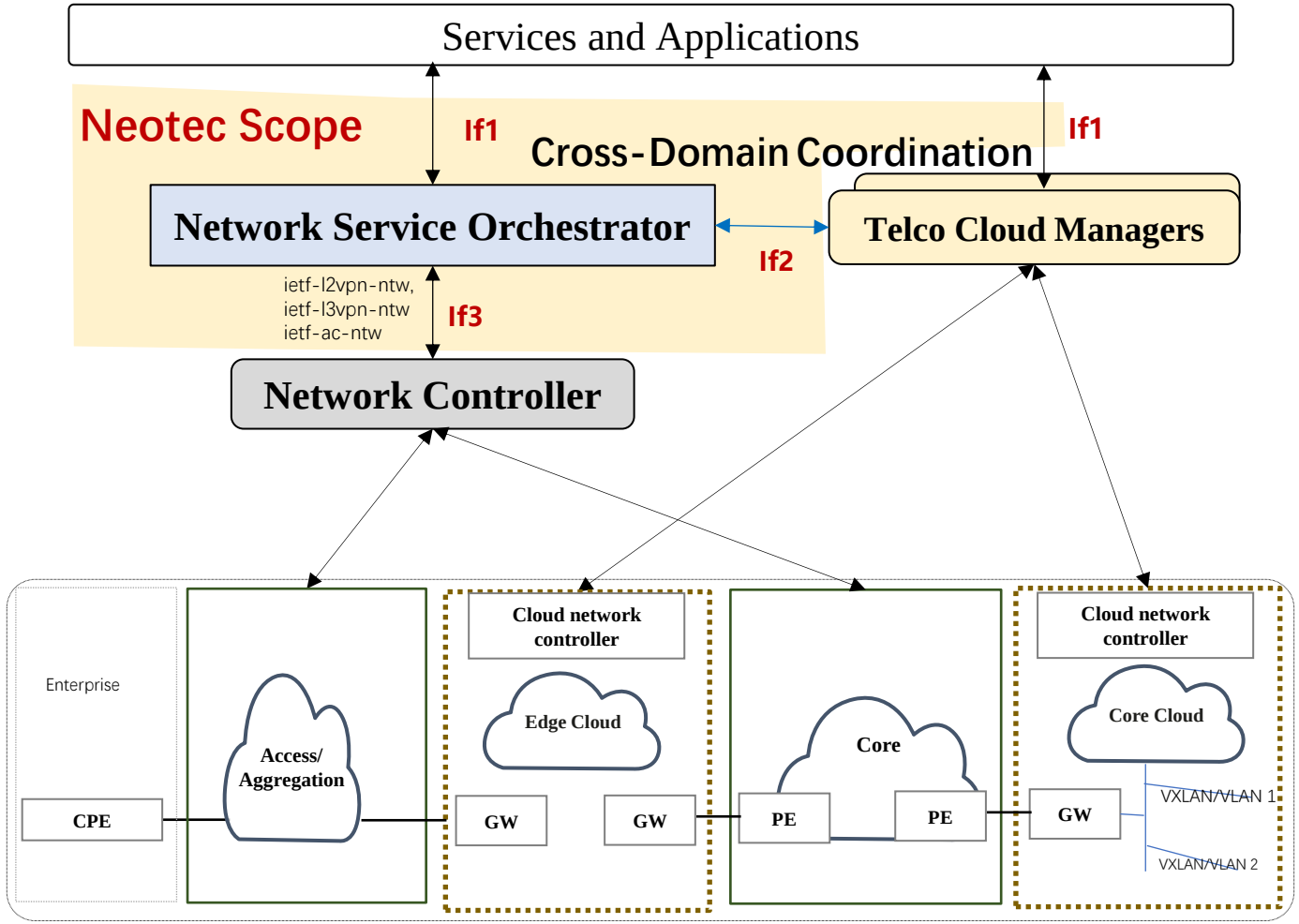
Network Telco-cloud Orchestration Interfaces Goal

- Interface 1(If 1) : 1)Intent-driven service deployment and scaling policy with service and SLO requirements can be directly mapped to cloud-network alliance policies. E.g. low-latency 100ms service, the system automatically selects edge nodes whose latency is less than 100 ms and reserves dedicated network bandwidth for the node. 2) Cloud aware network topology and metrics information
- Interface 2(If 2) : Cloud exposes the resource and operation metrics to the orchestrator, for network aware service placement and scaling policies
- Interface 3(If 3) : Network exposes the resource and operation metrics to the orchestrator for cloud resource aware network connectivity's and service QoS policy



Note: Telco Cloud Managers could be NFVO, OpenStack or Kubernetes platform

Neotec Goal:

