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**PCEP Extension for Native IP Network
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Abstract

This document defines the PCEP extension for CCDR application in Native IP network. The scenario and architecture of CCDR in native IP is described in [[I-D.ietf-teas-native-ip-scenarios](#)] and [[I-D.ietf-teas-pce-native-ip](#)]. This draft describes the key information that is transferred between PCE and PCC to accomplish the end2end traffic assurance in Native IP network under central control mode.

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[1.](#) Introduction

Traditionally, MPLS-TE traffic assurance requires the corresponding network devices support MPLS or the complex RSVP/LDP/Segment Routing etc. technologies to assure the end-to-end traffic performance. But in native IP network, there will be no such signaling protocol to synchronize the action among different network devices. It is necessary to use the central control mode that described in [\[RFC8283\]](#) to correlate the forwarding behavior among different network devices. Draft [\[I-D.ietf-teas-pce-native-ip\]](#) describes the architecture and solution philosophy for the end2end traffic assurance in Native IP network via Dual/Multi BGP solution. This draft describes the corresponding PCEP extension to transfer the key information about peer address list, peer prefix association and the explicit peer route on on-path router.

[2.](#) Conventions used in this document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [\[RFC2119\]](#).

- o PAL TLV: Peer Address List TLV, used to tell the network device which peer it should be peered with dynamically
- o PPA TLV: Peer Prefix Association TLV, used to tell which prefixes should be advertised via the corresponding peer

- o EPR TLV: Explicit Peer Route TLV, used to point out which route should be taken to arrive to the peer.

4.1. Peer Address List TLV

The Peer Address List TLV is defined to specify the IP address of peer that the received network device should establish the BGP relationship with. This TLV should only be included and sent to the head and end router of the end2end path in case there is no RR involved. If the RR is used between the head and end routers, then such information should be sent to head router, RR and end router respectively.

```

0          1          2          3
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=TBD          |          Length          |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|          Peer Num          |          Resv.          |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|          Peer ID          |          AT          |          Resv.          |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|          Local AS Number          |
|          Peer AS Number          |
|          Local IP Address(4/16 Bytes)          |
|          Peer IP Address(4/16 Bytes)          |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|          Peer ID          |          AT          |          Resv.          |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|          Local AS Number          |
|          Peer AS Number          |
|          Local IP Address(4/16 Bytes)          |
//          Peer IP Address(4/16 Bytes)          //
```

Type: TBD

Length: The length of the following fields.

Peer Num : Peer Address Number on the advertised router.

Peer-ID: To distinguish the different peer pair, will be referenced in Peer Prefix Association, if the PCE use multi-BGP solution for different QoS assurance requirement.

AT: Address Type. To indicate the address type of Peer. Equal to 4, if the following IP address of peer is belong to IPv4; Equal to 6 if the following IP address of peer is belong to IPv6.

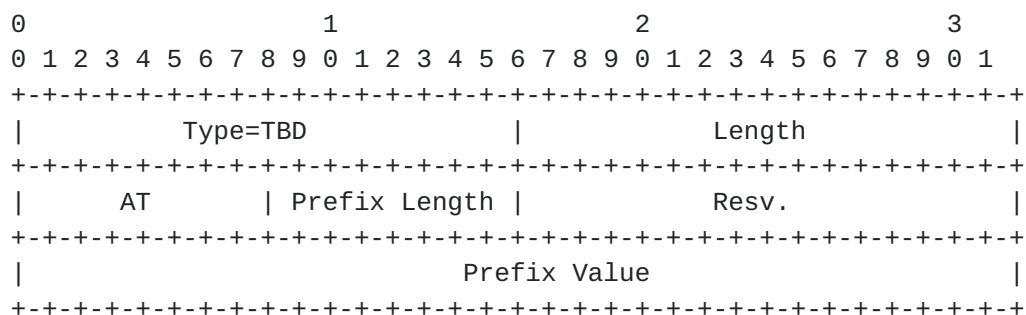
AT: Address Type. To indicate the address type of Peer. Equal to 4, if the following IP address of peer is belong to IPv4; Equal to 6 if the following IP address of peer is belong to IPv6.

Prefixes Num: Number of prefixes that advertised by the corresponding Peer. It should be equal to number of the following IP prefix sub TLV.

Peer Associated IP Prefix sub TLV: Variable Length, indicate the advertised IP Prefix.

4.2.1. Prefix sub TLV

Prefix sub TLV is used to carry the prefix information, which has the following format:



Type: TBD

Length: The length of the following fields.

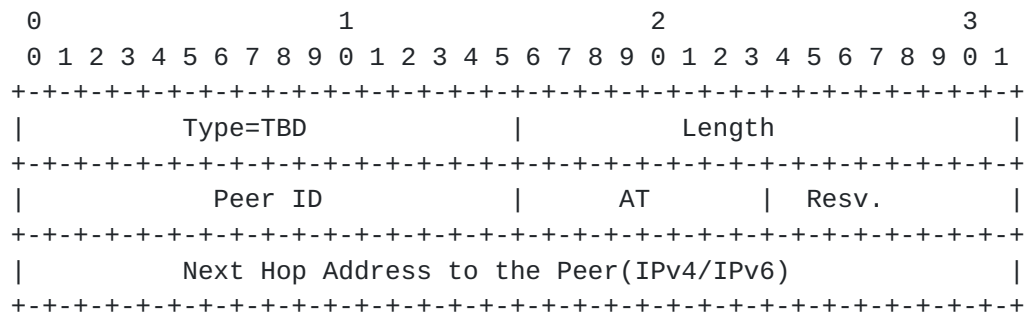
AT: Address Type. To indicate the address type of Peer. Equal to 4, if the following IP address of peer is belong to IPv4; Equal to 6 if the following IP address of peer is belong to IPv6.

Prefix Length: The length of the following prefix. For example, for 10.0.0.0/8, this field will be equal to 8.

Prefix Value: The value of the prefix. For example, for 10.0.0./8, this field will be 10.0.0.0

4.3. Explicit Peer Route TLV

The Explicit Peer Route TLV is defined to specify the explicit peer route to the corresponding peer address on each device that is on the end2end assurance path. This TLV should be sent to all the devices that locates on the end2end assurance path that calculated by PCE.



Type: TBD

Length: The length of following fields.

Peer-ID: To indicate the peer that the following next hop address point to. This value is assigned in the Peer Address List object and is referred in this object.

AT: Address Type. To indicate the address type of explicit peer route. Equal to 4, if the following next hop address to the peer is belong to IPv4; Equal to 6 if the following next hop address to the peer is belong to IPv6. Resv(16 bits): Reserved for future use.

Next Hop Address to the Peer: Variable Length, to indicate the next hop address to the corresponding peer that indicated by the Peer-ID. If AT=4, the length will be 4 bytes, if AT=6, the length will be 16 bytes.

5. Management Consideration

TBD

6. Security Considerations

TBD

7. IANA Considerations

TBD

8. Normative References

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