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Internet Draft

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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 [[draft-wang-teas-ccdr](#)] and [[draft-wang-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

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 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 [[draft-ietf-teas-pce-control-function](#)] to correlate the forwarding behavior  
 among different network devices. Draft [[draft-wang-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](#)].

## 3. New Objects Extension

Three new objects are defined in this draft; they are Peer Address  
 List Object (PAL Object), Peer Prefix Association Object (PPA Object)  
 and Explicit Peer Route object (EPR Object).

Peer Address List object is used to tell the network device which  
 peer it should be peered with dynamically, Peer Prefix Association  
 is used to tell which prefixes should be advertised via the  
 corresponding peer and Explicit Peer Route object is used to point  
 out which route should be taken to arrive to the peer.

## 4. Object Formats.

Each extension object takes the similar format, that is to say, it  
 began with the common object header defined in [[RFC5440](#)] as the  
 following:

```

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

+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+

| Object-Class | OT |Res|P|I| Object Length (bytes) |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+

|
//                               (Object body)                               //
```

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[illegible]

Different object-class, object type and the corresponding object body is defined separated in the following section.

#### 4.1. Peer Address List object.

The Peer Address List object is used in a PCE Initiate message [draft-ietf-pce-pce-initiated-lsp] to specify the ip address of peer that the received network device should establish the BGP relationship with.

This Object should only be 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 end routers, then such information should be sent to head router/RR and end router/RR respectively.

```
Peer Address List object Object-Class is **
```

Peer Address List object Object-Type is \*\*

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

[illegible]

Peer Num	Peer-Id	AT	Resv.
----------	---------	----	-------

+ - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - + - +

| Local IP Address(4/16 Bytes) |
|------------------------------|
| 192.168.1.1                  |
| 192.168.1.2                  |
| 192.168.1.3                  |
| 192.168.1.4                  |
| 192.168.1.5                  |
| 192.168.1.6                  |
| 192.168.1.7                  |
| 192.168.1.8                  |
| 192.168.1.9                  |
| 192.168.1.10                 |
| 192.168.1.11                 |
| 192.168.1.12                 |
| 192.168.1.13                 |
| 192.168.1.14                 |
| 192.168.1.15                 |
| 192.168.1.16                 |
| 192.168.1.17                 |
| 192.168.1.18                 |
| 192.168.1.19                 |
| 192.168.1.20                 |
| 192.168.1.21                 |
| 192.168.1.22                 |
| 192.168.1.23                 |
| 192.168.1.24                 |
| 192.168.1.25                 |
| 192.168.1.26                 |
| 192.168.1.27                 |
| 192.168.1.28                 |
| 192.168.1.29                 |
| 192.168.1.30                 |
| 192.168.1.31                 |
| 192.168.1.32                 |
| 192.168.1.33                 |
| 192.168.1.34                 |
| 192.168.1.35                 |
| 192.168.1.36                 |
| 192.168.1.37                 |
| 192.168.1.38                 |
| 192.168.1.39                 |
| 192.168.1.40                 |
| 192.168.1.41                 |
| 192.168.1.42                 |
| 192.168.1.43                 |
| 192.168.1.44                 |
| 192.168.1.45                 |
| 192.168.1.46                 |
| 192.168.1.47                 |
| 192.168.1.48                 |
| 192.168.1.49                 |
| 192.168.1.50                 |
| 192.168.1.51                 |
| 192.168.1.52                 |
| 192.168.1.53                 |
| 192.168.1.54                 |
| 192.168.1.55                 |
| 192.168.1.56                 |
| 192.168.1.57                 |
| 192.168.1.58                 |
| 192.168.1.59                 |
| 192.168.1.60                 |
| 192.168.1.61                 |
| 192.168.1.62                 |
| 192.168.1.63                 |
| 192.168.1.64                 |
| 192.168.1.65                 |
| 192.168.1.66                 |
| 192.168.1.67                 |
| 192.168.1.68                 |
| 192.168.1.69                 |
| 192.168.1.70                 |
| 192.168.1.71                 |
| 192.168.1.72                 |
| 192.168.1.73                 |
| 192.168.1.74                 |
| 192.168.1.75                 |
| 192.168.1.76                 |
| 192.168.1.77                 |
| 192.168.1.78                 |
| 192.168.1.79                 |
| 192.168.1.80                 |
| 192.168.1.81                 |
| 192.168.1.82                 |
| 192.168.1.83                 |
| 192.168.1.84                 |
| 192.168.1.85                 |
| 192.168.1.86                 |
| 192.168.1.87                 |
| 192.168.1.88                 |
| 192.168.1.89                 |
| 192.168.1.90                 |
| 192.168.1.91                 |
| 192.168.1.92                 |
| 192.168.1.93                 |
| 192.168.1.94                 |
| 192.168.1.95                 |
| 192.168.1.96                 |
| 192.168.1.97                 |
| 192.168.1.98                 |
| 192.168.1.99                 |
| 192.168.1.100                |

```
// Peer IP Address(4/16 Bytes) //
```

[illegible]

Peer Num (8 bits): Peer Address Number on the advertised router.

Peer-Id(8 bits): 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(8 bits): 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.

Peer IP Address(4/16 Bytes): IPv4 address of the peer router, used to peer with the local router. When AT equal to 4, length is 32bit; IPv6 address of the peer when AT equal to 16, length is 128bit;



Resv(8 bits): Reserved for future use.

Peer Associated IP Prefix TLV: Variable Length, use the TLV format to indicate the advertised IP Prefix.

This Object should be sent to all the devices that locates on the end2end assurance path that calculated by PCE.

```
EXPLICIT PEER ROUTE Object Object-Type is **
```

AT(8 bits): Address Type. To indicate the address type of explicit peer route. Equal to 4, if the following next hop address to the

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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 TLV: Variable Length, use the TLV  
format to indicate the next hop address to the corresponding peer  
that indicated by the Peer-Id.

## **5. Management Consideration.**

## **6. Security Considerations**

TBD

## **7. IANA Considerations**

TBD

## **8. Conclusions**

TBD

## **9. References**

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## **10. Acknowledgments**

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