**3GPP TSG- WG3 Meeting #**

**Online, 22 - 24 January, 2024**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.549** | **CR** |  | **rev** | **-** | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Service API analytics | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Lenovo | | | | | | | | | |
| ***Source to TSG:*** | C3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ADAES | | | | |  | ***Date:*** | | | 2023-12-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TS 23.436 adds stage 2 for service API analytics for the ADAE service which is a SEAL service. Stage 3 of service API analytics needs to be defined. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The added changes are:   * Added new SEAL service in the table. * Added SS\_ADAE\_ServiceApiAnalytics API * Added resource for individual application performance event subscription * Modified data types for SrvApiSubs and SrvApiNoti * Corrected numbering for the tables. * Added exposure level requirements which was added in SA6#57. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 3 of SS\_ADAE\_ServiceApiAnalytics API does not exist. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1, 5.X.5 (new), 7.10.5.2.3 (new), 7.10.5.4.1, 7.10.5.4.2.2, 7.10.5.4.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

## 5.1 Introduction of SEAL services

The table 5.1-1 lists the SEAL server APIs below the service name. A service description clause for each API gives a general description of the related API.

Table 5.1-1: List of SEAL Service APIs

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantics | Consumer(s) |
| SS\_LocationReporting | Create\_Trigger\_Location\_Reporting | Request/ Response | VAL server |
| Fetch\_Location\_Report\_Trigger | Request/Response | VAL server |
| Update\_Trigger\_Location\_Reporting | Request/ Response | VAL server |
| Cancel\_Trigger\_Location\_Reporting | Request/ Response | VAL server |
| SS\_LocationInfoEvent | Subscribe\_Location\_Info | Subscribe/Notify | VAL server |
| Unsubscribe\_Location\_Info | VAL server |
| Notify\_Location\_Info | VAL server |
| SS\_LocationInfoRetrieval | Obtain\_Location\_Info | Request/ Response | VAL server |
| SS\_LocationAreaInfoRetrieval | Obtain\_UEs\_Info | Request/ Response | VAL server |
| SS\_LocationMonitoring | Subscribe\_Location\_Monitoring | Subscribe/Notify | VAL server |
| Unsubscribe\_Location\_Monitoring |
| Notify\_Location\_Monitoring\_Events |
| SS\_LocationAreaMonitoring | Subscribe\_Location\_Area\_Monitoring | Subscribe/Notify | VAL server |
| Notify\_Location\_Area\_Monitoring\_Events |
| Update\_Location\_Area\_Monitoring\_Subscribe |
| Unsubscribe\_Location\_Area\_Monitoring |
| SS\_VALServiceAreaConfiguration | Configure\_VAL\_Service\_Area | Request/Response | VAL server |
| Obtain\_VAL\_Service\_Area | Request/Response | VAL server |
| Update\_VAL\_Service\_Area | Request/Response | VAL server |
| Delete\_VAL\_Service\_Area | Request/Response | VAL server |
| SS\_GroupManagement | Query\_Group\_Info | Request/ Response | VAL server |
| Update\_Group\_Info | Request/ Response | VAL server |
| Create\_Group | Request/ Response | VAL server |
| Delete\_Group | Request/Response | VAL server |
| SS\_GroupManagementEvent | Subscribe\_Group\_Info\_Modification | Subscribe/Notify | VAL server |
