

BGP-LS Extensions for PCE Discovery

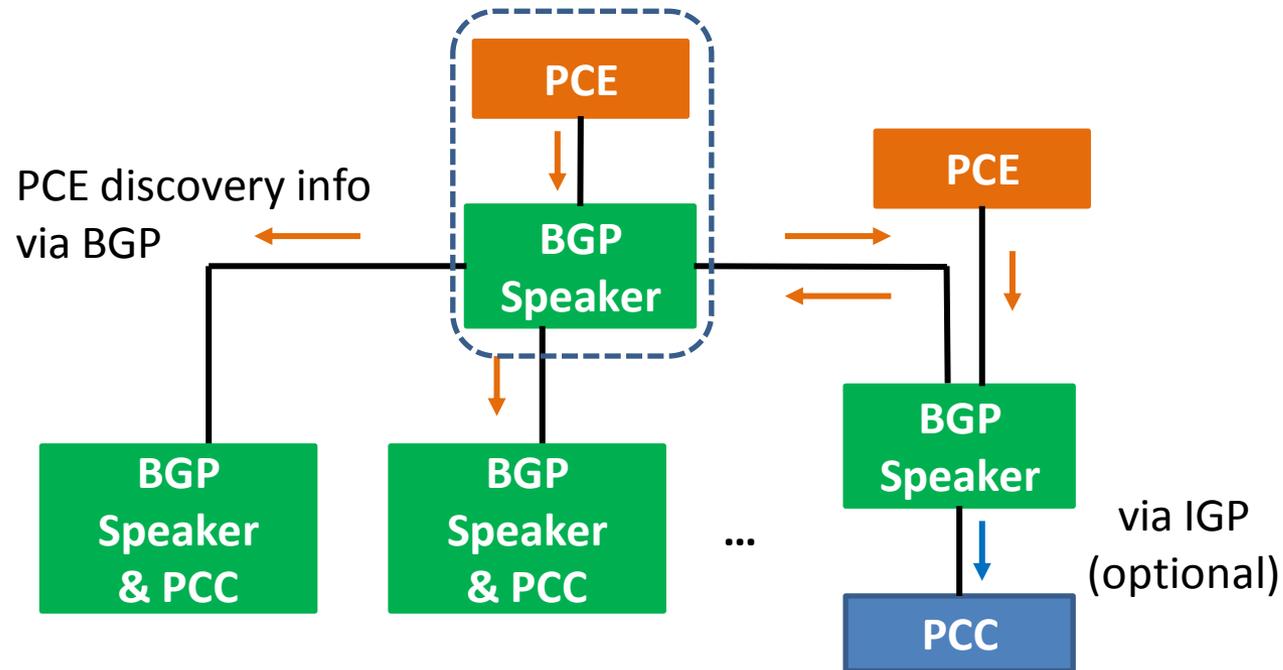
draft-dong-pce-discovery-proto-bgp-07

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Motivation

- PCCs & PCEs need to automatically discover the set of PCEs along with their characteristics
- IGP based PCE discovery (RFC 5088, 5089) is applicable when both PCCs and PCEs participate in *same* IGP
- PCE discovery is also needed in some other scenarios
 - Cooperative Inter-domain path computation
 - *Inter-AS scenarios*
 - Hierarchical PCEs
 - *When child and parent PCE are in different AS or do not run IGP*
- As BGP-LS is used for routing information distribution to controller (PCE), the same BGP sessions can be **re-used** for PCE discovery at the PCCs.

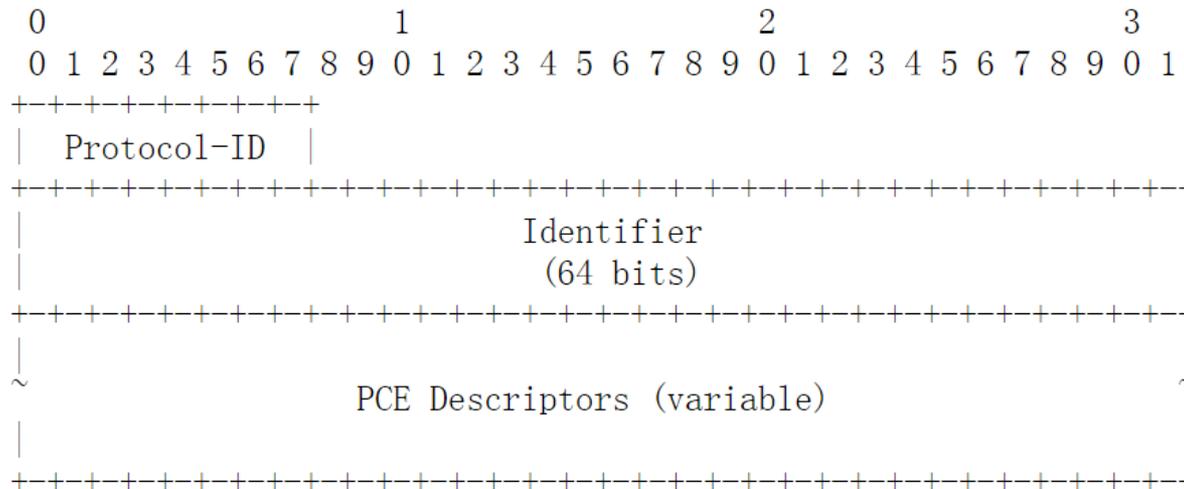
Solution Overview



- PCE discovery info is advertised from PCE to BGP speakers
 - Could be co-located or learned via some means!
- BGP distributes the PCE discovery info on the BGP session
 - According to policy
- BGP speaker may use IGP to re-distribute further in the local IGP domain

Protocol Extensions

- New BGP-LS NLRI
 - NLRI-Type 'PCE' to carry PCE address info



- Protocol-ID: can be either direct, or static configuration
- PCE descriptors: TLV based
 - IPv4 or IPv6 addresses of PCE

Protocol Extensions (Cont.)

- PCE Attribute TLVs
 - Carried in BGP-LS Attribute, only used with PCE NLRI
 - Detailed PCE information used for PCE selection
 - PATH-SCOPE TLV
 - Format and semantics same as IS-IS PCED Sub-TLV
 - PCE Capability TLV
 - Format and semantics same as IS-IS PCED Sub-TLV
 - PCE Domain TLV
 - Specifies PCE-Domains where the PCE has topology visibility and through which the PCE can compute paths
 - Neighbor PCE Domain TLV
 - Specifies neighbor PCE-Domains toward which a PCE can compute paths

Operational Considerations

- PCE information is treated as pure application level data which has no immediate impact on forwarding states on the BGP speakers.
- PCE information SHOULD be advertised only to the domains where such information is allowed to be used
 - Can be achieved by policy control on ASBRs
- PCE information is considered relatively stable and does not change frequently, thus this information will not bring significant impact on the amount of BGP updates in the network

Next Steps

- BGP-LS based PCE discovery is complementary to the IGP discovery mechanisms
- Content of the draft is stable
- Need feedbacks from IDR to further move forward in PCE

Thank You!