



Advancements in ONF Transport API for Orchestration of Multi-layer Connectivity Service

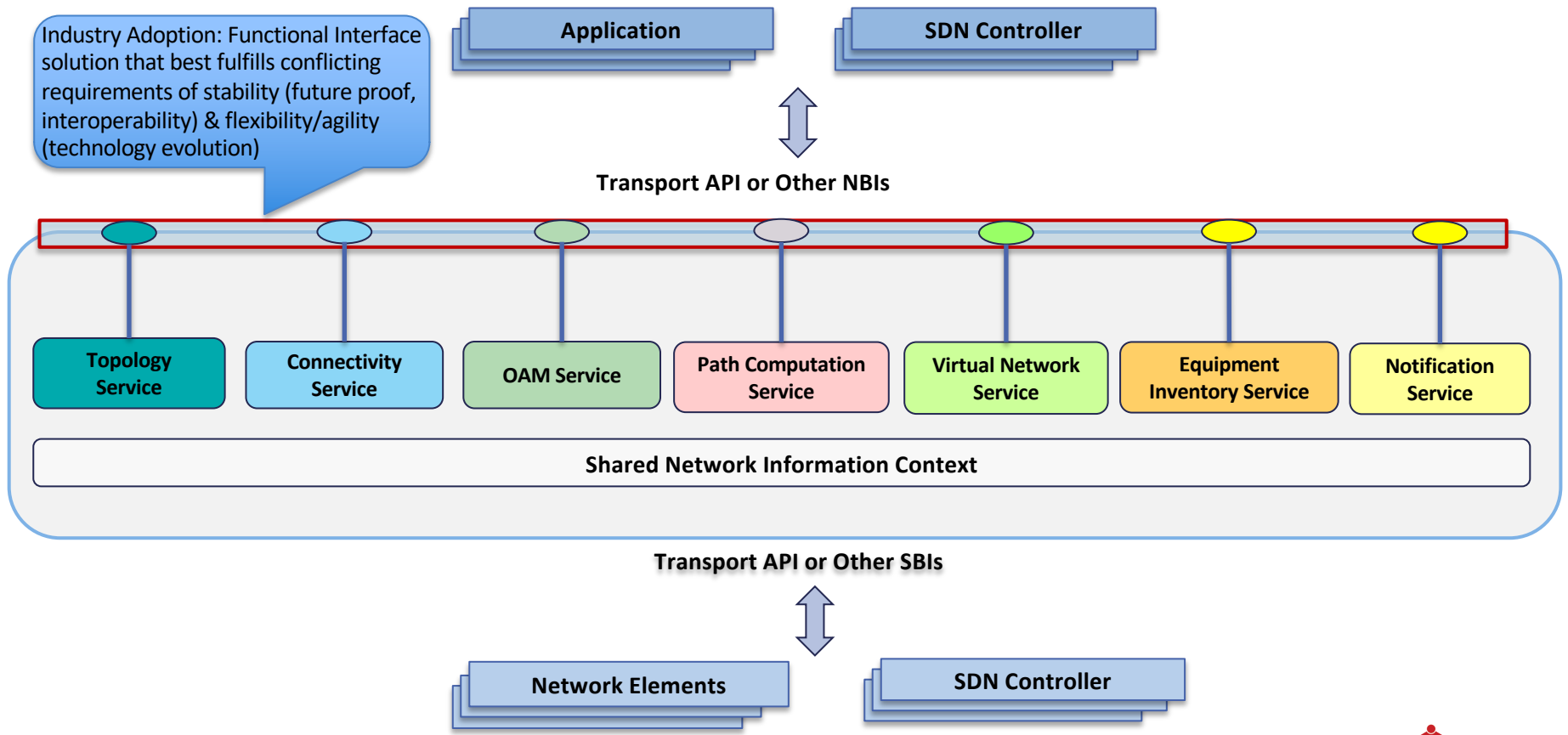
Andrea Mazzini, Nokia
Karthik Sethuraman, NEC

