

P-GW CDR Field Descriptions

This chapter describes the CDR fields supported by the system for use in PGW-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 PGW-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 32.015
- 3GPP TS 32.215
- 3GPP TS 32.251 (v8.5.0, v8.6.0)
- 3GPP TS 32.298 (v8.4.0, v8.5.0) (PGW-CDRs)

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

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

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CDR Fields

Access Point Name Network Identifier

The network identifier portion of the Access Point Name (APN). This APN is sent to the S-GW by the MME and is relayed to the P-GW in the EGTP Create Session Request message.

The APN string may consist of alphabetic characters ("A...Z", "a...z"), digits ("0...9") and the dash "-".

Format

IA5 string

Length

1–63 bytes

AF Record Information

This field includes the **AF Charging Identifier** and associated flow identifiers generated by the AF and received by the P-GW over Gx interfaces.



Note

- 'Flows' information is not supported on Cisco P-GW currently. The **AF Record Information** field is not part of the 3GPP 32.298 Release 6 and 7 specifications. The **AF Record Information** field is an Release 15 attribute and it is present in Release 8 dictionary if enabled through the gtpp attribute **af-record-info** CLI command. This attribute will be available for the dictionaries custom35, custom24, custom44, custom48, custom50,custom52,custom53, and custom34 only when the CLI command gtpp attribute **af-record-info** is configured.
- The P-GW CDR generated for PDP Context Release does not contain the AFCID field in the following scenario:
  - When P-GW sends Re-Authorization Request (RAR) with Dynamic Rule1 with AFCID and traffic is not sent after the RAR, and if P-GW sends a second RAR with Dynamic Rule2 without AFCID and traffic is sent after the RAR.

Format

Sequence OF

Section

Holds the OCTET String size

AF-ChargingIdentifier

The AF-Charging-Identifier AVP (AVP code 505) contains the AF Charging Identifier that is sent by the AF. This information is used for charging correlation with bearer layer. The IM CN subsystem Charging Identifier (ICID) value is globally unique across all 3GPP IMS networks for a time period of at least one month. This implies that neither the node that generated this ICID nor any other IMS Network Element can reuse this value before the uniqueness period expires. The one month minimum uniqueness period count starts from the time of release of the ICID and is achieved by using node specific information, for example, high-granularity time information , or topology or location information.

Format

Octet string

Length

variable

APN Selection Mode

An index indicating how the APN was selected.

The following APN selection mode indexes are possible:

- 0: MS or network provided APN, subscription verified
- 1: MS provided APN, subscription not verified
- 2: Network provided APN, subscription not verified

Format

Enumerated

Length

1 byte

Cause for Record Closing

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

Some of the possible reasons are as follows:

- normalRelease (0): The PDP context was terminated normally through a PDP context release (end of context or SGSN change) or a GPRS detach.
- abnormalRelease (4): The PDP context was abnormally terminated.
- volumeLimit (16): The PDP context was terminated due to exceeding volume limit.
- timeLimit (17): The PDP context was terminated due to exceeding time limit.
- servingNodeChange (18): The PDP context was terminated due to Serving Node Address List Overflow.
- maxChangeCond (19): The PDP context was terminated due to exceeding the changed condition limit.
- managementIntervention (20): The record was closed due to an O&M; request, or change in rulebase triggered from any external interface e.g. OCS, PCRF.
- rATChange (22): The PDP context was terminated due to change in RAT.
- mSTimeZoneChange (23): The PDP context was terminated due to change in time zone of MS.
- PLMNChange (24): The PDP context was terminated due to change of PLMN-ID.
- Ocs_Unreachable (302): The PDP context was terminated due to change of PLMN-ID.
- Ocs_Reachable (303): The PDP context was terminated due to change of PLMN-ID.
- Ocs_Status_Unknown (304): The PDP context was terminated due to change of PLMN-ID.

- Partial record generation: A partial CDR was generated for reasons such as the reaching of data volume or time (duration) limits, or reaching the maximum number of charging condition changes.

Note that the Ocs_Unreachable (302), Ocs_Reachable (303), and Ocs_Status_Unknown (304) Cause for Record Closing reasons are applicable only to custom45 GTPP dictionary for P-GW.

Format

Integer

Length

1 byte

Charging Characteristics

Lists the charging characteristics applied to the PDP context by the P-GW.



Important For the custom42 GTPP dictionary, release 14.0 onwards, the Charging Characteristics (CC) field with the value greater than 9 should be encoded in hexadecimal format instead of decimal format.

