

# BGP Flow Specification for DetNet Flow Mapping

draft-xiong-idr-detnet-flow-mapping-04

Quan Xiong(ZTE)  
Haisheng Wu(ZTE)  
Junfeng Zhao(CAICT)  
Dong Yang(Beijing Jiaotong University)

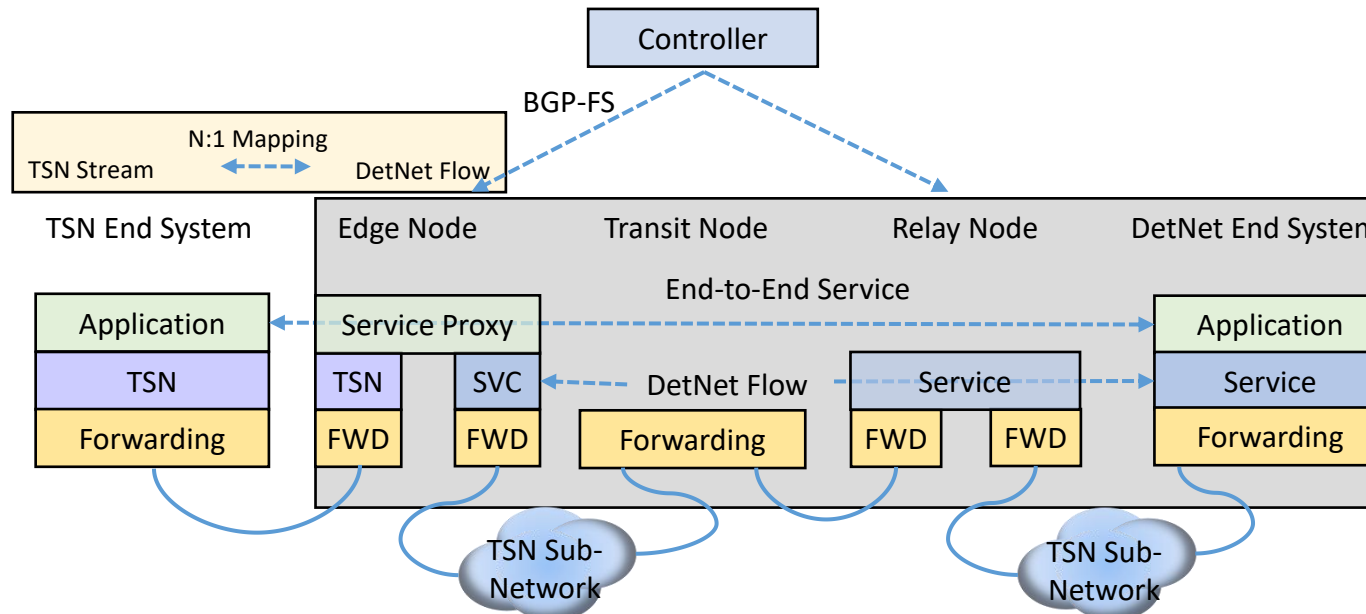
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# Update from last versions

- Presented at IETF#112 and #113 and got feedback from DetNet and IDR WG:
  - Lou Berger:
    - clarify that this document is focused on TSN mapping, not generic DetNet
    - DetNet chairs are OK to work on this topic in either DetNet or IDR (where flowspec is defined)
  - Jeffrey Haas:
    - need to be implemented in flowspec v2
- Change the draft name to clarify the TSN mapping.
  - “BGP Flow Specification for DetNet and TSN Flow Mapping”
- Align with the progress of enhanced DetNet data plane in DetNet WG
  - Consider the new **DetNet-specific metadata in scaling network requirements**
- Change the extensions from BGP-FSv1 to BGP-FSv2 as per draft-ietf-idr-flowspec-v2.
  - Adding **TSN SubTLV** in BGP-FSv2 L2 header TLV defined in draft-ietf-idr-flowspec-v2 section 3.4 **to filter TSN streams.**
  - Adding **Deterministic Latency Action SubTLV** in BGP FSv2 Wide Community defined in draft-ietf-idr-flowspec-v2 section 3.2 **to accept the TSN streams and map them to DetNet flows.**
  - Adding **DetNet SubTLV** in BGP FSv2 IP header TLV defined in draft-ietf-idr-flowspec-v2 section 3.1 **to filter DetNet flows with deterministic latency information in enhanced DetNet such as queuing metadata.**
  - Adding **TSN Action SubTLV** in BGP FSv2 Wide Community defined in draft-ietf-idr-flowspec-v2 section 3.2 **to accept the DetNet flows and map them to the particular TSN streams.**

