

# Gateway Function for Network Slicing

I-D.homma-nfvrg-slice-gateway-00

Shunsuke Homma –NTT

Xavier De Foy –InterDigital Inc.

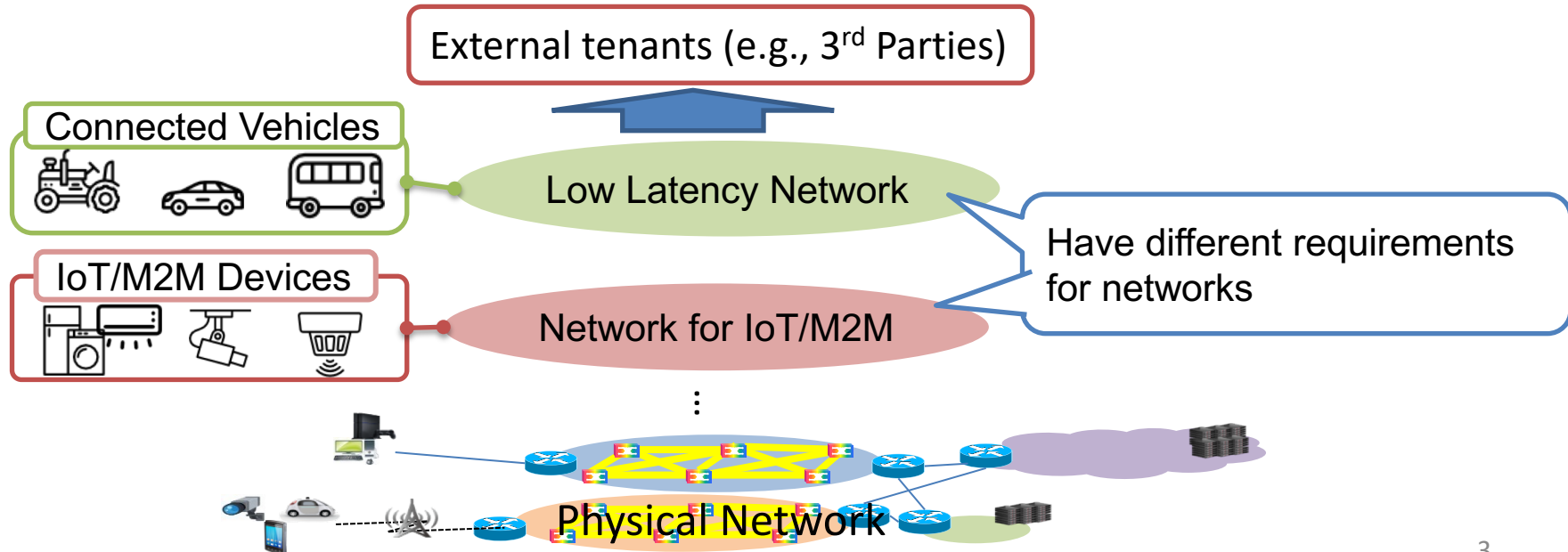
Alex Galis –University College London

# Purpose of Slice Gateway (SLG)

- To define capabilities of data-plane for network slicing (e.g., QoS control, transform encaps, etc.) with interaction with the management plane.
- To provide data-plane functionalities for providing E2E slices across multiple heterogeneous domains.

