**3GPP TSG-CT4 Meeting #101e**

**E-Meeting, 3rd – 13th Novenmber, 2020**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.540** | **CR** | **0059** | **rev** | **-** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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 to support multiple access type for SMS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, ZTE | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GS\_Ph1-CT | | | | |  | ***Date:*** | | | 2020-10-26 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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:*** | | TS 23.502 require the SMSF to support authorization of SMS service for an UE over multiple Access Types. See TS 23.502 CR 2368 ([S2-2006179](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_140e_Electronic/INBOX/S2-2006179.zip))  Excerpt from TS 23.502:  ======  5.2.9.2.2 Nsmsf\_SMService\_Activate service operation  Service operation name: Nsmsf\_SMService\_Activate.  Description: Authorize whether the specified UE is allowed to activate SMS service, or add connectivity for SMS over new Access Type.  ======  Corresponding changes to the Nsmsf\_SMService Activate operation are missing. Currently Nsmsf\_SMService Activate operation supports only one Access Type.  TS 23.502 also requires the SMSF to support removal of authorization for SMS over one of the Access Types when the UE has SMS service activated over both 3GPP and non-3GPP access.  Excerpt from TS 23.502:  ======  5.2.9.2.3 Nsmsf\_SMService\_Deactivate service operation  Service operation name: Nsmsf\_SMService\_Deactivate.  Description: Remove SMS service authorization from SMSF for a given service user, or with Access Type included, remove connectivity for SMS over the affected Access Type.  ======  Corresponding changes to the Nsmsf\_SMService Deactivate operation are missing. Currently Nsmsf\_SMService Deactivate operation supports only deleting an individual UE Context for SMS in the SMSF. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | New optional attributes "additionalAccessType" and "additionalRatType" are added to "UeSmsContextData". | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage 2 requirements cannot be implemented.  SMSF cannot support SMS activation for multiple Access Types.  SMSF cannot support removal of authorization for SMS over one access Type. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.1, 5.2.2.2, 5.2.2.3, 6.1.3.1, 6.1.3.3.1, 6.1.6.2.2, A.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 introduces backward compatible corrections to the Nsmsf\_SMService API | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* Begin of Changes \* \* \* \*

### 5.2.1 Service Description

The Nsmsf\_SMService service provides the service capability for the NF Service Consumer (e.g. AMF) to authorize SMS and activate SMS for a service user on SMSF. The following are the key functionalities of this NF service:

- Activation or deactivation of SMS service for a given service user, which results in creating/updating/deleting an UE Context for SMS in SMSF;

- Send SMS payload in uplink direction to SMSF;

The Nsmsf\_SMService service supports the following service operations.

Table 5.2.1-1: Service operations supported by the Nsmsf\_SMService service

|  |  |  |  |
| --- | --- | --- | --- |
| Service Operations | Description | Operation  Semantics | Example Consumer(s) |
| Activate | Activate SMS service for a given service user, which results in creating or updating a UE Context for SMS in SMSF. | Request/Response | AMF |
| Deactivate | Deactivate SMS service for a given service user, which results in deleting or updating a UE Context for SMS in SMSF. | Request/Response | AMF |
| UplinkSMS | Send SMS payload in uplink direction to SMSF; | Request/Response | AMF |

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

#### 5.2.2.2 Activate

##### 5.2.2.2.1 General

The Activate service operation shall be used by the NF Service Consumer (e.g. AMF) to activate SMS service for a given service user, which results in creating or updating an individual UE Context for SMS in the SMSF, in the following procedures:

- Registration Procedure for SMS over NAS (see clause 4.13.3.1 of 3GPP TS 23.502 [3]);

- Registration Update Procedure for SMS over NAS due to AMF change (see clause 4.13.3.1 of 3GPP TS 23.502 [3]);

- Registration Update Procedure for SMS over NAS to add authorization for SMS over a new additional Access Type;

There shall be only one individual UE Context for SMS per service user.

##### 5.2.2.2.2 Registration procedure using Activate service operation

The NF Service Consumer (e.g. AMF) shall activate SMS service for a given service user by using the HTTP PUT method as shown in Figure 5.2.2.2.2-1.



Figure 5.2.2.2.2-1: Activation of SMS service

1. The NF Service Consumer (e.g. AMF) shall send a PUT request to the resource representing the UE Context for SMS (i.e. …/ue-contexts/{supi}) in the SMSF to activate SMS service for a given service user. The payload body of the PUT request shall contain a representation of the individual UE Context resource to be created or updated.

Depending on whether the target UE Context for SMS has already been created, the SMSF performs 2a or 2b or 2c:

2a. If the target UE Context for SMS is not created in SMSF, the SMSF retrieves subscription data from the UDM, performs service authorization for the given UE, and create UE Context for SMS for this UE;

If successful, "201 Created" shall be returned, the payload body of the PUT response shall contain the representation of the created resource and the "Location" header shall contain the URI of the created resource.

