**3GPP TSG-CT WG1 Meeting #131-eC1-21xxxx**

**E-meeting, 19-27 August 2021 Revision of C1-214284**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** |  | **rev** | **1** | **Current version:** |  |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | The solution to the case the allowed CAG IDs of a PLMN beyond the limit of one Entry-R17 |
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| ***Source to WG:*** | China Mobile |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc17 |  | ***Date:*** | 2021-08-12 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 canbe 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:*** | As discussed in CT1#130-e meeting, in TS 24.501 9.11.3.18A, the “Length of entry contents” of CAG information list IE is one octet, which means there is a limit to the number of the CAG-IDs for one PLMN. On the other hand, there's no restriction on the number of the allowed CAG IDs in one PLMN on UDM side and SBI. How the network and the UE handle the case the number of the allowed CAG IDs in one PLMN exceeds the limit of an Entry is not specified in Rel-16/Rel-17 TS, which could cause problems in practice.The discussion paper C1-214282 proposes a solution for Rel-17 network. This CR is the implementation of the solution.This CR is related to C1-213899, C1-214282, C1-214283. |
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| ***Summary of change:*** | 1. To extend the messages containing the CAG information list to support more than one CAG information list IE.
2. To extend the CAG information list IE to support multiple Entries have the same PLMN ID.
3. To mention the further study for the behaviors of the network and the UE.
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| ***Consequences if not approved:*** | How the network and the UE handle the case the number of the allowed CAG IDs in one PLMN exceeds the limit of an Entry is not specified in Rel-17 TS, which could cause problems in practice. |
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| ***Clauses affected:*** | 8.2.7.36, 8.2.9.6, 8.2.14.5, 8.2.18.6, 8.2.19.20, 9.11.3.18A |
|  |  |
|  | **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:*** | 1. Add NOTE to describe how Rel-16 UE handles the repeated IEs.And update the EN to point out its for Rel-17 UE.
2. Add EN for how to handle the “Entry for a PLMN holding multiple Entries” bit and mark the bit x for this indication.
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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 8.2.7.36 CAG information list

This IE may be included to assign a new "CAG information list" to the UE or delete the "CAG information list" at the UE side.

There may be more than one CAG information list IE included in the REGISTRATION ACCEPT message in the case the network needs to provide multiple Entries with the same MCC and MNC.

NOTE: Rel-16 UE handles only the contents of this IE appearing first and ignores all subsequent repetitions of CAG information list IE, as specified in subclause 7.6.3.

Editor's note [WI:5GProtoc17, CR#3413]: How to provide and how the Rel-17 UE handle more than one CAG information list IE in the 5GMM messages is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 8.2.9.6 CAG information list

This IE may be included to assign a new "CAG information list" to the UE or delete the "CAG information list" at the UE side.

There may be more than one CAG information list IE included in the REGISTRATION REJECT message in the case the network needs to provide multiple Entries with the same MCC and MNC.

NOTE: Rel-16 UE handles only the contents of this IE appearing first and ignores all subsequent repetitions of CAG information list IE, as specified in subclause 7.6.3.

Editor's note [WI:5GProtoc17, CR#3413]: How to provide and how the Rel-17 UE handle more than one CAG information list IE in the 5GMM messages is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 8.2.14.5 CAG information list

This IE may be included to assign a new "CAG information list" to the UE or delete the "CAG information list" at the UE side.

There may be more than one CAG information list IE included in the DEREGISTRATION REQUEST message in the case the network needs to provide multiple Entries with the same MCC and MNC.

NOTE: Rel-16 UE handles only the contents of this IE appearing first and ignores all subsequent repetitions of CAG information list IE, as specified in subclause 7.6.3.

Editor's note [WI:5GProtoc17, CR#3413]: How to provide and how the Rel-17 UE handle more than one CAG information list IE in the 5GMM messages is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 8.2.18.6 CAG information list

This IE may be included to assign a new "CAG information list" to the UE or delete the "CAG information list" at the UE side.

There may be more than one CAG information list IE included in the SERVICE REJECT message in the case the network needs to provide multiple Entries with the same MCC and MNC.

NOTE: Rel-16 UE handles only the contents of this IE appearing first and ignores all subsequent repetitions of CAG information list IE, as specified in subclause 7.6.3.

