**3GPP TSG-CT3 Meeting #130C3-234126**

**Xiamen, China, 9th – 13th October 2023**

**Source: Huawei**

**Title: Pseudo-CR on applying various updates and corrections**

**Spec: 3GPP TS 29.548 V 0.3.0**

**Agenda item: 18.22 (SEALDD)**

**Document for: Agreement**

**1. Introduction**

The following issues have been identified:

- The Introduction clause needs to be removed as it is not needed for this TS.

- The "DD" abbreviation should be used in clause 5.4.1 to align with the other clauses of this TS.

- The "Initiated by" column of Table 5.4.2.1-1 should be updated to contain "e.g.," as for the other similar clauses and enable future extensibility/reuse of the API.

- As this TS defined the APIs exposed by a SEAL Server (i.e., SEALDD Server), the references to the general/common protocol and interface definition clauses should point to TS 29.549, which is the main TS documenting the APIs of the SEAL Servers. TS 29.549 is anyway referencing the relevant clauses of TS 29.122. It is hence needed to change the existing references to TS 29.122 to the corresponding references to TS 29.549.

- The level of numbering of the error handling clauses of the SDD\_DDContext API is incorrect.

- The TransType attribute is updated to be defined as an enumeration to avoid any unsupported values and the corresponding descriptions/provisions are updated to avoid confusing the path segment value (e.g., "urllc") with its meaning (e.g., "URLLC transmission").

- The service description clauses of the SEALDD connection status events subscription/notification are completed. An EN is added on the subscription update/deletion operation waiting for SA6's feedback.

- The successful DD Context push response should be a "201 Created" response as it is a creation of a new resource.

- The name of the data types related to the connection status subscription/notification API are updated to avoid confusion and align with the corresponding service operations names.

- The "DDContextPushResp" data type's name is changed to "DDContextResp" so that it can be used for both push and pull responses. Its content is updated accordingly.

- Various other editorial issues.

- Update the obsoleted HTTP RFCs as per the agreement in the frame of the discussion paper in C4-233140.

**2. Reason for Change**

Correct the above listed issues.

**3. Conclusions**

N/A

**4. Proposal**

It is proposed to agree the following changes to 3GPP TS 29.548 V 0.3.0.

\* \* \* \* Start of Changes \* \* \* \*

\* \* \* \* Next Changes \* \* \* \*

# 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 23.434: "Service Enabler Architecture Layer for Verticals (SEAL); Functional architecture and information flows".

[7] 3GPP TS 23.433: "Service Enabler Architecture Layer for Verticals (SEAL); Data Delivery enabler for vertical applications".

[8] 3GPP TS 23.222: "Common API Framework for 3GPP Northbound APIs; Stage 2".

[9] 3GPP TS 29.222: "Common API Framework for 3GPP Northbound APIs; Stage 3".

[10] 3GPP TS 33.122: "Security aspects of Common API Framework (CAPIF) for 3GPP northbound APIs".

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

[12] IETF RFC 9113: "HTTP/2".

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

[14] IETF RFC 7807: "Problem Details for HTTP APIs".

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

[16] 3GPP TS 29.508: "5G System; Session Management Event Exposure Service; Stage 3".

[17] 3GPP TS 29.558: "Enabling Edge Applications; Application Programming Interface (API) specification; Stage 3".

[18] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

\* \* \* \* Next Changes \* \* \* \*

### 5.4.1 Service Description

The SDD\_DDContext service exposed by the SEALDD server via the SEALDD-E reference point enables a service consumer (e.g., SEALDD server) to:

- push the DD context to the new SEALDD server; and

- pull the DD context from the old SEALDD server.

\* \* \* \* Next Changes \* \* \* \*

#### 5.4.2.1 Introduction

The service operations defined for the SDD\_DDContext API are shown in the table 5.4.2.1-1.

