BGP FlowSpec Redirect to Generalized Segment ID Action

(draft-li-idr-flowspec-redirect-generalized-sid)

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History

☐Initially presented in the IDR Interim Meeting of 2015-10-26 , and discussed in IDR mailing list

https://www.ietf.org/proceedings/interim/2015/10/26/idr/slides/slides-interim-2015-idr-12-8.pdf

https://www.ietf.org/mail-archive/web/rtgwg/current/msg05195.html

slides-interim-2015-idr-12-8.pdf, Page 15 said:

<Snip>

– Segment ID can be the alternative way of Path ID proposed by the draft "BGP Flowspec Redirect to Path ID". Then it may save the work to define the Path ID from the beginning. But there is some difference between Segment ID and Path ID. For Path ID, it is totally "semantics independent" while the segment type should be specified for Segment ID which will introduce something "semantics dependent".
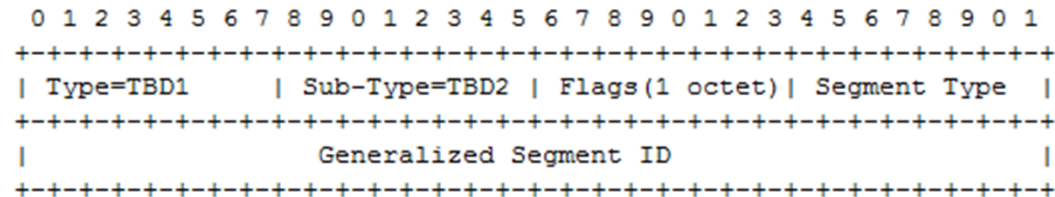– Multiple Segment IDs which are a group of indicators of link segments of a specific node can be carried with BGP Prefix which can redirect the flow to the specified interface group specified by multiple segment IDs.

☐No consensus reached after the IDR Interim Meeting of 2015-10-26 & discussions

☐"semantics dependent" Redirect to Generalized Segment ID Action documented as draft-li-idr-flowspec-redirect-generalized-sid

summary of draft-li-idr-flowspec-redirect-generalized-sid

☐ Defines Redirect to Generalized Segment ID Action

```
 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=TBD1       | Sub-Type=TBD2 | Flags(1 octet)| Segment Type  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                      Generalized Segment ID                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

☐When activated, the Redirect to Generalized Segment ID Extended Community is used by BGP FlowSpec Controller to signal the specific redirecting action to BGP Flowspec Client

☐Then the BGP Flowspec Client will use the Generalized Segment ID and Segment Type to find a local forwarding entity in a local mapping table.
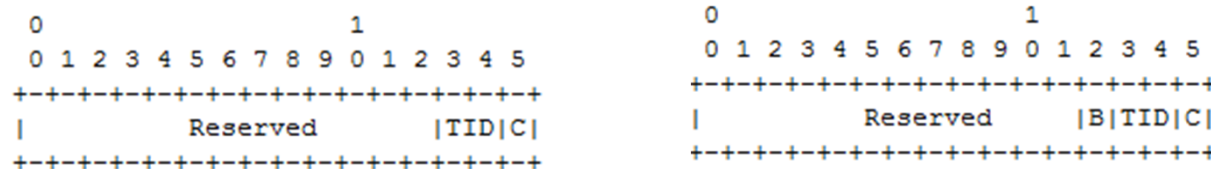
☐Existing technologies (BGP, IGP, LDP, SR, RSVP, Manual-Config, etc…) can be used to setup the mapping tables per segment type.

☐Segment Type includes: Node Segment, Agency Segment, AS (Autonomous System) Segment, Anycast Segment, Tunnel Segment (Tunnel Binding Segment), etc. (Note: Generalized Segments can be IP & Non-IP forwarding entities.)

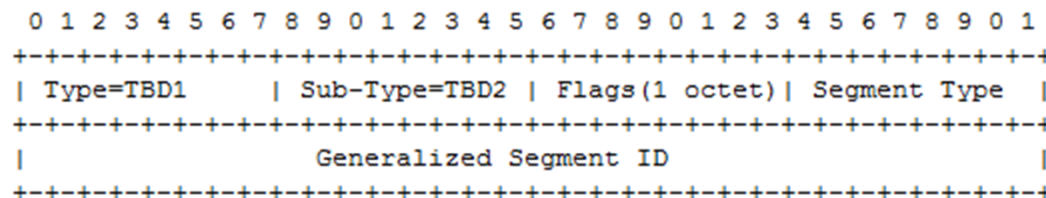# Comparison with draft-vandevelde-idr-flowspec-path-redirect

☐ draft-vandevelde-idr-flowspec-path-redirect
- ✓ Revision 01 defined "Semantics Independent" action: Redirect to INDIRECTION-ID Communities, INDIRECTION_ID + Flags.
- ✓ Revision 02 introduces "B" bit to map the value encoded in the global administrator field to a Binding Segment Identifier value:

```
 0                   1              0                   1
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5    0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|         Reserved      |TID|C|    |       Reserved     |B|TID|C|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

☐ draft-li-idr-flowspec-redirect-generalized-sid-00 defined a "Semantics Dependent" Flowspec Redirection: Redirect to GSID Action, Generalized Segment ID + Flags +**Segment Type**

```
 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=TBD1     | Sub-Type=TBD2 | Flags(1 octet)| Segment Type  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Generalized Segment ID                     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

☐ **At this point, can we think that we already have reach a consensus?**
- ✓ **Our common goal is to define a "Semantics dependent" action!**

Comparison with draft-vandevelde-idr-flowspec-path-redirect (Cont.)

☐draft-vandevelde-idr-flowspec-path-redirect constructedone INDIRECTION_ID Table for all kinds of indirection entries:

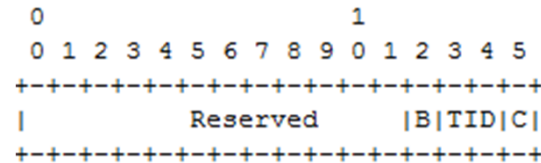## Indirection_ID Table on R1

Indirection_ID	Localised Indirection Information
Indirection_ID#1	SR-TE (R5->R8)
Indirection_ID#2	EVPN ESI redirect to ESI#foo
Indirection_ID#3	Manual Configured next-hop
Indirection_ID#4	IP Routing Table Lookup

☐draft-li-idr-flowspec-redirect-generalized-sidsetup the mapping tables per segment/tunnel type.

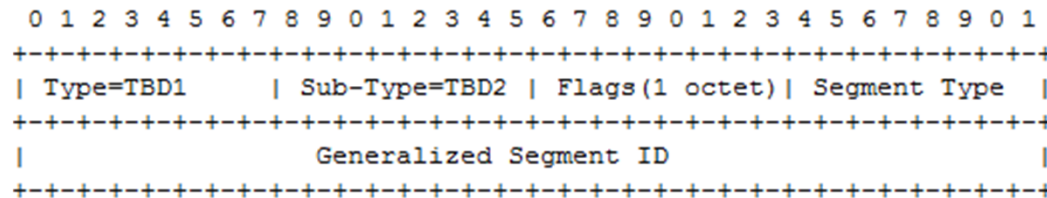☐We think that "setup the mapping tables per segment type" is easier to implement.

Comparison with draft-vandevelde-idr-flowspec-path-redirect

☐For ID type:

✓draft-vandevelde-idr-flowspec-path-redirect-02 used bit for different forwarding entities, "B" bit plus 12 bits Reserved field,can only be used for 13 types.

```
 0                   1
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|          Reserved      |B|TID|C|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

✓draft-li-idr-flowspec-redirect-generalized-sid-00used a octet to identify ID type, can be used for 255 types.

```
 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=TBD1     | Sub-Type=TBD2 | Flags(1 octet)| Segment Type  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Generalized Segment ID                     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

If we want to signal the ID type within the "Redirect Action", the second method defined in draft-li is better.

Comparison with draft-hao-idr-flowspec-redirect-tunnel

❑draft-hao-idr-flowspec-redirect-tunnel:

    ✓No signaling to set up a tunnel, Flowspec Controller knows detail tunnel info using in Flowspec Clients

    ✓Specify the specific tunnel from Flowspec Controller

    ✓The redirect tunnel information is encoded in BGP Path Attribute [TUNNELENCAPS][MPP] that is carried in the BGP flow-spec UPDATE.

❑draft-li-idr-flowspec-redirect-generalized-sid:

    ✓No signaling to set up a tunnel, Flowspec Controller knows detail tunnel info using in Flowspec Clients and "the ID to Tunnel Mapping table" in Flowspec Clients

    ✓Specify the Generalized Segment ID and Segment Type from Flowspec Controller

    ✓Flowspec Clients Use the Generalized Segment ID and Segment Type to find a local forwarding entity in a local mapping table

Questions for the WG discussion

- 1. Redirect-to-Specific-Tunnel with BGP Path Attribute [TUNNELENCAPS][MPP] and Redirect-to-IID/GSID, Required by different use cases, can we have two docs in IDR In parallel? [Comparison to Redirect-to-IID/GSID , draft-hao will have more little modification to existing mechanisms, No need to do Mapping /Recursive Lookup.]

- 2. For IID/GSID, one mapping table for all kinds of segments/forwarding-entities vs. one mapping table per segments/forwarding-entities type, should we support both?

Thanks