Gateway Function for Network Slicing

I-D.homma-rtgwg-slice-gateway-01

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Background

- Network slicing would be needed for applying network to various types of services and applications

  (e.g., broadband, high-reliability and low latency, etc.)
- Network slicing is supported by 5G architecture, and recently, several SDOs, including 3GPP, are discussing it.

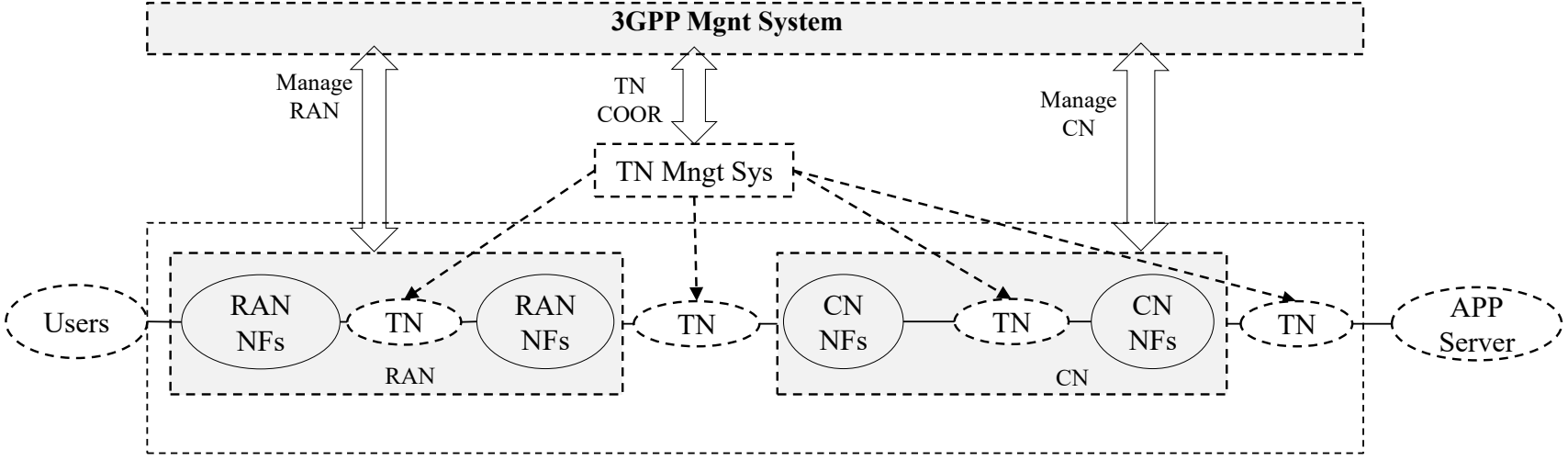
  (IETF TEAS WG also started to discuss transport slice)

E2E Network Slice Realization

- Network slice is composed of network slice subnets.

  * The Network Slice Subnet represents a group of network functions (and connectivity among them) that form part or complete constituents of a Network Slice.

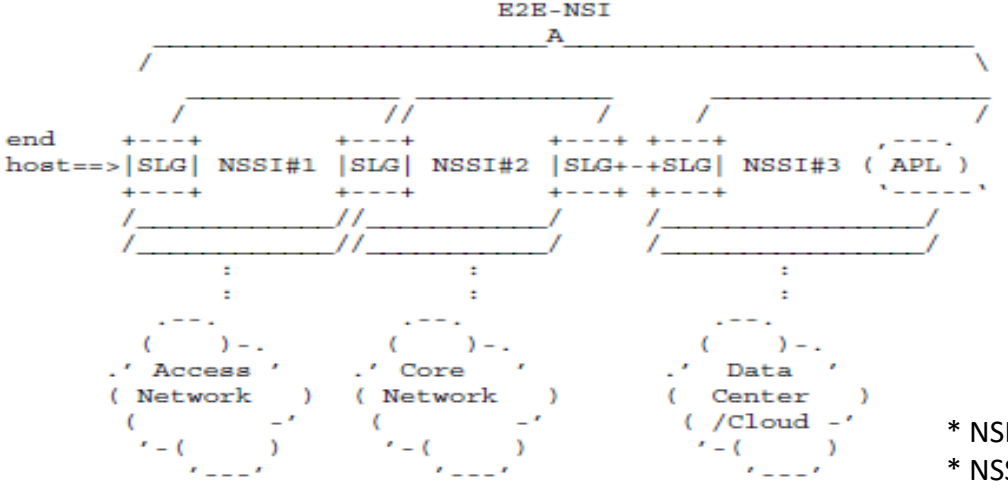
- For providing an end to end communication services, stitching of several network slice subnets would be required.



