Path Computation Element Communication Protocol (PCEP) Extensions to Enable IFIT

draft-chen-pce-pcep-ifit-06

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Background and Motivation

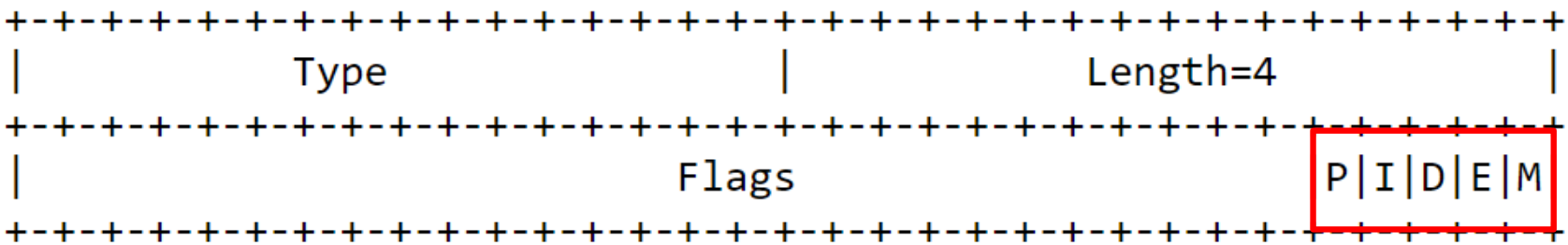
- In-situ Flow Information Telemetry (**IFIT**) refers to dataplane on-path telemetry techniques, including **IOAM** (draft-ietf-ippm-ioam-data) and **Alternate Marking** (RFC8321, RFC8889)

- The **PCEP extension** defined in this document allows to signal the IFIT capabilities. In this way IFIT methods are automatically activated and running.

The IFIT attributes can be generalized and included as **TLVs** carried inside the **LSPA** (**LSP Attributes**) **object** in order to be applied for all path types, as long as they support the relevant data plane telemetry method

IFIT capability advertisement TLV

A new **IFIT-CAPABILITY TLV**, that is an optional TLV for use in the OPEN Object for IFIT attributes via PCEP capability advertisement



P: IOAM Pre-allocated Trace Option Type-enabled flag (draft-ietf-ippm-ioam-data)

I: IOAM Incremental Trace Option Type-enabled flag (draft-ietf-ippm-ioam-data)

D: IOAM DEX Option Type-enabled flag (draft-ietf-ippm-ioam-data)

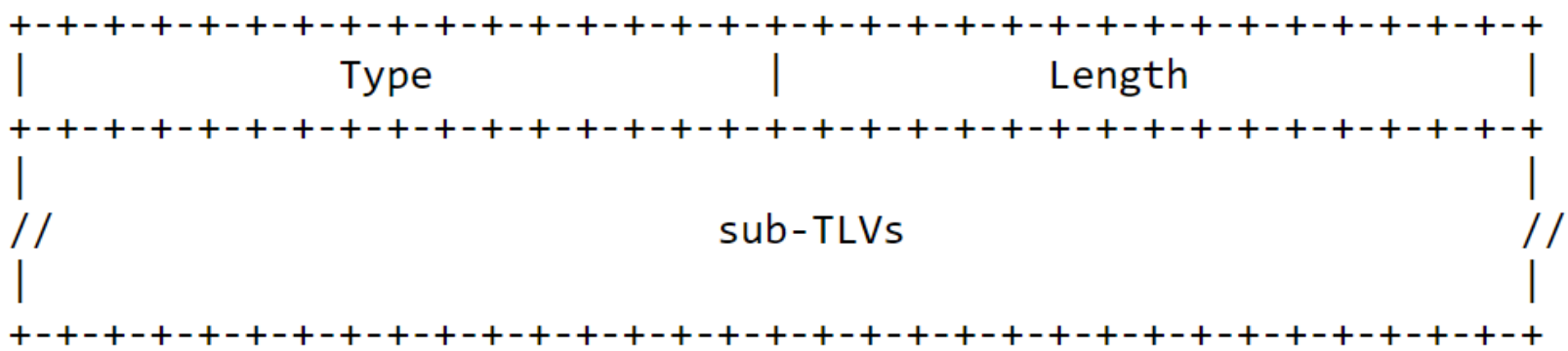
E: IOAM E2E Option Type-enabled flag (draft-ietf-ippm-ioam-data)

M: Alternate Marking enabled flag (RFC8321)

- If set to 1 by a PCC, the flag indicates that the PCC allows instantiation of the feature by a PCE
- If set to 1 by a PCE, the flag indicates that the PCE supports the feature instantiation
- The flag MUST be set by both PCC and PCE in order to support the instantiation

