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| Technical Specification | |
| 3rd Generation Partnership Project;  Technical Specification Group Core Network and Terminals;  Proximity-services (ProSe) in 5G System (5GS);  User Equipment (UE) policies;  Stage 3  (Release 17) | |
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| ***3GPP***  Postal address  3GPP support office address  650 Route des Lucioles - Sophia Antipolis  Valbonne - FRANCE  Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16  Internet  http://www.3gpp.org |
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# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

# 1 Scope

The present document defines User Equipment (UE) policies that are used to configure the UE for Proximity-based Services (ProSe) in 5G System (5GS) based on the architectural requirements defined in 3GPP TS 23.304 [2].

The protocol aspects for 5G ProSe are described in 3GPP TS 24.554 [3].

# 2 References

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

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

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

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

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

[2] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS); Stage 2".

[3] 3GPP TS 24.554: " Proximity-services (ProSe) in 5G System (5GS) protocol aspects; Stage 3".

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

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

[6] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[7] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[8] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone".

[9] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone".

# 3 Definitions of terms, symbols and abbreviations

## 3.1 Terms

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

## 3.2 Abbreviations

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

5G ProSe 5G Proximity-based Services

ProseP 5G ProSe Policy

# 4 Descriptions of UE policies for 5G ProSe

## 4.1 Overview

The ProSe policy in 5GS includes:

a) UE policies for 5G ProSe direct discovery (see clause 4.2);

b) UE policies for 5G ProSe direct communications (see clause 4.3); and

c) UE policies for 5G ProSe UE-to-network relay (see clause 4.4).

The ProSe policy can be delivered from the PCF to the UE. The UE policy delivery procedure is specified in 3GPP TS 24.501 [4].

## 4.2 UE policies for 5G ProSe direct discovery

The UE policies for 5G ProSe direct discovery are defined in clause 5.2.3 of 3GPP TS 24.554 [3]. The generic description of the UE policies for 5G ProSe direct discovery are specified in 3GPP TS 23.304 [2].

## 4.3 UE policies for 5G ProSe direct communications

The UE policies for 5G ProSe direct communications are defined in clause 5.2.4 of 3GPP TS 24.554 [3]. The generic description of the UE policies for 5G ProSe direct communications are specified in 3GPP TS 23.304 [2].

## 4.4 UE policies for 5G ProSe UE-to-network relay

# 5 Encoding of UE policies for 5G ProSe

## 5.1 Overview

The UE policies for 5G ProSe are provided to the UE in a 5G ProSe policy (ProseP) UE policy part using the UE policy delivery service as specified in 3GPP TS 24.501 [4] annex D.

## 5.2 Encoding of 5G ProSe policy UE policy part

The purpose of the ProseP is to indicate UE policies for 5G ProSe direct discovery, 5G ProSe direct communications, 5G ProSe UE-to-network relay, UE policies for 5G ProSe usage reporting configuration and rules and UE policies for 5G ProSe service path selection.

The ProseP is encoded as shown in figures 5.2.1 to 5.2.3 and table 5.2.1 according to the UE policy part top level format (see annex D of 3GPP TS 24.501 [4]).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| UE policy part contents length | | | | | | | | octet 1  octet 2 |
| 0 | 0 | 0 | 0 | UE policy part type={ProseP} | | | | octet 3 |
| Spare | | | |
| UE policy part contents={ProseP contents} | | | | | | | | octet 4  octet x |

Figure 5.2.1: UE policy part when UE policy part type = {ProseP}

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| ProseP info #1 | | | | | | | | octet 4  octet a |
| ProseP info #2 | | | | | | | | octet (a+1)\*  octet b\* |
| … | | | | | | | | octet (b+1)\*  octet w\* |
| ProseP info #n | | | | | | | | octet (w+1)\*  octet x\* |

Figure 5.2.2: ProseP contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | ProseP info type | | | | octet k |
| Spare | | | |
| Length of ProseP info contents | | | | | | | | octet k+1  octet k+2 |
| ProseP info contents | | | | | | | | octet k+3  octet l |

Figure 5.2.3: ProseP info

Table 5.2.1: ProseP information format

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| UE policy part type field is set to '0100' (=ProseP) as specified in 3GPP TS 24.501 [4] annex D. | | | | |
|  | | | | |
| UE policy part contents length field indicate the length of the ProseP contents in octets. | | | | |
| ProseP contents (octets 4 to x) | | | | |
|  | | | | |
| ProseP contents consist of 1 or more ProseP info(s) (see figure 5.2.2). | | | | |
|  | | | | |
| ProseP info type (bit 1 to 4 of octet k) shall be set according to the following: | | | | |
| Bits | | | | |
| 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 1 | UE policies for 5G ProSe direct discovery |
| 0 | 0 | 1 | 0 | UE policies for 5G ProSe direct communications |
| 0 | 0 | 1 | 1 | UE policies for 5G ProSe UE-to-network relay |
| 0 | 1 | 0 | 0 | UE policies for 5G ProSe usage reporting configuration and rules |
| 0 | 1 | 0 | 1 | UE policies for 5G ProSe service path selection |
| All other values are reserved. | | | | |
|  | | | | |
| Bits 8 to 5 of octet k are spare and shall be encoded as zero. | | | | |
|  | | | | |
| Length of ProseP info contents (octets k+1 to k+2) indicates the length of the ProseP info contents field. | | | | |
|  | | | | |
| ProseP info contents (octets k+3 to l) can be UE policies for 5G ProSe direct discovery (see clause 5.3), UE policies for 5G ProSe direct communications (see clause 5.4), UE policies for 5G ProSe UE-to-network relay (see clause 5.5), UE policies for 5G ProSe usage reporting configuration and rules (clause 5.6) or UE policies for 5G ProSe service path selection (see clause 5.7). | | | | |
|  | | | | |

## 5.3 Encoding of UE policies for 5G ProSe direct discovery

### 5.3.1 General

The UE policies for 5G ProSe direct discovery are coded as shown in figures 5.3.1.1 and table 5.3.1.1.

### 5.3.2 Information elements coding

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | ProseP info type = {UE policies for 5G ProSe direct discovery} | | | | octet k |
| Spare | | | |
| Length of ProseP info contents | | | | | | | | octet k+1  octet k+2 |
| Validity timer | | | | | | | | octet k+3  octet k+7 |
| Served by NG-RAN | | | | | | | | octet k+8  octet o1 |
| Not served by NG-RAN | | | | | | | | octet o1+1  octet o2 |
| ProSe direct discovery UE ID | | | | | | | | octet o2+1  octet o2+3 |
| Group member discovery parameters | | | | | | | | octet o2+4  octet o3 |
| ProSe application identifiers | | | | | | | | octet o3+1  octet o4 |
| ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rules | | | | | | | | octet o4+1  octet o5 |
| Security parameters used for direct discovery | | | | | | | | octet o5+1  octet l |

Figure 5.3.1.1: ProseP Info = {UE policies for 5G ProSe direct discovery}

Editor's note: How to define the security parameters used for direct discovery depends on SA3 final requirements.