http://www.3gpp.org/ftp/Specs/archive/22_series/22.891/22891-e20.zip

Slice Gateway (SLG)

- In addition to stitching subnets, several functionalities for handling slices and traffic would be required at boundaries of domains.
- SLG provides data-plane functionalities (e.g., slice selection, QoS control, encap/decap, etc) for handling slices with interaction with the management- plane



* NSI: Network Slice Instance
* NSSI: Network Slice Subnet Instance

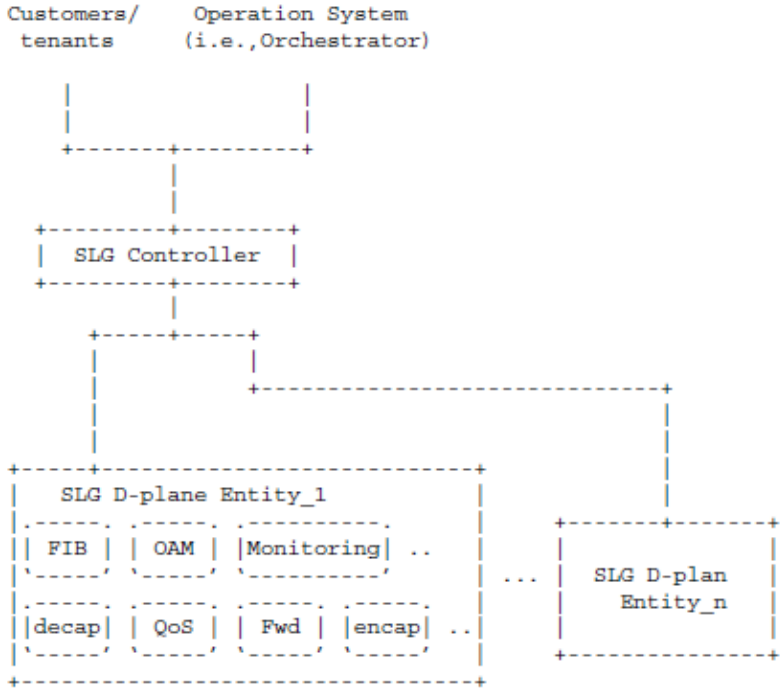
Requirements for SLG

- SLG is realized by one device or a group of modules
- Functionalities required for SLG are below:

	On Data-Plane	On Control/Management-Plane
Handling underlay infrastructure	• Classification • Forwarding • Isolation ✓ QoS control per NS ✓ Traffic Engineering • Service Chaining	• IF to controller/orchestrator • Address resolution/Routing • AAA • OAM
Control services on NS	• Classification • QoS control per flow • Steering/Service Chaining	• IF to service management system • Telemetry collection

Overview of SLG Architecture

- SLG is composed of data plane entity and controller.
- SLG controller may accommodate multiple SLG data plane entities.
- SLG controller has two types of APIs:
  - For managing slices (connected with operation systems)
  - For controlling user traffic on slices (connected with customers/tenants)