Editor's note [WI:5GProtoc17, CR#3413]: How to provide and how the Rel-17 UE handle more than one CAG information list IE in the 5GMM messages is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 8.2.19.20 CAG information list

This IE may be included to assign new "CAG information list" to the UE or delete the "CAG information list" at the UE side.

There may be more than one CAG information list IE included in the CONFIGURATION UPDATE COMMAND message in the case the network needs to provide multiple Entries with the same MCC and MNC.

NOTE: Rel-16 UE handles only the contents of this IE appearing first and ignores all subsequent repetitions of CAG information list IE, as specified in subclause 7.6.3.

Editor's note [WI:5GProtoc17, CR#3413]: How to provide and how the Rel-17 UE handle more than one CAG information list IE in the 5GMM messages is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* NEXT CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 9.11.3.18A CAG information list

The purpose of the CAG information list information element is to provide "CAG information list" or to delete the "CAG information list" at the UE.

The CAG information list information element is coded as shown in figures 9.11.3.18A.1 and 9.11.3.18A.2 and table 9.11.3.18A.1.

The CAG information list is a type 6 information element, with a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| CAG information list IEI | octet 1 |
| Length of CAG information list contents | octet 2octet 3 |
| Entry 1 | octet 4\*octet a\* |
| Entry 2 | octet a+1\*octet b\* |
| … | octet b+1\*octet g\* |
| Entry n | octet g+1\*octet h\* |

Figure 9.11.3.18A.1: CAG information list information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of entry contents | octet q |
| MCC digit 2 | MCC digit 1 | octet q+1 |
| MNC digit 3 | MCC digit 3 | octet q+2 |
| MNC digit 2 | MNC digit 1 | octet q+3 |
| - | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | Entry for a PLMN holding multiple Entries | CAGonly | octet q+4 |
| CAG-ID 1 | octet q+5\*octet q+8\* |
| CAG-ID 2 | octet q+9\*octet q+12\* |
| … | octet q+13\*octet q+4m\* |
| CAG-ID n | octet q+4m+1\*octet q+4m+4\* |

Figure 9.11.3.18A.2: Entry n

Table 9.11.3.18A.1: CAG information list information element

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| --- |
| MCC, Mobile country code (octet q+1 and bits 1 to 4 octet q+2)The MCC field is coded as in ITU-T Recommendation E.212 [42], annex A. |
|  |
| MNC, Mobile network code (bits 5 to 8 of octet q+2 and octet q+3)The coding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator decides to use only two digits in the MNC, bits 5 to 8 of octet q+2 shall be coded as "1111". |
|  |
| The contents of the MCC and MNC digits are coded as octets 6 to 8 of the Temporary mobile group identity IE in figure 10.5.154 of 3GPP TS 24.008 [12]. |
|  |
| Indication that the UE is only allowed to access 5GS via CAG cells (CAGonly) (bit 1 of octet q+4) |
| Bit |
| 1 |  |
| 0 | "Indication that the UE is only allowed to access 5GS via CAG cells" is not set (i.e. the UE is allowed to access 5GS via non-CAG cells) |
| 1 | "Indication that the UE is only allowed to access 5GS via CAG cells" is set (i.e. the UE is not allowed to access 5GS via non-CAG cells) |
|  |
| Indication this Entry is for a PLMN holding multiple Entries(Entry for a PLMN holding multiple Entries) (bit x of octet q+4) |
| Bit |
| x |
| 0 "Indication this Entry is for a PLMN holding multiple Entries" is not set (i.e. this Entry is not for a PLMN holding multiple Entries) |
| 1 "Indication this Entry is for a PLMN holding multiple Entries" is set (i.e. this Entry is for a PLMN holding multiple Entries) |
|  |
| CAG-ID m (octet q+4m+1 to octet q+4m+4)This field contains the 32 bit CAG-ID. The coding of the CAG-ID is defined as the CAG-Identifier in 3GPP TS 23.003 [4].NOTE 1: The Length of CAG information list contents shall be 3 if no subscription data for CAG information list exists.NOTE 2: The Length of entry contents shall be 4 if there is no allowed CAG-ID for the PLMN. |

Editor's note (WI:5GProtoc17, CR#3413): How the UE handles the abnormal case the conflicted CAG only indications included in separate entries of the same PLMN is FFS.

Editor's note (WI:5GProtoc17, CR#3413): How the UE handle the “Entry for a PLMN holding multiple Entries” bit is FFS.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* END of CHANGE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*