September 2019

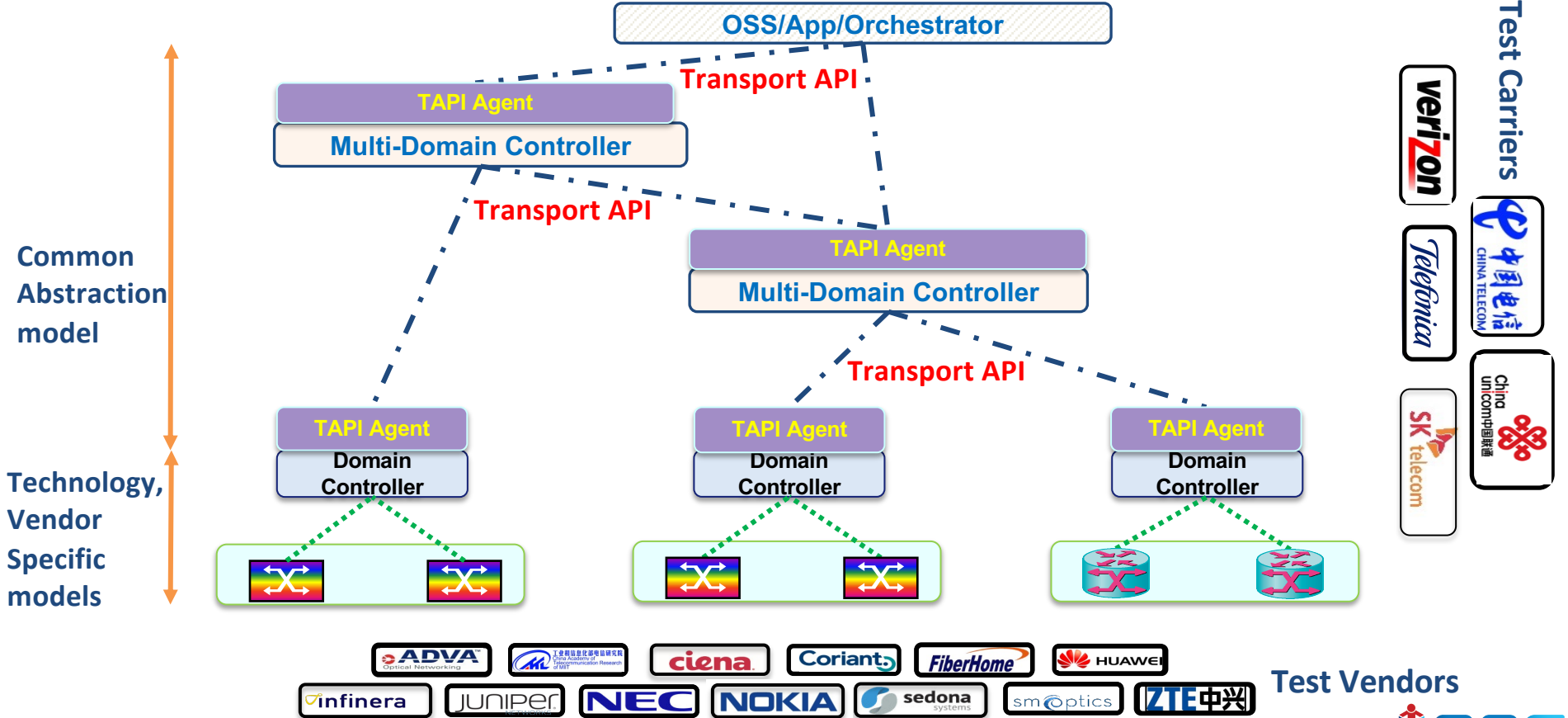
***animated slides**

ONF Transport API (TAPI): Functional Architecture

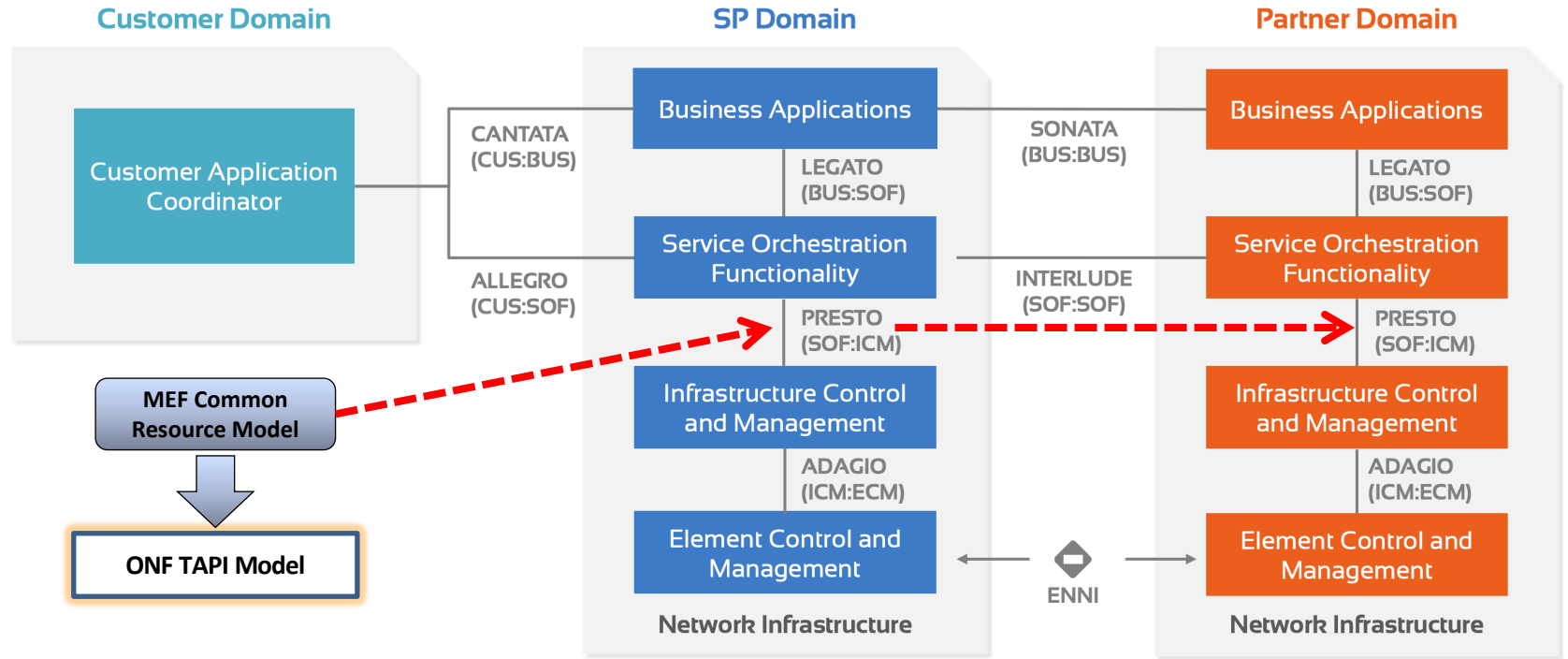
Industry Adoption: Functional Interface solution that best fulfills conflicting requirements of stability (future proof, interoperability) & flexibility/agility (technology evolution)



OIF Transport API Interop Demo (2014, 2016, 2018)

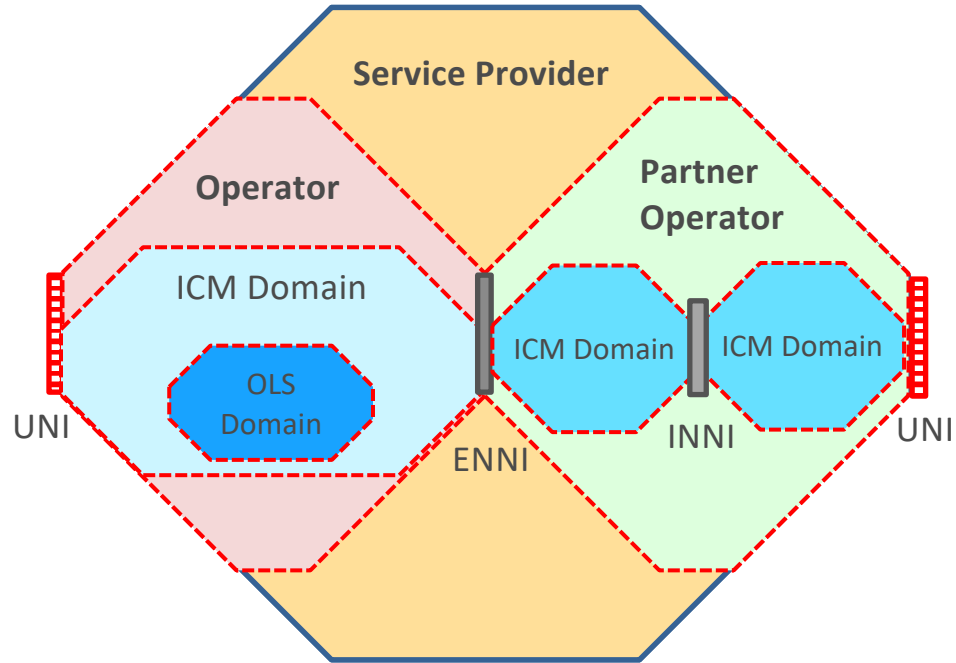


MEF: Lifecycle Service Orchestration Reference Architecture (LSO RA)

