**3GPP TSG-CT WG1 Meeting #136-eC1-22xxxx**

**E-Meeting, 12th – 20th May 2022**

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** | **4410** | **rev** | **1** | **Current version:** | **17.6.1** |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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| --- |
|  |
| ***Title:***  | Clarification for the encoding of MCC and MNC parameters in TS 24.501 |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2022-05-03 |
|  |  |  |  |  |
| ***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:*** | The spec contains the following statement, whenever it talks about the encoding of the MCC and MNC parameters:*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].*It was discussed within the handling of C1-222032 in CT1#134-e, that this statement can be wrongly understood as if it indicates that the **contents** (i.e. the values) of the MCC and MNC are the same as the contents of the MCC and MNC that are inside the Temporary mobile group identity (TMGI), specially that the IE modified in C1-222032 is related to MBS and already contains a TMGI parameter. But this is not the intention of this statement, i.e. the intention of the statement is just to indicate that the "way of encoding MCC/MNC" is the same, not the content. i.e. the MCC/MNC look like the following:

|  |  |
| --- | --- |
| MCC digit 2 | MCC digit 1 |
| MNC digit 3 | MCC digit 3 |
| MNC digit 2 | MNC digit 1 |

Hence it is better to rephrase that statement to remove any confusion and to avoid any misinterpretation. |
|  |  |
| ***Summary of change:*** | Rephrasing the following statement, wherever it is mentioned:*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].*by removing the word "contents" from it. |
|  |  |
| ***Consequences if not approved:*** | Wrong interpretation remains, that the values of MCC/MNC inside any IE are the exact same values of the MCC/MNC used inside the TMGI. |
|  |  |
| ***Clauses affected:*** | 9.11.3.4, 9.11.3.18A, 9.11.3.83, 9.11.3.85, 9.11.3.86, 9.11.4.31 |
|  |  |
|  | **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:*** |  |

\*\*\*\*\* First change \*\*\*\*\*

#### 9.11.3.4 5GS mobile identity

The purpose of the 5GS mobile identity information element is to provide either the SUCI, the 5G-GUTI, the IMEI, the IMEISV, the 5G-S-TMSI, the MAC address or the EUI-64.

The 5GS mobile identity information element is coded as shown in figures 9.11.3.4.1, 9.11.3.4.2, 9.11.3.4.3, 9.11.3.4.4, 9.11.3.4.5, 9.11.3.4.6, 9.11.3.4.8 and 9.11.3.4.7, and table 9.11.3.4.1.

The 5GS mobile identity is a type 6 information element with a minimum length of 4.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 1 | 1 | 1 | 1 | 0spare | Type of identity | octet 4 |
| MCC digit 2 | MCC digit 1 | octet 5 |
| MNC digit 3 | MCC digit 3 | octet 6 |
| MNC digit 2 | MNC digit 1 | octet 7 |
| AMF Region ID | octet 8 |
| AMF Set ID | octet 9 |
| AMF Set ID (continued) | AMF Pointer | octet 10 |
| 5G-TMSI | octet 11 |
| 5G-TMSI (continued) | octet 12 |
| 5G-TMSI (continued) | octet 13 |
| 5G-TMSI (continued) | octet 14 |

Figure 9.11.3.4.1: 5GS mobile identity information element for type of identity "5G-GUTI"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| Identity digit 1 | odd/evenindic | Type of identity | octet 4 |
| Identity digit p+1 | Identity digit p | octet 5\* |

Figure 9.11.3.4.2: 5GS mobile identity information element for type of identity "IMEI" or "IMEISV"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 0spare | SUPI format | 0spare | Type of identity | octet 4 |
| MCC digit 2 | MCC digit 1 | octet 5 |
| MNC digit 3 | MCC digit 3 | octet 6 |
| MNC digit 2 | MNC digit 1 | octet 7 |
| Routing indicator digit 2 | Routing indicator digit 1 | octet 8 |
| Routing indicator digit 4 | Routing indicator digit 3 | octet 9 |
| 0Spare | 0Spare | 0Spare | 0Spare | Protection scheme Id | octet 10 |
| Home network public key identifier | octet 11 |
| Scheme output | octet 12 - x |

