

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

draft-chen-pce-pcep-ifit-04

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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

Latest Changes

- Specified the usage scenario of IFIT

IFIT is a solution focusing on specific network domains according to RFC8799.

- For a number of reasons, such as policies, options supported, style of network management and security requirements, it is suggested to limit applications including the emerging IFIT techniques to a controlled domain.

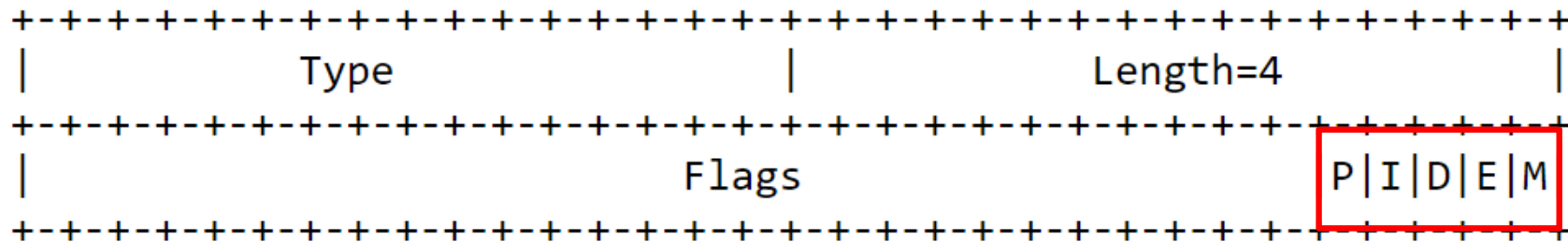
- Improved Security Considerations section

IFIT data **MUST** be propagated in a limited domain to avoid malicious attacks. Solutions to ensure this requirement are respectively discussed in [draft-ietf-ippm-ioam-data](#) and [draft-ietf-6man-ipv6-alt-mark](#).

- A limited administrative domain provides the network administrator with the means to select, monitor and control the access to the network, making it a trusted domain also for the PCEP extensions defined in this document.

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

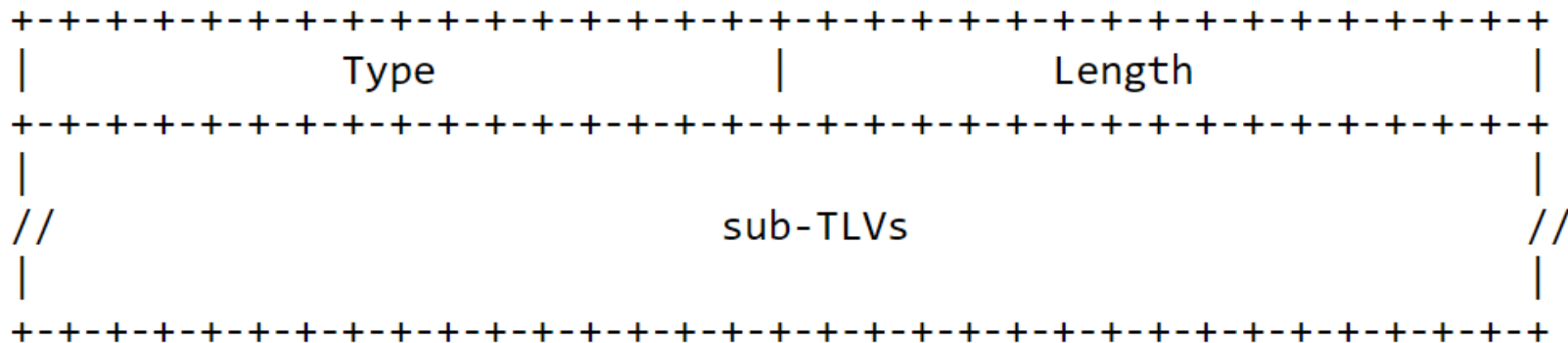


- P:** IOAM Pre-allocated Trace Option Type-enabled flag (draft-ietf-ippm-ioam-data)
- I:** IOAM Incremental Trace Option Type-enabled flag (draft-ietf-ippm-ioam-data)
- D:** IOAM DEX Option Type-enabled flag (draft-ietf-ippm-ioam-data)
- E:** IOAM E2E Option Type-enabled flag (draft-ietf-ippm-ioam-data)
- 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 Sub-TLVs

- IOAM Pre-allocated Trace Option Sub-TLV

| | | |
|-----------------|----------|-------|
| Type=1 | Length=8 | |
| Namespace ID | Rsvd1 | |
| IOAM Trace Type | Flags | Rsvd2 |

- IOAM Incremental Trace Option Sub-TLV

| | | |
|-----------------|----------|-------|
| Type=2 | Length=8 | |
| Namespace ID | Rsvd1 | |
| IOAM Trace Type | Flags | Rsvd2 |

- IOAM Directly Export Option Sub-TLV

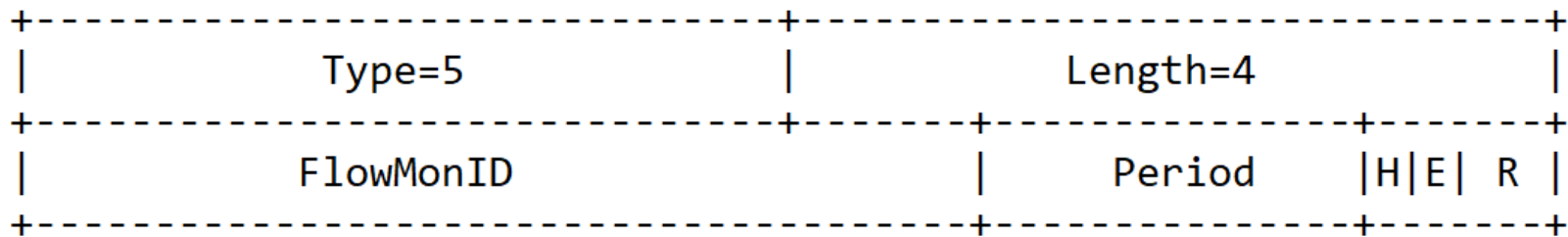
| | |
|-----------------|-----------|
| Type=3 | Length=12 |
| Namespace ID | Flags |
| IOAM Trace Type | Rsvd |
| Flow ID | |

- IOAM Edge-to-Edge Option Sub-TLV

| | |
|--------------|---------------|
| Type=4 | Length=4 |
| Namespace ID | IOAM E2E Type |

Enhanced Alternate Marking Sub-TLV

- Enhanced Alternate Marking Sub-TLV



H: A flag indicating that the measurement is Hop-By-Hop.

E: A flag indicating that the measurement is end to end.

Discussion & Next Steps

- 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