PCEP Extension for Native IP

[draft-wang-pce-pcep-extension-native-ip]

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Background for PCEP extensions

1. **Scenarios** and **Solutions** for TE in native IP network adopt as TEAS WG documents.
2. Without the help of PCE/SDN controller, it is not easy to meet the goal of E2E QoS.
3. We propose the following solutions:
   - Deploy PCE/SDN Controller in the native IP network
   - PCE/SDN Controller is responsible for the complex algorithm
     - Populate traffic prefixes via different BGP sessions between peers
     - Manipulate the path to BGP nexhop of these prefixes via PCEP
What The Proposal for PCEP extensions?

- Using PCEP to:
  - Build BGP peer dynamically and rapidly.
  - Populate differentiate prefixes between them.
  - Manipulate the path to BGP nexthop on demand based on real network conditions.

- Only key parameters needs to be transferred
  - compared contents bundle of NETCONF/YANG

<table>
<thead>
<tr>
<th>New PCEP Objects</th>
<th>Key Parameters</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Address List (PAL)</td>
<td>List of Peer Addresses</td>
<td>PCC uses this information to build BGP connection with the appointed peer</td>
</tr>
<tr>
<td>Peer Prefix Association (PPA)</td>
<td>Relation between Different Prefixes and their associated peer</td>
<td>PCC advertises different prefixes via different BGP peer.</td>
</tr>
<tr>
<td>Explicit Peer Route (EPR)</td>
<td>Explicit Routes to Peer Address</td>
<td>PCC builds the explicit routes to the peer address</td>
</tr>
</tbody>
</table>
Two different approaches to transfer new Obj.

<table>
<thead>
<tr>
<th></th>
<th>Approach One</th>
<th>Approach Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message that carry newly defined Obj</td>
<td>Piggybacked within “LSP Initiate Request” message</td>
<td>Carried within new defined “CCDR TE Request” message</td>
</tr>
<tr>
<td>PCE-PCC communication procedures</td>
<td>Same as that in <a href="http://www.example.com">RFC8281</a></td>
<td>Same as that in <a href="http://www.example.com">RFC8281</a></td>
</tr>
<tr>
<td>Capabilities Negotiation</td>
<td>Reuse the “I” Flags</td>
<td>Define New Flag “N”</td>
</tr>
<tr>
<td>Implementation</td>
<td>Consider mainly the newly defined Objects</td>
<td>Concept/Procedures are more distinguished.</td>
</tr>
</tbody>
</table>

4.1. Stateful PCE Capability TLV

The format of the STATEFUL-PCE-CAPABILITY TLV is shown in the following figure:

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                  Type                 |          Length=4          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                     Flags                   |          |S|U|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 1: STATEFUL-PCE-CAPABILITY TLV format
Further Action

• Adopt as WG draft?
• Which approach to transfer newly defined Obj is better?
• Comments?

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