IETF Network Slice use cases and attributes for Northbound Interface of controller
draft-contreras-teas-slice-nbi-05

Luis M. Contreras (Telefonica)
Shunsuke Homma (NTT)
Jose Ordonez-Lucena (Telefonica)
Jeff Tantsura (Microsoft)
Krzysztof Szarkowicz (Juniper)

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Motivation

• **Background:** The definition of IETF Network Slice (incl. high-level architecture framework, data models, etc) is being developed without a clear view yet of the overall needs for different use cases

• **Rationale:** Any mechanism for deploying IETF Network Slices can be expected to be used for different range of services
  - Unify provisioning systems rather than maintaining separated, specialized ones
  - Existing services can be expected to be delivered as slices looking for synergy and simplicity and taking profit of slice capabilities

• **Purpose:** This draft covers the gap of analysing use cases for identifying SLOs, attributes and methods needed for a IETF Network Slice controller

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Updates from -03 version

• Two versions generated from -03
• New use cases documented (details in next slides)
  • SD-WAN
  • Radio functional splits
• Existing use case complemented
  • 5G services (adding details in the situation when IETF Network Slice Customer is the 3GPP mgmt system)
• Two new co-authors (Jeff and Krzysztof)
• Content in progress for -06
  • Slices extending to DC
  • Summary table of attributes / functionalities providing an aggregated view of all the scenarios

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SD-WAN

- Objective: Support SD-WAN overlays connecting sparse customers’ sites
- NBI attributes:
  - SLOs such as Bandwidth, service uptime, packet loss, latency, etc.
  - Additional characteristics such as need for encryption, addressing, frame size, etc.
- NBI procedures:
  - Policies per Application Flow groups (e.g., encryption, Internet break-out, etc).
- Applicability of IETF Network Slice:
  - Mapping of SD-WAN services to IETF Network Slices in the underlay
- Reference: MEF-70
Radio functional split

• Objective: Accommodate fronthaul/midhaul connectivity through slices

• NBI attributes:
  • SLOs such as Bandwidth, latency, packet loss, etc (as per nature of the connection – FH, MH -).
  • Additional characteristics such as geographical location can have influence.

• NBI procedures:
  • Similar slice lifecycle as in 5G services, even though reliance on closed loop automation could motivate more dynamism.

• Applicability of IETF Network Slice:
  • Provisioning of FH and MH connectivity

Next steps

• Complete the work in progress (and correct some typos)
  • DC, summary table

• Scan for additional relevant cases, if any

• Collect feedback / comments from the WG

• Prepare a new version for IETF#112

• Call for adoption as WG document
  • Document valuable as input for several others in the WG (YANG models, NSC structure, instantiation of NS in service providers’ Networks, etc)
Backup slides
Backup -- 5G Services

• Objective: Support the E2E Network slices as defined for 5G systems

• NBI attributes:
  • SLOs such as DL/UL throughput, slice QoS parameters, deterministic communication, etc.
  • Additional characteristics such as group communication Support, Support for non-IP traffic, area of service, etc.

• NBI procedures:
  • Defined in 3GPP specs for slice lifecycle as slice instance allocation / de-allocation, modification, status, etc.

• Applicability of IETF Network Slice:
  • N3/N9/N6 interfaces for providing different networks depending on applied service types (i.e., eMBB, mMTC, and URLLC)

• Reference: GSMA GST, 3GPP TS28.541

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Backup -- NFV-based Services

• Objective: Support connectivity services for VNFs established across geographically remote NFVI points of presence

• NBI attributes:
  • SLOs such as incoming and outgoing bandwidth, QoS metrics, etc.
  • Additional characteristics such as directionality, protection scheme, etc.

• NBI procedures:
  • Lifecycle, capacity, fault and performance management of Multi-Site Connectivity Service (MSCS)

• Applicability of IETF Network Slice:
  • Inter-NFVI-PoP communications for the support of services with different SLOs

• Reference: ETSI NFV IFA 032, ETSI NFV SOL 017
Backup -- RAN Sharing

• Objective: Provisioning of connectivity between cell sites and interconnection points agreed among operators

• NBI attributes:
  • SLOs such as maximum and guaranteed bit rate, bounded latency, packet loss rate, etc.
  • Additional characteristics such as secure connection, IP addressing, etc.

• NBI procedures:
  • Provisioning of connectivity services, collection of performance and fault data, etc.

• Applicability of IETF Network Slice:
  • Multi-tenancy on mobile front/mid/backhaul

• Reference: MEF white paper on fronthaul/backhaul sharing