Table 5.4.2.1-1: Operations of the SDD\_DDContext API

|  |  |  |
| --- | --- | --- |
| Service operation name | Description | Initiated by |
| SDD\_DDContext\_Push | This service operation is used by the old SEALDD server to push the DD context to the new SEALDD server. | e.g., SEALDD server |
| SDD\_DDContext\_Pull | This service operation is used by the new SEALDD server to pull the DD context from the old SEALDD server. | e.g., SEALDD server |

\* \* \* \* Next Changes \* \* \* \*

### 5.2.1 Service Description

The SDD\_Transmission service exposed by the SEALDD Server enables a service consumer (e.g. VAL Server) to:

- request SEALDD enabled Regular or URLLC application data transmission; and

- subscribe to / receive notifications on SEALDD connection status event(s).

\* \* \* \* Next Changes \* \* \* \*

### 5.2.2 Service Operations

#### 5.2.2.1 Introduction

The service operations defined for the SDD\_Transmission service are shown in table 5.5.2.1-1.

Table 5.5.2.1-1: SDD\_Transmission Service Operations

|  |  |  |
| --- | --- | --- |
| Service Operation Name | Description | Initiated by |
| SDD\_Transmission\_Request | This service operation enables a service consumer to request SEALDD enabled regular or URLLC application data transmission. | e.g. VAL Server |
| SDD\_Transmission\_ConnStatusSubscribe | This service operation enables a service consumer to request the creation of a subscription to SEALDD connection status event(s) reporting. | e.g. VAL Server |
| SDD\_Transmission\_ConnStatusNotify | This service operation enables a service consumer to receive SEALDD connection status event(s) notifications. | SEALDD Server |

\* \* \* \* Next Changes \* \* \* \*

\* \* \* \* Next Changes \* \* \* \*

##### 5.2.2.2.1 General

This service operation is used by a service consumer (e.g. VAL Server) to request SEALDD enabled Regular or URLLC application data transmission to the SEALDD Server.

The following procedures are supported by the "SDD\_Transmission\_Request" service operation:

- SEALDD Transmission Request.

\* \* \* \* Next Changes \* \* \* \*

##### 5.2.2.2.2 SEALDD Transmission Request

Figure 5.2.2.2.2-1 depicts a scenario where a service consumer (e.g. VAL Server) sends a request to the SEALDD Server to request SEALDD enabled Regular or URLLC application data transmission (see also clauses 9.2 and 9.3 of 3GPP°TS°23.433°[7]).



Figure 5.2.2.2.2-1: Procedure for SEALDD Transmission Request

1. In order to request SEALDD enabled Regular or URLLC application data transmission, the service consumer (e.g. VAL Server) shall send an HTTP POST request to the SEALDD Server targeting the URI of the corresponding custom operation (i.e., "RequestTrans"), with the request body including the TransReq data structure. The "{transType}" URI variable path segment shall be set to either:

- "regular", when Regular application data transmission is requested; or

- "urllc", when URLLC application data transmission is requested.

2a. Upon success, the SEALDD Server shall respond with an HTTP "200 OK" status code with the response body containing the TransResp 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.

\* \* \* \* Next Changes \* \* \* \*

##### 5.2.2.3.1 General

This service operation is used by a service consumer (e.g. VAL Server) to request to create a subscription to SEALDD connection status event(s) reporting.

The following procedures are supported by the "SDD\_Transmission\_ConnStatusSubscribe service operation:

- SEALDD Connection Status Subscription Creation.

- SEALDD Connection Status Subscription Update.

- SEALDD Connection Status Subscription Deletion.

\* \* \* \* Next Changes \* \* \* \*

##### 5.2.2.3.2 SEALDD Connection Status Subscription Creation

Figure 5.2.2.3.2-1 depicts a scenario where a service consumer (e.g. VAL Server) sends a request to the SEALDD Server to request the creation of a subscription to SEALDD Connection Status event(s) reporting (see also clauses 9.2 and 9.3 of 3GPP°TS°23.433°[7]).



