**3GPP SA6 Meeting #49BIS-eS6-22xxxx**

**e-meeting,22nd June to 1st Jul 2022 (revision of 221730)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.434** | **CR** | **0110** | **rev** | **1** | **Current version:** | **18.1.0** |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Establishing communication with service requirements | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Hisilicon, Deutsche Telekom | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FFAPP, eSEAL2 | | | | |  | ***Date:*** | | | 2022-06-17 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | The feature for establishing communication with service requirements is moved from clause 7.1 of TS 23.545 which is considered as generic capability which can be used by any vertical application. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The feature as specified in clause 7.1 of TS 23.545 is moved to SEAL NRM service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The feature will not be generically available to vertical applications. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 14.3.x (new), 14.3.x.1 (new), 14.3.x.2 (new), 14.3.x.2.1 (new), 14.3.2.x (new), 14.3.2.y (new), 14.3.2.z (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **N** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **N** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

### 14.3.x Establishing communication with application service requirements

#### 14.3.x.1 General

The NRM client and the NRM server (acting as an AS) are involved in the exchange and analysis of the desired service requirements (e.g. packet size, packet transmission interval, reliability, packet loss rate) for the communication amongst the Vertical UEs. The NRM server triggers the establishment of direct service connectivity via Uu based on the information provided by the UEs and static configuration information available to the NRM server prior to the UE interaction. Note that service connectivity among VAL clients is established over the Uu, without device-to-device direct radio connectivity (e.g. PC5) requirement.

#### 14.3.x.2 Procedures

#### 14.3.x.2.1 Procedure for establishing communication with application service requirements

The procedure for establishing Uu service communication with application service requirements is as illustrated in figure 14.3.x.2.1‑1.

Pre-conditions:

- NRM client 1 and NRM client 2 are provided configuration information for the VAL clients served e.g. connectivity requirements, which destination UEs to connect to over Uu, etc.

- The NRM client 1 and NRM client 2 are configured with the information of the NRM server and have connectivity enabled to communicate with the NRM server. The information is provided via pre-configuration.

- The NRM server is configured with policies and information of the UEs to determine authorization of the UEs requesting connectivity via Uu.

- The VAL clients associated with NRM client 1 and NRM client 2 have triggered the establishment of connectivity.



Figure 14.3.x.2.1-1: Establishing communication with application service requirements

1a. The NRM client 1 sends the application connectivity request (source identity and IP address, destination identities, service requirements) to the NRM Server. The service requirement from the source includes packet size, packet transmission interval, packet processing latency, allowed packet loss rate/packet loss amount/packet error rate, etc. The destination may be multiple UEs (devices). The identity of source and destination may be the application user identity or the MAC address.

1b. The NRM server determines whether the UE of NRM client 1 is authorized to connect to the destination UEs for direct service communications via Uu. If UE of NRM client 1 is authorized to connect to the destination UEs, then a response is provided to the NRM client 1 indicating acceptance of the request.

2a. The NRM client 2 sends the application connectivity request (destination identity and IP address, source identity, service requirements) to the NRM server. The service requirements from the destination includes the service requirements as described in step 1a.

2b. The NRM server determines whether the UE of NRM client 2 is authorized to connect to the destination UEs for direct service communications via Uu. If UE of NRM client 2 is authorized to connect to the destination UEs, then a response is provided to the NRM client 2 indicating acceptance of the request.

3. Based on the service requirements received in step 1 and step 2, the NRM server determines the parameters and patterns for direct service connectivity between the UEs via Uu and also the transport requirements, i.e., QoS requirements for the 3GPP system (e.g. 5GS). This step may also include retrieving the direct link status of the UEs (e.g. PDU Session Status, UE reachability). If the NRM server determines that direct service connectivity via Uu is not authorized or not possible with the given connectivity requirements, it skips step 4 and proceeds to steps 5 and 6, informing each NRM client accordingly.

NRM server will process E2E connectivity establishment between NRM client 1 and NRM client 2 only after it receives the request from NRM client 2. There can be several NRM clients (destinations) which will perform step 2 and NRM server will process their E2E connectivity with NRM client 1 (source) as and when the requests are received by the NRM server.

NOTE: The NRM server can determine the transport layer priority of the E2E connections between NRM client 1 (source) and one or more NRM client 2 (destination) using the service requirements provided to the NRM server by the NRM clients.

4. The NRM server triggers 3GPP system to establish Uu connectivity between the UE of NRM client 1 and UE of NRM client 2 with required QoS as specified in 3GPP TS 23.501 [x].

5. The NRM server sends the application connectivity notification (connectivity/session information) to NRM client 1 indicating successful establishment of the connectivity. The connectivity/session information may contain the accepted destination identities.

6. The NRM server sends the application connectivity notification (connectivity/session information) to NRM client 2 indicating successful establishment of the connectivity.

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

#### 14.3.2.x Application connectivity request

Table 14.3.2.x-1 describes the information flow for application connectivity request from a NRM client to the NRM server.

Table 14.3.2.x-1: Application connectivity request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Source UE ID | M | Identifier of the requestor UE |
| VAL service ID | M | Identifier of the VAL service |
| List of destination UE IDs | M | Identifiers of the destination UEs |
| Application service requirements | M | Details of service requirements |
| >Packet size (NOTE) | O | Size of the packet to be transmitted. |
| >Packet transmission interval (NOTE) | O | Intervals at which the packet is to be transmitted |
| >Packet processing latency (NOTE) | O | Latency for packet processing |
| >Packet loss KPI (NOTE) | O | The KPIs related to packet loss (e.g. allowed packet loss rate, packet loss amount, packet error rate) |
| >Bandwidth (NOTE) | O | The bandwidth required |
| NOTE: At least one of information elements of the application service requirements shall be included. | | |

#### 14.3.2.y Application connectivity response

Table 14.3.2.y-1 describes the information flow for application connectivity response from the NRM server to the NRM client.

Table 14.3.2.y-1: Application connectivity response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Result | M | Result from the NRM server in response to request indicating success or failure for accepting the request. |
| Cause | O | The cause of failure, if the result indicates failure. |

#### 14.3.2.z Application connectivity notification

Table 14.3.2.z-1 describes the information flow for application connectivity notification from the NRM server to the NRM client.

Table 14.3.2.z-1: Application connectivity notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Session information | M | Session information for the established connectivity for application communication |
| VAL service ID | M | Identifier of the VAL service |
| List of accepted UE IDs (NOTE) | O | The list of UEs which are accepted for the connectivity established for the application service communication |
| NOTE: The List of accepted UE IDs IE shall be included when the application connectivity notification is sent to the initiator of the application connectivity request. | | |