ETSI GR ENI 032 V4.1.1 (2024-05)

Experiential Networked Intelligence (ENI); In-situ Flow Information Telemetry (IFIT) Deployment Scenarios

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Foreword

This Group Report (GR) has been produced by ETSI Industry Specification Group (ISG) Experiential Networked Intelligence (ENI).

Modal verbs terminology

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1 Scope

The purpose of the present document is to provide guidelines about IFIT deployment use cases and application scenarios. As described in ETSI GR ENI 012 [i.1], IFIT is a key technology for ensuring the SLA of future network services and for implementing automated and intelligent IP networks. Several technical specifications in IETF have already been defined to set the basis and ISG ENI is playing an important role in defining the whole framework. The present document includes a report of IFIT use cases and how they fit the ENI architecture.

2 References

2.1 Normative references

Normative references are not applicable in the present document.

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI GR ENI 012 (V1.1.1): "Experiential Networked Intelligence (ENI); Reactive In-situ Flow Information Telemetry".

[i.2] IETF RFC 9341 (December 2022): "Alternate-Marking Method".

[i.3] IETF RFC 9342 (December 2022): "Clustered Alternate-Marking Method".

[i.4] IETF RFC 9343 (December 2022): "IPv6 Application of the Alternate-Marking Method".

[i.5] IETF RFC 9197 (May 2022): "Data Fields for In Situ Operations, Administration, and Maintenance (IOAM)".

[i.6] IETF RFC 9326 (November 2022): "In-situ OAM Direct Exporting".

[i.7] IETF RFC 7011 (September 2013): "Specification of the IP Flow Information Export (IPFIX) Protocol for the Exchange of Flow Information".

[i.8] IETF draft-song-opsawg-ifit-framework (work in progress): "In-situ Flow Information Telemetry".

[i.9] Bo Lu, Ling Xu, Yuezhong Song, Longfei Dai, Min Liu, Tianran Zhou, Zhenbin Li and Haoyu Song: "IFIT: Intelligent Flow Information Telemetry". In Proceedings of the ACM SIGCOMM 2019 Conference Posters and Demos (SIGCOMM Posters and Demos '19). Association for Computing Machinery, New York, NY, USA, p15-17.

[i.10] IETF RFC 8639 (September 2019): "Subscription to YANG Notifications".

[i.11] IETF RFC 8640 (September 2019): "Dynamic Subscription to YANG Events and Datastores over NETCONF".

[i.12] IETF RFC 8641 (September 2019): "Subscription to YANG Notifications for Datastore Updates".

[i.13] IETF RFC 8650 (November 2019): "Dynamic Subscription to YANG Events and Datastores over RESTCONF".

[i.14] draft-ietf-ippm-ioam-yang (work in progress): "A YANG Data Model for In-Situ OAM".

[i.15] IETF RFC 7950 (August 2016): "The YANG 1.1 Data Modeling Language".

[i.16] IETF RFC 6241 (June 2011): "Network Configuration Protocol (NETCONF)".

[i.17] IETF RFC 8040 (January 2017): "RESTCONF Protocol".

[i.18] draft-ietf-idr-sr-policy-ifit (work in progress): "BGP SR Policy Extensions to Enable IFIT".

[i.19] draft-ietf-pce-pcep-ifit (work in progress): "Path Computation Element Communication Protocol (PCEP) Extensions to Enable IFIT".

[i.20] ETSI GS ENI 005 (V2.1.1): "Experiential Networked Intelligence (ENI); System Architecture".

[i.21] draft-ietf-ippm-alt-mark-deployment (work in progress): "Alternate Marking Deployment Framework".

[i.22] draft-gfz-opsawg-ipfix-alt-mark (work in progress): "IPFIX Alternate-Marking Information".

[i.23] draft-gfz-ippm-alt-mark-yang (work in progress): "A YANG Data Model for the Alternate Marking Method".

[i.24] draft-fz-spring-srv6-alt-mark (work in progress): "Application of the Alternate Marking Method to the Segment Routing Header".

[i.25] draft-ietf-opsawg-ipfix-on-path-telemetry (work in progress): "Export of On-Path Delay in IPFIX".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

In-situ Flow Information Telemetry (IFIT): network OAM data plane on-path telemetry techniques, including Alternate Marking Method (AMM), In-situ OAM (IOAM), IOAM Direct Exporting (IOAM-DEX), and Postcard-Based Telemetry (PBT)

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AMM	Alternate Marking Method
API	Application Programming Interface
BGP	Border Gateway Protocol
BUM	Broadcast, Unknown-Unicast and Multicast
DEX	Direct Exporting
E2E	End-to-End
ECMP	Equal-Cost Multipath
ENI	Experiential Networked Intelligence
ESQM	Enhanced Stream Quality Monitoring
GTP	GPRS Tunnelling Protocol
GUI	Graphical User Interface
HD	High-Definition
IFIT	In-situ Flow Information Telemetry