**3GPP TSG-CT WG1 Meeting #124-eC1-203117**

**Electronic meeting, 2-10 June 2020 (was C1-202106)**

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| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.588** | **CR** | **0001** | **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:***  | NR PC5 unicast security policy provisioning |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated, Ericsson |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eV2XARC |  | ***Date:*** | 2020-05-18 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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 canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | At SA3#98e, SA3 agreed S3-200507 to TS 33.536 which specifies that for NR PC5 unicast the UE shall be provisioned with the list of V2X services, e.g. PSIDs or ITS-AIDs of the V2X applications, with Geographical Area(s) and their security policy which indicates the following:- Signalling integrity protection: REQUIRED/PREFERRED/OFF- Signalling confidentiality protection: REQUIRED/PREFERRED/OFF- User plane integrity protection: REQUIRED/PREFERRED/OFF- User plane confidentiality protection: REQUIRED/PREFERRED/OFFAt SA3#98bis-e, SA3 further agreed S3-200690 which changed the “OFF” setting to “NOT NEEDED”.TS 24.588 needs to be updated accordingly. |
|  |  |
| ***Summary of change:*** | The security policy was added to the configuration parameters for V2X communication over PC5. |
|  |  |
| ***Consequences if not approved:*** | Provisioning of the security policy for NR PC5 unicast will not be supported. |
|  |  |
| ***Clauses affected:*** | 5.3.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

### 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+1octet k+2 |
| Validity timer | octet k+3octet k+TBD |
| VSITPMRI | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | octet k+TBD+1 |
| Served by E-UTRA or served by NR | octet k+TBD+2octet o1 |
| Not served by E-UTRA and not served by NR | octet o1+1octet o2 |
| V2X service identifier to Tx profiles mapping rules | octet (o2+1)\*octet o3\* |
| Privacy config | octet o3+1octet o4 |
| V2X communication over PC5 in E-UTRA | octet o4+1octet o5 |
| V2X communication over PC5 in NR | octet o5+1octet 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: |
|  |
| 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 absent1 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. |
|  |

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of served by E-UTRA or served by NR contents | octet k+TBD+2octet k+TBD+3 |
| Authorized PLMN and RATs combinations | octet k+TBD+4octet 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+TBD+4octet k+TBD+5 |
| Authorized PLMN and RATs combination 1 | octet (k+TBD+6)\*octet (k+TBD+9)\* |
| Authorized PLMN and RATs combination 2 | octet (k+TBD+10)\*octet (k+TBD+13)\* |
| ... | octet (k+TBD+14)\*octet (k+TBD+1+n\*4)\* |
| Authorized PLMN and RATs combination n | octet (k+TBD+2+n\*4)\*octet (k+TBD+5+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. |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| PLMN ID | octet k+TBD+10octet k+TBD+12 |
| PEIEN | PNIEN | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | octet k+TBD+13 |

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 authorized1 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 authorized1 Authorized |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MCC digit 2 | MCC digit 1 | octet k+TBD+10 |
| MNC digit 3 | MCC digit 3 | octet k+TBD+11 |
| MNC digit 2 | MNC digit 1 | octet k+TBD+12 |

Figure 5.3.1.5: PLMN ID

Table 5.3.1.5: PLMN ID

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| --- |
| 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+1octet o1+2 |
| PEINENN | PNINENN | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | VPNENNI | octet o1+3 |
| Radio parameters per geographical area list | octet o1+4octet 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 authorized1 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 authorized1 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 authorized1 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+4octet 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. |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of radio parameters per geographical area contents | octet o6+1octet o6+2 |
| Geographical area | octet o6+3octet o9 |
| Radio parameters | octet o9+1octet o7-1 |
| MI | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 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 managed1 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+3octet 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. |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Latitude | octet o6+11octet o6+13 |
| Longitude | octet o6+14octet 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+1octet o9+2 |
| Radio parameters contents | octet o9+3octet o7-1 |

