

CDR Format for the GGSN and PGW

PRINTOUT DESCRIPTION

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1 Introduction

This document describes the structure and content of the Charging Data Records (CDRs) generated by the EPG for GSM, WCDMA, LTE, trusted Non-3GPP network, and untrusted Non-3GPP network.

Note: In this document, the term bearer refers to Packet Data Protocol (PDP) context, EPS bearer, and PMIPv6 PDN connection. To facilitate the understanding of this document, refer to *CPI Library Readers' Guide*.

The EPG can generate GGSN generated - CDRs (G-CDRs), enhanced G-CDRs (eG-CDRs), PGW Generated-CDRs (PGW-CDRs), or SGW Generated-CDRs (SGW-CDRs), depending on the configuration and the activated features.

For information on the SGW-CDRs, refer to *CDR Format for the SGW*. For information on the ASN.1 format for CDR releases, refer to *CDR ASN.1 Format*.

Note: Actual CDRs can contain sensitive information regarding privacy and personal data according to the EU directives on privacy. Therefore, all CDR information must be regarded as personal and handled accordingly.

1.1 CDR Encoding

The CDRs generated in the GGSN and PDN Gateway (PGW) are specified according to Abstract Syntax Notation One (ASN.1), a language used for sending data across dissimilar communication systems. ASN.1 ensures that the data received is the same as the data transmitted by providing a common syntax for specifying application layer protocols. ASN.1 is an International Organization for Standardization/International Telecommunication Union Standard-Telecommunication Standardization Sector (ISO/ITU-T) standard based on the Open Systems Interconnection (OSI) model and is defined in ITU-T Recommendation X.680.

The GGSN and PGW use ASN.1 Basic Encoding Rules (BER) to encode the CDRs. BER is a set of standard rules, defined in ITU-T Recommendation X.690, for encoding data types specified in ASN.1. A field containing a value of a certain data type is encoded into the following parts:

- Identifier: consists of an ASN.1 tag and data structure information to identify the data type
- Length: the length in octets of the contents
- Contents: the value encoded according to data type-specific rules

The ASN.1 tags assigned to CDR fields are specified in Section 6 on page 101.



1.1.1 ASN.1 BER Encoding of Integers

ASN.1 defines the integer type as a simple type with values, which are the positive and negative numbers, including zero.

The contents of an integer field are BER-encoded in one or more octets. The two complement form implies that the most significant bit of the content octets indicates the sign of the value (0 for positive numbers and 1 for negative numbers). This means that the highest positive number a sequence of X octets can represent is: $2^{(8X-1)}-1$

— Example 1

The highest positive number represented by four octets (32 bits) is: $2^{31}-1$.

— Example 2

To represent the highest value for a 32-bit positive integer ($2^{32}-1$), five content octets are needed.

For more information on BER encoding, refer to ITU-T Recommendation X.690.

1.2 CDR Field Categories

The charging standard 3GPP TS 32.240 specifies field categories. The following scheme is used:

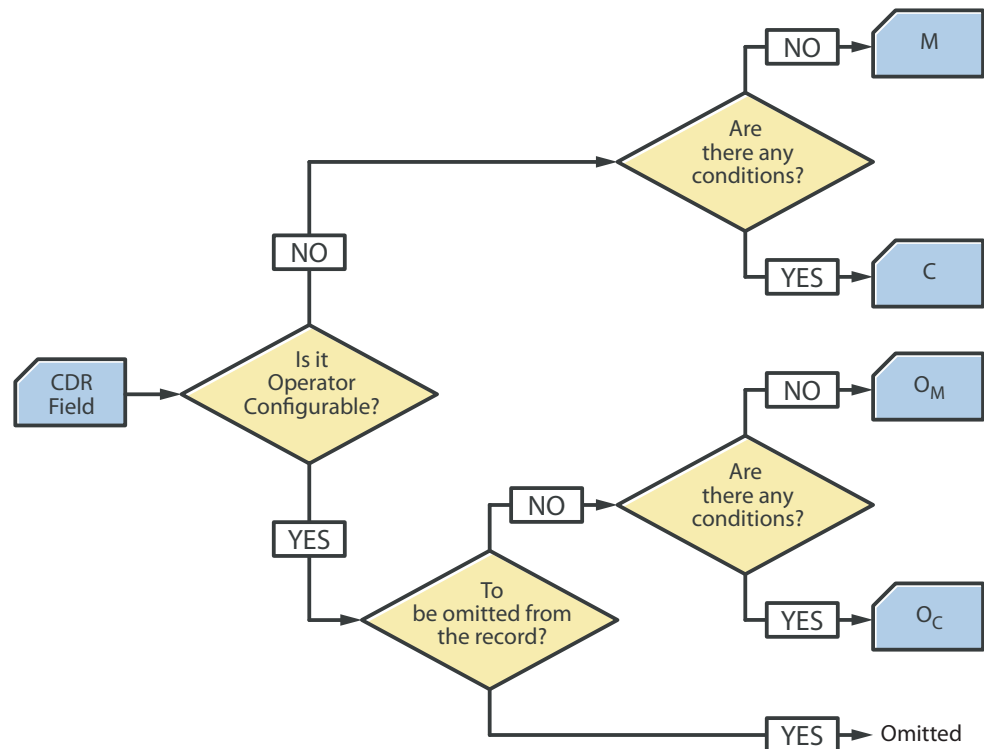


Figure 1 CDR Field Categories

- Mandatory field (M): The field is always present in a CDR.
- Conditional field (C): The field is present if a required condition is fulfilled.
- Mandatory and operator-configurable field (O_M): The field is always present if not excluded by configuration.
- Conditional and operator-configurable field (O_C): The field is present if a required condition is fulfilled and the field is not excluded by configuration.

For information on how to exclude operator-configurable fields (O_M and O_C), refer to *Offline Charging Configuration*.

1.3 CDR Partial Format

When more than one CDR is generated during the lifetime of a bearer, the generated CDRs are called partial CDRs.

Two partial CDR formats exist:

- **Fully Qualified Partial CDR**

Contains all mandatory fields (M), conditional (C), and those fields not excluded by the Operator (O_M and O_C).



— **Reduced Partial CDR**

Contains all mandatory fields (M) and only the changes that have occurred in any other field relative to the previous partial CDR.

The first partial CDR generated for a bearer is always a Fully Qualified Partial CDR.

For more information on the different CDR types, refer to [Offline Charging](#).



2 CDR Content

Table 1 lists the fields that can be present in a G-CDR, eG-CDR, or PGW-CDR together with the field categories for each supported release of the charging standard and for the special closing CDR (Special).

Note: Only PGW-CDRs (Release 8 and 13) are supported for PMIPv6-based S2a access.

Special closing partial CDRs are generated for bearers handled by a failing PGW Session Controller (PSC). Under this specific condition, the GGSN, or PGW does not include certain mandatory fields from the 3GPP specifications. In order for the billing systems to remain fully compatible with the GGSN, and PGW, the affected fields are optional in the corresponding ASN.1 format descriptions. For information about the special closing CDR, refer to [Offline Charging](#).

- The field category may be: mandatory (M), conditional (C), mandatory and operator-configurable (O_M), and conditional and operator-configurable (O_C).
- O: means that the field is originally specified as optional (operator-configurable).
- N/A: means that the field is originally not specified by the charging standard.
- Yes: means that the field is included in the special closing partial CDR generated at GGSN or PGW failure (refer to [Offline Charging](#)), if supported by the applied version and provisioned by the operator.

Table 1 CDR Fields and Subfields Presence by CDR Release

CDR Field	R15	R13	R8	R7	R6	Special
Access Point Name Access Point Name Network Identifier			O _M	O _M	O _M	No
APN Selection Mode	O _M	O _M	O _M	O _M	O _M	No
Cause for Record Closing	M	M	M	M	M	Yes
Charging Characteristics	M	M	M	M	M	Yes
Charging Characteristics Selection Mode	O _M	O _M	O _M	O _M	O _M	No
Charging ID	M	M	M	M	M	Yes
Duration	M	M	M	M	M	Yes
Dynamic Address Flag	O _C	O _C	O _C	O _C	O _C	No
GGSN Address P-GW Address	M	M	M	M	M	Yes
List of Service Data	O _M	O _M	O _M	O _M	O _M	No
Rating Group	M	M	M	M	M	No
Result Code	C	C	C	C	C	No
Local Sequence Number	C	C	C	C	C	No



Table 1 CDR Fields and Subfields Presence by CDR Release

CDR Field	R15	R13	R8	R7	R6	Special
Time of First Usage	C	C	C	C	C	No
Time of Last Usage	C	C	C	C	C	No
Time Usage	C	C	C	C	C	No
Service Condition Change	M	M	M	M	M	No
QoS Information Negotiated	O _C	O _C	O _C	O _C	O _C	No
SGSN Address Serving Node Address	O _M	O _M	O _M	O _M	O _M	No
SGSN PLMN Identifier	N/A	N/A	N/A	O _C	O _C	No
Data Volume FBC Uplink	C	C	C	C	C	No
Data Volume FBC Downlink	C	C	C	C	C	No
Time Of Report	M	M	M	M	M	No
RAT Type	N/A	N/A	N/A	O _C	O _C	No
Failure Handling Continue	C	C	C	C	C	No
Service Identifier	C	C	C	C	C	No
PS Furnish Charging Information	C	C	C	C	C	No
AF Record Information	C	C	C	C	C	No
User Location Information	C	C	C	C	N/A	No
Low Priority Indicator	O _C	O _C	N/A	N/A	N/A	No
Event Based Charging Information	C	C	C	C	N/A	No
3GPP2 User Location Information	C	C	C	N/A	N/A	No
List of Traffic Volumes	O _C	O _C	O _C	O _M	O _M	Yes
QoS Negotiated	N/A	N/A	N/A	C	C	No
Data Volume GPRS Uplink	M	M	M	M	M	Yes
Data Volume GPRS Downlink	M	M	M	M	M	Yes
Change Condition	M	M	M	M	M	Yes
Change Time	M	M	M	M	M	Yes
User Location Information	C	C	C	C	N/A	No
EPC QoS Information	C	C	C	N/A	N/A	No
Local Record Sequence Number	O _M	O _M	O _M	O _M	O _M	Yes
MS Time Zone	O _C	O _C	O _C	O _C	O _C	No
Node ID	O _M	O _M	O _M	O _M	O _M	Yes
PDN Connection ID PDN Connection Charging ID	O _C	O _C	O _C	N/A	N/A	No
PDP Type PDP/PDN Type	O _M	O _M	O _M	O _M	O _M	No
PDP PDN Type Extension	O _M	O _M	N/A	N/A	N/A	No
PGW PLMN Identifier	O _C	O _C	O _C	N/A	N/A	No
PS Furnish Charging Information	O _C	O _C	O _C	O _C	O _C	No



Table 1 CDR Fields and Subfields Presence by CDR Release

CDR Field	R15	R13	R8	R7	R6	Special
PS Free Format Data	M	M	M	M	M	No
PS FFD Append Indicator	C	C	C	C	C	No
RAT Type	O _C	O _C	O _C	O _C	O _C	No
Record Extensions See Table 2 for subfields.	O _C	O _C	O _C	O _C	O _C	No
Record Opening Time	M	M	M	M	M	Yes
Record Sequence Number	C	C	C	C	C	Yes
Record Type	M	M	M	M	M	Yes
SCS AS Address	O _C	O _C	N/A	N/A	N/A	No
Served IMEISV	O _C	O _C	O _C	O _C	O _C	No
Served IMSI	M	M	M	M	M	Yes
Served MSISDN	O _C	O _C	O _C	O _C	O _C	No
Served PDP Address Served PDP/PDN Address	O _C	O _C	O _C	O _C	O _C	No
Served PDP/PDN Address Extension	O _C	O _C	O _C	N/A	N/A	No
Serving Node Type	M	M	M	N/A	N/A	No
SGi PtP Tunnelling Method	O _C	O _C	N/A	N/A	N/A	No
SGSN Address Serving Node Address	M	M	M	M	M	No
SGSN PLMN Identifier Serving Node PLMN Identifier	O _M	O _M	O _M	O _C	O _C	No
Start Time	O _C	O _C	O _C	N/A	N/A	No
Stop Time	O _C	O _C	O _C	N/A	N/A	No
User Location Information	O _C	O _C	O _C	O _C	O _C	No
3GPP2 User Location Information	O _C	O _C	O _C	N/A	N/A	No
UNI PDU CP Only Flag	O _C	O _C	N/A	N/A	N/A	No

Table 2 lists the subfields in the field Record Extensions. The subfields are related to the optional feature Service-Aware Charging and Control (SACC).

Note: Record Extensions are only supported for Release 6, 7, 8, 13, and 15, see Section 4.21 on page 54.

Table 2 Record Extensions Subfields

Field	Release 15	Release 13	Release 8	Release 7	Release 6	Special
Record Extensions	O _C	O _C	O _C	O _C	O _C	No
Credit Control Information	C	C	C	C	C	No
Credit Control Failure Report	C	C	C	C	C	No



Table 2 Record Extensions Subfields

Credit Control Session ID	C	C	C	C	C	No
CCS Realm	C	C	C	C	C	No
Policy Control Information	C	C	C	C	C	No
Policy Control Failure Report	C	C	C	C	C	No
PCS Realm	C	C	C	C	C	No
Policy Control Session ID	C	C	C	C	C	No
User Category	O _M	O _M	O _M	O _M	O _M	No
Rule Space ID	C	C	C	C	C	No
Service Containers	C	C	C	C	C	No
Rating Group	M	M	M	M	M	No
Service Identifier	C	C	C	C	C	No
Local Sequence Number	C	C	C	C	C	No
Method	C	C	C	C	C	No
Inactivity	C	C	C	C	C	No
Resolution	C	C	C	C	C	No
CC Request Number	C	C	C	C	C	No
Service-Specific Units	C	C	C	C	C	No
List of URI	O _C	O _C	O _C	O _C	O _C	No
List of IP Flow	O _M	O _M	O _M	N/A	N/A	No
Time Reports	C	C	C	C	C	No
Rating Group	M	M	M	M	M	No
Start Time	M	M	M	M	M	No
End Time	M	M	M	M	M	No
Data Volume Uplink	C	C	C	C	C	No
Data Volume Downlink	C	C	C	C	C	No

Table 3 lists all the CDR fields and shows for what CDR types the fields are supported.

Table 3 CDR Fields and Subfields Presence by CDR Type

Field	PGW-CDR	eG-CDR	G-CDR
Access Point Name Access Point Name Network Identifier	X	X	X
APN Selection Mode	X	X	X



Table 3 CDR Fields and Subfields Presence by CDR Type

Field	PGW-CDR	eG-CDR	G-CDR
Cause for Record Closing	X	X	X
Charging Characteristics	X	X	X
Charging Characteristics Selection Mode	X	X	X
Charging ID	X	X	X
Duration	X	X	X
Dynamic Address Flag	X	X	X
GGSN Address P-GW Address	X	X	X
List of Service Data	X	X	
Rating Group	X	X	
Result Code	X	X	
Local Sequence Number	X	X	
Time of First Usage	X	X	
Time of Last Usage	X	X	
Time Usage	X	X	
Service Condition Change	X	X	
QoS Information Negotiated	X	X	
SGSN Address Serving Node Address	X	X	
SGSN PLMN Identifier		X	
Data Volume FBC Uplink	X	X	
Data Volume FBC Downlink	X	X	
Time Of Report	X	X	
RAT Type		X	
Failure Handling Continue	X	X	
Service Identifier	X	X	
PS Furnish Charging Information	X	X	
AF Record Information	X	X	
User Location Information	X	X	
Event Based Charging Information	X	X	
3GPP2 User Location Information	X		
List of Traffic Volumes	X	X	X
QoS Negotiated		X	X
Data Volume GPRS Uplink	X	X	X
Data Volume GPRS Downlink	X	X	X
Change Condition	X	X	X
Change Time	X	X	X



Table 3 CDR Fields and Subfields Presence by CDR Type

Field	PGW-CDR	eG-CDR	G-CDR
User Location Information	X	X	X
EPC QoS Information	X		
Local Record Sequence Number	X	X	X
MS Time Zone	X	X	X
Node ID	X	X	X
PDN Connection ID PDN Connection Charging ID	X		
PDP Type PDP/PDN Type	X	X	X
PDP PDN Type Extension	X		
P-GW PLMN Identifier	X		
PS Furnish Charging Information	X	X	
PS Free Format Data	X	X	
PS FFD Append Indicator	X	X	
RAT Type	X	X	X
Record Extensions See Table 2 for subfields.	X	X	
Record Opening Time	X	X	X
Record Sequence Number	X	X	X
Record Type	X	X	X
SCS AS Address	X		
Served IMEISV	X	X	X
Served IMSI	X	X	X
Served MSISDN	X	X	X
Served PDP Address Served PDP/PDN Address	X	X	X
Served PDP/PDN Address Extension	X		
Serving Node Type	X		
SGSN Address Serving Node Address	X	X	X
SGSN PLMN Identifier Serving Node PLMN Identifier	X	X	X
SGi PtP Tunnelling Method	X		
Start Time	X		
Stop Time	X		
UNI PDU CP Only Flag	X		
User Location Information	X	X	X
3GPP2 User Location Information	X		
Low Priority Indicator	X		



3 CDR Records

This section contains a description of the GGSN/EGSN PDP records, and PGW records. The CDR fields that these records contain are described in Section 4 on page 21.

