### 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

# Changes from -02

• 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 <u>draft-ietf-ippm-ioam-data</u> and <u>draft-ietf-6man-ipv6-alt-mark</u>.

- 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

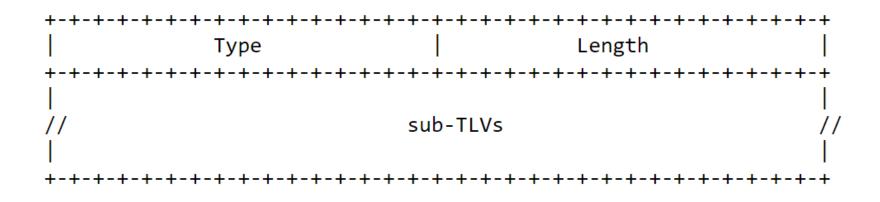
P: IOAM Pre-allocated Trace Option Type-enabled flag (draft-ietf-ippm-ioam-data)
I: IOAM Incremental Trace Option Type-enabled flag (draft-ietf-ippm-ioam-data)
D: IOAM DEX Option Type-enabled flag (draft-ietf-ippm-ioam-data)
E: IOAM E2E Option Type-enabled flag (draft-ietf-ippm-ioam-data)
M: Alternate 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
 Namespace ID
 IOAM Trace Type
 Flags

#### IOAM Incremental Trace Option Sub-TLV

1	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	+
ļ	Namespace ID	IOAM E2E Type	

### **Enhanced Alternate Marking** Sub-TLV

•	Enhanced Alternate Marking Sub-TLV						
	Type=5		Length=4				
	FlowMonID		Period	H E  R			

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 <u>draft-ietf-pce-</u> <u>segment-routing-policy-cp</u> to enable SR policy with native IFIT.
- Evaluate WG adoption
- Welcome questions, comments

### Thank you