**3GPP TSG-CT WG4 Meeting #106-eC4-215022**

**E-Meeting, 11th – 15th Oct 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.531** | **CR** | **0110** | **rev** | **-** | **Current version:** | **17.2.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | UDM indication to provide full set of subscribed S-NSSAIs | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** | C4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNS\_Ph2 | | | | |  | ***Date:*** | | | 2021-10-01 |
|  |  | | | |  | |  | | |  |
| ***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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This CR implements changes agreed in S2-2106860 (3GPP TS 23.502 CR2888r1).  In Nnssf\_NSSelection service, AMF includes:  UDM indication to provide all subscribed S-NSSAIs for UEs not indicating support of subscription-based restrictions to simultaneous registration of network slices, | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updated Nnssf\_NSSelection API to include UDM Indication | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Stage-2 requirements not met | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.2.2.2, 5.2.2.2.4, 6.1.6.2.10, 6.1.6.2.13, 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 new feature to the OpenAPI specification files of TS29531\_ Nnssf\_NSSelection.yaml. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

##### 5.2.2.2.2 Get service operation of Nnssf\_NSSelection service

In this procedure, the NF Service Consumer (e.g. AMF) retrieves the slice selection information including the Allowed NSSAI, Configured NSSAI, target AMF Set or the list of candidate AMF(s) and other optional information.

This service operation shall also be used to retrieve the slice mapping information including the mapping of S-NSSAI(s) of the VPLMN to corresponding HPLMN S-NSSAI(s) during inter-PLMN mobility procedure.



Figure 5.2.2.2.2-1: Retrieve the network slice information during the mobility procedure

1 The AMF shall send a GET request to the NSSF.

If the AMF wants to retrieve the slice selection information, one or more of the following parameters shall be included as query parameters: Requested NSSAI and Subscribed S-NSSAI(s) with the indication if marked as default S-NSSAI and the associated subscribed NSSRG information and optionally UE support of subscription-based restrictions to simultaneous registration of network slice feature Indication, UDM indication to provide all subscribed S-NSSAIs for UEs not indicating support of subscription-based restrictions to simultaneous registration of network slices feature included in the slice-info-request-for-registration, PLMN ID of the SUPI, TAI, NF type of the NF service consumer, Requester ID.

If the AMF wants to retrieve the slice mapping information, the following parameters shall be included as query parameters: sNssaiForMapping IE and requestMapping IE included in the slice-info-request-for-registration, PLMN ID of the SUPI, TAI, NF type of the NF service consumer and Requester ID.

2a On success, "200 OK" shall be returned when the NSSF is able to find authorized network slice information for the requested network slice selection information, the response body shall include a payload body containing at least the Allowed NSSAI, target AMF Set or the list of candidate AMF(s); the payload body may additionally contain a target AMF Service Set and target NSSAI. If subscribed NSSRG list is provided, the NSSF shall provide the compatible S-NSSAIs in the Allowed NSSAI as defined in clause 5.15.12 of 3GPP TS 23.501 [2]. "200 OK" shall also be returned when the NSSF is able to find the requested slicing mapping information, the response body shall include a payload body containing the mapping of S-NSSAI(s) of the VPLMN to corresponding HPLMN S-NSSAI(s) included in the allowedNssaiList IE. If the request indicated that UE does not support subscription-based restrictions to simultaneous registration of network slice feature, and UDM has requested to provide all subscribed S-NSSAIs for such UEs, Configured NSSAI, if included, shall be provided ignoring the NSSRG restrictions.

2b If no slice instances can be found for the requested slice selection information or the requested slice mapping information, then the NSSF shall return a 403 Forbidden response with the "ProblemDetails" IE containing the Application Error "SNSSAI\_NOT\_SUPPORTED" (cf. Table 6.1.7.3-1).

On failure or redirection, the NSSF shall return one of the HTTP status codes together with the response body listed in Table 6.1.3.2.3.1-3.

