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| Technical Specification | |
| 3rd Generation Partnership Project;  Technical Specification Group Core Network and Terminals;  Service Enabler Architecture Layer for Verticals (SEAL);  Network Slice Capability Enablement (NSCE) Server Services;  Stage 3  (Release 19) | |
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# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# Introduction

This clause is optional. If it exists, it is always the second unnumbered clause.

# 1 Scope

The present document specifies the stage 3 protocol and data model for the Network Slice Capability Exposure (NSCE) Server Services, for enabling the support of Network Slice Capability Exposure (NSCE) Server services for vertical applications. It provides stage 3 protocol definitions and message flows, and specifies the API for each service offered by the NSCE Server.

The stage 2 application layer architecture, functional requirements, procedures and information flows necessary for enabling Network Slice Capability Exposure (NSCE) are specified in 3GPP TS 23.435 [14].

The common protocol and interface aspects for API definition are specified in clause 5.2 of 3GPP TS 29.122 [2].

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 29.122: "T8 reference point for Northbound Application Programming Interfaces (APIs)".

[3] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".

[4] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.

[5] 3GPP TR 21.900: "Technical Specification Group working methods".

[6] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[7] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

[8] 3GPP TS 33.122: "Security aspects of Common API Framework (CAPIF) for 3GPP northbound APIs".

[9] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".

[10] IETF RFC 9113: "HTTP/2".

[11] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".

[12] IETF RFC 9457: "Problem Details for HTTP APIs".

[13] 3GPP TS 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[14] 3GPP TS 23.435: "Procedures for Network Slice Capability Exposure for Application Layer Enablement Service".

[15] 3GPP TS 29.549: "Service Enabler Architecture Layer for Verticals (SEAL); Application Programming Interface (API) specification".

[16] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[17] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[18] 3GPP TS 29.572: "5G System; Location Management Services; Stage 3".

[19] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[20] 3GPP TS 29.531: "5G System; Network Slice Selection Services; Stage 3".

[21] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

[22] 3GPP TS 28.104: "Management and orchestration; Management Data Analytics (MDA)".

[23] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".

[24] 3GPP TS 28.554: "Management and orchestration; 5G end to end Key Performance Indicators (KPI)".

[25] 3GPP TS 29.558: " Enabling Edge Applications; Application Programming Interface (API) specification; Stage 3".

[26] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

For the purpose of the present document, the terms and definitions specified in clause 3.1 of 3GPP TS 23.435 [14] and clause 3.1 of 3GPP TS 29.549 [15] also apply, including the ones referencing other specifications.

## 3.2 Symbols

Void

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

NSCE Network Slice Capability Enablement

SEAL Service Enabler Architecture Layer for Verticals

# 4 Overview

The Network Slice Capability Enablement (NSCE) Server forms part of the SEAL Enabler Layer defined in 3GPP TS 23.434 [13] and aims to ensure the efficient use and deployment of network slice capability exposure capabilities to vertical applications. The NSCE Server services expose network slicing capabilities based on the 5GS management system services (e.g., MnS services) and the 5GS network services (e.g., NEF APIs, NWDAF APIs, NSACF APIs).The NCSE Server supports for this purpose, among other functionalities defined in 3GPP TS 23.435 [14], the following functionalities:

* network slice API configuration and translation management;
* network slice lifecycle management;
* network slice policy management;
* network slice optimization management;
* network slice management service discovery management;
* network slice related performance and analytics monitoring management;
* network slice information collection management;
* network slice predictive modification management;
* multiple network slice coordinated resource optimization management;
* network slice adaptation management;
* network slice related communication services management;
* network slice modification in Inter-PLMN continuity management;
* network slice diagnostics management;
* network slice fault management;
* network slice requirements verification and alignment management;
* network slice information retrieval and delivery management; and
* network slice allocation management.

Figure 4-1 shows the reference model of the NSCE Enabler Layer, with a focus on the NSCE Server:



Figure 4-1: NSCE Enabler Layer functional model

# 5 Services offered by the NSCE Server

## 5.1 Introduction

The NSCE Server provides the following services:

- NSCE\_SliceApiManagement

- NSCE\_NetSliceLifeCycleMngt

- NSCE\_PolicyManagement

- NSCE\_NSOptimization

- NSCE\_ManagementServiceDiscovery

- NSCE\_PerfMonitoring

- NSCE\_InfoCollection

- NSCE\_ServiceContinuity

- NSCE\_MultiSlicesOptimization

- NSCE\_NetworkSliceAdaptation

- NSCE\_SliceCommService

- NSCE\_InterPLMNContinuity

- NSCE\_NSDiagnostics

- NSCE\_FaultDiagnosis

- NSCE\_SliceReqVerifyAndAlign

- NSCE\_NSInfoDelivery

- NSCE\_NSAllocation

Table 5.1-1 summarizes the corresponding APIs defined for this specification.

Table 5.1-1: API Descriptions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Service Name | Clause | Description | OpenAPI Specification File | API Name | Annex |
| NSCE\_SliceApiManagement | 6.1 | NSCE Slice API Management Service | nsce-sam | TS29435\_NSCE\_SliceApiManagement.yaml | A.2 |
| NSCE\_NetSliceLifeCycleMngt | 6.2 | NSCE Network Slice Lifecycle Management Service | nsce-nslcm | TS29435\_NSCE\_NetSliceLifeCycleMngt.yaml | A.3 |
| NSCE\_PolicyManagement | 6.3 | NSCE Policy Management Service | nsce-pm | TS29435\_NSCE\_PolicyManagement.yaml | A.4 |
| NSCE\_NSOptimization | 6.4 | NSCE Network Slice Optimization Service | nsce-nso | TS29435\_NSCE\_NSOptimization.yaml | A.5 |
| NSCE\_ManagementServiceDiscovery | 6.5 | NSCE Management Service Discovery Service | nsce-msd | TS29435\_NSCE\_ManagementServiceDiscovery.yaml | A.6 |
| NSCE\_PerfMonitoring | 6.6 | NSCE Network Slice Performance and Analytics Monitoring Service | nsce-pam | TS29435\_NSCE\_PerfMonitoring.yaml | A.7 |
| NSCE\_InfoCollection | 6.7 | NSCE Information Collection Service | nsce-ic | TS29435\_NSCE\_InfoCollection.yaml | A.8 |
| NSCE\_ServiceContinuity | 6.8 | NSCE Service Continuity Service | nsce-sc | TS29435\_NSCE\_ServiceContinuity.yaml | A.9 |
| NSCE\_MultiSlicesOptimization | 6.9 | NSCE Multiple Slices Optimization Service | nsce-mso | TS29435\_NSCE\_MultiSlicesOptimization.yaml | A.10 |
| NSCE\_NetworkSliceAdaptation | 6.10 | NSCE Network Slice Adaptation Service | ss-nsa | TS29435\_NSCE\_NetworkSliceAdaptation.yaml | A.11 |
| NSCE\_SliceCommService | 6.11 | NSCE Network Slice Communication Service | nsce-scs | TS29435\_NSCE\_SliceCommService.yaml | A.12 |
| NSCE\_InterPLMNContinuity | 6.12 | NSCE Inter-PLMN Service Continuity Service | nsce-ipc | TS29435\_NSCE\_InterPLMNContinuity.yaml | A.13 |
| NSCE\_NSDiagnostics | 6.13 | NSCE Network Slice Diagnostics Service | nsce-nsd | TS29435\_NSCE\_NetworkSliceDiagnostics.yaml | A.14 |
| NSCE\_FaultDiagnosis | 6.14 | NSCE Network Slice Fault Diagnosis Service | nsce-fd | TS29435\_NSCE\_FaultDiagnosis.yaml | A.15 |
| NSCE\_SliceReqVerifyAndAlign | 6.15 | NSCE Network Slice Requirements Verification And Alignment Service | nsce-srva | TS29435\_NSCE\_SliceReqVerifyAndAlign.yaml | A.16 |
| NSCE\_NSInfoDelivery | 6.16 | NSCE Network Slice Information Delivery Service | nsce-nsid | TS29435\_NSCE\_NSInfoDelivery.yaml | A.17 |
| NSCE\_NSAllocation | 6.18 | NSCE Network Slice Allocation Service | nsce-nsa | TS29435\_NSCE\_NSAllocation.yaml | A.18 |

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 5, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

## 5.2 NSCE\_SliceApiManagement

### 5.2.1 Service Description

The NSCE\_SliceApiManagement service exposed by the NSCE Server enables a service consumer to:

- create/delete a Slice API Configuration;

- request the update of an existing slice API configuration;

- receive Slice API Configuration notifications; and

- request slice API invocation.

### 5.2.2 Service Operations

#### 5.2.2.1 Introduction

The service operations defined for the NSCE\_SliceApiManagement service are shown in table 5.2.2.1-1.

Table 5.2.2.1-1: NSCE\_SliceApiManagement Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_SliceApiManagement\_Configure | This service operation enables a service consumer to create/delete a Slice API Configuration. | e.g., VAL Server |
| NSCE\_SliceApiManagement\_Update | This service operation enables a service consumer to request the update of an existing slice API configuration. | e.g., VAL Server |
| NSCE\_SliceApiManagement\_Notify | This service operation enables a service consumer to receive Slice API Configuration notifications. | NSCE Server |
| NSCE\_SliceApiManagement\_Invoke | This service operation enables a service consumer to request slice API invocation. | e.g., VAL Server |

#### 5.2.2.2 NSCE\_SliceApiManagement\_Configure

##### 5.2.2.2.1 General

This service operation is used by a service consumer to request the creation/deletion of a Slice API Configuration at the NSCE Server.

The following procedures are supported by the "NSCE\_SliceApiManagement\_Configure" service operation:

- Slice API Configuration Creation.

- Slice API Configuration Deletion.

##### 5.2.2.2.2 Slice API Configuration Creation

Figure 5.2.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the creation of a Slice API Configuration (see also clause 9.3 of 3GPP°TS°23.435°[14]).

 Figure 5.2.2.2.2-1: Procedure for Slice API Configuration Creation

1. In order to create a new Slice API Configuration, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Slice API Configurations" collection resource, with the request body including the SliceAPIConfig data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing the representation of the created "Individual Slice API Configuration" resource within the SliceAPIConfig data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

##### 5.2.2.2.3 Slice API Configuration Deletion

Figure 5.2.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of an existing Slice API Configuration (see also clause 9.3 of 3GPP°TS°23.435°[14]).



Figure 5.2.2.2.3-1: Procedure for Slice API Configuration Deletion

1. In order to request the deletion of an existing Slice API Configuration, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Slice API Configuration" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.1.7.

#### 5.2.2.3 NSCE\_SliceApiManagement\_Update

##### 5.2.2.3.1 General

This service operation is used by a service consumer to request the update of an existing slice API configuration at the NSCE Server.

The following procedures are supported by the "NSCE\_SliceApiManagement\_Update" service operation:

- Slice API Configuration Update.

##### 5.2.2.3.2 Slice API Configuration Update

Figure 5.2.2.3.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing slice API configuration (see also clause 9.3 of 3GPP°TS°23.435°[14]).



Figure 5.2.2.3.2-1: Procedure for Slice API Configuration Update

1. In order to request the update of an existing slice API configuration, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding resource custom operation (i.e., "Update"), with the request body including the UpdateReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "200 OK" status code with the response body containing the updated slice API configuration information within the UpdateResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

#### 5.2.2.4 NSCE\_SliceApiManagement\_Notify

##### 5.2.2.4.1 General

This service operation is used by the NSCE Server to notify a previously subscribed service consumer on:

- Slice API Configuration event(s).

The following procedures are supported by the "NSCE\_SliceApiManagement\_Notify" service operation:

- Slice API Configuration Notification.

##### 5.2.2.4.2 Slice API Configuration Notification

Figure 5.2.2.4.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Slice API Configuration event(s) (see also clause 9.3 of 3GPP°TS°23.435°[14]).



Figure 5.2.2.4.2-1: Slice API Configuration Notification

1. In order to notify a previously subscribed service consumer on Slice API Configuration event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation of the corresponding Slice API Configuration using the procedures defined in clause 5.2.2.2.2, and the request body including the SliceAPIConfigNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the successful reception and processing of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

#### 5.2.2.5 NSCE\_SliceApiManagement\_Invoke

##### 5.2.2.5.1 General

This service operation is used by a service consumer to request slice API invocation to the NSCE Server.

The following procedures are supported by the "NSCE\_SliceApiManagement\_Invoke" service operation:

- Slice API Invocation Request.

##### 5.2.2.5.2 Slice API Invocation Request

Figure 5.2.2.5.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request slice API invocation (see also clause 9.3 of 3GPP°TS°23.435°[14]).



Figure 5.2.2.5.2-1: Procedure for Slice API Invocation Request

1. In order to request slice API invocation, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding custom operation (i.e., "Invoke"), with the request body including the InvokeReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.1.7.

## 5.3 NSCE\_NetSliceLifeCycleMngt

### 5.3.1 Service Description

The NSCE\_NetSliceLifeCycleMngt service exposed by the NSCE Server enables a service consumer to:

- create/update/delete a Slice Lifecycle Management Subscription; and

- receive Slice Lifecycle Management related event(s) notifications.

### 5.3.2 Service Operations

#### 5.3.2.1 Introduction

The service operations defined for the NSCE\_NetSliceLifeCycleMngt service are shown in table 5.3.2.1-1.

Table 5.3.2.1-1: NSCE\_NetSliceLifeCycleMngt Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_NetSliceLifeCycleMngt\_Subscribe | This service operation enables a service consumer to request the creation/update/deletion of an Application layer Network Slice Lifecycle Management Subscription at the NSCE Server. | e.g., VAL Server |
| NSCE\_NetSliceLifeCycleMngt\_Notify | This service operation enables a service consumer to receive application layer network slice lifecycle management related notifications. | NSCE Server |
| NSCE\_NetSliceLifeCycleMngt\_QoEMetricsSubscribe | This service operation enables the NSCE Server to subscribe to QoE metrics reporting at the service consumer. | NSCE Server |
| NSCE\_NetSliceLifeCycleMngt\_QoEMetricsNotify | This service operation enables a service consumer to send QoE metrics report(s) to the NSCE Server. | e.g., VAL Server |
| NSCE\_NetSliceLifeCycleMngt\_Recommend | This service operation enables a service consumer to receive network slice LCM recommendation notifications. | NSCE Server |

#### 5.3.2.2 NSCE\_NetSliceLifeCycleMngt\_Subscribe

##### 5.3.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of an Application layer Network Slice Lifecycle Management Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_NetSliceLifeCycleMngt\_Subscribe" service operation:

- Network Slice Lifecycle Management Subscription Creation.

- Network Slice Lifecycle Management Subscription Update.

- Network Slice Lifecycle Management Subscription Deletion.

##### 5.3.2.2.2 Network Slice Lifecycle Management Subscription Creation

Figure 5.3.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Network Slice Lifecycle Management Subscription (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.2.2-1: Procedure for Network Slice Lifecycle Management Subscription Creation

1. In order to request the creation of a new Network Slice Lifecycle Management Subscription, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Network Slice Lifecycle Management Subscriptions" collection resource, with the request body including the NSLCMSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Network Slice Lifecycle Management Subscription" resource within the NSLCMSubsc data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

##### 5.3.2.2.3 Network Slice Lifecycle Management Subscription Update

Figure 5.3.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Network Slice Lifecycle Management Subscription (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.2.3-1: Procedure for Network Slice Lifecycle Management Subscription Update

1. In order to update an existing Network Slice Lifecycle Management Subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Network Slice Lifecycle Management Subscription" resource, with the request body including either:

- the updated representation of the resource within the NSLCMSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the NSLCMSubscPatch data structure, in case the HTTP PATCH method is used.

2a. Upon success, the NSCE Server shall update the targeted "Individual Network Slice Lifecycle Management Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Network Slice Lifecycle Management Subscription" resource within the NSLCMSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.2.7.

##### 5.3.2.2.4 Network Slice Lifecycle Management Subscription Deletion

Figure 5.3.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of an existing Network Slice Lifecycle Management Subscription (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.2.4-1: Procedure for Network Slice Lifecycle Management Subscription Deletion

1. In order to request the deletion of an existing Network Slice Lifecycle Management Subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Network Slice Lifecycle Management Subscription" resource.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.2.7.

#### 5.3.2.3 NSCE\_NetSliceLifeCycleMngt\_Notify

##### 5.3.2.3.1 General

This service operation is used by the NSCE Server to notify a previously subscribed service consumer on:

- Network Slice Lifecycle Management event(s).

The following procedures are supported by the "NSCE\_NetSliceLifeCycleMngt\_Notify" service operation:

- Network Slice Lifecycle Management Notification.

##### 5.3.2.3.2 Network Slice Lifecycle Management Notification

Figure 5.3.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Network Slice Lifecycle Management event(s) (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.3.2-1: Network Slice Lifecycle Management Notification

1. In order to notify a previously subscribed service consumer on Network Slice Lifecycle Management event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" is set to the value received from the service consumer during the creation/update of the corresponding Network Slice Lifecycle Management Subscription using the procedures defined in clause 5.3.2.2, and the request body including the NSLCMNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

#### 5.3.2.4 NSCE\_NetSliceLifeCycleMngt\_QoEMetricsSubscribe

##### 5.3.2.4.1 General

This service operation is used by a NSCE Server to subscribe a previously subscribed service consumer on:

- QoE metrics.

The following procedures are supported by the "NSCE\_NetSliceLifeCycleMngt\_QoEMetricsSubscribe" service operation:

- QoE Metrics Subscription Notification.

##### 5.3.2.4.2 QoE Metrics Subscription Notification

Figure 5.3.2.4.2-1 depicts a scenario where the NSCE Server sends a request to subscribe to QoE metrics reporting at the service consumer (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.4.2-1: QoE Metrics Subscribe Notification

1. In order to subscribe at the service consumer on QoE metrics reporting, the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}/subscribe-qoe", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Network Slice Lifecycle Management Subscription using the procedures defined in clause 5.3.2.2, and the request body including the QoEMetricsSubscNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with either:

- an HTTP "200 OK" status code with the response body containing immediate QoE metrics reporting related information within the QoEMetricsNotifResp data structure, if immediate reporting was requested.

- an HTTP "204 No Content" status code to acknowledge the reception of the notification and the successful subscription to QoE metrics reporting.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

#### 5.3.2.5 NSCE\_NetSliceLifeCycleMngt\_QoEMetricsNotify

##### 5.3.2.5.1 General

This service operation is used by a service consumer to notify the NSCE Server on:

- QoE metrics report(s).

The following procedures are supported by the "NSCE\_NetSliceLifeCycleMngt\_QoEMetricsNotify" service operation:

- QoE Metrics Notification.

##### 5.3.2.5.2 QoE Metrics Notification

Figure 5.3.2.5.2-1 depicts a scenario where the service consumer sends a request to notify the NSCE Server on QoE metrics report(s) (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.5.2-1: QoE Metrics Notification

1. In order to send a notification on QoE metrics report(s), the service consumer shall send an HTTP POST request targeting the corresponding resource custom operation (i.e., "QoE Metrics Notification") to the NSCE Server, with request body including the QoEMetricsReportNotif data structure.

2a. Upon success, the NSCE Server shall respond to the service consumer with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

#### 5.3.2.6 NSCE\_NetSliceLifeCycleMngt\_Recommend

##### 5.3.2.6.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- network slice LCM recommendation Notification.

The following procedures are supported by the "NSCE\_NetSliceLifeCycleMngt\_Recommend" service operation:

- Network Slice LCM Recommendation Notification.

##### 5.3.2.6.2 Network Slice LCM Recommendation Notification

Figure 5.3.2.6.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on network slice LCM recommendation (see also clause 9.4 of 3GPP°TS°23.435°[14]).



Figure 5.3.2.6.2-1: Network Slice LCM Recommendation Notification

1. In order to notify a previously subscribed service consumer on network Slice LCM Recommendation, the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}/recommend", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Network Slice Lifecycle Management Subscription using the procedures defined in clause 5.3.2.2, and the request body including the NSLCMRecom data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.2.7.

## 5.4 NSCE\_PolicyManagement

### 5.4.1 Service Description

The NSCE\_PolicyManagement service exposed by the NSCE Server enables a service consumer to:

- provision/update/delete a Policy;

- create/update/delete a Policy Usage Subscription; and

- receive Policy Usage Notifications.

### 5.4.2 Service Operations

#### 5.4.2.1 Introduction

The service operations defined for the NSCE\_PolicyManagement service are shown in table 5.4.2.1-1.

Table 5.4.2.1-1: NSCE\_PolicyManagement Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_PolicyManagement\_Create | This service operation enables a service consumer to request the provisioning of a Policy at the NSCE Server. | e.g., VAL Server |
| NSCE\_PolicyManagement\_Update | This service operation enables a service consumer to request the update/modification of a Policy at the NSCE Server. | e.g., VAL Server |
| NSCE\_PolicyManagement\_Delete | This service operation enables a service consumer to request the deletion of a Policy at the NSCE Server. | e.g., VAL Server |
| NSCE\_PolicyManagement\_HarmonizationNotify | This service operation enables a service consumer to receive Policy Harmonization Notifications. | NSCE Server |
| NSCE\_PolicyManagement\_Subscribe | This service operation enables a service consumer to request the creation/update/deletion of a Policy Usage Subscription. | e.g., VAL Server |
| NSCE\_PolicyManagement\_Notify | This service operation enables a service consumer to receive Policy Usage Notifications. | NSCE Server |

#### 5.4.2.2 NSCE\_PolicyManagement\_Create

##### 5.4.2.2.1 General

This service operation is used by a service consumer to request the provisioning of a Policy at the NSCE Server.

The following procedures are supported by the "NSCE\_PolicyManagement\_Create" service operation:

- Policy Provisioning.

##### 5.4.2.2.2 Policy Provisioning

Figure 5.4.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the provisioning of a Policy (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.2.2-1: Procedure for Policy Provisioning

1. In order to provision a new Policy, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Policies" collection resource, with the request body including the Policy data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Policy" resource within the Policy data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7. In particular:

- if the NSCE Server needs to perform policy harmonization for the policy that is requested to be created and the harmonization process is still ongoing, the NSCE Server may reject the request with an HTTP "403 Forbidden" status code with the response body including the ProblemDetails data structure containing the "cause" attribute set to the "HARMOMIZATION\_ONGOING" application error.

#### 5.4.2.3 NSCE\_PolicyManagement\_Update

##### 5.4.2.3.1 General

This service operation is used by a service consumer to request the update of an existing Policy at the NSCE Server.

The following procedures are supported by the "NSCE\_PolicyManagement\_Update" service operation:

- Policy Update.

##### 5.4.2.3.2 Policy Update

Figure 5.4.2.3.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Policy (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.3.2-1: Procedure for Policy Update

1. In order to update an existing Policy, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Policy" resource, with the request body including either:

- the updated representation of the resource within the Policy data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the PolicyPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e., other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Policy" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Policy" resource within the Policy data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.3.7. In particular:

- if the NSCE Server needs to perform policy harmonization for the policy that is requested to be updated and the harmonization process is still ongoing, the NSCE Server may reject the request with an HTTP "403 Forbidden" status code with the response body including the ProblemDetails data structure containing the "cause" attribute set to the "HARMOMIZATION\_ONGOING" application error.

#### 5.4.2.4 NSCE\_PolicyManagement\_Delete

##### 5.4.2.4.1 General

This service operation is used by a service consumer to request the deletion of one or several existing Policy(ies) at the NSCE Server.

The following procedures are supported by the "NSCE\_PolicyManagement\_Delete" service operation:

- Policy(ies) Deletion.

##### 5.4.2.4.2 Policy(ies) Deletion

Figure 5.4.2.4.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of one or several existing Policy(ies) (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.4.2-1: Procedure for Policy(ies) Deletion

1. In order to request the deletion of one or several existing Policy(ies), the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding custom operation (i.e., "Delete"), with the request body including the PolDeleteReq data structure.

NOTE: An alternative service consumer (i.e., other than the one that requested the creation/update of the concerned policy(ies)) can initiate this request.

2a. Upon success, the NSCE Server shall delete the concerned "Individual Policy" resource(s), update the default policy(ies), accordingly and when relevant, and respond with either:

- an HTTP "200 OK" status code with the response body containing policy(ies) deletion related information within the PolDeleteResp data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

#### 5.4.2.5 NSCE\_PolicyManagement\_HarmonizationNotify

##### 5.4.2.5.1 General

This service operation is used by a NSCE Server to notify a previously implicitly subscribed service consumer on:

- Policy Harmonization event(s).

The following procedures are supported by the "NSCE\_PolicyManagement\_HarmonizationNotify" service operation:

- Policy Harmonization Notification.

##### 5.4.2.5.2 Policy Harmonization Notification

Figure 5.4.2.5.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously implicitly subscribed service consumer on Policy Harmonization event(s) (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.5.2-1: Procedure for Policy Harmonization Notification

1. In order to notify a previously implicitly subscribed service consumer on Policy Harmonization event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Policy, using the procedures defined in clause 5.4.2.2 and 5.4.2.3, and the request body including the HarmonizationNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with either:

- an HTTP "200 OK" status code to acknowledge the reception of the notification, with the response body containing harmonization related information within the HarmonizationResp data structure; or

- an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

#### 5.4.2.6 NSCE\_PolicyManagement\_Subscribe

##### 5.4.2.6.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a Policy Usage Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_PolicyManagement\_Subscribe" service operation:

- Policy Usage Subscription Creation.

- Policy Usage Subscription Update.

- Policy Usage Subscription Deletion.

##### 5.4.2.6.2 Policy Usage Subscription Creation

Figure 5.4.2.6.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Policy Usage Subscription (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.6.2-1: Procedure for Policy Usage Subscription Creation

1. In order to request the creation of a new Policy Usage Subscription, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Policy Usage Subscriptions" collection resource, with the request body including the PolUsageSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Policy Usage Subscription" resource within the PolUsageSubsc data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

##### 5.4.2.6.3 Policy Usage Subscription Update

Figure 5.4.2.6.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Policy Usage Subscription (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.6.3-1: Procedure for Policy Usage Subscription Update

1. In order to update an existing Policy Usage Subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Policy Usage Subscription" resource, with the request body including either:

- the updated representation of the resource within the PolUsageSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the PolUsageSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e., other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Policy Usage Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Policy Usage Subscription" resource within the PolUsageSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.3.7.

##### 5.4.2.6.4 Policy Usage Subscription Deletion

Figure 5.4.2.6.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of an existing Policy Usage Subscription (see also clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.4.2.6.4-1: Procedure for Policy Usage Subscription Deletion

1. In order to request the deletion of an existing Policy Usage Subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Policy Usage Subscription" resource.

NOTE: An alternative service consumer (i.e., other than the one that requested the creation/update of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.3.7.

#### 5.4.2.7 NSCE\_PolicyManagement\_Notify

##### 5.4.2.7.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- Policy Usage event(s).

The following procedures are supported by the "NSCE\_PolicyManagement\_Notify" service operation:

- Policy Usage Notification.

##### 5.4.2.7.2 Policy Usage Notification

Figure 5.4.2.7.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Policy Usage event(s) (see also clause 9.5 of 3GPP°TS°23.435°[14]).

Figure 5.4.2.7.2-1: Procedure for Policy Usage Notification

1. In order to notify a previously subscribed service consumer on Policy Usage event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" is set to the value received from the service consumer during the creation/update of the corresponding Policy Usage Subscription, using the procedures defined in clause 5.4.2.6, and the request body including the PolUsageNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.3.7.

## 5.5 NSCE\_NSOptimization

### 5.5.1 Service Description

The NSCE\_NSOptimization service exposed by the NSCE Server enables a service consumer to:

- Create/delete a Network Slice Optimization Subscription;

- Receive Network Slice Optimization notifications; and

- Retrieve Network Slice Optimization reports.

### 5.5.2 Service Operations

#### 5.5.2.1 Introduction

The service operations defined for the NSCE\_NSOptimization service are shown in table 5.5.2.1-1.

Table 5.5.2.1-1: NSCE\_NSOptimization Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_NSOptimization\_Subscribe | This service operation enables a service consumer to create/update/delete a Network Slice Optimization Subscription. | e.g., VAL Server |
| NSCE\_NSOptimization\_Notify | This service operation enables a service consumer to receive Network Slice Optimization notifications. | NSCE Server |

#### 5.5.2.2 NSCE\_NSOptimization\_Subscribe

##### 5.5.2.2.1 General

This service operation is used by a service consumer (e.g. VAL Server) to request the creation/update/deletion of a Network Slice Optimization Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_NSOptimization\_Subscribe" service operation:

- Network Slice Optimization Subscription Creation;

- Network Slice Optimization Subscription Update;

- Network Slice Optimization Subscription Deletion.

##### 5.5.2.2.2 Network Slice Optimization Subscription Creation

Figure 5.5.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Network Slice Optimization Subscription (as defined in clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.5.2.2.2-1: Procedure for Network Slice Optimization Subscription Creation

1. In order to subscribe to network slice optimization reporting, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Network Slice Optimization Subscriptions" collection resource, with the request body including the NetSliceOptSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual Network Slice Optimization Subscription" resource within the NetSliceOptSubsc data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.7.

##### 5.5.2.2.3 Network Slice Optimization Subscription Update

Figure 5.5.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Network Slice Optimization Subscription (as defined in clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.5.2.2.3-1: Procedure for Network Slice Optimization Subscription Update

1. In order to update an existing network slice optimization subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Network Slice Optimization Subscription" resource, with the request body including either:

- the updated representation of the resource within the NetSliceOptSubsc data structure, in case the HTTP PUT method is used.

- the requested modifications to the resource within the NetSliceOptSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Network Slice Optimization Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Network Slice Optimization Subscription" resource within the NetSliceOptSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT response body, as specified in clause 6.4.7.

##### 5.5.2.2.4 Network Slice Optimization Subscription Deletion

Figure 5.5.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to delete an existing Network Slice Optimization Subscription (as defined in clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.5.2.2.4-1: Procedure for Network Slice Optimization Subscription Deletion

1. In order to request the deletion of an existing network slice optimization subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Network Slice Optimization Subscription" resource.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.4.7.

#### 5.5.2.3 NSCE\_NSOptimization\_Notify

##### 5.5.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- Network Slice Optimization report(s).

The following procedures are supported by the "NSCE\_NSOptimization\_Notify" service operation:

- Network Slice Optimization Notification.

##### 5.5.2.3.2 Network Slice Optimization Notification

Figure 5.5.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Network Slice Optimization report(s) (as defined in clause 9.5 of 3GPP°TS°23.435°[14]).



Figure 5.5.2.3.2-1: Procedure for Network Slice Optimization Notification

1. In order to notify a previously subscribed service consumer on Network Slice Optimization report(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" is set to the value received from the service consumer during the creation/update of the corresponding Network Slice Optimization Subscription using the procedures defined in clause 5.5.2.2, and the request body including the NetSliceOptNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.4.7.

## 5.6 NSCE\_ManagementServiceDiscovery

### 5.6.1 Service Description

The NSCE\_ManagementServiceDiscovery service exposed by the NSCE Server enables a service consumer to:

- create/update/delete a Management Discovery Subscription; and

- receive Management Discovery Notifications.

### 5.6.2 Service Operations

#### 5.6.2.1 Introduction

The service operations defined for the NSCE\_ManagementServiceDiscovery service are shown in table 5.6.2.1-1.

Table 5.6.2.1-1: NSCE\_ManagementServiceDiscovery Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_ManagementServiceDiscovery\_Subscribe | This service operation enables a service consumer to request the creation of a Management Discovery Subscription at the NSCE Server. | e.g., VAL Server |
| NSCE\_ManagementServiceDiscovery\_Notify | This service operation enables a service consumer to receive Management Discovery Notifications. | NSCE Server |

#### 5.6.2.2 NSCE\_ManagementServiceDiscovery\_Subscribe

##### 5.6.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a Management Discovery Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_ManagementServiceDiscovery\_Subscribe" service operation:

- Management Discovery Subscription Creation.

- Management Discovery Subscription Update.

- Management Discovery Subscription Deletion.

##### 5.6.2.2.2 Management Discovery Subscription Creation

Figure 5.6.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Management Discovery Subscription (see also clause 9.6 of 3GPP°TS°23.435°[14]).



Figure 5.6.2.2.2-1: Procedure for Management Discovery Subscription Creation

1. In order to request the creation of a new Management Discovery Subscription, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Management Discovery Subscription" collection resource, with the request body including the MnSDiscSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Management Discovery Subscription" resource within the MnSDiscSubsc data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.5.7.

##### 5.6.2.2.3 Management Discovery Subscription Update

Figure 5.6.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Management Discovery Subscription (see also clause 9.6 of 3GPP°TS°23.435°[14]).



Figure 5.6.2.2.3-1: Procedure for Management Discovery Subscription Update

1. In order to update an existing Management Discovery Subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Management Discovery Subscription" resource, with the request body including either:

- the updated representation of the resource within the MnSDiscSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the MnSDiscSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Management Discovery Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Management Discovery Subscription" resource within the MnSDiscSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.5.7.

##### 5.6.2.2.4 Management Discovery Subscription Deletion

Figure 5.6.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of an existing Management Discovery Subscription (see also clause 9.6 of 3GPP°TS°23.435°[14]).



Figure 5.6.2.2.4-1: Procedure for Management Discovery Subscription Deletion

1. In order to request the deletion of an existing Management Discovery Subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Management Discovery Subscription" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.5.7.

#### 5.6.2.3 NSCE\_ManagementServiceDiscovery\_Notify

##### 5.6.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- Management Discovery Subscription.

The following procedures are supported by the "NSCE\_ManagementServiceDiscovery\_Notify" service operation:

- MnS discovery Notification.

##### 5.6.2.3.2 Management Discovery Notification

Figure 5.6.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Management Discovery event(s) (see also clause 9.6 of 3GPP°TS°23.435°[14]).



Figure 5.6.2.3.2-1: MnS discovery Notification

1. In order to notify a previously subscribed service consumer on Management Discovery event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Management Discovery Subscription using the procedures defined in clause 5.6.2.2, and the request body including the MnSDiscNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.5.7.

## 5.7 NSCE\_PerfMonitoring

### 5.7.1 Service Description

The NSCE\_PerfMonitoring service exposed by the NSCE Server enables a service consumer to:

- create/update/delete a network slice related performance and analytics monitoring job;

- create/update/delete a network slice related performance and analytics monitoring subscription;

- receive network slice related performance and analytics monitoring event(s) related notifications; and

- request a multiple slices related performance and analytics consolidated reporting;

### 5.7.2 Service Operations

#### 5.7.2.1 Introduction

The service operations defined for the NSCE\_PerfMonitoring service are shown in table 5.7.2.1-1.

Table 5.7.2.1-1: NSCE\_PerfMonitoring Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_PerfMonitoring\_Manage | This service operation enables a service consumer to request the creation/update/deletion of a network slice related performance and analytics monitoring job at the NSCE Server. | e.g., VAL Server |
| NSCE\_PerfMonitoring\_Subscribe | This service operation enables a service consumer to request the creation/update/deletion of a network slice related performance and analytics monitoring subscription at the NSCE Server. | e.g., VAL Server |
| NSCE\_PerfMonitoring\_Notify | This service operation enables a service consumer to receive network slice related performance and analytics monitoring event(s) related notifications from the NSCE Server. | NSCE Server |
| NSCE\_PerfMonitoring\_Request | This service operation enables a service consumer to request a multiple slices related performance and analytics consolidated reporting to the NSCE Server. | e.g., VAL Server |

#### 5.7.2.2 NSCE\_PerfMonitoring\_Manage

##### 5.7.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a network slice related performance and analytics monitoring job at the NSCE Server.

The following procedures are supported by the "NSCE\_PerfMonitoring\_Manage" service operation:

- Monitoring Job Creation.

- Monitoring Job Update.

- Monitoring Job Deletion.

##### 5.7.2.2.2 Monitoring Job Creation

Figure 5.7.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the creation of a Monitoring Job (see also clause 9.7 of 3GPP°TS°23.435°[14]).

 Figure 5.7.2.2.2-1: Procedure for Monitoring Job Creation

1. In order to create a new network slice related performance and analytics monitoring job, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Monitoring Jobs" collection resource, with the request body including the MonitoringJob data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Monitoring Job" resource within the MonitoringJob data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.6.7.

##### 5.7.2.2.3 Monitoring Job Update

Figure 5.7.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Monitoring Job (see also clause 9.7 of 3GPP°TS°23.435°[14]).



Figure 5.7.2.2.3-1: Procedure for Monitoring Job Update

1. In order to request the update of an existing network slice related performance and analytics monitoring job, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Monitoring Job" resource, with the request body including either:

- the updated representation of the resource within the MonitoringJob data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the MonitoringJobPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Monitoring Job" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Monitoring Job" resource within the MonitoringJob data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.6.7.

##### 5.7.2.2.4 Monitoring Job Deletion

Figure 5.7.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of an existing Monitoring Job (see also clause 9.7 of 3GPP°TS°23.435°[14]).



Figure 5.7.2.2.4-1: Procedure for Monitoring Job Deletion

1. In order to request the deletion of an existing network slice related performance and analytics monitoring job, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Monitoring Job" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation/update of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.6.7.

#### 5.7.2.3 NSCE\_PerfMonitoring\_Subscribe

##### 5.7.2.3.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a network slice related performance and analytics monitoring subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_PerfMonitoring\_Subscribe" service operation:

- Monitoring Subscription Creation.

- Monitoring Subscription Update.

- Monitoring Subscription Deletion.

##### 5.7.2.3.2 Monitoring Subscription Creation

Figure 5.7.2.3.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Monitoring Subscription (see also clause 9.7 of 3GPP°TS°23.435°[14]).

 Figure 5.7.2.3.2-1: Procedure for Monitoring Subscription Creation

1. In order to create a new network slice related performance and analytics monitoring subscription, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Monitoring Subscriptions" collection resource, with the request body including the MonitoringSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Monitoring Subscription" resource within the MonitoringSubsc data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.6.7.

##### 5.7.2.3.3 Monitoring Subscription Update

Figure 5.7.2.3.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Monitoring Subscription (see also clause 9.7 of 3GPP°TS°23.435°[14]).



Figure 5.7.2.3.3-1: Procedure for Monitoring Subscription Update

1. In order to request the update of an existing network slice related performance and analytics monitoring subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Monitoring Subscription" resource, with the request body including either:

- the updated representation of the resource within the MonitoringSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the MonitoringSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Monitoring Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Monitoring Subscription" resource within the MonitoringSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.6.7.

##### 5.7.2.3.4 Monitoring Subscription Deletion

Figure 5.7.2.3.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the deletion of an existing Monitoring Subscription (see also clause 9.7 of 3GPP°TS°23.435°[14]).



Figure 5.7.2.3.4-1: Procedure for Monitoring Subscription Deletion

1. In order to request the deletion of an existing network slice related performance and analytics monitoring subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Monitoring Subscription" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation/update of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.6.7.

#### 5.7.2.4 NSCE\_PerfMonitoring\_Notify

##### 5.7.2.4.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- network slice related performance and analytics monitoring event(s).

The following procedures are supported by the "NSCE\_PerfMonitoring\_Notify" service operation:

- Monitoring Notification.

##### 5.7.2.4.2 Monitoring Notification

Figure 5.7.2.4.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on network slice related performance and analytics monitoring event(s) (see also clause 9.7 of 3GPP°TS°23.435°[14]).

Figure 5.7.2.4.2-1: Procedure for Monitoring Notification

1. In order to notify a previously subscribed service consumer on network slice related performance and analytics monitoring event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Monitoring Subscription using the procedures defined in clause 5.7.2.3, and the request body including the MonitoringNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the successful reception and processing of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.6.7.

#### 5.7.2.5 NSCE\_PerfMonitoring\_Request

##### 5.7.2.5.1 General

This service operation is used by a service consumer to request a multiple slices related performance and analytics consolidated reporting to the NSCE Server.

The following procedures are supported by the "NSCE\_PerfMonitoring\_Request" service operation:

- Multiple Slices related Performance and Analytics Consolidated Reporting Request.

##### 5.7.2.5.2 Multiple Slices related Performance and Analytics Consolidated Reporting Request

Figure 5.7.2.5.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request a multiple slices related performance and analytics consolidated reporting (see also clause 9.7 of 3GPP°TS°23.435°[14]).



Figure 5.7.2.5.2-1: Procedure for Multiple Slices related Performance and Analytics Consolidated Reporting Request

1. In order to request a multiple slices related performance and analytics consolidated reporting, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the MonitoringReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "200 OK" status code with the response body containing the requested multiple slices related performance and analytics consolidated report within the MonitoringResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.6.7.

## 5.8 NSCE\_InfoCollection

### 5.8.1 Service Description

The NSCE\_InfoCollection service exposed by the NSCE Server enables a service consumer to:

- create/update/delete the Information Collection Subscription; and

- receive the Information Collection Notifications.

### 5.8.2 Service Operations

#### 5.8.2.1 Introduction

The service operations defined for the NSCE\_InfoCollection service are shown in table 5.8.2.1-1.

Table 5.8.2.1-1: NSCE\_InfoCollection Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_InfoCollection\_Subscribe | This service operation enables a service consumer to create/update/delete an Information Collection Subscription. | e.g., NSCE Server |
| NSCE\_InfoCollection\_Notify | This service operation enables a service consumer to receive Information Collection Notifications. | e.g., NSCE Server |

#### 5.8.2.2 NSCE\_InfoCollection\_Subscribe

##### 5.8.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of an Information Collection Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_InfoCollection\_Subscribe" service operation:

- Information Collection Subscription Creation;

- Information Collection Subscription Update;

- Information Collection Subscription Deletion.

##### 5.8.2.2.2 Information Collection Subscription Creation

Figure 5.8.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the creation of an Information Collection Subscription (as defined in clause 9.8 of 3GPP°TS°23.435°[14]).

**Service Consumer**

**NSCE Server**

POST.../subscriptions(InfoCollectSubsc)

2a. 201 Created (InfoCollectSubsc)

2b. 4xx/5xx

Figure 5.8.2.2.2-1: Procedure for Information Collection Subscription Creation

1. In order to request the creation of an Information Collection Subscription, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Information Collection Subscriptions" collection resource, with the request body including the InfoCollectSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual Information Collection Subscription" resource within the InfoCollectSubsc data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.7.7.

##### 5.8.2.2.3 Information Collection Subscription Update

Figure 5.8.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Information Collection Subscription (as defined in clause 9.8 of 3GPP°TS°23.435°[14]).

**Service Consumer**

**NSCE Server**

PUT or PATCH.../subscriptions/{subscriptionId}

2a. 200 OK (InfoCollectSubsc)/204 No Content

2b. 4xx/5xx

(InfoCollectSubsc or InfoCollectSubscPatch)

Figure 5.8.2.2.3-1: Procedure for Information Collection Subscription Update

1. In order to update an existing Information Collection Subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Information Collection Subscription" resource, with the request body including either:

- the updated representation of the resource within the InfoCollectSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the InfoCollectSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Information Collection Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Information Collection Subscription" resource within the InfoCollectSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.7.7.

##### 5.8.2.2.4 Information Collection Subscription Deletion

Figure 5.8.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Information Collection Subscription (as defined in clause 9.8 of 3GPP°TS°23.435°[14]).

**Service Consumer**

**NSCE Server**

DELETE.../subscriptions/{subscriptionId}

2a. 204 No Content

2b. 4xx/5xx

Figure 5.8.2.2.4-1: Procedure for Information Collection Subscription Deletion

1. In order to request the deletion of an existing Information Collection Subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Information Collection Subscription" resource.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.7.7.

#### 5.8.2.3 NSCE\_InfoCollection\_Notify

##### 5.8.2.3.1 General

This service operation is used by an NSCE Server to notify a previously subscribed service consumer on:

- information Collection report(s).

The following procedures are supported by the "NSCE\_InfoCollection\_Notify" service operation:

- Information Collection Notification.

##### 5.8.2.3.2 Information Collection Notification

Figure 5.8.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Information Collection report(s) (as defined in clause 9.8 of 3GPP°TS°23.435°[14]).

**NSCE Server**

**Service Consumer**

POST{notifUri}(InfoCollectNotif)

2a. 204 No Content

2b. 4xx/5xx

Figure 5.8.2.3.2-1: Procedure for Information Collection Notification

1. In order to notify a previously subscribed service consumer on Information Collection report(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Information Collection Subscription using the procedures defined in clause 5.8.2.2, and the request body including the InfoCollectNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.7.7.

## 5.9 NSCE\_ServiceContinuity

### 5.9.1 Service Description

The NSCE\_ServiceContinuity service exposed by the NSCE Server enables a service consumer to:

- request edge service continuity requirement; and

- receive edge service continuity requirement related notifications.

- request edge service continuity negotiation; and

- receive edge service continuity negotiation related notifications.

### 5.9.2 Service Operations

#### 5.9.2.1 Introduction

The service operations defined for the NSCE\_ServiceContinuity service are shown in table 5.9.2.1-1.

Table 5.9.2.1-1: NSCE\_ServiceContinuity Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_ServiceContinuity\_Request | This service operation enables a service consumer to request edge service continuity requirement to the NSCE Server. | e.g., VAL Server |
| NSCE\_ServiceContinuity\_Notify | This service operation enables a service consumer to receive edge service continuity requirement related notifications from the NSCE Server. | NSCE Server |
| NSCE\_ServiceContinuity\_Negotiate | This service operation enables a service consumer to request edge service continuity negotiation to the NSCE Server. | NSCE Server |
| NSCE\_ServiceContinuity\_NegotiateNotify | This service operation enables a service consumer to receive edge service continuity negotiation related notifications from the NSCE Server. | NSCE Server |

#### 5.9.2.2 NSCE\_ServiceContinuity\_Request

##### 5.9.2.2.1 General

This service operation is used by a service consumer to request edge service continuity requirement to the NSCE Server.

The following procedures are supported by the "NSCE\_ServiceContinuity\_Request" service operation:

- Edge service continuity requirement Request.

##### 5.9.2.2.2 Edge service continuity requirement Request

Figure 5.9.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request edge service continuity requirement to the NSCE Server (see also clause 9.9 of 3GPP°TS°23.435°[14]).



Figure 5.9.2.2.2-1: Procedure for Edge service continuity requirement Request

1. In order to request edge service continuity requirement, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the EdgeSCRequirementReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code to indicate that the edge service continuity requirement request is successfully received, accepted and processed.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.8.7.

#### 5.9.2.3 NSCE\_ServiceContinuity\_Notify

##### 5.9.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- edge service continuity requirement.

The following procedures are supported by the "NSCE\_ServiceContinuity\_Notify" service operation:

- Edge service continuity requirement Notification.

