**3GPP TSG-WG SA2 Meeting #88E e-meeting  *SP-200529***

**Elbonia, June 30 -July 3, 2020 (revision of S2-2003288)**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.502** | **CR** | **2278** | **rev** | **2** | **Current version:** | **15.9.0** |  |
|  | | | | | | | | |
| *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:*** | Correction on Deregistration procedures for SMS over NAS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GS\_Ph1 | | | | |  | ***Date:*** | | | 2020-04-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This CR proposes the following changes:   1. Consider the Access Type over which the SMS is deactivated.   According to the clause 4.13.3.2, the SMS deactivation is triggered by Deregistration or Registration with UE’s capability change for SMS over NAS.  The general Registration or Deregistration is associated with Access Type (i.e., 3GPP Access or non-3GPP Access).  It is clarified the UE is deregistered for SMS for both access type at one AMF if only one Registration misses the "SMS supported" indication.   1. Some editorial changes to correct the Nudr\_DM\_Unsubscribe service operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | It is proposed to consider the Access Type over which the SMS is deactivated. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Deregistration on one of the access types will cause SMS service become completely unusable to the UE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.13.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | R2 updates the SA2 agreed CR in S2-2003288 to avoid the possiblity the Support of SMS over NAS at a single AMF is slective per access type when the UE is registered for both. | | | | | | | | |

\* \* \* \* First change \* \* \* \*

#### 4.13.3.2 Deregistration procedures for SMS over NAS

If the UE no longer indicates "SMS supported" to the AMF in a Registration Request message, or, the AMF considers that UE is deregistered for one Access Type, or the AMF receives for one Access Type a Deregistration Notification from UDM indicating UE Initial Registration, Subscription Withdrawn or 5GS to EPS Mobility as specified in clause 5.2.3.2.2, then:

- When the UE is not registered at the AMF for the other Access Type, the AMF may unsubscribe from SMS Subscription data changes notification with the UDM by means of the Nudm\_SDM\_Unsubscribe service operation. The UDM may remove the corresponding subscription of data change notification in UDR by Nudr\_DM\_Unsubscribe service operation.

- The AMF invokes, for every impacted Access Type, either Nsmsf\_SMService\_Deactivate or Nsmsf\_SMService\_Update service operation to trigger the release of UE Context for SMS on SMSF.

- When the UE is not registered at the AMF for the other Access Type, the AMF shall delete or deactivate the stored SMSF address in its UE Context.

- The SMSF shall invoke Nudm\_UECM\_Deregistration (SUPI, NF ID, Access Type) service operation from UDM to trigger UDM to delete SMSF address of the UE for the impacted Access Type(s) and the UDM may update the UE context in SMSF in UDR by Nudr\_DM\_Update (SUPI, Subscription Data, SMS Subscription data, SMSF address). The SMSF also removes the UE Context for SMS for the impacted Access Type(s), including the AMF address.

- If the UE is no longer registered for SMS over NAS service at the SMSF for any Access Type, the SMSF unsubscribes from SMS Management Subscription data changes notification with the UDM by means of the Nudm\_SDM\_Unsubscribe service operation. The UDM may remove the corresponding subscription of data change notification in UDR by Nudr\_DM\_Unsubscribe service operation.

\* \* \* \* Second change \* \* \* \*

### 5.2.9 SMSF Services

#### 5.2.9.1 General

The following table illustrates the SMSF Services.

Table 5.2.9.1-1: List of SMSF Services

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation  Semantics | Example Consumer(s) |
| Nsmsf\_SMService | Activate | Request/Response | AMF |
| Update | Request/Response | AMF |
| Deactivate | Request/Response | AMF |
|  | UplinkSMS | Request/Response | AMF |

\* \* \* \* Third change \* \* \* \*

##### 5.2.9.2.x Nsmsf\_SMService\_Update service operation

**Service operation name:** Nsmsf\_SMService\_Update.

**Description:** update the specified UE SMS service information.

**Concurrent use:** None.

**Inputs, Required:** SUPI, NF ID, RAT Type.

**Inputs, Optional:** GPSI, Access Type (adding or removal), Time Zone, UE's Routing Indicator or UDM Group ID for the UE.

**Outputs, Required:** SMS service update result.

**Outputs, Optional:** None.

\* \* \* Fourth change \* \* \* \*

### 4.13.3 SMS over NAS procedures

#### 4.13.3.1 Registration procedures for SMS over NAS



Figure 4.13.3.1-1: Registration procedure supporting SMS over NAS

1. During Registration procedure in 5GS defined in Figure 4.2.2.2.2-1, to enable SMS over NAS transporting, the UE includes an "SMS supported" indication in Registration Request in step 1-3 indicating the UE's capability for SMS over NAS transport. The "SMS supported" indication indicates whether the UE supports SMS delivery over NAS.

