

PCEP Extension for Distribution of Link-State and TE information for Optical Networks

draft-lee-pce-pcep-ls-optical-00

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Related Work

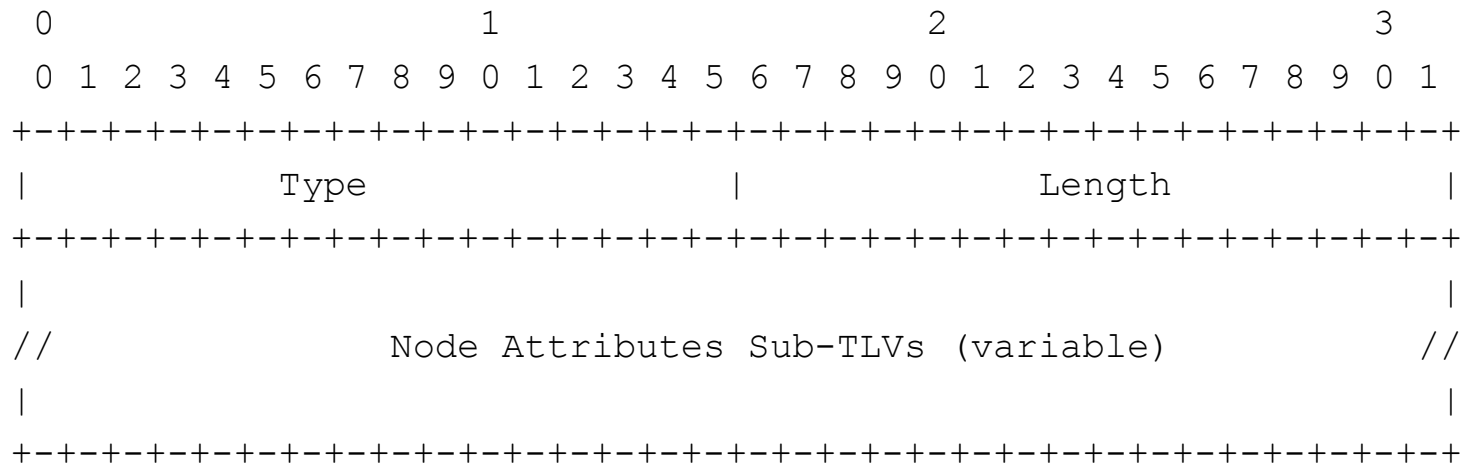
- [PCEP-LS-Arch] proposes alternative architecture approaches for learning and maintaining the Link State (and TE) information directly on a PCE from network nodes as an alternative to IGPs and BGP transport and investigate the impact from the PCE, routing protocol, and network node perspectives.
- H-PCE
 - [RFC6805] describes a Hierarchical PCE (H-PCE) architecture which can be used for computing end-to-end paths for inter-domain MPLS Traffic Engineering (TE) and GMPLS Label Switched Paths (LSPs).
 - [Stateful H-PCE] presents general considerations for stateful PCE(s) in hierarchical PCE architecture. In particular, the behavior changes and additions to the existing stateful PCE mechanisms (including PCE-initiated LSP setup and active PCE usage) in the context of networks using the H-PCE architecture.
- [PCEP-LS] describes a generic mechanism by which Link State and TE information can be collected from packet networks and shared with PCE with the PCEP itself. This is achieved using a new PCEP message format.

Use-cases/Applicability

- Case 1: Where there is IGP running in optical network but there is a need for a faster link-state and TE resource collection at the PCE directly from an optical node (PCC) via a PCC-PCE interface. A PCE may receive **an incremental update** (as opposed to the entire TE information of the node/link when only a single attribute changes).
- Case 2: Where there is no IGP running in the optical network and there is a need for **link-state and TE resource collections at the PCE directly from an optical node (PCC)** via a PCC-PCE interface.
- Case 3: Where there is a need for **transporting abstract** optical link-state and TE information from child PCE and to a parent PCE in H-PCE [RFC6805] and [Stateful H-PCE] as well as for Physical Network Controller (PNC) to Multi-Domain Service Coordinator (MDSC) in Abstraction and Control of TE Networks (ACTN) [ACTN-Frame].

Node Attributes TLV

- Node-Attributes TLV is defined in Section 9.2.10.1 in [PCEP-LS] as follows. This TLV is applicable for LS Node Object-Type as defined in [PCEP-LS].