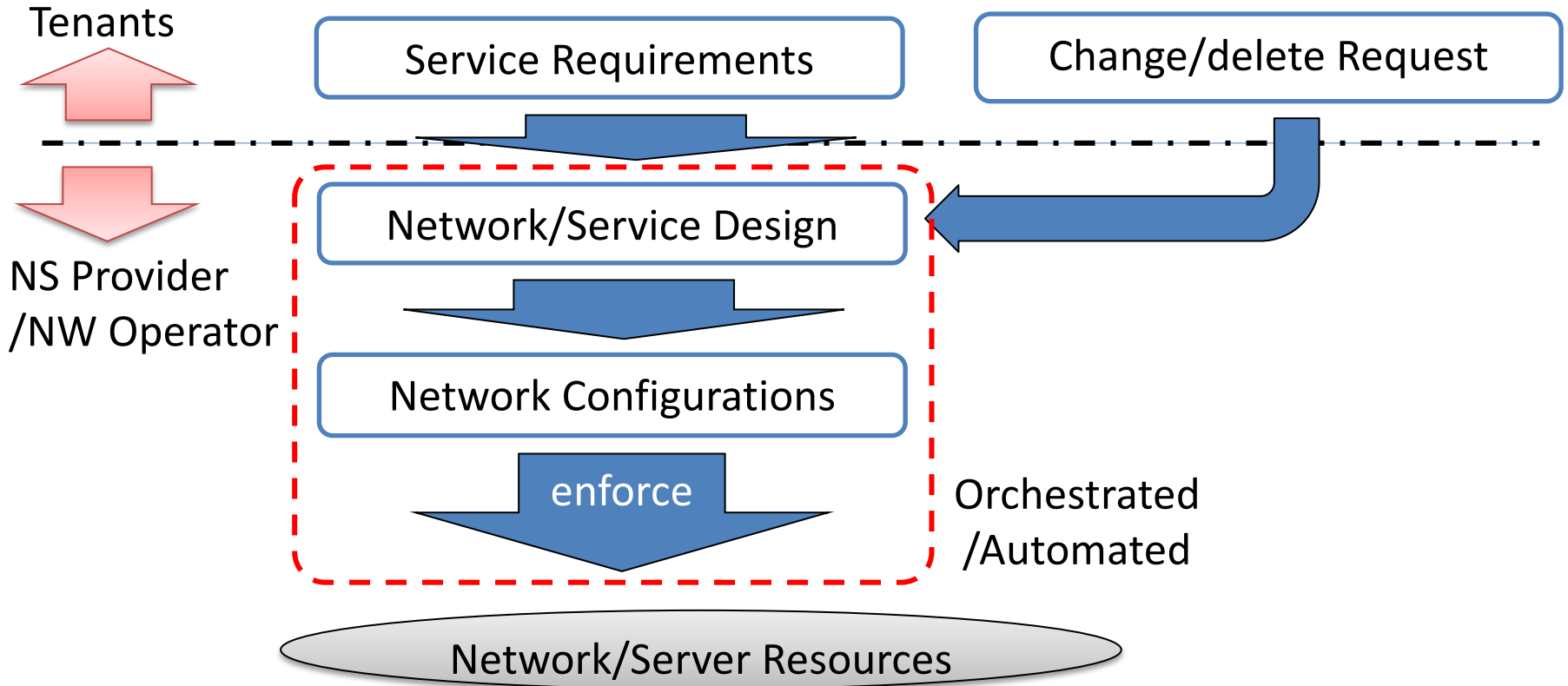
# Overview of Network Slicing

- Network slice (NS) is a logical network deployed based on service requirements.
- NS enables 3<sup>rd</sup> parties to use network resources as a part of their own services.