Format

Octet string

Length

2 bytes

Charging Characteristics Selection Mode

This field specifies how the Charging Characteristics were selected.

Supported values:

- servingNodeSupplied (0)
- homeDefault (3)
- roamingDefault (4)
- visitingDefault (5)
- AAASupplied (6)
- GWOverride (7)

Note: The values AAASupplied (6) and GWOverride (7) are only supported in the custom40 GTPP dictionary.

Format

Enumerated

Length

1 byte

Charging ID

This field contains 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 P-GW.

Format

Integer

Length

1–5 bytes

Diagnostics

This field is included in the CDR when the bearer is released and when the option **gtpp attribute diagnostics** is configured.

Format

Integer

Length

Variable

Network Specific Cause (GTPP custom34 Dictionary)

Customer-specific field included when the optional Diagnostics field is included for GTPP custom34 dictionary.

Network Specific Cause ::= Management Extension Sequence

Field Name	Description	Format	ASN.1 Code
identifier	OBJECT IDENTIFIER for diagnostics	OCTET STRING	6
significance	BOOLEAN DEFAULT FALSE	BOOLEAN	81
information	SEQUENCE OF CauseInformation		A2
CauseInformation	SEQUENCE		30
msgTimestamp	message TimeStamp	TimeStamp	81
msgType	message Type	INTEGER	82
msgSourceIp	Source IP Address	IP Address	A3

Field Name	Description	Format	ASN.1 Code
msgCause	Cause Code	OCTET STRING	84
abnormalTerminationCause	Abnormal Termination Cause Code	ENUM	83

Format

Management Extensions

Length

Always included when the optional Diagnostics field is included

Duration

This field contains the duration in seconds for the record. 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.

Important For custom40 GTPP dictionary, the duration is first calculated based on the actual opening and closing times of the record, and then rounded off. For all other GTPP dictionaries, the opening and closing times are first rounded off and then used for the calculation of duration.

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 the address is static.

Format

Boolean

Length

1 byte

List of RAN Secondary RAT Usage Reports

This field includes one or more containers reported from the RAN for a secondary RAT.

Format

Sequence of RAN Secondary RAT Usage Report

Length

Variable

RAN Secondary RAT Usage Report

This field includes one or more containers reported from the RAN for a secondary RAT.

Each container includes the following fields.

Format

Sequence

Length

Variable

Data Volume Downlink

This field includes the number of octets transmitted during the use of the packet data services in the downlink direction reported from RAN. The counting and reporting from RAN of downlink data volumes is optional.

Format

Integer

Length

9 bytes

Data Volume Uplink

This field includes the number of octets transmitted during the use of the packet data services in the uplink direction reported from RAN. The counting and reporting from RAN of uplink data volumes is optional.

Format

Integer

Length

9 bytes

RAN Start Time

This field is a time stamp, which defines the moment when the volume container is opened by the RAN.

Format

Timestamp

Length

9 bytes

RAN End Time

This field is a time stamp, which defines the moment when the volume container is closed by the RAN.

Format

Timestamp

Length

9 bytes

Secondary RAT Type

This field contains the RAT type for the secondary RAT.

Format

Integer

Length

1 byte

List of Service Data

This list includes one or more service data containers. Each container is associated with a service condition change on a service data flow (categorized per rating group or per combination of the rating group and service ID) within this IP CAN bearer.



Important The List of Service Data field will be present in a P-GW CDR only if there is non-zero data consumption.

In releases prior to 18.0, the customer-specific GTPP dictionaries "custom38" and "custom39" have restriction of one Service Data Container per CDR. In 18.0 and later releases, this restriction is removed for these two dictionaries and the number of containers per CDR is configurable through the CLI "**gtpp egcdr losdv-max-containers**". Note that the default value of max_losdv is 10 and max_losdv attribute is configurable for both custom38 and custom39 dictionaries. Default value of max_lotv in GTPP group is 8 and max_lotv is now configurable.

Format

Sequence

Length

Variable

Data Service Volume Block

This is a service data container. A container is associated with a service condition change on a service data flow (categorized per rating group or per combination of the rating group and service id) within this IP CAN bearer.

A service data container may include the fields in the following subsections.

Format

Sequence

Length

Variable

Charging Rulebase Name

The name of the Rulebase used for charging. This is the group name of charging rules.

Format

IA5string

Length

1–63 bytes

Data Volume FBC Downlink

The number of octets transmitted during the use of the packet data services in the downlink direction.

