**3GPP TSG SA WG5 Meeting #155 *S5-243033***

Jeju, South Korea, 27 - 31 May 2024

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **32.255** | **CR** | **0528** | **rev** | **1** | **Current version:** | **18.3.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Rel-18 CR 32.255 Add tenant identifier for 5G data connectivity charging |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | TEI18 |  | ***Date:*** | 2024-05-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP o. | *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)* |
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| ***Reason for change:*** | “Tenant identifier” is introduced in Release 18 to be part of the common IEs in TS 32.290 table 7.1. This field contains the identification of the business subscriber that uses the requested service. The 5G data connectivity charging can support the business charging as introduced during Release 18, e.g. per Network Slice (NETSLICE\_CH\_Ph2), per NPN (eNPN\_CH), per TSN bridge (TSN\_CH).Hence, the common IE Tenant identifier can be used in the charging data request to hold the business subscriber identification, in the case when there is interaction between C-CHF and B-CHF for the purpose of business charging. |
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| ***Summary of change:*** | 1. Add Tenant Identifier in Charging Data Request, Table 6.1.1.2.1 and Table 6.2.2.1.2. Add Tenant Identifier in CHF CDR, Table 6.1.3.2.1 (FBC). |
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| ***Consequences if not approved:*** | The 5G data connectivity charging per business subscriber is incomplete, due to the lack of identification.  |
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| ***Clauses affected:*** | 6.1.1.2, 6.1.3.2, 6.2.2 |
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|  | **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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | Revision of S5-242731 |

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| **First change** |

#### 6.1.1.2 Charging Data Request message

Table 6.1.1.2.1 illustrates the basic structure of a Charging Data Request message from the SMF as used for 5G data connectivity converged charging.

Table 6.1.1.2.1: Charging Data Request message contents

| **Information Element** | **Category for converged charging** | **Category for offline only charging** | **Description** |
| --- | --- | --- | --- |
| Session Identifier | OC | OC | Described in TS 32.290 [57] |
| Subscriber Identifier | OM | M | Described in TS 32.290 [57]In case SUPI is not present (for emergency service), the User Equipment Info in table 6.2.1.2.1. shall be present for identifying the user. |
| Tenant Identifier | OC | OC | Described in TS 32.290 [57]. This field may be used in the business context. |
| NF Consumer Identification | M | M | Described in TS 32.290 [57] |
| NF Functionality | M | OC | Described in TS 32.290 [57] |
| NF Name | OC | OC | Described in TS 32.290 [57] |
| NF Address | OC | OC | Described in TS 32.290 [57] |
| NF PLMN ID | OC | OC | Described in TS 32.290 [57] |
| Invocation Timestamp | M | M | Described in TS 32.290 [57] |
| Invocation Sequence Number | M | M | Described in TS 32.290 [57] |
| Retransmission Indicator | OC | OC | Described in TS 32.290 [57] |
| Notify URI | OC | OC | Described in TS 32.290 [57] |
| Service Specification Information | OC | OC | Described in TS 32.290 [57] |
| Supported Features | OC | - | This field indicates the features supported by the NF consumer. |
| Triggers | OC | OC | This field is described in TS 32.290 [57] and holds the 5G data connectivity specific triggers described in clause 5.2.1. |
| Multiple Unit Usage  | OC | OC | Described in TS 32.290 [57]This field is not applicable to QBC. |
| Rating Group | M | M | Described in TS 32.290 [57] |
| Requested Unit | OC | - | Described in TS 32.290 [57] |
| Used Unit Container | OC | OC | Described in TS 32.290 [57] |
| Service Identifier | OC | OC | Described in TS 32.290 [57] |
| Quota management Indicator | OC | - | Described in TS 32.290 [57] |
| Triggers | OC | OC | This field is described in TS 32.290 [57] and holds the 5G data connectivity specific triggers described in clause 5.2.1.  |
| Trigger Timestamp | OC | OC | Described in TS 32.290 [57] |
| Time | OC | OC | Described in TS 32.290 [57] |
| Total Volume | OC | OC | Described in TS 32.290 [57] |
| Uplink Volume | OC | OC | Described in TS 32.290 [57] |
| Downlink Volume | OC | OC | Described in TS 32.290 [57] |
| Local Sequence Number  | OM | OM | Described in TS 32.290 [57] |
| PDU Container Information  | OC | OC | This field holds the 5G data connectivity PDU session container specific information described in clause 6.2. |
| UPF ID | OC | OC | This field holds the UPF identifier used to identify the UPF.These fields shall only be included when either quota is requested per UPF, or used units are reported per UPF |
| multi-homed PDU address | OC | OC | This field holds the IPv6 prefix used by UPF. It may only be used for IPv6 multi-homed PDU sessions and then only for reporting used units. |
| PDU Session Charging Information | OM | OM | This field holds the 5G data connectivity specific information described in clause 6.2.This field is applicable to FBC and QBC. |
| Roaming QBC information | OM | OM | This field holds the roaming QBC specific information defined in clause 6.2.1.4This field is only applicable to QBC. |
| Inter-CHF Information | OC | - | This field holds inter CHF specific information described in clause 6.2.1.6.  |

