



## ePDG CDR Field Descriptions

This chapter describes the CDR fields supported by the system for use in ePDG-CDRs.

The following information is provided for each field:

- **Description:** The field's description.
- **Format:** The field's data format.
- **Length:** The field's size, in bytes.

All ePDG-CDRs are encoded using the ASN.1 format and are sent to the charging gateway function (CGF) using the GPRS Tunneling Protocol Prime (GTPP) as defined in the following standards:

- 3GPP TS 29.060
- 3GPP TS TS32.298

Also see the *ePDG CDR Field Reference* chapter for information on CDR fields supported in ePDG-CDRs.



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**Important** The behavior for several of the fields supported in CDRs can be modified. For more information, refer to the **gtp attributes** command in the *Command Line Interface Reference*.

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## CDR Fields

### Access Point Name Network Identifier

This field contains the Network Identifier part of the Access Point Name (APN). This APN is sent to the ePDG by the UE and authorized by AAA and is relayed to the P-GW in the Create Session Request message. APN name selected from AAA server success response will be used for ePDG (IDr payload and AAA supplied should be the same). The APN string consists of alphabetic characters ("A..Z", "a..z"), digits ("0..9") and the dash "-". This is controlled by the CLI command "**gtp attribute apn-ni**".

**Format**

IA5string

**Length**

1-63 bytes

## APN Selection Mode

An index indicating how the APN was selected. This is controlled by the CLI command "**gtp attribute apn-selection-mode**".

The following APN selection mode index is possible:

0: MS or network provided APN, subscription verified

**Format**

Enumerated

**Length**

1 byte

## Cause for Record Closing

This field contains a reason for the closure of the CDR.

Supported values:

- normalRelease (0)
- abnormalRelease (4)
- volumeLimit (16)
- timeLimit (17)
- maxChangeCond (19)
- managementIntervention (20)

**Format**

Integer

**Length**

1 byte

## Charging Characteristics

Lists the charging characteristics applied to the PDP context by the ePDG. The ePDG accepts the charging characteristics from the AAA server or use its own configured values.

**Format**

Octet string

**Length**

2 bytes

## Charging Characteristics Selection Mode

This field specifies how the Charging Characteristics was selected. This is controlled by the CLI command "**gtpp attribute charging-characteristic-selection-mode**".

Supported values:

- subscriptionSpecific (1)
- aPNSpecific (2)

**Format**

Enumerated

**Length**

1 byte

## Charging ID

This field is a charging identifier, which can be used together with the P-GW address to identify all records involved in a single bearer context. The Charging ID is generated by the P-GW during bearer context activation and is transferred to the context requesting ePDG.

**Format**

Integer

**Length**

1-5 bytes

## Duration

This field contains the duration in seconds for the record. For partial records, only the interval described by the "recordOpeningTime" and the "last ChangeTime" in the "ListOfTrafficVolumes" is counted. The value is reset for each new partial CDR. This value is converted from the internal representation in milliseconds to an integer value representing only seconds. The mechanism for this conversion (ceiling, floor, round-off) can be configured.

**Format**

Integer

**Length**

1-5 bytes

## Dynamic Address Flag

This field indicates that the PDN address has been dynamically allocated for that particular IP-CAN bearer (PDN connection). This field is missing if address is static. Dynamic address allocation might be relevant for charging e.g. as one resource offered and possibly owned by network operator. This is controlled through the CLI command "**gtp attribute dynamic-flag**".

**Format**

Boolean

**Length**

1 byte

## Dynamic Address Flag Extension

This field indicates that the IPv4 address has been dynamically allocated for that particular IP-CAN bearer (PDN connection) of PDN type IPv4v6, and the dynamic IPv6 prefix is indicated in Dynamic Address Flag. This field is missing if IPv4 address is static. This is controlled through the CLI command "**gtp attribute dynamic-flag-extension**".

**Format**

Boolean

**Length**

1 byte

## ePDG Address Used

This field indicates the serving ePDG IP address for the Control Plane on S2b interface. If both an IPv4 and an IPv6 address of the ePDG is available, the ePDG includes the IPv4 address in the CDR. This is a choice attribute and the CDR can contain the binary format or the ASCII format in the CDR.

