**3GPP TSG-CT WG1 Meeting #124-eC1-203063**

**Electronic meeting, 2-10 June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.588** | **CR** | **0009** | **rev** | **1** | **Current version:** | **16.0.0** |  |
|  | | | | | | | | |
| *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:*** | Correction of coding of validity timers | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eV2XARC | | | | |  | ***Date:*** | | | 2020-06-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | TS 24.588 contains the following editor's notes:  Editor's note: exact semantic and length of validity timer field are FFS.  Editor's note: length and semantic of validity timer field is FFS.  The above quoted editor’s notes were added as during the CT1#122-e meeting (in February), CT1 could not come to agreement of whether the validity timer should an absolute UTC value (as in EPS) or a relative timer value (similar to GPRS timer value).  If the validity timer were a relative time, in order to detect whether a policy (i.e. UE policies for V2X communication over PC5 or UE policies for V2X communication over Uu) is valid:  - upon reception of the policy, the UE would start a timer set to the received validity timer. The UE would consider the policy as valid if the timer were running;  or  - upon reception of the policy, the UE would calculate the expiration time as sum of the current absolute time and the received validity timer. The UE would consider the policy as valid if the expiration time were higher than the current absolute time.  Neither of the above is described in TS 24.587.  If the validity timer is an absolute time, in order to detect whether a policy (i.e. UE policies for V2X communication over PC5 or UE policies for V2X communication over Uu) is valid, the UE considers the policy as valid if the validity timer is higher than the current absolute time.  Additionally, we believe that the use of UTC time is first easier to implement and especially considering that “switch-off and switch-on” (restart of UE scenario) will not have any potential of influence if we go with UTC time.  Furthremore, it is important to consider that there is requirement of interworking to EPS. In EPS, the validity time is already defined as UTC time (see TS 24.385).  Thus, it is proposed that the validity timer contains an absolute time.  Furthermore, 23.287 states:  -----------  *5.1.2.1 Policy/Parameter provisioning*  *The following sets of information for V2X communications over PC5 reference point is provisioned to the UE:*  *...*  *7) Validity timer indicating the expiration time of the V2X Policy/Parameter.*  *...*  -----------  and  -----------  *5.1.3.1 Policy/Parameter provisioning*  *The following set of information may be provisioned to the UE for V2X communications over Uu reference point:*  *...*  *2) Validity timer indicating the expiration time of the V2X Policy/Parameter.*  ----------- | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The validity timer contains an absolute expiration time. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Editor's note remain. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.1, 5.4.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **x** |  | Other core specifications | | | | TS 23.287 CR 0109 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\* change \*\*\*\*\*

### 5.3.1 General

The UE policies for V2X communication over PC5 are coded as shown in figures 5.3.1.1 and table 5.3.1.1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | V2XP info type = {UE policies for V2X communication over PC5} | | | | octet k |
| Spare | | | |
| Length of V2XP info contents | | | | | | | | octet k+1  octet k+2 |
| Validity timer | | | | | | | | octet k+3  octet k+7 |
| VSITPMRI | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet k+8 |
| Served by E-UTRA or served by NR | | | | | | | | octet k+9  octet o1 |
| Not served by E-UTRA and not served by NR | | | | | | | | octet o1+1  octet o2 |
| V2X service identifier to Tx profiles mapping rules | | | | | | | | octet (o2+1)\*  octet o3\* |
| Privacy config | | | | | | | | octet o3+1  octet o4 |
| V2X communication over PC5 in E-UTRA | | | | | | | | octet o4+1  octet o5 |
| V2X communication over PC5 in NR | | | | | | | | octet o5+1  octet l |

Figure 5.3.1.1: V2XP Info = {UE policies for V2X communication over PC5}

Table 5.3.1.1: V2XP Info = {UE policies for V2X communication over PC5}

|  |
| --- |
| V2XP info type (bit 1 to 4 of octet k) shall be set to "0001" (UE policies for V2X communication over PC5) |
|  |
| Length of Length of V2XP info contents (octets k+1 to k+2) indicates the length of V2XP info contents. |
|  |
|  |
| Validity timer:  The validity timer field indicates expiration time of UE policies for V2X communication over PC5. The validity timer field is binary encoded 40 bits unsigned integer value indicating a UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds). |
|  |
| V2X service identifier to Tx profiles mapping rules indicator (VSITPMRI)  The VSITPMRI bit indicates presence of the V2X service identifier to Tx profiles mapping rules field.  Bit  **8**  0 V2X service identifier to Tx profiles mapping rules field is absent  1 V2X service identifier to Tx profiles mapping rules field is present |
|  |
| Served by E-UTRA or served by NR:  The served by E-UTRA or served by NR field is coded according to figure 5.3.1.2 and table 5.3.1.2, and contains configuration parameters for V2X communication over PC5 when the UE is served by E-UTRA or served by NR. |
|  |
| Not served by E-UTRA and not served by NR:  The not served by E-UTRA and not served by NR field is coded according to figure 5.3.1.6 and table 5.3.1.6, and contains configuration parameters for V2X communication over PC5 when the UE is not served by E-UTRA or NR. |
|  |
| V2X service identifier to Tx profiles mapping rules:  The V2X service identifier to Tx profiles mapping rules field is coded according to figure 5.3.1.12 and table 5.3.1.12, and contains a list of V2X service identifier to Tx profiles mapping rules. |
|  |
| Privacy config:  The Privacy config field is coded according to figure 5.3.1.15 and table 5.3.1.15, and contains configuration parameters for privacy configuration. |
|  |
| V2X communication over PC5 in E-UTRA:  The V2X communication over PC5 in E-UTRA field is coded according to figure 5.3.1.19 and table 5.3.1.19, and contains configuration parameters for V2X communication over PC5 in E-UTRA. |
|  |
| V2X communication over PC5 in NR:  The V2X communication over PC5 in NR field is coded according to figure 5.3.1.31 and table 5.3.1.31, and contains configuration parameters for V2X communication over PC5 in NR. |
|  |
| If the length of V2XP info contents field indicates a length bigger than indicated in figure 5.3.1.1, 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 served by E-UTRA or served by NR contents | | | | | | | | octet k+9  octet k+10 |
| Authorized PLMN and RATs combinations | | | | | | | | octet k+11  octet o1 |

Figure 5.3.1.2: Served by E-UTRA or served by NR

Table 5.3.1.2: Served by E-UTRA or served by NR

|  |
| --- |
| Authorized PLMN and RATs combinations:  The authorized PLMN and RATs combinations field is coded according to figure 5.3.1.3 and table 5.3.1.3. |
|  |
| If the length of served by E-UTRA or served by NR contents field indicates a length bigger than indicated in figure 5.3.1.2, receiving entity shall ignore any superfluous octets located at the end of the served by E-UTRA or served by NR contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of authorized PLMN and RATs combinations contents | | | | | | | | octet k+11  octet k+12 |
| Authorized PLMN and RATs combination 1 | | | | | | | | octet (k+13)\*  octet (k+16)\* |
| Authorized PLMN and RATs combination 2 | | | | | | | | octet (k+17)\*  octet (k+20)\* |
| ... | | | | | | | | octet (k+21)\*  octet (k+8+n\*4)\* |
| Authorized PLMN and RATs combination n | | | | | | | | octet (k+9+n\*4)\*  octet (k+12+n\*4)\* = octet o1\* |

Figure 5.3.1.3: Authorized PLMN and RATs combinations

Table 5.3.1.3: Authorized PLMN and RATs combinations

|  |
| --- |
| Authorized PLMN and RATs combination:  The authorized PLMN and RATs combination field is coded according to figure 5.3.1.4 and table 5.3.1.4. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| PLMN ID | | | | | | | | octet k+17  octet k+19 |
| PEIEN | PNIEN | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet k+20 |

Figure 5.3.1.4: Authorized PLMN and RATs combination

Table 5.3.1.4: Authorized PLMN and RATs combination

|  |
| --- |
| PLMN ID:  The PLMN ID field is coded according to figure 5.3.1.5 and table 5.3.1.5. |
|  |
| PC5 E-UTRA indicator when served by E-UTRA or served by NR (PEIEN):  The PEIEN bit indicates whether the UE is authorized to use V2X communication over PC5 E-UTRA in the PLMN indicated by the PLMN ID field when served by E-UTRA or served by NR.  Bit  **8**  0 Not authorized  1 Authorized |
|  |
| PC5 NR indicator when served by E-UTRA or served by NR (PNIEN):  The PNIEN bit indicates whether the UE is authorized to use V2X communication over PC5 NR in the PLMN indicated by the PLMN ID field when served by E-UTRA or served by NR.  Bit  **7**  0 Not authorized  1 Authorized |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MCC digit 2 | | | | MCC digit 1 | | | | octet k+17 |
| MNC digit 3 | | | | MCC digit 3 | | | | octet k+18 |
| MNC digit 2 | | | | MNC digit 1 | | | | octet k+19 |