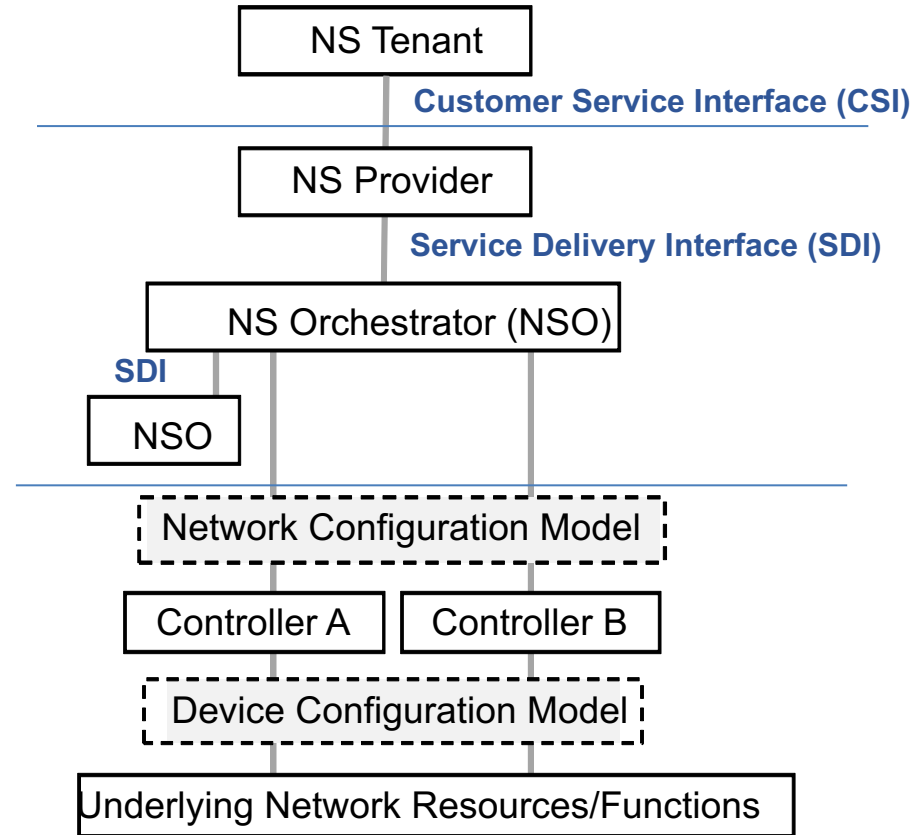
# NS Lifecycle

- Network slice (NS) are deployed depending on the following flow.



