**3GPP TSG-CT WG1 Meeting #125-eC1-205430**

**Electronic meeting, 20-28 August 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.501** | **CR** | **2582** | **rev** | **1** | **Current version:** | **16.5.1** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:***  | Correction on QoS parameter “value is not used” in 5GS |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5GProtoc16 |  | ***Date:*** | 2020-07-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)* |
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| ***Reason for change:*** | In QoS flow descriptions IE and Session-AMBR IE coding in TS 24.501, about the "*value is not used*" unit, it has following NOTE:"*NOTE 2: In this release of the specifications if received it shall be interpreted as value is incremented in multiples of 1 Kbps.*"However, it is unclear how does the legacy UE and the legacy network which compliant with the earlier releases of specifications interpret such "*value is not used*" unit.Note that in TS 24.301, for the similar Extended APN aggregate maximum bit rate IE and Extended quality of service IE coding, for the "*value is not used*" unit, it has following NOTE:"*NOTE: In this release of the specifications if received it shall be interpreted as value is incremented in multiples of 200 Kbps. In earlier releases of specifications, the interpretation of this value is up to implementation.*" |
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| ***Summary of change:*** | It proposes to specify the "*value is not used*" unit in QoS flow descriptions IE and Session-AMBR IE coding that in earlier releases of specifications, the interpretation of this value is up to implementation. |
|  |  |
| ***Consequences if not approved:*** | It is unclear how does the legacy UE and the legacy network which compliant with the earlier releases of specifications interpret the "*value is not used*" unit in QoS flow descriptions IE and Session-AMBR IE coding. |
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| ***Clauses affected:*** | 9.11.4.12, 9.11.4.14 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* First Change \* \* \* \*

#### 9.11.4.12 QoS flow descriptions

The purpose of the QoS flow descriptions information element is to indicate a set of QoS flow descriptions to be used by the UE, where each QoS flow description is a set of parameters as described in subclause 6.2.5.1.1.4.

The QoS flow descriptions information element is a type 6 information element with a minimum length of 6 octets. The maximum length for the information element is 65538 octets.

The QoS flow descriptions information element is coded as shown in figure 9.11.4.12.1, figure 9.11.4.12.2, figure 9.11.4.12.3, figure 9.11.4.12.4, and table 9.11.4.12.1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| QoS flow descriptions IEI | octet 1 |
| Length of QoS flow descriptions contents | octet 2octet 3 |
| QoS flow description 1 | octet 4octet u |
| QoS flow description 2 | octet u+1octet v |
| ... | octet v+1octet w |
| QoS flow description n | octet w+1octet x |

Figure 9.11.4.12.1: QoS flow descriptions information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0Spare | 0Spare | QFI | octet 4 |
| Operation code | 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | octet 5 |
| 0Spare | E | Number of parameters | octet 6 |
| Parameters list | octet 7\*octet u\* |

Figure 9.11.4.12.2: QoS flow description

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Parameter 1 | octet 7octet m |
| Parameter 2 | octet m+1octet n |
| ... | octet n+1octet o |
| Parameter n | octet o+1octet u |

Figure 9.11.4.12.3: Parameters list

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Parameter identifier | octet 7 |
| Length of parameter contents | octet 8 |
| Parameter contents | octet 9octet m |