Figure 9.11.3.4.3: 5GS mobile identity information element for type of identity "SUCI" and SUPI format "IMSI"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MSIN digit 2 | MSIN digit 1 | octet 12 |
| … |  |
| MSIN digit n+1 | MSIN digit n | octet x |

Figure 9.11.3.4.3a: Scheme output for type of identity "SUCI", SUPI format "IMSI" and Protection scheme Id "Null scheme"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 0Spare | SUPI format | 0Spare | Type of identity | octet 4 |
| SUCI NAI | octet 5 - y |

Figure 9.11.3.4.4: 5GS mobile identity information element for type of identity "SUCI" and SUPI format "Network specific identifier", "GCI" or "GLI"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 1 | 1 | 1 | 1 | 0spare | Type of identity | octet 4 |
| AMF Set ID | octet 5 |
| AMF Set ID (continued) | AMF Pointer | octet 6 |
| 5G-TMSI | octet 7 |
| 5G-TMSI (continued) | octet 8 |
| 5G-TMSI (continued) | octet 9 |
| 5G-TMSI (continued) | octet 10 |

Figure 9.11.3.4.5: 5GS mobile identity information element for type of identity "5G-S-TMSI"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 0 | 0 | 0 | 0 | 0 | Type of identity | octet 4 |
| spare |

Figure 9.11.3.4.6: 5GS mobile identity information element for type of identity "No identity"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 0spare | 0spare | 0spare | 0spare | MAURI | Type of identity | octet 4 |
| MAC address | octet 5octet 10 |

Figure 9.11.3.4.7: 5GS mobile identity information element for type of identity "MAC address"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS mobile identity IEI | octet 1 |
| Length of 5GS mobile identity contents | octet 2octet 3 |
| 0spare | 0spare | 0spare | 0spare | 0spare | Type of identity | octet 4 |
| EUI-64 | octet 5octet 12 |

Figure 9.11.3.4.8: 5GS mobile identity information element for type of identity "EUI-64"

