

Considerations Arising from PCE-CC Proposals

Adrian Farrel (adrian@olddog.co.uk)

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PCE Centralised Controller (PCE-CC)

- A couple of I-Ds over the last year
 - The Use Cases for Using PCE as the Central Controller(PCECC) of LSPs
 - draft-zhao-pce-central-controller-user-cases
 - PCEP Procedures and Protocol Extensions for Using PCE as a Central Controller (PCECC) of LSPs
 - draft-zhao-pce-pcep-extension-for-pce-controller
- Examining the role of a PCE as a centralised control in an SDN-like architecture

Two “New” Functions Emerge

1. Using PCE to compute a path and then using PCEP to touch each node in the network to establish the end-to-end LSP. The underlying forwarding might be MPLS swapping or MPLS pop-and-go (segment routing), and PCEP is essentially being used as an equivalent to OpenFlow or Netconf.
2. Using PCEP to install a packet classification rule for LSPs. This seems to be a big missing component in the case of delegated/initiated LSPs where the PCC/LER has no idea what it is supposed to use the LSP for.

SBI : What Can We Do

Already?

- A TE-LSP is a series of “cross connects” and “resource reservations”
 - Each is a mapping from {input interface, input label} to {output interface, output label}
- PCEP allows an active PCE to install a TE-LSP in the network
 - The “cross-connects” are indicated by the ERO
 - An ERO can include label information (GMPLS)
- LSPs can be short
 - A single hop LSP can be just one “cross-

SBI : Work Might We Do?

- The ERO approach is a little ugly
 - It might trigger the signalling component to attempt to do work
 - We haven't worked much on “upstream interface for head-end LER” in GMPLS or PCEP
- We could add to PCEP specifically for this function
 - Not a lot of work

SBI : How Excited Should We Be?

- There seem to be a number of existing SBIs
 - NETCONF
 - OpenFlow
 - ...
- Why develop a new one?
 - Arguments include:
 - We already have to implement PCEP
 - We already have a PCE
 - It doesn't necessitate any changes to PCE or PCEP
- Other applications might include
 - DetNet
 - 6tisch

Traffic Classification for LSPs

- When a TE-LSP is set up, the head end needs to know how to use it
 - What traffic to send on the LSP
 - Whether it is a virtual link
 - Whether to advertise it in the IGP
 - What bits of this information to signal to the tail end
- PCEP allows an Active PCE to set up or modify LSPs
 - But we have no way to tell the head end how to use the LSP
 - This is because of history
 - It used to be the LER that made the request of the PCE, so it knew why it wanted the LSP
- This function is presumably necessary
 - But it is missing

TC : How Do We Handle It

Today?

- There are several possibilities
 - No-one uses Active PCE
 - The problem doesn't arise
 - Active PCE is used only in controlled environments
 - Head end always knows what the LSP is for
 - Active PCE is used in conjunction with config
 - The LSP is set up using PCEP
 - Some other mechanism tells the head end what to do
 - Active PCE is used in conjunction with BGP Flowspec
 - Possibly not what BGP Flowspec was designed for
 - But it works
- Note that the last two of these seem a waste
 - Why separate the functions?
 - Could use one protocol for everything

TC : What Might We Do?

- It would not be hard to add some Objects and TLVs to PCEP
- Describe:
 - How to use the LSP
 - How to advertise the LSP
 - Extra signaling information
- We already have ways of describing flowspecs
 - Can re-use encodings (e.g., from BGP Flowspec)

Suggestions for the WG

- Decide whether either case is related to ACTN
 - Some suggestions made at IETF-93
 - Doesn't seem related to me
 - Maybe both functions could be applied in ACTN
- Keep the two functions separate
 - They seem to have different motivations
 - The solution work is quite different
- Determine implementer/deployer support for each function
- Do not develop standards unless there is support
- Work SBI as an Applicability Statement
 - Develop protocol extensions only to fill gaps
- Work TC as extensions to Stateful PCEP
 - Doesn't seem to be relevant for Stateless PCE