**Format**

Octet string

**Length**

6 bytes or 18 bytes based on the address type (IPv4 or IPv6)

## ePDG IPv4 Binary Address

The octet string included in the "ePDG Address Used" field includes the S2b IPv4 address of the ePDG service in binary coding.

**Format**

Octet string

**Length**

4 bytes

**ePDG IPv6 Binary Address**

The octet string included in the "ePDG Address Used" field includes the S2b IPv6 address of the ePDG service in binary coding.

**Format**

Octet string

**Length**

4 bytes

**ePDGiPv6Address**

This field indicates the control plane IPv6 address, in case of IPv4v6 dual stack, of the ePDG on S2b interface. This is controlled using the CLI command "**gtpp attribute sgw-ipv6-addr**".

**Format**

Octet string

**Length**

18 bytes

**ePDG IPv6 Binary Address**

This field indicates the control plane IPv6 address, in case of IPv4v6 dual stack, of the ePDG on S2b interface.

**Format**

Octet string

**Length**

16 bytes

**iMSSignalingContext**

Indicates if the IP-CAN bearer is used for IMS signaling. It is only present if the IP-CAN bearer is an IMS signaling bearer.

**Format**

Null

**Length**

Zero

## List of Traffic Data Volumes

This list includes one or more Traffic Volume containers related to a "Change of Charging Condition". The maximum number of containers is configurable.

**Format**

Sequence

**Length**

Variable

## Change Of Charging Condition

Each traffic volume container contains details related to a charging condition as described in the following subsections. A new container is usually created for a QoS change and for tariff changes.

**Format**

Sequence

**Length**

Variable

### GPRS Uplink data volume

The Data Volume GPRS Uplink field is a part of the "ChangeOfCharCondition" element in the List of Traffic Volumes. It includes the number of octets received in the uplink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.

The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.




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**Important** In the CDRs, the data volume usage field is defined with a maximum size of 4 bytes. If the volume triggers are disabled and the volume usage goes beyond 4GB, then the CDRs will not be generated and the data stats will be reset to zero after the max usage.

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**Format**

Integer

**Length**

1-5 bytes

**GPRS Downlink data volume**

The Data Volume GPRS Downlink field is a part of the "ChangeOfCharCondition" element in the List of Traffic Volumes. It includes the number of octets transmitted in the downlink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.

The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.




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**Important** In the CDRs, the data volume usage field is defined with a maximum size of 4 bytes. If the volume triggers are disabled and the volume usage goes beyond 4GB, then the CDRs will not be generated and the data stats will be reset to zero after the max usage.

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**Format**

Integer

**Length**

1-5 bytes

**Change Condition**

The Change Condition field is part of the "ChangeOfCharCondition" element in the List of Traffic Volumes. It defines the reason for closing the container.

Supported values:

```
ChangeCondition ::= ENUMERATED
{
    qosChange          (0),
    tariffTime         (1),
    recordClosure      (2)
}
```

**Format**

Enumerated

**Length**

1 byte

**Change time**

The Change Time field is part of the "ChangeOfCharCondition" element in the List of Traffic Volumes. It provides the local time when a change condition (e.g. record closure) occurred and the container was closed.

The format is shown below:

```
TimeStamp ::= OCTET STRING (SIZE(6))
```

The contents of this field are a compact form of the UTC Time format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead.

- e.g. YYMMDDhhmmssShhmm
- where
- YY = Year 00 to 99 BCD encoded
- MM = Month 01 to 12 BCD encoded
- DD = Day 01 to 31 BCD encoded
- hh = hour 00 to 23 BCD encoded
- mm = minute 00 to 59 BCD encoded
- ss = second 00 to 59 BCD encoded
- S = Sign 0 = "+", "-" ASCII encoded
- hh = hour 00 to 23 BCD encoded
- mm = minute 00 to 59 BCD encoded

#### Format

BCD encoded octet string

#### Length

9 bytes

## Local Record Sequence Number

This field contains a unique sequence number associated with the NodeId field and independent of the bearer context. For each Node ID, this number with range 1..4294967295 is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR. For ePDG-CDRs, this field is included only when the command **gtp attribute local-record-sequence-number** is configured.