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| **Next change** |

#### 6.1.3.2 PDU session charging CHF CDR data

If enabled, CHF CDRs for PDU session charging shall be produced for each PDU session. In roaming Home routed scenario, the PDU session charging CHF CDR shall cover both Flow based Charging and Qos flow Based Charging (QBC) from H-SMF.

The fields of PDU session charging CHF CDR are specified in table 6.1.3.2.1.

Table 6.1.3.2.1: PDU session charging CHF record data

| Field | Category | Description |
| --- | --- | --- |
| Record Type  | M | CHF record. |
| Recording Network Function ID | OM | This field holds the name of the recording entity, i.e. the CHF id. |
| Subscriber Identifier | OM | This field holds the Subscription Permanent Identifier (SUPI) of the served party. This fields should be present except for emergency session. The detail of SUPI is specified in clause 5.9.2 of TS 23.501 [200] |
| Tenant Identifier | OC | Described in TS 32.298 [57]. It is used in the business context. |
| NF Consumer Information | M | This field holds the information of the SMF that used the charging service. |
| NF Functionality | M | This field contains the function of the node (i.e. SMF) |
| NF Name | OC | This field holds the name of the SMF used. |
| NF Address | OC | This fields holds the IP Address of the SMF used. |
| NF PLMN ID | OC | This field holds the PLMN identifier (MCC MNC) of the SMF. |
| Invocation Timestamp | OC | This field holds the timestamp of the charging service invocation, described in TS 32.290 [57]. |
| List of Multiple Unit Usage  | OM | This field holds a list of changes in charging conditions for all service data flows within this PDU session.This list is categorized per rating group or per combination of rating group and service id or per combination of rating group, sponsor identity and application service provider identity. In addition, usage is differentiated between with and without quota management. Each change is time stamped. Charging conditions are used to categorize traffic volumes, elapsed time and number of events, such as per tariff period.  |
| Rating Group | OM | This filed holds the rating group.  |
| Used Unit Container | OC | This field holds the used units and information connected to the reported units. |
| Service Identifier | OC | This field holds the Service Identifier. |
| Quota management Indicator | OM | This field holds an indicator on whether the used units are with or without quota management. |
| Triggers | OC | This field holds the reason for closing the used unit container. |
| Trigger Timestamp | OC | This field holds the timestamp of the trigger. |
| Time | OC | This field holds the amount of used time. |
| Total Volume | OC | This field holds the amount of used volume in both uplink and downlink directions. |
| Uplink Volume | OC | This field holds the amount of used volume in uplink direction. |
| Downlink Volume | OC | This field holds the amount of used volume in downlink direction. |
| Rating Indicator | OC | This field indicates if the units have been rated or not. |
| Local Sequence Number | M | This field holds the container sequence number. |
| PDU Container Information | OC | This field holds the 5G data connectivity specific information defined in clause 6.2.1.3. |
| UPF ID | OC | This field holds the UPF identifier used to identify the UPF when reporting the usage for the UPF. |
| Multi-homed PDU address | Oc | This field holds the Multi-homed IPv6 prefix used by UPF, identified by the UPF ID. It may only be used for reporting used units. |
| Record Opening Time | M | This field contains the time stamp when the record is opened, described in TS 32.298 [51], |
| Duration | M | This field holds the duration of this record. |
| Record Sequence Number | C | Partial record sequence number, only present in case of partial records. |
| Cause for Record Closing  | M | The reason for the release of the record. |
| Diagnostics | OM | This field holds a more detailed reason for the release of the PDU session, when a single cause is applicable. |
| Local Record Sequence Number | OM | Consecutive record number created by the CDF. The number is allocated sequentially including all CDR types. |
| Record Extensions | OC | A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension. |
| PDU Session Charging Information | OM | This field holds the 5G data connectivity specific information defined in clause 6.2.1.2. |
| Roaming QBC information | OC | This field holds the roaming QBC specific information defined in clause 6.2.1.4, when applicable. |
| Inter-CHF Information | OC | This field holds inter-CHF specific information described in clause 6.2.1.6 |

