Segment Routing for Enhanced VPN Service (VPN+)

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

Jie Dong@Huawei
Stewart Bryant@Futurewei
Takuya Miyasaka@KDDI
Yongqing Zhu@China Telecom
Fengwei Qin, Zhenqiang Li@China Mobile

SPRING WG IETF 106@Singapore Nov. 2019
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?
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