Figure 9.11.4.12.4: Parameter

Table 9.11.4.12.1: QoS flow descriptions information element

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| QoS flow identifier (QFI) (bits 6 to 1 of octet 4)QFI field contains the QoS flow identifier.Bits6 5 4 3 2 10 0 0 0 0 0 no QoS flow identifier assigned0 0 0 0 0 1 QFI 1 to1 1 1 1 1 1 QFI 63The network shall not set the QFI value to 0. |
| Operation code (bits 8 to 6 of octet 5)Bits8 7 60 0 1 Create new QoS flow description0 1 0 Delete existing QoS flow description0 1 1 Modify existing QoS flow descriptionAll other values are reserved. |
| E bit (bit 7 of octet 6)For the "create new QoS flow description" operation, the E bit is encoded as follows:Bit70 reserved1 parameters list is includedFor the "Delete existing QoS flow description" operation, the E bit is encoded as follows:Bit70 parameters list is not included1 reservedFor the "modify existing QoS flow description" operation, the E bit is encoded as follows:Bit70 extension of previously provided parameters1 replacement of all previously provided parametersIf the E bit is set to "parameters list is not included", the number of parameters field has zero value. If the E bit is set to "parameters list is included", the number of parameters field has non-zero value. If the E bit is set to "extension of previously provided parameters" or "replacement of all previously provided parameters", the number of parameters field has non-zero value. If the E bit is set to "extension of previously provided parameters" and one of the parameters in the new parameters list already exists in the previously provided parameters, the parameter shall be set to the new value.Number of parameters (bits 6 to 1 of octet 6)The number of parameters field contains the binary coding for the number of parameters in the parameters list field. The number of parameters field is encoded in bits 6 through 1 of octet 6 where bit 6 is the most significant and bit 1 is the least significant bit. Parameters list (octets 7 to u)The parameters list contains a variable number of parameters.Each parameter included in the parameters list is of variable length and consists of:- a parameter identifier (1 octet); - the length of the parameter contents (1 octet); and- the parameter contents itself (variable amount of octets).The parameter identifier field is used to identify each parameter included in the parameters list and it contains the hexadecimal coding of the parameter identifier. Bit 8 of the parameter identifier field contains the most significant bit and bit 1 contains the least significant bit. In this version of the protocol, the following parameter identifiers are specified:- 01H (5QI);- 02H (GFBR uplink);- 03H (GFBR downlink);- 04H (MFBR uplink);- 05H (MFBR downlink);- 06H (Averaging window); and- 07H (EPS bearer identity).If the parameters list contains a parameter identifier that is not supported by the receiving entity the corresponding parameter shall be discarded.The length of parameter contents field contains the binary coded representation of the length of the parameter contents field. The first bit in transmission order is the most significant bit.When the parameter identifier indicates 5QI, the parameter contents field contains the binary representation of 5G QoS identifier (5QI) that is one octet in length.5QI:Bits8 7 6 5 4 3 2 10 0 0 0 0 0 0 0 Reserved0 0 0 0 0 0 0 1 5QI 10 0 0 0 0 0 1 0 5QI 20 0 0 0 0 0 1 1 5QI 30 0 0 0 0 1 0 0 5QI 40 0 0 0 0 1 0 1 5QI 50 0 0 0 0 1 1 0 5QI 60 0 0 0 0 1 1 1 5QI 70 0 0 0 1 0 0 0 5QI 80 0 0 0 1 0 0 1 5QI 90 0 0 0 1 0 1 0 to Spare0 1 0 0 0 0 0 00 1 0 0 0 0 0 1 5QI 650 1 0 0 0 0 1 0 5QI 660 1 0 0 0 0 1 1 5QI 670 1 0 0 0 1 0 0 Spare0 1 0 0 0 1 0 1 5QI 690 1 0 0 0 1 1 0 5QI 700 1 0 0 0 1 1 1 5QI 710 1 0 0 1 0 0 0 5QI 720 1 0 0 1 0 0 1 5QI 730 1 0 0 1 0 1 0 5QI 740 1 0 0 1 0 1 1 5QI 750 1 0 0 1 1 0 0 5QI 760 1 0 0 1 1 0 1 to Spare0 1 0 0 1 1 1 00 1 0 0 1 1 1 1 5QI 790 1 0 1 0 0 0 0 5QI 800 1 0 1 0 0 0 1 Spare0 1 0 1 0 0 1 0 5QI 820 1 0 1 0 0 1 1 5QI 830 1 0 1 0 1 0 0 5QI 840 1 0 1 0 1 0 1 5QI 850 1 0 1 0 1 1 0 5QI 860 1 0 1 0 1 1 1 to Spare0 1 1 1 1 1 1 11 0 0 0 0 0 0 0 to Operator-specific 5QIs1 1 1 1 1 1 1 01 1 1 1 1 1 1 1 ReservedThe network shall consider all other values not explicitly defined in this version of the protocol as unsupported.If the UE receives a 5QI value (excluding the reserved 5QI values) that it does not understand, the UE shall choose a 5QI value from the set of 5QI values defined in this version of the protocol (see 3GPP TS 23.501 [8]) and associated with: - GBR QoS