2. Step 4 to step 14 of the Registration procedure in Figure 4.2.2.2.2-1 are performed. The AMF may retrieve the SMS Subscription data and UE Context in SMSF data using Nudm\_SDM\_Get. This requires that UDM may retrieve this information from UDR by Nudr\_DM\_Query. The UDM includes the SMSF information in the Nudm\_SDM\_Get response message if the stored SMSF belongs to the same PLMN of the AMF. After a successful response is received and if SMS service is allowed, the AMF subscribes to be notified using Nudm\_SDM\_Subscribe when the SMS Subscription data is modified, and UDM may subscribe to UDR by Nudr\_DM\_Subscribe.

The AMF can also receive UE context information containing SMSF Information from old AMF. When AMF re-allocation happens during the Registration procedure, the old AMF transfers SMSF Information to the new AMF as part of UE context in step 5 of Figure 4.2.2.2.2-1.

NOTE 1: The AMF can, instead of the Nudm\_SDM\_Get service operation, use the Nudm\_SDM\_Subscribe service operation with an Immediate Report Indication that triggers the UDM to immediately return the subscribed data if the corresponding feature is supported by both the AMF and the UDM.

3. If the "SMS supported" indication is included in the Registration Request, the AMF checks in the SMS Subscription data that was received in step 2 whether the SMS service is allowed to the UE. If SMS service is allowed and the UE context received in step 2 includes an available SMSF of the serving PLMN, the AMF activates this SMSF Address and continues the registration procedure. If SMS service is allowed but an SMSF of the serving PLMN was not received in step 2, the AMF discovers and selects an SMSF to serve the UE as described in clause 6.3.10 of TS 23.501 [2].

4. Step 15 to step 20 of the Registration procedure in Figure 4.2.2.2.2-1 are performed.

5. The AMF invokes Nsmsf\_SMService\_Activate service operation from the SMSF, or Nsmsf\_SMService\_Update service operation from the SMSF if AMF has already invoked the SMS service for the UE for the other access type. The invocation includes AMF address, Access Type, RAT Type, Trace Requirements, GPSI (if available) and SUPI. AMF uses the SMSF Information derived from step 3. Trace Requirements is provided if it has been received by AMF as part of subscription data.

6. The SMSF discovers a UDM as described in TS 23.501 [2], clause 6.3.8.

7a-7b. If the UE context for the current Access Type already exists in the SMSF, the SMSF shall replace the old AMF address with the new AMF address.

Otherwise, the SMSF registers with the UDM using Nudm\_UECM\_Registration with Access Type. As a result, the UDM stores the following information: SUPI, SMSF identity, SMSF address, Access Type in UE Context in SMSF data. The UDM may further store SMSF Information in UDR by Nudr\_DM\_Update (SUPI, Subscription Data, UE Context in SMSF data). SMSF retrieves SMS Management Subscription data (e.g., SMS teleservice, SMS barring list) using Nudm\_SDM\_Get and this requires that UDM may get this information from UDR by Nudr\_DM\_Query (SUPI, Subscription Data, SMS Management Subscription data). After a successful response is received, the SMSF subscribes to be notified using Nudm\_SDM\_Subscribe when the SMS Management Subscription data is modified and UDM may subscribe to notifications from UDR by Nudr\_DM\_Subscribe.

SMSF also creates a UE context to store the SMS subscription information and the AMF address that is serving this UE.

NOTE 2: The SMSF can, instead of the Nudm\_SDM\_Get service operation, use the Nudm\_SDM\_Subscribe service operation with an Immediate Report Indication that triggers the UDM to immediately return the subscribed data if the corresponding feature is supported by both the SMSF and the UDM.

8. The SMSF responds back to the AMF with either Nsmsf\_SMService\_Activate, or Nsmsf\_SMService\_Update service operation response message base on step 5. The AMF stores the SMSF Information received as part of the UE context.

9. The AMF includes the "SMS allowed" indication to the UE in the Registration Accept message of step 21 of Figure 4.2.2.2.2-1 only after step 8 in which the AMF has received a positive indication from the selected SMSF.

The "SMS allowed" indication in the Registration Accept message indicates to the UE whether the network allows the SMS message delivery over NAS.

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