**3GPP TSG-CT WG1 Meeting #146C1-24xxxx**

**Online, 22– 26 January 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **1** | **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)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Encoding of V2X MBS configuration and V2X AS MBS configuration in the policies of V2X in 5GS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI18\_MBS4V2X | | | | |  | ***Date:*** | | | 2024-01-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The encoding of V2X MBS configuration and V2X AS MBS configuration in the policies of V2X in 5GS needs to be specified. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introducing the encoding of V2X AS MBS configuration and V2X AS MBS configuration. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No support for V2X MBS configuration and V2X AS MBS configuration in the received policies. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.2, 5.4.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \*\*\*\*\*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[3] 3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Stage 3".

[4] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[5] ISO TS 17419 ITS-AID AssignedNumbers : <http://standards.iso.org/iso/ts/17419/TS17419%20Assigned%20Numbers/TS17419_ITS-AID_AssignedNumbers.pdf>

[6] ITU-T Recommendation E.212: "The international identification plan for public networks and subscriptions", 2016-09-23.

[7] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[8] IEEE 1609.3 2016: "IEEE Standard for Wireless Access in Vehicular Environments (WAVE) -- Networking Services".

[9] ISO 29281-1 2013: "Intelligent transport systems -- Communication access for land mobiles (CALM) -- Non-IP networking -- Part 1: Fast networking & transport layer protocol (FNTP)".

[10] ETSI EN 302 636-3 v1.2.1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network Architecture".

[11] 3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

[12] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[13] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".

[14] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone".

[15] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone".

[16] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".

[17] 3GPP TS 23.003: "Numbering, addressing and identification".

[Refxx] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[Refyy] 3GPP TS 24.502: "Access to the 3GPP 5G Core Network (5GCN) via non-3GPP access networks".

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

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

CGI Cell Global Identity

FSA Frequency Selection Area

MBS Multicast/Broadcast Services

TMGI Temporary Mobile Group Identity

V2X Vehicle-to-Everything

V2XP V2X Policy

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

### 5.4.1 General

The UE policies for V2X communication over Uu are coded as shown in figures 5.4.1.1 and table 5.4.1.1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | V2XP info type = {UE policies for V2X communication over Uu} | | | | octet k |
| Spare | | | |
| Length of V2XP info contents | | | | | | | | octet k+1  octet k+2 |
| Validity timer | | | | | | | | octet k+3  octet k+7 |
| VPSPI | PII | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet (k+8)\* |
| V2X service identifier to PDU session parameters mapping rules | | | | | | | | octet (k+9)\*  octet o1\* |
| PLMN infos | | | | | | | | octet o29\*  (see NOTE)  octet l\* |

NOTE: The field is placed immediately after the last present preceding field.

Figure 5.4.1.1: V2XP Info = {UE policies for V2X communication over Uu}

Table 5.4.1.1: V2XP Info = {UE policies for V2X communication over Uu}

|  |
| --- |
| V2XP info type (bit 1 to 4 of octet k) shall be set to "0010" (UE policies for V2X communication over Uu) |
|  |
| Length of V2XP info contents (octets k+1 to k+2) indicates the length of V2XP info contents. |
|  |
| Validity timer  The validity timer field provides the expiration time of validity of the UE policies for V2X communication over Uu. The validity timer field is a binary coded representation of a UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds). |
|  |
| V2X service identifier to PDU session parameters mapping rules indicator (VPSPI)  The VPSPI bit indicates presence of the V2X service identifier to PDU session parameters mapping rules field.  Bit  8  0 V2X service identifier to PDU session parameters mapping rules field is absent  1 V2X service identifier to PDU session parameters mapping rules field is present |
|  |
| PLMN infos indicator (APII)  The PII bit indicates presence of the PLMN infos field.  Bit  7  0 PLMN infos field is absent  1 PLMN infos field is present |
|  |
| V2X service identifier to PDU session parameters mapping rules  The V2X service identifier to PDU session parameters mapping rules field is coded according to figure 5.4.1.17 and table 5.4.1.17. |
|  |
| PLMN infos  The PLMN infos field is coded according to the figure 5.4.1.2 and table 5.4.1.2 and contains a list of PLMNs in which the UE is configured to use V2X communication over Uu. |
|  |
| If the length of V2XP info contents field indicates a length bigger than indicated in figure 5.4.1.1, receiving entity shall ignore any superfluous octets located at the end of the V2XP info contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of PLMN infos contents | | | | | | | | octet o29  octet o29+1 |
| PLMN info 1 | | | | | | | | octet o29+2  octet o7 |
| PLMN info 2 | | | | | | | | octet (o7+1)\*  octet o8\* |
| ... | | | | | | | | octet (o8+1)\*  octet o9\* |
| PLMN info n | | | | | | | | octet (o9+1)\*  octet l\* |

