



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

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Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology.....	5
1 Scope	6
2 References	6
2.1 Normative references	6
2.2 Informative references.....	6
3 Definition of terms, symbols and abbreviations.....	7
3.1 Terms.....	7
3.2 Symbols.....	7
3.3 Abbreviations	7
4 Overview of interfaces for the provisioning of network services across multiple administrative domains	7
4.1 Introduction	7
4.2 Relation to other NFV group specifications	8
4.3 Conventions.....	8
5 Reference points and interface requirements	9
5.1 Introduction	9
5.2 Or-Or reference point requirements	9
5.3 Or-Or interface requirements	9
5.3.1 NSD Management interface requirements	9
5.3.2 NS Lifecycle Management interface requirements	9
5.3.3 NS Lifecycle Operation Granting interface requirements.....	10
5.3.4 NS Instance Usage Notification interface requirements	10
5.3.5 NS Performance Management interface requirements.....	10
5.3.6 NS Fault Management interface requirements.....	10
5.3.7 Policy Management interface requirements.....	10
6 Interfaces related to multiple administrative domains.....	10
6.1 NFVO exposed interfaces	10
6.1.1 Introduction.....	10
6.1.2 NSD Management interface.....	10
6.1.3 NS Lifecycle Management interface.....	11
6.1.4 NS Performance Management interface	11
6.1.5 NS Fault Management interface	11
6.1.6 NS Instance Usage Notification Interface.....	11
6.1.6.1 Description	11
6.1.6.2 Subscribe operation.....	12
6.1.6.2.1 Description	12
6.1.6.2.2 Input parameters	12
6.1.6.2.3 Output parameters	12
6.1.6.2.4 Operation results.....	12
6.1.6.3 Notify operation	12
6.1.6.3.1 Description	12
6.1.6.4 Terminate Subscription operation	13
6.1.6.4.1 Description	13
6.1.6.4.2 Input parameters	13
6.1.6.4.3 Output parameters	13
6.1.6.4.4 Operation results.....	13
6.1.6.5 Query Subscription Info operation.....	13
6.1.6.5.1 Description	13
6.1.6.5.2 Input parameters	13
6.1.6.5.3 Output parameters	14
6.1.6.5.4 Operation results.....	14

6.1.7	Policy Management interface	14
6.1.8	NS Lifecycle Operation Granting interface	14
6.1.8.1	Description	14
6.1.8.2	Grant NS Lifecycle Operation.....	14
6.1.8.2.1	Description	14
6.1.8.2.2	Input parameters	14
6.1.8.2.3	Output parameters	15
6.1.8.2.4	Operation results.....	15
6.2	Void.....	15
7	Information elements.....	15
7.1	Introduction	15
7.2	Information elements and notifications related to NS instance usage notification.....	15
7.2.1	Introduction.....	15
7.2.2	NsInstanceUsageNotification	16
7.2.2.1	Description	16
7.2.2.2	Trigger conditions	16
7.2.2.3	Attributes.....	16
8	Security considerations and requirements	16
8.1	Introduction	16
8.2	Security assessment.....	16
8.3	Security requirements.....	17
Annex A (informative):	Security assessment.....	18
Annex B (informative):	Authors & contributors.....	22
Annex C (informative):	Change History	23
History		24

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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 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.

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 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 GS 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 GS 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 GS 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 GS 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 relate interfaces of the Or-Or reference point.

4.3 Conventions

The following notations, defined in ISO/IEC 9646-7 [1.2], 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 left for the protocol design/data model design stage.

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 and Os-Ma-nfvo.NsLcm.022 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.NSIun.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.

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.