| Notify\_Group\_Info\_Modification | VAL server |
| Notify\_Group\_Creation | VAL server |
| SS\_UserProfileRetrieval | Obtain\_User\_Profile | Request/ Response | VAL server |
| SS\_VALServiceData | Obtain\_VAL\_Service\_Data | Request/Response | SEAL server |
| SS\_UserProfileEvent | Subscribe\_User\_Profile\_Update | Subscribe/Notify | VAL server |
| Notify\_User\_Profile\_Update | VAL server |
| SS\_NetworkResourceAdaptation  (NOTE 3) | Reserve\_Network\_Resource | Request/Response | VAL server |
| Request\_Unicast\_Resource | Request/Response | VAL server |
| Update\_Unicast\_Resource | Request/Response | VAL server |
| Request\_Multicast\_Resource | Request/Response | VAL server |
| Notify\_UP\_Delivery\_Mode | Subscribe/Notify | VAL server |
| Discover\_TSC\_Stream\_Availability | Request/Response | VAL server |
| Create\_TSC\_Stream | Request/Response | VAL server |
| Delete\_TSC\_Stream | Request/Response | VAL server |
| Create\_MBS\_Resource | Request/Response | VAL server |
| Update\_MBS\_Resource | Request/Response | VAL server |
| Delete\_MBS\_Resource | Request/Response | VAL server |
| Activate\_MBS\_Resource | Request/Response | VAL server |
| Deactivate\_MBS\_Resource | Request/Response | VAL server |
| SS\_EventsMonitoring | Subscribe\_Monitoring\_Events | Subscribe/Notify | VAL server |
| Notify\_Monitoring\_Events |
| SS\_Events | Subscribe\_Event | Subscribe/Notify | VAL server |
| Notify\_Event | VAL server |
| Unsubscribe\_Event | VAL server |
| Update\_Subscription | VAL server |
| SS\_KeyInfoRetrieval | Obtain\_Key\_Info | Request/Response | VAL server |
| SS\_NetworkSliceAdaptation | Request\_Network\_Slice\_Adaptation | Request/Response | VAL server |
| SS\_NetworkResourceMonitoring | Subscribe\_Unicast\_QoS\_Monitoring\_Data | Subscribe/Notify | VAL server |
| Unsubscribe\_Unicast\_QoS\_Monitoring\_Data | VAL server |
| Notify\_Unicast\_QoS\_Monitoring\_Data | VAL server |
| Obtain\_Unicast\_QoS\_Monitoring\_Data | Request/Response | VAL server |
| Update\_Unicast\_QoS\_Monitoring\_Subscription | VAL server |
| SS\_IdmParameterProvisioning | Provide\_Configuration | Request/Response | VAL server |
| SS\_ADAE\_ServiceApiAnalytics | Subscribe\_Service\_API\_Analytics | Subscribe/Notify | VAL server |
| Notify\_Service\_API\_Analytics |  |
| Unsubscribe\_Service\_API\_Analytics |  |
| NOTE 1: The service operations of SS\_Events API are reused by the SS\_LocationInfoEvent, SS\_LocationMonitoring, SS\_LocationAreaMonitoring, SS\_GroupManagementEvent, SS\_UserProfileEvent and SS\_EventsMonitoring for events related services.  NOTE 2: The service APIs exposed by the SEALDD Server and the corresponding service operations, operation semantics and service consumers are specified in clause 5 of 3GPP TS 29.548 [35].  NOTE 3: The "Create\_MBS\_Resource", "Update\_MBS\_Resource", "Delete\_MBS\_Resource", "Activate\_MBS\_Resource" and "Deactivate\_MBS\_Resource" service operations correspond to the stage 2 "Request\_Multicast/Broadcast\_Resource", "Update\_Multicast/Broadcast\_Resource", "Delete\_Multicast/Broadcast\_Resource", "Activate\_Multicast\_Resource" and "Deactivate\_Multicast\_Resource" service operations defined in clause 14.4.2 of 3GPP TS 23.434 [2]. | | | |

Table 5.1-2 summarizes the corresponding APIs defined in this specification.