#### Format

Octet String

#### Length

1-5 bytes

## MACAddress of AP

The AP-MAC address will be populated in ePDG-CDR only when it is supplied by UE during initial IKEv2 exchange in IDi payload as expected by ePDG. This is an optional proprietary parameter available only in custom38 GTPP dictionary.



**Format**

Octet string

**Length**

6 bytes

## Node ID

This field contains an identifier string for the node that had generated the CDR.

The NodeID field is a printable string of the ndddSTRING format:

n: The first digit is the Sessmgr restart counter having a value between 0 and 7.

ddd: The number of the sessmgr instance generating the CDR.

STRING: This is a configured Node-ID-Suffix having any string from 1 to 16 characters, defined using the **gtpp attribute node-id** command.

If this node-id-suffix is not configured, the ePDG uses the GTPP context name as the Node-id-suffix (truncated to 16 characters).

This field is included only when the command **gtpp attribute local-record-sequence-number** is configured.

**Format**

IA5string

**Length**

5-20 bytes

## PDN Connection Id

This field defines the PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection. This field includes Charging ID of first IP-CAN bearer activated within the PDN connection. Together with P-GW address this uniquely identifies the PDN connection. This is controlled by the CLI command "**gtpp attribute pdn-connection-id**".

**Format**

Integer

**Length**

1-5 bytes

## PDP PDN Type

This field is controlled through the CLI command "**gtpp attribute pdp-type**".

-- OCTET 1: PDP Type Organization

Spare '1111' PDP Type Organization Value

PDP Type Organization	Value
ETSI	0
IETF	1

NOTE: In LTE, only IETF is supported.

#### -- OCTET 2: PDP/PDN Type Number

```

Bits
3   2   1
0   0   1   IPv4
0   1   0   IPv6
0   1   1   IPv4/IPv6
Bits 8-4 of octet are spare and are coded as zero.

```

#### Format

Octet string

#### Length

2 bytes

## PGW Address used

This field is the serving P-GW IP address for the Control Plane. If both an IPv4 and an IPv6 address of the P-GW is available, the P-GW includes the IPv4 address in the CDR. This is a choice attribute and the CDR can contain the binary format or the ASCII format in the CDR.

#### Format

Octet string

#### Length

The length can vary based on whether the encoded IP address is IPv4 or IPv6.

## PGW IPv4 Binary Address

The octet string included in the field "PGW Address used" includes the IPv4 address of the P-GW in binary coding.

#### Format

Octet string

#### Length

4 bytes

## PGW Ipv6 Binary Address

The octet string included in the field "PGW ipv6 Address used" includes the IPv6 address assigned to the subscriber by the P-GW in binary coding.

### Format

Octet string

### Length

16 bytes

## PGW PLMN Identifier

This field indicates the PLMN identifier (MCC MNC) of the P-GW used. MCC and MNC are coded as described for "User Location Info" in 3GPP TS 29.274. This is controlled by the CLI command "**gtp attribute pgw-plmn-id**".

### Format

Octet string

### Length

3 bytes

## RAT Type

Holds the value of RAT Type, as provided to ePDG and P-GW, described in TS 29.274. This is controlled through the CLI command "**gtp attribute rat**".

RAT Types	Values (Decimal)
WLAN	3

### Format

Integer

### Length

1 byte

## Record Opening Time

This field contains the time stamp when a PDP context is activated or when a subsequent record is opened after a partial record.

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off), this is translated into the timestamp which only shows the full seconds.

The format is shown below:

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTC Time format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead.