##### 5.9.2.3.2 Edge service continuity requirement Notification

Figure 5.9.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously requested service consumer on edge service continuity requirement (see also clause 9.9 of 3GPP°TS°23.435°[14]).



Figure 5.9.2.3.2-1: Edge service continuity requirement Notification

1. In order to notify a previously subscribed service consumer on edge service continuity requirement, the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer using the procedures defined in clause 5.9.2.2, and the request body including the EdgeSCRequirementNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the successful reception and processing of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.8.7.

#### 5.9.2.4 NSCE\_ServiceContinuity\_Negotiate

##### 5.9.2.4.1 General

This service operation is used by a service consumer to request edge service continuity negotiation to the NSCE Server.

The following procedures are supported by the "NSCE\_ServiceContinuity\_Negotiate" service operation:

- Edge service continuity negotiation Request.

##### 5.9.2.4.2 Edge service continuity negotiation Request

Figure 5.9.2.4.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request edge service continuity negotiation to the NSCE Server (see also clause 9.9 of 3GPP°TS°23.435°[14]).



Figure 5.9.2.4.2-1: Procedure for Edge service continuity negotiation Request

1. In order to request edge service continuity negotiation, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the EdgeSCNegotiationReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code to indicate that the edge service continuity negotiation request is successfully received, accepted and processed.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.8.7.

#### 5.9.2.5 NSCE\_ServiceContinuity\_NegotiateNotify

##### 5.9.2.5.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- edge service continuity negotiation.

The following procedures are supported by the "NSCE\_ServiceContinuity\_NegotiateNotify" service operation:

- Edge service continuity negotiation Notification.

##### 5.9.2.5.2 Edge service continuity negotiation Notification

Figure 5.9.2.5.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously requested service consumer on edge service continuity negotiation (see also clause 9.9 of 3GPP°TS°23.435°[14]).



Figure 5.9.2.5.2-1: Edge service continuity negotiation Notification

1. In order to notify a previously subscribed service consumer on edge service continuity negotiation, the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer using the procedures defined in clause 5.9.2.4, and the request body including the EdgeSCNegotiationNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the successful reception and processing of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.8.7.

## 5.10 NSCE\_MultiSlicesOptimization

### 5.10.1 Service Description

The NSCE\_MultiSlicesOptimization service exposed by the NSCE Server enables a service consumer to:

- request Multiple Slices Optimization.

### 5.10.2 Service Operations

#### 5.10.2.1 Introduction

The service operation defined for the NSCE\_MultiSlicesOptimization service is shown in table 5.10.2.1-1.

Table 5.10.2.1-1: NSCE\_MultiSlicesOptimization Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_MultiSlicesOptimization\_Request | This service operation enables a service consumer to request multiple slices optimization to the NSCE Server. | e.g., VAL Server |

#### 5.10.2.2 NSCE\_MultiSlicesOptimization\_Request

##### 5.10.2.2.1 General

This service operation is used by a service consumer to request multiple slices optimization to the NSCE Server.

The following procedures are supported by the "NSCE\_MultiSlicesOptimization\_Request" service operation:

- Multiple Slices Optimization Request.

##### 5.10.2.2.2 Multiple Slices Optimization Request

Figure 5.10.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request multiple slices optimization (as defined in clause 9.10 of 3GPP°TS°23.435°[14]).



Figure 5.10.2.2.2-1: Procedure for Multiple Slices Optimization Request

1. In order to request multiple slices optimization, the service consumer shall send an HTTP POST request to the NSCE Server, with the request body including the MultiSlicesOptReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.9.7.

## 5.11 NSCE\_NetworkSliceAdaptation

### 5.11.1 Service Description

The NSCE\_NetworkSliceAdaptation service exposed by the NSCE Server enables a service consumer to:

- request network slice adaptation;

- receive Network Slice Adaptation Status notifications;

NOTE: The Rel-17 version of this API is documented in clauses 5.8.1.1, 7.7.1, and Annex A.9 of 3GPP TS 29.549 [15]. This API moves to this specification in Rel-18.

### 5.11.2 Service Operations

#### 5.11.2.1 Introduction

The service operations defined for the NSCE\_NetworkSliceAdaptation service are shown in table 5.11.2.1-1.

Table 5.11.2.1-1: NSCE\_NetworkSliceAdaptation Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| Network\_slice\_adaptation | This service operation enables a service consumer to request network slice adaptation to the NSCE Server. | e.g., VAL Server |
| NSCE\_NetworkSliceAdaptation\_Notify | This service operation enables a service consumer to receive Network Slice Adaptation Status notifications. | NSCE Server |

#### 5.11.2.2 Network\_slice\_adaptation

##### 5.11.2.2.1 General

This service operation is used by a service consumer to request network slice adaptation to the NSCE Server.

The following procedures are supported by the "Network\_slice\_adaptation" service operation:

- Network Slice Adaptation Request.

##### 5.11.2.2.2 Network Slice Adaptation Request

Figure 5.11.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request network slice adaptation (see also clause 9.11 of 3GPP°TS°23.435°[14]).



Figure 5.11.2.2.2-1: Procedure for Network Slice Adaptation Request

1. To request network slice adaptation, the service consumer shall send an HTTP POST request to the NSCE server targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the NwSliceAdptInfo data structure.

2a. Upon reception of the HTTP POST request message, the NSCE server shall:

- process the request and trigger the network slice configuration per VAL UE within the VAL Application;

- send guidance information to the PCF via the NEF as part of the AF-driven guidance for URSP determination to the 5G system, using the Nnef\_ServiceParameter API defined in 3GPP TS 29.522 [16]; and

- after receiving a successful response from the NEF, respond with an HTTP "204 No content" status code to confirm the fulfillement of the network slice adaptation request.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.10.7. In particular:

- if the requested network slice adaptation fails or cannot be performed at the NSCE Server, the NSCE Serevr may reject the request and respond to the AF with an HTTP "403 Forbidden" status code with the response body including the ProblemDetailsSliceAdapt data structure containing:

- the ProblemDetails data structure with the "cause" attribute set to the "ADAPTATION\_FAILURE" application error; and optionally

- the AdaptFailCause data structure containing the cause of the network slice adaptation failure.

#### 5.11.2.3 NSCE\_NetworkSliceAdaptation\_Notify

##### 5.11.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- Network Slice Adaptation Status event(s).

The following procedures are supported by the "NSCE\_NetworkSliceAdaptation\_Notify" service operation:

- Network Slice Adaptation Status Notification.

##### 5.11.2.3.2 Network Slice Adaptation Status Notification

Figure 5.11.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously implicitly subscribed service consumer on Network Slice Adaptation Status event(s) (see also clause 9.11 of 3GPP°TS°23.435°[14]).

Figure 5.11.2.3.2-1: Procedure for Network Slice Adaptation Status Notification

1. In order to notify a previously implicitly subscribed service consumer on Network Slice Adaptation Status event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the corresponding Network Slice Adaptation Request, using the procedures defined in clause 5.11.2.2, and the request body including the AdaptStatusNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.10.7.

## 5.12 NSCE\_SliceCommService

### 5.12.1 Service Description

The NSCE\_SliceCommService service exposed by the NSCE Server enables a service consumer to:

- create/reconfigure/disengage a Slice Related Communication Service.

### 5.12.2 Service Operations

#### 5.12.2.1 Introduction

The service operations defined for the NSCE\_SliceCommService service are shown in table 5.12.2.1-1.

Table 5.12.2.1-1: NSCE\_SliceCommService Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_SliceCommService\_Create | This service operation enables a service consumer to request the creation of a Slice Related Communication Service at the NSCE Server. | e.g., VAL Server |
| NSCE\_SliceCommService\_Reconfigure | This service operation enables a service consumer to request the update/modification (i.e., reconfiguration) of an existing Slice Related Communication Service at the NSCE Server. | e.g., VAL Server |
| NSCE\_SliceCommService\_Disengage | This service operation enables a service consumer to request the deletion (disengagement) of an existing Slice Related Communication Service at the NSCE Server. | e.g., VAL Server |

#### 5.12.2.2 NSCE\_SliceCommService\_Create

##### 5.12.2.2.1 General

This service operation is used by a service consumer to request the creation of a Slice Related Communication Service at the NSCE Server.

The following procedures are supported by the "NSCE\_SliceCommService\_Create" service operation:

- Slice Related Communication Service Creation.

##### 5.12.2.2.2 Slice Related Communication Service Creation

Figure 5.12.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Slice Related Communication Service (see also clause 9.12 of 3GPP°TS°23.435°[14]).



Figure 5.12.2.2.2-1: Procedure for Slice Related Communication Service Creation

1. In order to create a new Slice Related Communication Service, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Slice Related Communication Services" collection resource, with the request body including the SliceCommService data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code, with the response body containing a representation of the created "Individual Slice Related Communication Service" resource within the SliceCommService data structure, and an HTTP "Location" header field containing the URI of the created resource.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.11.7.

#### 5.12.2.3 NSCE\_SliceCommService\_Reconfigure

##### 5.12.2.3.1 General

This service operation is used by a service consumer to request the reconfiguration of an existing Slice Related Communication Service at the NSCE Server.

The following procedures are supported by the "NSCE\_SliceCommService\_Reconfigure" service operation:

- Slice Related Communication Service Reconfiguration.

##### 5.12.2.3.2 Slice Related Communication Service Reconfiguration

Figure 5.12.2.3.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the reconfiguration of an existing Slice Related Communication Service (see also clause 9.12 of 3GPP°TS°23.435°[14]).



Figure 5.12.2.3.2-1: Procedure for Slice Related Communication Service Reconfiguration

1. In order to request the update (i.e., reconfiguration) of an existing Slice Related Communication Service, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Slice Related Communication Service" resource, with the request body including either:

- the updated representation of the resource within the SliceCommService data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the SliceCommServicePatch data structure, in case the HTTP PATCH method is used.

NOTE 1: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Slice Related Communication Service" resource accordingly and respond with an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Slice Related Communication Service" resource within the SliceCommService data structure.

NOTE 2: The HTTP "204 No Content" status code is not supported for this case as the response has to always include a response body to convey the the information of the network slice determined and assigned to fulfill the received updated application service requirements within the updated resource representation.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.11.7.

#### 5.12.2.4 NSCE\_SliceCommService\_Disengage

##### 5.12.2.4.1 General

This service operation is used by a service consumer to request the disengagement of an existing Slice Related Communication Service at the NSCE Server.

The following procedures are supported by the "NSCE\_SliceCommService\_Disengage" service operation:

- Slice Related Communication Service Disengagement.

##### 5.12.2.4.2 Slice Related Communication Service Disengagement

Figure 5.12.2.4.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the disengagement of an existing Slice Related Communication Service (see also clause 9.12 of 3GPP°TS°23.435°[14]).



Figure 5.12.2.4.2-1: Procedure for Slice Related Communication Service Disengagement

1. In order to request the deletion (i.e., disengagement) of an existing Slice Related Communication Service, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Slice Related Communication Service" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation/update of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.11.7.

## 5.13 NSCE\_InterPLMNContinuity

### 5.13.1 Service Description

The NSCE\_InterPLMNContinuity service exposed by the NSCE Server enables a service consumer to:

- request inter-PLMN application service continuity; and

- receive inter-PLMN service continuity event(s) related notifications.

### 5.13.2 Service Operations

#### 5.13.2.1 Introduction

The service operations defined for the NSCE\_InterPLMNContinuity service are shown in table 5.13.2.1-1.

Table 5.13.2.1-1: NSCE\_InterPLMNContinuity Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_InterPLMNContinuity\_Request | This service operation enables a service consumer to request inter-PLMN application service continuity to the NSCE Server. | e.g., VAL Server |
| NSCE\_InterPLMNContinuity\_Notify | This service operation enables a service consumer to receive inter-PLMN service continuity event(s) related notifications from the NSCE Server. | NSCE Server |

#### 5.13.2.2 NSCE\_InterPLMNContinuity\_Request

##### 5.13.2.2.1 General

This service operation is used by a service consumer to request inter-PLMN application service continuity to the NSCE Server.

The following procedures are supported by the "NSCE\_InterPLMNContinuity\_Request" service operation:

- Inter-PLMN Application Service Continuity Request.

##### 5.13.2.2.2 Inter-PLMN Application Service Continuity Request

Figure 5.13.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request inter-PLMN application service continuity (see also clause 9.13 of 3GPP°TS°23.435°[14]).



Figure 5.13.2.2.2-1: Procedure for Inter-PLMN Application Service Continuity Request

1. In order to request inter-PLMN application service continuity, the service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the corresponding custom operation (i.e., "Request"), with the request body including the InterPlmnServContReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code to indicate that the inter-PLMN application service continuity request is successfully received, accepted and processed.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.12.7.

#### 5.13.2.3 NSCE\_InterPLMNContinuity\_Notify

##### 5.13.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- inter-PLMN service continuity event(s).

The following procedures are supported by the "NSCE\_InterPLMNContinuity\_Notify" service operation:

- Inter-PLMN Service Continuity Notification.

##### 5.13.2.3.2 Inter-PLMN Service Continuity Notification

Figure 5.13.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on inter-PLMN service continuity event(s) (see also clause 9.13 of 3GPP°TS°23.435°[14]).



Figure 5.13.2.3.2-1: Inter-PLMN Service Continuity Notification

1. In order to notify a previously subscribed service consumer on inter-PLMN service continuity event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer using the procedures defined in clause 5.13.2.2, and the request body including the InterPlmnServContNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the successful reception and processing of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.12.7.

## 5.14 NSCE\_NSDiagnostics

### 5.14.1 Service Description

The NSCE\_NSDiagnostics service exposed by the NSCE Server enables a service consumer to:

- request network slice diagnostics information.

### 5.14.2 Service Operations

#### 5.14.2.1 Introduction

The service operations defined for NSCE\_NSDiagnostics service is shown in the table 5.14.2.1-1.

Table 5.14.2.1-1: NSCE\_NSDiagnostics API Service Operations

|  |  |  |
| --- | --- | --- |
| Service operation name | Description | Initiated by |
| NSCE\_NSDiagnostics\_Request | This service operation is used by a service consumer to request network slice diagnostics from the NSCE Server. | e.g., VAL Server |

#### 5.14.2.2 NSCE\_NSDiagnostics\_Request

##### 5.14.2.2.1 General

This service operation is used by a service consumer to request network slice diagnostics from the NSCE Server.

The following procedures are supported by the "NSCE\_NSDiagnostics\_Request" service operation:

- Network Slice Diagnostics Request.

##### 5.14.2.2.2 Network Slice Diagnostics Request

Figure 5.14.2.2.2-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the network slice diagnostics (see also clause 9.14 of 3GPP°TS°23.435°[14]).



Figure 5.14.2.2.2-1: Procedure for Network Slice Diagnostics Request

1. In order to request network slice diagnostics, the service consumer shall send an HTTP POST request (i.e., custom operation "Request") to the NSCE Server, with the request body containing the NwSliceDiagReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "200 OK" status code with the response body containing the requested network slice diagnostics within the NwSliceDiagRep data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.13.7.

## 5.15 NSCE\_FaultDiagnosis

### 5.15.1 Service Description

The NSCE\_FaultDiagnosis service exposed by the NSCE Server enables a service consumer to:

- create/update/delete a Network Slice Fault Diagnosis Subscription;

- receive Network Slice Fault Diagnosis Notifications; and

### 5.15.2 Service Operations

#### 5.15.2.1 Introduction

The service operations defined for the NSCE\_FaultDiagnosis service are shown in table 5.15.2.1-1.

Table 5.15.2.1-1: NSCE\_FaultDiagnosis Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_FaultDiagnosis\_Subscribe | This service operation enables a service consumer to create/update/delete a Network Slice Fault Diagnosis Subscription. | e.g., VAL Server |
| NSCE\_FaultDiagnosis\_Notify | This service operation enables a service consumer to receive Network Slice Fault Diagnosis Notifications. | NSCE Server |

#### 5.15.2.2 NSCE\_FaultDiagnosis\_Subscribe

##### 5.15.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a Network Slice Fault Diagnosis Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_FaultDiagnosis\_Subscribe" service operation:

- Network Slice Fault Diagnosis Subscription Creation;

- Network Slice Fault Diagnosis Subscription Update;

- Network Slice Fault Diagnosis Subscription Deletion.

##### 5.15.2.2.2 Network Slice Fault Diagnosis Subscription Creation

Figure 5.15.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Network Slice Fault Diagnosis Subscription (see also clause 9.15 of 3GPP°TS°23.435°[14]).



Figure 5.15.2.2.2-1: Procedure for Network Slice Fault Diagnosis Subscription Creation

1. In order to subscribe to network slice fault diagnosis reporting, a service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Network Slice Fault Diagnosis Subscriptions" collection resource, with the request body including the FaultDiagSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual Network Slice Fault Diagnosis Subscription" resource within the FaultDiagSubsc data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.14.7.

##### 5.15.2.2.3 Network Slice Fault Diagnosis Subscription Update

Figure 5.15.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Network Slice Fault Diagnosis Subscription (see also clause 9.15 of 3GPP°TS°23.435°[14]).



Figure 5.15.2.2.3-1: Procedure for Network Slice Fault Diagnosis Subscription Update

1. In order to update an existing network slice fault diagnosis subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Network Slice Fault Diagnosis Subscription" resource, with the request body including either:

- the updated representation of the resource within the FaultDiagSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the FaultDiagSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Network Slice Fault Diagnosis Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Network Slice Fault Diagnosis Subscription" resource within the FaultDiagSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT response body, as specified in clause 6.14.7.

##### 5.15.2.2.4 Network Slice Fault Diagnosis Subscription Deletion

Figure 5.15.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to delete an existing Network Slice Fault Diagnosis Subscription (see also clause 9.15 of 3GPP°TS°23.435°[14]).



Figure 5.15.2.2.4-1: Procedure for Network Slice Fault Diagnosis Subscription Deletion

1. In order to request the deletion of an existing network slice fault diagnosis subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Network Slice Fault Diagnosis Subscription" resource.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.14.7.

#### 5.15.2.3 NSCE\_FaultDiagnosis\_Notify

##### 5.15.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- Network Slice Fault Diagnosis event(s).

The following procedures are supported by the "NSCE\_FaultDiagnosis\_Notify" service operation:

- Network Slice Fault Diagnosis Notification.

##### 5.15.2.3.2 Network Slice Fault Diagnosis Notification

Figure 5.15.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Network Slice Fault Diagnosis event(s) (see also clause 9.15 of 3GPP°TS°23.435°[14]).



Figure 5.15.2.3.2-1: Procedure for Network Slice Fault Diagnosis Notification

1. In order to notify a previously subscribed service consumer on network slice fault diagnosis event(s), the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Network Slice Fault Diagnosis Subscription using the procedures defined in clause 5.15.2.2, and the request body including the FaultDiagNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.14.7.

## 5.16 NSCE\_SliceReqVerifyAndAlign

### 5.16.1 Service Description

The NSCE\_SliceReqVerifyAndAlign service exposed by the NSCE Server enables a service consumer to:

- create/update/delete a Network Slice Requirements Verification and Alignment Subscription;

- receive Network Slice Requirements Verification and Alignment Notifications.

### 5.16.2 Service Operations

#### 5.16.2.1 Introduction

The service operations defined for the NSCE\_SliceReqVerifyAndAlign service are shown in table 5.16.2.1-1.

Table 5.16.2.1-1: NSCE\_SliceReqVerifyAndAlign Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_SliceReqVerifyAndAlign\_Subscribe | This service operation enables a service consumer to create/update/delete a Network Slice Requirements Verification and Alignment Subscription. | e.g., VAL Server |
| NSCE\_SliceReqVerifyAndAlign\_Notify | This service operation enables a service consumer to receive Network Slice Requirements Verification and Alignment Notifications. | NSCE Server |

#### 5.16.2.2 NSCE\_SliceReqVerifyAndAlign\_Subscribe

##### 5.16.2.2.1 General

This service operation is used by a service consumer to request the creation/update/deletion of a Network Slice Requirements Verification and Alignment Subscription at the NSCE Server.

The following procedures are supported by the "NSCE\_SliceReqVerifyAndAlign\_Subscribe" service operation:

- Network Slice Requirements Verification and Alignment Subscription Creation;

- Network Slice Requirements Verification and Alignment Subscription Update;

- Network Slice Requirements Verification and Alignment Subscription Deletion.

##### 5.16.2.2.2 Network Slice Requirements Verification and Alignment Subscription Creation

Figure 5.16.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the creation of a Network Slice Requirements Verification and Alignment Subscription (see also clause 9.16 of 3GPP°TS°23.435°[14]).



Figure 5.16.2.2.2-1: Procedure for Network Slice Requirements Verification and Alignment Subscription Creation

1. In order to subscribe to network slice requirements verification and alignment, a service consumer shall send an HTTP POST request to the NSCE Server targeting the URI of the "Network Slice Requirements Verification and Alignment Subscriptions" collection resource, with the request body including the SliceReqVerAlignSubsc data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "201 Created" status code with the response body containing a representation of the created "Individual Network Slice Requirements Verification and Alignment Subscription" resource within the SliceReqVerAlignSubsc data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.15.7.

##### 5.16.2.2.3 Network Slice Requirements Verification and Alignment Subscription Update

Figure 5.16.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the update of an existing Network Slice Requirements Verification and Alignment Subscription (see also clause 9.16 of 3GPP°TS°23.435°[14]).



Figure 5.16.2.2.3-1: Procedure for Network Slice Requirements Verification and Alignment Subscription Update

1. In order to update an existing network slice requirements verification and alignment subscription, the service consumer shall send an HTTP PUT/PATCH request to the NSCE Server, targeting the URI of the corresponding "Individual Network Slice Requirements Verification and Alignment Subscription" resource, with the request body including either:

- the updated representation of the resource within the SliceReqVerAlignSubsc data structure, in case the HTTP PUT method is used; or

- the requested modifications to the resource within the SliceReqVerAlignSubscPatch data structure, in case the HTTP PATCH method is used.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall update the targeted "Individual Network Slice Requirements Verification and Alignment Subscription" resource accordingly and respond with either:

- an HTTP "200 OK" status code with the response body containing a representation of the updated "Individual Network Slice Requirements Verification and Alignment Subscription" resource within the SliceReqVerAlignSubsc data structure; or

- an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP PUT/PATCH response body, as specified in clause 6.15.7.

##### 5.16.2.2.4 Network Slice Requirements Verification and Alignment Subscription Deletion

Figure 5.16.2.2.4-1 depicts a scenario where a service consumer sends a request to the NSCE Server to delete an existing Network Slice Requirements Verification and Alignment Subscription (see also clause 9.16 of 3GPP°TS°23.435°[14]).



Figure 5.16.2.2.4-1: Procedure for Network Slice Requirements Verification and Alignment Subscription Deletion

1. In order to request the deletion of an existing network slice requirements verification and alignment subscription, the service consumer shall send an HTTP DELETE request to the NSCE Server targeting the corresponding "Individual Network Slice Requirements Verification and Alignment Subscription" resource.

NOTE: An alternative service consumer (i.e. other than the one that requested the creation/update of the targeted resource) can initiate this request.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP DELETE response body, as specified in clause 6.15.7.

#### 5.16.2.3 NSCE\_SliceReqVerifyAndAlign\_Notify

##### 5.16.2.3.1 General

This service operation is used by a NSCE Server to notify a previously subscribed service consumer on:

- Network Slice Requirements Verification and Alignment information.

The following procedures are supported by the "NSCE\_SliceReqVerifyAndAlign\_Notify" service operation:

- Network Slice Requirements Verification and Alignment Notification.

##### 5.16.2.3.2 Network Slice Requirements Verification and Alignment Notification

Figure 5.16.2.3.2-1 depicts a scenario where the NSCE Server sends a request to notify a previously subscribed service consumer on Network Slice Requirements Verification and Alignment information (see also clause 9.16 of 3GPP°TS°23.435°[14]).



Figure 5.16.2.3.2-1: Procedure for Network Slice Requirements Verification and Alignment Notification

1. In order to notify a previously subscribed service consumer on network slice requirements verification and alignment information, the NSCE Server shall send an HTTP POST request to the service consumer with the request URI set to "{notifUri}", where the "notifUri" variable is set to the value received from the service consumer during the creation/update of the corresponding Network Slice Requirements Verification and Alignment Subscription using the procedures defined in clause 5.16.2.2, and the request body including the SliceReqVerAlignNotif data structure.

2a. Upon success, the service consumer shall respond to the NSCE Server with an HTTP "204 No Content" status code to acknowledge the reception of the notification.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.15.7.

## 5.17 NSCE\_NSInfoDelivery

### 5.17.1 Service Description

The NSCE\_NSInfoDelivery service exposed by the NSCE Server enables a service consumer to:

- retrieve Network Slice Information; and

- request Network Slice Information delivery to another entity (e.g., NSCE Client).

### 5.17.2 Service Operations

#### 5.17.2.1 Introduction

The service operations defined for the NSCE\_NSInfoDelivery service are shown in table 5.17.2.1-1.

Table 5.17.2.1-1: NSCE\_NSInfoDelivery Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| NSCE\_NSInfoDelivery\_Request | This service operation enables a service consumer to either:  - retrieve Network Slice Information; or  - request Network Slice Information delivery to another entity (e.g., NSCE Client). | e.g., VAL Server |

#### 5.17.2.2 NSCE\_NSInfoDelivery\_Request

##### 5.17.2.2.1 General

This service operation is used by a service consumer to request Network Slice Information retrieval or delivery from the NSCE Server.

The following procedures are supported by the "NSCE\_NSInfoDelivery\_Request" service operation:

- Network Slice Information Retrieval.

- Network Slice Information Delivery.

##### 5.17.2.2.2 Network Slice Information Retrieval

Figure 5.17.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request the retrieval of Network Slice Information (see also clause 9.17 of 3GPP°TS°23.435°[14]).



Figure 5.17.2.2.2-1: Procedure for Network Slice Information Retrieval

1. In order to request the retrieval of Network Slice Information, the service consumer shall send an HTTP GET request targeting the URI of the "Network Slice Information Sets" collection resource and including query parameter(s) to filter the content of the response from the NSCE Server.

2a. Upon success, the NSCE Server shall respond with an HTTP "200 OK" status code with the response body containing the requested Network Slice Information within the NSInfoRetResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP GET response body, as specified in clause 6.16.7.

##### 5.17.2.2.3 Network Slice Information Delivery

Figure 5.17.2.2.3-1 depicts a scenario where a service consumer sends a request to the NSCE Server to request the delivery of Network Slice Information (see also clause 9.17 of 3GPP°TS°23.435°[14]).



Figure 5.17.2.2.3-1: Procedure for Network Slice Information Delivery

1. In order to request Network Slice Information delivery, the service consumer shall send an HTTP POST request to the NSCE Server, targeting the URI of the corresponding "Deliver" resource custom operation defined under the "Network Slice Information Sets" collection resource, with the request body including the NSInfoDelReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "204 No Content" status code.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.16.7.

## 5.18 Void

## 5.19 NSCE\_NSAllocation

### 5.19.1 Service Description

The NSCE\_NSAllocation service exposed by the NSCE Server enables a service consumer to:

- request network slice allocation.

### 5.19.2 Service Operations

#### 5.19.2.1 Introduction

The service operation defined for NSCE\_NSAllocation API is shown in the table 5.19.2.1-1.

Table 5.19.2.1-1: NSCE\_NSAllocation API Service Operations

|  |  |  |
| --- | --- | --- |
| Service operation name | Description | Initiated by |
| NSAllocation\_Request | This service operation is used by a service consumer to request for network slice allocation. | e.g., VAL Server |

#### 5.19.2.2 NSCE\_NSAllocation\_Request

##### 5.19.2.2.1 General

This service operation is used by a service consumer to request network slice allocation from the NSCE Server.

The following procedures are supported by the "NSCE\_NSAllocation\_Request" service operation:

- Network Slice Allocation Request.

##### 5.19.2.2.2 Network Slice Allocation Request

Figure 5.19.2.2.2-1 depicts a scenario where a a service consumer sends a request to the NSCE Server to request network slice allocation (see also clause 9.18 of 3GPP°TS°23.435°[14]).



Figure 5.19.2.2.2-1: Procedure for Network Slice Allocation Request

1. In order to request network slice allocation, the service consumer shall send an HTTP POST request (i.e. custom operation "Request") to the NSCE Server, with the request body containing the NwSliceAllocReq data structure.

2a. Upon success, the NSCE Server shall respond with an HTTP "200 OK" status code with the response body containing network slice allocation related information within the NwSliceAllocResp data structure.

2b. On failure, the appropriate HTTP status code indicating the error shall be returned and appropriate additional error information should be returned in the HTTP POST response body, as specified in clause 6.18.7.

# 6 API Definitions

## 6.1 NSCE\_SliceApiManagement API

### 6.1.1 Introduction

The NSCE\_SliceApiManagement service shall use the NSCE\_SliceApiManagement API.

The API URI of the NSCE\_SliceApiManagement Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-sam".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.1, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.1.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_SliceApiManagement API.

### 6.1.3 Resources

#### 6.1.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.1.3.1-1 depicts the resource URIs structure for the NSCE\_SliceApiManagement API.



Figure 6.1.3.1-1: Resource URIs structure of the NSCE\_SliceApiManagement API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_SliceApiManagement API.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Slice API Configurations | /configurations | POST | Request the creation of a Slice API Configuration. |
| Individual Slice API Configuration | /configurations/{configId} | GET | Retrieve an existing "Individual Slice API Configuration" resource. |
| DELETE | Request the deletion of an existing "Individual Slice API Configuration" resource. |
| Update | Request the update of an existing slice API configuration. |

#### 6.1.3.2 Resource: Slice API Configurations

##### 6.1.3.2.1 Description

This resource represents the collection of Slice API Configurations managed by the NSCE Server.

##### 6.1.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-sam/<apiVersion>/configurations**

This resource shall support the resource URI variables defined in table 6.1.3.2.2-1.

Table 6.1.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.1.1. |

##### 6.1.3.2.3 Resource Standard Methods

###### 6.1.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Slice API Configuration at the NSCE Server.

This method shall support the URI query parameters specified in table 6.1.3.2.3.1-1.

Table 6.1.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.1.3.2.3.1-2 and the response data structures and response codes specified in table 6.1.3.2.3.1-3.

Table 6.1.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceAPIConfig | M | 1 | Represents the parameters to request the creation of a Slice API Configuration. |

Table 6.1.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceAPIConfig | M | 1 | 201 Created | Successful case. The Slice API Configuration is successfully created and a representation of the created "Individual Slice API Configuration" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.1.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-sam/<apiVersion>/configurations/{configId} |

##### 6.1.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.1.3.3 Resource: Individual Slice API Configuration

##### 6.1.3.3.1 Description

This resource represents a Slice API Configuration managed by the NSCE Server.

##### 6.1.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-sam/<apiVersion>/configurations/{configId}**

This resource shall support the resource URI variables defined in table 6.1.3.3.2-1.

Table 6.1.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.1.1. |
| configId | string | Represents the identifier of the "Individual Slice API Configuration" resource. |

##### 6.1.3.3.3 Resource Standard Methods

###### 6.1.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Slice API Configuration" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.1.3.3.3.1-1.

Table 6.1.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.1.3.3.3.1-2 and the response data structures and response codes specified in table 6.1.3.3.3.1-3.

Table 6.1.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceAPIConfig | M | 1 | 200 OK | Successful case. The requested "Individual Slice API Configuration" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.1.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.1.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.1.3.3.3.2 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Slice API Configuration" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.1.3.3.3.2-1.

Table 6.1.3.3.3.2-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.1.3.3.3.2-2 and the response data structures and response codes specified in table 6.1.3.3.3.2-3.

Table 6.1.3.3.3.2-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.1.3.3.3.2-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Slice API Configuration" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.1.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.1.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.1.3.3.4 Resource Custom Operations

###### 6.1.3.3.4.1 Overview

Table 6.1.3.3.4.1-1 specifies the custom operations defined on this resource.

Table 6.1.3.3.4.1-1: Resource Custom Operations

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operaration URI | Mapped HTTP method | Description |
| Update | /configurations/{configId}/update | POST | Enables a service consumer to request the update of an existing slice API configuration. |

###### 6.1.3.3.4.2 Operation: Update

6.1.3.3.4.2.1 Description

This resource custom operation enables a service consumer to request the update of an existing slice API configuration at the NSCE Server.

6.1.3.3.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.1.3.3.4.2.2-1 and the response data structure and response codes specified in table 6.1.3.3.4.2.2-2.

Table 6.1.3.3.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| UpdateReq | M | 1 | Contains the parameters to request the update of the slice API configuration. |

Table 6.1.3.3.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| UpdateResp | M | 1 | 200 OK | Successful case. The slice API configuration update request is successfully received and processed, and slice API configuration update related information shall be returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource custom operation located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource custom operation located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.1.3.3.4.2.2-3: Headers supported by the 307 Response Code on this resource custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource custom operation located in an alternative NSCE Server. |

Table 6.1.3.3.4.2.2-4: Headers supported by the 308 Response Code on this resource custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource custom operation located in an alternative NSCE Server. |

### 6.1.4 Custom Operations without associated resources

#### 6.1.4.1 Overview

The structure of the custom operation URIs of the NSCE\_SliceApiManagement API is shown in Figure 6.1.4.1-1.



Figure 6.1.4.1-1: Custom operation URI structure of the NSCE\_SliceApiManagement API

Table 6.1.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the NSCE\_SliceApiManagement API.

Table 6.1.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Custom operation name | Custom operation URI | Mapped HTTP method | Description |
| Invoke | /invoke | POST | Enables a service consumer to request slice API invocation. |

The custom operations shall support the URI variables defined in table 6.1.4.1-2.

Table 6.1.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.1.1. |

#### 6.1.4.2 Operation: Invoke

##### 6.1.4.2.1 Description

The custom operation enables a service consumer to request slice API invocation to the NSCE Server.

##### 6.1.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.1.4.2.2-1 and the response data structures and response codes specified in table 6.1.4.2.2-2.

Table 6.1.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InvokeReq | M | 1 | Contains the parameters to request slice API invocation. |

Table 6.1.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The slice API invocation request is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.1.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.1.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

### 6.1.5 Notifications

#### 6.1.5.1 General

Notifications shall comply to clause 6.1 of 3GPP TS 29.549 [15].

Table 6.1.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Slice API Configuration Notification | {notifUri} | POST | Enables a NSCE Server to notify a previously subscribed service consumer on Slice API Configuration event(s). |

#### 6.1.5.2 Slice API Configuration Notification

##### 6.1.5.2.1 Description

The Slice API Configuration Notification is used by the NSCE Server to notify a previously subscribed service consumer on Slice API Configuration event(s).

##### 6.1.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.1.5.2.2-1.

Table 6.1.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.1.5.2.3 Standard Methods

6.1.5.2.3.1 POST

This method shall support the request data structures specified in table 6.1.5.2.3.1-1 and the response data structures and response codes specified in table 6.1.5.2.3.1-2.

Table 6.1.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceAPIConfigNotif | M | 1 | Represents the Slice API Configuration Notification. |

Table 6.1.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Slice API Configuration Notification is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.1.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.1.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.1.6 Data Model

#### 6.1.6.1 General

This clause specifies the application data model supported by the API.

Table 6.1.6.1-1 specifies the data types defined for the NSCE\_SliceApiManagement API.

Table 6.1.6.1-1: NSCE\_SliceApiManagement API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AppServReqs | 6.1.6.2.3 | Represents the application service requirements for a network slice. |  |
| InvokeReq | 6.1.6.2.7 | Represents a slice API invocation request. |  |
| SliceAPIConfigNotif | 6.1.6.2.8 | Represents a Slice API Configuration Notification. |  |
| SliceAPIInfo | 6.1.6.2.6 | Represents slice API information. |  |
| SliceAPIConfig | 6.1.6.2.2 | Represents a Slice API Configuration. |  |
| TriggerEvent | 6.1.6.3.3 | Represents the triggering event. |  |
| UpdateReq | 6.1.6.2.4 | Represents the parameters to request the update of a slice API configuration. |  |
| UpdateResp | 6.1.6.2.5 | Represents the response to a slice API configuration update request. |  |

Table 6.1.6.1-2 specifies data types re-used by the NSCE\_SliceApiManagement API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_SliceApiManagement API.

Table 6.1.6.1-2: NSCE\_SliceApiManagement API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AppReqs | Clause 6.12.6.2.3 | Represents the application QoS requirements. |  |
| NetSliceId | Clause 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| ServArea | Clause 6.16.6.2.5 | Represents a network slice service area. |  |
| ServReq | Clause 6.11.6.2.4 | Represents a set of application service requirements. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.1.6.2 Structured data types

##### 6.1.6.2.1 Introduction

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

##### 6.1.6.2.2 Type: SliceAPIConfig

Table 6.1.6.2.2-1: Definition of type SliceAPIConfig

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| servReqs | array(AppServReqs) | M | 1..N | Contains one or several set(s) of per network slice related application service requirements. |  |
| notifUri | Uri | M | 1 | Contains the URI via which Slice API Configuration notifications shall be delivered. |  |
| timeValidity | TimeWindow | O | 0..1 | Contains the time validity of the slice API configuration. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported feature(s) among the ones defined in clause 6.1.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.1.6.2.3 Type: AppServReqs

Table 6.1.6.2.3-1: Definition of type AppServReqs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServiceId | string | M | 1 | Represents the identifier of the VAL service to which the application service requirements are related. |  |
| netSliceId | NetSliceId | M | 1 | Contains the identifier of the network slice to which the application service requirements are related. |  |
| servKpis | AppReqs | O | 0..1 | Contains the QoS related application service requirements. |  |
| servReqs | array(ServReq) | O | 1..N | Contains the application layer Service Profile representing the network slice related application service requirements. |  |
| areaOfInterest | ServArea | O | 0..1 | Represents the service area within which the application service requirements shall apply. |  |

##### 6.1.6.2.4 Type: UpdateReq

Table 6.1.6.2.4-1: Definition of type UpdateReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| triggEvent | TriggerEvent | M | 1 | Contains the event triggering the need for slice API configuration update. |  |
| netSliceId | NetSliceId | O | 0..1 | Contains the identifier of the network slice for which the slice API configuration update is requested.  When this attribute is absent, the slice API configuration update request applies to all the network slice(s) of the corresponding Network Slice API Configuration. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported feature(s) among the ones defined in clause 6.1.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.1.6.2.5 Type: UpdateResp

Table 6.1.6.2.5-1: Definition of type UpdateResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| sliceAPIInfo | SliceAPIInfo | M | 1 | Contains the updated slice API information. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported feature(s) among the ones defined in clause 6.1.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.1.6.2.6 Type: SliceAPIInfo

Table 6.1.6.2.6-1: Definition of type SliceAPIInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| apiInfo | string | C | 0..1 | Contains slice API information.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

##### 6.1.6.2.7 Type: InvokeReq

Table 6.1.6.2.7-1: Definition of type InvokeReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| sliceApiIdInfo | string | M | 1 | Contains the identification information of the targeted slice API. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported feature(s) among the ones defined in clause 6.1.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.1.6.2.8 Type: SliceAPIConfigNotif

Table 6.1.6.2.8-1: Definition of type SliceAPIConfigNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| sliceAPIInfo | SliceAPIInfo | M | 1 | Contains the configured slice API information. |  |

#### 6.1.6.3 Simple data types and enumerations

##### 6.1.6.3.1 Introduction

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

##### 6.1.6.3.2 Simple data types

The simple data types defined in table 6.1.6.3.2-1 shall be supported.

Table 6.1.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.1.6.3.3 Enumeration: TriggerEvent

The enumeration TriggerEvent represents the triggering event for slice API configuration update. It shall comply with the provisions defined in table 6.1.6.3.3-1.

Table 6.1.6.3.3-1: Enumeration TriggerEvent

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| UE\_MOBILITY | Indicates that the triggering event for slice API configuration update is UE mobility to a different service area. |  |
| MIGRATION | Indicates that the triggering event for slice API configuration update is application server migration to a different edge/cloud platform. |  |
| SERV\_API\_UNAVAILABILITY | Indicates that the triggering event for slice API configuration update is service API unavailability. |  |
| APP\_QOS\_REQ\_CHANGE | Indicates that the triggering event for slice API configuration update is application QoS requirements change. |  |

#### 6.1.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.1.6.5 Binary data

##### 6.1.6.5.1 Binary Data Types

Table 6.1.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.1.7 Error Handling

#### 6.1.7.1 General

For the NSCE\_SliceApiManagement API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_SliceApiManagement API.

#### 6.1.7.2 Protocol Errors

No specific protocol errors for the NSCE\_SliceApiManagement API are specified.

#### 6.1.7.3 Application Errors

The application errors defined for the NSCE\_SliceApiManagement API are listed in Table 6.1.7.3-1.

Table 6.1.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.1.8 Feature negotiation

The optional features listed in table 6.1.8-1 are defined for the NSCE\_SliceApiManagement API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.1.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.1.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_SliceApiManagement API.

## 6.2 NSCE\_NetSliceLifeCycleMngt API

### 6.2.1 Introduction

The NSCE\_NetSliceLifeCycleMngt service shall use the NSCE\_NetSliceLifeCycleMngt API.

The API URI of the NSCE\_NetSliceLifeCycleMngt Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-nslcm".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.2, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.2.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NetSliceLifeCycleMngt API.

### 6.2.3 Resources

#### 6.2.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.2.3.1-1 depicts the resource URIs structure for the NSCE\_NetSliceLifeCycleMngt API.



Figure 6.2.3.1-1: Resource URIs structure of the NSCE\_NetSliceLifeCycleMngt API

Table 6.2.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_NetSliceLifeCycleMngt API.

Table 6.2.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Network Slice Lifecycle Management Subscriptions | /subscriptions | POST | Request the creation of a Network Slice Lifecycle Management Subscription. |
| Individual Network Slice Lifecycle Management Subscription | /subscriptions/{subscriptionId} | GET | Retrieve an existing Network Slice Lifecycle Management Subscription. |
| PUT | Request the update of an existing Network Slice Lifecycle Management Subscription. |
| PATCH | Request the modification of an existing Network Slice Lifecycle Management Subscription. |
| DELETE | Request the deletion of an existing Network Slice Lifecycle Management Subscription. |
| QoEMetricNotify | Notify on QoE metrics. |
| /sbscriptions/{subscriptionId}/notify | POST | Enables to notify the NSCE Server on QoE metrics. |

#### 6.2.3.2 Resource: Network Slice Lifecycle Management Subscriptions

##### 6.2.3.2.1 Description

This resource represents the collection of Network Slice Lifecycle Management Subscriptions managed by the NSCE Server.

##### 6.2.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-nslcm/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 6.2.3.2.2-1.

Table 6.2.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.2.1. |

##### 6.2.3.2.3 Resource Standard Methods

###### 6.2.3.2.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a Network Slice Lifecycle Management Subscription at the NSCE Server.

This method shall support the URI query parameters specified in table 6.2.3.2.3.2-1.

Table 6.2.3.2.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.2.3.2-2 and the response data structures and response codes specified in table 6.2.3.2.3.2-3.

Table 6.2.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NSLCMSubsc | M | 1 | Represents the parameters to request the creation of a Network Slice Lifecycle Management Subscription. |

Table 6.2.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NSLCMSubsc | M | 1 | 201 Created | Successful case. The Network Slice Lifecycle Management Subscription is successfully created and a representation of the created "Individual Network Slice Lifecycle Management Subscription" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.3.2.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-nslcm/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.2.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.2.3.3 Resource: Individual Network Slice Lifecycle Management Subscription

##### 6.2.3.3.1 Description

This resource represents a Network Slice Lifecycle Management Subscription managed by the NSCE Server.

##### 6.2.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-nslcm/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 6.2.3.3.2-1.

Table 6.2.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.2.1. |
| subscriptionId | string | Represents the identifier of the "Individual Network Slice Lifecycle Management Subscription" resource. |

##### 6.2.3.3.3 Resource Standard Methods

###### 6.2.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Network Slice Lifecycle Management Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.2.3.3.3.1-1.

Table 6.2.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.1-2 and the response data structures and response codes specified in table 6.2.3.3.3.1-3.

Table 6.2.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NSLCMSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Network Slice Lifecycle Management Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.2.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.2.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Network Slice Lifecycle Management Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.2.3.3.3.2-1.

Table 6.2.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.2-2 and the response data structures and response codes specified in table 6.2.3.3.3.2-3.

Table 6.2.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NSLCMSubsc | M | 1 | Represents the updated representation of the "Individual Network Slice Lifecycle Management Subscription" resource. |

Table 6.2.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NSLCMSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Lifecycle Management Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Lifecycle Management Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.2.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.2.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Network Slice Lifecycle Management Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.2.3.3.3.3-1.

Table 6.2.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.3-2 and the response data structures and response codes specified in table 6.2.3.3.3.3-3.

Table 6.2.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NSLCMSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Network Slice Lifecycle Management Subscription" resource. |

Table 6.2.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NSLCMSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Lifecycle Management Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Lifecycle Management Subscription" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.2.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.2.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Network Slice Lifecycle Management Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.2.3.3.3.4-1.

Table 6.2.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.2.3.3.3.4-2 and the response data structures and response codes specified in table 6.2.3.3.3.4-3.

Table 6.2.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.2.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Lifecycle Management Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.2.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.2.3.3.4 Resource Custom Operations

###### 6.2.3.3.4.1 Overview

Table 6.2.3.3.4.1-1 specifies the custom operations defined on this resource.

Table 6.2.3.3.4.1-1: Resource Custom Operations

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operaration URI | Mapped HTTP method | Description |
| QoEMetricNotify | /notify | POST | Enables a service consumer to notify the NSCE Server on QoE metrics. |

###### 6.2.3.3.4.2 Operation: QoEMetricNotify

6.2.3.3.4.2.1 Description

This resource custom operation is used by a service consumer to notify the NSCE Server on QoE metrics.

6.2.3.3.4.2.2 Operation Definition

This method shall support the request data structures specified in table 6.2.3.3.4.2.2-1 and the response data structures and response codes specified in table 6.2.3.3.4.2.2-2.

Table 6.2.3.3.4.2.2-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| QoEMetricsReportNotif | M | 1 | Represents the QoE Metrics Notification related information. |

Table 6.2.3.3.4.2.2-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The QoE Metrics Notification is successfully received and processed, and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.3.3.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.2.3.3.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

### 6.2.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.2.5 Notifications

#### 6.2.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.2.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Network Slice Lifecycle Management Notification | {notifUri} | POST | Enables the NSCE Server to notify a previously subscribed service consumer on Network Slice Lifecycle Management event(s). |
| QoE Metrics Subscription Notification | {notifUri}/subscribe-qoe | POST | Enables the NSCE Server to subscribe toQoE metrics reporting at the service consumer. |
| Network Slice LCM Recommendation Notification | {notifUri}/recommend | POST | Enables the NSCE Server to notify a previously subscribed service consumer on network slice LCM recommendation. |

#### 6.2.5.2 Network Slice Lifecycle Management Notification

##### 6.2.5.2.1 Description

The Network Slice Lifecycle Management Notification is used by the NSCE Server to notify a previously subscribed service consumer on Network Slice Lifecycle Management event(s).