Figure 5.2.2.3.2-1: Procedure for SEALDD Connection Status Subscription Creation

1. In order to subscribe to SEALDD connection status event(s) reporting, the service consumer (e.g. VAL Server) shall send an HTTP POST request message to the SEALDD Server targeting the URI of the "Connection Status Subscriptions" collection resource with the request body including the ConnStatusSubsc data structure defined in clause 6.1.6.2.8.

2a. Upon success, the SEALDD Server shall respond with a "201 Created" status code with the response body including a representation of the created "Individual Connection Status Subscription" resource within the ConnStatusSubsc 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.

##### 5.2.2.3.3 SEALDD Connection Status Subscription Update

Editor's Note: Whether this service operation is needed or not and its definition are FFS.

##### 5.2.2.3.4 SEALDD Connection Status Subscription Deletion

Editor's Note: Whether this service operation is needed or not and its definition are FFS.

\* \* \* \* Next Changes \* \* \* \*

##### 5.2.2.4.1 General

This service operation is used by a SEALDD Server to notify a previously subscribed service consumer (e.g., VAL Server) on:

- SEALDD connection status event(s).

The following procedures are supported by the "SDD\_Transmission\_ConnStatusNotify service operation:

- Connection Status Notification.

\* \* \* \* Next Changes \* \* \* \*

##### 5.2.2.4.2 Connection Status Event Notification

Figure 5.2.2.4.2-1 depicts a scenario where the SEALDD Server sends a request to notify a previously subscribed service consumer (e.g. VAL Server) SEALDD connection status event(s) (see also clauses 9.2 and 9.3 of 3GPP°TS°23.433°[7]).



Figure 5.2.2.4.2-1: Procedure for Connection Status Event Notification

1. In order to notify a previously subscribed service consumer (e.g. VAL Server) on SEALDD Connection Status event(s), the SEALDD Server shall send an HTTP POST request message to the service consumer (e.g. VAL server) with the request URI set to "{notifUri}", where the "notifUri" variable set to the value received from the service consumer (e.g., VAL Server) during the creation of the corresponding SEALDD Connection Status Subscription using the procedures defined in clause 5.2.2.3, and the request body including the ConnStatusNotif data structure.

2a. Upon success, the service consumer (e.g. VAL Server) shall respond to the SEALDD Server with a "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.

\* \* \* \* Next Changes \* \* \* \*

### 6.1.1 Introduction

The SDD\_Transmission shall use the SDD\_Transmission API.

The API URI of the SDD\_Transmission 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 "sdd-trans".

- 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 5, the service producer (i.e. SEALDD Server) takes the role of the SCEF and the service consumer (i.e. VAL Server) takes the role of the SCS/AS.

\* \* \* \* Next Changes \* \* \* \*

### 6.1.2 Usage of HTTP

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

\* \* \* \* Next Changes \* \* \* \*

#### 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 SDD\_Transmission API.

Figure 6.1.3.1-1: Resource URI structure of the SDD\_Transmission API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource purpose/name | Resource URI (relative path after API URI) | HTTP method or custom operation | Description (service operation) |
| Connection Status Subscriptions | /subscriptions | POST | Request the creation of a new Connection Status Subscription. |

Editor's Note: Whether the individual resource should be defined with the update/modify and delete operations on it is FFS.

\* \* \* \* Next Changes \* \* \* \*

##### 6.1.3.2.4 Resource Custom Operations

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











\* \* \* \* Next Changes \* \* \* \*

#### 6.1.4.1 Overview

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



Figure 6.1.4.1-1: Custom operation URI structure of the SDD\_Transmission API

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

Table 6.1.4.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Custom operation name | Custom operation URI | Mapped HTTP method | Description |
| RequestTrans | /{transType}/request-trans | POST | Enables a VAL Server to request the SEALDD enabled regular or URLLC application data transmission service. |

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. |
| transType | TransType | Represents the requested transmission type (i.e., Regular transmission or URLLC transmission). |

\* \* \* \* Next Changes \* \* \* \*

#### 6.1.5.1 General

Notifications shall comply to clause 6.6 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) |
| Connection Status Notification | {notifUri} | POST | This service operation enables a SEALDD Server to notify a previously subscribed service consumer (e.g. VAL Server) on SEALDD connection status event(s). |

