

Framework for End-to-End IETF Network Slicing

draft-li-teas-e2e-ietf-network-slicing-02

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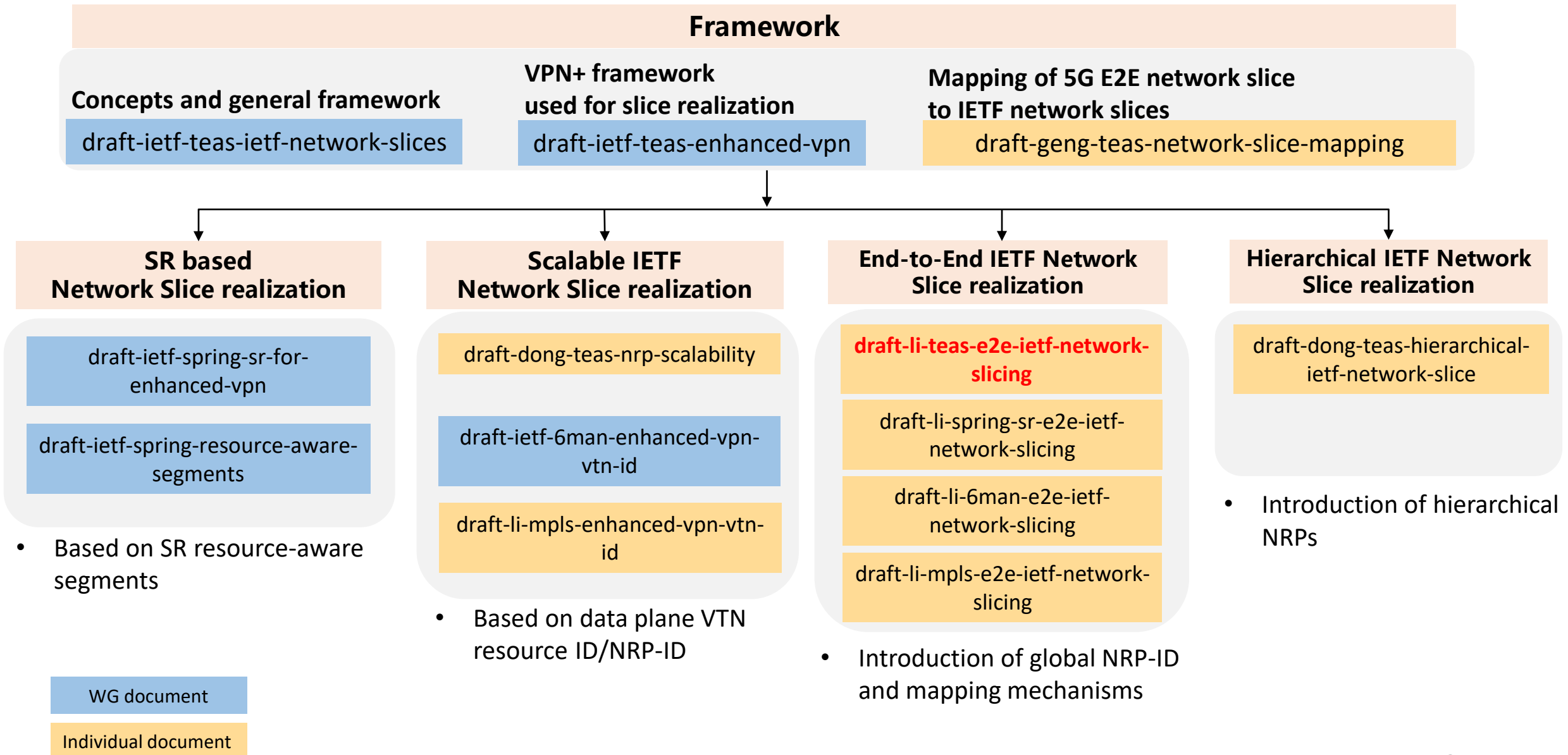
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Background