Figure 5.4.1.2: PLMN infos

Table 5.4.1.2: PLMN infos

|  |
| --- |
| PLMN info  The PLMN info field is coded according to figure 5.4.1.3 and table 5.4.1.3. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of PLMN info contents | | | | | | | | octet o7+1  octet o7+2 |
| PLMN IDs | | | | | | | | octet o7+3  octet o5 |
| VSIUII | VSIRII | VAMCI | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o5+1 |
| V2X service identifier unrelated info | | | | | | | | octet (o5+2)\*  octet o6\* |
| V2X service identifier related info | | | | | | | | octet o30\*  (see NOTE)  octet o110\* |
| V2X AS MBS configurations | | | | | | | | octet (o110+1)\*  octet o8\* |

NOTE: The field is placed immediately after the last present preceding field.

Figure 5.4.1.3: PLMN info

Table 5.4.1.3: PLMN info

|  |
| --- |
| PLMN IDs  The PLMN IDs field is coded according to figure 5.4.1.4 and table 5.4.1.4. |
|  |
| V2X service identifier unrelated info indicator (VSIUII)  The VSIUII bit indicates presence of the V2X service identifier unrelated info field.  Bit  **8**  0 V2X service identifier unrelated info field is absent  1 V2X service identifier unrelated info field is present |
|  |
| V2X service identifier related info indicator (VSIRII)  The VSIRII bit indicates presence of the V2X service identifier related info field.  Bit  **7**  0 V2X service identifier related info field is absent  1 V2X service identifier related info field is present |
|  |
| V2X AS MBS configurations indicator (VAMCI)  The VAMCI bit indicates presence of the V2X AS MBS configurations field.  Bit  **6**  0 V2X AS MBS configurations field is absent  1 V2X AS MBS configurations field is present |
|  |
| V2X service identifier unrelated info  The V2X service identifier unrelated info field is coded according to figure 5.4.1.6 and table 5.4.1.6, and contains information for V2X services not identified by V2X service identifiers, applicable in a PLMN indicated in the PLMN IDs field. |
|  |
| V2X service identifier related info  The V2X service identifier related info field is coded according to figure 5.4.1.9 and table 5.4.1.9, and contains information for V2X services identified by V2X service identifiers, applicable in a PLMN indicated in the PLMN IDs field. |
|  |
| V2X AS MBS configurations  The V2X AS MBS configurations field is coded according to figure 5.4.1.16a and table 5.4.1.16a and indicates V2X AS MBS configurations for receiving V2X application server information via MBS. |
|  |
| If the length of PLMN info contents field indicates a length bigger than indicated in figure 5.4.1.3, receiving entity shall ignore any superfluous octets located at the end of the PLMN info contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of PLMN IDs contents | | | | | | | | octet o7+3  octet o7+4 |
| PLMN ID 1 | | | | | | | | octet o7+5  octet o7+7 |
| PLMN ID 2 | | | | | | | | octet (o7+8)\*  octet (o7+10)\* |
| ... | | | | | | | | octet (o7+11)\*  octet (o7+1+(3\*n))\* |
| PLMN ID n | | | | | | | | octet (o7+2+(3\*n))\*  octet (o7+4+(3\*n))\* = octet o5\* |

Figure 5.4.1.4: PLMN IDs

Table 5.4.1.4: PLMN IDs

|  |
| --- |
| PLMN ID  The PLMN ID field is coded according to figure 5.4.1.5 and table 5.4.1.5. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MCC digit 2 | | | | MCC digit 1 | | | | octet o7+8 |
| MNC digit 3 | | | | MCC digit 3 | | | | octet o7+9 |
| MNC digit 2 | | | | MNC digit 1 | | | | octet o7+10 |