-- e.g. YYMMDDhhmmssShhmm

-- where

-- YY = Year 00 to 99 BCD encoded

-- MM = Month 01 to 12 BCD encoded

-- DD = Day 01 to 31 BCD encoded

-- hh = hour 00 to 23 BCD encoded

-- mm = minute 00 to 59 BCD encoded

-- ss = second 00 to 59 BCD encoded

-- S = Sign 0 = "+", "-" ASCII encoded

-- hh = hour 00 to 23 BCD encoded

-- mm = minute 00 to 59 BCD encoded

#### **Format**

BCD encoded octet string

#### **Length**

9 bytes

## **Record Sequence Number**

A running sequence number with range 1.. 4294967296 used to link partial records generated by the ePDG for a specific IP-CAN bearer context (characterized with the same Charging ID and P-GW address). This field is not present if the first record is also the final record.

#### **Format**

Integer

#### **Length**

1-5 bytes

## Record Type

This field identifies the type of the record.

ePDG-CDR(ePDGRECORD) 96 (0x60)

### Format

Integer

### Length

1 byte

## Served IMSI

This field contains the International Mobile Subscriber Identity (IMSI) of the served party. The IMSI is formatted in accordance with 3GPP TS 23.003. The IMSI is extracted from MN-ID AVP from AAA or NAI (username part contains IMSI).

Example for Coding: (Set by SGSN)

```
3GPP TS 23.003 (CCITT Rec. E 212)
ServedIMSI ::= OCTET STRING (SIZE(1..8))
-- subscriber identification IMSI
-- octet 1..8: <= 15 digits TBCD-String (twisted)
-- substructure (without spares or fillers):
-- 3 digits - mobile country code (MCC)
-- 2 digits - mobile network code (MNC)
-- <= 10 digits - mobile subscriber identification number (MSIN)
-- first and intermediate octet = 2 digits
-- last octet = 2 digits or 1 digit + 1 fill digit H'F
--
-- example:
-- IMSI: '262025600010020'
-- filled: '262025600010020F'
-- encoded: H'62 02 52 06 00 01 20 F0
```

### Format

BCD encoded octet string

### Length

3-8 bytes

## Served MSISDN

This field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is transparently copied from the Create Session Request message. The MSISDN is supplied by AAA in "Subscription-ID" AVP for ePDG. This is controlled through the CLI command "**gtpp attribute msisdn**".

The MSISDN is TBCD encoded as shown in the example below:

3GPP TS 23.003 (CCITT Rec. E 213)

ServedMSISDN ::= OCTET STRING (SIZE(1..9))

MSISDN in CDR is 1:1 copy of the MSISDN sent in GTP-V2 message. MSISDN value contains only the actual MSISDN number (does not contain the "nature of address indicator" octet, which indicates "international number" as in 3GPP TS 29.002) and is encoded as TBCD digits (i.e. digits from 0 through 9 are encoded "0000" to "1001"). When there is an odd number of digits, bits 8 to 5 of the last octet are encoded with the filler "1111".

Example:

encoded: H' 94 71 02 04 30 50

#### Format

BCD encoded octet string

#### Length

1-9 bytes

## Served PDP PDN Address

This field contains the IP address for the PDN connection (PDP context, IP-CAN bearer) if available. This is a network layer address of type IP version 4 (PDN Type is IPv4) or IP version 6 (PDN Type is IPv6 or IPv4v6). The address for each bearer type is allocated either temporarily or permanently (see "Dynamic Address Flag"). This parameter is present except when both the bearer type is PPP and dynamic address assignment is used. This is controlled through the CLI command "**gtp attribute pdp-address**".

NOTE: IP address allocated for the PDP context / PDN connection, if available, i.e. IPv4 when PDN Type is IPv4 or IPv6 when PDN Type is IPv6 or IPv4v6.

#### Format

Octet string

#### Length

8 bytes or 20 bytes based on the address type (IPv4 or IPv6)

## PDP IP Address

This field contains the IP address for the PDP context.

#### Format

IP address

#### Length

The length can vary based on whether the encoded IP address is IPv4 or IPv6.

## PDP IPv4 Binary Address

The octet string included in the field "PDP IP Address" includes the IPv4 address of the P-GW in binary coding.

**Format**

Octet string

**Length**

4 bytes

**PDP IPv6 Binary Address**

The octet string included in the field "PDP IP Address" includes the IPv6 address of the P-GW in binary coding.