Table 9.11.3.4.1: 5GS mobile identity information element

|  |
| --- |
| Type of identity (octet 4)Bits |
| 3 | 2 | 1 |  |
| 0 | 0 | 0 | No identity (see NOTE 1) |
| 0 | 0 | 1 | SUCI |
| 0 | 1 | 0 | 5G-GUTI |
| 0 | 1 | 1 | IMEI |
| 1 | 0 | 0 | 5G-S-TMSI |
| 1 | 0 | 1 | IMEISV |
| 1 | 1 | 0 | MAC address |
| 1 | 1 | 1 | EUI-64 |
| All other values are reserved. |
|  |
| Odd/even indication (octet 4)Bit |
| 4 |  |  |  |
| 0 |  |  | even number of identity digits |
| 1 |  |  | odd number of identity digits |
|  |
| For the 5G-GUTI, then bits 5 to 8 of octet 4 are coded as "1111", octet 5 through 7 contain the MCC and MNC values as specified below, octet 8 through 10 contain the AMF Region ID, the AMF Set ID and the AMF Pointer values and octet 11 through 14 contain the 5G-TMSI as defined in 3GPP TS 23.003 [4]. |
| MCC, Mobile country code (octet 5, octet 6 bits 1 to 4)The MCC field is coded as in ITU-T Recommendation E.212 [42], annex A. |
| MNC, Mobile network code (octet 6 bits 5 to 8, octet 7)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 6 shall be coded as "1111".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]. |
|  |
| AMF Region ID (octet 8)This field contains the binary encoding of the AMF Region ID. Bit 8 of octet 7 is the most significant bit and bit 1 of octet 7 is the least significant bit.AMF Set ID (octet 9, octet 10 bits 7 to 8)This field contains the binary encoding of the AMF Set ID. Bit 8 of octet 9 is the most significant bit and bit 7 of octet 10 is the least significant bit.AMF Pointer (octet 10 bits 1 to 6)This field contains the binary encoding of the AMF Pointer. Bit 6 of octet 9 is the most significant bit and bit 1 of octet 9 is the least significant bit.5G-TMSI (octet 11 to 14)Bit 8 of octet 11 is the most significant bit and bit 1 of octet 14 is the least significant bit. |
|  |
| Identity digit (octet 4 bits 5 to 8, octet 5 etc.) |
| For the IMEI, Identity digit field is coded using BCD coding. If the number of identity digits is even then bits 5 to 8 of the last octet shall be filled with an end mark coded as "1111". The format of the IMEI is described in 3GPP TS 23.003 [4]. |
|  |
| For the IMEISV, Identity digit field is coded using BCD coding. Bits 5 to 8 of the last octet shall be filled with an end mark coded as "1111". The format of the IMEISV is described in 3GPP TS 23.003 [4]. |
|  |
| For the SUCI, bit 8 of octet 4 is spare and shall be coded as zero. Bits 5-7 of octet 4 contain the SUPI format and are coded as shown below. |
| SUPI format (octet 4, bits 5-7)Bits |
| 7 | 6 | 5 |  |  |
| 0 | 0 | 0 |  | IMSI |
| 0 | 0 | 1 |  | Network specific identifier |
| 0 | 1 | 0 |  | GCI |
| 0 | 1 | 1 |  | GLI |
| All other values are interpreted as IMSI by this version of the protocol. |
|  |
| For the SUCI with SUPI format "IMSI", octets 5 through 7 contain the MCC and MNC values as specified below. For subsequent fields, bit 8 of octet 8 is the most significant bit and bit 1 of the last octet the least significant bit. The required fields for the SUCI are as defined in 3GPP TS 23.003 [4]. |
| MCC, Mobile country code (octet 5, octet 6 bits 1 to 4)The MCC field is coded as in ITU-T Recommendation E.212 [42], annex A. |
| MNC, Mobile network code (octet 6 bits 5 to 8, octet 7)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 6 shall be coded as "1111".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]. |
|  |
| Routing indicator (octets 8-9)Routing Indicator shall consist of 1 to 4 digits. The coding of this field is the responsibility of home network operator but BCD coding shall be used. If a network operator decides to assign less than 4 digits to Routing Indicator, the remaining digits shall be coded as "1111" to fill the 4 digits coding of Routing Indicator (see NOTE 2). If no Routing Indicator is configured in the USIM or the ME, the UE shall code bits 1 to 4 of octet 8 of the Routing Indicator as "0000" and the remaining digits as "1111". |
|  |
| Protection scheme identifier (octet 10 bits 1 to 4) |
| Bits |
|  |
| 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | Null scheme |
| 0 | 0 | 0 | 1 | ECIES scheme profile A |
| 0 | 0 | 1 | 0 | ECIES scheme profile B |
| 0 | 0 | 1 | 1 |  |
| to | Reserved |
| 1 | 0 | 1 | 1 |  |
| 1 | 1 | 0 | 0 |  |
| to | Operator-specific protection scheme |
| 1 | 1 | 1 | 1 |  |
|  |
| Bits 5-8 of octet 10 are spare and shall be coded as zero. |
|  |
| Home network public key identifier (octet 11) |
| The Home network public key identifier (PKI) field is coded as defined in 3GPP TS 23.003 [4]. Home network public key identifier shall be coded as "00000000" when Protection scheme identifier is set to "0000" (i.e. Null scheme). |
| Bits |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | Home network PKI value 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  |  |
| to |  | Home network PKI value (1-254) |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |  |  |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |  | Reserved |
|  |
|  |
| Scheme output (octets 12 to x)The Scheme output field consists of a string of characters with a variable length or hexadecimal digits as specified in 3GPP TS 23.003 [4]. If Protection scheme identifier is set to "0000" (i.e. Null scheme), then the Scheme output consists of the MSIN and is coded using BCD coding with each digit of the MSIN coded over 4 bits. If the MSIN includes an odd number of digits, bits 5 to 8 of octet x shall be coded as "1111". If Protection scheme identifier is not "0000" (i.e. ECIES scheme profile A, ECIES scheme profile B or Operator-specific protection scheme), then Scheme output is coded as hexadecimal digits. |
|  |
| For the SUCI with SUPI format set to "Network specific identifier", the SUCI NAI field contains an NAI constructed as specified in subclause 28.7.3 of 3GPP TS 23.003 [4] and encoded as UTF-8 string. |
|  |
| For the SUCI with SUPI format set to "GCI", the SUCI NAI field contains an NAI constructed as specified in subclause 28.15.5 of 3GPP TS 23.003 [4] and encoded as UTF-8 string. |
|  |
| For the SUCI with SUPI format set to "GLI", the SUCI NAI field contains an NAI constructed as specified in subclause 28.16.5 of 3GPP TS 23.003 [4] and encoded as UTF-8 string. |
|  |
| For the 5G-S-TMSI, bits 5 to 8 of octet 4 are coded as "1111". The coding of the 5G-S-TMSI is left open for each administration. |
|  |
| AMF Set ID (octet 5, octet 6 bits 7 to 8)This field contains the binary encoding of the AMF Set ID. Bit 8 of octet 5 is the most significant bit and bit 7 of octet 6 is the least significant bit.AMF Pointer (octet 6 bits 1 to 6)This field contains the binary encoding of the AMF Pointer. Bit 6 of octet 6 is the most significant bit and bit 1 of octet 6 is the least significant bit.5G-TMSI (octet 7 to 10)Bit 8 of octet 7 is the most significant bit and bit 1 of octet 10 is the least significant bit. |
| For Type of identity "No identity", the length of mobile identity contents parameter shall be set to 1 and the bits 4-8 of octet 4 are spare and shall be coded as zero. |
| MAC address usage restriction indication (MAURI) (octet 4 bit 4) |
| Bit |
| 4 |  |  |  |  |
| 0 |  |  |  | No restrictions |
| 1 |  |  |  | MAC address is not usable as an equipment identifier |
| MAC address (octets 5 to 10)This field contains the MAC address as defined in subclause 8 of IEEE Std 802 [43].Bit 8 of octet 5 is the most significant bit and bit 1 of octet 10 is the least significant bit. |
| EUI-64 (octets 5 to 12)This field contains an EUI-64 as defined in [48].Bit 8 of octet 5 is the most significant bit and bit 1 of octet 12 is the least significant bit. |
| NOTE 1: This can be used when the requested identity is not available at the UE during the identification procedure.NOTE 2: For a 3-digit Routing Indicator, e.g "567", bits 1 to 4 of octet 8 are coded as "0101", bits 5 to 8 of octet 8 are coded as "0110", bits 1 to 4 of octet 9 are coded as "0111", bits 5 to 8 of octet 9 are coded as "1111". |