Figure 5.4.1.5: PLMN ID

Table 5.4.1.5: PLMN ID

|  |
| --- |
| Mobile country code (MCC)  The MCC field is coded as in ITU-T Recommendation E.212 [6], annex A. |
|  |
| Mobile network code (MNC)  The coding of MNC 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, MNC digit 3 shall be coded as "1111". |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifier unrelated info contents | | | | | | | | octet o5+2  octet o5+3 |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | VMCI | VAAI | octet o5+4 |
| V2X AS addresses | | | | | | | | octet (o5+5)\*  octet o111\* |
| V2X MBS configurations | | | | | | | | octet (o111+1)\*  octet o6\* |

Figure 5.4.1.6: V2X service identifier unrelated info

Table 5.4.1.6: V2X service identifier unrelated info

|  |
| --- |
| V2X AS address indicator (VAAI)  The VAAI bit indicates presence of the V2X AS address field.  Bit  **1**  0 V2X AS address field is absent  1 V2X AS address field is present |
|  |
| V2X MBS configurations indicator (VMCI)  The VMCI bit indicates presence of the V2X MBS configurations field.  Bit  **2**  0 V2X MBS configurations field is absent  1 V2X MBS configurations field is present |
|  |
|  |
| V2X AS addresses  The V2X AS addresses field is coded according to figure 5.4.1.7 and table 5.4.1.7. |
|  |
| V2X MBS configurations  The V2X MBS configurations field is coded according to figure 5.4.1.8a and table 5.4.1.8a and indicates V2X MBS configurations for receiving V2X communication over Uu via MBS. |
|  |
| If the length of V2X service identifier unrelated info contents field indicates a length bigger than indicated in figure 5.4.1.6, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier unrelated info contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X AS addresses contents | | | | | | | | octet o5+5  octet o5+6 |
| V2X AS address 1 | | | | | | | | octet o5+7  octet o12 |
| V2X AS address 2 | | | | | | | | octet (o12+1)\*  octet o13\* |
| ... | | | | | | | | octet (o13+1)\*  octet o14\* |
| V2X AS address n | | | | | | | | octet (o14+1)\*  octet o111\* |

Figure 5.4.1.7: V2X AS addresses

Table 5.4.1.7: V2X AS addresses

|  |
| --- |
| V2X AS address  The V2X AS address field is coded according to figure 5.4.1.8 and table 5.4.1.8. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X AS address contents | | | | | | | | octet o12+1  octet o12+2 |
| I4AI | I6AI | FI | UPUTI | TPBTI | UPDTI | GAI | 0  Spare | octet o12+3 |
| IPv4 address | | | | | | | | octet (o12+4)\*  octet (o12+7)\* |
| IPv6 address | | | | | | | | octet o31\*  (see NOTE)  octet (o31+15)\* |
| FQDN | | | | | | | | octet o32\*  (see NOTE)  octet o15\* |
| UDP port for uplink transport | | | | | | | | octet o33\*  (see NOTE)  octet (o33+1)\* |
| TCP port for bidirectional transport | | | | | | | | octet o34\*  (see NOTE)  octet (o34+1)\* |
| UDP port for downlink transport | | | | | | | | octet o35\*  (see NOTE)  octet (o35+1)\* |
| Geographical area | | | | | | | | octet o36\*  (see NOTE)  octet o13\* |

NOTE: The field is placed immediately after the last present preceding field.

