MEF's Lifecycle Service Orchestration (LSO): Multi-operator Service Delivery from Months to Minutes..

Gastón Cutignola
Senior Solution Engineer Latin America
Telco Systems
Examples:

- Establishing New Connections
- On-demand Bandwidth Increase
- App-Driven Network Changes
- L3 to L7 services
MEF Third Network Vision

- Accelerate transition to Third Network services for digital economy & hyper-connected world.
- Combine agility & ubiquity of Internet + assurance & security of CE 2.0.
- Provide on-demand, assured & orchestrated experience for cloud-centric world
- Deliver over automated, virtualized & interconnected networks powered by LSO, SDN, NFV & CE 2.0
Lifecycle Service Orchestration (LSO)

FRAMEWORK

Lifecycle Service Orchestration (LSO)

Network Operator 2

Network Operator 1

User Service Endpoint

User Service Endpoint

End-to-End Network-as-a-Service

Self-service Web Portal

Service Orchestration Function

Service Orchestration Function

Business Applications

Business Applications

LSO Allegro

LSO Cantata

LSO Legato

LSO Sonata

LSO Interlude

LSO Presto

User

Service

Endpoint

Service

Endpoint

Network

as-a-Service

Web Portal

Operator

Service

Endpoint

Device

ENNI

Packet SDN Controller

Traditional EMS

Packet SDN Controller

Packet SDN Controller

Packet PNFs

Packet PNFs

Packet PNFs

Head Office

SDN Switch

VNF

VNF

VNF

VNF

NFV MANO

EMS: Element Management System

PNF: Physical Network Function

MEF LSO CAPABILITIES

- Fulfillment
- Performance
- Control
- Assurance
- Usage
- Analytics
- Security
- Policy
Evolution to Value Added NFaaS

**Customer Value**
On-demand access to their sites and clouds

**Third Network Carrier Value**
- Site-site connectivity
- Site-to-cloud connectivity
- Value added NFaaS
- Future value added cloud services

**Cloud Provider Value**
The cloud just works for a great quality of experience

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**The Third Network with Cloud Access**

- **Site A**
  - SDN Switch
  - SDN Controller

- **Site B**
  - IP VPN
  - IPS/IDS
  - Firewall
  - Analytics
  - Carrier NAT
  - BGP Routing

- **Site C**
  - Self-service Web Portal

**NFaaS (optional)**
- IP VPN
- IPS/IDS
- Firewall
- Analytics
- Carrier NAT
- BGP Routing

**Cloud Provider**
- NFV MANO
- LSO

**MEF**
- On-demand access to their sites and clouds
- Value added NFaaS
- Future value added cloud services

**NFaaS: Network Function as a Service**
Third Network & Brownfield Deployments

Self-service Web Portal

Northbound Interfaces (NBIs)

OTN

Head Office

T-SDN Controller

P-SDN Controller

EMS

SDN Switch

Data Center or Head End

Wide Area Network

Southbound Interfaces (SBIs)

Broadway Controller

Self-service
Web Portal

Northbound Interfaces (NBIs)

Wide Area Network

OTN

Head Office

T-SDN Controller

P-SDN Controller

EMS

SDN Switch

Data Center or Head End

Self-service
Web Portal

Northbound Interfaces (NBIs)
Third Network Services

Orchestrated Connectivity Services
- E-Line
- E-LAN
- E-Tree
- E-Access
- E-Transit
- Wavelength
- Internet Access
- L3 VPNs
- IP Transit

Orchestrated Cloud Services
- IaaS
- SaaS
- PaaS
- UCaaS
- BlaaS
- SECaaS
- L4-L7 NFaaS

MEF LSO FRAMEWORK

MEF Open LSO Lifecycle Service Orchestration

TECHNOLOGY DOMAINS
MEF Activities

MEF Committees

Services
Operations
Orchestration

MEF Agile Development Lifecycle

Collaboration

Liaisons to SDOs
Open Source Projects

Open Initiative

ACCELERATOR
Informative Reference Implementations

Steering Group
RULES, TOOLS, IPR, GOVERNANCE

MEF Agile  Development
Lifecycle

NORMATIVE SPECS,
CERTIFICATIONS & MARKETING

MEF Activities
• Definition
  – OpenCS is a MEF-facilitated ecosystem that provides reference implementations of MEF-defined connectivity services (e.g. E-Line) using combinations of Open Source software, Open Spec hardware, SDN, NFV and CE 2.0-certified devices.

• Objective
  – Simplify and accelerate adoption of MEF specs to develop Third Network services based on any combination of SDN controllers, NFV infrastructure, VNFs, white boxes and traditional PNFs
MEF Open Initiatives for Third Network Services

**Orchestrated Connectivity Services**
- E-Line
- E-LAN
- E-Tree
- E-Access
- E-Transit
- Wavelength
- Internet Access
- L3 VPNs
- IP Transit

**Orchestrated Cloud Services**
- IaaS
- SaaS
- PaaS
- UCaaS
- BlaaS
- SECaaS
- L4-L7 NFaaS

**OpenLSO Capabilities**
- Fulfillment
- Performance
- Control
- Assurance
- Usage
- Analytics
- Security
- Policy

**OpenCS Technology Domains**
- Data Center
- Packet WAN
- NFV
- Optical Transport
- SD-WAN
- Cloud Exchange
- 5G Wireless

APIs:
- Sonata APIs
- Interlude APIs
- Presto APIs
The OpenCS Data Center project is creating for service providers reference Data Center implementations based on E-CORD that can be service orchestrated by LSO (MEF-defined Lifecycle Service Orchestration) and integrated into multi-operator agile, assured and orchestrated end to end L2 and L3 services.
OpenCS – Optical Transport Use Case

• This project was created to develop and demonstrate a Reference Architecture, Design & Implementation for orchestration of MEF Connectivity Services and SDN controlled dynamic, on-demand Optical Transport connectivity.
• The OpenCS 5G project was started at the MEF 3Q2016 Members Meeting in Boston under the leadership of Ericsson and Fujitsu.

• It is aimed at enabling the LSO orchestration of connectivity services implemented in 5G networks that will be included in multi-domain Third Network services.
Industry Analysts Value MEF’s Vision & Work

Michael Howard, Senior Research Director, Carrier Networks

“...LSO progress will be critical to deploy dynamic services with automation...”

Scott Raynovich, VP of Content & Research

“...MEF has been breaking new ground in helping operators integrate OSS/BSS functions with the new SDN and NFV world...”
What Other Analysts are Saying About MEF

The Best Approach to SDN and NFV isn’t from ETSI or Open-Something, but From the MEF

“A combination of overlay/underlay and an interconnected-metro model of the network of the future would be in my view incredibly insightful, and if it could be promoted effectively, it could be a revolution. The MEF is the only body that seems to be articulating this model, and that makes them a player in next-gen infrastructure in itself.”

http://blog.cimicorp.com
Opening keynote presentation from China Telecom CEO Advisor Wei Leping at China SDN/NFV Conference 2016

... And From Heidi Adams, IHS Infonetics

“The whole LSO area has really struck a chord in China.”
Q&A
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