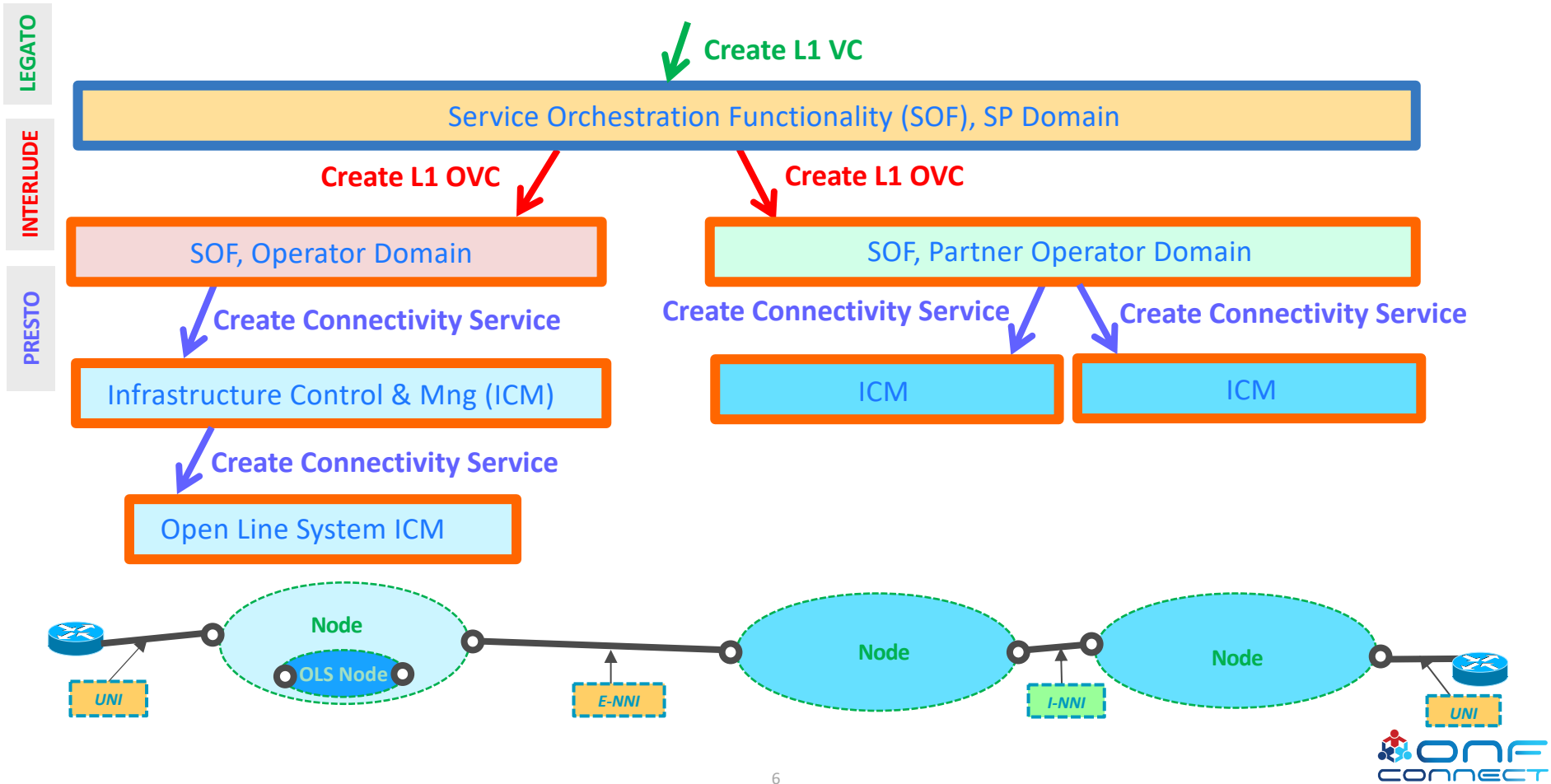


CUS: Customer Application Coordinator
BUS: Business Applications
SOF: Service Orchestration Functionality
ICM: Infrastructure Control and Management
ECM: Element Control and Management

MEF: Service Provider, Operators, ICM Domains, UNI, ENNI, INNI (1)



MEF: Service Provider, Operators, ICM Domains, UNI, ENNI, INNI (3)



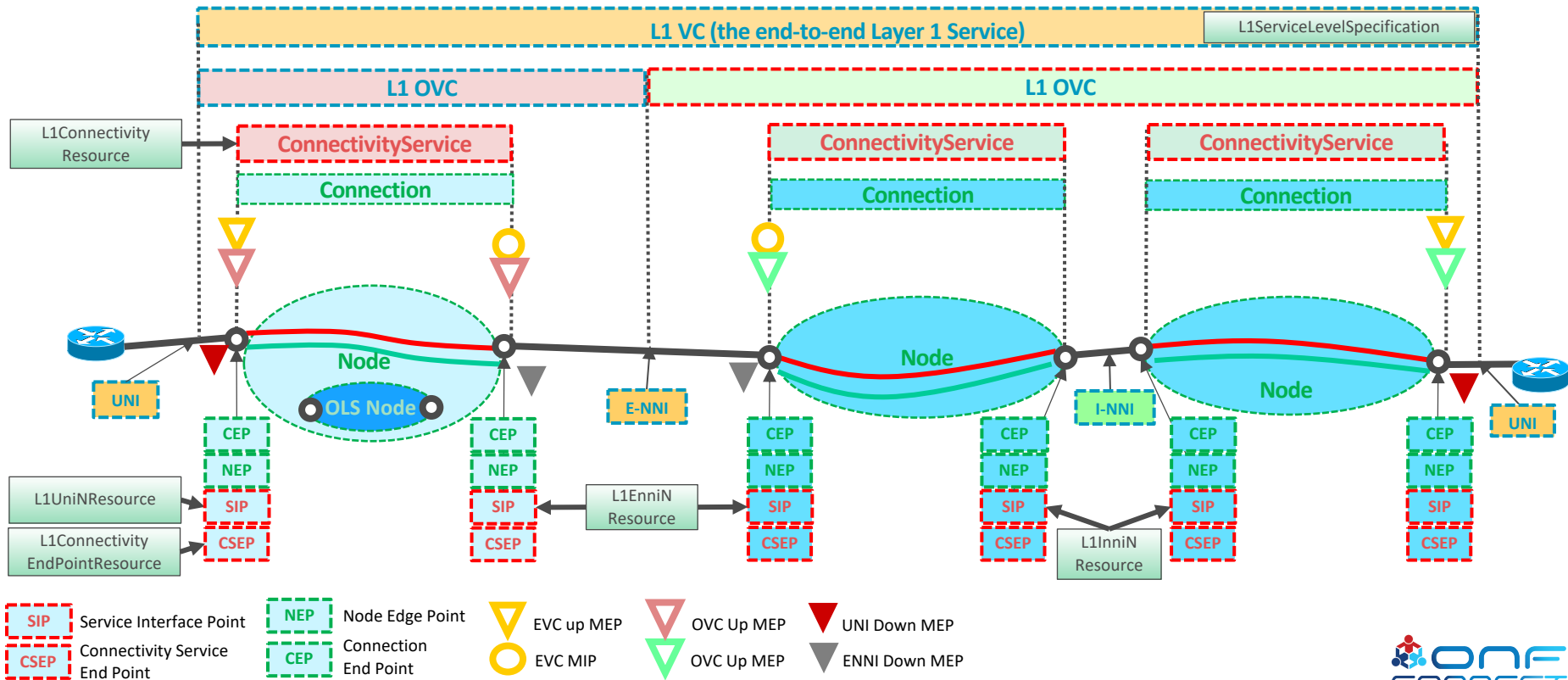
MEF: Layer 1 Service across different Operators & Management Domains