Figure 5.4.1.8: V2X AS address

Table 5.4.1.8: V2X AS address

|  |
| --- |
| IPv4 Address Indicator (I4AI)  The I4AI bit indicates presence of the IPv4 address field.  Bit  **8**  0 IPv4 address field is absent  1 IPv4 address field is present |
|  |
| IPv6 Address Indicator (I6AI)  The I6AI bit indicates presence of the IPv6 address field.  Bit  **7**  0 IPv6 address field is absent  1 IPv6 address field is present |
|  |
| FQDN Indicator (FI)  The FI bit indicates presence of the FQDN field.  Bit  **6**  0 FQDN field is absent  1 FQDN field is present |
|  |
| UDP Port for Uplink Transport Indicator (UPUTI)  The UPUI bit indicates presence of the UDP port for uplink transport field.  Bit  **5**  0 UDP port for uplink transport field is absent  1 UDP port for uplink transport field is present |
|  |
| TCP Port for Bidirectional Transport Indicator (TPBTI)  The TPBTI bit indicates presence of the TCP port for bidirectional transport field.  Bit  **4**  0 TCP port for bidirectional transport field is absent  1 TCP port for bidirectional transport field is present |
|  |
| UDP Port for Downlink Transport Indicator (UPUTI)  The UPUTI bit indicates presence of the UDP port for downlink transport field.  Bit  **3**  0 UDP port for downlink transport field is absent  1 UDP port for downlink transport field is present |
|  |
| Geographical Area Indicator (GAI)  The GAI bit indicates presence of the geographical area field.  Bit  **2**  0 geographical area field is absent  1 geographical area field is present |
|  |
| IPv4 address (NOTE 2)  The IPv4 address field contains an IPv4 address of a V2X application server. |
|  |
| IPv6 address (NOTE 2)  The IPv6 address field contains an IPv6 address of a V2X application server. |
|  |
| FQDN (NOTE 2)  The FQDN field contains an FQDN of a V2X application server. The first octet of the FQDN field indicates length of the FQDN and the remaining octets of the FQDN field contain the FQDN. |
|  |
| UDP port for uplink transport (NOTE 1)  The UDP port for uplink transport field indicates binary coded UDP port to be used for uplink transport. |
|  |
| TCP port for bidirectional transport (NOTE 1)  The TCP port for bidirectional transport field indicates binary coded TCP port to be used for bidirectional transport. |
|  |
| UDP port for downlink transport (NOTE 1)  The UDP port for downlink transport field indicates binary coded UDP port to be used for downlink transport. |
|  |
| Geographical area  The Geographical area field is coded according to figure 5.4.1.15 and table 5.4.1.15, and contains a list of points of a polygon. |
|  |
| If the length of V2X AS address contents field indicates a length bigger than indicated in figure 5.4.1.8, receiving entity shall ignore any superfluous octets located at the end of the V2X AS address contents. |
|  |
| NOTE 1: The UDP port for uplink transport field, the TCP port for bidirectional transport field, and the UDP port for downlink transport field are absent when the V2X AS address is present in the V2X service identifier unrelated info. |
| NOTE 2: One of the IPv4 address field, the IPv6 address field or the FQDN field is present. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X MBS configurations contents | | | | | | | | octet o111+1  octet o111+2 |
| V2X MBS configuration 1 | | | | | | | | octet o111+3  octet o115 |
| V2X MBS configuration 2 | | | | | | | | octet (o115+1)\*  octet (o116)\* |
| ... | | | | | | | | octet (o116+1)\*  octet (o117)\* |
| V2X MBS configuration n | | | | | | | | octet (o117+1)\*  octet o6\* |

Figure 5.4.1.8a: V2X MBS configurations

Table 5.4.1.8a: V2X MBS configurations

|  |
| --- |
| V2X MBS configuration  The V2X MBS configuration field is coded according to figure 5.4.1.8b and table 5.4.1.8b. |
|  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | | 2 | 1 |  |
| Length of V2X MBS configuration contents | | | | | | | | | octet o111+3  octet o111+4 |
| 0  Spare | 0  Spare | FSAI | FII | MSAI | | NIDI | | MST | octet o111+5 | |
| TMGI | | | | | | | | | octet o111+6  octet o111+11 |
| NID | | | | | | | | | octet (o111+12)\*  octet (o111+17)\* |
| MBS service area | | | | | | | | | octet (o111+18)\*  octet o119\* |
| Frequency information | | | | | | | | | octet (o119+1)\*  octet o128\* |
| FSA IDs information | | | | | | | | | octet (o128+1)\*  octet o129\* |
| SDP body information | | | | | | | | | octet o129+1  octet o115 |