##### 6.2.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.2.5.2.2-1.

Table 6.2.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.2.5.2.3 Standard Methods

###### 6.2.5.2.3.1 POST

This method shall support the request data structures specified in table 6.2.5.2.3.1-1 and the response data structures and response codes specified in table 6.2.5.2.3.1-2.

Table 6.2.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NSLCMNotif | M | 1 | Represents the Network Slice Lifecycle Management Notification. |

Table 6.2.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice Lifecycle Management Notification is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.2.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

#### 6.2.5.3 QoE metrics Subscribe Notification

##### 6.2.5.3.1 Description

The QoE metrics Subscription is used by the NSCE Server to subscribe a previously implicitly subscribed service consumer on QoE Metrics Subscription.

##### 6.2.5.3.2 Target URI

The Callback URI **"{notifUri}/subscribe-qoe"** shall be used with the callback URI variables defined in table 6.2.5.3.2-1.

Table 6.2.5.3.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.2.5.3.3 Standard Methods

###### 6.2.5.3.3.1 POST

This method shall support the request data structures specified in table 6.2.5.3.3.1-1 and the response data structures and response codes specified in table 6.2.5.3.3.1-2.

Table 6.2.5.3.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| QoEMetricsSubsc | M | 1 | Represents the QoE metrics Subscription. |

Table 6.2.5.3.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| QoEMetricsResp | M | 1 | 200 OK | Successful case. The QoE metrics Subscribe Notification is successfully received and processed, and immediate QoE metrics reporting related information shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The QoE metrics Subscription is successfully received and processed, and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.2.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.2.5.3.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

#### 6.2.5.4 Network Slice LCM Recommendation Notification

##### 6.2.5.4.1 Description

The Network Slice LCM Recommendation is used by the NSCE Server to notify a previously subscribed service consumer on network slice LCM recommendation.

##### 6.2.5.4.2 Target URI

The Callback URI **"{notifUri}/recommend"** shall be used with the callback URI variables defined in table 6.2.5.4.2-1.

Table 6.2.5.4.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.2.5.4.3 Standard Methods

###### 6.2.5.4.3.1 POST

This method shall support the request data structures specified in table 6.2.5.4.3.1-1 and the response data structures and response codes specified in table 6.2.5.4.3.1-2.

Table 6.2.5.4.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NSLCMRecom | M | 1 | Represents the Network Slice LCM Recommendation Notification. |

Table 6.2.5.4.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice LCM Recommendation Notification is successfully received and processed, and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.2.5.4.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.2.5.4.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.2.6 Data Model

#### 6.2.6.1 General

This clause specifies the application data model supported by the API.

Table 6.2.6.1-1 specifies the data types defined for the NSCE\_NetSliceLifeCycleMngt API.

Table 6.2.6.1-1: NSCE\_NetSliceLifeCycleMngt API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| CollectInfo | 6.2.6.2.8 | The information collected from the interested network slice. |  |
| NSLCMNotif | 6.2.6.2.3 | The Network Slice Lifecycle Management Notification. |  |
| NSLCMRecom | 6.2.6.2.7 | The Network Slice LCM Recommendation. |  |
| NSLCMSubsc | 6.2.6.2.1 | The parameters to request the creation of a Network Slice Lifecycle Management Subscription resource. |  |
| NSLCMSubscPatch | 6.2.6.2.2 | The parameters to request the update of a Network Slice Lifecycle Management Subscription resource. |  |
| QoEMetric | 6.2.6.2.10 | The QoE metric type and the corresponding QoE threshold. |  |
| QoEMetricsResp | 6.2.6.2.5 | The response of QoE Metris Subscription. |  |
| QoEMetricsReport | 6.2.6.2.6 | The QoE Metrics Report. |  |
| QoEMetricsReportNotif | 6.2.6.2.11 | The QoE metrics notification including the QoE Metrics Report. |  |
| QoEMetricsSubsc | 6.2.6.2.4 | The subscription to a previously subscribed service consumer on QoE metrics |  |
| QoEType | 6.2.6.3.3 | The QoE metric type, e.g., latency, throughput, jitter, etc. |  |
| SliceLCMAction | 6.2.6.3.5 | Recommend network slice LCM action. |  |
| TriggerCond | 6.2.6.2.9 | The updated monitored parameters and the corresponding thresholds which could trigger the AppLayer-NS-LCM. |  |
| TriggerType | 6.2.6.3.4 | The monitored parameter type, e.g., Network Slice load, collected Network Slice performance, collected QoE, etc. |  |

Table 6.2.6.1-2 specifies data types re-used by the NSCE\_NetSliceLifeCycleMngt API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_NetSliceLifeCycleMngt API.

Table 6.2.6.1-2: NSCE\_NetSliceLifeCycleMngt API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AppServReqs | 6.1.6.2.3 | Represents the application service requirements for a network slice. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| NetworkPerfInfo | 3GPP TS 29.520 [26] | Represents the network performance information. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| NSInfoSet | 6.16.6.2.4 | Represents a Network Slice Information Set. |  |
| PacketLossRate | 3GPP TS 29.571 [16] | Represents the Packet Loss Rate. |  |

#### 6.2.6.2 Structured data types

##### 6.2.6.2.0 Introduction

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

##### 6.2.6.2.1 Type: NSLCMSubsc

Table 6.2.6.2.1-1: Definition of type NSLCMSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which the Network Slice Lifecycle Management Notifications shall be delivered. |  |
| servReqs | array(AppServReqs) | C | 1..N | Contains one or several set(s) of per network slice related application service requirements.  This attribute shall be present if avaliable. |  |
| triggerConds | array(TriggerCond) | O | 1..N | Contains the monitored parameters and the corresponding thresholds which could trigger the AppLayer-NS-LCM. |  |
| expTime | DateTime | O | 0..1 | Indicates the time at which the Network Slice Lifecycle Management subscription shall expire.  This attribute may only be present in Network Slice Lifecycle Management subscription creation/update responses.  If this attribute is absent, this means that the Network Slice Lifecycle Management subscription shall not expire, until explicitly deleted by the service consumer. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.2.8.  This attribute shall be present only if feature negotiation needs to take place. |  |

##### 6.2.6.2.2 Type: NSLCMSubscPatch

Table 6.2.6.2.2-1: Definition of type NSLCMSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which the Network Slice Lifecycle Management Notifications shall be delivered. |  |
| servReqs | array(AppServReqs) | O | 1..N | Contains one or several set(s) of per network slice related application service requirements. |  |
| triggerConds | array(TriggerCond) | O | 1..N | Contains the updated monitored parameters and the corresponding thresholds which could trigger the AppLayer-NS-LCM. |  |
| expTime | DateTime | O | 0..1 | Indicates the updated time at which the Network Slice Lifecycle Management subscription shall expire.  This attribute may only be present in Network Slice Lifecycle Management subscription creation/update responses.  If this attribute is absent, this means that the Network Slice Lifecycle Management subscription shall not expire, until explicitly deleted by the service consumer. |  |

##### 6.2.6.2.3 Type: NSLCMNotif

Table 6.2.6.2.3-1: Definition of type NSLCMNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | M | 1 | Represents the identifier of the reported network slice. |  |

##### 6.2.6.2.4 Type: QoEMetricsSubsc

Table 6.2.6.2.4-1: Definition of type QoEMetricsSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifCorrId | string | O | 0..1 | Contains the notification correlation ID for the subscription of QoE Metrics. |  |
| subscriptionId | string | O | 0..1 | Contains the identifier of the related subscription. |  |
| collectInfos | map(CollectInfo) | M | 1..N | Contains the information collected from the interested network slice.  The key of the map shall be any unique string encoded value. |  |
| expTime | DateTime | O | 0..1 | Contains the proposed expiration time of the subscription. |  |

##### 6.2.6.2.5 Type: QoEMetricsResp

Table 6.2.6.2.5-1: Definition of type QoEMetricsResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| qoeMetrics | QoEMetricsSubsc | O | 0..1 | Identifier of the subscription. |  |
| qoeMetricsReports | array(QoEMetricsReport) | O | 1..N | Contains the network slice related performance and analytics report(s).  Shall only be present if the immediate reporting indication in the "immRepFlag" attribute within the "collectInfos" attribute sets to true in the event subscription, and the reports are available. |  |

##### 6.2.6.2.6 Type: QoEMetricsReport

Table 6.2.6.2.6-1: Definition of type QoEMetricsReport

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | M | 1 | Represents the identifier of the targeted network slice. |  |
| qoeMetrics | array(QoEMetric) | M | 1..N | Contains the QoE metric type and the corresponding QoE threshold. |  |

##### 6.2.6.2.7 Type: NSLCMRecom

Table 6.2.6.2.7-1: Definition of type NSLCMRecom

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | M | 1 | Represents the identifier of the targeted network slice. |  |
| sliceLCMActions | array(SliceLCMAction) | M | 1..N | Recommend network slice LCM action. |  |
| sliceInfo | NSInfoSet | O | 0..1 | Contains the network slice information.  (NOTE) |  |
| NOTE: At least the "snssai" attribute within the NSInfoSet shall be provided. | | | | | |

##### 6.2.6.2.8 Type: CollectInfo

Table 6.2.6.2.8-1: Definition of type CollectInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | M | 1 | Represents the targeted concerned network slice. |  |
| qoeMetric | array(QoEMetric) | O | 1..N | Contains the QoE metric type and the corresponding QoE threshold. |  |
| repPeriod | DurationSec | O | 0..1 | Contains the reporting period. |  |
| immRepFlag | boolean | O | 0..1 | Contains the immediate reporting indication.  - Set to "true" to indicate that immediate reporting is requested.  - Set to "false" to indicate that immediate reporting is not requested.  - The default value is "false" if this attribute is omitted. |  |

##### 6.2.6.2.9 Type: TriggerCond

Table 6.2.6.2.9-1: Definition of type TriggerCond

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| triggerType | TriggerType | M | 1 | Represents the monitored parameter type, e.g., Network Slice load, collected Network Slice performance, collected QoE, etc. |  |
| netSliceId | NetSliceId | O | 0..1 | Represents the identifier of the targeted network slice. |  |
| loadLevelThreshold | integer | C | 0..1 | Indicates that the NSCE shall report the corresponding network slice load level to the NF service consumer where the load level of the network slice identified by "netSliceId" exceeds the threshold (expressed as a percentage).  This attribute shall be present only when the subscribed event is "NETWORK\_SLICE\_LOAD".  Minimum = 0. Maximum = 100. |  |
| perfThreshold | integer | O | 0..1 | Indicates that the NSCE shall report the corresponding network slice performance when the performance exceeds the threshold (expressed as a percentage).  Minimum = 0. Maximum = 100. |  |
| qoeMetrics | array(QoEMetric) | O | 1..N | Contains the QoE metric type and the corresponding QoE threshold. |  |

##### 6.2.6.2.10 Type: QoEMetric

Table 6.2.6.2.10-1: Definition of type QoEMetric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| qoeType | QoEType | M | 1 | Represents the QoE metric type, e.g., latency, throughput, jitter, etc. |  |
| latency | Float | O | 0..1 | Contains the threshold average latency in milliseconds.  This attribute may be present only if the "qoeType" attribute is set to "LATENCY". |  |
| throughput | BitRate | O | 0..1 | Contains the threshold average throughput.  This attribute may be present only if the "qoeType" attribute is set to "THROUGHPUT". |  |
| jitter | Uint32 | O | 0..1 | Contains the threshold average jitter.  This attribute may be present only if the "qoeType" attribute is set to "JITTER". |  |
| avgPacketLossRate | PacketLossRate | O | 0..1 | Contains the threshold average Packet Loss Rate.  This attribute may be present only if the "qoeType" attribute is set to "AVG\_PKT\_LOSS\_RATE". |  |
| maxPacketLossRate | PacketLossRate | O | 0..1 | Contains the threshold maximum Packet Loss Rate.  This attribute may be present only if the "qoeType" attribute is set to "MAX\_PKT\_LOSS\_RATE". |  |
| NOTE: The attributes "latency", "throughput", "jitter", "avgPacketLossRate" and "maxPacketLossRate" are mutually exclusive. Either one of them may be present. | | | | | |

##### 6.2.6.2.11 Type: QoEMetricsReportNotif

Table 6.2.6.2.11-1: Definition of type QoEMetricsReportNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifCorrId | string | M | 1 | Contains the notification correlation Id for the subscription of QoE Metrics. |  |
| qoEMetricsReport | QoEMetricsReport | M | 1 | Contains the QoE metric report. |  |

#### 6.2.6.3 Simple data types and enumerations

##### 6.2.6.3.1 Introduction

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

##### 6.2.6.3.2 Simple data types

The simple data types defined in table 6.2.6.3.2-1 shall be supported.

Table 6.2.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.2.6.3.3 Enumeration: QoEType

Table 6.2.6.3.3-1: Enumeration QoEType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| LATENCY | Indicates that the QoE type is latency. |  |
| THROUGHPUT | Indicates that the QoE type is throughput. |  |
| JITTER | Indicates that the QoE type is jitter. |  |
| AVG\_PKT\_LOSS\_RATE | Indicates that the QoE type is average Packet Loss Rate. |  |
| MAX\_PKT\_LOSS\_RATE | Indicates that the QoE type is maximum Packet Loss Rate. |  |

##### 6.2.6.3.4 Enumeration: TriggerType

Table 6.2.6.3.4-1: Enumeration TriggerType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| NETWORK\_SLICE\_LOAD | Indicates that the trigger type is Network Slice load. |  |
| NETWORK\_SLICE\_PERFORMANCE | Indicates that the trigger type is Network Slice performance. |  |
| QOE | Indicates that the trigger type is QoE. |  |

##### 6.2.6.3.5 Enumeration: SliceLCMAction

Table 6.2.6.3.5-1: Enumeration SliceLCMAction

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| MODIFY\_CONFIGURATION | Indicates that the recommend action is modifying the configuration. |  |
| ALLOCATE\_SLICE | Indicates that the recommend action is allocating a network slice. |  |

#### 6.2.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.2.6.5 Binary data

##### 6.2.6.5.1 Binary Data Types

Table 6.2.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.2.7 Error Handling

#### 6.2.7.1 General

For the NSCE\_NetSliceLifeCycleMngt API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_NetSliceLifeCycleMngt API.

#### 6.2.7.2 Protocol Errors

No specific protocol errors for the NSCE\_NetSliceLifeCycleMngt API are specified.

#### 6.2.7.3 Application Errors

The application errors defined for the NSCE\_NetSliceLifeCycleMngt API are listed in Table 6.2.7.3-1.

Table 6.2.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.2.8 Feature negotiation

The optional features listed in table 6.2.8-1 are defined for the NSCE\_NetSliceLifeCycleMngt API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.2.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.2.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NetSliceLifeCycleMngt API.

## 6.3 NSCE\_PolicyManagement API

### 6.3.1 Introduction

The NSCE\_PolicyManagement service shall use the NSCE\_PolicyManagement API.

The API URI of the NSCE\_PolicyManagement Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-pm".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.3, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.3.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_PolicyManagement API.

### 6.3.3 Resources

#### 6.3.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.3.3.1-1 depicts the resource URIs structure for the NSCE\_PolicyManagement API.



Figure 6.3.3.1-1: Resource URIs structure of the NSCE\_PolicyManagement API

Table 6.3.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_PolicyManagement API.

Table 6.3.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Policies | /policies | POST | Request the provisioning of a Policy. |
| Delete | Request the deletion of one or several existing Policy(ies). |
| Individual Policy | /policies/{policyId} | GET | Retrieve an existing Policy. |
| PUT | Request the update of an existing Policy. |
| PATCH | Request the modification of an existing Policy. |
| Policy Usage Subscriptions | /subscriptions | POST | Request the creation of a Policy Usage Subscription. |
| Individual Policy Usage Subscription | /subscriptions/{subscriptionId} | GET | Retrieve an existing Policy Usage Subscription. |
| PUT | Request the update of an existing Policy Usage Subscription. |
| PATCH | Request the modification of an existing Policy Usage Subscription. |
| DELETE | Request the deletion of an existing Policy Usage Subscription. |

#### 6.3.3.2 Resource: Policies

##### 6.3.3.2.1 Description

This resource represents the collection of Policies managed by the NSCE Server.

##### 6.3.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pm/****<apiVersion>/policies**

This resource shall support the resource URI variables defined in table 6.3.3.2.2-1.

Table 6.3.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.3.1. |

##### 6.3.3.2.3 Resource Standard Methods

###### 6.3.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the provisioning of a Policy at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.2.3.1-1.

Table 6.3.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.2.3.1-2 and the response data structures and response codes specified in table 6.3.3.2.3.1-3.

Table 6.3.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| Policy | M | 1 | Represents the parameters to request the provisioning of a Policy. |

Table 6.3.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| Policy | M | 1 | 201 Created | Successful case. The Policy is successfully provisioned and a representation of the created "Individual Policy" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.3.7. | | | | |

Table 6.3.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-pm/<apiVersion>/policies/{policyId} |

##### 6.3.3.2.4 Resource Custom Operations

###### 6.3.3.2.4.1 Overview

Table 6.3.3.2.4.1-1 specifies the custom operations defined on this resource.

Table 6.3.3.2.4.1-1: Resource Custom Operations

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operaration URI | Mapped HTTP method | Description |
| Delete | /policies/delete | POST | Enables a service consumer to request the deletion of one or several existing Policy(ies). |

###### 6.3.3.2.4.2 Operation: Delete

6.3.3.2.4.2.1 Description

This resource custom operation enables a service consumer to request the deletion of one or several existing Policy(ies) at the NSCE Server.

6.3.3.2.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.3.3.2.4.2.2-1 and the response data structure and response codes specified in table 6.3.3.2.4.2.2-2.

Table 6.3.3.2.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolDeleteReq | M | 1 | Contains the parameters to request the deletion of one or several existing Policy(ies). |

Table 6.3.3.2.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PolDeleteResp | M | 1 | 200 OK | Successful case. The Policy(ies) deletion request is successfully received and processed, and deletion related information shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The Policy(ies) deletion request is successfully received and processed, and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource custom operation located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource custom operation located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.2.4.2.2-3: Headers supported by the 307 Response Code on this resource custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource custom operation located in an alternative NSCE Server. |

Table 6.3.3.2.4.2.2-4: Headers supported by the 308 Response Code on this resource custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource custom operation located in an alternative NSCE Server. |

#### 6.3.3.3 Resource: Individual Policy

##### 6.3.3.3.1 Description

This resource represents a Policy managed by the NSCE Server.

##### 6.3.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pm/<apiVersion>/policies/{policyId}**

This resource shall support the resource URI variables defined in table 6.3.3.3.2-1.

Table 6.3.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.3.1. |
| policyId | string | Represents the identifier of the "Individual Policy" resource. |

##### 6.3.3.3.3 Resource Standard Methods

###### 6.3.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Policy" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.1-1.

Table 6.3.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.1-2 and the response data structures and response codes specified in table 6.3.3.3.3.1-3.

Table 6.3.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| Policy | M | 1 | 200 OK | Successful case. The requested "Individual Policy" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.3.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Policy" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.2-1.

Table 6.3.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.2-2 and the response data structures and response codes specified in table 6.3.3.3.3.2-3.

Table 6.3.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| Policy | M | 1 | Represents the updated representation of the "Individual Policy" resource. |

Table 6.3.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| Policy | M | 1 | 200 OK | Successful case. The "Individual Policy" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Policy" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.3.7. | | | | |

Table 6.3.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.3.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Policy" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.3.3.3-1.

Table 6.3.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.3.3.3-2 and the response data structures and response codes specified in table 6.3.3.3.3.3-3.

Table 6.3.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolicyPatch | M | 1 | Represents the parameters to request the modification of the "Individual Policy" resource. |

Table 6.3.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| Policy | M | 1 | 200 OK | Successful case. The "Individual Policy" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Policy" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.3.7. | | | | |

Table 6.3.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.3.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.3.3.4 Resource: Policy Usage Subscriptions

##### 6.3.3.4.1 Description

This resource represents the collection of Policy Usage Subscriptions managed by the NSCE Server.

##### 6.3.3.4.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pm/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 6.3.3.4.2-1.

Table 6.3.3.4.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.3.1. |

##### 6.3.3.4.3 Resource Standard Methods

###### 6.3.3.4.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a Policy Usage Subscription at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.4.3.2-1.

Table 6.3.3.4.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.4.3.2-2 and the response data structures and response codes specified in table 6.3.3.4.3.2-3.

Table 6.3.3.4.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolUsageSubsc | M | 1 | Represents the parameters to request the creation of a Policy Usage Subscription resource. |

Table 6.3.3.4.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PolUsageSubsc | M | 1 | 201 Created | Successful case. The Policy Usage Subscription is successfully created and a representation of the created "Individual Policy Usage Subscription" resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.4.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-pm/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.3.3.4.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.3.3.5 Resource: Individual Policy Usage Subscription

##### 6.3.3.5.1 Description

This resource represents a Policy Usage Subscription managed by the NSCE Server.

##### 6.3.3.5.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pm/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 6.3.3.5.2-1.

Table 6.3.3.5.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.3.1. |
| subscriptionId | string | Represents the identifier of the "Individual Policy Usage Subscription" resource. |

##### 6.3.3.5.3 Resource Standard Methods

###### 6.3.3.5.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Policy Usage Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.5.3.1-1.

Table 6.3.3.5.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.5.3.1-2 and the response data structures and response codes specified in table 6.3.3.5.3.1-3.

Table 6.3.3.5.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.5.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PolUsageSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Policy Usage Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.5.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.5.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.3.3.5.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Policy Usage Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.5.3.2-1.

Table 6.3.3.5.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.5.3.2-2 and the response data structures and response codes specified in table 6.3.3.5.3.2-3.

Table 6.3.3.5.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolUsageSubsc | M | 1 | Represents the updated representation of the "Individual Policy Usage Subscription" resource. |

Table 6.3.3.5.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PolUsageSubsc | M | 1 | 200 OK | Successful case. The "Individual Policy Usage Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Policy Usage Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.5.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.5.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.3.3.5.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Policy Usage Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.5.3.3-1.

Table 6.3.3.5.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.5.3.3-2 and the response data structures and response codes specified in table 6.3.3.5.3.3-3.

Table 6.3.3.5.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolUsageSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Policy Usage Subscription" resource. |

Table 6.3.3.5.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| PolUsageSubsc | M | 1 | 200 OK | Successful case. The "Individual Policy Usage Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Policy Usage Subscription" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.5.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.5.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.3.3.5.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Policy Usage Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.3.3.5.3.4-1.

Table 6.3.3.5.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.3.3.5.3.4-2 and the response data structures and response codes specified in table 6.3.3.5.3.4-3.

Table 6.3.3.5.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.3.3.5.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Policy Usage Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.3.5.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.3.3.5.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.3.3.5.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.3.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.3.5 Notifications

#### 6.3.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.3.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Policy Usage Notification | {notifUri} | POST | This service operation enables the NSCE Server to notify a previously subscribed service consumer on Policy Usage event(s). |
| Policy Harmonization Notification | {notifUri} | POST | This service operation enables the NSCE Server to notify a previously implicitly subscribed service consumer on Policy Harmonization event(s). |

#### 6.3.5.2 Policy Usage Notification

##### 6.3.5.2.1 Description

The Policy Usage Notification is used by the NSCE Server to notify a previously subscribed service consumer on Policy Usage event(s).

##### 6.3.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.3.5.2.2-1.

Table 6.3.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.3.5.2.3 Standard Methods

6.3.5.2.3.1 POST

This method shall support the request data structures specified in table 6.3.5.2.3.1-1 and the response data structures and response codes specified in table 6.3.5.2.3.1-2.

Table 6.3.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| PolUsageNotif | M | 1 | Represents the Policy Usage Notification. |

Table 6.3.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Policy Usage Notification is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.3.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

#### 6.3.5.3 Policy Harmonization Notification

##### 6.3.5.3.1 Description

The Policy Harmonization Notification is used by the NSCE Server to notify a previously implicitly subscribed service consumer on Policy Harmonization event(s).

##### 6.3.5.3.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.3.5.3.2-1.

Table 6.3.5.3.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.3.5.3.3 Standard Methods

6.3.5.3.3.1 POST

This method shall support the request data structures specified in table 6.3.5.3.3.1-1 and the response data structures and response codes specified in table 6.3.5.3.3.1-2.

Table 6.3.5.3.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| HarmonizationNotif | M | 1 | Represents the Policy Harmonization Notification. |

Table 6.3.5.3.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| HarmonizationResp | M | 1 | 200 OK | Successful case. The Policy Harmonization Notification is successfully received and processed, and policy harmonization related information shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The Policy Harmonization Notification is successfully received and processed, and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.3.5.3.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.3.5.3.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.3.6 Data Model

#### 6.3.6.1 General

This clause specifies the application data model supported by the API.

Table 6.3.6.1-1 specifies the data types defined for the NSCE\_PolicyManagement API.

Table 6.3.6.1-1: NSCE\_PolicyManagement API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| DefaultPolInfo | 6.3.6.2.12 | Represents the default policy related information. |  |
| Ensi | 6.3.6.3.2 | Represents the External Network Slice Information. |  |
| HarmonizationNotif | 6.3.6.2.13 | Represents a Policy Harmonization Notification. |  |
| HarmonizationResp | 6.3.6.2.14 | Represents the response to a Policy Harmonization Notification. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| QoSAction | 6.3.6.3.4 | Represents the QoS related action. |  |
| Policy | 6.3.6.2.2 | Represents the parameters to request the provisioning of a Policy. |  |
| PolicyActions | 6.3.6.2.17 | Represents the policy related actions. |  |
| PolicyPatch | 6.3.6.2.3 | Represents the requested modifications to a Policy. |  |
| PolicyData | 6.3.6.2.4 | Represents the content of a policy. |  |
| PolicyTriggers | 6.3.6.2.16 | Represents the policy related triggers. |  |
| PolicyType | 6.3.6.3.3 | Represents the policy type. |  |
| PolDeleteReq | 6.3.6.2.10 | Represents the parameters to request the deletion of one or several Policy(ies). |  |
| PolDeleteResp | 6.3.6.2.11 | Represents the response to the Policy(ies) deletion request. |  |
| PolRepData | 6.3.6.2.9 | Represents policy usage reporting data. |  |
| PolUsageNotif | 6.3.6.2.8 | Represents a Policy Usage Notification. |  |
| PolUsageSubsc | 6.3.6.2.5 | Represents a Policy Usage Subscription. |  |
| PolUsageSubscPatch | 6.3.6.2.6 | Represents the requested modifications to a Policy Usage Subscription. |  |
| PriorityLevel | 6.3.6.3.2 | Represents the priority level of a policy. |  |
| ReqPolRep | 6.3.6.2.7 | Represents the requested policy usage reporting information. |  |
| TimePeriodInfo | 6.3.6.2.18 | Represents the time period related information. |  |

Table 6.3.6.1-2 specifies data types re-used by the NSCE\_PolicyManagement API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_PolicyManagement API.

Table 6.3.6.1-2: NSCE\_PolicyManagement API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| DayOfWeek | 3GPP TS 29.122 [2] | Represents a day of the week. |  |
| Dnn | 3GPP TS 29.571 [16] | Represents a DNN. |  |
| DurationSec | 3GPP TS 29.122 [2] | Represents a time duration in seconds. |  |
| NsiId | 3GPP TS 29.531 [20] | Represents the identifier of a network slice instance. |  |
| ProblemDetails | 3GPP TS 29.122 [2] | Represents error related information. |  |
| ServArea | Clause 6.16.6.2.5 | Represents a service area. |  |
| Snssai | 3GPP TS 29.571 [16] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window with a start time and an end time. |  |
| Uinteger | 3GPP TS 29.571 [16] | Represents an unsigned integer. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.3.6.2 Structured data types

##### 6.3.6.2.1 Introduction

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

##### 6.3.6.2.2 Type: Policy

Table 6.3.6.2.2-1: Definition of type Policy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | C | 0..1 | Contains the identifier of the concerned network slice.  (NOTE 1, NOTE 2) |  |
| reqDnn | Dnn | C | 0..1 | Contains the requested DNN.  (NOTE 1, NOTE 2) |  |
| polHarmInd | boolean | O | 0..1 | Contains the policy harmonization indication. It indicates whether policy harmonization is requested or not, i.e.:  - "true" means that policy harmonization is requested.  - "false" means that policy harmonization is not requested.  - The default value when omitted is "false". |  |
| policy | PolicyData | M | 0..1 | Contains the provisioned policy content data. |  |
| defaultPolInd | boolean | O | 0..1 | Contains the default policy indication. It indicates whether or not the provisioned policy shall be used as a default policy for the network slices provisioned without any policy for the policy type it belongs to, i.e.:  - "true" means that the provisioned policy shall be used as a default policy for the network slices provisioned without any policy for the policy type.  - "false" means that the provisioned policy shall not be used as a default policy for the network slices provisioned without any policy for the policy type.  - The default value when omitted is "false".  (NOTE 1) |  |
| notifUri | Uri | C | 0..1 | Contains the URI via which the Policy Harmonization Notifications shall be delivered.  This attribute shall be present only when the "polHarmInd" attribute is present and set to "true". |  |
| harmonizationId | string | O | 0..1 | Contains the harmonization identifier.  This attribute may only be present in a response to a policy provisioning/update request.  When this attribute is present, it indicates that policy harmonization of the provisioned/updated policy is still ongoing, i.e., the NSCE Server will notify the service consumer once the harmonization process is finalized. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be present only when feature negotiation needs to take place. |  |
| NOTE 1: At least one of these attributes shall be present, unless the provisioned policy is a default policy (i.e., the "defaultPolInd" attribute is present and set to "true"), in which case these attributes are both optional.  NOTE 2: In case of a default policy provisioning (i.e., when the "defaultPolInd" attribute is present and set to "true"), both the "netSliceId" attribute and the "reqDnn" attribute are optional. When one of them or both of them is/are present, this means that the provisioned default policy applies only to the provided network slice and/or DNN for the policy type it belongs to. Otherwise, when both of them are absent, this means that the provisioned default policy applies to all the network slice(s) and/or DNN(s) that do not have any configured policy for the policy type it belongs to. | | | | | |

##### 6.3.6.2.3 Type: PolicyPatch

Table 6.3.6.2.3-1: Definition of type PolicyPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | O | 0..1 | Contains the identifier for the concerned network slice. |  |
| reqDnn | Dnn | O | 0..1 | Contains the requested DNN. |  |
| polHarmInd | boolean | O | 0..1 | Contains the policy harmonization indication. It indicates whether policy harmonization is requested or not, i.e.:  - "true" means that policy harmonization is requested.  - "false" means that policy harmonization is not requested.  - The default value when omitted and not previously provisioned is "false". |  |
| policy | PolicyData | O | 0..1 | Contains the updated policy content data. |  |
| defaultPolInd | boolean | O | 0..1 | Contains the default policy indication. It indicates whether or not the provisioned policy shall be used as a default policy for the network slices provisioned without any policy for the policy type it belongs to, i.e.:  - "true" means that the provisioned policy shall be used as a default policy for the network slices provisioned without any policy for the policy type.  - "false" means that the provisioned policy shall not be used as a default policy for the network slices provisioned without any policy for the policy type.  - The default value when omitted and not previously provisioned is "false". |  |
| notifUri | Uri | C | 0..1 | Contains the updated URI via which the Policy Harmonization Notifications shall be delivered.  This attribute shall be present only if the "polHarmInd" attribute is provisioned for the first time and set to "true", and may be present only when the "polHarmInd" attribute is already present and set to "true" within the targeted "Individual Policy" resource representation. |  |

##### 6.3.6.2.4 Type: PolicyData

Table 6.3.6.2.4-1: Definition of type PolicyData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| policyType | PolicyType | M | 1 | Represents the policy type. |  |
| areaOfInterest | ServArea | M | 1 | Represents the service area within which the policy shall apply. |  |
| triggers | PolicyTriggers | M | 1 | Contains the criteria (e.g., thresholds) to be used to trigger the policy. |  |
| actions | PolicyActions | M | 1 | Contains the actions to be initiated when the criteria provided within the "triggers" attribute are met. |  |
| lifetime | DurationSec | C | 0..1 | Indicates the time duration of the policy.  (NOTE) |  |
| maxNumTimes | Uinteger | C | 0..1 | Indicates the maximum number of times that the policy can be used/triggered.  (NOTE) |  |
| priority | PriorityLevel | O | 0..1 | Contains the priority of the policy. |  |
| schedule | TimeWindow | O | 0..1 | Contains the time scheduling information (i.e., start time and end time) of the policy. |  |
| preemption | PriorityLevel | O | 0..1 | Contains the pre-emption capability of the policy. |  |
| NOTE: These attributes are mutually exclusive. Either one of them shall be present. | | | | | |

##### 6.3.6.2.5 Type: PolUsageSubsc

Table 6.3.6.2.5-1: Definition of type PolUsageSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which the Policy Usage Notifications shall be delivered. |  |
| netSliceId | NetSliceId | M | 1 | Contains the identifier for the requested network slice. |  |
| reqPolicyRep | ReqPolRep | M | 1 | Contains the requested policy usage reporting information. |  |
| repPeriodicity | DurationSec | O | 0..1 | Contains the reporting periodicity (i.e., reporting interval). |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.3.6.2.6 Type: PolUsageSubscPatch

Table 6.3.6.2.6-1: Definition of type PolUsageSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which the Policy Usage Notifications shall be delivered. |  |
| reqPolicyRep | ReqPolRep | O | 0..1 | Contains the updated requested policy usage reporting information. |  |
| repPeriodicity | DurationSec | O | 0..1 | Contains the updated reporting periodicity (i.e., reporting interval). |  |

##### 6.3.6.2.7 Type: ReqPolRep

Table 6.3.6.2.7-1: Definition of type ReqPolRep

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| policyId | string | M | 1 | Contains the identifier of the targeted policy. |  |
| startTime | DateTime | M | 1 | Contains the start time of the requested policy usage reporting. |  |
| endTime | DateTime | M | 1 | Contains the end time of the requested policy usage reporting. |  |

##### 6.3.6.2.8 Type: PolUsageNotif

Table 6.3.6.2.8-1: Definition of type PolUsageNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriptionId | string | M | 1 | Contains the identifier of the subscription to which the Policy Usage Notification is related. |  |
| reports | array(PolRepData) | M | 1..N | Contains the reported policy usage data. |  |

##### 6.3.6.2.9 Type: PolRepData

Table 6.3.6.2.9-1: Definition of type PolRepData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| policyId | string | M | 1 | Contains the identifier of the policy to which the policy usage report is related. |  |
| count | Uinteger | M | 1 | Contains the number of times the policy identified by the "policyId" attribute is active/used. |  |
| timeSpent | DurationSec | M | 1 | Contains the usage time duration of the policy identified by the "policyId" attribute. |  |
| preEmptCount | Uinteger | O | 0..1 | Contains the number of times the policy is pre-empted by another policy.  (NOTE) |  |
| preEmptPolId | array(string) | O | 1..N | Contains the identifier(s) of the policy(s) that are used for pre-emption.  (NOTE) |  |
| NOTE: When the "preEmptCount" attribute is present and set to "1", then the "preEmptPolId" attribute, when present, shall not contain more than one array element. | | | | | |

##### 6.3.6.2.10 Type: PolDeleteReq

Table 6.3.6.2.10-1: Definition of type PolDeleteReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| policyIds | array(string) | M | 1..N | Contains the identifier(s) of the Policy(ies) to be deleted. |  |
| defPolicyIds | map(string) | C | 1..N | Contains the identifier(s) of the policy(ies) that are to be configured as the new default Policy(ies). Each map entry corresponds to the new default policy for a particular policy type. There shall not be more than one new default policy for the same policy type.  This attribute shall be present only when at least one of the deleted policies provided within the "policyIds" is the current default Policy for a policy type.  The key of the map shall be the policy type (encoded using the PolicyType enumeration data type defined in clause 6.3.6.3.3) for which the provided new default policy identified by the corresponding map value is related. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.3.6.2.11 Type: PolDeleteResp

Table 6.3.6.2.11-1: Definition of type PolDeleteResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| defPoliciesInfo | map(DefaultPolInfo) | M | 1..N | Contains the new default policy(ies) related information. Each map entry corresponds to the information of the new default policy for a particular policy type.  The key of the map shall be set to the value of the "policyType" attribute of the corresponding map entry encoded using the DefaultPolInfo data type. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.3.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.3.6.2.12 Type: DefaultPolInfo

Table 6.3.6.2.12-1: Definition of type DefaultPolInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| policyType | PolicyType | M | 1 | Represents the policy type. |  |
| defPolicyId | string | M | 1 | Contains the identifier of the default policy. |  |
| priority | PriorityLevel | O | 0..1 | Contains the priority of the default policy. |  |

##### 6.3.6.2.13 Type: HarmonizationNotif

Table 6.3.6.2.13-1: Definition of type HarmonizationNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| harmonizationId | string | M | 1 | Contains the harmonization identifier. |  |
| policy | PolicyData | M | 1 | Contains the policy content data after harmonization. |  |

##### 6.3.6.2.14 Type: HarmonizationResp

Table 6.3.6.2.14-1: Definition of type HarmonizationResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| feedback | boolean | M | 1 | Contains the policy harmonization feedback. It indicates whether the policy harmonization result is accepted or not, i.e.:  - "true" means that the policy harmonization result is accepted.  - "false" means that the policy harmonization result is not accepted. |  |

##### 6.3.6.2.15 Type: NetSliceId

Table 6.3.6.2.15-1: Definition of type NetSliceId

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | C | 0..1 | Contains the S-NSSAI.  (NOTE) |  |
| nsiId | NsiId | C | 0..1 | Contains the identifier of the network slice instance.  (NOTE) |  |
| ensi | Ensi | C | 0..1 | Contains the external network slice identifier.  (NOTE) |  |
| NOTE: These attributes are mutually exclusive. Either one of them shall be present. | | | | | |

##### 6.3.6.2.16 Type: PolicyTriggers

Table 6.3.6.2.16-1: Definition of type PolicyTriggers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monPercentage | integer | C | 0..1 | Contains the monitoring percentage to be used to trigger the actions.  When used to encode the "triggers" attribute of the PolicyData data structure, this attribute may be presents only when the "policyType" attribute of the PolicyData data structure is set to either:  - "MAX\_NUM\_PDU\_SESS", to indicate the threshold utilization percentage of the available capacity, i.e., the maximum number of PDU Sessions within the network slice.  - "MAX\_NUM\_UE", to indicate the threshold utilization percentage of the available capacity, i.e., the maximum number of UEs within the network slice.  - "SLICE\_LOAD\_PREDICTION", to indicate the threshold network slice load level.  Minimum value = 0. Maximum value = 100.  (NOTE) |  |
| monValue | integer | C | 0..1 | Contains the monitoring value to be used to trigger the actions.  When used to encode the "triggers" attribute of the PolicyData data structure, this attribute may be presents only when the "policyType" attribute of the PolicyData data structure is set to either:  - "MAX\_NUM\_PDU\_SESS", to indicate the threshold number of PDU Sessions value.  - "MAX\_NUM\_UE", to indicate the threshold number of UE(s) value.  - "MAX\_NUM\_UE", to indicate the threshold number of UE(s) value.  Minimum value = 1.  (NOTE) |  |
| monParamsValues | string | C | 0..1 | Contains the values of the monitoring parameters to be used to trigger the actions.  When used to encode the "triggers" attribute of the PolicyData data structure, this attribute shall be presents only when the "policyType" attribute of the PolicyData data structure is set to either:  - "TIME\_PERIOD\_AND\_AVG\_QOS", to indicate the threshold average QoS parameter(s)' value(s).  - "TIME\_PERIOD\_AND\_MIN\_QOS", to indicate the threshold minimum QoS parameter(s)' value(s).  Minimum value = 1.  (NOTE) |  |
| timePeriod | TimePeriodInfo | C | 0..1 | Contains the time period during which the policy trigger is valid.  This attribute may be present only when the "monParamsValues" is present. |  |
| NOTE: When used to encode the "triggers" attribute of the PolicyData data structure, these attributes are mutually exclusive, i.e., only one of them shall be present. | | | | | |

##### 6.3.6.2.17 Type: PolicyActions

Table 6.3.6.2.17-1: Definition of type PolicyActions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| stepIncreasePerc | integer | C | 0..1 | Contains the requested actions in in the form of steps of increase expressed in percentage.  This attribute may be presents only when the "policyType" attribute is set to either:  - "MAX\_NUM\_PDU\_SESS", to indicate the step (expressed in percentage) by which the capacity, i.e., the maximum number of PDU Sessions within the network slice, should be increased when the policy triggers are met.  - "MAX\_NUM\_UE", to indicate the step (expressed in percentage) by which the capacity, i.e., the maximum number of UEs within the network slice, should be increased when the policy triggers are met.  - "SLICE\_LOAD\_PREDICTION", to indicate the step (expressed in percentage) by which the capacity, i.e., network slice load level, should be increased when the policy triggers are met.  Minimum value = 0. Maximum value = 100.  (NOTE) |  |
| allowedQoSActions | array(QoSAction) | C | 1..N | Indicates the allowed QoS related action(s) to be triggered.  This attribute may be presents only when the "policyType" attribute is set to either:  - "TIME\_PERIOD\_AND\_AVG\_QOS", to indicate whether the network slice capacity shall be modified to fulfil the requested period average QoS during the provided time period, if applicable.  - "TIME\_PERIOD\_AND\_MIN\_QOS", to indicate whether the network slice capacity shall be modified to fulfil the requested minimum QoS during the provided time period, if applicable.  (NOTE) |  |
| NOTE: When used to encode the "actions" attribute of the PolicyData data structure, these attributes are mutually exclusive, i.e., only one of them shall be present. | | | | | |

##### 6.3.6.2.18 Type: TimePeriodInfo

Table 6.3.6.2.18-1: Definition of type TimePeriodInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| startTime | DateTime | C | 0..1 | Contains the applicable start time.  (NOTE 1, NOTE 2, NOTE 3) |  |
| endTime | DateTime | C | 0..1 | Contains the applicable end time.  (NOTE 1, NOTE 2, NOTE 3) |  |
| daysOfWeek | array(DayOfWeek) | C | 1..7 | Contains the applicable day(s) of the week.  (NOTE 1, NOTE 2, NOTE 3) |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: When the "daysOfWeek" attribute is present, then if the "startTime" attribute is absent, this means that the applicable start time is the start of the day, and/or if the "endTime" attribute is absent, this means that the applicable end time is the end of the day, for each applicable day.  NOTE 3: When the "daysOfWeek" attribute is absent, then both the "startTime" and "endTime" attributes shall be present. | | | | | |

#### 6.3.6.3 Simple data types and enumerations

##### 6.3.6.3.1 Introduction

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

##### 6.3.6.3.2 Simple data types

The simple data types defined in table 6.3.6.3.2-1 shall be supported.

Table 6.3.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
| PriorityLevel | integer | Represents an unsigned integer, within the range 1 to 255, indicating the priority level of a policy or the pre-emption capability of a policy.  The values are ordered in decreasing order of priority, with 1 being the highest priority and 255 the lowest priority. |  |
| Ensi | string | Represents the External Network Slice Information that is used to identify a network slice, as specified in 3GPP TS 33.501 [21]. |  |

##### 6.3.6.3.3 Enumeration: PolicyType

The enumeration PolicyType represents the policy type. It shall comply with the provisions defined in table 6.3.6.3.3-1.

Table 6.3.6.3.3-1: Enumeration PolicyType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| MAX\_NUM\_PDU\_SESS | Indicates that the policy type is the maximum number of PDU Sessions. |  |
| MAX\_NUM\_UE | Indicates that the policy type is the maximum number of UEs Sessions. |  |
| SLICE\_LOAD\_PREDICTION | Indicates that the policy type is the network slice load prediction. |  |
| TIME\_PERIOD\_AND\_AVG\_QOS | Indicates that the policy type is the time period and average QoS per UE. |  |
| TIME\_PERIOD\_AND\_MIN\_QOS | Indicates that the policy type is the time period and minimum QoS per UE. |  |

##### 6.3.6.3.4 Enumeration: QoSAction

The enumeration PolicyType represents the QoS related action. It shall comply with the provisions defined in table 6.3.6.3.3-1.

Table 6.3.6.3.4-1: Enumeration QoSAction

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| MODIFY | Indicates that the QoS related action is to trigger the modification of the network slice capacity to fulfil the requested needs (e.g., average QoS, minimum QoS). |  |

#### 6.3.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.3.6.5 Binary data

##### 6.3.6.5.1 Binary Data Types

Table 6.3.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.3.7 Error Handling

#### 6.3.7.1 General

For the NSCE\_PolicyManagement API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_PolicyManagement API.

#### 6.3.7.2 Protocol Errors

No specific protocol errors for the NSCE\_PolicyManagement API are specified.

#### 6.3.7.3 Application Errors

The application errors defined for the NSCE\_PolicyManagement API are listed in Table 6.3.7.3-1.

Table 6.3.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
| INVALID\_POLICY | 403 Forbidden | Indicates that the Policy provisioning/update is rejected because the provided policy in not valid. |  |
| POLICY\_CONFLICT | 403 Forbidden | Indicates that the Policy provisioning/update is rejected because the provided policy conflicts with existing policies.  This application error applies only when policy harmonization was not requested. |  |
| HARMOMIZATION\_ONGOING | 403 Forbidden | Indicates that the Policy provisioning/update is rejected because policy harmonization of the policy to be created/updated is ongoing.  This application error applies only when policy harmonization was requested. |  |

### 6.3.8 Feature negotiation

The optional features listed in table 6.3.8-1 are defined for the NSCE\_PolicyManagement API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.3.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.3.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_PolicyManagement API.

## 6.4 NSCE\_NSOptimization API

### 6.4.1 Introduction

The NSCE\_NSOptimization service shall use the NSCE\_NSOptimization API.

The API URI of the NSCE\_NSOptimization Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-nso".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.4, the service producer (i.e. NSCE Server) takes the role of the SCEF and the service consumer (e.g., VAL Server) takes the role of the SCS/AS.

### 6.4.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSOptimization API.

### 6.4.3 Resources

#### 6.4.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.4.3.1-1 depicts the resource URIs structure for the NSCE\_NSOptimization API.