2b. If the target UE Context for SMS has already been created, the SMSF updates the UE Context for SMS with the NF Service Consumer (e.g. AMF) provided parameters.

If successful, "204 No Content" shall be returned.

2c. If the target UE Context for SMS has already been created and the NF Service Consumer (e.g. AMF) provided parameters contains 2 access types (i.e. an additional Access Type), the SMSF registers itself in UDM for the new Access Type for the given UE, performs service authorization for the given UE for the new Access Type and updates the UE context for SMS for this UE with the new additional Access Type.

If successful, "204 No Content" shall be returned.

2d. On failure or redirection, the appropriate HTTP status code (e.g. "403 Forbidden") indicating the error shall be returned.

A ProblemDetails IE shall be included in the payload body of PUT response, with the "cause" attribute of ProblemDetails set to application error codes specified in table 6.1.7.3-1.

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

#### 5.2.2.3 Deactivate

##### 5.2.2.3.1 General

The Deactivate service operation shall be used by the NF Service Consumer (e.g. AMF) to deactivate SMS service for a given service user, which results in deleting or updating an individual UE Context for SMS in the SMSF, in the following procedures:

- De-Registration Procedure to remove SMS service authorization from SMSF for SMS over NAS (see clause 4.13.3.2 of 3GPP TS 23.502 [3]);

- De-Registration procedure to remove SMS service authorization from SMSF for one of the registered Access Type (see clause 4.13.3.2 of 3GPP TS 23.502 [3]);

##### 5.2.2.3.2 De-Registration procedure to remove SMS service authorization from SMSF

The NF Service Consumer (e.g. AMF) shall deactivate SMS service for a given service user by using the HTTP DELETE method as shown in Figure 5.2.2.3.2-1.



Figure 5.2.2.3.2-1: Deactivation of SMS service

1. The NF Service Consumer (e.g. AMF) shall send a DELETE request to the resource representing the UE Context for SMS (i.e. …/ue-contexts/{supi}) in the SMSF.

2a. The SMSF deactivates the SMS service for the service user, and deletes the UE context for SMS from the SMSF.

On success, "204 No Content" shall be returned.

2b. On failure, the appropriate HTTP status code (e.g. "403 Forbidden") indicating the error shall be returned.

A ProblemDetails IE shall be included in the payload body of DELETE response, with the "cause" attribute of ProblemDetails set to application error codes specified in table 6.1.7.3-1.

##### 5.2.2.3.x De-Registration procedure to remove SMS service authorization from SMSF for one of the registered Access Type

When the UE has SMS service activated on both of the Access Types and the NF Service Consumer (e.g. AMF) wants to deactivate SMS service for the given UE for one of the affected Access Type, the NF Service Consumer (e.g. AMF) shall use HTTP PUT method as shown in Figure 5.2.2.3.x-1.



Figure 5.2.2.3.x-1: Removal of SMS service authorization over one of the access types

1. The NF Service Consumer (e.g. AMF) shall send a PUT request to the resource representing the UE Context for SMS (i.e. …/ue-contexts/{supi}) in the SMSF. The payload body of the PUT request shall contain a representation of the individual UE Context resource to be updated. Only one Access Type that is allowed for SMS service shall be included in the PUT request payload body.

2a. Since the target UE Context for SMS was already created at the SMSF with both 3GPP and non-3GPP Access Types for the same NF Service Consumer (e.g. AMF) and the NF Service Consumer provided parameters contains only one Access Type, the SMSF deregisters itself in the UDM for the affected Access Type (i.e. the access type not included in the PUT request) for the given UE and updates the UE context for SMS by removing the affected Access Type.

On success, "204 No Content" shall be returned.

2b. On failure or redirection, the appropriate HTTP status code (e.g. "403 Forbidden") indicating the error shall be returned.

A ProblemDetails IE shall be included in the payload body of PUT response, with the "cause" attribute of ProblemDetails set to application error codes specified in table 6.1.7.3-1.

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

#### 6.1.3.1 Overview

The figure 6.1.3.1-1 describes the resource URI structure of the Nsmsf-sms API.



Figure 6.1.3.1-1: Resource URI structure of the nsmsf-sms API

Table 6.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 6.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| UEContext (Document) | /ue-contexts/{supi} | PUT | It is used for the Activate service operation, for the purpose of:  - Activate SMS service for a given UE, which results in creating an individual UE Context resource in SMSF.  - Update SMS service parameters for a given UE, which results in updating an existing individual UE Context resource in SMSF.  - Deactivate SMS service for a given UE for one of the two registered Access Types, which results in updating an existing individual UE context resource in SMSF. |
| DELETE | It is used for the Deactivate service operation, for the purpose of:  - Deactivate SMS service for a given UE, which results in deleting an existing individual UE Context resource in SMSF. |
| /ue-contexts/{supi}/sendsms | sendsms  (POST) | It is used for the UplinkSMS service operation, to allow NF Service Consumer to send SMS payload in uplink direction. |

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

##### 6.1.3.3.1 Description

This resource represents an individual UE Context for SMS in SMSF.