Format

Integer

Length

1–5 bytes

Data Volume FBC Uplink

The number of octets received during the use of the packet data services in the uplink direction.

Format

Integer

Length

1–5 bytes

Failure Handling Continue

This parameter is included when the failure handling procedure has been executed and new containers are opened. This parameter shall be included in the first and subsequent containers opened after the failure handling execution.

Format

Boolean

Length

1 byte

Local Sequence Number (LOSDV)

A service data container sequence number. It starts from 1 and is increased by 1 for each service data container generated within the lifetime of this IP-CAN bearer.

Format

Integer

Length

1–5 bytes

QoS Information Negotiated

For an IP-CAN bearer-specific container, this contains the authorized QoS for the IP-CAN bearer. The first container for each QCI/ARP pair includes this field. In the following containers this field is present if the previous change condition is "QoS change".

This field contains a sequence of the following subfields:

Field Name	Value	Format	Category
qCI	1	Integer	
maxRequestedBandwithUL	2	Ineger	Optional
maxRequestedBandwithDL	3	Integer	Optional
guaranteedBitrateUL	4	Integer	Optional
guaranteedBitrateDL	5	Integer	Optional
aRP	6	Integer	Optional
extendedMaxRequestedBWUL	9	Integer	Optional
extendedMaxRequestedBWDL	10	Integer	Optional
extendedGBRUL	11	Integer	Optional
extendedGBRDL	12	Integer	Optional
extendedAPNAMBRUL	13	Integer	Optional

Field Name	Value	Format	Category
extendedAPNAMBRDL	14	Integer	Optional

Format

Sequence

Length

Variable

Allocation and Retention Priority (ARP)

The ARP contains information about the priority level (scalar), the pre-emption capability (flag) and the pre-emption vulnerability (flag). The primary purpose of ARP is to decide whether a bearer establishment or modification request can be accepted, or needs to be rejected due to resource limitations (typically available radio capacity for GBR bearers). Range: 1-127.

Format

Integer

Length

1–5 bytes

Guaranteed Bit Rate (GBR) Downlink

The GBR denotes the downlink bit rate that can be expected to be provided by a GBR bearer.

Format

Integer

Length

1–5 bytes

Guaranteed Bit Rate (GBR) Uplink

The GBR denotes the uplink bit rate that can be expected to be provided by a GBR bearer.

Format

Integer

Length

1–5 bytes

Maximum Bit Rate (MBR) Downlink

The MBR limits the downlink bit rate that can be expected to be provided by a GBR bearer (for example, excess traffic may get discarded by a rate shaping function).



Important Note that, if the CLI command **gtpp attribute apn-ambr** is configured in the GTPP Server Configuration mode, the values of APN-AMBR attribute will be populated in the PGW-CDR in the custom24 GTPP dictionary.

Format

Integer

Length

1–5 bytes

Maximum Bit Rate (MBR) Uplink

The MBR limits the uplink bit rate that can be expected to be provided by a GBR bearer.



Important Note that, if the CLI command **gtpp attribute apn-ambr** is configured in the GTPP Server Configuration mode, the values of APN-AMBR attribute will be populated in the PGW-CDR in the custom24 GTPP dictionary.

Format

Integer

Length

1–5 bytes

Quality Class Identifier (QCI)

A QCI is a scalar that is used as a reference to access node-specific parameters that control bearer level packet forwarding treatment (for example, scheduling weights, admission thresholds, queue management thresholds, link layer protocol configuration, etc.), and that have been pre-configured by the operator owning the access node (for example, eNodeB). Value Range: 1-9.

Format

Integer

Length

1–5 bytes

Rating Group

This is the service flow identity and must be used for differentiated evaluation of user's traffic. This is also known as content-id.

Format

Integer

Length

1–5 bytes

Result Code

This is filled by OCS on Gy interface.

The following are the values as per RFC 3588 and 4006 (Other Result Codes not defined in the RFCs can also be seen in the Result Code field if sent by OCS):

