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GROUP SPECIFICATION

Experiential Networked Intelligence (ENI);
Proof of Concepts Framework

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1   Scope

The present document specifies a Proof of Concept (PoC) framework for use within ETSI ENI ISG, to coordinate and promote public demonstrations which validate key technical components developed in ENI.

The primary PoC objectives - to illustrate the use of AI/ML techniques in support of mobile network operations, build commercial awareness and confidence in this emerging technology area, and encourage development of an open ecosystem by integrating components from different contributors.

This framework outlines:

- rationale for ENI ISG PoCs;

- the ENI ISG PoC process;

- submission, format and criteria for ENI ISG PoC Proposals;

- review and acceptance criteria of PoC Proposals;

- ENI ISG PoC Report format and requirements;

- ETSI support for PoC team.

The present publication is revised to include; e.g.:

- the ENI System Architecture;

- the ENI new Requirements and Use Cases;

- the ENI measurability criteria.

2   References

2.1   Normative 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.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference.

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 necessary for the application of the present document.

[1]   ETSI GS ENI 002: "Experiential Networked Intelligence (ENI); ENI requirements".

[2]   Void.

[3]   ETSI GS ENI 001: "Experiential Networked Intelligence (ENI); ENI use cases".

[4]   ETSI GS ENI 005: "Experiential Networked Intelligence (ENI); System Architecture".

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 Directives (March 2018).

NOTE: Available at https://portal.etsi.org/directives/38_directives_feb_2018.pdf.

[i.2]   ETSI GR ENI 004: "Experiential Networked Intelligence (ENI); Terminology for Main Concepts in ENI".

[i.3]   Void.

3   Definition of terms, symbols and abbreviations

3.1   Terms

For the purposes of the present document, the terms given in ETSI GR ENI 004 [i.2] and the following apply:

NOTE: A term defined in the present document takes precedence over the definition of the same term, if any, in ETSI GR ENI 004 [i.2].

ENI ISG PoC proposal: initial description of a PoC Project, submitted as a contribution for review and acceptance by the ENI ISG before the PoC Project starts

NOTE: See annex A.

ENI ISG PoC report: detailed description of the results and findings of a PoC project, submitted once the PoC Project has finished

manufacturer: company having a substantial capacity to develop and/or produce and/or install and/or maintain products to be used in, or directly or indirectly connected to, an electronics communications network

NOTE: An association or organization of such manufacturers also falls within this category. (Member categories from Rules of procedure in ETSI Directives [i.1]).

network operator: operator of an electronics communications network or part thereof

NOTE: An association or organization of such network operators also falls within this category. (Member categories from Rules of procedure in ETSI Directives [i.1]).

PoC demo objective: detailed description of one particular aspect that the PoC Team intends to demonstrate and how it will be achieved

PoC project: activity oriented to perform a PoC according to the framework described in the present document

PoC review team: entity in charge of administering the PoC activity process

PoC scenario report: collection of PoC Demo Objectives

NOTE: See annex B.

PoC team: organizations participating in the PoC Project

service provider: company or organization, making use of an electronics communications network or part thereof to provide a service or services on a commercial basis to third parties

NOTE: An association or organization of such service providers also falls within this category. (Member categories from Rules of procedure in ETSI Directives [i.1]).

3.2 Symbols

Void.

3.3 Abbreviations

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

AI   Artifical Intelligence
ENI   Experiential Network Intelligence
IDC   Internet Data Centre
IP   Internet Protocol
ISG   Industry Specification Group
ML   Machine Learning
PoC   Proof of Concept
SD-WAN   Software Defined - Wide Area Network
URL   Universal Resource Location
WG   Working Group
WI   Work Item

4 ENI ISG PoC Framework

4.1 Rationale

The ENI system is an innovative, policy-based, model-driven functional entity that improves operator experience. It does not simply address automation - it also assists with the decision-making capability of humans, as well as machines. The goal is to enable the system to be more maintainable, reliable, and provide context-aware services that meet the needs of the business.

Proof of Concepts are an important tool to demonstrate ENI as a viable technology. Results from PoCs may guide the work in the ENI ISG by providing feedback on interoperability and other technical challenges. The public demonstration of these ENI concepts will help build commercial awareness and confidence in this ENI approach, and develop a diverse, open ENI ecosystem. A single PoC demonstration will impact its immediate audience, but a cumulative set of successful PoCs will provide industry momentum for ENI concepts.

The PoCs shall adopt the ENI use cases as a working baseline, and address the technical challenges and approaches therein.

4.2 Call for PoCs

The ETSI ENI ISG calls for PoC proposals during the life of the ISG. Details will be made publicly available on the ETSI ENI ISG portal.

4.3 ENI ISG PoC Proposal Submission

PoC Team formation is beyond the scope of the ENI ISG. The PoC Team shall prepare an ENI ISG PoC Proposal according to the ENI ISG PoC Proposal template in clause A.1, and the ENI ISG PoC Review Team may be consulted in support of this effort. The PoC Proposal shall be submitted to the ENI ISG as a contribution uploaded on the ETSI Portal and a link to the contribution shall be sent by the ENI PoC Review Team to the dedicated e-mail distribution list 'ISG_ENI@LIST.ETSI.ORG' with [ENI ISG PoC Proposal] in the subject line.

