ETSI GS NFV-SOL 012 V4.5.1 (2023-12)

GROUP SPECIFICATION

**Network Functions Virtualisation (NFV) Release 4;
Protocols and Data Models;
RESTful protocols specification for
the Policy Management Interface**

Disclaimer

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
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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 RESTful protocol and data model fulfilling the requirements specified in the following Group Specifications for the policy management interfaces used over the NFV-MANO reference points:

- ETSI GS NFV-IFA 005 [1]

- ETSI GS NFV-IFA 006 [2]

- ETSI GS NFV-IFA 007 [3]

- ETSI GS NFV-IFA 008 [4]

- ETSI GS NFV-IFA 013 [5]

- ETSI GS NFV-IFA 030 [6]

A data model for policy content is out of scope of the present document.

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 005: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Or-Vi reference point - Interface and Information Model Specification".

[2]   ETSI GS NFV-IFA 006: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Vi-Vnfm reference point - Interface and Information Model Specification".

[3]   ETSI GS NFV-IFA 007: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Or-Vnfm reference point - Interface and Information Model Specification".

[4]   ETSI GS NFV-IFA 008: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification".

[5]   ETSI GS NFV-IFA 013: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Os-Ma-Nfvo reference point - Interface and Information Model Specification".

[6]   ETSI GS NFV-IFA 030: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Multiple Administrative Domain Aspect Interfaces Specification".

[7]   ETSI GS NFV-SOL 013: "Network Functions Virtualisation (NFV) Release 4; Protocols and Data Models; Specification of common aspects for RESTful NFV MANO APIs".

[8]   ETSI GS NFV-IFA 048: "Network Functions Virtualisation (NFV) Release 4; Management and Orchestration; Policy Information Model Specification".

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

[i.2]   ETSI GR NFV-IFA 023: "Network Functions Virtualisation (NFV); Management and Orchestration; Report on Policy Management in MANO; Release 3".

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.1] apply.

3.2   Symbols

Void.

3.3   Abbreviations

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

PF   Policy Function
REST   Representational State Transfer
URI   Uniform Resource Identifier

4   General aspects

4.1   Overview

The present document defines the protocol and data model for the policy management interface used over the following reference points, in the form of RESTful Application Programming Interfaces (APIs) specifications:

- Os-Ma-nfvo reference point (interface produced by the NFVO towards the OSS/BSS).

- Or-Vnfm reference point (interface produced by the VNFM towards the NFVO).

- Ve-Vnfm-em reference point (interface produced by the VNFM towards the EM).

- Or-Vi reference point (interface produced by the VIM towards the NFVO).

- Vi-Vnfm reference point (interface produced by the VIM towards the VNFM).

- Or-Or reference point (interface produced by NFVO-N towards NFVO-C).

The design of the protocol and data model for the policy management interface is based on the information model and requirements defined in ETSI GS NFV-IFA 005 [1], ETSI GS NFV-IFA 006 [2], ETSI GS NFV-IFA 007 [3], ETSI GS NFV-IFA 008 [4], ETSI GS NFV-IFA 013 [5] and ETSI GS NFV-IFA 030 [6]. ETSI GS NFV-IFA 048 [8] specifies the structure of the NFV-MANO policies which serves as an information model for the policy content referred in the present document.

In clause 4, general aspects are specified that apply to the policy management interface over different reference points. In addition, the provisions in clauses 4, 5, 6, 8 and 9 of ETSI GS NFV-SOL 013 [7] define common aspects of RESTful NFV-MANO APIs, and shall apply for all APIs defined in the present document.

In clause 5, the protocol and data model for the policy management interface is specified. 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.

## 4.2		Common data types

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

# 5		Policy Management interface

## 5.1		Description

This interface allows the API consumer to invoke policy management operations towards the API producer, to subscribe to notifications regarding policy changes and any detected policy conflicts and to retrieve API version information.

The operations provided through this interface are:

- Transfer Policy.

- Delete Policy.

- Query Policy.

- Activate Policy.

- Deactivate Policy.

- Associate Policy.

- Disassociate Policy.

- Subscribe.

- Query Subscription Information.

- Terminate Subscription.

- Notify.

NOTE:	The association feature (i.e. the associate policy and disassociate policy operations) applies when the Policy Function (PF) that enforces the policy is NFVO, NFVO-N or VNFM.

## 5.2		API version

For the policy management 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 [7] for a definition of the version fields). Consequently, the {apiMajorVersion} URI variable shall be set to "v1".

5.3   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 [7].
The string "nfvpolicy" shall be used to represent {apiName}. All resource URIs in the clauses below are defined
relative to the above base URI.

Figure 5.3-1 shows the overall resource URI structure defined for the policy management interface.
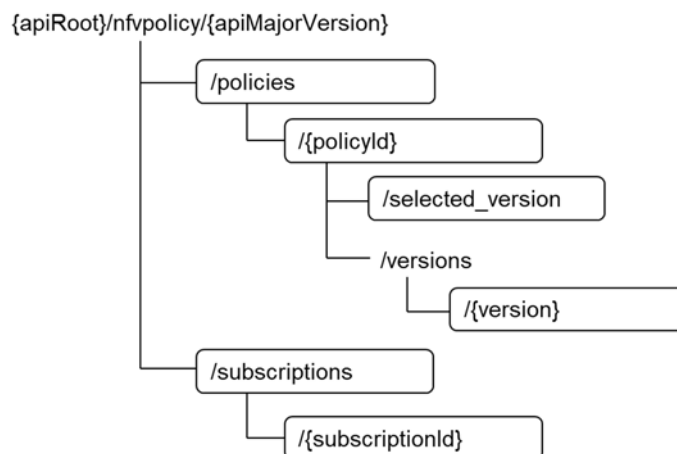
Figure 5.3-1: Resource URI structure of the policy management interface

Table 5.3-1 lists the individual resources defined, and the applicable HTTP methods.

The API producer shall support responding to requests for all HTTP methods on the resources in table 5.3-1 that are
marked as "M" (mandatory) in the "Cat" column. The API producer shall also support the "API versions" resource as
specified in clause 9.3.2 of ETSI GS NFV-SOL 013 [7].

Table 5.3-1: Resources and methods overview of the policy management interface

Resource name	Resource URI	HTTP Method	Cat	Meaning
Policies	/policies	POST	M	Create a new individual policy resource.
		GET	M	Query multiple policies.
Individual policy	/policies/{policyId}	GET	M	Read an individual policy.
		PATCH	M	Activate/deactivate, or modify the associations, or change the selected version of an individual policy.
		DELETE	M	Delete an individual policy.
Selected version of an individual policy	/policies/{policyId}/selected_version	GET	M	Read the selected version of an individual policy.
Particular version of an individual policy	/policies/{policyId}/versions/{version}	GET	M	Read a particular version of an individual policy.
		PUT	M	Transfer the content of a particular version of an individual policy.
		DELETE	M	Delete a particular version of an individual policy.

Resource name	Resource URI	HTTP Method	Cat	Meaning
Subscriptions	/subscriptions	POST	M	Subscribe to notifications of policy changes or conflicts.
		GET	M	Query multiple subscriptions.
Individual subscription	/subscriptions/{subscriptionId}	GET	M	Read an individual subscription resource.
		DELETE	M	Terminate a subscription.
Notification endpoint	(client-provided)	POST	See note	Notify about policy changes or conflicts. See note.
		GET	See note	Test the notification endpoint. See note.
NOTE: The API producer shall support invoking the HTTP methods defined for the "Notification endpoint" resource exposed by the API consumer. If the API consumer supports invoking the POST method on the "Subscriptions" resource towards the API producer, it shall also support responding to the HTTP requests defined for the "Notification endpoint" resource.				

5.4 Sequence diagrams (informative)

5.4.1 Flow of creating a policy

This clause describes a sequence for creating an individual policy resource.
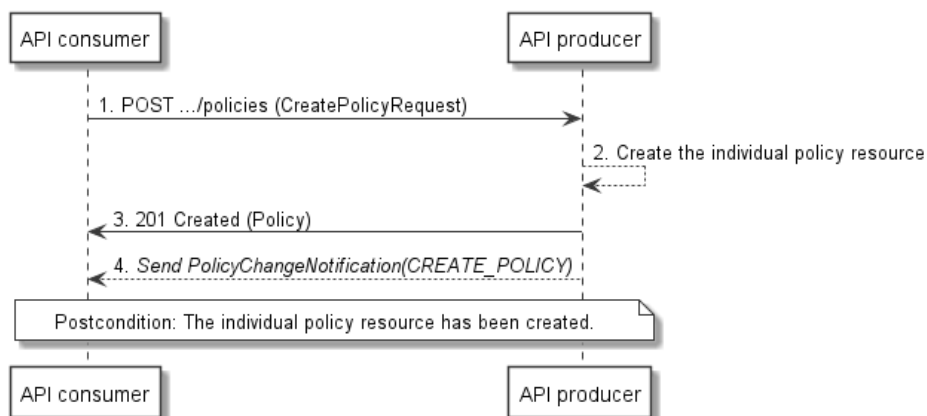
Figure 5.4.1-1: Flow of policy creation

Policy creation, as illustrated in figure 5.4.1-1, consists of the following steps.

Precondition: None.

1) The API consumer sends a POST request to the "Policies" resource, including one data structure of type "CreatePolicyRequest" in the payload body.

2) The API producer creates an individual policy resource in CREATED/DEACTIVATED state.

3) The API producer returns a "201 Created" response to the API consumer, and includes in the payload body a representation of the policy, and provides the URI of the newly-created individual policy resource in the "Location" HTTP header.

4) The API producer sends a policy change notification (see clause 5.4.8) to the API consumer to indicate the creation of the individual policy resource.

Postcondition: Upon successful completion, the individual policy resource has been created.

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

5.4.2 Flow of transferring a policy

This clause describes a sequence for transferring a policy.

Figure 5.4.2-1: Flow of policy transfer

Policy transfer, as illustrated in figure 5.4.2-1, consists of the following steps.

Precondition: The individual policy resource has been created.

1) The API consumer sends a PUT request to the "particular version of an individual policy" resource addressed by the appropriate policy identifier and version identifier in its resource URI, and includes a copy of the policy content in the payload body. The version identifier in the URI is assigned by the API consumer, and cannot be overlapped with any existing version identifiers of the same policy on the API producer.

2) The API producer creates the "particular version of an individual policy" resource.

3) If the API consumer is transferring the first version of the policy, the API producer creates the "selected version of an individual policy" resource, sets the first version as the default selected version and changes the transferState of the policy to TRANSFERRED.