Table 5.3.1.1: ProseP Info = {UE policies for 5G ProSe direct discovery}

|  |
| --- |
| ProseP info type (bit 1 to 4 of octet k) shall be set to "0001" (UE policies for 5G ProSe direct discovery) |
|  |
| Length of Length of ProseP info contents (octets k+1 to k+2) indicates the length of ProseP info contents. |
|  |
|  |
| Validity timer (octet k+3 to k+7):  The validity timer field provides the expiration time of validity of the UE policies for 5G ProSe direct discovery. The validity timer field is a binary coded representation of a UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds). |
|  |
| Served by NG-RAN (octet k+8 to o1):  The served by NG-RAN field is coded according to figure 5.3.1.2 and table 5.3.1.2, and contains configuration parameters for 5G ProSe direct discovery when the UE is served by NG-RAN. |
|  |
| Not served by NG-RAN (octet o1+1 to o2):  The not served by NG-RAN field is coded according to figure 5.3.1.6 and table 5.3.1.6, and contains configuration parameters for 5G ProSe direct discovery when the UE is not served by NG-RAN. |
|  |
| ProSe Direct Discovery UE ID (octet o2+1 to o2+3):  The ProSe Direct Discovery UE ID is a 24-bit long bit string. |
|  |
| Group member discovery parameters (octet o2+4 to o3):  The group member discovery parameters field is coded according to figure 5.3.1.12 and table 5.3.1.12 and contains group member discovery parameters. |
|  |
| ProSe application identifiers (octet o3+1 to o4):  The ProSe application identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14 and contains ProSe application identifiers. |
|  |
| ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rules (octet o4+1 to o5):  The ProSe application identifiers to default destination Layer-2 ID for initial discovery signalling mapping rules field is coded according to figure 5.3.1.15 and table 5.3.1.15 and contains ProSe application identifiers to default destination Layer-2 ID for initial discovery signalling mapping rules. |
|  |
| Security parameters used for direct discovery (octet o5+1 to l):  The security parameters used for direct discovery field is coded according to figure 5.3.1.x and table 5.3.1.x and contains Security parameters used for direct discovery. |
|  |
| If the length of ProseP info contents field is bigger than indicated in figure 5.3.1.1, receiving entity shall ignore any superfluous octets located at the end of the ProseP info contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of served by NG-RAN contents | | | | | | | | octet k+8  octet k+9 |
| Authorization for direct discovery info 1 | | | | | | | | octet k+10  octet o50 |
| Authorization for direct discovery info 2 | | | | | | | | octet o50+1  octet o51 |
| … | | | | | | | | octet o51+1  octet o52 |
| Authorization for direct discovery info n | | | | | | | | octet o52+1  octet o1 |

Figure 5.3.1.2: Served by NG-RAN

Table 5.3.1.2: Served by NG-RAN

|  |
| --- |
| Authorization for direct discovery info:  The authorization for direct discovery info field is coded according to figure 5.3.1.3 and table 5.3.1.3. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of authorization for direct discovery info contents | | | | | | | | octet o50+1  octet o50+2 |
| 0  spare | 0  spare | 0  spare | 0  spare | 0  spare | Role | Model | DDT | octet o50+3 |
| Authorized PLMN info | | | | | | | | octet o50+4  octet o51 |

Figure 5.3.1.3: Authorization for direct discovery info

Table 5.3.1.3: Authorization for direct discovery info

|  |
| --- |
| Direct discovery type (DDT) (octet o50+3 bit 1):  Bit  **1**  0 Open  1 Restricted |
|  |
| Model (octet o50+3 bit 2):  Bit  **2**  0 A  1 B |
|  |
| If Model bit is set to "A",  Role (octet o50+3 bit 3):  Bit  **3**  0 Announcing  1 Monitoring |
|  |
| If Model bit is set to "B",  Role (octet o50+3 bit 3):  Bit  **3**  0 Discoverer  1 Discoveree |
|  |
| Authorized PLMN info (octet o50+4 to o51):  The authorized PLMN info field is coded according to figure 5.3.1.4 and table 5.3.1.4, or figure 5.3.1.4B and table 5.3.1.4B. |
| If the length of authorization for direct discovery info field is bigger than indicated in figure 5.3.1.3, receiving entity shall ignore any superfluous octets located at the end of the authorization for direct discovery info. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of authorized PLMN info contents | | | | | | | | octet o50+4  octet o50+5 |
| Authorized PLMN and range 1 | | | | | | | | octet (o50+6)\*  octet (o50+9)\* |
| Authorized PLMN and range 2 | | | | | | | | octet (o50+10)\*  octet (o50+13)\* |
| ... | | | | | | | | octet (o50+14)\*  octet o150\* |
| Authorized PLMN and range n | | | | | | | | octet (o150+1)\*  octet o51\* |

Figure 5.3.1.4: Authorized PLMN info when the Role bit is not "monitoring"

Table 5.3.1.4: Authorized PLMN info when the Role bit is not "monitoring"

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| PLMN ID | | | | | | | | octet o50+6  octet o50+8 |
| Range | | | | | | | | octet o50+9 |

Figure 5.3.1.4A: Authorized PLMN and range

Table 5.3.1.4A: Authorized PLMN and range

|  |
| --- |
| PLMN ID:  The PLMN ID field is coded according to figure 5.3.1.5 and table 5.3.1.5. |
|  |
| Range:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 1 Short  0 0 0 0 0 0 1 0 Medium  0 0 0 0 0 0 1 1 Long  The other values are reserved. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of authorized PLMN info contents | | | | | | | | octet o50+4  octet o50+5 |
| Authorized PLMN 1 | | | | | | | | octet (o50+6)\*  octet (o50+8)\* |
| Authorized PLMN 2 | | | | | | | | octet (o50+9)\*  octet (o50+11)\* |
| ... | | | | | | | | octet (o50+12)\*  octet o150\* |
| Authorized PLMN n | | | | | | | | octet (o150+1)\*  octet o51\* |

Figure 5.3.1.4B: Authorized PLMN info when the Role bit is "monitoring"

Table 5.3.1.4B: Authorized PLMN

|  |
| --- |
| Authorized PLMN:  The authorized PLMN field is coded according to figure 5.3.1.5 and table 5.3.1.5. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MCC digit 2 | | | | MCC digit 1 | | | | octet o50+6 |
| MNC digit 3 | | | | MCC digit 3 | | | | octet o50+7 |
| MNC digit 2 | | | | MNC digit 1 | | | | octet o50+8 |

Figure 5.3.1.5: PLMN ID

Table 5.3.1.5: PLMN ID

|  |
| --- |
| Mobile country code (MCC) (octet o50+5, octet o50+6 bit 1 to 4):  The MCC field is coded as in ITU-T Recommendation E.212 [5], annex A. |
|  |
| Mobile network code (MNC) (octet o50+6 bit 5 to 8, octet o50+7):  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 NG-RAN contents | | | | | | | | octet o1+1  octet o1+2 |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | PDNNI | octet o1+3 |
| NR radio parameters per geographical area list | | | | | | | | octet (o1+4)\*  octet o2\* |