\*\*\*\*\* 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 | 0Spare | 0Spare | 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

|  |
| --- |
| 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 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) |
|  |
| 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.NOTE 3: Bit 2 in octet q+4 may be set to 1 in the USIM (see 3GPP TS 31.102 [22]).NOTE 4: For a given PLMN ID, there shall be up to one Entry containing the MCC value and the MNC value of the PLMN ID. |

\*\*\*\*\* Next change \*\*\*\*\*

#### 9.11.3.83 List of PLMNs to be used in disaster condition

The purpose of the list of PLMNs to be used in disaster condition information element is to provide the "list of PLMN(s) to be used in disaster condition" associated with the serving PLMN to the UE.

The list of PLMNs to be used in disaster condition information element is coded as shown in figures 9.11.3.83.1 and 9.11.3.83.2 and table 9.11.3.83.1.

The list of PLMNs to be used in disaster condition is a type 4 information element, with a minimum length of 2 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| List of PLMNs to be used in disaster condition list IEI | octet 1 |
| Length of list of PLMNs to be used in disaster condition contents | octet 2 |
| PLMN ID 1 | octet 3\*octet 5\* |
| PLMN ID 2 | octet 6\*octet 8\* |
| … | octet 9\*octet g\* |
| PLMN ID n | octet g+1\*octet q+3\* |

Figure 9.11.3.83.1: List of PLMNs to be used in disaster condition information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 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 |

Figure 9.11.3.83.2: PLMN ID n

Table 9.11.3.83.1: List of PLMNs to be used in disaster condition information element

|  |
| --- |
| 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 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]. |
| NOTE: The PLMN IDs are provided in decreasing order of priority, i.e. PLMN ID 1 indicates highest priority and PLMN ID n indicates lowest priority. |

\*\*\*\*\* Next change \*\*\*\*\*

#### 9.11.3.85 PLMN identity

The purpose of the PLMN identity information element is to provide a PLMN identity.