3.1 Call Event Record

The basic structure of the CDRs is set up by the Call Event Record. Below, the structure is specified for each supported release of the charging standard.

3.1.1 Release 6

```
GPRSCallEventRecord ::= CHOICE
{
  ggsnPDPRecord      [21] GGSNPDPRecord,
  egsnPDPRecord      [28] EGSNPDPRecord
}
```

3.1.2 Release 7

```
GPRSRecord ::= CHOICE
{
  ggsnPDPRecord      [21] GGSNPDPRecord,
  egsnPDPRecord      [70] EGSNPDPRecord
}
```

3.1.3 Release 8, 13, and 15

```
GPRSRecord ::= CHOICE
{
  pgwRecord          [79] PGWRecord
}
```

3.2 GGSN PDP Record

Contents

The GGSN Packet Data Protocol (PDP) Record contains charging information in various CDR fields. Below, the CDR structure is specified for each supported release of the charging standard.



3.2.1

Release 6

ASN.1 Format

ggsnPDPRecord [21] GGSNPDPRecord

GGSNPDPRecord ::= SET

```

{
    recordType [0] CallEventRecordType,
    servedIMSI [3] IMSI,
    ggsnAddress [4] GSNAddress,
    chargingID [5] ChargingID,
    sgsnAddress [6] SEQUENCE OF GSNAddress OPTIONAL,
    accessPointNameNI [7] AccessPointNameNI OPTIONAL,
    pdpType [8] PDPTType OPTIONAL,
    servedPDPAddress [9] PDPAddress OPTIONAL,
    dynamicAddressFlag [11] DynamicAddressFlag OPTIONAL,
    listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTI
    recordOpeningTime [13] TimeStamp,
    duration [14] CallDuration,
    causeForRecClosing [15] CauseForRecClosing,
    recordSequenceNumber [17] INTEGER,
    nodeID [18] NodeID OPTIONAL,
    recordExtensions [19] ManagementExtensions OPTIONAL,
    localSequenceNumber [20] LocalSequenceNumber,
    apnSelectionMode [21] APNSelectionMode OPTIONAL,
    servedMSISDN [22] MSISDN OPTIONAL,
    chargingCharacteristics [23] ChargingCharacteristics,
    chChSelectionMode [24] ChChSelectionMode OPTIONAL,
    iMSsignalingContext [25] NULL OPTIONAL,
    sgsnPLMNIdentifier [27] PLMN-Id OPTIONAL,
    servedIMEISV [29] IMEI OPTIONAL,
    rATType [30] RATType OPTIONAL,
    mSTimeZone [31] MSTimeZone OPTIONAL,
    userLocationInformation [32] OCTET STRING OPTIONAL
}

```

Encoded ASN.1 Tag

H'B5 ggsnPDPRecord

3.2.2

Release 7

ASN.1 Format

ggsnPDPRecord [21] GGSNPDPRecord

GGSNPDPRecord ::= SET

```

{

```



```

recordType                [0] RecordType,
servedIMSI                [3] IMSI,
ggsnAddress               [4] GSNAAddress,
chargingID                [5] ChargingID,
sgsnAddress               [6] SEQUENCE OF GSNAAddress OPTIONAL,
accessPointNameNI        [7] AccessPointNameNI OPTIONAL,
pdpType                   [8] PDPTType OPTIONAL,
servedPDPAddress         [9] PDPAddress OPTIONAL,
dynamicAddressFlag       [11] DynamicAddressFlag OPTIONAL,
listOfTrafficVolumes     [12] SEQUENCE OF ChangeOfCharCondition O
recordOpeningTime        [13] TimeStamp,
duration                  [14] CallDuration,
causeForRecClosing       [15] CauseForRecClosing,
recordSequenceNumber     [17] INTEGER,
nodeID                   [18] NodeID OPTIONAL,
recordExtensions         [19] ManagementExtensions OPTIONAL,
localSequenceNumber      [20] LocalSequenceNumber,
apnSelectionMode         [21] APNSelectionMode OPTIONAL,
servedMSISDN             [22] MSISDN OPTIONAL,
chargingCharacteristics  [23] ChargingCharacteristics,
chChSelectionMode       [24] ChChSelectionMode OPTIONAL,
iMSSignalingContext      [25] NULL OPTIONAL,
sgsnPLMNIdentifier       [27] PLMN-Id OPTIONAL,
servedIMEISV             [29] IMEI OPTIONAL,
rATType                  [30] RATType OPTIONAL,
mSTimeZone               [31] MSTimeZone OPTIONAL,
userLocationInformation  [32] OCTET STRING OPTIONAL
}

```

Encoded ASN.1 Tag

H'B5 ggsnPDPRecord

3.3 EGSN PDP Record

Contents

The EGSN PDP Record contains charging information in various CDR fields. Below, the CDR structure is specified for each supported release of the charging standard.

Note: The Record Extensions field contains subfields supported in relation to the GGSN and PGW support for SACC.

3.3.1 Release 6

ASN.1 Format

egsnPDPRecord [28] EGSNPDPRecord



```

EGSNPDPRecord ::= SET
{
    recordType                [0] CallEventRecordType,
    servedIMSI                [3] IMSI,
    ggsnAddress                [4] GSNAddress,
    chargingID                 [5] ChargingID,
    sgsnAddress                [6] SEQUENCE OF GSNAddress OPTIONAL,
    accessPointNameNI         [7] AccessPointNameNI OPTIONAL,
    pdpType                    [8] PDPTType OPTIONAL,
    servedPDPAddress          [9] PDPAddress OPTIONAL,
    dynamicAddressFlag         [11] DynamicAddressFlag OPTIONAL,
    listOfTrafficVolumes       [12] SEQUENCE OF ChangeOfCharCondition OPTI
    recordOpeningTime          [13] TimeStamp,
    duration                   [14] CallDuration,
    causeForRecClosing         [15] CauseForRecClosing,
    recordSequenceNumber      [17] INTEGER,
    nodeID                     [18] NodeID OPTIONAL,
    recordExtensions           [19] ManagementExtensions OPTIONAL,
    localSequenceNumber        [20] LocalSequenceNumber,
    apnSelectionMode          [21] APNSelectionMode OPTIONAL,
    servedMSISDN               [22] MSISDN OPTIONAL,
    chargingCharacteristics     [23] ChargingCharacteristics,
    chChSelectionMode          [24] ChChSelectionMode OPTIONAL,
    iMSSignalingContext        [25] NULL OPTIONAL,
    sgsnPLMNIdentifier         [27] PLMN-Id OPTIONAL,
    pSFurnishChargingInformation [28] PSFurnishChargingInformation OPTIONAL,
    servedIMEISV               [29] IMEI OPTIONAL,
    rATType                    [30] RATType OPTIONAL,
    mSTimeZone                 [31] MSTimeZone OPTIONAL,
    userLocationInformation     [32] OCTET STRING OPTIONAL,
    listOfServiceData          [34] SEQUENCE OF ChangeOfServiceCondition C
}

```

Encoded ASN.1 Tag

H'BC egsnPDPRecord

3.3.2

Release 7

ASN.1 Format

egsnPDPRecord [70] EGSNPDPRecord

```

EGSNPDPRecord ::= SET
{
    recordType                [0] RecordType,
    servedIMSI                [3] IMSI,
    ggsnAddress                [4] GSNAddress,
    chargingID                 [5] ChargingID,
    sgsnAddress                [6] SEQUENCE OF GSNAddress OPTIONAL,

```



accessPointNameNI	[7] AccessPointNameNI OPTIONAL,
pdpType	[8] PDPTType OPTIONAL,
servedPDPAddress	[9] PDPAddress OPTIONAL,
dynamicAddressFlag	[11] DynamicAddressFlag OPTIONAL,
listOfTrafficVolumes	[12] SEQUENCE OF ChangeOfCharCondition O
recordOpeningTime	[13] TimeStamp,
duration	[14] CallDuration,
causeForRecClosing	[15] CauseForRecClosing,
recordSequenceNumber	[17] INTEGER,
nodeID	[18] NodeID OPTIONAL,
recordExtensions	[19] ManagementExtensions OPTIONAL,
localSequenceNumber	[20] LocalSequenceNumber,
apnSelectionMode	[21] APNSelectionMode OPTIONAL,
servedMSISDN	[22] MSISDN OPTIONAL,
chargingCharacteristics	[23] ChargingCharacteristics,
chChSelectionMode	[24] ChChSelectionMode OPTIONAL,
iMSSignalingContext	[25] NULL OPTIONAL,
sgsnPLMNIIdentifier	[27] PLMN-Id OPTIONAL,
psFurnishChargingInformation	[28] PSFurnishChargingInformation OPTION
servedIMEISV	[29] IMEI OPTIONAL,
rATType	[30] RATType OPTIONAL,
mSTimeZone	[31] MSTimeZone OPTIONAL,
userLocationInformation	[32] OCTET STRING OPTIONAL,
listOfServiceData	[34] SEQUENCE OF ChangeOfServiceConditio

}

Encoded ASN.1 Tag

H'BF46 egsnPDPRecord

3.4 PGW Records

Contents

The PGW Record contains charging information in various CDR fields. Below, the CDR structure is specified for each supported release of the charging standard.

Note: The Record Extensions field contains subfields supported in relation to the GGSN and PGW support for SACC.

3.4.1 Release 8

ASN.1 Format

pgwRecord [79] PGWRecord

PGWRecord ::= SET

{

recordType [0] RecordType,



servedIMSI	[3] IMSI,
p-GWAddress	[4] GSNAddress,
chargingID	[5] ChargingID,
servingNodeAddress	[6] SEQUENCE OF GSNAddress OPTIONAL,
accessPointNameNI	[7] AccessPointNameNI OPTIONAL,
pdpPDNType	[8] PDPTYPE OPTIONAL,
servedPDPPDNAddress	[9] PDPAddress OPTIONAL,
dynamicAddressFlag	[11] DynamicAddressFlag OPTIONAL,
listOfTrafficVolumes	[12] SEQUENCE OF ChangeOfCharCondition OPTI
recordOpeningTime	[13] TimeStamp,
duration	[14] CallDuration,
causeForRecClosing	[15] CauseForRecClosing,
recordSequenceNumber	[17] INTEGER,
nodeID	[18] NodeID OPTIONAL,
recordExtensions	[19] ManagementExtensions OPTIONAL,
localSequenceNumber	[20] LocalSequenceNumber,
apnSelectionMode	[21] APNSelectionMode OPTIONAL,
servedMSISDN	[22] MSISDN OPTIONAL,
chargingCharacteristics	[23] ChargingCharacteristics,
chChSelectionMode	[24] ChChSelectionMode OPTIONAL,
iMSSignalingContext	[25] NULL OPTIONAL,
servingNodePLMNIdentifier	[27] PLMN-Id OPTIONAL,
pSFurnishChargingInformation	[28] PSFurnishChargingInformation OPTIONAL,
servedIMEISV	[29] IMEI OPTIONAL,
rATType	[30] RATType OPTIONAL,
mSTimeZone	[31] MSTimeZone OPTIONAL,
userLocationInformation	[32] OCTET STRING OPTIONAL,
listOfServiceData	[34] SEQUENCE OF ChangeOfServiceCondition C
servingNodeType	[35] SEQUENCE OF ServingNodeType,
p-GWPLMNIdentifier	[37] PLMN-Id OPTIONAL,
startTime	[38] TimeStamp OPTIONAL,
stopTime	[39] TimeStamp OPTIONAL,
pDNConnectionID	[41] ChargingID OPTIONAL
3GPP2UserLocationInformation	[42] OCTET STRING OPTIONAL,
servedPDPPDNAddressExt	[45] PDPAddress OPTIONAL

}

Encoded ASN.1 Tag

H'BF4F pgwRecord

3.4.2**Release 13****ASN.1 Format**

pgwRecord [79] PGWRecord

PGWRecord ::= SET

{

recordType

[0] RecordType,



```

servedIMSI [3] IMSI,
p-GWAddress [4] GSNAAddress,
chargingID [5] ChargingID,
servingNodeAddress [6] SEQUENCE OF GSNAAddress OPTIONAL,
accessPointNameNI [7] AccessPointNameNI OPTIONAL,
pdpPDNType [8] PDPTType OPTIONAL,
servedPDPPDNAddress [9] PDPAddress OPTIONAL,
dynamicAddressFlag [11] DynamicAddressFlag OPTIONAL,
listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTIONAL,
recordOpeningTime [13] TimeStamp,
duration [14] CallDuration,
causeForRecClosing [15] CauseForRecClosing,
recordSequenceNumber [17] INTEGER,
nodeID [18] NodeID OPTIONAL,
recordExtensions [19] ManagementExtensions OPTIONAL,
localSequenceNumber [20] LocalSequenceNumber,
apnSelectionMode [21] APNSelectionMode OPTIONAL,
servedMSISDN [22] MSISDN OPTIONAL,
chargingCharacteristics [23] ChargingCharacteristics,
chChSelectionMode [24] ChChSelectionMode OPTIONAL,
iMSSignalingContext [25] NULL OPTIONAL,
servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL,
pSFurnishChargingInformation [28] PSFurnishChargingInformation OPTIONAL,
servedIMEISV [29] IMEI OPTIONAL,
rATType [30] RATType OPTIONAL,
mSTimeZone [31] MSTimeZone OPTIONAL,
userLocationInformation [32] OCTET STRING OPTIONAL,
listOfServiceData [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL,
servingNodeType [35] SEQUENCE OF ServingNodeType,
p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL,
startTime [38] TimeStamp OPTIONAL,
stopTime [39] TimeStamp OPTIONAL,
pDNConnectionID [41] ChargingID OPTIONAL,
3GPP2UserLocationInformation [44] OCTET STRING OPTIONAL,
servedPDPPDNAddressExt [45] PDPAddress OPTIONAL,
lowPriorityIndicator [46] NULL OPTIONAL,
uNIPDUCPOnlyFlag [60] UNIPDUCPOnlyFlag OPTIONAL,
sGiPtPTunnellingMethod [64] SGiPtPTunnellingMethod OPTIONAL,
pDPPDNTypeExtension [68] PDPPDNTypeExtension OPTIONAL,
sCSASAddress [71] SCSASAddress OPTIONAL
}

```

Encoded ASN.1 Tag

H'BF4F pgwRecord



3.4.3

Release 15

ASN.1 Format

pgwRecord [79] PGWRecord

PGWRecord ::= SET

{

recordType	[0] RecordType,
servedIMSI	[3] IMSI,
p-GWAddress	[4] GSNAddress,
chargingID	[5] ChargingID,
servingNodeAddress	[6] SEQUENCE OF GSNAddress OPTIONAL,
accessPointNameNI	[7] AccessPointNameNI OPTIONAL,
pdpPDNType	[8] PDPTYPE OPTIONAL,
servedPDPPDNAddress	[9] PDPAddress OPTIONAL,
dynamicAddressFlag	[11] DynamicAddressFlag OPTIONAL,
listOfTrafficVolumes	[12] SEQUENCE OF ChangeOfCharCondition OPT
recordOpeningTime	[13] TimeStamp,
duration	[14] CallDuration,
causeForRecClosing	[15] CauseForRecClosing,
recordSequenceNumber	[17] INTEGER,
nodeID	[18] NodeID OPTIONAL,
recordExtensions	[19] ManagementExtensions OPTIONAL,
localSequenceNumber	[20] LocalSequenceNumber,
apnSelectionMode	[21] APNSelectionMode OPTIONAL,
servedMSISDN	[22] MSISDN OPTIONAL,
chargingCharacteristics	[23] ChargingCharacteristics,
chChSelectionMode	[24] ChChSelectionMode OPTIONAL,
iMSsignalingContext	[25] NULL OPTIONAL,
servingNodePLMNIdentifier	[27] PLMN-Id OPTIONAL,
pSFurnishChargingInformation	[28] PSFurnishChargingInformation OPTIONAL,
servedIMEISV	[29] IMEI OPTIONAL,
rATType	[30] RATType OPTIONAL,
mSTimeZone	[31] MSTimeZone OPTIONAL,
userLocationInformation	[32] OCTET STRING OPTIONAL,
listOfServiceData	[34] SEQUENCE OF ChangeOfServiceCondition O
servingNodeType	[35] SEQUENCE OF ServingNodeType,
p-GWPLMNIdentifier	[37] PLMN-Id OPTIONAL,
startTime	[38] TimeStamp OPTIONAL,
stopTime	[39] TimeStamp OPTIONAL,
pDNConnectionChargingID	[41] ChargingID OPTIONAL
3GPP2UserLocationInformation	[44] OCTET STRING OPTIONAL,
servedPDPPDNAddressExt	[45] PDPAddress OPTIONAL
lowPriorityIndicator	[46] NULL OPTIONAL,
uNIPDUCPOnlyFlag	[60] UNIPDUCPOnlyFlag OPTIONAL
sGiPtPTunnellingMethod	[64] SGiPtPTunnellingMethod OPTIONAL,
pDPPDNTypeExtension	[68] PDPPDNTypeExtension OPTIONAL,
sCSASAddress	[72] SCSASAddress OPTIONAL

}



Encoded ASN.1 Tag

H'BF4F pgwRecord





4 CDR Fields

This section contains a description of each CDR field listed in Section 2 on page 5.