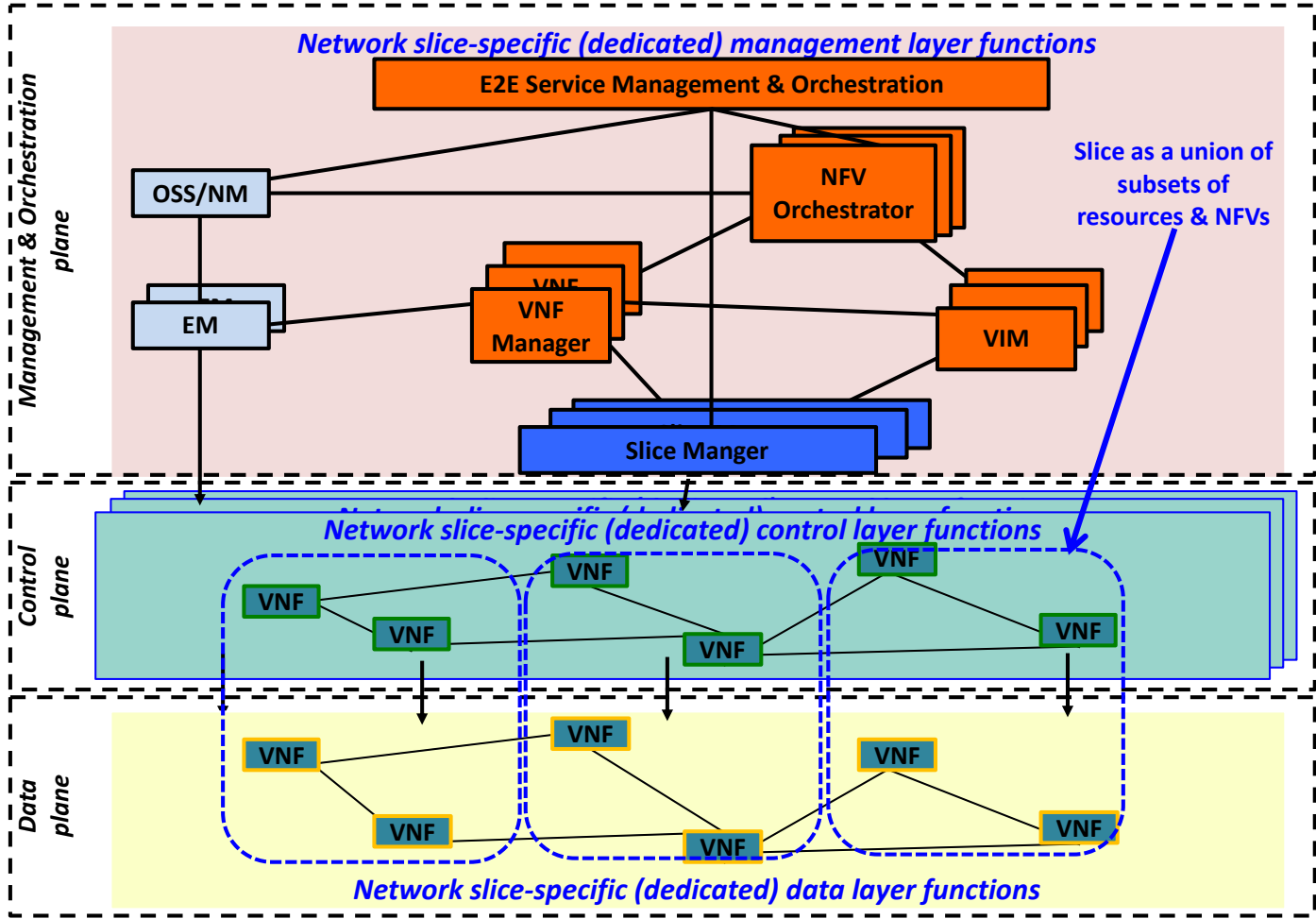
# Overview of NS System Framework

- NS are automatically deployed on physical network resources by NS orchestrator(NSO).
- NSO converts service requirements from tenants to network configuration.
- NS are instantiated dynamically with SDN/NFV technologies.



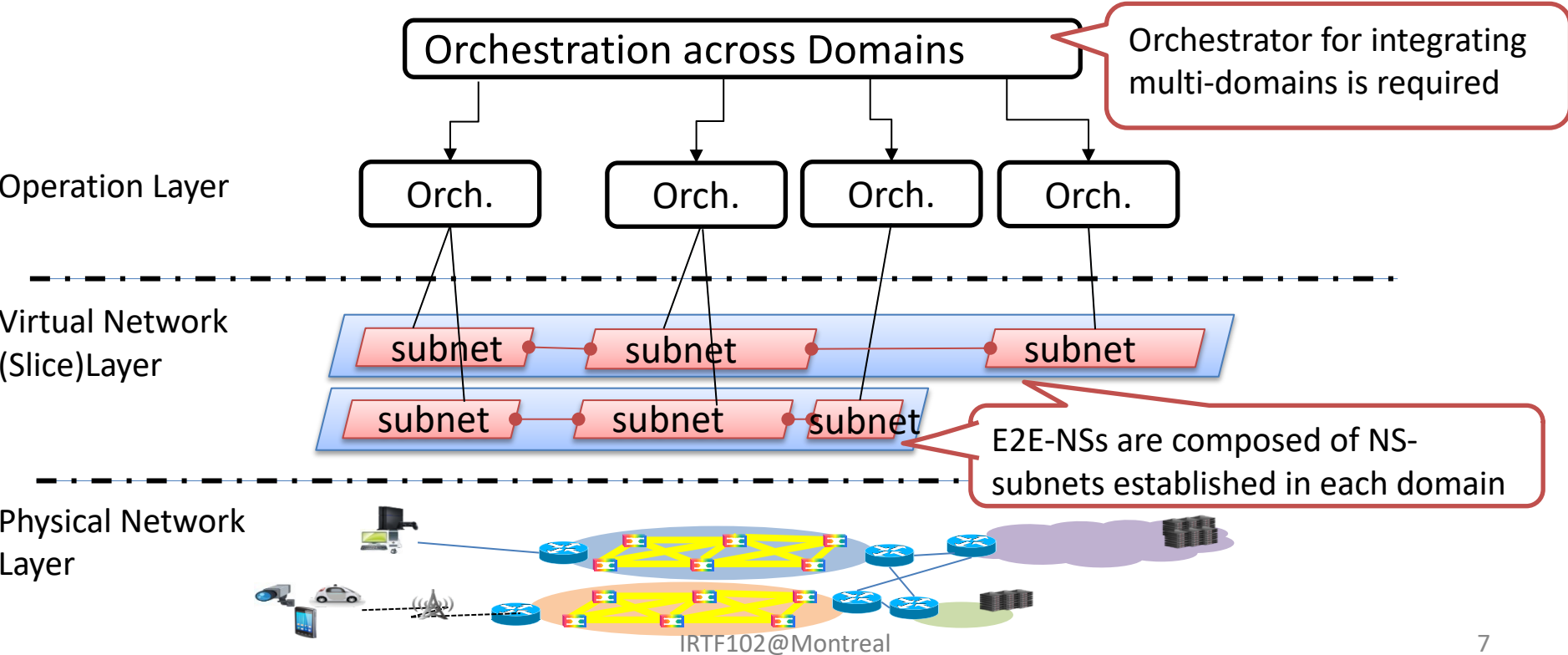
<https://datatracker.ietf.org/doc/draft-geng-coms-architecture/>