\* \* \* \* Next Changes \* \* \* \*

\* \* \* \* Next Changes \* \* \* \*

#### 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 SDD\_Transmission API.

Table 6.1.6.1-1: SDD\_Transmission API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| ConnEstabData | 6.1.6.2.11 | Represents SEALDD connection status establishment data. |  |
| ConnStatusEvent | 6.1.6.3.3 | Represents Connection Status Events. |  |
| ConnInfo | 6.1.6.2.4 | Represents SEALDD Data transmission connection information. |  |
| ConnStatusNotif | 6.1.6.2.9 | Represents a Connection Status Event Notification. |  |
| ConnStatusReport | 6.1.6.2.10 | Represents a Connection Status Event report. |  |
| ConnStatusSubsc | 6.1.6.2.8 | Represents a Connection Status Event Subscription. |  |
| QoSInfo | 6.1.6.2.5 | Represents SEALDD related QoS requirements. |  |
| TransReq | 6.1.6.2.2 | Represents the parameters to request the SEALDD enabled regular or URLLC application data transmission service. |  |
| TransResp | 6.1.6.2.3 | Represents a SEALDD enabled regular or URLLC application data transmission service response. |  |
| TransType | 6.1.6.3.4 | Represents the requested transmission type (i.e., Regular transmission or URLLC transmission). |  |
| ValServBdw | 6.1.6.2.6 | Represents VAL Server related bandwidth information. |  |
| ValUsersBdw | 6.1.6.2.7 | Represents VAL users related bandwidth information. |  |

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

Table 6.1.6.1-2: SDD\_Transmission API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| Bandwidth | 3GPP TS 29.122 [2] | Represents a bandwidth. |  |
| DurationSec | 3GPP TS 29.122 [2] | Represents a time duration in seconds. |  |
| Ipv4Addr | 3GPP TS 29.122 [2] | Represents an IPv4 address. |  |
| Ipv4Addr | 3GPP TS 29.122 [2] | Represents an IPv6 address. |  |
| Port | 3GPP TS 29.122 [2] | Represents an IP port. |  |
| SupportedFeatures | 3GPP TS 29.571 [18] | Represents the supported features and used to negotiate the supported optional features. |  |
| Uri | 3GPP TS 29.122 [2] | Represents a URI. |  |

\* \* \* \* Next Changes \* \* \* \*

##### 6.1.6.2.8 Type: ConnStatusSubsc

Table 6.1.6.2.8-1: Definition of type ConnStatusSubsc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| events | array(ConntStatusEvent) | M | 1..N | Represents the list of the subscribed event(s). |  |
| valServiceId | string | O | 0..1 | Represents the identity of the VAL service. |  |
| valTgtUe | ValTargetUe | O | 0..1 | Represents the target VAL UE or VAL user. |  |
| sContext | FFS | M | 1 | Represents the SEALDD-S data transmission connection information. |  |
| notifUri | Uri | M | 1 | It indicates the URI where the notification should be delivered to. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Represents the supported features.  This parameter shall be provided if the feature negotiation needs to take place. |  |

Editor's Note: The data type of the "sContext" attribute is FFS and to be aligned with the implementation of the Sdd\_RegularTransmission API.

Editor's Note: The encoding of the "valTgtUe" attribute is FFS.

\* \* \* \* Next Changes \* \* \* \*

##### 6.1.6.2.9 Type: ConnStatusNotif

Table 6.1.6.2.9-1: Definition of type ConnStatusNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| reports | array(ConnStatusReport) | M | 1..N | Represents the connection status event report(s). |  |

\* \* \* \* Next Changes \* \* \* \*

##### 6.1.6.2.9 Type: ConnStatusReport

Table 6.1.6.2.9-1: Definition of type ConnStatusReport

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | ConnStatusEvent | M | 1 | Represents the connection status event. |  |
| valTgtUe | ValTargetUe | O | 0..1 | Represents the target VAL UE or VAL user. |  |
| conEstStat | ConnectEstabData | C | 0..1 | Represents the SEALDD connection establishment data.  This attribute shall be present only if the "event" attribute is set to "ESTABLISHED". |  |

Editor's Note: The encoding of the "valTgtUe" attribute is FFS.

