**3GPP TSG- Meeting # *rev1***

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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 |  |

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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Definition of charging information is missing when SMF+PGW-C is selected for GERAN or UTRAN access. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add an annex for supporting of GERAN/UTRAN access by SMF+PGW-C. Add SGSN as one of Serving Network Function. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not possible for operators to simplify the charging architecture when 5GS is deployed and 2G or 3G still exists in their network. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Annex X(New) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **First change** |

Annex X (normative):  
Support of GERAN/UTRAN access

## X.1 General

This Annex specifies Nchf from SMF+PGW-C enhanced to support UE accessing the network via GERAN/UTRAN.

## X.2 5G data connectivity charging principles and scenarios

### X.2.1 5G data connectivity charging principles

The 5G data connectivity charging principles as described in clause 5,1 shall apply for fields applicable when SMF+PGW-C supports GERAN/UTRAN access.

For GERAN/UTRAN access access scenario, the Charging Identifier for the PDP Context will be generated by SMF+PGW-C.

### X.2.2 5G data connectivity converged online and offline charging scenarios

The 5G data connectivity converged online and offline charging scenarios as described in clause 5,2 shall apply for fields applicable when PGW-C+SMF supports GERAN/UTRAN access.

## X.3 Data description for 5G data connectivity charging

### X.3.1 Data description for supporting GERAN/UTRAN

#### X.3.1.1 Message contents

The Charging message as described in clause 6.1.1 shall apply to the PGW-C+SMF to support GERAN/UTRAN access.

When UE is connected to PGW-C+SMF via GERAN/UTRAN, the information included in clause 6.1.1 and TS 32.290[57] is supported.

#### X.3.1.2 Ga message contents

#### X.3.1.3 CDR description on the Bd interface

The CDR description defined in clause 6.1.3 shall apply for fields applicable when PGW-C+SMF supports GERAN/UTRAN access.

### X.3.2 5G data connectivity charging specific parameters

#### X.3.2.1 Definition of 5G data connectivity charging information

The charging information defined in clause 6.2.1 is used for the PGW-C+SMF to support GERAN/UTRAN access.

The specific PDU session charging information used for PS charging when UE is connected to P-GW+SMF via GERAN/UTRAN is provided as defined in clause 6.2.1.2, with the following difference:

Table X.3.2.1-1: Structure of PDU Session Charging Information

|  |  |  |
| --- | --- | --- |
| Information Element | Category | Description |
| Charging Id | OM | This field holds the Charging Id for PDP Context. |
| Home Provided Charging Id | OC | This field is not applicable to GERAN/UTRAN access. |
| User Information | OM | Described in table 6.2.1.2. |
| User Identifier | OC | This field contains the identification of the user (i.e. MSISDN). |
| User Equipment Info | OC | This field holds the identification of the terminal (i.e. IMEI, MAC Address) . |
| unauthenticatedFlag | OC | This field indicates the served IMSI is not authenticated. |
| Roamer In Out | OC | Described in table 6.2.1.2. |
| User Location Info | OC | Described in table 6.2.1.2. |
| MA PDU Non 3GPP User Location info | OC | This field is not applicable to GERAN/UTRAN access. |
| User Location Time | OC | Described in table 6.2.1.2. |
| MA PDU Non 3GPP User Location Time | OC | This field is not applicable to GERAN/UTRAN access. |
| UE Time Zone | OC | Described in table 6.2.1.2. |
| Presence Reporting Area Information | OC | Described in table 6.2.1.2. |
| PDU Session Information | OC | Group of PDP Context information. |
| PDU Session ID | M | This field holds identifier of PDP Context. |
| Network Slice Instance Identifier | OM | This field is not applicable to GERAN/UTRAN access. |
| PDU Type | OM | This field holds the type of PDP Context. |
| PDU Address | OC | Described in table 6.2.1.2. |
| PDU Ipv4 Address | OC | This field holds the IP Address of the served IMSI allocated for PDP Context, i.e. IPv4 address. |
| PDU IPv6 Address with Prefix | OC | This field holds the IP Address of the served IMSI allocated for PDP Context, i.e. IPv6 prefix. |
| PDU Address prefix length | OC | PDP/PDN Address prefix length of an IPv6 typed Served PDP Address. The field needs not available for prefix length of 64 bits. |
| IPv4 Dynamic Address Flag | OC | Described in table 6.2.1.2. |
| IPv6 Dynamic Address Flag | OC | Described in table 6.2.1.2. |
| SSC Mode | OC | This field is not applicable to GERAN/UTRAN access. |
| MA PDU session information | OC | This field is not applicable to GERAN/UTRAN access. |
| MA PDU session indicator | OC | This field is not applicable to GERAN/UTRAN access. |
| ATSSS capability | OC | This field is not applicable to GERAN/UTRAN access. |
| IMSI PLMN ID | OC | This field holds PLMN ID of the IMSI. |
| Serving Network Function ID | OC | Described in table 6.2.1.2. |
| Serving Network Function Functionality | M | This field holds the functionality of the Serving Network Function: i.e. SGSN.  This field holds “SGSN” when SMF+PGW-C serves GERAN/UTRAN access. |
| Serving Network Function Name | OC | This field is not applicable to GERAN/UTRAN access. |
| Serving Network Function Addresses | OC | Described in table 6.2.1.2. |
| Serving Network Function FQDN | OC | Described in table 6.2.1.2. |
| Serving Network Function PLMN ID | OC | Described in table 6.2.1.2. |
| AMF Identifier | OC | This field is not applicable to GERAN/UTRAN access. |
| Serving CN PLMN ID | OC | Described in table 6.2.1.2. |
| RAT Type | OC | This field holds the Radio Access Technology (RAT) currently serving the UE (i.e. GERAN, UTRAN). |
| MA PDU Non 3GPP RAT Type | OC | This field is not applicable to GERAN/UTRAN access. |
| Data Network Name Identifier | M | This field contains the identifier of the APN the user is connected to. |
| DNN Selection Mode | OC | This field is not applicable to GERAN/UTRAN access. |
| Authorized QoS Information | OC | This field holds the authorized QoS applied to PDP Context. QoS information mapped according interaction with PCC as specified in clause 4.11.0a.2 of TS 23.502 [201] |
| Subscribed QoS Information | OC | This field holds the subscribed default QoS for the PDP Context. QoS information mapped according interaction with PCC as specified in clause 4.11.0a.2 of TS 23.502 [201]. |
| Authorized Session-AMBR | OC | This field holds the authorized Session-AMBR for the PDP Context. |
| Subscribed Session-AMBR | OC | This field holds the subscribed Session-AMBR for the PDP Context. |
| PDU session start Time | OC | This field holds the timestamp when PDP Context starts. |
| PDU session stop Time | OC | This field holds the timestamp when PDP Context terminates. |
| Diagnostics | OC | This field holds a detailed reason for the release of the PDP Context and complements the "Change Condition" information. |
| Enhanced Diagnostics | OC | This field holds a more detailed reason for the release of the PDP Context, when a set of causes are applicable. |
| Charging Characteristics | OC | This field holds the Charging Characteristics for this PDP Context. |
| Charging Characteristics  Selection Mode | OC | Described in table 6.2.1.2. |
| 3GPP PS Data Off Status | OC | Described in table 6.2.1.2. |
| Session Stop Indicator | OC | This field is not applicable to GERAN/UTRAN access. |
| Redundant Transmission  Type | OC | This field is not applicable to GERAN/UTRAN access. |
| RAN Secondary RAT Usage Report | OC | This field is not applicable to GERAN/UTRAN access. |
| NG RAN Secondary RAT Type | OC | This field is not applicable to GERAN/UTRAN access. |
| Qos Flows Usage Reports | OC | This field is not applicable to GERAN/UTRAN access. |
| QoS Flow Id | OM | This field is not applicable to GERAN/UTRAN access. |
| Start Timestamp | OC | This field is not applicable to GERAN/UTRAN access. |
| End Timestamp | OC | This field is not applicable to GERAN/UTRAN access. |
| Downlink Volume | OC | This field is not applicable to GERAN/UTRAN access. |
| Uplink Volume | OC | This field is not applicable to GERAN/UTRAN access. |

