**3GPP TSG-SA WG6 Meeting #46-e S6-212602 rev1**

**e-meeting, 15th – 23rd November 2021 (revision of S6-21xxxx)**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  |  | **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 | **X** | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Security aspect of MSGin5G align with SA3 |
|  |  |
| ***Source to WG:*** | China Mobile |
| ***Source to TSG:*** | S6 |
|  |  |
| ***Work item code:*** | 5GMARCH |  | ***Date:*** | 2021-11-08 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***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 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | SA3 has specified the Security aspects of MSGin5G in CR S3-214108 (and S3-214109). This CR will be implemented as Annex X of 3GPP TS 33.501. This CR is proposed to align with the output of SA3 and fix the SA3 placeholder in TS23.554.NOTE: the operational Security credentials in the MSGin5G message request has not been specified by SA3. |
|  |  |
| ***Summary of change:*** | Align the security aspects of MSGin5G with SA3. |
|  |  |
| ***Consequences if not approved:*** | The security aspects of MSGin5G will be still a placeholder of SA3 in TS23.554. |
|  |  |
| ***Clauses affected:*** | 2 and 8.2 |
|  |  |
|  | **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:*** |  |

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Change 1\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# 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 22.262: "Message Service within the 5G System".

[3] GSMA PRD RCC.07: "RCC.07 Rich Communication Suite 9.0 Advanced Communications Services and Client Specification".

[4] OMA OMA-ERELD-LightweightM2M-V1\_1-20180612-C: "Enabler Release Definition for LightweightM2M".

[5] 3GPP TS 23.434: "Service Enabler Architecture Layer for Verticals".

[6] 3GPP TS 23.222: "Functional architecture and information flows to support Common API Framework for 3GPP Northbound APIs; Stage 2".

[7] 3GPP TS 23.502: "Procedures for the 5G System".

[8] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[9] 3GPP TS 29.122: "T8 reference point for northbound Application Programming Interfaces (APIs)".

[10] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[11] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[12] 3GPP TS 23.501: "System Architecture for the 5G System (5GS); Stage 2".

[13] 3GPP TS 23.204: "Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access; Stage 2".

[14] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[15] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[16] 3GPP TS 33.501: "Security architecture and procedures for 5G System".

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Change 2\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 8.2 Registration

### 8.2.1 MSGin5G UE Registration

The signalling flow for MSGin5G UE registration is illustrated in figure 8.2.1-1. The procedure assumes that the MSGin5G UE is responsible for initiating registration to the MSGin5G Server in order to establish association with the MSGin5G Server to receive MSGin5G Services.

Pre-conditions:

1. The MSGin5G UE has connected to the serving network successfully.

2. A UE Service ID has been provisioned on the MSGin5G UE.

3. The MSGin5G Server address has been provisioned on the MSGin5G UE.

4. Both the MSGin5G UE and MSGin5G Server have been configured with the necessary credentials to enable authenticating one another.



Figure 8.2.1-1: MSGin5G Client registration

1. The MSGin5G UE sends an MSGin5G UE registration request to the MSGin5G Server. The request includes security credentials required for the MSGin5G Client to register to the MSGin5G Server. The request includes the UE Service ID and MSGin5G Client Profile information as detailed in Table 8.2.1-1.

Table 8.2.1-1: MSGin5G UE registration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the requesting MSGin5G UE. |
| UE credential information | M | The information needed to authenticate the UE. The authentication and authorization between MSGin5G client and MSGin5G Server are specified in Annex X.2 of 3GPP TS 33.501 [16]  |
| MSGin5G Client Profile | O | Set of parameters describing the MSGin5G Client |
| >MSGin5G Client Triggering Information | O | UE Identifier (i.e., MSISDN, external ID), port number(s) and associated protocol (e.g., SMS, NIDD, etc.) for device triggering. The MSGin5G Server uses the information in step 5 of clause 8.8.3. See Table 8.2.1-2. |
| >MSGin5G Client Communication Availability | O | Communication availability information for the MSGin5G Client to receive MSGin5G messages. This IE informs the MSGin5G Server if the client has a specific application-level schedule/periodicity to its MSGin5G communications, which may be used in conjunction with UE reachability monitoring to determine whether and when MSGin5G communications are attempted. See Table 8.2.1-3. |

Table 8.2.1-2: MSGin5G Client Triggering Information

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| MSGin5G UE ID | M | Identity of the UE hosting the MSGin5G Client (e.g., the External Identifier defined in TS 23.682 [19], or an MSISDN) |
| MSGin5G Client Ports | M | List of port numbers that the MSGin5G Client listens on for device triggers from the MSGin5G Server. Also included with each port number is an associated protocol (e.g., SMS, NIDD, etc.).   |

Table 8.2.1-3: MSGin5G Client and Non-MSGin5G UE Communication Availability

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Scheduled communication time | M | Time when the UE becomes available for communication.  |
| Communication duration time | M | Duration time of periodic communication.  |
| Periodic communication indicator | O | Identifies whether the client communicates periodically or not, e.g., on demand. |
| Periodic communication interval  | O | Interval Time of periodic communication. This IE is mandatory if the Periodic communication indicator indicates periodic communications. |
| Data size indication | O | Indicates the expected data size to be exchanged during the communication duration. |
| Store and forward option | O | Indicates opting out of store and forward services for incoming MSGin5G requests. |

Editor's note: Whether MSGin5G client capabilities are needed is FFS.

