



GROUP SPECIFICATION

Network Functions Virtualisation (NFV); Proofs of Concept; Framework

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Reference

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Foreword

This Group Specification (GS) has been produced by ETSI Industry Specification Group (ISG) Network Functions Virtualisation (NFV).

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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines a framework for use within ETSI NFV ISG to coordinate and promote public demonstrations of Proofs of Concept (PoC) illustrating key aspects of NFV.

The objective for the PoCs is to build commercial awareness and confidence and encourage development of an open ecosystem by integrating components from different players.

This framework outlines:

- rationale for NFV ISG PoCs;
- NFV ISG PoC process;
- format and criteria for NFV ISG PoC Proposals;
- NFV ISG PoC Report format and requirements.

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 NFV 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".
- [2] ETSI GS NFV 001: "Network Functions Virtualisation (NFV); Use Cases".
- [3] ETSI GS NFV 004: "Network Functions Virtualisation (NFV); Virtualisation Requirements".
- [4] ETSI GS NFV 002: "Network Functions Virtualisation (NFV); Architectural Framework".
- [5] ETSI Directives (April 2019).

NOTE: Available at <https://portal.etsi.org/Resources/ETSI-Directives>.

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 GS NFV-PER 001: "Network Functions Virtualisation (NFV); NFV Performance & Portability Best Practises".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI GS NFV 003 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in ETSI GS NFV 003 [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. (Membership category from ETSI directives [5].)

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

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

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

NOTE: See annex A: NFV ISG PoC Proposal Template.

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

PoC scenario report: collection of PoC Demo Objectives

NOTE: See annex B: NFV ISG PoC Report Template.

PoC team: organizations, community participants and/or researchers 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. (Membership category from ETSI directives [5].)

supplier: 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 suppliers also falls within this category. (Membership category from ETSI directives [5].)

3.2 Symbols

Void.

3.3 Abbreviations

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

EG	Expert Group
EPC	Evolved Packet Core
INF	INFrastructure
ISG	Industry Specification Group
MME	Mobility Management Entity
NFV ISG TST WG	NFV WG responsible of the PoC Framework
NFV	Network Function Virtualisation
PoC	Proof of Concept
UC	Use Case
WG	Working Group
WI	Work Item

4 NFV ISG PoC Framework

4.1 Rationale

NFV proposes a new approach to the implementation and operation of network functions, and may inspire the development and deployment of new types of network functions. Proof of Concepts are an important tool to demonstrate NFV as a viable technology. Results from PoCs may guide the work in the NFV ISG by providing feedback on interoperability and other technical challenges. The public demonstration of these NFV concepts helps to build commercial awareness and confidence in this NFV approach, and helps to develop a diverse, open, NFV ecosystem. Any given PoC demonstration event impacts its immediate audience, but the cumulative set of PoC demonstration events provides a measure of industry impact from these NFV concepts.

The PoCs shall be scoped around existing or new NFV use cases and address the technical challenges and approaches being progressed by the Working Groups (WGs) or help propose new approaches and concepts.

4.2 Call for PoCs

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

4.3 NFV ISG PoC Proposal Submission

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

4.4 NFV ISG PoC Proposal Review

4.4.0 Introduction

The NFV ISG WG responsible of the PoC Framework (TST WG) Chair(s) are responsible for administering this NFV ISG PoC process. During interim periods with no elected Chair(s) for NFV TST WG, the TSC will assume this role in order to guarantee the continuity of the NFV ISG PoC process.

The NFV ISG TST WG Chair(s) shall collect and distribute the NFV ISG PoC Proposals and announce the accepted NFV ISG PoC Proposal based on the review against the NFV ISG PoC acceptance criteria of clause 4.5.

ETSI Centre for Testing and Interoperability (CTI) will provide the NFV ISG TST WG Chair(s) with a confirmation of whether the required elements of the NFV ISG PoC Proposal have been completed as required by clause 4.5.

The NFV ISG TST WG Chair(s) will provide a response to the PoC Team within 14 business days after receipt of the NFV ISG PoC proposal.

4.4.1 Accepted NFV ISG PoC Proposals

The NFV ISG TST WG Chair(s) will send an email to the PoC Team to confirm the acceptance of the NFV ISG PoC Proposal.

The NFV ISG TST WG Chair(s) will send an email to the 'NFV_POC@LIST.ETSI.ORG' list to announce accepted NFV ISG PoC Proposals to the NFV ISG community.