- DIAMETER_SUCCESS 2001
- DIAMETER_LIMITED_SUCCESS 2002
- DIAMETER_COMMAND_UNSUPPORTED 3001
- DIAMETER_UNABLE_TO_DELIVER 3002
- DIAMETER_REALM_NOT_SERVED 3003
- DIAMETER_TOO_BUSY 3004
- DIAMETER_LOOP_DETECTED 3005
- DIAMETER_REDIRECT_INDICATION 3006
- DIAMETER_APPLICATION_UNSUPPORTED 3007
- DIAMETER_INVALID_HDR_BITS 3008
- DIAMETER_INVALID_AVP_BITS 3009
- DIAMETER_UNKNOWN_PEER 3010
- DIAMETER_AUTHENTICATION_REJECTED 4001
- DIAMETER_OUT_OF_SPACE 4002
- ELECTION_LOST 4003
- DIAMETER_END_USER_SERVICE_DENIED 4010
- DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE 4011
- DIAMETER_CREDIT_LIMIT_REACHED 4012
- DIAMETER_AVP_UNSUPPORTED 5001
- DIAMETER_UNKNOWN_SESSION_ID 5002
- DIAMETER_AUTHORIZATION_REJECTED 5003
- DIAMETER_INVALID_AVP_VALUE 5004
- DIAMETER_MISSING_AVP 5005
- DIAMETER_RESOURCES_EXCEEDED 5006
- DIAMETER_CONTRADICTING_AVPS 5007
- DIAMETER_AVP_NOT_ALLOWED 5008

- DIAMETER_AVP_OCCURS_TOO_MANY_TIMES 5009
- DIAMETER_NO_COMMON_APPLICATION 5010
- DIAMETER_UNSUPPORTED_VERSION 5011
- DIAMETER_UNABLE_TO_COMPLY 5012
- DIAMETER_INVALID_BIT_IN_HEADER 5013
- DIAMETER_INVALID_AVP_LENGTH 5014
- DIAMETER_INVALID_MESSAGE_LENGTH 5015
- DIAMETER_INVALID_AVP_BIT_COMBO 5016
- DIAMETER_NO_COMMON_SECURITY 5017
- DIAMETER_USER_UNKNOWN 5030
- DIAMETER_RATING_FAILED 5031

Format

Integer

Length

1–5 bytes

Service Condition Change

The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc.

Bit Setting regarding TS 32.298:

- qoSChange (0), bearer modification
- sGSNChange (1), bearer modification
- sGSNPLMNIDChange (2), bearer modification
- tariffTimeSwitch (3), tariff time change
- pDPContextRelease (4), bearer release
- rATChange (5), bearer modification
- serviceIdledOut (6), IP flow idle out, DCCA QHT expiry
- reserved (7), old: QCTexpiry is no report event
- configurationChange (8), configuration change
- serviceStop (9), IP flow termination
- dCCATimeThresholdReached (10), DCCA quota reauth.
- dCCAVolumeThresholdReached (11), DCCA quota reauth.

- dCCAServiceSpecificUnitThresholdReached (12), DCCA quota reauth.
- dCCATimeExhausted (13), DCCA quota reauth.
- dCCAVolumeExhausted (14), DCCA quota reauth.
- dCCAValidityTimeout (15), DCCA quota validate time (QVT expiry)
- reserved (16), reserved due to no use case, old: return Requested is covered by (17), (18)
- dCCAReauthorisationRequest (17), DCCA quota reauthorization request by OCS
- dCCAContinueOngoingSession (18), DCCA failure handling continue IP flow
- dCCARetryAndTerminateOngoingSession (19), DCCA failure handling terminate IP flow after DCCA retry
- dCCATerminateOngoingSession (20), DCCA failure handling, terminate IP flow
- cGISAIChange (21), bearer modification
- rAIChange (22), bearer modification
- dCCAServiceSpecificUnitExhausted (23), DCCA quota reauthorization
- recordClosure (24), PGW-CDR closure
- timeLimit (25), intermediate recording
- volumeLimit (26), intermediate recording
- serviceSpecificUnitLimit (27), intermediate recording
- envelopeClosure (28)
- eCGIChange (29), bearer modification. "ECGI Change"
- tAIChange (30), bearer modification. "TAI Change"
- userLocationChange (31) bearer modification. "User Location Change"

Releases prior to 14.0, the CGISAIChange service condition exists in LOSDV of PGW-CDR even if ULI Change trigger is disabled. In releases 14.0 and beyond, if the ULI Change trigger is disabled and if the ULI is changed, the CGISAIChange service condition is not present in LOSDV of PGW-CDR.

Format

Bit string

Length

5 bytes

Service Identifier

The service identifier may designate an end user service, a part of an end user service, or an arbitrarily formed group thereof. This field is only included if reporting is per combination of the rating group and service ID.

Format

Integer

Length

1–5 bytes

Serving Node Address (LOSDV)

This field contains the serving node (for example, SGSN/S-GW) control plane IP address.

Format

Octet string

Length

6 or 18 bytes (depending on v4 or v6 address)

Time of First Usage

The timestamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.

