PCEP Extension for Native IP (Update)

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

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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

- The PCEP Objects are included within **PCE Initiate LSP Request Message** (Original)

<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>
New Proposal for Carrying The Key Info.

- [PCE-PCEP-Extension-for-PCE-Controller] defines the CCI object to transfer the central control instruction.
- “PCE in Native IP network” has some flavor of PCECC
- Similar procedure → Easy implementation after integration.
  - Define new CCI Object-Type
  - Put the key info. within CCI Object as TLV

OCI Object-Type is TBD for Native IP network

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-----------------------------------------------+
|                                        CC-ID |
+-----------------------------------------------+
| Reserved                                      Flags |
+-----------------------------------------------+
| // Optional TLV                                // |
+-----------------------------------------------+
```

Figure 1: CCI Object Format
## Updates on the Newly Defined TLV

<table>
<thead>
<tr>
<th>TLV</th>
<th>Key Fields</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Address List (PAL)</td>
<td>Peer ID, AS, IP Address</td>
<td>Build BGP session Dynamically</td>
</tr>
<tr>
<td>Peer Prefix Association</td>
<td>Peer ID, Associated Prefixes</td>
<td>Distribute the Prefixes dynamically</td>
</tr>
<tr>
<td>(PPA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explicit Peer Route (EPR)</td>
<td>Peer ID, Nexthop Address to the Peer</td>
<td>Manipulate the path to peer explicitly</td>
</tr>
</tbody>
</table>


Comments/Suggestions

• What issues do you need the WG to help with?
  – Review and comments for the proposed TLV extensions are welcome.
• What areas of contention have you encountered?
  – Coordination considerations with the management plane (NETCONF/YANG)
• What special input do you need from the WG?
  – Implementation considerations for the extension?

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Background for PCEP extensions

1. **Scenarios** and **Solutions** for TE in native IP network described in 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 next-hop of these prefixes via PCEP