Table 5.1-2: API Descriptions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Service Name** | **Clause** | **Description** | **OpenAPI Specification File** | **apiName** | **Annex** |
| SS\_LocationReporting | 7.1 | Report Location Information Service. | TS29549\_SS\_LocationReporting.yaml | ss-lr | A.2 |
| SS\_GroupManagement | 7.2 | Group Management Service | TS29549\_SS\_GroupManagement.yaml | ss-gm | A.3 |
| SS\_UserProfileRetrieval | 7.3 | User Profile Retrieval Service | TS29549\_SS\_UserProfileRetrieval.yaml | ss-upr | A.4 |
| SS\_NetworkResourceAdaptation | 7.4 | Network Resource Adaptation Service | TS29549\_SS\_NetworkResourceAdaptation.yaml | ss-nra | A.5 |
| SS\_Events | 7.5 | Events Notify Service | TS29549\_SS\_Events.yaml | ss-events | A.6 |
| SS\_KeyInfoRetrieval | 7.6 | Key Information Retrieval Service | TS29549\_SS\_KeyInfoRetrieval.yaml | ss-kir | A.7 |
| SS\_LocationAreaInfoRetrieval | 7.1 | Location Area Info Retrieval Service | TS29549\_SS\_LocationAreaInfoRetrieval.yaml | ss-lair | A.8 |
| SS\_NetworkSliceAdaptation | 7.7 | Network Slice Adaptation Service | TS29549\_SS\_NetworkSliceAdaptation.yaml | ss-nsa | A.9 |
| SS\_NetworkResourceMonitoring | 7.4 | Network Resource Monitoring | TS29549\_SS\_NetworkResourceMonitoring.yaml | ss-nrm | A.10 |
| SS\_VALServiceData | 7.3 | VAL Service Data Service | TS29549\_SS\_VALServiceData.yaml | ss-vsd | A.11 |
| SS\_VALServiceAreaConfiguration | 7.1 | VAL Service Area Configuration Service | TS29549\_SS\_VALServiceAreaConfiguration.yaml | ss-vsac | A.12 |
| SS\_ADAE\_ServiceApiAnalytics | 7.10 | ADAE service API analytics service | TS29549\_SS\_ADAE\_ServiceApiAnalytics.yaml | ss-adaesaa | A.18 |
| NOTE: The APIs exposed by the SEALDD Server are specified in clause 5 of 3GPP TS 29.548 [35]. | | | | | |

\* \* \* Next Change \* \* \* \*

### 5.X.5 SS\_ADAE\_ServiceApiAnalytics API

#### 5.X.5.1 Service Description

##### 5.X.5.1.1 Overview

The SS\_ ADAE\_ServiceApiAnalytics API, as defined 3GPP TS 23.436 [38], allows the VAL server via ADAE-S reference point to subscribe to service API analytics event.

#### 5.X.5.2 Service Operations

##### 5.X.5.2.1 Introduction

The service operation defined for SS\_ ADAE\_ServiceApiAnalytics API is shown in the table 5.X.5.2.1-1.

Table 5.X.5.2.1-1: Operations of the SS\_ADAE\_ServiceApiAnalytics API

|  |  |  |
| --- | --- | --- |
| Service operation name | Description | Initiated by |
| Subscribe\_Service\_API\_Analytics | This service operation is used by VAL server to subsribe to the event of the service API analytics. | VAL Server |
| Notify\_Service\_API\_Analytics | This service operation is used by ADAE server to notify about the service API analytics. | ADAE server |
| Unsubscribe\_Service\_API\_Analytics | This service operation is used by VAL server to unsubsribe from the event of the service API analytics. | VAL server |

##### 5.X.5.2.2 Subscribe\_Service\_API\_Analytics

###### 5.X.5.2.2.1 General

This service operation is used by the VAL server for service API analytics event subscription to the ADAE server.

###### 5.X.5.2.2.2 Subscribing to service API analytics event using Subscribe\_Service\_API\_Analytics service operation

To subscribe to service API analytics event, the VAL server shall send an HTTP POST request with a Request-URI according to the pattern "{apiRoot}/ss-adae-sa/<apiVersion>/service-api" and with a body containing data type SrvApiSubs as defined in clause 7.10.5.4.2.2 with the following attributes:

1. VAL server identifier;

2. analytics identifier for the service API event;

3. service API identifier;

4. optionally, the service area;

5. optionally, the time interval; and

6. optionally, the requirement for exposure level.

Upon receipt of the HTTP POST request, the ADAES shall:

1. verify the identity of the VAL server and determine if the VAL server is authorized to subscribe to the service API analytics event; and

2. if the VAL server:

a. is not authorized, the ADAE server shall respond to the VAL server with an appropriate error status code; or

b. is authorized, the ADAE server shall create a new "Subscription to the event of service API analytics" resource and respond to the VAL server with an HTTP "201 Created" status code, including a Location header field containing the URI for the created "Subscription to the event of service API analytics" and the response body including the SrvApiSubs data structure containing a representation of the created resource as defined in clause 7.10.5.2.

