

Using MEF's LSO APIs to Create Agile, Assured, & Orchestrated MEF 3.0 Services

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Speakers



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Housekeeping

1

Submit questions at any time in the **Questions** tab.

2

Today's presentation can be downloaded from the **Handouts** tab.

3

A **recording** of this webinar will be made available on the MEF wiki home page.

4

A short **survey** will be launched after the webinar. Please share your feedback.

Agenda

1

Problem Statement

2

MEF 3.0 Services Framework & LSO Reference Architecture

3

LSO APIs Roadmap and Releases

4

Deep Dive into LSO Sonata & Presto SDKs

5

Review of SDKs on GitHub

6

Q&A

Our digital economy

HYPERCONNECTED

50%
World Pop



3,748,541,916

Internet Users in the world

AGILE, ON-DEMAND

NETFLIX



\$6 Billion

streaming content investment **2017**

MACHINE AUTOMATED



Autonomous taxi in Dubai by

2020

CLOUD-BASED



Amazon Web Services

\$2.56B **2015** ▶ **\$ 3.66B** **2017**

DYNAMIC



1.7% CRM CAGR **2015-2020**

Salesforce **27%**
FY2017 YoY Growth

BEST-EFFORT



\$5 Billion

2017 est. ransomware damage costs

... requires a dramatic transformation of network-based services.