\* \* \* \* Next Changes \* \* \* \*

##### 6.1.6.2.11 Type: ConnEstabData

Table 6.1.6.2.11-1: Definition of type ConnEstabData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| sContext | FFS | M | 1 | Represents the SEALDD-S data transmission connection information. |  |
| comLifetime | DurationSec | O | 0..1 | Represents the SEALDD communication lifetime. |  |

Editor's Note: The data type of the "sContext" attribute is FFS and to be aligned with the implementation of the Sdd\_RegularTransmission API.

\* \* \* \* Next Changes \* \* \* \*

##### 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 |
|  |  |  |  |

\* \* \* \* Next Changes \* \* \* \*

##### 6.1.6.3.4 Enumeration: TransType

The enumeration TransType represents the requested transmission type. It shall comply with the provisions defined in table 6.1.6.3.4-1.

Table 6.1.6.3.4-1: Enumeration TransType

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| regular | Indicates that the SEALDD connection is established. |  |
| urllc | Indicates that the SEALDD connection is released. |  |
| NOTE: The enumeration values defined in this table shall use the "lower-with-hyphen" naming convention, as defined in clause 5.2.4.1 of 3GPP TS 29.122 [2], as they are used as a URI path segment. They shall not follow the "UPPER\_WITH\_UNDERSCORE" convention for enumerations as defined in clause 5.2.9.10 of 3GPP TS 29.122 [2]. | | |

\* \* \* \* Next Changes \* \* \* \*

#### 6.1.7.1 General

For the SDD\_Transmission 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 SDD\_Transmission API.

\* \* \* \* Next Changes \* \* \* \*

### 6.1.8 Feature negotiation

The optional features in table 6.1.8-1 are defined for the SDD\_Transmission 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 |
|  |  |  |

\* \* \* \* Next Changes \* \* \* \*

###### 6.3.3.2.3.1 POST

This operation enables to push the DD context to the SEALDD 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 |
| 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 |
| DdContextPushReq | M | 1 | Represents the DD context pushed to the SEALDD Server. |

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 |
| DdContextResp | M | 1 | 201 Created | Successful case. The DD context is successfully pushed to the SEALDD Server and the related information 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 SEALDD 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 SEALDD 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 POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [2] also apply. | | | | |

Editor's Note: The error cases of the SDD\_DDContext API are FFS.

Table 6.3.3.2.3.1-4: Headers supported by the 307 Response Code on this resource

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

Table 6.3.3.2.3.1-5: Headers supported by the 308 Response Code on this resource

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

\* \* \* \* Next Changes \* \* \* \*

###### 6.3.3.2.3.2 GET

This operation enables to pull the DD Context from the SEALDD Server.

This method shall support the URI query parameters specified in table 6.3.3.2.3.2-1.

Table 6.3.3.2.3.2-1: URI query parameters supported by the GET method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| supp-feats | SupportedFeatures | O | 0..1 | To filter irrelevant responses related to unsupported features. |

This method shall support the request data structures specified in table 6.3.3.2.3.2-2 and the response data structures and response codes specified in table 6.3.3.2.3.2-3.

Table 6.3.3.2.3.2-2: Data structures supported by the GET Request Body on this resource

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

Table 6.3.3.2.3.2-3: Data structures supported by the GET Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| DdContextResp | M | 1 | 200 OK | Successful case. The requested DD context 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 SEALDD 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 SEALDD 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 5.2.7.1-1 of 3GPP TS 29.122 [2] shall also apply. | | | | |

Editor's Note: The application errors of the SDD\_DDContext API are FFS.