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| **Next change** |

### 6.2.2 Detailed message format for converged charging

The following clause specifies per Operation Type the charging data that are sent by SMF for 5G data connectivity converged charging or offline only charging.

The Operation Types are listed in the following order: I (Initial)/U (Update)/T (Termination)/E (Event). Therefore, when all Operation Types are possible it is marked as IUTE. If only some Operation Types are allowed for a node, only the appropriate letters are used (i.e. IUT or E) as indicated in the table heading. The omission of an Operation Type for a particular field is marked with "-" (i.e. IU-E). Also, when an entire field is not allowed in a node the entire cell is marked as "-".

Table 6.2.2.1 defines the basic structure of the supported fields in the *Charging Data* Request message for 5G data connectivity converged charging or offline only charging.

Table 6.2.2.1: Supported fields in *Charging Data Request* message

| Information Element | Functionality of SMF | FBC | QBC | FBC | QBC |
| --- | --- | --- | --- | --- | --- |
| Charging Service | Converged Charging | Converged Charging | Offline Only Charging | Offline Only Charging |
| Supported Operation Types | I/U/T/E | I/U/T/E | I/U/T/E | I/U/T/E |
| Session Identifier | -UT- | -UT- | -UT- | -UT- |
| Subscriber Identifier | IUT- | IUT- | IUT- | IUT- |
| Tenant Identifier | IUT- | - | IUT- | - |
| NF Consumer Identification | IUT- | IUT- | IUT- | IUT- |
| Invocation Timestamp | IUT- | IUT- | IUT- | IUT- |
| Invocation Sequence Number | IUT- | IUT- | IUT- | IUT- |
| Retransmission Indicator | IUT- | IUT- | IUT- | IUT- |
| Notify URI | IU- | IU- | IU- | IU- |
| Supported Features | IU- | IU- | - | - |
| Service Specification Information | IUT- | IUT- | IUT- | IUT- |
| Triggers | -UT- | -UT- | -UT- | -UT- |
| Multiple Unit Usage | IUT- | - | IUT- | - |
| Rating Group | IUT- | - | IUT- | - |
| Requested Unit | IU-- | - | - | - |
| Used Unit Container | -UT- | - | -UT- | - |
| Triggers | -UT- | - | -UT- | - |
| PDU Container Information  | -UT- | - | -UT- | - |
| UPF ID | IUT- | - | IUT- | - |
| PDU Session Charging Information | IUT- | IUT- | IUT- | IUT- |
| Charging Id | IUT- | IUT- | IUT- | IUT- |
| SMF Charging Id | IUT- | IUT- | IUT- | IUT- |
| Home Provided Charging Id | -UT- | -UT- | -UT- | -UT- |
| SMF Home Provided Charging Id | -UT- | -UT- | -UT- | -UT- |
| User Information | IUT- | IUT- | IUT- | IUT- |
| User Location Info | IUT- | IUT- | IUT- | IUT- |
| IMS Session Information | IUT- | IUT- | IUT- | IUT- |
| MA PDU Non 3GPP User Location Info | IUT- | IUT- | IUT- | IUT- |