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

##### 5.2.2.2.4 Get service operation of Nnssf\_NSSelection service during UE configuration update procedure

In this procedure, the NF Service Consumer (e.g. AMF) retrieves network slice configuration information (e.g. the Allowed NSSAI and the Configured NSSAI) during the UE configuration update procedure.



Figure 5.2.2.2.4-1: Retrieve the network slice information during UE configuration update procedure

1 The NF Service consumer (e.g. AMF) shall send a GET request to the NSSF. The request shall include query parameters: Subscribed S-NSSAI(s) with the indication if the S-NSSAI is marked as default S-NSSAI and the associated subscribed NSSRG information and optionally UE support of subscription-based restrictions to simultaneous registration of network slice feature Indication, UDM indication to provide all subscribed S-NSSAIs for UEs not indicating support of subscription-based restrictions to simultaneous registration of network slices feature, PLMN ID of the SUPI, TAI, NF type of the NF service consumer and the NF instance ID of the requester NF.

2a On success, "200 OK" shall be returned when the NSSF is able to find authorized network slice information for the requested network slice selection information, the response body shall include a payload body containing at least the Allowed NSSAI, Configured NSSAI and optionally target NSSAI. If subscribed NSSRG list is provided, the NSSF shall provide the compatible S-NSSAIs in the Allowed NSSAI and Configured NSSAI as defined in the clause 5.15.12 of 3GPP TS 23.501 [2]. If the request indicated that UE does not support subscription-based restrictions to simultaneous registration of network slice feature, and UDM has requested to provide all subscribed S-NSSAIs for such UEs, the NSSF shall provide Configured NSSAI ignoring the NSSRG restrictions.

2b If no slice instances can be found for the requested slice selection information, then the NSSF shall return a 403 Forbidden response with the "ProblemDetails" IE containing the Application Error "SNSSAI\_NOT\_SUPPORTED" (cf. Table 6.1.7.3-1).

On failure or redirection, the NSSF shall return one of the HTTP status codes together with the response body listed in Table 6.1.3.2.3.1-3.