4) The API producer returns a "201 Created" response to the API consumer.

5) The API producer sends a policy change notification (see clause 5.4.8) to the API consumer to indicate the transfer of the policy content.

Postcondition: Upon successful completion, the content of a particular version of the policy has been transferred, and the state of the policy is not changed.

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

5.4.3   Flow of querying/reading policies

This clause describes a sequence for querying/reading policies.

Figure 5.4.3-1: Flow of policy query/read

Policy query/read, as illustrated in figure 5.4.3-1, consists of the following steps.

Precondition: One or more individual policy resources are created.

1)   If the API consumer intends to query multiple policies, it sends a GET request to the "policies" resource.

2)   The API producer returns a "200 OK" response to the API consumer, and includes zero or more data structures of type "Policy" in the payload body.

3)   If the API consumer intends to read information about an individual policy, it sends a GET request to the "individual policy" resource, addressed by the appropriate policy identifier in its resource URI.

4)   The API producer returns a "200 OK" response to the API consumer, and includes one data structure of type "Policy" in the payload body.

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

5.4.4   Flow of fetching the content of a policy

This clause describes a sequence for fetching the content of a policy.

Figure 5.4.4-1: Flow of fetching policy content

Fetching policy content, as illustrated in figure 5.4.4-1, consists of the following steps.

Precondition: The individual policy resource is created and at least one version of the policy has been transferred.

1) If the API consumer intends to fetch the content of the selected version of the policy, it sends a GET request to the "selected version of an individual policy" resource, addressed by the appropriate policy identifier in its resource URI.

2) The API producer returns a "200 OK" response to the API consumer, and includes a copy of the policy content in the payload body.

3) If the API consumer intends to fetch the content of a particular version of the policy, it sends a GET request to the "particular version of an individual policy" resource, addressed by the appropriate policy identifier and version identifier in its resource URI.

4) The API producer returns a "200 OK" response to the API consumer, and includes a copy of the policy content in the payload body.

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

5.4.5 Flow of modifying a policy

This clause describes a sequence for modifying a policy, which includes activating/deactivating a policy, or modifying the associations of a policy, or changing the selected version of a policy.
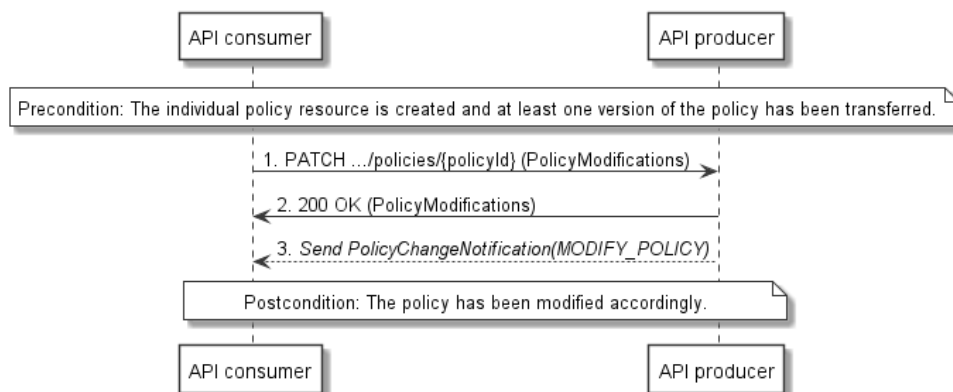
Figure 5.4.5-1: Flow of policy modification

Policy modification, as illustrated in figure 5.4.5-1, consists of the following steps.
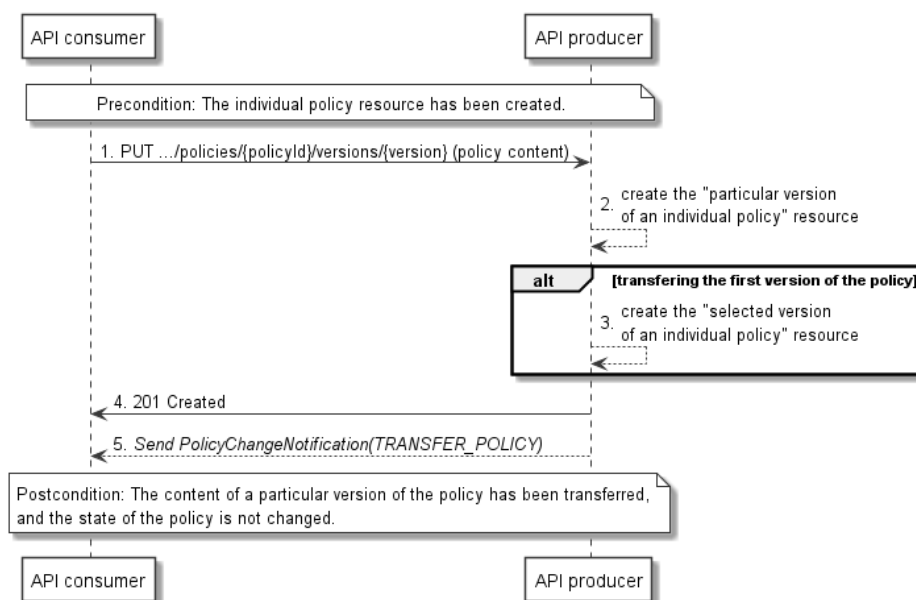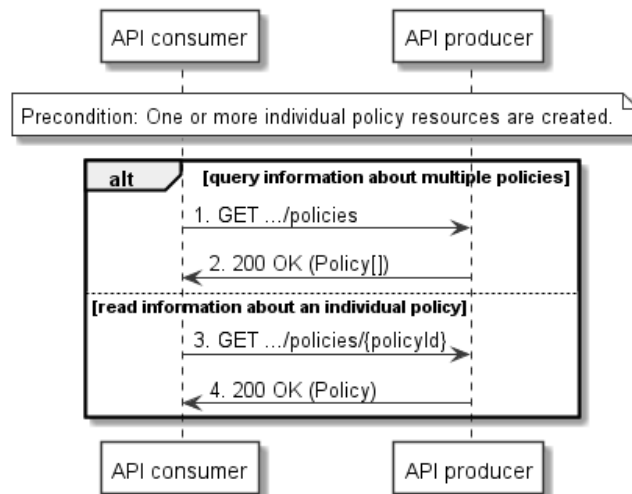
Precondition: The individual policy resource is created and at least one version of the policy has been transferred.

1) If the API consumer intends to modify a policy, it sends a PATCH request to the "individual policy" resource, addressed by the appropriate policy identifier in its resource URI, and includes one data structure of type "PolicyModifications" in the payload body.

2) The API producer returns a "200 OK" response to the API consumer, and includes in the payload body a data structure of type "PolicyModifications" to represent the applied policy modifications.

3) The API producer sends a policy change notification (see clause 5.4.8) to the API consumer to indicate the modification of the policy.

Postcondition: Upon successful completion, the policy has been modified accordingly.

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

5.4.6   Flow of deleting a policy

This clause describes a sequence for deleting a policy.
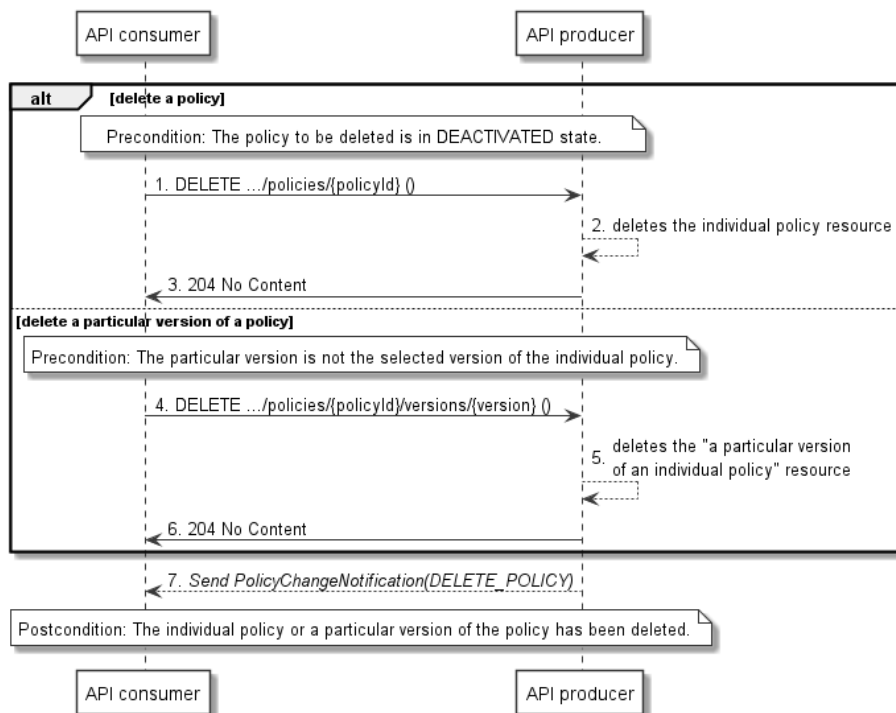
Figure 5.4.6-1: Flow of policy deletion

Policy deletion, as illustrated in figure 5.4.6-1, consists of the following steps.

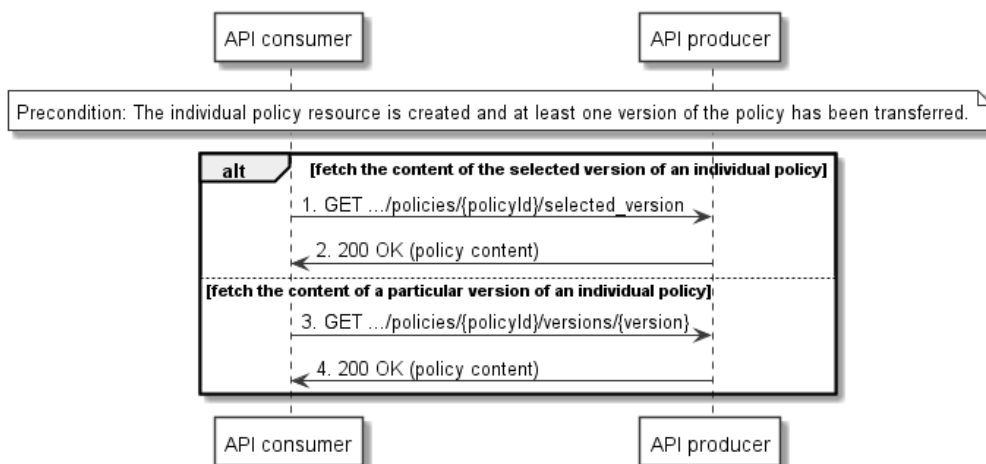**Precondition:** The individual policy resource to be deleted is in DEACTIVATED state, or the particular version of the policy to be deleted is not the selected version of the individual policy:

1) If the API consumer intends to delete an individual policy, it sends a DELETE request to the "individual policy" resource, addressed by the appropriate policy identifier in its URI.