##### 5.X.5.2.3 Notify\_Service\_API\_Analytics

###### 5.X.5.2.3.1 General

This service operation is used by the ADAE server to send notification to the VAL server with the service API analytics event subscription to the ADAE server.

###### 5.X.5.2.3.2 Notifying service API analytics event using Notify\_Service\_API\_Analytics service operation

To notify service API analytics event, the ADAE server shall send an HTTP POST request with a Request-URI according to the pattern "{apiRoot}/ss-adae-sa/<apiVersion>/ service-api and with a body containing data type SrvApiNotif as defined in clause 7.10.5.4.2.3 with the following attributes:

1. identity of the service API analytics;

2. service API Identifier

3. predictive or statistical service API analytics;

4. optionally, the geographical or service area of the service API analytics; and

5. optionally, the confidence level for predictive analytics.

Upon receipt of the HTTP POST request, the VAL server shall process the event notification.

##### 5.X.5.2.4 Unsubscribe\_Service\_API\_Analytics

###### 5.X.5.2.4.1 General

This service operation is used by the VAL server to unsubscribe from the service API analytics event.

###### 5.X.5.2.4.2 Unsubscribing from service API analytics event using Unsubscribe\_Service\_API\_Analytics service operation

To unsubscribe from service API analytics event, the VAL server shall send an HTTP DELETE request to the resource representing the event in the ADAE server as specified in clause 7.10.5.2.3.3.1.

Upon receiving the HTTP DELETE request, the ADAE sever shall:

1. verify the identity of the VAL server and check if the VAL server is authorized to unsubscribe from the service API analytics event associated with the resource URI "{apiRoot}/ss-adae-sa/<apiVersion>/service-api/{srvApiId}"; and

2. if the VAL server is authorized to unsubscribe from the service-api analytics event, the ADAE server shall delete the resource pointed by the resource URI "{apiRoot}/ss-adae-sa/<apiVersion>/service-api/{srvApiId}".

\* \* \* Next Change \* \* \* \*

##### 7.10.5.2.3 Resource: Individual service API event subscription

###### 7.10.5.2.3.1 Description

The individual service API event subscription resource represents an individual event subscription of the VAL server.

###### 7.10.5.2.3.2 Resource Definition

Resource URI: **{apiRoot}/ss-adae-laa/<apiVersion>/location-accuracy/{srvApiId}**

This resource shall support the resource URI variables defined in the table 7.10.5.2.3.2-1.

Table 7.10.5.2.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data Type | Definition |
| apiRoot | string | See clause 6.5 |
| srvApiId | string | Identifies a service API event subscription |

###### 7.10.5.2.3.3 Resource Standard Methods

7.10.5.2.3.3.1 DELETE

This method shall support the URI query parameters specified in table 7.10.5.2.3.3.1-1.

Table 7.10.5.2.3.3.1-1: 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 7.10.5.2.3.3.1-2 and the response data structures and response codes specified in table 7.10.5.2.3.3.1-3.

Table 7.10.5.2.3.3.1-2: Data structures supported by the DELETE Request Body on this resource

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

Table 7.10.5.2.3.3.1-3: Data structures supported by the DELETE Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Response  codes | Description |
| n/a |  |  | 204 No Content | The individual service API event subscription matching the srvApiId is deleted. |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection, during resource termination. The response shall include a Location header field containing an alternative URI of the resource located in an alternative ADAE server or an alternative data producer such as A-ADRF, A-DCCF, VAL server, or SEALDD.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection, during resource termination. The response shall include a Location header field containing an alternative URI of the resource located in an alternative ADAE server or an alternative data producer such as A-ADRF, A-DCCF, VAL server, or SEALDD.  Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [3]. |
| NOTE: The mandatory HTTP error status codes for the DELETE method listed in table 5.2.6-1 of 3GPP TS 29.122 [3] also apply. | | | | |

Table 7.10.5.2.3.3.1-4: 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 ADAE server or an alternative data producer such as A-ADRF, A-DCCF, VAL server, or SEALDD. |

Table 7.10.5.2.3.3.1-5: 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 ADAE server or an alternative data producer such as A-ADRF, A-DCCF, VAL server, or SEALDD. |

###### 7.10.5.2.3.4 Resource Custom Operations

None.