managed object classes at Service level
(appearing at Legato, Interlude Management IRPs)

ONF TAPI managed object classes at Resource level
(appearing at Presto for provisioning purposes)

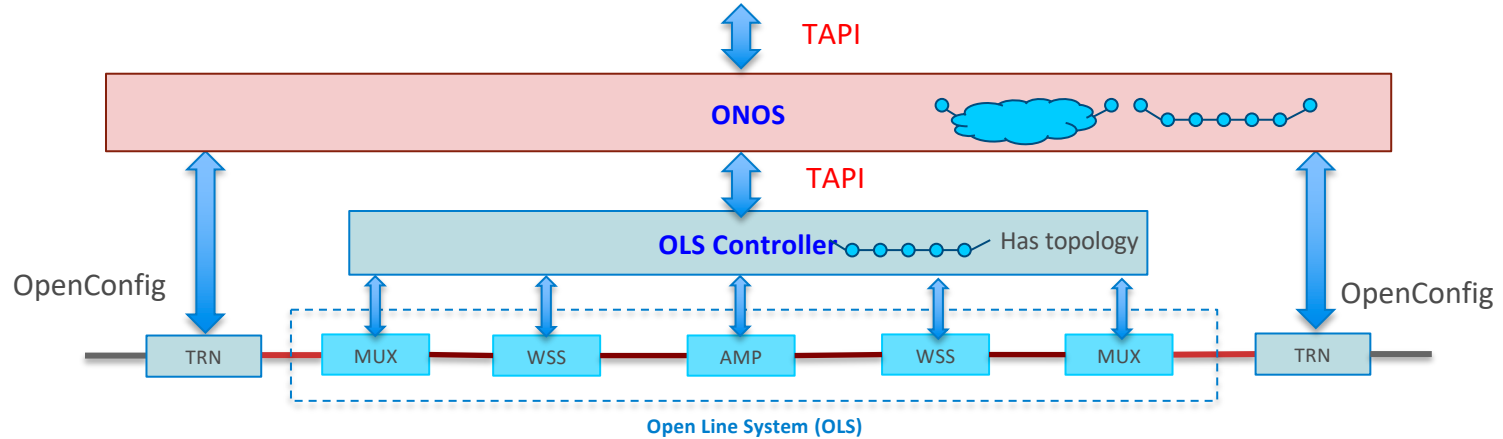
ONF TAPI managed object classes at Resource level
(appearing at Presto for discovery purposes, e.g. topology)

MEF Resource managed object classes augmenting TAPI



ONF ODTN (Open Disaggregated Transport) Architecture

With OLS Controller

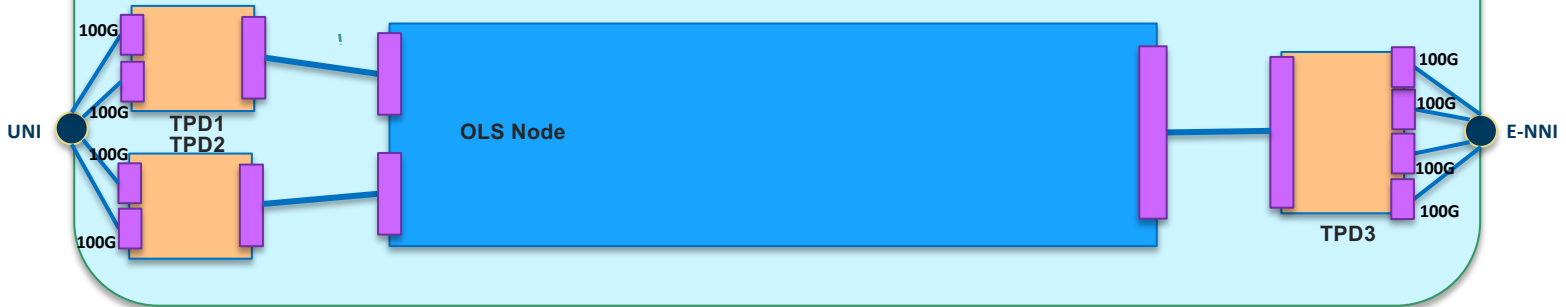


Operator Domain Topology

SOF-ICM TAPI Context (LSO Presto)