4.1 Access Point Name / Access Point Name Network Identifier

CDR Field	R15	R13	R8	R7	R6	Special
Access Point Name						No
Access Point Name Network Identifier	O _M	O _M	O _M	O _M	O _M	No

Content

Contains the network identifier part of the APN. This can be the APN used on the Gi or SGi interface, the APN provided by the SGSN on the Gn interface, or the APN provided by the MME or S4-SGSN.

Value

According to 3GPP TS 23.003, Access Point Name / AccessPointNameNI may be encoded in either dot or digit notation. The notation is configurable in the GGSN and PGW. In dot notation, the labels are separated by a dot.

For an example of dot notation (www.ericsson.se) in hexadecimal representation, see Table 4.

Table 4 Dot Notation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
77	77	77	2e	65	72	69	63	73	73	6f	6e	2e	73	65

- Octets 1, 2 and 3 – 8-bit ASCII characters (here: w, w, and w)
- Octet 4 – 8-bit ASCII character (here: .)
- Octets 5, 6, 7, 8, 9, 10, 11, and 12 – 8-bit ASCII characters (here: e, r, i, c, s, s, o, and n)
- Octet 13 – 8-bit ASCII character (here: .)
- Octets 14 and 15 – 8-bit ASCII characters (here: s and e)

In digit notation the label length precedes each label. The syntax of the APN follows the Name Syntax defined in IETF RFC 2181 and IETF RFC 1035. The APN consists of one or more labels. Each label is coded as a 1-octet field followed by that number of octets coded as 8-bit ASCII characters. Following IETF RFC 1035



the labels consist only of the alphabetic characters (A – Z and a – z), digits (0 – 9), and the dash (–). The APN is not terminated by a length byte of zero.

For an example of digit notation (\03www\08ericsson\02se) in hexadecimal representation, see Table 5.

Table 5 Digit Notation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
03	77	77	77	08	65	72	69	63	73	7b	6e	02	73	65	

- Octet 1 – length of following octets (here: three octets)
- Octets 2, 3 and 4 – 8-bit ASCII characters (here: w, w, and w)
- Octet 5 – length of following octets (here: eight octets)
- Octets 6, 7, 8, 9, 10, 11, 12, and 13 – 8-bit ASCII characters (here: e, r, i, c, s, s, o, and n)
- Octet 14 – length of following octets (here: two octets)
- Octets 15 and 16 – 8-bit ASCII characters (here: s and e)

4.1.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

accessPointNameNI [7] AccessPointNameNI

AccessPointNameNI ::= IA5String (SIZE(1..63))

Encoded ASN.1 Tag

H'87 accessPointNameNI

4.2 APN Selection Mode

CDR Field	R15	R13	R8	R7	R6	Special
APN Selection Mode	O _M	O _M	O _M	O _M	O _M	No

Contents

Indicates how the SGSN or MME selected the APN.



4.2.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

apnSelectionMode [21] APNSelectionMode OPTIONAL

APNSelectionMode ::= ENUMERATED

```
{
  mSorNetworkProvidedSubscriptionVerified (0),
  mSProvidedSubscriptionNotVerified (1),
  NetworkProvidedSubscriptionNotVerified (2)
}
```

Value

0 User Equipment (UE) or network-provided APN, subscription verified.

1 UE-provided APN, subscription not verified.

2 Network-provided APN, subscription not verified.

Encoded ASN.1 Tag

H'95 apnSelectionMode

4.3 Cause for Record Closing

CDR Field	R15	R13	R8	R7	R6	Special
Cause for Record Closing	M	M	M	M	M	Yes

Contents

Indicates the reason for record closure.

For a description of the applicable values, see the section on Record Data in [Offline Charging](#).

4.3.1 Release 6

ASN.1 Format

causeForRecClosing [15] CauseForRecClosing

CauseForRecClosing ::= INTEGER

```
{
  normalRelease (0),
  abnormalRelease (4),
}
```



```
    volumeLimit           (16),  
    timeLimit            (17),  
    sgsnChange           (18),  
    maxChangeCond       (19),  
    managementIntervention (20),  
    rATChange           (22),  
    mSTimeZoneChange    (23),  
    managementInitRelease (100),  
    pLMNChange          (101),  
    creditControlChange  (102),  
    creditControlInitRelease (104),  
    policyControlInitRelease (105)  
}
```

Encoded ASN.1 Tag

H'8F causeForRecClosing

4.3.2

Release 7

ASN.1 Format

causeForRecClosing [15] CauseForRecClosing

CauseForRecClosing ::= INTEGER

```
{  
    normalRelease           (0),  
    abnormalRelease        (4),  
    volumeLimit            (16),  
    timeLimit              (17),  
    sgsnChange             (18),  
    maxChangeCond         (19),  
    managementIntervention (20),  
    rATChange              (22),  
    mSTimeZoneChange      (23),  
    sGSNPLMNIDChange      (24),  
    managementInitRelease  (100),  
    creditControlChange    (102),  
    creditControlInitRelease (104),  
    policyControlInitRelease (105)  
}
```

Encoded ASN.1 Tag

H'8F causeForRecClosing



4.3.3 Release 8, 13, and 15

ASN.1 Format

causeForRecClosing [15] CauseForRecClosing

```
CauseForRecClosing ::= INTEGER
{
    normalRelease           (0),
    abnormalRelease        (4),
    volumeLimit             (16),
    timeLimit               (17),
    servingNodeChange      (18),
    maxChangeCond          (19),
    managementIntervention (20),
    rATChange               (22),
    mSTimeZoneChange       (23),
    sGSNPLMNIDChange       (24),
    managementInitRelease  (100),
    creditControlChange     (102),
    creditControlInitRelease (104),
    policyControlInitRelease (105)
}
```

Encoded ASN.1 Tag

H'8F causeForRecClosing

4.4 Charging Characteristics

CDR Field	R15	R13	R8	R7	R6	Special
Charging Characteristics	M	M	M	M	M	Yes

Contents

Contains the charging characteristics of the subscriber provided by the Home Location Register (HLR) through the SGSN, by the Home Subscriber Server (HSS) through the MME and SGW, or by EPG configuration. The selection of charging characteristics for a bearer is further described in [Offline Charging](#).

The charging characteristics determine the charging method to apply for the bearer.



4.4.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
chargingCharacteristics [23] ChargingCharacteristics
```

```
ChargingCharacteristics ::= OCTET STRING (SIZE (2))
```

Value

Table 6 describes the structure of the charging characteristics octets.

Table 6 Structure of Charging Characteristics

B4	B3	B2	B1	P3	P2	P1	P0
B12	B11	B10	B9	B8	B7	B6	B5

The charging characteristics octets consist of profile bits P0-P3 and behavior bits B1-12.

Representing a value range of 0-15, the profile bits are used to select one of the 16 charging characteristics profiles configured in the GGSN and PGW. The profile bits are interpreted as follows, see Table 7:

Table 7 Profile Bits

Value	Configuration Name
0	profile-0
1	profile-1
2	profile-2
3	profile-3
4	profile-4
5	profile-5
6	profile-6
7	profile-7
8	profile-8
9	profile-9
10	profile-10
11	profile-11
12	profile-12
13	profile-13



Value	Configuration Name
14	profile-14
15	profile-15

Encoded ASN.1 Tag

H'97 chargingCharacteristics

4.5 Charging Characteristics Selection Mode

CDR Field	R15	R13	R8	R7	R6	Special
Charging Characteristics Selection Mode	O _M	O _M	O _M	O _M	O _M	No

Contents

Describes how the charging characteristics value is selected.

Home default refers to charging characteristics configured in the GGSN and PGW, and is used in Home, Roaming and Visiting traffic cases.

4.5.1 Release 6 and 7

ASN.1 Format

chChSelectionMode [24] ChChSelectionMode OPTIONAL

```
ChChSelectionMode ::= ENUMERATED
{
    sGSNSupplied          (0),
    homeDefault           (3),
    radiusSupplied        (100),
    roamingClassBased     (101)
}
```

Value

-

Encoded ASN.1 Tag

H'98 chChSelectionMode



4.5.2 Release 8, 13, and 15

ASN.1 Format

chChSelectionMode [24] ChChSelectionMode OPTIONAL

```

ChChSelectionMode ::= ENUMERATED
{
    servingNodeSupplied      (0),
    homeDefault              (3),
    radiusSupplied           (100),
    roamingClassBased        (101)
}

```

Value

-

Encoded ASN.1 Tag

H'98 chChSelectionMode

4.6 Charging ID

CDR Field	R15	R13	R8	R7	R6	Special
Charging ID	M	M	M	M	M	Yes

Contents

All CDRs produced for a certain bearer are uniquely identified using the GGSN or PGW address together with the charging ID. GGSNs or PGWs on different physical nodes allocate charging IDs independently from each other which may result in them allocating identical numbers. As a result, the charging ID must always be combined with the GGSN or PGW address and a time stamp to form a unique identifier for the bearer.

The charging ID is generated by the GGSN or PGW upon bearer activation and transferred to the related SGSNs or SGWs. Mediation devices or billing systems may use the charging ID with the GGSN or PGW address to consolidate CDRs. Since the EPG provides the possibility of having both GGSN and PGW running on the same physical node, charging ID assignment is done on a per node basis, which means that the GGSN and PGW share charging ID to assign unique numbers to all bearers within the node.

For PDN connections over PMIPv6-based S2a interface, only one charging ID exists. For example, if an IRAT handover from S5 access to PMIPv6-based S2a access occurs, the charging ID for the default EPS bearer is kept for the PMIPv6 PDN connection.



4.6.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

chargingID [5] ChargingID

ChargingID ::= INTEGER (0..4294967295)

Value

The value range is from $0 - 2^{32}-1$.

Encoded ASN.1 Tag

H'85 ChargingID

4.7 Duration

CDR Field	R15	R13	R8	R7	R6	Special
Duration	M	M	M	M	M	Yes

Contents

Contains the duration in seconds for a bearer. For partial records, this field represents the duration of the individual partial record and not the cumulative bearer duration.

4.7.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

duration [14] CallDuration

CallDuration ::= INTEGER

Value

-

Encoded ASN.1 Tag

H'8E duration



4.8 Dynamic Address Flag

CDR Field	R15	R13	R8	R7	R6	Special
Dynamic Address Flag	O _c	O _c	O _c	O _c	O _c	No

Contents

Indicates if a PDP or PDN address was dynamically allocated. This field is omitted if the address is static, that is, part of bearer subscription. Dynamic address allocation might be relevant for charging, for example, the dynamic allocated address may be a resource owned and offered by the network operator.

Note: When PDP/PDN type is IPv4v6 (Dual Stack), the dynamic address flag value is only applicable for the IPv4 address.

4.8.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
dynamicAddressFlag [11] DynamicAddressFlag OPTIONAL
```

```
DynamicAddressFlag ::= BOOLEAN
```

Value

TRUE

Encoded ASN.1 Tag

H'8B dynamicAddressFlag

4.9 GGSN Address / P-GW Address

CDR Field	R15	R13	R8	R7	R6	Special
GGSN Address				M	M	Yes
P-GW Address	M	M	M			Yes

Contents

Contains the address of the GGSN or PGW for the Control Plane. This address is provided in the signaling messages toward the involved SGSNs, MMEs, or SGWs. Both IPv4 or IPv6 address is supported.

If both IPv4 and IPv6 addresses are available, this field includes the IPv4 address of the GGSN or PGW.



4.9.1 Release 6 and 7

ASN.1 Format

```

ggsnAddress [4] GSNAddress

GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    iPBinV4Address [0] OCTET STRING (SIZE(4)),
    iPBinV6Address [1] OCTET STRING (SIZE(16))
}

```

Value

A binary IPv4 address or a binary IPv6 address.

Encoded ASN.1 Tag

```

H'A4 ggsnAddress
H'80 iPBinV4Address
H'81 iPBinV6Address

```

4.9.2 Release 8, 13, and 15

ASN.1 Format

```

p-GWAddress [4] GSNAddress

GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    iPBinV4Address [0] OCTET STRING (SIZE(4)),
    iPBinV6Address [1] OCTET STRING (SIZE(16))
}

```



Value

A binary IPv4 address or a binary IPv6 address.

Encoded ASN.1 Tag

H'A4 p-GWAddress
 H'80 iPBinV4Address
 H'81 iPBinV6Address

4.10 List of Service Data

CDR Field	R15	R13	R8	R7	R6	Special
List of Service Data	O _M	O _M	O _M	O _M ⁽¹⁾	O _M ⁽¹⁾	No
Rating Group	M	M	M	M	M	No
Result Code	C	C	C	C	C	No
Local Sequence Number	C	C	C	C	C	No
Time of First Usage	C	C	C	C	C	No
Time of Last Usage	C	C	C	C	C	No
Time Usage	C	C	C	C	C	No
Service Condition Change	M	M	M	M	M	No
QoS Information Negotiated	O _C	O _C	O _C	O _C	O _C	No
SGSN Address				O _M	O _M	No
Serving Node Address	O _M	O _M	O _M			
SGSN PLMN Identifier				O _C	O _C	No
Data Volume FBC Uplink	C	C	C	C	C	No
Data Volume FBC Downlink	C	C	C	C	C	No
Time Of Report	M	M	M	M	M	No
RAT Type				O _C	O _C	No
Failure Handling Continue	C	C	C	C	C	No
Service Identifier	C	C	C	C	C	No
PS Furnish Charging Information	C	C	C	C	C	No
AF Record Information	C	C	C	C	C	No
User Location Information	C	C	C	C		No
Event Based Charging Information	C	C	C	C		No
3GPP2 User Location Information	C	C	C			No

(1) Only applicable for eG-CDRs.



Contents

Includes service data containers that contain service data attributes. Service data containers are identified within a CDR by a combination of Rating Group, Service Identifier (if applicable), and Local Sequence Number.

If record extensions are applied, service data extension attributes related to service data containers in the **List of Service Data** field are reported in service data extension containers in the Record Extensions field, in the Service Containers subfield.

Each service data container includes the following subfields:

- **Rating Group**

Rating Group (RG) number.

- **Result Code**

Contains the result code received in the corresponding Multiple Services Credit Control (MSCC) AVP from the OCS.

Included if a result code other than diameter-success is received.

- **Local Sequence Number**

Sequence numbering of containers associated with the same RG or RG/SI-combination.