Figure 6.4.3.1-1: Resource URIs structure of the NSCE\_NSOptimization API

Table 6.4.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_NSOptimization API.

Table 6.4.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Network Slice Optimization Subscriptions | /subscriptions | POST | Request the creation of a Network Slice Optimization Subscription. |
| Individual Network Slice Optimization Subscription | /subscriptions/{subscriptionId} | GET | Retrieve an existing "Individual Network Slice Optimization Subscription". |
| PUT | Request the fully update of an existing "Individual Network Slice Optimization Subscription". |
|  |  | PATCH | Request to partially update of an existing "Individual Network Slice Optimization Subscription" resource. |
|  |  | DELETE | Request the deletion of an existing "Individual Network Slice Optimization Subscription". |

#### 6.4.3.2 Resource: Network Slice Optimization Subscriptions

##### 6.4.3.2.1 Description

This resource represents the collection of Network Slice Optimization Subscriptions managed by the NSCE Server.

##### 6.4.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-nso/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 6.4.3.2.2-1.

Table 6.4.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.4.1 |

##### 6.4.3.2.3 Resource Standard Methods

###### 6.4.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Network Slice Optimization Subscription at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.4.3.2.3.1-1.

Table 6.4.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.2.3.1-2 and the response data structures and response codes specified in table 6.4.3.2.3.1-3.

Table 6.4.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NetSliceOptSubsc | M | 1 | Represents the parameters to request the creation of a new network slice optimization subscription. |

Table 6.4.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NetSliceOptSubsc | M | 1 | 201 Created | Successful case. The Network Slice Optimization Subscription is successfully created and a representation of the created "Individual Network Slice Optimization Subscription" resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status code for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.2.3.1-4: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-nso/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.4.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.4.3.3 Resource: Individual Network Slice Optimization Subscription

##### 6.4.3.3.1 Description

This resource represents a Network Slice Optimization Subscription managed by the NSCE Server.

##### 6.4.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-nso/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in the table 6.4.3.3.2-1.

Table 6.4.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.4.1 |
| subscriptionId | string | Represents the identifier of the "Individual Network Slice Optimization Subscription" resource. |

##### 6.4.3.3.3 Resource Standard Methods

###### 6.4.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Network Slice Optimization Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.4.3.3.3.1-1.

Table 6.4.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.1-2 and the response data structures and response codes specified in table 6.4.3.3.3.1-3.

Table 6.4.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NetSliceOptSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Network Slice Optimization Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NSCE server. |

Table 6.4.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NSCE server. |

###### 6.4.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Network Slice Optimization Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.4.3.3.3.2-1.

Table 6.4.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.2-2 and the response data structures and response codes specified in table 6.4.3.3.3.2-3.

Table 6.4.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NetSliceOptSubsc | M | 1 | Represents the updated representation of the "Individual Network Slice Optimization Subscription" resource. |

Table 6.4.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NetSliceOptSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Optimization Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Optimization Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NSCE server. |

Table 6.4.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NSCE server. |

###### 6.4.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Network Slice Optimization Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.3-1.

Table 6.4.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.3-2 and the response data structures and response codes specified in table 6.4.3.3.3.3-3.

Table 6.4.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NetSliceOptSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Network Slice Optimization Subscription" resource. |

Table 6.4.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NetSliceOptSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Optimization Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Optimization Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.4.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.4.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Network Slice Optimization Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.4.3.3.3.4-1.

Table 6.4.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.4.3.3.3.4-2 and the response data structures and response codes specified in table 6.4.3.3.3.4-3.

Table 6.4.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.4.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Optimization Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status code for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NSCE Server. |

Table 6.4.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NSCE Server. |

##### 6.4.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.4.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.4.5 Notifications

#### 6.4.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.4.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Network Slice Optimization Notification | {notifUri} | POST | This service operation enables a NSCE Server to notify a previously subscribed service consumer on Network Slice Optimization reports. |

#### 6.4.5.2 Network Slice Optimization Notification

##### 6.4.5.2.1 Description

The Network Slice Optimization Notification is used by a NSCE Server to notify a previously subscribed service consumer on Network Slice Optimization reports.

##### 6.4.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.4.5.2.2-1.

Table 6.4.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | String formatted as a URI containing the Callback URI.  The notification URI is provided as part of the corresponding Network Slice Optimization Subscription creation/update request. |

##### 6.4.5.2.3 Standard Methods

###### 6.4.5.2.3.1 POST

This method shall support the request data structures specified in table 6.4.5.2.3.1-1 and the response data structures and response codes specified in table 6.4.5.2.3.1-2.

Table 6.4.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NetSliceOptNotif | M | 1 | Represents a Network Slice Optimization notification. |

Table 6.4.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice Optimization Notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.4.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.4.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.4.6 Data Model

#### 6.4.6.1 General

This clause specifies the application data model supported by the API.

Table 6.4.6.1-1 specifies the data types defined for the NSCE\_NSOptimization API.

Table 6.4.6.1-1: NSCE\_NSOptimization API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| NetSliceOptNotif | 6.4.6.2.4 | Represents a Network Slice Optimization notification. |  |
| NetSliceOptSubsc | 6.4.6.2.2 | Represents a Network Slice Optimization subscription. |  |
| NetSliceOptSubscPatch | 6.4.6.2.3 | Represents the requested modifications to a Network Slice Optimization subscription. |  |

Table 6.4.6.1-2 specifies data types re-used by the NSCE\_NSOptimization API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_NSOptimization API.

Table 6.4.6.1-2: NSCE\_NSOptimization API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| DateTimeRm | 3GPP TS 29.122 [2] | Represents the same as the DateTime data type, but with the "nullable: true" property. |  |
| Dnn | 3GPP TS 29.571 [16] | Identifies a DNN. |  |
| DurationSec | 3GPP TS 29.571 [16] | Identifies a period of time in units of seconds. |  |
| NSInfoSet | 6.16.6.2.4 | Represents a Network Slice Information Set. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| Snssai | 3GPP TS 29.571 [16] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Used to negotiate the applicability of the optional features. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.4.6.2 Structured data types

##### 6.4.6.2.1 Introduction

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

##### 6.4.6.2.2 Type: NetSliceOptSubsc

Table 6.4.6.2.2-1: Definition of type NetSliceOptSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which notifications shall be provided. |  |
| netSliceId | NetSliceId | O | 0..1 | Contains the identifier for the network slice.  (NOTE) |  |
| dnn | Dnn | O | 0..1 | Identifies a DNN, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  (NOTE) |  |
| policyId | string | O | 0..1 | Identifies the VAL server policy.  (NOTE) |  |
| expTime | DateTime | O | 0..1 | Indicates the time at which the network slice optimization subscription shall expire.  This attribute may only be present in Network Slice Optimization subscription creation/update responses.  If this attribute is absent, this means that the Network Slice Optimization subscription shall not expire, until explicitly deleted by the service consumer.  (NOTE) |  |
| secPolicId | string | O | 0..1 | Contains the identifier of the secondary policy for the network slice optimization in the case of a failed network slice optimization.  (NOTE) |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.4.8.  This attribute shall be provided if feature negotiation shall take place. |  |
| NOTE: At least one of the attributes shall be provided. | | | | | |

##### 6.4.6.2.3 Type: NetSliceOptSubscPatch

Table 6.4.6.2.3-1: Definition of type NetSliceOptSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which notifications shall be provided. |  |
| netSliceId | NetSliceId | O | 0..1 | Contains the identifier for the network slice.  (NOTE) |  |
| dnn | Dnn | O | 0..1 | Identifies a DNN, a full DNN with both the Network Identifier and Operator Identifier, or a DNN with the Network Identifier only.  (NOTE) |  |
| policyId | string | O | 0..1 | Identifies the VAL server policy.  (NOTE) |  |
| expTime | DateTimeRm | O | 0..1 | Indicates the time at which the network slice optimization subscription shall expire.  This attribute may only be present in Network Slice Optimization subscription creation/update responses.  If this attribute is absent, this means that the Network Slice Optimization subscription shall not expire, until explicitly deleted by the service consumer (e.g. VAL Server).  (NOTE) |  |
| secPolicId | string | O | 0..1 | Contains the identifier of the secondary policy for the network slice optimization in the case of a failed network slice optimization.  (NOTE) |  |
| NOTE: At least one of the attributes shall be provided. | | | | | |

##### 6.4.6.2.4 Type: NetSliceOptNotif

Table 6.4.6.2.4-1: Definition of type NetSliceOptNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriptionId | string | M | 1 | Represents the identifier of the subscription to which the network slice optimization notification is related. |  |
| sliceInfo | NSInfoSet | M | 1 | Contains the network slice information.  (NOTE) |  |
| optTime | DurationSec | O | 0..1 | Indicates time spent for slice optimization by the NSCE Server. |  |
| enforPolId | string | O | 0..1 | Indicates the policy used for slice optimization in the case of the failed network slice optimization. |  |
| NOTE: At least the "snssai" attribute within the NSInfoSet shall be provided. | | | | | |

#### 6.4.6.3 Simple data types and enumerations

##### 6.4.6.3.1 Introduction

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

##### 6.4.6.3.2 Simple data types

The simple data types defined in table 6.4.6.3.2-1 shall be supported.

Table 6.4.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.4.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.4.6.5 Binary data

##### 6.4.6.5.1 Binary Data Types

Table 6.4.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.4.7 Error Handling

#### 6.4.7.1 General

For the NSCE\_NSOptimization API, HTTP error responses shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_NSOptimization API.

#### 6.4.7.2 Protocol Errors

No specific protocol errors for the NSCE\_NSOptimization API are specified.

#### 6.4.7.3 Application Errors

The application errors defined for the NSCE\_NSOptimization API are listed in Table 6.4.7.3-1.

Table 6.4.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.4.8 Feature negotiation

The optional features in table 6.4.8-1 are defined for the NSCE\_NSOptimization API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.4.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| n/a |  |  |

### 6.4.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSOptimization API.

## 6.5 NSCE\_ManagementServiceDiscovery API

### 6.5.1 Introduction

The NSCE\_ManagementServiceDiscovery service shall use the NSCE\_ManagementServiceDiscovery API.

The API URI of the NSCE\_ManagementServiceDiscovery API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-msd".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6, the service producer NSCE server takes the role of the SCEF and the service consumer (i.e. NSCE server) takes the role of the SCS/AS.

### 6.5.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_ManagementServiceDiscovery API.

### 6.5.3 Resources

#### 6.5.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.5.3.1-1 depicts the resource URIs structure for the NSCE\_ManagementServiceDiscovery API.



Figure 6.5.3.1-1: Resource URIs structure of the NSCE\_ManagementServiceDiscovery API

Table 6.5.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_ManagementServiceDiscovery API.

Table 6.5.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Management Discovery Subscription | /subscriptions | POST | Request the creation of a Management Discovery Subscription. |
| Individual Management Discovery Subscription | /subscriptions/{subscriptionId} | GET | Retrieve an existing "Individual Management Discovery Subscription" resource. |
| PUT | Request the update of an existing "Individual Management Discovery Subscription" resource. |
| PATCH | Request the modification of an existing "Individual Management Discovery Subscription" resource. |
| DELETE | Request the deletion of an existing "Individual Management Discovery Subscription" resource. |

#### 6.5.3.2 Resource: Management Discovery Subscription

##### 6.5.3.2.1 Description

This resource represents the collection of Management Discovery Subscription managed by the NSCE Server.

##### 6.5.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-msd/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 6.5.3.2.2-1.

Table 6.5.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.5.1. |

##### 6.5.3.2.3 Resource Standard Methods

###### 6.5.3.2.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a Management Discovery Subscription at the NSCE Server.

This method shall support the URI query parameters specified in table 6.5.3.2.3.2-1.

Table 6.5.3.2.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.5.3.2.3.2-2 and the response data structures and response codes specified in table 6.5.3.2.3.2-3.

Table 6.5.3.2.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MnSDiscSubsc | M | 1 | Represents the parameters to request the creation of a Management Discovery Subscription resource. |

Table 6.5.3.2.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MnSDiscSubsc | M | 1 | 201 Created | Successful case. The Management Discovery Subscription is successfully created and a representation of the created "Individual Management Discovery Subscription" resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.2.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-msd/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.5.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.5.3.3 Resource: Individual Management Discovery Subscription

##### 6.5.3.3.1 Description

This resource represents a Management Discovery Subscription managed by the NSCE Server.

##### 6.5.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-msd/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 6.5.3.3.2-1.

Table 6.5.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.5.1. |
| subscriptionId | string | Represents the identifier of the "Individual Management Discovery Subscription" resource. |

##### 6.5.3.3.3 Resource Standard Methods

###### 6.5.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Management Discovery Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.1-1.

Table 6.5.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.5.3.3.3.1-2 and the response data structures and response codes specified in table 6.5.3.3.3.1-3.

Table 6.5.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.5.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MnSDiscSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Management Discovery Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.5.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.5.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Management Discovery Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.2-1.

Table 6.5.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.5.3.3.3.2-2 and the response data structures and response codes specified in table 6.5.3.3.3.2-3.

Table 6.5.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MnSDiscSubsc | M | 1 | Represents the updated representation of the "Individual Management Discovery Subscription" resource. |

Table 6.5.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MnSDiscSubsc | M | 1 | 200 OK | Successful case. The "Individual Management Discovery Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Management Discovery Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.5.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.5.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Management Discovery Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.3-1.

Table 6.5.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.5.3.3.3.3-2 and the response data structures and response codes specified in table 6.5.3.3.3.3-3.

Table 6.5.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MnSDiscSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Management Discovery Subscription" resource. |

Table 6.5.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MnSDiscSubsc | M | 1 | 200 OK | Successful case. The "Individual Management Discovery Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Management Discovery Subscription" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.5.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.5.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Management Discovery Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.5.3.3.3.4-1.

Table 6.5.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.5.3.3.3.4-2 and the response data structures and response codes specified in table 6.5.3.3.3.4-3.

Table 6.5.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.5.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Management Discovery Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.5.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.5.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.5.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.5.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.5.5 Notifications

#### 6.5.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.5.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Management discovery Notification | {notifUri} | POST | This service operation enables a NSCE Server to notify a previously subscribed service consumer on Management Discovery event(s). |

#### 6.5.5.2 Management discovery Notification

##### 6.5.5.2.1 Description

The Management discovery Notification is used by the NSCE Server to notify a previously subscribed service consumer on Management discovery subscriptions.

##### 6.5.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.5.5.2.2-1.

Table 6.5.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.5.5.2.3 Standard Methods

6.5.5.2.3.1 POST

This method shall support the request data structures specified in table 6.5.5.2.3.1-1 and the response data structures and response codes specified in table 6.5.5.2.3.1-2.

Table 6.5.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MnSDiscNotif | M | 1 | Represents the Management Discovery Notification. |

Table 6.5.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Management Discovery Notification is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Table 6.5.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.5.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.5.6 Data Model

#### 6.5.6.1 General

This clause specifies the application data model supported by the API.

Table 6.5.6.1-1 specifies the data types defined for the NSCE\_ManagementServiceDiscovery API.

Table 6.5.6.1-1: NSCE\_ManagementServiceDiscovery API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| ExpCapReqs | 6.5.6.2.6 | Represents the exposure capability requirements. |  |
| ExpCapType | 6.5.6.3.4 | Represents the exposure capability type. |  |
| MnSDiscNotif | 6.5.6.2.4 | Represents a Management Discovery Notification. |  |
| MnSDiscSubsc | 6.5.6.2.2 | Represents a Management Discovery Subscription. |  |
| MnSDiscSubscPatch | 6.5.6.2.3 | Represents the requested modifications to a Management Discovery Subscription. |  |
| MnSInfo | 6.5.6.2.5 | Represents the Management Services related information. |  |
| MnSPermission | 6.5.6.3.3 | Represents the permissions for exposing information related to the target slice over the MnS. |  |

Table 6.5.6.1-2 specifies data types re-used by the NSCE\_ManagementServiceDiscovery API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_ManagementServiceDiscovery API.

Table 6.5.6.1-2: NSCE\_ManagementServiceDiscovery API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| Dnn | 3GPP TS 29.571 [18] | Represents a DNN. |  |
| DurationSec | 3GPP TS 29.122 [2] | Represents a time duration in seconds. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| ProblemDetails | 3GPP TS 29.122 [2] | Represents error related information. |  |
| Snssai | 3GPP TS 29.571 [18] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [18] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Uinteger | 3GPP TS 29.571 [18] | Represents an unsigned integer. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.5.6.2 Structured data types

##### 6.5.6.2.1 Introduction

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

##### 6.5.6.2.2 Type: MnSDiscSubsc

Table 6.5.6.2.2-1: Definition of type MnSDiscSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which the Management Discovery Notifications shall be delivered. |  |
| netSliceIds | array(NetSliceId) | O | 1..N | Contains the identifier for the requested network slice(s). |  |
| expCapReqs | ExpCapReqs | O | 0..1 | Contains the exposure capability requirements, i.e., the indication of the requested permissions for exposing information related to the target slice and/or the supported exposure capability type (e.g., via EGMF or directly to MnS producer). |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.5.8.  This attribute shall be present only if feature negotiation needs to take place. |  |

##### 6.5.6.2.3 Type: MnSDiscSubscPatch

Table 6.5.6.2.3-1: Definition of type MnSDiscSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which the Management Discovery Notifications shall be delivered. |  |
| expCapReqs | ExpCapReqs | O | 0..1 | Contains the updated exposure capability requirements, i.e., the updated indication of the requested permissions for exposing information related to the target slice and/or the updated supported exposure capability type (e.g., via EGMF or directly to MnS producer). |  |

##### 6.5.6.2.4 Type: MnSDiscNotif

Table 6.5.6.2.4-1: Definition of type MnSDiscNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| mnSDomainId | string | M | 1 | Contains the identifier of the management system/domain of interest. |  |
| mnSs | array(MnSInfo) | M | 1..N | Contains the list of Management Services. |  |

##### 6.5.6.2.5 Type: MnSInfo

Table 6.5.6.2.5-1: Definition of type MnSInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| mnSIds | array(string) | M | 1..N | Contains the list of the identifiers of the needed MnSs / MnS producers |  |
| mnSCap | string | M | 1 | Contains the capability per needed MnS. Such capability may be related to the managed elements such as considerations for radio, technology, coverage or NFs. |  |
| mnSPerms | array(MnSPermission) | O | 1..N | Contains the allowed permissions of the VAL server over the MnS, e.g., whether it is allowed to read, write, delete, and/or update. |  |
| netSliceId | NetSliceId | O | 0..1 | Contains the identifier of the concerned network slice. |  |

##### 6.5.6.2.6 Type: ExpCapReqs

Table 6.5.6.2.6-1: Definition of type ExpCapReqs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| reqPerm | array(MnSPermission) | C | 1..N | Contains the list of the requested permissions for exposing information related to the target slice.  (NOTE) |  |
| expCapType | array(ExpCapType) | C | 1..N | Contains the supported exposure capability type (e.g., via EGMF or directly to MnS producer).  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

#### 6.5.6.3 Simple data types and enumerations

##### 6.5.6.3.1 Introduction

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

##### 6.5.6.3.2 Simple data types

The simple data types defined in table 6.5.6.3.2-1 shall be supported.

Table 6.5.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.5.6.3.3 Enumeration: MnSPermission

The enumeration MnSPermission represents the permissions for exposing information related to the target slice over the MnS. It shall comply with the provisions defined in table 6.5.6.3.3-1.

Table 6.5.6.3.3-1: Enumeration MnSPermission

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| READ | Indicates the allowed permission is to read over the MnS. |  |
| WRITE | Indicates the allowed permission is to write over the MnS. |  |
| DELETE | Indicates the allowed permission is to delete over the MnS. |  |
| UPDATE | Indicates the allowed permission is to update over the MnS. |  |

##### 6.5.6.3.4 Enumeration: ExpCapType

The enumeration ExpCapType represents the exposure capability type. It shall comply with the provisions defined in table 6.5.6.3.4-1.

Table 6.5.6.3.4-1: Enumeration ExpCapType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| VIA\_EGMF | Indicates the supported exposure capability is via EGMF. |  |
| DIRECT | Indicates the supported exposure capability is directly to MnS producer. |  |

#### 6.5.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.5.6.5 Binary data

##### 6.5.6.5.1 Binary Data Types

Table 6.5.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.5.7 Error Handling

#### 6.5.7.1 General

For the NSCE\_ManagementServiceDiscovery API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_ManagementServiceDiscovery API.

#### 6.5.7.2 Protocol Errors

No specific protocol errors for the NSCE\_ManagementServiceDiscovery API are specified.

#### 6.5.7.3 Application Errors

The application errors defined for the NSCE\_ManagementServiceDiscovery API are listed in Table 6.5.7.3-1.

Table 6.5.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.5.8 Feature negotiation

The optional features listed in table 6.5.8-1 are defined for the NSCE\_ManagementServiceDiscovery API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.5.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.5.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_ManagementServiceDiscovery API.

## 6.6 NSCE\_PerfMonitoring API

### 6.6.1 Introduction

The NSCE\_PerfMonitoring service shall use the NSCE\_PerfMonitoring API.

The API URI of the NSCE\_PerfMonitoring Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-pam".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.6, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.6.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_PerfMonitoring API.

### 6.6.3 Resources

#### 6.6.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.6.3.1-1 depicts the resource URIs structure for the NSCE\_PerfMonitoring API.



Figure 6.6.3.1-1: Resource URIs structure of the NSCE\_PerfMonitoring API

Table 6.6.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_PerfMonitoring API.

Table 6.6.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Monitoring Jobs | /jobs | POST | Request the creation of a Monitoring Job. |
| Individual Monitoring Job | /jobs/{jobId} | GET | Retrieve an existing "Individual Monitoring Job" resource. |
| PUT | Request the update of an existing "Individual Monitoring Job" resource. |
| PATCH | Request the modification of an existing "Individual Monitoring Job" resource. |
| DELETE | Request the deletion of an existing "Individual Monitoring Job" resource. |
| Monitoring Subscriptions | /subscriptions | POST | Request the creation of a Monitoring Subscription. |
| Individual Monitoring Subscription | /subscriptions/{subscId} | GET | Retrieve an existing "Individual Monitoring Subscription" resource. |
| PUT | Request the update of an existing "Individual Monitoring Subscription" resource. |
| PATCH | Request the modification of an existing "Individual Monitoring Subscription" resource. |
| DELETE | Request the deletion of an existing "Individual Monitoring Subscription" resource. |

#### 6.6.3.2 Resource: Monitoring Jobs

##### 6.6.3.2.1 Description

This resource represents the collection of Monitoring Jobs managed by the NSCE Server.

##### 6.6.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pam/<apiVersion>/jobs**

This resource shall support the resource URI variables defined in table 6.6.3.2.2-1.

Table 6.6.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |

##### 6.6.3.2.3 Resource Standard Methods

###### 6.6.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Monitoring Job at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.2.3.1-1.

Table 6.6.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.2.3.1-2 and the response data structures and response codes specified in table 6.6.3.2.3.1-3.

Table 6.6.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringJob | M | 1 | Represents the parameters to request the creation of a Monitoring Job. |

Table 6.6.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringJob | M | 1 | 201 Created | Successful case. The Monitoring Job is successfully created and a representation of the created "Individual Monitoring Job" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-pam/<apiVersion>/jobs/{jobId} |

##### 6.6.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.6.3.3 Resource: Individual Monitoring Job

##### 6.6.3.3.1 Description

This resource represents a Monitoring Job managed by the NSCE Server.

##### 6.6.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pam/<apiVersion>/jobs/{jobId}**

This resource shall support the resource URI variables defined in table 6.6.3.3.2-1.

Table 6.6.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |
| jobId | string | Represents the identifier of the "Individual Monitoring Job" resource. |

##### 6.6.3.3.3 Resource Standard Methods

###### 6.6.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Monitoring Job" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.1-1.

Table 6.6.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.3.3.1-2 and the response data structures and response codes specified in table 6.6.3.3.3.1-3.

Table 6.6.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.6.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringJob | M | 1 | 200 OK | Successful case. The requested "Individual Monitoring Job" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.6.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Monitoring Job" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.2-1.

Table 6.6.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.3.3.2-2 and the response data structures and response codes specified in table 6.6.3.3.3.2-3.

Table 6.6.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringJob | M | 1 | Represents the updated representation of the "Individual Monitoring Job" resource. |

Table 6.6.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringJob | M | 1 | 200 OK | Successful case. The "Individual Monitoring Job" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Monitoring Job" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.6.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Monitoring Job" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.3-1.

Table 6.6.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.3.3.3-2 and the response data structures and response codes specified in table 6.6.3.3.3.3-3.

Table 6.6.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringJobPatch | M | 1 | Represents the parameters to request the modification of the "Individual Monitoring Job" resource. |

Table 6.6.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringJob | M | 1 | 200 OK | Successful case. The "Individual Monitoring Job" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Monitoring Job" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.6.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Monitoring Job" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.3.3.4-1.

Table 6.6.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.3.3.4-2 and the response data structures and response codes specified in table 6.6.3.3.3.4-3.

Table 6.6.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.6.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Monitoring Job" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.6.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.6.3.4 Resource: Monitoring Subscriptions

##### 6.6.3.4.1 Description

This resource represents the collection of Monitoring Subscriptions managed by the NSCE Server.

##### 6.6.3.4.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pam/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in table 6.6.3.4.2-1.

Table 6.6.3.4.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |

##### 6.6.3.4.3 Resource Standard Methods

###### 6.6.3.4.3.2 POST

The HTTP POST method allows a service consumer to request the creation of a Monitoring Subscription at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.4.3.2-1.

Table 6.6.3.4.3.2-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.4.3.2-2 and the response data structures and response codes specified in table 6.6.3.4.3.2-3.

Table 6.6.3.4.3.2-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringSubsc | M | 1 | Represents the parameters to request the creation of a Monitoring Subscription. |

Table 6.6.3.4.3.2-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringSubsc | M | 1 | 201 Created | Successful case. The Monitoring Subscription is successfully created and a representation of the created "Individual Monitoring Subscription" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.4.3.2-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-pam/<apiVersion>/subscriptions/{subscId} |

##### 6.6.3.4.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.6.3.5 Resource: Individual Monitoring Subscription

##### 6.6.3.5.1 Description

This resource represents a Monitoring Subscription managed by the NSCE Server.

##### 6.6.3.5.2 Resource Definition

Resource URI: **{apiRoot}/nsce-pam/<apiVersion>/subscriptions/{subscId}**

This resource shall support the resource URI variables defined in table 6.6.3.5.2-1.

Table 6.6.3.5.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |
| subscId | string | Represents the identifier of the "Individual Monitoring Subscription" resource. |

##### 6.6.3.5.3 Resource Standard Methods

###### 6.6.3.5.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Monitoring Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.5.3.1-1.

Table 6.6.3.5.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.5.3.1-2 and the response data structures and response codes specified in table 6.6.3.5.3.1-3.

Table 6.6.3.5.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.6.3.5.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Monitoring Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.5.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.5.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.6.3.5.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Monitoring Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.5.3.2-1.

Table 6.6.3.5.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.5.3.2-2 and the response data structures and response codes specified in table 6.6.3.5.3.2-3.

Table 6.6.3.5.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringSubsc | M | 1 | Represents the updated representation of the "Individual Monitoring Subscription" resource. |

Table 6.6.3.5.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringSubsc | M | 1 | 200 OK | Successful case. The "Individual Monitoring Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Monitoring Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.5.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.5.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.6.3.5.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Monitoring Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.5.3.3-1.

Table 6.6.3.5.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.5.3.3-2 and the response data structures and response codes specified in table 6.6.3.5.3.3-3.

Table 6.6.3.5.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Monitoring Subscription" resource. |

Table 6.6.3.5.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringSubsc | M | 1 | 200 OK | Successful case. The "Individual Monitoring Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Monitoring Subscription" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.5.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.5.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.6.3.5.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Monitoring Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.6.3.5.3.4-1.

Table 6.6.3.5.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.6.3.5.3.4-2 and the response data structures and response codes specified in table 6.6.3.5.3.4-3.

Table 6.6.3.5.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.6.3.5.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Monitoring Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.3.5.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.6.3.5.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

### 6.6.4 Custom Operations without associated resources

#### 6.6.4.1 Overview

The structure of the custom operation URIs of the NSCE\_PerfMonitoring API is shown in Figure 6.6.4.1-1.



Figure 6.6.4.1-1: Custom operation URI structure of the NSCE\_PerfMonitoring API

Table 6.10.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the NSCE\_PerfMonitoring API.

Table 6.6.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Custom operation name | Custom operation URI | Mapped HTTP method | Description |
| Request | /request | POST | Enables a service consumer to request a multiple slices related performance and analytics consolidated reporting. |

The custom operations shall support the URI variables defined in table 6.6.4.1-2.

Table 6.6.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.6.1. |

#### 6.6.4.2 Operation: Request

##### 6.6.4.2.1 Description

The custom operation enables a service consumer to request a multiple slices related performance and analytics consolidated reporting to the NSCE Server.

##### 6.6.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.6.4.2.2-1 and the response data structures and response codes specified in table 6.6.4.2.2-2.

Table 6.6.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringReq | M | 1 | Contains the parameters to request a multiple slices related performance and analytics consolidated report. |

Table 6.6.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| MonitoringResp | M | 1 | 200 OK | Successful case. The requested multiple slices related performance and analytics consolidated report shall be returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.6.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

### 6.6.5 Notifications

#### 6.6.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.6.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Monitoring Notification | {notifUri} | POST | This service operation enables a NSCE Server to notify a previously subscribed service consumer on Monitoring event(s). |

#### 6.6.5.2 Monitoring Notification

##### 6.6.5.2.1 Description

The Monitoring Notification is used by the NSCE Server to notify a previously subscribed service consumer on Monitoring event(s).

##### 6.6.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.6.5.2.2-1.

Table 6.6.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.6.5.2.3 Standard Methods

###### 6.6.5.2.3.1 POST

This method shall support the request data structures specified in table 6.6.5.2.3.1-1 and the response data structures and response codes specified in table 6.6.5.2.3.1-2.

Table 6.6.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MonitoringNotif | M | 1 | Represents the Monitoring Notification. |

Table 6.6.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Monitoring Notification is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.6.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.6.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.6.6 Data Model

#### 6.6.6.1 General

This clause specifies the application data model supported by the API.

Table 6.6.6.1-1 specifies the data types defined for the NSCE\_PerfMonitoring API.

Table 6.6.6.1-1: NSCE\_PerfMonitoring API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| MonitoringJob | 6.6.6.2.2 | Represents a Monitoring Job. |  |
| MonitoringJobPatch | 6.6.6.2.3 | Represents the requested modifications to a Monitoring Job. |  |
| MonitoringMetric | 6.6.6.2.4 | Represents the parameters of a network slice related performance and analytics monitoring metric. |  |
| MonitoringNotif | 6.6.6.2.9 | Represents a Monitoring Notification. |  |
| MonitoringReq | 6.6.6.2.12 | Represents a multiple slices related performance and analytics consolidated reporting request. |  |
| MonitoringResp | 6.6.6.2.13 | Represents a multiple slices related performance and analytics consolidated reporting response. |  |
| MonitoringSubsc | 6.6.6.2.6 | Represents a Monitoring Subscription. |  |
| MonitoringSubscPatch | 6.6.6.2.7 | Represents the requested modifications to a Monitoring Subscription. |  |
| MonPerfAnalyRes | 6.6.6.2.11 | Represents a monitored performance or analytics result. |  |
| MonPerfAnalytics | 6.6.6.2.5 | Represents a monitored performance or analytics information. |  |
| MonReqMetrics | 6.6.6.2.14 | Represents the parameters of a network slice related performance and analytics monitoring metric used within a multiple slices related performance and analytics consolidated reporting request. |  |
| MonRespRepData | 6.6.6.2.15 | Represents a network slice related performance and analytics monitoring report instance provided as part of a multiple slices related performance and analytics consolidated reporting response. |  |
| ReportingData | 6.6.6.2.10 | Represents a network slice related performance and analytics monitoring report. |  |
| ReportingInfo | 6.6.6.2.8 | Represents the network slice related performance and analytics monitoring reporting information. |  |

Table 6.6.6.1-2 specifies data types re-used by the NSCE\_PerfMonitoring API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_PerfMonitoring API.

Table 6.6.6.1-2: NSCE\_PerfMonitoring API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Bytes | 3GPP TS 29.122 [2] | Represents a sequence of bytes. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| DurationSec | 3GPP TS 29.122 [2] | Represents a time duration. |  |
| NetSliceId | Clause 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| SupportedFeatures | 3GPP TS 29.571 [18] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |

#### 6.6.6.2 Structured data types

##### 6.6.6.2.1 Introduction

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

##### 6.6.6.2.2 Type: MonitoringJob

Table 6.6.6.2.2-1: Definition of type MonitoringJob

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monMetrics | map(MonitoringMetric) | M | 1..N | Contains the requested performance and analytics monitoring metric(s).  The key of the map shall be any unique string encoded value. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.6.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.6.6.2.3 Type: MonitoringJobPatch

Table 6.6.6.2.3-1: Definition of type MonitoringJobPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monMetrics | map(MonitoringMetric) | O | 1..N | Contains the requested performance and analytics monitoring metric(s).  The key of the map shall be any unique string encoded value and shall be set to the same value as the one provided during the creation of the corresponding Monitoring Job. |  |

##### 6.6.6.2.4 Type: MonitoringMetric

Table 6.6.6.2.4-1: Definition of type MonitoringMetric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | C | 0..1 | Contains the identifier of the VAL Service to which the performance and analytics monitoring is related.  (NOTE 1) |  |
| netSliceIds | array(NetSliceId) | C | 1..N | Contains the identifier(s) of the network slice(s) to which the performance and analytics monitoring is related.  (NOTE 1, NOTE 2) |  |
| perfAnalyList | array(MonPerfAnalytics) | M | 1..N | Contains the list of the performance and/or analytics information to be monitored.  (NOTE 2) |  |
| startTime | DateTime | M | 1 | Contains the start time of the performance and analytics monitoring. |  |
| endTime | DateTime | O | 0..1 | Contains the end time of the performance and analytics monitoring.  If this attribute is not present, the performance and analytics monitoring shall not stop until explicitly terminated. |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: When the "netSliceIds" attribute is present and the "monNetSliceIds" attribute of the MonPerfAnalytics data structure is present within an array element of the "perfAnalyList" attribute, then the network slice(s) identified by the "monNetSliceIds" attribute of the MonPerfAnalytics data structure shall be a subset of the network slice(s) identified by the "netSliceIds" attribute. | | | | | |

##### 6.6.6.2.5 Type: MonPerfAnalytics

Table 6.6.6.2.5-1: Definition of type MonPerfAnalytics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monNetSliceIds | array(NetSliceId) | O | 1..N | Contains the identifier(s) of the network slice(s) for which the monitoring of the metric provided within the "metricName" attribute or the "metricCustName" attribute should be performed. |  |
| metricName | MonPerfMetric | M | 1 | Contains the name of the performance or analytics metric to be monitored. |  |
| metricCustName | string | C | 0..1 | Contains the custom name of the performance or analytics metric to be monitored.  This attribute shall be present only when the "metricName" attribute is set to "OTHER". |  |

##### 6.6.6.2.6 Type: MonitoringSubsc

Table 6.6.6.2.6-1: Definition of type MonitoringSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| reqReportingList | map(ReportingInfo) | M | 1..N | Contains the requested performance and analytics reporting information.  The key of the map shall be any unique string encoded value. |  |
| notifUri | Uri | M | 1 | Contains the URI via which the network slice related performance and analytics monitoring event(s) notifications shall be delivered. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.6.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.6.6.2.7 Type: MonitoringSubscPatch

Table 6.6.6.2.7-1: Definition of type MonitoringSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monMetrics | map(MonitoringMetric) | O | 1..N | Contains the updated requested performance and analytics reporting information.  The key of the map shall be any unique string encoded value and shall be set to the same value as the one provided during the creation of the corresponding Monitoring Subscription. |  |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which the network slice related performance and analytics monitoring event(s) notifications shall be delivered. |  |

##### 6.6.6.2.8 Type: ReportingInfo

Table 6.6.6.2.8-1: Definition of type ReportingInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | C | 0..1 | Contains the identifier of the VAL Service to which the performance and analytics monitoring is related.  (NOTE 1, NOTE 2) |  |
| netSliceIds | array(NetSliceId) | C | 1..N | Contains the identifier(s) of the network slice(s) to which the performance and analytics monitoring is related.  (NOTE 1, NOTE 2) |  |
| perfAnalyList | array(MonPerfAnalytics) | M | 1..N | Contains the list of the performance and/or analytics information to be monitored.  (NOTE 2) |  |
| startTime | DateTime | M | 1 | Contains the start time of the performance and analytics monitoring. |  |
| endTime | DateTime | M | 1 | Contains the end time of the performance and analytics monitoring. |  |
| repPeriodicity | DurationSec | O | 0..1 | Contains the reporting periodicity, i.e., the time interval between consecutive reportings. |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: When the "netSliceIds" attribute is present and the "monNetSliceIds" attribute of the MonPerfAnalytics data structure is present within an array element of the "perfAnalyList" attribute, then the network slice(s) identified by the "monNetSliceIds" attribute of the MonPerfAnalytics data structure shall be a subset of the network slice(s) identified by the "netSliceIds" attribute. | | | | | |

##### 6.6.6.2.9 Type: MonitoringNotif

Table 6.6.6.2.9-1: Definition of type MonitoringNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscId | string | M | 1 | Contains the identifier of the Monitoring Subscription to which the notification is related. |  |
| reports | array(ReportingData) | M | 1..N | Contains the network slice related performance and analytics report(s). |  |

##### 6.6.6.2.10 Type: ReportingData

Table 6.6.6.2.10-1: Definition of type ReportingData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | C | 0..1 | Contains the identifier of the VAL Service to which the performance and analytics monitoring report is related.  (NOTE 1, NOTE 2) |  |
| netSliceIds | array(NetSliceId) | C | 1..N | Contains the identifier(s) of the network slice(s) to which the performance and analytics monitoring report is related.  (NOTE 1, NOTE 2) |  |
| perfResults | array(MonPerfAnalyRes) | M | 1..N | Contains the list of the network slice related performance and analytics result(s).  (NOTE 2) |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: When the "netSliceIds" attribute is present and the "monNetSliceIds" attribute of the MonPerfAnalyRes data structure is present within an array element of the "perfResults" attribute, then the network slice(s) identified by the "monNetSliceIds" attribute of the MonPerfAnalyRes data structure shall be a subset of the network slice(s) identified by the "netSliceIds" attribute. | | | | | |

##### 6.6.6.2.11 Type: MonPerfAnalyRes

Table 6.6.6.2.11-1: Definition of type MonPerfAnalyRes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monNetSliceIds | array(NetSliceId) | O | 1..N | Contains the identifier of the network slice(s) for which the reported result is related. |  |
| metricName | MonPerfMetric | M | 1 | Contains the name of the reported performance or analytics metric. |  |
| metricCustName | string | C | 0..1 | Contains the custom name of the performance or analytics metric to be monitored.  This attribute shall be present only when the "metricName" attribute is set to "OTHER". |  |
| metricValue | Bytes | M | 1 | Contains the value of the reported performance or analytics information. |  |

##### 6.6.6.2.12 Type: MonitoringReq

Table 6.6.6.2.12-1: Definition of type MonitoringReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| monMetrics | array(MonReqMetrics) | M | 1..N | Contains the requested multiple slices related performance and analytics monitoring metric(s). |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.6.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.6.6.2.13 Type: MonitoringResp

Table 6.6.6.2.13-1: Definition of type MonitoringResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| perfResults | array(MonRespRepData) | M | 1..N | Contains the list of the multiple slices related network slice related performance and analytics result(s). |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.6.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.6.6.2.14 Type: MonReqMetrics

Table 6.6.6.2.14-1: Definition of type MonReqMetrics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | C | 0..1 | Contains the identifier of the VAL Service to which the performance and analytics monitoring is related.  (NOTE 1, NOTE 2) |  |
| netSliceIds | array(NetSliceId) | C | 1..N | Contains the identifier(s) of the network slice(s) to which the performance and analytics monitoring is related.  (NOTE 1, NOTE 2) |  |
| perfAnalyList | array(MonPerfAnalytics) | M | 1..N | Contains the list of the performance and/or analytics information to be monitored.  (NOTE 2) |  |
| startTime | DateTime | M | 1 | Contains the start time of the performance and analytics monitoring. |  |
| endTime | DateTime | M | 1 | Contains the end time of the performance and analytics monitoring. |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: When the "netSliceIds" attribute is present and the "monNetSliceIds" attribute of the MonPerfAnalytics data structure is present within an array element of the "perfAnalyList" attribute, then the network slice(s) identified by the "monNetSliceIds" attribute of the MonPerfAnalytics data structure shall be a subset of the network slice(s) identified by the "netSliceIds" attribute. | | | | | |

##### 6.6.6.2.15 Type: MonRespRepData

Table 6.6.6.2.15-1: Definition of type MonRespRepData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | C | 0..1 | Contains the identifier of the VAL Service to which the performance and analytics monitoring report is related.  (NOTE 1, NOTE 2) |  |
| netSliceIds | array(NetSliceId) | C | 1..N | Contains the identifier(s) of the network slice(s) to which the performance and analytics monitoring report is related.  (NOTE 1, NOTE 2) |  |
| perfResults | array(MonPerfAnalyRes) | M | 1..N | Contains the list of the network slice related performance and analytics result(s).  (NOTE 2) |  |
| startTime | DateTime | M | 1 | Contains the start time of the reported performance and analytics monitoring. |  |
| endTime | DateTime | M | 1 | Contains the end time of the reported performance and analytics monitoring. |  |
| NOTE 1: At least one of these attributes shall be present.  NOTE 2: When the "netSliceIds" attribute is present and the "monNetSliceIds" attribute of the MonPerfAnalyRes data structure is present within an array element of the "perfResults" attribute, then the network slice(s) identified by the "monNetSliceIds" attribute of the MonPerfAnalyRes data structure shall be a subset of the network slice(s) identified by the "netSliceIds" attribute. | | | | | |

#### 6.6.6.3 Simple data types and enumerations

##### 6.6.6.3.1 Introduction

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

##### 6.6.6.3.2 Simple data types

The simple data types defined in table 6.6.6.3.2-1 shall be supported.

Table 6.6.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.6.6.3.3 Enumeration: MonPerfMetric

The enumeration MonPerfMetric represents a performance or analytics metric. It shall comply with the provisions defined in table 6.6.6.3.3-1.

Table 6.6.6.3.3-1: Enumeration MonPerfMetric

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| RTT | Indicates that the performance or analytics metric is the round-trip time within the network slice. |  |
| E2E\_LATENCY | Indicates that the performance or analytics metric is the E2E Latency within the network slice. |  |
| PACKET\_LOSS | Indicates that the performance or analytics metric is the packet loss within the network slice. |  |
| RETRANSMISSIONS | Indicates that the performance or analytics metric is the retransmissions within the network slice. |  |
| THROUGHPUT | Indicates that the performance or analytics metric is the throughput within the network slice. |  |
| NUM\_OF\_REG\_UES | Indicates that the performance or analytics metric is the number of registered UEs within the network slice. |  |
| NUM\_OF\_EST\_PDU\_SESS | Indicates that the performance or analytics metric is the number of established PDU Sessions within the network slice. |  |
| RESOURCE\_USAGE | Indicates that the performance or analytics metric is the resources usage within the network slice. |  |
| LOAD\_LEVEL | Indicates that the performance or analytics metric is the load level within the network slice. |  |
| OTHER | Indicates that the performance or analytics metric is a custom metric. |  |

#### 6.6.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.6.6.5 Binary data

##### 6.6.6.5.1 Binary Data Types

Table 6.6.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.6.7 Error Handling

#### 6.6.7.1 General

For the NSCE\_PerfMonitoring API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_PerfMonitoring API.

#### 6.6.7.2 Protocol Errors

No specific protocol errors for the NSCE\_PerfMonitoring API are specified.

#### 6.6.7.3 Application Errors

The application errors defined for the NSCE\_PerfMonitoring API are listed in Table 6.6.7.3-1.

Table 6.6.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.6.8 Feature negotiation

The optional features listed in table 6.6.8-1 are defined for the NSCE\_PerfMonitoring API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.6.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.6.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_PerfMonitoring API.

## 6.7 NSCE\_InfoCollection API

### 6.7.1 Introduction

The NSCE\_InfoCollection service shall use the NSCE\_InfoCollection API.

The API URI of the NSCE\_InfoCollection Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-ic".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.7, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.7.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_InfoCollection API.

### 6.7.3 Resources

#### 6.7.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.7.3.1-1 depicts the resource URIs structure for the NSCE\_InfoCollection API.



Figure 6.7.3.1-1: Resource URIs structure of the NSCE\_InfoCollection API

Table 6.7.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_InfoCollection API.

Table 6.7.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Information Collection Subscriptions | /subscriptions | POST | Request the creation of an Information Collection Subscription. |
| Individual Information Collection Subscription | /subscriptions/{subscriptionId} | GET | Retrieve an existing "Individual Information Collection Subscription" resource. |
| PUT | Request the update of an existing "Individual Information Collection Subscription" resource. |
| PATCH | Request the modification of an existing "Individual Information Collection Subscription" resource. |
| DELETE | Request the deletion of an existing "Individual Information Collection Subscription" resource. |

#### 6.7.3.2 Resource: Information Collection Subscriptions

##### 6.7.3.2.1 Description

This resource represents the collection of Information Collection Subscriptions managed by the NSCE Server.

##### 6.7.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-ic/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 6.7.3.2.2-1.

Table 6.7.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.7.1 |

##### 6.7.3.2.3 Resource Standard Methods

###### 6.7.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of an Information Collection Subscription at the NSCE Server.

This method shall support the URI query parameters specified in table 6.7.3.2.3.1-1.

Table 6.7.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.7.3.2.3.1-2 and the response data structures and response codes specified in table 6.7.3.2.3.1-3.

Table 6.7.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InfoCollectSubsc | M | 1 | Represents the parameters to request the creation of an Information Collection Subscription resource. |

Table 6.7.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response Codes | Description |
| InfoCollectSubsc | M | 1 | 201 Created | Successful case. The Information Collection Subscription is successfully created and a representation of the created "Individual Information Collection Subscription" resource shall be returned.  An HTTP "Location" header that contains the resource URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.7.3.2.3.1-4: Headers supported by the 201 Response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-ic/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.7.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.7.3.3 Resource: Individual Information Collection Subscription

##### 6.7.3.3.1 Description

This resource represents an Information Collection Subscription managed by the NSCE Server.

##### 6.7.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-ic/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in the table 6.7.3.3.2-1.

