

ETSI GS NFV-IFA 030 V3.7.1 (2022-11)



Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Multiple Administrative Domain Aspect Interfaces Specification

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ReferenceRGS/NFV-IFA030ed371

Keywordsinterface, management, MANO, NFV

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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 the functional requirements, interfaces and operations to support the provision of network services across multiple administrative domains based on the interactions between NFVOs in different administrative domains (supported over the Or-Or reference point).

The present document also specifies the information elements exchanged over the specified interfaces.

The different aspects specified in the present document are derived from ETSI GR NFV-IFA 028 [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.

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-IFA 013: "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Os-Ma-Nfvo reference point - Interface and Information Model Specification".
- [2] ETSI GS NFV-IFA 010: "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Functional requirements specification".

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 028: "Network Functions Virtualisation (NFV) Release 3; Management and Orchestration; Report on architecture options to support multiple administrative domains".
- [i.2] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".
- [i.3] ETSI GR NFV 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".
- [i.4] ETSI GS NFV-SEC 004 (V1.1.1): "Network Functions Virtualisation (NFV); NFV Security; Privacy and Regulation; Report on Lawful Interception Implications".
- [i.5] ETSI GS NFV-SEC 006 (V1.1.1): "Network Functions Virtualisation (NFV); Security Guide; Report on Security Aspects and Regulatory Concerns".

- [i.6] ETSI GS NFV-SEC 010 (V1.1.1): "Network Functions Virtualisation (NFV); NFV Security; Report on Retained Data problem statement and requirements".
- [i.7] 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.8] 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 GR NFV 003 [i.3] and the following apply:

NFVO-C: NFVO that manages a composite NS instance that has one or more nested NS instances as constituents which are managed by an NFVO in another administrative domain

NFVO-N: NFVO that manages an NS instance which is used as a nested NS of a composite NS instance managed by an NFVO in another administrative domain

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GR NFV 003 [i.3] and the following apply:

NOTE: An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in ETSI GR NFV 003 [i.3].

LCM Life Cycle Management

4 Overview of interfaces for the provisioning of network services across multiple administrative domains

4.1 Introduction

NFV-MANO services can be offered and consumed across multiple administrative domains. Those administrative domains can be mapped to different organizations, e.g. different network operators or different departments of the same network operator.

Based on the study output of ETSI GR NFV-IFA 028 [i.1], multiple administrative domain aspect includes the case of network service offered by multiple administrative domains. The concept of composite NS and nested NS as specified in ETSI GS NFV-IFA 010 [2] is utilized. Reference point Or-Or is provided in NFV-MANO architecture for supporting the interoperability in this case.

The Or-Or reference point is used for the exchanges between NFVOs in different administrative domains, and supports the following interfaces:

- Network Service Descriptor (NSD) Management;
- Network Service (NS) Lifecycle Management;
- NS Lifecycle Operation Granting;

- NS Instance Usage Notification;
- NS Performance Management;
- NS Fault Management;
- Policy Management.

The information elements exchanged via the interfaces above are also part of the present document.

4.2 Relation to other NFV group specifications

The present document is referencing information from the following ISG NFV Group Specifications:

- Management and Orchestration - Functional requirements specification ETSI GS NFV-IFA 010 [2]:
 - Interfaces associated with the Or-Or reference point are based on the functional requirements specified in ETSI GS NFV-IFA 010 [2] for the NFVO.
- Management and Orchestration - Os-Ma-Nfvo reference point - Interface and Information Model Specification ETSI GS NFV-IFA 013 [1]:
 - The NSD Management, NS Lifecycle Management, NS Performance Management, NS Fault Management interface and Policy Management on the Or-Or reference point are based on corresponding interfaces defined in ETSI GS NFV-IFA 013 [1]. For NSD Management and NS Lifecycle Management interface, only a subset of operations in ETSI GS NFV-IFA 013 [1] is applied on the related interfaces of the Or-Or reference point.

4.3 Conventions

The following notations, defined in ISO/IEC 9646-7 [i.2], are used for the qualifier column of interface information elements:

- M mandatory - the capability is required to be supported;
- O optional - the capability may be supported or not;
- CM conditional mandatory - the capability is required to be supported and is conditional on the support of some condition. This condition shall be specified in the Description column;
- CO conditional optional - the capability may be supported or not and is conditional on the support of some condition. This condition shall be specified in the Description column.

The following notation is used for parameters that represent identifiers, and for attributes that represent identifiers in information elements and notifications:

- If parameters are referring to an identifier of an actual object, their type is "Identifier".
- If an object (information element or notification) contains an attribute that identifies the object, the type of that attribute is "Identifier" and the description states that the attribute is the identifier of that particular notification or information element.

