

BGP-LS with Multi-topology

for Segment Routing based Virtual Transport Networks

draft-xie-idr-bgpls-sr-vtn-mt

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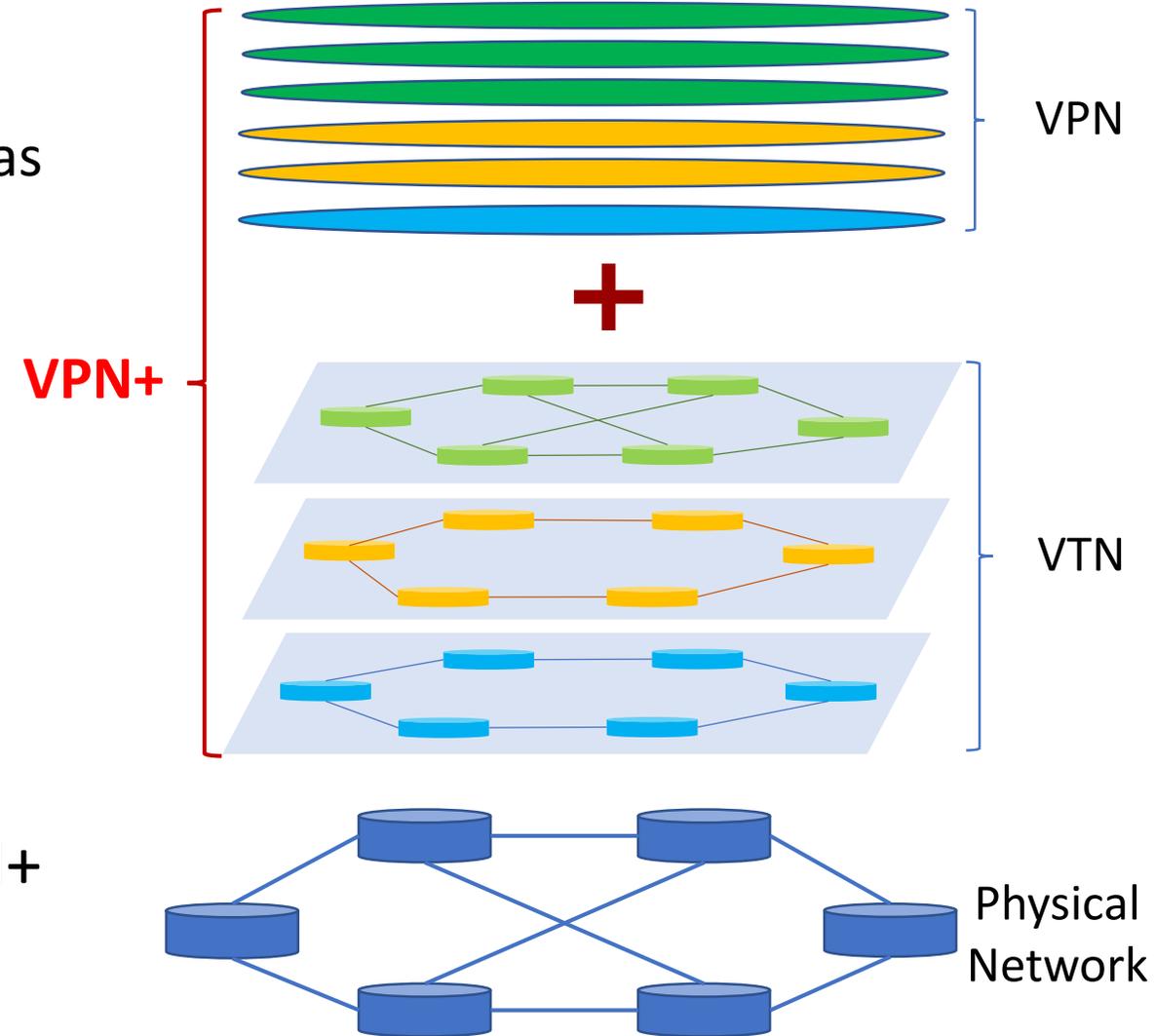
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Background

- VPN+ framework is described in *draft-ietf-teas-enhanced-vpn*
 - VTN is introduced as the virtual underlay network with required topology and resource characteristics
- SR based VPN+ is defined in *draft-dong-spring-sr-for-enhanced-vpn*
 - Resource-aware SIDs are introduced to build resource guaranteed SR virtual networks
- IGP extensions for SR VPN+/VTN is under discussion in LSR WG
 - Multi-Topology and Flex- Algo can be reused/combined with necessary specifications/extensions
- This documents define the BGP-LS mechanism with MT for SR VTN
 - Distribution of VTN attributes to network controller
 - Reuse Multi-topology to build a basic/simplified solution
 - Considerations about scalability is provided

Terminology

- VPN+
 - An enhanced VPN service (VPN+) is a VPN service with additional commitments such as resource isolation and performance guarantee.
- VTN
 - A virtual network which has a customized topology and a set network resources allocated from the underlay network.
- A VTN provides the required underlay characteristics for one or a group of VPN+ services



Mechanism in this document

- MT-ID is used as the identifier of a VTN in control plane
- Intra-Domain Topology Advertisement
 - Use MT-ID TLV in BGP-LS Link Descriptor, Node Descriptor, and BGP-LS attribute to identify the topology of the link-state information advertised for a VTN
 - Topology-specific SIDs can be advertised using BGP-LS extensions for SR/SRv6
- Inter-Domain Topology Advertisement
 - Use MT-ID TLV with BGP-LS EPE to advertise topology-specific Peer-Adj-SIDs, Peer-node-SIDs and Peer-set-SIDs.
 - MT-ID needs to be consistently used in each domain and on inter-domain links
- Advertise per-topology TE attributes
 - One link can participate in multiple topologies (VTNs)
 - How to advertise topology-specific TE attributes is specified
 - E.g. Maximum Link Bandwidth sub-TLV can be reused to advertise the subset of bandwidth allocated to each VTN

Scalability Considerations

- When a link or prefix participates in multiple topologies, multiple NLRIs need to be generated to report all the topologies a link or prefix participates in, together with the topology-specific segment routing information.
 - This may increase the number of BGP Updates, hence introduce additional processing burden to both the sending BGP speaker and the receiving network controller.
 - Some optimization may be introduced for the reporting of multi-topology information and the associated segment routing information in BGP-LS.
- Each VTN has a unique MT-ID
 - This means independent topology/route computation for each VTN is needed, even if some VTNs may have the same topology in some domains

Next Steps

- Solicit feedbacks and comments
- Refine the document accordingly

Thank You