Format

BCD encoded octet string

Length

9 bytes

Time of Last Usage

The timestamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.

Format

BCD encoded octet string

Length

9 bytes

Time of Report

A timestamp defining the moment when the service data container is closed.

Format

BCD encoded octet string

Length

9 bytes

Time Usage

The difference in seconds within the range of 0.to.4294967295 between "time of first usage" and "time of last usage".

Format

Integer

Length

1–5 bytes

User Location Information (LOSDV)

This field indicates details of where the UE is currently located (SAI, TAI, RAI, CGI, ECGI or access-specific user location information).

Format

Octet string

Length

6–13 bytes

Local Sequence Number

This field contains a unique sequence number associated with the Node ID field and independent of the bearer context.

Format

Integer

Length

1–5 bytes

Low Access Priority Indicator

This field indicates if the PDN connection has a low priority, i.e. for Machine Type Communication.



Important This attribute field is currently available only in custom35 , custom38 and custom40 GTPP dictionaries for PGW-CDRs when the CLI command "**gtpp attribute lapi**" is configured in GTPP Server Group Configuration mode.

Format

Null

Length

1 Byte

MS Time Zone

The "Time Zone" IE that the SGSN may provide to the P-GW during the PDP context activation/modification procedure.

Format

Octet string

Length

2 bytes

Node ID

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

On the Cisco P-GW, this Node ID field is a printable string in the format ndddSTRING:

Format Variable	Meaning
n	The first digit is th.e Sessmgr restart counter having a value between 0 and 7.
ddd	The number of the session manager instances generating the CDR.
STRING	This is a configured Node-ID-Suffix having any string between 1 and 16 characters, defined using the **gtpp attribute node-id** command. If this node-id-suffix is not configured, the P-GW uses the active-charging service name as the Node-id-suffix (truncated to 16 characters). This field is only included when the option **gtpp attribute local-record-sequence-number** is configured.

Format

IA5string

Length

1–20 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 the Charging Id of the first IP-CAN bearer activated within the PDN connection. Together with P-GW address, this uniquely identifies the PDN connection.

Format

Integer

Length

1–5 bytes

PDP PDN 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

P-GW Address

These 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 shall include the IPv4 address in the CDR.

Format

Octet string

Length

6 or 18 bytes (depending on v4 or v6 address)

P-GW PLMN Identifier

This field is the P-W PMLN Identifier (Mobile Country Code and Mobile Network Code).

The MCC and MNC are coded as described for "User Location Info" in TS 29.274 [91].

Format

Octet string

Length

3 bytes

PSFurnishChargingInformation

This field contains charging information sent by the OCS in the Diameter Credit Control Credit-Control-Answer messages as defined in 3GPP TS 32.251.



Important The Furnish Charging Information (FCI) feature is currently applicable to all GTPP dictionaries that are compliant to 3GPP Rel.7 and 3GPP Rel.8 standard. Note that custom43 (rel. 8 compliant) dictionary has additional custom handling with respect to free format data encoding and FCI change trigger for CDR generation. This feature is CLI-controlled.

Note that inclusion of this field in the CDR for any given GTPP dictionary is controlled through the CLI command **gtpp attribute furnish-charging-information** in the GTPP Server Group Configuration mode. PGW-CDR and eG-CDR will contain FCI based on the GTPP group configuration.

For dictionaries other than custom43, whenever FCI changes, a new Free-Format-Data (FFD) value is either appended to existing FFD or overwritten on the current FFD for online charging session depending on Append-Free-Format-Data (AFFD) flag. CDR is not generated upon FCI change.

FCI is supported in main CDR as well as in LOSDV. Whenever a trigger (volume, time, RAT, etc.) happens current available FFD at command level is added to the main body of the CDR. The same FFD at command level is added to the main body of the next CDRs until it is not appended or overwritten by next Credit-Control-Answer message at command level.

The command level FCI implementation for custom43 dictionary can be outlined as follows:

- Whenever FCI changes at main command level PGW-CDR will be generated. This PGW-CDR will include the old FCI value. The Cisco proprietary value for change condition trigger will be 301 (FCI_CHANGE).
- Translation for the PS-Free-Format-Data in CDR will be conversion of hexadecimal values in ASCII format (for numbers 0 to 9) to decimal values as integers.
- PS-Append-Free-Format-Data always OVERWRITE at command level (main body of CDR).

Important Note the above described behavior applies only to command level PS FCI.

Format

Sequence

Length

Variable

RAT Type

Holds the value of RAT Type, as provided to S-GW and P-GW, described in TS 29.274 for eGTP case.