2) The API producer deletes the individual policy resource.

3) The API producer returns a "204 No Content" response with an empty payload body to the API consumer.

4) If the API consumer intends to delete a particular version of a policy, it sends a DELETE request to the "a particular version of an individual policy" resource, addressed by the appropriate policy identifier and version identifier in its URI.

5) The API producer delete the requested "a particular version of an individual policy" resource.

6) The API producer returns a "204 No Content" response with an empty payload body to the API consumer.

7) The API producer sends a policy change notification (see clause 5.4.8) to the API consumer to indicate the deletion of the individual policy or the deletion of the particular version of the policy.

Postcondition: Upon successful completion, the individual policy or a particular version of the policy has been deleted.

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

5.4.7 Flow of managing subscriptions

This clause describes a sequence for creating, querying/reading and terminating subscriptions to notifications related to policy management.
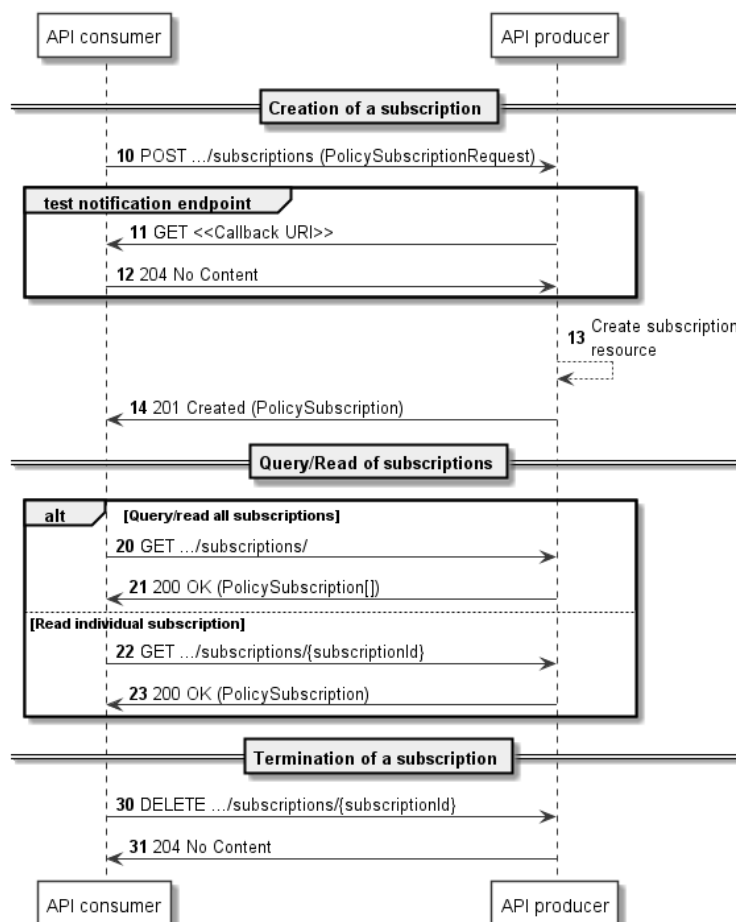
Figure 5.4.7-1: Flow of managing subscriptions

A) Procedure of subscription creation

The procedure of creating subscriptions consists of the following steps as illustrated in figure 5.4.7-1.

Precondition: The notification endpoint URI is enabled.

10) The API consumer sends a POST request to the "subscriptions" resource including in the payload body a data structure of type "PolicySubscriptionRequest". This data structure contains filtering criteria and a client side URI to which the API producer will subsequently send notifications about events that match the filter.

11) To test the notification endpoint that was registered by the API consumer as part of the subscription, the API producer sends a GET request to the notification endpoint URI.

12) The API consumer returns a "204 No Content" response to indicate success.

13) The API producer creates a new subscription for notifications related to policy management, and a resource that represents this subscription.

14) The API producer returns a "201 Created" response containing a data structure of type "PolicySubscription", representing the subscription resource created by the API producer, and provides the URI of the newly-created resource in the "Location" HTTP header.

Postcondition: The subscription to notifications related to policy management is available to the API consumer.

Error handling: The API producer rejects a subscription if the subscription information is not valid: endpoint cannot be reached, subscription information is malformed, etc.

B) Procedure of subscription query/read

The procedure of querying/reading subscriptions consists of the following steps, as illustrated in figure 5.4.7-1.

Precondition: Subscriptions have been created.

20) Optionally, for example when trying to recover from an error situation, the API consumer can query information about its subscriptions by sending a GET request to the "subscriptions" resource.

21) In case of step 20), the API producer returns a "200 OK" response that contains the list of representations of all existing subscriptions that were created by the API consumer.

22) Optionally, for example when trying to recover from an error situation, the API consumer can read information about a particular subscription by sending a GET request to the resource representing that individual subscription.

23) In case of step 22), the API producer returns a "200 OK" response that contains a representation of that individual subscription.

Postcondition: The subscription information is available to the API consumer.

Error handling: The API producer provides in the response message appropriate error information that reports an erroneous query request.

C) Procedure of subscription termination

The procedure of terminating a subscription consists of the following steps, as illustrated in figure 5.4.7-1.

Precondition: The subscription to terminate exists.

30) When the API consumer does not need the subscription anymore, it terminates the subscription by sending a DELETE request to the resource that represents the individual subscription.

31) The API producer acknowledges the successful termination of the subscription by returning a "204 No Content" response.

Postcondition: The subscription to notifications related to policy management is deleted and not available to the API consumer, and notifications associated to this subscription are not sent anymore by the API producer.

Error handling: The API producer provides in the response message appropriate error information that reports an erroneous termination request: the subscription to terminate does not exist, etc.

5.4.8   Flow of sending notifications

This clause describes the procedure for sending notifications related to policy management.
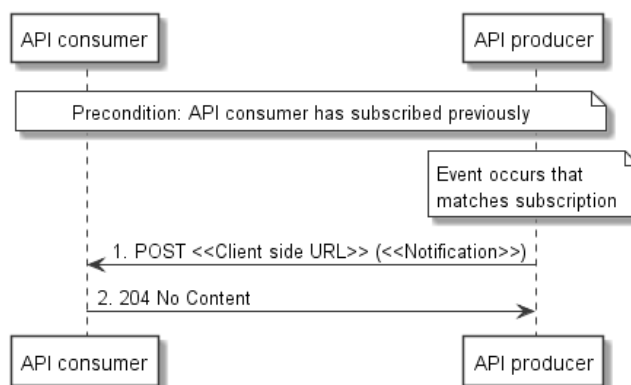
Figure 5.4.8-1: Flow of sending notifications

The procedure consists of the following steps as illustrated in figure 5.4.8-1.

Precondition: The API consumer has subscribed previously for notifications related to policy management and the API producer has thus a related subscription:

1) If an event occurs that matches the filtering criteria which are part of the subscription, the API producer generates a notification that includes information about the event, and sends it in the body of a POST request to the URI which the API consumer has registered as part of the subscription request. The variable <<Notification>> in the flow is a placeholder for the different types of notifications that can be sent by this API.

2) The API consumer acknowledges the successful delivery of the notification by returning a "204 No Content" response.

Postcondition: The notification is available to the API consumer.

Error handling: If the API producer does not receive the "204 No Content" response from the API consumer, it can retry sending the notification.

5.5   Resources

5.5.1   Introduction

This clause defines all the resources and methods provided by the policy management interface.

5.5.2   Resource: API versions

The "API versions" resources as defined in clause 9.3.3 of ETSI GS NFV-SOL 013 [7] are part of the policy management interface.

5.5.3   Resource: Policies

5.5.3.1   Description

This resource represents policies. The API consumer can use this resource to create a policy, and to query multiple policies.

5.5.3.2   Resource definition

The resource URI is:

{apiRoot}/nfvpolicy/{apiMajorVersion}/policies

This resource shall support the resource URI variables defined in table 5.5.3.2-1.

Table 5.5.3.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [7]
apiMajorVersion	See clause 5.2

5.5.3.3   Resource methods

5.5.3.3.1   POST

The POST method creates a new individual policy resource.

This method shall follow the provisions specified in tables 5.5.3.3.1-1 and 5.5.3.3.1-2 for URI query parameters, request and response data structures, and response codes.

As the result of successfully executing this method, a new "individual policy" resource as defined in clause 5.5.4 shall have been created, and the value of the "activationStatus" attribute in the representation of that resource shall be "DEACTIVATED". A notification of type PolicyChangeNotification shall be triggered as part of successfully executing this method as defined in clause 5.6.2.7.

Table 5.5.3.3.1-1: URI query parameters supported by the POST method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.3.3.1-2: Details of the POST request/response on this resource

Request body	Data type	Cardinality		Description
	CreatePolicyRequest	1		The policy creation parameters, as defined in clause 5.6.2.2.
Response body	**Data type**	**Cardinality**	**Response Codes**	**Description**
	Policy	1	201 Created	Shall be returned when a policy has been created successfully. The response body shall contain a representation of the individual policy, as defined in clause 5.6.2.3. The HTTP response shall include a "Location" HTTP header that contains the resource URI of the created policy.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.3.3.2   GET

The GET method queries information about multiple policies.

This method shall follow the provisions specified in tables 5.5.3.3.2-1 and 5.5.3.3.2-2 for URI query parameters, request and response data structures and response codes.

Table 5.5.3.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
filter	0..1	Attribute-based filtering expression according to clause 5.2 of ETSI GS NFV-SOL 013 [7]. The API producer shall support receiving this parameter as part of the URI query string. The API consumer may supply this parameter. All attribute names that appear in the Policy and in data types referenced from it shall be supported by the API producer in the filter expression.
nextpage_opaque_marker	0..1	Marker to obtain the next page of a paged response. Shall be supported by the API producer if it supports alternative 2 (paging) according to clause 5.4.2.1 of ETSI GS NFV-SOL 013 [7] for this resource.