By default, the EPG restarts the local Sequence Number for each new partial CDR. Optionally, the EPG can be configured so that the local Sequence Number is incremented throughout the lifetime of a bearer.

For more information, refer to [Offline Charging Configuration](#).

- **Time of First Usage, Time of Last Usage**

Time stamps of first and last transferred service data during the lifetime of this container.

The fields are omitted if no service data has been transferred.

Contain time stamps as described in Section 5.2 on page 89.

- **Time Usage**

Time usage.

Included if time measurement is applied.

For detailed information on time measurement, refer to [Charging Methods](#).

- **Service Condition Change**



Indicates the reason for service data container closure.

For a description of the applicable values, see the section on Service Data in [Offline Charging](#).

— **QoS Information Negotiated**

Always included in the first service data container of each service a partial CDR, and in following service data containers only when QoS changes.

Contains QoS information as described in Section 5.1 on page 85.

— **SGSN Address**

Contains the address of the SGSN, TWAN, or Evolved Packet Data Gateway (ePDG) used during the lifetime of the service data container.

— **Serving Node Address**

Contains the address of the serving node, that is, SGSN, TWAN, ePDG, or SGW, used during the lifetime of the service data container.

— **SGSN PLMN Identifier**

Contains the PLMN Identifier that is valid during the lifetime of the service data container.

— **Data Volume FBC Uplink, Data Volume FBC Downlink**

Volume usage.

For detailed information on volume measurement, refer to [Charging Methods](#).

— **Time of Report**

The time of the closure of the container.

Contains a timestamp as described in Section 5.2 on page 89.

— **RAT Type**

Contains the RAT type that is valid during the lifetime of the service data container.

— **Failure Handling Continue**

Included repeatedly if a failure handling procedure is being executed.

— **Service Identifier**

Service Identifier (SI) number.

Included in SI containers if SI level reporting is applied.



For detailed information on SI level reporting, refer to [Offline Charging](#).

— PS Furnish Charging Information

Free text information that may be provided by OCS for the RG.

Note: **PS Furnish Charging Information** is sent on RG level. If the GGSN and PGW are configured to report on SI level, the first service data container in the CDR contains the **PS Furnish Charging Information** data for the RG with no volume, hence, the **Service Identifier** subfield is left out. The traffic is reported in the subsequent containers.

For details on configuring reporting levels for eG-CDRs and PGW-CDRs, refer to [Offline Charging Configuration](#).

— AF Record Information

This field indicates the Application Function (AF) record information.

The field includes the AF Charging Identifier, which is the IMS Charging Identifier (ICID) for the IMS, and can include associated flow IDs generated by the AF and received by the GGSN or PGW over the Gx interface.

Note: The AF Charging Identifier is only included if the CDR usage reporting level is configured as Service Identifier (SI) level. For details on how to configure SI level reporting, refer to [Offline Charging Configuration](#).

— User Location Information

Includes the GTP User Location Information IE, excluding the GTP header, received from the SGSN or SGW.

Contains User Location Information as described in Section 5.3 on page 90.

— Event Based Charging Information

Event usage and associated time stamps.

Included if event tracking is applied.

For detailed information on event tracking, refer to [Charging Methods](#).

— 3GPP2 User Location Information

This field indicates the 3GPP2 User Location Information.

This field includes the 3GPP2-BSID AVP, which indicates the Base Station Identity Code (BSID) of where the UE is located.

Note: The 3GPP2 User Location Information subfield is only valid for PGW-CDRs.



4.10.1

Release 6

ASN.1 Format

```
listOfServiceData          [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL
```

```
ChangeOfServiceCondition ::= SEQUENCE
```

```
{
```

```
    ratingGroup              [1] RatingGroupId,
    resultCode                [3] ResultCode OPTIONAL,
    localSequenceNumber      [4] LocalSequenceNumber OPTIONAL,
    timeOfFirstUsage         [5] TimeStamp OPTIONAL,
    timeOfLastUsage          [6] TimeStamp OPTIONAL,
    timeUsage                 [7] CallDuration OPTIONAL,
    serviceConditionChange   [8] ServiceConditionChange,
    qosInformationNeg        [9] QoSInformation OPTIONAL,
    sgsn-Address              [10] GSNAAddress OPTIONAL,
    sGSNPLMNIdentifier       [11] PLMN-Id OPTIONAL,
    datavolumeFBCUplink      [12] DataVolumeGPRS OPTIONAL,
    datavolumeFBCDownlink   [13] DataVolumeGPRS OPTIONAL,
    timeOfReport             [14] TimeStamp,
    rATType                  [15] RATType OPTIONAL,
    failureHandlingContinue [16] FailureHandlingContinue OPTIONAL,
    serviceIdentifier         [17] ServiceIdentifier OPTIONAL,
    pSFurnishChargingInformation [18] PSFurnishChargingInformation OPTIONAL,
    aFRecordInformation      [19] SEQUENCE OF OCTET STRING OPTIONAL
```

```
}
```

```
RatingGroupId ::= INTEGER
```

```
ResultCode ::= INTEGER
```

```
LocalSequenceNumber ::= INTEGER (0..4294967295)
```

```
TimeStamp ::= OCTET STRING (SIZE(9))
```

```
CallDuration ::= INTEGER
```

```
ServiceConditionChange ::= BIT STRING
```

```
{
```

```
    qosChange                (0),
    sGSNChange                (1),
    sGSNPLMNIDChange         (2),
    tariffTimeSwitch          (3),
    pDPContextRelease         (4),
    rATChange                 (5),
    serviceIdledOut           (6),
    serviceStop                (9),
    timeThresholdReached      (10),
    volumeThresholdReached    (11),
    timeExhausted             (13),
    volumeExhausted           (14),
    timeout                   (15),
    returnRequested           (16),
    reauthorisationRequest    (17),
    continueOngoingSession    (18),
    retryAndTerminateOngoingSession (19),
```



```

    terminateOngoingSession                (20)
}
QoSInformation ::= OCTET STRING (SIZE (4..15))
    See section on shared data type QoS Information for further details.
GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress                        IPBinaryAddress,
IPBinaryAddress ::= CHOICE
{
    iPBinV4Address                         [0] OCTET STRING (SIZE(4)),
    iPBinV6Address                         [1] OCTET STRING (SIZE(16))
}
}
PLMN-Id ::= OCTET STRING (SIZE(3))
DataVolumeGPRS ::= INTEGER
RATType ::= INTEGER (0..255)
FailureHandlingContinue ::= BOOLEAN
ServiceIdentifier ::= INTEGER (0..4294967295)
PSFurnishChargingInformation ::= SEQUENCE
{
    pSFreeFormatData                       [1] FreeFormatData,
    pSFFDAppendIndicator                   [2] FFDAppendIndicator OPTIO
}
FFDAppendIndicator ::= BOOLEAN
FreeFormatData ::= OCTET STRING (SIZE (1..160))

```

Encoded ASN.1 Tag

```

H'BF22 listOfServiceData
    H'30 ChangeOfServiceCondition (SEQUENCE)
        H'81 ratingGroup
        H'83 resultCode
        H'84 localSequenceNumber
        H'85 timeOfFirstUsage
        H'86 timeOfLastUsage
        H'87 timeUsage
        H'88 serviceConditionChange
        H'89 qosInformationNeg
        See section on shared data type QoS Information for further details
    H'AA sgsn-Address
        H'80 iPBinV4Address
        H'81 iPBinV6Address
    H'8B sGSNPLMNIdentifier
    H'8C datavolumeFBCUplink
    H'8D datavolumeFBCDownlink
    H'8E timeOfReport
    H'8F rATType
    H'90 failureHandlingContinue
    H'91 serviceIdentifier
    H'B2 pSFurnishChargingInformation
        H'81 pSFreeFormatData

```



H'82 pSFFDAppendIndicator
H'B3 aFRecordInformation

4.10.2 Release 7

ASN.1 Format

listOfServiceData [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL

ChangeOfServiceCondition ::= SEQUENCE

```
{
  ratingGroup                [1] RatingGroupId,
  resultCode                 [3] ResultCode OPTIONAL,
  localSequenceNumber       [4] LocalSequenceNumber OPTIONAL,
  timeOfFirstUsage          [5] TimeStamp OPTIONAL,
  timeOfLastUsage           [6] TimeStamp OPTIONAL,
  timeUsage                 [7] CallDuration OPTIONAL,
  serviceConditionChange    [8] ServiceConditionChange,
  qosInformationNeg         [9] QoSInformation OPTIONAL,
  ggsn-Address              [10] GSNAAddress OPTIONAL,
  sGSNPLMNIdentifier        [11] PLMN-Id OPTIONAL,
  datavolumeFBCUplink       [12] DataVolumeGPRS OPTIONAL,
  datavolumeFBCDownlink    [13] DataVolumeGPRS OPTIONAL,
  timeOfReport              [14] TimeStamp,
  rATType                   [15] RATType OPTIONAL,
  failureHandlingContinue   [16] FailureHandlingContinue OPTIONAL,
  serviceIdentifier         [17] ServiceIdentifier OPTIONAL,
  pSFurnishChargingInformation [18] PSFurnishChargingInformation OPTIONAL,
  aFRecordInformation       [19] SEQUENCE OF OCTET STRING OPTIONAL,
  userLocationInformation   [20] OCTET STRING OPTIONAL,
  eventBasedChargingInformation [21] EventBasedChargingInformation OPTIONAL
}
```

RatingGroupId ::= INTEGER

ResultCode ::= INTEGER

LocalSequenceNumber ::= INTEGER (0..4294967295)

TimeStamp ::= OCTET STRING (SIZE(9))

CallDuration ::= INTEGER

ServiceConditionChange ::= BIT STRING

```
{
  qosChange                (0),
  sGSNChange               (1),
  sGSNPLMNIDChange        (2),
  tariffTimeSwitch         (3),
  pDPContextRelease        (4),
  rATChange                (5),
  serviceIdledOut          (6),
  serviceStop              (9),
  dCCATimeThresholdReached (10),
  dCCAVolumeThresholdReached (11),
  dCCAServiceSpecificUnitThresholdReached (12),
}
```



```

    dCCATimeExhausted           (13),
    dCCAVolumeExhausted        (14),
    dCCAValidityTimeout        (15),
    dCCAReauthorisationRequest (17),
    dCCAContinueOngoingSession (18),
    dCCARetryAndTerminateOngoingSession (19),
    dCCATerminateOngoingSession (20),
    cGI-SAICheck                (21),
    dCCAserviceSpecificUnitExhausted (23),
    recordClosure                (24)
}
QoSInformation ::= OCTET STRING (SIZE (4..17))
    See section on shared data type QoS Information for further details.
GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    ipBinaryAddress             IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    ipBinV4Address              [0] OCTET STRING (SIZE(4)),
    ipBinV6Address              [1] OCTET STRING (SIZE(16))
}
PLMN-Id ::= OCTET STRING (SIZE(3))
DataVolumeGPRS ::= INTEGER
RATType ::= INTEGER (0..255)
FailureHandlingContinue ::= BOOLEAN
ServiceIdentifier ::= INTEGER (0..4294967295)
PSFurnishChargingInformation ::= SEQUENCE
{
    pSFreeFormatData           [1] FreeFormatData,
    pSFFDAppendIndicator       [2] FFDAppendIndicator OPTIO
}
FFDAppendIndicator ::= BOOLEAN
FreeFormatData ::= OCTET STRING (SIZE (1..160))
EventBasedChargingInformation ::= SEQUENCE
{
    numberOfEvents              [1] INTEGER,
    eventTimeStamps             [2] SEQUENCE OF TimeStamp OP
}

```

Encoded ASN.1 Tag

```

H'BF22 listOfServiceData
  H'30 ChangeOfServiceCondition (SEQUENCE)
    H'81 ratingGroup
    H'83 resultCode
    H'84 localSequenceNumber
    H'85 timeOfFirstUsage
    H'86 timeOfLastUsage
    H'87 timeUsage

```



```

H'88 serviceConditionChange
H'89 qosInformationNeg
    See section on shared data type QoS Information for further details.
H'AA sgsn-Address
    H'80 iPBInV4Address
    H'81 iPBInV6Address
H'8B sGSNPLMNIdentifier
H'8C datavolumeFBCUplink
H'8D datavolumeFBCDownlink
H'8E timeOfReport
H'8F rATType
H'90 failureHandlingContinue
H'91 serviceIdentifier
H'B2 pSFurnishChargingInformation
    H'81 pSFreeFormatData
    H'82 pSFFDAppendIndicator
H'B3 aFRecordInformation
H'94 userLocationInformation
H'B5 eventBasedChargingInformation
    H'81 numberOfEvents
    H'A2 eventTimeStamps (SEQUENCE)
        H'04 timeStamp

```

4.10.3 Release 8, 13, and 15

ASN.1 Format

listOfServiceData [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL

ChangeOfServiceCondition ::= SEQUENCE

```

{
    ratingGroup                [1] RatingGroupId,
    resultCode                  [3] ResultCode OPTIONAL,
    localSequenceNumber        [4] LocalSequenceNumber OPTIONAL,
    timeOfFirstUsage           [5] TimeStamp OPTIONAL,
    timeOfLastUsage            [6] TimeStamp OPTIONAL,
    timeUsage                   [7] CallDuration OPTIONAL,
    serviceConditionChange     [8] ServiceConditionChange,
    qosInformationNeg          [9] EPCQoSInformation OPTIONAL,
    servingNodeAddress         [10] GSNAAddress OPTIONAL,
    datavolumeFBCUplink        [12] DataVolumeGPRS OPTIONAL,
    datavolumeFBCDownlink     [13] DataVolumeGPRS OPTIONAL,
    timeOfReport               [14] TimeStamp,
    failureHandlingContinue    [16] FailureHandlingContinue OPTIONAL,
    serviceIdentifier          [17] ServiceIdentifier OPTIONAL,
    pSFurnishChargingInformation [18] PSFurnishChargingInformation OPTIONAL,
    aFRecordInformation        [19] SEQUENCE OF AFRecordInformation OPTIO
    userLocationInformation    [20] OCTET STRING OPTIONAL,
    eventBasedChargingInformation [21] EventBasedChargingInformation OPTIONA
    3GPP2UserLocationInformation [24] OCTET STRING OPTIONAL

```



```

}
RatingGroupId ::= INTEGER
ResultCode ::= INTEGER
LocalSequenceNumber ::= INTEGER (0..4294967295)
TimeStamp ::= OCTET STRING (SIZE(9))
CallDuration ::= INTEGER
ServiceConditionChange ::= BIT STRING
{
    qoSChange (0),
    sGSNChange (1),
    sGSNPLMNIDChange (2),
    tariffTimeSwitch (3),
    pDPContextRelease (4),
    rATChange (5),
    serviceIdledOut (6),
    serviceStop (9),
    dCCATimeThresholdReached (10),
    dCCAVolumeThresholdReached (11),
    dCCAServiceSpecificUnitThresholdReached (12),
    dCCATimeExhausted (13),
    dCCAVolumeExhausted (14),
    dCCAValidityTimeout (15),
    dCCAReauthorisationRequest (17),
    dCCAContinueOngoingSession (18),
    dCCARetryAndTerminateOngoingSession (19),
    dCCATerminateOngoingSession (20),
    cGI-SAIChange (21),
    rAIChange (22),
    dCCAServiceSpecificUnitExhausted (23),
    recordClosure (24),
    eCGIChange (29),
    tAIChange (30)
}
EPCQoSInformation
    See section on shared data type QoS Information for further details.
GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    ipBinaryAddress IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    ipBinV4Address [0] OCTET STRING (SIZE(4)),
    ipBinV6Address [1] OCTET STRING (SIZE(16))
}
DataVolumeGPRS ::= INTEGER
FailureHandlingContinue ::= BOOLEAN
ServiceIdentifier ::= INTEGER (0..4294967295)
PSFurnishChargingInformation ::= SEQUENCE
{
    pSFreeFormatData [1] FreeFormatData,

```



```
        pSFFDAppendIndicator          [2] FFDApendIndicator OPTIONAL
    }
    FreeFormatData ::= OCTET STRING (SIZE (1..160))
    FFDApendIndicator ::= BOOLEAN
    AFRecordInformation ::= SEQUENCE
    {
        aFChargingIdentifier          [1] AFChargingIdentifier
    }
    AFChargingIdentifier ::= OCTET STRING
    EventBasedChargingInformation ::= SEQUENCE
    {
        numberOfEvents                [1] INTEGER,
        eventTimeStamps               [2] SEQUENCE OF TimeStamp OPTIONAL
    }
```

Encoded ASN.1 Tag

```
H'BF22 listOfServiceData
    H'30 ChangeOfServiceCondition (SEQUENCE)
        H'81 ratingGroup
        H'83 resultCode
        H'84 localSequenceNumber
        H'85 timeOfFirstUsage
        H'86 timeOfLastUsage
        H'87 timeUsage
        H'88 serviceConditionChange
        H'89 qosInformationNeg
            See section on shared data type QoS Information for further details.
    H'AA sgsn-Address
        H'80 iPBInV4Address
        H'81 iPBInV6Address
    H'8B sGSNPLMNIIdentifier
    H'8C datavolumeFBCUplink
    H'8D datavolumeFBCDownlink
    H'8E timeOfReport
    H'8F rATType
    H'90 failureHandlingContinue
    H'91 serviceIdentifier
    H'B2 pSFurnishChargingInformation
        H'81 pSFreeFormatData
        H'82 pSFFDAppendIndicator
    H'B3 aFRecordInformation
        H'30 AFRecordInformation (SEQUENCE)
            H'81 aFChargingIdentifier
    H'94 userLocationInformation
    H'B5 eventBasedChargingInformation
        H'81 numberOfEvents
        H'A2 eventTimeStamps (SEQUENCE)
            H'04 timeStamp
    H'98 3GPP2UserLocationInformation
```



4.11 List of Traffic Volumes

CDR Field	R15	R13	R8	R7	R6	Special
List of Traffic Volumes	O _C	O _C	O _C	O _M	O _M	Yes
QoS Negotiated	N/A	N/A	N/A	C	C	No
Data Volume GPRS Uplink	M	M	M	M	M	Yes
Data Volume GPRS Downlink	M	M	M	M	M	Yes
Change Condition	M	M	M	M	M	Yes
Change Time	M	M	M	M	M	Yes
User Location Information	C	C	C	C		No
EPC QoS Information	C	C	C			No

Contents

Includes traffic volume containers that contain bearer data attributes. Each traffic volume container includes the following subfields:

— QoS Negotiated

Includes the authorized QoS for the PDP context.

