**3GPP TSG-CT3 Meeting #132eC3-240046**

**e-meeting, 22nd** **– 24th November 2023**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Pseudo-CR on defining the resources and data model clauses of the NSCE**\_**NSDiagnostics API**

**Spec: 3GPP TS 29.435 V 0.1.1**

**Agenda item: 18.49 (NSCALE)**

**Document for: Agreement**

**1. Introduction**

As specified in clause 9.14 of TS 23.435, the NSCE\_NSDiagnostics Service API was defined in order to support the functionality of receiving Network Slice Diagnostics for specified events by the VAL server.

The stage 3 definition of this API in this specification needs hence to be started.

**2. Reason for Change**

Update the definition of the resources and data model clauses of the new NSCE\_NSDiagnostics Service API in the new TS 29.435.

**3. Conclusions**

N/A

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.435 V 0.1.1.

\* \* \* \* Start of changes \* \* \* \*

## 6.14 NSCE\_NSDiagnostics API

### 6.14.1 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 "ss-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 6.14, the NSCE Server 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\_NSDiagnostics API.

### 6.14.3 Resources

There are no resources defined for this API in this release of the specification.

### 6.14.4 Custom Operations without associated resources

#### 6.14.4.1 Overview

The structure of the custom operation URIs of the NSCE\_NSDiagnostics API is shown in Figure 6.14.4.1-1.



Figure 6.14.4.1-1: Custom operation URI structure of the NSCE\_NSDiagnostics API

Table 6.14.4.1-1 provides an overview of the custom operation and applicable HTTP methods defined for the NSCE\_NSDiagnostics API.

Table 6.14.4.1-1: 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 6.14.4.1-2.

Table 6.14.4.1-2: URI variables for this custom operation

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See clause 6.14.1. |

#### 6.14.4.2 Operation: Request

##### 6.14.4.2.1 Description

The custom operation allows a service consumer to request network slice diagnostics information to the NSCE Server.

##### 6.14.4.2.2 Operation Definition

This operation shall support the request data structures specified in table 6.14.4.2.2-1 and the response data structures and response codes specified in table 6.14.4.2.2-2.

Table 6.14.4.2.2-1: 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 6.14.4.2.2-2: 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 6.14.4.2.2-3: 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 6.14.4.2.2-4: 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. |

### 6.14.5 Notifications

There are no notifications defined for this API in this release of the specification.

### 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 specifically for the NSCE\_NSDiagnostics API.

Table 6.14.6.1-1: NSCE\_NSDiagnostics API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| DataType | 6.14.6.3.4 | Represents the reported data type. |  |
| Error | 6.14.6.3.3 | Represents the service degradation related error. |  |
| ErrorInfo | 6.14.6.2.5 | Represents error related information. |  |
| NwSliceDiagReq | 6.14.6.2.2 | Represents the information associated with requested network slice diagnostics. |  |
| NwSliceDiagResp | 6.14.6.2.3 | Represents the network slice diagnostics report. |  |
| ServDgradInfo | 6.14.6.2.4 | Represents the service degraded information. |  |
| DataReport | 6.14.6.2.6 | Represents the reported data. |  |

Table 6.14.6.1-2 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 6.14.6.1-2: 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. |  |
| LocationArea5G | 3GPP TS 29.122 [2] | Represents a location area. |  |
| NetSliceId | 6.3.6.2.15 | Represents the identification information of a network slice. |  |
| SupportedFeatures | 3GPP TS 29.571 [16] | Used to negotiate the applicability of the optional features. |  |
| NOTE: Properties marked with a feature as defined in clause 5.14.6 are applicable as described in clause 5.2.7 of 3GPP TS 29.122 [2]. If no feature is indicated, the related property applies for all the features. |

#### 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: NwSliceDiagReq

Table 6.14.6.2.2-1: 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 6.14.8.This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.14.6.2.3 Type: NwSliceDiagResp

Table 6.14.6.2.3-1: Definition of type NwSliceDiagRep

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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 6.14.8.This attribute shall be present only when feature negotiation needs to take place. |  |

##### 6.14.6.2.4 Type: ServDgradInfo

Table 6.14.6.2.4-1: 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. |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |

##### 6.14.6.2.5 Type: ErrorInfo

Table 6.14.6.2.5-1: 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 | LocationArea5G | O | 0..1 | Contains the area within which the requested service degradation applies.(NOTE) |  |
| 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. |  |

##### 6.14.6.2.6 Type: DataReport

Table 6.14.6.2.6-1: 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..N | Represents the diagnostics data based. |  |

#### 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: Error

The enumeration Error represents the service degradation related error. It shall comply with the provisions defined in table 6.14.6.3.3-1.

Table 6.14.6.3.3-1: 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. |  |

#### 6.14.6.3.4 Enumeration: DataType

The enumeration DataTyperepresents the reported data type. It shall comply with the provisions defined in table 6.14.6.3.4-1.

Table 6.14.6.3.4-1: 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. |  |

#### 6.14.6.4 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\_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 For the NSCE\_NSDiagnostics API.

#### 6.14.7.2 Protocol Errors

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

#### 6.14.7.3 Application Errors

The application errors defined for NSCE\_NSDiagnostics 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 listed in table 6.14.8-1 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 6.14.8-1: Supported Features

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

### 6.14.9 Security

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

\* \* \* \* End of changes \* \* \* \*