Table 5.5.3.3.2-2: Details of the GET request/response on this resource

Request body	Data type	Cardinality		Description
	n/a			
Response body	Data type	Cardinality	Response Codes	Description
	Policy	0..N	200 OK	Shall be returned when information about zero or more policies has been queried successfully. The response body shall contain in an array the representations of zero or more policies, as defined in clause 5.6.2.3. If the "filter" URI parameter was supplied in the request and is supported, the data in the response body shall have been transformed according to the rules specified in clauses 5.2.2 and 5.3.2 of ETSI GS NFV- SOL 013 [7], respectively. If the API producer supports alternative 2 (paging) according to clause 5.4.2.1 of ETSI GS NFV-SOL 013 [7] for this resource, inclusion of the Link HTTP header in this response shall follow the provisions in clause 5.4.2.3 of ETSI GS NFV-SOL 013 [7].
	ProblemDetails	1	400 Bad Request	Shall be returned upon the following error: Invalid attribute-based filtering expression. The response body shall contain a ProblemDetails structure, in which the "detail" attribute should convey more information about the error.
	ProblemDetails	1	400 Bad Request	Shall be returned upon the following error: Response too big. If the API producer supports alternative 1 (error) according to clause 5.4.2.1 of ETSI GS NFV-SOL 013 [7] for this resource, this error response shall follow the provisions in clause 5.4.2.2 of ETSI GS NFV-SOL 013 [7].
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.3.3.3   PUT

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.3.3.4   PATCH

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.3.3.5   DELETE

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.4   Resource: Individual policy

5.5.4.1   Description

This resource represents an individual policy. The API consumer can use this resource to modify an individual policy, to read information about the policy and delete the policy.

5.5.4.2   Resource definition

The resource URI is:

{apiRoot}/nfvpolicy/{apiMajorVersion}/policies/{policyId}

This resource shall support the resource URI variables defined in table 5.5.4.2-1.

Table 5.5.4.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [7]
apiMajorVersion	See clause 5.2
policyId	Identifier of the policy. See note
NOTE:	This identifier can be retrieved from the resource referenced by the "Location" HTTP header in the response to a POST request creating a new "individual policy" resource. It can also be retrieved from the "id" attribute in the payload body of that response.

5.5.4.3   Resource methods

5.5.4.3.1   POST

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.4.3.2   GET

The GET method retrieves information about a policy by reading an individual policy resource.

This method shall follow the provisions specified in tables 5.5.4.3.2-1 and 5.5.4.3.2-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.4.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.4.3.2-2: Details of the GET request/response on this resource

Request body	Data type	Cardinality		Description	
	n/a				
Response body	Data type	Cardinality	Response Codes	Description	
	Policy	1	200 OK	Shall be returned when information about an individual policy has been read successfully. The response body shall contain a representation of the policy, as defined in clause 5.6.2.3.	
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.	

5.5.4.3.3 PUT

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.4.3.4 PATCH

The PATCH method modifies a policy.

This method shall follow the provisions specified in tables 5.5.4.3.4-1 and 5.5.4.3.4-2 for URI query parameters, request and response data structures, and response codes.

Modification of a policy includes three functionalities: activating/deactivating the policy, changing the associations of the policy, and changing the selected version of the policy. The three functionalities may be combined flexibly in one request unless there is conflict with the state of the policy. With respect to changing the associations, refer also to the provisions specified in clause 5.5.6.3.3 regarding the initial setting of the "associations" attribute values in the "Individual policy" representation, which can be modified using the present method.

Table 5.5.4.3.4-1: URI query parameters supported by the PATCH method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.4.3.4-2: Details of the PATCH request/response on this resource

Request body	Data type	Cardinality	Description	
	PolicyModifications	1	The parameter for the policy modifications, as defined in clause 5.6.2.4.	
	Data type	**Cardinality**	**Response Codes**	**Description**
Response body	PolicyModifications	1	200 OK	Shall be returned when the modifications have been processed successfully. The response body shall contain a representation of modifications of the policy, as defined in clause 5.6.2.4.
	ProblemDetails	1	409 Conflict	Shall be returned upon the following error: The operation cannot be executed currently, due to a conflict with the state of the resource. Typical reasons are attempts to: • modify a policy in CREATED state; • activate a policy in ACTIVATED state; • deactivate a policy in DEACTIVATED state. The response body shall contain a ProblemDetails structure, in which the "detail" attribute shall convey more information about the error.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.4.3.5 DELETE

The DELETE method deletes an individual policy.

This method shall follow the provisions specified in tables 5.5.4.3.5-1 and 5.5.4.3.5-2 for URI query parameters, request and response data structures, and response codes.

As the result of successfully executing this method, the "individual policy" resource shall not exist any longer. A notification of type "PolicyChangeNotification" shall be triggered as part of successfully executing this method as defined in clause 5.6.2.7.

Table 5.5.4.3.5-1: URI query parameters supported by the DELETE method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.4.3.5-2: Details of the DELETE request/response on this resource

Request body	Data type	Cardinality		Description
	n/a			
Response body	Data type	Cardinality	Response Codes	Description
	n/a		204 No Content	Shall be returned when the individual policy has been deleted successfully. The response body shall be empty.
	ProblemDetails	1	409 Conflict	Shall be returned upon the following error: The operation cannot be executed currently, due to a conflict with the state of the resource. Typically, this is due to the fact that the policy is in ACTIVATED state. The response body shall contain a ProblemDetails structure, in which the "detail" attribute shall convey more information about the error.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.5   Resource: Selected version of an individual policy

5.5.5.1   Description

This resource represents the selected version of an individual policy. The API consumer can use this resource to read the content of the selected version of the policy.

The selected version is the version to be used when activating the policy and is then enforced as long as the policy is in ACTIVATED state.

5.5.5.2   Resource definition

The resource URI is:

{apiRoot}/nfvpolicy/{apiMajorVersion}/policies/{policyId}/selected_version

This resource shall support the resource URI variables defined in table 5.5.5.2-1.

Table 5.5.5.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [7]
apiMajorVersion	See clause 5.2
policyId	Identifier of the policy. See note.
NOTE:	This identifier can be retrieved from the resource referenced by the "Location" HTTP header in the response to a POST request creating a new "individual policy" resource. It can also be retrieved from the "id" attribute in the payload body of that response.

5.5.5.3 Resource methods

5.5.5.3.1 POST

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.5.3.2 GET

The GET method fetches the content of the selected version of an individual policy.

This method shall follow the provisions specified in tables 5.5.5.3.2-1 and 5.5.5.3.2-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.5.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.5.3.2-2: Details of the GET request/response on this resource

Request body	Data type	Cardinality		Description
	n/a			
Response body	Data type	Cardinality	Response Codes	Description
	n/a	1	200 OK	Shall be returned when the content of the selected version of an individual policy has been read successfully. The response body shall include a copy of the policy content. The "Content-Type" HTTP header shall be set according to the type of the policy content.
	ProblemDetails	0..1	404 Not Found	Shall be returned upon the following error: The API producer did not find a current representation for the target resource or is not willing to disclose that one exists. The general cause for this error and its handling is specified in clause 6.4 of ETSI GS NFV-SOL 013 [7], including rules for the presence of the response body. Specifically in case of this resource, the response code 404 shall also be returned if the policy is in CREATED state. In this case, the response body shall be present, and shall contain a ProblemDetails structure, in which the "detail" attribute shall convey more information about the error.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.5.3.3 PUT

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.5.3.4   PATCH

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.5.3.5   DELETE

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.6   Resource: Particular version of an individual policy

5.5.6.1   Description

This resource represents a particular version of an individual policy. The API consumer can use this resource to transfer the content, read the content and delete a particular version of a policy.

5.5.6.2   Resource definition

The resource URI is:

{apiRoot}/nfvpolicy/{apiMajorVersion}/policies/{policyId}/versions/{version}

This resource shall support the resource URI variables defined in table 5.5.6.2-1.

Table 5.5.6.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [7].
apiMajorVersion	See clause 5.2.
policyId	Identifier of the policy. See note 1.
version	Version of the policy. See note 2.
NOTE 1: This identifier can be retrieved from the resource referenced by the "Location" HTTP header in the response to a POST request creating a new "individual policy" resource. It can also be retrieved from the "id" attribute in the payload body of that response.	
NOTE 2: This URI variable is provided by the API consumer in a PUT request creating the new particular version of an individual policy resource. It can be retrieved from the "versions" attribute in the payload body of the response to a GET request to the "individual policy" resource.	

5.5.6.3   Resource methods

5.5.6.3.1   POST

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.6.3.2   GET

The GET method fetches the content of a particular version of an individual policy.

This method shall follow the provisions specified in tables 5.5.6.3.2-1 and 5.5.6.3.2-2 for URI query parameters, request and response data structures and response codes.

Table 5.5.6.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.6.3.2-2: Details of the GET request/response on this resource

Request body	Data type	Cardinality		Description	
	n/a				
Response body	**Data type**	**Cardinality**	**Response Codes**	**Description**	
	n/a	1	200 OK	Shall be returned when the content of a particular version of an individual policy has been read successfully. The response body shall include a copy of the policy content. The "Content-Type" HTTP header shall be set according to the type of the policy content.	
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.	

5.5.6.3.3 PUT

The PUT method transfers the content of a particular version of an individual policy.

As the result of successfully executing this method, the API producer shall update the "associations" attribute in the representation of the "Individual policy" resource as follows:

- If no associations were provided in the initial creation of the "Individual policy" resource (see clause 5.5.3.3.1) and the policy content includes relevant associations information, the API producer shall set the values of "associations" attribute according to the information in the policy content.

- If associations were provided in the initial creation of the "Individual policy" resource (see clause 5.5.3.3.1) or current values are already set on the "associations" attribute in the representation of the "Individual policy" resource, and the policy content includes relevant associations information, the API producer shall not apply the values present in the policy content (i.e. values provided via the API take precedence).

This method shall follow the provisions specified in tables 5.5.6.3.3-1 and 5.5.6.3.3-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.6.3.3-1: URI query parameters supported by the PUT method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.6.3.3-2: Details of the PUT request/response on this resource

	Data type	Cardinality	Description	
Request body	n/a	1	The payload body contains a copy of the policy content. The "Content-Type" HTTP header shall be set according to the type of the policy content.	
	Data type	**Cardinality**	**Response Codes**	**Description**
Response body	n/a		201 Created	Shall be returned when the policy content has been transferred successfully. The response body shall be empty.
	ProblemDetails	1	409 Conflict	Shall be returned upon the following error: The operation cannot be executed currently, due to a conflict with an existing resource. Typically, this is due to the fact that the particular version has already been transferred to the API producer. The response body shall contain a ProblemDetails structure, in which the "detail" attribute shall convey more information about the error.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.6.3.4   PATCH

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 4.6 of ETSI GS NFV-SOL 013 [7].

