PCEP Extensions for Supporting Multiple Sources and Destinations

draft-avantika-pce-multi-src-dest-01

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Introduction

[RFC5440] - a single PCReq message may carry more than one path computation request.

- Each request is uniquely identified by a request-id number.

A need to send multiple requests with the same constraints and attributes to the PCE.

- Currently these requests are either sent in a separate PCReq messages or clubbed together in one (or more) PCReq messages.
- The constraints and attributes need to be encoded separately for each request even though they are exactly identical.

A mechanism to request path computation between multiple sources and destinations in a single path computation request would be helpful.

Scenarios

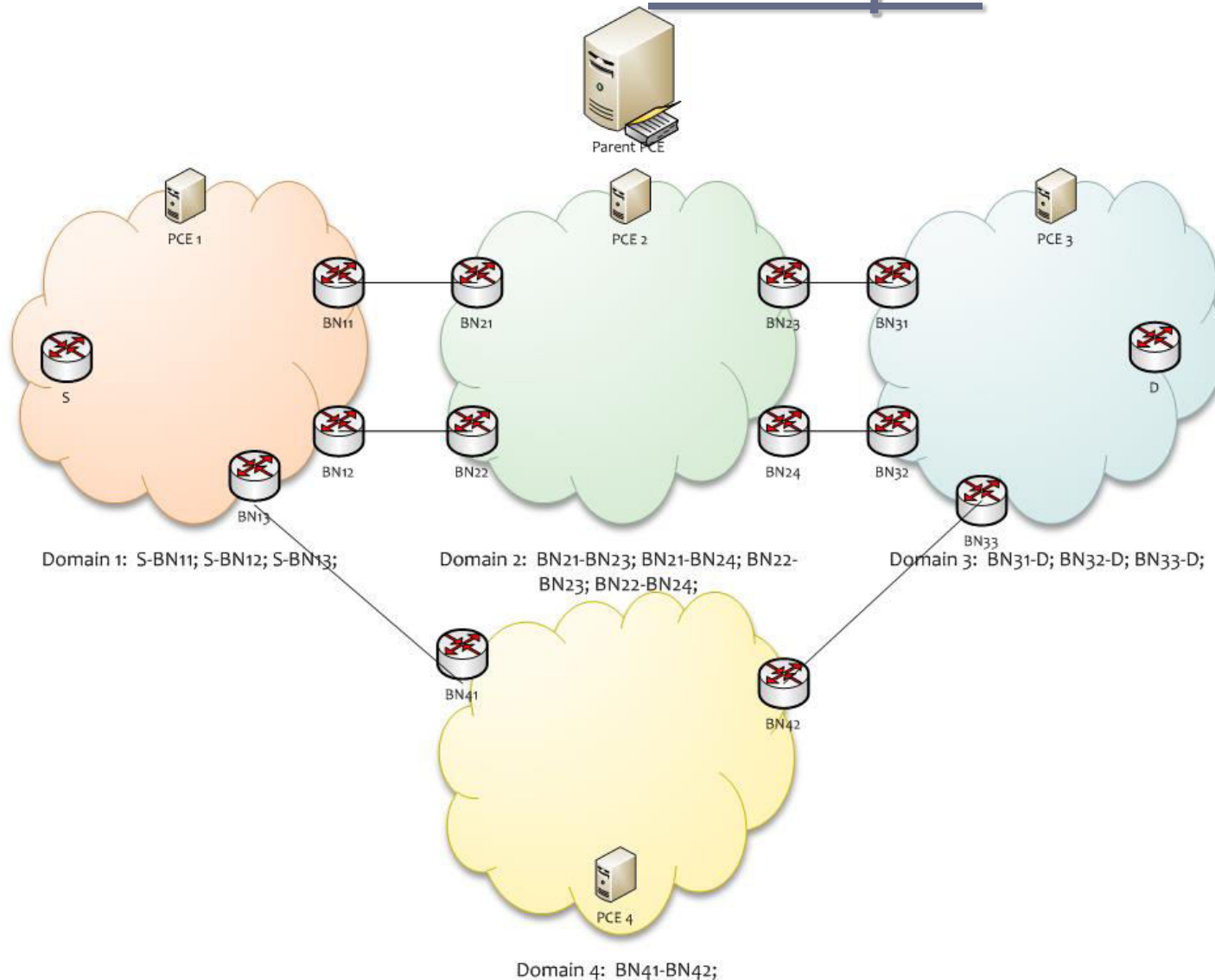| Hierarchical PCE	Inter-Layer PCE	Management-Based PCE	MP2MP TE LSP
• E2E path computation by Parent PCE, it needs to issue multiple path computation requests to child PCEs.	• Co-operating PCEs collaborate to compute an end-to-end path across layers. • The higher layer PCE may need to issue multiple requests to lower layer PCE requesting paths from each entry boundary node to each exit boundary node.	• PCC is not necessarily an LSR, but for example - NMS or a planning tool. • Such a PCC may issue multiple requests to PCE with identical constraints and attributes to select among the several source-destination pairs.	• a MP2MP TE LSP tunnel, multiple P2P path computation requests are sent to the PCE, one for each source-destination pair with identical constraints and attributes.