Figure 5.4.1.8b: V2X MBS configuration

Table 5.4.1.8b: V2X MBS configuration

|  |  |  |  |
| --- | --- | --- | --- |
| MBS service type (MST) | | | |
| The MST indicates the type of the MBS service | | | |
| Bit | | | |
| **1** | | | |
| 0 | | Broadcast MBS service | |
| 1 | | Multicast MBS service | |
|  | | | |
| NID indicator (NIDI) | | | |
| The NIDI bit indicates presence of the NID field | | | |
| Bit | | | |
| **2** | | | |
| 0 | | NID field is absent | |
| 1 | | NID field is present | |
|  | | | |
| MBS service area indicator (MSAI) | | | |
| The MSAI indicates the format of the MBS service area | | | |
| Bit | | | |
| **4** | **3** | |  |
| 0 | 0 | | MBS service area not included |
| 0 | 1 | | MBS service area included as MBS TAI list |
| 1 | 0 | | MBS service area included as NR CGI list |
| 1 | 1 | | MBS service area included as MBS TAI list and NR CGI list |
|  | | | |
| Frequency information indicator (FII) | | | |
| The FII bit indicates presence of the frequency information field | | | |
| Bit | | | |
| **5** | | | |
| 0 | | Frequency information field is absent | |
| 1 | | Frequency information field is present | |
|  | | | |
| FSA IDs information indicator (FSAI) | | | |
| The FSAI bit indicates presence of the FSA IDs information field | | | |
| Bit | | | |
| **6** | | | |
| 0 | | FSA IDs information field is absent | |
| 1 | | FSA IDs information field is present | |
|  | | | |
| TMGI | | | |
| The TMGI field contains the TMGI of the MBS service and is coded as the TMGI field defined in clause 10.5.6.13 of 3GPP TS 24.008 [Refxx] starting from octet 3. | | | |
|  | | | |
| NID | | | |
| The NID field contains the NID of an SNPN, and is coded as the NID field defined in clause 9.2.7 of 3GPP TS 24.502 [Refyy] starting from octet 3. | | | |
|  | | | |
| MBS service area | | | |
| The MBS service area field contains the MBS TAI list, the NR CGI list or both, that identifies the service area(s) of the MBS service. The MBS service area field is coded as the MBS service area field defined in 3GPP TS 24.501 [4]. | | | |
|  | | | |
| Frequency information | | | |
| The frequency information field contains the information of the MBS frequency and is coded according to figure 5.4.1.8c and table 5.4.1.8c. | | | |
|  | | | |
| FSA IDs information | | | |
| The FSA IDs information field contains the list of the MBS frequency selection area IDs (MBS FSA IDs) and is coded according to figure 5.4.1.8d and table 5.4.1.8d. | | | |
|  | | | |
| SDP body information | | | |
| The SDP body information field contains the information of the V2X MBS configuration SDP and is coded according to figure 5.4.1.8e and table 5.4.1.8e. | | | |
|  | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of frequency information contents | | | | | | | | octet o119+1  octet o119+2 |
| MBS frequency | | | | | | | | octet o119+3  octet o128 |

Figure 5.4.1.8c: Frequency information

Table 5.4.1.8c: Frequency information

|  |
| --- |
| MBS frequency |
| The MBS frequency is coded according to the NR-ARFCN value defined in 3GPP TS 38.101-1 [14] and 3GPP TS 38.101-2 [15]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of FSA IDs information contents | | | | | | | | octet o128+1  octet o128+2 |
| MBS FSA ID 1 | | | | | | | | octet o128+3  octet o128+5 |
| MBS FSA ID 2 | | | | | | | | octet (o128+6)\*  octet (o128+8)\* |
| … | | | | | | | | octet (o128+9)\*  octet (o133)\* |
| MBS FSA ID n | | | | | | | | octet (o133+1)\*  octet (o133+3)\* = octet o129\* |

Figure 5.4.1.8d: FSA IDs information

Table 5.4.1.8d: FSA IDs information

|  |
| --- |
| MBS FSA ID |
| The MBS FSA ID field contains the value of the MBS frequency selection area ID (MBS FSA ID) and is coded as defined in 3GPP TS 23.003 [17]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of SDP body information contents | | | | | | | | octet o129+1  octet o129+2 |
| SDP body | | | | | | | | octet o129+3  octet o115 |

Figure 5.4.1.8e: SDP body information

Table 5.4.1.8e: SDP body information

|  |
| --- |
| SDP body |
| The SDP body field contains the encoding of the V2X MBS configuration SDP as defined in 3GPP TS 24.587 [3]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifier related info contents | | | | | | | | octet o30  octet o30+1 |
| VSII | DVAAII | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o30+2 |
| V2X service infos | | | | | | | | octet (o30+3)\*  octet o18\* |
| Default V2X AS address infos | | | | | | | | octet o37\*  (see NOTE)  octet o110\* |

NOTE: The field is placed immediately after the last present preceding field.