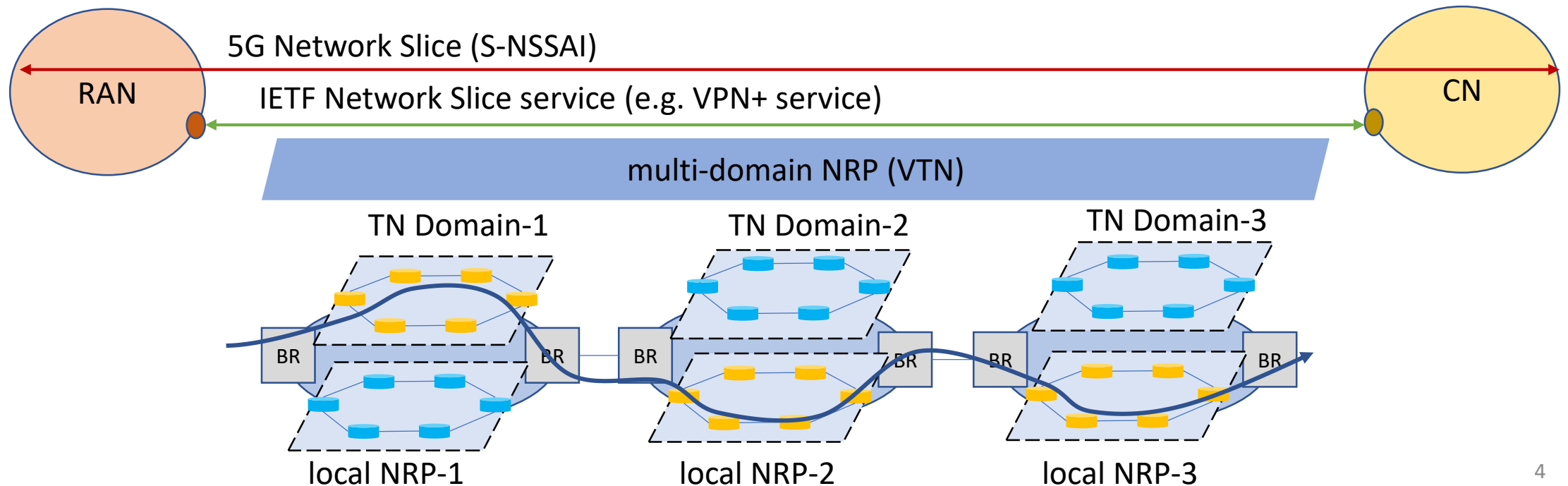
- Network slicing can be used to meet the connectivity and SLO/SLE requirements of different services or customers in a shared network
- The concept of 5G E2E network slice is defined in 3GPP
 - 5G network slice spans multiple technical domains: RAN, TN, CN
 - IETF network slice provides the TN segment of 5G E2E network slice
- draft-ietf-teas-ietf-network-slices describes the concepts and general framework of IETF network slice
 - IETF network slices can be realized by mapping one or a group of connectivity constructs to an NRP
 - NRP is an instantiation of VTN defined in draft-ietf-teas-enhanced-vpn (VPN+)
- An IETF network slice may span multiple administrative domains
 - This document describes the framework of multi-domain IETF network slicing and introduces the identifiers used for E2E and multi-domain network slice realization

IETF Network Slice Framework and VPN+ Realization



Framework of E2E IETF Network Slicing

- 5G end-to-end network slice is identified by the S-NSSAI (Single Network Slice Selection Assistance Information)
- In the TN segment, one or multiple 5G network slices can be mapped to an IETF network slice, which can be realized as a multi-domain VPN+ service.
- In the underlay network, the multi-domain VPN+ service is supported by a multi-domain NRP, which is comprised of multiple intra-domain NRPs
 - This is similar to option C of inter-domain VPN service



Identifiers for E2E IETF Network Slicing

- **Domain NRP ID:**

- In each domain, a local domain NRP-ID is carried in the packet to identify the set of network resource reserved for the NRP in the corresponding domain
- Domain NRP ID is mandatory for packet forwarding

- **E2E NRP ID:**

- In order to concatenate multiple domain NRPs into a multi-domain NRP, a global NRP-ID can be carried in the packet, which is used by the domain border nodes to map to the local NRP-IDs in each domain.
- E2E NRP ID is optional, if consistent NRP ID allocation among multiple domains is possible

- **5G E2E network slice ID (e.g. S-NSSAI):**

- In order to facilitate the network slice mapping between RAN, CN and TN, the identifier of 5G E2E network slice may be carried in the data packet sent to the TN
- It may also be used by TN nodes for traffic monitoring at the E2E network slice granularity

Requirements of E2E IETF Network Slicing

- Data Plane:
 - One or multiple network slice related identifiers may need to be carried in data packet
 - The edge nodes of IETF network slice should support to map the 5G network slice ID (e.g. S-NSSAI) to the global NRP-ID and the domain NRP-ID
 - The domain border nodes should support to map the global NRP-ID to the domain NRP-ID of the local domain.
- Management Plane/Control Plane
 - A centralized IETF network slice controller is responsible for the allocation of the Global NRP-ID and the domain NRP-IDs, and the provisioning of the mapping relationship between the global NRP-ID and the domain NRP-IDs to the network edge nodes
 - If 5G network slice ID (e.g. S-NSSAI) is used for the mapping of RAN/CN network slices to IETF network slices, IETF network slice controller is responsible for the provisioning of the mapping relationship between S-NSSAI and the Global and local NRP-IDs

Updates in -02 Version

- Aligns the terminology with IETF network slice and VPN+ draft
- Revises the text about the data plane requirements
- Editorial changes

Next Steps

- Solicit comments and feedbacks
- Refine the draft accordingly

Thank You