Figure 5.3.1.6: Not served by NG-RAN

Table 5.3.1.6: Not served by NG-RAN

|  |
| --- |
| 5G ProSe direct discovery when not served by NG-RAN indicator (PDNNI) (octet o1+3 bit 1):  The PDNNI bit indicates whether the UE is authorized to perform 5G ProSe direct discovery when not served by NG-RAN.  Bit  **1**  0 Not authorized  1 Authorized |
|  |
| NR radio parameters per geographical area list (octet o1+4 to o2):  If PNNI bit is set to "Authorized", the NR radio parameters per geographical area list field is present otherwise the NR radio parameters per geographical area list field is absent. It is coded according to figure 5.3.1.7 and table 5.3.1.7. |
| If the length of not served by NG-RAN contents field is 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 NG-RAN 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 (octet o6+3 to o9):  The geographical area field is coded according to figure 5.3.1.9 and table 5.3.1.9. |
|  |
| Radio parameters (octet o9 to o7-1):  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 NG-RAN. |
|  |
| Managed indicator (MI) (octet o7 bit 8):  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 is 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 clause 6.1 of 3GPP TS 23.032 [6]. |
|  |
| Longitude:  The longitude field is coded according to clause 6.1 of 3GPP TS 23.032 [6]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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:  Radio parameters are defined as *SL-PreconfigurationNR* in clause 9.3 of 3GPP TS 38.331 [7]. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of groupcast parameters contents | | | | | | | | | octet o2+4  octet o2+5 | |
| Application layer group info 1 | | | | | | | | | octet (o2+6)\*  octet (o51)\* | |
| Application layer group info 2 | | | | | | | | | octet (o51+1)\*  octet (o52)\* | |
| … | | | | | | | | | octet (o52+1)\*  octet (o53)\* | |
| Application layer group info n | | | | | | | | | octet (o53+1)\*  octet o3 | |

Figure 5.3.1.12: Groupcast parameters

Table 5.3.1.12: Groupcast parameters

|  |
| --- |
| Application layer group info:  The application layer group info 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 application layer group info contents | | | | | | | | | octet o51+1  octet o51+2 | |
| Application layer group identifier | | | | | | | | | octet o51+3  octet o151 | |
| ProSe Layer-2 group identifier | | | | | | | | | octet o151+1  octet o151+3 | |
| User info ID | | | | | | | | | octet o151+4  octet o151+9 | |
| Discovery group ID | | | | | | | | | octet o151+10  octet o52 | |

Figure 5.3.1.13: Application layer group info

Table 5.3.1.13: Application layer group info

|  |
| --- |
| Application layer group identifier (octet o51+3 to o151):  The first octet of application layer group identifier field is the length of application group identifier. The value of application group identifier field is a bit string. The format of application group identifier parameter is out of scope of this specification. |
| ProSe Layer-2 group identifier (octet o151+1 to o151+3) |
| The ProSe Layer-2 group identifier field is a binary coded layer-2 identifier. |
|  |
| User info ID (octet o151+4 to o151+9) |
| The value of the User Info ID parameter is a 48-bit long bit string. The format of the User Info ID parameter is out of scope of this specification. |
|  |
| Discovery group ID (octet o151+10 to o52):  The value of the discovery group ID parameter is a 24-bit long bit string. The format of the discovery group ID parameter is out of scope of this specification. |
| If the length of application layer group info contents field is bigger than indicated in figure 5.3.1.13, receiving entity shall ignore any superfluous octets located at the end of the application layer group info contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of ProSe application identifiers contents | | | | | | | | octet o3+1  octet o3+2 |
| ProSe application identifier 1 | | | | | | | | octet (o3+3)\*  octet (o3+6)\* |
| ProSe application identifier 2 | | | | | | | | octet (o3+7)\*  octet (o3+10)\* |
| ... | | | | | | | | octet (o3+11)\*  octet (o3+n\*4)\* |
| ProSe application identifier n | | | | | | | | octet (o3-1+n\*4)\*  octet (o3+2+n\*4)\*  = octet o4\* |

Figure 5.3.1.14: ProSe application identifiers

Table 5.3.1.14: ProSe application identifiers

|  |
| --- |
| ProSe application identifier: |

Editor's note: It is FFS on how to define the ProSe application identifier.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rules contents | | | | | | | | | octet o4+1  octet o4+2 | |
| ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule 1 | | | | | | | | | octet (o4+3)\*  octet o54\* | |
| ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule 2 | | | | | | | | | octet (o54+1)\*  octet o55\* | |
| ... | | | | | | | | | octet (o55+1)\*  octet o56\* | |
| ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule n | | | | | | | | | octet (o56+1)\*  octet o46\* | |

Figure 5.3.1.15: ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rules

Table 5.3.1.15: ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rules

|  |
| --- |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rule:  The ProSe application identifier to destination Layer-2 ID for broadcast mapping rule field is coded according to figure 5.3.1.16 and table 5.3.1.16. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule contents | | | | | | | | | octet o54+1  octet o54+2 | |
| ProSe application identifiers | | | | | | | | | octet o54+3  octet o154 | |
| Destination Layer-2 ID for initial discovery signalling | | | | | | | | | octet o154+1  octet (o154+3)  = octet o55 | |

Figure 5.3.1.16: ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule

Table 5.3.1.16: ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule

|  |
| --- |
| ProSe application identifiers (octet o54+3 to o154):  The ProSe application identifiers field is coded according to figure 5.3.1.14 and table 5.3.1.14. |
|  |
| Destination Layer-2 ID for initial discovery signalling (octet o154+1 to o55):  The destination Layer-2 ID for initial discovery signalling field is a binary coded layer-2 identifier. |
|  |
| If the length of ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule contents field is bigger than indicated in figure 5.3.1.16, receiving entity shall ignore any superfluous octets located at the end of the ProSe application identifier to default destination Layer-2 ID for initial discovery signalling mapping rule contents. |
|  |

## 5.4 Encoding of UE policies for 5G ProSe direct communications

### 5.4.1 General

The UE policies for 5G ProSe direct communication are coded as shown in figures 5.4.1.1 and table 5.4.1.1.

### 5.4.2 Information elements coding

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | ProseP info type = {UE policies for 5G ProSe direct communication} | | | | octet k |
| Spare | | | |
| Length of ProseP info contents | | | | | | | | octet k+1  octet k+2 |
| Validity timer | | | | | | | | octet k+3  octet k+7 |
| Served by NG-RAN | | | | | | | | octet k+8  octet o1 |
| Not served by NG-RAN | | | | | | | | octet o1+1  octet o2 |
| Privacy config | | | | | | | | octet o2+1  octet o4 |
| 5G ProSe direct communication in NR-PC5 | | | | | | | | octet o4+1  octet o5 |
| ProSe application to path preference mapping rules | | | | | | | | octet o5+1  octet l |

