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Network Functions Virtualisation (NFV) Release 3; Protocols and Data Models; RESTful protocols specification for the Or-Or Reference Point

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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 a set of RESTful protocol and data models fulfilling the requirements specified in ETSI GS NFV-IFA 030 [1] for the interfaces used over the Or-Or reference point.

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

[2] ETSI GS NFV-SOL 013: "Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models; Specification of common aspects for RESTful NFV MANO APIs".

[3] ETSI GS NFV-SOL 005: "Network Functions Virtualisation (NFV) Release 2; Protocols and Data Models; RESTful protocols specification for the Os-Ma-nfvo Reference Point".

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 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".

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.1] and ETSI GS NFV-IFA 030 [1] apply.

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI GS NFV 003 [i.1] and the following apply:

HTTP HyperText Transfer Protocol

4 General aspects

4.1 Overview

The present document defines the protocol and data model for the following interfaces, in the form of RESTful Application Programming Interface (APIs) specifications:

- NSD Management interface (as produced by the NFVO-N towards the NFVO-C)
- NS Lifecycle Management interface (as produced by the NFVO-N towards the NFVO-C)
- NS Lifecycle Operation Granting interface (as produced by the NFVO-N towards the NFVO-C)
- NS Instance Usage Notification interface (as produced by the NFVO-N towards the NFVO-C)
- NS Performance Management interface (as produced by the NFVO-N towards the NFVO-C)
- NS Fault Management interface (as produced by the NFVO-N towards the NFVO-C)

The design of the protocol and data model for the above interfaces is based on the information model and requirements defined in ETSI GS NFV-IFA 030 [1].

In the subsequent clauses, the protocol and data model for the individual interfaces are specified. Per interface, the resource structure with associated HTTP methods is defined and applicable flows are provided. Further, the resources and the data model are specified in detail.

Annex A provides the mapping of the combination of resources and methods defined in the present document to the operations defined in ETSI GS NFV-IFA 030 [1].

Even though the various interfaces defined in the present document are related, implementations shall not assume a particular order of messages that arrive via different interfaces.

4.2 Common data types

The structured data types and simple data types defined in clause 7 of ETSI GS NFV-SOL 013 [2] shall apply in the present document.

5 NSD Management interface

This interface allows the NFVO-C to invoke management operations of NSDs towards the NFVO-N.

The interface shall follow the provisions specified in the clause 5 of ETSI GS NFV-SOL 005 [3] for the NSD management interface, except that the producer is NFVO-N and the consumer is NFVO-C.

Only the "query NSD info" operation as defined in clause 5 of ETSI GS NFV-SOL 005 [3] is supported on the Or-Or reference point, i.e. only the "NS Descriptors" and "Individual NS Descriptor" resources with the GET method are supported for the present interface, and the API producer shall return a "405 Method Not Allowed" response for other methods requested on the "NS Descriptors" and "Individual NS Descriptor" resources, as defined in clause 6.4 of ETSI GS NFV-SOL 013 [2].

6 NS Lifecycle Management interface

This interface allows the NFVO-C to invoke NS lifecycle management operations of NS instances towards the NFVO-N, and to subscribe to notifications regarding NS lifecycle changes provided by the NFVO-N.

The interface shall follow the provisions specified in the clause 6 of ETSI GS NFV-SOL 005 [3] for the NS lifecycle management interface, except that the producer is NFVO-N and the consumer is NFVO-C.

The "update NS" as defined in clause 6 of ETSI GS NFV-SOL 005 [3] is not supported on the Or-Or reference point, i.e. the "Update NS task" resource and related methods are not supported for the present interface, and the API producer shall return a "404 Not Found" response for all methods requested on the "update NS" resource, as defined in clause 6.4 of ETSI GS NFV-SOL 013 [2].

7 NS Lifecycle Operation Granting interface

7.1 Description

This interface allows the NFVO-N to obtain from the NFVO-C permission for an NS lifecycle operations. This interface also allows API version information retrieval.

The operations provided through this interface are:

- Grant NS Lifecycle Operation

7.2 API version

For the NS lifecycle operation granting interface as specified in the present document, the MAJOR version field shall be 1, the MINOR version field shall be 0 and the PATCH version field shall be 0 (see clause 9.1 of ETSI GS NFV-SOL 013 [2] for a definition of the version fields). Consequently, the {apiMajorVersion} URI variable shall be set to "v1".

7.3 Resource structure and method

All resource URIs of the API shall use the base URI specification defined in clause 4.1 of ETSI GS NFV-SOL 013 [2]. The string "nslcog" shall be used to represent {apiName}. All resource URIs in the clauses below are defined relative to the above base URI.

Figure 7.3-1 shows the overall resource URI structure defined for the NS lifecycle operation granting interface.