Figure 5.3.1.5: PLMN ID

Table 5.3.1.5: 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 not served by E-UTRA and not served by NR contents | | | | | | | | octet o1+1  octet o1+2 |
| PEINENN | PNINENN | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | VPNENNI | octet o1+3 |
| Radio parameters per geographical area list | | | | | | | | octet o1+4  octet o2 |

Figure 5.3.1.6: Not served by E-UTRA and not served by NR

Table 5.3.1.6: Not served by E-UTRA and not served by NR

|  |
| --- |
| V2X communication over PC5 when not served by E-UTRA and not served by NR indicator (VPNENNI):  The VPNENNI bit indicates whether the UE is authorized to use V2X communication over PC5 when not served by E-UTRA and not served by NR.  Bit  **1**  0 Not authorized  1 Authorized |
|  |
| PC5 E-UTRA indicator when not served by E-UTRA and not served by NR (PEINENN):  The PEINENN bit indicates whether the UE is authorized to use V2X communication over PC5 E-UTRA when not served by E-UTRA and not served by NR.  Bit  **8**  0 Not authorized  1 Authorized |
|  |
| PC5 NR indicator when not served by E-UTRA and not served by NR (PNINENN):  The PNINENN bit indicates whether the UE is authorized to use V2X communication over PC5 NR when not served by E-UTRA and not served by NR.  Bit  **7**  0 Not authorized  1 Authorized |
|  |
| Radio parameters per geographical area list:  The radio parameters per geographical area list field is coded according to figure 5.3.1.7 and table 5.3.1.7. |
|  |
| If the length of not served by E-UTRA and not served by NR contents field indicates a length bigger than indicated in figure 5.3.1.6, receiving entity shall ignore any superfluous octets located at the end of the not served by E-UTRA and not served by NR contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of radio parameters per geographical area list contents | | | | | | | | octet o1+4  octet o1+5 |
| Radio parameters per geographical area info 1 | | | | | | | | octet (o1+6)\*  octet o6\* |
| Radio parameters per geographical area info 2 | | | | | | | | octet (o6+1)\*  octet o7\* |
| ... | | | | | | | | octet (o7+1)\*  octet o8\* |
| Radio parameters per geographical area info n | | | | | | | | octet (o8+1)\*  octet o2\* |

Figure 5.3.1.7: Radio parameters per geographical area list

Table 5.3.1.7: Radio parameters per geographical area list

|  |
| --- |
| Radio parameters per geographical area info:  The radio parameters per geographical area info field is coded according to figure 5.3.1.8 and table 5.3.1.8. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of radio parameters per geographical area contents | | | | | | | | octet o6+1  octet o6+2 |
| Geographical area | | | | | | | | octet o6+3  octet o9 |
| Radio parameters | | | | | | | | octet o9+1  octet o7-1 |
| MI | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o7 |

Figure 5.3.1.8: Radio parameters per geographical area info

Table 5.3.1.8: Radio parameters per geographical area info

|  |
| --- |
| Geographical area:  The geographical area field is coded according to figure 5.3.1.9 and table 5.3.1.9. |
|  |
| Radio parameters:  The radio parameters field is coded according to figure 5.3.1.11 and table 5.3.1.11, applicable in the geographical area indicated by the geographical area field when not served by E-UTRA and not served by NR. |
|  |
| Managed indicator (MI):  The Managed indicator indicates how the radio parameters indicated in the radio parameters field in the geographical area indicated by the geographical area field are managed.  Bit  **8**  0 Non-operator managed  1 Operator managed |
|  |
| If the length of radio parameters per geographical area contents field indicates a length bigger than indicated in figure 5.3.1.8, receiving entity shall ignore any superfluous octets located at the end of the radio parameters per geographical area contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of geographical area contents | | | | | | | | octet o6+3  octet o6+4 |
| Coordinate 1 | | | | | | | | octet (o6+5)\*  octet (o6+10)\* |
| Coordinate 2 | | | | | | | | octet (o6+11)\*  octet (o6+16)\* |
| ... | | | | | | | | octet (o6+17)\*  octet (o6-2+6\*n)\* |
| Coordinate n | | | | | | | | octet (o6-1+6\*n)\*  octet (o6+4+6\*n)\* = octet o9\* |

Figure 5.3.1.9: Geographical area

Table 5.3.1.9: Geographical area

|  |
| --- |
| Coordinate:  The coordinate field is coded according to figure 5.3.1.10 and table 5.3.1.10. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Latitude | | | | | | | | octet o6+11  octet o6+13 |
| Longitude | | | | | | | | octet o6+14  octet o6+17 |

Figure 5.3.1.10: Coordinate area

Table 5.3.1.10: Coordinate area

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of radio parameters contents | | | | | | | | octet o9+1  octet o9+2 |
| Radio parameters contents | | | | | | | | octet o9+3  octet o7-1 |

Figure 5.3.1.11: Radio parameters

Table 5.3.1.11: Radio parameters

|  |
| --- |
| Radio parameters contents: |
|  |

Editor's notes: radio parameters contents are FFS.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifier to Tx profiles mapping rules contents | | | | | | | | octet o2+1  octet o2+2 |
| V2X service identifier to Tx profiles mapping rule 1 | | | | | | | | octet (o2+3)\*  octet o10\* |
| V2X service identifier to Tx profiles mapping rule 2 | | | | | | | | octet (o10+1)\*  octet o11\* |
| ... | | | | | | | | octet (o11+1)\*  octet o12\* |
| V2X service identifier to Tx profiles mapping rule n | | | | | | | | octet (o12+1)\*  octet o3\* |

Figure 5.3.1.12: V2X service identifier to Tx profiles mapping rules

Table 5.3.1.12: V2X service identifier to Tx profiles mapping rules

|  |
| --- |
| V2X service identifier to Tx profiles mapping rule:  The V2X service identifier to Tx profiles mapping rule field is coded according to figure 5.3.1.13 and table 5.3.1.13. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifier to Tx profiles mapping rule contents | | | | | | | | octet o10+1  octet o10+2 |
| V2X service identifiers | | | | | | | | octet o10+3  octet o79 |
| Tx profile | | | | | | | | octet o79  octet (o79 + TBD) = octet o11 |

Figure 5.3.1.13: V2X service identifier to Tx profiles mapping rule

Table 5.3.1.13: V2X service identifier to Tx profiles mapping rules

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Tx profile: |
|  |
| If the length of V2X service identifier to Tx profiles mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.13, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to Tx profiles mapping rule contents. |
|  |

Editor's note: length and coding of Tx profile is FFS. If of variable length, a new length of Tx profile field might need to be introduced.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifiers contents | | | | | | | | octet o10+3  octet o10+4 |
| V2X service identifier 1 | | | | | | | | octet (o10+5)\*  octet (o10+8)\* |
| V2X service identifier 2 | | | | | | | | octet (o10+9)\*  octet (o10+12)\* |
| ... | | | | | | | | octet (o10+13)\*  octet (o10+n\*4)\* |
| V2X service identifier n | | | | | | | | octet (o10+1+n\*4)\*  octet (o10+4+n\*4)\*  = octet o11-1\* |

Figure 5.3.1.14: V2X service identifiers

Table 5.3.1.14: 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 privacy config contents | | | | | | | | octet o3+1  octet o3+2 |
| V2X services requiring privacy | | | | | | | | octet o3+3  octet o4-2 |
| Privacy timer | | | | | | | | octet o4-1  octet o4 |