Figure 5.4.1.1: ProseP Info = {UE policies for 5G ProSe direct communication}

Table 5.4.1.1: ProseP Info = {UE policies for 5G ProSe direct communication}

|  |
| --- |
| ProseP info type (bit 1 to 4 of octet k) shall be set to "0010" (UE policies for 5G ProSe direct communication) |
|  |
| Length of Length of ProseP info contents (octets k+1 to k+2) indicates the length of ProseP info contents. |
|  |
|  |
| Validity timer (octet k+3 to k+7):  The validity timer field provides the expiration time of validity of the UE policies for 5G ProSe direct communication. The validity timer field is a binary coded representation of a UTC time, in seconds since midnight UTC of January 1, 1970 (not counting leap seconds). |
|  |
| Served by NG-RAN (octet k+8 to o1):  The served by NG-RAN field is coded according to figure 5.4.1.2 and table 5.4.1.2, and contains configuration parameters for 5G ProSe direct communication when the UE is served by NG-RAN. |
|  |
| Not served by NG-RAN (octet o1+1 to o2):  The not served by NG-RAN field is coded according to figure 5.4.1.5 and table 5.4.1.5, and contains configuration parameters for 5G ProSe direct communication when the UE is not served by NG-RAN. |
|  |
| Privacy config (octet o2+1 to o4):  The privacy config field is coded according to figure 5.4.1.11 and table 5.4.1.11, and contains configuration parameters for privacy configuration. |
|  |
| 5G ProSe direct communication in NR-PC5 (octet o4+1 to o5):  The 5G ProSe direct communication in NR-PC5 field is coded according to figure 5.4.1.15 and table 5.4.1.15, and contains configuration parameters for 5G ProSe direct communication in NR-PC5. |
|  |
| ProSe application to path preference mapping rules (octet o5+1 to l):  The ProSe application to path preference mapping rules field is coded according to figure 5.4.1.38 and table 5.4.1.38, and contains configuration parameters for ProSe application to path preference mapping rules. |
|  |
| If the length of ProseP info contents field is bigger than indicated in figure 5.4.1.1, receiving entity shall ignore any superfluous octets located at the end of the ProseP info contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of served by NG-RAN contents | | | | | | | | octet k+8  octet k+9 |
| Authorized PLMN | | | | | | | | octet k+10  octet o1 |

Figure 5.4.1.2: Served by NG-RAN

Table 5.4.1.2: Served by NG-RAN

|  |
| --- |
| Authorized PLMN (octet k+10 to o1):  The authorized PLMN field is coded according to figure 5.4.1.3 and table 5.4.1.3. |
|  |
| If the length of served by NG-RAN contents field is bigger than indicated in figure 5.4.1.2, receiving entity shall ignore any superfluous octets located at the end of the served by NG-RAN contents. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of authorized PLMN contents | | | | | | | | octet k+10  octet k+11 |
| PLMN ID 1 | | | | | | | | octet (k+12)\*  octet (k+14)\* |
| PLMN ID 2 | | | | | | | | octet (k+15)\*  octet (k+17)\* |
| ... | | | | | | | | octet (k+18)\*  octet (k+8+n\*3)\* |
| PLMN ID n | | | | | | | | octet (k+9+n\*3)\*  octet (k+11+n\*3)\* = octet o1\* |

Figure 5.4.1.3: Authorized PLMN

Table 5.4.1.3: Authorized PLMN

|  |
| --- |
| PLMN ID:  The PLMN ID field is coded according to figure 5.4.1.4 and table 5.4.1.4. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MCC digit 2 | | | | MCC digit 1 | | | | octet k+15 |
| MNC digit 3 | | | | MCC digit 3 | | | | octet k+16 |
| MNC digit 2 | | | | MNC digit 1 | | | | octet k+17 |

Figure 5.4.1.4: PLMN ID

Table 5.4.1.4: PLMN ID

|  |
| --- |
| Mobile country code (MCC) (octet k+15, octet k+16 bit 1 to 4):  The MCC field is coded as in ITU-T Recommendation E.212 [5], annex A. |
|  |
| Mobile network code (MNC) (octet k+16 bit 5 to 8, octet k+17):  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 NG-RAN contents | | | | | | | | octet o1+1  octet o1+2 |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | PNNI | octet o1+3 |
| NR radio parameters per geographical area list | | | | | | | | octet (o1+4)\*  octet o2\* |

Figure 5.4.1.5: Not served by NG-RAN

Table 5.4.1.5: Not served by NG-RAN

|  |
| --- |
| 5G ProSe direct communication when not served by NG-RAN indicator (PNNI) (octet o1+3 bit 1):  The PNNI bit indicates whether the UE is authorized to use 5G ProSe direct communication when not served by NG-RAN.  Bit  **1**  0 Not authorized  1 Authorized |
| NR radio parameters per geographical area list (octet o1+4 to o2):  If PNNI bit is set to "Authorized", the NR radio parameters per geographical area list field is present otherwise the NR radio parameters per geographical area list field is absent. It is coded according to figure 5.4.1.6 and table 5.4.1.6. |
| If the length of not served by NG-RAN contents field is bigger than indicated in figure 5.4.1.5, receiving entity shall ignore any superfluous octets located at the end of the not served by NG-RAN 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 5.4.1.6: Radio parameters per geographical area list

Table 5.4.1.6: 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 5.4.1.7 and table 5.4.1.7. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 5.4.1.7: Radio parameters per geographical area info

Table 5.4.1.7: Radio parameters per geographical area info

|  |
| --- |
| Geographical area (octet o6+3 to o9):  The geographical area field is coded according to figure 5.4.1.8 and table 5.4.1.8. |
|  |
| Radio parameters (octet o9 to o7-1):  The radio parameters field is coded according to figure 5.4.1.10 and table 5.4.1.10, applicable in the geographical area indicated by the geographical area field when not served by NG-RAN. |
|  |
| Managed indicator (MI) (octet o7 bit 8):  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 is bigger than indicated in figure 5.4.1.7, 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 5.4.1.8: Geographical area

Table 5.4.1.8: Geographical area

|  |
| --- |
| Coordinate:  The coordinate field is coded according to figure 5.4.1.9 and table 5.4.1.9. |
|  |

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

Figure 5.4.1.9: Coordinate area

Table 5.4.1.9: Coordinate area

|  |
| --- |
| Latitude:  The latitude field is coded according to clause 6.1 of 3GPP TS 23.032 [6]. |
|  |
| Longitude:  The longitude field is coded according to clause 6.1 of 3GPP TS 23.032 [6]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 5.4.1.10: Radio parameters

Table 5.4.1.10: Radio parameters

|  |
| --- |
| Radio parameters contents:  Radio parameters are defined as *SL-PreconfigurationNR* in clause 9.3 of 3GPP TS 38.331 [7]. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of privacy config contents | | | | | | | | octet o2+1  octet o2+2 |
| ProSe applications requiring privacy | | | | | | | | octet o2+3  octet o4-2 |
| Privacy timer | | | | | | | | octet o4-1  octet o4 |

Figure 5.4.1.11: Privacy config

Table 5.4.1.11: Privacy config

|  |
| --- |
| ProSe applications requiring privacy (octet o2+3 to o4-2):  The ProSe applications requiring privacy field is coded according to figure 5.4.1.12 and table 5.4.1.12. |
|  |
| Privacy timer (octet o4-1, octet o4): |
| The privacy timer field contains binary encoded duration, in units of seconds, after which the UE shall change the source Layer-2 ID self-assigned by the UE while performing transmission of 5G ProSe direct communication when privacy is required. |
|  |
| If the length of privacy config contents field is bigger than indicated in figure 5.4.1.11, 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 ProSe applications requiring privacy contents | | | | | | | | octet o2+3  octet o2+4 |
| ProSe application requiring privacy 1 | | | | | | | | octet (o2+5)\*  octet o12\* |
| ProSe application requiring privacy 2 | | | | | | | | octet (o12+1)\*  octet o13\* |
| ... | | | | | | | | octet (o13+1)\*  octet o14\* |
| ProSe application requiring privacy n | | | | | | | | octet (o14+1)\*  octet (o4-2)\* |

Figure 5.4.1.12: ProSe applications requiring privacy

Table 5.4.1.12: ProSe applications requiring privacy

|  |
| --- |
| ProSe application requiring privacy:  The ProSe application requiring privacy field is coded according to figure 5.4.1.13 and table 5.4.1.13. |
|  |