The specific PDU Container Information used for PS charging when UE is connected to P-GW+SMF via GERAN/UTRAN is provided as defined in clause 6.2.1.3, with the following difference:

Table X.3.2.1-2: Structure of PDU Container Information

| Information Element | Category | Description |
| --- | --- | --- |
| Time of First Usage | OC | Described in table 6.2.1.3.1. |
| Time of Last Usage | OC | Described in table 6.2.1.3.1. |
| QoS Information | OC | Described in table 6.2.1.3.1. |
| QoS Characteristics | OC | Described in table 6.2.1.3.1. |
| AF Charging Identifier | OC | This field is not applicable to GERAN/UTRAN access. |
| AF Charging Id String | OC | This field is not applicable to GERAN/UTRAN access. |
| User Location Information | OC | Described in table 6.2.1.3.1. |
| UE Time Zone | OC | Described in table 6.2.1.3.1. |
| Presence Reporting Area Information | OC | Described in table 6.2.1.3.1. |
| Serving Network Function ID | OC | Described in table 6.2.1.3.1. |
| RAT Type | OC | This field holds the RAT type during the used unit container interval (i.e. GERAN, UTRAN). |
| Sponsor Identity | OC | Described in table 6.2.1.3.1. |
| Application Service Provider Identity | OC | Described in table 6.2.1.3.1. |
| Charging Rule Base Name | OC | Described in table 6.2.1.3.1. |
| 3GPP PS Data Off Status | OC | Described in table 6.2.1.3.1. |
| MA PDU Steering functionality | OC | This field is not applicable to GERAN/UTRAN access. |
| MA PDU Steering mode | OC | This field is not applicable to GERAN/UTRAN access. |

Roaming QBC information used for PS charging when UE is connected to P-GW+SMF via EPC is defined in table X.3.2.1-3:

Table X.3.2.1-3: Roaming QBC information

|  |  |  |
| --- | --- | --- |
| Information Element | Category | Description |
| MultipleQFIcontainer | OC | This field holds the containers associated to a charging condition change on a PDP Context. This is included when triggers conditions are met (Qos change, tariff time change ...).  It may have multiple occurences.  This field is applicable for both non-roaming and roaming Home Routed scenario |
| Triggers | OC | Described in table 6.2.1.4.1 |
| Trigger Timestamp | OC | Described in table 6.2.1.4.1 |
| Uplink Volume | OC | Described in table 6.2.1.4.1 |
| Downlink Volume | OC | Described in table 6.2.1.4.1 |
| Local Sequence Number | OC | Described in table 6.2.1.4.1 |
| QFI Container information | OC | This field holds the data container information. |

Roaming QBC information used for PS charging when UE is connected to P-GW+SMF via EPC is defined in table X.3.2.1-4:

Table X.3.2.1-4: QFI Container Information

| Information Element | Category | Description |
| --- | --- | --- |
| QoS Information | OC | Described in table 6.2.1.5.1 |
| QoS Characteristics | OC | Described in table 6.2.1.5.1 |
| User Location Information | OC | Described in table 6.2.1.5.1 |
| Presence Reporting Area Information | OC | Described in table 6.2.1.5.1 |
| RAT Type | OC | Described in table 6.2.1.5.1 |
| Report Time | M | Described in table 6.2.1.5.1 |
| 3GPP PS Data Off Status | OC | Described in table 6.2.1.5.1 |
| EPS bearer Charging Id | OM | This field holds the Charging Id associated to the PDP Context. |
| Diagnostics | OM | This field holds a more detailed reason for the release of the PDP Context, when a single cause is applicable. |
| Enhanced Diagnostics | OC | This field holds a more detailed reason for the release of the PDP Context, when a set of causes is applicable. |

#### X.3.2.2 Detailed message format for converged charging

The basic structure of supported fields in *Charging Data* Request/Response message defined in clause 6.2.2 shall apply for fields applicable when PGW-C+SMF supports GERAN/UTRAN access.

#### X.3.2.3 Formal 5G data connectivity charging parameter description

The CHF CDR parameters and resources attributes defined in clause 6.2.3 shall apply for fields applicable when PGW-C+SMF supports GERAN/UTRAN access.

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| **End of change** |