SR Policy for Enhanced DetNet

draft-zhang-sr-policy-enhanced-detnet-00

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Background

- Segment routing policy is described in draft-ietf-spring-segment-routing-policy

    - A SR policy is a set of candidate path which consist of one or more segment lists.

    - It provides a method for the headend node to instruct the source routing.

- The Deterministic Networking architecture is described in RFC8655

    - It provides the capability to carry specified data flows with extremely low data loss rates and bounded end-to-end latency within a network domain.

- The enhanced DetNet data plane is described in draft-yzz-detnet-enhanced-data-plane

    - It introduces the Bounded Latency Information to facilitate DetNet transit nodes to guarantee the bounded latency transmission in data plane.

- The segment routing for enhanced DetNet is described in draft-geng-spring-sr-enhanced-detnet

    - defines how to leverage Segment Routing(SR) and Segment Routing over IPv6 (SRv6) to implement bounded latency.

- This documents describes the BGP-sr policy extensions for bounded latency path.

    - Introduces how to carry the Bounded Latency Information with a candidate path of SR policy.

Overview of the Related Drafts

Data Plane

IP/MPLS based

draft-yzz-detnet-enhanced-data-plane

SRv6/SR based

draft-geng-spring-sr-enhanced-detnet

Control Plane

IGP based

draft-geng-lsr-isis-te-extension-enhanced-detnet

BGP LS based

draft-geng-idr-bgp-ls-enhanced-detnet

PCEP and PCEP SR policy based

draft-zhang-pce-enhanced-detnet

BGP SR policy based

draft-zhang-sr-policy-enhanced-detnet

What is Bounded Latency Information

- **Bounded Latency Information (BLI)** is used to indicate the requirement and resource allocation for each of the node in the path to guarantee the bounded latency transmission.

- The format of BLI are proposed in draft-yzz-detnet-enhanced-data-plane-00
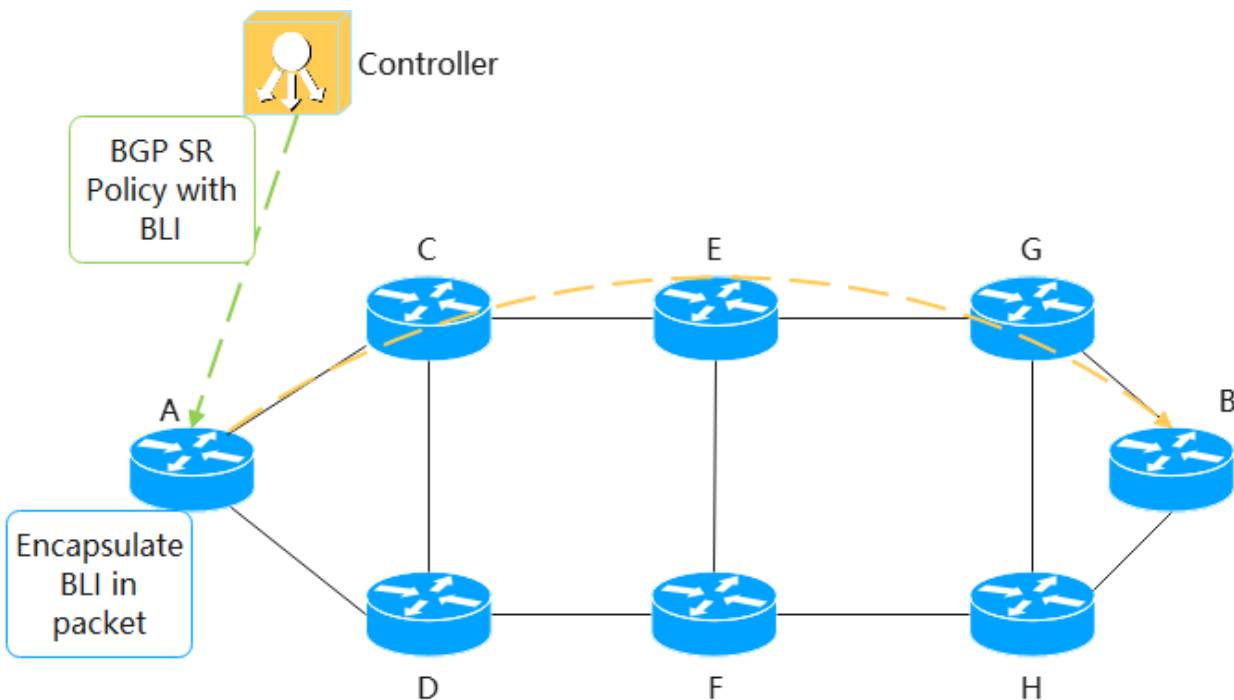
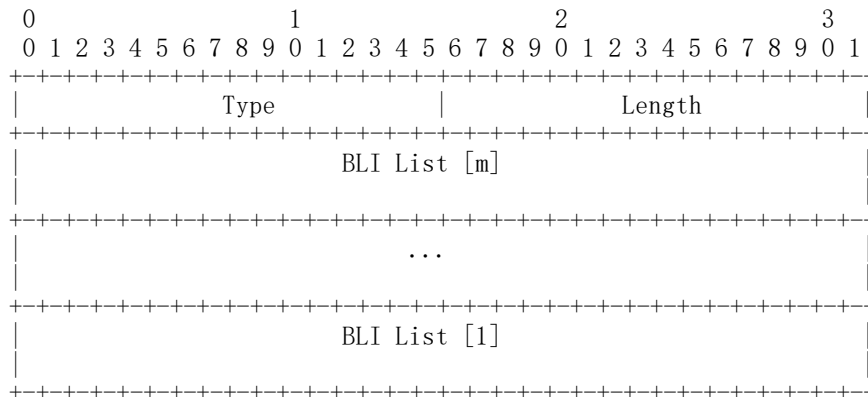BLI format