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

Figure 5.4.1.13: ProSe application requiring privacy

Table 5.4.1.13: ProSe application requiring privacy

|  |
| --- |
| ProSe application identifiers (octet o12+3 to o15):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Geographical areas (octet o15+1 to o13):  The geographical areas field is coded according to figure 5.4.1.8 and table 5.4.1.8. |
|  |
| If the length of ProSe applications requiring privacy contents field is bigger than indicated in figure 5.4.1.13, receiving entity shall ignore any superfluous octets located at the end of the ProSe applications requiring privacy contents. |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of ProSe application identifiers contents | | | | | | | | octet o12+3  octet o12+4 |
| ProSe application identifier 1 | | | | | | | | octet (o12+5)\*  octet (o12+8)\* |
| ProSe application identifier 2 | | | | | | | | octet (o12+9)\*  octet (o12+12)\* |
| ... | | | | | | | | octet (o12+13)\*  octet (o12+n\*4)\* |
| ProSe application identifier n | | | | | | | | octet (o12+1+n\*4)\*  octet (o12+4+n\*4)\*  = octet o15\* |

Figure 5.4.1.14: ProSe application identifiers

Table 5.4.1.14: ProSe application identifiers

|  |
| --- |
| ProSe application identifier: |

Editor's note: It is FFS on how to define the ProSe application identifier.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 5.4.1.15: Geographical areas

Table 5.4.1.15: Geographical areas

|  |
| --- |
| Geographical area:  The geographical area 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 5G ProSe direct communication in NR-PC5 contents | | | | | | | | | | | | | | | | octet o4+1  octet o4+2 | |
| DDL2IBI | | PINFMRI | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o4+3 | |
| ProSe application identifier to ProSe NR frequency mapping rules | | | | | | | | | | | | | | | | octet (o4+4)\*  octet o45\* | |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rules | | | | | | | | | | | | | | | | octet o108  (see NOTE)  octet o46 | |
| Groupcast parameters | | | | | | | | | | | | | | | | octet o46+1  octet o47 | |
| ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rules | | | | | | | | | | | | | | | | octet o47+1  octet o48 | |
| ProSe application identifier to PC5 QoS parameters mapping rules | | | | | | | | | | | | | | | | octet o48+1  octet o49 | |
| AS configuration | | | | | | | | | | | | | | | | octet o49+1  octet o50 | |
| Default destination Layer-2 ID for broadcast | | | | | | | | | | | | | | | | octet (o50+1)\*  octet (o50+3)\* | |
| NR-PC5 unicast security policies | | | | | | | | | | | | | | | | octet o93 (see NOTE)  octet o84 | |
| ProSe application identifier to default mode of communication mapping rules | | | | | | | | | | | | | | | | octet (o84+1)  octet o85 = octet l | |

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

Figure 5.4.1.15: 5G ProSe direct communication over PC5 in NR-PC5

Editor's note: NR-PC5 unicast security policies depends on SA3 final requirements.

Table 5.4.1.15: 5G ProSe direct communication over PC5 in NR-PC5

|  |
| --- |
| Default destination Layer-2 ID for broadcast indicator (DDL2IBI) (octet o4+3 bit 8):  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 |
|  |
| ProSe application identifier to ProSe NR frequency mapping rules indicator (PINFMRI) (octet o4+3 bit 7):  The PINFMRI bit indicates presence of the ProSe application identifier to ProSe NR frequency mapping rules field.  Bit  **7**  0 ProSe application identifier to ProSe NR frequency mapping rules field is absent  1 ProSe application identifier to ProSe NR frequency mapping rules field is present |
|  |
| ProSe application identifier to ProSe NR frequency mapping rules (octet o4+4 to o45):  The ProSe application identifier to ProSe NR frequency mapping rules field is coded according to figure 5.4.1.16 and table 5.4.1.16. |
|  |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rules (octet o108 to o46):  The ProSe application identifier to destination Layer-2 ID for broadcast mapping rules field is coded according to figure 5.4.1.21 and table 5.4.1.21. |
|  |
| Groupcast parameters (octet o46+1 to o47):  The Groupcast parameters field is coded according to figure 5.4.1.23 and table 5.4.1.23. |
|  |
| ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rules (octet o47+1 to o48):  The ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rules field is coded according to figure 5.4.1.25 and table 5.4.1.25. |
|  |
| ProSe application identifier to PC5 QoS parameters mapping rules (octet o48+1 to o49):  The ProSe application identifier to PC5 QoS parameters mapping rules field is coded according to figure 5.4.1.27 and table 5.4.1.27. |
|  |
| AS configuration (octet o49+1 to o50):  The AS configuration field is coded according to figure 5.4.1.29 and table 5.4.1.29. |
|  |
| Default destination Layer-2 ID for broadcast (octet o50+1 to o50+3):  The default destination Layer-2 ID for broadcast field is a binary coded layer 2 identifier. |
|  |
| NR-PC5 unicast security policies (octet o93 to o84):  The NR-PC5 unicast security policies field is coded according to figure 5.4.1.33 and table 5.4.1.33. |
| ProSe application identifier to default mode of communication mapping rules (o84+1 to l):  The ProSe application identifier to default mode of communication mapping rules is coded according to figure 5.4.1.36 and table 5.4.1.36. |
| If the length of 5G ProSe direct communication over PC5 in NR-PC5 contents field is bigger than indicated in figure 5.4.1.15, receiving entity shall ignore any superfluous octets located at the end of the 5G ProSe direct communication over PC5 in NR-PC5 contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe application identifier to ProSe NR frequency mapping rules contents | | | | | | | | | octet o4+4  octet o4+5 | |
| ProSe application identifier to ProSe NR frequency mapping rule 1 | | | | | | | | | octet (o4+6)\*  octet o51\* | |
| ProSe application identifier to ProSe NR frequency mapping rule 2 | | | | | | | | | octet (o51+1)\*  octet o52\* | |
| ... | | | | | | | | | octet (o52+1)\*  octet o53\* | |
| ProSe application identifier to ProSe NR frequency mapping rule n | | | | | | | | | octet (o53+1)\*  octet o45\* | |

Figure 5.4.1.16: ProSe application identifier to ProSe NR frequency mapping rules

Table 5.4.1.16: ProSe application identifier to ProSe NR frequency mapping rules

|  |
| --- |
| ProSe application identifier to ProSe NR frequency mapping rule:  The ProSe application identifier to ProSe NR frequency mapping rule is coded according to figure 5.4.1.17 and table 5.4.1.17. |
|  |

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

Figure 5.4.1.17: ProSe application identifier to ProSe NR frequency mapping rule

Table 5.4.1.17: ProSe application identifier to ProSe NR frequency mapping rule

|  |
| --- |
| ProSe application identifiers (octet o51+3 to o54):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| ProSe NR frequencies with geographical areas list (octet o54+1 to o52):  The ProSe NR frequencies with geographical areas list field is coded according to figure 5.4.1.18 and table 5.4.1.18. |
|  |
| If the length of ProSe application identifier to ProSe NR frequency mapping rule contents field is bigger than indicated in figure 5.4.1.17, receiving entity shall ignore any superfluous octets located at the end of the ProSe application identifier to ProSe NR frequency mapping rule contents. |
|  |