Cloud-like & assured



Automated



Operate across a global ecosystem

MEF 3.0 launched in November 2017



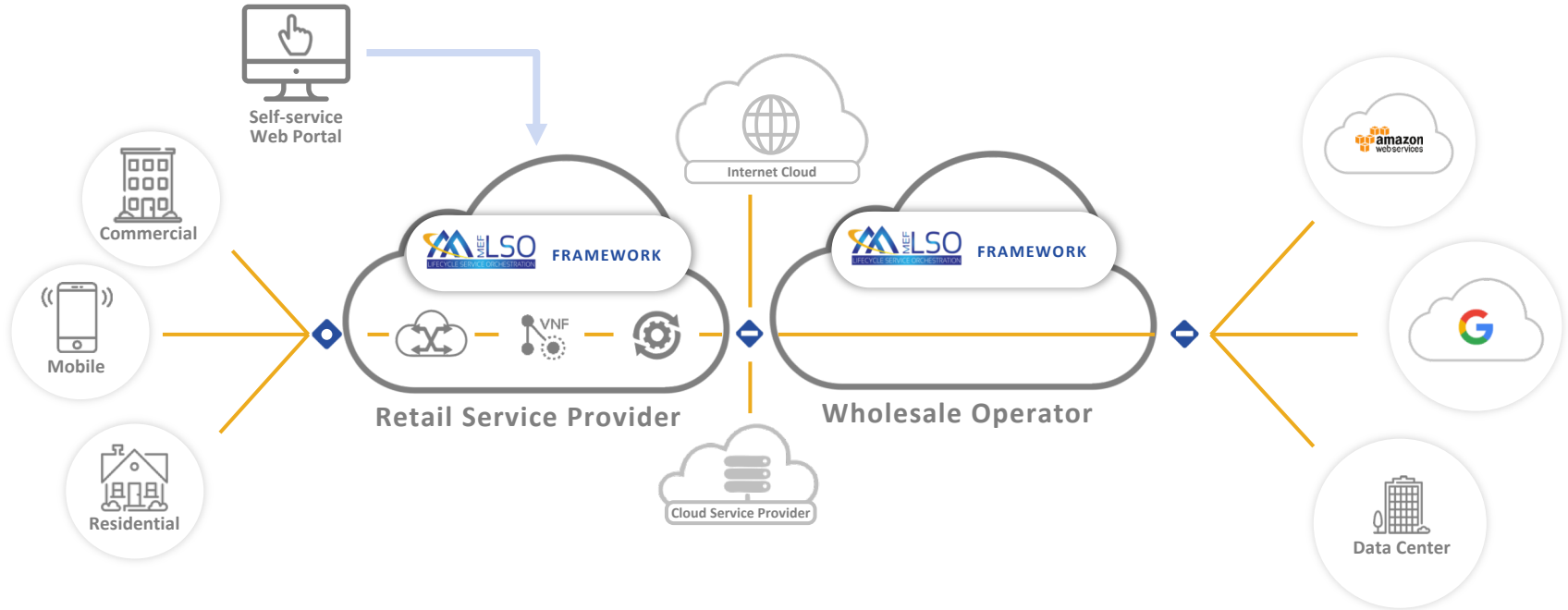
The MEF 3.0 Services Framework

