Segment Routing for Enhanced VPN Service (VPN+)

draft-dong-spring-sr-for-enhanced-vpn-05

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Background and Recap

- VPN+ framework is described in draft-ietf-teas-enhanced-vpn

    - A layered architecture and candidate technologies in each plane & layer

    - To meet the requirements of 5G network slicing and other generic scenarios

    - Segment routing is one of the candidates for virtual network instantiation

- This document describes the SR mechanisms to build virtual networks with required attributes to support VPN+

    - Mainly focus on the SR data plane mechanisms and extensions

    - Both SR-MPLS and SRv6 are applicable

    - Control plane extensions will be discussed in relevant WGs

Challenges in Current SR

- SR was designed for source routing

  - SID list is used to specify the nodes and links along the path

  - Services share the same group of SIDs

  - How to build customized virtual networks?

- SR did not take resource reservation into consideration

  - Rely on DiffServ QoS for traffic differentiation

  - May not meet the requirement of 5G critical applications

 - How to achieve guaranteed/predictable SLA?

SR with Topology and Resource Awareness

- SID is used as topology identifier in data plane
  - Use different SIDs to identify the same network segment (node, link) in different network topologies
- SIDs can also be used to represent a subset of network resources allocated to a network slice
  - Different mechanisms can be used in the underlay for resource partitioning and management
- Network slices built with different groups of SIDs
  - Traffic is steered to isolated topologies and resources according to the SID/SID list
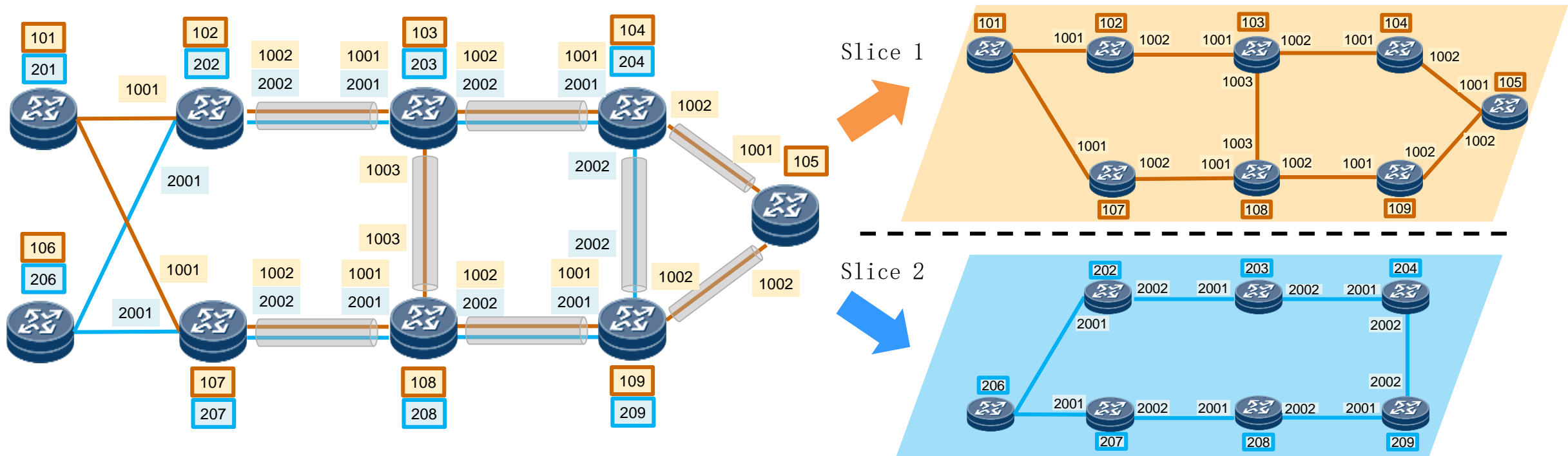
Similar Mechanism for SRv6

- SRv6 Locator is used as topology identifier in data plane
  - Use different Locators to identify the same network segment (node, link) in different network topologies
  - SRv6 SIDs inherit the topology identification from Locator
- SRv6 Locator/SIDs can also be used to represent a subset of network resources allocated to a network slice
- Network slices built with different groups of SRv6 Locators/SIDs
  - Traffic is steered to isolated topologies and resources according to the SID/SID list
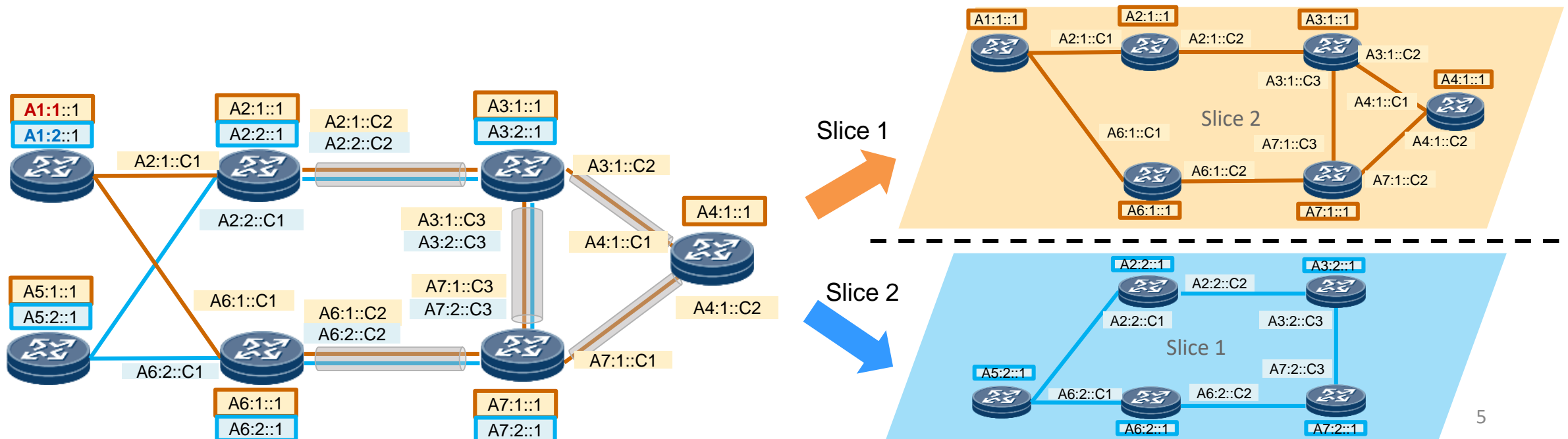
Updates Since IETF 103

- New coauthors, updated affiliations

- Add reference to network slicing definition in 3GPP and VPN+ framework

- Clarify that SR SIDs can identify the topology and may represent the associated network resource

  - A unified data plane mechanism for both soft and hard isolation

- Solve received review comments

- Editorial changes to improve readability

- Update the references

Next Steps

- Resolve further comments received

- VPN+ framework has been adopted in TEAS
  - Draft gets mature and will progress towards WG last call

- This document provides an SR based solution for VPN+
  - Work started in early 2018
  - Content of this draft is getting stable
  - Interests from operators to have SR based solution for network slicing

- WG adoption request has been raised on SPRING mail list
  - Would like to know WG's opinion on the adoption poll

Thank You