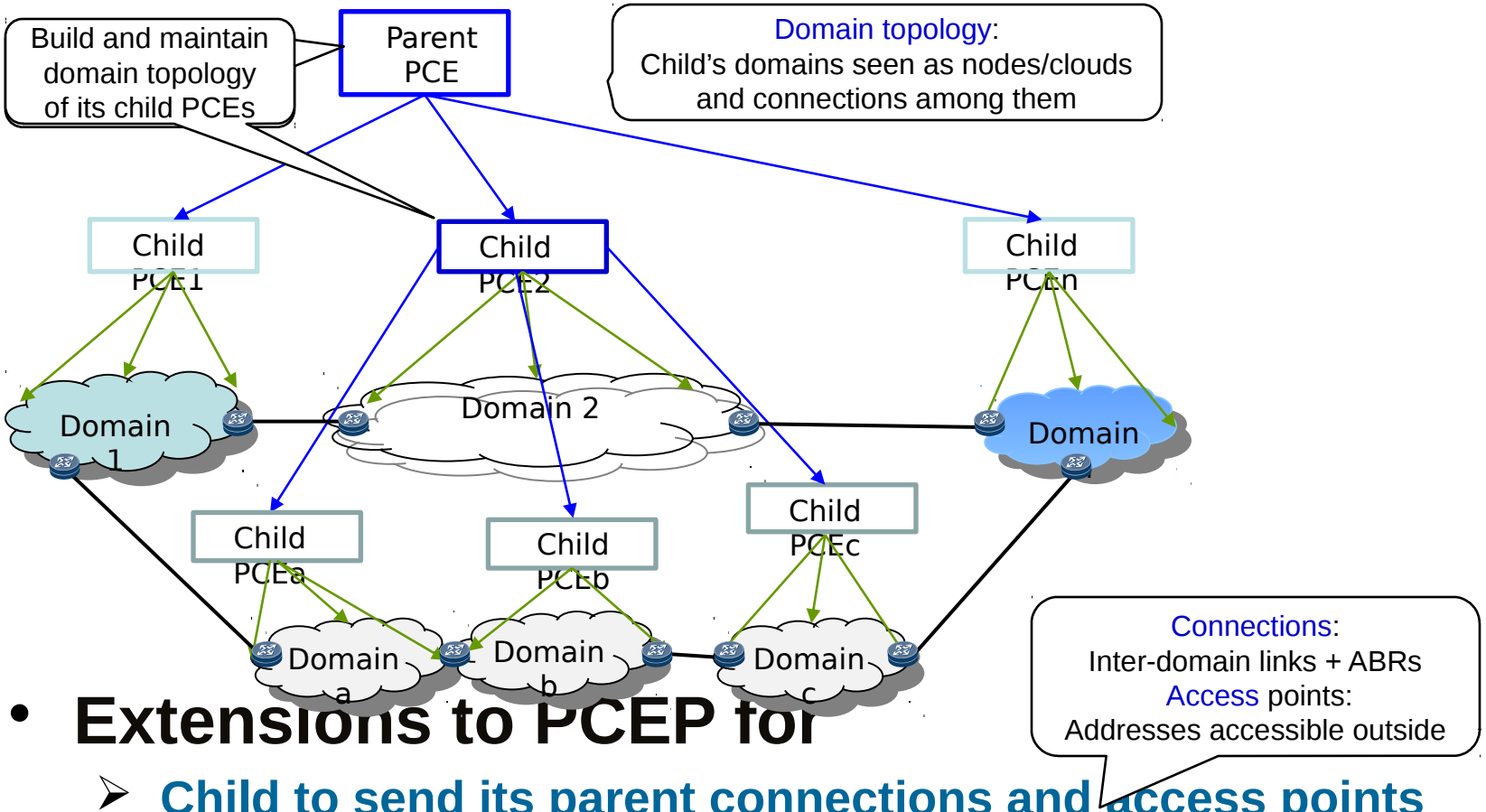
Connections and Accesses for Hierar chical PCE

draft-chen-pce-h-connect-access-00

Huaimo Chen (huaimo.chen@huawei.com)
Mehmet Toy (mehmet_toy@cable.comcast.com)
Lei Liu (lliu@us.fujitsu.com)
Zhenqiang Li(li_zhenqiang@hotmail.com)