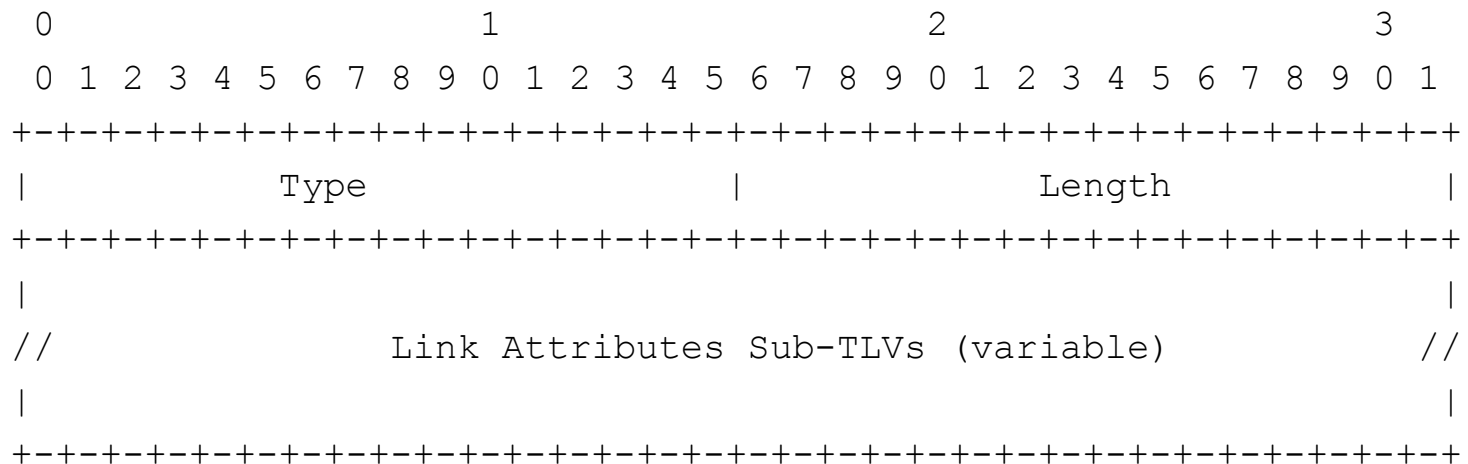
Node Attributes TLV

- The following 'Node Attribute' sub- TLVs are valid for optical networks (along with attributes already defined in [PCEP-LS]):

Sub-TLV	Description	TLV/Sub-TLV	Length	Reference
TBD	Connectivity Matrix	5/14	variable	[RFC7579] [RFC7580]
TBD	Resource Block Information	6/1	variable	[RFC7688]
TBD	Resource Block Accessibility	6/2	variable	[RFC7688]
TBD	Resource Block Wavelength Const	6/3	variable	[RFC7688]
TBD	Resource Block Pool State	6/4	variable	[RFC7688]
TBD	Resource Block Shared Access Wavelength Avail.	6/5	variable	[RFC7688]

Link Attributes TLV

- Link-Attributes TLV is defined in Section 9.2.10.2 in [PCEP-LS] as follows. This TLV is applicable for LS Link Object-Type as defined in [PCEP-LS].



Link Attributes TLV

- The following 'Link Attribute' sub- TLVs are valid for optical networks (along with attributes already defined in [PCEP-LS]):

Sub-TLV	Description	TLV/Sub-TLV	Length	Reference
TBD	ISCD	15	Variable	[RFC4203]
TBD	OTN-TDM SCSI	15/1,2	Variable	[RFC4203] [RFC7138]
TBD	WSON-LSC SCSI	15/1,2	Variable	[RFC4203] [RFC7688]
TBD	Flexi-grid SCSI	15/1	Variable	[FlexOSPF]
TBD	Port Label Restriction	34	Variable	[RFC7579] [RFC7580] [FlexOSPF]

Implementation Report

- Both the Generic PCEP-LS and WSON related PCEP-LS has been implemented will be demonstrated in the Bits-n-Bytes
- Bits-n-Bytes
 - Thursday night at 7 pm
 - ACTN booth.

Next Steps

- PCEP-LS to have been discussed in the WG multiple times
 - Implementation exists
- Time to adopt PCEP-LS in the PCE WG?
 - Generic PCEP-LS (draft-dhodylee-pce-pcepls)
 - Optical PCEP-LS (this draft)