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

##### 6.1.6.2.10 Type: SliceInfoForRegistration

Table 6.1.6.2.10-1: Definition of type SliceInfoForRegistration

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| subscribedNssai | array(SubscribedSnssai) | C | 1..N | This IE shall be included during the initial registration procedure or during mobility registration procedure in 5GS. This IE may also be included during EPS to 5GS handover procedure/Idle mode Mobility Registration Procedure using N26 interface or the handover procedure within 5GS. When present, this IE shall contain the list of subscribed S-NSSAIs along with an indication for each S-NSSAI if it is a default S-NSSAI. |
| allowedNssaiCurrentAccess | AllowedNssai | C | 0..1 | This IE shall be included during an initial registration procedure in 5GS or during mobility registration update procedure in 5GS with a native 5G-GUTI as the old GUTI, and an allowed NSSAI for the current access type of the UE is available at the NF service consumer (e.g AMF). |
| allowedNssaiOtherAccess | AllowedNssai | C | 0..1 | This IE shall be present during an initial registration procedure in 5GS or during mobility registration update procedure in 5GS with a native 5G-GUTI as the old GUTI, and if the UE was registered with the NF service consumer (e.g AMF) earlier for another access type and an allowed NSSAI for the other access type is available at the NF service consumer (e.g AMF). |
| sNssaiForMapping | array(Snssai) | C | 1..N | This IE shall be included if the requestMapping IE is set to true. When included, this IE shall contain the set of S-NSSAIs obtained from PGW+SMF in the HPLMN for PDU sessions that are handed over from EPS to 5GS, or shall contain the set of HPLMN S-NSSAIs obtained from source AMF during handover procedure within 5GS, or shall contain the S-NSSAIs for the HPLMN received from the UE during EPS to 5GS Idle mode Mobility Registration Procedure using N26 interface/idle state mobility registration procedure in 5GS. |
| mappingOfNssai | array(MappingOfSnssai) | O | 1..N | This IE may be present when the network slice information is requested during the Registration procedure. If present, this IE shall contain the mapping of S-NSSAI of the VPLMN to corresponding HPLMN S-NSSAI, for the S-NSSAIs included in the requestedNssai and allowedNssai IEs for the current and other access types.  This IE may also be present when the network slice information is requested during EPS to 5GS handover procedure using N26 interface or the handover procedure within 5GS. If present, this IE shall contain the mapping of S-NSSAI of the VPLMN to corresponding HPLMN S-NSSAI, for the S-NSSAIs included in the requestedNssai IE. |
| requestedNssai | array(Snssai) | O | 1..N | This IE may contain the set of S-NSSAIs requested by the UE.  During EPS to 5GS handover procedure using N26 interface, this IE may contain the set of S-NSSAIs in the serving PLMN obtained from PGW+SMF in VPLMN, or mapped from the set of S-NSSAIs obtained from PGW+SMF in the HPLMN.  During handover procedure within 5GS, this IE may contain the set of S-NSSAIs in the serving PLMN obtained from the source AMF, or mapped from the set of HPLMN S-NSSAIs obtained from source AMF. |
| defaultConfiguredSnssaiInd | boolean | C | 0..1 | This IE shall be present when the UE includes the Default Configured NSSAI Indication during the Registration procedure.  true: The Default Configured NSSAI is indicated by the UE; false (default): The Default Configured NSSAI is not indicated by the UE. |
| requestMapping | boolean | O | 0..1 | This IE may be present when the Nnssf\_NSSelection\_Get procedure is invoked during EPS to 5GS Mobility Registration Procedure (Idle State) using N26 interface or during EPS to 5GS handover procedure using N26 interface.  This IE may also be present when Nnssf\_NSSelection\_Get procedure is invoked during idle state Mobility Registration Procedure or handover procedure in 5GS.  When present this IE shall indicate to the NSSF that the NSSF shall return the VPLMN specific mapped SNSSAI values for the S-NSSAI values in the sNssaiForMapping IE. |
| ueSupNssrgInd | boolean | O | 0..1 | This IE shall be present in the request towards an NSSF in the serving PLMN when UE has indicated the support of NSSRG feature. When present, this IE shall contain the indication of UE support of subscription-based restrictions to simultaneous registration of network slice feature.  This IE shall be set as follows:  - true: the UE supports NSSRG feature  - false: the UE does not support NSSRG feature. |
| suppressNssrgInd | boolean | O | 0..1 | When present, this IE shall contain the UDM indication to provide all subscribed S-NSSAIs for UEs not indicating support of subscription-based restrictions to simultaneous registration of network slices. This IE may be present and set to true if the ueSupNssrgInd is set to false.  This IE shall be set as follows:  - true: UDM Indication to suppress NSSRG is present  - false: UDM Indication to suppress NSSRG is not present |