Always included in the first traffic volume container of a partial CDR and in the following traffic volume containers if the previous change condition is QoS change, or if QoS Negotiated is configured to be included in all containers.

Contains QoS information as described in Section 5.1 on page 85.

Note: The QoS Negotiated subfield is only valid for G-CDRs and eG-CDRs. In PGW-CDRs, the subfield EPC QoS Information is used instead.

— Data Volume GPRS Uplink, Data Volume GPRS Downlink

Volume usage reported on bearer level.

For detailed information on volume measurement, refer to [Charging Methods](#).

— Change Condition

Indicates the reason for traffic volume container closure.

For a description of the applicable values, see the section on Bearer Data in [Offline Charging](#).

— Change Time

Indicates the time when the traffic volume container is closed.

Contains a timestamp as described in Section 5.2 on page 89.



— **User Location Information**

Includes the GTP User Location Information IE, excluding the GTP header, received from the SGSN or SGW.

Contains User Location Information as described in Section 5.3 on page 90.

— **EPC QoS Information**

Includes the authorized QoS for the EPS bearer.

Contains QoS information as described in Section 5.1 on page 85.

Note: The EPC QoS Information subfield is only valid for PGW-CDRs. In G-CDRs and eG-CDRs, the subfield QoS Negotiated is used instead.

4.11.1

Release 6

ASN.1 Format

```
listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTIONAL
```

```
ChangeOfCharCondition ::= SEQUENCE,
```

```
{
  qosNegotiated [2] QoSInformation OPTIONAL,
  dataVolumeGPRSuplink [3] DataVolumeGPRS,
  dataVolumeGPRSDownlink [4] DataVolumeGPRS,
  changeCondition [5] ChangeCondition,
  changeTime [6] TimeStamp
}
```

```
QoSInformation ::= OCTET STRING (SIZE (4..15))
```

See section on shared data type QoS Information for further details.

```
DataVolumeGPRS ::= INTEGER
```

```
ChangeCondition ::= ENUMERATED
```

```
{
  qoSChange (0),
  tariffTime (1),
  recordClosure (2),
  failureHandlingContinueOngoing (3),
  failureHandlingRetryandTerminateOngoing (4),
  failureHandlingTerminateOngoing (5)
}
```

```
TimeStamp ::= OCTET STRING (SIZE(9))
```

Encoded ASN.1 Tag

```
H'AC listOfTrafficVolumes
```

```
  H'30 (sequence indicator)
```

```
    H'82 qosNegotiated
```

See section on shared data type QoS Information for further details.



```
H'83 dataVolumeGPRSuplink
H'84 dataVolumeGPRSDownlink
H'85 changeCondition
H'86 changeTime
```

4.11.2

Release 7

ASN.1 Format

```
listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTI
```

```
ChangeOfCharCondition ::= SEQUENCE,
{
  qosNegotiated [2] QoSInformation OPTIONAL,
  dataVolumeGPRSuplink [3] DataVolumeGPRS,
  dataVolumeGPRSDownlink [4] DataVolumeGPRS,
  changeCondition [5] ChangeCondition,
  changeTime [6] TimeStamp,
  userLocationInformation [8] OCTET STRING OPTIONAL
}
```

```
QoSInformation ::= OCTET STRING (SIZE (4..17))
```

See section on shared data type QoS Information for further details.

```
DataVolumeGPRS ::= INTEGER
```

```
ChangeCondition ::= ENUMERATED
```

```
{
  qosChange (0),
  tariffTime (1),
  recordClosure (2),
  failureHandlingContinueOngoing (3),
  failureHandlingRetryandTerminateOngoing (4),
  failureHandlingTerminateOngoing (5)
}
```

```
TimeStamp ::= OCTET STRING (SIZE(9))
```

Encoded ASN.1 Tag

```
H'AC listOfTrafficVolumes
```

```
H'30 (sequence indicator)
```

```
H'82 qosNegotiated
```

See section on shared data type QoS Information for further details

```
H'83 dataVolumeGPRSuplink
```

```
H'84 dataVolumeGPRSDownlink
```

```
H'85 changeCondition
```

```
H'86 changeTime
```

```
H'88 userLocationInformation
```



4.11.3 Release 8, 13, and 15

ASN.1 Format

listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTIONAL

ChangeOfCharCondition ::= SEQUENCE,

```
{
  dataVolumeGPRSUplink           [3] DataVolumeGPRS OPTIONAL,
  dataVolumeGPRSDownlink         [4] DataVolumeGPRS OPTIONAL,
  changeCondition                 [5] ChangeCondition,
  changeTime                     [6] TimeStamp,
  userLocationInformation         [8] OCTET STRING OPTIONAL,
  ePCQoSInformation              [9] EPCQoSInformation OPTIONAL
}
```

DataVolumeGPRS ::= INTEGER

ChangeCondition ::= ENUMERATED

```
{
  qoSChange                       (0),
  tariffTime                      (1),
  recordClosure                   (2),
  failureHandlingContinueOngoing (3),
  failureHandlingRetryandTerminateOngoing (4),
  failureHandlingTerminateOngoing (5)
}
```

TimeStamp ::= OCTET STRING (SIZE(9))

EPCQoSInformation ::= SEQUENCE

See section on shared data type QoS Information for further details

Encoded ASN.1 Tag

H'AC listOfTrafficVolumes

H'30 (sequence indicator)

H'83 dataVolumeGPRSUplink

H'84 dataVolumeGPRSDownlink

H'85 changeCondition

H'86 changeTime

H'88 userLocationInformation

H'89 ePCQoSInformation

See section on shared data type QoS Information for further details.

4.12 Local Record Sequence Number

CDR Field	R15	R13	R8	R7	R6	Special
Local Record Sequence Number	O _M	O _M	O _M	O _M	O _M	Yes



Contents

Includes a unique record number created by the GGSN or PGW. The number is allocated sequentially.

Note: This field is not included in CDRs transferred using GTP'.

4.12.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

localSequenceNumber [20] LocalSequenceNumber

LocalSequenceNumber ::= INTEGER (0..4294967295)

Value

-

Encoded ASN.1 Tag

H'94 localSequenceNumber

4.13 MS Time Zone

CDR Field	R15	R13	R8	R7	R6	Special
MS Time Zone	O _c	O _c	O _c	O _c	O _c	No

Contents

This field contains the MS Time Zone information received from the SGSN or SGW at the bearer activation and modification procedure. If a changed MS time zone is received from the SGSN in an Update PDP Context Request message or from the SGW in a Modify Bearer Request message, a partial CDR is closed with the cause MS time zone change. This field is included if the information has been received from the SGSN or SGW.

Note: This field is not supported for PMIPv6-based S2a access.

4.13.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

mSTimeZone [31] MSTimeZone OPTIONAL

MSTimeZone ::= OCTET STRING (SIZE (2))

**Value**

The first octet contains the time zone. The second octet contains Daylight Saving Time, refer to SoC with 3GPP TS 29.060.

Encoded ASN.1 Tag

H'9F1F mSTimeZone

4.14 Node ID

CDR Field	R15	R13	R8	R7	R6	Special
Node ID	O _M	O _M	O _M	O _M	O _M	No

Contents

Contains an operator-configurable identifier string for the GGSN or PGW that generated the CDR.

4.14.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

nodeID [18] NodeID OPTIONAL

NodeID ::= IA5String (SIZE(1..32))

Value

Configured node identifier.

Encoded ASN.1 Tag

H'92 nodeID

4.15 PDN Connection ID / PDN Connection Charging ID

CDR Field	R15	R13	R8	R7	R6	Special
PDN Connection ID		O _C	O _C			No
PDN Connection Charging ID	O _C					

Contents

This field defines the PDN connection ID to identify different records belonging to the same PDN connection. This field includes the charging ID of the first bearer



activated within the PDN connection. The PDN connection ID uniquely identifies the PDN connection together with the PGW address for PGW-CDRs.

4.15.1 Release 8 and 13

ASN.1 Format

pDNConnectionID [41] ChargingID OPTIONAL

ChargingID ::= INTEGER (0..4294967295)

Value

-

Encoded ASN.1 Tag

H'9F29 pDNConnectionID

4.15.2 Release 15

ASN.1 Format

pDNConnectionChargingID [41] ChargingID OPTIONAL

ChargingID ::= INTEGER (0..4294967295)

Value

-

Encoded ASN.1 Tag

H'9F29 pDNConnectionChargingID

4.16 PDP Type / PDP/PDN Type

CDR Field	R15	R13	R8	R7	R6	Special
PDP Type				O _M	O _M	No
PDP/PDN Type	O _M	O _M	O _M			No



Contents

Contains the PDP type for a PDP context and the PDN type for an EPS bearer.

4.16.1 Release 6 and 7

ASN.1 Format

pdpType [8] PDPTYPE OPTIONAL

PDPTYPE ::= OCTET STRING (SIZE(2))

Value

Table 8 PDP Type / PDP/PDN Type Field Contents

Octet	Bit							
	8	7	6	5	4	3	2	1
1	PDP Type Organization							
1	PDP Type Number							

The PDP Type Organization number is always set to 01 (hexadecimal) meaning IETF. The PDP Type Number for Internet Protocol (IP) is 21 (hexadecimal) for IPv4, 57 (hexadecimal) for IPv6, and 8D (hexadecimal) for IPv4v6, as specified in Assigned PPP DLL Protocol Numbers list in the IETF RFC 1700.

Encoded ASN.1 Tag

H'88 pdpType

4.16.2 Release 8, 13, and 15

ASN.1 Format

pdpPDNTYPE [8] PDPTYPE OPTIONAL

PDPTYPE ::= OCTET STRING (SIZE(1..2))

Value for PDP Context

The PDP/PDN type field for a PDP context contains two octets and is defined by SoC with 3GPP TS 29.060. See also Table 8.

The PDP Type Organization number is 01 (hexadecimal), indicating the IETF. The PDP type number for IP is 21 (hexadecimal) for IPv4 and 57 (hexadecimal) for IPv6, as specified in the Assigned PPP DLL Protocol Numbers list in IETF RFC 1700.



Value for EPS Bearer

The PDP/PDN field for an EPS bearer contains one octet and is defined by SoC with 3GPP TS 29.274.

See Information Element (IE) PDN Type (octet 5). Possible values are: IPv4 (1), IPv6 (2), and IPv4v6 (3).

Encoded ASN.1 Tag

H'88 pdpPDNType

4.17 PDP PDN Type Extension

CDR Field	R15	R13	R8	R7	R6	Special
PDPPDNTypeExtension	O _M	O _M				No

Contents

This field indicates Non-IP PDN type.

4.17.1 Release 13 and 15

ASN.1 Format

pDPPDNTypeExtension [68] PDPPDNTypeExtension OPTIONAL

PDPPDNTypeExtension ::= INTEGER

Value

The value range is only integers.

Encoded ASN.1 Tag

H'9F44 pDPPDNTypeExtension

4.18 PGW PLMN Identifier

CDR Field	R15	R13	R8	R7	R6	Special
P-GW PLMN Identifier	O _C	O _C	O _C			No

Contents

Contains the GGSN or PGW PLMN-ID.



4.18.1 Release 8, 13, and 15

ASN.1 Format

p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL

PLMN-Id ::= OCTET STRING (SIZE (3))

Value

For PGW-CDRs, this field is retrieved from the configuration. The MCC and MNC are coded as described for User Location Information in SoC with 3GPP TS 29.274.

Encoded ASN.1 Tag

H'9F25 p-GWPLMNIdentifier

4.19 PS Furnish Charging Information

CDR Field	R15	R13	R8	R7	R6	Special
PS Furnish Charging Information	O _c	O _c	O _c	O _c ⁽¹⁾	O _c ⁽¹⁾	No

(1) Only applicable for eG-CDRs.

Contents

Furnish Charging Information (FCI) that can be included if received from an Online Charging System (OCS) on the Gy+ interface. The FCI consists of a text string and optionally an append indicator. If the append indicator is true, the text string shall be appended to any previously received FCI; otherwise the text shall replace the previous FCI.

4.19.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

pSFurnishChargingInformation [28] PSFurnishChargingInformation OPTIONAL

PSFurnishChargingInformation ::= SEQUENCE

```

{
  pSFreeFormatData [1] FreeFormatData,
  pSFFDAppendIndicator [2] FFAppendIndicator
}

```

FFAppendIndicator ::= BOOLEAN

FreeFormatData ::= OCTET STRING (SIZE (1..160))



Value

Data received from the OCS for the bearer.

Encoded ASN.1 Tag

H'BC pSFurnishChargingInformation
 H'81 pSFreeFormatData
 H'82 pSFFDAppendIndicator

4.20 RAT Type

CDR Field	R15	R13	R8	R7	R6	Special
RAT Type	O _c	O _c	O _c	O _c	O _c	No

Contents

This field indicates the Radio Access Technology (RAT) type (for example, EUTRAN, NB-IoT, UTRAN, GSM EDGE Radio Access Network (GERAN), WLAN, Generic Access Network (GAN), eHRPD, or HSPA Evolution) currently used by the UE.

- This field is present for the bearer if the RAT type is provided by the SGSN in a PDP context request (Create or Update), or EPS bearer request (Create or Update), or from a preconfigured table in the EPG with a mapping between the SGSN IP address and the RAT-type information.
- This field is always present for EPS bearers.

4.20.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

rATType [30] RATType OPTIONAL

RATType ::= INTEGER (0..255)

Value

The value is encoded according to SoC with 3GPP TS 29.060 and SoC with 3GPP TS 29.274:

1	UTRAN
2	GERAN
3	WLAN



4	GAN
5	HSPA Evolution
6	EUTRAN
8	NB-IoT
102	3GPP2 eHRPD
103	3GPP2 HRPD

Encoded ASN.1 Tag

H'9E rATType

4.21 Record Extensions

CDR Field	R15	R13	R8	R7	R6	Special
Record Extensions	O _c	O _c	O _c	O _c	O _c	No

Contents

This field includes charging information related to the optional feature SACC. The field contains the subfields Credit Control Information, Policy Control Information, User Category, Rule Space ID, Service Containers, and Time Reports.