RAT Types	Values (Decimal)
<reserved>	0
UTRAN	1
GERAN	2
WLAN	3
GAN	4
HSPA Evolution	5
EUTRAN	6
<spare>	7-255

The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

Format

Integer

Length

1 byte

Record Extension (GTPP custom34 Dictionary)

Proprietary field used to report a RAN cause code and packet counts. In 16.0 and later releases, the IE "packet count" in the Record Extension field of custom34 and custom35 dictionaries has been changed as "packetCount".

Important Note that, in releases prior to 14.0, the RAN and NAS cause codes were not included in PGW-CDR when Delete Bearer Command is received, instead were included when Delete Session Command is received. In 14.0 and later releases, these cause codes are populated in the PGW-CDRs for custom34 GTPP dictionary during Delete Bearer Command.

Field Name	Description	Format	ASN.1 Code
recordExtensions (#19)	ManagementExtensions	SET OF ManagementExtension	0xB3
ManagementExtension	SEQUENCE of RAN Causecode		0x30
identifier	OBJECT IDENTIFIER for RAN cause code	OCTET STRING	0x6
significance	BOOLEAN DEFAULT FALSE	BOOLEAN	0x81
information	SEQUENCE OF CauseInformation	OCTET STRING	0xA2
CauseInformation	SEQUENCE		0x30
msgTimestamp	message TimeStamp	TimeStamp	0x81
msgType	message Type	INTEGER	0x82
msgSourceIp	Source IP Address	IP Address	0x83
msgCause	Cause Code	OCTET STRING	0x84
recordExtensions	ManagementExtensions	SET OF ManagementExtension	0xB3
ManagementExtension	uplink packet count SEQUENCE		0x30
identifier	OBJECT IDENTIFIER for uplink data	OCTET STRING	0x6
significance	BOOLEAN DEFAULT FALSE	BOOLEAN	0x81
information	ANY DEFINED BY identifier		0xA2
identifier value	uplink packet count	INTEGER	0x2
ManagementExtension	downlink packet count SEQUENCE		0x30
identifier	OBJECT IDENTIFIER for downlink data	OCTET STRING	0x6
significance	BOOLEAN DEFAULT FALSE	BOOLEAN	0x81

Field Name	Description	Format	ASN.1 Code
information	ANY DEFINED BY identifier		0xA2
identifier value	downlink packet count	INTEGER	0x2

Format

Management Extensions

Length

Variable

Record Extension (GTPP custom38 Dictionary)

List of Service Level CDRs.

Format

Sequence

Length

Variable

Service Level CDR (GTPP custom38 Dictionary)

A sequence of CSG fields.

Format

Sequence

Length

Variable

Quota Server Flags (GTPP custom38 Dictionary)

Used to notify the receiver of various conditions or actions of the quota server:

- Flags Value: 0x00000001
- Description: Passthru used

Format

Integer

Length

0–4 bytes

Qualified Usage (GTPP custom38 Dictionary)

Specifies qualified usage and defining units of service. Used for credit-control.

Format

Integer

Length

0–19 bytes

Usage (GTPP custom38 Dictionary)

Holds the value of number of quadrans used.

Format

Octet string

Length

8 bytes

Units (GTPP custom38 Dictionary)

- 1 = Seconds
- 2 = Bytes IP
- 3 = Bytes TCP
- 4 = Transactions
- 5 = Seconds transaction

Format

Integer

Length

1 byte

Service ID (GTPP custom38 Dictionary)

An octet string which denotes the name of the Service. Rating Group of PGW-CDR (service data) will be used for this information.

Format

Octet string

Length

0–128

Service IP Volume Usage (GTPP custom38 Dictionary)

IP level volume usage. When this volume is calculated, all the L4-L7 headers are counted (i.e., volume equals length of IP packet).

Format

Sequence

Length

0–24 bytes

Cumulative IP Bytes Uploaded (GTPP custom38 Dictionary)

Holds the cumulative value of IP bytes uploaded.

Format

Integer

Length

0–4 bytes

Cumulative IP Bytes Downloaded (GTPP custom38 Dictionary)

Holds the cumulative value of IP bytes downloaded.

Format

Integer

Length

0–4 bytes

Delta IP Bytes Uploaded (GTPP custom38 Dictionary)

Holds the value of delta of IP bytes uploaded.

Delta IP Bytes Downloaded (GTPP custom38 Dictionary)

Holds the value of delta of IP bytes downloaded.