The NFV ISG TST WG Chair(s) will post accepted NFV ISG PoC Proposals on a publicly accessible ETSI NFV ISG portal.

The NFV ISG TST WG Chair(s) will bring accepted NFV ISG PoC Proposals to the attention of NFV ISG WG/EG Chairs through the Technical Steering Committee to publicize the PoC to the relevant NFV ISG WGs/EGs/WIs.

Accepted NFV ISG PoC Proposals are expected to be executed by the PoC Team and an NFV ISG PoC Report is expected to be submitted at completion.

4.4.2 Rejected NFV ISG PoC Proposals

The NFV ISG TST WG Chair(s) will send an email to the PoC Team to notify them that the NFV 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 NFV ISG on rejected proposals. PoC Teams may submit revised NFV ISG PoC Proposals for future consideration.

4.5 NFV ISG PoC Proposal Acceptance Criteria

The criteria for acceptance of NFV ISG PoC Proposals are:

- 1) The NFV ISG PoC Proposal shall contain the information requested in the format of the NFV ISG PoC Proposal Template of clause A.1.
- 2) The organizations participating in an PoC Project shall include one Network Operator or one Service Provider (where at least one is an NFV ISG participant), and one or several of the following options:
 - a) two suppliers;
 - b) one open source community; or
 - c) one research organization.
- 3) The main point of contact for the PoC team should be an NFV participant or an NFV member in order to facilitate communications between the ISG NFV and the PoC team.
- 4) The NFV ISG PoC Proposal shall address at least one goal relevant to an NFV Use Case, NFV Requirement or NFV Architectural Framework reference point (refer clause A.1.2).
- 5) The NFV ISG PoC Proposal shall indicate the venue where the PoC will be demonstrated (e.g. PoC Team member lab, industry trade show, etc.) (refer clause A.1.3).
- 6) A PoC Project timeline shall be provided (refer clause A.1.5).

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

4.6 NFV ISG PoC Report

Once an NFV ISG PoC Project is concluded, a NFV ISG PoC Report with the PoC results is expected to be provided to NFV ISG as a contribution to the NFV ISG participants section of the ETSI portal and be announced on the 'NFV_POC@list.etsi.org' mailing list.

An NFV ISG PoC Report should contain the information requested in the NFV ISG PoC Report Template of clause B.1 to notify the NFV ISG that the PoC Team has completed their PoC Project. PoC Teams are encouraged to provide additional technical details on the results of their PoC Project using the report format provided in clause B.2.

The NFV ISG TST WG Chair(s) will present a list of all the NFV ISG PoC Reports to the ISG Plenary.

PoC Team members who are participants of ISG NFV may bring technical proposals based on PoC results to NFV ISG as regular contributions.

5 ETSI Support for NFV ISG PoC Teams

NFV ISG Participants activities in forming PoC Teams and executing PoC Projects are outside the scope of the NFV ISG. The NFV ISG shall not project manage individual PoC Projects nor get involved in forming PoC Teams or executing NFV ISG PoC Proposals.

The ETSI Centre for Testing and Interoperability (CTI) has experience in supporting the organization of technology evaluations and interoperability events (in many ways similar to PoCs). This experience may be useful in assisting the PoC Teams with administration and project management support including:

- Formation of the PoC Team.
- Preparation of the NFV ISG PoC proposal.
- Development of the NFV ISG PoC Scenario Report.
- Providing feedback to the ISG.
- Collecting and reporting results.
- Administration, logistics, etc.

CTI is not a test lab. CTI assistance is free of charge for ISG participants. ISG participants may request CTI assistance by contacting 'CTI_Support@etsi.org' by email with the subject to include [NFV ISG PoC].

PoC Team members are not required to make use of CTI support. Other ISG members or commercial entities may provide additional or similar services.

Annex A (normative): NFV ISG PoC Proposal Template

A.1 NFV ISG PoC Proposal Template

A.1.1 PoC Team Members

- Include additional suppliers, operators or labs should additional roles apply.
- PoC Project Name: _____
- Network Operators/ Service Providers: _____ Contact: _____
- Supplier A: _____ Contact: _____
- Supplier B: _____ Contact: _____
- Open Source Community: _____ Contact: _____
- Research organization: _____ Contact: _____
- Additional Members: _____ Contact: _____

A.1.2 PoC Project Goals

EXAMPLE: The PoC will verify that the VNF running on top of the NFVI is able to optimize the location and required resources of the VNFs as per ETSI GS NFV-004 Part.3 [3].