Figure 5.3.1.15: Privacy config

Table 5.3.1.15: Privacy config

|  |
| --- |
| V2X services requiring privacy:  The V2X services requiring privacy field is coded according to figure 5.3.1.16 and table 5.3.1.16. |
|  |
| Privacy timer: |
| The privacy timer field contains binary encoded duration, in units of seconds, after which the UE shall change the source Layer-2 ID and source IP address (for IP data) self-assigned by the UE while performing transmission of V2X communication over the PC5 when privacy is required. |
|  |
| If the length of privacy config contents field indicates a length bigger than indicated in figure 5.3.1.15, receiving entity shall ignore any superfluous octets located at the end of the privacy config contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X services requiring privacy contents | | | | | | | | octet o3+3  octet o3+4 |
| V2X service requiring privacy 1 | | | | | | | | octet (o3+5)\*  octet o12\* |
| V2X service requiring privacy 2 | | | | | | | | octet (o12+1)\*  octet o13\* |
| ... | | | | | | | | octet (o13+1)\*  octet o14\* |
| V2X service requiring privacy n | | | | | | | | octet (o14+1)\*  octet (o4-2)\* |

Figure 5.3.1.16: V2X services requiring privacy

Table 5.3.1.16: V2X services requiring privacy

|  |
| --- |
| V2X service requiring privacy:  The V2X service requiring privacy field is coded according to figure 5.3.1.17 and table 5.3.1.17. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service requiring privacy contents | | | | | | | | | octet o12+1  octet o12+2 | |
| V2X service identifiers | | | | | | | | | octet o12+3  octet o15 | |
| Geographical areas | | | | | | | | | octet o15+1  octet o13 | |

Figure 5.3.1.17: V2X service requiring privacy

Table 5.3.1.17: V2X service requiring privacy

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Geographical areas:  The geographical areas field is coded according to figure 5.3.1.18 and table 5.3.1.18. |
|  |
| If the length of V2X service requiring privacy contents field indicates a length bigger than indicated in figure 5.3.1.17, receiving entity shall ignore any superfluous octets located at the end of the V2X service requiring privacy contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of geographical areas contents | | | | | | | | | octet o15+1  octet o15+2 | |
| Geographical area 1 | | | | | | | | | octet (o15+3)\*  octet o23\* | |
| Geographical area 2 | | | | | | | | | octet (o23+1)\*  octet o24\* | |
| ... | | | | | | | | | octet (o24+1)\*  octet o25\* | |
| Geographical area n | | | | | | | | | octet (o25+1)\*  octet o13\* | |

Figure 5.3.1.18: Geographical areas

Table 5.3.1.18: Geographical areas

|  |
| --- |
| Geographical area:  The geographical area field is coded according to figure 5.3.1.9 and table 5.3.1.9. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of V2X communication over PC5 in E-UTRA contents | | | | | | | | | | | | | | | | octet o4+1  octet o4+2 | |
| DDL2II | | VSIEFMRI | | VSAPI | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o4+3 | |
| V2X service identifier to destination layer-2 ID mapping rules | | | | | | | | | | | | | | | | octet o4+4  octet o26 | |
| PPPP to PDB mapping rules | | | | | | | | | | | | | | | | octet o26+1  octet o27 | |
| V2X service identifier to V2X E-UTRA frequency mapping rules | | | | | | | | | | | | | | | | octet (o27+1)\*  octet o28\* | |
| V2X services authorized for PPPR | | | | | | | | | | | | | | | | octet (o28+1)\*  octet o29\* | |
| Default destination layer-2 ID | | | | | | | | | | | | | | | | octet (o29+1)\*  octet (o29+3)\* = octet o5\* | |

Figure 5.3.1.19: V2X communication over PC5 in E-UTRA

Table 5.3.1.19: V2X communication over PC5 in E-UTRA

|  |
| --- |
| Default destination layer-2 ID indicator (DDL2II):  The DDL2II bit indicates presence of the default destination layer-2 ID field.  Bit  **8**  0 Default destination layer-2 ID field is absent  1 Default destination layer-2 ID field is present |
|  |
| V2X service identifier to V2X E-UTRA frequency mapping rules indicator (VSIEFMRI):  The VSIEFMRI bit indicates presence of the V2X service identifier to V2X E-UTRA frequency mapping rules field.  Bit  **7**  0 V2X service identifier to V2X E-UTRA frequency mapping rules field is absent  1 V2X service identifier to V2X E-UTRA frequency mapping rules field is present |
|  |
| V2X services authorized for PPPR indicator (VSAPI):  The VSAPI bit indicates presence of the V2X services authorized for PPPR field.  Bit  **6**  0 V2X services authorized for PPPR field is absent  1 V2X services authorized for PPPR field is present |
|  |
| V2X service identifier to destination layer-2 ID mapping rules:  The V2X service identifier to destination layer-2 ID mapping rules field is coded according to figure 5.3.1.20 and table 5.3.1.20. |
|  |
| PPPP to PDB mapping rules:  The PPPP to PDB mapping rules field is coded according to figure 5.3.1.22 and table 5.3.1.22. |
|  |
| V2X service identifier to V2X E-UTRA frequency mapping rules:  The V2X service identifier to V2X E-UTRA frequency mapping rules field is coded according to figure 5.3.1.24 and table 5.3.1.24. |
|  |
| V2X services authorized for PPPR:  The V2X services authorized for PPPR field is coded according to figure 5.3.1.29 and table 5.3.1.29. |
|  |
| Default destination layer-2 ID:  The default destination layer-2 ID field is a binary coded layer 2 identifier. |
|  |
| If the length of V2X communication over PC5 in E-UTRA contents field indicates a length bigger than indicated in figure 5.3.1.19, receiving entity shall ignore any superfluous octets located at the end of the V2X communication over PC5 in E-UTRA contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID mapping rules contents | | | | | | | | | octet o4+4  octet o4+5 | |
| V2X service identifier to destination layer-2 ID mapping rule 1 | | | | | | | | | octet o4+6\*  octet o19\* | |
| V2X service identifier to destination layer-2 ID mapping rule 2 | | | | | | | | | octet (o19+1)\*  octet o20\* | |
| ... | | | | | | | | | octet (o20+1)\*  octet o21\* | |
| V2X service identifier to destination layer-2 ID mapping rule n | | | | | | | | | octet (o21+1)\*  octet o26\* | |

Figure 5.3.1.20: V2X service identifier to destination layer-2 ID mapping rules

Table 5.3.1.20: V2X service identifier to destination layer-2 ID mapping rules

|  |
| --- |
| V2X service identifier to destination layer-2 ID mapping rule:  The V2X service identifier to destination layer-2 ID mapping rule field is coded according to figure 5.3.1.21 and table 5.3.1.21. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID mapping rule contents | | | | | | | | | octet o19+1  octet o19+2 | |
| V2X service identifiers | | | | | | | | | octet o19+3  octet o22 | |
| Destination layer-2 ID | | | | | | | | | octet o22+1  octet (o22+3) = octet o20 | |

Figure 5.3.1.21: V2X service identifier to destination layer-2 ID mapping rule

Table 5.3.1.21: V2X service identifier to destination layer-2 ID mapping rule

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Destination layer-2 ID:  The destination layer-2 ID field is a binary coded layer 2 identifier. |
|  |
| If the length of V2X service identifier to destination layer-2 ID mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.21, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to destination layer-2 ID mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of PPPP to PDB mapping rules contents | | | | | | | | | octet o26+1  octet o26+2 | |
| PPPP to PDB mapping rule 1 | | | | | | | | | octet (o26+3)\*  octet (o26+5)\* | |
| PPPP to PDB mapping rule 2 | | | | | | | | | octet (o26+6)\*  octet (o26+8)\* | |
| ... | | | | | | | | | octet (o26+9)\*  octet (o26+3\*n-1)\* | |
| PPPP to PDB mapping rule n | | | | | | | | | octet (o26+3\*n)\*  octet (o26+2+3\*n)\*  = octet o27\* | |

Figure 5.3.1.22: PPPP to PDB mapping rules

Table 5.3.1.22: PPPP to PDB mapping rules

|  |
| --- |
| PPPP to PDB mapping rule:  The PPPP to PDB mapping rule field is coded according to figure 5.3.1.23 and table 5.3.1.23. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | 1 |  | |
| 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | PPPP | | | | octet o26+6 | |
| PDB | | | | | | | | | | | | | | octet o26+7  octet o26+8 | |

