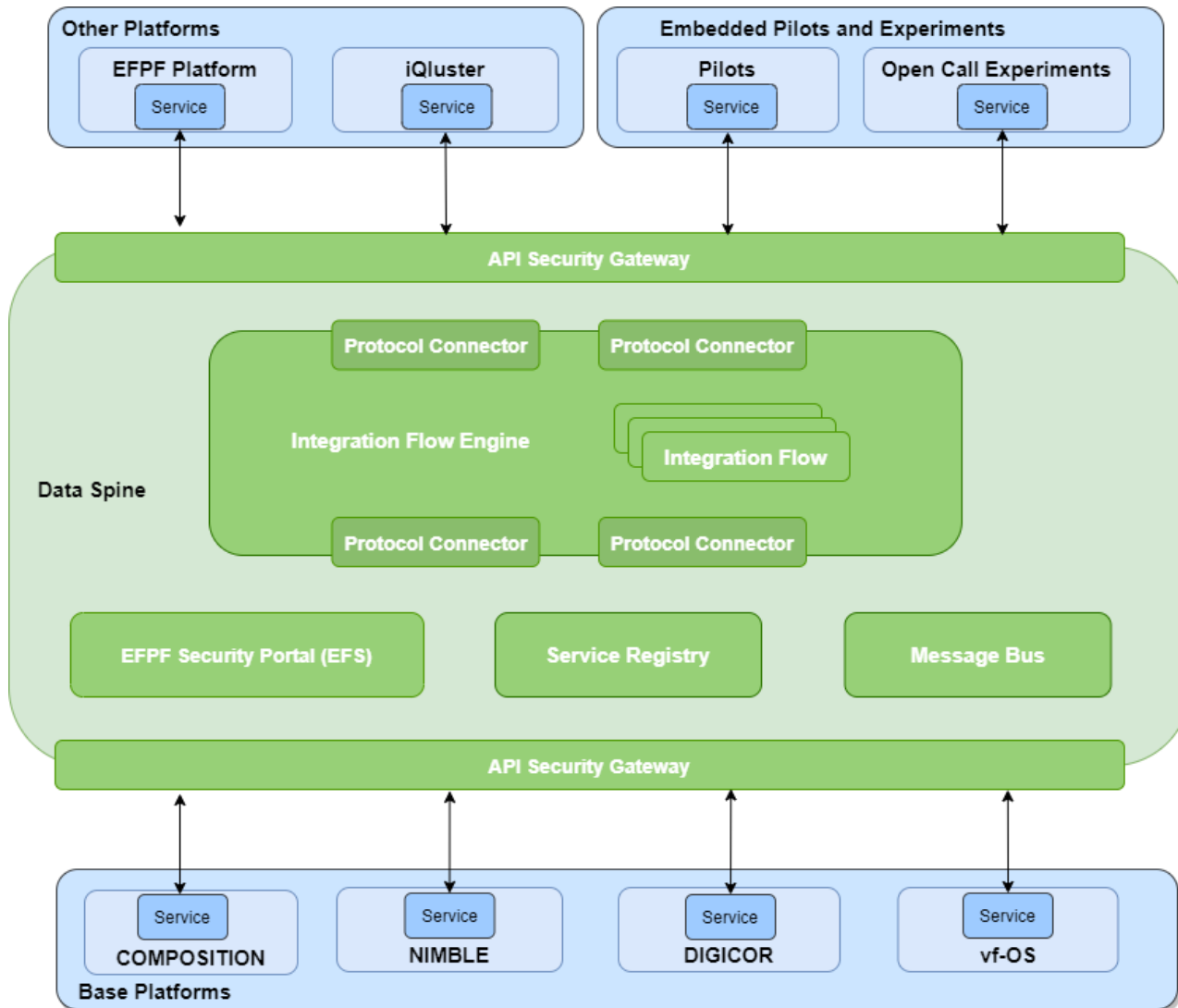
What is the Data Spine?

- It is an Integration and Communications Layer.
- Its main purpose is to **bridge protocol heterogeneity** and provide uniform access to services between base platforms and apps/tools.
- It supports **routing** of data (pub/sub and req/resp) and **transformation of data models**.
- It provides **security** and identity & access management (e.g. SSO) facilities.

