**3GPP TSG-CT WG3 Meeting #120e *C3-221271***

**E-Meeting, 17th – 25th February 2022**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.549** | **CR** | **0065** | **rev** | **2** | **Current version:** | **17.3.0** |  |
|  | | | | | | | | |
| *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:*** | SS\_NetworkResourceMonitoring API definition and Subscribe/Unsubscribe/Notify service operations | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eSEAL | | | | |  | ***Date:*** | | | 2022-01-31 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The CR #0092 on TS 23.434 presented in SA6 #47e meeting provides new clarifications for SS\_NetworkResourceMonitoring API.  3GPP TS 23.434 defines the SS\_NetworkResourceMonitoring API and the related Subscribe/Unsubscribe/Notify Unicast QoS Monitoring Data service operations in clause 14.4.4.Thus, need to support the SS\_NetworkResourceMonitoring API in this specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This CR provides definitions for the SS\_NetworkResourceMonitoring API and the related procedures for Subscribe/Unsubscribe/Notify QoS Monitoring Data service operations. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Missing the SS\_NetworkResourceMonitoring API definition and the procedures for the related service operations that is not aligned with Stage 2. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.1; 5.5.Y(new); | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.434 CR #0092 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not affect OpenAPI file.  This CR is connected with the following CRs:   * 29.549 CR 0056 "SS\_NetworkResourceMonitoring API support" (reference to clause 7.4.Z); * 29.549 CR 0057 "SS\_NetworkResourceMonitoring OpenAPI implementation" (reference to Annex A.Z) | | | | | | | | |
| ***()*** | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\* \* \* 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 |
| 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 |
| Notify\_Location\_Monitoring\_Events |
| 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\_UserProfileEvent | Subscribe\_User\_Profile\_Update | Subscribe/Notify | VAL server |
| Notify\_User\_Profile\_Update | VAL server |
| SS\_NetworkResourceAdaptation | 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 |
| 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 |
| 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 |
| NOTE: The service operations of SS\_Events API are reused by the SS\_LocationInfoEvent, SS\_LocationMonitoring, SS\_GroupManagementEvent, SS\_UserProfileEvent and SS\_EventsMonitoring for events related services. | | | |

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\_Network\_Resource\_Adaptation | 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.Z |

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

### 5.5.Y SS\_NetworkResourceMonitoring API

#### 5.5.Y.1 Service Description

##### 5.5.Y.1.1 Overview

The SS\_NetworkResourceMonitoring API, as defined in 3GPP TS 23.434 [2], allows VAL server via NRM-S reference point to communicate with the network resource management server for network resource monitoring including requesting unicast QoS monitoring data and managing unicast QoS monitoring subscription.

#### 5.5.Y.2 Service Operations

##### 5.5.Y.2.1 Introduction

The service operation defined for SS\_NetworkResourceMonitoring API is shown in the table 5.5.Y.2.1-1.

Table 5.5.Y.2.1-1: Operations of the SS\_NetworkResourceMonitoring API

|  |  |  |
| --- | --- | --- |
| Service operation name | Description | Initiated by |
| Subscribe\_Unicast\_QoS\_Monitoring | This service operation is used by VAL server to subscribe for unicast QoS monitoring events from SEAL servers. | VAL server |
| Unsubscribe\_Unicast\_QoS\_Monitoring | This service operation is used by VAL server to unsubscribe for unicast QoS monitoring events from SEAL servers. | VAL server |
| Notify\_Unicast\_QoS\_Monitoring | This service operation is used by SEAL servers to send the notifications to the VAL server. | NRM server |
| Obtain\_Unicast\_QoS\_Monitoring | This service operation is used by VAL server to obtain unicast QoS monitoring data. | VAL server |

##### 5.5.Y.2.2 Subscribe\_Unicast\_QoS\_Monitoring

###### 5.5.Y.2.2.1 General

This service operation is used by a VAL server to create a unicast QoS monitoring subscription to the NRM server.

###### 5.5.Y.2.2.2 VAL server subscribes for Unicast QoS Monitoring using Subscribe\_Unicast\_QoS\_Monitoring

In order to subscribe to unicast QoS monitoring, the VAL server shall send an HTTP POST message to the NRM server, on the Measurements resource collection representation URI as specified in subclause 7.4.Z.2.2.3.1. The request body with the "MeasurementSubscription" data structure shall include one of a list of requested target VAL UE ID(s), a VAL group ID, or a list of VAL stream ID(s), the time period of interest, and the URI where the notification should be delivered to, and may also include the requested reporting information, the frequency of reporting, and the termination of reporting settings.