| User Location Time | IUT- | IUT- | IUT- | IUT- |
| MA PDU Non 3GPP User Location Time | IUT- | IUT- | IUT- | IUT- |
| UE Time Zone | IUT- | IUT- | IUT- | IUT- |
| Presence Reporting Area Information | -UT- | -UT- | -UT- | -UT- |
| PDU Session Information | IUT- | IUT- | IUT- | IUT- |
| PDU Session ID | IUT- | IUT- | IUT- | IUT- |
| Network Slice Instance Identifier  | IUT- | IUT- | IUT- | IUT- |
| PDU Type | IUT- | IUT- | IUT- | IUT- |
| PDU Address | IUT- | IUT- | IUT- | IUT- |
| SSC Mode | IUT- | IUT- | IUT- | IUT- |
| MA PDU session information | IUT- | IUT- | IUT- | IUT- |
| SUPI PLMN ID | IUT- | IUT- | IUT- | IUT- |
| Serving Network Function ID  | IUT- | IUT- | IUT- | IUT- |
| Serving CN PLMN ID | IUT- | IUT- | IUT- | IUT- |
| RAT Type | IUT- | IUT- | IUT- | IUT- |
| MA PDU Non 3GPP RAT Type | IUT- | IUT- | IUT- | IUT- |
| Data Network Name Identifier | IUT- | IUT- | IUT- | IUT- |
| DNN Selection Mode | IUT- | IUT- | IUT- | IUT- |
| Authorized QoS Information | IUT- | IUT- | IUT- | IUT- |
| Subscribed QoS Information | IUT- | IUT- | IUT- | IUT- |
| Authorized Session-AMBR | IUT- | IUT- | IUT- | IUT- |
| Subscribed Session-AMBR | IUT- | IUT- | IUT- | IUT- |
| PDU session start Time | I--- | I--- | I--- | I--- |
| PDU session stop Time | --T- | --T- | --T- | --T- |
| Diagnostics | --T- | --T- | --T- | --T- |
| Enhanced Diagnostics | --T- | --T- | --T- | --T- |
| Charging Characteristics | IUT- | IUT- | IUT- | IUT- |
| Charging Characteristics Selection Mode | IUT- | IUT- | IUT- | IUT- |
| 3GPP PS Data Off Status | IUT- | IUT- | IUT- | IUT- |
| Session Stop Indicator | --T- | --T- | --T- | --T- |
| Redundant Transmission Type | IUT- | IUT- | IUT- | IUT- |
| PDU Session Pair ID | IUT- | IUT- | IUT- | IUT- |
| 5G LAN Type Service  | IUT- | IUT- | IUT- | IUT- |
| SNPN Information | IUT- | IUT- | IUT- | IUT- |
| 5GS Bridge Information | IUT- | - | - | - |
| 5G Multicast Service | IUT- | IUT- | IUT- | IUT- |
| 5G Satellite Access Indicator | IUT- | IUT- | - | - |
| Satellite backhaul Information | IUT- | IUT- | - | - |
| Unit Count Inactivity Timer | IU-- | - | IU-- | - |
| RAN Secondary RAT Usage Report | -UT- | -UT- | -UT- | -UT- |
| Roaming QBC information | - | IUT- | - | IUT- |
| Multiple QFI container | - | IUT- | - | IUT- |
| UPF ID | - | IUT- | - | IUT- |
| Roaming Charging Profile | - | IU-- | - | IU-- |
| Inter-CHF Information | IUT- | IUT- | - | - |
| Remote CHF resource | - | - | - | - |
| Original NF Consumer Id | IUT- | IUT- | - | - |

Table 6.2.2.2 defines the basic structure of the supported fields in the *Charging Data* Response message for 5G data connectivity converged charging or offline only charging.