Session ID (GTPP custom38 Dictionary)

A unique session ID that is assigned to each user session. A user going to multiple services will be assigned a unique session ID for each service.

Format

Octet string

Length

0–128 bytes

Time of First Usage (GTPP custom38 Dictionary)

The timestamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.

Format

BCD encoded octet string

Length

9 bytes

Record Opening Time

This field contains the timestamp when a PDP context is activated in PGW 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, or round-off) this field is translated to only show full seconds.

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

For example: YYMMDDhhmmssShhmm

Format Variable	Meaning	Encoding Format
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 within the range of 1 to 4294967296 used to link partial records generated by the P-GW 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:

PGW-CDR (pgwPDPRecord) 85 (0x55)

Format

Integer

Length

1 byte

Served IMEISV

This field contains the International Mobile Equipment Identity (IMEISV) of the equipment served.

The structure of the IMEI is defined in TS 23.003.

The IMEI is composed of the following elements:

- Type Allocation Code (TAC). Its length is 8 digits.
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

If SV is not available, a filler digit "f" is added after the spare digit to fill up the last byte. Spare digit: this digit shall be zero, when transmitted by the MS.

Format

BCD encoded octet string

Length

8 bytes

Served IMSI

The International Mobile Subscriber Identity (IMSI) of the MS. The IMSI is formatted in accordance with 3GPP TS 23.003. This will be present if the Anonymous Access Indicator is FALSE or not supplied.

The IMSI is formatted in accordance with 3GPP TS 23.003.

Format

BCD encoded octet string

Length

3–8 bytes

Served MNNAI

This field contains the Mobile identifier of the served user in Network Access Identifier (NAI) format based on IMSI, as defined in TS 23.003 [68].

SubscriptionID ::= SET

{

subscriptionIDType [0] SubscriptionIDType,

subscriptionIDData [1] UTF8String

}

SubscriptionIDType ::= ENUMERATED

{

END_USER_E164 (0),

END_USER_IMSI (1),

END_USER_SIP_URI (2),

END_USER_NAI (3),

END_USER_PRIVATE (4)

}

The type will be END_USER_NAI.

For IMSI: 123456789012345 mcc=123 mnc=045

subscriptionIDData is a string will be

0123456789012345@nai.epc.mnc045.mcc123.3gppnetwork.org

Format

Set

Length

Variable (Max 62)

Served MSISDN

The 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 TBCD encoded as shown in the example below:3GPP TS 23.003 (CCITT Rec. E 213)

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

subscriber identification MSISDN

octet 1 : bit 8 (msb): extension bit

= 1 : no extension

other : not relevant

bit 7..5 : type of number

= 000 : unknown

= 001 : international number

= 010 : national significant number

= 011 : network specific number

= 100 : subscriber number

= 101 : reserved

= 110 : abbreviated number

= 111 : reserved for extension

bit 4..1 : numbering plan indicator

= 0001: ISDN/Telephony Numbering Plan (Rec CCITT E.164)

other : not relevant

octet 2..9: <= 16 digits TBCD-String (twisted)

substructure (without spares or fillers):

1..3 digits - country code (CC)

(only international number)

3 digits - national destination code (NDC)

<= 10 digits - subscriber number (SN)

first and intermediate octet = 2 digits

last octet = 2 digits or 1 digit + 1 fill digit H'F

As per 3GPP TS 29.274 v 8.11.0, "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 [37]) and is encoded as TBCD digits."

To comply with this, octet 1 (nature of address indicator) is not added in the encoded value of MSISDN.

For example:

MSISDN: '491720400305'

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). 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 shall be present except when both the Bearer type is PPP and dynamic address assignment is used.

Format

Octet string

Length

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

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.



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.

ASN.1 Definition:

```
-- This field was made available in PGWRecord in Release 8. If the above mentioned CLI is
enabled
```

```
-- we can treat this field to be available in GGSNPDPRecord or EGSNPDPRecord.
-- PGWRecord                      ::= SET
{
...
  servedPDPPDNAddressExt                      [45] PDPAddress OPTIONAL
}
```

Format

Octet string

Length

8 bytes

Serving Node Address

The serving node control plane IP address of the S-GW used during this record. This is a list of IP addresses. If the list overflows with a configured number of IP addresses, a CDR with "serving node Change" as cause for record closure will be generated. The serving node addresses that are listed here are sequentially mapped to the serving node types listed in the field "Serving node Types".

Format

Sequence of IPv4 orIPv6 addresses.