2. Upon receiving the request, the MSGin5G Server validates the registration request and verifies the security credentials.

3. The MSGin5G Server sends an MSGin5G UE registration response to the MSGin5G UE. If the registration is successful, the MSGin5G Server stores the MSGin5G Client Profile information.

Table 8.2.1-4: MSGin5G UE registration response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the requesting MSGin5G UE. |
| Registration result | M | Indication if the registration is success or failure |

### 8.2.2 MSGin5G UE De-Registration

By de-registering, the MSGin5G UE informs the MSGin5G Server that it wishes to terminate its association with the MSGin5G Server.

NOTE: De-registration implies that Client Triggering Information and the Client Communication Availability Information are no longer valid.

The procedure assumes that the MSGin5G UE is responsible for initiating the de-registration from the MSGin5G Server. The signalling flow for MSGin5G UE de-registration is illustrated in figure 8.2.2-1.

Pre-conditions:

1. The MSGin5G UE is registered to the MSGin5G Server.



Figure 8.2.2-1: MSGin5G UE de-registration

1. The MSGin5G UE determines to de-register from the MSGin5G Server.

2. The MSGin5G UE sends an MSGin5G UE de-registration request to the MSGin5G Server that includes the UE Service ID, as detailed in Table 8.2.2-1.

Table 8.2.2-1: MSGin5G UE de-registration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the Non-MSGin5G UE. |
| UE credential information | M | The information needed to authenticate the UE. The authentication and authorization between MSGin5G client and MSGin5G Server are specified in Annex X.2 of 3GPP TS 33.501 [16] . |

3. The MSGin5G Server validates the MSGin5G UE de-registration request and verifies the security credentials. The MSGin5G Server deletes any applicable MSGin5G Client Profile information that it has stored.

4. The MSGin5G Server an MSGin5G UE de-registration response as detailed in Table 8.2.2-2 to the MSGin5G UE.

Table 8.2.2-2: MSGin5G UE de-registration response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the non-SGin5G UE. |
| De-registration result | M | Indication if the de-registration is success or failure |

### 8.2.3 Non-MSGin5G UE Registration

Non-MSGin5G UEs (i.e., Legacy 3GPP UEs or Non-3GPP UEs) are connected to the MSGin5G Server through a Message Gateway. The Message Gateway performs registration with the MSGin5G Server on behalf of the Non-3GPP UEs, based on the registration request from the Non-3GPP UE or on pre-provisioned information. After the procedure is complete, the Message Gateway may communicate the result to the UE to enable MSGin5G Services at the Non-3GPP UEs.

The signalling flow is illustrated in figure 8.2.3-1.

Pre-conditions:

1. The Message Gateway has been pre-provisioned with the MSGin5G Server address and UE Service ID for a Non-3GPP UE.

2. Both the Non-3GPP UE and Message Gateway have been configured with the necessary credentials to enable authentication and Non-3GPP UE registration at the Message Gateway.

3. A secured connection has been established between the Message Gateway and the MSGin5G Server.



Figure 8.2.3-1: Non-MSGin5G UE registration

1. The Non-MSGin5G UE registers at the Message Gateway. Alternatively, the Non-MSGin5G UE registration information is configured at the Message Gateway. The Message Gateway, based on the registration request and pre-provisioned information, registers the UE with the MSGin5G Server, a corresponding UE Service ID and, if available, a Non-MSGin5G UE profile.

Table 8.2.3-1: Non-MSGin5G UE registration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the requesting Non-MSGin5G UE. |
| GW Service ID | M | GW service identifier of the Message Gateway performing registration on behalf of a Non-MSGin5G UE |
| UE credential information | M | The information needed to authenticate the UE. The authentication and authorization between MSGin5G client and MSGin5G Server are specified in Annex X.2 of 3GPP TS 33.501 [16]. |
| Non-MSGin5G UE Profile | O | Set of parameters describing the Non-MSGin5G UE |
| >Non-MSGin5G UE Communication Availability | O | Communication availability information for the Non-MSGin5G UE to receive messages. This IE informs the MSGin5G Server if the UE has a specific application-level schedule/periodicity to its MSGin5G communications, which may be used to determine whether and when MSGin5G communications are attempted. See Table 8.2.1-3. |

2. The Message Gateway sends the Non-MSGin5G UE registration request to the MSGin5G Server. The request includes the information detailed in Table 8.2.3-1.