Table 6.7.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.7.1 |
| subscriptionId | string | Represents the identifier of the "Individual Information Collection Subscription" resource. |

##### 6.7.3.3.3 Resource Standard Methods

###### 6.7.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Information Collection Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.7.3.3.3.1-1.

Table 6.7.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.7.3.3.3.1-2 and the response data structures and response codes specified in table 6.7.3.3.3.1-3.

Table 6.7.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.7.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| InfoCollectSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Information Collection Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.7.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.7.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.7.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Information Collection Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.7.3.3.3.2-1.

Table 6.7.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.7.3.3.3.2-2 and the response data structures and response codes specified in table 6.7.3.3.3.2-3.

Table 6.7.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InfoCollectSubsc | M | 1 | Represents the updated representation of the "Individual Information Collection Subscription" resource. |

Table 6.7.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| InfoCollectSubsc | M | 1 | 200 OK | Successful case. The "Individual Information Collection Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Information Collection Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.7.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.7.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.7.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Information Collection Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.7.3.3.3.3-1.

Table 6.7.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.7.3.3.3.3-2 and the response data structures and response codes specified in table 6.7.3.3.3.3-3.

Table 6.7.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InfoCollectSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Information Collection Subscription" resource. |

Table 6.7.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| InfoCollectSubsc | M | 1 | 200 OK | Successful case. The "Individual Information Collection Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Information Collection Subscription" resource is successfully modified and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.7.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.7.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.7.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Information Collection Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.7.3.3.3.4-1.

Table 6.7.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.7.3.3.3.4-2 and the response data structures and response codes specified in table 6.7.3.3.3.4-3.

Table 6.7.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.7.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Information Collection Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.7.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.7.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.7.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.7.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.7.5 Notifications

#### 6.7.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.7.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Information Collection Notification | {notifUri} | POST | This service operation enables an NSCE Server to notify a previously subscribed service consumer on Information Collection report(s). |

#### 6.7.5.2 Information Collection Notification

##### 6.7.5.2.1 Description

The Information Collection Notification is used by an NSCE Server to notify a previously subscribed service consumer on Information Collection report(s).

##### 6.7.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.7.5.2.2-1.

Table 6.7.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.7.5.2.3 Standard Methods

###### 6.7.5.2.3.1 POST

This method shall support the request data structures specified in table 6.7.5.2.3.1-1 and the response data structures and response codes specified in table 6.7.5.2.3.1-2.

Table 6.7.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InfoCollectNotif | M | 1 | Represents an Information Collection Notification. |

Table 6.7.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Information Collection Notification is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.7.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.7.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.7.6 Data Model

#### 6.7.6.1 General

Table 6.7.6.1-1: NSCE\_InfoCollection API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| CollectInfo | 6.7.6.2.5 | Represents the information to be collected. |  |
| InfoCollectSubsc | 6.7.6.2.2 | Represents an Information Collection subscription. |  |
| InfoCollectSubscPatch | 6.7.6.2.3 | Represents the requested modifications of an Information Collection subscription. |  |
| InfoCollectNotif | 6.7.6.2.4 | Represents an Information Collection Notification. |  |
| QoSMetric | 6.7.6.2.6 | Represents the QoS metric. |  |
| QoSType | 6.7.6.3.3 | Represents the QoS metric type. |  |

Table 6.7.6.1-2 specifies data types re-used by the NSCE\_InfoCollection API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_InfoCollection API.

Table 6.7.6.1-2: NSCE\_InfoCollection API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| BitRate | 3GPP TS 29.571 [16] | Represents a bit rate. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| DurationSec | 3GPP TS 29.571 [16] | Represents a time duration in seconds. |  |
| Float | 3GPP TS 29.571 [16] | Represents a number with format "float" as defined in the OpenAPI Specification [4]. |  |
| ReportingData | Clause 6.6.6.2.10 | Represents a network slice related performance and analytics monitoring report. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Uint32 | 3GPP TS 29.571 [16] | Represents an unsigned 32-bit integer. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.7.6.2 Structured data types

##### 6.7.6.2.1 Introduction

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

##### 6.7.6.2.2 Type: InfoCollectSubsc

Table 6.7.6.2.2-1: Definition of type InfoCollectSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which notifications shall be delivered. |  |
| collectInfo | map(CollectInfo) | M | 1..N | Contains the information collected from the interested network slice.  The key of the map shall be any unique string encoded value. |  |
| expTime | DateTime | O | 0..1 | Contains the proposed expiration time of the subscription. |  |
| netSlicePerf | array(ReportingData) | O | 1..N | Contains the network slice related performance and analytics report(s).  This attribute may be present only in Information Collection Subscription creation/update responses. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.7.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.7.6.2.3 Type: InfoCollectSubscPatch

Table 6.7.6.2.2-1: Definition of type InfoCollectSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which notifications shall be provided. |  |
| collectInfo | map(CollectInfo) | O | 1..N | Contains the updated information collected from the interested network slice.  The key of the map shall be any unique string encoded value and shall be set to the same value as the as the one provided during the creation of the corresponding Information Collection Subscription. |  |
| expTime | DateTime | O | 0..1 | Contains the expiration time of the subscription. |  |

##### 6.7.6.2.4 Type: InfoCollectNotif

Table 6.7.6.2.4-1: Definition of type InfoCollectNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriptionId | string | M | 1 | Contains the identifier of the subscription to which the notification is related. |  |
| netSlicePerf | array(ReportingData) | M | 1..N | Contains the network slice related performance and analytics report(s). |  |

##### 6.7.6.2.5 Type: CollectInfo

Table 6.7.6.2.5-1: Definition of type CollectInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| netSliceId | NetSliceId | M | 1 | Represents the targeted concerned network slice. |  |
| qosMetrics | array(QoSMetric) | O | 1..N | Contains the QoS metric(s) related information with each instance including the QoS metric type and the corresponding QoS threshold.  (NOTE) |  |
| repPeriod | DurationSec | O | 0..1 | Contains the reporting period. |  |
| immRepFlag | boolean | O | 0..1 | Contains the immediate reporting indication.  - Set to "true" to indicate that immediate reporting is requested.  - Set to "false" to indicate that immediate reporting is not requested.  - The default value is "false" if this attribute is omitted.  (NOTE) |  |
| NOTE: If the "immRepFlag" is set to "false" or omitted, the "qosMetrics" attribute indicates the reporting conditions as the average "latency", "throughput", or "jitter" is greater than the threshold. | | | | | |

##### 6.7.6.2.6 Type: QoSMetric

Table 6.7.6.2.6-1: Definition of type QoSMetric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| qosType | QoSType | M | 1 | Represents the QoS metric type, e.g., latency, throughput, jitter, etc. |  |
| latency | Float | O | 0..1 | Contains the threshold average latency in milliseconds.  This attribute may be present only if the "qosType" attribute is set to "LATENCY". |  |
| throughput | BitRate | O | 0..1 | Contains the threshold average throughput.  This attribute may be present only if the "qosType" attribute is set to "THROUGHPUT". |  |
| jitter | Uint32 | O | 0..1 | Contains the threshold average jitter.  This attribute may be present only if the "qosType" attribute is set to "JITTER". |  |
| NOTE: The attributes "latency", "throughput", and "jitter" are mutually exclusive. Either one of them may be present. | | | | | |

#### 6.7.6.3 Simple data types and enumerations

##### 6.7.6.3.1 Introduction

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

##### 6.7.6.3.2 Simple data types

The simple data types defined in table 6.7.6.3.2-1 shall be supported.

Table 6.7.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.7.6.3.3 Enumeration: QoSType

Table 6.7.6.3.3-1: Enumeration QoSType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| LATENCY | Indicates that the QoS type is latency. |  |
| THROUGHPUT | Indicates that the QoS type is throughput. |  |
| JITTER | Indicates that the QoS type is jitter. |  |

#### 6.7.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.7.6.5 Binary data

##### 6.7.6.5.1 Binary Data Types

Table 6.7.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.7.7 Error Handling

#### 6.7.7.1 General

For the NSCE\_InfoCollection API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_InfoCollection API.

#### 6.7.7.2 Protocol Errors

No specific protocol errors for the NSCE\_InfoCollection API are specified.

#### 6.7.7.3 Application Errors

The application errors defined for the NSCE\_InfoCollection API are listed in Table 6.7.7.3-1.

Table 6.7.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.7.8 Feature negotiation

The optional features in table 6.7.8-1 are defined for the NSCE\_InfoCollection API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.7.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| n/a |  |  |

### 6.7.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_InfoCollection API.

## 6.8 NSCE\_ServiceContinuity API

6.8.1 Introduction

The NSCE\_ServiceContinuity service shall use the NSCE\_ServiceContinuity API.

The API URI of the NSCE\_ServiceContinuity Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-esc".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.18, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

6.8.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_ServiceContinuity API.

### 6.8.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.8.4 Custom Operations without associated resources

#### 6.8.4.1 Overview

The structure of the custom operation URIs of the NSCE\_ServiceContinuity API is shown in Figure 6.8.4.1-1.



Figure 6.8.4.1-1: Custom operation URI structure of the NSCE\_ServiceContinuity API

Table 6.8.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the NSCE\_ServiceContinuity API.

Table 6.8.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Custom operation name | Custom operation URI | Mapped HTTP method | Description |
| Edge Service Continuity Requirement Request | /request | POST | Enables a service consumer to request Edge service continuity requirement. |
| Edge Service Continuity Negotiation Request | /negotiate | POST | Enables a service consumer to request Edge service continuity negotiation. |

The custom operations shall support the URI variables defined in table 6.8.4.1-2.

Table 6.8.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.8.1. |

#### 6.8.4.2 Operation: Edge Service Continuity Requirement Request

##### 6.8.4.2.1 Description

The custom operation enables a service consumer to request Edge service continuity requirement to the NSCE Server.

##### 6.8.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.8.4.2.2-1 and the response data structures and response codes specified in table 6.8.4.2.2-2.

Table 6.8.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EdgeSCRequirementReq | M | 1 | Contains the parameters to request Edge service continuity requirement. |

Table 6.8.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | The Edge Service Continuity Requirement request is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.12.7. | | | | |

Table 6.8.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.8.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

#### 6.8.4.3 Operation: Edge Service Continuity Negotiation Request

##### 6.8.4.2.1 Description

The custom operation enables a service consumer to request Edge service continuity negotiation to the NSCE Server.

##### 6.8.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.8.4.2.2-1 and the response data structures and response codes specified in table 6.8.4.2.2-2.

Table 6.8.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| EdgeSCNegotiationReq | M | 1 | Contains the parameters to request Edge service continuity negotiation. |

Table 6.8.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | The Edge Service Continuity Negotiation request is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.12.7. | | | | |

Table 6.8.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.8.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

### 6.8.5 Notifications

6.8.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

**Table 6.8.5.1-1: Notifications overview**

|  |  |  |  |
| --- | --- | --- | --- |
| **Notification** | **Callback URI** | **HTTP method or custom operation** | **Description**  **(service operation)** |
| Edge Service Continuity Requirement Notification | {notifUri} | POST | This service operation enables the NSCE Server to notify a previously subscribed service consumer on Edge Service Continuity Requirement. |
| Edge Service Continuity Negotiation Notification | {notifUri} | POST | This service operation enables the NSCE Server to notify a previously subscribed service consumer on Edge Service Continuity Negotiation. |

6.8.5.2 Edge Service Continuity Requirement Notification

6.8.5.2.1 Description

The Edge Service Continuity Requirement Notification is used by the NSCE Server to notify a previously subscribed service consumer on Edge Service Continuity Requirement Subscription.

6.8.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.8.5.2.2-1.

**Table 6.8.5.2.2-1: Callback URI variables**

|  |  |
| --- | --- |
| **Name** | **Definition** |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.8.5.2.3 Standard Methods

###### 6.8.5.2.3.1 POST

This method shall support the request data structures specified in table 6.8.5.2.3.1-1 and the response data structures and response codes specified in table 6.8.5.2.3.1-2.

**Table 6.8.5.2.3.1-1: Data structures supported by the POST Request Body**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| EdgeSCRequirementNotif | M | 1 | Represents the Edge Service Continuity Requirement Notification. |

**Table 6.8.5.2.3.1-2: Data structures supported by the POST Response Body**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| n/a |  |  | 204 No Content | Successful case. The Edge Service Continuity Requirement Notification is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

**Table 6.8.5.2.3.1-3: Headers supported by the 307 Response Code on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

**Table 6.8.5.2.3.1-4: Headers supported by the 308 Response Code on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

6.8.5.3 Edge Service Continuity Negotiation Notification

6.8.5.3.1 Description

The Edge Service Continuity Negotiation Notification is used by the NSCE Server to notify a previously subscribed service consumer on Edge Service Continuity Negotiation.

6.8.5.3.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.8.5.3.2-1.

**Table 6.8.5.3.2-1: Callback URI variables**

|  |  |
| --- | --- |
| **Name** | **Definition** |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.8.5.3.3 Standard Methods

###### 6.8.5.3.3.1 POST

This method shall support the request data structures specified in table 6.8.5.3.3.1-1 and the response data structures and response codes specified in table 6.8.5.3.3.1-2.

**Table 6.8.5.3.3.1-1: Data structures supported by the POST Request Body**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Description** |
| EdgeSCNegotiationNotif | M | 1 | Represents the Edge Service Continuity Negotiation Notification. |

**Table 6.8.5.3.3.1-2: Data structures supported by the POST Response Body**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data type** | **P** | **Cardinality** | **Response codes** | **Description** |
| n/a |  |  | 204 No Content | Successful case. The Edge Service Continuity Negotiation Notification is successfully received. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

**Table 6.8.5.3.3.1-3: Headers supported by the 307 Response Code on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

**Table 6.8.5.3.3.1-4: Headers supported by the 308 Response Code on this resource**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Data type** | **P** | **Cardinality** | **Description** |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.8.6 Data Model

#### 6.8.6.1 General

This clause specifies the application data model supported by the API.

Table 6.8.6.1-1 specifies the data types defined for the NSCE\_ServiceContinuity API.

Table 6.8.6.1-1: NSCE\_ServiceContinuity API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| EdgeSCNegotiationNotif | 6.8.6.2.5 | Represents a Edge Service Continuity Negotiation Notification. |  |
| EdgeSCNegotiationReq | 6.8.6.2.4 | Represents the parameters to request Edge Service Continuity Negotiation. |  |
| EdgeSCRequirementNotif | 6.8.6.2.3 | Represents a Edge Service Continuity Requirement Notification. |  |
| EdgeSCRequirementReq | 6.8.6.2.2 | Represents the parameters to request Edge Service Continuity Requirement. |  |
| TriggerAction | 6.8.6.3.3 | Represents the trigger action. |  |

Table 6.8.6.1-2 specifies data types re-used by the NSCE\_ServiceContinuity API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_ServiceContinuity API.

Table 6.8.6.1-2: NSCE\_ServiceContinuity API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| AppReqs | 6.12.6.2.3 | Represents the application QoS requirements. |  |
| EndPoint | 3GPP TS 29.558 [25] | Represents endpoint information. |  |
| NetSliceId | 6.3.6.2.15 | Identifies the S-NSSAI. |  |
| ServArea | Clause 6.16.6.2.5 | Represents a service area. |  |
| ServContReq | 6.12.6.3.3 | Represents the service continuity requirement. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.8.6.2 Structured data types

##### 6.8.6.2.1 Introduction

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

##### 6.8.6.2.2 Type: EdgeSCRequirementReq

Table 6.8.6.2.2-1: Definition of type EdgeSCRequirementReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| notifUri | Uri | M | 1 | Contains the URI via which the Edge Service Continuity Requirement Notifications shall be delivered. |  |
| valServId | string | M | 1 | The identifier of the VAL service for which the requirement request applies. |  |
| valUeIds | array(string) | O | 1..N | The list of VAL UE IDs for which the requirement request applies. |  |
| netSliceId | NetSliceId | O | 0..1 | Identifier of the network slice for which is mapped to the VAL application. |  |
| servContReq | ServContReq | M | 1 | Contains the requested service continuity requirement information. |  |
| targetServArea | ServArea | O | 0..1 | Contains the target service area. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.8.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.8.6.2.3 Type: EdgeSCRequirementNotif

Table 6.8.6.2.3-1: Definition of type EdgeSCRequirementNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| valServId | string | M | 1 | The identifier of the VAL service for which the requirement request applies |  |
| valUeIds | array(string) | O | 1..N | The list of VAL UE IDs for which the requirement request applies |  |
| netSliceId | NetSliceId | M | 1 | Identifier of the network slice for which is mapped to the VAL application. |  |
| tgtNsceServId | string | M | 1 | Contains the identifier of the target NSCE Server. |  |
| tgtNsceAddr | EndPoint | M | 1 | Contains the addressing information of the target NSCE Server. |  |
| targetServArea | ServArea | M | 1 | Contains the target service area. |  |

##### 6.8.6.2.4 Type: EdgeSCNegotiationReq

Table 6.8.6.2.4-1: Definition of type EdgeSCNegotiationReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| notifUri | Uri | M | 1 | Contains the URI via which the Edge Service Continuity Negotiation Notifications shall be delivered. |  |
| valServId | string | M | 1 | The identifier of the VAL service for which the Negotiation request applies |  |
| valUeIds | array(string) | O | 1..N | The list of VAL UE IDs for which the negotiation request applies |  |
| netSliceId | NetSliceId | M | 1 | Identifier of the network slice for which is mapped to the VAL application. |  |
| servContReq | ServContReq | M | 1 | Contains the requested service continuity requirement information. |  |
| appQoSReqs | AppReqs | O | 0..1 | Represents the requested application QoS requirements. |  |
| triggerAction | TriggerAction | O | 0..1 | Represents the requested proposed trigger action. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.8.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.8.6.2.5 Type: EdgeSCNegotiationNotif

Table 6.8.6.2.5-1: Definition of type EdgeSCNegotiationNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| valServId | string | M | 1 | Represents the identifier of the VAL service to which the notification is related. |  |
| triggerAction | TriggerAction | M | 1 | Represents the determined trigger action. |  |

6.8.6.3 Simple data types and enumerations

6.8.6.3.1 Introduction

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

6.8.6.3.2 Simple data types

The simple data types defined in table 6.8.6.3.2-1 shall be supported.

**Table 6.8.6.3.2-1: Simple data types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type Name** | **Type Definition** | **Description** | **Applicability** |
|  |  |  |  |

##### 6.8.6.3.3 Enumeration: TriggerAction

Table 6.8.6.3.3-1: Enumeration TriggerAction

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| SLICE\_LIFECYCLE\_CHG | Indicates that the trigger action is slice lifecycle change. |  |

### 6.8.7 Error Handling

#### 6.8.7.1 General

For the NSCE\_ServiceContinuity API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_ServiceContinuity API.

#### 6.8.7.2 Protocol Errors

No specific procedures for the NSCE\_ServiceContinuity API are specified.

#### 6.8.7.3 Application Errors

The application errors defined for the NSCE\_ServiceContinuity API are listed in Table 6.8.7.3-1.

Table 6.8.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.8.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the NSCE\_ServiceContinuity API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.8.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.8.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_ServiceContinuity API.

## 6.9 NSCE\_MultiSlicesOptimization API

### 6.9.1 Introduction

The NSCE\_MultiSlicesOptimization service shall use the NSCE\_MultiSlicesOptimization API.

The API URI of the NSCE\_MultiSlicesOptimization Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-mso".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.9, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.9.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_MultiSlicesOptimization API.

### 6.9.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.9.4 Custom Operations without associated resources

#### 6.9.4.1 Overview

The structure of the custom operation URIs of the NSCE\_MultiSlicesOptimization API is shown in Figure 6.9.4.1-1.

Figure 6.9.4.1-1: Custom operation URI structure of the NSCE\_MultiSlicesOptimization API

Table 6.9.4.1-1 provides an overview of the custom operation and applicable HTTP methods defined for the NSCE\_MultiSlicesOptimization API.

Table 6.9.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| Request | /request | POST | Enables a service consumer to request multiple slices optimization. |

The custom operations shall support the URI variables defined in table 6.9.4.1-2.

Table 6.9.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.9.1. |

#### 6.9.4.2 Operation: Request

##### 6.9.4.2.1 Description

The custom operation enables a service consumer to request multiple slices optimization to the NSCE Server.

##### 6.9.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.9.4.2.2-1 and the response data structures and response codes specified in table 6.9.4.2.2-2.

Table 6.9.4.2.2-1: Data structures supported by the POST Request Body for this operation

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MultiSlicesOptReq | M | 1 | Contains the parameters to request multiple slices optimization. |

Table 6.9.4.2.2-2: Data structures supported by the POST Response Body for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The multiple slices optimization request is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.9.4.2.2-3: Headers supported by 307 Response Code for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.9.4.2.2-4: Headers supported by 308 Response Code for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

### 6.9.5 Notifications

There are no notifications defined for this API in this release of the specification.

### 6.9.6 Data Model

#### 6.9.6.1 General

This clause specifies the application data model supported by the API.

Table 6.9.6.1-1 specifies the data types defined specifically for the NSCE\_MultiSlicesOptimization API.

Table 6.9.6.1-1: NSCE\_MultiSlicesOptimization API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| MultiSlicesOptReq | 6.9.6.2.2 | Represents a multiple slices optimization request. |  |

Table 6.9.6.1-2 specifies data types re-used by the NSCE\_MultiSlicesOptimization API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_MultiSlicesOptimization API.

Table 6.9.6.1-2: NSCE\_MultiSlicesOptimization API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Snssai | 3GPP TS 29.571 [16] | Identifies an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| ServArea | Clause 6.16.6.2.5 | Represent network slice coverage area. |  |

#### 6.9.6.2 Structured data types

##### 6.9.6.2.1 Introduction

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

##### 6.9.6.2.2 Type: MultiSlicesOptReq

Table 6.9.6.2.2-1: Definition of type MultiSlicesOptReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | M | 1 | Represents the identifier of the targeted VAL service. |  |
| optZone | ServArea | O | 0..1 | Contains the preferred optimization zone, i.e., the preferred location where the performance monitoring and optimization should be performed. |  |
| snssais | array(Snssai) | O | 1..N | Contains the targeted S-NSSAI(s). |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.9.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

#### 6.9.6.3 Simple data types and enumerations

##### 6.9.6.3.1 Introduction

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

##### 6.9.6.3.2 Simple data types

The simple data types defined in table 6.9.6.3.2-1 shall be supported.

Table 6.9.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.9.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.9.6.5 Binary data

##### 6.9.6.5.1 Binary Data Types

Table 6.9.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.9.7 Error Handling

#### 6.9.7.1 General

For the NSCE\_MultiSlicesOptimization API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_MultiSlicesOptimization API.

#### 6.9.7.2 Protocol Errors

No specific protocol errors for the NSCE\_MultiSlicesOptimization API are specified.

#### 6.9.7.3 Application Errors

The application errors defined for the NSCE\_MultiSlicesOptimization API are listed in Table 6.9.7.3-1.

Table 6.9.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.9.8 Feature negotiation

The optional features in table 6.9.8-1 are defined for the NSCE\_MultiSlicesOptimization API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.9.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| n/a |  |  |

### 6.9.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_MultiSlicesOptimization API.

## 6.10 NSCE\_NetworkSliceAdaptation API

### 6.10.1 Introduction

The NSCE\_NetworkSliceAdaptation service shall use the NSCE\_NetworkSliceAdaptation API.

The API URI of the NSCE\_NetworkSliceAdaptation Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "ss-nsa".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.10, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.10.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NetworkSliceAdaptation API.

### 6.10.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.10.4 Custom Operations without associated resources

#### 6.10.4.1 Overview

The structure of the custom operation URIs of the NSCE\_NetworkSliceAdaptation API is shown in Figure 6.10.4.1-1.



Figure 6.10.4.1-1: Custom operation URI structure of the NSCE\_NetworkSliceAdaptation API

Table 6.10.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the NSCE\_NetworkSliceAdaptation API.

Table 6.10.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Custom operation name | Custom operation URI | Mapped HTTP method | Description |
| Request | /request | POST | Enables a service consumer to request network slice adaptation. |

The custom operations shall support the URI variables defined in table 6.10.4.1-2.

Table 6.10.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.10.1. |

#### 6.10.4.2 Operation: Request

##### 6.10.4.2.1 Description

The custom operation enables a service consumer to request network slice adaptation to the NSCE Server.

##### 6.10.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.10.4.2.2-1 and the response data structures and response codes specified in table 6.10.4.2.2-2.

Table 6.10.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NwSliceAdptInfo | M | 1 | Represents the parameters to request network slice adaptation. |

Table 6.10.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The network slice adaptation request is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| ProblemDetailsSliceAdapt | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.10.7. | | | | |

Table 6.10.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.10.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

### 6.10.5 Notifications

#### 6.10.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.10.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Network Slice Adaptation Status Notification | {notifUri} | POST | This service operation enables the NSCE Server to notify a previously implicitly subscribed service consumer on Network Slice Adaptation Status event(s). |

#### 6.10.5.2 Network Slice Adaptation Status Notification

##### 6.10.5.2.1 Description

The Network Slice Adaptation Status Notification is used by the NSCE Server to notify a previously implicitly subscribed service consumer on Network Slice Adaptation Status event(s).

##### 6.10.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.10.5.2.2-1.

Table 6.10.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.10.5.2.3 Standard Methods

6.10.5.2.3.1 POST

This method shall support the request data structures specified in table 6.10.5.2.3.1-1 and the response data structures and response codes specified in table 6.10.5.2.3.1-2.

Table 6.10.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AdaptStatusNotif | M | 1 | Represents the Network Slice Adaptation Status Notification. |

Table 6.10.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice Adaptation Status Notification is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.10.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.10.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.10.6 Data Model

#### 6.10.6.1 General

This clause specifies the application data model supported by the API.

Table 6.10.6.1-1 specifies the data types defined for the NSCE\_NetworkSliceAdaptation API.

Table 6.10.6.1-1: NSCE\_NetworkSliceAdaptation API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AdaptFailCause | 6.10.6.3.2 | Represents the network slice adaptation failure cause. |  |
| AdaptStatusNotif | 6.10.6.2.4 | Represents a Network Slice Adaptation Status Notification. |  |
| AdaptThresholdName | 6.10.6.3.2 | Represents the name of the adaptation threshold. | NetSliceAdapt\_Ext1 |
| AdaptThreshold | 6.10.6.2.3 | Represents the network slice adaptation threshold. | NetSliceAdapt\_Ext1 |
| AdaptThresholdValue | 6.10.6.3.2 | Represents the value of the adaptation threshold. | NetSliceAdapt\_Ext1 |
| NwSliceAdptInfo | 6.10.6.2.2 | Represents the information associated with requested network slice adaptation with the underlying network. |  |
| ProblemDetailsSliceAdapt | 6.10.6.4.1 | Represents an extension to the ProblemDetails data structure with potentially additional error information related to network slice adaptation failure. |  |

Table 6.10.6.1-2 specifies data types re-used by the NSCE\_NetworkSliceAdaptation API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_NetworkSliceAdaptation API.

Table 6.10.6.1-2: NSCE\_NetworkSliceAdaptation API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Dnn | 3GPP TS 29.571 [16] | Represents a DNN. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| ProblemDetails | 3GPP TS 29.122 [2] | Represents error related information. |  |
| Snssai | 3GPP TS 29.571 [16] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.10.6.2 Structured data types

##### 6.10.6.2.1 Introduction

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

##### 6.10.6.2.2 Type: NwSliceAdptInfo

Table 6.10.6.2.2-1: Definition of type NwSliceAdptInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServiceId | string | M | 1 | Contains the VAL service ID of the VAL application for which the network slice adaptation may corresponds to. |  |
| valTgtUeIds | array(string) | M | 1..N | Contains the list of the identifier(s) the VAL UE(s) within the VAL service to which the slice adaptation request relates. |  |
| snssai | Snssai | O | 0..1 | Contains the new S-NSSAI that is requested.  (NOTE) |  |
| netSliceId | NetSliceId | O | 0..1 | Contains the identifier(s) of the requested network slice.  (NOTE) | NetSliceAdapt\_Ext1 |
| monNetSliceIds | array(NetSliceId) | O | 1..N | Contains the identifier(s) of the network slice(s) that are provisioned for the VAL UE(s) (identified by the "valTgtUeIds" attribute) and are to be monitored. | NetSliceAdapt\_Ext1 |
| dnn | Dnn | O | 0..1 | Contains the requested DNN. |  |
| reqAdaptThres | array(AdaptThreshold) | O | 1..N | Contains the requested network slice adaptation threshold(s). | NetSliceAdapt\_Ext1 |
| notifUri | Uri | C | 0..1 | Contains the URI via which the Network Slice Adaptation Status Notifications shall be delivered.  This attribute shall be present when Network Slice Adaptation Status event(s) reporting is required. | NetSliceAdapt\_Ext1 |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.10.8.  This parameter shall be supplied by VAL server in the POST request that requests the network slice adaptation and shall be supplied in the reply of corresponding request. |  |
| NOTE: When the "NetSliceAdapt\_Ext1" feature is supported, these attributes are mutually exclusive. Either one of them may be present. | | | | | |

\* \* \* \* Next changes \* \* \* \*

##### 6.10.6.2.3 Type: AdaptThreshold

Table 6.10.6.2.3-1: Definition of type AdaptThreshold

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| threshName | AdaptThresholdName | M | 1 | Contains the name of the adaptation threshold. |  |
| threshValue | AdaptThresholdValue | M | 1 | Contains the value of the adaptation threshold identified by the "threshName" attribute. |  |

\* \* \* \* Next changes \* \* \* \*

##### 6.10.6.2.4 Type: AdaptStatusNotif

Table 6.10.6.2.4-1: Definition of type AdaptStatusNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| status | boolean | M | 1 | Contains the network slice adaptation status. It indicates whether the network slice adaptation was successful or not, i.e.:  - "true" means that the network slice adaptation was successful.  - "false" means that the network slice adaptation failed. |  |
| failureCause | AdaptFailCause | C | 0..1 | Contains the network slice adaptation failure cause.  This attribute shall be present only when the "status" attribute is set to "false" (i.e., the network slice adaptation failed). |  |

#### 6.10.6.3 Simple data types and enumerations

##### 6.10.6.3.1 Introduction

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

##### 6.10.6.3.2 Simple data types

The simple data types defined in table 6.10.6.3.2-1 shall be supported.

Table 6.10.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
| AdaptFailCause | string | Represents the network slice adaptation failure cause (e.g., insufficient resources at the target network slice and/or DNN, policy conflict, billing related issues, etc.). |  |
| AdaptThresholdName | string | Represents the name of the metric to be used as an adaptation threshold, which shall be either:  - one of the packet delay performance metrics (e.g., "Average delay DL air-interface", "Average delay UL on over-the-air interface") defined in clause 5.1.1.1 of 3GPP TS 28.552 [23].  - one of the radio resource utilization performance metrics (e.g., "DL Total PRB Usage", "UL Total PRB Usage") defined in clause 5.1.1.2 of 3GPP TS 28.552 [23].  - one of the UE throughput performance metrics (e.g., "Average DL UE throughput in gNB", "Average UL UE throughput in gNB") defined in clause 5.1.1.3 of 3GPP TS 28.552 [23].  - one of the integrity KPIs (e.g., "Downlink latency in gNB-DU", "Downlink delay in NG-RAN for a sub-network") defined in clause 6.3 of 3GPP TS 28.554 [24].  - one of the E2E latency analysis metrics (e.g., "Average e2e UL/DL delay for a network slice") defined in clause 8.4.2.4 of 3GPP TS 28.104 [22].  - one of the network slice load analysis metrics (e.g., "Number of PDU sessions of network slice") defined in clause 8.4.2.5 of 3GPP TS 28.104 [22].  The title of the clause or table cell defining the metric shall be used as the value of this data type, as indicated by the above examples. |  |
| AdaptThresholdValue | string | Represents the name of the metric to be used as an adaptation threshold, which shall be encoded as specified in the corresponding metric definition in clause 5.1.1.1, 5.1.1.2 or 5.1.1.3 of 3GPP TS 28.552 [23], clause 6.3 of 3GPP TS 28.554 [24] or clause 8.4.2.4 or 8.4.2.5 of 3GPP TS 28.104 [22]. |  |

#### 6.10.6.4 Data types describing alternative data types or combinations of data types

##### 6.10.6.4.1 Type: ProblemDetailsSliceAdapt

Table 6.10.6.4.1-1: Definition of type ProblemDetailsSliceAdapt as a list of to be combined data types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Cardinality | Description | Applicability |
| ProblemDetails | 1 | Contains the details of the encountered problem, as defined in 3GPP TS 29.571 [15]. |  |
| AdaptFailCause | 0..1 | Contains the network slice adaptation failure cause. |  |

#### 6.10.6.5 Binary data

##### 6.10.6.5.1 Binary Data Types

Table 6.10.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.10.7 Error Handling

#### 6.10.7.1 General

For the NSCE\_NetworkSliceAdaptation API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_NetworkSliceAdaptation API.

#### 6.10.7.2 Protocol Errors

No specific protocol errors for the NSCE\_NetworkSliceAdaptation API are specified.

#### 6.10.7.3 Application Errors

The application errors defined for the NSCE\_NetworkSliceAdaptation API are listed in Table 6.10.7.3-1.

Table 6.10.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
| ADAPTATION\_FAILURE | 403 Forbidden | Indicates that the requested network slice adaptation failed. |  |

### 6.10.8 Feature negotiation

The optional features listed in table 6.10.8-1 are defined for the NSCE\_NetworkSliceAdaptation API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.10.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| 1 | NetSliceAdapt\_Ext1 | This feature indicates the support of the enhancements to the Network Slice Adaptation functionality as part of the definition of the Network Slice Capability Exposure for Application Layer Enablement.  The following functionalities are supported:  - Support that network slice adaptation is triggered only for a list of monitored network slice(s) and/or based on network slice adaptation thresholds. |

### 6.10.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NetworkSliceAdaptation API.

## 6.11 NSCE\_SliceCommService API

### 6.11.1 Introduction

The NSCE\_SliceCommService service shall use the NSCE\_SliceCommService API.

The API URI of the NSCE\_SliceCommService Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-scs".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.11, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.11.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_SliceCommService API.

### 6.11.3 Resources

#### 6.11.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.11.3.1-1 depicts the resource URIs structure for the NSCE\_SliceCommService API.



Figure 6.11.3.1-1: Resource URIs structure of the NSCE\_SliceCommService API

Table 6.11.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_SliceCommService API.

Table 6.11.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Slice Related Communication Services | /services | POST | Request the creation of a Slice Related Communication Service. |
| Individual Slice Related Communication Service | /services/{servId} | GET | Retrieve an existing "Individual Slice Related Communication Service" resource. |
| PUT | Request the update of an existing "Individual Slice Related Communication Service" resource. |
| PATCH | Request the modification of an existing "Individual Slice Related Communication Service" resource. |
| DELETE | Request the deletion of an existing "Individual Slice Related Communication Service" resource. |

#### 6.11.3.2 Resource: Slice Related Communication Services

##### 6.11.3.2.1 Description

This resource represents the collection of Slice Related Communication Services managed by the NSCE Server.

##### 6.11.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-scs/<apiVersion>/services**

This resource shall support the resource URI variables defined in table 6.11.3.2.2-1.

Table 6.11.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.11.1. |

##### 6.11.3.2.3 Resource Standard Methods

###### 6.11.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Slice Related Communication Service at the NSCE Server.

This method shall support the URI query parameters specified in table 6.11.3.2.3.1-1.

Table 6.11.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.11.3.2.3.1-2 and the response data structures and response codes specified in table 6.11.3.2.3.1-3.

Table 6.11.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceCommService | M | 1 | Represents the parameters to request the creation of a Slice Related Communication Service. |

Table 6.11.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceCommService | M | 1 | 201 Created | Successful case. The Slice Related Communication Service is successfully created and a representation of the created "Individual Slice Related Communication Service" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.11.7. | | | | |

Table 6.11.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-scs/<apiVersion>/services/{servId} |

##### 6.11.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.11.3.3 Resource: Individual Slice Related Communication Service

##### 6.11.3.3.1 Description

This resource represents a Slice Related Communication Service managed by the NSCE Server.

##### 6.11.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-scs/<apiVersion>/services/{servId}**

This resource shall support the resource URI variables defined in table 6.11.3.3.2-1.

Table 6.11.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.11.1. |
| servId | string | Represents the identifier of the "Individual Slice Related Communication Service" resource. |

##### 6.11.3.3.3 Resource Standard Methods

###### 6.11.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Slice Related Communication Service" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.11.3.3.3.1-1.

Table 6.11.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.11.3.3.3.1-2 and the response data structures and response codes specified in table 6.11.3.3.3.1-3.

Table 6.11.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.11.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceCommService | M | 1 | 200 OK | Successful case. The requested "Individual Slice Related Communication Service" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.11.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.11.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.11.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Slice Related Communication Service" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.11.3.3.3.2-1.

Table 6.11.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.11.3.3.3.2-2 and the response data structures and response codes specified in table 6.11.3.3.3.2-3.

Table 6.11.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceCommService | M | 1 | Represents the updated representation of the "Individual Slice Related Communication Service" resource. |

Table 6.11.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceCommService | M | 1 | 200 OK | Successful case. The "Individual Slice Related Communication Service" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP PUT method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.11.7. | | | | |

Table 6.11.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.11.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.11.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Slice Related Communication Service" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.11.3.3.3.3-1.

Table 6.11.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.11.3.3.3.3-2 and the response data structures and response codes specified in table 6.11.3.3.3.3-3.

Table 6.11.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceCommServicePatch | M | 1 | Represents the parameters to request the modification of the "Individual Slice Related Communication Service" resource. |

Table 6.11.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceCommService | M | 1 | 200 OK | Successful case. The "Individual Slice Related Communication Service" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.11.7. | | | | |

Table 6.11.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.11.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.11.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Slice Related Communication Service" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.11.3.3.3.4-1.

Table 6.11.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.11.3.3.3.4-2 and the response data structures and response codes specified in table 6.11.3.3.3.4-3.

Table 6.11.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.11.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The "Individual Slice Related Communication Service" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.11.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.11.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.11.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.11.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.11.5 Notifications

There are no notifications defined for this API in this release of the specification.

### 6.11.6 Data Model

#### 6.11.6.1 General

This clause specifies the application data model supported by the API.

Table 6.11.6.1-1 specifies the data types defined for the NSCE\_SliceCommService API.

Table 6.11.6.1-1: NSCE\_SliceCommService API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| NetSliceInfo | 6.11.6.2.5 | Represents network slice related information. |  |
| ServReq | 6.11.6.2.4 | Represents a set of application service requirements. |  |
| SliceCommService | 6.11.6.2.2 | Represents a Slice Related Communication Service. |  |
| SliceCommServicePatch | 6.11.6.2.3 | Represents the requested modifications to a Slice Related Communication Service. |  |

Table 6.11.6.1-2 specifies data types re-used by the NSCE\_SliceCommService API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_SliceCommService API.

Table 6.11.6.1-2: NSCE\_SliceCommService API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| ProblemDetails | 3GPP TS 29.122 [2] | Represents error related information. |  |
| ServiceProfile | 3GPP TS 28.541 [19] | Represents the service profile containing the properties of the network slice related requirements. |  |
| ServArea | Clause 6.16.6.2.5 | Represents a network slice service area. |  |
| Snssai | 3GPP TS 29.571 [18] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [18] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |

#### 6.11.6.2 Structured data types

##### 6.11.6.2.1 Introduction

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

##### 6.11.6.2.2 Type: SliceCommService

Table 6.11.6.2.2-1: Definition of type SliceCommService

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServName | string | M | 1 | Contains the name of the target VAL service. |  |
| valServId | string | M | 1 | Contains the identifier of the targeted VAL service. |  |
| areaOfInterest | ServArea | M | 1 | Contains the service area within which the requested VAL service profile applies. |  |
| servProfile | map(ServReq) | M | 1..N | Represents the requested VAL service profile containing the application requirements of the VAL service to be supported.  The key of the map shall be any unique string encoded value. |  |
| sliceInfo | NetSliceInfo | C | 1..N | Contains the information of the network slice determined and assigned to fulfill the received application service requirements.  This attribute shall be present only in a response to a Slice Related Communication Service Creation or Reconfiguration request. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.11.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.11.6.2.3 Type: SliceCommServicePatch

Table 6.11.6.2.3-1: Definition of type SliceCommServicePatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| areaOfInterest | ServArea | O | 0..1 | Contains the updated service area within which the requested VAL service profile applies. |  |
| servProfile | map(ServReq) | O | 1..N | Represents the updated requested VAL service profile containing the application requirements of the VAL service to be supported.  The key of the map shall be any unique string encoded value and shall be set to the same value as the one provided during the creation of the corresponding Slice Related Communication Service. |  |

##### 6.11.6.2.4 Type: ServReq

Table 6.11.6.2.4-1: Definition of type ServReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| reqName | string | M | 1 | Contains the requirement name. |  |
| reqValue | string | M | 1 | Contains the requirement value. |  |

##### 6.11.6.2.5 Type: NetSliceInfo

Table 6.11.6.2.5-1: Definition of type NetSliceInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | C | 0..1 | Contains the S-NSSAI of the network slice.  (NOTE) |  |
| attributes | ServiceProfile | C | 0..1 | Contains the attributes (i.e., parameters and characteristics) of the network slice.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

#### 6.11.6.3 Simple data types and enumerations

##### 6.11.6.3.1 Introduction

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

##### 6.11.6.3.2 Simple data types

The simple data types defined in table 6.11.6.3.2-1 shall be supported.

Table 6.11.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.11.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.11.6.5 Binary data

##### 6.11.6.5.1 Binary Data Types

Table 6.11.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.11.7 Error Handling

#### 6.11.7.1 General

For the NSCE\_SliceCommService API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_SliceCommService API.

#### 6.11.7.2 Protocol Errors

No specific protocol errors for the NSCE\_SliceCommService API are specified.

#### 6.11.7.3 Application Errors

The application errors defined for the NSCE\_SliceCommService API are listed in Table 6.11.7.3-1.

Table 6.11.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
| INSUFFICIENT\_RESOURCES | 403 Forbidden | Indicates that the requested Slice Related Communication Service creation/reconfiguration is rejected because it exceeds the existing available network slice resources within the network. |  |

### 6.11.8 Feature negotiation

The optional features listed in table 6.11.8-1 are defined for the NSCE\_SliceCommService API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.11.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.11.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_SliceCommService API.

## 6.12 NSCE\_InterPLMNContinuity API

### 6.12.1 Introduction

The NSCE\_InterPLMNContinuity service shall use the NSCE\_InterPLMNContinuity API.

The API URI of the NSCE\_InterPLMNContinuity Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-ipc".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.12, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.12.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_InterPLMNContinuity API.

### 6.12.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.12.4 Custom Operations without associated resources

#### 6.12.4.1 Overview

The structure of the custom operation URIs of the NSCE\_InterPLMNContinuity API is shown in Figure 6.12.4.1-1.



Figure 6.12.4.1-1: Custom operation URI structure of the NSCE\_InterPLMNContinuity API

Table 6.12.4.1-1 provides an overview of the custom operations and applicable HTTP methods defined for the NSCE\_InterPLMNContinuity API.

Table 6.12.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Custom operation name | Custom operation URI | Mapped HTTP method | Description |
| Request | /request | POST | Enables a service consumer to request inter-PLMN application service continuity. |

The custom operations shall support the URI variables defined in table 6.12.4.1-2.

Table 6.12.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.12.1. |

#### 6.12.4.2 Operation: Request

##### 6.12.4.2.1 Description

The custom operation enables a service consumer to request inter-PLMN application service continuity to the NSCE Server.

##### 6.12.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.12.4.2.2-1 and the response data structures and response codes specified in table 6.12.4.2.2-2.

Table 6.12.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InterPlmnServContReq | M | 1 | Contains the parameters to request inter-PLMN application service continuity. |

Table 6.12.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | The inter-PLMN application service continuity request is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2] |
| ProblemDetails | O | 0..1 | 403 Forbidden | (NOTE 2) |
| NOTE 1: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply.  NOTE 2: Failure causes are described in clause 6.12.7. | | | | |

Table 6.12.4.2.2-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

Table 6.12.4.2.2-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI located in an alternative NSCE Server. |

### 6.12.5 Notifications

#### 6.12.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.12.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Inter-PLMN Service Continuity Notification | {notifUri} | POST | This service operation enables a NSCE Server to notify a previously subscribed service consumer on inter-PLMN application service continuity event(s). |

#### 6.12.5.2 Monitoring Notification

##### 6.12.5.2.1 Description

The Inter-PLMN Service Continuity Notification is used by the NSCE Server to notify a previously subscribed service consumer on inter-PLMN application service continuity event(s).

##### 6.12.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.12.5.2.2-1.

Table 6.12.5.2.2-1: Callback URI variables

|  |  |
| --- | --- |
| Name | Definition |
| notifUri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.12.5.2.3 Standard Methods

###### 6.12.5.2.3.1 POST

This method shall support the request data structures specified in table 6.12.5.2.3.1-1 and the response data structures and response codes specified in table 6.12.5.2.3.1-2.

Table 6.12.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| InterPlmnServContNotif | M | 1 | Represents the Inter-PLMN Service Continuity Notification. |

Table 6.12.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Inter-PLMN Service Continuity Notification is successfully received and processed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.12.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.12.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.12.6 Data Model

#### 6.12.6.1 General

This clause specifies the application data model supported by the API.

Table 6.12.6.1-1 specifies the data types defined for the NSCE\_InterPLMNContinuity API.

Table 6.12.6.1-1: NSCE\_InterPLMNContinuity API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| AppReqs | 6.12.6.2.3 | Represents the application QoS requirements. |  |
| InterPlmnServContNotif | 6.12.6.2.4 | Represents an Inter-PLMN Service Continuity Notification. |  |
| InterPlmnServContReq | 6.12.6.2.2 | Represents the parameters to request inter-PLMN application service continuity. |  |
| ServContReq | 6.12.6.3.3 | Represents the service continuity requirement. |  |

Table 6.12.6.1-2 specifies data types re-used by the NSCE\_InterPLMNContinuity API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_InterPLMNContinuity API.