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

Figure 5.4.1.18: ProSe NR frequencies with geographical areas list

Table 5.4.1.18: ProSe NR frequencies with geographical areas list

|  |
| --- |
| ProSe NR frequencies with geographical areas info:  The ProSe NR frequencies with geographical areas info field is coded according to figure 5.4.1.19 and table 5.4.1.19. |
|  |

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

Figure 5.4.1.19: ProSe NR frequencies with geographical areas info

Table 5.4.1.19: ProSe NR frequencies with geographical areas info

|  |
| --- |
| ProSe NR frequencies (octet o55+3 to o58):  The ProSe NR frequencies field is coded according to figure 5.4.1.20 and table 5.4.1.20. |
|  |
| Geographical areas (octet o58+1 to o56):  The geographical areas field is coded according to figure 5.4.1.8 and table 5.4.1.8. |
|  |
| If the length of ProSe NR frequencies with geographical areas info contents field is bigger than indicated in figure 5.4.1.19, receiving entity shall ignore any superfluous octets located at the end of the ProSe NR frequencies with geographical areas info contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe NR frequencies contents | | | | | | | | | octet o55+3  octet o55+4 | |
| ProSe NR frequency 1 | | | | | | | | | octet (o55+5)\*  octet (o55+7)\* | |
| ProSe NR frequency 2 | | | | | | | | | octet (o55+8)\*  octet (o55+10)\* | |
| ... | | | | | | | | | octet (o55+11)\*  octet (o55+4+(n-1)\*3)\* | |
| ProSe NR frequency n | | | | | | | | | octet (o55+5+(n-1)\*3)\*  octet (o55+4+n\*3)\* = octet o58\* | |

Figure 5.4.1.20: ProSe NR frequencies

Table 5.4.1.20: ProSe NR frequencies

|  |
| --- |
| ProSe NR frequency:  ProSe NR frequency is coded according to the NR-ARFCN value defined in 3GPP TS 38.101-1 [8] and 3GPP TS 38.101-2 [9]. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe application identifier to destination Layer-2 ID for broadcast mapping rules contents | | | | | | | | | octet o108  octet o108+1 | |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rule 1 | | | | | | | | | octet (o108+2)\*  octet o59\* | |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rule 2 | | | | | | | | | octet (o59+1)\*  octet o60\* | |
| ... | | | | | | | | | octet (o60+1)\*  octet o61\* | |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rule n | | | | | | | | | octet (o61+1)\*  octet o46\* | |

Figure 5.4.1.21: ProSe application identifier to destination Layer-2 ID for broadcast mapping rules

Table 5.4.1.21: ProSe application identifier to destination Layer-2 ID for broadcast mapping rules

|  |
| --- |
| ProSe application identifier to destination Layer-2 ID for broadcast mapping rule:  The ProSe application identifier to destination Layer-2 ID for broadcast mapping rule field is coded according to figure 5.4.1.22 and table 5.4.1.22. |
|  |

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

Figure 5.4.1.22: ProSe application identifier to destination Layer-2 ID for broadcast mapping rule

Table 5.4.1.22: ProSe application identifier to destination Layer-2 ID for broadcast mapping rule

|  |
| --- |
| ProSe application identifiers (octet o59+3 to o62):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Destination Layer-2 ID for broadcast (octet o62+1 to o60):  The destination Layer-2 ID for broadcast field is a binary coded layer-2 identifier. |
|  |
| If the length of ProSe application identifier to destination Layer-2 ID for broadcast mapping rule contents field is bigger than indicated in figure 5.4.1.22, receiving entity shall ignore any superfluous octets located at the end of the ProSe application identifier to destination Layer-2 ID for broadcast mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of groupcast parameters contents | | | | | | | | | octet o46+1  octet o46+2 | |
| Application layer group info 1 | | | | | | | | | octet (o46+3)\*  octet o63\* | |
| Application layer group info 2 | | | | | | | | | octet (o63+1)\*  octet o64\* | |
| … | | | | | | | | | octet (o64+1)\*  octet o65\* | |
| Application layer group info n | | | | | | | | | octet (o65+1)\*  octet 47\* | |

Figure 5.4.1.23: Groupcast parameters

Table 5.4.1.23: Groupcast parameters

|  |
| --- |
| Application layer group info:  The application layer group info field is coded according to figure 5.4.1.24 and table 5.4.1.24. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of application layer group info contents | | | | | | | | | | | | | | | | octet o63+1  octet o63+2 | |
| Application layer group identifier | | | | | | | | | | | | | | | | octet o63+3  octet o163 | |
| IPv4 | | IPv4AI | | IPv6 | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o163+1 | |
| ProSe Layer-2 gorup identifier | | | | | | | | | | | | | | | | octet o163+2  octet o163+4 | |
| ProSe group IP multicast address | | | | | | | | | | | | | | | | octet o163+5  octet o163+8 | |
| IPv4 address | | | | | | | | | | | | | | | | octet (o163+9)\*  octet (o163+10)\* | |
| Group security parameters | | | | | | | | | | | | | | | | octet o164  octet o64 | |

Figure 5.4.1.24: Application layer group info

Table 5.4.1.24: Application layer group info

|  |
| --- |
| Application layer group identifier (octet o63+3 to o163):  The first octet of application layer group identifier field is the length of application group identifier. The value of application group identifier field is a bit string. The format of application group identifier parameter is out of scope of this specification. |
| IPv4 (octet o163+1 bit 8):  Bit  **8**  0 IPv4 is not authorized  1 IPv4 is authorized |
|  |
| IPv4 address indicator (IPv4AI) (octet o163+1 bit 7):  Bit  **7**  0 IPv4 address is absent  1 IPv4 address is present |
|  |
| IPv6 (octet o163+1 bit 6):  Bit  **6**  0 IPv6 is not authorized  1 IPv6 is authorized |
|  |
| ProSe Layer-2 gorup identifier (octet o163+5 to o163+8):  The ProSe Layer-2 gorup identifier field is a binary coded layer-2 identifier. |
|  |
| IPv4 address (octet o163+9 to o163+10): |
| The IPv4 address field contains an IPv4 address as the source address for a specific Group configured to operate using IPv4. |
|  |
| Group security parameters: |

Editor's note: The content of group security parameters is FFS and depends on SA3 requirements.