IFIT Attributes TLV

The **IFIT-ATTRIBUTES TLV** provides the configurable knobs of the IFIT feature, and it can be included as an optional TLV in the **LSPA object**

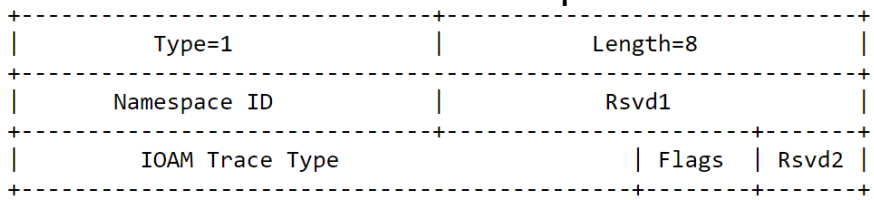


IFIT attribute TLVs, carried inside the LSPA object and applicable to all path types

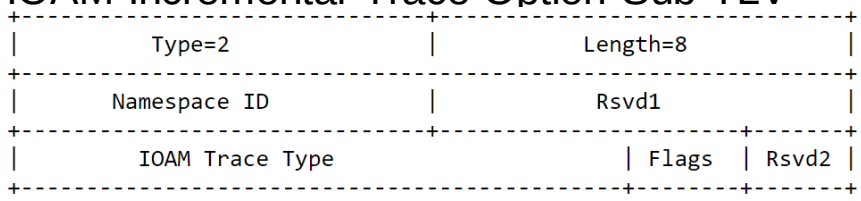
- IFIT TLVs are optional and can be taken into account by the PCE during path computation and by the PCC during path setup.
- In general, the LSPA object can be carried within a PCInitiate message, a PCUpd message, or a PCRpt message in the stateful PCE model.

IOAM and AltMark Sub-TLVs

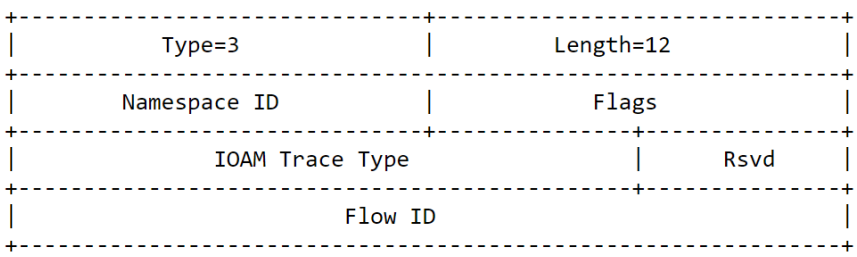
- IOAM Pre-allocated Trace Option Sub-TLV



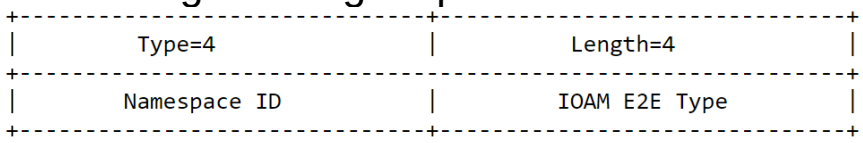
- IOAM Incremental Trace Option Sub-TLV



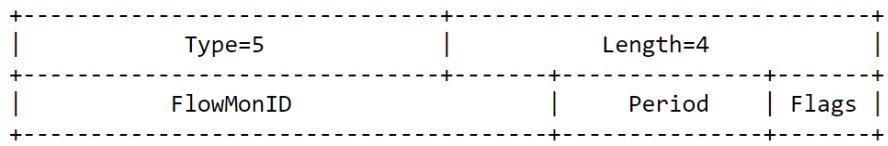
- IOAM Directly Export Option Sub-TLV



- IOAM Edge-to-Edge Option Sub-TLV



- Enhanced Alternate Marking Sub-TLV



Latest Changes

- Revised section on IANA Considerations
  - Added subsection on PCEP TLV Type Indicators
  - Added subsection on IFIT-CAPABILITY TLV Flags field
  - Added subsection on IFIT-ATTRIBUTES Sub-TLV
  - New subsection on Enhanced Alternate Marking Sub-TLV Flags field
    - Flags: A 4-bits field. Two flags are currently assigned:

Bit no.	Flag Name	Reference
3	H: Hop-By-Hop flag	This document
2	E: End-to-End flag	This document
0-1	Unassigned	

  - Added subsection on PCEP Error Codes

Discussion & Next Steps

- Relevant document to enable IFIT (IOAM and AltMark) control mechanisms

- Since IFIT methods are becoming mature for SR-MPLS and SRv6, IFIT attributes TLV also complements draft-ietf-pce-segment-routing-policy-cp to enable SR policy with native IFIT.

- Ask for WG adoption

Welcome questions, comments

Thank you