A transformational services framework

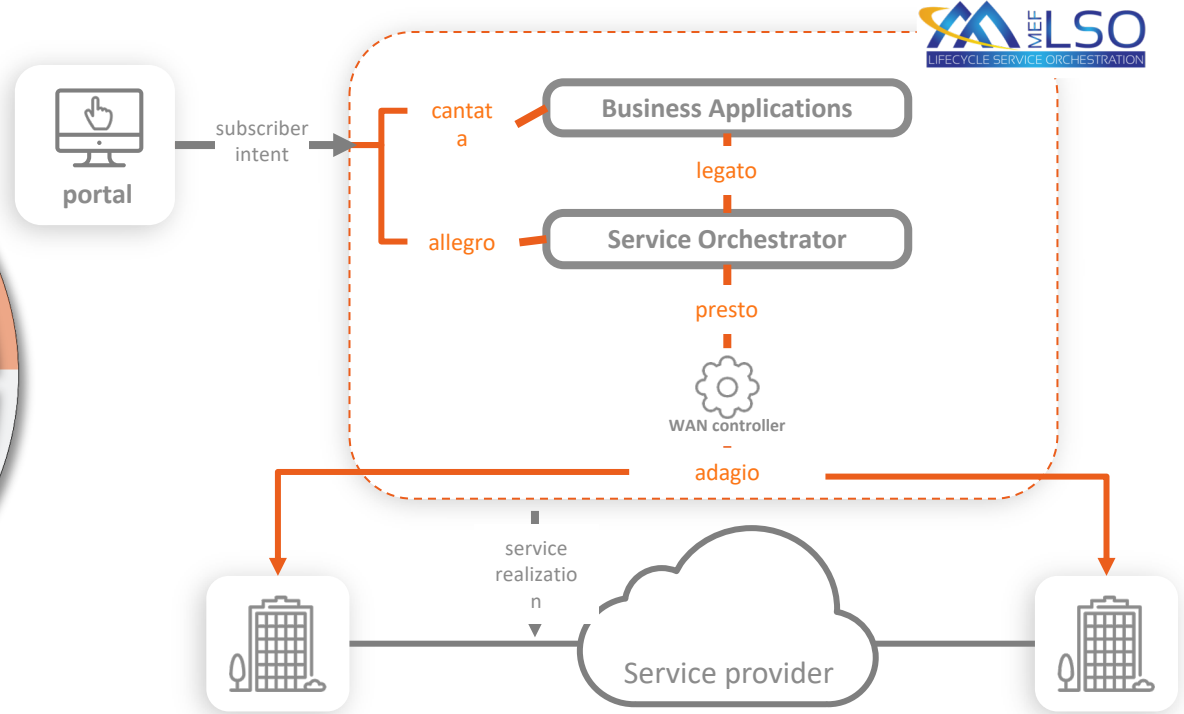
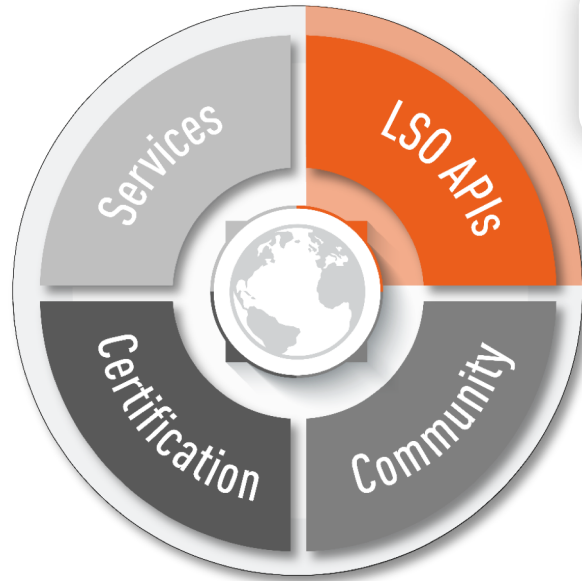
defining, delivering, and certifying agile,
assured, and orchestrated services

