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LSP Object Flag field of Stateful PCE
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Abstract

RFC8231 describes a set of extensions to PCEP to enable stateful control of MPLS-TE and GMPLS Label Switched Paths(LSPs) via PCEP. One of the extensions is the LSP object which includes a Flag field and the length is 12 bits. However, 11 bits of the Flag field has been assigned in RFC8231, RFC8281 and RFC8623 respectively.

This document updates RFC8231 by defining a new LSP-EXTENDED-FLAG TLV for LSP object to extend the length of the flag.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on May 29, 2020.

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1. Introduction

[RFC5440] describes the Path Computation Element Protocol (PCEP) which is used between a Path Computation Element (PCE) and a Path Computation Client (PCC) (or other PCE) to enable computation of Multi-protocol Label Switching (MPLS) for Traffic Engineering Label Switched Path (TE LSP).

PCEP Extensions for the Stateful PCE Model [RFC8231] describes a set of extensions to PCEP to enable active control of MPLS-TE and Generalized MPLS (GMPLS) tunnels. One of the extensions is the LSP object which includes a Flag field and the length is 12 bits.However, 11 bits of the Flag field has been assigned in RFC8231, RFC8281 and RFC8623 respectively.

This document updates RFC8231 by defining a new LSP-EXTENDED-FLAG TLV for LSP object to extend the length of the flag.

2. Conventions used in this document

2.1. Terminology

The terminology is defined as [RFC5440] and [RFC8231].

2.2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Update

3.1. Flag Field in LSP Object

As Figure 1 shows, the LSP Object is defined in Section 7.3 of [RFC8231]. The LSP object contains a flag field indicating to a PCE that the LSP State Synchronization is in progress.

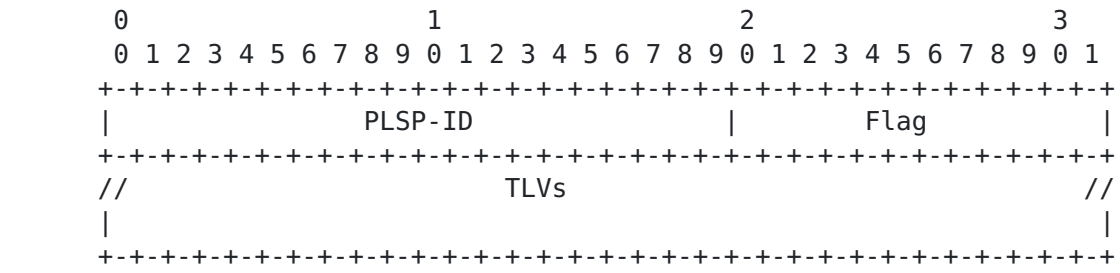

Figure 1: Flag field in LSP Object

As defined in [RFC8231], the length of LSP Object Flag field is 12 bits and it defined the value from bit 5 to bit 11. The bits from 1 to 3 are assigned in [RFC8623], the bit value 4 is used in [RFC8281]. The details of the flag field and assigned bits are shown as follows.

Value	Name	Reference
1	ERO-compression	RFC8623
2	Fragmentation	RFC8623
3	P2MP	RFC8623
4	Create	RFC8281
5-7	Operational (3 bits)	RFC8231
8	Administrative	RFC8231
9	Remove	RFC8231
10	SYNC	RFC8231
11	Delegate	RFC8231

Table 1

3.2. The LSP-EXTENDED-FLAG TLV

All bits of the flag has been assigned except bit 0. This document proposes to define a new LSP-EXTENDED-FLAG TLV for LSP object to extend the length of the flag as the Figure 2 shown.

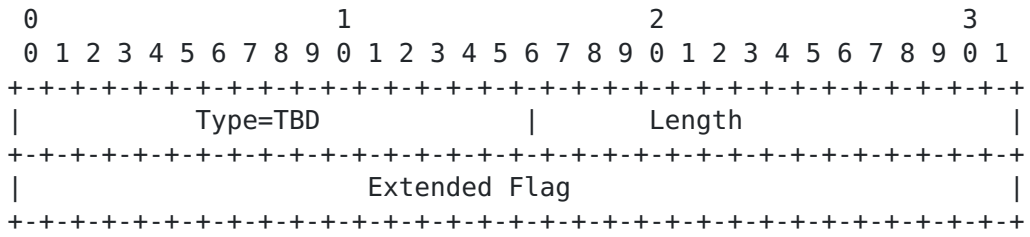

Figure 2: LSP-EXTENDED-FLAG TLV Format

Extended Flag (32 bits), starting from the least significant bit. The bit 0 SHOULD be reserved. Other unassigned bits are reserved for future uses. They MUST be set to 0 on transmission and MUST be ignored on receipt.

The LSP-EXTENDED-FLAG MUST be included in the LSP object when the bit 0 of the Flag field carried in the LSP object set to 1. If the TLV is missing, the PCE will generate an error with Error-type=6 (Mandatory Object missing) and error-value TBD (LSP-EXTENDED-FLAG TLV missing) and close the session.

4. Security Considerations

TBA

5. Acknowledgements

TBA

6. IANA Considerations

6.1. LSP Object

[RFC8231] defines the LSP object; per that RFC, IANA created a registry to manage the value of the LSP object's Flag field. IANA is requested to make allocations from the registry, as follows:

Value	Name	Reference
0	Indicate the LSP Extended Flag	[this document]
TBD	LSP-EXTENDED-FLAG TLV	[this document]

Table 2

6.2. PCEP-Error Object

The following error types and error values have been registered within the "PCEP-ERROR Object Error Types and Values" subregistry of the "Path Computation Element Protocol (PCEP) Numbers" registry:

Error-Type	Meaning
6	Mandatory Object missing
	Error-value
	TBD: LSP-EXTENDED-FLAG TLV missing

Table 3

7. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/info/rfc2119>.

[RFC5440] Vasseur, JP., Ed. and JL. Le Roux, Ed., "Path Computation Element (PCE) Communication Protocol (PCEP)", RFC 5440, DOI 10.17487/RFC5440, March 2009, <https://www.rfc-editor.org/info/rfc5440>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/info/rfc8174>.

[RFC8231] Crabbe, E., Minei, I., Medved, J., and R. Varga, "Path Computation Element Communication Protocol (PCEP) Extensions for Stateful PCE", RFC 8231, DOI 10.17487/RFC8231, September 2017, <https://www.rfc-editor.org/info/rfc8231>.

[RFC8281] Crabbe, E., Minei, I., Sivabalan, S., and R. Varga, "Path Computation Element Communication Protocol (PCEP) Extensions for PCE-Initiated LSP Setup in a Stateful PCE Model", RFC 8281, DOI 10.17487/RFC8281, December 2017, <https://www.rfc-editor.org/info/rfc8281>.

[RFC8623] Palle, U., Dhody, D., Tanaka, Y., and V. Beeram, "Stateful Path Computation Element (PCE) Protocol Extensions for Usage with Point-to-Multipoint TE Label Switched Paths (LSPs)", RFC 8623, DOI 10.17487/RFC8623, June 2019, <https://www.rfc-editor.org/info/rfc8623>.

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