Figure 5.3.1.11: Radio parameters

Table 5.3.1.11: Radio parameters

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| --- |
| 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+1octet 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. |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifier to Tx profiles mapping rule contents | octet o10+1octet o10+2 |
| V2X service identifiers | octet o10+3octet o79 |
| Tx profile | octet o79octet (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.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service identifiers contents | octet o10+3octet 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

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| --- |
| 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]. |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of privacy config contents | octet o3+1octet o3+2 |
| V2X services requiring privacy | octet o3+3octet o4-2 |
| Privacy timer | octet o4-1octet 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. |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X services requiring privacy contents | octet o3+3octet 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

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| --- |
| 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. |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X service requiring privacy contents | octet o12+1octet o12+2 |
| V2X service identifiers | octet o12+3octet o15 |
| Geographical areas | octet o15+1octet 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. |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of geographical areas contents | octet o15+1octet 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. |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of V2X communication over PC5 in E-UTRA contents | octet o4+1octet o4+2 |
| DDL2II | VSIEFMRI | VSAPI | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | octet o4+3 |
| V2X service identifier to destination layer-2 ID mapping rules | octet o4+4octet o26 |
| PPPP to PDB mapping rules | octet o26+1octet 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 absent1 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 absent1 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 absent1 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+4octet 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+1octet o19+2 |
| V2X service identifiers | octet o19+3octet o22 |
| Destination layer-2 ID | octet o22+1octet (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+1octet 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 |  |
| 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | PPPP | octet o26+6 |
| PDB | octet o26+7octet 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 10 0 1 PPPP value 20 1 0 PPPP value 30 1 1 PPPP value 41 0 0 PPPP value 51 0 1 PPPP value 61 1 0 PPPP value 71 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+1octet 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+1octet o33+2 |
| V2X service identifiers | octet o33+3octet o39 |
| V2X E-UTRA frequencies with geographical areas list | octet o39+1octet 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+1octet 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+1octet o40+2 |
| V2X E-UTRA frequencies | octet o40+3octet o43 |
| Geographical areas | octet o43+1octet 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+3octet 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+1octet 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+1octet o36+2 |
| V2X service identifiers | octet o36+3octet o37-1 |
| 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 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 10 0 1 PPPR value 20 1 0 PPPR value 30 1 1 PPPR value 41 0 0 PPPR value 51 0 1 PPPR value 61 1 0 PPPR value 71 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+1octet o5+2 |
| DDL2IBI | VSINFMRI | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 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+1octet o46 |
| V2X service identifier to destination layer-2 ID for groupcast mapping rules | octet o46+1octet o47 |
| V2X service identifier to destination layer-2 ID for unicast initial signalling mapping rules | octet o47+1octet o48 |
| PC5 QoS mapping rules | octet o48+1octet o49 |
| SLRB mapping rules | octet o49+1octet o50 |
| Default destination layer-2 ID for broadcast | octet (o50+1)\*octet (o50+3)\* |
| NR-PC5 unicast security policies | octet o50+4octet oTBD1 = 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 absent1 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 absent1 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. |
|  |
| NR-PC5 unicast security policies:The NR-PC5 unicast security policies field is coded according to figure 5.3.1.aa and table 5.3.1.aa. |
|  |
| 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+4octet 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+1octet o51+2 |
| V2X service identifiers | octet o51+3octet o54 |
| V2X NR frequencies with geographical areas list | octet o54+1octet 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+1octet 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+1octet o55+2 |