Length

6-98 or 18-292 bytes (depending on IPv4 or IPv6 address; for 1-16 S-GW/SGSN addresses)

Serving Node PLMN Identifier

This field contains a serving node (SGSN/S-GW/MME/ePDG/HSGW) PLMN Identifier (Mobile Country Code and Mobile Network Code).

The MCC and MNC are coded as described for "Routing Area Identity" in TS 29.060 [75].

Format

Octet string

Length

3 bytes

Serving Node Type

These fields contain one or several serving node types in the control plane of an S-GW or P-GW, which have been connected during the record. The serving node types listed here are sequentially mapped to the serving node addresses listed in the field "Serving node Address".

The possible values are:

```
ServingNodeType    ::= ENUMERATED
{
                sGSN            (0),
                pMIPSGW       (1),
                gTPSGW         (2),
                ePDG            (3),
                hSGW            (4),
                mME              (5)
}
```

Format

Sequence of serving Node Type

Length

3-48; variable length format (based on number of nodes connected during this period)

Start Time

This field contains the time when the User IP-CAN session starts at the P-GW, available in the CDR for the first bearer in an IP-CAN session.

In releases prior to 14.0, for P-GW service, the "startTime" attribute is added only to the first CDR of the default bearer of the IP-CAN session. In this case, if the first CDR was lost, the start time of the session remained unknown. Releases beyond 14.0, the "startTime" attribute is present in every PGW-CDR of the default bearer. Hence, if for any reason the first CDR is lost, the start time of the session can still be retrieved through the subsequent PGW-CDRs.

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.

For example: YYMMDDhhmmssShhmm

Format Variable	Meaning	Encoding Format
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

Format Variable	Meaning	Encoding Format
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 User IP-CAN session is terminated at the P-GW, available in the CDR for the last bearer in an IP-CAN session.

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

For example: YYMMDDhhmmssShhmm

Format Variable	Meaning	Encoding Format
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

TWAN ULI

This field contains the location information of UE in a Trusted WLAN Access Network (TWAN).

Format

Octet string

Length

38 bytes

User Location Information

This field contains the User Location Information of the MS as defined in TS 29.060 for GPRS case, and in TS 29.274 for EPC case (e.g. CGI, SAI, RAI TAI and ECGI), if available.

This field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.

User Location Information contains the location (e.g. CGI/SAI, ECGI/TAI or RAI) where the UE is located and used during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is "user location change". Note the user location information in SGW-CDR main level contains the location where the UE was when PGW-CDR was opened.

The flags ECGI, TAI, RAI, SAI and CGI in octet 5 indicate if the corresponding fields are present in the IE or not. If one of these flags is set to "0", the corresponding field is not present at all. The respective identities are defined in 3GPP TS 23.003.

The following subclauses specify the coding of the different identities. For each identity, if an Administration decides to include only two digits in the MNC, then bits 5 to 8 of octet 7 are coded as "1111".

CGI field: The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Cell Identity (CI) consists of 2 octets. Bit 8 of Octet 11 is the most significant bit and bit 1 of Octet 12 the least significant bit. The coding of the cell identity is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

SAI field: The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Service Area Code (SAC) consists of 2 octets. Bit 8 of Octet 11 is the most significant bit and bit 1 of Octet 12 the least significant bit. The SAC is defined by the operator.

RAI field: The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Routing Area Code (RAC) consists of 2 octets. Only Octet 11 contains the RAC. Octet 12 is coded as all 1's (11111111). The RAC is defined by the operator.

TAI field: The Tracking Area Code (TAC) consists of 2 octets. Bit 8 of Octet 9 is the most significant bit and bit 1 of Octet 10 the least significant bit. The coding of the tracking area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

ECGI field: The E-UTRAN Cell Identifier (ECI) consists of 28 bits. Bit 4 of octet 10 is the most significant bit and bit 1 of Octet 11 the least significant bit. The coding of the E-UTRAN cell identifier is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

In releases prior to 16.0, only a fixed number of combinations of User Location Information (ULI) identity types is supported. That is, Release 10 ULI values were only partially populated in PGW-CDRs as the ULI identity type combinations "CGI & RAI" and "SAI & RAI" introduced in 3GPP Release 10 specification were not supported. In 16.0 and later releases, Release 10 ULI values are populated as received in PGW-CDRs. This support is extended to Create Session Request, Create Bearer Response, Modify Bearer Request and Delete Session Requests.



Important This behavior change is applicable to Release 10 GTPP dictionaries for P-GW.

Format

Octet string

Length

6–13 bytes