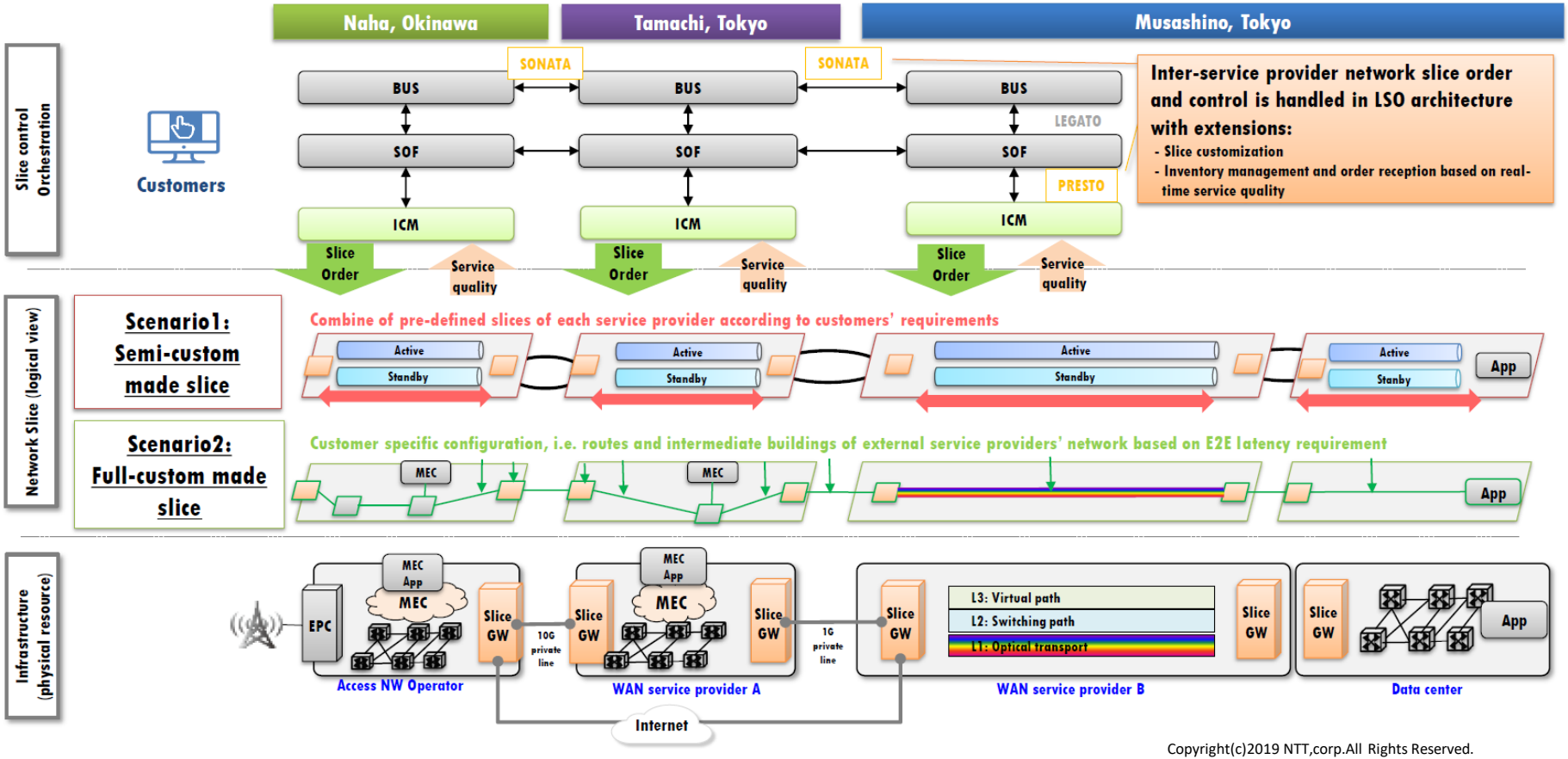


Work on SLG

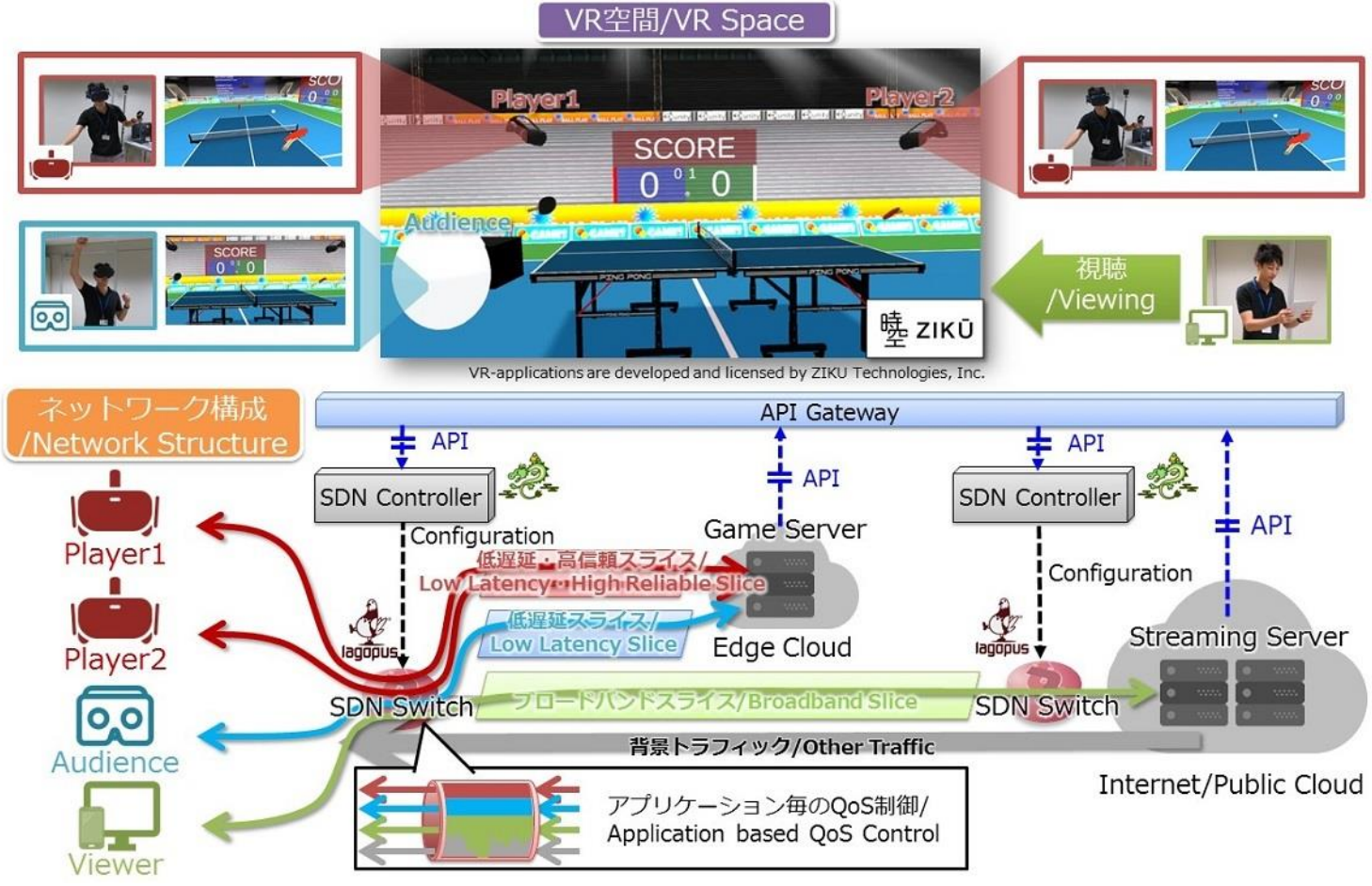
- PoC in MEF: Feasibility test of E2E network slicing across multiple administrative domains