① Central Cloud: Elastic Scaling on Demand (Millisecond-Level Scaling)

② Edge Cloud: Deterministic Low Latency (<10ms End-to-End)

③ Global Efficiency: Cross-Domain Resource Utilization Improved, and agile Domain Coordination

Network for Cloud Interface 2&3 (If 2&3) Option 1: ETSI NFV WAN Infrastructure Manager (WIM)

- **ETSI GS NFV-IFA 032 WIM**: **Network is NOT aware of cloud information**. Network management and cloud management are decoupled. The NFVO can schedule VPNs and TE tunnels through the WIM interface, and subscribe to the performance and faults of network TE resources and VPNs.
- **Interface complexity challenge**: The interfaces of TE topology, VPN, and TE tunnel matrix are open interfaces. However, multiple VPNs and MPLS-TE/SR-TE/SRv6 tunnels make the solution complex, especially cross-domain.

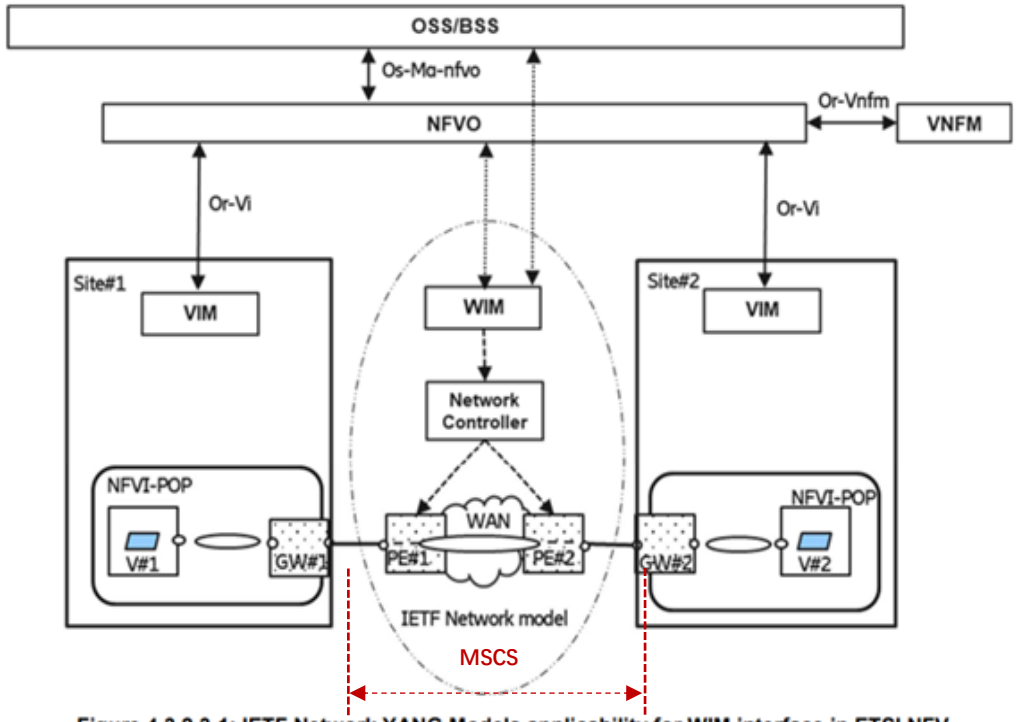


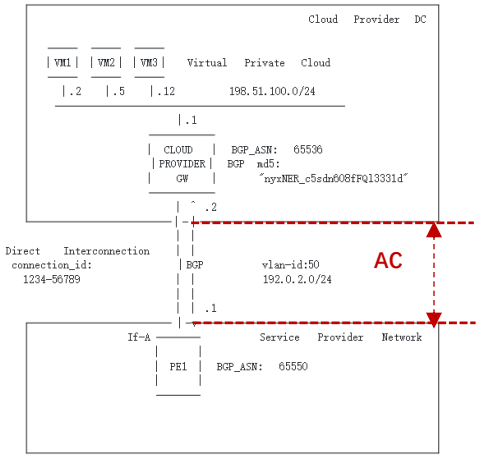
Figure 4.3.2.3-1: IETF Network YANG Models applicability for WIM interface in ETSI NFV

(From ETSI GR NFV-SOL 017 Report on protocol and data model solutions for Multi-site Connectivity Services)

