

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

draft-chen-pce-pcep-ifit-01

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Background and Motivation

- ❑ In-situ Flow Information Telemetry (**IFIT**) refers to dataplane on-path telemetry techniques, including In-situ OAM (**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

Changes after IETF108

We got some feedback during IETF 108 and later on the mailing list

- The draft has deeply changed because the PCEP extension is now applied as TLVs to the LSP Attributes and not to the Association Groups
- The PCEP extension for IFIT is now general and the LSPA TLVs are applicable for all path types, if the IFIT methods are supported (input from Dhruv Dhody)
 - The application to SR policy is now mentioned as use case
- Addition of different IFIT-CAPABILITY TLV Flags for IOAM and Alternate Marking, in this way each capability can be advertised separately (comment from Fengwei Qin)
- A new section about the PCEP messages and the procedures of handling the TLV (comment from Huaimo Chen)
- Revised the section on the Example of application to SR Policy (comment from Huaimo Chen)

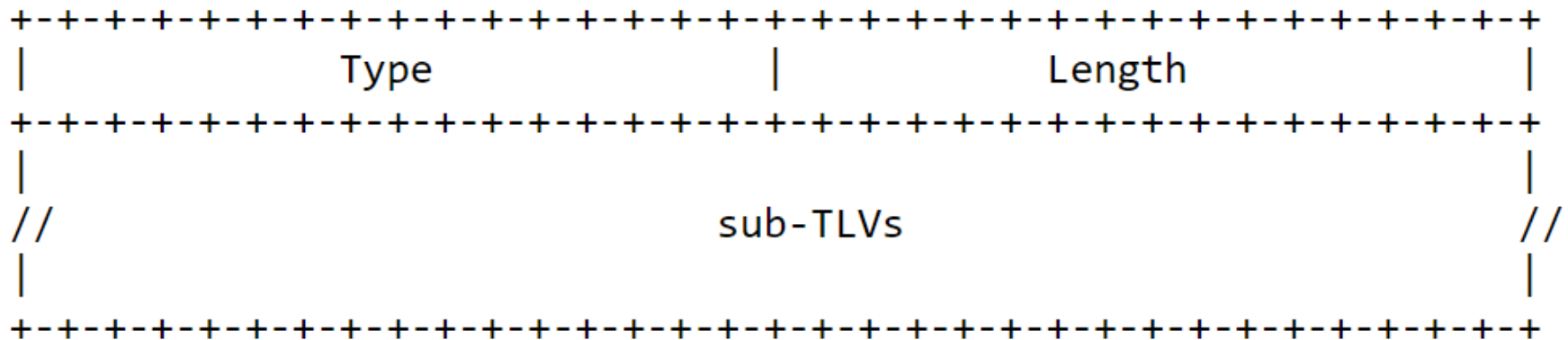
PCEP Extensions for IFIT Attributes

IFIT attribute TLVs are carried inside the LSPA (LSP Attributes) 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.
- IFIT for SR Policies: IFIT attributes also complement draft-ietf-pce-segment-routing-policy-cp

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**



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

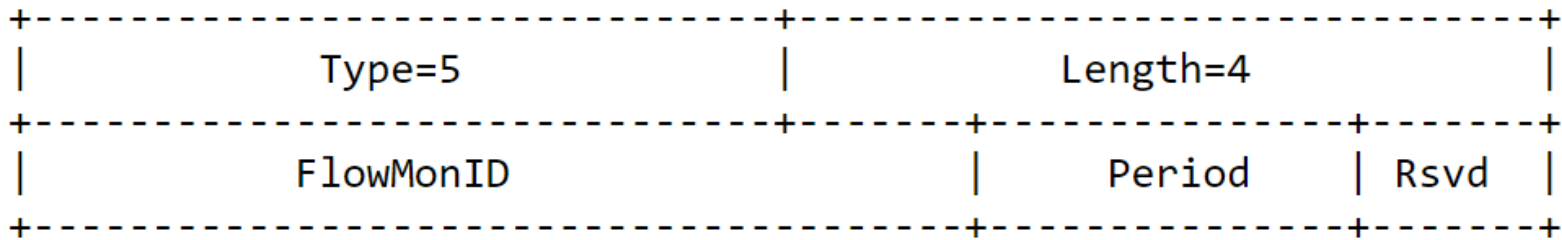
Type=3	Length=12
Namespace ID	Flags
IOAM Trace Type	Rsvd
Flow ID	

- 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



PCEP Messages and Example of application to SR Policy

The Examples of PCC Initiated SR Policy and PCE Initiated SR Policy are reported in draft-ietf-pce-segment-routing-policy-cp and this draft describes the addition of IFIT TLVs through LSPA object:

- For the PCE-initiated LSP with the IFIT feature enabled, IFIT-ATTRIBUTES TLV MUST be included in the LSPA object with the **PCInitiate message**
- The PCC creates the LSP using the attributes communicated by the PCE and the local values for the unspecified parameters
- After the successful instantiation of the LSP, the PCC automatically delegates the LSP to the PCE and generates a **PCRpt message** to provide the status report for the LSP
- When the LSP is instantiated the IFIT methods are applied as specified for the corresponding data plane, e.g. draft-ietf-ippm-ioam-ipv6-options and draft-ietf-6man-ipv6-alt-mark
- To enabling/disabling some features, the IFIT-ATTRIBUTES TLV MUST be included in the LSPA object with the **PCUpd message**

Discussion & Next Steps

- Collect feedbacks
 - Comment from Mike Koldychev about multiple SLs signaling (draft-koldychev-pce-multipath-04)
- Evaluate WG adoption
- Welcome questions, comments

Thank you