- PoC at NTT R&D Forum: Cooperation between network slices and game applications

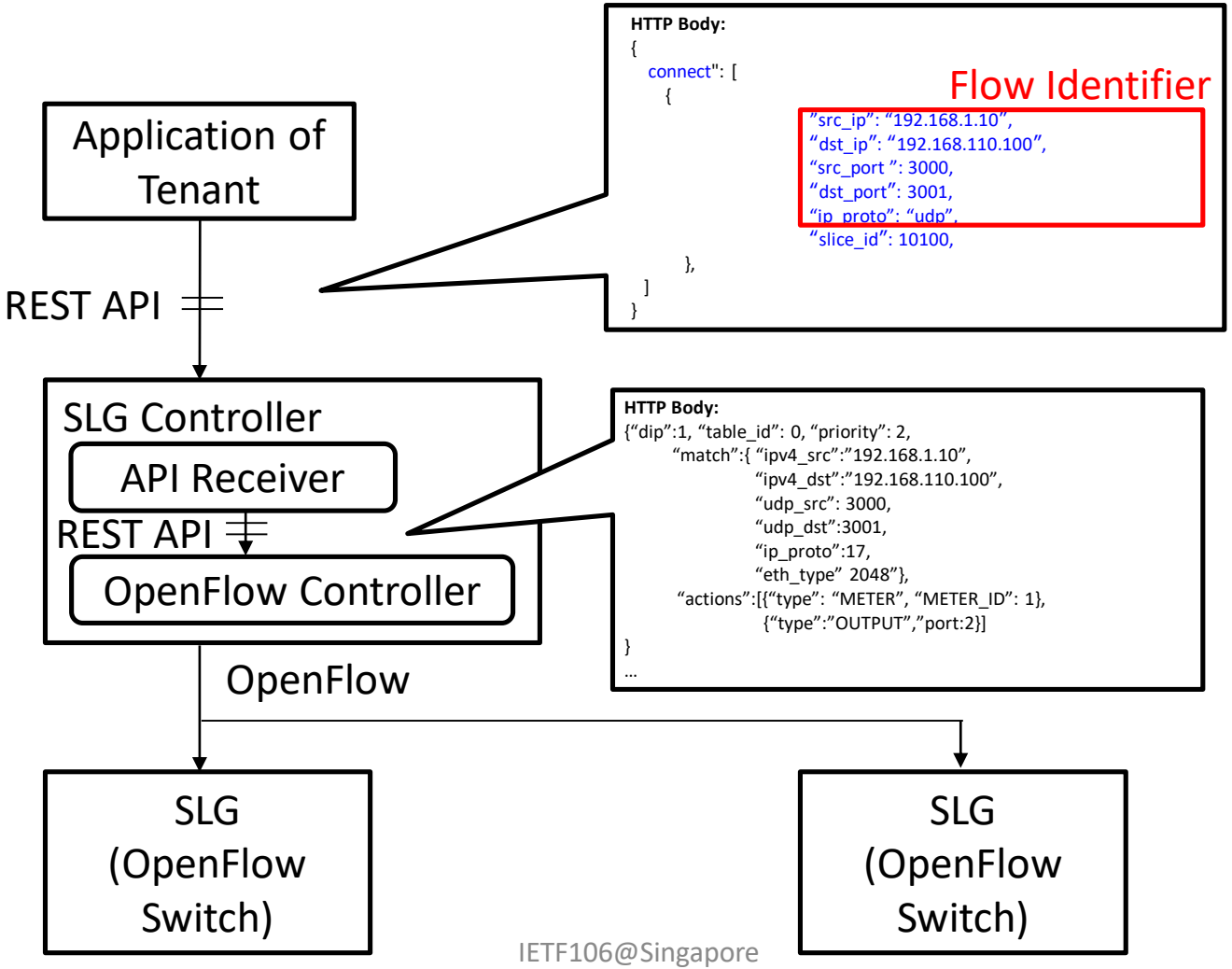
PoC Scenarios in MEF



PoC Scenarios at NTT R&D Forum



Example of API to Allocate Traffic to Slice



Next Steps

- Defining SLG northbound interface with referring definitions and specifications of NS-DT in TEAS WG.
- Providing use cases where SLG (i.g., subnet concept) would be beneficial.
- Documenting the results of PoCs if they are useful.

Your feedback would be appreciated.

Thank you