**3GPP TSG- WG3 Meeting #**

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

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.549** | **CR** | **0212** | **rev** | **-** | **Current version:** | **18.4.0** |  |
|  |
| *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:***  | VAL performance analytics |
|  |  |
| ***Source to WG:*** | Lenovo |
| ***Source to TSG:*** | C3 |
|  |  |
| ***Work item code:*** | ADAES |  | ***Date:*** | 2023-12-01 |
|  |  |  |  |  |
| ***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 canbe 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 VAL performance analytics for the ADAE service which is a SEAL service. Stage 3 of VAL performance analytics needs to be defined. |
|  |  |
| ***Summary of change:*** | The added changes are:* Added abbreviations.
* Added new SEAL service in the table.
* Added SS\_ADAE\_VALPerformanceAnalytics API
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|  |  |
| ***Consequences if not approved:*** | Stage 3 of SS\_ADAE\_VALPerformanceAnalytics API does not exist. |
|  |  |
| ***Clauses affected:*** | 3.2, 5.1, 5.11 (new), 5.11.1 (new) |
|  |  |
|  | **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 \* \* \* \*

## 3.2 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].

5GS 5G System

ADAE Application Data Analytics Enablement

A-ADRF Application layer - Analytical Data Repository Function

A-DCCF Application layer - Data Collection and Coordination Function

AEF API Exposing Function

API Application Programming Interface

DS-TT Device-Side TSN Translator

JSON JavaScript Object Notation

NDS Network Domain Security

NDS/IP NDS for IP based protocols

NRM Network Resource Management

NSCE Network Slice Capability Enablement

PLMN Public Land Mobile Network

REST Representational State Transfer

SCEF Service Capability Exposure Function

SCS Service Capability Server

SEAL Service Enabler Architecture Layer for Verticals

SEALDD SEAL Data Delivery

TMGI Temporary Mobile Group Identity

TSC Time Sensitive Communication

TSN Time Sensitive Networking

UE User Equipment

VAL Vertical Application Layer

\* \* \* Next 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\_VALPerformanceAnalytics API | Subscribe\_VAL\_Performance\_Analytics | Subscribe/Notify | VAL server, ADAE server |
| Notify\_VAL\_Performance\_Analytics |
| Unsubscribe\_VAL\_Performance\_Analytics |
|  |
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|  |
| 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\_VALPerformanceAnalytics | 7.10 | ADAE VAL performance analytics service | TS29549\_SS\_ADAE\_VALPerformanceAnalytics.yaml | ss-adaevpa | A.14 |
| NOTE: The APIs exposed by the SEALDD Server are specified in clause 5 of 3GPP TS 29.548 [35]. |

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

## 5.11 Application data analytics enablement service configuration APIs

### 5.11.1 SS\_ADAE\_VALPerformanceAnalytics API

#### 5.11.1.1 Service Description

##### 5.11.1.1.1 Overview

The SS\_ ADAE\_VALPerformanceAnalytics API, as defined 3GPP TS 23.436 [38], allows:

- VAL server via ADAE-S reference point to subscribe to VAL performance analytics event; and

- ADAES to subscribe to VAL performance historic data collection event to the data producer such as the A-ADRF, the A-DCCF, the VAL server, or SEALDD server.

#### 5.11.1.2 Service Operations

##### 5.11.1.2.1 Introduction

The service operation defined for SS\_ ADAE\_VALPerformanceAnalytics API is shown in the table 5.11.1.2.1-1.

Table 5.11.1.2.1-1: Operations of the SS\_ADAE\_VALPerformanceAnalytics API

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

##### 5.11.1.2.2 Subscribe\_VAL\_Performance\_Analytics

###### 5.11.1.2.2.1 General

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

###### 5.11.1.2.2.2 Subscribing to VAL performance analytics event using Subscribe\_VAL\_Performance\_Analytics service operation

To subscribe to VAL performance analytics event, the VAL server shall send an HTTP POST request with a Request-URI according to the pattern "{apiRoot}/ss-adae-pa/<apiVersion>/application-performance" and with a body containing data type AppPerfSubs as defined in clause 7.10.1.4.2.2 with the following attributes:

1. URI for the notification;

2. type of analytics;

3. VAL service identifier;

4. optionally, one or more VAL UEs;

5. optionally, VAL server identifier to which the VAL performance analytics subscription is applied;

6. optionally, characteristics of the data producers to be used;

7. optionally, confidence level for the VAL performance analytics;

8. optionally, the service area;

9. optionally, the time interval; and

10. optionally, the requirement whether the reporting is periodic or based on threshold.

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 VAL performance 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 VAL performance 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 VAL performance analytics" and the response body including the AppPerfSubs data structure containing a representation of the created resource as defined in clause 7.10.1.2.

##### 5.11.1.2.3 Notify\_VAL\_Performance\_Analytics

###### 5.11.1.2.3.1 General

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

###### 5.11.1.2.3.2 Notifying VAL performance analytics event using Notify\_VAL\_Performance\_Analytics service operation

To notify VAL performance analytics event, the ADAE server shall send an HTTP POST request with a Request-URI according to the pattern "{apiRoot}/ss-adae-pa/<apiVersion>/application-performance and with a body containing data type AppPerfNotif as defined in clause 7.10.1.4.2.3 with the following attributes:

1. identity of the VAL performance analytics;

2. predictive or statistical VAL performance analytics;

3. optionally, type of analytics;

4. optionally, the confidence level for predictive analytics; and

5. optionally, the time duration for the predictive VAL performance analytics.

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

##### 5.11.1.2.4 Unsubscribe\_VAL\_Performance\_Analytics

###### 5.11.1.2.4.1 General

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

###### 5.11.1.2.4.2 Unsubscribing from VAL performance analytics event using Unsubscribe\_VAL\_Performance\_Analytics service operation

To unsubscribe from VAL performance 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 7.10.1.2.3.3.1.

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 VAL performance analytics event associated with the resource URI "{apiRoot}/ss-adae-pa/<apiVersion>/application-performance/{appPerfId}"; and

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

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