Figure 5.3.1.23: PPPP to PDB mapping rule

Table 5.3.1.23: PPPP to PDB mapping rule

|  |
| --- |
| ProSe per-packet priority (PPPP):  The PPPP field is a ProSe per-packet priority value.  Bits  **3 2 1**  0 0 0 PPPP value 1  0 0 1 PPPP value 2  0 1 0 PPPP value 3  0 1 1 PPPP value 4  1 0 0 PPPP value 5  1 0 1 PPPP value 6  1 1 0 PPPP value 7  1 1 1 PPPP value 8 |
|  |
| Packet delay budget (PDB): |
| The PDB field indicates binary encoded the packet delay budget value in miliseconds to which the ProSe per-packet priority value indicated by the PPPP field is mapped. |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to V2X E-UTRA frequency mapping rules contents | | | | | | | | | octet o27+1  octet o27+2 | |
| V2X service identifier to V2X E-UTRA frequency mapping rule 1 | | | | | | | | | octet (o27+3)\*  octet o33\* | |
| V2X service identifier to V2X E-UTRA frequency mapping rule 2 | | | | | | | | | octet (o33+1)\*  octet o34\* | |
| ... | | | | | | | | | octet (o34+1)\*  octet o35\* | |
| V2X service identifier to V2X E-UTRA frequency mapping rule n | | | | | | | | | octet (o35+1)\*  octet o28\* | |

Figure 5.3.1.24: V2X service identifier to V2X E-UTRA frequency mapping rules

Table 5.3.1.24: V2X service identifier to V2X E-UTRA frequency mapping rules

|  |
| --- |
| V2X service identifier to V2X E-UTRA frequency mapping rule:  The V2X service identifier to V2X E-UTRA frequency mapping rule is coded according to figure 5.3.1.25 and table 5.3.1.25. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to V2X E-UTRA frequency mapping rule contents | | | | | | | | | octet o33+1  octet o33+2 | |
| V2X service identifiers | | | | | | | | | octet o33+3  octet o39 | |
| V2X E-UTRA frequencies with geographical areas list | | | | | | | | | octet o39+1  octet o34 | |

Figure 5.3.1.25: V2X service identifier to V2X E-UTRA frequency mapping rule

Table 5.3.1.25: V2X service identifier to V2X E-UTRA frequency mapping rule

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| V2X E-UTRA frequencies with geographical areas list:  The V2X E-UTRA frequencies with geographical areas list field is coded according to figure 5.3.1.26 and table 5.3.1.26. |
|  |
| If the length of V2X service identifier to V2X E-UTRA frequency mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.25, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to V2X E-UTRA frequency mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X E-UTRA frequencies with geographical areas list contents | | | | | | | | | octet o39+1  octet o39+2 | |
| V2X E-UTRA frequencies with geographical areas info 1 | | | | | | | | | octet o39+3\*  octet o40\* | |
| V2X E-UTRA frequencies with geographical areas info 2 | | | | | | | | | octet (o40+1)\*  octet o41\* | |
| ... | | | | | | | | | octet (o41+1)\*  octet o42\* | |
| V2X E-UTRA frequencies with geographical areas info n | | | | | | | | | octet (o42+1)\*  octet o34\* | |

Figure 5.3.1.26: V2X E-UTRA frequencies with geographical areas list

Table 5.3.1.26: V2X E-UTRA frequencies with geographical areas list

|  |
| --- |
| V2X E-UTRA frequencies with geographical areas info:  The V2X E-UTRA frequencies with geographical areas info field is coded according to figure 5.3.1.27 and table 5.3.1.27. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X E-UTRA frequencies with geographical areas info contents | | | | | | | | | octet o40+1  octet o40+2 | |
| V2X E-UTRA frequencies | | | | | | | | | octet o40+3  octet o43 | |
| Geographical areas | | | | | | | | | octet o43+1  octet o41 | |

Figure 5.3.1.27: V2X E-UTRA frequencies with geographical areas info

Table 5.3.1.27: V2X E-UTRA frequencies with geographical areas info

|  |
| --- |
| V2X E-UTRA frequencies:  The V2X E-UTRA frequencies field is coded according to figure 5.3.1.28 and table 5.3.1.28. |
|  |
| Geographical areas:  The geographical areas field is coded according to figure 5.3.1.18 and table 5.3.1.18. |
|  |
| If the length of V2X E-UTRA frequencies with geographical areas info contents field indicates a length bigger than indicated in figure 5.3.1.27, receiving entity shall ignore any superfluous octets located at the end of the V2X E-UTRA frequencies with geographical areas info contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X E-UTRA frequencies contents | | | | | | | | | octet o40+3  octet o40+4 | |
| V2X E-UTRA frequency 1 | | | | | | | | | octet (o40+5)\*  octet (o40+4+TBD)\* | |
| V2X E-UTRA frequency 2 | | | | | | | | | octet (o40+5+TBD)\*  octet (o40+4+2\*TBD)\* | |
| ... | | | | | | | | | octet (o40+5+2\*TBD)\*  octet (o40+4+(n-1)\*TBD)\* | |
| V2X E-UTRA frequency n | | | | | | | | | octet (o40+5+(n-1)\*TBD)\*  octet (o40+4+n\*TBD)\* = octet o42\* | |

Figure 5.3.1.28: V2X E-UTRA frequencies

Table 5.3.1.28: V2X E-UTRA frequencies

|  |
| --- |
| V2X E-UTRA frequency:  V2X E-UTRA frequency |
|  |

Editor's note: length and coding of V2X E-UTRA frequency is FFS.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X services authorized for PPPR contents | | | | | | | | | octet o28+1  octet o28+2 | |
| V2X service authorized for PPPR 1 | | | | | | | | | octet (o28+3)\*  octet o36\* | |
| V2X service authorized for PPPR 2 | | | | | | | | | octet (o36+1)\*  octet o37\* | |
| ... | | | | | | | | | octet (o37+1)\*  octet o38\* | |
| V2X service authorized for PPPR n | | | | | | | | | octet (o38+1)\*  octet o29\* | |

Figure 5.3.1.29: V2X services authorized for PPPR

Table 5.3.1.29: V2X services authorized for PPPR

|  |
| --- |
| V2X service authorized for PPPR:  The V2X services authorized for PPPR field is coded according to figure 5.3.1.30 and table 5.3.1.30. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | 1 |  | |
| Length of V2X service authorized for PPPR contents | | | | | | | | | | | | | | octet o36+1  octet o36+2 | |
| V2X service identifiers | | | | | | | | | | | | | | octet o36+3  octet o37-1 | |
| 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | PPPR | | | | octet o37 | |

Figure 5.3.1.30: V2X service authorized for PPPR

Table 5.3.1.30: V2X service authorized for PPPR

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| ProSe per-packet reliability (PPPR):  The PPPR field is a ProSe per-packet reliability value.  Bits  **3 2 1**  0 0 0 PPPR value 1  0 0 1 PPPR value 2  0 1 0 PPPR value 3  0 1 1 PPPR value 4  1 0 0 PPPR value 5  1 0 1 PPPR value 6  1 1 0 PPPR value 7  1 1 1 PPPR value 8 |
|  |
| If the length of V2X service authorized for PPPR contents field indicates a length bigger than indicated in figure 5.3.1.30, receiving entity shall ignore any superfluous octets located at the end of the V2X service authorized for PPPR contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of V2X communication over PC5 in NR contents | | | | | | | | | | | | | | | | octet o5+1  octet o5+2 | |
| DDL2IBI | | VSINFMRI | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o5+3 | |
| V2X service identifier to V2X NR frequency mapping rules | | | | | | | | | | | | | | | | octet (o5+4)\*  octet o45\* | |
| V2X service identifier to destination layer-2 ID for broadcast mapping rules | | | | | | | | | | | | | | | | octet o45+1  octet o46 | |
| V2X service identifier to destination layer-2 ID for groupcast mapping rules | | | | | | | | | | | | | | | | octet o46+1  octet o47 | |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules | | | | | | | | | | | | | | | | octet o47+1  octet o48 | |
| PC5 QoS mapping rules | | | | | | | | | | | | | | | | octet o48+1  octet o49 | |
| SLRB mapping rules | | | | | | | | | | | | | | | | octet o49+1  octet o50 | |
| Default destination layer-2 ID for broadcast | | | | | | | | | | | | | | | | octet (o50+1)\*  octet (o50+3)\* = octet l\* | |