across a global ecosystem of automated
networks.

Enabling a new, revenue-generating, multi-services framework

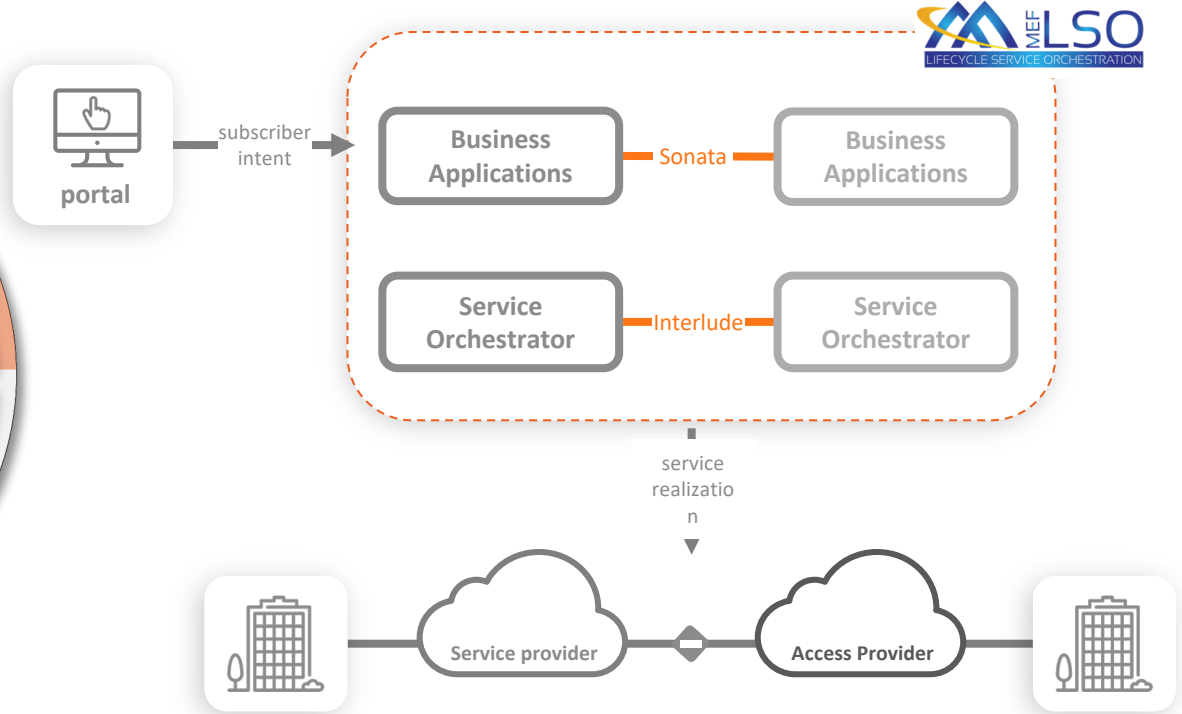


Goal: Develop a model to automate, orchestrate and communicate subscriber intent



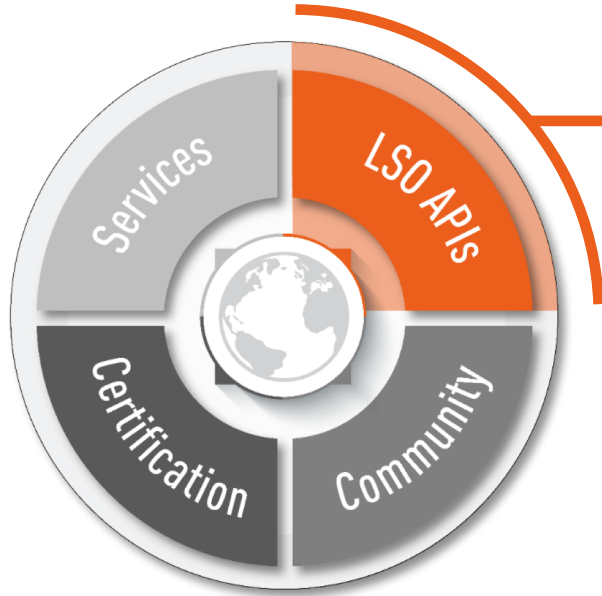
e.g.: Dynamic CE Service

And do so across inter-organizational boundaries



e.g.: Multi-Operator CE Service

LSO API Releases



Defined in **MEF 55:**
The LSO Framework specification

APIs are released as **SDKs**

Available in **experimental** or **published** states

Based on a **6 month sprint** cycle

LSO API Roadmap

● Released ● In Development ● Planned



LSO Cantata

R1
(Portal-based
Service Ordering)

LSO Allegro

R1
(Elastic Service,
Notifications – Performance,
Service Status, Testing, Fault)

LSO Sonata

R1, R1.1
(Ordering-I
Serviceability)

R2
(Ordering-II
Inventory,
Trouble Ticket)

R3
(Quote-I)

R4
(Quote-II)

SLA Reporting,
Contracting, Catalog,
Invoicing, Contact Mgmt.,
Implementation Feedback

LSO Interlude

R1
(Elastic Service, Performance Reporting,
Testing, Technical Fault Notification)

LSO Legato

R1
(Service Catalog, Service Order,
Service Inventory)

LSO Presto

R1
(Network Resource
Provisioning - I)

R2
(Network Resource
Provisioning - II)

R2
(SOAM/SAT)

R3
(Optical)

LSO Adagio

Exploring What Is Inside LSO SDKs

MEF LSO PRESTO SDK



- Information model (ONF TAPI, NRM, NRP)
- Data model (YANG)
- API definitions (YAML/JSON Swaggers) for Network Resource Provisioning (NRP)
- Tutorial and example usage (using ODL UniMgr.)



Explore MEF-GIT [here](#)

MEF LSO SONATA SDK



- Information model (based on TMF models, MEF Ordering, Serviceability, Trouble Ticket, Product Inventory)
- Resource model
- API definitions (YAML/JSON Swaggers)
 - Product Ordering
 - Serviceability
 - Product Inventory API
 - Trouble Ticket API
- JSON representations for
 - ProductSpecDescription
 - PlaceDescription
- Tutorial and example usage (using postman client and server)



Explore MEF-GIT [here](#)



Sonata APIs: Deep Dive

Sonata APIs Objectives

Standardize and automate **interoperability** management of MEF connectivity products **by Service Providers** offering multi-operator services.

In order to avoid specific/locked proposal, our design follows principles based on **API** architecture :