- PoC Project Goal #1: _____

List additional (optional) PoC Project Goals (follow the same format).

A.1.3 PoC Demonstration

Examples include: PoC Team's member's labs, industry trade shows, research networks, etc.

- Venue for the demonstration of the PoC: _____

A.1.4 (optional) Publication

Publication of PoC results outside the ISG is encouraged to enable peer review, to avoid duplication of PoC proposals and to enable others to build on the PoC outcomes. Publication of PoC results is not mandatory and is not a selection criterion, but if you are proposing publication, please provide the following information:

EXAMPLES include: Conferences, public demonstrations, online publication, trade magazine, etc.

- What would be the publication channel(s) for the PoC. _____
- What would be the planned publication date(s)? _____
- URLs where applicable: _____

A.1.5 PoC Project Timeline

- What is the PoC start date? _____
- (First) Demonstration target date _____
- PoC stages target dates(optional) _____
- PoC Report target date _____
- When is the PoC considered completed? _____

A.2 NFV PoC Technical Details (optional)

A.2.1 PoC Overview

In order to maintain a high quality of the PoC Projects and provide meaningful feedback to the various NFV ISG Work Items, it is desirable for the NFV ISG PoC Proposal to identify, in detail, the NFV aspects that are being demonstrated. PoC team members are encouraged to focus on NFV ISG documents such as the Architectural Framework [4], Use Cases [2], Requirements [3], as well as other NFV ISG documents. The PoC may also propose new concepts related to the previous.

- Add a graphical depiction of the PoC Project and its building blocks.

A.2.2 PoC Scenarios

Describe the high level scenario(s) that will be demonstrated. Where applicable, provide a network diagram(s):

- Scenario 1 - _____
- Scenario 2 - _____

A.2.3 Mapping to NFV ISG Work

Describe how this PoC relates to the NFV ISG work:

- 1) Specify below the most relevant NFV ISG end-to-end concept from the NFV Use Cases [2], Requirements [3], and Architectural Framework functional blocks or reference points [4] addressed by the different PoC scenarios:

	Use Case	Requirement	E2E Arch	Comments
Scenario 1	UC#4	Gen.1		Progressive (partial to full) virtualisation of EPC
Scenario 2	UC#4	Elas.2		Scaling of vMME (in, out, on-demand, automatic...)
...				

- 2) (Optional) If this PoC intends to solve or validate any challenge or ongoing work in NFV ISG Work Items, complete the table below:

	Work Items	Comments
Scenario 1		
Scenario 2	DGS/NFV-PER 001	This scenario is intended to validate and/or complete the portability templates
...		

A.2.4 PoC Success Criteria

- Explain how you intend to verify that the goals you presented in clause A.1.2 have been met.

EXAMPLE: Functional (it worked, it did not work), Performance(transactions per second, throughput, processing per second, packet per second, etc.), Scalability, Availability, Service Quality.

A.2.5 Expected PoC Contribution

One of the intended goals of the NFV PoC activity is to support the various groups within the NFV ISG. The PoC Team is therefore expected to submit contributions relevant to the NFV ISG work items as a result of their PoC Project.

List of contributions towards specific NFV ISG WIs expected to result from the PoC Project:

- PoC Project Contribution #1: _____ NFV WI _____
- PoC Project Contribution #2: _____ NFV WI _____
- PoC Project Contribution #3: _____ NFV WI _____

Annex B (normative): NFV ISG PoC Report Template

B.0 Disclaimer

The following normative disclaimer shall be included on the front page of a PoC report:

Submission of this NFV ISG PoC Report as a contribution to the NFV ISG does not imply any endorsement by the NFV ISG of the contents of this report, or of any aspect of the PoC activity to which it refers.

B.1 NFV ISG PoC Report

B.1.1 PoC Project Completion Status

Indicate the PoC Project Status. Can the PoC be considered completed? If this is a multi-stage PoC project, indicate the Reported Stage status and plans for future Project Stages.

- Overall PoC Project Completion Status: _____
- PoC Stage Completion Status (Optional - for Multi Stage projects only): _____

B.1.2 NFV PoC Project Participants

Specify PoC Team; indicate any changes from the NFV ISG PoC Proposal:

- PoC Project Name: _____
- Network Operator/Service Provider: _____ Contact: _____
- Supplier A: _____ Contact: _____
- Supplier B: _____ Contact: _____
- Open Source Community: _____ Contact: _____
- Research organization: _____ Contact: _____
- Additional Members: _____ Contact: _____

B.1.3 Confirmation of PoC Event Occurrence

To be considered complete, the PoC should have been physically demonstrated with evidence provided that the demonstration has taken place.