Operator SOF view

Operator ICM View

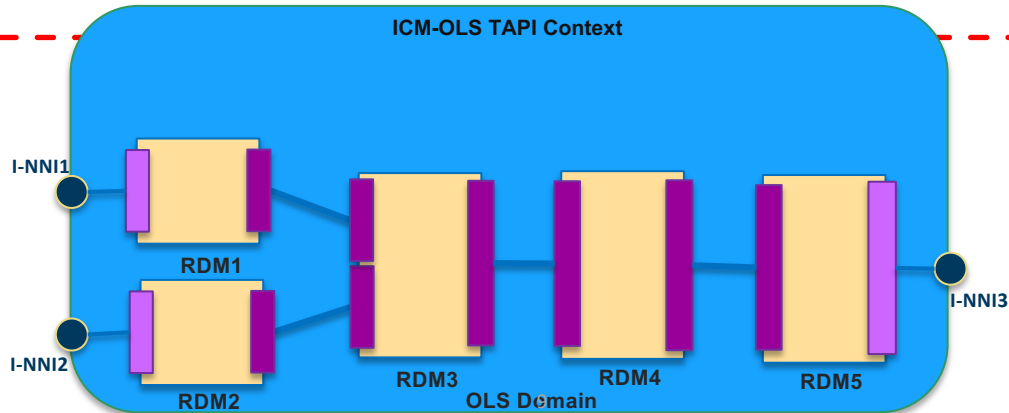


OLS View

ICM-OLS TAPI Context

Abbreviations

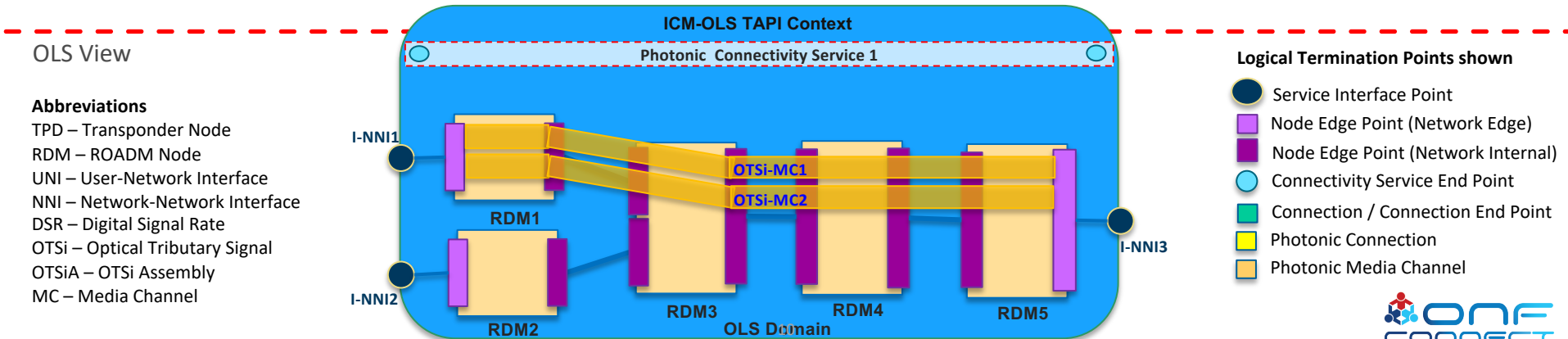
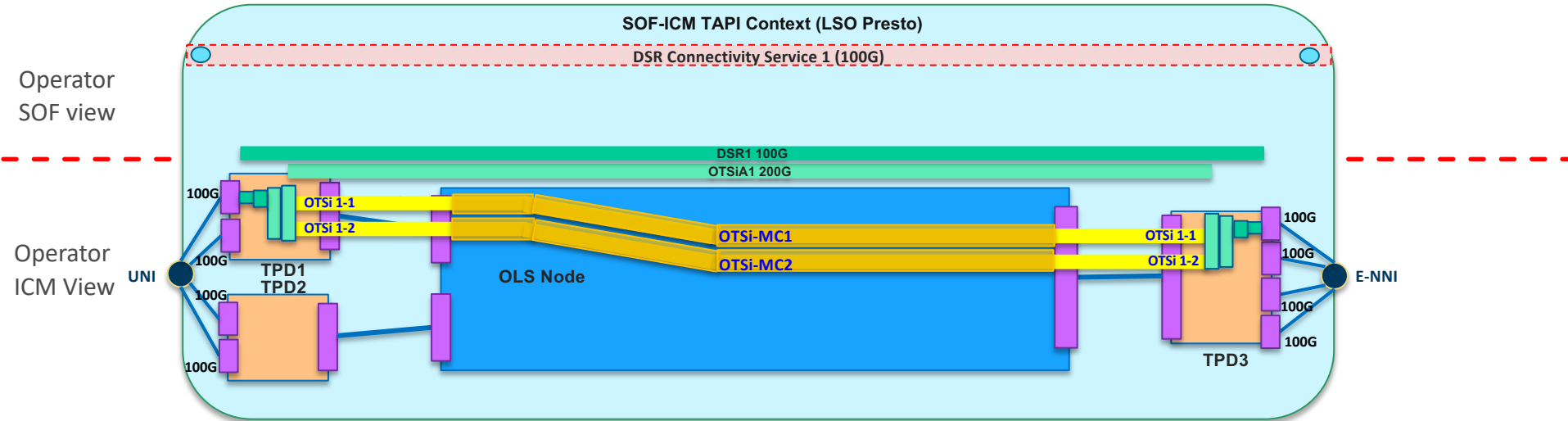
- TPD – Transponder Node
- RDM – ROADM Node
- UNI – User-Network Interface
- NNI – Network-Network Interface
- DSR – Digital Signal Rate
- OTSi – Optical Tributary Signal
- OTSiA – OTSi Assembly
- MC – Media Channel



Logical Termination Points shown

- Service Interface Point
- Node Edge Point (Network Edge)
- Node Edge Point (Network Internal)
- Connectivity Service End Point
- Connection / Connection End Point
- Photonic Connection
- Photonic Media Channel

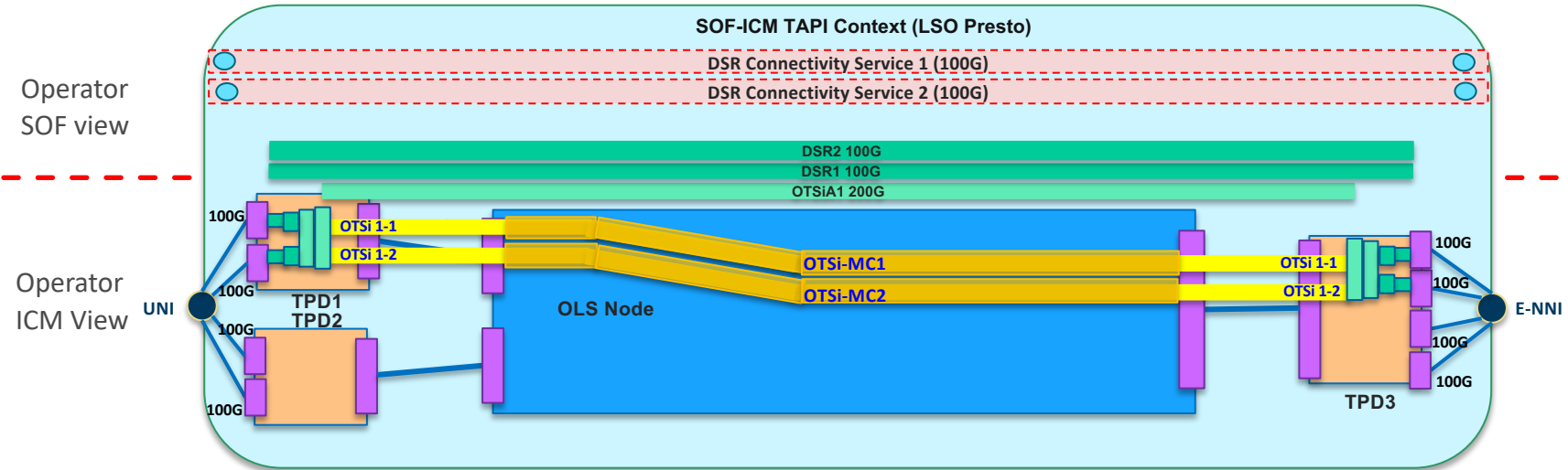
Operator Domain Connectivity Service & Resources(1)



