Carrying VTN-ID in IPv6 Extension Header

draft-dong-6man-enhanced-vpn-vtn-id-01

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The VTN concept is introduced in *draft-ietf-teas-enhanced-vpn*

- A virtual underlay network with the topology and network resources required by one or a group of VPN+ services

- Information of the associated VTN needs to be carried in data plane
  - Nodes can steer packet to the set of local network resource allocated to the VTN for packet processing

- This document proposes to carry VTN-ID in IPv6 extension headers
  - Applicable to IPv6/SRv6 networks
Mechanisms in this draft

• A new IPv6 extension header option is defined to carry VTN-ID

<table>
<thead>
<tr>
<th>Option Type</th>
<th>Option Data Len</th>
<th>Option Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBCTTTTTT</td>
<td>00000100</td>
<td>4-octet VTN ID</td>
</tr>
</tbody>
</table>

• **BB**: set to 00, if unrecognized, skip and continue processing
• **C**: set to 0, can not change en route
• **VTN ID**: 4-octet identifier of a VTN
  • match the length of network slice ID in wireless network (3GPP)

• It is RECOMMENDED to carry VTN option in IPv6 extension headers which can be processed hop-by-hop in forwarding plane
Procedures

• VTN option insertion
  • Ingress node of IPv6/SRv6 domain encapsulates VTN option in an outer IPv6 header, according to traffic classification and mapping policy

• VTN based packet forwarding
  • Nodes which can parse VTN option SHOULD use VTN-ID to identify the VTN the packet belongs to, and use the local resource allocated to the VTN for packet forwarding
    • Forwarding behavior is based on both the destination IP and the VTN-ID
  • Nodes which cannot parse VTN option SHOULD ignore this option
    • Forwarding behavior is based on destination IP only
Deployment considerations

• Taking implementations of Hop-by-Hop Options header into consideration
  • Packets containing Hop-by-Hop Options header may be dropped or assigned to a slow processing path [RFC 8200]

• Operator needs to make sure all the network nodes involved in a VTN can
  • either process the Hop-by-Hop Options header in packet forwarding,
  • or ignore the Hop-by-Hop Options header and continue to forward the packet based on other fields and headers.

• It is RECOMMENDED to configure nodes involved in VTN to process the Hop-by-Hop Options header if there is a nob for this.
Next Steps

• Comments and feedbacks are welcome

• Revise the draft accordingly
Thank You