5.5.6.3.5   DELETE

The DELETE method deletes a particular version of an individual policy.

This method shall follow the provisions specified in tables 5.5.6.3.5-1 and 5.5.6.3.5-2 for URI query parameters, request and response data structures, and response codes.

As the result of successfully executing this method, the "particular version of an individual policy" resource shall be deleted. It is not allowed to delete the selected version of the individual policy.

A notification of type "PolicyChangeNotification" shall be triggered as part of successfully executing this method as defined in clause 5.6.2.8.

Table 5.5.6.3.5-1: URI query parameters supported by the DELETE method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.6.3.5-2: Details of the DELETE request/response on this resource

Request body	Data type	Cardinality		Description
	n/a			
	Data type	**Cardinality**	**Response Codes**	**Description**
Response body	n/a		204 No Content	Shall be returned when a particular version of an individual policy has been deleted successfully. The response body shall be empty.
	ProblemDetails	1	409 Conflict	Shall be returned upon the following error: The operation cannot be executed currently, due to a conflict with the state of the resource. Typically, this is due to the fact that the requested version is the selected version. The response body shall contain a ProblemDetails structure, in which the "detail" attribute shall convey more information about the error.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.7   Resource: Subscriptions

5.5.7.1   Description

This resource represents subscriptions. The API consumer can use this resource to subscribe to notifications related to policy changes and any detected policy conflicts, and to query its subscriptions.

5.5.7.2   Resource definition

The resource URI is:

{apiRoot}/nfvpolicy/{apiMajorVersion}/subscriptions

This resource shall support the resource URI variables defined in table 5.5.7.2-1.

Table 5.5.7.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [7]
apiMajorVersion	See clause 5.2

5.5.7.3   Resource methods

5.5.7.3.1   POST

The POST method creates a new subscription.

This method shall follow the provisions specified in tables 5.5.7.3.1-1 and 5.5.7.3.1-2 for URI query parameters, request and response data structures, and response codes.

As the result of successfully executing this method, a new "Individual subscription" resource as defined in clause 5.5.6 shall have been created. This method shall not trigger any notification.

Creation of two subscription resources with the same callback URI and the same filter can result in performance degradation and will provide duplicates of notifications to the API consumer, and might make sense only in very rare use cases. Consequently, the API producer may either allow creating a subscription resource if another subscription resource with the same filter and callback URI already exists (in which case it shall return the "201 Created" response code), or may decide to not create a duplicate subscription resource (in which case it shall return a "303 See Other" response code referencing the existing subscription resource with the same filter and callback URI).

Table 5.5.7.3.1-1: URI query parameters supported by the POST method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.7.3.1-2: Details of the POST request/response on this resource

Request body	Data type	Cardinality		Description
	PolicySubscriptionRequest	1		Details of the subscription to be created.
	Data type	**Cardinality**	**Response Codes**	**Description**
Response body	PolicySubscription	1	201 Created	Shall be returned when the subscription has been created successfully. A representation of the created subscription resource shall be returned in the response body, as defined in clause 5.6.2.6. The HTTP response shall include a "Location" HTTP header that points to the created "Individual subscription" resource.
	n/a		303 See Other	Shall be returned if a subscription with the same callbackUri and the same filter already exists and the policy of the API producer is to not create redundant subscriptions. The HTTP response shall include a "Location" HTTP header that contains the resource URI of the existing "individual subscription" resource. The response body shall be empty.
	ProblemDetails	1	422 Unprocessable Entity	Shall be returned upon the following error: The content type of the payload body is supported and the payload body of a request contains syntactically correct data but the data cannot be processed. The general cause for this error and its handling is specified in clause 6.4 of ETSI GS NFV-SOL 013 [7], including rules for the presence of the response body. Specifically in case of this resource, the response code 422 shall also be returned if the API producer has tested the Notification endpoint as described in clause 5.5.9.3.2 and the test has failed. In this case, the "detail" attribute in the "ProblemDetails" structure shall convey more information about the error.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.7.3.2 GET

The GET method queries the list of active subscriptions of the functional block that invokes the method. It can be used e.g. for resynchronization after error situations.

This method shall follow the provisions specified in tables 5.5.7.3.2-1 and 5.5.7.3.2-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.7.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
filter	0..1	Attribute-based filtering expression according to clause 5.2 of ETSI GS NFV-SOL 013 [7]. The API producer shall support receiving this parameter as part of the URI query string. The API consumer may supply this parameter. All attribute names that appear in the PolicySubscription and in data types referenced from it shall be supported by the API producer in the filter expression.
nextpage_opaque_marker	0..1	Marker to obtain the next page of a paged response. Shall be supported by the API producer if the API producer supports alternative 2 (paging) according to clause 5.4.2.1 of ETSI GS NFV-SOL 013 [7] for this resource.

Table 5.5.7.3.2-2: Details of the GET request/response on this resource

Request body	Data type	Cardinality		Description
	n/a			

	Data type	Cardinality	Response Codes	Description
Response body	PolicySubscription	0..N	200 OK	Shall be returned when the list of subscriptions has been queried successfully. The response body shall contain in an array the representations of all active subscriptions of the functional block that invokes the method, i.e. zero or more representations of policy subscriptions as defined in clause 5.6.2.6. If the "filter" URI parameter was supplied in the request, the data in the response body shall have been transformed according to the rules specified in clause 5.2.2 of ETSI GS NFV-SOL 013 [7]. If the API producer supports alternative 2 (paging) according to clause 5.4.2.1 of ETSI GS NFV-SOL 013 [7] for this resource, inclusion of the Link HTTP header in this response shall follow the provisions in clause 5.4.2.3 of ETSI GS NFV-SOL 013 [7].
	ProblemDetails	1	400 Bad Request	Shall be returned upon the following error: Invalid attribute-based filtering expression. The response body shall contain a ProblemDetails structure, in which the "detail" attribute should convey more information about the error.
	ProblemDetails	1	400 Bad Request	Shall be returned upon the following error: Response too big. If the API producer supports alternative 1 (error) according to clause 5.4.2.1 of ETSI GS NFV-SOL 013 [7] for this resource, this error response shall follow the provisions in clause 5.4.2.2 of ETSI GS NFV-SOL 013 [7].

	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.7.3.3   PUT

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.7.3.4   PATCH

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.7.3.5   DELETE

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.8   Resource: Individual subscription

5.5.8.1   Description

This resource represents an individual subscription.

The API consumer can use this resource to read and to terminate a subscription to notifications related to policy management.

5.5.8.2   Resource definition

The resource URI is:

   {apiRoot}/nfvpolicy/{apiMajorVersion}/subscriptions/{subscriptionId}

This resource shall support the resource URI variables defined in table 5.5.8.2-1.

Table 5.5.8.2-1: Resource URI variables for this resource

Name	Definition
apiRoot	See clause 4.1 of ETSI GS NFV-SOL 013 [7].
apiMajorVersion	See clause 5.2.
subscriptionId	Identifier of the subscription. See note.
NOTE:	This identifier can be retrieved from the resource referenced by the "Location" HTTP header in the response to a POST request creating a new "Individual subscription" resource. It can also be retrieved from the "id" attribute in the payload body of that response.

5.5.8.3   Resource methods

5.5.8.3.1   POST

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.8.3.2   GET

The GET method retrieves information about a subscription by reading an "Individual subscription" resource.

This method shall follow the provisions specified in tables 5.5.8.3.2-1 and 5.5.8.3.2-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.8.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.8.3.2-2: Details of the GET request/response on this resource

Request body	Data type	Cardinality		Description	
	n/a				
Response body	Data type	Cardinality	Response Codes	Description	
	PolicySubscription	1	200 OK	Shall be returned when information about an individual subscription has been read successfully. The response body shall contain a representation of the subscription resource, as defined in clause 5.6.2.6.	
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.	

5.5.8.3.3   PUT

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.8.3.4   PATCH

This method is not supported. When this method is requested on this resource, the API producer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.8.3.5   DELETE

The DELETE method terminates an individual subscription.

This method shall follow the provisions specified in tables 5.5.8.3.5-1 and 5.5.8.3.5-2 for URI query parameters, request and response data structures, and response codes.

As the result of successfully executing this method, the "Individual subscription" resource shall not exist any longer. This means that no notifications for that subscription shall be sent to the formerly-subscribed API consumer.

NOTE: Due to race conditions, some notifications can still be received by the formerly-subscribed API consumer for a certain time period after the deletion.

Table 5.5.8.3.5-1: URI query parameters supported by the DELETE method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.8.3.5-2: Details of the DELETE request/response on this resource

Request body	Data type	Cardinality		Description	
	n/a				
Response body	Data type	Cardinality	Response Codes	Description	
	n/a		204 No Content	Shall be returned when the "individual subscription" resource has been deleted successfully. The response body shall be empty.	
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.	

5.5.9 Resource: Notification endpoint

5.5.9.1 Description

This resource represents a notification endpoint for policy management.

The API producer can use this resource to send notifications related to policy management events to a subscribed API consumer, which has provided the URI of this resource during the subscription process.

5.5.9.2 Resource definition

The resource URI is provided by the API consumer when creating the subscription.

This resource shall support the resource URI variables defined in table 5.5.9.2-1.

Table 5.5.9.2-1: Resource URI variables for this resource

Name	Definition
n/a	

5.5.9.3 Resource methods

5.5.9.3.1 POST

The POST method delivers a notification regarding a policy management event from the API producer to an API consumer. The API consumer shall have previously created an "Individual subscription" resource with a matching filter.

This method shall follow the provisions specified in tables 5.5.9.3.1-1 and 5.5.9.3.1-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.9.3.1-1: URI query parameters supported by the POST method on this resource

Name	Cardinality	Description
none supported		

Each notification request body shall include exactly one of the alternatives defined in table 5.5.9.3.1-2.

Table 5.5.9.3.1-2: Details of the POST request/response on this resource

	Data type	Cardinality		Description
Request body	PolicyChangeNotification	1		A notification about policy changes.
	PolicyConflictNotification	1		A notification about a detected policy conflict.
	Data type	**Cardinality**	**Response Codes**	**Description**
Response body	n/a		204 No Content	Shall be returned when the notification has been delivered successfully.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.9.3.2 GET

The GET method allows the API producer to test the notification endpoint that is provided by the API consumer, e.g. during subscription.

This method shall follow the provisions specified in tables 5.5.9.3.2-1 and 5.5.9.3.2-2 for URI query parameters, request and response data structures, and response codes.

