BGP SR Policy Extensions for **Segment List Identifier** and **Headend Behavior**

draft-lin-idr-sr-policy-seglist-id
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Motivation for Segment List Identifier [draft-lin-idr-sr-policy-seglist-id]

[I-D.ietf-idr-segment-routing-te-policy] specifies a mechanism by using BGP to distribute SR Policy to headend node. But there is no identifier for segment list in BGP SR Policy, and this situation has caused inconvenience in some scenarios:

For example:

✓ Report traffic forwarding statistic

  headend nodes collect traffic forwarding statistics per segment list and report statistic data to controller. Because there is no identifier for segment list,
  
  - **headend**: report whole segment list and statistic
  
  - **controller**: compare the SID one by one to identify the segment list

✓ Distributing configuration of segment list

  A implementation is SR Policy is distributed by BGP, and configuration is distributed by NETCONF. For the configuration of segment list
  
  - **controller**: distribute whole segment list and configuration
  
  - **headend**: compare the SID one by one to identify the segment list

Such operations not only occupy bandwidth, but also affect efficiency. In these cases, a simple identifier of segment list can be helpful.
Segment List Identifier in SR Policy

As per [I-D.ietf-idr-segment-routing-te-policy], draft-lin-idr-sr-policy-seglist-id adds the Segment List Identifier in SR policy.

The segment list Identifier could be:

- **A 4 octets number**
  - Segment List ID Sub-TLV is defined

- **A name**
  - Segment List Name sub-TLV is defined
Sub-TLV for Segment List Identifier

✓ Segment List ID Sub-TLV

The Segment List ID sub-TLV specifies the identifier of the segment list by a 4-octet number.

The Segment List ID sub-TLV is optional and it **MUST NOT** appear more than once inside the Segment List sub-TLV.

- Type: TBD.
- Flags: 1 octet of flags. None are defined at this stage. Flags **SHOULD** be set to zero on transmission and **MUST** be ignored on receipt.
- RESERVED: 1 octet of reserved bits. **SHOULD** be set to zero on transmission and **MUST** be ignored on receipt.
- **Segment List ID**: 4 octet of ID for the segment list.

✓ Segment List Name Sub-TLV

The Segment List Name sub-TLV specifies the identifier of the segment list by a symbolic name.

The Segment List Name sub-TLV is optional and it **MUST NOT** appear more than once inside the Segment List sub-TLV.

- Type: TBD.
- Length: Variable.
- Flags: 1 octet of flags. None are defined at this stage. Flags **SHOULD** be set to zero on transmission and **MUST** be ignored on receipt.
- RESERVED: 1 octet of reserved bits. **SHOULD** be set to zero on transmission and **MUST** be ignored on receipt.
- **Segment List Name**: Symbolic name for the segment list. It **SHOULD** be a string of printable ASCII characters, without a NULL terminator.
Motivation for Headend Behavior [draft-lin-idr-sr-policy-headend-behavior]

headend can steer a packet flow into an SR Policy in various ways

- **BSID steering**
  - BSID has multiple behaviors which are suitable for different scenarios.
    - End.B6.Encaps behavior
    - End.B6.Insert
  
- **Per-destination steering**

- **Per-flow steering**

- **Policy-based steering**

- **FlowSpec steering** [I-D.jiang-idr-ts-flowspec-srv6-policy]

- **...**

[I-D.ietf-spring-segment-routing-policy] defines the SRv6 Binding SID sub-TLV to signal the SRv6 BSID information along with SR Policies.

For other steering way, the headend behavior is not specified during the distributing of SR Policy by BGP.
Headend Behavior in SR Policy

As per [I-D.ietf-idr-segment-routing-te-policy], draft-lin-idr-sr-policy-headend-behavior adds the Headend Behavior in SR policy.

The Headend Behavior could be:

- behavior associated with the candidate path for **L3 traffic**
  Headend Behavior Sub-TLV is defined

- behavior associated with the candidate path for **L2 traffic**
  L2 Headend Behavior Sub-TLV is defined
Sub-TLV for Headend Behavior

✓ **Headend Behavior Sub-TLV**

The Headend Behavior sub-TLV is optional, and MUST NOT appear more than once in the SR Policy encoding.

- **Type**: TBD.
- **Length**: 4.
- **Reserved**: 2 octets of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.

- **Headend Behavior**: a 2-octet value. The following values are defined.
  - **TBD**: H.Encaps. A headend behavior defined in [RFC8986].
  - **TBD**: H.Encaps.Red. A headend behavior defined in [RFC8986].
  - **TBD**: H.Insert. A headend behavior defined in [I-D.filsfils-spring-srv6-net-pgm-insertion].
  - **TBD**: H.Insert.Red. A headend behavior defined in [I-D.filsfils-spring-srv6-net-pgm-insertion].

✓ **L2 Headend Behavior Sub-TLV**

The L2 Headend Behavior sub-TLV is optional, and MUST NOT appear more than once in the SR Policy encoding.

- **Type**: TBD.
- **Length**: Variable.
- **Reserved**: 2 octet of reserved bits. SHOULD be set to zero on transmission and MUST be ignored on receipt.

- **L2 Headend Behavior**: a 2-octet value. The following values are defined.
  - **TBD**: H.Encaps.L2. A headend behavior defined in [RFC8986].
  - **TBD**: H.Encaps.L2.Red. A headend behavior defined in [RFC8986].
Next Steps

• Any questions or comments are Welcomed
• Seeking for feedback
Thank You