Figure 5.3.1.31: V2X communication over PC5 in NR

Table 5.3.1.31: V2X communication over PC5 in NR

|  |
| --- |
| Default destination layer-2 ID for broadcast indicator (DDL2IBI):  The DDL2IBI bit indicates presence of the default destination layer-2 ID for broadcast field.  Bit  **8**  0 Default destination layer-2 ID for broadcast field is absent  1 Default destination layer-2 ID for broadcast field is present |
|  |
| V2X service identifier to V2X NR frequency mapping rules indicator (VSINFMRI):  The VSINFMRI bit indicates presence of the V2X service identifier to V2X NR frequency mapping rules field.  Bit  **7**  0 V2X service identifier to V2X NR frequency mapping rules field is absent  1 V2X service identifier to V2X NR frequency mapping rules field is present |
|  |
| V2X service identifier to V2X NR frequency mapping rules:  The V2X service identifier to V2X NR frequency mapping rules field is coded according to figure 5.3.1.32 and table 5.3.1.32. |
|  |
| V2X service identifier to destination layer-2 ID for broadcast mapping rules:  The V2X service identifier to destination layer-2 ID for broadcast mapping rules field is coded according to figure 5.3.1.37 and table 5.3.1.37. |
|  |
| V2X service identifier to destination layer-2 ID for groupcast mapping rules:  The V2X service identifier to destination layer-2 ID for groupcast mapping rules field is coded according to figure 5.3.1.39 and table 5.3.1.39. |
|  |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules:  The V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules field is coded according to figure 5.3.1.41 and table 5.3.1.41. |
|  |
| PC5 QoS mapping rules:  The PC5 QoS mapping rules field is coded according to figure 5.3.1.43 and table 5.3.1.43. |
|  |
| SLRB mapping rules:  The SLRB mapping rules field is coded according to figure 5.3.1.47 and table 5.3.1.47. |
|  |
| Default destination layer-2 ID for broadcast:  The default destination layer-2 ID for broadcast field is a binary coded layer 2 identifier. |
|  |
| If the length of V2X communication over PC5 in NR contents field indicates a length bigger than indicated in figure 5.3.1.31, receiving entity shall ignore any superfluous octets located at the end of the V2X communication over PC5 in NR contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to V2X NR frequency mapping rules contents | | | | | | | | | octet o5+4  octet o5+5 | |
| V2X service identifier to V2X NR frequency mapping rule 1 | | | | | | | | | octet (o5+6)\*  octet o51\* | |
| V2X service identifier to V2X NR frequency mapping rule 2 | | | | | | | | | octet (o51+1)\*  octet o52\* | |
| ... | | | | | | | | | octet (o52+1)\*  octet o53\* | |
| V2X service identifier to V2X NR frequency mapping rule n | | | | | | | | | octet (o53+1)\*  octet o45\* | |

Figure 5.3.1.32: V2X service identifier to V2X NR frequency mapping rules

Table 5.3.1.32: V2X service identifier to V2X NR frequency mapping rules

|  |
| --- |
| V2X service identifier to V2X NR frequency mapping rule:  The V2X service identifier to V2X NR frequency mapping rule is coded according to figure 5.3.1.33 and table 5.3.1.33. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to V2X NR frequency mapping rule contents | | | | | | | | | octet o51+1  octet o51+2 | |
| V2X service identifiers | | | | | | | | | octet o51+3  octet o54 | |
| V2X NR frequencies with geographical areas list | | | | | | | | | octet o54+1  octet o52 | |

Figure 5.3.1.33: V2X service identifier to V2X NR frequency mapping rule

Table 5.3.1.33: V2X service identifier to V2X NR frequency mapping rule

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| V2X NR frequencies with geographical areas list:  The V2X NR frequencies with geographical areas list field is coded according to figure 5.3.1.34 and table 5.3.1.34. |
|  |
| If the length of V2X service identifier to V2X NR frequency mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.33, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to V2X NR frequency mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X NR frequencies with geographical areas list contents | | | | | | | | | octet o54+1  octet o54+2 | |
| V2X NR frequencies with geographical areas info 1 | | | | | | | | | octet (o54+3)\*  octet o55\* | |
| V2X NR frequencies with geographical areas info 2 | | | | | | | | | octet (o55+1)\*  octet o56\* | |
| ... | | | | | | | | | octet (o56+1)\*  octet o57\* | |
| V2X NR frequencies with geographical areas info n | | | | | | | | | octet (o57+1)\*  octet o52\* | |

Figure 5.3.1.34: V2X NR frequencies with geographical areas list

Table 5.3.1.34: V2X NR frequencies with geographical areas list

|  |
| --- |
| V2X NR frequencies with geographical areas info:  The V2X NR frequencies with geographical areas info field is coded according to figure 5.3.1.35 and table 5.3.1.35. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X NR frequencies with geographical areas info contents | | | | | | | | | octet o55+1  octet o55+2 | |
| V2X NR frequencies | | | | | | | | | octet o55+3  octet o58 | |
| Geographical areas | | | | | | | | | octet o58+1  octet o56 | |

Figure 5.3.1.35: V2X NR frequencies with geographical areas info

Table 5.3.1.35: V2X NR frequencies with geographical areas info

|  |
| --- |
| V2X NR frequencies:  The V2X NR frequencies field is coded according to figure 5.3.1.36 and table 5.3.1.36. |
|  |
| Geographical areas:  The geographical areas field is coded according to figure 5.3.1.18 and table 5.3.1.18. |
|  |
| If the length of V2X NR frequencies with geographical areas info contents field indicates a length bigger than indicated in figure 5.3.1.35, receiving entity shall ignore any superfluous octets located at the end of the V2X NR frequencies with geographical areas info contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X NR frequencies contents | | | | | | | | | octet o55+3  octet o55+4 | |
| V2X NR frequency 1 | | | | | | | | | octet (o55+5)\*  octet (o55+4+TBD)\* | |
| V2X NR frequency 2 | | | | | | | | | octet (o55+5+TBD)\*  octet (o55+4+2\*TBD)\* | |
| ... | | | | | | | | | octet (o55+5+2\*TBD)\*  octet (o55+4+(n-1)\*TBD)\* | |
| V2X NR frequency n | | | | | | | | | octet (o55+5+(n-1)\*TBD)\*  octet (o55+4+n\*TBD)\* = octet o58\* | |

Figure 5.3.1.36: V2X NR frequencies

Table 5.3.1.36: V2X NR frequencies

|  |
| --- |
| V2X NR frequency:  V2X NR frequency |
|  |

Editor's note: length and coding of V2X NR frequency is FFS.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID for broadcast mapping rules contents | | | | | | | | | octet o45+1  octet o45+2 | |
| V2X service identifier to destination layer-2 ID for broadcast mapping rule 1 | | | | | | | | | octet (o45+3)\*  octet o59\* | |
| V2X service identifier to destination layer-2 ID for broadcast mapping rule 2 | | | | | | | | | octet (o59+1)\*  octet o60\* | |
| ... | | | | | | | | | octet (o60+1)\*  octet o61\* | |
| V2X service identifier to destination layer-2 ID for broadcast mapping rule n | | | | | | | | | octet (o61+1)\*  octet o46\* | |

Figure 5.3.1.37: V2X service identifier to destination layer-2 ID for broadcast mapping rules

Table 5.3.1.37: V2X service identifier to destination layer-2 ID for broadcast mapping rules

|  |
| --- |
| V2X service identifier to destination layer-2 ID for broadcast mapping rule:  The V2X service identifier to destination layer-2 ID for broadcast mapping rule field is coded according to figure 5.3.1.38 and table 5.3.1.38. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID for broadcast mapping rule contents | | | | | | | | | octet o59+1  octet o59+2 | |
| V2X service identifiers | | | | | | | | | octet o59+3  octet o62 | |
| Destination layer-2 ID for broadcast | | | | | | | | | octet o62+1  octet (o62+3)  = octet o60 | |

Figure 5.3.1.38: V2X service identifier to destination layer-2 ID for broadcast mapping rule

Table 5.3.1.38: V2X service identifier to destination layer-2 ID for broadcast mapping rule

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Destination layer-2 ID for broadcast:  The destination layer-2 ID for broadcast field is a binary coded layer 2 identifier. |
|  |
| If the length of V2X service identifier to destination layer-2 ID for broadcast mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.38, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to destination layer-2 ID for broadcast mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID for groupcast mapping rules contents | | | | | | | | | octet o46+1  octet o46+2 | |
| V2X service identifier to destination layer-2 ID for groupcast mapping rule 1 | | | | | | | | | octet (o46+3)\*  octet o63\* | |
| V2X service identifier to destination layer-2 ID for groupcast mapping rule 2 | | | | | | | | | octet (o63+1)\*  octet o64\* | |
| ... | | | | | | | | | octet (o64+1)\*  octet o65\* | |
| V2X service identifier to destination layer-2 ID for groupcast mapping rule n | | | | | | | | | octet (o65+1)\*  octet o47\* | |

