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**Conveying policies associated with traffic engineering paths over PCEP
session
draft-sivabalan-pce-policy-identifier-00.txt**

Abstract

This document describes a simple extension to the Path Computation Element (PCE) Communication Protocol (PCEP) using which a PCEP speaker can enforce one or more policies on the other PCEP speaker. A policy is represented by a numeric value which can be interpreted only by the receiving PCEP speaker. Using the proposed extension, a path computation client (PCC) can signal one or more policies that must be taken into consideration by a PCE during path computation. Similarly, when initiating or updating a path, a stateful PCE can signal one or more policies (e.g., traffic steering rules) that a PCC is expected to apply to the path.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

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[1.](#) Introduction

[RFC5440] describes the Path Computation Element Protocol (PCEP) for communication between a Path Computation Client (PCC) and a PCE or between a pair of PCEs. [[I-D.ietf-pce-stateful-pce](#)] specifies extension to PCEP that allows a PCC to delegate its LSPs to a PCE. The PCE can then update the state of LSPs delegated to it. [[I-D.ietf-pce-pce-initiated-lsp](#)] specifies a mechanism allowing a PCE to dynamically instantiate, maintain, and tear down Label Switched Paths (LSPs) without the need for configuring those LSPs on the PCC. Currently, the LSPs can either be signaled via RSVP-TE or can be segment routed as specified in [[I-D.ietf-pce-segment-routing](#)].

As described in the next section, a PCEP speaker may want to influence its PCEP counterpart with respect to path selection and other policies. This document describes a PCEP extension to signal policy identifier represented by numeric value using OPTIONAL PCEP

TLV. The specification is applicable to both stateful and stateless PCEP sessions.

2. Motivation

Paths computed using PCEP are subject to various policies on both PCE as well as PCC. For example, in a centralized traffic engineering scenario, network operators may instantiate LSPs and specifies policies for traffic steering, path monitoring, etc., for those LSPs via stateful PCE. Similarly, a PCC can request a path that is diverse from any other path originating from other PCC(s) from a stateful PCE. With a current state of PCEP, introducing such policy requires new PCEP extension. A generic mechanism that allows a PCEP speaker to specify the path policies without the need to know the details of such policies simplifies network operations, avoids frequent software upgrades, as well provides an ability to introduce new policy faster.