This resource is modelled with the Document resource archetype (see clause C.2 of 3GPP TS 29.501 [5]).

A PUT method to this resource can be invoked by the NF Service Consumer (e.g. AMF) to:

- activate SMS service for a given UE, which results in creating new individual UE Context for SMS in SMSF, during the Registration procedure for SMS over NAS (see 3GPP TS 23.502 [3] clause 4.13.3.1);

- update SMS service parameters for a given UE, which results in updating individual UE Context for SMS in SMSF, during the Registration Update procedure due to AMF change (see 3GPP TS 23.502 [3] clause 4.13.3.1).

- update SMS service parameters for a given UE, which results in updating individual UE Context for SMS in SMSF, to add a new Access Type for SMS over NAS.

- Deactivate SMS service for a given UE for one of the two registered Access Types, which results in updating an existing individual UE context resource in SMSF to remove the affected Access Type for SMS over NAS.

A DELETE method to this resource can be invoked by the NF Service Consumer (e.g. AMF) to:

- deactivate SMS service for a given UE, which results in deleting existing individual UE Context for SMS in SMSF, during the De-Registration procedure form SMS over NAS (see 3GPP TS 23.502 [3] clause 4.13.3.2).

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

##### 6.1.6.2.2 Type: UeSmsContextData

Table 6.1.6.2.2-1: Definition of type UeSmsContextData

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| supi | Supi | M | 1 | This IE shall be present, and it shall contain the subscriber permanent identify of the service user. |
| gpsi | Gpsi | O | 0..1 | When present, this IE shall contain the generic public subscriber identifier of the service user. |
| pei | Pei | O | 0..1 | When present, this IE shall contain the IMEI or IMEISV of the service user. |
| accessType | AccessType | M | 1 | This IE shall be present, and it shall contain the access type from which the service user accesses to network. |
| additionalAccessType | AccessType | C | 0..1 | This IE shall be present in activate service operations to indicate that the service user accesses the network and request SMS service from both 3GPP access and Non-3GPP access.  This IE shall be absent in deactivate service operations to indicate that service user is no longer served with SMS service via two access types. In this case the accessType attribute shall indicate the remaining access type. |
| amfId | NfInstanceId | M | 1 | This IE shall be present, and it shall contain the NF instance ID of the requesting AMF. |
| guamis | array(Guami) | O | 1..N | When present, this IE shall contain the GUAMI(s) of the AMF. |
| ueLocation | UserLocation | O | 0..1 | When present, this IE shall contain the UE location information (e.g. TAI and CGI). |
| ueTimeZone | TimeZone | O | 0..1 | When present, this IE shall contain the current time zone of the service user. |
| traceData | TraceData | O | 0..1 | Trace Data. The Null value indicates that trace is not active. |
| backupAmfInfo | array(BackupAmfInfo) | C | 1..N | This IE shall be included if the NF service consumer is an AMF and the AMF supports the AMF management without UDSF when the UE Context for SMS to be created in the SMSF, or to be updated in the SMSF.  The SMSF uses this attribute to do an NRF query in order to invoke later services in a backup AMF e.g. Namf\_MT. |
| udmGroupId | NfGroupId | O | 0..1 | Identity of the UDM group serving the supi |
| routingIndicator | string | O | 0..1 | When present, it shall indicate the Routing Indicator of the UE. |
| ratType | RatType | C | 0..1 | When present, it shall indicate the RAT type of the UE. |
| additionalRatType | RatType | C | 0..1 | When present, it shall indicate the RAT type of the UE corresponding to additionalAccessType. This IE shall not be included if additionalAccessType IE is not present. |

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

## A.2 Nsmsf\_SMService API

openapi: 3.0.0

***(… text not shown for clarity …)***

schemas:

UeSmsContextData:

type: object

required:

- supi

- amfId

- accessType

properties:

supi:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Supi'

pei:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Pei'

amfId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

guamis:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Guami'

minItems: 1

accessType:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

additionalAccessType:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/AccessType'

gpsi:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/Gpsi'

ueLocation:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/UserLocation'

ueTimeZone:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/TimeZone'

traceData:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/TraceData'

backupAmfInfo:

type: array

items:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/BackupAmfInfo'

minItems: 1

udmGroupId:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/NfGroupId'

routingIndicator:

type: string

ratType:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

additionalRatType:

$ref: 'TS29571\_CommonData.yaml#/components/schemas/RatType'

***(… text not shown for clarity …)***

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