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

##### 6.1.6.2.13 Type: SliceInfoForUEConfigurationUpdate

Table 6.1.6.2.13-1: Definition of type SliceInfoForUEConfigurationUpdate

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description |
| subscribedNssai | array(SubscribedSnssai) | C | 1..N | This IE shall be included during UE configuration update procedure in 5GS. When present, this IE shall contain the list of subscribed S-NSSAIs along with an indication for each S-NSSAI if it is a default S-NSSAI. |
| allowedNssaiCurrentAccess | AllowedNssai | O | 0..1 | This IE may be included during UE configuration update procedure in 5GS. When present, this IE shall contain the list of allowed S-NSSAIs in the AMF for the current access type of the UE. |
| allowedNssaiOtherAccess | AllowedNssai | O | 0..1 | This IE may be included during UE configuration update procedure in 5GS. When present, this IE shall contain the list of allowed S-NSSAIs in the AMF for the other access type of the UE. |
| defaultConfiguredSnssaiInd | boolean | O | 0..1 | This IE may be present if the UE included the Default Configured NSSAI Indication during the recent Registration procedure. |
| requestedNssai | array(Snssai) | O | 1..N | This IE may contain the set of S-NSSAIs requested by the UE in the recent registration procedure. |
| mappingOfNssai | array(MappingOfSnssai) | O | 1..N | This IE may be present when the network slice information is requested during UE configuration update procedure. If present, this IE shall contain the mapping of S-NSSAI of the VPLMN to corresponding HPLMN S-NSSAI, for the S-NSSAIs included in the requestedNssai and the allowedNssai IEs for the current and other access types. |
| ueSupNssrgInd | boolean | O | 0..1 | This IE shall be present in the request towards an NSSF in the serving PLMN when UE has indicated the support of NSSRG feature. When present, this IE shall contain the indication of UE support of subscription-based restrictions to simultaneous registration of network slice feature.  This IE shall be set as follows:  - true: the UE supports NSSRG feature  - false: the UE does not support NSSRG feature. |
| suppressNssrgInd | boolean | O | 0..1 | When present, this IE shall contain the UDM indication to provide all subscribed S-NSSAIs for UEs not indicating support of subscription-based restrictions to simultaneous registration of network slices. This IE may be present and set to true if the ueSupNssrgInd is set to false.  This IE shall be set as follows:  - true: UDM Indication to suppress NSSRG is present  - false: UDM Indication to suppress NSSRG is not present |

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

## A.2 Nnssf\_NSSelection API

openapi: 3.0.0

info:

version: '2.2.0-alpha.2'

title: 'NSSF NS Selection'

description: |

NSSF Network Slice Selection Service.

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security:

- {}

- oAuth2ClientCredentials:

- nnssf-nsselection

servers:

- url: '{apiRoot}/nnssf-nsselection/v2'

variables:

apiRoot:

default: https://example.com

description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

externalDocs:

description: 3GPP TS 29.531 V17.2.0; 5G System; Network Slice Selection Services; Stage 3

url: http://www.3gpp.org/ftp/Specs/archive/29\_series/29.531/

…

…

[skipped for clarity]

SliceInfoForRegistration:

description: Contains the slice information requested during a Registration procedure

type: object

properties:

subscribedNssai:

type: array

items:

$ref: '#/components/schemas/SubscribedSnssai'

minItems: 1

allowedNssaiCurrentAccess:

$ref: '#/components/schemas/AllowedNssai'

allowedNssaiOtherAccess:

$ref: '#/components/schemas/AllowedNssai'

sNssaiForMapping:

type: array

items:

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

minItems: 1

requestedNssai:

type: array

items:

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

minItems: 1

defaultConfiguredSnssaiInd:

type: boolean

mappingOfNssai:

type: array

items:

$ref: '#/components/schemas/MappingOfSnssai'

minItems: 1

requestMapping:

type: boolean

ueSupNssrgInd:

type: boolean

suppressNssrgInd:

type: boolean

…

…

[skipped for clarity]

SliceInfoForUEConfigurationUpdate:

description: Contains the slice information requested during UE configuration update procedure

type: object

properties:

subscribedNssai:

type: array

items:

$ref: '#/components/schemas/SubscribedSnssai'

minItems: 1

allowedNssaiCurrentAccess:

$ref: '#/components/schemas/AllowedNssai'

allowedNssaiOtherAccess:

$ref: '#/components/schemas/AllowedNssai'

defaultConfiguredSnssaiInd:

type: boolean

requestedNssai:

type: array

items:

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

minItems: 1

mappingOfNssai:

type: array

items:

$ref: '#/components/schemas/MappingOfSnssai'

minItems: 1

ueSupNssrgInd:

type: boolean

suppressNssrgInd:

type: boolean

ConfiguredSnssai:

description: Contains the configured S-NSSAI(s) authorized by the NSSF in the serving PLMN and optional mapped home S-NSSAI

type: object

required:

- configuredSnssai

properties:

configuredSnssai:

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

mappedHomeSnssai:

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

RoamingIndication:

description: Contains the indication on roaming

anyOf:

- type: string

enum:

- NON\_ROAMING

- LOCAL\_BREAKOUT

- HOME\_ROUTED\_ROAMING

- type: string

NsiId:

description: Contains the Identifier of the selected Network Slice instance

type: string

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