4.21.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
recordExtensions [19] ManagementExtensions OPTIONAL
```

```
ManagementExtensions ::= SET OF ManagementExtension
```

```
ManagementExtension ::= SEQUENCE
```

```
{
  identifier          OBJECT IDENTIFIER,
  significance        [1] BOOLEAN DEFAULT TRUE,
  information          [2] GprsCdrExtensions
}
```

```
GprsCdrExtensions ::= SET
```

```
{
  creditControlInfo   [2] CreditControlInfo OPTIONAL,
  policyControlInfo   [3] PolicyControlInfo OPTIONAL,
  userCategory        [5] INTEGER OPTIONAL,
  ruleSpaceId         [6] IA5String OPTIONAL,
  serviceContainers   [7] SEQUENCE OF ServiceContainer OPTIONAL,
  timeReports         [8] SEQUENCE OF TimeReport OPTIONAL
}
```



```
}

```

Value

The identifier refers to the virtual ASN.1 module that defines the information type GprsCdrExtensions: GPRS Charging Extensions { ITU-T (0) identified-organization (4) ETSI (0) reserved (127) etsi-identified-organization (0) Ericsson (5) oAM (2) accounting (2) charging (0) mobileDomain (0) UMTS (0) Packet Switched (1) ts32015Extensions (0) version1 (1) }.

Encoded ASN.1 Tag

```
H'B3 recordExtensions
  H'30 ManagementExtension (SEQUENCE)
    H'06 identifier
    H'81 significance
    H'A2 GprsCdrExtensions

```

4.21.2 Credit Control Information

Contents

This field contains information related to the interaction with the OCS. The credit control information includes the following subfields:

— Credit Control Failure Report

Information on an unsuccessful request to the OCS, if applicable. The credit control failure report includes the following subfields:

- Request Type

Type of request: start (initial), interim (update), or stop (terminate).

- Request Status

Status of the request: unsent, no answer, failure or OCS restart.

- Result Code

Result code at CCA command level of the response, if request status indicates failure.

- CC Request Number

Request number of the failed request.

— Credit Control Session ID

The ID of the credit control session.



— CCS Realm

The realm of the OCS.

4.21.2.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
CreditControlFailureReport ::= SEQUENCE
{
    requestType          [0] CreditRequestType,
    requestStatus       [1] CreditRequestStatus,
    resultCode           [2] CreditResultCode OPTIONAL,
    ccRequestNumber     [12] INTEGER OPTIONAL
}
CreditControlInfo ::= SEQUENCE
{
    creditControlFailureReport [6] CreditControlFailureReport OPTIONAL,
    creditControlSessionId    [7] OCTET STRING (SIZE(1..255)) OPTIONAL,
    ccsRealm                  [8] OCTET STRING (SIZE(1..255)) OPTIONAL
}
CreditRequestType ::= ENUMERATED
{
    start    (0),
    interim (1),
    stop     (2)
}
CreditRequestStatus ::= ENUMERATED
{
    unsent      (0),
    noAnswer   (1),
    failure     (2),
    oCSRestart (3)
}
CreditResultCode ::= INTEGER
```

Encoded ASN.1 Tag

```
H'A2 creditControlInfo
  H'A6 creditControlFailureReport
    H'80 requestType
    H'81 requestStatus
    H'82 resultCode
    H'8C ccRequestNumber
  H'87 creditControlSessionId
  H'88 ccsRealm
```



4.21.3 Policy Control Information

Contents

This field contains information related to the interaction with the PCRF. The policy control information includes the following subfields:

— Policy Control Failure Report

Information on an unsuccessful request to the PCRF, if applicable. The policy control failure report includes the following subfields:

- Request Type

Type of request: *start* (initial), *interim* (update), or *stop* (terminate)

- Request Status

Status of the request: *unsent*, *no answer*, *failure*, or *PCRF restart*.

- Result Code

Result code at CCA command level of the response, if request status indicates *failure*.

- Stop Time

Time of the request.

— PCS Realm

The realm of the PCRF.

— Policy Control Session ID

The ID of the policy control session.

4.21.3.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
PolicyControlFailureReport ::= SEQUENCE
```

```
{
  requestType    [0] PolicyRequestType,
  requestStatus  [1] PolicyRequestStatus,
  resultCode     [2] PolicyResultCode OPTIONAL,
  stopTime      [5] TimeStamp OPTIONAL
}
```

```
PolicyControlInfo ::= SEQUENCE
```

```
{
  policyControlFailureReport [4] PolicyControlFailureReport OPTIONAL,
  pcsRealm                   [6] OCTET STRING (SIZE(1..255)) OPTIONAL,
}
```



```
    policyControlSessionId    [7] OCTET STRING (SIZE(1..255)) OPTIONAL
  }
PolicyRequestType ::= ENUMERATED
{
  start    (0),
  interim (1),
  stop     (2)
}
PolicyRequestStatus ::= ENUMERATED
{
  unsent      (0),
  noAnswer    (1),
  failure     (2),
  pCRFRestart (3)
}
PolicyResultCode ::= INTEGER
```

Encoded ASN.1 Tag

```
H'A3 policyControlInfo
  H'A4 policyControlFailureReport
    H'80 requestType
    H'81 requestStatus
    H'82 resultCode
    H'85 stopTime
  H'86 pcsRealm
  H'87 policyControlSessionId
```

4.21.4 User Category

Contents

This field contains the user category of the user session.

4.21.4.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
userCategory    [5] INTEGER
```

Encoded ASN.1 Tag

```
H'85 userCategory
```



4.21.5 Rule Space Identity

Contents

This field contains the rule space of the user session.

4.21.5.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

ruleSpaceId [6] IA5String

Encoded ASN.1 Tag

H'86 ruleSpaceId

4.21.6 Service Containers

Contents

Includes service data extension containers that contain service data extension attributes. Service data extension containers are related to service data containers in List of Service Data with the same combination of Rating Group, Service Identifier (if applicable), and Local Sequence Number.

Service data extension containers are included only if record extensions are applied and if any applicable attributes are present.

Each service data extension container includes the following subfields:

- Rating Group

Rating Group (RG) number of the associated service data container.

- Service Identifier

Service Identifier (SI) number of the associated service data container. Included in SI containers if SI level reporting is applied.

For detailed information on SI level reporting, refer to [Offline Charging](#).

- Local Sequence Number

Local Sequence Number of the associated service data container.

- Method

Time measurement method. Included if time measurement is applied.

For detailed information on time measurement, refer to [Charging Methods](#).



— Inactivity

Time measurement parameter. Included if time measurement is applied.

For detailed information on time measurement, refer to [Charging Methods](#).

— Resolution

Time measurement parameter. Included if time measurement is applied.

For detailed information on time measurement, refer to [Charging Methods](#).

— CC Request Number

The CC request number of the corresponding request to the OCS. Included in case a service data container is closed because of credit control.

— Service-Specific Units

Event usage. Included if event tracking is applied.

For detailed information on event tracking, refer to [Charging Methods](#).

— List of URI

List of tracked URIs. Included if URI tracking and URI level reporting are applied.

For detailed information on URI tracking and URI level reporting, refer to [Offline Charging](#).

A URI item contains a combination of the following fields, determined by configuration:

- URI

A textual URI identifier. Included if present.

Note: Both 7-bits and 8-bits character encoding of URI strings can appear in the CDR.

- URI identifier

A numerical URI identifier. Included if numerical URI identifier reporting is applied.

- URI Data Volume Uplink and Downlink

Volume usage. Included if URI level volume reporting is applied.

- URI Count, List of URI time stamps

Event usage. Included if event tracking and URI level event reporting are applied.



Table 9 shows the content of the URI list depending on which protocol is used.

Table 9 URI List Content Based on Protocol

Protocol	The Content of URI List
HTTP	HTTP absolute URIs
Wireless Session Protocol (WSP) or WSP Connection less	WSP URIs
Real Time Streaming Protocol (RTSP)	RTSP PLAY URIs
Session Initiation Protocol (SIP)	SIP ACK URIs
Multimedia Messaging Service (MMS)	HTTP or WSP URIs or MMSC URIs
File Transfer Protocol (FTP)	FTP URIs, for example, ftp://172.30.21.21/gprs

— List of IP Flows

List of IP flows to be reported per service identified by RG, or the combination of RG and SI. Included if IP flow level volume reporting is activated.

List of IP flows contains all the tracked IP flows until the maximum number of IP flows is reached during the lifetime of the CDR. An IP flow item contains the five-tuple (UE IP address, UE port, server IP address, server port, and protocol) and volume (uplink or downlink data volume) information. If the IP flow handles HTTP traffic, the URI domain is also included.

For detailed information on IP flow level volume reporting, refer to [Offline Charging](#).

4.21.6.1 Release 6 and 7

ASN.1 Format

serviceContainers [7] SEQUENCE OF ServiceContainer

ServiceContainer ::= SEQUENCE

```
{
  ratingGroup           [1] RatingGroupId,
  serviceIdentifier     [2] ServiceIdentifier,
  localSequenceNumber  [3] LocalSequenceNumber,
  method               [4] ActiveTimeMethod,
  inactivity           [5] INTEGER,
  resolution           [6] INTEGER,
  ccRequestNumber      [7] INTEGER,
  serviceSpecificUnits [8] INTEGER,
  listOfURI            [9] SEQUENCE OF URI}
```



Encoded ASN.1 Tag

```
H'A7 serviceContainers
  H'30 ServiceContainer (SEQUENCE)
    H'81 ratingGroup
    H'82 serviceIdentifier
    H'83 localSequenceNumber
    H'84 method
    H'85 inactivity
    H'86 resolution
    H'87 ccRequestNumber
    H'88 serviceSpecificUnits
    H'A9 listOfURI (SEQUENCE)
      H'30 URI (SEQUENCE)
        H'81 count INTEGER
        H'82 uri IA5String
        H'83 uriIdentifier INTEGER
        H'84 uriDataVolumeUplink INTEGER
        H'85 uriDataVolumeDownlink INTEGER
        H'A6 listOfUriTimeStamps (SET)
          H'04 uriTimeStamp
```

4.21.6.2

Release 8, 13, and 15

ASN.1 Format

```
serviceContainers      [7] SEQUENCE OF ServiceContainer

ServiceContainer ::= SEQUENCE
{
    ratingGroup          [1] RatingGroupId,
    serviceIdentifier    [2] ServiceIdentifier OPTIONAL,
    localSequenceNumber [3] LocalSequenceNumber OPTIONAL,
    method               [4] ActiveTimeMethod OPTIONAL,
    inactivity           [5] INTEGER OPTIONAL,
    resolution           [6] INTEGER OPTIONAL,
    ccRequestNumber      [7] INTEGER OPTIONAL,
    serviceSpecificUnits [8] INTEGER OPTIONAL,
    listOfURI            [9] SEQUENCE OF URI OPTIONAL,
    listOfIPFlow        [10] SEQUENCE OF IPFlow OPTIONAL
}

URI ::= SEQUENCE
{
    count                [1] INTEGER,
    uri                  [2] IA5String,
    uriIdentifier        [3] INTEGER,
    uriDataVolumeUplink [4] INTEGER,
    uriDataVolumeDownlink [5] INTEGER,
    listOfUriTimeStamps [6] SET OF UriTimeStamps
```



```

IPFlow ::= SEQUENCE
{
    uEAddress          [1] IPAddress OPTIONAL,
    uEPort             [2] IPPort OPTIONAL,
    networkAddress     [3] IPAddress OPTIONAL,
    networkPort        [4] IPPort OPTIONAL,
    protocol           [5] IPProtocol OPTIONAL,
    dataVolumeUplink   [6] INTEGER OPTIONAL,
    dataVolumeDownlink [7] INTEGER OPTIONAL,
    listOfURI          [8] SEQUENCE OF UTF8String OPTIONAL
}
}
IPPort ::= INTEGER (0..65535)
IPProtocol ::= INTEGER (0..255)

```

Encoded ASN.1 Tag

```

H'A7 serviceContainers
  H'30 ServiceContainer (SEQUENCE)
    H'81 ratingGroup
    H'82 serviceIdentifier
    H'83 localSequenceNumber
    H'84 method
    H'85 inactivity
    H'86 resolution
    H'87 ccRequestNumber
    H'88 serviceSpecificUnits
    H'A9 listOfURI (SEQUENCE)
      H'30 URI (SEQUENCE)
        H'81 count INTEGER
        H'82 uri IA5String
        H'83 uriIdentifier INTEGER
        H'84 uriDataVolumeUplink INTEGER
        H'85 uriDataVolumeDownlink INTEGER
        H'A6 listOfUriTimeStamps (SET)
          H'04 uriTimeStamp
    H'AA listOfIPFlow (SEQUENCE)
      H'30 IPFlow (SEQUENCE)
        H'81 uEAddress IPAddress
        H'82 uEPort IPPort
        H'83 networkAddress IPAddress
        H'84 networkPort IPPort
        H'85 protocol IPProtocol
        H'86 dataVolumeUplink INTEGER
        H'87 dataVolumeDownlink INTEGER
        H'A8 listOfURI (SEQUENCE)

```



4.21.7 Time Reports

Contents

This field contains a list of time envelopes. The time report subfield contains a closed time envelope. For detailed information on time envelopes, refer to Charging Methods.

4.21.7.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

```
timeReports          [8] SEQUENCE OF TimeReport
```

```
TimeReport ::= SEQUENCE
{
    ratingGroup          [1] RatingGroupId,
    startTime            [2] TimeStamp,
    endTime              [3] TimeStamp,
    dataVolumeUplink     [4] DataVolumeGPRS,
    dataVolumeDownlink  [5] DataVolumeGPRS
}
```

Encoded ASN.1 Tag

```
H'A8 timeReports
H'30 TimeReport (SEQUENCE)
H'81 ratingGroup
H'82 startTime
H'83 endTime
H'84 dataVolumeUplink
H'85 dataVolumeDownlink
```

4.22 Record Opening Time

CDR Field	R15	R13	R8	R7	R6	Special
Record Opening Time	M	M	M	M	M	Yes

Contents

Indicates the time when the record is opened.

Contents

This field contains the time stamp when the record was opened.



4.22.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

recordOpeningTime [13] TimeStamp

TimeStamp ::= OCTET STRING (SIZE(9))

Value

Contains a time stamp as described in Section 5.2 on page 89.

Encoded ASN.1 Tag

H'8D recordOpeningTime

4.23 Record Sequence Number

CDR Field	R15	R13	R8	R7	R6	Special
Record Sequence Number	C	C	C	C	C	Yes

Contents

Contains a Sequence Number for linking CDRs generated for the same bearer (holding the same Charging ID and GGSN/PGW address).

4.23.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

recordSequenceNumber [17] INTEGER

Value

With a value starting at 1, this field appears in all partial CDRs.

Note: For single CDRs, the record Sequence Number field is excluded, unless specified otherwise by configuration to be included. For information on enabling the inclusion of record Sequence Numbers in single CDRs, refer to [Offline Charging Configuration](#).

Encoded ASN.1 Tag

H'91 recordSequenceNumber



4.24 Record Type

CDR Field	R15	R13	R8	R7	R6	Special
Record Type	M	M	M	M	M	Yes

Contents

This field identifies the type of the CDR.

4.24.1 Release 6

ASN.1 Format

recordType [0] CallEventRecordType

```
CallEventRecordType ::= INTEGER
{
  ggsnPDPRecord      (19),
  egsnPDPRecord      (70)
}
```

Value

19 ggsnPDPRecord

70 egsnPDPRecord

Encoded ASN.1 Tag

H'80 recordType

4.24.2 Release 7

ASN.1 Format

recordType [0] RecordType

```
RecordType ::= INTEGER
{
  ggsnPDPRecord      (19),
  egsnPDPRecord      (70)
}
```

Value

19 ggsnPDPRecord

70 egsnPDPRecord



Encoded ASN.1 Tag

H'80 recordType

4.24.3 Release 8, 13, and 15

ASN.1 Format

recordType [0] RecordType

```
RecordType ::= INTEGER
{
  pGWRecord      (85)
}
```

Value

85 pGWRecord

Encoded ASN.1 Tag

H'80 recordType

4.25 SCS AS Address

CDR Field	R15	R13	R8	R7	R6	Special
SCSASAddress	o c	o c				Yes

Contents

This field contains the address of SCS/AS for SGi PtP Tunnelling.

