RSVP Color in PCEP

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PROBLEM STATEMENT

• Provide a convenient way to associate service prefixes with RSVP underlay tunnels

• Need has existed for some time. Existing solutions using ‘color’ marking for SR-TE:

• Carrying color markings across domain boundaries in BGP:

• Existing RSVP deployments have a similar need.
ENVISIONED USAGE

(1) BGP Routes carry indication of overlay color.

(2) RSVP LSPs have corresponding markings.

(3) Ingress chooses the underlay LSPs based on overlay & underlay markings.

Gold Prefixes

Silver Prefixes

Gold

Silver

R1

R2

R3

RSVP LSP

RSVP LSP

RSVP LSP

IETF 110
SOLUTION OVERVIEW: PCEP PROTOCOL

• LSP Object carries color marking in a new TLV
  • Can be used by PCE to create an LSP with the appropriate color
  • Can be used by PCC to report color

• ‘Color’ is a property of a tunnel, rather than individual LSP’s of the tunnel.
  • Attach with “primary” LSP

<table>
<thead>
<tr>
<th>Type (2 bytes)</th>
<th>Length(2 bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (4 bytes)</td>
</tr>
</tbody>
</table>

Note: Need to reconcile with https://tools.ietf.org/html/draft-peng-pce-te-constraints-04
### MISMATCH HANDLING

<table>
<thead>
<tr>
<th>PCE</th>
<th>PCC</th>
<th>Implication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>N</td>
<td>LSP can’t honor color. Server needs to know.</td>
</tr>
<tr>
<td>N</td>
<td>Y</td>
<td>The values reported by the PCC are ignored by server, which is benign. But, client can as well not insert color.</td>
</tr>
</tbody>
</table>

#### STATEFUL-PCE-CAPABILITY TLV

<table>
<thead>
<tr>
<th>Type (2 bytes)</th>
<th>Length (2 bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flags (4 bytes)</td>
<td></td>
</tr>
<tr>
<td><strong>A new C-bit to represent color</strong></td>
<td></td>
</tr>
</tbody>
</table>
Usage with BGP-CT

• While BGP-CT is not a pre-requisite for using the color specified in this draft, BGP-CT & RSVP PCEP color can inter-operate.

• In BGP-CT, overlay marking (mapping community) selects “resolution scheme”
  • Resolution scheme is associated with an ordered set of transport classes
  • The PCEP RSVP ‘color’ field can be used to associate LSP’s with transport classes
THANK YOU!