# Overview of Network Slicing in NFV



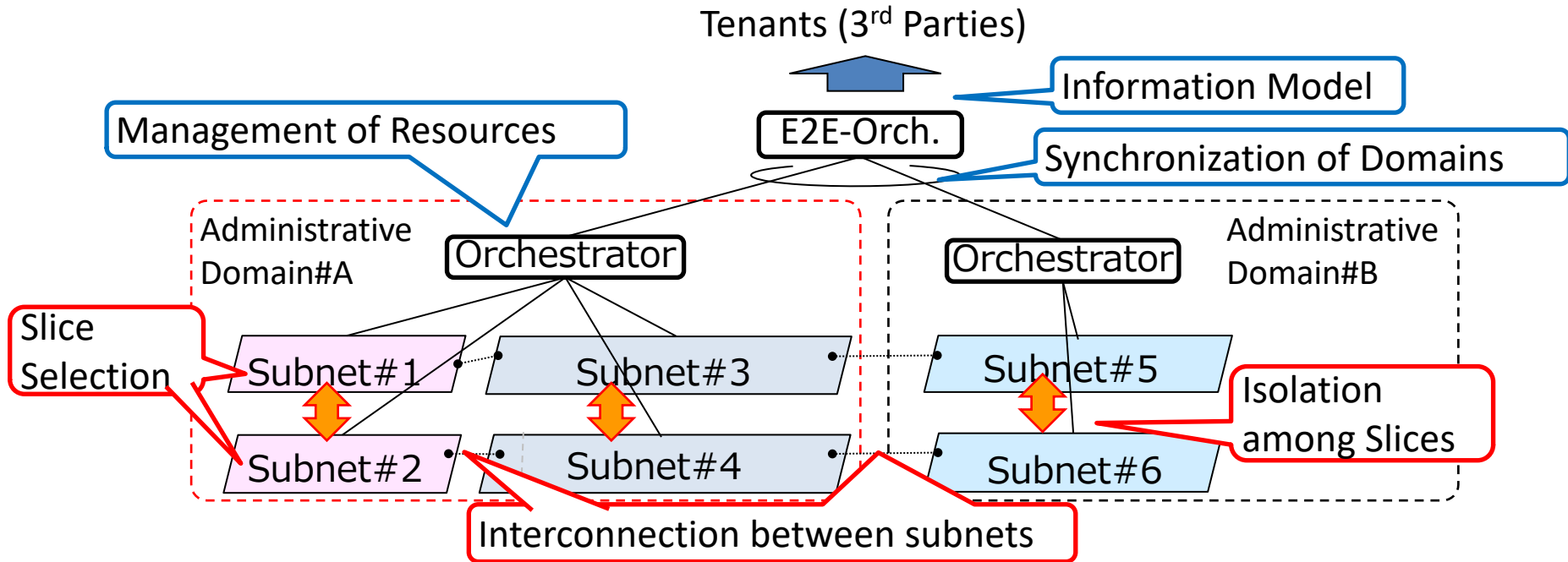
# E2E Network Slicing Concept

- NS is required to provide specific quality from end to end.
- NS is composed of subnets which deployed in each domain.



