**SA WG2 Meeting #143e S2-2100067**

**Feb 24th – March 9th, 2021 ; Elbonia (revision of S2-2002040)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.501** | **CR** | **2525** | **rev** | **-** | **Current version:** | **16.7.0** |  |
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| *For* [***HELP***](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:*** | Support of different slices over different Non 3GPP access | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | S2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17\_N3SLICE | | | | |  | ***Date:*** | | | 2021-01-18 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Per Current 3GPP specifications,   * the AMF receives from the 5G AN (in N3GPP case: N3IWF / TNGF / W-AGF) information on the slices (S-NSSAI) supported by the 5G AN TA(s). This is done as part of NG set up request (38.413)  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | >>>>TAI Slice Support List | M |  | Slice Support List  9.3.1.17 | **Supported S-NSSAIs per TA**. | - |  |  * **all the 5G AN (N3IWF / TNGF / W-AGF) correspond to the same unique TA**   This mean that **support of slices has to be homogeneous between (Un)trusted Non 3GPP access (N3IWF/TNGF) and wireline access** (W-AGF) as well as between different **wireline** AN of a PLMN;  This looks like an un-necessary restriction.  The corresponding WID is in SP-200456 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Support the possibility for operators to allocate a TAI per non 3GPP 5G AN (e.g. N3IWF / TNGF / W-AGF) : each non 3GPP access gateway is locally configured with its own TAI and the slices it supports. The TAI value is provided (as in case of 3GPP access) to AMF over N2 in NG SET UP message. There is one TAI value per non 3GPP access gateway.  Different non 3GPP access gateways (e.g. different N3IWF / TNGF / W-AGF) can thus advertise different TAI values, and can support different slices.  As TAI values are not advertised over Non 3GPP access, UE(s) do not need to be aware of the fact that different non 3GPP access gateways may correspond to a different TAI beyond the fact that they (UE) may receive different TAI values within the TAI list sent by the network over successive registration over non 3GPP access. | | | | | | | | |
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| ***Consequences if not approved:*** | | Support of slices has to be homogeneous between (Un)trusted Non 3GPP access (N3IWF/TNGF) and wireline access (W-AGF) as well as between different wireline AN of a PLMN. | | | | | | | | |
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| ***Clauses affected:*** | | 5.3.2.3 ; | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.502 CR | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | **From:** antoine.mouquet@orange.com <antoine.mouquet@orange.com>  **Sent:** Monday, January 4, 2021 3:47 PM | | | | | | | | |

*FIRST CHANGE*

#### 5.3.2.3 Registration Area management

Registration Area management comprises the functions to allocate and reallocate a Registration area to a UE. Registration area is managed per access type i.e., 3GPP access or Non-3GPP access.

When a UE registers with the network over the 3GPP access, the AMF allocates a set of tracking areas in TAI List to the UE. When the AMF allocates registration area, i.e. the set of tracking areas in TAI List, to the UE it may take into account various information (e.g. Mobility Pattern and Allowed/Non-Allowed Area (refer to clause 5.3.4.1)). An AMF which has the whole PLMN as serving area may alternatively allocate the whole PLMN ("all PLMN") as registration area to a UE in MICO mode (refer to clause 5.4.1.3).

The 5G System shall support allocating a Registration Area using a single TAI List which includes tracking areas of any NG-RAN nodes in the Registration Area for a UE.

TAI(s) dedicated to Non-3GPP access may be defined in a PLMN and apply within thisPLMN: each Non-3GPP 5G AN (e.g. N3IWF / TNGF / W-AGF) is locally configured with its own (one) TAI whose value is provided (as in case of 3GPP access) to the AMF as part of the N2 Configuration procedure (see 23.502 [2] clause 4.2.7.1).

When a UE registers with the network over a Non-3GPP access, the AMF allocates to the UE a registration area that only includes the TAI corresponding to the Non-3GPP 5G AN (e.g. N3IWF / TNGF / W-AGF) via which the UE registers to the 5GC. . This TAI corresponds to the value indicated by the Non-3GPP 5G AN as part of the N2 Configuration procedure.