Table 6.12.6.1-2: NSCE\_InterPLMNContinuity API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| EndPoint | 3GPP TS 29.558 [25] | Represents endpoint information. |  |
| Float | 3GPP TS 29.571 [16] | Represents a float number. |  |
| GeographicArea | 3GPP TS 29.572 [18] | Represents a geographic area. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| PlmnId | 3GPP TS 29.571 [16] | Represents the identifier of a PLMN. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Uint32 | 3GPP TS 29.571 [16] | Represents an unsigned integer 32-bit integer. |  |

#### 6.12.6.2 Structured data types

##### 6.12.6.2.1 Introduction

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

##### 6.12.6.2.2 Type: InterPlmnServContReq

Table 6.12.6.2.2-1: Definition of type InterPlmnServContReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | M | 1 | Represents the identifier of the targeted VAL service. |  |
| ueIds | array(string) | O | 1..N | Contains the list of the identifier(s) of the targeted VAL UE(s). |  |
| servContReq | ServContReq | M | 1 | Contains the requested service continuity requirement information. |  |
| targetPlmnId | PlmnId | M | 1 | Contains the identifier of the target PLMN. |  |
| netSliceId | NetSliceId | M | 1 | Represents the identifier of the targeted network slice. |  |
| targetServArea | array(GeographicArea) | O | 1..N | Contains the target service area. |  |
| appQoSReqs | AppReqs | O | 0..1 | Represents the application QoS requirements. |  |
| notifUri | Uri | M | 1 | Contains the URI via which inter-PLMN application service continuity notifications shall be delivered. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.12.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.12.6.2.3 Type: AppReqs

Table 6.12.6.2.3-1: Definition of type AppReqs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| reliability | Float | O | 0..1 | Represents the reliability expressed as a percentage.  Minimum = 0.  Maximum = 100.  (NOTE) |  |
| delay | integer | O | 0..1 | Represents the delay in milliseconds.  Minimum = 1.  (NOTE) |  |
| jitter | Uint32 | O | 0..1 | Represents the jitter in nanoseconds.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

##### 6.12.6.2.4 Type: InterPlmnServContNotif

Table 6.12.6.2.4-1: Definition of type InterPlmnServContNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | M | 1 | Represents the identifier of the VAL service to which the notification is related. |  |
| ueIds | array(string) | O | 1..N | Contains the list of the identifier(s) of the impacted VAL UE(s). |  |
| netSliceId | NetSliceId | M | 1 | Represents the identifier of the network slice to which the notification is related. |  |
| plmnId | PlmnId | M | 1 | Contains the identifier of the PLMN to which the notification is related. |  |
| targetServArea | array(GeographicArea) | M | 1..N | Contains the target service area. |  |

#### 6.12.6.3 Simple data types and enumerations

##### 6.12.6.3.1 Introduction

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

##### 6.12.6.3.2 Simple data types

The simple data types defined in table 6.12.6.3.2-1 shall be supported.

Table 6.12.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.12.6.3.3 Enumeration: ServContReq

The enumeration ServContReq represents a service continuity requirement. It shall comply with the provisions defined in table 6.12.6.3.3-1.

Table 6.12.6.3.3-1: Enumeration ServContReq

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| EXPECTED\_MIGRATION | Indicates that the service continuity requirement is the expected migration of the VAL application (or a list of VAL UE(s) of the VAL application) to a target area. |  |
| PREDICTED\_MIGRATION | Indicates that the service continuity requirement is the predicted migration of the VAL application (or a list of VAL UE(s) of the VAL application) to a target area. |  |

#### 6.12.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.12.6.5 Binary data

##### 6.12.6.5.1 Binary Data Types

Table 6.12.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.12.7 Error Handling

#### 6.12.7.1 General

For the NSCE\_InterPLMNContinuity API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_InterPLMNContinuity API.

#### 6.12.7.2 Protocol Errors

No specific protocol errors for the NSCE\_InterPLMNContinuity API are specified.

#### 6.12.7.3 Application Errors

The application errors defined for the NSCE\_InterPLMNContinuity API are listed in Table 6.12.7.3-1.

Table 6.12.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
| SERVICE\_NOT\_SUPPORTED | 403 Forbidden | Indicates that the inter-PLMN application service continuity request is rejected because the NSCE Server does not support the requested inter-PLMN service continuity (e.g., the targeted PLMN is not supported). |  |

### 6.12.8 Feature negotiation

The optional features listed in table 6.12.8-1 are defined for the NSCE\_InterPLMNContinuity API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.12.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.12.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_InterPLMNContinuity API.

## 6.13 NSCE\_NSDiagnostics API

### 6.13.1 Introduction

The NSCE\_NSDiagnostics service shall use the NSCE\_NSDiagnostics API.

The API URI of the NSCE\_NSDiagnostics Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-nsd".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.13, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.13.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSDiagnostics API.

### 6.13.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.13.4 Custom Operations without associated resources

#### 6.13.4.1 Overview

The structure of the custom operation URIs of the NSCE\_NSDiagnostics API is shown in Figure 6.13.4.1-1.



Figure 6.13.4.1-1: Custom operation URI structure of the NSCE\_NSDiagnostics API

Table 6.13.4.1-1 provides an overview of the custom operation and applicable HTTP methods defined for the NSCE\_NSDiagnostics API.

Table 6.13.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| Request | /request | POST | Enables a service consumer to request network slice diagnostics information. |

The custom operations shall support the URI variables defined in table 6.13.4.1-2.

Table 6.13.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.13.1. |

#### 6.13.4.2 Operation: Request

##### 6.13.4.2.1 Description

The custom operation allows a service consumer to request network slice diagnostics information to the NSCE Server.

##### 6.13.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.13.4.2.2-1 and the response data structures and response codes specified in table 6.13.4.2.2-2.

Table 6.13.4.2.2-1: Data structures supported by the POST Request Body for this operation

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NwSliceDiagReq | M | 1 | Contains the parameters to request network slice diagnostics information. |

Table 6.13.4.2.2-2: Data structures supported by the POST Response Body for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| NwSliceDiagResp | M | 1 | 200 OK | The successful response to the request, including the network slice diagnostics report |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI representing an alternative NSCE server to which the request should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI representing an alternative NSCE server to which the request should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.13.4.2.2-3: Headers supported by 307 Response Code for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing an alternative NSCE server to which the request should be redirected. |

Table 6.13.4.2.2-4: Headers supported by 308 Response Code for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing an alternative NSCE server to which the request should be redirected. |

### 6.13.5 Notifications

There are no notifications defined for this API in this release of the specification.

### 6.13.6 Data Model

#### 6.13.6.1 General

This clause specifies the application data model supported by the API.

Table 6.13.6.1-1 specifies the data types defined specifically for the NSCE\_NSDiagnostics API.

Table 6.13.6.1-1: NSCE\_NSDiagnostics API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| DataType | 6.13.6.3.4 | Represents the reported data type. |  |
| Error | 6.13.6.3.3 | Represents the service degradation related error. |  |
| ErrorInfo | 6.13.6.2.5 | Represents error related information. |  |
| NwSliceDiagReq | 6.13.6.2.2 | Represents the information associated with requested network slice diagnostics. |  |
| NwSliceDiagResp | 6.13.6.2.3 | Represents the network slice diagnostics report. |  |
| ServDgradInfo | 6.13.6.2.4 | Represents the service degraded information. |  |
| DataReport | 6.13.6.2.6 | Represents the reported data. |  |

Table 6.13.6.1-2 specifies data types re-used by the NSCE\_NSDiagnostics API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_NSDiagnostics API.

Table 6.13.6.1-2: NSCE\_NSDiagnostics API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Bytes | 3GPP TS 29.122 [2] | Represents a sequence of bytes. |  |
| DateTime | 3GPP TS 29.122 [2] | Represents a date and a time. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| ServArea | Clause 6.16.6.2.5 | Represents a network slice service area. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Used to negotiate the applicability of the optional features. |  |

#### 6.13.6.2 Structured Data Types

##### 6.13.6.2.1 Introduction

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

##### 6.13.6.2.2 Type: NwSliceDiagReq

Table 6.13.6.2.2-1: Definition of type NwSliceDiagReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| servDgradInfos | ServDgradInfo | M | 1 | Represents the requested service degraded information. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.13.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.13.6.2.3 Type: NwSliceDiagResp

Table 6.13.6.2.3-1: Definition of type NwSliceDiagResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| startTime | DateTime | M | 1 | Represents the start time of the reported network slice diagnostics data. |  |
| endTime | DateTime | M | 1 | Represents the end time of the reported network slice diagnostics data. |  |
| dataReport | array(DataReport) | M | 1..N | Represents the reported data related to network slice diagnostics. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.13.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.13.6.2.4 Type: ServDgradInfo

Table 6.13.6.2.4-1: Definition of type ServDgradInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServiceId | string | M | 1 | Represents the identifier of the targeted VAL service. |  |
| reqErrors | array(ErrorInfo) | M | 1..N | Contains the list of requested errors causing service degradation and the related information. |  |

##### 6.13.6.2.5 Type: ErrorInfo

Table 6.13.6.2.5-1: Definition of type ErrorInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| errorName | Error | M | 1 | Contains the name of the error. |  |
| netSliceId | NetSliceId | M | 1 | Represents the identifier of the targeted network slice. |  |
| ueIds | array(string) | O | 1..N | Contains the list of the identifier(s) of the targeted VAL UE(s). |  |
| areaOfInterest | ServArea | O | 0..1 | Contains the area within which the requested service degradation applies. |  |
| startTime | DateTime | M | 1 | Represents the start time of the requested service degradation. |  |
| endTime | DateTime | M | 1 | Represents the end time of the requested service degradation. |  |

##### 6.13.6.2.6 Type: DataReport

Table 6.13.6.2.6-1: Definition of type DataReport

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| errorName | Error | M | 1 | Represents the error to which the report is related. |  |
| dataType | DataType | M | 1 | Represents the data type of the reported data. |  |
| dataOutput | Bytes | M | 1 | Represents the diagnostics data based. |  |

#### 6.13.6.3 Simple data types and enumerations

##### 6.13.6.3.1 Introduction

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

##### 6.13.6.3.2 Simple data types

The simple data types defined in table 6.13.6.3.2-1 shall be supported.

Table 6.13.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.13.6.3.3 Enumeration: Error

The enumeration Error represents the service degradation related error. It shall comply with the provisions defined in table 6.13.6.3.3-1.

Table 6.13.6.3.3-1: Enumeration Error

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| COMMUNICATION\_ERROR | Indicates that the service degradation is due to a detected communication error. |  |
| RTT\_ABOVE\_LIMIT | Indicates that the service degradation is due to the packet round trip time exceeding an upper threshold limit. |  |
| QOS\_DOWNGRADE | Indicates that the service degradation is due to QoS being downgraded. |  |

##### 6.13.6.3.4 Enumeration: DataType

The enumeration DataTyperepresents the reported data type. It shall comply with the provisions defined in table 6.13.6.3.4-1.

Table 6.13.6.3.4-1: Enumeration DataType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| UE\_DATA | Indicates that the reported data type is UE data. |  |
| NETWORK\_DATA | Indicates that the reported data type is network data. |  |
| APPLICATION\_DATA | Indicates that the reported data type is application data. |  |

#### 6.13.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.13.6.5 Binary data

##### 6.13.6.5.1 Binary Data Types

Table 6.13.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.13.7 Error Handling

#### 6.13.7.1 General

For the NSCE\_NSDiagnostics API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_NSDiagnostics API.

#### 6.13.7.2 Protocol Errors

No specific protocol errors for the NSCE\_NSDiagnostics API are specified.

#### 6.13.7.3 Application Errors

The application errors defined for NSCE\_NSDiagnostics API are listed in table 6.13.7.3-1.

Table 6.13.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.13.8 Feature Negotiation

The optional features listed in table 6.13.8-1 are defined for the NSCE\_NSDiagnostics API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.13.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
|  |  |  |

### 6.13.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSDiagnostics API.

## 6.14 NSCE\_FaultDiagnosis API

### 6.14.1 Introduction

The NSCE\_FaultDiagnosis service shall use the NSCE\_FaultDiagnosis API.

The API URI of the NSCE\_FaultDiagnosis Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-fd".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.14, the service producer takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

6.14.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_FaultDiagnosis API.

### 6.14.3 Resources

#### 6.14.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.14.3.1-1 depicts the resource URIs structure for the NSCE\_FaultDiagnosis API.



Figure 6.14.3.1-1: Resource URIs structure of the NSCE\_FaultDiagnosis API

Table 6.14.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_FaultDiagnosis API.

Table 6.14.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Network Slice Fault Diagnosis Subscriptions | /subscriptions | POST | Request the creation of a Network Slice Fault Diagnosis Subscription. |
| Individual Network Slice Fault Diagnosis Subscription | /subscriptions/{subscriptionId} | GET | Retrieve an existing "Individual Network Slice Fault Diagnosis Subscription" resource. |
| PUT | Request the update of an existing "Individual Network Slice Fault Diagnosis Subscription" resource. |
| PATCH | Request the modification of an existing "Individual Network Slice Fault Diagnosis Subscription" resource. |
| DELETE | Request the deletion of an existing "Individual Network Slice Fault Diagnosis Subscription" resource. |

#### 6.14.3.2 Resource: Network Slice Fault Diagnosis Subscriptions

##### 6.14.3.2.1 Description

This resource represents the collection of Network Slice Fault Diagnosis Subscriptions managed by the NSCE Server.

##### 6.14.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-fd/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 6.14.3.2.2-1.

Table 6.14.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.14.1 |

##### 6.14.3.2.3 Resource Standard Methods

###### 6.14.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Network Slice Fault Diagnosis Subscription at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.14.3.2.3.1-1.

Table 6.14.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.14.3.2.3.1-2 and the response data structures and response codes specified in table 6.14.3.2.3.1-3.

Table 6.14.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FaultDiagSubsc | M | 1 | Represents the parameters to request the creation of a new Network Slice Fault Diagnosis Subscription. |

Table 6.14.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FaultDiagSubsc | M | 1 | 201 Created | Successful case. The Network Slice Fault Diagnosis Subscription is successfully created and a representation of the created "Individual Network Slice Fault Diagnosis Subscription" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.14.3.2.3.1-4: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-fd/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.14.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.14.3.3 Resource: Individual Network Slice Fault Diagnosis Subscription

##### 6.14.3.3.1 Description

This resource represents a Network Slice Fault Diagnosis Subscription managed by the NSCE Server.

##### 6.14.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-fd/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in the table 6.14.3.3.2-1.

Table 6.14.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.14.1 |
| subscriptionId | string | Represents the identifier of the "Individual Network Slice Fault Diagnosis Subscription" resource. |

##### 6.14.3.3.3 Resource Standard Methods

###### 6.14.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Network Slice Fault Diagnosis Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.14.3.3.3.1-1.

Table 6.14.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.14.3.3.3.1-2 and the response data structures and response codes specified in table 6.14.3.3.3.1-3.

Table 6.14.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.14.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FaultDiagSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Network Slice Fault Diagnosis Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.14.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.14.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.14.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Network Slice Fault Diagnosis Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.14.3.3.3.2-1.

Table 6.14.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.14.3.3.3.2-2 and the response data structures and response codes specified in table 6.14.3.3.3.2-3.

Table 6.14.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FaultDiagSubsc | M | 1 | Represents the updated representation of the "Individual Network Slice Fault Diagnosis Subscription" resource. |

Table 6.14.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FaultDiagSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Fault Diagnosis Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Fault Diagnosis Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.14.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE server. |

Table 6.14.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE server. |

###### 6.14.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Network Slice Fault Diagnosis Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.14.3.3.3.3-1.

Table 6.14.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.14.3.3.3.3-2 and the response data structures and response codes specified in table 6.14.3.3.3.3-3.

Table 6.14.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FaultDiagSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Network Slice Fault Diagnosis Subscription" resource. |

Table 6.14.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| FaultDiagSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Fault Diagnosis Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Fault Diagnosis Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.14.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.14.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.14.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Network Slice Fault Diagnosis Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.14.3.3.3.4-1.

Table 6.14.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.14.3.3.3.4-2 and the response data structures and response codes specified in table 6.14.3.3.3.4-3.

Table 6.14.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.14.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The targeted "Individual Network Slice Fault Diagnosis Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.14.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.14.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.14.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.14.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.14.5 Notifications

#### 6.14.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.14.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Network Slice Fault Diagnosis Notification | {notifUri} | POST | This service operation enables to notify a previously subscribed service consumer on Network Slice Fault Diagnosis event(s). |

#### 6.14.5.2 Network Slice Fault Diagnosis Notification

##### 6.14.5.2.1 Description

The Network Slice Fault Diagnosis Notification is used by a NSCE Server to notify a previously subscribed service consumer on Network Slice Fault Diagnosis event(s).

##### 6.14.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.14.5.2.2-1.

Table 6.14.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.14.5.2.3 Standard Methods

###### 6.14.5.2.3.1 POST

This method shall support the request data structures specified in table 6.14.5.2.3.1-1 and the response data structures and response codes specified in table 6.14.5.2.3.1-2.

Table 6.14.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| FaultDiagNotif | M | 1 | Represents a Network Slice Fault Diagnosis Notification. |

Table 6.14.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice Fault Diagnosis Notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.14.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.14.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.14.6 Data Model

#### 6.14.6.1 General

This clause specifies the application data model supported by the API.

Table 6.14.6.1-1 specifies the data types defined for the NSCE\_FaultDiagnosis API.

**Table 6.14.6.1-1: NSCE\_FaultDiagnosis API specific Data Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Section defined** | **Description** | **Applicability** |
| AlarmType | 6.14.6.3.3 | Represents the alarm type(s). |  |
| CorrelatedAlarm | 6.14.6.2.6 | Represents the correlated alarm information. |  |
| FaultDiagInformation | 6.14.6.2.7 | Represents the fault diagnosis information. |  |
| FaultDiagNotif | 6.14.6.2.4 | Represents a Network Slice Fault Diagnosis notification. |  |
| FaultDiagSubsc | 6.14.6.2.2 | Represents a Network Slice Fault Diagnosis subscription. |  |
| FaultDiagSubscPatch | 6.14.6.2.3 | Represents the requested modifications to a Network Slice Fault Diagnosis subscription. |  |
| FaultReportInfo | 6.14.6.2.5 | Represents the report of the fault diagnosis information. |  |
| Priority | 6.14.6.3.4 | Represents the prioritization of the fault associated with the correlated alarm. |  |

Table 6.14.6.1-2 specifies data types re-used by the NSCE\_FaultDiagnosis API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_FaultDiagnosis API.

**Table 6.14.6.1-2: NSCE\_FaultDiagnosis API re-used Data Types**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data type** | **Reference** | **Comments** | **Applicability** |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| TimeWindow | 3GPP TS 29.122 [2] | Represents a time window with a start time and an end time. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.14.6.2 Structured data types

##### 6.14.6.2.1 Introduction

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

##### 6.14.6.2.2 Type: FaultDiagSubsc

**Table 6.14.6.2.2-1: Definition of type FaultDiagSubsc**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| notifUri | Uri | M | 1 | Contains the URI via which notifications shall be delivered. |  |
| valServId | string | M | 1 | Contains the identifier of the VAL Service to which the fault diagnosis is related. |  |
| valUeIds | array(string) | O | 1..N | Contains the list of the identifier(s) of the VAL UE(s) to which the subscription is related. |  |
| faultDiagInfo | array(FaultDiagInformation) | O | 1..N | Contains the fault diagnosis information to which the subscription is related. |  |
| netSliceIds | array(NetSliceId) | O | 1..N | Contains the identifier(s) of the network slice(s) to be monitored. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.14.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.14.6.2.3 Type: FaultDiagSubscPatch

**Table 6.14.6.2.3-1: Definition of type FaultDiagSubscPatch**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which notifications shall be delivered. |  |
| faultDiagInfo | array(FaultDiagInformation) | O | 1..N | Contains the updated fault diagnosis information to which the subscription is related. |  |
| valUeIds | array(string) | O | 1..N | Contains the updated list of the identifier(s) of the VAL UE(s) to which the subscription is related. |  |
| netSliceIds | array(NetSliceId) | O | 1..N | Contains the updated identifier(s) of the network slice to be monitored. |  |

##### 6.14.6.2.4 Type: FaultDiagNotif

Table 6.14.6.2.4-1: Definition of type FaultDiagNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriptionId | string | M | 1 | Contains the identifier of the subscription to which the Network Slice Fault Diagnosis Notification is related. |  |
| faultRep | FaultReportInfo | M | 1 | Contains the report of the fault diagnosis. |  |

##### 6.14.6.2.5 Type: FaultReportInfo

Table 6.14.6.2.5-1: Definition of type FaultReportInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| corelAlarm | array(CorrelatedAlarm) | M | 1..N | Contains the list of the correlated alarms. |  |
| NOTE: At least one of the CorrelatedAlarm shall provide rootCause attribute. | | | | | |

##### 6.14.6.2.6 Type: CorrelatedAlarm

Table 6.14.6.2.6-1: Definition of type CorrelatedAlarm

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| alarmType | AlarmType | M | 1 | Contains the correlated alarm type. |  |
| priority | Priority | O | 0..1 | Indicates the prioritization of the fault associated with the correlated alarm. |  |
| rootCause | boolean | O | 0..1 | Indicates whether the event is the root cause of the events.  When set to "true", it indicates that the event is the root cause of the events. When set to "false", it indicates that the event is not the root cause of the events.  The default value when omitted is "false". |  |

6.14.6.2.7 Type: FaultDiagInformation

**Table 6.14.6.2.7-1: Definition of type FaultDiagInformation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Data type** | **P** | **Cardinality** | **Description** | **Applicability** |
| monitorTime | TimeWindow | O | 0..1 | Contains the monitoring time window of the subscription. |  |
| alarmType | AlarmType | O | 0..1 | Contains the correlated alarm type to which the subscription is related. |  |

#### 6.14.6.3 Simple data types and enumerations

##### 6.14.6.3.1 Introduction

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

##### 6.14.6.3.2 Simple data types

The simple data types defined in table 6.14.6.3.2-1 shall be supported.

Table 6.14.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.14.6.3.3 Enumeration: AlarmType

The enumeration AlarmType represents the alarm types. It shall comply with the provisions defined in table 6.14.6.3.3-1.

Table 6.14.6.3.3-1: Enumeration AlarmType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| COMMUNICATIONS\_ALARM | An alarm associated with the procedures and/or processes required to convey information from one point to another. |  |
| PROCESSING\_ERROR\_ALARM | An alarm associated with a software or processing fault. |  |
| ENVIRONMENTAL\_ALARM | An alarm associated with a condition relating to an enclosure in which the equipment resides. |  |
| QUALITY\_OF\_SERVICE\_ALARM | An alarm associated with a degradation in the  quality of a service. |  |
| EQUIPMENT\_ALARM | An alarm associated with an equipment fault. |  |
| INTEGRITY\_VIOLATION | An indication that information may have been illegally modified, inserted or deleted. |  |

##### 6.14.6.3.4 Enumeration: Priority

The enumeration Priority represents the prioritization. It shall comply with the provisions defined in table 6.14.6.3.4-1.

Table 6.14.6.3.4-1: Enumeration Priority

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| CRITICAL | Indicates the prioritization of the fault is "critical". |  |
| MAJOR | Indicates the prioritization of the fault is "major". |  |
| MINOR | Indicates the prioritization of the fault is "minor". |  |
| IGNORE | Indicates the prioritization of the fault is "ignore". |  |

#### 6.14.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.14.6.5 Binary data

##### 6.14.6.5.1 Binary Data Types

Table 6.14.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.14.7 Error Handling

#### 6.14.7.1 General

For the NSCE\_FaultDiagnosis API, HTTP error responses shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_FaultDiagnosis API.

#### 6.14.7.2 Protocol Errors

No specific protocol errors for the NSCE\_FaultDiagnosis API are specified.

#### 6.14.7.3 Application Errors

The application errors defined for the NSCE\_FaultDiagnosis API are listed in Table 6.14.7.3-1.

Table 6.14.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.14.8 Feature negotiation

The optional features in table 6.14.8-1 are defined for the NSCE\_FaultDiagnosis API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.14.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
| n/a |  |  |

### 6.14.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_FaultDiagnosis API.

## 6.15 NSCE\_SliceReqVerifyAndAlign API

### 6.15.1 Introduction

The NSCE\_SliceReqVerifyAndAlign service shall use the NSCE\_SliceReqVerifyAndAlign API.

The API URI of the NSCE\_SliceReqVerifyAndAlign Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-srva".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.15, the service producer takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.15.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_SliceReqVerifyAndAlign API.

### 6.15.3 Resources

#### 6.15.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.15.3.1-1 depicts the resource URIs structure for the NSCE\_SliceReqVerifyAndAlign API.



Figure 6.15.3.1-1: Resource URIs structure of the NSCE\_SliceReqVerifyAndAlign API

Table 6.15.3.1-1 provides an overview of the resources and applicable HTTP methods for the NSCE\_SliceReqVerifyAndAlign API.

Table 6.15.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Network Slice Requirements Verification and Alignment Subscriptions | /subscriptions | POST | Request the creation of a Network Slice Requirements Verification and Alignment Subscription. |
| Individual Network Slice Requirements Verification and Alignment Subscriptions | /subscriptions/{subscriptionId} | GET | Retrieve an existing "Individual Network Slice Requirements Verification and Alignment Subscription" resource. |
| PUT | Request the update of an existing "Individual Network Slice Requirements Verification and Alignment Subscription" resource. |
| PATCH | Request the modification of an existing "Individual Network Slice Requirements Verification and Alignment Subscription" resource. |
| DELETE | Request the deletion of an existing "Individual Network Requirements Verification and Alignment Subscription" resource. |

#### 6.15.3.2 Resource: Network Slice Requirements Verification and Alignment Subscriptions

##### 6.15.3.2.1 Description

This resource represents the collection of Network Slice Requirements Verification and Alignment Subscriptions managed by the NSCE Server.

##### 6.15.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-srva/<apiVersion>/subscriptions**

This resource shall support the resource URI variables defined in the table 6.15.3.2.2-1.

Table 6.15.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.15.1 |

##### 6.15.3.2.3 Resource Standard Methods

###### 6.15.3.2.3.1 POST

The HTTP POST method allows a service consumer to request the creation of a Network Slice Requirements Verification and Alignment Subscription at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.15.3.2.3.1-1.

Table 6.15.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.15.3.2.3.1-2 and the response data structures and response codes specified in table 6.15.3.2.3.1-3.

Table 6.15.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceReqVerAlignSubsc | M | 1 | Represents the parameters to request the creation of a new Network Slice Requirements Verification and Alignment Subscription. |

Table 6.15.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceReqVerAlignSubsc | M | 1 | 201 Created | Successful case. The Network Slice Requirements Verification and Alignment Subscription is successfully created and a representation of the created "Individual Network Slice Requirements Verification and Alignment Subscription" resource shall be returned.  An HTTP "Location" header that contains the URI of the created resource shall also be included. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.15.3.2.3.1-4: Headers supported by the 201 response code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure:  {apiRoot}/nsce-srva/<apiVersion>/subscriptions/{subscriptionId} |

##### 6.15.3.2.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

#### 6.15.3.3 Resource: Individual Network Slice Requirements Verification and Alignment Subscription

##### 6.15.3.3.1 Description

This resource represents a Network Slice Requirements Verification and Alignment Subscription managed by the NSCE Server.

##### 6.15.3.3.2 Resource Definition

Resource URI: **{apiRoot}/nsce-srva/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in the table 6.15.3.3.2-1.

Table 6.15.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.15.1 |
| subscriptionId | string | Represents the identifier of the "Individual Network Slice Requirements Verification and Alignment Subscription" resource. |

##### 6.15.3.3.3 Resource Standard Methods

###### 6.15.3.3.3.1 GET

The HTTP GET method allows a service consumer to retrieve an existing "Individual Network Requirements Verification and Alignment Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.15.3.3.3.1-1.

Table 6.15.3.3.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.15.3.3.3.1-2 and the response data structures and response codes specified in table 6.15.3.3.3.1-3.

Table 6.15.3.3.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.15.3.3.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceReqVerAlignSubsc | M | 1 | 200 OK | Successful case. The requested "Individual Network Slice Requirements Verification and Alignment Subscription" resource shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.15.3.3.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.15.3.3.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.15.3.3.3.2 PUT

The HTTP PUT method allows a service consumer to request the update of an existing "Individual Network Slice Requirements Verification and Alignment Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in the table 6.15.3.3.3.2-1.

Table 6.15.3.3.3.2-1: URI query parameters supported by the PUT method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 6.15.3.3.3.2-2 and the response data structures and response codes specified in table 6.15.3.3.3.2-3.

Table 6.15.3.3.3.2-2: Data structures supported by the PUT Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceReqVerAlignSubsc | M | 1 | Represents the updated representation of the "Individual Network Slice Requirements Verification and Alignment Subscription" resource. |

Table 6.15.3.3.3.2-3: Data structures supported by the PUT Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceReqVerAlignSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Requirements Verification and Alignment Subscription" resource is successfully updated and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Requirements Verification and Alignment Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the PUT method listed in Table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.15.3.3.3.2-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE server. |

Table 6.15.3.3.3.2-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE server. |

###### 6.15.3.3.3.3 PATCH

The HTTP PATCH method allows a service consumer to request the modification of an existing "Individual Network Slice Requirements Verification and Alignment Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.15.3.3.3.3-1.

Table 6.15.3.3.3.3-1: URI query parameters supported by the PATCH method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.15.3.3.3.3-2 and the response data structures and response codes specified in table 6.15.3.3.3.3-3.

Table 6.15.3.3.3.3-2: Data structures supported by the PATCH Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceReqVerAlignSubscPatch | M | 1 | Represents the parameters to request the modification of the "Individual Network Slice Requirements Verification and Alignment Subscription" resource. |

Table 6.15.3.3.3.3-3: Data structures supported by the PATCH Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| SliceReqVerAlignSubsc | M | 1 | 200 OK | Successful case. The "Individual Network Slice Requirements Verification and Alignment Subscription" resource is successfully modified and a representation of the updated resource shall be returned in the response body. |
| n/a |  |  | 204 No Content | Successful case. The "Individual Network Slice Requirements Verification and Alignment Subscription" resource is successfully updated and no content is returned in the response body. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP PATCH method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.15.3.3.3.3-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.15.3.3.3.3-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

###### 6.15.3.3.3.4 DELETE

The HTTP DELETE method allows a service consumer to request the deletion of an existing "Individual Network Slice Requirements Verification and Alignment Subscription" resource at the NSCE Server.

This method shall support the URI query parameters specified in table 6.15.3.3.3.4-1.

Table 6.15.3.3.3.4-1: URI query parameters supported by the DELETE method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| n/a |  |  |  |  |  |

This method shall support the request data structures specified in table 6.15.3.3.3.4-2 and the response data structures and response codes specified in table 6.15.3.3.3.4-3.

Table 6.15.3.3.3.4-2: Data structures supported by the DELETE Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.15.3.3.3.4-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The targeted "Individual Network Slice Requirements Verification and Alignment Subscription" resource is successfully deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.15.3.3.3.4-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.15.3.3.3.4-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.15.3.3.4 Resource Custom Operations

There are no resource custom operations defined for this resource in this release of the specification.

### 6.15.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.15.5 Notifications

#### 6.15.5.1 General

Notifications shall comply to clause 6.6 of 3GPP TS 29.549 [15].

Table 6.15.5.1-1: Notifications overview

|  |  |  |  |
| --- | --- | --- | --- |
| Notification | Callback URI | HTTP method or custom operation | Description  (service operation) |
| Network Slice Requirements Verification and Alignment Notification | {notifUri} | POST | This service operation enables to notify a previously subscribed service consumer on Network Slice Requirements Verification and Alignment information. |

#### 6.15.5.2 Network Slice Requirements Verification and Alignment Notification

##### 6.15.5.2.1 Description

The Network Slice Requirements Verification and Alignment Notification is used by a NSCE Server to notify a previously subscribed service consumer on Network Slice Requirements Verification and Alignment information.

##### 6.15.5.2.2 Target URI

The Callback URI **"{notifUri}"** shall be used with the callback URI variables defined in table 6.15.5.2.2-1.

Table 6.15.5.2.2-1: Callback URI variables

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| notifUri | Uri | Represents the callback URI encoded as a string formatted as a URI. |

##### 6.15.5.2.3 Standard Methods

###### 6.15.5.2.3.1 POST

This method shall support the request data structures specified in table 6.15.5.2.3.1-1 and the response data structures and response codes specified in table 6.15.5.2.3.1-2.

Table 6.15.5.2.3.1-1: Data structures supported by the POST Request Body

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| SliceReqVerAlignNotif | M | 1 | Represents a Network Slice Requirements Verification and Alignment Notification. |

Table 6.15.5.2.3.1-2: Data structures supported by the POST Response Body

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice Requirements Verification and Alignment Notification is successfully received and acknowledged. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing the end point of an alternative service consumer where the notification should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.15.5.2.3.1-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

Table 6.15.5.2.3.1-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI representing the end point of an alternative service consumer towards which the notification should be redirected. |

### 6.15.6 Data Model

#### 6.15.6.1 General

This clause specifies the application data model supported by the API.

Table 6.15.6.1-1 specifies the data types defined for the NSCE\_SliceReqVerifyAndAlign API.

Table 6.15.6.1-1: NSCE\_SliceReqVerifyAndAlign API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| SliceReqVerAlignNotif | 6.15.6.2.4 | Represents a Network Slice Requirements Verification and Alignment notification. |  |
| SliceReqVerAlignSubsc | 6.15.6.2.2 | Represents a Network Slice Requirements Verification and Alignment subscription. |  |
| SliceReqVerAlignSubscPatch | 6.15.6.2.3 | Represents the requested modifications to a Network Slice Requirements Verification and Alignment subscription. |  |

Table 6.15.6.1-2 specifies data types re-used by the NSCE\_SliceReqVerifyAndAlign API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_SliceReqVerifyAndAlign API.

Table 6.15.6.1-2: NSCE\_SliceReqVerifyAndAlign API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| ServiceProfile | 3GPP TS 28.541 [19] | Represents the service profile containing the properties of the network slice related requirements. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

#### 6.15.6.2 Structured data types

##### 6.15.6.2.1 Introduction

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

##### 6.15.6.2.2 Type: SliceReqVerAlignSubsc

Table 6.15.6.2.2-1: Definition of type SliceReqVerAlignSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | M | 1 | Contains the URI via which notifications shall be delivered. |  |
| valServId | string | M | 1 | Contains the identifier of the VAL Service to which the subscription is related. |  |
| valUeIds | array(string) | O | 1..N | Contains the list of the identifier(s) of the VAL UE(s) to which the subscription is related. |  |
| sliceReq | array(ServiceProfile) | M | 1..N | Contains the list of the slice requirements (i.e., parameters and characteristics) which need to be verified and aligned. |  |
| netSliceId | NetSliceId | M | 1 | Contains the identifier of the network slice to which the subscription is related. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.15.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.15.6.2.3 Type: SliceReqVerAlignSubscPatch

Table 6.15.6.2.3-1: Definition of type SliceReqVerAlignSubscPatch

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| notifUri | Uri | O | 0..1 | Contains the updated URI via which notifications shall be delivered. |  |
| valUeIds | array(string) | O | 1..N | Contains the updated list of the identifier(s) of the VAL UE(s) to which the subscription is related. |  |
| sliceReq | array(ServiceProfile) | O | 1..N | Contains the updated slice requirements (i.e., parameters and characteristics) which need to be verified and aligned. |  |
| netSliceId | NetSliceId | O | 0..1 | Contains the updated identifier of the network slice to be monitored. |  |

##### 6.15.6.2.4 Type: SliceReqVerAlignNotif

Table 6.15.6.2.4-1: Definition of type SliceReqVerAlignNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriptionId | string | M | 1 | Contains the identifier of the subscription to which the Network Slice Requirements Verification and Alignment Notification is related. |  |
| sliceReqInfo | array(ServiceProfile) | M | 1..N | Contains the information of the updated slice requirements (i.e., parameters and characteristics). |  |

#### 6.15.6.3 Simple data types and enumerations

##### 6.15.6.3.1 Introduction

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

##### 6.15.6.3.2 Simple data types

The simple data types defined in table 6.15.6.3.2-1 shall be supported.

Table 6.15.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.15.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.15.6.5 Binary data

##### 6.15.6.5.1 Binary Data Types

Table 6.15.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.15.7 Error Handling

#### 6.15.7.1 General

For the NSCE\_SliceReqVerifyAndAlign API, HTTP error responses shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_SliceReqVerifyAndAlign API.

#### 6.15.7.2 Protocol Errors

No specific protocol errors for the NSCE\_SliceReqVerifyAndAlign API are specified.

#### 6.15.7.3 Application Errors

The application errors defined for the NSCE\_SliceReqVerifyAndAlign API are listed in Table 6.15.7.3-1.

Table 6.15.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.15.8 Feature negotiation

The optional features in table 6.15.8-1 are defined for the NSCE\_SliceReqVerifyAndAlign API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.15.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.15.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_SliceReqVerifyAndAlign API.

## 6.16 NSCE\_NSInfoDelivery API

### 6.16.1 Introduction

The NSCE\_NSInfoDelivery service shall use the NSCE\_NSInfoDelivery API.

The API URI of the NSCE\_NSInfoDelivery Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-nsid".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.16, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.16.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSInfoDelivery API.

### 6.16.3 Resources

#### 6.16.3.1 Overview

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 6.16.3.1-1 depicts the resource URIs structure for the NSCE\_NSInfoDelivery API.



Figure 6.16.3.1-1: Resource URIs structure of the NSCE\_NSInfoDelivery API

Table 6.16.3.1-1 provides an overview of the resources and applicable HTTP methods or custom operations for the NSCE\_NSInfoDelivery API.

Table 6.16.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| Network Slice Information Sets | /slice-info-sets | GET | Request Network Slice Information retrieval. |
| Deliver | Request Network Slice Information delivery. |

#### 6.16.3.2 Resource: Network Slice Information Sets

##### 6.16.3.2.1 Description

This resource represents the collection of Network Slice Information Sets managed by the NSCE Server.

##### 6.16.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nsce-nsid/<apiVersion>/slice-info-sets**

This resource shall support the resource URI variables defined in table 6.16.3.2.2-1.

Table 6.16.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.16.1. |

##### 6.16.3.2.3 Resource Standard Methods

###### 6.16.3.2.3.1 GET

The HTTP GET method allows a service consumer to request Network Slice Information retrieval at the NSCE Server.

This method shall support the URI query parameters specified in table 6.16.3.2.3.1-1.

Table 6.16.3.2.3.1-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description | Applicability |
| val-serv-id | string | M | 1 | Contains the identifier of the targeted VAL service. |  |
| req-slice-info | array(ReqSliceInfo) | O | 1..N | Contains the requested Network Slice Information type(s). |  |
| supp-feats | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.16.8.  This query parameter shall be present only when feature negotiation needs to take place. |  |

This method shall support the request data structures specified in table 6.16.3.2.3.1-2 and the response data structures and response codes specified in table 6.16.3.2.3.1-3.

Table 6.16.3.2.3.1-2: Data structures supported by the GET Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| n/a |  |  |  |

Table 6.16.3.2.3.1-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| NSInfoRetResp | M | 1 | 200 OK | Successful case. The representation of the "Individual Network Slice Information Set" resource corresponding to the requested Network Slice Information shall be returned. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI of the resource located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP GET method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.16.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

Table 6.16.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative URI of the resource located in an alternative NSCE Server. |

##### 6.16.3.2.4 Resource Custom Operations

###### 6.16.3.2.4.1 Overview

Table 6.16.3.2.4.1-1 specifies the custom operations defined on this resource.

Table 6.16.3.2.4.1-1: Resource Custom Operations

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operaration URI | Mapped HTTP method | Description |
| Deliver | /slice-info-sets/deliver | POST | Enables a service consumer to request Network Slice Information delivery. |

###### 6.16.3.2.4.2 Operation: Deliver

6.16.3.2.4.2.1 Description

This resource custom operation enables a service consumer to request Network Slice Information delivery at the NSCE Server.

6.16.3.2.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.16.3.2.4.2.2-1 and the response data structure and response codes specified in table 6.16.3.2.4.2.2-2.

Table 6.16.3.2.4.2.2-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NSInfoDelReq | M | 1 | Contains the parameters to request Network Slice Information delivery. |

Table 6.16.3.2.4.2.2-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | Successful case. The Network Slice Information delivery request is successfully received, processed and completed. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative target URI for the resource custom operation located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative target URI for the resource custom operation located in an alternative NSCE Server.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.16.3.2.4.2.2-3: Headers supported by the 307 Response Code on this resource custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI for the resource custom operation located in an alternative NSCE Server. |

Table 6.16.3.2.4.2.2-4: Headers supported by the 308 Response Code on this resource custom operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains an alternative target URI for the resource custom operation located in an alternative NSCE Server. |

### 6.16.4 Custom Operations without associated resources

There are no custom operations without associated resources defined for this API in this release of the specification.

### 6.16.5 Notifications

There are no notifications defined for this API in this release of the specification.

### 6.16.6 Data Model

#### 6.16.6.1 General

This clause specifies the application data model supported by the API.

Table 6.16.6.1-1 specifies the data types defined for the NSCE\_NSInfoDelivery API.

Table 6.16.6.1-1: NSCE\_NSInfoDelivery API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| NSInfoDelReq | 6.16.6.2.2 | Represents a Network Slice Information Delivery request. |  |
| NSInfoRetResp | 6.16.6.2.3 | Represents a Network Slice Information Retrieval response. |  |
| NSInfoSet | 6.16.6.2.4 | Represents a Network Slice Information Set. |  |
| ReqSliceInfo | 6.16.6.3.3 | Represents the requested Network Slice Information type. |  |
| ServArea | 6.16.6.2.5 | Represents the network Slice Coverage Area. |  |

Table 6.16.6.1-2 specifies data types re-used by the NSCE\_NSInfoDelivery API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_NSInfoDelivery API.

Table 6.16.6.1-2: NSCE\_NSInfoDelivery API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| GeographicArea | 3GPP TS 29.572 [18] | Represents a geographic area. |  |
| Snssai | 3GPP TS 29.571 [16] | Represents an S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |
| Tai | 3GPP TS 29.571 [16] | Represents a TAI. |  |
| Uinteger | 3GPP TS 29.571 [16] | Represents an unsigned integer. |  |

#### 6.16.6.2 Structured data types

##### 6.16.6.2.1 Introduction

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

##### 6.16.6.2.2 Type: NSInfoRetResp

Table 6.16.6.2.2-1: Definition of type NSInfoRetResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| sliceInfo | NSInfoSet | M | 1 | Contains the requested Network Slice Information. |  |

##### 6.16.6.2.3 Type: NSInfoDelReq

Table 6.16.6.2.3-1: Definition of type NSInfoDelReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServId | string | M | 1 | Contains the identifier of the targeted VAL service. |  |
| valUeIds | array(string) | M | 1..N | Contains the identifiers of the targeted VAL UE(s). |  |
| reqSliceInfo | array(ReqSliceInfo) | O | 1..N | Contains the Network Slice Information requested to be delivered. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.16.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.16.6.2.4 Type: NSInfoSet

Table 6.16.6.2.4-1: Definition of type NSInfoSet

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | C | 0..1 | Represents the S-NSSAI.  (NOTE) |  |
| sst | Uinteger | C | 0..1 | Contains the SST.  (NOTE) |  |
| sliceCovArea | ServArea | C | 0..1 | Contains the network Slice Coverage Area.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

##### 6.16.6.2.5 Type: ServArea

Table 6.16.6.2.5-1: Definition of type ServArea

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| tais | array(Tai) | C | 1..N | Represents the identifier(s) or the TA(s) where the network slice is available.  (NOTE) |  |
| geoAreas | array(GeographicArea) | C | 1..N | Contains the geographical area(s) where the network slice is available.  (NOTE) |  |
| NOTE: At least one of these attributes shall be present. | | | | | |

#### 6.16.6.3 Simple data types and enumerations

##### 6.16.6.3.1 Introduction

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

##### 6.16.6.3.2 Simple data types

The simple data types defined in table 6.16.6.3.2-1 shall be supported.

Table 6.16.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

##### 6.16.6.3.3 Enumeration: ReqSliceInfo

The enumeration ReqSliceInfo represents the requested Network Slice Information type. It shall comply with the provisions defined in table 6.16.6.3.3-1.

Table 6.16.6.3.3-1: Enumeration ReqSliceInfo

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| SNSSAI | Indicates that the requested Network Slice Information is the S-NSSAI. |  |
| SST | Indicates that the requested Network Slice Information is the SST. |  |
| SLICE\_COV\_AREA | Indicates that the requested Network Slice Information is the Slice Coverage Area. |  |

#### 6.16.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.16.6.5 Binary data

##### 6.16.6.5.1 Binary Data Types

Table 6.16.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.16.7 Error Handling

#### 6.16.7.1 General

For the NSCE\_NSInfoDelivery API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_NSInfoDelivery API.

#### 6.16.7.2 Protocol Errors

No specific protocol errors for the NSCE\_NSInfoDelivery API are specified.

#### 6.16.7.3 Application Errors

The application errors defined for the NSCE\_NSInfoDelivery API are listed in Table 6.16.7.3-1.

Table 6.16.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.16.8 Feature negotiation

The optional features listed in table 6.16.8-1 are defined for the NSCE\_NSInfoDelivery API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.16.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| Feature number | Feature Name | Description |
|  |  |  |

### 6.16.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSInfoDelivery API.

## 6.17 Void

## 6.18 NSCE\_NSAllocation API

### 6.18.1 Introduction

The NSCE\_NSAllocation service shall use the NSCE\_NSAllocation API.

The API URI of the NSCE\_NSAllocation Service API shall be:

**{apiRoot}/<apiName>/<apiVersion>**

The request URIs used in HTTP requests shall have the Resource URI structure defined in clause 6.5 of 3GPP TS 29.549 [15], i.e.:

**{apiRoot}/<apiName>/<apiVersion>/<apiSpecificSuffixes>**

with the following components:

- The {apiRoot} shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

- The <apiName>shall be "nsce-nsa".

- The <apiVersion> shall be "v1".

- The <apiSpecificSuffixes> shall be set as described in clause 6.5 of 3GPP TS 29.549 [15].

NOTE: When 3GPP TS 29.122 [2] is referenced for the common protocol and interface aspects for API definition in the clauses under clause 6.18, the NSCE Server takes the role of the SCEF and the service consumer takes the role of the SCS/AS.

### 6.18.2 Usage of HTTP

The provisions of clause 6.3 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSAllocation API.

### 6.18.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.18.4 Custom Operations without associated resources

#### 6.18.4.1 Overview

The structure of the custom operation URIs of the NSCE\_NSAllocation API is shown in Figure 6.18.4.1-1.



Figure 6.18.4.1-1: Custom operation URI structure of the NSCE\_NSAllocation API

Table 6.18.4.1-1 provides an overview of the custom operation and applicable HTTP methods defined for the NSCE\_NSAllocation API.

Table 6.18.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| Request | /request | POST | Enables a service consumer to request network slice allocation. |

#### 6.18.4.2 Operation: Request

##### 6.18.4.2.1 Description

The custom operation allows a service consumer to request network slice allocation to the NSCE Server.