All requests need to be encoded separately even though they have identical constraints and attributes!!

Example

Parent PCE

PCE 1

PCE 2

PCE 3

BN11   BN21   BN23   BN31

S   D

BN12   BN22   BN24   BN32

BN13   BN33

Domain 1: S-BN11; S-BN12; S-BN13;

Domain 2: BN21-BN23; BN21-BN24; BN22-BN23; BN22-BN24;

Domain 3: BN31-D; BN32-D; BN33-D;

BN41

BN42

PCE 4

Domain 4: BN41-BN42;
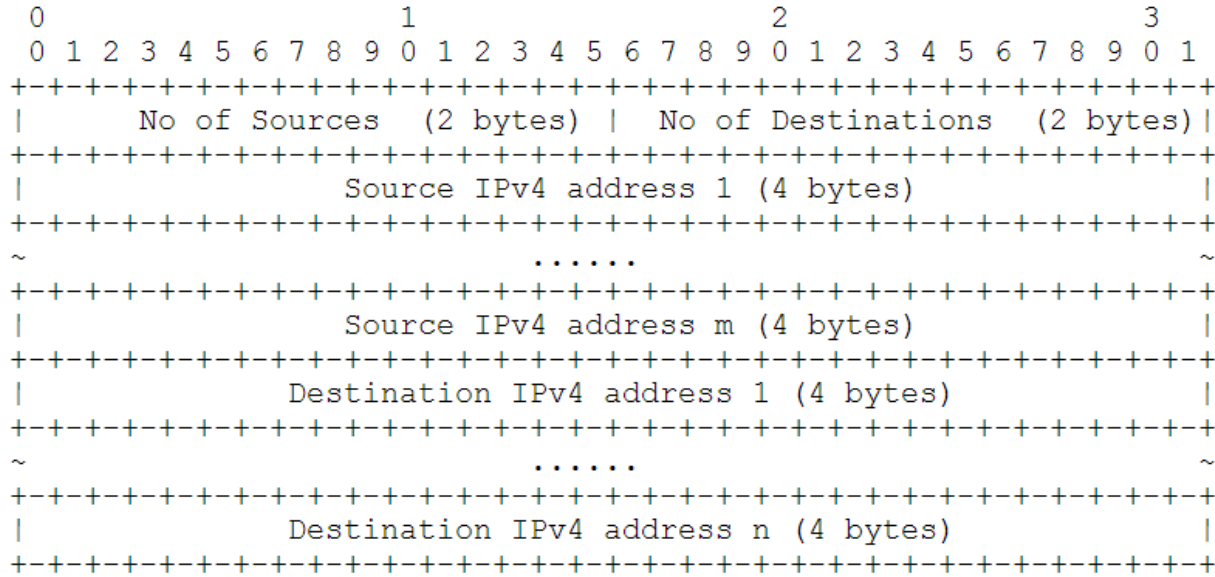
∂ Eleven individual requests are generated by parent PCE.

∂ A mechanism to request them together in a single path computation request would be helpful, in which case total 4 requests would be generated by parent PCE.

New END-POINTS Object

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      No of Sources  (2 bytes) |  No of Destinations  (2 bytes)|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                  Source IPv4 address 1 (4 bytes)              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                         ......                                ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                  Source IPv4 address m (4 bytes)              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|               Destination IPv4 address 1 (4 bytes)           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
~                         ......                                ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|               Destination IPv4 address n (4 bytes)           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

The END-POINTS object is used in a PCReq message to specify the source IP address and the destination IP address of the path for which a path computation is requested.

Extends the END-POINT object to support multiple sources and destinations in a single path request.

Two new END-POINTS objects for IPv4 and IPv6.

Other Considerations

Identification of Source-Destination Pair in PCRep Message

Use First and the Last hop in ERO as source and destinations

- Via <path-list>.

Request-ID

a single request is used for multiple sources and destinations sharing the same request-id number

Questions
&
Comments?

Thanks!