Table 6.2.2.2: Supported fields in *Charging Data Response* message

| Information Element | Functionality of SMF | FBC | QBC | FBC | QBC |
| --- | --- | --- | --- | --- | --- |
| Charging Service | Converged Charging | Converged Charging  | Offline Only Charging | Offline Only Charging |
| Supported Operation Types | I/U/T/E | I/U/T/E | I/U/T/E | I/U/T/E |
| Session Identifier | I--- | I--- | I--- | I--- |
| Invocation Timestamp | IUT- | IUT- | IUT- | IUT- |
| Invocation Result | IUT- | IUT- | IUT- | IUT- |
| Invocation Sequence Number | IUT- | IUT- | IUT- | IUT- |
| Session Failover  | IU-- | IUT- | IU-- | IUT- |
| Supported Features | IU-- | IU-- | - | - |
| Triggers | IU-- | IU-- | IU-- | IU-- |
| Multiple Unit information  | IU-- | - | IU-- | - |
| Result Code | IU-- | - | IU-- | - |
| Rating Group | IU-- | - | IU-- | - |
| UPF ID | IU-- | - | IU-- | - |
| Granted Unit | IU-- | - | - | - |
| Validity Time | IU-- | - | - | - |
| Final Unit Indication | IU-- | - | - | - |
| Time Quota Threshold  | IU-- | - | - | - |
| Volume Quota Threshold  | IU-- | - | - | - |
| Unit Quota Threshold  | IU-- | - | - | - |
| Quota Holding Time | IU-- | - | - | - |
| Triggers | IU-- | - | IU-- | - |
| PDU Session Charging Information | IU-- | IU-- | IU-- | IU-- |
| Charging Id | - | - | - | - |
| SMF Charging Id | - | - | - | - |
| Home Provided Charging Id | - | - | - | - |
| SMF Home Provided Charging Id | - | - | - | - |
| User Information | - | - | - | - |
| User Location Info | - | - | - | - |
| IMS Session Information | - | - | - | - |
| MA PDU Non 3GPP User Location info | - | - | - | - |
| User Location Time | - | - | - | - |
| MA PDU Non 3GPP User Location Time | - | - | - | - |
| UE Time Zone | - | - | - | - |
| Presence Reporting Area Information | IU-- | IU-- | IU-- | IU-- |
| PDU Session Information | - | - | - | - |
| PDU Session ID | - | - | - | - |
| Network Slice Instance Identifier  | - | - | - | - |
| PDU Type | - | - | - | - |
| PDU Address | - | - | - | - |
| SSC Mode | - | - | - | - |
| MA PDU session information | - | - | - | - |
| SUPI PLMN ID | - | - | - | - |
| Serving Network Function ID  | - | - | - | - |
| Serving CN PLMN ID | - | - | - | - |
| RAT Type | - | - | - | - |
| MA PDU Non 3GPP RAT Type | - | - | - | - |
| Data Network Name Identifier | - | - | - | - |
| DNN Selection Mode | - | - | - | - |
| Authorized QoS Information | - | - | - | - |
| Subscribed QoS Information | - | - | - | - |
| Authorized Session-AMBR | - | - | - | - |
| Subscribed Session-AMBR | - | - | - | - |
| PDU session start Time | - | - | - | - |
| PDU session stop Time | - | - | - | - |
| Diagnostics | - | - | - | - |
| Enhanced Diagnostics | - | - | - | - |
| Charging Characteristics | - | - | - | - |
| Charging Characteristics Selection Mode | - | - | - | - |
| 3GPP PS Data Off Status | - | - | - | - |
| Session Stop Indicator | - | - | - | - |
| Redundant Transmission Type | - | - | - | - |
| PDU Session Pair ID | - | - | - | - |
| 5G LAN Type Service | - | - | - | - |
| SNPN Information | - | - | - | - |
| 5GS TSN Bridge Information | - | - | - | - |
| 5G Multicast Service | - | - | - | - |
| Unit Count Inactivity Timer | IU-- | - | - | - |
| RAN Secondary RAT Usage Report | - | - | - | - |
| Roaming QBC information | - | IU-- | - | IU-- |
| Multiple QFI container | - | - | - | - |
| UPF ID | - | - | - | - |
| Roaming Charging Profile | - | IU-- | - | IU-- |
| Inter-CHF Information | IUT- | IUT- | - | - |
| Remote CHF resource | IUT- | IUT- | - | - |
| Original NF Consumer Id | - | - | - | - |

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| **End of change** |