flows, if the QoS flow includes a GFBR uplink parameter, a GFBR downlink parameter, a MFBR uplink parameter and a MFBR downlink parameter; and - non-GBR QoS flows, if the QoS flow does not include any one of a GFBR uplink parameter, a GFBR downlink parameter, a MFBR uplink parameter or a MFBR downlink parameter.The UE shall use this chosen 5QI value for internal operations only. The UE shall use the received 5QI value in subsequent NAS signalling procedures.When the parameter identifier indicates "GFBR uplink", the parameter contents field contains one octet indicating the unit of the guaranteed flow bit rate for uplink followed by two octets containing the value of the guaranteed flow bit rate for uplink.Unit of the guaranteed flow bit rate for uplink (octet 1)Bits8 7 6 5 4 3 2 10 0 0 0 0 0 0 0 value is not used (see NOTE 2)0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 Kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther values shall be interpreted as multiples of 256 Pbps in this version of the protocol.Value of the guaranteed flow bit rate for uplink (octets 2 and 3)Octets 2 and 3 represent the binary coded value of the guaranteed flow bit rate for uplink in units defined by the unit of the guaranteed flow bit rate for uplink.When the parameter identifier indicates "GFBR downlink", the parameter contents field contains one octet indicating the unit of the guaranteed flow bit rate for downlink followed by two octets containing the value of the guaranteed flow bit rate for downlink.Unit of the guaranteed flow bit rate for downlink (octet 1)The coding is identical to that of the unit of the guaranteed flow bit rate for uplink.Value of the guaranteed flow bit rate for downlink (octets 2 and 3)Octets 2 and 3 represent the binary coded value of the guaranteed flow bit rate for downlink in units defined by the unit of the guaranteed flow bit rate for downlink.When the parameter identifier indicates "MFBR uplink", the parameter contents field contains the one octet indicating the unit of the maximum flow bit rate for uplink followed by two octets containing the value of maximum flow bit rate for uplink.Unit of the maximum flow bit rate for uplink (octet 1)The coding is identical to that of the unit of the guaranteed flow bit rate for uplink.Value of the maximum flow bit rate for uplink (octets 2 and 3)Octets 2 and 3 represent the binary coded value of the maximum flow bit rate for uplink in units defined by the unit of the maximum flow bit rate for uplink.When the parameter identifier indicates "MFBR downlink", the parameter contents field contains one octet indicating the unit of the maximum flow bit rate for downlink followed by two octets containing the value of the maximum flow bit rate for downlink.Unit of the maximum flow bit rate for downlink (octet 1)The coding is identical to that of the unit of the guaranteed flow bit rate for uplink.Value of the maximum flow bit rate for downlink (octets 2 and 3)Octets 2 and 3 represent the binary coded value of the maximum flow bit rate for downlink in units defined by the unit of the maximum flow bit rate for downlink.In this version of the protocol, for messages specified in the present document, the sending entity shall not request 0 kbps for both the maximum flow bit rate for downlink and the maximum flow bit rate for uplink at the same time. Any entity receiving a request for 0 kbps in both the maximum flow bit rate for downlink and the maximum flow bit rate for uplink shall consider that as a syntactical error (see clause 7).When the parameter identifier indicates "averaging window", the parameter contents field contains the binary representation of the averaging window for both uplink and downlink in milliseconds and the parameter contents field is two octets in length.When the parameter identifier indicates EPS bearer identity, the length of EPS bearer identity is one octet, bits 5 to 8 of the parameter contents contain the EPS bearer identity as specified in subclause 9.3.2 of 3GPP TS 24.301 [15] (see NOTE) and bits 1 to 4 of the parameter contents are spare and shall be coded as zero. The UE shall not include the EPS bearer identity parameter in any mobile originated 5GSM messages. |
|  |
| NOTE 1: The total number of EPS bearer identities included in all QoS flow descriptions of a UE cannot exceed fifteen.NOTE 2: In this release of the specifications if received it shall be interpreted as value is incremented in multiples of 1 Kbps. In earlier releases of specifications, the interpretation of this value is up to implementation. |