# Overview with TSN and DetNet Mapping

- As defined in [RFC8655], the DetNet may provide the deterministic services for the TSN end system and the DetNet IP and MPLS flows may be carried over TSN sub-networks.
- As discussed in RFC8938, RFC9023, RFC9024, RFC9037, the primary requirements of the Controller Plane for the TSN and DetNet flow mapping is as follows.
  - **The mapping between TSN Streams and DetNet flows is required for the service proxy function at DetNet Edge nodes and the mapping table can be configured and maintained in the control plane.**
- This document proposes **extensions to BGP Fsv2 for TSN and DetNet mapping** by using the traffic filtering rules to identify the packet and using the associated action to map the packet to the flows to **achieve the end-to-end deterministic service.**



# BGP-FS Extensions for TSN Stream Mapping to DetNet Flow

- Filtering Rules for TSN Streams

- As IEEE Std 802.1Q defined, a Stream ID is a 64-bit field that uniquely identifies a stream and the Stream identification functions are defined in IEEE 802.1CB and IEEE P802.1CBdb.
- The Ethernet Layer 2 traffic filtering rules defined in draft-ietf-idr-flowspec-l2vpn can be used in TSN Stream identification.
- This document proposes a **new TSN SubTLV** in BGP-FSv2 L2 header TLV defined in draft-hares-idr-flowspec-v2 section 3.4 for **TSN traffic filtering in Mask-and-Match Stream identification.**

- Traffic Action for TSN Streams

- The action for L3 traffic with extended communities types per RFC8955, RFC8956 and draft-ietf-idr-bgp-flowspec-label can be used for DetNet flows.
- This document proposes the **Deterministic Latency Action SubTLV** in BGP FSv2 Wide Community defined in draft-hares-idr-flowspec-v2 section 3.2 **to accept the TSN streams and map the streams to the DetNet flows with particular queuing mechanisms to guarantee the deterministic latency.**

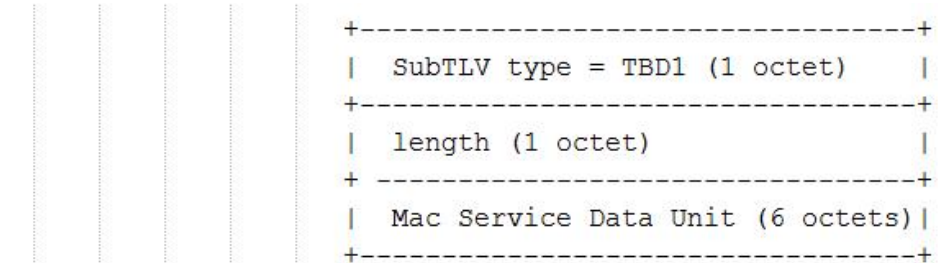


Figure 2: TSN SubTLV

SubTLV type = TBD1: Mac Service Data Unit  
 Encoding: <type (1 octet), length (1 octet), [op, value]+>

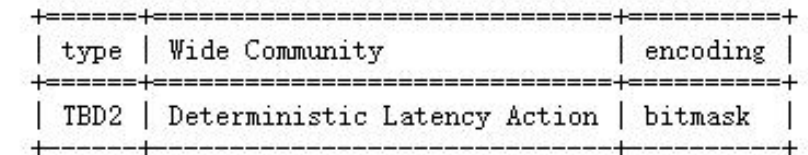
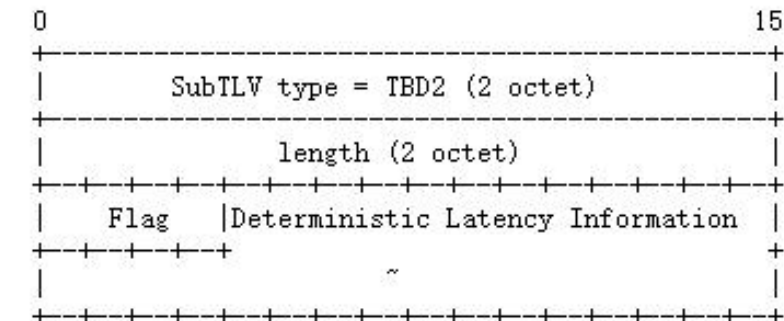


Table 1

The Deterministic Latency Action SubTLV is shown in Figure 3.