4.25.1 Release 13

ASN.1 Format

sCSASAddress [71] SCSASAddress OPTIONAL

sCSASAddress ::= SET

```
{
  sCSAddress [1] IPAddress,
  sCSRealm   [2] DiameterIdentity
}
```



DiameterIdentity ::= OCTET STRING

Value

The value is retrieved from the local configuration of sCSASAddress.

Encoded ASN.1 Tag

H'BF47 sCSASAddress

H'81 sCSAddress

H'82 sCSRealm

4.25.2

Release 15

ASN.1 Format

sCSASAddress [72] SCSASAddress OPTIONAL

SCSASAddress ::= SET

{

 sCSAddress [1] IPAddress,

 sCSRealm [2] DiameterIdentity

}

DiameterIdentity ::= OCTET STRING

Value

The value is retrieved from the local configuration of sCSASAddress.

Encoded ASN.1 Tag

H'BF48 sCSASAddress

H'81 sCSAddress

H'82 sCSRealm

4.26

Served IMEISV

CDR Field	R15	R13	R8	R7	R6	Special
Served IMEISV	O _C	O _C	O _C	O _C	O _C	No



Contents

This field contains the International Mobile Equipment Identity and Software Version (IMEI-SV) of the served party. The term served party is used to describe the mobile subscriber initiating the bearer. This field is present if IMEI-SV is provided by the SGSN, SGW, or MME.

Note: This field is not supported for PMIPv6-based S2a access.

4.26.1

Release 6, 7, 8, 13, and 15

ASN.1 Format

servedIMEISV [29] IMEI OPTIONAL

IMEI ::= TBCD-STRING (SIZE (8))

TBCD-STRING ::= OCTET STRING

Value

The IMEI structure is specified in 3GPP TS 23.003. The IMEI data type is specified in 3GPP TS 29.002.

The IMEI consists of the following elements:

- Type Allocation Code (TAC) – 8 digits
- Serial Number (SNR) – 6 digits
- Software Version Number (SVN) – 2 digits

Each element consists of decimal digits only. The elements are concatenated and BCD encoded in the following order TAC, SNR, and SVN, see Table 10.

Table 10 IMEI Format

Octet	Bit							
	8	7	6	5	4	3	2	1
1	TAC Digit 2				TAC Digit 1			
2	TAC Digit 4				TAC Digit 3			
3	TAC Digit 6				TAC Digit 5			
4	TAC Digit 8				TAC Digit 7			
5	SNR Digit 2				SNR Digit 1			
6	SNR Digit 4				SNR Digit 3			
7	SNR Digit 6				SNR Digit 5			
8	SVN Digit 2 ⁽¹⁾				SVN Digit 1 ⁽²⁾			

(1) If SVN is not present, then bits 5–8 of octet 8 are coded as 1111.

(2) If SVN is not present, then bits 1–4 of octet 8 are coded as 0000.

**Encoded ASN.1 Format**

H'9D servedIMEISV

4.27 Served IMSI

CDR Field	R15	R13	R8	R7	R6	Special
Served IMSI	M	M	M	M	M	Yes

Contents

Contains the International Mobile Subscriber Identity (IMSI) of the served party. The term served party is used to describe the mobile subscriber initiating the bearer.

Note: The format of the EPG Charging Data parameter **Served IMSI** reflects the IMSI format as received from the Serving GPRS Support Node (SGSN) or Serving Gateway (SGW). This section describes the format of **Served IMSI**, as would result from interworking with SGSNs or SGWs implemented according to 3GPP TS 23.003.

4.27.1 Release 6, 7, 8, 13, and 15**ASN.1 Format**

servedIMSI [3] IMSI

IMSI ::= TBCD-STRING (SIZE (3..8))

TBCD-STRING ::= OCTET STRING

Value

The IMSI structure is specified in 3GPP TS 23.003. The IMSI data type is specified in 3GPP TS 29.002.

The value is encoded as the IMSI IE in the SoC with 3GPP TS 29.060, that is, a fixed length of 8 octets is used. Each unused half octet is coded as 1111.

For Release 8 and 13, the value is encoded as the IMSI IE in the SoC with 3GPP TS 29.274, that is, the number of encoded digits can vary. When there is an odd number of digits, bits 8 to 5 of the last octet are coded as 1111.

The value is filled with a configured IMSI for the unauthenticated user of emergency APN when:

- PGW-CDR.
- The PGW is configured to generate eG-CDRs.



The IMSI components are concatenated in the following order: MCC, MNC, and MSIN. The value and encoding for TBCD-STRING is presented in Table 11.

Table 11 TBCD-STRING

Octet	Bit							
	8	7	6	5	4	3	2	1
1	digit 2				digit 1			
2	digit 4				digit 3			
3	digit 6				digit 5			
...	...							
n	digit 2n				digit 2n-1			

Digits 0–9, 2 digits per octet, each digit encoded 0000 – 1001. Overdecadic digits H'A to H'E, two digits per octet, each digit encoded 1010–1110. 1111 is used as filler when an odd number of digits occurs.

Encoded ASN.1 Tag

H'83 servedIMSI

4.28 Served MSISDN

CDR Field	R15	R13	R8	R7	R6	Special
Served MSISDN	O _c	O _c	O _c	O _c	O _c	No

Contents

This field contains the Mobile Station ISDN number (MSISDN) of the served party (including an address indicator octet), if available. The term served party is used to describe the mobile subscriber initiating the bearer.

Note: The format of the field Served MSISDN reflects the MSISDN format as received from the SGSN, MME, or SGW. This section describes the format of MSISDN, as would result from interworking with SGSNs, MMEs, and SGWs implemented according to standard 3GPP TS 23.003, for example, Ericsson SGSNs.

4.28.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

servedMSISDN [22] MSISDN OPTIONAL

```
MSISDN ::= ISDN-AddressString
ISDN-AddressString ::= AddressString (SIZE(1..9))
```



AddressString ::= OCTET STRING (SIZE (1..20))

Value

The structure of MSISDN is specified in 3GPP TS 23.003. The MSISDN data type is specified in 3GPP TS 29.002.

The maximum length is nine octets, of which eight stands for the TBCD digits and one for the Extension Indication, Nature of Address and NPI.

The range is: 5–15 digits. Only decadic digits are allowed.

The data type AddressString is specified in 3GPP TS 29.002, see also Table 12.

Table 12 AddressString

Octet	Bit							
	8	7	6	5	4	3	2	1
1 ⁽¹⁾	Extension Indicator	Nature of Address Indicator			Numbering Plan Indicator			
	1 - No extension	000 - Unknown 001 - International number 010 - National significant number			0001 - ISDN/Telephony Number Plan (ITU-T Recommendation E.164) 0110 - Land mobile Numbering Plan (ITU-T Recommendation E.212)			
TBCD 1	Digit 2			Digit 1				
TBCD 2	Digit 4			Digit 3				
TBCD 3	Digit 6			Digit 5				
...	...							
TBCD n	Digit 2n			Digit 2n-1				

(1) If not provided, the EPG inserts Extension Indicator, Nature of Address Indicator, and Numbering Plan Indicator (0x91).

Encoded ASN.1 Tag

H'96 servedMSISDN



4.29 Served PDP Address / Served PDP/PDN Address

CDR Field	R15	R13	R8	R7	R6	Special
Served PDP Address				O _c	O _c	No
Served PDP/PDN Address	O _c	O _c	O _c			No

Contents

Contains the IPv4 or IPv6 address for the PDN connection.

When Dual Stack IPv4v6 is used, the IPv6 address is included in the **Served PDP Address / Served PDP/PDN Address** field, and the IPv4 address is included in the Served PDP/PDN Address Extension field.

4.29.1 Release 6 and 7

ASN.1 Format

```
servedPDPAddress          [9] PDPAddress OPTIONAL

PDPAddress ::= CHOICE
{
  ipAddress                [0] IPAddress,
}
IPAddress ::= CHOICE
{
  IPBinaryAddress          IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
  iPBInV4Address           [0] OCTET STRING (SIZE(4)),
  iPBInV6Address           [1] OCTET STRING (SIZE(16))
}
```

Value

A binary IPv4 address or binary IPv6 address.

Encoded ASN.1 Tag

```
H'A9 servedPDPAddress
  H'A0 IPAddress
    H'80 iPBInV4Address
    H'81 iPBInV6Address
```



4.29.2 Release 8, 13, and 15

ASN.1 Format

```

servedPDPPDNAddress          [9] PDPAddress OPTIONAL

PDPAddress ::= CHOICE
{
  ipAddress                   [0] IPAddress,
}
IPAddress ::= CHOICE
{
  iPBinaryAddress             IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
  iPBinV4Address              [0] OCTET STRING (SIZE(4)),
  iPBinV6Address              [1] OCTET STRING (SIZE(16))
}

```

Value

A binary IPv4 address or binary IPv6 address.

Encoded ASN.1 Tag

```

H'A9 servedPDPPDNAddress
  H'A0 IPAddress
    H'80 iPBinV4Address
    H'81 iPBinV6Address

```

4.30 Served PDP/PDN Address Extension

CDR Field	R15	R13	R8	R7	R6	Special
Served PDP/PDN Address Extension	O _c	O _c	O _c			No

Contents

Contains the IPv4 address for the PDN connection when Dual Stack IPv4v6 is used.

When Dual Stack IPv4v6 is used, the IPv6 address is included in the Served PDP Address / Served PDP/PDN Address field, and the IPv4 address is included in the Served PDP/PDN Address Extension field.



4.30.1 Release 8, 13, and 15

ASN.1 Format

```

servedPDPPDNAddressExt          [45] PDPAddress OPTIONAL

PDPAddress ::= CHOICE
{
    ipAddress                    [0] IPAddress,
}
IPAddress ::= CHOICE
{
    IPBinaryAddress              IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    iPBInV4Address              [0] OCTET STRING (SIZE(4)),
}

```

Value

A binary IPv4 address.

Encoded ASN.1 Tag

```

H'BF2D servedPDPPDNAddressExt
  H'A0 IPAddress
  H'80 iPBInV4Address

```

4.31 Serving Node Type

CDR Field	R15	R13	R8	R7	R6	Special
Serving Node Type	M	M	M			No

Contents

This field contains one or several serving node types in the Control Plane of the GGSN or PGW connected during the record. The serving node types listed here are mapped to the serving node addresses listed in sequence in the Serving Node Address field.

The following serving node types are defined: SGSN, Proxy Mobile IP (PMIP) based SGW, GTP-based SGW, ePDG, HRPD Serving Gateway (HSGW), TWAN, and MME.



4.31.1 Release 8, 13, and 15

ASN.1 Format

servingNodeType [35] SEQUENCE OF ServingNodeType

ServingNodeType ::= ENUMERATED

```

{
  sGSN           (0),
  pMIPSGW       (1),
  gTPSGW        (2),
  ePDG          (3),
  hSGW          (4),
  mME           (5),
  tWAN          (6)
}

```

Value

-

Encoded ASN.1 Tag

H'9F23 servingNodeType

4.32 SGSN Address / Serving Node Address

CDR Field	R15	R13	R8	R7	R6	Special
SGSN Address				M	M	No
Serving Node Address	M	M	M			No

Contents

Contains the Control Plane addresses of the involved SGSNs, SGWs, TWANs, ePDGs, or HSGWs. These are the same as received in the signaling messages from the SGSNs, SGWs, TWANs, ePDGs, or HSGWs. The number of SGSN or SGW addresses can be configured between one and five.

If both IPv4 and IPv6 transport are available, the EPG sends the IPv4 address of the serving node.

4.32.1 Release 6 and 7

ASN.1 Format

sgsnAddress [6] SEQUENCE OF GSNAddress OPTIONAL



```

GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress                IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    iPBinV4Address                [0] OCTET STRING (SIZE(4)),
    iPBinV6Address                [1] OCTET STRING (SIZE(16))
}

```

Value

A binary IPv4 address or a binary IPv6 address.

Encoded ASN.1 Format

```

H'A6 sgsnAddress
    H'80 iPBinV4Address
    H'81 iPBinV6Address

```

4.32.2 Release 8, 13, and 15

ASN.1 Format

```

servingNodeAddress                [6] SEQUENCE OF GSNAddress OPTIONAL

```

```

GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress                IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    iPBinV4Address                [0] OCTET STRING (SIZE(4)),
    iPBinV6Address                [1] OCTET STRING (SIZE(16))
}

```

Value

A binary IPv4 address or a binary IPv6 address.

Encoded ASN.1 Format

```

H'A6 servingNodeAddress
    H'80 iPBinV4Address

```



H'81 iPBinV6Address

4.33 SGi PtP Tunnelling Method

CDR Field	R15	R13	R8	R7	R6	Special
SGiPtPTunnellingMethod	O _c	O _c				No

Contents

This field indicates if SGi PtP tunnelling methods based on UDP/IP are used for the PDN connection of Non-IP PDN type.

4.33.1 Release 13 and 15

ASN.1 Format

```
SGiPtPTunnellingMethod ::= ENUMERATED
{
    uDPIbased      (0),
    others         (1)
}
```

Value

The value is either 0 or 1.

Encoded ASN.1 Tag

H'9F40 sGiPtPTunnellingMethod

4.34 SGSN PLMN Identifier / Serving Node PLMN Identifier

CDR Field	R15	R13	R8	R7	R6	Special
SGSN PLMN Identifier				O _c	O _c	No
Serving Node PLMN Identifier	O _M	O _M	O _M			No



Contents

This field contains the Public Land Mobile Network (PLMN) identifier, that is, Mobile Country Code (MCC) and Mobile Network Code (MNC), for the SGSN, SGW, or MME connected during the record. For the GGSN and PGW, when the UE moves to another PLMN, a partial CDR is generated.

- For the GGSN and PGW, the field is present for the PDP context if the PLMN-ID is provided by SGSN in a PDP context request (Create or Update) or from a preconfigured table in the GGSN or PGW with a mapping between the SGSN IP address and PLMN-ID information. The GGSN and PGW can also accept PLMN-ID information from a RADIUS server, but only if no PLMN-ID is provided by the SGSN or from internal configuration.
- For EPS bearers, the field is always present.

4.34.1 Release 6 and 7

ASN.1 Format

sgsnPLMNIdentifier [27] PLMN-Id OPTIONAL

PLMN-Id ::= OCTET STRING (SIZE(3))

Value

For G-CDRs and eG-CDRs this is a 1:1 copy from the Routing Area Identity (RAI) IE specified in SoC with 3GPP TS 29.060 as follows:

- OCTET 1 of PLMN-ID = OCTET 2 of RAI
- OCTET 2 of PLMN-ID = OCTET 3 of RAI
- OCTET 3 of PLMN-ID = OCTET 4 of RAI

The PLMN-ID contains MCC and MNC, which are stored Binary Coded Decimal (BCD) encoded as presented in Table 13.

Table 13 PLMN Identifier

Octet	Bit							
	8	7	6	5	4	3	2	1
1	MCC Digit 2				MCC Digit 1			
2	MNC Digit 3				MCC Digit 3			
3	MNC Digit 2				MNC Digit 1			

Bits 5–8 of octet 2 contain third MNC digit, or 1111 used as filler when MNC has only two digits.



Depending on the MCC value, the MNC will have two or three digits. If the MCC has a value between 310-316, a three-digit MNC is provided. Otherwise, a two-digit MNC is provided.

Encoded ASN.1 Tag

H'9B sgsnPLMNIdentifier

4.34.2 Release 8, 13, and 15

ASN.1 Format

servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL

PLMN-Id ::= OCTET STRING (SIZE(3))

Value

For PGW-CDRs, the value is abstracted from the Serving Network IE specified in SoC with 3GPP TS 29.274. The field is specified as follows:

- OCTET 1 of PLMN-ID = OCTET 5 of Serving Network
- OCTET 2 of PLMN-ID = OCTET 6 of Serving Network
- OCTET 3 of PLMN-ID = OCTET 7 of Serving Network

For more information about the structure of the PLMN-ID field, see Table 13.

Encoded ASN.1 Tag

H'9B servingNodePLMNIdentifier

4.35 Start Time

CDR Field	R15	R13	R8	R7	R6	Special
Start Time	O _c	O _c	O _c			No

Contents

This field contains the time when the PDP session or PDN connection starts at the GGSN or PGW, and is available in the CDR for the first bearer in a PDP session or PDN connection.



