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Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Functional requirements specification

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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).

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1 Scope

The present document specifies functional requirements for NFV management and orchestration, and general guidelines and requirements for NFV management and orchestration interface design.

The scope of the present document does not cover the functional requirements on interfaces.

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/.

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The following referenced documents are necessary for the application of the present document.

Not applicable.

2.2 Informative references

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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] Void.

[i.2] ETSI GR NFV 003: "Network Functions Virtualisation (NFV); Terminology for main concepts in NFV".

[i.3] ETSI GS NFV 004: "Network Functions Virtualisation (NFV); Virtualisation Requirements".

[i.4] Void.

[i.5] Void.

[i.6] Void.

[i.7] Void.

[i.8] ETSI GS NFV-PER 001: "Network Functions Virtualisation (NFV); NFV Performance & Portability Best Practises".

[i.9] ETSI GR NFV-IFA 023: "Network Functions Virtualisation (NFV); Management and Orchestration; Report on Policy Management in Mano; Release 3".

[i.10] ETSI GR NFV-TST 005: "Network Functions Virtualisation (NFV); Continuous Development and Integration; Report on use cases and recommendations for VNF Snapshot".

[i.11] ETSI GR NFV-IFA 022: "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Report on Management and Connectivity for Multi-Site Services".

[i.12] ETSI GR NFV-EVE 012 (V3.1.1): "Network Functions Virtualisation (NFV) Release 3; Evolution and Ecosystem; Report on Network Slicing Support with ETSI NFV Architecture Framework".

[i.13] ETSI GS NFV-IFA 013: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Os-Ma-nfvo reference point - Interface and Information Model Specification".

[i.14] ETSI GS NFV-IFA 005: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Or-Vi reference point - Interface and Information Model Specification".

[i.15] ETSI GS NFV-IFA 007: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Or-Vnfm reference point - Interface and Information Model Specification".

[i.16] ETSI GS NFV-IFA 008: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification".

[i.17] ETSI GS NFV-IFA 014: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Network Service Templates Specification".

[i.18] ETSI GR NFV 001: "Network Functions Virtualisation (NFV); Use Cases".

[i.19] ETSI GS NFV-IFA 011: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; VNF Descriptor and Packaging Specification".

[i.20] ETSI GS NFV-REL 006: "Network Functions Virtualisation (NFV) Release 3; Reliability; Maintaining Service Availability and Continuity Upon Software Modification".

[i.21] ETSI GS NFV 006: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Architectural Framework Specification".

[i.22] ETSI GS NFV-IFA 040: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Requirements for service interfaces and object model for OS container management and orchestration specification".

[i.23] ETSI GS NFV-IFA 036: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Requirements for service interfaces and object model for container cluster management and orchestration specification".

[i.24] ETSI GS NFV-IFA 047: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Management data analytics Service Interface and Information Model".

[i.25] ETSI GS NFV-IFA 050: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Intent Management Service Interface and Information Model Specification".

[i.26] ETSI GR NFV-IFA 029: "Network Functions Virtualisation (NFV) Release 3; Architecture; Report on the Enhancements of the NFV architecture towards "Cloud-native" and "PaaS"".

[i.27] ETSI GR NFV-IFA 037: "Network Functions Virtualisation (NFV) Release 4; Architectural Framework; Report on further NFV support for 5G".

[i.28] ETSI GR NFV-EVE 019: "Network Functions Virtualisation (NFV) Release 5; Architectural Framework; Report on VNF generic OAM functions".

[i.29] ETSI GS NFV-IFA 049: "Network Functions Virtualisation (NFV) Release 5; Architectural Framework; VNF generic OAM functions specification".

[i.30] ETSI GS NFV-IFA 026: "Network Functions Virtualisation (NFV) Release 5; Management and Orchestration; Architecture enhancement for Security Management Specification".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI GR NFV 003 [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 NFV 003 [i.2].

compute host: whole server entity, part of an NFVI, composed of a HW platform (processor, memory, I/O devices, internal disk) and a hypervisor running on it

NOTE: This definition is from ETSI GS NFV-PER 001 [i.8].

containerized workload: VNF or VNF component designed to be deployed and managed on Container Infrastructure Service (CIS) instances

NOTE: This definition is from ETSI GS NFV-IFA 040 [i.22].

data flow mirroring job: set of processing tasks that enables the data flow mirroring from specified source network end points and the forwarding of the mirrored data flow to a specific destination network endpoint

EXAMPLE: In the OpenStack® case, data flow mirroring jobs are performed by a TaaS function.

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deployable module: set of optional VDUs, specified in the VNFD for a particular VNF deployment flavour, which are used to create VNFC instances only if selected by the consumer in a VNF lifecycle management operation

Network Service (NS) healing: procedure that includes all virtualisation related corrective actions to repair a faulty Network Service (NS) instance including components/functionalities which make up the instance, and have been associated with this fault situation

NOTE 1: In a virtualised environment network service healing focuses only on the virtualised components/functionalities. In case of an NS consisting of virtualised and non-virtualised parts, a procedure able to handle both parts is needed. This will be done in connection with components/functionalities that are located outside the virtualised environment.

NOTE 2: "Virtualisation related corrective actions" refers to action(s) toward virtualised resource(s) and associated NS instance.

Operating System (OS) container: virtualisation container utilizing a shared Operating System (OS) kernel of its host

NOTE 1: The host providing the shared OS kernel can be a physical compute node or another virtualisation container.

NOTE 2: This definition is from ETSI GS NFV-IFA 040 [i.22].

PaaS Service consumer: one or more specific set of applications or services that consume a PaaS Service

EXAMPLE: Consumers can be VNFs or NS.

service availability level: information provided to assist in the selection of virtualised resources to be allocated for the NS constituents in terms of availability

VNF Common Service: modular service or a function with a lifecycle independent from its consumers and that is consumable by either one or multiple services

NOTE: Consumer of VNF Common Service can be VNFs or other services.

EXAMPLE: Messaging and storage services in IT PaaS systems, monitoring service, networked (or network-based) services like authentication and synchronization, and encryption service.

VNF Dedicated Service: modular service or a function with a lifecycle dependent on its consumers and that can only be consumed by a specific set of applications or services

NOTE: Consumer of VNF Dedicated Services can be VNFs or other services.

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GR NFV 003 [i.2] and the following apply:

CIR	Container Image Registry
CMF	Certificate Management Function
FPGA	Field Programmable Gate Array
NUMA	Non Uniform Memory Access
P	P-node (Provider node)
PCIe	Peripheral Component Interface express
PE	Provider Edge
PSD	PaaS Services Descriptor
PSM	PaaS Services Management
PSR	PaaS Services Repository
URI	Uniform Resource Identifier

4 General Description

4.1 Introduction

Network Functions Virtualisation (NFV) adds new capabilities to communications networks and requires a new set of management and orchestration functions to be added to the current model of operations, administration, maintenance and provisioning. The NFV Management and Orchestration (NFV-MANO) architectural framework has the role to manage the infrastructure and orchestrate the resources needed by the Network Services (NSs) and Virtualised Network Functions (VNFs).

In order to guide the development of the specification of the interfaces exposed between the NFV-MANO Functional Blocks (FBs), it is important to have a clear and consolidated set of functional requirements to be addressed by the NFV-MANO. The present document is providing functional requirements on NFV-MANO e.g. VNF Lifecycle Management (LCM), NS LCM, virtualised resource management, etc.

4.2 Overview

In order to provide systematic functional requirements, the present document arranges the functional requirements by categorizing the requirements according to key operational functions of NFV-MANO, which are documented in ETSI GS NFV 006 [i.21].