# BGP-FS Extensions for DetNet Flow Mapping to TSN Stream

- Filtering Rules for DetNet Flows

- The L3 traffic filtering rules defined in [RFC8955] and [RFC8956] can be used for DetNet IP flow. The S-label in DetNet MPLS flow can use the filtering rules defined in draft-ietf-idr-flowspec-mpls-match.
- This document proposes a **DetNet SubTLV** in BGP FSv2 IP header TLV defined in draft-hares-idr-flowspec-v2 section 3.1 for a **DetNet traffic filtering flowspec to filter DetNet flows with deterministic latency information in enhanced DetNet such as queuing metadata.**

- Traffic Action for DetNet Flows

- This document proposes the **TSN Action SubTLV** in BGP FSv2 Wide Community defined in draft-hares-idr-flowspec-v2 section 3.2 **to accept the DetNet flows and map the flows to the TSN streams indicated by TSN profile.**
- The TSN-profile can be converted to the stream related parameters and requirements including TSN Stream ID, stream\_handle, sequence\_number and traffic\_scheduling information.

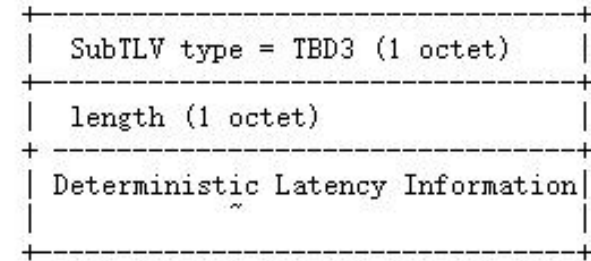


Figure 4: DetNet SubTLV

SubTLV Type TBD3: indicates deterministic latency information.

Encoding: <type (1 octet), length (1 octet), [op, value]+>

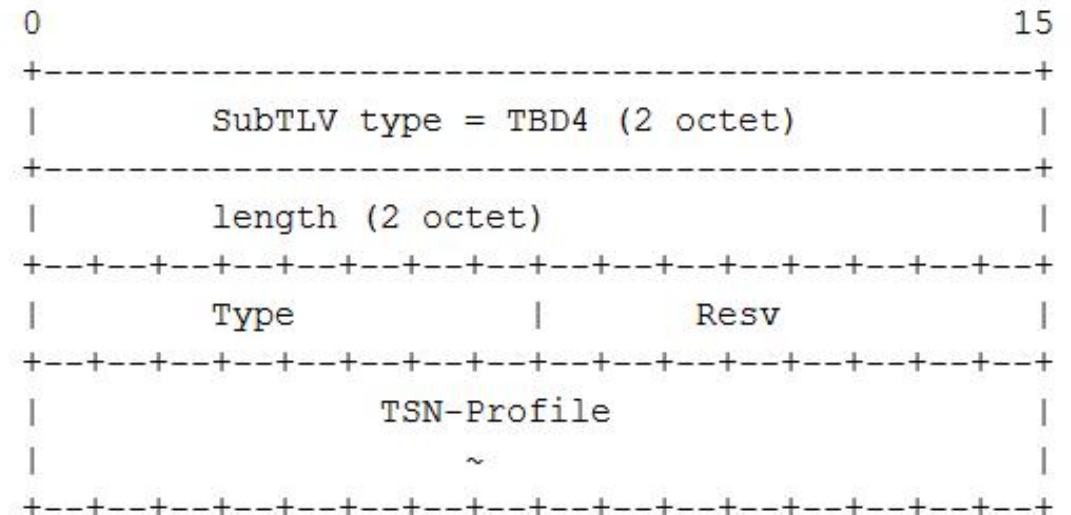


Figure 5: TSN Action

# Next Step

- Align with BGP FSv2 [draft-ietf-idr-flowspec-v2].
- Align with the progress of enhanced DetNet data plane in DetNet WG.
- Comments and discussions are very welcome!

Thank you!