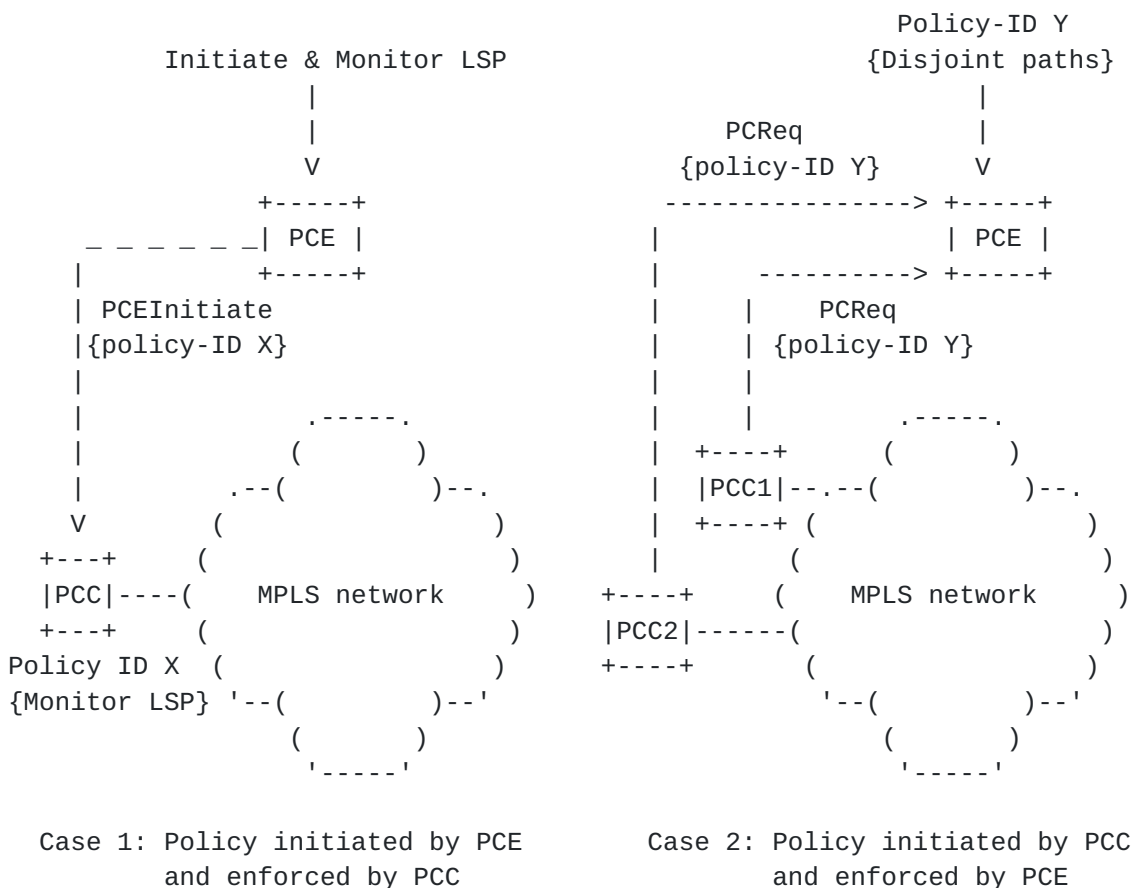


Figure 1: Sample use-cases for carrying policies over PCEP session

3. Terminology

The following terminologies are used in this document:

LSP: Label Switched Path.

PCC: Path Computation Client.

PCE: Path Computation Element

PCEP: Path Computation Element Protocol.

TLV: Type, Length, and Value.

4. Policy Identifier TLV

The new optional TLV is called "POLICY-ID-TLV" whose format is shown in the diagram below is defined to indicate the policies applied to a path. This TLV is associated with the RP or SRP objects specified in[RFC5440] and [[I-D.ietf-pce-stateful-pce](#)] respectively. The type of this TLV is to be allocated by IANA.

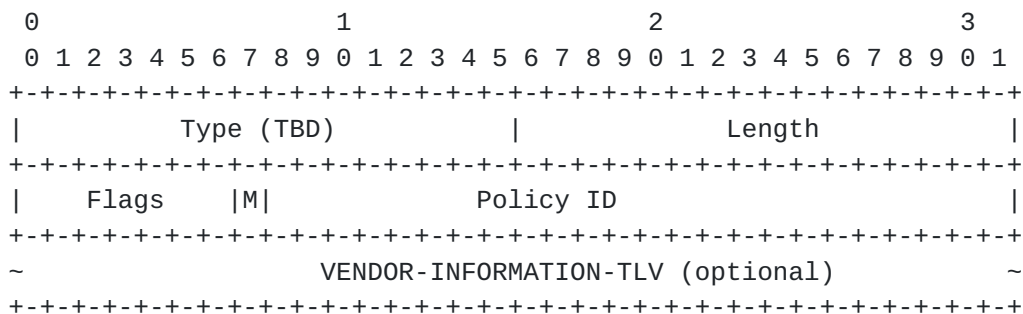


Figure 2: Format of POLICY-ID-TLV

The TLV is formatted according to the rules specified in [[RFC5440](#)]. The body of the POLICY-ID-TLV contains one 1-Octet flags and 3-Octet policy identifier. By default, a policy is OPTIONAL. If the M-flag is set, the policy is considered MANDATORY. This TLV can optionally carry vendor-specific information via VENDOR-INFORMATION-TLV whose format and processing rules are specified in [[RFC7470](#)]. The presence of VENDOR-INFORMATION-TLV is detected based on the TLV length, and the content and processing rule of vendor-specific information is outside the scope of this specification.

5. Operation

A single message MAY contain more than one POLICY-ID-TLVs. In case, a speaker receives a message containing multiple POLICY-ID-TLVs with the same policy ID, it MUST ignore all except for the first one it encounters in the message. If a PCEP speaker does not recognize the TLV, it MUST ignore the TLV in accordance with ([RFC5440]). If a PCEP speaker recognizes the TLV but does not support a mandatory policy included in the message, it MUST ignore the whole message and send PCErr with Error-Type = 2 (Capability not supported) as well include the POLICY-ID-TLV corresponding to the unsupported policies.

When requesting a path from a PCE using a PCReq message ([RFC5440]), a PCC MAY include the POLICY-ID-TLV in the RP object. The PCE MUST take into account all the policies included in the PCReq otherwise it MUST ignore the whole message and send PCErr message as mentioned above.

In the case of stateful PCE, POLICY-ID-TLV MAY be included in PCReq, PCRpt, PCUpd, and PCInitiate messages as well. When including POLICY-ID-TLV in PCRpt message, the SRP object MUST be present even in cases when the SRP-ID-number is the reserved value of 0x00000000.

6. Security Considerations

No additional security measure is required.

7. IANA Considerations

IANA is requested to allocate a new code point in the PCEP TLV Type Indicators registry, as follows:

Value	Description	Reference
TBD	POLICY-ID-TLV	This document

8. Acknowledgements

9. Normative References

[I-D.ietf-pce-pce-initiated-lsp]
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