Figure 5.3.1.39: V2X service identifier to destination layer-2 ID for groupcast mapping rules

Table 5.3.1.39: V2X service identifier to destination layer-2 ID for groupcast mapping rules

|  |
| --- |
| V2X service identifier to destination layer-2 ID for groupcast mapping rule:  The V2X service identifier to destination layer-2 ID for groupcast mapping rule field is coded according to figure 5.3.1.40 and table 5.3.1.40. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID for groupcast mapping rule contents | | | | | | | | | octet o63+1  octet o63+2 | |
| V2X service identifiers | | | | | | | | | octet o63+3  octet o80 | |
| Destination layer-2 ID for groupcast | | | | | | | | | octet o80+1  octet (o80+3) = octet o64 | |

Figure 5.3.1.40: V2X service identifier to destination layer-2 ID for groupcast mapping rule

Table 5.3.1.40: V2X service identifier to destination layer-2 ID for groupcast mapping rule

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Destination layer-2 ID for groupcast:  The destination layer-2 ID for groupcast field is a binary coded layer 2 identifier. |
|  |
| If the length of V2X service identifier to destination layer-2 ID for groupcast mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.40, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to destination layer-2 ID for groupcast mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules contents | | | | | | | | | octet o47+1  octet o47+2 | |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule 1 | | | | | | | | | octet (o47+3)\*  octet o66\* | |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule 2 | | | | | | | | | octet (o66+1)\*  octet o67\* | |
| ... | | | | | | | | | octet (o67+1)\*  octet o68\* | |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule n | | | | | | | | | octet (o68+1)\*  octet o48\* | |

Figure 5.3.1.41: V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules

Table 5.3.1.41: V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules

|  |
| --- |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule:  The V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule field is coded according to figure 5.3.1.42 and table 5.3.1.42. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule contents | | | | | | | | | octet o66+1  octet o66+2 | |
| V2X service identifiers | | | | | | | | | octet o66+3  octet o81 | |
| Destination layer-2 ID for unicast initial signalling | | | | | | | | | octet o81+1  octet (o81+3)  = octet o67 | |

Figure 5.3.1.42: V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule

Table 5.3.1.42: V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule

|  |
| --- |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Destination layer-2 ID for unicast initial signalling:  The destination layer-2 ID for unicast initial signalling field is a binary coded layer 2 identifier. |
|  |
| If the length of V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.42, receiving entity shall ignore any superfluous octets located at the end of the V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of PC5 QoS mapping rules contents | | | | | | | | | octet o48+1  octet o48+2 | |
| PC5 QoS mapping rule 1 | | | | | | | | | octet (o48+3)\*  octet o70\* | |
| PC5 QoS mapping rule 2 | | | | | | | | | octet (o70+1)\*  octet o71\* | |
| ... | | | | | | | | | octet (o71+1)\*  octet o72\* | |
| PC5 QoS mapping rule n | | | | | | | | | octet (o72+1)\*  octet o49\* | |

Figure 5.3.1.43: PC5 QoS mapping rules

Table 5.3.1.43: PC5 QoS mapping rules

|  |
| --- |
| PC5 QoS mapping rule:  The PC5 QoS mapping rule field is coded according to figure 5.3.1.44 and table 5.3.1.44. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of PC5 QoS mapping rule contents | | | | | | | | | octet o70+1  octet o70+2 | |
| PC5 QoS mapping rule inputs | | | | | | | | | octet o70+3  octet o73 | |
| PC5 QoS mapping rule outputs | | | | | | | | | octet o73+1  octet o71 | |

Figure 5.3.1.44: PC5 QoS mapping rule

Table 5.3.1.44: PC5 QoS mapping rule

|  |
| --- |
| PC5 QoS mapping rule inputs:  The PC5 QoS mapping rule inputs field is coded according to figure 5.3.1.45 and table 5.3.1.45. |
|  |
| PC5 QoS mapping rule outputs:  The PC5 QoS mapping rule outputs field is coded according to figure 5.3.1.46 and table 5.3.1.46. |
|  |
| If the length of PC5 QoS mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.44, receiving entity shall ignore any superfluous octets located at the end of the PC5 QoS mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of PC5 QoS mapping rule inputs contents | | | | | | | | | | | | | | | | octet o70+3  octet o70+4 | |
| VARVSI | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o70+5 | |
| V2X service identifiers | | | | | | | | | | | | | | | | octet o70+6  octet o74 | |
| Length of V2X application requirements for V2X service | | | | | | | | | | | | | | | | octet o74+1  octet o74+2 | |
| V2X application requirements for V2X service | | | | | | | | | | | | | | | | octet o74+3  octet o73 | |

Figure 5.3.1.45: PC5 QoS mapping rule inputs

Table 5.3.1.45: PC5 QoS mapping rule inputs

|  |
| --- |
| V2X application requirements for V2X service indicator (VARVSI):  The VARVSI bit indicates presence of the length of V2X application requirements for V2X service field and the V2X application requirements for V2X service field.  Bit  **8**  0 length of V2X application requirements for V2X service field and V2X application requirements for V2X service field are absent  1 length of V2X application requirements for V2X service field and V2X application requirements for V2X service field are present |
|  |
| V2X service identifiers:  The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Length of V2X application requirements for V2X service:  The length of V2X application requirements for V2X service field indicates length of the V2X application requirements for V2X service field in octets. |
|  |
| V2X application requirements for V2X service:  Coding of the V2X application requirements for V2X service is out of scope of the present specification. |
|  |
| If the length of PC5 QoS mapping rule inputs contents field indicates a length bigger than indicated in figure 5.3.1.45, receiving entity shall ignore any superfluous octets located at the end of the PC5 QoS mapping rule inputs contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of PC5 QoS mapping rule outputs contents | | | | | | | | | | | | | | | | octet o73+1  octet o73+2 | |
| GFBRI | | MFBRI | | PLAMBRI | | RI | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o73+3 | |
| PQI | | | | | | | | | | | | | | | | octet o70+6 | |
| Guaranteed flow bit rate | | | | | | | | | | | | | | | | octet (o70+7)\*  octet (o70+9)\* | |
| Maximum flow bit rate | | | | | | | | | | | | | | | | octet (o70+10)\*  octet (o70+12)\* | |
| Per-link aggregate maximum bit rate | | | | | | | | | | | | | | | | octet (o70+13)\*  octet (o70+15)\* | |
| Range | | | | | | | | | | | | | | | | octet (o70+16)\*  octet (o70+17)\* = octet o71\* | |

