Carrying VTN-ID in IPv6 Extension Header

draft-dong-6man-enhanced-vpn-vtn-id-06

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6man & v6ops IETF 112 Online Meeting Nov. 2021
A VTN is a virtual underlay network consisting of a set of dedicated or shared network resources, and is associated with a customized logical topology
  - Used as the virtual underlay network to deliver one or a group of enhanced VPN services
  - Please read the draft and draft-ietf-teas-enhanced-vpn for more about the background

The identifier of the VTN needs to be carried in data packet, and parsed by each hop along the forwarding path
  - To steer packets to use the set of network resource allocated to the VTN for processing
  - IPv6 HBH header is the suitable approach for this application

This document proposes a mechanism to carry VTN information in IPv6 HBH extension header
Proposal

- A new option type is defined to carry VTN resource ID in the HBH header

```
+-----------------+-----------------+-----------------
| Option Type     | Option Data Len | Option Data     |
+-----------------+-----------------+-----------------
| 0000000100      | 4-octet VTN     |
|                 | Resource ID     |
```

- **BB**: set to 00, if unrecognized, skip and continue processing
- **C**: set to 0, can not change en route
- **VTN Resource ID**: 4-octet identifier used to uniquely identify the set of network resources allocated to a VTN

- Procedures
  - **Domain ingress node**: encapsulates an outer IPv6 header and a HBH header with the VTN option, based on traffic classification and mapping policies of the operator
  - **Domain transit nodes**: uses destination IPv6 address to determine the next-hop, use VTN option to determine the set of local resources allocated to the VTN for packet forwarding
  - **Domain egress node**: decapsulates the outer IPv6 header, including the VTN option in the HBH header
Operational Considerations

• According to RFC 8200, network nodes may be configured to ignore the HBH header, some implementations may drop packets with HBH header or assign them to slow path
  • draft-hinden-6man-hbh-processing is working on solving this problem
• Operator needs to make sure that all the network nodes in a VTN can either process HBH header in fast path, or ignore the HBH header
  • It is practical to ensure that all the network nodes involved in the logical topology of the VTN support the processing of the HBH header and the VTN option
  • Packets will only be sent on paths computed within the logical topology
Thank You