Extensions in this document

- BLI encoding in BGP-sr policy

  - BLI list sub-tlv, when all of the nodes/adjacencies in the explicit path indicated by the segment list request different BLI.

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|            Type               |            Length             |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          BLI List [m]                         |
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             ...                               |
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                          BLI List [1]                         |
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

```
SR Policy SAFI NLRI: <Distinguisher, Policy-Color, Endpoint>
    Attributes:
        Tunnel Encaps Attribute (23)
            Tunnel Type: SR Policy
                Binding SID
                Preference
                Priority
                Policy Name
                Explicit NULL Label Policy (ENLP)
                Segment List
                    BLI List/Shared BLI
                    Weight
                    Segment
                    ...
```
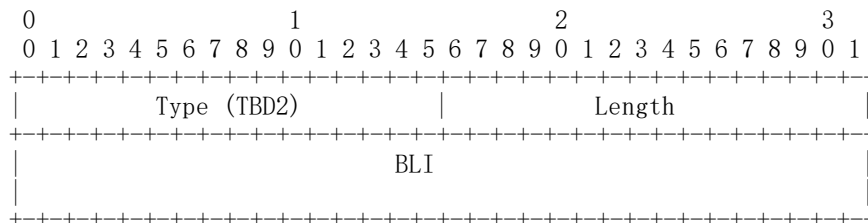
  - Shared BLI sub-tlv, when all of the nodes/adjacencies in the explicit path indicated by the segment list request same BLI.

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|         Type (TBD2)           |            Length             |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             BLI                               |
|                                                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Extensions in this document

- Procedures
    - The originating node of SR policy MUST include the associated bounded latency information in the BGP Tunnel Encapsulation Attribute of the BGP SR Policy for the bounded-latency candidate path.

    - When a BGP speaker receives an SR and the bounded-latency path is selected as the best candidate path, the receiver node of the SR Policy must encapsulate the specific bounded latency information to the header of packets steered to the SR Policy.

Next Steps

- Discussion on mailing list
- Keep align with progress in DetNet

Thank You