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

Figure 5.4.1.25: ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rules

Table 5.4.1.25: ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rules

|  |
| --- |
| ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rule:  The ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rule field is coded according to figure 5.4.1.25 and table 5.4.1.25. |
|  |

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

Figure 5.4.1.26: ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rule

Table 5.4.1.26: ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rule

|  |
| --- |
| ProSe application identifiers (octet o66+3 to o81):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Destination Layer-2 ID for unicast initial signalling (octet o81+1 to o67):  The destination Layer-2 ID for unicast initial signalling field is a binary coded layer 2 identifier. |
|  |
| If the length of ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rule contents field is bigger than indicated in figure 5.4.1.26, receiving entity shall ignore any superfluous octets located at the end of the ProSe application identifier to destination Layer-2 ID for unicast initial signalling mapping rule contents. |
|  |

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

Figure 5.4.1.27: ProSe application identifier to PC5 QoS parameters mapping rules

Table 5.4.1.27: ProSe application identifier to PC5 QoS parameters mapping rules

|  |
| --- |
| ProSe application identifier to PC5 QoS parameters mapping rule:  The ProSe application identifier to PC5 QoS parameters mapping rule field is coded according to figure 5.4.1.28 and table 5.4.1.28. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| Length of ProSe application identifier to PC5 QoS parameters mapping rule contents | | | | | | | | | | | | | | | | octet o70+1  octet o70+2 | |
| ProSe application identifiers | | | | | | | | | | | | | | | | octet o70+3  octet o74 | |
| GFBRI | | MFBRI | | PLAMBRI | | RI | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | octet o74+1 | |
| PQI | | | | | | | | | | | | | | | | octet o74+2 | |
| Guaranteed flow bit rate | | | | | | | | | | | | | | | | octet (o74+3)\*  octet (o74+5)\* | |
| Maximum flow bit rate | | | | | | | | | | | | | | | | octet (o94)\* (see NOTE)  octet (o94+2)\* | |
| Per-link aggregate maximum bit rate | | | | | | | | | | | | | | | | octet (o95)\* (see NOTE)  octet (o95+2)\* | |
| Range | | | | | | | | | | | | | | | | octet (o96)\* (see NOTE)  octet (o96+1)\* = octet o71\* | |

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

Figure 5.4.1.28: ProSe application identifier to PC5 QoS parameters mapping rule

Table 5.4.1.28: ProSe application identifier to PC5 QoS parameters mapping rule

|  |
| --- |
| ProSe application identifiers (octet o70+3 to o74):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Guaranteed flow bit rate indicator (GFBRI) (octet o74+1 bit 8):  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) (octet o74+1 bit 7):  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) (octet o74+1 bit 6):  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) (octet o74+1 bit 5):  The RI bit indicates presence of range field.  Bit  **5**  0 Range field is absent  1 Range field is present |
|  |
| PQI (octet o74+2):  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 PQI 24  0 0 0 1 1 0 0 1 PQI 25  0 0 0 1 1 0 1 0 PQI 26  0 0 0 1 1 0 1 1  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 PQI 60  0 0 1 1 1 1 0 1 PQI 61  0 0 1 1 1 1 1 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 PQI 92  0 1 0 1 1 1 0 1 PQI 93  0 1 0 1 1 1 1 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 23.304 [2]) and associated with:  - GBR resource type, if the ProSe application identifier to PC5 QoS parameters mapping rule includes the guaranteed flow bit rate field; and  - non-GBR resource type, if the ProSe application identifier to PC5 QoS parameters mapping rule does 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 5G ProSe direct communication over PC5 signalling procedures. |
|  |
| Guaranteed flow bit rate (octet o74+3 to o74+5):  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 (octet o94 to o94+2):  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 (octet o95 to o95+2):  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 (octet o96 to o71):  The range field indicates a binary encoded value of the range in meters. |
|  |
| If the length of ProSe application identifier to PC5 QoS parameters mapping rule contents field is bigger than indicated in figure 5.4.1.28, receiving entity shall ignore any superfluous octets located at the end of the ProSe application identifier to PC5 QoS parameters mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of AS configuration contents | | | | | | | | | octet o49+1  octet o49+2 | |
| SLRB mapping rules | | | | | | | | | octet o49+3  octet o50 | |

Figure 5.4.1.29: AS configuration

Table 5.4.1.29: AS configuration

|  |
| --- |
| SLRB mapping rules:  The SLRB mapping rules field is coded according to figure 5.4.1.30 and table 5.4.1.30. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of SLRB mapping rules contents | | | | | | | | | octet o49+3  octet o49+4 | |
| SLRB mapping rule 1 | | | | | | | | | octet (o49+5)\*  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 5.4.1.30: SLRB mapping rules

Table 5.4.1.30: SLRB mapping rules

|  |
| --- |
| SLRB mapping rule:  The SLRB mapping rule field is coded according to figure 5.4.1.31 and table 5.4.1.31. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | |
| Length of SLRB | | | | | | | | | octet o78+1  octet o78+2 | |
| SLRB | | | | | | | | | octet o78+3  octet o76 | |

Figure 5.4.1.31: SLRB mapping rule

Table 5.4.1.31: SLRB mapping rule

|  |
| --- |
| PC5 QoS profile octet (o75+3 to o78):  The PC5 QoS profile field is coded according to figure 5.4.1.32 and table 5.4.1.32. |
|  |
| SLRB (o78+3 to o76): |
| SLRB is defined as *SL-PreconfigurationNR* in clause 9.3 of 3GPP TS 38.331 [7]. |
|  |
| If the length of SLRB mapping rule contents field is bigger than indicated in figure 5.4.1.31, receiving entity shall ignore any superfluous octets located at the end of the SLRB mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 o75+5 | |
| PQI | | | | | | | | | | | | | | | | octet o75+6 | |
| Guaranteed flow bit rate | | | | | | | | | | | | | | | | octet (o75+7)\*  octet (o75+9)\* | |
| Maximum flow bit rate | | | | | | | | | | | | | | | | octet o97\* (see NOTE)  octet (o97+2)\* | |
| Per-link aggregate maximum bit rate | | | | | | | | | | | | | | | | octet o98\* (see NOTE)  octet (o98+2)\* | |
| Range | | | | | | | | | | | | | | | | octet o99\* (see NOTE)  octet (o99+1)\* | |
| 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | Priority level | | | | | | octet o100\*  (see NOTE) | |
| Averaging window | | | | | | | | | | | | | | | | octet o101\*  (see NOTE)  octet (o101+1)\* | |
| Maximum data burst volume | | | | | | | | | | | | | | | | octet o102\*  (see NOTE)  octet (o102+1)\* = octet o78\* | |

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

Figure 5.4.1.32:PC5 QoS profile

Table 5.4.1.32:PC5 QoS profile

|  |
| --- |
| Guaranteed flow bit rate indicator (GFBRI) (o75+5 bit 8):  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) (o75+5 bit 7):  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) (o75+5 bit 6):  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) (o75+5 bit 5):  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) (o75+5 bit 4):  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) (o75+5 bit 3):  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) (o75+5 bit 2):  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 (o75+6):  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 PQI 24  0 0 0 1 1 0 0 1 PQI 25  0 0 0 1 1 0 1 0 PQI 26  0 0 0 1 1 0 1 1  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 PQI 60  0 0 1 1 1 1 0 1 PQI 61  0 0 1 1 1 1 1 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 PQI 92  0 1 0 1 1 1 0 1 PQI 93  0 1 0 1 1 1 1 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 23.304 [2]) and associated with:  - GBR resource type, if the PC5 QoS profile includes the guaranteed flow bit rate field; and  - non-GBR resource type, if the PC5 QoS profile does 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 5G ProSe direct communication over PC5 signalling procedures. |
|  |
| Guaranteed flow bit rate octet (o75+7 to o75+9):  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 (o97 to o97+2):  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 (o98 to o98+2):  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 (o99 to o99+1):  The range field indicates a binary encoded value of the range in meters. |
|  |
| Priority level (octet o100 bit 1 to 3):  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 (o101 to o101+1):  The averaging window field indicates a binary representation of the averaging window for both sending and receiving in milliseconds. |
|  |
| Maximum data burst volume (o102 to o78):  The maximum data burst volume 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 is bigger than indicated in figure 5.4.1.32, 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 o93  octet o93+1 | |
| NR-PC5 unicast security policy 1 | | | | | | | | | octet (o93+2)\*  octet o86\* | |
| NR-PC5 unicast security policy 2 | | | | | | | | | octet (o86+1)\*  octet o87\* | |
| ... | | | | | | | | | octet (o87+1)\*  octet o88\* | |
| NR-PC5 unicast security policy n | | | | | | | | | octet (o88+1)\*  octet o84\* | |

