



Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Requirements and interfaces specification for management of NFV-MANO

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ReferenceRGS/NFV-IFA031ed321

Keywordsinterface, management, MANO, NFV,
requirements

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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

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1 Scope

The present document specifies the interface requirements, the interfaces and the necessary information elements enabling the fault, configuration and information, performance, state and log management of NFV-MANO functional entities.

In addition, the present document also describes the framework to support the management of NFV-MANO functional entities.

The different aspects specified in the present document have been analysed firstly in ETSI GR NFV-IFA 021 [i.1].

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.

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

- [1] ETSI GS NFV-IFA 010 (V3.1.1): "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Functional requirements specification".
- [2] Recommendation ITU-T X.733: "Information technology - Open Systems Interconnection - Systems Management: Alarm reporting function".

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.

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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] ETSI GR NFV-IFA 021 (V3.1.1): "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Report on management of NFV-MANO and automated deployment of EM and other OSS functions".
- [i.2] ETSI GS NFV-MAN 001 (V1.1.1): "Network Functions Virtualisation (NFV); Management and Orchestration".
- [i.3] ETSI GS NFV-IFA 005 (V2.3.1): "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Or-Vi reference point - Interface and Information Model Specification".
- [i.4] ETSI GS NFV-IFA 006 (V2.3.1): "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Vi-Vnfm reference point - Interface and Information Model Specification".

- [i.5] ETSI GS NFV-IFA 007 (V2.3.1): "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Or-Vnfm reference point - Interface and Information Model Specification".
 - [i.6] ETSI GS NFV-IFA 008 (V2.3.1): "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification".
 - [i.7] ETSI GS NFV-IFA 013 (V2.3.1): "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Os-Ma-Nfvo reference point - Interface and Information Model Specification".
 - [i.8] ETSI GS NFV-IFA 011 (V2.3.1): "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; VNF Packaging Specification".
 - [i.9] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
 - [i.10] Recommendation ITU-T X.731: "Information technology - Open Systems Interconnection - Systems Management: State management function".
 - [i.11] Linux™ man pages: "vmstat - Report virtual memory statistics".
- NOTE Available at: <http://man7.org/linux/man-pages/man8/vmstat.8.html>.
- [i.12] ETSI GS NFV 003 (V1.3.1): "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".
 - [i.13] ETSI GS NFV-SEC 012 (V3.1.1): "Network Functions Virtualisation (NFV) Release 3; Security; System architecture specification for execution of sensitive NFV components".
 - [i.14] ETSI GS NFV-SEC 006 (V1.1.1): "Network Functions Virtualisation (NFV); Security Guide; Report on Security Aspects and Regulatory Concerns".
 - [i.15] ETSI GS NFV-SEC 014 (V3.1.1): "Network Functions Virtualisation (NFV) Release 3; NFV Security; Security Specification for MANO Components and Reference Points".

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 [i.12] 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 GS NFV 003 s[i.12].

NFV-MANO functional entity application: set of NFV-MANO services

NFV-MANO functional entity component: internal component of an NFV-MANO functional entity

NFV-MANO management service: one or more management capabilities offered by an NFV-MANO functional block for the support of its operations, administration and maintenance

NFV-MANO service interface: interface, associated to an NFV-MANO service, over which operations can be invoked and/or notifications issued

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GS NFV 003 [i.12] and the following apply:

FM	Fault Management
HTTP	Hypertext Transfer Protocol
MANO	Management and Orchestration
OM	Object Mapping
OSS	Operations Support Systems
PM	Performance Management
PNFD	PNF Descriptor
RAM	Random Access Memory
SC	Status Counter
TF	Transparent Forwarding
VL	Virtual Link
VR	Virtualised Resource

4 Overview and framework of management of NFV-MANO

4.1 Introduction

Network Functions Virtualisation (NFV) introduces a new set of management and orchestration functions in addition to existing Element Management (EM) and Operations Support Systems (OSS) functions. This new set of management and orchestration functions is referred as Network Functions Virtualisation Management and Orchestration (NFV-MANO), and is used to manage and orchestrate:

- The relationship between the Virtualised Network Functions (VNFs) and the NFV Infrastructure (NFVI).
- The interconnection of VNFs and/or other Physical Network Functions (PNFs) and/or nested Network Service(s) (NS) to realize a NS.

The NFV-MANO architectural framework in ETSI GS NFV-MAN 001 [i.2] identifies and describes the following functional blocks:

- NFV Orchestrator (NFVO);
- VNF Manager (VNFM); and
- Virtualised Infrastructure Manager (VIM).

The NFVO has two main responsibilities:

- the orchestration of NFVI resources across multiple VIM instances, fulfilling the Resource Orchestration functions; and
- the lifecycle management of NS, fulfilling the Network Service Orchestration functions.

The VNFM is mainly responsible for the lifecycle management of VNF instances.

The VIM is responsible for controlling and managing NFVI compute, storage and network resources. The VIM manages the association of the virtualised resources to the physical compute, storage and networking resources.

Functional requirements for the NFVO, VNFM and VIM are specified in ETSI GS NFV-IFA 010 [1].

NFV-MANO functional entities shall be able to be managed for the purpose of configuring, monitoring and retrieving relevant information for the network operator as specified in clause 5.3 and clause 10 of ETSI GS NFV-IFA 010 [1].