Introduction

- Hierarchical PCE Architecture in RFC 6805



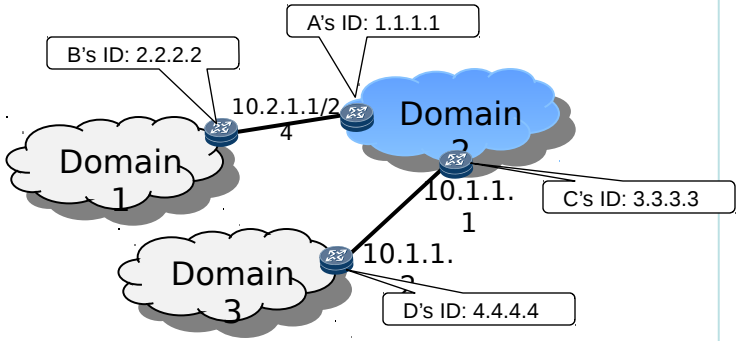
- **Extensions to PCEP for**
  - **Child to send its parent connections and access points**
  - **Parent to build and maintain domain topology and acces s points**

Connection and Access: Inter-domain Link

Information on Inter-domain Link (no IGP running over it):

- P2P Link between ASBR C and D (C's point of view)
  1) Link Type: P2P
  2) Local IP address: 10.1.1.1
  3) Remote IP address: 10.1.1.2
  4) TE metric: 10
  5) Maximum bandwidth: 100G
  6) Maximum reservable bandwidth: 100G
  7) Unreserved bandwidth: …
  8) Administrative group: …

  Note: no link ID (i.e., Router ID of neighbor B)



- **Broadcast Link connecting multiple ASBRs A, B, … (A's point view)**
  a) Link Type: Multi-access
  b) Local IP address with mask length: 10.2.1.1/24

  + 4), 5), 6), 7) and 8) above

  Note: No Remote IP address, No Link ID (since no IGP selects DR)

PCE as child sends its parent info on inter-domain links connected to its domain

Parent builds AS domain topology after receiving info from its child PCEs

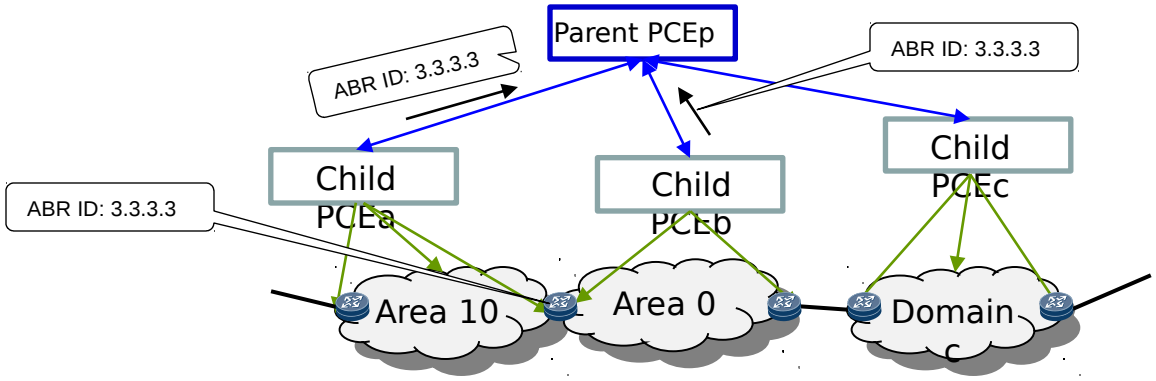
Connection and Access: ABR

Area Border Router (ABR)

Running IGP (OSPF or IS-IS) and connecting 2+ areas

Information on ABR (from one area's point of view):

- **Router ID of ABR**

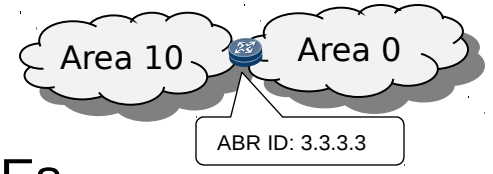


PCE as child responsible for an area

- **sends its parent information on ABR**

Parent PCE

- knows all areas attached to ABR after receiving info on ABR from its child PCEs



