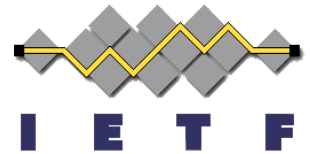


BGP VPN service for SRv6 Plus IETF 105, Montreal

Ron Bonica, Juniper Networks
Srihari Sangli, Juniper Networks

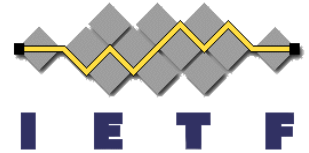


Agenda

- Background
- Problem statement
- Proposal
- Ask & Next step

BGP VPN on SRv6-Plus

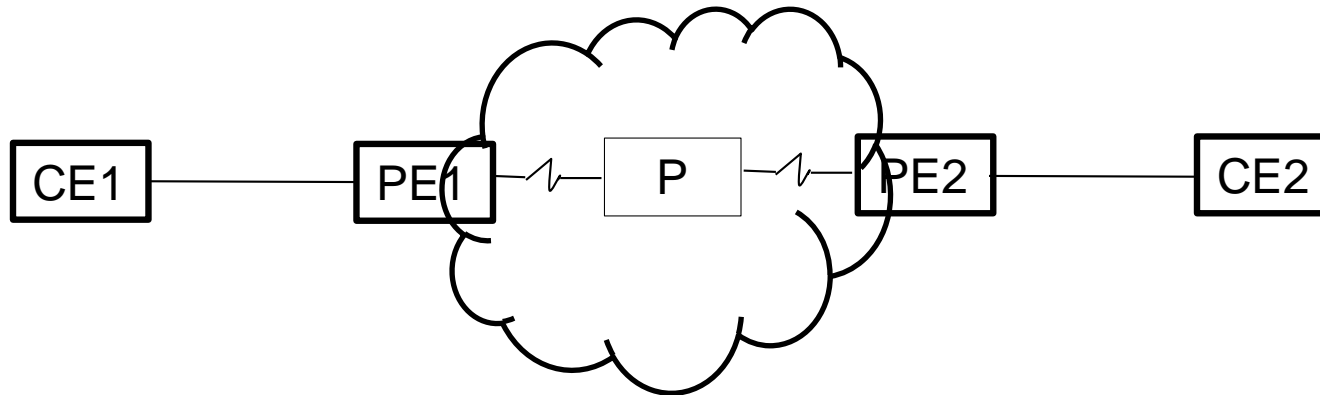
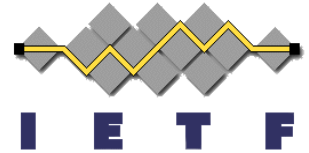
Background



- SRv6+ [[I-D.bonica-spring-srv6-plus](https://datatracker.ietf.org/doc/draft-ietf-srv6-srv6-plus/)]
 - provides unidirectional connectivity from ingress → egress nodes
 - Introduces programmable instructions
 - Relies exclusively on IPv6 data plane
- BGP IP/E VPNs over various transport tunnel – MPLS, IP, GRE, etc.

BGP VPN on SRv6-Plus

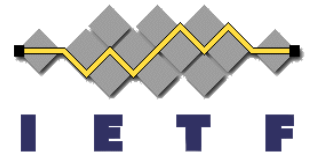
Problem statement



VPN topology over MPLS free IPv6 network (SRv6+ underlay)

- SRv6+ underlay
 - PE aware of PPSI (Per-Path Service Instruction)
 - PPSI embedded in Destinations Options Header
 - P routers are IPv6 capable and not PPSI aware
- PE to distribute service instructions for IP/E VPN connectivity

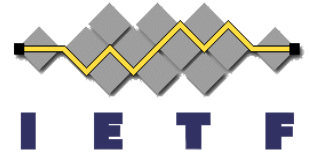
BGP VPN on SRv6-Plus Proposal



- Leverages Tunnel Encapsulation Attribute mechanism [[I-D.ietf-idr-tunnel-encaps](#)]
 - SRv6+ path considered as tunnel
 - New Tunnel type : SRv6+
 - Tunnel type codepoint : to be assigned by IANA
 - Sub-TLVs as per [[I-D.ietf-idr-tunnel-encaps](#)]
 - Tunnel-endpoint, Protocol type & Color
 - Sub-TLVs not needed
 - IPv4 DS Field, UDP Destination Port, MPLS Label Stack & Prefix SID
 - Extended Label Handling sub-TLV = 3
 - IP/E VPN encoding treat PPSI as embedded label
 - The Extended Label Handling sub-TLV value 3
 - Ingress router to embed the label field value into the Destination Options Header

BGP VPN on SRv6-Plus

Proposal – encoding examples



- Encoding for IPv4 VPN on SRv6+ enabled IPv6 Core
 - AFI : 1; SAFI : 128
 - Length of the Next Hop : 16 (or 32 if Link Local)
 - Network address of Next Hop : IPv6 address of the egress BGP
 - NLRI : IPv6-VPN routes
 - Label : PPSI Identifier
- +
- Tunnel Encapsulation Path Attribute for SRv6+ Tunnel
- Encoding for Ethernet Per ES Auto-Discovery (A-D) Route
 - NLRI encoding as per RFC7432 except the following
 - MPLS label : set to zero
- +
- Tunnel Encapsulation Path Attribute for SRv6+ Tunnel
- ESI label in the ESI label extended community : PPSI Identifier

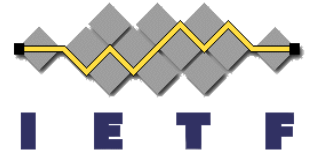
BGP VPN on SRv6-Plus Proposal



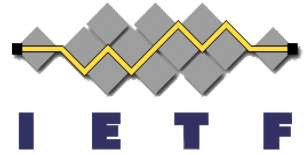
- BGP procedures on egress PE
 - PPSI is associated with forwarding table, used for demux'ng in data plane
 - PPSI encoded as embedded label in IP/E VPN encoding
 - Tunnel Encapsulation attribute advertised with IP/E VPN NLRI
- BGP procedures on ingress PE
 - PPSI constructed – Top-order 1 byte zero'd and Low-order 3 byte is Embedded label field in IP/E VPN NLRI
 - Tuple (PPSI identifier, Prefix) programmed in forwarding table
- PPSI carried in IPv6 Destination Options Header
 - Inserted by ingress PE; Processed by egress PE
 - P routers do not process this header and unaware of PPSI

BGP VPN on SRv6-Plus

Ask & Next steps



- Comments Welcome
- Request workgroup to adopt the document



Thank you