TEAS NSDT Definition Draft Update

~~IETF Definition of Transport Slice~~

Definition of IETF Network Slices

~~draft-nsdt-teas-transport-slice-definition-03~~

draft-nsdt-teas-ietf-network-slice-definition-01

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Overview of Changes

- Stable concepts/terms
  - Definition
  - Characteristics
  - Structure
  - Stakeholder
  - Controller interfaces

- Highlights of Changes
  - Name change: transport slice is now IETF Network slice
  - Improved description of SLA/SLOs.
  - Revised draft on isolation section
  - New text in Security Considerations
  - Removed descriptive text for realization, end-to-end and composition sections

Various suggestions

Term
1	IETF Network Slice
2	Transport Slice
3	Transport network slice
4	Connectivity Slice
5	Connectivity Network Slice
6	Connection Slice
7	Slice Network

Term
8	Virtual Slice Network (VSN)
9	TE Network slice
10	Carrier network slice
11	Network slice
12	Data transmission network slice (DTNS)
13	Transmission Network Slice
14	Transmission Slice

*Details in back up slides

Replacing 'Transport' with 'IETF Network' Slice
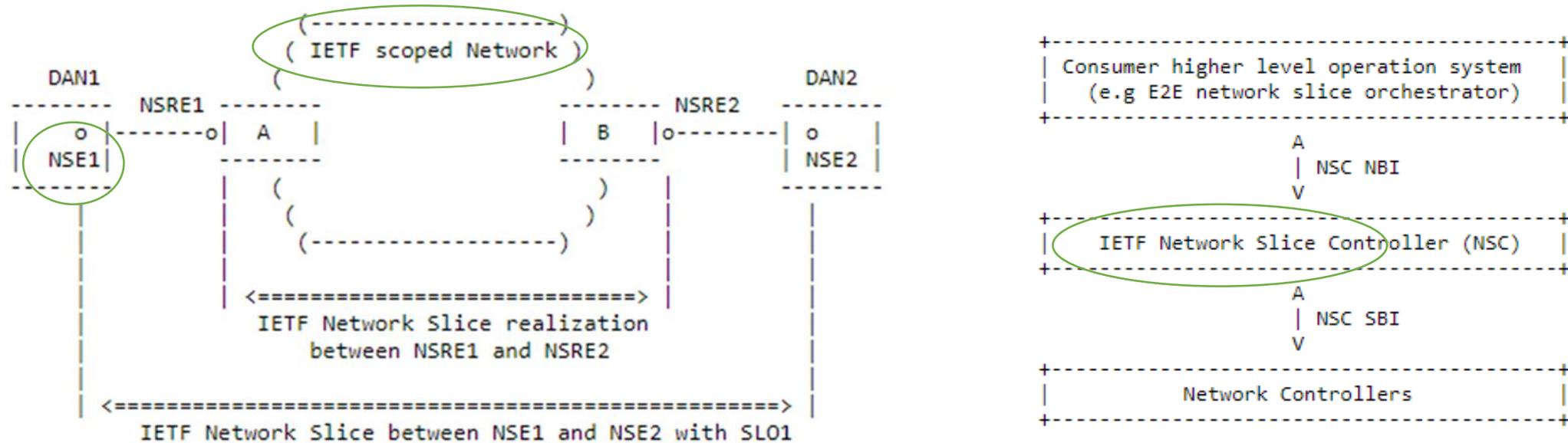
- Qualifying term 'IETF' is used to limit the scope of network slice to network technologies described and standardized by the IETF.

- Definition

    An IETF Network Slice is a logical network topology connecting a number of endpoints with a set of shared or dedicated network resources, that are used to satisfy specific Service Level Objectives (SLOs).

Improvements

- Received and addressed review comments that helped refine the written text.

- Improved Section 4. Objectives for IETF Network Slices to better describe the terms SLO, SLI and SLA.

- Removed text that is more suitable for framework
  - Details on Realization of IETF Network slices
  - IETF network slices in the context of an overall End to end slice
  - Vertical and Horizontal (renamed to hierarchical and sequential) concepts.

Contribution on Isolation text

- Section 9, introduces Isolation in the context of IETF Network Slices
  - What's meant by isolation here is
    - That there is no negative impact on the IETF Network Slice due to changes in the network and/or due to any other traffic in the network.
    - Customers may explicitly ask for specific network characteristics as a requirement.
    - Generic classification as traffic separation, interference avoidance, and service assurance/continuity.
  - Open for discussion/Where's the contention
    - A. Is it relevant for definition? – Yes, in order to provides means for containers in NBI models.
    - B. Is it an SLO or not? – Sometimes it can be. Other times may be not. OR superseded by customer requirement/ask.
    - C. Place holder until WG adoption – we feel its better to revise a given text otherwise we will repeat same discussions.

Open Items/Issues

- Section 10, Security
    - Should be more than N/A.
    - New text has been suggested to express security in relation to SLO, isolation, etc.

- Review comment on -01 revision from mailing list
    - Still connectivity centric
    - Requested for more information on what else should be included.

Next Steps

- Request for WG adoption

- The initial content and structure has remained the same (implies reasonably stable and mature).