Table 5.5.9.3.2-1: URI query parameters supported by the GET method on this resource

Name	Cardinality	Description
none supported		

Table 5.5.9.3.2-2: Details of the GET request/response on this resource

	Data type	Cardinality		Description
Request body	n/a			
	Data type	**Cardinality**	**Response Codes**	**Description**
Response body	n/a		204 No Content	Shall be returned to indicate that the notification endpoint has been tested successfully. The response body shall be empty.
	ProblemDetails	See clause 6.4 of [7]	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 [7] may be returned.

5.5.9.3.3 PUT

This method is not supported. When this method is requested on this resource, the API consumer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.9.3.4 PATCH

This method is not supported. When this method is requested on this resource, the API consumer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.5.9.3.5 DELETE

This method is not supported. When this method is requested on this resource, the API consumer shall return a "405 Method Not Allowed" response as defined in clause 6.4 of ETSI GS NFV-SOL 013 [7].

5.6   Data model

5.6.1   Introduction

This clause defines the request and response data structures of the policy management interface. If a request or response contains attributes not defined in the present document, a receiving functional block that does not understand these attributes shall not treat their presence as an error and may choose to ignore them.

This clause does not define a data model for the policy content.

5.6.2   Resource and notification data types

5.6.2.1   Introduction

This clause defines the data structures to be used in resource representations and notifications.

5.6.2.2   Type: CreatePolicyRequest

This type represents request parameters for creating a policy. It shall comply with the provisions defined in table 5.6.2.2-1.

Table 5.6.2.2-1: Definition of the CreatePolicyRequest data type

Attribute name	Data type	Cardinality	Description
designer	String	1	Human readable name of the designer of the policy.
name	String	1	Human readable name of the policy.
pfId	Identifier	0..1	Identifier of the Policy Function (PF) which enforces the policy. Shall be present when the PF is not the API producer and shall be absent otherwise. Shall be absent when the API producer is NFVO-N. More information concerning the PF can be found in ETSI GR NFV-IFA 023 [i.2]. See note 1.
associations	Identifier	0..N	Initial value of the "associations" attribute in the "Policy" data structure which represents the policy. Shall be absent when the association feature is not applicable for the PF, i.e. the target information in the policy content defined by the "targetType" attribute of the "Policy" information element specified in clause 5.2 of ETSI GS NFV-IFA 048 [8] is equal to "COMMON". See note 2 and note 3.
NOTE 1: For example, the PF can be a VNFM or VIM when the API producer is an NFVO.			
NOTE 2: The associations refer to identifiers of entities that the PF manages. E.g. if the PF is a VNFM, the policy can associate to VNF instances; if the PF is NFVO, the policy can associate to an NS instances.			
NOTE 3: How the PF determines the scope of applicability of the policy when this attribute is absent is outside the scope of the present document.			

5.6.2.3   Type: Policy

This type represents an individual policy. It shall comply with the provisions defined in table 5.6.2.3-1.

Table 5.6.2.3-1: Definition of the Policy data type

Attribute name	Data type	Cardinality	Description
id	Identifier	1	Identifier of the policy.
designer	String	1	Human readable name of the designer of the policy.
name	String	1	Human readable name of the policy.
pfId	Identifier	0..1	Identifier of the Policy Function (PF) which enforces the policy. Shall be present when the PF is not the API producer and shall be absent otherwise. Shall be absent when the API producer is NFVO-N. More information concerning the PF can be found in ETSI GR NFV-IFA 023 [i.2]. See note 1.
versions	Version	0..N	Versions of the policy. Shall be present if at least one version of the policy has been transferred. Its value shall be the same as the version present in the actual policy content as defined by the "policyVersion" attribute in the "Policy" information element specified in clause 5.2 of ETSI GS NFV-IFA 048 [8]
selectedVersion	Version	0..1	Selected version of the policy. Shall be present if one or more versions of the policy have been transferred. The "versions" attribute provides available values of versions of transferred policies.
activationStatus	ActivationStatus	1	Status of the policy on whether it is activated or deactivated.
transferStatus	TransferStatus	1	Status of the policy on whether the content of the policy has been transferred.
associations	Identifier	0..N	Identifiers of the entities that the PF manages and to which the policy associates to. Shall be absent when the association feature is not applicable for the PF, i.e. the target information in the policy content defined by the "targetType" attribute of the "Policy" information element specified in clause 5.2 of ETSI GS NFV-IFA 048 [8] is equal to "COMMON". An initial set of associations applicable to a policy to be set by the API producer may either be provided by the "associations" attribute in the "CreatePolicyRequest" or by the actual policy content via the "targetObjectId" attribute of the "Policy" information element specified in clause 5.2 of ETSI GS NFV-IFA 048 [8]. Values of the "associations" attribute can be further modified with the PATCH method. See note 2 and note 3.
_links	Structure (inlined)	1	Links for this resource.
>self	Link	1	URI of this resource.
>selected	Link	0..1	URI of the selected version of this policy, if exists.
>versions	Link	0..N	URIs of all the transferred versions of this policy, if exists.
NOTE 1: For example, the PF can be a VNFM or VIM when the API producer is an NFVO.			
NOTE 2: The associations refer to identifiers of entities that the PF manages. E.g. if the PF is a VNFM, the policy can associate to VNF instances; if the PF is NFVO, the policy can associate to an NS instances.			
NOTE 3: How the PF determines the scope of applicability of the policy when this attribute is absent is outside the scope of the present document.			

5.6.2.4   Type: PolicyModifications

This type represents the parameters for modifying a policy. It shall comply with the provisions defined in table 5.6.2.4-1.

Table 5.6.2.4-1: Definition of the PolicyModifications data type

Attribute name	Data type	Cardinality	Description
activationStatus	ActivationStatus	0..1	New activation status of the policy.
selectedVersion	Version	0..1	New version of the policy to be selected.
addAssociations	Identifier	0..N	Identifiers of entities to be added to the "associations" attribute in the "Policy" data structure which represents the policy. The API producer shall ignore the identifiers that already exist in the "associations" attribute in the "Policy" data structure. Shall be absent when the association feature is not applicable for the PF.
removeAssociations	Identifier	0..N	Identifiers of entities to be removed from the "associations" attribute in the "Policy" data structure which represents the policy. The API producer shall ignore the identifiers that do not exist in the "associations" attribute in the "Policy" data structure. Shall be absent when the association feature is not applicable for the PF. See note 1 and note 2.
removeAllAssociations	Boolean	0..1	Shall be set to TRUE if the policy is no longer associated to any specific entities managed by the PF. Shall be absent when the association feature is not applicable for the PF. See note 1 and note 2.
NOTE 1: If "removeAllAssociations" is set to TRUE, neither "addAssociations" nor "removeAssociations" attributes shall be present.			
NOTE 2: Once all associations have been removed, how the PF determines the scope of applicability of the policy is outside the scope of the present document.			

5.6.2.5   Type: PolicySubscriptionRequest

This type represents a subscription request related to notifications about policy changes and policy conflicts. It shall comply with the provisions defined in table 5.6.2.5-1.

Table 5.6.2.5-1: Definition of the PolicySubscriptionRequest data type

Attribute name	Data type	Cardinality	Description
filter	PolicyNotificationsFilter	0..1	Filter settings for this subscription, to define the subset of all notifications this subscription relates to. A particular notification is sent to the subscriber if the filter matches, or if there is no filter.
callbackUri	Uri	1	The URI of the endpoint to send the notification to.
authentication	SubscriptionAuthentication	0..1	Authentication parameters to configure the use of Authorization when sending notifications corresponding to this subscription, as defined in clause 8.3.4 of ETSI GS NFV-SOL 013 [7]. This attribute shall only be present if the subscriber requires authorization of notifications.

5.6.2.6   Type: PolicySubscription

This type represents a subscription related to notifications about policy changes and policy conflicts. It shall comply with the provisions defined in table 5.6.2.6-1.

Table 5.6.2.6-1: Definition of the PolicySubscription data type

Attribute name	Data type	Cardinality	Description
id	Identifier	1	Identifier of this subscription resource.
filter	PolicyNotificationsFilter	0..1	Filter settings for this subscription, to define the subset of all notifications this subscription relates to. A particular notification is sent to the subscriber if the filter matches, or if there is no filter.
callbackUri	Uri	1	The URI of the endpoint to send the notification to.
_links	Structure (inlined)	1	Links for this resource.
>self	Link	1	URI of this resource.

5.6.2.7   Type: PolicyChangeNotification

This type represents a notification about policy change. It shall comply with the provisions defined in table 5.6.2.7-1.

This notification shall be triggered by the API producer when a policy has been changed as the result of an operation of creating, transferring, deleting or modifying a policy.

Table 5.6.2.7-1: Definition of the PolicyChangeNotification data type

Attribute name	Data type	Cardinality	Description
id	Identifier	1	Identifier of this notification. If a notification is sent multiple times due to multiple subscriptions, the "id" attribute of all these notifications shall have the same value.
notificationType	String	1	Discriminator for the different notification types. Shall be set to "PolicyChangeNotification" for this notification type.
subscriptionId	Identifier	1	Identifier of the subscription that this notification relates to.
timeStamp	DateTime	1	Date and time of the generation of the notification.
policyId	Identifier	1	Identifier of the policy.
affectedVersion	Version	0..1	Affected version of the policy. The value is the version identifier in the URI when a particular version of the policy is transferred or deleted, or the selected version of the policy when the policy is activated/deactivated/modified. Shall be present when a particular version of the policy is impacted by the policy management operation. Shall be absent otherwise.
previousSelectedVersion	Version	0..1	The previous selected version of the policy. Shall be present when another version of the policy has been selected. Shall be absent otherwise.
policyModifications	PolicyModifications	0..1	Information about the modifications of the policy. Shall be present when the changeType equals to "MODIFY_POLICY". Shall be absent otherwise.
changeType	PolicyOperationType	1	Policy management operation that cause the change of the policy.
_links	Structure (inlined)	1	Links to resources related to this notification.
>subscription	NotificationLink	1	Link to the related subscription.
>objectInstance	NotificationLink	0..1	Link to the resource representing the policies to which the notified change applies. Shall be present if the policy is accessible as a resource.

5.6.2.8   Type: PolicyConflictNotification

This type represents a notification about policy conflict. It shall comply with the provisions defined in table 5.6.2.8-1.

This notification shall be triggered by the API producer when a policy conflict is detected, and any of the policies specified in an associated notification subscription is impacted by the conflict.