\* \* \* Next Change \* \* \* \*

#### 9.11.4.14 Session-AMBR

The purpose of the Session-AMBR information element is to indicate the initial subscribed PDU session aggregate maximum bit rate when the UE establishes a PDU session or to indicate the new subscribed PDU session aggregate maximum bit rate if it is changed by the network.

The Session-AMBR information element is coded as shown in figure 9.11.4.14.1 and table 9.11.4.14.1.

The Session-AMBR is a type 4 information element with a length of 8 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Session-AMBR IEI | octet 1 |
| Length of Session-AMBR contents | octet 2 |
| Unit for Session-AMBR for downlink | octet 3 |
| Session-AMBR for downlink | octet 4-5 |
| Unit for Session-AMBR for uplink | octet 6 |
| Session-AMBR for uplink | octet 7-8 |

Figure 9.11.4.14.1: Session-AMBR information element

Table 9.11.4.14.1: Session-AMBR information element

|  |
| --- |
| Unit for Session-AMBR for downlink (octet 3)0 0 0 0 0 0 0 0 value is not used (see NOTE)0 0 0 0 0 0 0 1 value is incremented in multiples of 1 Kbps0 0 0 0 0 0 1 0 value is incremented in multiples of 4 Kbps0 0 0 0 0 0 1 1 value is incremented in multiples of 16 Kbps0 0 0 0 0 1 0 0 value is incremented in multiples of 64 Kbps0 0 0 0 0 1 0 1 value is incremented in multiples of 256 kbps0 0 0 0 0 1 1 0 value is incremented in multiples of 1 Mbps0 0 0 0 0 1 1 1 value is incremented in multiples of 4 Mbps0 0 0 0 1 0 0 0 value is incremented in multiples of 16 Mbps0 0 0 0 1 0 0 1 value is incremented in multiples of 64 Mbps0 0 0 0 1 0 1 0 value is incremented in multiples of 256 Mbps0 0 0 0 1 0 1 1 value is incremented in multiples of 1 Gbps0 0 0 0 1 1 0 0 value is incremented in multiples of 4 Gbps0 0 0 0 1 1 0 1 value is incremented in multiples of 16 Gbps0 0 0 0 1 1 1 0 value is incremented in multiples of 64 Gbps0 0 0 0 1 1 1 1 value is incremented in multiples of 256 Gbps0 0 0 1 0 0 0 0 value is incremented in multiples of 1 Tbps0 0 0 1 0 0 0 1 value is incremented in multiples of 4 Tbps0 0 0 1 0 0 1 0 value is incremented in multiples of 16 Tbps0 0 0 1 0 0 1 1 value is incremented in multiples of 64 Tbps0 0 0 1 0 1 0 0 value is incremented in multiples of 256 Tbps0 0 0 1 0 1 0 1 value is incremented in multiples of 1 Pbps0 0 0 1 0 1 1 0 value is incremented in multiples of 4 Pbps0 0 0 1 0 1 1 1 value is incremented in multiples of 16 Pbps0 0 0 1 1 0 0 0 value is incremented in multiples of 64 Pbps0 0 0 1 1 0 0 1 value is incremented in multiples of 256 PbpsOther values shall be interpreted as multiples of 256 Pbps in this version of the protocol.Session-AMBR for downlink (octets 4 and 5)Octets 4 and 5 represent the binary coded value of PDU session aggregated maximum bit rate for downlink in units defined by octet 3.Unit for Session-AMBR for uplink (octet 6)The coding is identical to the unit coding defined for Session-AMBR for downlink (octet 3)Session-AMBR for uplink (octets 7 and 8)Octets 7 and 8 represent the binary coded value of PDU session aggregated maximum bit rate for uplink in units defined by octet 6. |
| NOTE: In this release of the specifications if received it shall be interpreted as value is incremented in multiples of 1 Kbps. In earlier releases of specifications, the interpretation of this value is up to implementation. |

\* \* \* End of Change \* \* \* \*