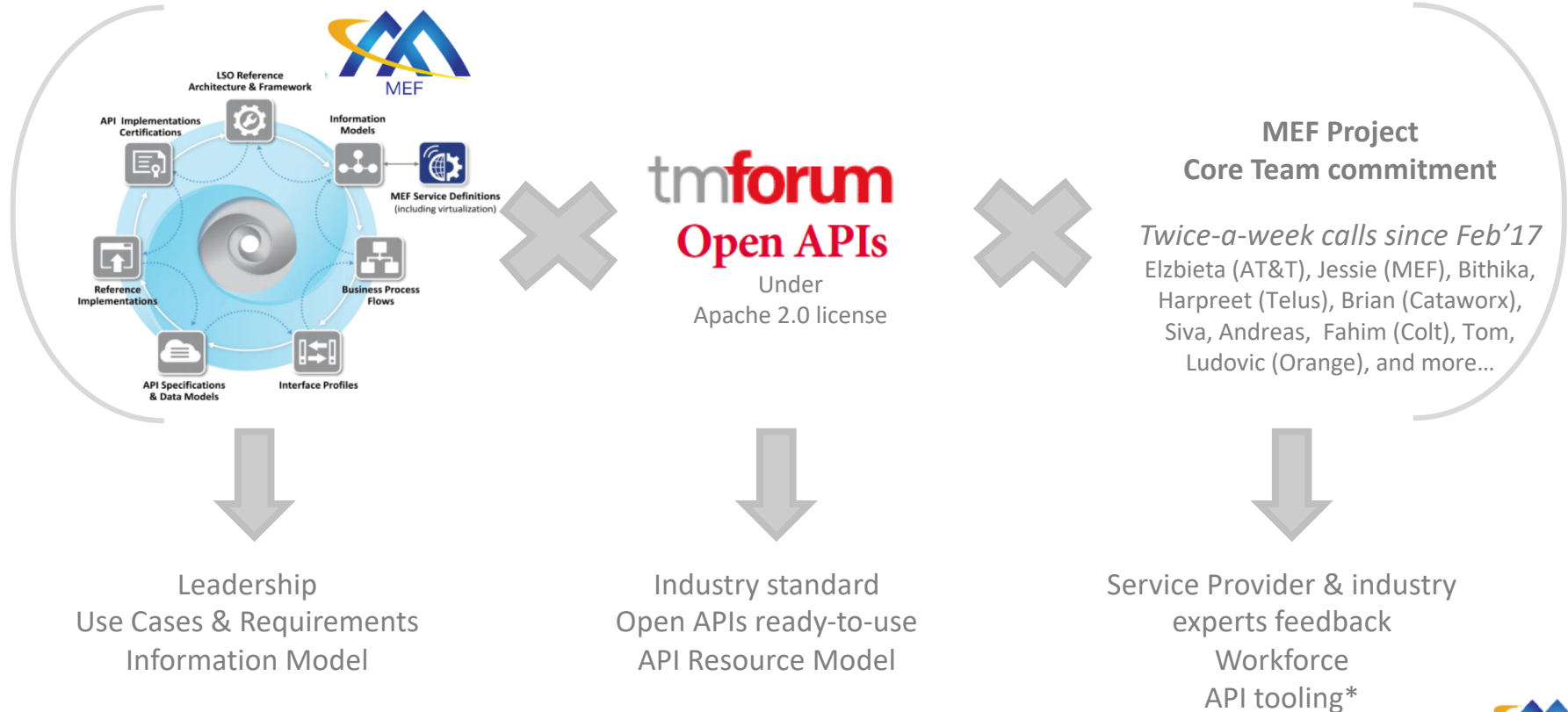
– Extensible

- APIs will follow RESTful patterns driven (TMF Open APIs) by Meta-data
- API structure covers standard service/product features (e.g. UNI, E-Line MEF standard description) but can support extensions

– Flexible

- Same API Function structure will support different kind of Services
- Each API Functions will support different API Operations (e.g., Ordering API includes: New start, Changes, Cancels, Life-cycle Status)

Sonata APIs Build Methodology



* Orange API tooling has been used to produce Sonata release 1 & 2 swaggers but objective is to have independent MEF tooling for R3

APIs Overview

- **Product Order API** – details are covered later with DEMO
- **Inventory API** provides the ability for a Service Provider's (Buyer) to retrieve from a Partner's (Seller) Inventory management system a set of product instances based upon a filter of product inventory attributes, or a specific product instance based upon a product identifier
- Under **Serviceability**, we provide a set of 3 APIs that allow to:
 - **Validate an address** for a specific site associated with the service delivery location
 - **Retrieve sites** based on filtering criteria or id
 - Determine **if service can be delivered** to a specific customer site within a Partner's domain
- **Event API** provides the ability for a SP to receive notification based on generic event subscription(s) – for example:
 - Notified when order is delivered (or failed)
 - Notified when a trouble ticket solution need to be validation