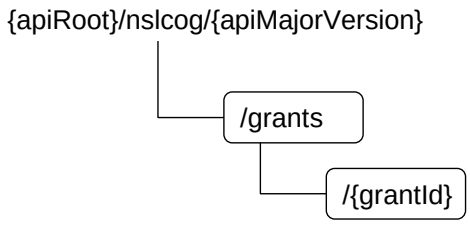

Figure 7.3-1: Resource URI structure of the NS lifecycle operation granting interface

Table 7.3-1 lists the individual resources defined, and the applicable HTTP methods.

The NFVO-C shall support responding to requests for all HTTP methods on the resources in table 7.3-1 that are marked as "M" (mandatory) in the "Cat" column. The NFVO-C shall also support the "API versions" resource as specified in clause 9.3.2 of ETSI GS NFV-SOL 013 [2].

Table 7.3-1: Resources and methods overview of the NS lifecycle operation granting interface

Resource name	Resource URI	HTTP Method	Cat	Meaning
Grants	/grants	POST	M	Request a grant
Individual grant	/grants/{grantId}	GET	M	Read a grant

7.4 Sequence diagrams (informative)

7.4.1 Flow of requesting a grant

This clause describes a sequence for requesting a grant.

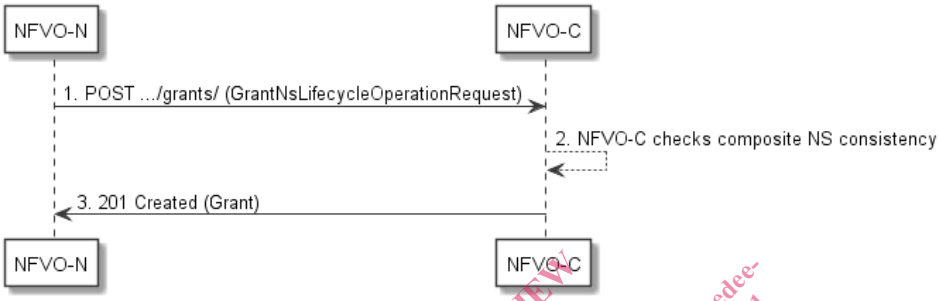

Figure 7.4.1-1: Flow of requesting a grant

The grant request procedure, as illustrated in figure 7.4.1-1, consists of the following steps:

1) The NFVO-N sends a POST request to the "Grants" resource, including one data structure of type "GrantNsLifecycleOperationRequest" in the payload body.

2) The NFVO-C checks whether the consistency of the composite NS is impacted by the nested NS lifecycle operation.

3) The NFVO-C returns a "201 Created" response with a "Grant" data structure in the body.

Error handling: In case of failure or rejection of the grant request, appropriate error information is provided in the response.

7.5 Resources

7.5.1 Introduction

This clause defines all the resources and methods provided by the NS lifecycle operation granting interface.

7.5.2 Resource: API versions

The "API versions" resources as defined in clause 9.3.3 of ETSI GS NFV-SOL 013 [2] are part of the NS lifecycle operation granting interface.

7.5.3 Resource: Grants

7.5.3.1 Description

This resource represents grants. The NFVO-N can use this resource to request a grant.

7.5.3.2 Resource definition

The resource URI is:

{apiRoot}/nslcog/{apiMajorVersion}/grants

This resource shall support the resource URI variables defined in table 7.5.3.2-1.

Table 7.5.3.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [2]
apiMajorVersion	See clause 7.2

7.5.3.3 Resource methods

7.5.3.3.1 POST

The POST method requests a grant for a particular NS lifecycle operation.

This method shall follow the provisions specified in the tables 7.5.3.3.1-1 and 7.5.3.3.1-2 for URI query parameters, request and response data structures, and response codes.

As the result of successfully processing this request, a new "Individual grant" resource shall be created.

Table 7.5.3.3.1-1: URI query parameters supported by the POST method on this resource

Name	Cardinality	Description
none supported		

Table 7.5.3.3.1-2: Details of the POST request/response on this resource

Request body	Data type	Cardinality	Description	
	GrantNsLifecycleOperationRequest	1	The NS lifecycle operation grant request parameters, as defined in clause 7.6.2.2.	
Response body	**Data type**	**Cardinality**	**Response Codes**	**Description**
	Grant		201 Created	Shall be returned when the grant has been created successfully. A representation of the created "Individual grant" resource shall be returned in the response body. The HTTP response shall include a "Location" HTTP header that indicates the URI of the "Individual grant" resource just created.
	ProblemDetails	1	403 Forbidden	Shall be returned upon the following error: the grant request was rejected. A ProblemDetails structure shall be included in the response to provide more details about the rejection in the "details" attribute.
	ProblemDetails	See clause 6.4 of [2]	4xx/5xx	In addition to the response codes defined above, any common error response code as defined in clause 6.4 of ETSI GS NFV-SOL 013 [2] may be returned.