Figure 5.4.1.9: V2X service identifier related info

Table 5.4.1.9: V2X service identifier related info

|  |
| --- |
| V2X service infos indicator (VSII)  The VSII bit indicates presence of the V2X service infos field.  Bit  **8**  0 V2X service infos field is absent  1 V2X service infos field is present |
|  |
| Default V2X AS address infos indicator (DVAAII)  The AVSII bit indicates presence of the default V2X AS address infos field.  Bit  **7**  0 Default V2X AS address infos field is absent  1 Default V2X AS address infos field is present |
|  |
| V2X service infos  The V2X service infos field is coded according to figure 5.4.1.10 and table 5.4.1.10 and indicates a list of V2X service identifier to V2X application server address mapping rules. |
|  |
| Default V2X AS address infos  The default V2X AS address infos field is coded according to figure 5.4.1.13 and table 5.4.1.13 and indicates default V2X application server addresses for the unicast V2X communication over Uu. |
|  |
| If the length of V2X service identifier related info contents field indicates a length bigger than indicated in figure 5.4.1.9, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier related info contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service infos contents | | | | | | | | octet o30+3  octet o30+4 |
| V2X service info 1 | | | | | | | | octet o30+5  octet o20 |
| V2X service info 2 | | | | | | | | octet (o20+1)\*  octet o21\* |
| ... | | | | | | | | octet (o21+1)\*  octet o22\* |
| V2X service info n | | | | | | | | octet (o22+1)\*  octet o18\* |

Figure 5.4.1.10: V2X service infos

Table 5.4.1.10: V2X service infos

|  |
| --- |
| V2X service info  The V2X service info field is coded according to figure 5.4.1.11 and table 5.4.1.11. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service info contents | | | | | | | | octet o20+1  octet o20+2 |
| V2X service identifiers | | | | | | | | octet o20+3  octet o23 |
| VAAI | VMCI | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o23+1 |
| V2X AS addresses | | | | | | | | octet (o23+2)\*  octet o112\* |
| V2X MBS configurations | | | | | | | | octet o112+1\*  octet o21\* |

Figure 5.4.1.11: V2X service info

Table 5.4.1.11: V2X service info

|  |
| --- |
| V2X service identifiers  The V2X service identifiers field is coded according to figure 5.4.1.12 and table 5.4.1.12 and indicates a list of V2X service identifier. |
|  |
| V2X AS addresses indicator (VAAI)  The AVSII bit indicates presence of the V2X AS addresses field.  Bit  **8**  0 V2X AS addresses field is absent  1 V2X AS addresses field is present |
|  |
| V2X MBS configurations indicator (VMCI)  The VMCI bit indicates presence of the V2X MBS configurations field.  Bit  **7**  0 V2X MBS configurations field is absent  1 V2X MBS configurations field is present |
|  |
| V2X AS addresses  The V2X AS addresses field is coded according to figure 5.4.1.7 and table 5.4.1.7 and indicates V2X application server addresses for V2X services identified by the V2X service identifiers indicated in the V2X service identifiers field. |
|  |
| V2X MBS configurations  The V2X MBS configurations field is coded according to figure 5.4.1.8a and table 5.4.1.8a and indicates V2X MBS configurations for V2X services identified by the V2X service identifiers indicated in the V2X service identifiers field. |
|  |
| If the length of V2X service info contents field indicates a length bigger than indicated in figure 5.4.1.11, receiving entity shall ignore any superfluous octets located at the end of the V2X service info contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifiers contents | | | | | | | | octet o20+3  octet o20+4 |
| V2X service identifier 1 | | | | | | | | octet o20+5  octet o20+8 |
| V2X service identifier 2 | | | | | | | | octet (o20+9)\*  octet (o20+12)\* |
| ... | | | | | | | | octet (o20+13)\*  octet (o20+n\*4)\* |
| V2X service identifier n | | | | | | | | octet (o20+1+n\*4)\*  octet o23\* |

Figure 5.4.1.12: V2X service identifiers

Table 5.4.1.12: V2X service identifiers

|  |
| --- |
| V2X service identifier  The V2X service identifier field contains a binary coded V2X service identifier as specified in ISO TS 17419 ITS-AID AssignedNumbers [5]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of Default V2X AS address infos contents | | | | | | | | octet o37  octet o37+1 |
| Default V2X AS address info 1 | | | | | | | | octet o37+2  octet o24 |
| Default V2X AS address info 2 | | | | | | | | octet (o24+1)\*  octet o25\* |
| ... | | | | | | | | octet (o25+1)\*  octet o26\* |
| Default V2X AS address info n | | | | | | | | octet (o26+1)\*  octet o110\* |

Figure 5.4.1.13: Default V2X AS address infos

Table 5.4.1.13: Default V2X AS address infos

|  |
| --- |
| Default V2X AS address info  The default V2X AS address info field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of default V2X AS address info contents | | | | | | | | octet o24+1  octet o24+2 |
| TD | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o24+3 |
| V2X message family | | | | | | | | octet (o24+4)\* |
| V2X AS addresses | | | | | | | | octet o39  (see NOTE)  octet o25 |

NOTE: The field is placed immediately after the last present preceding field.