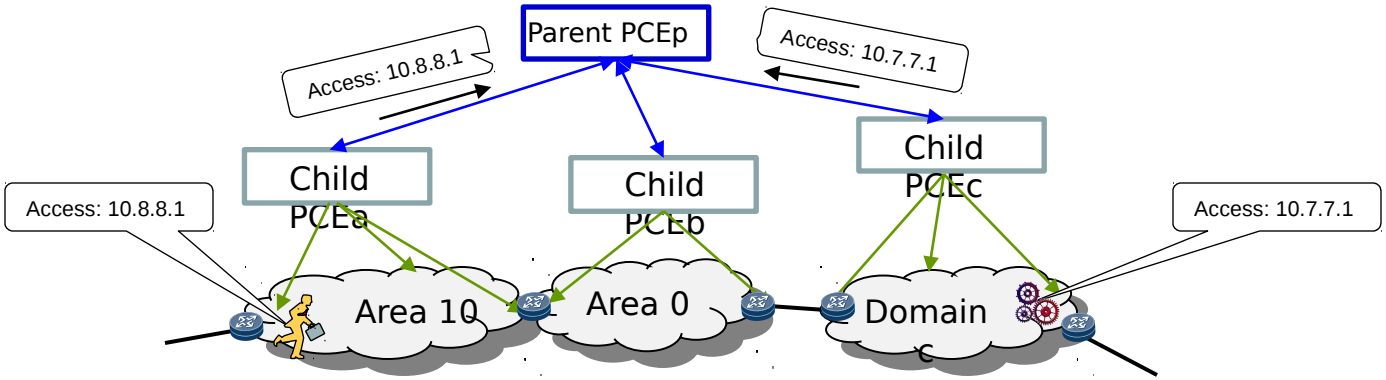
Connection and Access: Access Point

Access Point (Access for short)

IP Address in domain to be accessible outside

Information on Access (from PCE responsible for domain):

- **IP address**



PCE as child responsible for domain

- **sends its parent information on Access**

Parent PCE

- has all access points to be accessible outside of all its child PCEs' domains after receiving info on Access from its child PCEs

Access points:
10.7.7.1
10.8.8.1

Message Extensions

Message Extensions (2 options):

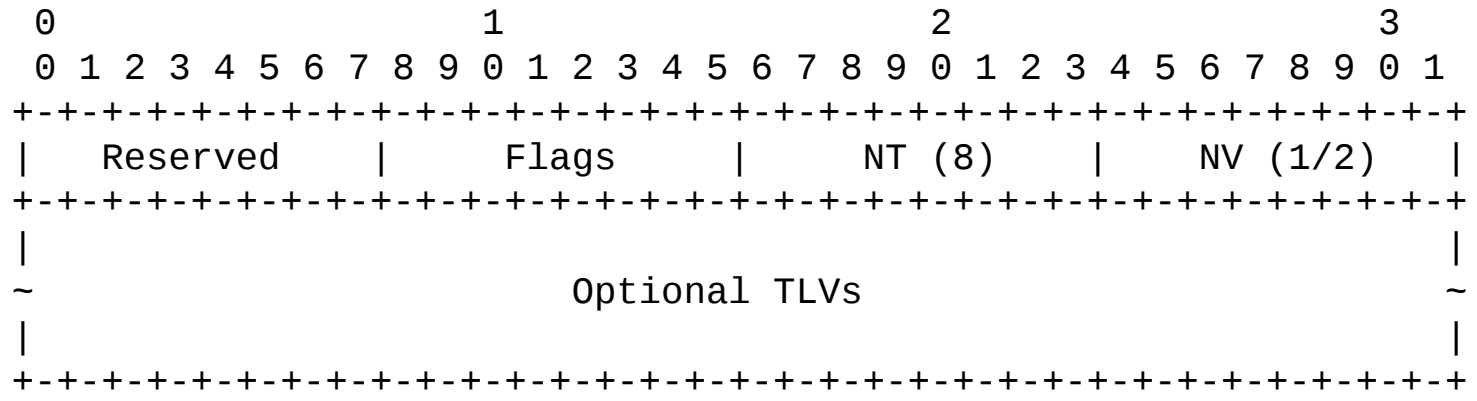
1) **Existing Notification (PCNtf) Message** **(Details below)**