# Challenges on E2E Network Slicing

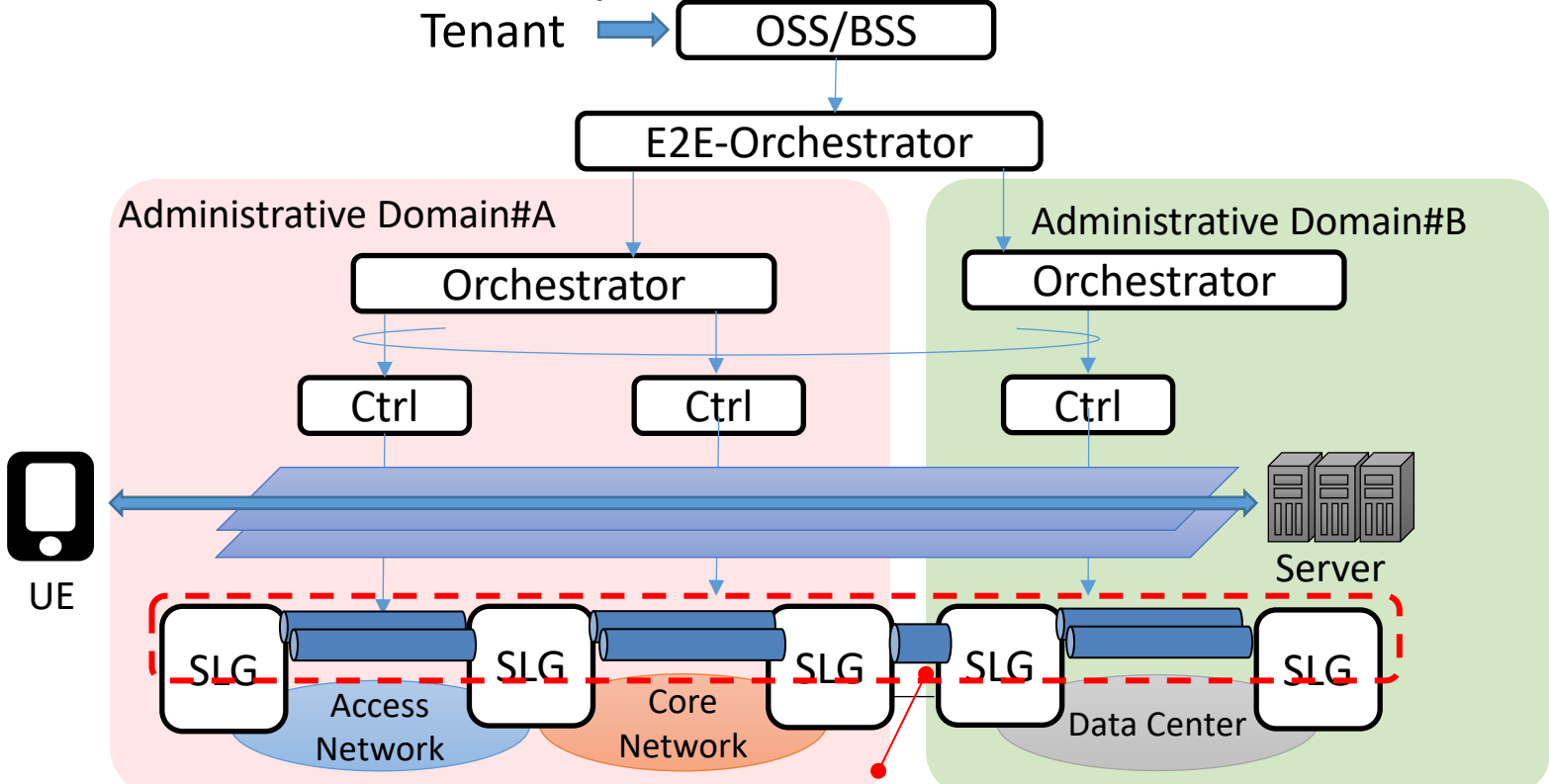
- Challenges on E2E network slicing are described below.
- In addition to operation aspects, some data-plane functionalities would be required to handle traffic.





# Slice Gateway

- Slice Gateway (SLG) provides data plane functionalities for NS.
- Some SLG would be deployed as VNF.



SLG creates slice subnets with virtual links and connects domains

# Requirements for SLG/Data-plane

- SLG would be required to provides functionalities in terms of the following two aspects:
  - Handling underlay infrastructure
  - Control services on NS

	On Data-Plane	On Control/Management-Plane
Handling underlay infrastructure	<ul style="list-style-type: none"><li>• Classification</li><li>• Forwarding</li><li>• Isolation</li><li>✓ QoS control per NS</li><li>✓ Traffic Engineering</li><li>• Service Chaining</li></ul>	<ul style="list-style-type: none"><li>• IF to controller/orchestrator</li><li>• Address resolution/Routing</li><li>• AAA</li><li>• OAM</li></ul>
Control services on NS	<ul style="list-style-type: none"><li>• Classification</li><li>• QoS control per flow</li><li>• Steering/Service Chaining</li></ul>	<ul style="list-style-type: none"><li>• IF to service management system</li><li>• Telemetry collection</li></ul>

# Conclusion

- For deploying appropriate E2E-NSs based on service requirements, definition of functionalities on data-plane would be required.
- SLG enables to provide E2E slices across multiple heterogeneous domains.

# Next Step

- Feedback would be appreciated.
- Breakdown the requirements to concrete functionalities.
- A dedicated group would be required for discussing and standardizing aspects of network slicing in IETF/ IRTF (i.e. a dedicated BoF planed for IETF 103).