Key Facts:

TMF Open API sourcing & MEF-Enhanced
Place description-agnostic

APIs Overview – Trouble Ticket

The following operations are included in the scope of this Trouble Ticket API:

- **Create** a new trouble ticket
- Retrieve an existing trouble ticket(s)
- Partial modification of an open trouble ticket
- **Close** an open trouble ticket
- Cancel an open trouble ticket
- Trouble ticket related notifications

Key Facts:
TMF Open API sourcing & MEF-Enhanced
Lifecycle designed
Notifications listed
Object-agnostic

APIs Overview – Product Order

The scope of this API covers following capabilities for product ordering:

- Create Order to request **install** new product
- Change Order: create Order to **change an existing Product**
- Disconnect Order: create Order to **disconnect** an existing Product
- Cancel Order: **cancellation** of an inflight-order
- Retrieve Order(s) based on criteria
- Get full data of an Order based on its id
- Support for Order Notifications

Key Facts:
TMF Open API sourcing & MEF-Enhanced
Product-Agnostic APIs
Lifecycle designed
Mapping with IPS
Notifications listed

Sonata APIs – Available Assets

DEMO

Demonstration on MEF GitHub to highlight following artifacts:

- API Guide
- API swaggers (JSON & YML)
- Postman collection
- Reference code

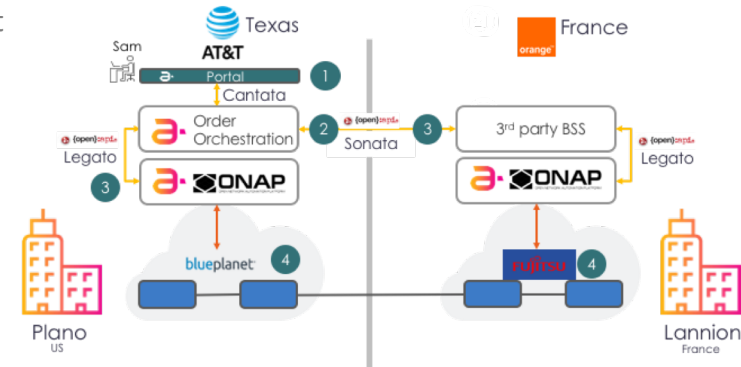
The collage features four main components:

- Code Editor:** Displays Java code for a service interface, including imports for exceptions, HTTP entities, and Spring annotations.
- Postman:** Shows a REST client interface for the 'Create productOrder' endpoint, displaying a POST request with a JSON body and a response.
- Swagger Editor:** Shows the API documentation for the 'Create productOrder' endpoint, including a description and a list of parameters.
- API Guide:** A document titled 'API Guide Product Offering Qualification March 2018' with the MEF logo.

Sonata APIs In Action

- Amdocs, AT&T, Ciena, Colt, Fujitsu, Orange put these APIs in motion at the MEF 17 POC with 3 Sonata APIs sequencing:
 1. API AddressValidation
 - AT&T asks Orange validation for address (*2 rue Pierre Marzin, 22300 Lannion, France*)
 - Orange confirms address existence & provides addressId
 2. API productOfferingQualification
 - AT&T requests serviceability to Orange for a 1000BASE-T UNI at this address for Nov20th
 - Orange provided serviceability (capabilities & date OK)
 3. API productOrder
 - AT&T orders to Orange the UNI + eLine with configuration at endpoints (CE VLAN, CIR)
 - AT&T pools Orange to get order delivery status