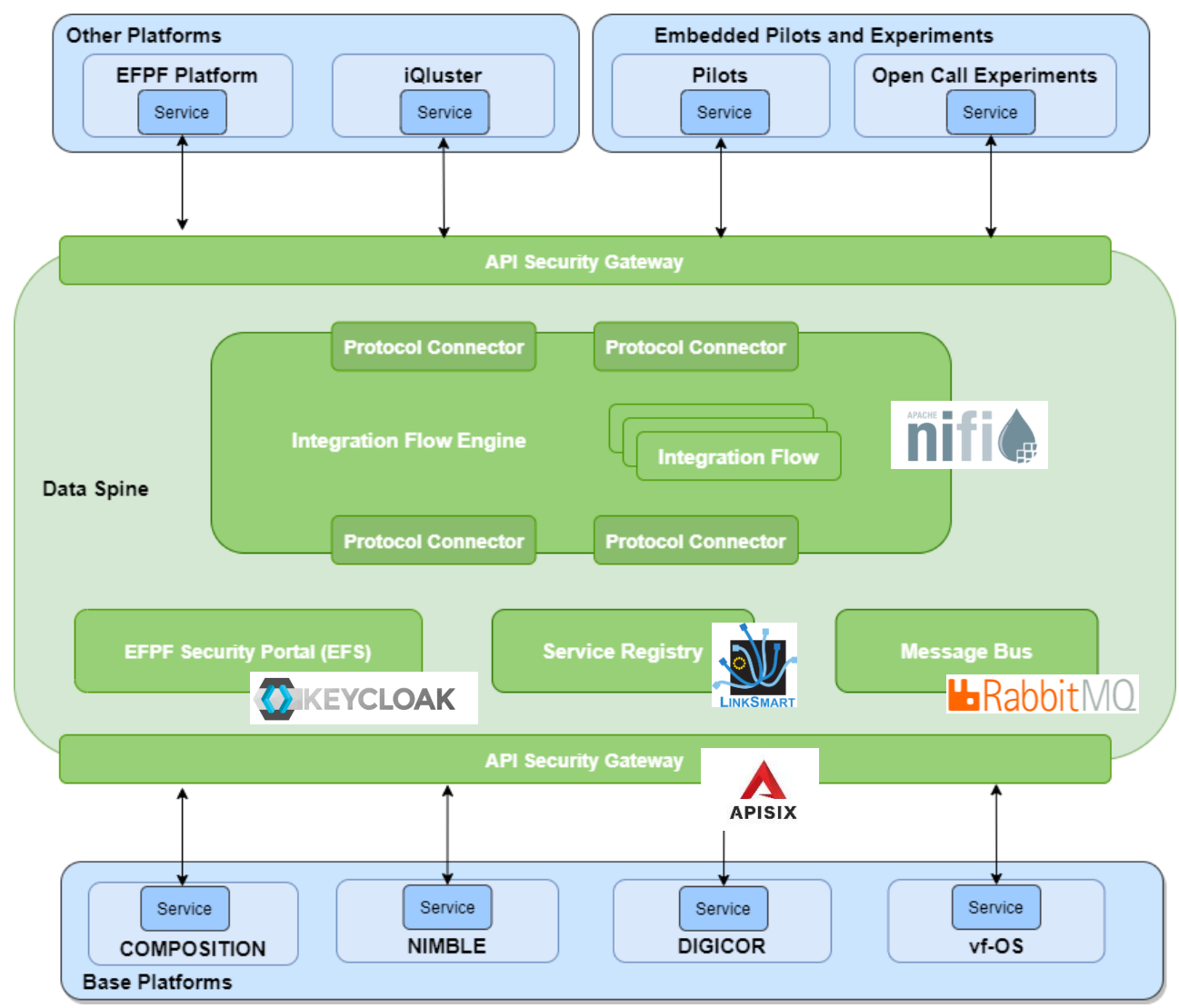
EFPF Ecosystem Architecture



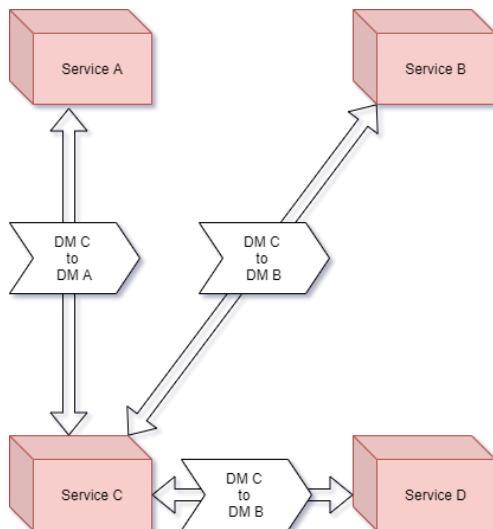
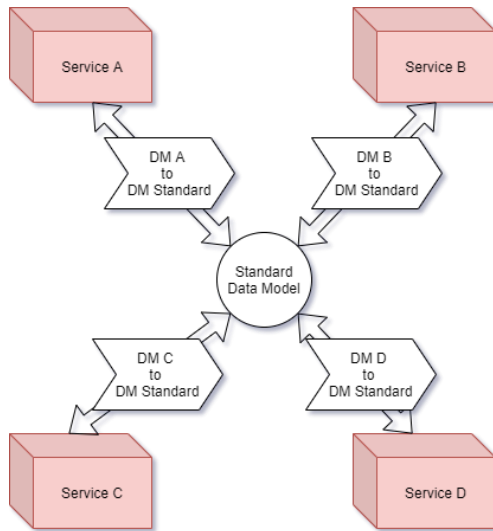
EFPF Ecosystem Architecture



Realisation of Interoperable Data Spine



Achieving Data Model Interoperability



- One-to-one translation approach used:
 - Each custom data model is translated to a standard data model (e.g. OPC-UA, UBL, OGC SensorThings) using one of the data model transformation tools.
 - In case one data model changes, just one transformation tool has to be changed (w.r.t. one-to-many translation approach)
- Tools considered for transforming the data models:
 - NiFi processors [Jolt, ExcScript, XSLT, ...]
 - Ad-hoc microservices