Different Non-3GPP 5G AN(s) supporting the same kind of access (e.g. different W-AGF(s)) may correspond to a different TAI (e.g. different W-AGF(s) may correspond to different set of slices)

NOTE 0: Different Non-3GPP 5G AN types can thus support different sets of S-NSSAI(s). If different Non-3GPP 5G AN supporting the same kind of access (e.g. different N3IWF) can correspond to a different TAI a UE trying to reconnect over a different Non-3GPP 5G AN (a different N3IWF) after the failure of an initial Non-3GPP 5G AN (initial N3IWF) can issue a Service Request outside of its registration area.

When generating the TAI list, the AMF shall include only TAIs that are applicable on the access type (i.e. 3GPP access or Non-3GPP access) where the TAI list is sent.

NOTE 1: To prevent extra signalling load resulting from Mobility Registration Update occurring at every RAT change, it is preferable to avoid generating a RAT-specific TAI list for a UE supporting more than one RAT.

For all 3GPP Access RATs in NG-RAN and for Non-3GPP Access, the 5G System supports the TAI format as specified in TS 23.003 [19] consisting of MCC, MNC and a 3-byte TAC only.

The additional aspects for registration management when a UE is registered over one access type while the UE is already registered over the other access type is further described in clause 5.3.2.4.

To ensure a UE initiates a Mobility Registration procedure when performing inter-RAT mobility to or from NB-IoT, a Tracking Area shall not contain both NB-IoT and other RATs cells (e.g. WB-E-UTRA, NR), and the AMF shall not allocate a TAI list that contains both NB-IoT and other RATs Tracking Areas.

For 3GPP access the AMF determines the RAT type the UE is camping on based on the Global RAN Node IDs associated with the N2 interface and additionally the Tracking Area indicated by NG-RAN. When the UE is accessing NR using unlicensed bands, as defined in clause 5.4.8, an indication is provided in N2 interface as defined in TS 38.413 [34].

The AMF may also determine more precise RAT Type information based on further information received from NG-RAN:

- The AMF may determine the RAT Type to be LTE-M as defined in clause 5.31.20; or

- The AMF may determine the RAT Type to be NR using unlicensed bands, as defined in clause 5.4.8.

For Non-3GPP accesses the AMF determines the RAT type the UE is camping based on the 5G-AN node associated with N2 interface as follows:

- The RAT type is Untrusted Non-3GPP if the 5G-AN node has a Global N3IWF Node ID;

- The RAT type is Trusted Non-3GPP if the 5G-AN node has a Global TNGF Node ID or a Global TWIF Node ID; and

- The RAT type is Wireline -BBF if the 5G-AN node has a Global W-AGF Node ID corresponding to a W-AGF supporting the Wireline BBF Access Network. The RAT type is Wireline-Cable if the 5G-AN node has a Global W-AGF Node ID corresponding to a W-AGF supporting the Wireline Cable Access Network. If not possible to distinguish between the two, the RAT type is Wireline.

NOTE 2: How to differentiate between W-AGF supporting either Wireline BBF Access Network or the Wireline (e.g. different Global W-AGF Node ID IE or the Global W-AGF Node ID including a field to distinguish between them) is left to Stage 3 definition.

NOTE 3: If an operator supports only one kind of Wireline Access Network (either Wireline BBF Access Network or a Wireline Cable Access Network) the AMF may be configured to use RAT type Wireline or the specific one.

For Non-3GPP access the AMF may also use the User Location Information provided at N2 connection setup to determine a more precise RAT Type, e.g. identifying IEEE 802.11 access, Wireline-Cable access, Wireline-BBF access.

When the 5G-AN node has either a Global N3IWF Node ID, or a Global TNGF Node ID, or a Global TWIF Node ID, or a Global W-AGF Node ID, the Access Type is Non-3GPP Access.

*NEXT CHANGE (2)*

*NEXT CHANGE (3)*

*NEXT CHANGE (4)*

*NEXT CHANGE (5)*

*END OF CHANGES*