Figure 5.4.1.14: Default V2X AS address info

Table 5.4.1.14: Default V2X AS address info

|  |
| --- |
| Type of Data (TD)  The type of data bit indicates type of data.  Bit  **8**  0 non-IP  1 IP  If the type of data bit is set to "non-IP", then the V2X message family field is present otherwise the V2X message family field is absent. |
|  |
| V2X message family  Bits  8 7 6 5 4 3 2 1  0 0 0 0 0 0 0 1 IEEE 1609, see IEEE 1609.3 [8]  0 0 0 0 0 0 1 0 ISO, see ISO 29281-1 [9]  0 0 0 0 0 0 1 1 ETSI-ITS, see ETSI EN 302 636-3 [10]  All other values are spare. |
|  |
| V2X AS addresses  The V2X AS addresses field is coded according to figure 5.4.1.7 and table 5.4.1.7 and indicates V2X application server addresses for type of data identified by the TD bit and the V2X message family (if the type of data is non-IP). |
| If the length of default V2X AS address info contents field indicates a length bigger than indicated in figure 5.4.1.14, receiving entity shall ignore any superfluous octets located at the end of the default V2X AS address info contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of Geographical area contents | | | | | | | | octet o36  octet o36+1 |
| Coordinate 1 | | | | | | | | octet o36+2  octet o36+7 |
| Coordinate 2 | | | | | | | | octet (o36+8)\*  octet (o36+13)\* |
| ... | | | | | | | | octet (o36+14)\*  octet (o36-5+6\*n)\* |
| Coordinate n | | | | | | | | octet (o36-4+6\*n)\*  octet (o36+1+6\*n) \* = octet o13\* |

Figure 5.4.1.15: Geographical area

Table 5.4.1.15: Geographical area

|  |
| --- |
| Coordinate  The coordinate field is coded according to figure 5.4.1.16 and table 5.4.1.16. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Latitude | | | | | | | | octet o36+8  octet o36+10 |
| Longitude | | | | | | | | octet o36+11  octet o36+13 |

Figure 5.4.1.16: Coordinate area

Table 5.4.1.16: Coordinate area

|  |
| --- |
| Latitude  The latitude field is coded according to clause 6.1 of 3GPP TS 23.032 [7]. |
|  |
| Longitude  The longitude field is coded according to clause 6.1 of 3GPP TS 23.032 [7]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X AS MBS configurations contents | | | | | | | | octet o110+1  octet o110+2 |
| V2X AS MBS configuration 1 | | | | | | | | octet o110+3  octet o130 |
| V2X AS MBS configuration 2 | | | | | | | | octet (o130+1)\*  octet (o131)\* |
| ... | | | | | | | | octet (o131+1)\*  octet (o132)\* |
| V2X AS MBS configuration n | | | | | | | | octet (o132+1)\*  octet o8\* |

Figure 5.4.1.16a: V2X AS MBS configurations

Table 5.4.1.16a: V2X AS MBS configurations

|  |
| --- |
| V2X AS MBS configuration  The V2X AS MBS configuration field is coded the same way as V2X MBS configuration as in figure 5.4.1.8b and table 5.4.1.8b but with the modification that the MST field is always set to "Broadcast MBS service" and the SDP body field contains the encoding of the V2X AS MBS configuration SDP as defined in 3GPP TS 24.587 [3]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifier to PDU session parameters mapping rules contents | | | | | | | | octet k+9  octet k+10 |
| V2X service identifier to PDU session parameters mapping rule 1 | | | | | | | | octet k+11  octet o2 |
| V2X service identifier to PDU session parameters mapping rule 2 | | | | | | | | octet (o2+1)\*  octet o3\* |
| ... | | | | | | | | octet (o3+1)\*  octet o4\* |
| V2X service identifier to PDU session parameters mapping rule n | | | | | | | | octet (o4+1)\*  octet o1\* |