The PLMN identity information element is coded as shown in figures 9.11.3.85.1, and table 9.11.3.85.1.

The PLMN identity is a type 4 information element.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| PLMN identity IEI | octet 1 |
| Length of PLMN identity contents | octet 2 |
| MCC digit 2 | MCC digit 1 | octet 3 |
| MNC digit 3 | MCC digit 3 | octet 4 |
| MNC digit 2 | MNC digit 1 | octet 5 |

Figure 9.11.3.85.1: PLMN identity information element

Table 9.11.3.85.1: PLMN identity information element

|  |
| --- |
| MCC, Mobile country code (octet 3, octet 4 bits 1 to 4) |
| The MCC field is coded as in ITU-T Recommendation E.212 [42], annex A. |
|  |
| MNC, Mobile network code (octet 4 bits 5 to 8, octet 5) |
| 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 6 shall be coded as "1111". |
| 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]. |
|  |

\*\*\*\*\* Next change \*\*\*\*\*

#### 9.11.3.86 Extended CAG information list

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

The Extended CAG information list information element is coded as shown in figures 9.11.3.86.1 and 9.11.3.86.2 and table 9.11.3.86.1.

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Extended CAG information list IEI | octet 1 |
| Length of Extended 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 9.11.3.86.1: Extended CAG information list information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of entry contents | octet q |
| octet q+1 |
| MCC digit 2 | MCC digit 1 | octet q+2 |
| MNC digit 3 | MCC digit 3 | octet q+3 |
| MNC digit 2 | MNC digit 1 | octet q+4 |
| 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | CAGonly | octet q+5 |
| CAG-ID 1 | octet q+6\*octet q+9\* |
| CAG-ID 2 | octet q+10\*octet q+13\* |
| … | octet q+14\*octet q+4m+1\* |
| CAG-ID m | octet q+4m+2\*octet q+4m+5\* |

Figure 9.11.3.86.2: Entry n

Table 9.11.3.86.1: Extended CAG information list information element

|  |
| --- |
| Value part of the Extended CAG information list information element (octet 4 to h)The value part of the Extended CAG information list information element consists of one or more entries.Entry n:Length of entry contents (octet q and q+1)MCC, Mobile country code (octet q+2 and bits 1 to 4 octet q+3)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+3 and octet q+4)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 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+5) |
| 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) |
|  |
| CAG-ID m (octet q+4m+2 to octet q+4m+5)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 Extended CAG information list contents shall be 0 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.NOTE 3: For a given PLMN ID, there shall be up to one Entry containing the MCC value and the MNC value of the PLMN ID. |

\*\*\*\*\* Next change \*\*\*\*\*

#### 9.11.4.31 Received MBS container

The purpose of the Received MBS container information element is to indicate to the UE the information of the MBS sessions that the network accepts or rejects the UE to join, the information of the MBS sessions that the UE is removed from, or the information of the updated MBS service area.

The Received MBS container information element is coded as shown in figure 9.11.4.31.1, figure 9.11.4.31.2, figure 9.11.4.31.3, figure 9.11.4.31.4, figure 9.11.4.31.5, figure 9.11.4.31.6, figure 9.11.4.31.7, figure 9.11.4.31.8, figure 9.11.4.31.9, figure 9.11.4.31.10 and table 9.11.4.31.1.

The Received MBS container is a type 6 information element with a minimum length of 9 octets and a maximum length of 65538 octets.

Editor's note: The maximum number of Received MBS informations is FFS and is currently assumed to be 4.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Received MBS container IEI | octet 1 |
| Length of Received MBS container contents | octet 2octet 3 |
| Received MBS information 1 | octet 4octet i |
| Received MBS information 2 | octet i+1\*octet l\* |
| … | octet l+1\*octet m\* |
| Received MBS information p | octet m+1\*octet n\* |

Figure 9.11.4.31.1: Received MBS container information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Rejection cause | MSAI | MD | octet 4 |
| 0 | 0 | 0 | 0 | MSCI | MTI | IPAE | octet 5 |
| spare |  |  |
| TMGI | octet 6octet j |
| Source IP address information | octet j+1\*octet v\* |
| Destination IP address information | octet v+1\*octet k\* |
| MBS service area | octet k+1\*octet s\* |
| MBS timers | octet s+1\*octet i\* |
| MBS security container | octet i+1\*octet e\* |