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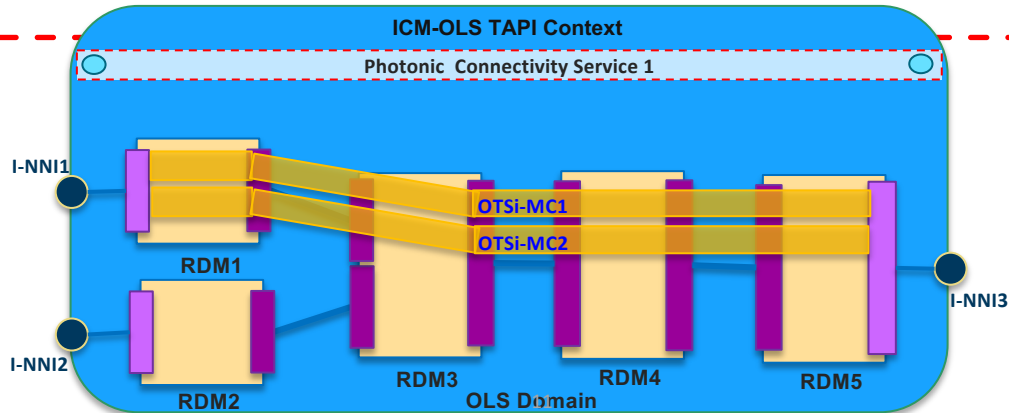
Operator Domain Connectivity Service & Resources (2)



OLS View

Abbreviations

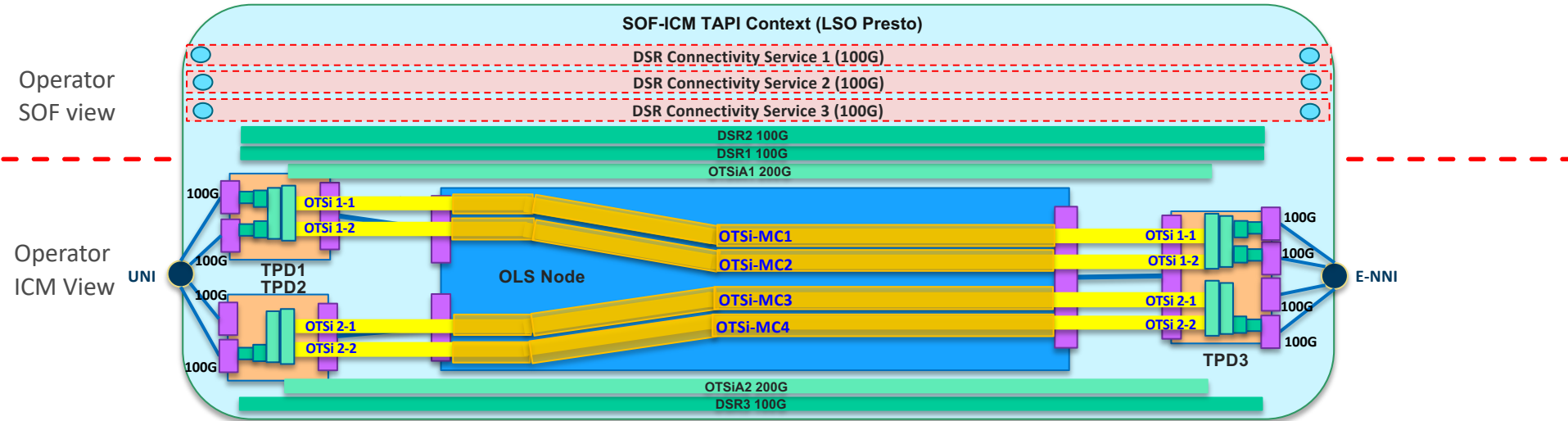
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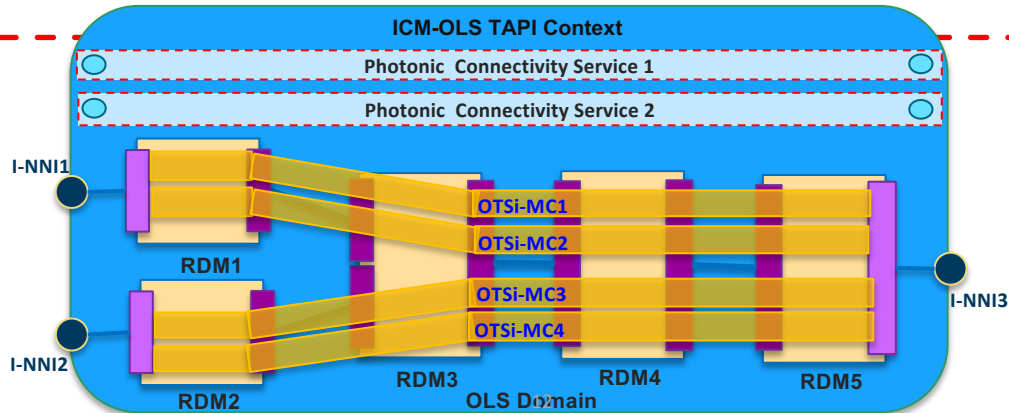
Operator Domain Connectivity Service & Resources (3)