| V2X NR frequencies | octet o55+3octet o58 |
| Geographical areas | octet o58+1octet 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+3octet 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+1octet 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+1octet o59+2 |
| V2X service identifiers | octet o59+3octet o62 |
| Destination layer-2 ID for broadcast | octet o62+1octet (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+1octet 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+1octet o63+2 |
| V2X service identifiers | octet o63+3octet o80 |
| Destination layer-2 ID for groupcast | octet o80+1octet (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+1octet 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+1octet o66+2 |
| V2X service identifiers | octet o66+3octet o81 |
| Destination layer-2 ID for unicast initial signalling | octet o81+1octet (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+1octet 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+1octet o70+2 |
| PC5 QoS mapping rule inputs | octet o70+3octet o73 |
| PC5 QoS mapping rule outputs | octet o73+1octet 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+3octet o70+4 |
| VARVSI | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | octet o70+5 |
| V2X service identifiers | octet o70+6octet o74 |
| Length of V2X application requirements for V2X service | octet o74+1octet o74+2 |
| V2X application requirements for V2X service | octet o74+3octet 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 absent1 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+1octet o73+2 |
| GFBRI | MFBRI | PLAMBRI | RI | 0Spare | 0Spare | 0Spare | 0Spare | 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 absent1 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 absent1 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 absent1 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 absent1 Range field is present |
|  |
| PQI:Bits**8 7 6 5 4 3 2 1**0 0 0 0 0 0 0 0 Reserved0 0 0 0 0 0 0 1 to Spare0 0 0 1 0 1 0 00 0 0 1 0 1 0 1 PQI 210 0 0 1 0 1 1 0 PQI 220 0 0 1 0 1 1 1 PQI 230 0 0 1 1 0 0 0 to Spare0 0 1 1 0 1 1 00 0 1 1 0 1 1 1 PQI 550 0 1 1 1 0 0 0 PQI 560 0 1 1 1 0 0 1 PQI 570 0 1 1 1 0 1 0 PQI 580 0 1 1 1 0 1 1 PQI 590 0 1 1 1 1 0 0 to Spare0 1 0 1 1 0 0 10 1 0 1 1 0 1 0 PQI 900 1 0 1 1 0 1 1 PQI 910 1 0 1 1 1 0 0 to Spare0 1 1 1 1 1 1 11 0 0 0 0 0 0 0 to Operator-specific PQIs1 1 1 1 1 1 1 01 1 1 1 1 1 1 1 ReservedIf 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 used0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther 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 used0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther 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 used0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther 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+1octet 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+1octet o75+2 |
| PC5 QoS profile | octet o75+3octet o78 |
| SLRB | octet o78+1octet 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+3octet o75+4 |
| GFBRI | MFBRI | PLAMBRI | RI | PLOI | AWI | MDBVI | 0Spare | 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)\* |
| 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | 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 absent1 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 absent1 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 absent1 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 absent1 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 absent1 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 absent1 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 absent1 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 Reserved0 0 0 0 0 0 0 1 to Spare0 0 0 1 0 1 0 00 0 0 1 0 1 0 1 PQI 210 0 0 1 0 1 1 0 PQI 220 0 0 1 0 1 1 1 PQI 230 0 0 1 1 0 0 0 to Spare0 0 1 1 0 1 1 00 0 1 1 0 1 1 1 PQI 550 0 1 1 1 0 0 0 PQI 560 0 1 1 1 0 0 1 PQI 570 0 1 1 1 0 1 0 PQI 580 0 1 1 1 0 1 1 PQI 590 0 1 1 1 1 0 0 to Spare0 1 0 1 1 0 0 10 1 0 1 1 0 1 0 PQI 900 1 0 1 1 0 1 1 PQI 910 1 0 1 1 1 0 0 to Spare0 1 1 1 1 1 1 11 0 0 0 0 0 0 0 to Operator-specific PQIs1 1 1 1 1 1 1 01 1 1 1 1 1 1 1 ReservedIf 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 used0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther 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 used0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther 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 used0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther 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 10 0 1 PPPP value 20 1 0 PPPP value 30 1 1 PPPP value 41 0 0 PPPP value 51 0 1 PPPP value 61 1 0 PPPP value 71 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. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of NR-PC5 unicast security policies contents | octet o50+4octet o50+5 |
| NR-PC5 unicast security policy 1 | octet (o50+6)\*octet oTBD2\* |
| NR-PC5 unicast security policy 2 | octet (oTBD2+1)\*octet oTBD3\* |
| ... | octet (oTBD3+1)\*octet oTBD4\* |
| NR-PC5 unicast security policy n | octet (oTBD4+1)\*octet TBD1\* |