Figure 9.11.4.31.2: Received MBS information

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MBS TAI list  | octet k+1\*octet i\* |

Figure 9.11.4.31.3: MBS service area for MBS service area indication = "MBS service area included as MBS TAI list"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| NR CGI list | octet k+1\*octet i\* |

Figure 9.11.4.31.4: MBS service area for MBS service area indication = "MBS service area included as NR CGI list"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MBS TAI list  | octet k+1\*octet y\* |
| NR CGI list | octet y+1\*octet i\* |

Figure 9.11.4.31.5: MBS service area for MBS service area indication = "MBS service area included as MBS TAI list and NR CGI list"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of NR CGI list contents | octet k+1\* |
| NR CGI 1 | octet k+2\*octet k+9\* |
| NR CGI 2 | octet k+10\*octet k+17\* |
| … | octet k+18\*octet c\* |
| NR CGI w | octet c+1\*octet s\* |

Figure 9.11.4.31.6: NR CGI list

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| NR Cell ID | octet k+1\* |
| octet k+5\* |
| MCC digit 2  | MCC digit 1 | octet k+6\* |
| MNC digit 3 | MCC digit 3 | octet k+7\* |
| MNC digit 2 | MNC digit 1 | octet k+8\* |

Figure 9.11.4.31.7: NR CGI

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MBS start time | octet s+1\*octet s+6\* |

Figure 9.11.4.31.8: MBS timers for MBS timer indication = "MBS start time"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MBS back-off timer | octet s+1\* |

Figure 9.11.4.31.9: MBS timers for MBS timer indication = "MBS back-off timer"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MSK ID | octet i+1\*octet i+4\* |
| MSK | octet i+5\*octet i+20\* |
| MTK ID | octet i+21\*octet i+22\* |
| Encrypted MTK | octet i+23\*octet i+38\* |