**Format**

Octet string

**Length**

16 bytes

## Served PDP PDN Address Extension

This field contains the IPv4 address for the PDN connection (PDP context, IP-CAN bearer) when dual-stack IPv4v6 is used, and the IPv6 address is included in Served PDP Address or Served PDP PDN Address.

This field is not included if the PDP/PDN address is IPv4 or IPv6. By default, this field is not sent, even if the PDP Type is IPv4v6; this field must be enabled using the **gtpp attribute served-pdp-pdn-address-extension** CLI command.



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**Important** Note that this field is not part of the 3GPP 32.298 Release 6 and 7 specifications. This field is an Rel.9 attribute and it can be present in Rel.7 or Rel.8 dictionary if enabled through the **gtpp attribute served-pdp-pdn-address-extension** CLI command.

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**Format**

Octet string

**Length**

8 bytes

## PDP IP Address

This field contains the IP address for the PDP context.

**Format**

IP address

**Length**

The length can vary based on whether the encoded IP address is IPv4 or IPv6.

**PDP IPv4 Binary Address**

The octet string included in the "PDP IP Address" field includes the IPv4 address of the P-GW in binary coding.

**Format**

Octet string

**Length**

4 bytes

**Start Time**

This field contains the time when the IP-CAN session starts at the ePDG/P-GW, available in the CDR for the first bearer in an IP-CAN session. This is controlled through the CLI command "**gtpp attribute start-time**".

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTC Time format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm

-- where

-- YY = Year 00 to 99 BCD encoded

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-- ss = second 00 to 59 BCD encoded

-- S = Sign 0 = "+", "-" ASCII encoded

-- hh = hour 00 to 23 BCD encoded

-- mm = minute 00 to 59 BCD encoded

**Format**

BCD encoded octet string



**Length**

9 bytes

## Stop Time

This field contains the time when the IP-CAN session is terminated at the ePDG/P-GW, available in the CDR for the last bearer in an IP-CAN session. This is controlled through the CLI command "**gtp attribute stop-time**".

The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off) this is translated into the timestamp which only shows the full seconds.

The format is shown below.

TimeStamp ::= OCTET STRING (SIZE(6))

The contents of this field are a compact form of the UTC Time format containing local time plus an offset to universal time. Binary coded decimal encoding is employed for the digits to reduce the storage and transmission overhead

-- e.g. YYMMDDhhmmssShhmm

-- where

-- YY = Year 00 to 99 BCD encoded

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-- ss = second 00 to 59 BCD encoded

-- S = Sign 0 = "+", "-" ASCII encoded

-- hh = hour 00 to 23 BCD encoded

-- mm = minute 00 to 59 BCD encoded

**Format**

BCD encoded octet string

**Length**

9 bytes

## UE Tunnel Information

This field contains the UE Tunnel information (UE IP address and port and ePDG IP address and port on SWu interface). The IP addresses will be binary encoded and present in sequence. This is an optional proprietary parameter available only in custom38 GTPP dictionary.

**Format**

Sequence

**Length**

The length varies based on whether the encoded IP address is IPv4 or IPv6.

## UE Tunnel Endpoint IP Address

This sub-field is the UE Tunnel endpoint IP address on SWu interface. The IP addresses will be binary encoded and can be IPv4 or IPv6 address.

**Format**

Octet string

**Length**

6 or 18 bytes depending on the encoded IP address type

## UE Tunnel Endpoint Port

This field is the UE Tunnel endpoint port on SWu interface.

**Format**

Octet string

**Length**

2 bytes

## ePDG Tunnel Endpoint IP Address

This field indicates the ePDG Tunnel IP address on SWu interface. The IP addresses will be binary encoded and can be IPv4 or IPv6 address.

**Format**

Octet string

**Length**

6 or 18 bytes depending on the encoded IP address type

## ePDG Tunnel Endpoint Port

This field is the ePDG Tunnel endpoint port on SWu interface.

**Format**

Octet string

**Length**

2 bytes