EFPF Security Components

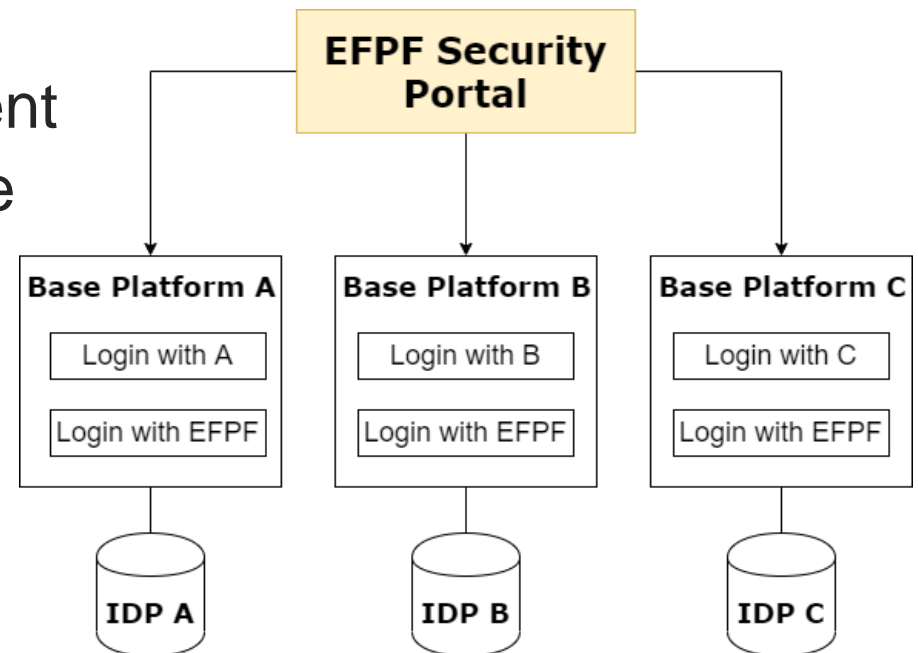
- API Security Gateway

- Policy Enforcement Point



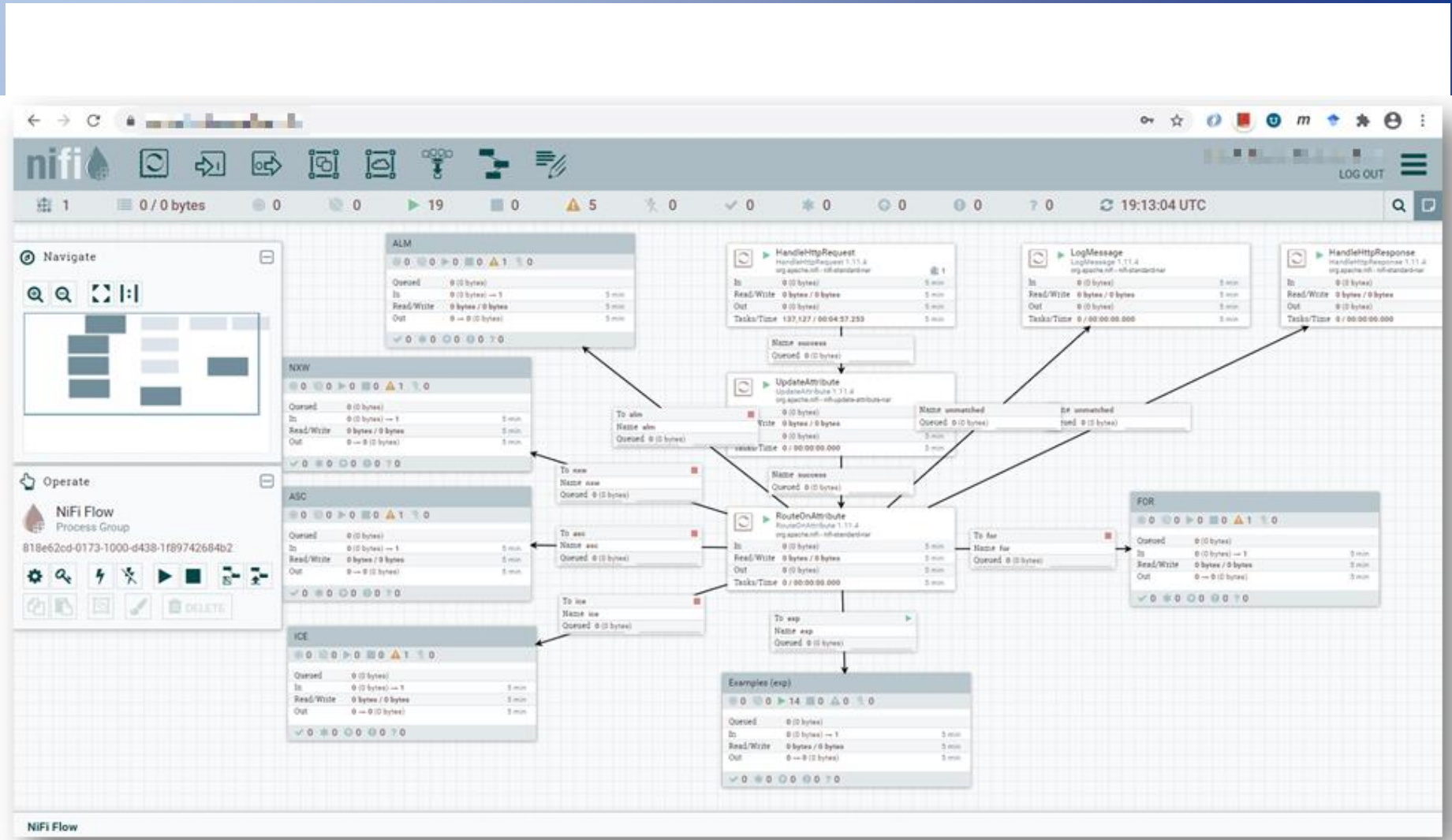
- EFPF Security Portal (EFS)

- SSO
- User & Policy Management
- Token Translation Service
- Policy Enforcement Service