Number Functional	requirement description	Name Draft or RFC Modules
WimIf.001	The WIM shall provide a (**Multi-site Connectivity Services**)MSCS Management interface.	1. Layer 3 VPN Network YANG Model (RFC9182) 2. Layer 2 VPN Network YANG Model (RFC9291) 3. Traffic Engineering (TE) and Service Mapping Yang Model(draft-ietf-teas-te-service-mapping-yang)
WimIf.002	The WIM shall provide a Capacity Management interface.	1. Traffic Engineering (TE) Topologies (RFC 8795)
WimIf.003	The WIM shall provide a Fault Management (FM) interface	1. Alarm Management (RFC 8632)
WimIf.004	The WIM shall provide a Performance Management (PM)interface.	1. Network and VPN Service PM 2. Virtual Network (VN)/TE PM Telemetry and Scaling Intent Autonomics YANG (draft-ietf-teas-actn-pm-telemetry-autonomics)

Network for Cloud Interface 2&3 (If 2&3): ACaaS and Network Slice Service(NSS)

- **WIM intent interfaces: Network is NOT aware of cloud information**. The WIM interfaces can be simplified but enhanced SLO of Network slice and AC intent interface, abstracting multiple VPN technologies and TE network models.
- **Potential gaps:** How to implement QoS and security policies for specific flows or applications with dynamic VM/container scaling and migration QoS and security policy?



draft-ietf-opsawg-teas-attachment-circuit

Connect a Cloud Infrastructure to a service provider network (Appendix A.8).

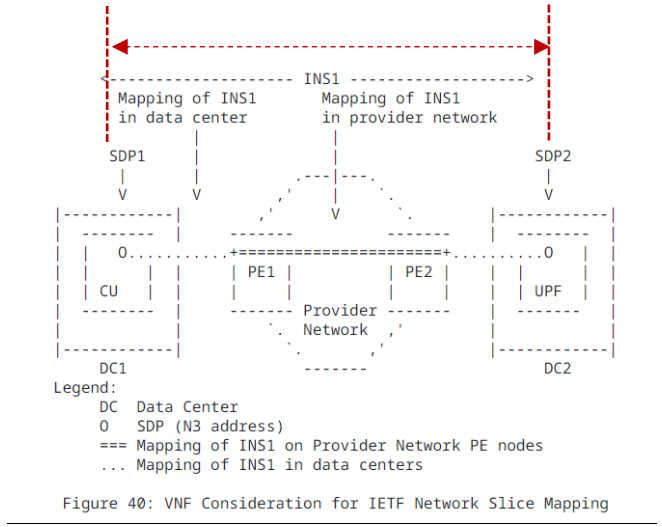


Figure 40: VNF Consideration for IETF Network Slice Mapping

draft-ietf-teas-5g-network-slice-application

Number Functional	requirement description	Name Draft or RFC Modules
WimIf.001	The WIM shall provide a Multi-site Connectivity Services (MSCS) Management interface	1. AC Service Model (draft-ietf-opsawg-teas-attachment-circuit) 2. IETF Network Slice Service Model (draft-ietf-teas-ietf-network-slice-nbi-yang)
WimIf.002	The WIM shall provide a Capacity Management interface.	1. AC Service Model – Bearers inventory
WimIf.003	The WIM shall provide a Fault Management (FM) interface	1. Alarm Management (RFC 8632) ->2. Network Incident (draft-ietf-nmop-network-incident-yang)
WimIf.004	The WIM shall provide a Performance Management (PM)interface.	1. IETF Network Slice Service Model (draft-ietf-teas-ietf-network-slice-nbi-yang)

Potential Gaps and Challenges

- Challenge: Interface 1(If 1) and Interface 2(If 2) may not be YANG interfaces

Interfaces	Requirement description	Existing Draft or RFC Modules	Potential Gaps and challenge
Interface 1 (If 1)	Services including computing, storage, network and SLO requirements	None in IETF (e.g. vCPE, SD-WAN, SASE, computing services, storage services)	In the scope of IETF?
Interface 2 (If 2) Cloud to Network	1. Cloud resources and metrics 2. Services traffic matrix	1. https://datatracker.ietf.org/doc/html/draft-llc-teas-dc-aware-topo-model-00 2. https://datatracker.ietf.org/doc/draft-ietf-teas-sf-aware-topo-model/	YANG interfaces or Restful APIs translator?
Interface 3 (If 3)	If 3 shall provide a Multi-site Connectivity Services (MSCS) Management interface	1. Layer 3 VPN Network YANG Model (RFC9182) 2. Layer 2 VPN Network YANG Model (RFC9291) 3. Traffic Engineering (TE) and Service Mapping Yang Model(draft-ietf-teas-te-service-mapping-yang) 4. Traffic Engineering (TE) Topologies (RFC 8795) 5. AC Service Model (draft-ietf-opsawg-teas-attachment-circuit) 6. IETF Network Slice Service Model (draft-ietf-teas-ietf-network-slice-nbi-yang)	1. Overlay virtual network services across Multi-DCs 2. Potential flow based QoS and security Policies