3. The MSGin5G Server authenticates the Message Gateway and authorises the Non-MSGin5G UE to receive the MSGin5G Service. The MSGin5G Server records the UE's availability for MSGin5G Service.

4. The MSGin5G Server returns the result of the registration in the Non-MSGin5G UE registration response message with the information detailed in table 8.2.2-2.

### 8.2.4 Non-MSGin5G UE De-registration

The Message Gateway performs de-registration with the MSGin5G Server on behalf of the Non-MSGin5G UEs, in order to terminate services from the MSGin5G Server. After the procedure is complete, the Message Gateway communicates the result to the requesting UE.

The procedure assumes that the Non-MSGin5G UE is responsible for initiating the de-registration from the MSGin5G Server. The signaling flow for Non-MSGin5G UE de-registration is illustrated in figure 8.2.4-1.

Pre-conditions:

1. The Message Gateway successfully performed registration with the MSGin5G Server on behalf of the Non-MSGin5G UE.



Figure 8.2.4-1 : Non-MSGin5G UE de-registration

1. The Message Gateway determines to de-register the Non-MSGin5G UE with the MSGin5G Server.

2. The Message Gateway sends a Non-MSGin5G UE de-registration request to the MSGin5G Server that includes the UE Service ID associated with the Non-MSGin5G UE, as shown in Table 8.2.4-1.

Table 8.2.4-1: Non-MSGin5G UE de-registration request

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the Non-MSGin5G UE. |
| UE credential information | M | The information needed to authenticate the UE. The authentication and authorization between MSGin5G client and MSGin5G Server are specified in Annex X.2 of 3GPP TS 33.501 [16]. |

3. The MSGin5G Server validates the Non-MSGin5G UE de-registration request and verifies the security credentials. The MSGin5G Server deletes any applicable MSGin5G Client Profile information that it has stored.

4. The MSGin5G Server deletes any applicable information that it has stored and replies with a Non-MSGin5G UE de-registration response as shown in table 8.2.4-2.

Table 8.2.4-2: Non-MSGin5G UE De-registration response

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| UE Service ID | M | UE service identifier assigned to the Non-MSGin5G UE. |
| De-registration result | M | Indication if the de-registration is success or failure |

Editor's note: Support for bulk registration and de-registration of Non-MSGin5G UE s (i.e., registering more than one UE Service ID at the same time) is FFS.

8.2.5 Application Server Registration

The signalling flow for Application Server registration is illustrated in figure 8.2.5-1. Application Server may use the procedure in this clause to do registration. The procedure assumes that the Application Server is responsible for triggering registration to the MSGin5G Server in order to establish association with the MSGin5G Server to receive MSGin5G Service.

NOTE: The procedure in this clause is optional for Application Server registration.

Pre-conditions:

1. The Application Server has connected to the serving network successfully.

2. An AS Service ID has been provisioned.

3. The MSGin5G Server address has been provisioned on the Application Server.

4. Both the Application Server and MSGin5G Server have been configured with the necessary credentials to enable authenticating one another.



Figure 8.2.5-1: Application Server registration

1. The Application Server sends an Application Server registration request to the MSGin5G Server. The request includes security credentials required for the Application Server to register to the MSGin5G Server. The request includes the AS Service ID and Application Server Profile information as detailed in Table 9.1.2.3-1.

2. Upon receiving the request, the MSGin5G Server validates the Application Server registration request and verifies the security credentials. The authentication and authorization between Application Server and MSGin5G Server are specified in Annex X.4 of 3GPP TS 33.501 [16].

3. The MSGin5G Server sends an Application Server registration response to the Application Server, the response includes the information elements as specified in Table 9.1.2.4-1. If the registration is successful, the MSGin5G Server stores the AS Profile information as detailed in Table 9.1.2.3-1.

8.2.6 Application Server De-registration

By de-registering, the Application Server informs the MSGin5G Server that it wishes to terminate its association with the MSGin5G Server.

The procedure assumes that the Application Server is responsible for triggering the de-registration from the MSGin5G Server. The signalling flow for Application Server de-registration is illustrated in figure 8.2.6-1.

Pre-conditions:

1. The Application Server is registered to the MSGin5G Server.



Figure 8.2.6-1: Application Server de-registration

1. The Application Server determines to de-register from the MSGin5G Server.

2. The Application Server sends an Application Server de-registration request to the MSGin5G Server that includes the AS Service ID, as detailed in Table 9.1.2.5-1.

3. The MSGin5G Server validates the Application Server de-registration request and verifies the security credentials. The authentication and authorization between Application Server and MSGin5G Server are specified in Annex X.4 of 3GPP TS 33.501 [16], The MSGin5G Server deletes any applicable AS Profile information that it has stored.

4. The MSGin5G Server replies an Application Server de-registration response as detailed in Table 9.1.2.6-1.