##### 6.18.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.18.4.2.2-1 and the response data structures and response codes specified in table 6.18.4.2.2-2.

Table 6.18.4.2.2-1: Data structures supported by the POST Request Body for this operation

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NwSliceAllocReq | M | 1 | Contains the parameters to request network slice allocation. |

Table 6.18.4.2.2-2: Data structures supported by the POST Response Body for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response codes | Description |
| NwSliceAllocResp | M | 1 | 200 OK | The successful response to the request, including the network slice allocation information. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection.  The response shall include a Location header field containing an alternative URI representing an alternative NSCE server to which the request should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection.  The response shall include a Location header field containing an alternative URI representing an alternative NSCE server to which the request should be sent.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [2]. |
| NOTE: The mandatory HTTP error status codes for the HTTP POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Table 6.18.4.2.2-3: Headers supported by 307 Response Code for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing an alternative NSCE server to which the request should be redirected. |

Table 6.18.4.2.2-4: Headers supported by 308 Response Code for this operation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI representing an alternative NSCE server to which the request should be redirected. |

### 6.18.5 Notifications

There are no notifications defined for this API in this release of the specification.

### 6.18.6 Data Model

#### 6.18.6.1 General

This clause specifies the application data model supported by the API.

Table 6.18.6.1-1 specifies the data types defined specifically for the NSCE\_NSAllocation API service.

Table 6.18.6.1-1: NSCE\_NSAllocation API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| NwSliceAllocReq | 6.18.6.2.2 | Represents the network slice allocation request. |  |
| NwSliceAllocResp | 6.18.6.2.3 | Represents the network slice allocation information. |  |

Table 6.18.6.1-2 specifies data types re-used by the NSCE\_NSAllocation API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the NSCE\_NSAllocation API.

Table 6.18.6.1-2: NSCE\_NSAllocation API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| ServArea | Clause 6.16.6.2.5 | Represents a network slice service area. |  |
| ServiceProfile | 3GPP TS 28.541 [19] | Represents the network slice service profile. |  |
| Snssai | 3GPP TS 29.571 [16] | Represents the S-NSSAI. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |  |

#### 6.18.6.2 Structured Data Types

##### 6.18.6.2.1 Introduction

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

##### 6.18.6.2.2 Type: NwSliceAllocReq

Table 6.18.6.2.2-1: Definition of type NwSliceAllocReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| valServiceId | string | M | 1 | Represents the VAL service identifier. |  |
| valUeIds | array(string) | O | 1..N | Represents the list of VAL UEs ID. |  |
| locArea | ServArea | M | 1 | Identification of location area to which the request applies. |  |
| sliceId | NetSliceId | O | 0..1 | Represents the requested slice identifier. |  |
| nwSliceServProf | ServiceProfile | O | 0..1 | Represents the requested Network slice service requirements. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.18.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.18.6.2.3 Type: NwSliceAllocResp

Table 6.18.6.2.3-1: Definition of type NwSliceAllocResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | M | 1 | Represents the identifier of the allocated network slice. |  |
| nwSliceServProf | ServiceProfile | M | 1 | Represents the allocated network slice attributes. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Contains the list of supported features among the ones defined in clause 6.18.8.  This attribute shall be present only when feature negotiation needs to take place. |  |

#### 6.18.6.3 Simple data types and enumerations

##### 6.18.6.3.1 Introduction

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

##### 6.18.6.3.2 Simple data types

The simple data types defined in table 6.18.6.3.2-1 shall be supported.

Table 6.18.6.3.2-1: Simple data types

|  |  |  |  |
| --- | --- | --- | --- |
| Type Name | Type Definition | Description | Applicability |
|  |  |  |  |

#### 6.18.6.4 Data types describing alternative data types or combinations of data types

There are no data types describing alternative data types or combinations of data types defined for this API in this release of the specification.

#### 6.18.6.5 Binary data

##### 6.18.6.5.1 Binary Data Types

Table 6.18.6.5.1-1: Binary Data Types

|  |  |  |
| --- | --- | --- |
| Name | Clause defined | Content type |
|  |  |  |

### 6.18.7 Error Handling

#### 6.18.7.1 General

For the NSCE\_NSAllocation API, error handling shall be supported as specified in clause 6.7 of 3GPP TS 29.549 [15].

In addition, the requirements in the following clauses are applicable for the NSCE\_NSAllocation API.

#### 6.18.7.2 Protocol Errors

No specific protocol errors for the NSCE\_NSAllocation API are specified.

#### 6.18.7.3 Application Errors

The application errors defined for NSCE\_NSAllocation API are listed in table 6.18.1.6.3-1.

Table 6.18.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| Application Error | HTTP status code | Description | Applicability |
|  |  |  |  |

### 6.18.8 Feature Negotiation

The optional features listed in table 6.18.8-1 are defined for the NSCE\_NSAllocation API. They shall be negotiated using the extensibility mechanism defined in clause 6.8 of 3GPP TS 29.549 [15].

Table 6.18.8-1: Supported Features

|  |  |  |
| --- | --- | --- |
| **Feature number** | **Feature Name** | **Description** |
|  |  |  |

### 6.18.9 Security

The provisions of clause 9 of 3GPP TS 29.549 [15] shall apply for the NSCE\_NSAllocation API.

# 7 Using Common API Framework

The provisions of clause 8 of 3GPP TS 29.549 [15] shall apply for the NSCE Server APIs defined in this specification.

Annex A (normative):  
OpenAPI specification

# A.1 General

This Annex specifies the formal definition of the API(s) defined in the present specification. It consists of OpenAPI specifications in YAML format.

This Annex takes precedence when being discrepant to other parts of the specification with respect to the encoding of information elements and methods within the API(s).

NOTE 1: The semantics and procedures, as well as conditions, e.g. for the applicability and allowed combinations of attributes or values, not expressed in the OpenAPI definitions but defined in other parts of the specification also apply.

Informative copies of the OpenAPI specification files contained in this 3GPP Technical Specification are available on a Git-based repository that uses the GitLab software version control system (see clause 5.3.1 of 3GPP TS 29.501 [3] and clause 5B of 3GPP TR 21.900 [5]).

# A.2 NSCE\_SliceApiManagement API

openapi: 3.0.0

info:

title: NSCE\_Server Slice API Management Service

version: 1.0.0

description: |

NSCE Server Slice API Management Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Exposure (NSCE) Server Services; Stage 3.

url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-sam/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/configurations:

post:

summary: Request the creation of a new Slice API Configuration.

operationId: CreateSliceAPIConfig

tags:

- Slice API Configurations (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceAPIConfig'

responses:

'201':

description: >

Created. The slice API Configuration is successfully created and a representation of

the created Individual Slice API Configuration shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceAPIConfig'

headers:

Location:

description: >

Contains the URI of the created Individual Slice API Configuration resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

SliceAPIConfigNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceAPIConfigNotif'

responses:

'204':

description: >

No Content. The Slice API Configuration Notification is successfully received

and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/configurations/{configId}:

parameters:

- name: configId

in: path

description: >

Represents the identifier of the Individual Slice API Configuration.

required: true

schema:

type: string

get:

summary: Request to retrieve an existing Individual Slice API Configuration.

operationId: GetIndSliceAPIConfig

tags:

- Individual Slice API Configuration (Document)

responses:

'200':

description: >

OK. The requested Individual Slice API Configuration resource shall be returned in the

response body.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceAPIConfig'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request to delete an existing Individual Slice API Configuration.

operationId: DeleteIndSliceAPIConfig

tags:

- Individual Slice API Configuration (Document)

responses:

'204':

description: >

No Content. The Individual Slice API Configuration resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/configurations/{configId}/update:

parameters:

- name: configId

in: path

description: >

Represents the identifier of the Individual Slice API Configuration.

required: true

schema:

type: string

post:

summary: Request the update of an existing slice API configuration.

operationId: Update

tags:

- Slice API Configuration Update

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/UpdateReq'

responses:

'200':

description: >

OK. The slice API configuration update request is successfully received and processed,

and slice API configuration update related information shall be returned in the response

body.

content:

application/json:

schema:

$ref: '#/components/schemas/UpdateResp'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/invoke:

post:

summary: Request slice API invocation.

operationId: Invoke

tags:

- Slice API Invocation Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InvokeReq'

responses:

'204':

description: >

No Content. The slice API invocation request is successfully received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

SliceAPIConfig:

description: >

Represents the slice API Configuration.

type: object

properties:

servReqs:

type: array

items:

$ref: '#/components/schemas/AppServReqs'

minItems: 1

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

timeValidity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- servReqs

- notifUri

AppServReqs:

description: >

Represents the application service requirements for a network slice.

type: object

properties:

valServiceId:

type: string

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

servKpis:

$ref: 'TS29435\_NSCE\_InterPLMNContinuity.yaml#/components/schemas/AppReqs'

servReqs:

type: array

items:

$ref: 'TS29435\_NSCE\_SliceCommService.yaml#/components/schemas/ServReq'

minItems: 1

areaOfInterest:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

required:

- valServiceId

- netSliceId

UpdateReq:

description: >

Represents the parameters to request the update of a slice API configuration.

type: object

properties:

triggEvent:

$ref: '#/components/schemas/TriggerEvent'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- triggEvent

UpdateResp:

description: >

Represents the response to the slice API configuration update resquest.

type: object

properties:

sliceAPIInfo:

$ref: '#/components/schemas/SliceAPIInfo'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- sliceAPIInfo

SliceAPIInfo:

description: >

Represents slice API information.

type: object

properties:

apiInfo:

type: string

anyOf:

- required: [apiInfo]

InvokeReq:

description: >

Represents a slice API invocation request.

type: object

properties:

sliceApiIdInfo:

type: string

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- sliceApiIdInfo

SliceAPIConfigNotif:

description: >

Represents a Slice API Configuration Notification.

type: object

properties:

sliceAPIInfo:

$ref: '#/components/schemas/SliceAPIInfo'

required:

- sliceAPIInfo

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

TriggerEvent:

anyOf:

- type: string

enum:

- UE\_MOBILITY

- MIGRATION

- SERV\_API\_UNAVAILABILITY

- APP\_QOS\_REQ\_CHANGE

- type: string

description: >

This string provides the triggering event for slice API configuration update.

description: |

Represents a trigger event.

Possible values are:

- UE\_MOBILITY: Indicates that the triggering event for slice API configuration update is

UE mobility to a different service area.

- MIGRATION: Indicates that the triggering event for slice API configuration update is

application server migration to a different edge/cloud platform.

- SERV\_API\_UNAVAILABILITY: Indicateds that the triggering event for slice API configuration

update is service API unavailability.

- APP\_QOS\_REQ\_CHANGE: Indicates that the triggering event for slice API configuration update

is application QoS requirements change.

# A.3 NSCE\_NetSliceLifeCycleMngt API

openapi: 3.0.0

info:

title: NSCE Server Network Slice LifeCycle Management

version: 1.0.1

description: |

NSCE Server Network Slice LifeCycle Management.

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externalDocs:

description: >

3GPP TS 29.435 V18.2.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Exposure (NSCE) Server Service(s); Stage 3.

url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-nslcm/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 5.2.4 of 3GPP TS 29.122

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Request the creation of a Network Slice Lifecycle Management Subscription.

operationId: CreateNetSliceLifeCycleMngtSubsc

tags:

- Network Slice Lifecycle Management Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMSubsc'

responses:

'201':

description: >

Created. The Network Slice Lifecycle Management Subscription is successfully created

and a representation of the created Individual Network Slice Lifecycle Management

Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMSubsc'

headers:

Location:

description: >

Contains the URI of the newly created resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

NetSliceLifeCycleMngtNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMNotif'

responses:

'204':

description: >

No Content. The Network Slice Lifecycle Management Notification is successfully

received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

QoEMetricsSubsNotif:

'{$request.body#/notifUri}/subscribe-qoe':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/QoEMetricsSubsc'

responses:

'200':

description: >

OK. The QoE metrics Subscription is successfully received

and processed, and immediate QoE metrics reporting related information

shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/QoEMetricsResp'

'204':

description: >

No Content. The QoE metrics Subscription is successfully received and

processed, and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

NetSliceLCMRecomNotif:

'{$request.body#/notifUri}/recommend':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMRecom'

responses:

'204':

description: >

No Content. The Network Slice LCM Recommendation Notification

is successfully received and processed, and no content is

returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Network Slice Lifecycle Management

Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Network Slice Lifecycle Management Subscription" resource at the NSCE Server.

operationId: GetIndNetSliceLifeCycleMngtSubsc

tags:

- Individual Network Slice Lifecycle Management Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Network Slice Lifecycle Management Subscription

resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Network Slice Lifecycle Management Subscription resource at the NSCE Server.

operationId: UpdateIndNetSliceLifeCycleMngtSubc

tags:

- Individual Network Slice Lifecycle Management Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMSubsc'

responses:

'200':

description: >

OK. The Individual Management Discovery Subscription resource is successfully updated

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMSubsc'

'204':

description: >

No Content. The Individual Network Slice Lifecycle Management Subscription resource

is successfully updated and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Network Slice Lifecycle Management Subscription resource at the NSCE Server.

operationId: ModifyIndNetSliceLifeCycleMngtSubsc

tags:

- Individual Network Slice Lifecycle Management Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/NSLCMSubscPatch'

responses:

'200':

description: >

OK. The Individual Network Slice Lifecycle Management Subscription resource is

successfully modified and a representation of the updated resource shall

be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/NSLCMSubsc'

'204':

description: >

No Content. The Individual Network Slice Lifecycle Management Subscription resource

is successfully modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Network Slice Lifecycle Management Subscription resource.

operationId: DeleteIndNetSliceLifeCycleMngtSubc

tags:

- Individual Network Slice Lifecycle Management Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Network Slice Lifecycle Management Subscription

resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}/notify:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Network Slice Lifecycle Management

Subscription resource.

required: true

schema:

type: string

post:

summary: Enables the service consumer to send a notification to the NSCE Server on QoE metrics.

operationId: QoEMetricNotify

tags:

- QoE metrics Notification

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/QoEMetricsReportNotif'

responses:

'204':

description: >

No Content. The QoE metrics notification is successfully received and processed,

and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

NSLCMSubsc:

description: Represents a Network Slice Life Cycle Management Subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

servReqs:

type: array

items:

$ref: 'TS29435\_NSCE\_SliceApiManagement.yaml#/components/schemas/AppServReqs'

minItems: 1

triggerConds:

type: array

items:

$ref: '#/components/schemas/TriggerCond'

minItems: 1

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

NSLCMSubscPatch:

description: >

Represents the requested modifications to a Network Slice Life Cycle

Management Subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

servReqs:

type: array

items:

$ref: 'TS29435\_NSCE\_SliceApiManagement.yaml#/components/schemas/AppServReqs'

minItems: 1

triggerConds:

type: array

items:

$ref: '#/components/schemas/TriggerCond'

minItems: 1

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

NSLCMNotif:

description: Represents a Network Slice Life Cycle Management Notification.

type: object

properties:

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

required:

- netSliceId

QoEMetricsSubsc:

description: Represents a QoE Metrics Subscription.

type: object

properties:

notifCorrId:

type: string

subscriptionId:

type: string

collectInfos:

type: object

additionalProperties:

$ref: '#/components/schemas/CollectInfo'

minProperties: 1

description: >

Contains the information collected from the interested network slice.

The key of the map shall be any unique string encoded value.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- collectInfos

QoEMetricsResp:

description: Represents the response to a QoE Metris Subscription.

type: object

properties:

qoeMetrics:

$ref: '#/components/schemas/QoEMetricsSubsc'

qoeMetricsReports:

type: array

items:

$ref: '#/components/schemas/QoEMetricsReport'

minItems: 1

QoEMetricsReport:

description: Represents the report of QoE Metris.

type: object

properties:

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

qoeMetrics:

type: array

items:

$ref: '#/components/schemas/QoEMetric'

minItems: 1

required:

- netSliceId

- qoeMetrics

NSLCMRecom:

description: Represents the Network Slice LCM Recommendation.

type: object

properties:

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

sliceLCMActions:

type: array

items:

$ref: '#/components/schemas/SliceLCMAction'

minItems: 1

sliceInfo:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/NSInfoSet'

required:

- netSliceId

- sliceLCMActions

CollectInfo:

description: Represents the information collected from the interested network slice.

type: object

properties:

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

qoeMetrics:

type: array

items:

$ref: '#/components/schemas/QoEMetric'

minItems: 1

repPeriod:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

immRepFlag:

type: boolean

description: >

Contains the immediate reporting indication.

true means that immediate reporting is requested.

false means that immediate reporting is not requested.

The default value is false if this attribute is omitted.

required:

- netSliceId

TriggerCond:

description: >

Represents the updated monitored parameters and the corresponding thresholds

which could trigger the AppLayer-NS-LCM.

type: object

properties:

triggerType:

$ref: '#/components/schemas/TriggerType'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

loadLevelThreshold:

type: integer

minimum: 0

maximum: 100

perfThreshold:

type: integer

minimum: 0

maximum: 100

qoeMetrics:

type: array

items:

$ref: '#/components/schemas/QoEMetric'

minItems: 1

required:

- triggerType

QoEMetric:

description: >

Represents the QoE metric type and the corresponding QoE threshold.

type: object

properties:

qoeType:

$ref: '#/components/schemas/QoEType'

latency:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Float'

throughput:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

jitter:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

avgPacketLossRate:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRate'

maxPacketLossRate:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PacketLossRate'

required:

- qoeType

QoEMetricsReportNotif:

description: >

Represents the QoE metrics notification including the QoE Metrics Report.

type: object

properties:

notifCorrId:

type: string

qoEMetricsReport:

$ref: '#/components/schemas/QoEMetricsReport'

required:

- notifCorrId

- qoEMetricsReport

#

# ENUMERATIONS DATA TYPES

#

QoEType:

anyOf:

- type: string

enum:

- LATENCY

- THROUGHPUT

- JITTER

- AVG\_PKT\_LOSS\_RATE

- MAX\_PKT\_LOSS\_RATE

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the QoE metric type, e.g., latency, throughput, jitter, etc.

Possible values are:

- LATENCY: Indicates that the QoE type is latency.

- THROUGHPUT: Indicates that the QoE type is throughput.

- JITTER: Indicates that the QoE type is jitter.

- AVG\_PKT\_LOSS\_RATE: Indicates that the QoE type is the average Packet Loss Rate.

- MAX\_PKT\_LOSS\_RATE: Indicates that the QoE type is the maximum Packet Loss Rate.

TriggerType:

anyOf:

- type: string

enum:

- NETWORK\_SLICE\_LOAD

- NETWORK\_SLICE\_PERFORMANCE

- QOE

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the monitored parameter type, e.g., Network Slice load,

collected Network Slice performance, collected QoE, etc.

Possible values are:

- NETWORK\_SLICE\_LOAD: Indicates that the trigger type is Network Slice Load.

- NETWORK\_SLICE\_PERFORMANCE: Indicates that the trigger type is Network Slice Performance.

- QOE: Indicates that the trigger type is QoE.

SliceLCMAction:

anyOf:

- type: string

enum:

- MODIFY\_CONFIGURATION

- ALLOCATE\_SLICE

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the recommended slice LCM action.

Possible values are:

- MODIFY\_CONFIGURATION: Indicates that the recommended action is modifying the

configuration.

- ALLOCATE\_SLICE: Indicates that the recommended action is allocating a network slice.

# A.4 NSCE\_PolicyManagement API

openapi: 3.0.0

info:

title: NSCE Server Policy Management Service

version: 1.0.0

description: |

NSCE Server Policy Management Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-pm/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/policies:

post:

summary: Request the provisioning of a Policy.

operationId: CreatePolicy

tags:

- Policies (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/Policy'

responses:

'201':

description: >

Created. The Policy is successfully created and a representation of the created

Individual Policy resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/Policy'

headers:

Location:

description: >

Contains the URI of the created Individual Policy resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

HarmonizationNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/HarmonizationNotif'

responses:

'200':

description: >

OK. The Policy Harmonization Notification is successfully received and

processed, and policy harmonization related information shall be returned in the

response body.

content:

application/json:

schema:

$ref: '#/components/schemas/HarmonizationResp'

'204':

description: >

No Content. The Policy Harmonization Notification is successfully received and

processed, and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/policies/delete:

post:

summary: Enables to request the deletion of one or several existing Policy(ies).

operationId: DeletePolicies

tags:

- Policy(ies) Deletion Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/PolDeleteReq'

responses:

'200':

description: >

OK. The Policy(ies) deletion request is successfully received and processed, and

deletion related information shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/PolDeleteResp'

'204':

description: >

No Content. The Policy(ies) deletion request is successfully received and processed, and

no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/policies/{policyId}:

parameters:

- name: policyId

in: path

description: >

Represents the identifier of the Individual Policy resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Policy resource.

operationId: GetIndPolicy

tags:

- Individual Policy (Document)

responses:

'200':

description: >

OK. The requested Individual Policy resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/Policy'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Policy resource.

operationId: UpdateIndDPolicy

tags:

- Individual Policy (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/Policy'

responses:

'200':

description: >

OK. The Individual Policy resource is successfully updated and a representation

of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/Policy'

'204':

description: >

No Content. The Individual Policy resource is successfully updated and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Policy resource.

operationId: ModifyIndPolicy

tags:

- Individual Policy (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/PolicyPatch'

responses:

'200':

description: >

OK. The Individual Policy resource is successfully modified and a representation

of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/Policy'

'204':

description: >

No Content. The Individual Policy resource is successfully modified and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions:

post:

summary: Request the creation of a Policy Usage Subscription.

operationId: CreatePolUsageSubsc

tags:

- Policy Usage Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageSubsc'

responses:

'201':

description: >

Created. The Policy Usage Subscription is successfully created and a representation

of the created Individual Policy Usage Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual Policy Usage Subscription resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

PolUsageNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageNotif'

responses:

'204':

description: >

No Content. The Policy Usage Notification is successfully received and

acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Policy Usage Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Policy Usage Subscription resource.

operationId: GetIndPolUsageSubsc

tags:

- Individual Policy Usage Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Policy Usage Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Policy Usage Subscription resource.

operationId: UpdateIndPolUsageSubsc

tags:

- Individual Policy Usage Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageSubsc'

responses:

'200':

description: >

OK. The Individual Policy Usage Subscription resource is successfully updated and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageSubsc'

'204':

description: >

No Content. The Individual Policy Usage Subscription resource is successfully updated

and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Policy Usage Subscription resource.

operationId: ModifyIndPolUsageSubsc

tags:

- Individual Policy Usage Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/PolUsageSubscPatch'

responses:

'200':

description: >

OK. The Individual Policy Usage Subscription resource is successfully modified and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/PolUsageSubsc'

'204':

description: >

No Content. The Individual Policy Usage Subscription resource is successfully modified

and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Policy Usage Subscription resource.

operationId: DeleteIndPolUsageSubsc

tags:

- Individual Policy Usage Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Policy Usage Subscription resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

Policy:

description: >

Represents a Policy.

type: object

properties:

netSliceId:

$ref: '#/components/schemas/NetSliceId'

reqDnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

polHarmInd:

type: boolean

default: false

description: >

Contains the policy harmonization indication. It indicates whether policy harmonization

is requested or not.

true means that policy harmonization is requested.

false means that policy harmonization is not requested.

The default value when omitted is false.

policy:

$ref: '#/components/schemas/PolicyData'

defaultPolInd:

type: boolean

default: false

description: >

Contains the default policy indication. It indicates whether or not the provisioned

policy shall be used as a default policy for the network slices provisioned without any

policy for the policy type it belongs to.

true means that the provisioned policy shall be used as a default policy for the network

slices provisioned without any policy for the policy type.

false means that the provisioned policy shall not be used as a default policy for the

network slices provisioned without any policy for the policy type.

The default value when omitted is false.

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

harmonizationId:

type: string

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- policy

PolicyPatch:

description: >

Represents the requested modifications to a Policy.

type: object

properties:

netSliceId:

$ref: '#/components/schemas/NetSliceId'

reqDnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

polHarmInd:

type: boolean

description: >

Contains the policy harmonization indication. It indicates whether policy harmonization

is requested or not.

true means that policy harmonization is requested.

false means that policy harmonization is not requested.

The default value when omitted and not previously provisioned is false.

policy:

$ref: '#/components/schemas/PolicyData'

defaultPolInd:

type: boolean

description: >

Contains the default policy indication. It indicates whether or not the provisioned

policy shall be used as a default policy for the network slices provisioned without any

policy.

true means that the provisioned policy shall be used as a default policy for the network

slices provisioned without any policy.

false means that the provisioned policy shall not be used as a default policy for the

network slices provisioned without any policy.

The default value when omitted and not previously provisioned is false.

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

PolicyData:

description: >

Represents the content of a policy.

type: object

properties:

policyType:

$ref: '#/components/schemas/PolicyType'

areaOfInterest:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

triggers:

$ref: '#/components/schemas/PolicyTriggers'

actions:

$ref: '#/components/schemas/PolicyActions'

lifetime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

maxNumTimes:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

priority:

$ref: '#/components/schemas/PriorityLevel'

schedule:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

preemption:

$ref: '#/components/schemas/PriorityLevel'

required:

- policyType

- areaOfInterest

- triggers

- actions

oneOf:

- required: [lifetime]

- required: [maxNumTimes]

PolUsageSubsc:

description: >

Represents a Policy Usage Subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

netSliceId:

$ref: '#/components/schemas/NetSliceId'

reqPolicyRep:

$ref: '#/components/schemas/ReqPolRep'

repPeriodicity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

- netSliceId

- reqPolicyRep

PolUsageSubscPatch:

description: >

Represents the requested modifications to a Policy Usage Subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

reqPolicyRep:

$ref: '#/components/schemas/ReqPolRep'

repPeriodicity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

ReqPolRep:

description: >

Represents the requested policy usage reporting information.

type: object

properties:

policyId:

type: string

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- policyId

- startTime

- endTime

PolUsageNotif:

description: >

Represents a Policy Usage Notification.

type: object

properties:

subscriptionId:

type: string

reports:

type: array

items:

$ref: '#/components/schemas/PolRepData'

minItems: 1

required:

- subscriptionId

- reports

PolRepData:

description: >

Represents policy usage reporting data.

type: object

properties:

policyId:

type: string

count:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

timeSpent:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

preEmptCount:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

preEmptPolId:

type: array

items:

type: string

minItems: 1

required:

- policyId

- count

- timeSpent

PolDeleteReq:

description: >

Represents the parameters to request the deletion of one or several Policy(ies).

type: object

properties:

policyIds:

type: array

items:

type: string

minItems: 1

defPolicyIds:

type: object

additionalProperties:

type: string

minProperties: 1

description: >

Contains the identifier(s) of the policy(ies) that are to be the new default

Policy(ies). Each map entry corresponds to the new default policy for a particular

policy type. There shall not be more than one default policy for the same policy type.

The key of the map shall be the policy type (encoded using the PolicyType enumeration

data type defined in clause 6.3.6.3.3) for which the provided new default policy

identified by the corresponding map value is related.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- policyIds

PolDeleteResp:

description: >

Represents the response to the Policy(ies) deletion request.

type: object

properties:

defPoliciesInfo:

type: object

additionalProperties:

$ref: '#/components/schemas/DefaultPolInfo'

minProperties: 1

description: >

Contains the new default policy(ies) related information. Each map entry corresponds to

the information of the new default policy for a particular policy type.

The key of the map shall be set to the value of the policyType attribute of the

corresponding map entry encoded using the DefaultPolInfo data type.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- defPoliciesInfo

DefaultPolInfo:

description: >

Represents the default policy related information.

type: object

properties:

policyType:

$ref: '#/components/schemas/PolicyType'

defPolicyId:

type: string

priority:

$ref: '#/components/schemas/PriorityLevel'

required:

- policyType

- defPolicyId

HarmonizationNotif:

description: >

Represents a Policy Harmonization Notification.

type: object

properties:

harmonizationId:

type: string

policy:

$ref: '#/components/schemas/PolicyData'

required:

- harmonizationId

- policy

HarmonizationResp:

description: >

Represents the response to a Policy Harmonization Notification.

type: object

properties:

feedback:

type: boolean

description: >

Contains the policy harmonization feedback. It indicates whether the policy

harmonization result is accepted or not.

true means that the policy harmonization result is accepted.

false means that the policy harmonization result is not accepted.

required:

- feedback

NetSliceId:

description: >

Represents the network slice identification information.

type: object

properties:

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

nsiId:

$ref: 'TS29531\_Nnssf\_NSSelection.yaml#/components/schemas/NsiId'

ensi:

$ref: '#/components/schemas/Ensi'

oneOf:

- required: [snssai]

- required: [nsiId]

- required: [ensi]

PolicyTriggers:

description: >

Represents the policy related triggers.

type: object

properties:

monPercentage:

type: integer

minimum: 0

maximum: 100

monValue:

type: integer

minimum: 1

description: Contains an unsigned Integer with only the values 1 and above permitted.

monParamsValues:

type: string

timePeriod:

$ref: '#/components/schemas/TimePeriodInfo'

PolicyActions:

description: >

Represents the policy related actions.

type: object

properties:

stepIncreasePerc:

type: integer

minimum: 0

maximum: 100

allowedQoSActions:

type: array

items:

$ref: '#/components/schemas/QoSAction'

minItems: 1

TimePeriodInfo:

description: >

Represents the time period related information.

type: object

properties:

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

daysOfWeek:

type: array

items:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DayOfWeek'

minItems: 1

maxItems: 7

anyOf:

- required: [startTime]

- required: [endTime]

- required: [daysOfWeek]

# SIMPLE DATA TYPES

#

PriorityLevel:

description: >

Represents an unsigned integer, within the range 1 to 255, indicating the priority level of

a policy or the pre-emption capability of a policy.

type: integer

minimum: 1

maximum: 255

Ensi:

description: >

Represents the External Network Slice Information that is used to identify a network slice,

as specified in 3GPP TS 33.501.

type: string

#

# ENUMERATIONS

#

PolicyType:

anyOf:

- type: string

enum:

- MAX\_NUM\_PDU\_SESS

- MAX\_NUM\_UE

- SLICE\_LOAD\_PREDICTION

- TIME\_PERIOD\_AND\_AVG\_QOS

- TIME\_PERIOD\_AND\_MIN\_QOS

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents policy type.

Possible values are:

- MAX\_NUM\_PDU\_SESS: Indicates that the policy type is the maximum number of PDU Sessions.

- MAX\_NUM\_UE: Indicates that the policy type is the maximum number of UEs Sessions.

- SLICE\_LOAD\_PREDICTION: Indicates that the policy type is the network slice load

prediction.

- TIME\_PERIOD\_AND\_AVG\_QOS: Indicates that the policy type is the time period and average QoS

per UE.

- TIME\_PERIOD\_AND\_MIN\_QOS: Indicates that the policy type is the time period and minimum QoS

per UE.

QoSAction:

anyOf:

- type: string

enum:

- MODIFY

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the QoS related action.

Possible values are:

- MODIFY: Indicates that the QoS related action is to trigger the modification of the

network slice capacity to fulfil the requested needs (e.g., average QoS, minimum QoS).

# A.5 NSCE\_NSOptimization API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Optimization Service

version: 1.0.0

description: |

NSCE Server Network Slice Optimization Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-nso/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549.

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Request the creation of a Network Slice Optimization Subscription.

operationId: CreateNetSliceOptSubsc

tags:

- Network Slice Optimization Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptSubsc'

responses:

'201':

description: >

Created. The Network Slice Optimization Subscription is successfully created and

a representation of the created Individual Network Slice Optimization

Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual Network Slice Optimization

Subscription resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

NetSliceOptNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptNotif'

responses:

'204':

description: >

No Content. The Network Slice Optimization Notification is successfully

received and acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Network Slice Optimization

Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Network Slice Optimization Subscription resource.

operationId: GetIndNetSliceOptSubsc

tags:

- Individual Network Slice Optimization Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Network Slice Optimization Subscription resource shall

be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the fully update of an existing Individual Network Slice Optimization Subscription resource.

operationId: UpdateIndNetSliceOptSubsc

tags:

- Individual Network Slice Optimization Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptSubsc'

responses:

'200':

description: >

OK. The Individual Network Slice Optimization Subscription resource is

successfully updated and a representation of the updated resource shall be returned

in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptSubsc'

'204':

description: >

No Content. The Individual Network Slice Optimization Subscription resource is

successfully updated and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the partially update of an existing Individual Network Slice Optimization Subscription resource.

operationId: ModifyIndNetSliceOptSubsc

tags:

- Individual Network Slice Optimization Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/NetSliceOptSubscPatch'

responses:

'200':

description: >

OK. The Individual Network Slice Optimization Subscription resource is

successfully modified and a representation of the updated resource shall be returned

in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/NetSliceOptSubsc'

'204':

description: >

No Content. The Individual Network Slice Optimization Subscription resource is

successfully modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Network Slice Optimization Subscription resource.

operationId: DeleteIndNetSliceOptSubsc

tags:

- Individual Network Slice Optimization Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Network Slice Optimization Subscription resource is

successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

NetSliceOptSubsc:

type: object

description: Represents a Network Slice Optimization subscription.

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

dnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

policyId:

type: string

description: Identifies the VAL server policy.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

secPolicId:

type: string

description: Identifies the the secondary policy for the network slice optimization.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

anyOf:

- required: [netSliceId]

- required: [dnn]

- required: [policyId]

- required: [expTime]

- required: [secPolicId]

NetSliceOptSubscPatch:

type: object

description: >

Represents the requested modifications to a Network Slice Optimization subscription.

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

dnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

policyId:

type: string

description: Identifies the VAL server policy.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTimeRm'

secPolicId:

type: string

description: Identifies the the secondary policy for the network slice optimization.

required:

- notifUri

anyOf:

- required: [netSliceId]

- required: [dnn]

- required: [policyId]

- required: [expTime]

- required: [secPolicId]

NetSliceOptNotif:

type: object

description: Represents a Network Slice Optimization notification.

properties:

subscriptionId:

type: string

description: Identifies the Network slice optimization subscribe event.

sliceInfo:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/NSInfoSet'

optTime:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'

enforPolId:

type: string

description: Indicates the policy used for slice optimization.

required:

- subscriptionId

- sliceInfo

# A.6 NSCE\_ManagementServiceDiscovery API

openapi: 3.0.0

info:

title: NSCE\_ManagementServiceDiscovery

version: 1.0.0

description: |

NSCE\_ManagementServiceDiscovery Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Exposure (NSCE) Server Service(s); Stage 3.

url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-msd/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Request the creation of a Management Discovery Subscription.

operationId: CreateMngtDiscSubsc

tags:

- Management Discovery Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscSubsc'

responses:

'201':

description: >

Created. The Management Discovery Subscription is successfully created and a

representation of the created Individual Management Discovery Subscription resource

shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscSubsc'

headers:

Location:

description: >

Contains the URI of the newly created resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

ManagementDiscoveryNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscNotif'

responses:

'204':

description: >

No Content. The Management Discovery Notification is successfully received and

processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Management Discovery Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Management Discovery Subscription resource.

operationId: GetIndMngtDiscSubsc

tags:

- Individual Management Discovery Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Management Discovery Subscription resource shall be

returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Management Discovery Subscription resource.

operationId: UpdateIndMngtDiscSubsc

tags:

- Individual Management Discovery Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscSubsc'

responses:

'200':

description: >

OK. The Individual Management Discovery Subscription resource is successfully updated

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscSubsc'

'204':

description: >

No Content. The Individual Management Discovery Subscription resource is successfully

updated and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Management Discovery Subscription resource.

operationId: ModifyIndMngtDiscSubsc

tags:

- Individual Management Discovery Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/MnSDiscSubscPatch'

responses:

'200':

description: >

OK. The Individual Management Discovery Subscription resource is successfully modified

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MnSDiscSubsc'

'204':

description: >

No Content. The Individual Management Discovery Subscription resource is successfully

modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Management Discovery Subscription resource.

operationId: DeleteIndMngtDiscSubsc

tags:

- Individual Management Discovery Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Management Discovery Subscription resource is successfully

deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

MnSDiscSubsc:

description: Represents a Management Discovery Subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

expCapReqs:

$ref: '#/components/schemas/ExpCapReqs'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

MnSDiscSubscPatch:

description: Represents the requested modifications to a Management Discovery Subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

expCapReqs:

$ref: '#/components/schemas/ExpCapReqs'

MnSDiscNotif:

description: Represents a Management Discovery Notification.

type: object

properties:

mnSDomainId:

type: string

mnSs:

type: array

items:

$ref: '#/components/schemas/MnSInfo'

minItems: 1

required:

- mnSDomainId

- mnSs

MnSInfo:

description: Represents the Management Services related information.

type: object

properties:

mnSIds:

type: array

items:

type: string

minItems: 1

mnSCap:

type: string

mnSPerms:

type: array

items:

$ref: '#/components/schemas/MnSPermission'

minItems: 1

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

required:

- mnSIds

- mnSCap

ExpCapReqs:

description: Represents the exposure capability requirements.

type: object

properties:

reqPerm:

type: array

items:

$ref: '#/components/schemas/MnSPermission'

minItems: 1

expCapType:

type: array

items:

$ref: '#/components/schemas/ExpCapType'

minItems: 1

anyOf:

- required: [reqPerm]

- required: [expCapType]

#

# ENUMERATIONS DATA TYPES

#

MnSPermission:

anyOf:

- type: string

enum:

- READ

- WRITE

- DELETE

- UPDATE

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the permissions for exposing information related to the target slice over the MnS.

Possible values are:

- READ: Indicates the allowed permission of the VAL server to read over the MnS.

- WRITE: Indicates the allowed permission of the VAL server to write over the MnS.

- DELETE: Indicates the allowed permission of the VAL server to delete over the MnS.

- UPDATE: Indicates the allowed permission of the VAL server to update over the MnS.

ExpCapType:

anyOf:

- type: string

enum:

- VIA\_EGMF

- DIRECT

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the exposure capability type.

Possible values are:

- VIA\_EGMF: Indicates the supported exposure capability is via EGMF.

- DIRECT: Indicates the supported exposure capability is directly to MnS producer.

# A.7 NSCE\_PerfMonitoring API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Performance and Analytics Monitoring Service

version: 1.0.0

description: |

NSCE Server Network Slice Performance and Analytics Monitoring Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-pam/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/jobs:

post:

summary: Request the creation of a Monitoring Job.

operationId: CreateMonJob

tags:

- Monitoring Jobs (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringJob'

responses:

'201':

description: >

Created. The Monitoring Job is successfully created and a representation of the

created Individual Monitoring Job resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringJob'

headers:

Location:

description: >

Contains the URI of the created Individual Monitoring Job resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/jobs/{jobId}:

parameters:

- name: jobId

in: path

description: >

Represents the identifier of the Individual Monitoring Job resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Monitoring Job resource.

operationId: GetIndMonJob

tags:

- Individual Monitoring Job (Document)

responses:

'200':

description: >

OK. The requested Individual Monitoring Job resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringJob'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Monitoring Job resource.

operationId: UpdateIndMonJob

tags:

- Individual Monitoring Job (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringJob'

responses:

'200':

description: >

OK. The Individual Monitoring Job resource is successfully updated and a representation

of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringJob'

'204':

description: >

No Content. The Individual Monitoring Job resource is successfully updated and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Monitoring Job resource.

operationId: ModifyIndMonJob

tags:

- Individual Monitoring Job (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/MonitoringJobPatch'

responses:

'200':

description: >

OK. The Individual Monitoring Job resource is successfully modified and a representation

of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringJob'

'204':

description: >

No Content. The Individual Monitoring Job resource is successfully modified and no

content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Monitoring Job resource.

operationId: DeleteIndMonJob

tags:

- Individual Monitoring Job (Document)

responses:

'204':

description: >

No Content. The Individual Monitoring Job resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions:

post:

summary: Request the creation of a Monitoring Subscription.

operationId: CreateMonSubsc

tags:

- Monitoring Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringSubsc'

responses:

'201':

description: >

Created. The Monitoring Subscription is successfully created and a representation of the

created Individual Monitoring Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual Monitoring Subscription resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

MonitoringNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringNotif'

responses:

'204':

description: >

No Content. The Monitoring Notification is successfully received and

acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscId}:

parameters:

- name: subscId

in: path

description: >

Represents the identifier of the Individual Monitoring Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Monitoring Subscription resource.

operationId: GetIndMonSubsc

tags:

- Individual Monitoring Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Monitoring Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Monitoring Subscription resource.

operationId: UpdateIndMonSubsc

tags:

- Individual Monitoring Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringSubsc'

responses:

'200':

description: >

OK. The Individual Monitoring Subscription resource is successfully updated and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringSubsc'

'204':

description: >

No Content. The Individual Monitoring Subscription resource is successfully updated

and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Monitoring Subscription resource.

operationId: ModifyIndMonSubsc

tags:

- Individual Monitoring Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/MonitoringSubscPatch'

responses:

'200':

description: >

OK. The Individual Monitoring Subscription resource is successfully modified and a

representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringSubsc'

'204':

description: >

No Content. The Individual Monitoring Subscription resource is successfully modified

and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Monitoring Subscription resource.

operationId: DeleteIndMonSubsc

tags:

- Individual Monitoring Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Monitoring Subscription resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/request:

post:

summary: Enables to request a multiple slices related performance and analytics consolidated reporting.

operationId: MultiSlicesMonRepReq

tags:

- Multiple Slices related Performance and Analytics Consolidated Reporting Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringReq'

responses:

'200':

description: >

OK. The requested multiple slices related performance and analytics consolidated report

shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/MonitoringResp'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

MonitoringJob:

description: >

Represents a Monitoring Job.

type: object

properties:

monMetrics:

type: object

additionalProperties:

$ref: '#/components/schemas/MonitoringMetric'

minProperties: 1

description: >

Contains the requested performance and analytics monitoring metric(s).

The key of the map shall be any unique string encoded value.

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- monMetrics

MonitoringJobPatch:

description: >

Represents the requested modifications to a Monitoring Job.

type: object

properties:

monMetrics:

type: object

additionalProperties:

$ref: '#/components/schemas/MonitoringMetric'

minProperties: 1

description: >

Contains the updated requested performance and analytics monitoring metric(s).

The key of the map shall be any unique string encoded value and shall be set to the same

value as the one provided during the creation of the corresponding Monitoring Job.

MonitoringMetric:

description: >

Represents the parameters of a network slice related performance and analytics monitoring

metric.

type: object

properties:

valServId:

type: string

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

perfAnalyList:

type: array

items:

$ref: '#/components/schemas/MonPerfAnalytics'

minItems: 1

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- perfAnalyList

- startTime

anyOf:

- required: [valServId]

- required: [netSliceIds]

MonPerfAnalytics:

description: >

Represents a monitored performance or analytics information.

metric.

type: object

properties:

monNetSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

metricName:

$ref: '#/components/schemas/MonPerfMetric'

metricCustName:

type: string

required:

- metricName

MonitoringSubsc:

description: >

Represents a Monitoring Subscription.

type: object

properties:

reqReportingList:

type: object

additionalProperties:

$ref: '#/components/schemas/ReportingInfo'

minProperties: 1

description: >

Contains the requested performance and analytics reporting information.

The key of the map shall be any unique string encoded value.

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- reqReportingList

- notifUri

MonitoringSubscPatch:

description: >

Represents the requested modifications to a Monitoring Subscription.

type: object

properties:

monMetrics:

type: object

additionalProperties:

$ref: '#/components/schemas/ReportingInfo'

minProperties: 1

description: >

Contains the updated requested performance and analytics reporting information.

The key of the map shall be any unique string encoded value and shall be set to the same

value as the one provided during the creation of the corresponding Monitoring

Subscription.

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

ReportingInfo:

description: >

Represents the network slice related performance and analytics monitoring reporting

information.

type: object

properties:

valServId:

type: string

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

perfAnalyList:

type: array

items:

$ref: '#/components/schemas/MonPerfAnalytics'

minItems: 1

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

repPeriodicity:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DurationSec'

required:

- perfAnalyList

- startTime

- endTime

anyOf:

- required: [valServId]

- required: [netSliceIds]

MonitoringNotif:

description: >

Represents a Monitoring Notification.

type: object

properties:

subscId:

type: string

reports:

type: array

items:

$ref: '#/components/schemas/ReportingData'

minItems: 1

required:

- subscId

- reports

ReportingData:

description: >

Represents a network slice related performance and analytics monitoring report.

type: object

properties:

valServId:

type: string

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

perfResults:

type: array

items:

$ref: '#/components/schemas/MonPerfAnalyRes'

minItems: 1

required:

- perfResults

anyOf:

- required: [valServId]

- required: [netSliceIds]

MonPerfAnalyRes:

description: >

Represents a monitored performance or analytics result.

metric.

type: object

properties:

monNetSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

metricName:

$ref: '#/components/schemas/MonPerfMetric'

metricCustName:

type: string

metricValue:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bytes'

required:

- metricName

- metricValue

MonitoringReq:

description: >

Represents a multiple slices related performance and analytics consolidated reporting

request.

type: object

properties:

monMetrics:

type: array

items:

$ref: '#/components/schemas/MonReqMetrics'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- monMetrics

MonitoringResp:

description: >

Represents a multiple slices related performance and analytics consolidated reporting

response.

type: object

properties:

perfResults:

type: array

items:

$ref: '#/components/schemas/MonRespRepData'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- perfResults

MonReqMetrics:

description: >

Represents the parameters of a network slice related performance and analytics monitoring

metric used within a multiple slices related performance and analytics consolidated

reporting request.

type: object

properties:

valServId:

type: string

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

perfAnalyList:

type: array

items:

$ref: '#/components/schemas/MonPerfAnalytics'

minItems: 1

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- perfAnalyList

- startTime

- endTime

anyOf:

- required: [valServId]

- required: [netSliceIds]

MonRespRepData:

description: >

Represents a network slice related performance and analytics monitoring report instance

provided as part of a multiple slices related performance and analytics consolidated

reporting response.

type: object

properties:

valServId:

type: string

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

perfResults:

type: array

items:

$ref: '#/components/schemas/MonPerfAnalyRes'

minItems: 1

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- perfResults

- startTime

- endTime

anyOf:

- required: [valServId]

- required: [netSliceIds]

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

MonPerfMetric:

anyOf:

- type: string

enum:

- RTT

- E2E\_LATENCY

- PACKET\_LOSS

- RETRANSMISSIONS

- THROUGHPUT

- NUM\_OF\_REG\_UES

- NUM\_OF\_EST\_PDU\_SESS

- RESOURCE\_USAGE

- LOAD\_LEVEL

- OTHER

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents a performance or analytics metric.

Possible values are:

- RTT: Indicates that the performance or analytics metric is the round-trip time within the

network slice.

