Path Computation Element (PCE) Discovery using Domain Name System(DNS)
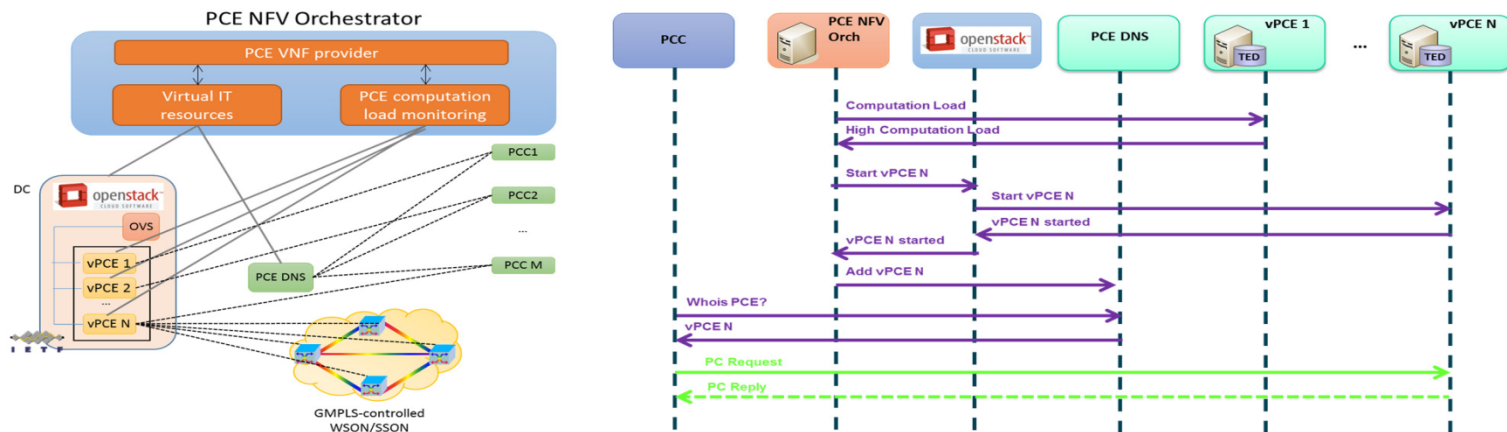
draft-wu-pce-dns-pce-discovery-07

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Status of this I-D

- First presented in IETF 87, Berlin meeting, agreed to address differences between the PCE and DNS domains
- Follow-up in IETF 88 Vancouver meeting
  - Allow NAPTR query for a specific PCE domain by linking PCE domain with DNS domain name (i.e., PCE domain added as subdomain of DNS domain name)
  - Define format of TXT record value field using syntax defined in RFC1464
  - Allow feature Negotiation capability by extending NAPTR service field format
  - Support Discovery of PCE server with TLS support by extending NAPTR transport field format
- Follow-up in IETF 89 London meeting
  - Use "pce+acronym" instead of "pce+apX" in the NAPTR service field format
  - Remove text record format for path computation scope
- Follow-up in IETF90 Toronto meeting
  - Add a DCI use case to clarify IGP inefficiency to handle a large number of PCE instances discovery.
  - DNS based discovery provide better means
    - Secure inter-domain discovery
      - E.g., discover PCE with TLS support across domain
    - Handling PCE Identity change
    - Provide better load balance in case of multiple PCE instances
- The latest update before IETF91, compared to v(-06):
  - Add implementation update.

The prototype using the DNS-based discovery proposal

- The cloud infrastructure use virtual machines with custom images to run vPCE.
- The cloud infrastructure assigned each vPCE a new IP address from a pool of available IP addresses.
- The PCE DNS server is notified with the new IP address for a new available vPCE.
- A PCC may use DNS to discover a PCE only when it needs to compute a path.

Case1: intermittent PCEP session
  - systematically opened and closed for each PCEP request in the virtualized environment

Case 2: load balancing among multiple vPCEs
  - Multiple vPCEs (with different IP addresses) are identified via DNS using a single PCE server name
  - in the event of failure of the VNFs, a new VNF or VM (hosting the VNFs) may be spawned
    - without having to update PCE reachability information on the PCC
    - or flooding the IGP with the PCE location each time the IP address changes.

Details of prototyping

- Full details of the prototyping can be found at:

  R. Vilalta, R. Munoz, R. Casellas, R. Martinez, V. Lopez, D. Lopez "Transport PCE Network Function Virtualization", in Proc. of European Conference on Optical Communication (ECOC 2014), September 21-25, Cannes (France).

  <http://www.vlopezalvarez.com/Profesional/Publications/Conferences/2014_ECOC_2.pdf>

Next Steps

- Well discussed on PCE list
  - Integrated cross WG input
- Good progress on Implementation development
- (Re)requesting WG adoption

Questions?