UC #1 - Service order and fulfilment



Winner

Third Network Proof of Concept Award - Gold

AT&T, Orange, Colt, Amdocs,
Ciena, Fujitsu



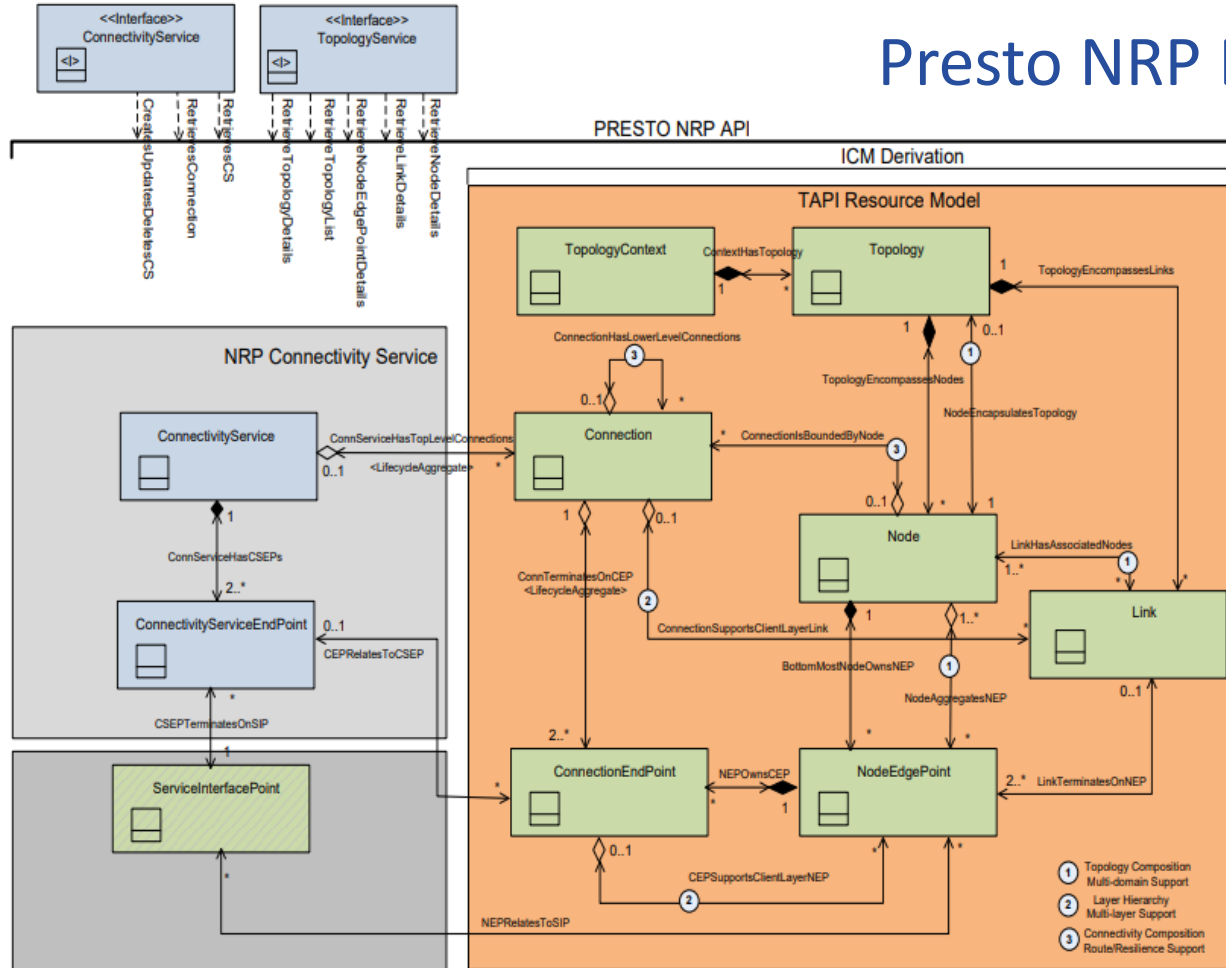
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Third Network Proof of Concept Award - Gold