- E2E\_LATENCY: Indicates that the performance or analytics metric is the E2E Latency within

the network slice.

- PACKET\_LOSS: Indicates that the performance or analytics metric is the packet loss within

the network slice.

- RETRANSMISSIONS: Indicates that the performance or analytics metric is the retransmissions

within the network slice.

- THROUGHPUT: Indicates that the performance or analytics metric is the throughput within

the network slice.

- NUM\_OF\_REG\_UES: Indicates that the performance or analytics metric is the number of

registered UEs within the network slice.

- NUM\_OF\_EST\_PDU\_SESS: Indicates that the performance or analytics metric is the number of

established PDU Sessions within the network slice.

- RESOURCE\_USAGE: Indicates that the performance or analytics metric is the resources usage

within the network slice.

- LOAD\_LEVEL: Indicates that the performance or analytics metric is the load level within

the network slice.

- OTHER: Indicates that the performance or analytics metric is a custom metric.

# A.8 NSCE\_InfoCollection API

openapi: 3.0.0

info:

title: NSCE\_InfoCollection

version: 1.0.1

description: |

NSCE\_InfoCollection Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.2.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-ic/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Request the creation of an Information Collection Subscription.

operationId: CreateInfoCollectSubscription

tags:

- Information Collection Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectSubsc'

responses:

'201':

description: >

Created. The Information Collection Subscription is successfully created and a

representation of the created Individual Information Collection Subscription resource

shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectSubsc'

headers:

Location:

description: >

Contains the URI of the newly created resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

InfoCollectNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectNotif'

responses:

'204':

description: >

No Content. The Information Collection Notification is successfully received.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Information Collection Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Information Collection Subscription resource.

operationId: GetIndInfoCollectSubscription

tags:

- Individual Information Collection Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Information Collection Subscription resource shall be

returned.

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Information Collection Subscription resource.

operationId: UpdateIndInfoCollectSubcription

tags:

- Individual Information Collection Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectSubsc'

responses:

'200':

description: >

OK. The Individual Information Collection Subscription resource is successfully updated

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectSubsc'

'204':

description: >

OK. The Individual Information Collection Subscription resource is successfully updated

and a representation of the updated resource shall be returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Information Collection Subscription resource.

operationId: ModifyIndInfoCollectSubscription

tags:

- Individual Information Collection Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/InfoCollectSubscPatch'

responses:

'200':

description: >

OK. The Individual Information Collection Subscription resource is successfully modified

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/InfoCollectSubsc'

'204':

description: >

No Content. The Individual Information Collection Subscription resource is successfully

modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Information Collection Subscription resource.

operationId: DeleteIndInfoCollectSubcription

tags:

- Individual Information Collection Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Information Collection Subscription resource is successfully

modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

InfoCollectSubsc:

description: Represents an Information Collection subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

collectInfo:

type: object

additionalProperties:

$ref: '#/components/schemas/CollectInfo'

minProperties: 1

description: >

Contains the information collected from the interested Network slice.

The key of the map shall be any unique string encoded value.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

netSlicePerf:

type: array

items:

$ref: 'TS29435\_NSCE\_PerfMonitoring.yaml#/components/schemas/ReportingData'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

- collectInfo

InfoCollectSubscPatch:

description: Represents the requested modifications of an Information Collection subscription.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

collectInfo:

type: object

additionalProperties:

$ref: '#/components/schemas/CollectInfo'

minProperties: 1

description: >

Contains the information collected from the interested Network slice.

The key of the map shall be any unique string encoded value and shall be set to the same

value as the as the one provided during the creation of the corresponding Information

Collection Subscription.

expTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

InfoCollectNotif:

description: Represents an Information Collection Notification.

type: object

properties:

subscriptionId:

type: string

description: >

Contains the identifier of the subscription to which the notification is related.

netSlicePerf:

type: array

description: Contains the network slice related performance and analytics report(s).

items:

$ref: 'TS29435\_NSCE\_PerfMonitoring.yaml#/components/schemas/ReportingData'

minItems: 1

required:

- subscriptionId

- netSlicePerf

CollectInfo:

type: object

properties:

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

qosMetrics:

type: array

items:

$ref: '#/components/schemas/QoSMetric'

minItems: 1

repPeriod:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/DurationSec'

immRepFlag:

type: boolean

description: Identifies the request needs immediate reporting or not.

required:

- netSliceId

QoSMetric:

type: object

properties:

qosType:

$ref: '#/components/schemas/QoSType'

latency:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Float'

throughput:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/BitRate'

jitter:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

required:

- qosType

#

# ENUMERATIONS DATA TYPES

#

QoSType:

anyOf:

- type: string

enum:

- LATENCY

- THROUGHPUT

- JITTER

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the QoS metric type.

Possible values are:

- LATENCY: Indicates that the QoS type is latency.

- THROUGHPUT: Indicates that the QoS type is throughput.

- JITTER: Indicates that the QoS type is jitter.

# A.9 NSCE\_ServiceContinuity API

openapi: 3.0.0

info:

title: NSCE Server Edge Service Continuity Service

version: 1.0.1

description: |

NSCE Server Edge Service Continuity Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.2.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-esc/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549.

security:

- {}

- oAuth2ClientCredentials: []

paths:

/request:

post:

summary: Enables to request Edge service continuity requirement.

operationId: EdgeSCRequirementReq

tags:

- Edge Service Continuity Requirement Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EdgeSCRequirementReq'

responses:

'204':

description: >

No Content. The Edge service continuity requirement request is successfully

received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

EdgeSCRequirementNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EdgeSCRequirementNotif'

responses:

'204':

description: >

No Content. The Edge Service Continuity requirement Notification

is successfully received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/negotiate:

post:

summary: Enables to request Edge service continuity negotiation.

operationId: EdgeSCNegotiationReq

tags:

- Edge Service Continuity Negotiation Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EdgeSCNegotiationReq'

responses:

'204':

description: >

No Content. The Edge service continuity Negotiation request is successfully

received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

EdgeSCNegotiationNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/EdgeSCNegotiationNotif'

responses:

'204':

description: >

No Content. The Edge Service Continuity Negotiation Notification is

successfully received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

EdgeSCRequirementReq:

description: >

Represents the parameters to request Edge Service Continuity Requirement.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

valServId:

type: string

description: >

The identifier of the VAL service for which the requirement request applies.

valUeIds:

type: array

items:

type: string

minItems: 1

description: >

The list of VAL UE IDs for which the requirement request applies.

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

servContReq:

$ref: 'TS29435\_NSCE\_InterPLMNContinuity.yaml#/components/schemas/ServContReq'

targetServArea:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServId

- servContReq

- notifUri

EdgeSCRequirementNotif:

description: >

Represents an Edge Service Continuity Requirement Notification.

type: object

properties:

valServId:

type: string

description: >

The identifier of the VAL service for which the requirement request applies.

valUeIds:

type: array

items:

type: string

minItems: 1

description: >

The list of VAL UE IDs for which the requirement request applies.

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

tgtNsceServId:

type: string

description: >

Contains the identifier of the target NSCE Server.

tgtNsceAddr:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/EndPoint'

targetServArea:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

required:

- valServId

- netSliceId

- tgtNsceServId

- tgtNsceAddr

- targetServArea

EdgeSCNegotiationReq:

description: >

Represents the parameters to request Edge Service Continuity Negotiation.

type: object

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

valServId:

type: string

description: >

The identifier of the VAL service for which the negotiation request applies.

valUeIds:

type: array

items:

type: string

minItems: 1

description: >

The list of VAL UE IDs for which the Negotiation request applies.

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

servContReq:

$ref: 'TS29435\_NSCE\_InterPLMNContinuity.yaml#/components/schemas/ServContReq'

appQoSReqs:

$ref: 'TS29435\_NSCE\_InterPLMNContinuity.yaml#/components/schemas/AppReqs'

triggerAction:

$ref: '#/components/schemas/TriggerAction'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServId

- servContReq

- netSliceId

- notifUri

EdgeSCNegotiationNotif:

description: >

Represents an Edge Service Continuity Negotiation Notification.

type: object

properties:

valServId:

type: string

description: >

The identifier of the VAL service for which the negotiation request applies.

triggerAction:

$ref: '#/components/schemas/TriggerAction'

required:

- valServId

- triggerAction

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

TriggerAction:

anyOf:

- type: string

enum:

- SLICE\_LIFECYCLE\_CHG

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the trigger action.

Possible values are:

- SLICE\_LIFECYCLE\_CHG: Indicates that the trigger action is slice lifecycle change.

# A.10 NSCE\_MultiSlicesOptimization API

openapi: 3.0.0

info:

title: NSCE Server Multiple Slices Optimization Service

version: 1.0.0

description: |

NSCE Server Multiple Slices Optimization Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-mso/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/request:

post:

summary: Request multiple slices optimization.

operationId: ReqMultiSlicesOptim

tags:

- Multiple Slices Optimization Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/MultiSlicesOptReq'

responses:

'204':

description: >

No Content. The multiple slices optimization request is successfully received and

processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

MultiSlicesOptReq:

description: >

Represents the multiple slices optimization request.

type: object

properties:

valServId:

type: string

description: Represents the identifier of the VAL service.

optZone:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

snssais:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServId

# A.11 NSCE\_NetworkSliceAdaptation API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Adaptation Service

version: 1.1.0

description: |

NSCE Server Network Slice Adaptation Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/ss-nsa/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/request:

post:

summary: Request network slice adaptation.

operationId: RequestNetworkSliceAdaptation

tags:

- Network Slice Adaptation Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NwSliceAdptInfo'

responses:

'204':

description: >

No Content. The network slice adaptation request is successfully received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

description: >

The request is rejected by the NSCE Server and additional details (along with

ProblemDetails data structure) may be returned.

content:

application/problem+json:

schema:

$ref: '#/components/schemas/ProblemDetailsSliceAdapt'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

AdaptStatusNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/AdaptStatusNotif'

responses:

'204':

description: >

No Content. The Network Slice Adaptation Status Notification is successfully

received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

NwSliceAdptInfo:

description: >

Represents the information associated with requested network slice adaptation

with the underlying network.

type: object

properties:

valServiceId:

type: string

valTgtUeIds:

type: array

items:

type: string

minItems: 1

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

monNetSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

minItems: 1

dnn:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

reqAdaptThres:

type: array

items:

$ref: '#/components/schemas/AdaptThreshold'

minItems: 1

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServiceId

- valTgtUeIds

not:

required: [snssai, netSliceId]

AdaptThreshold:

description: >

Represents the network slice adaptation threshold.

type: object

properties:

threshName:

$ref: '#/components/schemas/AdaptThresholdName'

threshValue:

$ref: '#/components/schemas/AdaptThresholdValue'

required:

- threshName

- threshValue

AdaptStatusNotif:

description: >

Represents a Network Slice Adaptation Status Notification.

type: object

properties:

status:

type: boolean

description: >

Contains the network slice adaptation status. It indicates whether the network slice

adaptation was successful or not.

true means that the network slice adaptation was successful.

false means that the network slice adaptation failed.

failureCause:

$ref: '#/components/schemas/AdaptFailCause'

required:

- status

# SIMPLE DATA TYPES

#

AdaptFailCause:

description: >

Represents the network slice adaptation failure cause.

type: string

AdaptThresholdName:

description: >

Represents the name of the adaptation threshold.

type: string

AdaptThresholdValue:

description: >

Represents the value of the adaptation threshold.

type: string

#

# ENUMERATIONS

#

#

# Data types describing alternative data types or combinations of data types

#

ProblemDetailsSliceAdapt:

description: >

Represents an extension to the ProblemDetails data structure with potentially additional

error information related to network slice adaptation failure.

allOf:

- $ref: 'TS29122\_CommonData.yaml#/components/schemas/ProblemDetails'

- $ref: '#/components/schemas/AdaptFailCause'

# A.12 NSCE\_SliceCommService API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Communication Service

version: 1.0.0

description: |

NSCE Server Network Slice Communication Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-scs/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/services:

post:

summary: Request the creation of a Slice Related Communication Service.

operationId: CreateSliceCommServ

tags:

- Slice Related Communication Services (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceCommService'

responses:

'201':

description: >

Created. The Slice Related Communication Service is successfully created and a

representation of the created Individual Slice Related Communication Service resource

shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceCommService'

headers:

Location:

description: >

Contains the URI of the created Individual Slice Related Communication Service

resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/services/{servId}:

parameters:

- name: servId

in: path

description: >

Represents the identifier of the Individual Slice Related Communication Service resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Slice Related Communication Service resource.

operationId: GetIndSliceCommServ

tags:

- Individual Slice Related Communication Service (Document)

responses:

'200':

description: >

OK. The requested Individual Slice Related Communication Service resource shall be

returned.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceCommService'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Slice Related Communication Service resource.

operationId: UpdateIndSliceCommServ

tags:

- Individual Slice Related Communication Service (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceCommService'

responses:

'200':

description: >

OK. The Individual Slice Related Communication Service resource is successfully updated

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceCommService'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Slice Related Communication Service resource.

operationId: ModifyIndSliceCommServ

tags:

- Individual Slice Related Communication Service (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/SliceCommServicePatch'

responses:

'200':

description: >

OK. The Individual Slice Related Communication Service resource is successfully modified

and a representation of the updated resource shall be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceCommService'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Slice Related Communication Service resource.

operationId: DeleteIndSliceCommServ

tags:

- Individual Slice Related Communication Service (Document)

responses:

'204':

description: >

No Content. The Individual Slice Related Communication Service resource is successfully

deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

SliceCommService:

description: >

Represents a Slice Related Communication Service.

type: object

properties:

valServName:

type: string

valServId:

type: string

areaOfInterest:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

servProfile:

type: object

additionalProperties:

$ref: '#/components/schemas/ServReq'

minProperties: 1

description: >

Represents the requested VAL service profile containing the application requirements of

the VAL service to be supported.

The key of the map shall be any unique string encoded value.

sliceInfo:

$ref: '#/components/schemas/NetSliceInfo'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServName

- valServId

- areaOfInterest

- servProfile

SliceCommServicePatch:

description: >

Represents the requested modifications to a Slice Related Communication Service.

type: object

properties:

areaOfInterest:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

servProfile:

type: object

additionalProperties:

$ref: '#/components/schemas/ServReq'

minProperties: 1

nullable: true

description: >

Represents the updated requested VAL service profile containing the application

requirements of the VAL service to be supported.

The key of the map shall be any unique string encoded value and shall be set to the same

value as the one provided during the creation of the corresponding Slice Related

Communication Service.

ServReq:

description: >

Represents a set of application service requirements.

type: object

properties:

reqName:

type: string

reqValue:

type: string

required:

- reqName

- reqValue

NetSliceInfo:

description: >

Represents network slice related information.

type: object

properties:

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

attributes:

$ref: 'TS28541\_SliceNrm.yaml#/components/schemas/ServiceProfile'

anyOf:

- required: [snssai]

- required: [attributes]

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

# A.13 NSCE\_InterPLMNContinuity API

openapi: 3.0.0

info:

title: NSCE Server Inter-PLMN Service Continuity Service

version: 1.0.0

description: |

NSCE Server Inter-PLMN Service Continuity Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-ipc/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/request:

post:

summary: Enables to request inter-PLMN application service continuity.

operationId: InterPlmnServContReq

tags:

- Inter-PLMN Application Service Continuity Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InterPlmnServContReq'

responses:

'204':

description: >

No Content. The inter-PLMN application service continuity request is successfully

received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

InterPlmnServContNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/InterPlmnServContNotif'

responses:

'204':

description: >

No Content. The Inter-PLMN Service Continuity Notification is successfully

received and processed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

InterPlmnServContReq:

description: >

Represents the parameters to request inter-PLMN application service continuity.

type: object

properties:

valServId:

type: string

ueIds:

type: array

items:

type: string

minItems: 1

servContReq:

$ref: '#/components/schemas/ServContReq'

targetPlmnId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnId'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

targetServArea:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minItems: 1

appQoSReqs:

$ref: '#/components/schemas/AppReqs'

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServId

- servContReq

- targetPlmnId

- netSliceId

- notifUri

AppReqs:

description: >

Represents application QoS requirements.

type: object

properties:

reliability:

format: float

type: number

minimum: 0

maximum: 100

delay:

type: integer

minimum: 1

jitter:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uint32'

anyOf:

- required: [reliability]

- required: [delay]

- required: [jitter]

InterPlmnServContNotif:

description: >

Represents an Inter-PLMN Service Continuity Notification.

type: object

properties:

valServId:

type: string

ueIds:

type: array

items:

type: string

minItems: 1

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

plmnId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/PlmnId'

targetServArea:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minItems: 1

required:

- valServId

- netSliceId

- plmnId

- targetServArea

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

ServContReq:

anyOf:

- type: string

enum:

- EXPECTED\_MIGRATION

- PREDICTED\_MIGRATION

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents a service continuity requirement.

Possible values are:

- EXPECTED\_MIGRATION: Indicates that the service continuity requirement is the expected

migration of the VAL application (or a list of VAL UE(s) of the VAL application) to a

target area.

- PREDICTED\_MIGRATION: Indicates that the service continuity requirement is the predicted

migration of the VAL application (or a list of VAL UE(s) of the VAL application) to a

target area.

# A.14 NSCE\_NSDiagnostics API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Diagnostics Service

version: 1.0.0

description: |

NSCE Server Network Slice Diagnostics Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-nsd/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/request:

post:

summary: Request network slice diagnostics information.

operationId: RequestNSDiagnostics

tags:

- Network Slice Diagnostics Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NwSliceDiagReq'

responses:

'200':

description: >

The network slice diagnostics request is successful received and processed

and the requested network slice diagnostics information shall be returned in the

response body.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/NwSliceDiagResp'

minItems: 1

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

NwSliceDiagReq:

description: >

Represents the network slice diagnostics request.

type: object

properties:

servDgradInfos:

$ref: '#/components/schemas/ServDgradInfo'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- servDgradInfos

NwSliceDiagResp:

description: >

Represents the requested network slice diagnostics report.

type: object

properties:

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

dataReport:

type: array

items:

$ref: '#/components/schemas/DataReport'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- startTime

- endTime

- dataReport

ServDgradInfo:

description: >

Represents the degraded service information.

type: object

properties:

valServiceId:

type: string

reqErrors:

type: array

items:

$ref: '#/components/schemas/ErrorInfo'

minItems: 1

required:

- valServiceId

- reqErrors

ErrorInfo:

description: >

Represents error related information.

type: object

properties:

errorName:

$ref: '#/components/schemas/Error'

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

ueIds:

type: array

items:

type: string

minItems: 1

areaOfInterest:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

startTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

endTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/DateTime'

required:

- errorName

- netSliceId

- startTime

- endTime

DataReport:

description: >

Represents the reported data.

type: object

properties:

errorName:

$ref: '#/components/schemas/Error'

dataType:

$ref: '#/components/schemas/DataType'

dataOutput:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bytes'

required:

- errorName

- dataType

- dataOutput

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

Error:

anyOf:

- type: string

enum:

- COMMUNICATION\_ERROR

- RTT\_ABOVE\_LIMIT

- QOS\_DOWNGRADE

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the errors causing service degradation.

Possible values are:

- COMMUNICATION\_ERROR: Indicates that the service degradation is due to a detected

communication error.

- RTT\_ABOVE\_LIMIT: Indicates that the service degradation is due to the packet round trip

time exceeding an upper threshold limit.

- QOS\_DOWNGRADE: Indicates that the service degradation is due to QoS being downgraded.

DataType:

anyOf:

- type: string

enum:

- UE\_DATA

- NETWORK\_DATA

- APPLICATION\_DATA

- type: string

description: >

This string provides forward-compatibility with future

extensions to the enumeration and is not used to encode

content defined in the present version of this API.

description: |

Represents the reported data type.

Possible values are:

- UE\_DATA: Indicates that the reported data type is UE data.

- NETWORK\_DATA: Indicates that the reported data type is Network data.

- APPLICATION\_DATA: Indicates that the reported data type is Application data.

# A.15 NSCE\_FaultDiagnosis API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Fault Diagnosis Service

version: 1.0.0

description: |

NSCE Server Network Slice Fault Diagnosis Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-fd/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549.

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Request the creation of a Network Slice Fault Diagnosis Subscription.

operationId: CreateFaultDiagSubsc

tags:

- Network Slice Fault Diagnosis Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagSubsc'

responses:

'201':

description: >

Created. The Network Slice Fault Diagnosis Subscription is successfully created

and a representation of the created Individual Network Slice Fault Diagnosis

Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual Network Slice Fault Diagnosis

Subscription resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

FaultDiagNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagNotif'

responses:

'204':

description: >

No Content. The Network Slice Fault Diagnosis Notification is successfully

received and acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Network Slice Fault Diagnosis

Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Network Slice Fault Diagnosis Subscription resource.

operationId: GetIndFaultDiagSubsc

tags:

- Individual Network Slice Fault Diagnosis Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Network Slice Fault Diagnosis Subscription resource shall

be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the fully update of an existing Individual Network Slice Fault Diagnosis Subscription resource.

operationId: UpdateIndFaultDiagSubsc

tags:

- Individual Network Slice Fault Diagnosis Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagSubsc'

responses:

'200':

description: >

OK. The Individual Network Slice Fault Diagnosis Subscription resource is

successfully updated and a representation of the updated resource shall be returned

in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagSubsc'

'204':

description: >

No Content. The Individual Network Slice Fault Diagnosis Subscription resource is

successfully updated and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the partially update of an existing Individual Network Slice Fault Diagnosis Subscription resource.

operationId: ModifyIndFaultDiagSubsc

tags:

- Individual Network Slice Fault Diagnosis Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/FaultDiagSubscPatch'

responses:

'200':

description: >

OK. The Individual Network Slice Fault Diagnosis Subscription resource is

successfully modified and a representation of the updated resource shall be returned

in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/FaultDiagSubsc'

'204':

description: >

No Content. The Individual Network Slice Fault Diagnosis Subscription resource is

successfully modified and no content is returned in the response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Network Slice Fault Diagnosis Subscription resource.

operationId: DeleteIndFaultDiagSubsc

tags:

- Individual Network Slice Fault Diagnosis Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Network Slice Fault Diagnosis Subscription resource is

successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

FaultDiagSubsc:

type: object

description: Represents a Network Slice Fault Diagnosis subscription.

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

valServId:

type: string

description: >

Contains the identifier of the VAL Service to which the fault diagnosis is related.

valUeIds:

type: array

items:

type: string

description: >

Contains the list of the identifier(s) of the VAL UE(s) to which the subscription

is related.

minItems: 1

faultDiagInfo:

type: array

items:

$ref: '#/components/schemas/FaultDiagInformation'

description: Contains the fault diagnosis information.

minItems: 1

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

description: Contains the identifier(s) of the network slice to be monitored.

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

- valServId

FaultDiagSubscPatch:

type: object

description: >

Represents the requested modifications to a Network Slice Fault Diagnosis subscription.

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

faultDiagInfo:

type: array

items:

$ref: '#/components/schemas/FaultDiagInformation'

description: Contains the updated fault diagnosis information.

minItems: 1

valUeIds:

type: array

items:

type: string

description: >

Contains the list of the identifier(s) of the VAL UE(s) to which the subscription

is related.

minItems: 1

netSliceIds:

type: array

items:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

description: Contains the updated identifier(s) of the network slice to be monitored.

minItems: 1

FaultDiagNotif:

type: object

description: Represents a Network Slice Fault Diagnosis notification.

properties:

subscriptionId:

type: string

description: >

Contains the identifier of the subscription to which the Network Slice Fault

Diagnosis Notification is related.

faultRep:

$ref: '#/components/schemas/FaultReportInfo'

required:

- subscriptionId

- faultRep

FaultReportInfo:

type: object

description: Represents the report of the fault diagnosis.

properties:

corelAlarm:

type: array

items:

$ref: '#/components/schemas/CorrelatedAlarm'

description: >

Contains the list of the correlated alarms.

minItems: 1

required:

- corelAlarm

CorrelatedAlarm:

type: object

description: Represents the correlated alarm information.

properties:

alarmType:

$ref: '#/components/schemas/AlarmType'

priority:

$ref: '#/components/schemas/Priority'

rootCause:

type: boolean

description: Indicates whether the event is the root cause of the events.

required:

- alarmType

FaultDiagInformation:

type: object

description: Represents the fault diagnosis information.

properties:

monitorTime:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

alarmType:

$ref: '#/components/schemas/AlarmType'

#

# ENUMERATIONS

#

AlarmType:

anyOf:

- type: string

enum:

- COMMUNICATIONS\_ALARM

- PROCESSING\_ERROR\_ALARM

- ENVIRONMENTAL\_ALARM

- QUALITY\_OF\_SERVICE\_ALARM

- EQUIPMENT\_ALARM

- INTEGRITY\_VIOLATION

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the alarm type(s).

Possible values are:

- COMMUNICATIONS\_ALARM: An alarm associated with the procedures and/or processes required

to convey information from one point to another.

- PROCESSING\_ERROR\_ALARM: An alarm associated with a software or processing fault.

- ENVIRONMENTAL\_ALARM: An alarm associated with a condition relating to an enclosure in

which the equipment resides.

- QUALITY\_OF\_SERVICE\_ALARM: An alarm associated with a degradation in the quality of a

service.

- EQUIPMENT\_ALARM: An alarm associated with an equipment fault.

- INTEGRITY\_VIOLATION: An indication that information may have been illegally modified,

inserted or deleted.

Priority:

anyOf:

- type: string

enum:

- CRITICAL

- MAJOR

- MINOR

- IGNORE

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the prioritization of the fault associated with the correlated alarm.

Possible values are:

- CRITICAL: Indicates the prioritization of the fault is critical.

- MAJOR: Indicates the prioritization of the fault is major.

- MINOR: Indicates the prioritization of the fault is minor.

- IGNORE: Indicates the prioritization of the fault is ignore.

# A.16 NSCE\_SliceReqVerifyAndAlign API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Requirements Verification and Alignment Service

version: 1.0.0

description: |

NSCE Server Network Slice Requirements Verification and Alignment Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-srva/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549.

security:

- {}

- oAuth2ClientCredentials: []

paths:

/subscriptions:

post:

summary: Request the creation of a Network Slice Requirements Verification and Alignment Subscription.

operationId: CreateSliceReqVerAlignSubsc

tags:

- Network Slice Requirements Verification and Alignment Subscriptions (Collection)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubsc'

responses:

'201':

description: >

Created. The Network Slice Requirements Verification and Alignment Subscription

is successfully created and a representation of the created Individual Network

Slice Requirements Verification and Alignment Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubsc'

headers:

Location:

description: >

Contains the URI of the created Individual Network Slice Requirements Verification

and Alignment Subscription resource.

required: true

schema:

type: string

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

callbacks:

SliceReqVerAlignNotif:

'{$request.body#/notifUri}':

post:

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignNotif'

responses:

'204':

description: >

No Content. The Network Slice Requirements Verification and Alignment

Notification is successfully received and acknowledged.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/subscriptions/{subscriptionId}:

parameters:

- name: subscriptionId

in: path

description: >

Represents the identifier of the Individual Network Slice Requirements Verification

and Alignment Subscription resource.

required: true

schema:

type: string

get:

summary: Retrieve an existing Individual Network Slice Requirements Verification and Alignment Subscription resource.

operationId: GetIndSliceReqVerAlignSubsc

tags:

- Individual Network Slice Requirements Verification and Alignment Subscription (Document)

responses:

'200':

description: >

OK. The requested Individual Network Slice Requirements Verification and Alignment

Subscription resource shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubsc'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

put:

summary: Request the update of an existing Individual Network Slice Requirements Verification and Alignment Subscription resource.

operationId: UpdateIndSliceReqVerAlignSubsc

tags:

- Individual Network Slice Requirements Verification and Alignment Subscription (Document)

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubsc'

responses:

'200':

description: >

OK. The Individual Network Slice Requirements Verification and Alignment Subscription

resource is successfully updated and a representation of the updated resource shall

be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubsc'

'204':

description: >

No Content. The Individual Network Slice Requirements Verification and Alignment

Subscription resource is successfully updated and no content is returned in the

response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

patch:

summary: Request the modification of an existing Individual Network Slice Requirements Verification and Alignment Subscription resource.

operationId: ModifyIndSliceReqVerAlignSubsc

tags:

- Individual Network Slice Requirements Verification and Alignment Subscription (Document)

requestBody:

required: true

content:

application/merge-patch+json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubscPatch'

responses:

'200':

description: >

OK. The Individual Network Slice Requirements Verification and Alignment Subscription

resource is successfully modified and a representation of the updated resource shall

be returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/SliceReqVerAlignSubsc'

'204':

description: >

No Content. The Individual Network Slice Requirements Verification and Alignment

Subscription resource is successfully modified and no content is returned in the

response body.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

delete:

summary: Request the deletion of an existing Individual Network Slice Requirements Verification and Alignment Subscription resource.

operationId: DeleteIndSliceReqVerAlignSubsc

tags:

- Individual Network Slice Requirements Verification and Alignment Subscription (Document)

responses:

'204':

description: >

No Content. The Individual Network Slice Requirements Verification and Alignment

Subscription resource is successfully deleted.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

SliceReqVerAlignSubsc:

type: object

description: >

Represents a Network Slice Requirements Verification and Alignment subscription.

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

valServId:

type: string

description: >

Contains the identifier of the VAL Service to which the requirement request is related.

valUeIds:

type: array

items:

type: string

description: >

Contains the list of the identifier(s) of the VAL UE(s) to which the subscription

is related.

minItems: 1

sliceReq:

type: array

items:

$ref: 'TS28541\_SliceNrm.yaml#/components/schemas/ServiceProfile'

description: >

Contains the list of the slice requirements which need to be verified and aligned.

minItems: 1

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- notifUri

- valServId

- sliceReq

- netSliceId

SliceReqVerAlignSubscPatch:

type: object

description: >

Represents the requested modifications to a Network Slice Requirements Verification

and Alignment subscription.

properties:

notifUri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

valUeIds:

type: array

items:

type: string

description: >

Contains the updated list of the identifier(s) of the VAL UE(s) to which the

subscription is related.

minItems: 1

sliceReq:

type: array

items:

$ref: 'TS28541\_SliceNrm.yaml#/components/schemas/ServiceProfile'

minItems: 1

description: >

Contains the updated list of the slice requirements which need to be verified and

aligned.

netSliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

SliceReqVerAlignNotif:

type: object

description: >

Represents a Network Slice Requirements Verification and Alignment notification.

properties:

subscriptionId:

type: string

description: >

Contains the identifier of the subscription to which the Network Slice Requirements

Verification and Alignment Notification is related.

sliceReqInfo:

type: array

items:

$ref: 'TS28541\_SliceNrm.yaml#/components/schemas/ServiceProfile'

minItems: 1

description: >

Contains the information of the updated slice requirements (i.e., parameters and

characteristics).

required:

- subscriptionId

- sliceReqInfo

#

# ENUMERATIONS

#

# A.17 NSCE\_NSInfoDelivery API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Information Delivery Service

version: 1.0.0

description: |

NSCE Server Network Slice Information Delivery Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-nsid/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/slice-info-sets:

get:

summary: Request the retrieval of Network Slice Information.

operationId: RetrieveNetSliceInfo

tags:

- Network Slice Information Sets (Collection)

parameters:

- name: val-serv-id

in: query

description: Contains the identifier of the targeted VAL service.

required: true

schema:

type: string

- name: req-slice-info

in: query

description: Contains the requested Network Slice Information type(s).

required: false

schema:

type: array

items:

$ref: '#/components/schemas/ReqSliceInfo'

minItems: 1

- name: supp-feats

in: query

description: >

Contains the list of supported features among the ones defined in clause 6.16.8.

This query parameter shall be present only when feature negotiation needs to take

place.

required: false

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

responses:

'200':

description: >

OK. The representation(s) of the "Individual Network Slice Information Set" resource(s)

corresponding to the requested Network Slice Information shall be returned.

content:

application/json:

schema:

$ref: '#/components/schemas/NSInfoRetResp'

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'406':

$ref: 'TS29122\_CommonData.yaml#/components/responses/406'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

/slice-info-sets/deliver:

post:

summary: Enables to request Network Slice Information delivery to another entity.

operationId: DeliverNetSliceInfo

tags:

- Network Slice Information Delivery

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NSInfoDelReq'

responses:

'204':

description: >

No Content. The Network Slice Information delivery request is successfully received,

processed and completed.

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

NSInfoRetResp:

description: >

Represents a Network Slice Information Retrieval response.

type: object

properties:

sliceInfo:

$ref: '#/components/schemas/NSInfoSet'

required:

- sliceInfo

NSInfoDelReq:

description: >

Represents a Network Slice Information Delivery request.

type: object

properties:

valServId:

type: string

valUeIds:

type: array

items:

type: string

minItems: 1

reqSliceInfo:

type: array

items:

$ref: '#/components/schemas/ReqSliceInfo'

minItems: 1

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServId

- valUeIds

NSInfoSet:

description: >

Represents a Network Slice Information Set.

type: object

properties:

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

sst:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

sliceCovArea:

$ref: '#/components/schemas/ServArea'

anyOf:

- required: [snssai]

- required: [sst]

- required: [sliceCovArea]

ServArea:

description: >

Represents the network Slice Coverage Area.

type: object

properties:

tais:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Tai'

minItems: 1

geoAreas:

type: array

items:

$ref: 'TS29572\_Nlmf\_Location.yaml#/components/schemas/GeographicArea'

minItems: 1

anyOf:

- required: [tais]

- required: [geoAreas]

# SIMPLE DATA TYPES

#

#

# ENUMERATIONS

#

ReqSliceInfo:

anyOf:

- type: string

enum:

- SNSSAI

- SST

- SLICE\_COV\_AREA

- type: string

description: >

This string provides forward-compatibility with future extensions to the enumeration

and is not used to encode content defined in the present version of this API.

description: |

Represents the requested Network Slice Information type.

Possible values are:

- SNSSAI: Indicates that the requested Network Slice Information is the S-NSSAI.

- SST: Indicates that the requested Network Slice Information is the SST.

- SLICE\_COV\_AREA: Indicates that the requested Network Slice Information is the Slice

Coverage Area.

# A.18 NSCE\_NSAllocation API

openapi: 3.0.0

info:

title: NSCE Server Network Slice Allocation Service

version: 1.0.0

description: |

NSCE Server Network Slice Allocation Service.

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externalDocs:

description: >

3GPP TS 29.435 V18.1.0; Service Enabler Architecture Layer for Verticals (SEAL);

Network Slice Capability Enablement (NSCE) Server Service(s); Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.435/

servers:

- url: '{apiRoot}/nsce-nsa/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/request:

post:

summary: Request network slice allocation.

operationId: RequestNSAllocation

tags:

- Network Slice Allocation Request

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/NwSliceAllocReq'

responses:

'200':

description: >

The network slice allocation request is successful received and processed

and the requested network slice allocation information shall be returned in the

response body.

content:

application/json:

schema:

type: array

items:

$ref: '#/components/schemas/NwSliceAllocResp'

minItems: 1

'307':

$ref: 'TS29122\_CommonData.yaml#/components/responses/307'

'308':

$ref: 'TS29122\_CommonData.yaml#/components/responses/308'

'400':

$ref: 'TS29122\_CommonData.yaml#/components/responses/400'

'401':

$ref: 'TS29122\_CommonData.yaml#/components/responses/401'

'403':

$ref: 'TS29122\_CommonData.yaml#/components/responses/403'

'404':

$ref: 'TS29122\_CommonData.yaml#/components/responses/404'

'411':

$ref: 'TS29122\_CommonData.yaml#/components/responses/411'

'413':

$ref: 'TS29122\_CommonData.yaml#/components/responses/413'

'415':

$ref: 'TS29122\_CommonData.yaml#/components/responses/415'

'429':

$ref: 'TS29122\_CommonData.yaml#/components/responses/429'

'500':

$ref: 'TS29122\_CommonData.yaml#/components/responses/500'

'503':

$ref: 'TS29122\_CommonData.yaml#/components/responses/503'

default:

$ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

securitySchemes:

oAuth2ClientCredentials:

type: oauth2

flows:

clientCredentials:

tokenUrl: '{tokenUrl}'

scopes: {}

schemas:

#

# STRUCTURED DATA TYPES

#

NwSliceAllocReq:

description: >

Represents the network slice allocation request.

type: object

properties:

valServiceId:

type: string

description: Represents the VAL service identifier.

valUeIds:

type: array

items:

type: string

minItems: 1

description: Represents the list of VAL UEs ID.

locArea:

$ref: 'TS29435\_NSCE\_NSInfoDelivery.yaml#/components/schemas/ServArea'

sliceId:

$ref: 'TS29435\_NSCE\_PolicyManagement.yaml#/components/schemas/NetSliceId'

nwSliceServProf:

$ref: 'TS28541\_SliceNrm.yaml#/components/schemas/ServiceProfile'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServiceId

- locArea

NwSliceAllocResp:

description: >

Represents the network slice allocation information.

type: object

properties:

snssai:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

nwSliceServProf:

$ref: 'TS28541\_SliceNrm.yaml#/components/schemas/ServiceProfile'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- snssai

- nwSliceServProf

Annex B (informative):  
Withdrawn API versions

# B.1 General

This Annex lists withdrawn API versions of the APIs defined in the present specification. clause 4.3.1.6 of 3GPP TS 29.501 [3] describes the withdrawal of API versions.

# B.2 NSCE\_SliceApiManagement API

The API versions listed in table B.2-1 are withdrawn for the NSCE\_SliceApiManagement API.

Table B.2-1: Withdrawn API versions of the NSCE\_SliceApiManagement service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.3 NSCE\_NetSliceLifeCycleMngt API

The API versions listed in table B.3-1 are withdrawn for the NSCE\_NetSliceLifeCycleMngt API.

Table B.3-1: Withdrawn API versions of the NSCE\_NetSliceLifeCycleMngt service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.4 NSCE\_PolicyManagement API

The API versions listed in table B.4-1 are withdrawn for the NSCE\_PolicyManagement API.

Table B.4-1: Withdrawn API versions of the NSCE\_PolicyManagement service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.5 NSCE\_NSOptimization API

The API versions listed in table B.5-1 are withdrawn for the NSCE\_NSOptimization API.

Table B.5-1: Withdrawn API versions of the NSCE\_NSOptimization service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.6 NSCE\_ManagementServiceDiscovery API

The API versions listed in table B.6-1 are withdrawn for the NSCE\_ManagementServiceDiscovery API.

Table B.6-1: Withdrawn API versions of the NSCE\_ManagementServiceDiscovery service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.7 NSCE\_PerfMonitoring API

The API versions listed in table B.7-1 are withdrawn for the NSCE\_PerfMonitoring API.

Table B.7-1: Withdrawn API versions of the NSCE\_PerfMonitoring service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.8 NSCE\_InfoCollection API

The API versions listed in table B.2-1 are withdrawn for the NSCE\_InfoCollection API.

Table B.8-1: Withdrawn API versions of the NSCE\_InfoCollection service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.9 NSCE\_ServiceContinuity API

The API versions listed in table B.9-1 are withdrawn for the NSCE\_ServiceContinuity API.

Table B.9-1: Withdrawn API versions of the NSCE\_ServiceContinuity service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.10 NSCE\_MultiSlicesOptimization API

The API versions listed in table B.10-1 are withdrawn for the NSCE\_MultiSlicesOptimization API.

Table B.10-1: Withdrawn API versions of the NSCE\_MultiSlicesOptimization service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.11 NSCE\_NetworkSliceAdaptation API

The API versions listed in table B.11-1 are withdrawn for the NSCE\_NetworkSliceAdaptation API.

Table B.11-1: Withdrawn API versions of the NSCE\_NetworkSliceAdaptation service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.12 NSCE\_SliceCommService API

The API versions listed in table B.12-1 are withdrawn for the NSCE\_SliceCommService API.

Table B.12-1: Withdrawn API versions of the NSCE\_SliceCommService service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.13 NSCE\_InterPLMNContinuity API

The API versions listed in table B.13-1 are withdrawn for the NSCE\_InterPLMNContinuity API.

Table B.13-1: Withdrawn API versions of the NSCE\_InterPLMNContinuity service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.14 NSCE\_NSDiagnostics API

The API versions listed in table B.14-1 are withdrawn for the NSCE\_NSDiagnostics API.

Table B.14-1: Withdrawn API versions of the NSCE\_NSDiagnostics service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.15 NSCE\_FaultDiagnosis API

The API versions listed in table B.15-1 are withdrawn for the NSCE\_FaultDiagnosis API.

Table B.15-1: Withdrawn API versions of the NSCE\_FaultDiagnosis service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.16 NSCE\_SliceReqVerifyAndAlign API

The API versions listed in table B.16-1 are withdrawn for the NSCE\_SliceReqVerifyAndAlign API.

Table B.16-1: Withdrawn API versions of the NSCE\_SliceReqVerifyAndAlign service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.17 NSCE\_NSInfoDelivery API

The API versions listed in table B.17-1 are withdrawn for the NSCE\_NSInfoDelivery API.

Table B.17-1: Withdrawn API versions of the NSCE\_NSInfoDelivery service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

# B.18 NSCE\_NSAllocation API

The API versions listed in table B.18-1 are withdrawn for the NSCE\_NSAllocation API.

Table B.18-1: Withdrawn API versions of the NSCE\_NSAllocation service

|  |  |
| --- | --- |
| API version number | Remarks |
|  |  |

Annex C (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** | |
| 2023-11 | CT3#131 | C3-235391 |  |  |  | TS Skeleton | 0.0.0 | |
| 2023-12 | CT3#131 | C3-235577 |  |  |  | Version agreed via email approval.  Inclusion of C3-235550, C3-235551, C3-235578, C3-235579,  C3-235580, C3-235630, C3-235631, C3-235632 | 0.1.1 | |
| 2024-01 | CT3#132e | C3-240153 |  |  |  | Version agreed via email approval.  Inclusion of C3-240176, C3-240177, C3-240178, C3-240179,  C3-240185, C3-240186, C3-240187, C3-240188, C3-240189,  C3-240191, C3-240192, C3-240193, C3-240194, C3-240195,  C3-240196, C3-240231, C3-240233, C3-240240, C3-240250,  C3-240251. | 0.2.0 | |
| 2024-03 | CT3#133 | C3-241656 |  |  |  | Version agreed via email approval.  Inclusion of C3-241229, C3-241230, C3-241231, C3-241232,  C3-241325, C3-241327, C3-241329, C3-241535, C3-241536,  C3-241693, C3-241694, C3-241722. | 0.3.0 | |
| 2024-03 | CT#103 | CP-240282 |  |  |  | Presentation to TSG CT for approval. | 1.0.0 | |
| 2024-03 | CT#103 | CP-240282 |  |  |  | Approved by TSG CT. | 18.0.0 | |
| 2024-06 | CT#104 | CP-241089 | 0009 |  | F | Corrections to NSCE\_FaultDiagnosis API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0010 |  | F | Corrections to NSCE\_InfoCollection API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0011 |  | F | Corrections to NSCE\_NSOptimization API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0012 |  | F | Corrections to NSCE\_PerfMonitoring API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0013 |  | F | Corrections to NSCE\_PolicyManagement API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0014 |  | F | Corrections to NSCE\_SliceCommService API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0015 | 1 | F | Corrections to NSCE\_SliceReqVerifyAndAlign API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0016 | 1 | F | Correction of the full name of NSCE | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0017 | 1 | B | Definition of service operation clause of the NSCE\_ServiceContinuity API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0018 | 1 | B | Definition of the API clause of the NSCE\_ServiceContinuity API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0019 | 2 | F | Definition of the OpenAPI file of the NSCE\_ServiceContinuity API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0020 | 2 | F | Support of Fault diagnosis information | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0021 |  | F | Various corrections | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0022 | 1 | F | Correct the reference number for TS 29.122 in some occurrences in the TS | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0023 | 2 | F | Updates to the definition of the NSCE\_NetSliceLifeCycleMngt API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0024 | 1 | F | Remove duplicated 5.11.2.2.1 and void 6.17 | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0025 |  | F | Corrections to Notifications | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0027 |  | F | Correction of service name for NSCE\_NetSliceLifeCycleMngt | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0028 |  | F | Correction of service name for NSCE\_NSAllocation | 18.1.0 | |
| 2024-06 | CT#104 | CP-241089 | 0030 |  | F | Corrections to the data structures in the response body. | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0031 |  | F | EN resolutions within NSCE\_NSAllocation API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0032 |  | F | Corrections to NSCE\_InfoCollection data model and open API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0033 | 1 | F | Corrections to NSCE\_InterPLMNContinuity data model and open API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0034 |  | F | Corrections to NSCE\_NetSliceLifeCycleMngt data model | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0035 |  | F | Corrections to NetworkSliceAdaptation data model and open API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0036 |  | F | Corrections to NSCE\_PolicyManagement data model and open API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0037 | 1 | B | Corrections of Overview and Reference | 18.1.0 | |
| 2024-06 | CT#104 | CP-241090 | 0039 | 1 | F | Various essential corrections | 18.1.0 | |
| 2024-06 | CT#104 | CP-241257 | 0040 | 2 | B | Update on NSCE\_NetSliceLifeCycleMngt API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241258 | 0041 | 2 | B | Update on NSCE\_ManagementServiceDiscovery API | 18.1.0 | |
| 2024-06 | CT#104 | CP-241085 | 0042 |  | F | Update of info and externalDocs fields | 18.1.0 | |
| 2024-07 | CT#104 |  |  |  |  | Correction to fix OpenAPI parsing errors | 18.1.1 | |
| 2024-09 | CT#105 | CP-242130 | 0044 |  | F | Corrections to the NSCE\_PolicyManagement API definition | 18.2.0 | |
| 2024-09 | CT#105 | CP-242130 | 0045 | 1 | F | Corrections to the NSCE\_InfoCollection API definition | 18.2.0 | |
| 2024-09 | CT#105 | CP-242130 | 0046 | 1 | F | Corrections to the NSCE\_ServiceContinuity API definition | 18.2.0 | |
| 2024-09 | CT#105 | CP-242130 | 0047 |  | F | Corrections to the NSCE\_SliceReqVerifyAndAlign API definition | 18.2.0 | |
| 2024-09 | CT#105 | CP-242130 | 0048 |  | F | Corrections to the NSCE\_NSAllocation API definition | 18.2.0 | |
| 2024-09 | CT#105 | CP-242130 | 0049 |  | F | Corrections to the NSCE\_NetSliceLifeCycleMngt API definition | 18.2.0 | |
| 2024-09 | CT#105 | CP-242120 | 0050 |  | F | Update of info and externalDocs fields | 18.2.0 | |
| 2024-09 | CT#105 | CP-242114 | 0043 | 1 | F | Correct presence field for some of the attributes | 19.0.0 | |