Table 5.6.2.8-1: Definition of the PolicyConflictNotification data type

Attribute name	Data type	Cardinality	Description
id	Identifier	1	Identifier of this notification. If a notification is sent multiple times due to multiple subscriptions, the "id" attribute of all these notifications shall have the same value.
notificationType	String	1	Discriminator for the different notification types. Shall be set to "PolicyConflictNotification" for this notification type.
subscriptionId	Identifier	1	Identifier of the subscription that this notification relates to.
timeStamp	DateTime	1	Date and time of the generation of the notification.
policyIds	Identifier	2..N	Identifiers of the conflicting policies. See note.
selectedVersions	Version	2..N	Selected versions of the conflicting policies. See note.
conflictDescription	String	1	Description of the detected policy conflicts, e.g. conflicting events, conditions or actions among the policies.
_links	Structure (inlined)	1	Links to resources related to this notification.
>subscription	NotificationLink	1	Link to the related subscription.
>objectInstances	NotificationLink	2..N	Link to the resources representing the policies to which the notified conflict applies.
NOTE: The policy identifier and the corresponding selected version are mapped by the order in the array.			

5.6.3   Referenced structured data types

5.6.3.1   Introduction

This clause defines data structures that can be referenced from data structures defined in the previous clauses, but can neither be resource representations nor bound to any subscribe/notify mechanism.

5.6.3.2   Type: PolicyNotificationsFilter

This type represents a subscription filter related to notifications about policy changes and policy conflicts. It shall comply with the provisions defined in table 5.6.3.2-1.

At a particular nesting level in the filter structure, the following applies: All attributes shall match in order for the filter to match (logical "and" between different filter attributes). If an attribute is an array, the attribute shall match if at least one of the values in the array matches (logical "or" between the values of one filter attribute).

Table 5.6.3.2-1: Definition of the PolicyNotificationsFilter data type

Attribute name	Data type	Cardinality	Description
notificationTypes	Enum (inlined)	0..N	Match particular notification types. Permitted values: - PolicyChangeNotification - PolicyConflictNotification See note 1.
policyIds	Identifier	0..N	Match particular policy identifiers. See note 2.
changeTypes	PolicyOperationType	0..N	Match particular policy management operation types that cause the change of the policy.
NOTE 1: The permitted values of the "notificationTypes" attribute are spelled exactly as the names of the notification types to facilitate automated code generation systems.			
NOTE 2: For "PolicyConflictNotification", the notification is sent if any of the policies specified in the subscription is impacted by the conflict, as defined in clause 5.6.2.8.			

5.6.4   Referenced simple data types and enumerations

5.6.4.1   Introduction

This clause defines simple data types and enumerations that can be referenced from data structures defined in the previous clauses.

5.6.4.2   Simple data types

No particular simple data types are defined for this interface, in addition to those defined in clause 4.2.

5.6.4.3   Enumeration: ActivationStatus

The enumeration ActivationStatus shall comply with the provisions defined in table 5.6.4.3-1. It indicates the activation status of a policy.

Table 5.6.4.3-1: Enumeration ActivationStatus

Enumeration value	Description
ACTIVATED	The status of the policy is activated.
DEACTIVATED	The status of the policy is deactivated.

5.6.4.4   Enumeration: TransferStatus

The enumeration TransferStatus shall comply with the provisions defined in table 5.6.4.4-1. It indicates the transfer status of a policy.

Table 5.6.4.4-1: Enumeration TransferStatus

Enumeration value	Description
CREATED	No version of the policy has been transferred.
TRANSFERRED	At least one version of the policy has been transferred, and is available on the API producer.

5.6.4.5   Enumeration: PolicyOperationType

The enumeration PolicyOperationType shall comply with the provisions defined in table 5.6.4.5-1. It indicates the type of the policy change.

Table 5.6.4.5-1: Enumeration PolicyOperationType

Enumeration value	Description
CREATE_POLICY	The policy is created.
TRANSFER_POLICY	The policy is transferred.
DELETE_POLICY	The policy is deleted.
MODIFY_POLICY	The policy is modified.

5.7   Policy management state model and error handling

5.7.1   Introduction

This clause describes the state model of the policy management. In addition, during the policy management procedures, failures can occur. This clause describes also how to handle errors during the policy management operations.

5.7.2   States and state transitions

The API producer shall support the policy management states and state transition specified below. The states and state transitions are also illustrated in figure 5.7.2-1.
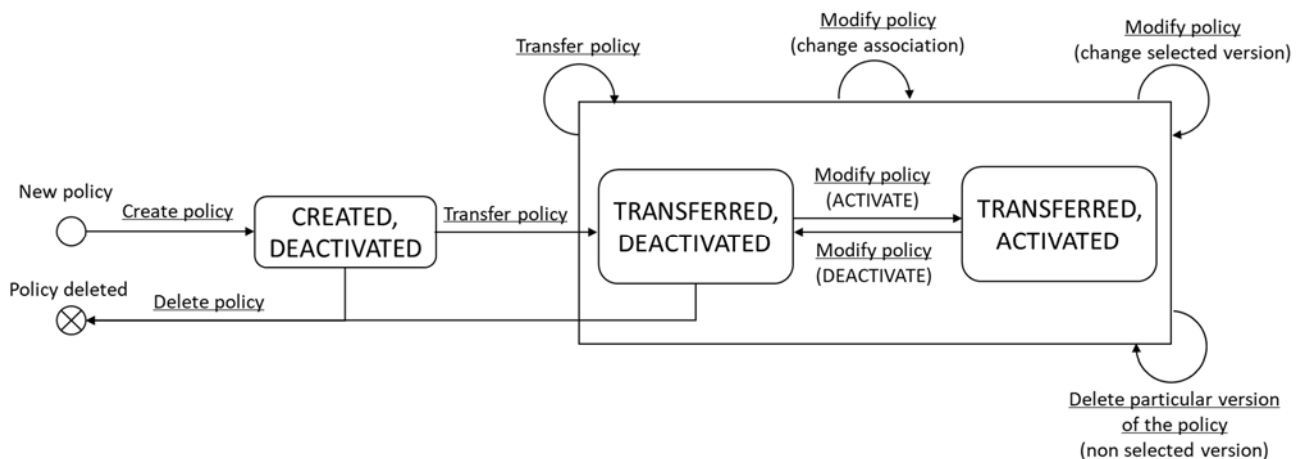

Figure 5.7.2-1: States and state transition of the policy management

CREATED/DEACTIVATED: The "Individual policy" resource has been created. This state has the following characteristics:

- This is the initial state after the successful completion of the POST request to the "Policies" resource.

- The API consumer can send a GET request to the "Individual policy" resource to query the information of the policy.

- If the API consumer sends a PUT request to the "Particular version of an individual policy" resource, upon successful handling of the transfer of the policy content, the "Particular version of an individual policy" resource and the "Selected version of an individual policy" resource are created, the state of the "Individual policy" resource shall transit to the "TRANSFERRED/DEACTIVATED" state and the "Selected version of and individual policy" shall refer to the created "Particular version of an individual policy" resource.

- A successful handling of the DELETE request to the "Individual policy" resource will delete the "Individual policy" resource.

TRANSFERRED/DEACTIVATED: The content of the policy has been uploaded, and the policy is not enforced. This state has the following characteristics:

- The API consumer can send a PUT request to the "Particular version of an individual policy" resource to transfer a new version of the policy to the API producer. Upon successful handling of the transfer of the policy content, a new "Particular version of an individual policy" resource is created.

- The API consumer can send a GET request to the "Individual policy" resource to query the information of the policy.

- The API consumer can send a GET request to the "Particular version of an individual policy" resource or to the "Selected version of an individual policy" resource to fetch the content of a particular or selected version of the policy.

- The API consumer can send a PATCH request to the "Individual policy" resource with the payload body containing the "activationStatus=ACTIVATED" attribute to activate the policy. Upon successful handling of the request, the state of the "Individual policy" resource shall transit to the "TRANSFERRED/ACTIVATED" state. If the request payload body also contains a valid "selectedVersion" attribute, the proposed version is enforced, and if not, the current selected version of the policy is enforced.

- The API consumer can send a PATCH request to the "Individual policy" resource with the payload body containing the "selectedVersion" attribute to change the selected version of the policy.

- The API consumer can send a PATCH request to the "Individual policy" resource with the payload body containing the "associations" attribute to change the associations of the policy.

- A successful handling of the DELETE request to the "Individual policy" resource will delete the "Individual policy" resource.

- A successful handling of the DELETE request to the "Particular version of an individual policy" resource will delete the "Particular version of an individual policy" resource.

TRANSFERRED/ACTIVATED: The content of the policy has been uploaded, and the policy is enforced. This state has the following characteristics:

- The API consumer can send a PUT request to the "Particular version of an individual policy" resource to transfer a new version of the policy to the API producer. Upon successful handling of the transfer of the policy content, a new "Particular version of an individual policy" resource is created.

- The API consumer can send a GET request to the "Individual policy" resource to query the information of the policy.

- The API consumer can send a GET request to the "Particular version of an individual policy" resource or to the "Selected version of an individual policy" resource to fetch the content of a particular or selected version of the policy.

- The API consumer can send a PATCH request to the "Individual policy" resource with the payload body containing the "activationStatus=DEACTIVATED" attribute to deactivate the policy. Upon successful handling of the request, the state of the "Individual policy" resource shall transit to the "TRANSFERRED/DEACTIVATED" state.

- The API consumer can send a PATCH request to the "Individual policy" resource with the payload body containing the "selectedVersion" attribute to change the selected version of the policy. The new selected version shall be enforced if the state of the policy is not changed.

- The API consumer can send a PATCH request to the "Individual policy" resource with the payload body containing the "associations" attribute to change the associations of the policy.

- This state shall block the request to delete the "Individual policy" resource.

- A successful handling of the DELETE request to the "Particular version of an individual policy" resource will delete the "Particular version of an individual policy" resource.

5.7.3   Handling of errors

5.7.3.1   Failure during transfer of the policy content

Upon a failure during the transfer, the "Individual policy" resource will remain in its state before transferring the policy:

- The API producer shall discard the transferred content, and delete the newly created "Particular version of an individual policy" resource.

- To resolve the failure, the API consumer may retry the PUT request to the same or another "Particular version of an individual policy" resource, or send a PUT request with a new payload body.

Annex A (informative):
Mapping operations to protocol elements

This annex provides the mapping between policy management operations as defined in ETSI GS NFV-IFA 005 [1], ETSI GS NFV-IFA 006 [2], ETSI GS NFV-IFA 007 [3], ETSI GS NFV-IFA 008 [4], ETSI GS NFV-IFA 013 [5] and ETSI GS NFV-IFA 030 [6], and the corresponding resources and HTTP methods defined in the present document.