Figure 5.3.1.aa: NR-PC5 unicast security policies

Table 5.3.1.aa: NR-PC5 unicast security policies

|  |
| --- |
| NR-PC5 unicast security policy:The NR-PC5 unicast security policy field is coded according to figure 5.3.1.bb and table 5.3.1.bb. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of NR-PC5 unicast security policy contents | octet oTBD2+1octet oTBD2+2 |
| V2X service identifiers | octet oTBD2+3octet oTBD5 |
| Security policy | octet oTBD5+1octet oTBD5+2 |
| Geographical areas | octet oTBD5+3octet oTBD3 |

Figure 5.3.1.bb: NR-PC5 unicast security policy

Table 5.3.1.bb: NR-PC5 unicast security policy

|  |
| --- |
| V2X service identifiers:The V2X service identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Security policy: |
| The security policy field is coded according to figure 5.3.1.cc and table 5.3.1.cc |
|  |
| 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 NR-PC5 unicast security policy contents field indicates a length bigger than indicated in figure 5.3.1.bb, the receiving entity shall ignore any superfluous octets located at the end of the NR-PC5 unicast security policy contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0spare | Signalling ciphering policy | 0spare | Signalling integrity protection policy | octet oTBD5+1 |
| 0spare | User plane ciphering policy | 0spare | User plane integrity protection policy | octet oTBD5+2 |

**Figure** **5.3.1.cc: Security policy**

**Table** **5.3.1.cc: Security policy**

|  |
| --- |
| Signalling integrity protection policy (octet oTBD5+1, bit 1 to 3): |
| Bits |
| **3** | **2** | **1** |  |  |
| 0 | 0 | 0 |  | Signalling integrity protection not needed |
| 0 | 0 | 1 |  | Signalling integrity protection preferred |
| 0 | 1 | 0 |  | Signalling integrity protection required |
| 0 | 1 | 1 |  |  |
|  to Spare |
| 1 | 1 | 0 |  |  |
| 1 | 1 | 1 |  | Reserved |
|  |
| If the UE receives a signalling integrity protection policy value that the UE does not understand, the UE shall interpret the value as 010 "Signalling integrity protection required". Signaling ciphering policy (octet oTBD5+1, bit 5 to 7): |
| Bits |
| **7** | **6** | **5** |  |  |
| 0 | 0 | 0 |  | Signalling ciphering not needed |
| 0 | 0 | 1 |  | Signalling ciphering preferred |
| 0 | 1 | 0 |  | Signalling ciphering required |
| 0 | 1 | 1 |  |  |
|  to Spare |
| 1 | 1 | 0 |  |  |
| 1 | 1 | 1 |  | Reserved |
|  |
| If the UE receives a signalling ciphering policy value that the UE does not understand, the UE shall interpret the value as 010 "Signalling ciphering required".Bit 4 and 8 of octet oTBD5+1 are spare and shall be coded as zero. |
|  |
| User plane integrity protection policy (octet oTBD5+2, bit 1 to 3): |
| Bits |
| **3** | **2** | **1** |  |  |
| 0 | 0 | 0 |  | User plane integrity protection not needed |
| 0 | 0 | 1 |  | User plane integrity protection preferred |
| 0 | 1 | 0 |  | User plane integrity protection required |
| 0 | 1 | 1 |  |  |
|  to Spare |
| 1 | 1 | 0 |  |  |
| 1 | 1 | 1 |  | Reserved |
|  |
| If the UE receives a user plane integrity protection policy value that the UE does not understand, the UE shall interpret the value as 010 "User plane integrity protection required".User plane ciphering policy (octet oTBD5+2, bit 5 to 7): |
| Bits |
| **7** | **6** | **5** |  |  |
| 0 | 0 | 0 |  | User plane ciphering not needed |
| 0 | 0 | 1 |  | User plane ciphering preferred |
| 0 | 1 | 0 |  | User plane ciphering required |
| 0 | 1 | 1 |  |  |
|  to Spare |
| 1 | 1 | 0 |  |  |
| 1 | 1 | 1 |  | Reserved |
|  |
| If the UE receives a user plane ciphering policy value that the UE does not understand, the UE shall interpret the value as 010 "User plane ciphering required".Bit 4 and 8 of octet oTBD5+2 are spare and shall be coded as zero. |
|  |

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