Table 6.3.3.2.3.2-4: 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 SEALDD Server. |

Table 6.3.3.2.3.2-5: 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 SEALDD Server. |

\* \* \* \* Next Changes \* \* \* \*

#### 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 SDD\_DDContext API.

Table 6.3.6.1-1: SDD\_DDContext API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| DdContext | 6.3.6.2.2 | Represents the DD context. |  |
| DdContextPushReq | 6.3.6.2.4 | Represents the DD context relocation push request. |  |
| DdContextResp | 6.3.6.2.5 | Represents the DD context relocation push response. |  |
| TranspLayerContext | 6.3.6.2.3 | Represents the transport layer context. |  |

Table 6.3.6.1-2 specifies data types re-used by the SDD\_DDContext API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the SDD\_DDContext API.

Table 6.3.6.1-2: SDD\_DDContext API re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| RouteInformation | 3GPP TS 29.571 [18] | Represents the end point information. |  |
| SupportedFeatures | 3GPP TS 29.571 [18] | Represents the supported features and used to negotiate the supported optional features. |  |
| TransportProtocol | 3GPP TS 29.558 [17] | Represents the transport layer protocol. |  |

\* \* \* \* Next Changes \* \* \* \*

##### 6.3.6.2.5 Type: DdContextResp

Table 6.3.6.2.5-1: Definition of type DdContextResp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| ddContext | DdContext | M | 1 | Represents the created DD context. |  |
| endPoint | RouteInformation | C | 0..1 | Represents the endpoint information for new SEALDD-Uu user plane communication.  This attribute shall be present only in a response to a DD context push request. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Represents the supported features.  This attribute shall be provided when feature negotiation needs to take place. |  |

\* \* \* \* Next Changes \* \* \* \*

### 6.3.7 Error Handling

\* \* \* \* Next Changes \* \* \* \*

#### 6.3.7.1 General

For the SDD\_DDContext 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 SDD\_DDContext API.

\* \* \* \* Next Changes \* \* \* \*

#### 6.3.7.2 Protocol Errors

No specific protocol errors for the SDD\_DDContext API are specified.

\* \* \* \* Next Changes \* \* \* \*

#### 6.3.7.3 Application Errors

The application errors defined for the SDD\_DDContext 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 |
|  |  |  |  |

\* \* \* \* Next Changes \* \* \* \*

# 7 Using Common API Framework

The provisions of clause 8 of 3GPP TS 29.549 [15] shall apply for the SEALDD Server APIs defined in this specification.

\* \* \* \* Next Changes \* \* \* \*

# A.2 SDD\_Transmission API

openapi: 3.0.0

info:

title: SEALDD Server Data Transmission Service

version: 1.0.0-alpha.1

description: |

SEALDD Server Data Transmission Service.

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externalDocs:

description: >

3GPP TS 29.548 V0.3.0; Service Enabler Architecture Layer for Verticals (SEAL);

SEAL Data Delivery (SEALDD) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.548/

servers:

- url: '{apiRoot}/sdd-trans/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

security:

- {}

- oAuth2ClientCredentials: []

paths:

/{transType}/request-trans:

parameters:

- name: transType

in: path

description: >

Represents the requested transmission type.

required: true

schema:

$ref: '#/components/schemas/TransType'

post:

summary: Request SEALDD enabled Regular or URLLC Data Transmission.

operationId: RequestTrans

tags:

- Request SEALDD Data Transmission

requestBody:

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/TransReq'

responses:

'200':

description: >

OK. The SEALDD enabled Regular or URLLC application data transmission service request

was successfully received and processed.

content:

application/json:

schema:

$ref: '#/components/schemas/TransResp'

'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:

TransReq:

description: >

Represents the parameters to request the SEALDD enabled Regular or URLLC application data

transmission service.

type: object

properties:

valServerId:

type: string

valServiceId:

type: string

valTargetUeId:

$ref: 'TS29548\_SDD\_TransmissionQualityMeasurement.yaml#/components/schemas/ValTargetUeId'

valServerConnInfo:

$ref: '#/components/schemas/ConnInfo'

valServerBdw:

$ref: '#/components/schemas/ValServBdw'

valUsersBdw:

$ref: '#/components/schemas/ValUsersBdw'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

required:

- valServerId

- valServerConnInfo

TransResp:

description: >

Represents a SEALDD enabled Regular or URLLC application data transmission service response.

type: object

properties:

ddServerConnInfo:

$ref: '#/components/schemas/ConnInfo'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

ConnInfo:

description: >

Represents SEALDD Data transmission connection information.

type: object

properties:

ipv4Addr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv4Addr'

ipv6Addr:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Ipv6Addr'

port:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Port'

uri:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Uri'

oneOf:

- required: [ipv4Addr]

- required: [ipv6Addr]

- required: [uri]

ValServBdw:

description: >

Represents VAL Server related bandwidth information.

type: object

properties:

totalUlBdw:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bandwidth'

totalDlBdw:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bandwidth'

required:

- totalUlBdw

- totalDlBdw

ValUsersBdw:

description: >

Represents VAL users related bandwidth information.

type: object

properties:

minUlBdw:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bandwidth'

minDlBdw:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bandwidth'

maxUlBdw:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bandwidth'

maxDlBdw:

$ref: 'TS29122\_CommonData.yaml#/components/schemas/Bandwidth'

required:

- minUlBdw

- minDlBdw

- maxUlBdw

- maxDlBdw

TransType:

anyOf:

- type: string

enum:

- regular

- urllc

- 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 transmission type.

Possible values are:

- regular: Indicates that the requested transmission type is Regular transmission.

- urllc: Indicates that the requested transmission type is URLLC transmission.

\* \* \* \* Next Changes \* \* \* \*

# A.3 SDD\_DDContext API

openapi: 3.0.0

info:

title: SEALDD Server Data Delivery Context Relocation

version: 1.0.0-alpha.1

description: |

SEALDD Server Data Delivery Context Relocation.

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externalDocs:

description: >

3GPP TS 29.548 V0.3.0 Service Enabler Architecture Layer for Verticals (SEAL);

SEAL Data Delivery (SEALDD) Server Services; Stage 3.

url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.548/

security:

- {}

- oAuth2ClientCredentials: []

servers:

- url: '{apiRoot}/sdd-ddc/v1'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 6.5 of 3GPP TS 29.549

paths:

/contexts:

get:

summary: Pull the DD context from the SEALDD Server.

operationId: PullDdContext

tags:

- DD Context Instances (Collection)

parameters:

- name: supp-feats

in: query

description: Contains the list of supported features.

required: false

schema:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

responses:

'200':

description: Successful case. The requested DD context is returned.

content:

application/json:

schema:

$ref: '#/components/schemas/DdContextResp'

'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'

post:

summary: Push the DD context to the SEALDD Server.

tags:

- DD Context Instances (Collection)

requestBody:

description: >

Represents the DD context to be pushed to the

SEALDD Server.

required: true

content:

application/json:

schema:

$ref: '#/components/schemas/DdContextPushReq'

responses:

'201':

description: >

Created. Successful case. The DD context is successfully pushed to the SEALDD Server and

the related information is returned in the response body.

content:

application/json:

schema:

$ref: '#/components/schemas/DdContextPushResp'

'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:

DdContext:

description: Represents the DD context.

type: object

properties:

trLayerContext:

$ref: '#/components/schemas/TranspLayerContext'

TranspLayerContext:

description: Represents the transport layer context.

type: object

properties:

transProtoc:

$ref: 'TS29558\_Eees\_EASRegistration.yaml#/components/schemas/TransportProtocol'

required:

- transProtoc

DdContextPushReq:

description: Represents the DD context relocation push request.

type: object

properties:

ddContext:

$ref: '#/components/schemas/DdContext'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

DdContextPushResp:

description: Represents the DD context relocation push response.

type: object

properties:

endPoint:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/RouteInformation'

suppFeat:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

\* \* \* \* End of Changes \* \* \* \*