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

draft-ietf-pce-pcep-ifit-00

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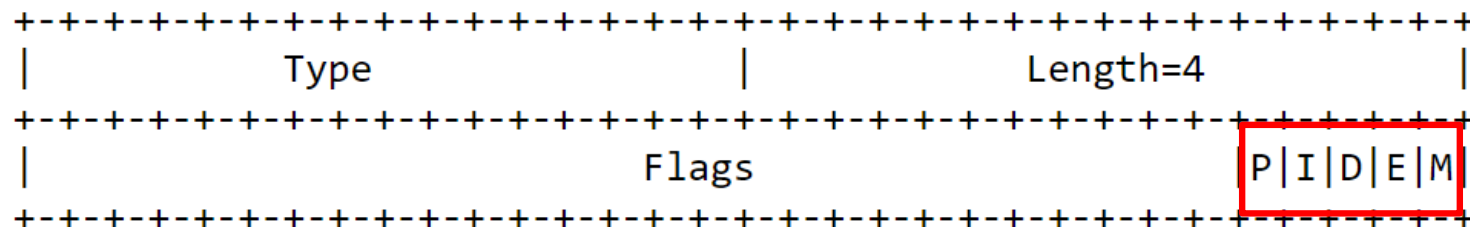Weidong Li (Huawei)
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Background and Motivation

❑ In-situ Flow Information Telemetry (**IFIT**) refers to dataplane on-path telemetry techniques, including **IOAM** (RFC9197) 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** as an optional IFIT TLV in the OPEN Object for PCEP capability advertisement

```
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|              Type              |            Length=4          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                       Flags                         |P|I|D|E|M|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

P: IOAM Pre-allocated Trace Option Type-enabled flag (RFC9197)

I: IOAM Incremental Trace Option Type-enabled flag (RFC9197)

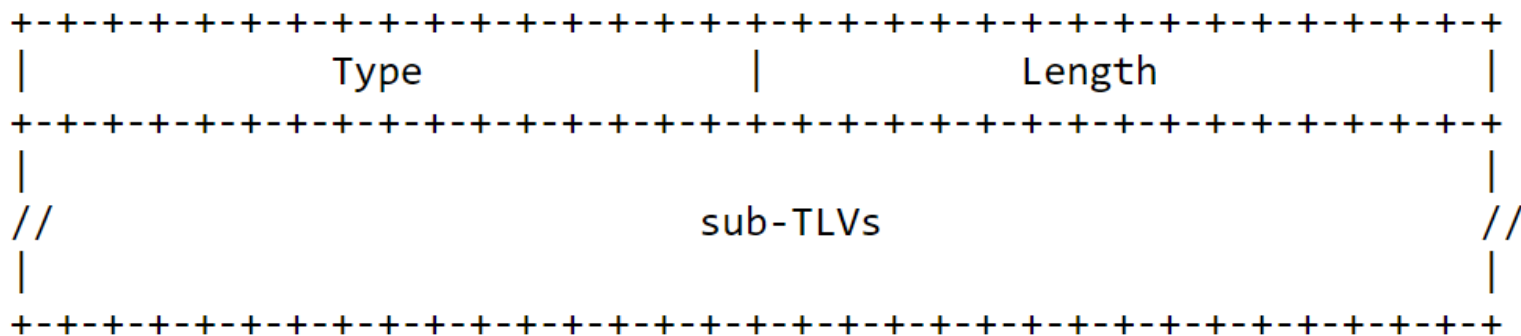**D**: IOAM DEX Option Type-enabled flag (RFC9197)

E: IOAM E2E Option Type-enabled flag (RFC9197)

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**

```
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                 Type                |              Length             |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                                                                 |
//                         sub-TLVs                              //
|                                                                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

IOAM and AltMark Sub-TLVs defined:

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

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

- These optional IFIT TLVs can be considered during path computation (PCE) and path setup (PCC) in the stateful PCE model.

WG Adoption discussion

Main comments to be addressed after the adoption:

- Clarification on the headend support of IFIT capability. It is supposed that there are at least two nodes (e.g. starting and ending node) which support it

- Example for IPv6 by leveraging draft-ietf-pce-pcep-extension-native-ip

- Relation with draft-ietf-idr-sr-policy-ifit: both PCEP and BGP can be used to instantiate SR Policies, so it is reasonable to have the same IFIT mechanism for PCEP and BGP.

- Clarification about the IFIT terminology and framework

- Editorial comments

Next Steps

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

- Plan to address the comments received in the -01 version

Welcome questions, comments

Thank you