Provide details on venue and content of PoC demonstration event. Provide pictures and supporting literature where available. Please identify who was present at the demonstration event (optional).

- PoC Demonstration Event Details: _____

B.1.4 PoC Goals Status Report

Specify PoC Goals from NFV ISG PoC Proposal (clause A.1.2). Identify any changes from the original NFV ISG PoC Proposal with an explanation as to why the changes were made. Indicate the extent that each goal was met. Provide sufficient information for those not familiar with the PoC goals to understand what has been achieved and/or learned.

- PoC Project Goal #1: _____ Goal Status (Demonstrated/Met?) _____

List additional (optional) PoC Project Goals (follow the same format).

B.1.5 PoC Feedback Received from Third Parties (Optional)

- Where applicable, provide in a free text, feedback received from potential customers, Ecosystem partners, event audience and/or general public.

B.2 NFV PoC Technical Report (Optional)

B.2.1 PoC Scenario Report

PoC Teams are encouraged to provide technical details on the results of their PoC using the PoC Scenario Report template below.

Use the table structure below and refer back to the Scenarios in the NFV ISG PoC Proposal (clause A.2.2) and provide information for each of them. Feel free to include additional Scenarios developed during the implementation of the PoC. Do not eliminate Scenarios that were not performed, instead provide a brief status for each with a reason why the scenario was not performed. Do not hesitate to fill multiple instances of the table if several objectives have been demonstrated for each scenario.

Objective Id:	UC[UC#]/SCE[SCE#]/[OBJ#] i.e. "UC4/SCE1/1"	
Description:	Description of the PoC Demo Objective: i.e. "Partial virtualisation of EPC: Predictable impact of MME replacement by vMME"	
Pre-conditions	Description of the pre-demo state, reference measures to be taken before demo starts (Optional)	
Procedure:	1	Description of how the PoC Demo Objective has been demonstrated. Can be detailed as a sequence (intermediate steps, measures to be taken, ...)
	2	
	...	
Results Details:	i.e. "objective demonstrated/objective not demonstrated/not run/etc."(Optional)	
Lessons Learnt & Recommendations	What was learnt with this demo? What are the recommendations for the NFV ISG work or the industry as a whole. i.e. "MME by vMME replacement has an important impact on This impact can be minimized (or predicted) by ... Additional requirements covering need to be specified"	

Objective Id:	UC4/SCE1/2	
Description:	...	
Pre-conditions		
Procedure:	1	
	2	
	...	
Results Details:		
Lessons Learnt & Recommendations		

B.2.2 PoC Contribution to NFV ISG

Use the table below to list any contributions to the NFV ISG resulting from this PoC Project.

Contribution	WG/EG	Work Item (WI)	Comments
Xxxxxx	PER	ETSI GS NFV-PER 001 [i.1].	<i>i.e. "New test proposal covering a different type of workload and proposing additional parameters for the portability templates"</i>
Yyyyyy			<i>i.e. "New WI proposal addressing"</i>
...			

B.2.3 Gaps identified in NFV standardization

Use the table below to indicate Gaps in standardization identified by this PoC Team including which forum(s) would be most relevant to work on closing the gap(s). Where applicable, outline any action(s) the NFV ISG should take.

Gap Identified	Forum (NFV ISG, Other)	Affected WG/EG	WI/Document Ref	Gap details and Status
Xxxxxx		PER	ETSI GS NFV-PER 001 [i.1]	<i>i.e. "The PoC demonstrated that Dynamic reconfiguration of Service Chain as defined in xxx does not address the needs of vMME implementation. Gap is addressed by Mano WG "</i>
Yyyyyy				
...				

B.2.4 PoC Suggested Action Items

- Provide suggested Action Items and/or further work required from the NFV ISG and/or external forums.

B.2.5 Any Additional messages the PoC Team wishes to convey to the NFV ISG as a whole?

- Provide any feedback in a free text format to the NFV ISG. Please indicate whether the team wishes any specific message to be published or publicly quoted.

B.2.6 Any Additional messages the PoC Team wishes to convey to Network Operators and Service Providers?

- Are there any specific requests/messages that the team would like to convey to Network Operators and Service Providers?

History

Document history		
V1.1.1	October 2013	Publication as ETSI GS NFV-PER 002
V1.1.2	December 2014	Publication as ETSI GS NFV-PER 002
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