**3GPP TSG-CT WG1 Meeting #135-eC1-22xxxx**

**E-Meeting, 6th – 12th April 2022 Revision of C1-222647**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **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)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Considering the last visited TAI for satellite access | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Mobile, China Southern Power Grid Co. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GSAT\_ARCH-CT | | | | |  | ***Date:*** | | | 2022-03-29 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **C** |  | | | | | ***Release:*** | | | -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:*** | | TS 23.501 subclause 5.4.11.6 specifies the support of Mobility Registration Update for NR satellite access:  *A moving radio cell for NR satellite access may indicate support for one or more TACs for each PLMN.*  *…*  *When indicating a last visited TAI in a Registration Update, a UE may indicate any TAI supported in a radio cell for the RPLMN or equivalent to the RPLMN for the last UE access prior to the Registration Update that is part of the UE Registration Area.*  TS 23.502 subclause 4.2.2.2 mentions:  *If available, the last visited TAI shall be included in order to help the AMF produce Registration Area for the UE.*  In R2-2111547 and S2-2201834, RAN2 and SA2 discussed about the number of broadcasting TACs per NR NTN cell.  *RAN2 assumes maximum 12 TACs per NR NTN cell, including same or different PLMNs, can be broadcast.*  *In order to size this signalling, RAN2 would like to ask for feedback on the expected size of the earth-fixed tracking area and the maximum number of TACs from the same or different PLMN that needs to be broadcast in a radio cell.*  **Obeservation**: If a cell broadcasts 12 TAC of the same PLMN, the UE located in TAI#1 and chose TA#12 as the lasted visited TAI, and TA is a quite large size, the accuracy of the decision of the registration area will be impacted.  In addition, random choosing could result in unnecessary update of lasted visited TAI stored in the non-volatile memory in the ME.  It is suggested to consider the above in 5.3.4.. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add the case of the last visited registered TAI for satellite access. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | How to store and indicate the last visited registered TAI for satellite access hasn’t been considered. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Remove the description of multiple last visited registered TAIs. | | | | | | | | |

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

### 5.3.4 Registration areas

Within the 5GS, the registration area is managed independently per access type, i.e., 3GPP access or non-3GPP access. The AMF assigns a registration area to the UE during the registration procedure. A registration area is defined as a set of tracking areas and each of these tracking areas consists of one or more cells that cover a geographical area. Within the 5GS, the concept of "registration to multiple tracking areas" applies:

a) A tracking area is identified by a TAI which is broadcast in the cells of the tracking area. The TAI is constructed from a TAC and a PLMN identity. In case of a shared network:

1) one or more TACs; and

2) any of the following:

i) multiple PLMN identities;

ii) multiple SNPN identities; or

iii) one or more PLMN identities and one or more SNPN identities;

are broadcast.

b) In order to reduce the tracking area update signalling within the 5GS, the AMF can assign several tracking areas to the UE. These tracking areas construct a list of tracking areas which is identified by a TAI list. When generating the TAI list, the AMF shall include only TAIs that are applicable on the access where the TAI list is sent. The AMF shall be able to allocate a TAI list over different NG-RAN access technologies. The AMF shall not allocate a TAI list containing both tracking areas in NB-N1 mode and tracking areas not in NB-N1 mode.

c) The UE considers itself registered to a list of tracking areas and does not need to trigger the registration procedure for mobility and periodic registration update used for mobility (i.e. the 5GS registration type IE set to "mobility registration updating" in the REGISTRATION REQUEST message) as long as the UE stays in one of the tracking areas of the list of tracking areas received from the AMF.

d) The UE will consider the TAI list as valid, until it receives a new TAI list in the next registration procedure for mobility and periodic registration update or generic UE configuration update procedure, or the UE is commanded by the network to delete the TAI list by a reject message or it is deregistered from the 5GS. If the registration request is accepted or the TAI list is reallocated by the AMF, the AMF shall provide at least one entry in the TAI list. If the new and the old TAI list are identical, the AMF does not need to provide the new TAI list to the UE during mobility registration update or periodic registration update.

e) The TAI list can be reallocated by the AMF.

f)- When the UE is deregistered from the 5GS, the TAI list in the UE is invalid.

g) The UE includes the last visited registered TAI, if available, to the AMF. The UE using satellite NG-RAN access technology may not include the last visited registered TAI in the case multiple TACs broadcasted in a satellite NG-RAN cell in the current registration area if it cannot select a TAI accurately(e.g.Maximum TACs broadcasted in a satellite NG-RAN cell. )

h) The UE should not update the last visited registered TAI if it enters a cell broadcasting multiple TACs and the last visited registered TAI is one of tracking areas of the serving cell.

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