Flowspec Path-id Redirect
(draft-vandevelde-idr-flowspec-path-redirect)

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Do not Panic!

PATH_ID

Renamed to

INDIRECTION_ID

(In this presentation the term PATH_ID is renamed to INDIRECTION_ID to better reflect its intentions and remove existing confusion. Nothing else changed. The text in the draft will be updated accordingly)
Flowspec “Indirection-id” Redirect

- **Use-case: Traffic Steering Service**
  - Provide a scalable apparatus to selective steer traffic onto an Tunnel (or Interface)
  - Routing system to propagate a reference of indirection supporting localised redirection
  - Decouple Steering Service and Underlay Topology

- **None Use-case: Tunnel Setup signaling**
  - No signaling of encapsulations using Flowspec NLRI
  - Flowspec does not exchange additional attributes
  - No signaling to setup a tunnel
  - No signaling for tunnel TE operational purpose
Anatomy of PBR

Note that PBR is NOT used at all to initiate/create/signal Tunnels

"interesting"
Traffic Identification

Parameters
- VPN
- Interfaces
- IP addresses
- Ports
- Applications
- etc…

Traffic Conditioning
- Policing
- Marking
- DSCP
- precedence
- rewriting

Traffic Steering
- Partially by RFC5575
- Only VRF Redirect
- Next hop
- Redirect
- etc,…
Intro to Indirection_ID

Flowspec Controller

RFC5575

New Community

Flowspec 1 MATCH 1 Conditioning 1 Indirection_ID#1

Flowspec 2 MATCH 2 Conditioning 2 Indirection_ID#2

Flowspec 3 MATCH 3 Conditioning 3 Indirection_ID#3

Flowspec 4 MATCH 4 Conditioning 4 Indirection_ID#4

Indirection_ID = Abstract reference to an Indirection

R1

R2

R3

RTGWG 5
Indirection_ID Table is localised Info

Table is decoupled from Flowspec & Table is independently populated

Potential tools:
draft-li-idr-mpls-path-programming
PCE PLSP-ID
manual config
XML/XMPP
netconf/yang
traditional routing
voodoo
etc...

Indirection_ID Table on R1

<table>
<thead>
<tr>
<th>Indirection_ID</th>
<th>Localised Indirection Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirection_ID#1</td>
<td>SR-TE (R5-&gt;R8)</td>
</tr>
<tr>
<td>Indirection_ID#2</td>
<td>EVPN ESI redirect to ESI#foo</td>
</tr>
<tr>
<td>Indirection_ID#3</td>
<td>Manual Configured next-hop</td>
</tr>
<tr>
<td>Indirection_ID#4</td>
<td>IP Routing Table Lookup</td>
</tr>
</tbody>
</table>
Indirection_ID Table is localised Info

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<td>Indirection_ID#4</td>
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</tr>
</tbody>
</table>

**Indirection_ID Table on R2**

<table>
<thead>
<tr>
<th>Indirection_ID</th>
<th>Localised Indirection Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirection_ID#1</td>
<td>SR-TE (R7-&gt;R8)</td>
</tr>
<tr>
<td>Indirection_ID#2</td>
<td>EVPN ESI redirect to ESI#foo</td>
</tr>
<tr>
<td>Indirection_ID#3</td>
<td>CLI defined redirect Interface</td>
</tr>
<tr>
<td>Indirection_ID#4</td>
<td>IP Routing Table Lookup</td>
</tr>
</tbody>
</table>

**Indirection_ID Table on R3**

<table>
<thead>
<tr>
<th>Indirection_ID</th>
<th>Localised Indirection Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirection_ID#1</td>
<td>RSVP-TE (R9-&gt;R8)</td>
</tr>
<tr>
<td>Indirection_ID#2</td>
<td>EVPN ESI redirect to ESI#foo</td>
</tr>
<tr>
<td>Indirection_ID#3</td>
<td>CLI defined redirect Interface</td>
</tr>
<tr>
<td>Indirection_ID#4</td>
<td>IP Routing Table Lookup</td>
</tr>
</tbody>
</table>
Life of a Packet

Packet Matching Flowspec1
Traffic Steering: Indirection_ID#1

Packet Matching Flowspec1
Traffic Steering: Indirection_ID#1
Details: Flowspec Redirect-to-PATH Community

- New Flowspec Traffic Action Community
- Indirection_ID is either 32 or 128 bit identifier
- Assumption
  - Router has Indirection_ID table pre-populated
  - Population of this table is outside the scope of Flowspec Redirect-to-PATH (work for RTGWG?)
  - Each “Indirection_ID” is represents a unique Redirect Service identifier for the network

- Indirection_ID structure
  - Indirection_ID is 32 or 128 bit value
  - C-bit (1 bit): copy original packet onto the Re-direct
  - TID (2 bit): support for nested redirects (i.e. SR Segments) or Multi-path functions

- Note: Indirection_ID could also be seen as Superset of Redirect-to-IP indirection where Indirection_ID has additional context as IP address (in this case Indirection_ID and Redirect IP are the same)
Looking at WG questions

- **Difference with other flowspec redirect-to-tunnel drafts?**
  - Flowspec NLRI does **NOT** carry “tunnel-encap attribute” or any other tunnel attributes
  - This draft does not intend to signal tunnel setup information
  - Total de-coupling of Steering Service and underlay network
  - Total de-coupling of Steering Service and localised Tunnel information

- **Purpose of TID: nested tunnels, Multi-Path, push SR segments**

- **If the Indirection_ID is down/non-exist in the Indirection_ID Table**
  - If the next-hop or interface is down, then just like PBR behaviour the rule is not applied on the router. No difference with PBR behaviour from this perspective

- **Flowspec Validation**
  - It should be possible for Flowspec controller to withdraw the signalled Flowspec NLRI

- **Indirection_ID Table questions**
  - Construction is outside scope
  - It could be populated CLI, Netconf/Yang, protocol extensions, etc.. (see before)

- **Difference between Redirect-to-IP and Redirect-to-PATH is small**
  - Redirect to Indirection_ID is indeed superset of Redirect-to-IP (in Redirect-to-ip the 32/128 bit number has IP address context correlation)

- **Tunnel Setup Questions**
  - Tunnel Setup is outside scope of this draft
THANK YOU!