4.4   ENI ISG PoC Proposal Review

4.4.1   General

The ENI PoC Review Team is responsible for administering this ENI ISG PoC process. The ENI PoC Review Team shall collect and distribute the ENI ISG PoC Proposals and announce the accepted ENI ISG PoC Proposal based on the review against the ENI ISG PoC acceptance criteria of clause 4.5. The ETSI Centre for Testing and Interoperability (CTI) will further evaluate the PoC according to the criteria acceptance and principles and provide the ENI PoC Review team with confirmation of meeting the acceptance criteria (as in clause 5.1) as required by clause 4.5.

The PoC Review process timeline follows:

1)   The ENI PoC Review Team will provide a response to the PoC Team within 30 days after receipt of the ENI ISG PoC proposal.

2)   If required, additional technical and clarification questions may be presented by the ENI PoC Review committee at the end of the first review term:

   a)   The PoC approval decision will be placed on hold, pending additional review.

   b)   The ENI committee's questions should be answered in written format.

   c)   Once these answers are submitted to the ENI PoC committee, a second review period of 15 days will commence.

   d)   A final decision will be rendered within the 15 days of the ENI committee's receipt of the response.

4.4.2   Accepted ENI ISG PoC Proposals

The ENI PoC Review Team will send an email to the PoC Team to confirm the acceptance of the ENI ISG PoC Proposal.

The ENI PoC Review Team will send an email to the 'ENI_POC@LIST.ETSI.ORG' list to announce each accepted ENI ISG PoC Proposal to the ENI ISG community. Keep a "List of Accepted Proposals" on the ETSI ENI Wiki page.

The ENI PoC Review Team will post accepted ENI ISG PoC Proposals on a publicly accessible ETSI ENI ISG portal.

Accepted ENI ISG PoC Proposals are expected to be executed by the PoC Team and a PoC Report is also expected to be submitted by the PoC Team at completion.

4.4.3   Rejected ENI ISG PoC Proposals

The ENI PoC Review Team will send an email to the PoC Team to notify them that the ENI ISG PoC Proposal has been rejected with the reason based on the criteria of clause 4.5.

No further action will be taken by the ENI ISG on rejected proposals. PoC Teams may submit revised ENI ISG PoC Proposals for future consideration.

   NOTE: This should be reported to the ENI management list and informally to the next meeting.

4.5   ENI ISG PoC Proposal Acceptance Criteria

The criteria for acceptance of ENI ISG PoC Proposals are:

1)   The ENI ISG PoC Proposal shall contain the information requested in the format of the ENI ISG PoC Proposal Template of clause A.1, referred to as the PoC Team. This will be checked by ETSI CTI and the PoC Review Team.

2) The organizations participating in an PoC Team shall include at least two Manufacturers and at least one Network Operator or one Service Provider, where at least one Network Operator or one Service Provider shall be a member of the ENI ISG (refer to clause A.1.1). The ENI ISG PoC Team proposal shall address at least one goal relevant to ENI related with an ENI Use Case [3], an ENI Requirement [1] or the suitability of an ENI System Architecture [4] aspect (refer to clause A.1.3.1).

3) The output of the PoC shall provide feedback to the ISG ENI in order to support the improvement of the output of the existing WIs. Alignment with existing activities is required.

4) All proposed ENI ISG PoC solutions shall allow manual intervention (triage and control) capability at all stages of test and production deployment. This is considered a critical requirement, given uptime considerations and the emerging regulatory environment for ENI solutions.

5) The ENI ISG PoC shall provide definitions and illustrations of the underlying AI/ML architectures, and utilize common/accessible programming languages. This will guarantee the level of transparency required for quick identification and resolution of technical issues.

6) The ENI ISG PoC Team proposal shall indicate the venue where the PoC will be demonstrated (e.g. PoC Team member lab, industry trade show, etc.) (refer to clause A.1.5).

7) A PoC Team project timeline shall be provided (refer to clause A.1.4).

8) Description of testing methods, how they are performed, and concrete measurement processes with expected measures should be indicated.

NOTE: This last requirement/guideline should be particularly taken into account by PoC Teams. Each set of measurements depend on the context and on the scenarios described for each PoC proposal.

Any ENI ISG PoC Proposal which meets these required elements will be accepted.

A summary table of Use Cases from [3] and requirements [1] is shown in table 1.

Table 1: Summary of the ENI Use Cases and Requirements

	Level 1	Level 2
Use Case	Network Operations	Policy-driven IP managed networks
		Radio coverage and capacity optimization
		Intelligent software rollouts
		Intelligent fronthaul management and orchestration
		Elastic Resource Management and Orchestration
		Application Characteristic based Network Operation
		AI enabled network traffic classification
		Automatic service and resource design framework for cloud service
		Intelligent time synchronization of network
	Service Orchestration and Management	Context aware VoLTE service experience optimization
		Intelligent network slicing management
		Intelligent carrier-managed SD-WAN
		Intelligent caching based on prediction of content popularity
	Assurance	Network fault identification and prediction
		Assurance of service requirements
		Network fault root-cause analysis and intelligent recovery
	Infrastructure Management	Policy-driven IDC traffic steering
		Handling of peak planned occurrences
		Energy optimization using AI
	Network Security	Policy-based network slicing for IoT security
		Limiting profit in cyber-attacks