Presto APIs: Deep Dive

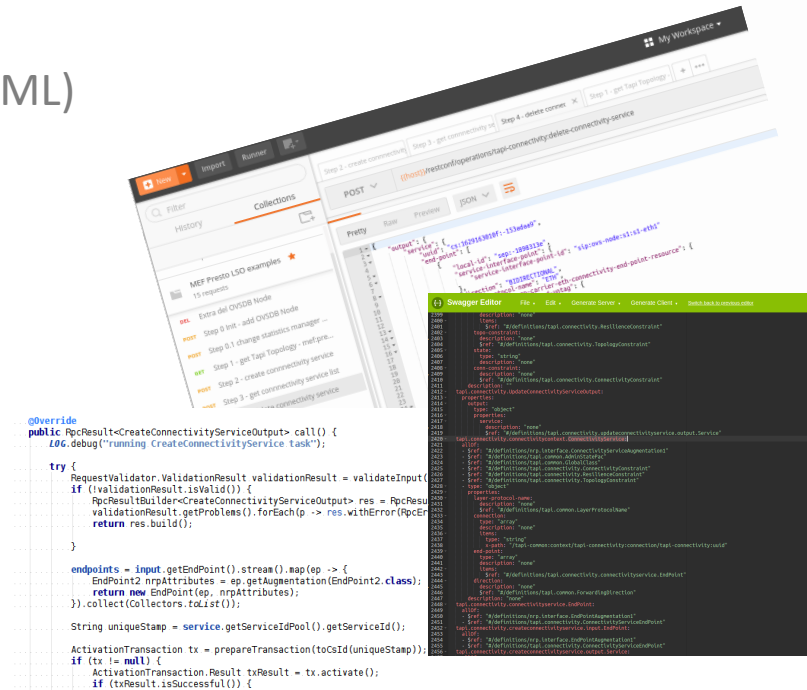
Presto NRP Data Model



Presto APIs – Available Assets

Demonstration on MEF GitHub to highlight following artifacts:

- API swaggers (YANG & YML)
- Postman collection
- Tutorial



DEMO



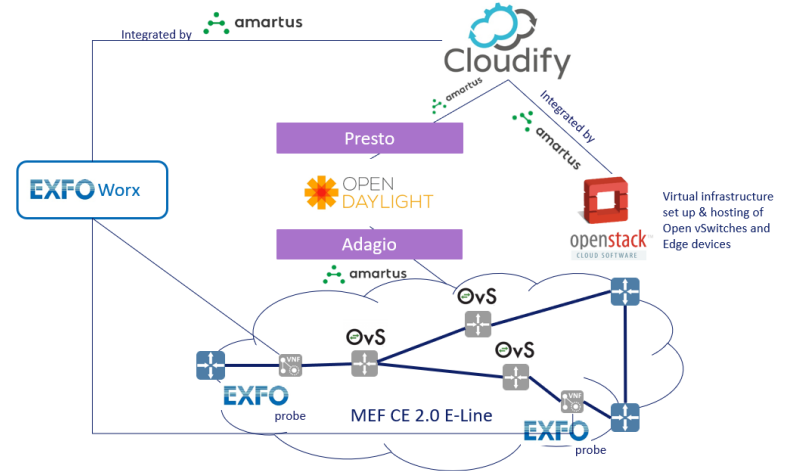
MEF SPECIFICATION
MEF 60
Network Resource Provisioning
Interface Profile Specification
January, 2018



Presto APIs in Action

MEF17 PoC

- LSO SOF Topology Engine
- On-demand Dynamic Bandwidth Scaling via LSO-compliant Platform and Continuous Performance Monitoring with NFV





Review of SDKs on GitHub

Access to GitHub

- Review MEF [Terms of Use](#)
- Establish GitHub user name (signup [here](#))
- Email Tom Dickson (tom@mef.net) with GitHub user name



LSO Presto:
Explore MEF-GIT [here](#)



LSO Sonata:
Explore MEF-GIT [here](#)

Call to Action

- Get engaged with LSO API design, definition, development
- Enhance the SDKs
- Test drive the APIs
- Give us implementation feedback

Q&A



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MEF
(Moderator)



Dhurvas (Siva) Sivakumar
Computer Sys. Sol. Architect,
AT&T



Ludovic Robert
IT Sr. Architect,
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