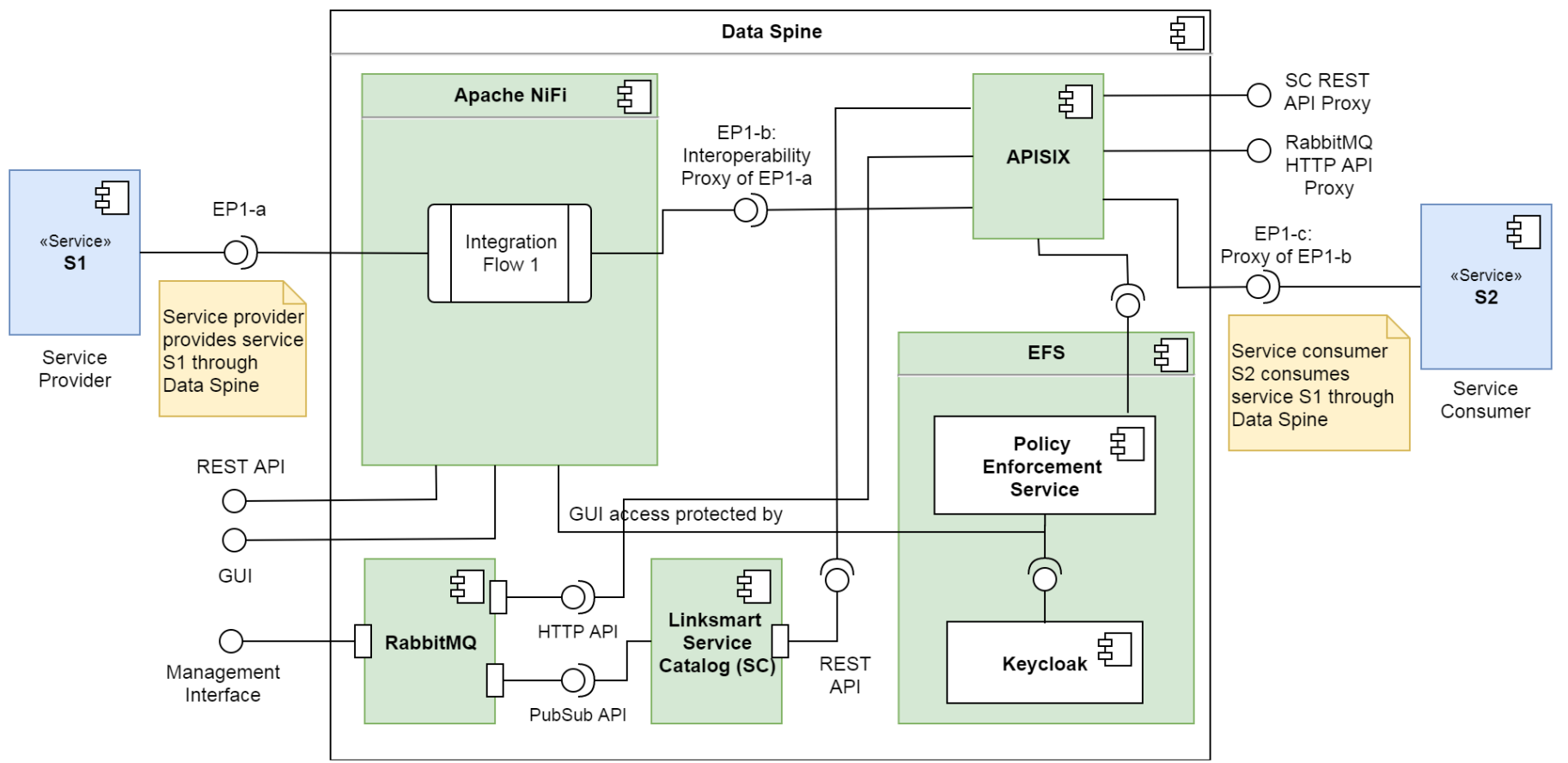




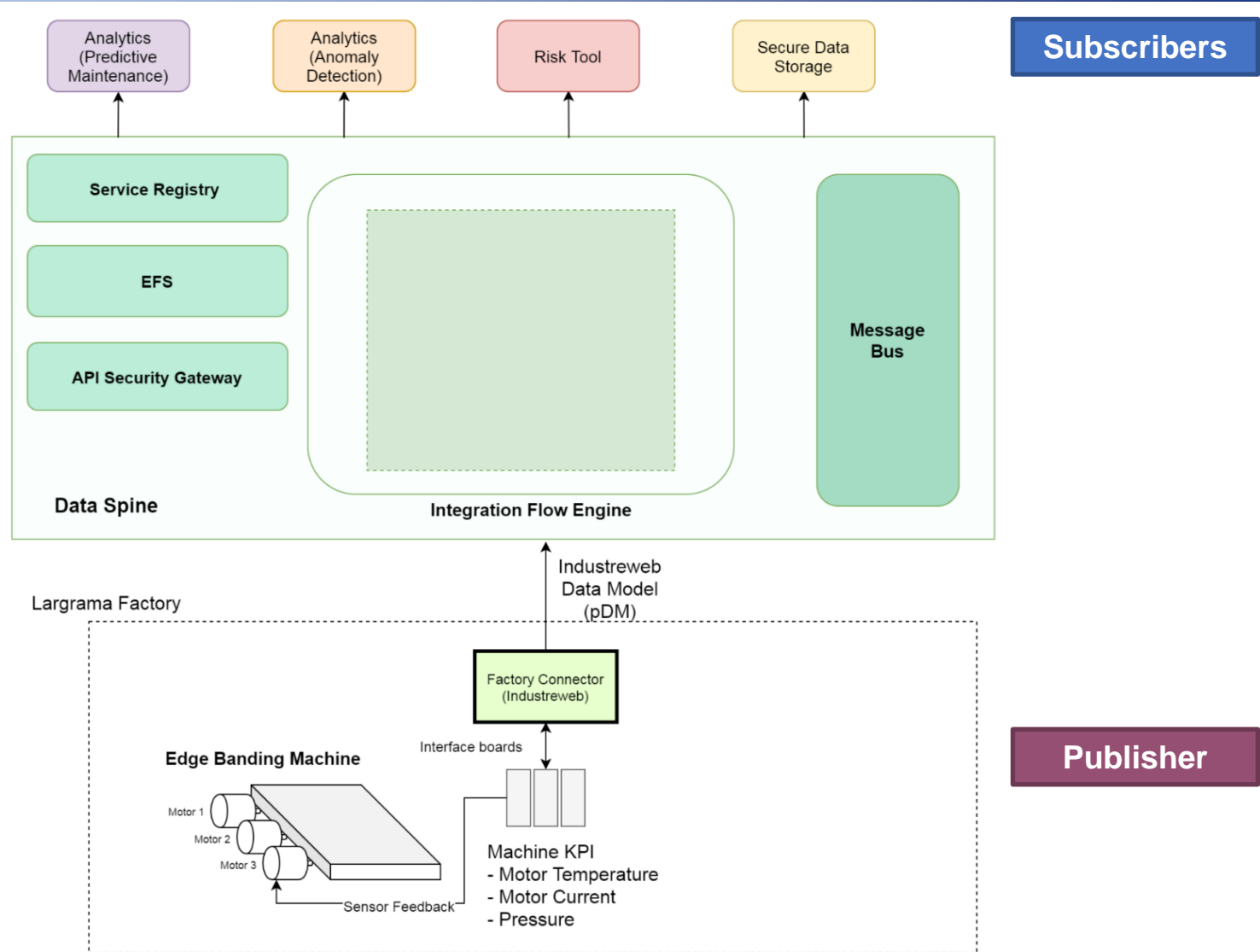
Integration Flow Engine (NiFi)



Data Spine Components' Interaction



Example: Predictive Maintenance



Available from EFPF Portal

EFPF Dev-Portal [Projects](#) [APIs](#)
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Projects

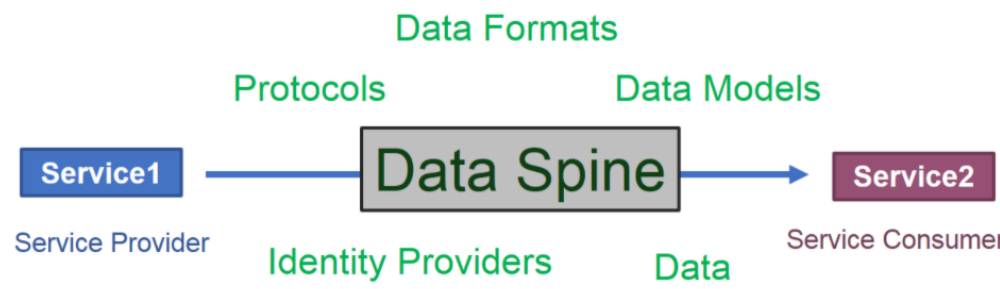
Accountancy Service

- Accountancy Service Admin Guide
- Accountancy Service Architecture
- Accountancy Service Integration Guide
- Accountancy Service User Guide

Anomaly

Data Spine

Why Data Spine?



```

graph LR
    SP[Service1  
Service Provider] -- Protocols --> DS[Data Spine]
    DS -- Data Models --> SC[Service2  
Service Consumer]
    subgraph Labels
        DF[Data Formats]
        IP[Identity Providers]
        D[Data]
    end
            
```

Contents

- Why Data Spine?
- Data Spine Overview
- Components
- Data Spine Documentation

Figure 1: High-level Dataflow through Data Spine

The EFPF ecosystem is based on a federation model. The services belonging to different platforms are heterogeneous and interoperability gaps exist between them at the levels of protocols, data models, data formats, data semantics, and

Thank you!

Any questions?

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