- Open issues are incremental improvements and resolvable.

https://datatracker.ietf.org/doc/draft-nsdt-teas-ietf-network-slice-definition

Various suggestions (backup)

	Term	Suggested by	Pros	Cons
1	IETF Network Slice	TEAS chairs	o It clearly elaborates the scope of technologies addressed with in the IETF leveraging the industry-wide term 'network slice. o It is golden middle, where "IETF" provides the exact context to "Network Slice" o Acceptable to TEAS WG chairs o Acceptable to draft co-authors	labeling a piece of work with SDO name is not a good idea and IETF has always worked towards wider use, generic solutions, so the name may be restrictive.
2	Transport Slice	Draft Authors and NSDT	o 'Transport network' is an abstraction of connectivity between the (network) end-points which is technology agnostic. Well covered by RFC5921. o Aligned with other SDO (i.e. MEF) See Figure 17 of following white paper https://wiki.mef.net/display/CESG/Slicing+for+Shared+5G+Fronthaul+and+Backhaul+-+White+Paper	As per recent WG adoption poll, it is not accepted
3	Transport network slice	Draft Authors and some IETF members	'Transport network' is an abstraction of connectivity between the (network)end-points which is technology agnostic. Well covered by RFC5921.	As per recent WG adoption poll, it is not accepted
4	Connectivity Slice	Draft Authors	o Since the transport slice is a set of distinct connections, term "Connectivity Slice" is selected o Aligned with other SDO (i.e. 3GPP) See Figure 4.9.3.1 of TR 28.801 and http://www.3gpp.org/NEWS-EVENTS/3GPP-NEWS/1951-SA5_5G	As per TEAS WG chair, connectivity has different meaning at IETF
5	Connectivity Network Slice	Luis	The term Network becomes now narrow downed to the reference to connectivity, which is subject of IETF	As per TEAS WG chair, connectivity has different meaning at IETF
6	Connection Slice	Luis	o The term associates the concept of slice to the connection enabling the data transmission among end-points participating of a communication o Note – here we could then follow a similar approach to how the VPNs are classified as L2 or L3; I mean L3/L2/(L1?) Connection Slice; if we classify the Connection Slices in that manner, such classification of the Connection Slice types will also help to describe recursiveness or hierarchical (multi-layer) slicing	o A connection can be established at different levels, including protocols above Layer 3 o Connection slice can make the people understand that there is a single connection represent a slice (i.e., 1:1) while actually could not be the case (i.e., 1 slice being formed by N connections)
7	Slice Network	Stewart	Stewart is coming with some background that a slice is combination of storage, compute and communications (or network). Slice network means an existing network is sliced to serve a particular user-case.	According to Lou, it has entirely different meaning.

Various suggestions (backup)

	Term	Suggested by	Pros	Cons
8	Virtual Slice Network (VSN)	Luis	o Variant on top of Stewart's suggestion to link with the evolution of the concept of legacy VPNs o The term reminds the idea of logical network per customer focusing on connectivity o As before, it could be possible to follow a similar approach to how the VPNs are classified as L2 or L3; I mean L3/L2/(L1?) VSN; also here, such classification of the VSNs can also help to describe recursiveness or hierarchical (multi-layer) slicing in transport	o There is no specific reference to transport or connectivity, apart of the generic idea of network (which we now is also an overloaded term) o Differently from a VPN, which basically is a single instance including a number of locations, a VSN could refer to a set of individual VSNs (e.g., one per network segment). So can be probably confusing. Thus probably it would be needed to add additional terms such as sub-VSN, or VSN-segment, VSN-part, VSN-sub-slice, or alike
9	TE Network slice	Some TEAS members	Aligns with same rationale used for naming ACTN.	Since not all transport networks are TE enabled, the realization of connectivity might be in a non-TE network. So, this term seems not appropriate
10	Carrier network slice	Webex/Stewart	In a generic use of term 'carrier' a carrier slice network carries use-case specific network traffic.	it may be confusing because it is associated with the infrastructure of telecommunication service providers, i.e., FNO/MNO. Recently, some network operators deploy COTS servers in their infrastructure for MEC usages, and some readers may expect control of compute and storage resources is in scope
11	Network slice	Some IETF members	An adoption of industry-wide term. While each SDO may look at it differently based on its own set of capabilities, for an end user it is a network slice in a specific technology domain.	o Since multiple connections are part of a single "Network Slice", it is not a good idea to call each of these connections "Network slice". o There is a lack of 'harmonized' definition of network slice. For end customers, message may be confusing on which SDO they should ask for what part. It may lead to duplication of orchestration or APIs, depending upon who is controlling end to end network slice - is it 3GPP operator, MVNO, ISP, service-integrator, OTT etc...
12	Data transmission network slice (DTNS)	Shunsuke	Since the transport slice is a set of distinct connections, providing the data transmission, this term might be suitable.	
13	Transmission Network Slice	Reza	Since the transport slice provides the data transmission across transport network, this term might be suitable.	
14	Transmission Slice	Reza	Same as "Transmission Network Slice"	