EXAMPLE 1: Identifier "resourceId" of the "NetworkSubnet information element" has type "Identifier" and description "Identifier of this NetworkSubnet information element".

- If an object (information element or notification) contains an attribute that references another object or objects defined in an ETSI NFV GS, the type of the attribute is "Identifier", followed by the list of objects it references.

EXAMPLE 2: "Identifier (Reference to Vnfc)" or "Identifier (Reference to Vnfc, Virtual Link (VL) or VirtualStorage)".

If the type of a parameter or attribute has been marked as "Not specified" in the "Content" column, this means that its specification is part of the protocol design/data model design.

5 Reference points and interface requirements

5.1 Introduction

This clause defines requirements applicable to interfaces in the context of the Or-Or reference point for the provisioning of network service across multiple administrative domains. In this case, the NFVO managing the composite NS is indicated as NFVO-C, and the NFVO managing the nested NS is indicated as NFVO-N.

5.2 Or-Or reference point requirements

Table 5.2-1 specifies requirements applicable to the Or-Or reference point.

Table 5.2-1: Or-Or reference point requirements

| Numbering | Functional requirement description |
|-----------|---|
| Or-Or.001 | The Or-Or reference point shall support the NSD Management interface produced by NFVO-N. |
| Or-Or.002 | The Or-Or reference point shall support the NS Lifecycle Management interface produced by NFVO-N. |
| Or-Or.003 | The Or-Or reference point shall support the NS Performance Management interface produced by NFVO-N. |
| Or-Or.004 | The Or-Or reference point shall support the NS Fault Management interface produced by NFVO-N. |
| Or-Or.005 | The Or-Or reference point shall support the NS Lifecycle Operation Granting interface produced by NFVO-C. |
| Or-Or.006 | The Or-Or reference point shall support the NS Instance Usage Notification interface produced by NFVO-C. |
| Or-Or.007 | The Or-Or reference point shall support the Policy Management interface produced by NFVO-N. |

5.3 Or-Or interface requirements

5.3.1 NSD Management interface requirements

The Or-Or reference point shall support the requirement Os-Ma-nfvo.Nsd.005 defined in ETSI GS NFV-IFA 013 [1], clause 5.3.1. The NFVO producing the interface is NFVO-N.

5.3.2 NS Lifecycle Management interface requirements

The Or-Or reference point shall support Requirement Os-Ma-nfvo.NsLcm.001, Os-Ma-nfvo.NsLcm.002, Os-Ma-nfvo.NsLcm.003, Os-Ma-nfvo.NsLcm.004, Os-Ma-nfvo.NsLcm.010, Os-Ma-nfvo.NsLcm.035, Os-Ma-nfvo.NsLcm.022 and Os-Ma-nfvo.NsLcm.028 defined in ETSI GS NFV-IFA 013 [1], clause 5.3.2. The NFVO producing the interface is NFVO-N.

Table 5.3.2-1 specifies additional requirements applicable to the network service lifecycle management interface produced by NFVO-N on the Or-Or reference point.

Table 5.3.2-1: Network service lifecycle management interface requirements

| Numbering | Functional requirement description |
|-----------------|---|
| Or-Or.NsLcm.001 | The NS lifecycle management interface produced by NFVO-N on the Or-Or reference point shall support sharing a nested NS instance among multiple NS instances. See note. |
| Or-Or.NsLcm.002 | The NS lifecycle management interface produced by NFVO-N on the Or-Or reference point shall support providing notifications about changes of an NS instance that are related to NS lifecycle management operations. |
| Or-Or.NsLcm.003 | The NS lifecycle management interface produced by NFVO-N on the Or-Or reference point shall support subscribing to NS lifecycle change notifications. |
| NOTE: | A nested NS instance can be shared among NS instances managed by the same or other NFVO. |

The mechanism of tracking a tenancy (e.g. the composite NS) in another administrative domain is not defined in the present document.

5.3.3 NS Lifecycle Operation Granting interface requirements

Table 5.3.3-1 specifies requirements applicable to the NS Lifecycle Operation Granting interface produced by NFVO-C on the Or-Or reference point.

Table 5.3.3-1: NS Lifecycle Operation Granting interface requirements

| Numbering | Requirement |
|------------------|---|
| Or-Or.NSLcog.001 | The NS Lifecycle Operation Granting interface produced by NFVO-C on the Or-Or reference point shall support granting NS lifecycle operations. |

5.3.4 NS Instance Usage Notification interface requirements

Table 5.3.4-1 specifies requirements applicable to the NS Instance Usage Notification interface produced by NFVO-C on the Or-Or reference point (see clause 6.1.6 for more illustration on NS instance usage).