Figure 5.4.1.17: V2X service identifier to PDU session parameters mapping rules

Table 5.4.1.17: V2X service identifier to PDU session parameters mapping rules

|  |
| --- |
| V2X service identifier to PDU session parameters mapping rule  The V2X service identifier to PDU session parameters mapping rule field is coded according to figure 5.4.1.18 and table 5.4.1.18. |
|  |

|  |  |
| --- | --- |
| Length of V2X service identifier to PDU session parameters mapping rule contents | octet o2+1  octet o2+2 |
| V2X service identifiers | octet o2+3  octet o28 |
| Length of route selection descriptor list | octet o28+1  octet o28+2 |
| Route selection descriptor list | octet (o28+3)\*  octet o3\* |

Figure 5.4.1.18: V2X service identifier to PDU session parameters mapping rule

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Route selection descriptor 1 | | | | | | | | octet o28+3  octet o29 |
| Route selection descriptor 2 | | | | | | | | octet (o29+1)\*  octet o30\* |
| … | | | | | | | | octet (o30+1)\*  octet o31\* |
| Route selection descriptor m | | | | | | | | octet (o30+1)\*  octet o3\* |

Figure 5.4.1.19: Route selection descriptor list

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of route selection descriptor | | | | | | | | octet o28+3  octet o28+4 |
| Precedence value of route selection descriptor | | | | | | | | octet o28+5 |
| Length of route selection descriptor contents | | | | | | | | octet o28+6  octet o28+7 |
| Route selection descriptor contents | | | | | | | | octet o28+8  octet o29 |

Figure 5.4.1.20: Route selection descriptor

Table 5.4.1.18: V2X service identifier to PDU session parameters mapping rule

|  |
| --- |
| V2X service identifiers  The V2X service identifiers field is coded according to figure 5.4.1.12 and table 5.4.1.12 and indicates a list of V2X service identifier. |
|  |
| Route selection descriptor contents (octets o28+8 to o29)  The route selection descriptor contents field is of variable size and contains a variable number (at least one) of route selection descriptor components. Each route selection descriptor component shall be encoded as a sequence of a one octet route selection descriptor component type identifier and a route selection descriptor component value field. The route selection descriptor component type identifier shall be transmitted first. |
| Route selection descriptor component type identifier  Bits 8 7 6 5 4 3 2 1  0 0 0 0 0 0 0 1 SSC mode type 0 0 0 0 0 0 1 0 S-NSSAI type 0 0 0 0 0 1 0 0 DNN type 0 0 0 0 1 0 0 0 PDU session type type 0 0 0 1 0 0 0 0 Transport layer protocol type  All other values are spare. If received, they shall be ignored. |
| For "SSC mode type", the route selection descriptor component value field shall be encoded as a one octet SSC mode field. The bits 8 through 4 of the octet shall be spare, and the bits 3 through 1 shall be encoded as the value part of the SSC mode information element defined in clause 9.11.4.16 of 3GPP TS 24.501 [4]. The "SSC mode type" route selection descriptor component shall not appear more than once in the route selection descriptor. |
| For "S-NSSAI type", the route selection descriptor component value field shall be encoded as a sequence of a one octet S-NSSAI length field and an S-NSSAI value field of a variable size. The S-NSSAI value shall be encoded as the value part of the S-NSSAI information element defined in clause 9.11.2.8 of 3GPP TS 24.501 [4]. |
| For "DNN type", the route selection descriptor component value field shall be encoded as a sequence of a one octet DNN length field and a DNN value field of a variable size. The DNN value contains an APN as defined in 3GPP TS 23.003 [17]. |
| For "PDU session type type", the route selection descriptor component value field shall be encoded as a one octet PDU session type field. The bits 8 through 4 of the octet shall be spare, and the bits 3 through 1 shall be encoded as the value part of the PDU session type information element defined in clause 9.11.4.11 of 3GPP TS 24.501 [4]. The "PDU session type type" route selection descriptor component shall not appear more than once in the route selection descriptor. |
| For "Transport layer protocol type", the route selection descriptor component value field shall be encoded as:  Bits  8 7 6 5 4 3 2 1  0 0 0 0 0 0 0 1 UDP  0 0 0 0 0 0 1 0 TCP  All other values are spared.  The "Transport layer protocol type" route selection descriptor component appears only when the "PDU session type type" appears and the PDU session type value is set to "IPv4", "IPv6" or "IPv4v6". It shall not appear more than once in the route selection descriptor. |
| If the length of V2X service identifier to PDU session parameters mapping rule contents field indicates a length bigger than indicated in figure 5.4.1.18, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to PDU session parameters mapping rule contents. |
|  |

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