\* \* \* Next Change \* \* \* \*

##### 7.10.5.4.1 General

This clause specifies the application data model supported by the API. Data types listed in clause 6.2 apply to this API.

Table 7.10.5.4.1-1 specifies the data types defined specifically for the SS\_ADAE\_ServiceApiAnalytics API service.

Table 7.10.5.4.1-1\_SS\_ADAE\_ServiceApiAnalytics API specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Section defined | Description | Applicability |
| SrvApiSubs | 7.10.5.4.2.2 | Subscription to the service API analytics event |  |
| SrvApiNotif | 7.10.5.4.2.3 | Notification information of the service API analytics event. |  |
| SrvApiIdType | 7.10.5.4.3.3 | Type of service API |  |
| ExpoLevelReq | 7.10.5.4.3.4 | Requirement for exposure level |  |

Table 7.10.5.4.1-2 specifies data types re-used by the SS\_ADAE\_ServiceApiAnalytics API service:

Table 7.10.5.4.1-2: Re-used Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| DurationSec | 3GPP TS 29.122 [3] | Represents a period of time in units of seconds. |  |
| LocationArea | 3GPP TS 29.122 [3] | Represents location information. |  |

\* \* \* Next Change \* \* \* \*

###### 7.10.5.4.2.2 Type: SrvApiSubs

Table 7.10.5.4.2.2-1: Definition of type SrvApiSubs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| subscriberId | string | M | 1 | Identity of the VAL server subscribing to the service API analytics event. |  |
| analyticsId | string | M | 1 | Identity of the analytics if the subsctipion is for service API analytics event. |  |
| serviceApiId | SrviApiIdType | M | 1 | The identifier for the service API |  |
| area | LocationArea | O | 0..1 | The geographical or service area, to which the service API analytics subscription is applied. |  |
| timeInterval | DurationSec | O | 0..1 | The time interval as the start and the end time, to which the service API analytics subscription is applied. |  |
| expoLevelReq | ExpoLevelReq | O | 0..1 | The level of exposure requirement for the service API analytics to be exposed. |  |

Editor's Note: Detailed definitions for data types are FFS.

\* \* \* Next Change \* \* \* \*

###### 7.10.5.4.2.3 Type: SrvApiNotif

Table 7.10.5.4.2.3-1: Definition of type SrvApiNotif

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| outputId | string | M | 1 | Identifier of the event output. |  |
| serviceApiId | SrvApiIdType | M | 1 | The identifier for the service API |  |
| analyticsOutputs | array(string) | M | 1..N | Service API analytics for prediction or statistics depending on the type. |  |
| area | LocationArea | O | 0..1 | The geographical or service area, to which the service API analytics subscription applies. |  |
| confidenceLevel | string | O | 0..1 | Provides accuracy level if the service API analytics is prediction.  The value shall be between 0.01 and 1.00 with a step size of 0.01, represented as string.  If not present, confidence level 1.00 applies.  Pattern: '^[0]\.[0-9]{2}|[1.00]$' |  |

Editor's Note: Detailed definitions for data types are FFS.

###### 7.10.5.4.3.4 Enumeration: ExpoLevelReq

Table 7.10.5.4.3.3-1: Enumeration ExpoLevelReq

|  |  |  |
| --- | --- | --- |
| Enumeration value | Description | Applicability |
| EXPOSURE\_LEVEL\_READ | The analytics are allowed to be read. |  |
| EXPOSURE\_LEVEL\_WRITE | The analytics are allowed to be written. |  |
| EXPOSURE\_LEVEL\_DELETE | The analytics are allowed to be deleted. |  |
| EXPOSURE\_LEVEL\_PERIODIC\_REPORT | Frequency for periodic reporting. |  |
| EXPOSURE\_LEVEL\_THRESHOLD\_REPORT | Threshold for the reporting. |  |

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