   New NT and NVs, TLVs in NOTIFICATION Object

2) **New Message** **(Details in Appendix)**

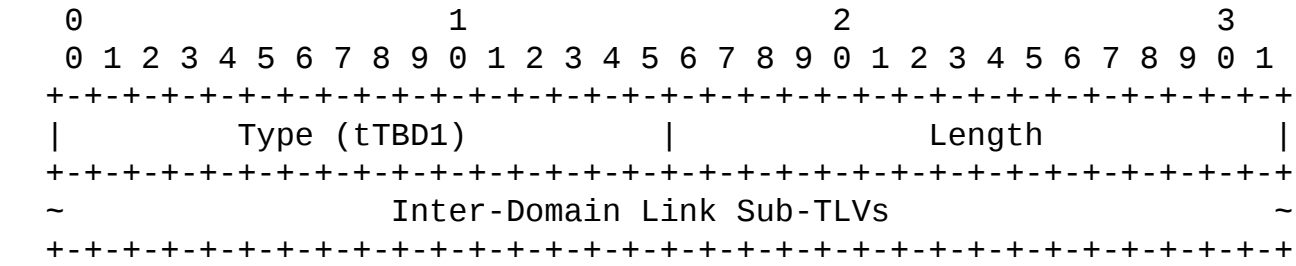
```
NT=8 (TBD): Connections and Accesses
   *  NV=1: Updates on Connections and Accesses
   *  NV=2: Withdraw Connections and Accesses
TLVs in NOTIFICATION contains information on Connections and Accesses
(Inter-Domain link TLV, Router-ID TLV, Access IPv4/6 Prefix TLV)

NOTIFICATION object body:
```

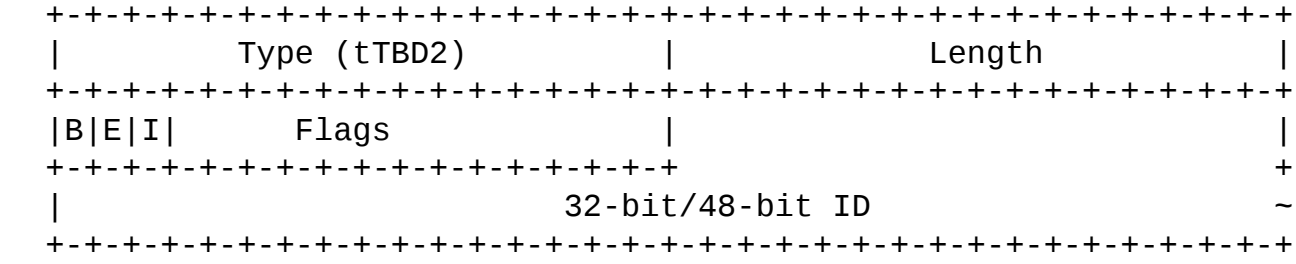


New TLVs and Sub-TLVs

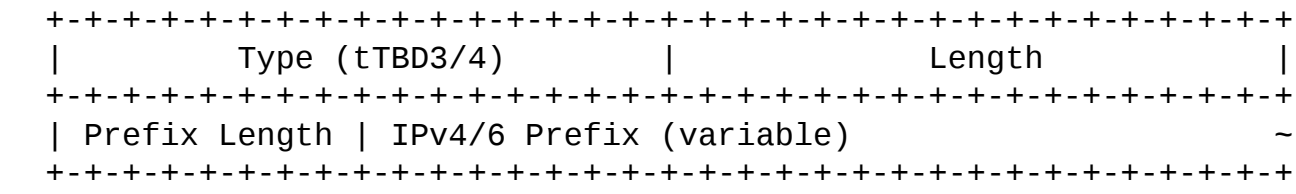
Inter-Domain Link TLV:



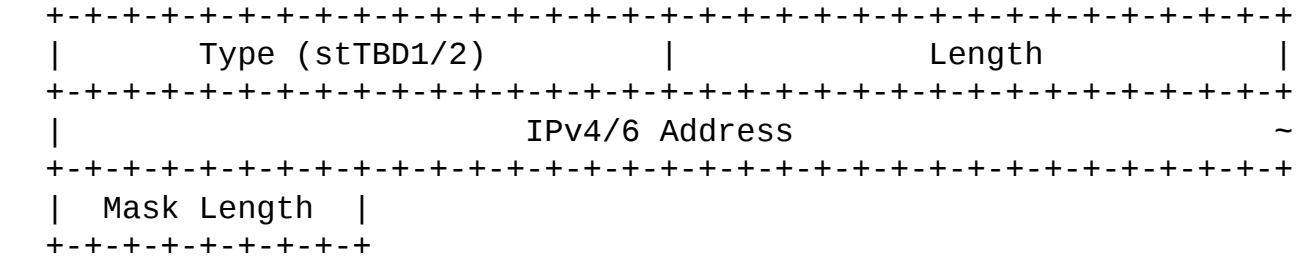
Router ID TLV:



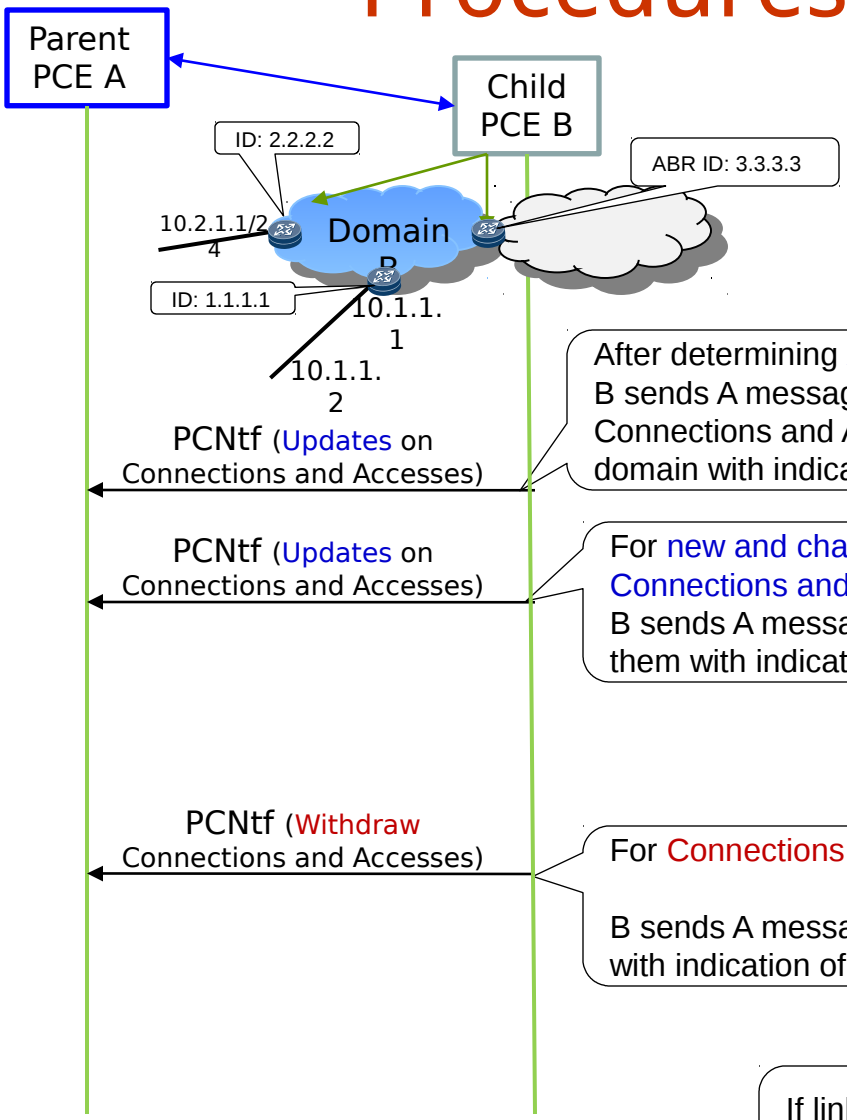
Access IPv4/6 Address TLV:



Local IPv4/6 address with mask Sub-TLV:



Procedures – Child PCE

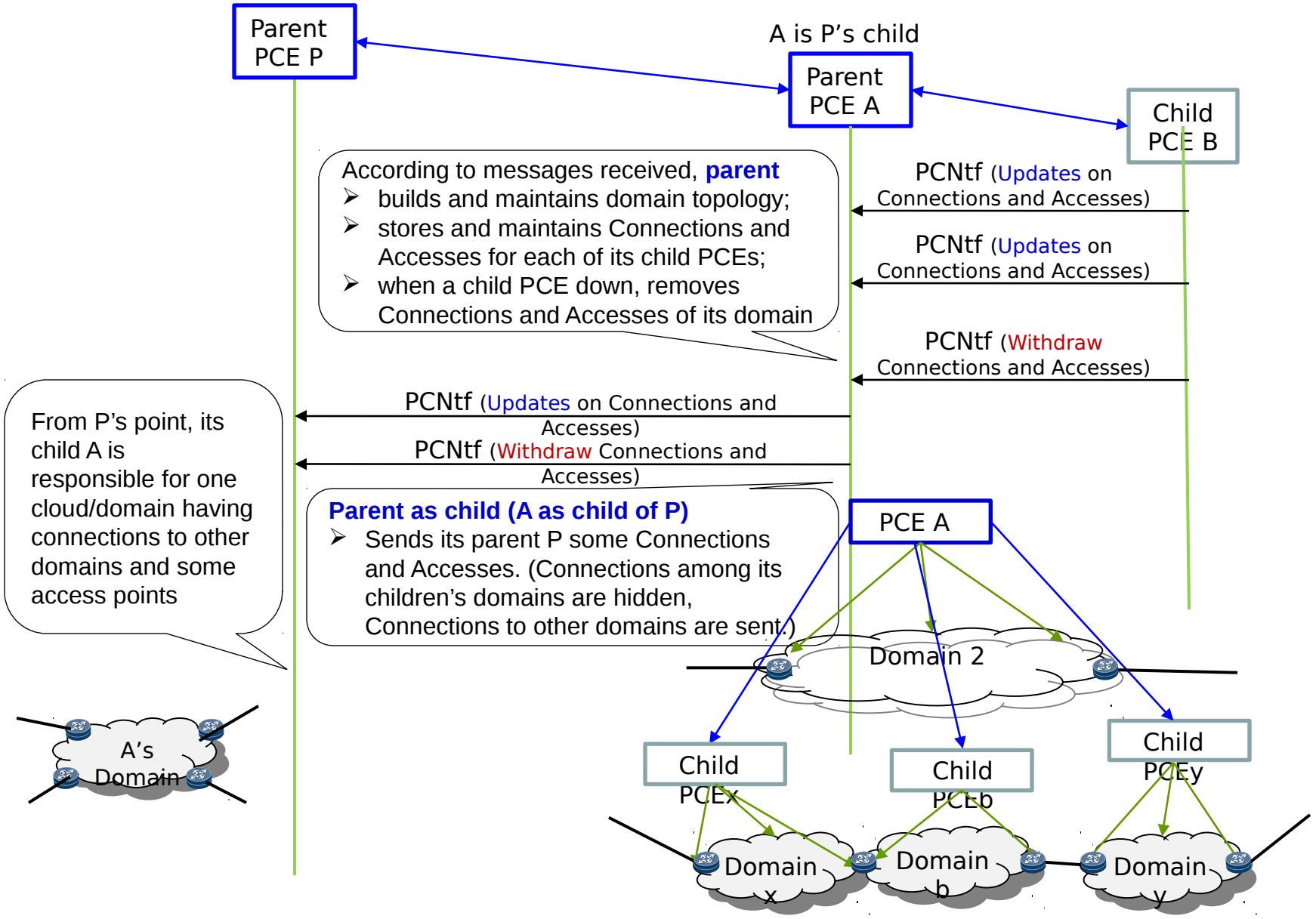


NOTIFICATION Object:

PCNtf (Updates)	
ID:1.1.1.1	Router-ID TLV
P2P	Inter-domain Link TLV
10.1.1.1	
10.1.1.2	
TE metric: 10	
…	
ID: 2.2.2.2	Router-ID TLV
Multi-Access	Inter-domain Link TLV
10.2.1.1/24	
TE metric: 20	
…	
ABR ID: 3.3.3.3	Router-ID TLV B=1

PCNtf (Withdraw)	
ID:1.1.1.1	Router-ID TLV
P2P	Inter-domain Link TLV
10.1.1.1	
10.1.1.2	
Multi-Access	Inter-domain Link TLV
10.2.1.1/24	
ABR ID:3.3.3.3	Router-ID TLV B=1

Procedures – Parent PCE



Summary

Presented

- Connections and Accesses
  - Inter-domain Links
  - ABRs
  - Access Points
- Extensions to Existing PCNtf Message
  - New NT and NVs, TLVs in NOTIFICATION object
- Procedures
  - Child PCE Procedure
  - Parent PCE Procedure
  - Parent as Child Procedure

Next Step

- Request for comments and suggestions