Figure 5.4.1.33: NR-PC5 unicast security policies

Table 5.4.1.33: NR-PC5 unicast security policies

|  |
| --- |
| NR-PC5 unicast security policy:  The NR-PC5 unicast security policy field is coded according to figure 5.4.1.34 and table 5.4.1.34. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of NR-PC5 unicast security policy contents | | | | | | | | | octet o86+1  octet o86+2 | |
| ProSe application identifiers | | | | | | | | | octet o86+3  octet o89 | |
| Security policy | | | | | | | | | octet o89+1  octet o89+2 | |
| Geographical areas | | | | | | | | | octet o89+3  octet o87 | |

Figure 5.4.1.34: NR-PC5 unicast security policy

Table 5.4.1.34: NR-PC5 unicast security policy

|  |
| --- |
| ProSe application identifiers (o86+3 to o89):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Security policy (o89+1 to o89+2): |
| The security policy field is coded according to figure 5.4.1.35 and table 5.4.1.35 |
|  |
| Geographical areas (o89+3 to o87):  The geographical areas field is coded according to figure 5.4.1.8 and table 5.4.1.8.  If the length of NR-PC5 unicast security policy contents field is bigger than indicated in figure 5.4.1.34, 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 |  |
| 0  spare | Signalling ciphering policy | | | 0  spare | Signalling integrity protection policy | | | octet o89+1 |
| 0  spare | User plane ciphering policy | | | 0  spare | User plane integrity protection policy | | | octet o89+2 |

**Figure** **5.4.1.35: Security policy**

**Table** **5.4.1.35: Security policy**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Signalling integrity protection policy (octet o89+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 o89+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 o89+1 are spare and shall be coded as zero. | | | | |
|  | | | | |
| User plane integrity protection policy (octet o89+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 o89+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 o89+2 are spare and shall be coded as zero. | | | | |
|  | | | | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe application identifier to default mode of communication mapping rules contents | | | | | | | | | octet o84+1  octet o84+2 | |
| ProSe application identifier to default mode of communication mapping rule 1 | | | | | | | | | octet (o84+3)\*  octet o90\* | |
| ProSe application identifier to default mode of communication mapping rule 2 | | | | | | | | | octet (o90+1)\*  octet o91\* | |
| ... | | | | | | | | | octet (o91+1)\*  octet o92\* | |
| ProSe application identifier to default mode of communication mapping rule n | | | | | | | | | octet (o92+1)\*  octet o85\* | |

Figure 5.4.1.36: ProSe application identifier to default mode of communication mapping rules

Table 5.4.1.36: ProSe application identifier to default mode of communication mapping rules

|  |
| --- |
| ProSe application identifier to default mode of communication mapping rule:  The ProSe application identifier to default mode of communication mapping rule field is coded according to figure 5.4.1.37 and table 5.4.1.37. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 |  | |
| Length of ProSe application identifier to default mode of communication mapping rule contents | | | | | | | | | | | | | | | octet o90+1  octet o90+2 | |
| ProSe application identifiers | | | | | | | | | | | | | | | octet o90+3  octet o91-1 | |
| 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | DMC | | | octet o91 | |

Figure 5.4.1.37: ProSe application identifier to default mode of communication mapping rule

Table 5.4.1.37: ProSe application identifier to default mode of communication mapping rule

|  |
| --- |
| ProSe application identifiers (o90+3 to o91-1):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Default mode of communication (DMC) (octet o91 bit 1 to 2):  The DMC field indicates the default mode of communication.  Bits  **2 1**  0 0 unicast  0 1 groupcast  1 0 broadcast  1 1 spare  If the DMC field is set to a spare value, the receiving entity shall ignore the ProSe application identifier to default mode of communication mapping rule. |
|  |
| If the length of ProSe application identifier to default mode of communication mapping rule contents field is bigger than indicated in figure 5.4.1.37, receiving entity shall ignore any superfluous octets located at the end of the ProSe application identifier to default mode of communication mapping rule contents. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  | |
| Length of ProSe application to path preference mapping rules contents | | | | | | | | | octet o5+1  octet o5+2 | |
| ProSe application to path preference mapping rule 1 | | | | | | | | | octet (o5+3)\*  octet o150\* | |
| ProSe application to path preference mapping rule 2 | | | | | | | | | octet (o150+1)\*  octet o151\* | |
| ... | | | | | | | | | octet (o151+1)\*  octet o152\* | |
| ProSe application to path preference mapping rule n | | | | | | | | | octet (o152+1)\*  octet l\* | |

Figure 5.4.1.38: ProSe application to path preference mapping rules

Table 5.4.1.38: ProSe application to path preference mapping rules

|  |
| --- |
| ProSe application to path preference mapping rule:  The ProSe application to path preference mapping rule field is coded according to figure 5.4.1.39 and table 5.4.1.39. |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 |  | |
| Length of ProSe application to path preference mapping rule contents | | | | | | | | | | | | | | | octet o150+1  octet o150+2 | |
| ProSe application identifiers | | | | | | | | | | | | | | | octet o150+3  octet o151-1 | |
| 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | 0  Spare | | PP | | | octet o151 | |

Figure 5.4.1.39: ProSe application to path preference mapping rule

Table 5.4.1.39: ProSe application to path preference mapping rule

|  |
| --- |
| ProSe application identifiers (o150+3 to o151-1):  The ProSe application identifiers field is coded according to figure 5.4.1.14 and table 5.4.1.14. |
|  |
| Path preference (PP) (octet o151 bit 1 to 2):  The PP field indicates the path preference.  Bits  **2 1**  0 0 No preference  0 1 PC5 preferred  1 0 Uu preferred  1 1 spare  If the PP field is set to a spare value, the receiving entity shall interpret as "00". |
|  |
| If the length of ProSe application to path preference mapping rule contents field is bigger than indicated in figure 5.4.1.39, receiving entity shall ignore any superfluous octets located at the end of the ProSe application to path preference mapping rule contents. |
|  |

## 5.5 Encoding of UE policies for 5G ProSe UE-to-network relay

## 5.6 Encoding of UE policies for 5G ProSe usage reporting configuration and rules

## 5.7 Encoding of UE policies for 5G ProSe service path selection

Annex A (informative):  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2021-2 | CT1#128e | C1-211187 |  |  |  | Draft skeleton provided by the rapporteur. | 0.0.0 |
| 2021-2 | CT1#128e | C1-210884 |  |  |  | Implementing the following p-CR agreed by CT1: C1-210884  Editorial change from the rapporteur.  Specification number added. | 0.1.0 |
| 2021-4 | CT1#129e |  |  |  |  | Implementing the following p-CR agreed by CT1:  C1-212386, C1-212396, C1-212530  Editorial change from by the rapporteur. | 0.2.0 |
| 2021-5 | CT1#130e |  |  |  |  | Implementing the following p-CR agreed by CT1:  C1-213021, C1-213574, C1-213746  Editorial change from by the rapporteur. | 0.3.0 |