Figure 5.3.1.46: PC5 QoS mapping rule outputs

Table 5.3.1.46: PC5 QoS mapping rule outputs

|  |
| --- |
| Guaranteed flow bit rate indicator (GFBRI):  The GFBRI bit indicates presence of guaranteed flow bit rate field.  Bit  **8**  0 Guaranteed flow bit rate field is absent  1 Guaranteed flow bit rate field is present |
|  |
| Maximum flow bit rate indicator (MFBRI):  The MFBRI bit indicates presence of maximum flow bit rate field.  Bit  **7**  0 Maximum flow bit rate field is absent  1 Maximum flow bit rate field is present |
|  |
| Per-link aggregate maximum bit rate indicator (PLAMBRI):  The PLAMBRI bit indicates presence of per-link aggregate maximum bit rate field.  Bit  **6**  0 Per-link aggregate maximum bit rate field is absent  1 Per-link aggregate maximum bit rate field is present |
|  |
| Range indicator (RI):  The RI bit indicates presence of range field.  Bit  **5**  0 Range field is absent  1 Range field is present |
|  |
| PQI:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1  to Spare  0 0 0 1 0 1 0 0  0 0 0 1 0 1 0 1 PQI 21  0 0 0 1 0 1 1 0 PQI 22  0 0 0 1 0 1 1 1 PQI 23  0 0 0 1 1 0 0 0  to Spare  0 0 1 1 0 1 1 0  0 0 1 1 0 1 1 1 PQI 55  0 0 1 1 1 0 0 0 PQI 56  0 0 1 1 1 0 0 1 PQI 57  0 0 1 1 1 0 1 0 PQI 58  0 0 1 1 1 0 1 1 PQI 59  0 0 1 1 1 1 0 0  to Spare  0 1 0 1 1 0 0 1  0 1 0 1 1 0 1 0 PQI 90  0 1 0 1 1 0 1 1 PQI 91  0 1 0 1 1 1 0 0  to Spare  0 1 1 1 1 1 1 1  1 0 0 0 0 0 0 0  to Operator-specific PQIs  1 1 1 1 1 1 1 0  1 1 1 1 1 1 1 1 Reserved  If the UE receives a PQI value (excluding the reserved PQI values) that it does not understand, the UE shall choose a PQI value from the set of PQI values defined in this version of the protocol (see 3GPP TS 23.287 [2]) and associated with:  - GBR resource type, if the PC5 QoS mapping rule outputs include the guaranteed flow bit rate field; and  - non-GBR resource type, if the PC5 QoS mapping rule outputs do not include the guaranteed flow bit rate field.  The UE shall use this chosen PQI value for internal operations only. The UE shall use the received PQI value in subsequent V2X communication over PC5 signalling procedures. |
|  |
| Guaranteed flow bit rate:  The guaranteed flow bit rate field indicates guaranteed flow bit rate for both sending and receiving and contains one octet indicating the unit of the guaranteed flow bit rate followed by two octets containing the value of the guaranteed flow bit rate.  Unit of the guaranteed flow bit rate:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 value is not used  0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps  0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps  0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps  0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps  0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps  0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps  0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps  0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps  0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps  0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps  0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps  0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps  0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps  0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps  0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps  0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps  0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps  0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps  0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps  0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps  0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps  0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps  0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps  0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps  0 0 0 1 1 0 0 1 value is incremented in multiples of 256 Pbps  Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.  Value of the guaranteed flow bit rate is binary coded value of the guaranteed flow bit rate in units defined by the unit of the guaranteed flow bit rate. |
|  |
| Maximum flow bit rate:  The maximum flow bit rate field indicates maximum flow bit rate for both sending and receiving and contains one octet indicating the unit of the maximum flow bit rate followed by two octets containing the value of the maximum flow bit rate.  Unit of the maximum flow bit rate:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 value is not used  0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps  0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps  0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps  0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps  0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps  0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps  0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps  0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps  0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps  0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps  0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps  0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps  0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps  0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps  0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps  0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps  0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps  0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps  0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps  0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps  0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps  0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps  0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps  0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps  0 0 0 1 1 0 0 1 value is incremented in multiples of 256 Pbps  Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.  Value of the maximum flow bit rate is binary coded value of the maximum flow bit rate in units defined by the unit of the maximum flow bit rate. |
|  |
| Per-link aggregate maximum bit rate:  The per-link aggregate maximum bit rate field indicates per-link aggregate maximum bit rate for both sending and receiving and contains one octet indicating the unit of the per-link aggregate maximum bit rate followed by two octets containing the value of the per-link aggregate maximum bit rate.  Unit of the per-link aggregate maximum bit rate:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 value is not used  0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps  0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps  0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps  0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps  0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps  0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps  0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps  0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps  0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps  0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps  0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps  0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps  0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps  0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps  0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps  0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps  0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps  0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps  0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps  0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps  0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps  0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps  0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps  0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps  0 0 0 1 1 0 0 1 value is incremented in multiples of 256 Pbps  Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.  Value of the per-link aggregate maximum bit rate is binary coded value of the per-link aggregate maximum bit rate in units defined by the unit of the per-link aggregate maximum bit rate. |
|  |
| Range  The range field indicates a binary encoded value of the range in meters. |
|  |
| If the length of PC5 QoS mapping rule outputs contents field indicates a length bigger than indicated in figure 5.3.1.46, receiving entity shall ignore any superfluous octets located at the end of the PC5 QoS mapping rule outputs contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of SLRB mapping rules contents | | | | | | | | | octet o49+1  octet o49+2 | |
| SLRB mapping rule 1 | | | | | | | | | octet (o48+3)\*  octet o75\* | |
| SLRB mapping rule 2 | | | | | | | | | octet (o75+1)\*  octet o76\* | |
| ... | | | | | | | | | octet (o76+1)\*  octet o77\* | |
| SLRB mapping rule n | | | | | | | | | octet (o77+1)\*  octet o50\* | |

Figure 5.3.1.47: SLRB mapping rules

Table 5.3.1.47: SLRB mapping rules

|  |
| --- |
| SLRB mapping rule:  The SLRB mapping rule field is coded according to figure 5.3.1.48 and table 5.3.1.48. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of SLRB mapping rule contents | | | | | | | | | octet o75+1  octet o75+2 | |
| PC5 QoS profile | | | | | | | | | octet o75+3  octet o78 | |
| SLRB | | | | | | | | | octet o78+1  octet o76 | |

Figure 5.3.1.48: SLRB mapping rule

Table 5.3.1.48: SLRB mapping rule

|  |
| --- |
| PC5 QoS profile:  The PC5 QoS profile field is coded according to figure 5.3.1.49 and table 5.3.1.49. |
|  |
| SLRB |
| SLRB |
|  |
| If the length of SLRB mapping rule contents field indicates a length bigger than indicated in figure 5.3.1.48, receiving entity shall ignore any superfluous octets located at the end of the SLRB mapping rule contents. |
|  |

Editor's note: length and coding of SLRB is FFS. If of variable length, a new length of SLRB field might need to be introduced.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of PC5 QoS profile contents | | | | | | | | | | | | | | | | octet o75+3  octet o75+4 | |
| GFBRI | | MFBRI | | PLAMBRI | | RI | | PLOI | | AWI | | MDBVI | | 0  Spare | | octet o73+5 | |
| PQI | | | | | | | | | | | | | | | | octet o75+6 | |
| Guaranteed flow bit rate | | | | | | | | | | | | | | | | octet (o75+7)\*  octet (o75+9)\* | |
| Maximum flow bit rate | | | | | | | | | | | | | | | | octet (o75+10)\*  octet (o75+12)\* | |
| Per-link aggregate maximum bit rate | | | | | | | | | | | | | | | | octet (o75+13)\*  octet (o75+15)\* | |
| Range | | | | | | | | | | | | | | | | octet (o75+7)\*  octet (o75+8)\* | |
| 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | Priority level | | | | | | octet (o75+9)\* | |
| Averaging window | | | | | | | | | | | | | | | | octet (o75+10)\*  octet (o75+11)\* | |
| Maximum data burst volume | | | | | | | | | | | | | | | | octet (o75+12)\*  octet (o75+13)\* = octet o78\* | |