Upon receiving the HTTP POST message, the NRM server shall:

1. verify the identity of the VAL server, and check whether the VAL server is authorized for the unicast QoS monitoring subscription to the NRM server;

2. if "immRep" attribute set to false or not presented in "MeasurementSubscription" data structure:

a) if the VAL server is authorized, the NRM server shall interact with the NEF to establish the relevant QoS monitoring subscriptions by invoking Nnef\_AFsessionWithQoS API with HTTP POST message as described in subclause 4.4.9 of 3GPP TS 29.522 [28] and may invoke Nnef\_AnalyticsExposure API with HTTP POST message as described in subclause 4.4.14 of 3GPP TS 29.522 [28], and DN Performance Analytics described in 3GPP TS 29.522 [28], and in particular the UE Communication Analytics Event based on the input received from the VAL server in step 1, the NRM server determines the relevant NEF subscription procedures and the parameters for these subscriptions; and

b) after the NRM server receiving a successful response from the NEF, the NRM server shall create the measurement resource and shall respond to the VAL server with a "201 Created" status code, including a Location header field containing the URI for the created resource. If the NRM server receiving an error response from the NEF, the NRM server shall not create the resource and shall respond to the VAL server with a proper error status code.

3. if "immRep" attribute set to true, for each VAL UE, VAL group or VAL stream the NRM server determines if it has the requested data stored during monitoring notification as described in subclause 5.5.Y.2.4:

a) if the requested data is available, NRM server retrieves it and may further process it according to VAL server’s requirement;

b) if the requested data is not stored internally, the NRM server interacts with the NEF to fetch the data using the AnalyticsExposure described in subclause 5.6.1.1 of 3GPP TS 29.522 [28] and DN Performance Analytics described in 3GPP TS 29.522 [28];

c) the NRM server collects, processes, and aggregates the collected data to match the measurement data requirement provided in the VAL server request. For a VAL group or a list of VAL UEs, the NRM server aggregates QoS monitoring data for each UE belonging to the group or the list; for a VAL stream, the NRM server aggregates the QoS monitoring data for the stream; and

d) the NRM server sends unicast QoS monitoring data response with "200 OK" status code or failure indication, and optionally the cause of the failure, in case the requested data is not available.

##### 5.5.Y.2.3 Unsubscribe\_Unicast\_QoS\_Monitoring

###### 5.5.Y.2.3.1 General

This service operation is used by a VAL server to terminate a unicast QoS monitoring subscription at the NRM server.

###### 5.5.Y.2.3.2 VAL server unsubscribes for Unicast QoS Monitoring using Unsubscribe\_Unicast\_QoS\_Monitoring

In order to terminate a unicast QoS monitoring subscription, the VAL server sends an HTTP DELETE message to the NRM server, on the individual measurements resource representation URI as specified in subclause 7.4.Z.2.3.3.1.

Upon receiving the HTTP DELETE message, the NRM server shall:

1. verify the identity of the VAL server and check if the VAL server is authorised to Unsubscribe from the Unicast QoS Monitoring associated with the Resource URI;
2. if the VAL server is authorized to unsubscribe from the Unicast QoS Monitoring interact with the NEF to terminate the related QoS monitoring subscriptions;
3. delete the related subscription resource at the NRM server; and
4. respond to the VAL server with a "204 No Content" status. If the NRM server receiving an error response from the NEF, the NRM shall respond to the VAL server with a proper error status code.

##### 5.5.Y.2.4 Notify\_Unicast\_QoS\_Monitoring

###### 5.5.Y.2.4.1 General

This service operation is used by the NRM server to notify the VAL server of a unicast QoS monitoring data.

###### 5.5.Y.2.4.2 NRM server notifies for Unicast QoS Monitoring using Notify\_Individual\_Measurement\_Data

The NRM server receives QoS monitoring data by means of notifications provided by the NEF. The NRM server stores the QoS monitoring data as needed for later retrieval. The NRM server coordinates and aggregates the information from the NEF notifications and determines whether to send a notification to the VAL server based on the VAL server subscription’s reporting requirements. For a VAL group or a list of VAL UEs, the NRM server aggregates QoS monitoring data for each UE belonging to the group or the list; for a VAL stream, the NRM server aggregates the QoS monitoring data for the stream. The NRM server stops reporting according to the VAL server subscription’s termination of reporting and indicates the termination of reporting in the last notification. After the last notification, the NRM server keeps the measurementId resource for the later data retrieval.In order to notify the VAL server about the subscribed individual measurement data updates, the NRM server sends HTTP POST message to the VAL server.

Upon receiving the HTTP POST message, the VAL server shall:

1. process the Unicast QoS Monitoring notification; and
2. respond to the NRM server with a "204 No Content" status.

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