

# Carrying VTN Information in IPv6 Extension Header

*draft-ietf-6man-enhanced-vpn-vtn-id-03*

**Jie Dong**, Zhenbin Li @Huawei

Chongfeng Xie, Chenhao Ma @China Telecom

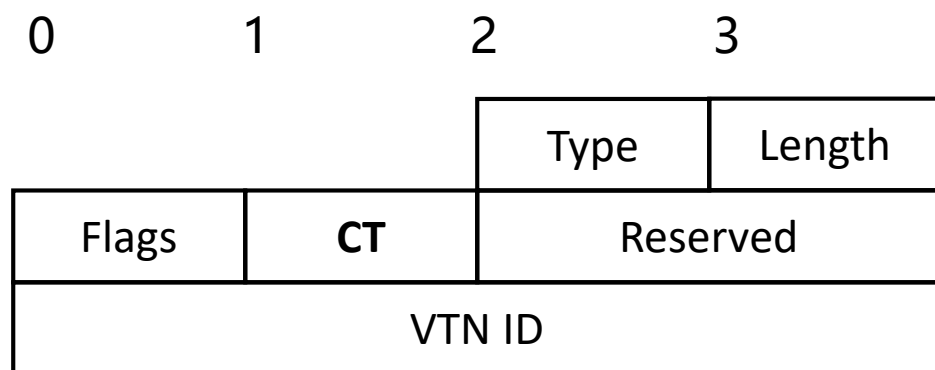
Gyan Mishra @Verizon

# Background Recap

- This document introduces a new HBH option to carry VTN information in IPv6 packets
  - Can be used by transit network nodes to determine the VTN a packet belongs to
  - VTN-specific packet processing and forwarding can be performed
- The term VTN refers to a virtual transport (underlay) network
  - The basic semantics is a subset of network resources allocated in the underlay network
  - The semantics of VTN may cover other attributes of a virtual underlay network
- There is interest in generalizing the VTN option
  - It may be extended for other related functions in future
  - The recent version (-03) introduces the mechanisms to facilitate future extensions

# Update of VTN Option Encoding

- Introduces the CT field in VTN option for future extensions



- Option Type: TBA
- Length: Length of the data fields in octets
- Flags: the first bit is defined as Strict Match (S)
- **Context Type (CT): Indicate the semantics and length of the VTN ID**
  - **CT=0: The VTN ID is a 4-octet resource ID**
- Reserved field: leave for future extensions
- VTN ID: The identifier of a Virtual Transport Network

- Takes the data plane processing overhead into consideration
  - The format of the option is stable
  - For a specific CT, the length of the VTN ID is fixed

# Generalization of VTN Semantics

- The VTN ID can refer to a group of network-wide attributes maintained on network nodes which participate in the VTN, here are some examples:
  - **Network resource attribute: the Resource ID**
    - The resource semantics is needed for realizing network slicing
  - Network topology attribute
    - May be used to identify the logical topology a packet belongs to
  - Network function attribute
    - May be used to identify the network actions to be executed
- It is important to understand the boundary of generalization
  - The attributes of VTN should be network-wide rather than node-specific
  - It may not be a good practice to put everything into one HBH option
    - Making the option itself too complex to implement and deploy

# Processing Procedures

- The processing of VTN Resource ID is specified in this document
  - Ingress node: encapsulates an outer IPv6 header and a HBH header with the VTN option
  - Transit nodes: uses both the Destination Address and the VTN Resource ID in determining the next-hop and the set of resources for packet forwarding
  - Egress node: decapsulates the outer IPv6 header and the HBH header which includes the VTN option
- The processing of VTN option with other Context Types will need to be specified in separate documents

# Operational Considerations

- Operators need to make sure all the network nodes involved in a VTN can either process the HBH header in fast path, or ignore the HBH header
  - One approach is to put all the network nodes supporting the processing of the HBH header and the VTN option in a logical topology, and constrain the packet forwarding only in that logical topology
- draft-ietf-6man-hbh-processing specifies the modified procedures for the processing of HBH header
  - Network nodes complying with that document can forward packets with HBH header

# Next Steps

- Use this document as the base of the VTN option specification
  - Stable basic encoding, ready for code point (early) allocation
  - Create the registry for VTN Context Types
- Future extensions to VTN semantics will be specified in separate documents
- Continue to collect feedbacks from the WG
- Move towards WG last call

Thank You