OLS View

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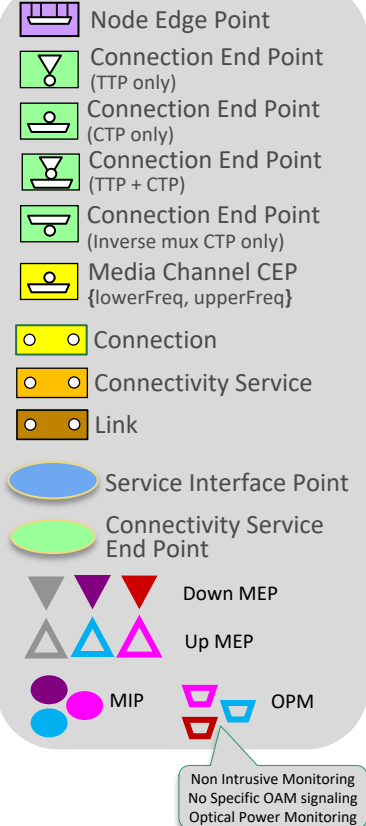
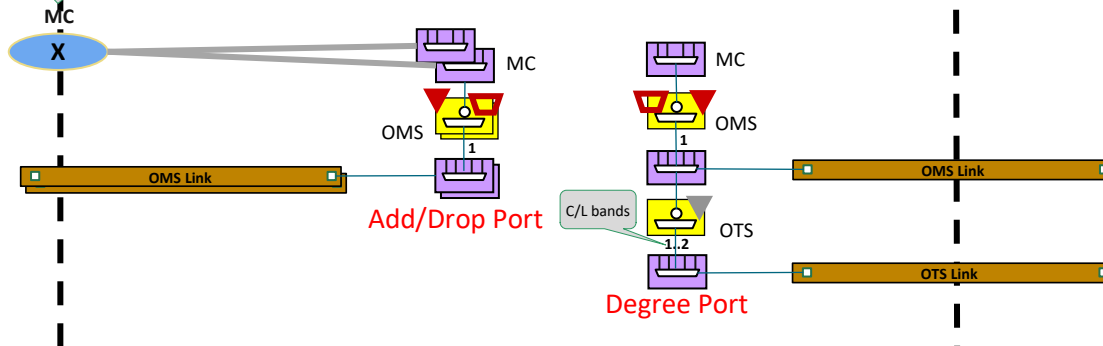
Photonic Logical Terminations, Connectivity Service, Step 1

TRANSPONDER |

ROADM |

- MC spectrum/**bandwidth** only, Create MCA ConnectivityService with the following input parameters:
 - MC SIPs
 - MC CSEPs with required spectrum (**or only bandwidth, delegating spectrum allocation**)
 The agent will create:
 - proper edge-to-edge MC Connection(s), MC XCs, MC CEPs and client OTSiMC NEPs, each MC CEP includes the MCA Id

This MC SIP refers to MCs NEPs, each MC NEP representing the spectrum available on an OMS.



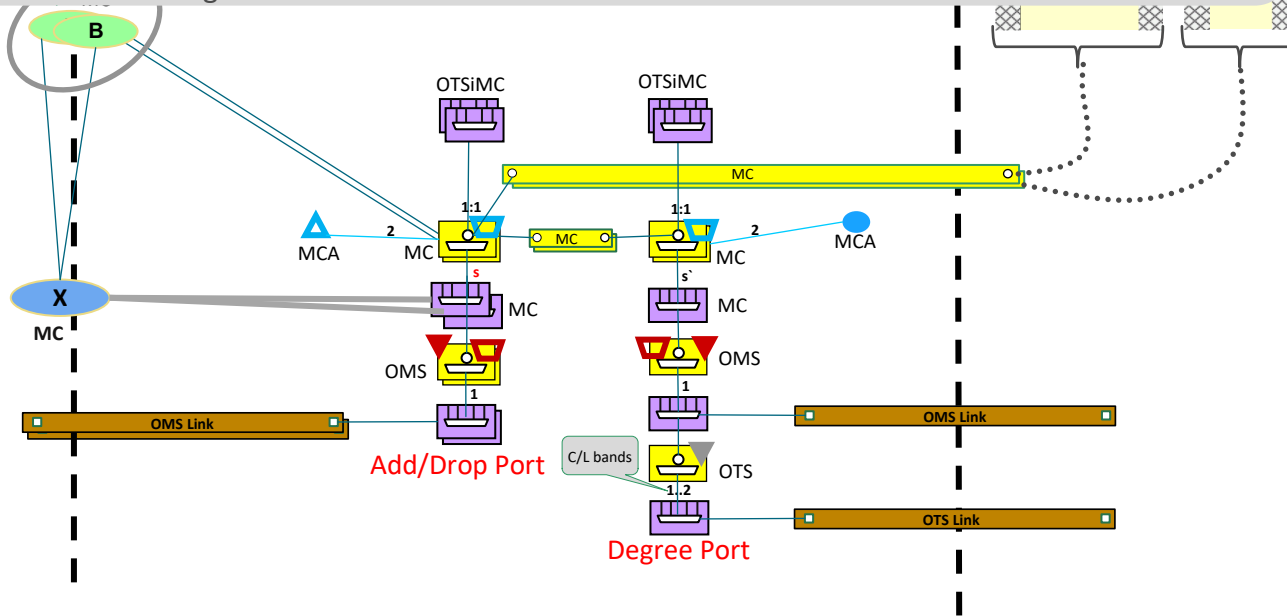
Photonic Logical Terminations, Connectivity Service, Step 2