Table A-1 provides the mapping between the operations and corresponding resources and HTTP methods for the policy management interface.

Table A-1: Mapping for the policy management interface

ETSI GS NFV-IFA spec operation (see note)	HTTP method	Resource	Direction
Transfer policy	POST	nfvpolicy/{apiMajorVersion}/policies	API consumer → API producer
	PUT	nfvpolicy/{apiMajorVersion}/policies/{policyId}/versions/{version}	API consumer → API producer
Delete policy	DELETE	nfvpolicy/{apiMajorVersion}/policies/{policyId}	API consumer → API producer
	DELETE	nfvpolicy/{apiMajorVersion}/policies/{policyId}/versions/{version}	API consumer → API producer
Query policy	GET	nfvpolicy/{apiMajorVersion}/policies	API consumer → API producer
	GET	nfvpolicy/{apiMajorVersion}/policies/{policyId}	API consumer → API producer
	GET	nfvpolicy/{apiMajorVersion}/policies/{policyId}/selected_version	API consumer → API producer
	GET	nfvpolicy/{apiMajorVersion}/policies/{policyId}/versions/{version}	API consumer → API producer
Activate policy	PATCH	nfvpolicy/{apiMajorVersion}/policies/{policyId}	API consumer → API producer
Deactivate policy	PATCH	nfvpolicy/{apiMajorVersion}/policies/{policyId}	API consumer → API producer
Associate policy	PATCH	nfvpolicy/{apiMajorVersion}/policies/{policyId}	API consumer → API producer
Disassociate policy	PATCH	nfvpolicy/{apiMajorVersion}/policies/{policyId}	API consumer → API producer
Subscribe	POST	nfvpolicy/{apiMajorVersion}/subscriptions	API consumer → API producer
Terminate Subscription	DELETE	nfvpolicy/{apiMajorVersion}/subscriptions/{subscriptionId}	API consumer → API producer
Notify	POST	(provided by API consumer)	API producer → API consumer
Query Subscription Information	GET	nfvpolicy/{apiMajorVersion}/subscriptions	API consumer → API producer
	GET	nfvpolicy/{apiMajorVersion}/subscriptions/{subscriptionId}	API consumer → API producer
NOTE: Transfer policy, delete policy, query policy, activate policy, deactivate policy, subscribe, terminate subscription, notify and query subscription information operations are defined in ETSI GS NFV-IFA 005 [1], ETSI GS NFV-IFA 006 [2], ETSI GS NFV-IFA 007 [3], ETSI GS NFV-IFA 008 [4], ETSI GS NFV-IFA 013 [5] and ETSI GS NFV-IFA 030 [6]. Associate policy and disassociate policy operations are defined in ETSI GS NFV-IFA 007 [3], ETSI GS NFV-IFA 008 [4], ETSI GS NFV-IFA 013 [5] and ETSI GS NFV-IFA 030 [6].			

Annex B (normative):
Authorization scope values

B.1   Overview

This annex specifies authorization scope values for selected APIs defined in the present document as defined in clause 8.3.7 of ETSI GS NFV-SOL 013 [7]. Each authorization scope value is defined recursively as the union of a set of permitted resource URIs with associated permitted methods, and a set of permitted referenced authorization scope values, where one of these sets can be empty.

B.2   Policy Management interface

This clause specifies authorization scope values to consume the Policy Management interface specified in clause 5. If the API producer supports authorization scope values, the API producer shall support the authorization scope values specified in table B.2-1 and may support additional authorization scope values, when authorizing an API request from an API consumer as specified in clause 8.3.3 of ETSI GS NFV-SOL 013 [7].

The elements in the authorization scope value definition specified in clause 8.3.7 of ETSI GS NFV-SOL 013 [7] are defined as follows, resulting in the authorization scope values given in table B.2-1:

- {apiName} is set as defined in clause 5.3;

- <vn> shall be set to the value of {apiMajorVersion} as defined in clause 5.2;

- <permissionName> and <qualifier> are set as defined in table B.2-1.

Table B.2-1: Authorization scope values for Policy Management interface

Authorization Scope value	Description
nfvpolicy:<vn>:policies	Allows to read the "Policies" resource, and to create, read, modify and delete its child resources. This permission allows to create an "Individual policy" resource as indicated in clause 5.4.1, query/read information in one or multiple "Individual policy" resource as indicated in clause 5.4.3, modify an "Individual policy" resource as indicated in clause 5.4.5, and delete an "Individual policy" resource as indicated in clause 5.4.6.
nfvpolicy:<vn>:policies:readonly	Allows read only access to the "Policies" resource and its child resources, but not to modify, create and delete them.
nfvpolicy:<vn>:selected_version :readonly	Allows to read the "Selected version of an individual policy" resource. This permission allows to fetch the content of a policy as indicated in clause 5.4.5.
nfvpolicy:<vn>:versions	Allows to access the "Particular version of an individual policy" resource. This permission allows to fetch the content of a policy as indicated in clause 5.4.4, transfer a policy as indicated in clause 5.4.2, and delete a policy as indicated in clause 5.4.6.
nfvpolicy:<vn>:versions:readonly	Allows read only access to the "Particular version of an individual policy" resource, but not to transfer and delete it.
nfvpolicy:<vn>:subscriptions	Allows to read the "Subscriptions" resource, and to create, read and delete its child resources. This permission allows managing subscriptions as indicated in clause 5.4.7.
nfvpolicy:<vn>:all	Allows to perform all methods on all resources of the Policy management interface.
nfvpolicy:<vn>:all:readonly	Allows read only access to all resources of the Policy management interface.

Table B.2-2 defines the authorization scope values that are applicable to the Policy Management interface.

Table B.2-2: Resource and permission of authorization scope for Policy Management interface

Authorization scope value	Resources and scopes	Permitted methods
nfvpolicy:<vn>:policies	/policies	GET, POST
	/policies/{policyId}	GET, PATCH, DELETE
nfvpolicy:<vn>:policies:readonly	/policies	GET
	/policies/{policyId}	GET
nfvpolicy:<vn>:selected_version :readonly	/policies/{policyId}/selected_version	GET
nfvpolicy:<vn>:versions	/policies/{policyId}/versions/{version}	GET, PUT, DELETE
	nfvpolicy:<vn>:policies	-
nfvpolicy:<vn>:versions:readonly	/policies/{policyId}/versions/{version}	GET
	nfvpolicy:<vn>:policies:readonly	-
nfvpolicy:<vn>:subscriptions	/subscriptions	GET, POST
	/subscriptions/{subscriptionId}	GET, DELETE
nfvpolicy:<vn>:all	nfvpolicy:<vn>:policies	-
	nfvpolicy:<vn>:selected_version:readonly	-
	nfvpolicy:<vn>:versions	-
	nfvpolicy:<vn>:subscriptions	-
nfvpolicy:<vn>:all:readonly	nfvpolicy:<vn>:policies:readonly	-
	nfvpolicy:<vn>:selected_version:readonly	-
	nfvpolicy:<vn>:versions:readonly	-
	nfvpolicy:<vn>:subscriptions (see note)	-
NOTE: The "readonly" authorization scope value allows to create and delete operations on "nfvpolicy:<vn>:subscriptions" as described in clause 8.3.7 of ETSI GS NFV-SOL 013 [7].		

Annex C (informative):
Change History

Date	Version	Information about changes
October 2018	0.0.1	Skeleton and scope
January 2019	0.0.2	Incorporate the following contributions: - NFVSOL(18)000739_SOL012_Overview - NFVSOL(18)000740r1_SOL012_generic_part_of_policy_management_interface - NFVSOL(18)000741r2_SOL012_resource_structure_of_policy_management_interface - NFVSOL(18)000742r2_SOL012_resource_definition_of_policy_management_interface - NFVSOL(18)000764r1_SOL012_sequence_diagram_of_policy_management_interface - NFVSOL(18)000765r1_SOL012_data_type_definitions_of_policy_management_interface
March 2020	0.0.3	Incorporate the following contributions: - NFVSOL(19)000318r1_SOL012_Clause_4_1_Address_Editor_s_Note_ - NFVSOL(19)000319_SOL012_Clause_4_2_Address_Editor_s_Note_ - NFVSOL(19)000321_SOL012_Address_Editor_s_Note_on_Asynchronous_Policy_Transfer - NFVSOL(19)000731_SOL012_Annex_A_Mapping_operations_to_protocol_elements Remove authors & contributors annex. Editorial changes to clean the document.
July 2020	0.1.0	Incorporate the following contributions: - NFVSOL(20)000483r1_SOL012ed331_Clause_5_Redesign_the_policy_resource_structure - NFVSOL(20)000543r2_SOL012ed331_Clause_5_4_Sequence_Diagram_Change - NFVSOL(20)000544r3_SOL012ed331_Clause_5_6_Data_Type_Change - NFVSOL(20)000612r2_SOL012ed331_Clause_5_5_Resource_Definition_Change - NFVSOL(20)000626_SOL012_Clause_5_5_Editorial_fix_to_align_with_other_API_spec
September 2020	0.1.1	Incorporate the following contributions: - NFVSOL(20)000636_SOL012ed331_Update_Annex_A - NFVSOL(20)000637_SOL012ed331_Clause_3_3_Update_Abbreviations - NFVSOL(20)000638_SOL012Ed331_-_Clause_1_to_3_-_Minor_fixes - NFVSOL(20)000639_SOL012Ed331_-_Use_of_May_and_Can - NFVSOL(20)000640_SOL012Ed331_-_Small_technical_enhancements - NFVSOL(20)000641_SOL012ed331_Clause_5_3_Fix_resource_URI_structure_diagram - NFVSOL(20)000642_SOL012Ed331_-_Handling_of_policy_associations - NFVSOL(20)000652r2_SOL012ed331_-_Clause_5_7_Policy_State_Model - NFVSOL(20)000653_SOL012ed331_Clause_1_Scope_clarification - NFVSOL(20)000703r1_SOL012_Resolve_Editor_s_Notes - NFVSOL(20)000704_SOL012_Update_to_v3_4_1
September 2022	3.6.2	Base line for Release 3 maintenance, created from v3.4.1
January 2023	4.3.1	Base line for Release 4 maintenance, and incorporate the following contribution: - NFVSOL(23)000014_SOL012ed441_Alignment_with_IFA048
May 2023	4.4.2	Base line for v4.5.1 maintenance, created from v4.4.1
October 2023	4.4.3	Incorporate the following contributions: - NFVSOL(23)000123_SOL012ed451_OAuth_scope_value_for_Policy

History

Document history		
V4.4.1	March 2023	Publication
V4.5.1	December 2023	Publication