Figure 5.3.1.49:PC5 QoS profile

Table 5.3.1.49:PC5 QoS profile

|  |
| --- |
| Guaranteed flow bit rate indicator (GFBRI):  The GFBRI bit indicates presence of guaranteed flow bit rate field.  Bit  **8**  0 Guaranteed flow bit rate field is absent  1 Guaranteed flow bit rate field is present |
|  |
| Maximum flow bit rate indicator (MFBRI):  The MFBRI bit indicates presence of maximum flow bit rate field.  Bit  **7**  0 Maximum flow bit rate field is absent  1 Maximum flow bit rate field is present |
|  |
| Per-link aggregate maximum bit rate indicator (PLAMBRI):  The PLAMBRI bit indicates presence of per-link aggregate maximum bit rate field.  Bit  **6**  0 Per-link aggregate maximum bit rate field is absent  1 Per-link aggregate maximum bit rate field is present |
|  |
| Range indicator (RI):  The RI bit indicates presence of range field.  Bit  **5**  0 Range field is absent  1 Range field is present |
|  |
| Priority level octet indicator (OPLI):  The OPLI bit indicates presence of the octet of the priority level field.  Bit  **4**  0 The octet of the priority level is absent  1 The octet of the priority level is present |
|  |
| Averaging window indicator (AWI):  The AWI bit indicates presence of averaging window field.  Bit  **3**  0 Averaging window field is absent  1 Averaging window field is present |
|  |
| Maximum data burst volume indicator (MDBVI):  The MDBVI bit indicates presence of maximum data burst volume field.  Bit  **2**  0 Maximum data burst volume field is absent  1 Maximum data burst volume field is present |
|  |
| PQI:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1  to Spare  0 0 0 1 0 1 0 0  0 0 0 1 0 1 0 1 PQI 21  0 0 0 1 0 1 1 0 PQI 22  0 0 0 1 0 1 1 1 PQI 23  0 0 0 1 1 0 0 0  to Spare  0 0 1 1 0 1 1 0  0 0 1 1 0 1 1 1 PQI 55  0 0 1 1 1 0 0 0 PQI 56  0 0 1 1 1 0 0 1 PQI 57  0 0 1 1 1 0 1 0 PQI 58  0 0 1 1 1 0 1 1 PQI 59  0 0 1 1 1 1 0 0  to Spare  0 1 0 1 1 0 0 1  0 1 0 1 1 0 1 0 PQI 90  0 1 0 1 1 0 1 1 PQI 91  0 1 0 1 1 1 0 0  to Spare  0 1 1 1 1 1 1 1  1 0 0 0 0 0 0 0  to Operator-specific PQIs  1 1 1 1 1 1 1 0  1 1 1 1 1 1 1 1 Reserved  If the UE receives a PQI value (excluding the reserved PQI values) that it does not understand, the UE shall choose a PQI value from the set of PQI values defined in this version of the protocol (see 3GPP TS 23.287 [2]) and associated with:  - GBR resource type, if the PC5 QoS mapping rule outputs include the guaranteed flow bit rate field; and  - non-GBR resource type, if the PC5 QoS mapping rule outputs do not include the guaranteed flow bit rate field.  The UE shall use this chosen PQI value for internal operations only. The UE shall use the received PQI value in subsequent V2X communication over PC5 signalling procedures. |
|  |
| Guaranteed flow bit rate:  The guaranteed flow bit rate field indicates guaranteed flow bit rate for both sending and receiving and contains one octet indicating the unit of the guaranteed flow bit rate followed by two octets containing the value of the guaranteed flow bit rate.  Unit of the guaranteed flow bit rate:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 value is not used  0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps  0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps  0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps  0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps  0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps  0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps  0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps  0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps  0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps  0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps  0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps  0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps  0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps  0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps  0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps  0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps  0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps  0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps  0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps  0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps  0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps  0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps  0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps  0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps  0 0 0 1 1 0 0 1 value is incremented in multiples of 256 Pbps  Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.  Value of the guaranteed flow bit rate is binary coded value of the guaranteed flow bit rate in units defined by the unit of the guaranteed flow bit rate. |
|  |
| Maximum flow bit rate:  The maximum flow bit rate field indicates maximum flow bit rate for both sending and receiving and contains one octet indicating the unit of the maximum flow bit rate followed by two octets containing the value of the maximum flow bit rate.  Unit of the maximum flow bit rate:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 value is not used  0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps  0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps  0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps  0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps  0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps  0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps  0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps  0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps  0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps  0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps  0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps  0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps  0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps  0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps  0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps  0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps  0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps  0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps  0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps  0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps  0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps  0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps  0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps  0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps  0 0 0 1 1 0 0 1 value is incremented in multiples of 256 Pbps  Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.  Value of the maximum flow bit rate is binary coded value of the maximum flow bit rate in units defined by the unit of the maximum flow bit rate. |
|  |
| Per-link aggregate maximum bit rate:  The per-link aggregate maximum bit rate field indicates per-link aggregate maximum bit rate for both sending and receiving and contains one octet indicating the unit of the per-link aggregate maximum bit rate followed by two octets containing the value of the per-link aggregate maximum bit rate.  Unit of the per-link aggregate maximum bit rate:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 value is not used  0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps  0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps  0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps  0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps  0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps  0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps  0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps  0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps  0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps  0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps  0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps  0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps  0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps  0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps  0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps  0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps  0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps  0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps  0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps  0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps  0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps  0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps  0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps  0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps  0 0 0 1 1 0 0 1 value is incremented in multiples of 256 Pbps  Other values shall be interpreted as multiples of 256 Pbps in this version of the protocol.  Value of the per-link aggregate maximum bit rate is binary coded value of the per-link aggregate maximum bit rate in units defined by the unit of the per-link aggregate maximum bit rate. |
|  |
| Range:  The range field indicates a binary encoded value of the range in meters. |
|  |
| Priority level:  The Priority level field contains a ProSe per-packet priority value.  Bits  **3 2 1**  0 0 0 PPPP value 1  0 0 1 PPPP value 2  0 1 0 PPPP value 3  0 1 1 PPPP value 4  1 0 0 PPPP value 5  1 0 1 PPPP value 6  1 1 0 PPPP value 7  1 1 1 PPPP value 8 |
|  |
| Averaging window:  The averaging window field indicates a binary representation of the averaging window for both sending and receiving in milliseconds. |
|  |
| Maximum data burst volume:  The averaging window field indicates a binary representation of the maximum data burst volume for both sending and receiving in octets. |
|  |
| If the length of PC5 QoS profile contents field indicates a length bigger than indicated in figure 5.3.1.49, receiving entity shall ignore any superfluous octets located at the end of the PC5 QoS profile contents. |
|  |

\*\*\*\*\* 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 o1+1\*  octet l\* |

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 indicates expiration time of UE policies for V2X communication over Uu. The validity timer field is binary encoded 40 bits unsigned integer value indicating 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. |

Editor's note: length and semantic of validity timer field is FFS.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of PLMN infos contents | | | | | | | | octet o1+1  octet o1+2 |
| PLMN info 1 | | | | | | | | octet o1+3  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 | 0  Spare | 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 o6+1\*  octet o8\* |

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 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. |
|  |
| 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 | 0  Spare | VAAI | octet o5+4 |
| V2X AS addresses | | | | | | | | octet o5+5\*  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 AS addresses  The V2X AS addresses field is coded according to figure 5.4.1.7 and table 5.4.1.7. |
|  |
| 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 o6\* |

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 o12+8\*  octet o12+23\* |
| FQDN | | | | | | | | octet o12+24\*  octet o15\* |
| UDP port for uplink transport | | | | | | | | octet o15+1\*  octet o15+2\* |
| TCP port for bidirectional transport | | | | | | | | octet o15+3\*  octet o15+4\* |
| UDP port for downlink transport | | | | | | | | octet o15+5\*  octet o15+6\* |
| Geographical area | | | | | | | | octet o15+7\*  octet o13\* |

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. |
|  |
| 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 service identifier related info contents | | | | | | | | octet o6+1  octet o6+2 |
| VSII | DVAAII | VSIURI | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o6+3 |
| V2X service infos | | | | | | | | octet o6+4\*  octet o18\* |
| Default V2X AS address infos | | | | | | | | octet o18+1\*  octet o19\* |
| V2X services with IP unicast routing | | | | | | | | octet o19+1\*  octet o8\* |

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 services with IP unicast routing indicator (VSIURI)  The VSIIURI bit indicates presence of the V2X services with IP unicast routing field.  Bit  **6**  0 V2X services with IP unicast routing field is absent  1 V2X services with IP unicast routing 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. |
|  |
| V2X services with IP unicast routing  The V2X services with IP unicast routing field is coded as V2X service identifiers according figure 5.4.1.12 and table 5.4.1.12 and indicates V2X service identifiers of the V2X services for V2X communication over Uu using existing unicast routing. |
|  |
| 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 o6+4  octet o6+5 |
| V2X service info 1 | | | | | | | | octet o6+6  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 | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | octet o23+1 |
| V2X AS addresses | | | | | | | | octet o23+2\*  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 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. |
|  |
| 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 18+1  octet o18+2 |
| Default V2X AS address info 1 | | | | | | | | octet o18+3  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 o19\* |

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 o24+5  octet o25 |

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 o15+7  octet o15+8 |
| Coordinate 1 | | | | | | | | octet o15+9  octet o15+14 |
| Coordinate 2 | | | | | | | | octet o15+15\*  octet o15+20\* |
| ... | | | | | | | | octet o15+21\*  octet (o15+2+6\*n)\* |
| Coordinate n | | | | | | | | octet (o15+3+6\*n)\*  octet (o15+8+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 o27+1  octet o27+3 |
| Longitude | | | | | | | | octet o27+4  octet o27+6 |

Figure 5.4.1.16: Coordinate area

Table 5.4.1.16: Coordinate area

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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

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 list |
| The route selection descriptor list field is coded according to 3GPP TS 24.526 [11] subclause 5.2. Any route selection descriptor component with the route selection descriptor component type identifier other than "SSC mode type", "S-NSSAI type", "DNN type", and "PDU session type" is ignored. The route selection descriptor list field indicates the PDU session parameters to be used for a V2X service identified by a V2X service identifier in the V2X service identifiers field. |
|  |
| 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. |
|  |