Table 5.3.4-1: NS Instance Usage Notification interface requirements

| Numbering | Requirement |
|-----------------|---|
| Or-Or.NSlun.001 | The NS Instance Usage Notification interface produced by NFVO-C on the Or-Or reference point shall support notifying the usage of the NS. |

5.3.5 NS Performance Management interface requirements

The Or-Or reference point shall support NS Performance Management interface requirements defined in ETSI GS NFV-IFA 013 [1], clause 5.3.4. The NFVO producing the interface is NFVO-N.

5.3.6 NS Fault Management interface requirements

The Or-Or reference point shall support NS Fault Management interface requirements defined in ETSI GS NFV-IFA 013 [1], clause 5.3.5. The NFVO producing the interface is NFVO-N.

5.3.7 Policy Management interface requirements

The Or-Or reference point shall support Policy Management interface requirements defined in ETSI GS NFV-IFA 013 [1], clause 5.3.8. The NFVO producing the interface is NFVO-N.

NOTE: For interface requirements related to transferring policy, the case that NFVO-C transfers policies to the VNFM or the VIM in the administrative domain of NFVO-N via NFVO-N does not apply.

6 Interfaces related to multiple administrative domains

6.1 NFVO exposed interfaces

6.1.1 Introduction

This clause defines the interfaces exposed by NFVO-N towards NFVO-C or exposed by NFVO-C towards NFVO-N over the Or-Or reference point.

Interface operations of NSD management, NS lifecycle management, NS performance management and NS fault management can be reused from corresponding definitions in ETSI GS NFV-IFA 013 [1]. Interface operations of NS lifecycle operation granting and NS instance usage notification which cannot be directly reused from ETSI GS NFV-IFA 013 [1] are specified in the present document in details.

6.1.2 NSD Management interface

This interface allows NFVO-C to invoke NSD management operations towards NFVO-N.

Only one operation of query NSD Info is supported by this interface. The definition of query NSD Info operation in clause 7.2.7 of ETSI GS NFV-IFA 013 [1] applies for the Or-Or reference point, except that the producer is NFVO-N and the consumer is NFVO-C.

6.1.3 NS Lifecycle Management interface

This interface allows NFVO-C to invoke NS lifecycle management operations towards NFVO-N.

The following operations are defined for this interface, and these operations are reused from ETSI GS NFV-IFA 013 [1], except that the producer is NFVO-N and the consumer is NFVO-C. Other operations of NS lifecycle management interface in ETSI GS NFV-IFA 013 [1] are not supported over Or-Or reference point:

- Create NS Identifier (refer to clause 7.3.2 of ETSI GS NFV-IFA 013 [1]).
- Delete NS Identifier (refer to clause 7.3.8 of ETSI GS NFV-IFA 013 [1]).
- Instantiate NS (refer to clause 7.3.3 of ETSI GS NFV-IFA 013 [1]).
- Terminate NS (refer to clause 7.3.7 of ETSI GS NFV-IFA 013 [1]).
- Scale NS (refer to clause 7.3.4 of ETSI GS NFV-IFA 013 [1]).
- Heal NS (refer to clause 7.3.9 of ETSI GS NFV-IFA 013 [1]).
- Query NS (refer to clause 7.3.6 of ETSI GS NFV-IFA 013 [1]).
- Get Operation Status (refer to clause 7.3.10 of ETSI GS NFV-IFA 013 [1]).
- Subscription/Notification (refer to clause 7.3.11 to clause 7.3.14 of ETSI GS NFV-IFA 013 [1]).

NOTE: There may be a need to restrict information about NS instance exposed in the NS query operation in the nested NS sharing scenario. The resolution is related to the isolation of information in multiple tenancy management and out of the scope of the present document.

6.1.4 NS Performance Management interface

This interface allows providing of performance information related to network services.

The operations in clause 7.5 of ETSI GS NFV-IFA 013 [1] apply for the Or-Or reference point, except that the producer is NFVO-N and the consumer is NFVO-C.

6.1.5 NS Fault Management interface

This interface allows NFVO-N to provide alarms related to the NS visible to NFVO-C.

The operations in clause 7.6 of ETSI GS NFV-IFA 013 [1] apply for the Or-Or reference point, except that the producer is NFVO-N and the consumer is NFVO-C.