Figure 9.11.4.31.12: MBS security container

**Table 9.11.4.31.1: Received MBS container information element**

|  |
| --- |
| MBS decision (MD) (bits 1 oto 3 of octet 4)  |
| The MD indicates the network decision of the join requested by the UE, the network requests to remove the UE from the MBS session or the network request to update the MBS service area of MBS session. |
| Bits |
| **3** | **2** | **1** |  |
| 0 | 0 | 1 | MBS service area update |
| 0 | 1 | 0 | MBS join is accepted |
| 0 | 1 | 1 | MBS join is rejected |
| 1 | 0 | 0 | Remove UE from MBS session |
| All other values are unused in this version of the specification and interpreted as 000 if received. |
|  |
| If MD is set to "MBS join is rejected" or “Remove UE from MBS session”, bits 6 to 8 of octet 4 shall contain the Rejection cause which indicates the reason of rejecting the MBS join request or the reason of removing the UE from MBS session, respectively, otherwise bits 6 to 8 of octet 4 are spare and shall be coded as zero. |
|  |
| MBS service area indication (MSAI) (bits 4 and 5 of octet 4) |
| The MSAI indicates whether the MBS service area is included in the IE or not. |
| Bits |
| **5** | **5** | **5** | **5** |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 |
|  |
| Rejection cause (bits 6 to 8 of octet 4) |
| The Rejection cause indicates the reason of rejecting the join request or the reason of removing the UE from the MBS session. |
| Bits |
| **8** | **7** | **6** |  |  |
| 0 | 0 | 0 |  | No additional information provided |
| 0 | 0 | 1 |  | Insufficient resources |
| 0 | 1 | 0 |  | User is not authorized to use MBS service  |
| 0 | 1 | 1 |  | MBS session has not started or will not start soon |
| 1 | 0 | 0 |  | User is outside of local MBS service area |
| 1 | 0 | 1 |  | Session context not found |
| 1 | 1 | 0 |  | MBS session is released |
| All other values are unused in this version of the specification and interpreted as 000 if received. |
|  |
| IP address existence (IPAE) (bit1 of octet 5) |
| The IPAE indicates whether the Source IP address information and Destination IP address information are included in the IE or not. |
| Bit |
| **1** |  |  |
| 0 |  | Source and destination IP address information not included |
| 1 |  | Source and destination IP address information included |
|  |
| If IPAE is set to "Source and destination IP address information included", Source IP address information and Destination IP address information shall be included in the IE, otherwise Source IP address information and Destination IP address information shall not be included in the IE. |
|  |
| MBS timer indication (MTI) (bits 2 and 3 of octet 5) |
| The MTI indicates whether there is MBS timer included in the IE or not. |
| Bit |
| **3** | **2** |  |
| 0 | 0 | No MBS timers included |
| 0 | 1 | MBS start time included |
| 1 | 0 | MBS back-off timer included |
| All other values are unused in this version of the specification and interpreted as 00 if received |
|  |
| MBS security container indication (MSCI) (bit 4 of octet 5) |
| The MSCI indicates whether the MBS security container is included in the IE or not |
| Bit |
| **4** |
| 0 | MBS security container not included |
| 1 | MBS security container included |
|  |
| TMGI (octets 6 to j) |
| The TMGI is coded as described in subclause 10.5.6.13 in 3GPP TS 24.008 [12] starting from octet 2. |
|  |
| Bits 5 to 8 of octet 5 are spare and shall be coded as zero. |
|  |
| Source IP address information (octet j+1 to v) |
| This field contains the IP unicast address used as source address in IP packets for identifying the source of the multicast service. The value of this field is copied from the corresponding source IP address information in the requested MBS container. |
|  |
| Destination IP address information (octet v+1 to k) |
| This field contains the IP multicast address used as destination address in related IP packets for identifying a multicast service associated with the source. The value of this field is copied from the corresponding destination IP address information in the requested MBS container. |
|  |
| MBS service area (octet k+1 to s) |
| The MBS service area contains the MBS TAI list, the NR CGI list or both, that identifies the service area(s) for a local MBS service. |
|  |
| MBS TAI list (octet k+1 to s) |
| The MBS TAI list is coded as octet 2 and above of the 5GS tracking area identity list IE defined in subclause 9.11.3.9. |
|  |
| NR CGI (octet k+2 to k+9) |
| The NR CGI globally identifies an NR cell. It contains the NR Cell ID and the PLMN ID of that cell. |
|  |
| NR Cell ID (octet k+2 to k+6) |
| The NR Cell ID consists of 36 bits identifying an NR Cell ID as specified in subclause 9.3.1.7 of 3GPP TS 38.413 [31], in hexadecimal representation. Bit 8 of octet y+1 is the most significant bit and bit 5 of octet y+5 is the least significant bit. Bits 1 to 4 of octet y+5 are spare and shall be coded as zero. |
| MCC, Mobile country code (octet k+6 and bits 1 to 4 octet k+7)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 k+7 and octet k+8)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 k+7 shall be coded as "1111". |
|  |
| 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]. |
|  |
| MBS start time (octets s+1 to s+6) |
| The MBS start time is coded as described in subclause 10.5.3.9 in 3GPP TS 24.008 [12] starting from octet 2 till octet 7. |
|  |
| MBS back-off timer (octet s+1) |
| The MBS back-off timer is coded as octet 3 described in subclause 10.5.7.4a in 3GPP TS 24.008 [12]. |
|  |
| MBS Service Key Identifier (MSK ID) (octets i+1 to i+4) |
| The MSK ID is 4 bytes long and is defined in 3GPP TS 33.246 [57]. |
|  |
| MBS Service Key (MSK) (octets i+5 to i+20) |
| The MSK is 16 bytes long and is defined in 3GPP TS 33.246 [57]. |
|  |
| MBS Traffic Key Identifier (MTK ID) (octets i+21 to i+22) |
| The MTK ID is 2 bytes long and is defined in 3GPP TS 33.246 [57]. |
|  |
| Encrypted MBS Traffic Key (Encrypted MTK) (octets i+23 to i+38) |
| The Encrypted MTK is 16 bytes long and contains the encrypted version of MTK using MSK as defined in 3GPP TS 33.246 [57]. |
|  |
| NOTE: The IPAE bit is not expected to be set to "Source and destination IP address information included" when the MBS decision (MD) indicates "Remove UE from MBS session". |

\*\*\*\*\* End of changes \*\*\*\*\*