TRANSPONDER

ROADM

MC Connectivity Service

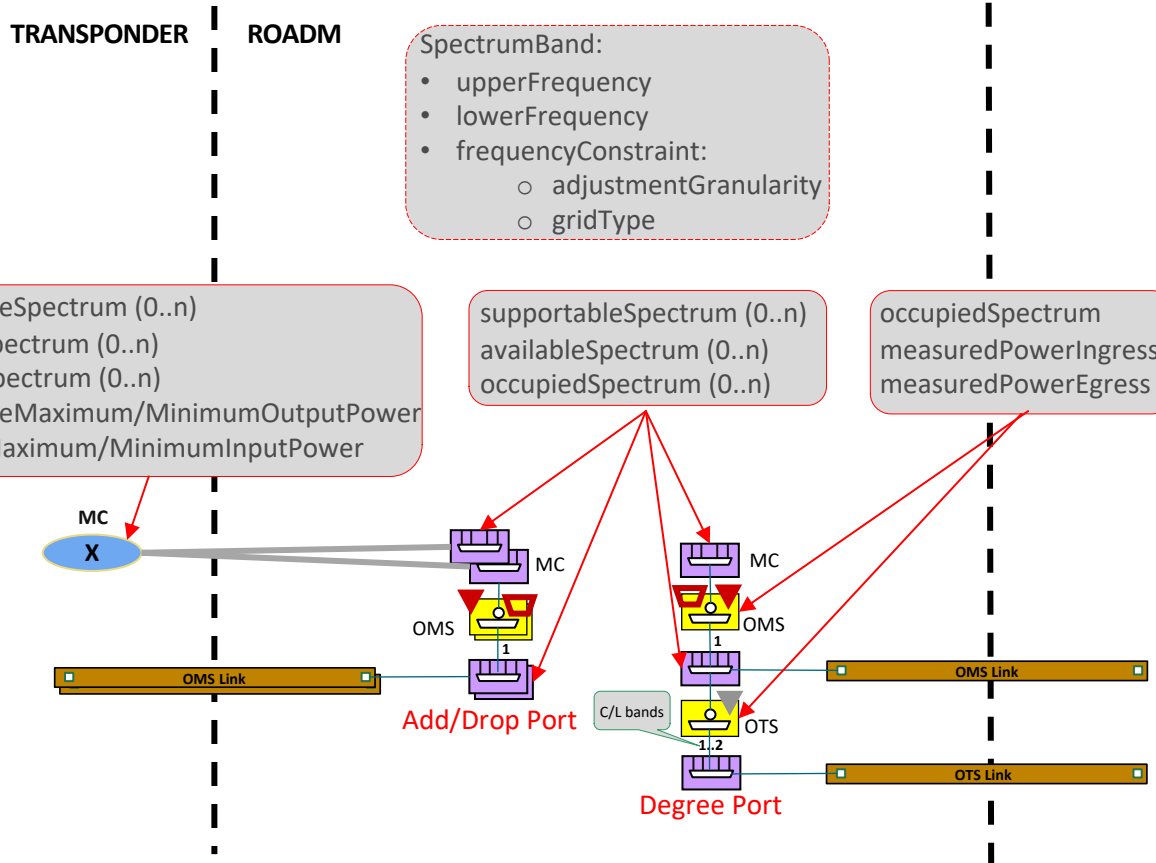
- Create OTSiMCA ConnectivityService with the following input parameters:
 1. MC SIPs
 2. OTSiMC CSEPs with required bandwidth (and spectrum) **in the existing MCA**
 The agent will create:
 1. proper edge-to-edge OTSiMC Connection(s), OTSiMC XCs, OTSiMC CEPs, each one including the OTSiMCA Id



Legend for the network diagram symbols:

- Node Edge Point
- Connection End Point (TTP only)
- Connection End Point (CTP only)
- Connection End Point (TTP + CTP)
- Connection End Point (Inverse mux CTP only)
- Media Channel CEP {lowerFreq, upperFreq}
- Connection
- Connectivity Service
- Link
- Service Interface Point
- Connectivity Service End Point
- Down MEP
- Up MEP
- MIP
- OPM
- Non Invasive Monitoring
No Specific OAM signaling
Optical Power Monitoring

Photonic Logical Terminations OLS Attributes

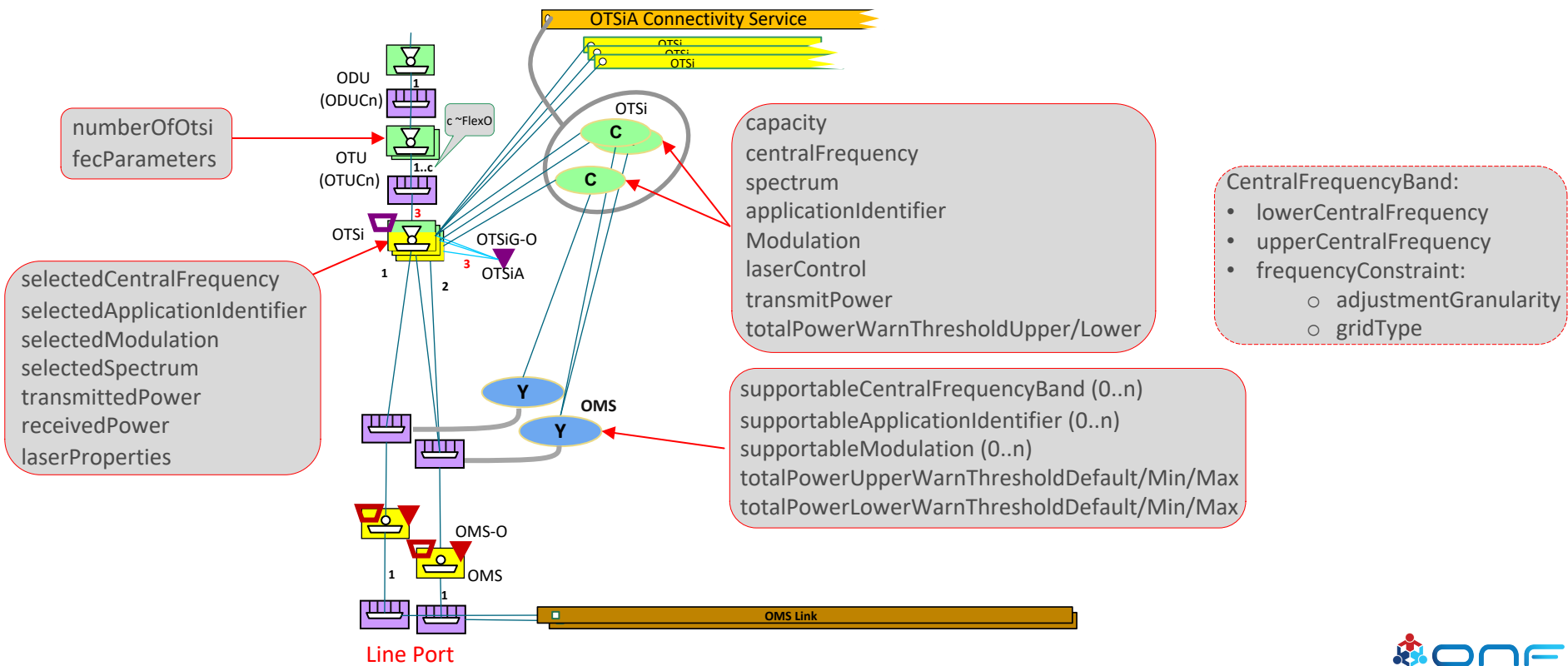


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Non Invasive Monitoring
No Specific OAM signaling
Optical Power Monitoring

Photonic Logical Terminations Transponder Attributes

TRANSPONDER





Thank You

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