4.35.1 Release 8, 13, and 15

ASN.1 Format

startTime [38] TimeStamp OPTIONAL

TimeStamp ::= OCTET STRING (SIZE(9))

Value

Contains a time stamp as described in Section 5.2 on page 89.

Encoded ASN.1 Tag

H'9F26 startTime

4.36 Stop Time

CDR Field	R15	R13	R8	R7	R6	Special
Stop Time	O _c	O _c	O _c			No

Contents

Contains the time when the PDN connection is terminated at the PGW, and is available in the CDR for the last bearer in a PDN connection.

Note: This field is not supported in a GGSN APN.

4.36.1 Release 8, 13, and 15

ASN.1 Format

stopTime [39] TimeStamp OPTIONAL

TimeStamp ::= OCTET STRING (SIZE(9))

Value

Contains a time stamp as described in Section 5.2 on page 89.

Encoded ASN.1 Tag

H'9F27 stopTime



4.37 User Location Information

CDR Field	R15	R13	R8	R7	R6	Special
User Location Information	O _c	O _c	O _c	O _c	O _c	No

Contents

This field is used to indicate where the UE is located, which is information that can be provided by the serving nodes.

Note: This field is not applicable for PMIPv6-based S2a access.

4.37.1 Release 6, 7, 8, 13, and 15

ASN.1 Format

userLocationInformation [32] OCTET STRING OPTIONAL

Value

Contains User Location Information as described in Section 5.3 on page 90.

Encoded ASN.1 Tag

H'9F20 userLocationInformation

4.38 3GPP2 User Location Information

CDR Field	R15	R13	R8	R7	R6	Special
3GPP2 User Location Information	O _c	O _c	O _c			No

Contents

This field is used to indicate the 3GPP2 user location where the UE is located. This parameter is provided to the PGW.

4.38.1 Release 8

ASN.1 Format

3GPP2userLocationInformation [42] OCTET STRING OPTIONAL

Value

Contains the 3GPP2 User Location Information, including the 3GPP2-BSID AVP.



Encoded ASN.1 Tag

H'9F2A 3GPP2userLocationInformation

4.38.2 Release 13 and 15

ASN.1 Format

3GPP2userLocationInformation [44] OCTET STRING OPTIONAL

Value

Contains the 3GPP2 User Location Information, including the 3GPP2-BSID AVP.

Encoded ASN.1 Tag

H'9F2C 3GPP2userLocationInformation

4.39 Low Priority Indicator

CDR Field	R15	R13	R8	R7	R6	Special
3GPP2 User Location Information	O _c	O _c				No

Contents

This field is used to indicate that the IP-CAN session has a low priority, for example, for Machine-Type Communication.

4.39.1 Release 13 and 15

ASN.1 Format

lowPriorityIndicator [46] NULL OPTIONAL

Value

Contains the Low Priority Indicator.

Encoded ASN.1 Tag

H'92E lowPriorityIndicator



4.40 UNI PDU CP Only Flag

CDR Field	R15	R13	R8	R7	R6	Special
UNI PDU CP Only Flag	o_c	o_c				No

Contents

Contains an indication on whether this PDN connection is applied with Control Plane Only flag, that is transfer using Control Plane NAS PDUs only, when Control Plane CIoT EPS Optimisation is enabled. This field is missing if both, User Plane and Control Plane UNI for PDU transfer (S1-U and S11-U from SGW) are allowed, when Control Plane CIoT EPS Optimisation is enabled.

4.40.1 Release 13 and 15

ASN.1 Format

```
uNIPDUCPOnlyFlag          [65] UNIPDUCPOnlyFlag OPTIONAL
```

```
UNIPDUCPOnlyFlag ::= BOOLEAN
```

Value

The value range is either True or False.

Encoded ASN.1 Tag

```
H'9F41 UNIPDUCPOnlyFlag
```



5 Shared Data Types

This section contains a description of shared data types used between CDR fields and subfields listed in Section 4 on page 21.

5.1 QoS Information

The EPG supports recording QoS information in CDRs in the following formats:

- UMTS QoS Information / QoS Information, based on the QoS format used in GPRS systems, in Release 6 and Release 7. For more information, refer to SoC with 3GPP TS 24.008 and SoC with 3GPP TS 29.060.
- EPC QoS Information, based on the QoS format used in EPS systems, in Release 8, Release 13, and Release 15. For more information, refer to SoC with 3GPP TS 29.274.

QoS information is included in CDRs in the following fields:

- In the List of Traffic Volumes field, in the **QoS Negotiated** and **EPC QoS Information** subfields.
- In the List of Service Data field, in the **QoS Information Negotiated** subfield.

The following subsections describe the QoS information formats supported by the EPG.

5.1.1 UMTS QoS Information / QoS Information

Contents

The contents of UMTS QoS Information or QoS Information indicate the applied QoS Profile accepted by the network.

Value and Encoding

In Releases 6 and 7, if a pre-Release 99 terminal is served, only octets 1 to 4 are included, and octet 1 is ignored.

The octet string, starting from octet 5, is a 1:1 copy of the contents of the QoS profile information element, as shown in Table 14.

The relation between UMTS QoS attributes and Release 99 attributes is defined by SoC with 3GPP TS 23.107, which also specifies the mapping between Release 97/98 and Release 99 attributes.



Table 14 QoS Profile Information Element, Release 99

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Allocation/Retention Priority							
2	Spare 0 0		Delay class			Reliability class		
3	Peak throughput				Spare 0	Precedence class		
4	Spare 0 0 0			Mean throughput				
5	Traffic class			Delivery order		Delivery of erroneous SDU		
6	Maximum SDU size							
7	Maximum Bit Rate for uplink							
8	Maximum Bit Rate for downlink							
9	Residual BER				SDU error ratio			
10	Transfer delay						Traffic Handling Priority	
11	Guaranteed Bit Rate for uplink							
12	Guaranteed Bit Rate for downlink							
13 ⁽¹⁾	Spare 0 0 0			Signaling indication	Source statistics descriptor			
14 ⁽²⁾	Maximum Bit Rate for downlink (extended)							
15 ⁽²⁾	Guaranteed Bit Rate for downlink (extended)							
16 ⁽³⁾	Maximum Bit Rate for uplink (extended)							
17 ⁽³⁾	Guaranteed Bit Rate for uplink (extended)							

(1) In Release 6 and 7, optional.

(2) In Release 6 and 7, optional. If included, octets 13–15 need to be included.

(3) In Release 7, optional. If included, octets 13–17 need to be included.

5.1.1.1

Release 6

ASN.1 Format

QoSInformation ::= OCTET STRING (SIZE (4..15))



Encoded ASN.1 Tag - List of Service Data

H'89 qoSInformationNeg

Encoded ASN.1 Tag - List of Traffic Volumes

H'82 qoSNegotiated

5.1.1.2

Release 7

ASN.1 Format

QoSInformation ::= OCTET STRING (SIZE (4..17))

Encoded ASN.1 Tag - List of Service Data

H'89 qoSInformationNeg

Encoded ASN.1 Tag - List of Traffic Volumes

H'82 qoSNegotiated

5.1.2

EPC QoS Information

Contents

The contents of EPC QoS Information indicate the applied QoS Profile accepted by the network.

Value and Encoding

In Release 8 and Release 13 CDRs, the values used for the fields are the following:

- If the EPG is configured as a GGSN, the maximum requested bandwidths and Guaranteed Bit Rates are set to the bit rates of the PDP context.
- If the EPG is configured as a PGW, for non-GBR bearers, the maximum requested bandwidths and Guaranteed Bit Rates are set to 0.

Note: Release 8 and Release 13 CDRs do not contain the APN Aggregated Maximum Bit Rate of the PDN connection.

5.1.2.1

Release 8 and 13

ASN.1 Format

```
EPCQoSInformation ::= SEQUENCE
{
    qCI [1] INTEGER,
```



```
maxRequestedBandwithUL    [2] INTEGER OPTIONAL,  
maxRequestedBandwithDL    [3] INTEGER OPTIONAL,  
guaranteedBitrateUL       [4] INTEGER OPTIONAL,  
guaranteedBitrateDL       [5] INTEGER OPTIONAL,  
aRP                        [6] INTEGER OPTIONAL  
}
```

Encoded ASN.1 Tag - List of Service Data

```
H'89 qoSInformationNeg  
  H'81 qCI  
  H'82 maxRequestedBandwithUL  
  H'83 maxRequestedBandwithDL  
  H'84 guaranteedBitrateUL  
  H'85 guaranteedBitrateDL  
  H'86 aRP
```

Encoded ASN.1 Tag - List of Traffic Volumes

```
H'89 ePCQoSInformation  
  H'81 qCI  
  H'82 maxRequestedBandwithUL  
  H'83 maxRequestedBandwithDL  
  H'84 guaranteedBitrateUL  
  H'85 guaranteedBitrateDL  
  H'86 aRP
```

5.1.2.2

Release 15

ASN.1 Format

```
EPCQoSInformation ::= SEQUENCE  
{  
  qCI [1] INTEGER,  
  maxRequestedBandwithUL [2] INTEGER OPTIONAL,  
  maxRequestedBandwithDL [3] INTEGER OPTIONAL,  
  guaranteedBitrateUL [4] INTEGER OPTIONAL,  
  guaranteedBitrateDL [5] INTEGER OPTIONAL,  
  aRP [6] INTEGER OPTIONAL,  
  aPNAggregateMaxBitrateUL [7] INTEGER OPTIONAL,  
  aPNAggregateMaxBitrateDL [8] INTEGER OPTIONAL,  
  extendedMaxRequestedBWUL [9] INTEGER OPTIONAL,  
  extendedMaxRequestedBWDL [10] INTEGER OPTIONAL,  
  extendedGBRUL [11] INTEGER OPTIONAL,  
  extendedGBRDL [12] INTEGER OPTIONAL,  
  extendedAPNAMBUL [13] INTEGER OPTIONAL,  
  extendedAPNAMBDL [14] INTEGER OPTIONAL,  
}
```



Encoded ASN.1 Tag - List of Service Data

```

H'89 qoSInformationNeg
  H'81 qCI
  H'82 maxRequestedBandwithUL
  H'83 maxRequestedBandwithDL
  H'84 guaranteedBitrateUL
  H'85 guaranteedBitrateDL
  H'86 aRP
  H'87 aPNAggregateMaxBitrateUL
  H'88 aPNAggregateMaxBitrateDL
  H'89 extendedMaxRequestedBWUL
  H'8a extendedMaxRequestedBWDL
  H'8b extendedGBRUL
  H'8c extendedGBRDL
  H'8d extendedAPNAMBUL
  H'8e extendedAPNAMBDL

```

Encoded ASN.1 Tag - List of Traffic Volumes

```

H'89 ePCQoSInformation
  H'81 qCI
  H'82 maxRequestedBandwithUL
  H'83 maxRequestedBandwithDL
  H'84 guaranteedBitrateUL
  H'85 guaranteedBitrateDL
  H'86 aRP
  H'87 aPNAggregateMaxBitrateUL
  H'88 aPNAggregateMaxBitrateDL
  H'89 extendedMaxRequestedBWUL
  H'8a extendedMaxRequestedBWDL
  H'8b extendedGBRUL
  H'8c extendedGBRDL
  H'8d extendedAPNAMBUL
  H'8e extendedAPNAMBDL

```

5.2 Time Stamp

Description

Time stamps indicate the time an event occurs.

Time stamps are included in CDRs in the following fields:

- In the Record Opening Time field.
- In the List of Traffic Volumes field, in the **Change Time** subfield.



- In the List of Service Data field, in the **Time of First Usage**, **Time of Last Usage** and **Time of Report** subfields
- In the Start Time field.
- In the Stop Time field.

Value

TimeStamp is local time in Coordinated Universal Time (UTC) compact format: "YYMMDDhhmmssShhmm".

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

Example of TimeStamp for Sweden, Central European Time (CET), when:

Date	=	2001 May 02
Time	=	15:45:00

TimeStamp = 010502154500+0200

5.3 User Location Information

Description

User Location Information indicates where the UE is located. User Location Information is retrieved as follows:

- For Release 6 and 7 CDRs, User Location Information is retrieved from the GTPv1 User Location Information IE, or is mapped from the GTPv2 User Location Information IE.
- For Release 8, 13, and 15 PGW-CDRs, User Location Information is retrieved from the GTPv2 User Location Information IE, or is mapped from the GTPv1 User Location Information IE.



The User Location Information can take the form of one of the following location types, depending on release and bearer type:

- Cell Global Identity (CGI), containing MCC, MNC, Location Area Code (LAC), and Cell Identity (CI)
- Service Area Identity (SAI), containing MCC, MNC, Location Area Code (LAC), and Service Area Code (SAC)
- Routing Area Identity (RAI), containing MCC, MNC, Location Area Code (LAC), and Routing Area Code (RAC)
- E-UTRAN CGI (ECGI), containing MCC, MNC, and E-UTRAN Cell Identifier (ECI)
- Tracking Area Identity (TAI), containing MCC, MNC, and Tracking Area Code (TAC)

Table 15 lists the location types applicable depending on release and bearer type.



Table 15 ULI Types by Release and Bearer Type

Release	PDP Context (GTPv1)	EPS Bearer (GTPv2)
Release 6	One of the following, in order of precedence:	One of the following, in order of precedence:
Release 7	<ul style="list-style-type: none"> • CGI • SAI • RAI 	<ul style="list-style-type: none"> • CGI • SAI • RAI <p>However, the information on these location types is converted from one of the following through an internal mapping function, see Section 8 on page 127:</p> <ul style="list-style-type: none"> • ECGI • TAI
Release 8, 13, and 15	One of the following, in order of precedence: <ul style="list-style-type: none"> • CGI • SAI • RAI 	One of the following: <ul style="list-style-type: none"> • RAI • CGI + RAI • SAI + RAI • TAI • ECGI • TAI + ECGI

For more information, refer to SoC with 3GPP TS 29.060 and SoC with 3GPP TS 29.274.

User Location Information is included in CDRs in the following fields:

- In the List of Traffic Volumes field, in the **User Location Information** subfield.
- In the List of Service Data field, in the **User Location Information** subfield.
- In the User Location Information field.

The following subsections describe the User Location Information formats supported by the EPG.



5.3.1

Release 6 and 7

Table 16 User Location Information Field for Cell Global Identification (CGI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Geographic Location Type = 0 (CGI)							
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	CI (most significant octet)							
8	CI (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5 to 8 of octet 3 are coded as 1111.

Table 17 User Location Information Field for Service Area Identity (SAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Geographic Location Type = 1 (SAI)							
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	SAC (most significant octet)							
8	SAC (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 18 User Location Information Field for Routing Area Identity (RAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Geographic Location Type = 2 (RAI)							
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							



Octet	Bit							
	8	7	6	5	4	3	2	1
6	LAC (least significant octet)							
7	RAC (most significant octet)							
8	RAC (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 19 User Location Information Field for Tracking Area Identity (TAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Geographic Location Type = 2 (RAI) ⁽¹⁾							
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽²⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	TAC (most significant octet)							
6	TAC (least significant octet)							
7	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1

(1) Geographic Location Information is set to RAI.

(2) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 20 User Location Information Field for E-UTRAN CGI (E-CGI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Geographic Location Type = 1 (SAI) ⁽¹⁾							
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽²⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	Spare				ECI			
6	ECI							
7	ECI							
8	ECI							

(1) Geographic Location Information is set to SAI.

(2) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.



5.3.2

Release 8, 13, and 15

Table 21 User Location Information Field for Cell Global Identification (CGI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 0	SAI 0	CGI 1
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	CI (most significant octet)							
8	CI (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 22 User Location Information Field for Service Area Identity (SAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 0	SAI 1	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	SAC (most significant octet)							
8	SAC (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 23 User Location Information Field for Routing Area Identity (RAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 1	SAI 0	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			



Octet	Bit							
	8	7	6	5	4	3	2	1
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	RAC (most significant octet)							
8	RAC (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 24 User Location Information Field for Cell Global Identification (CGI) and Routing Area Identity (RAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 1	SAI 0	CGI 1
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	CI (most significant octet)							
8	CI (least significant octet)							
9	MCC digit 2				MCC digit 1			
10	MNC digit 3 ⁽²⁾				MCC digit 3			
11	MNC digit 2				MNC digit 1			
12	LAC (most significant octet)							
13	LAC (least significant octet)							
14	RAC (most significant octet)							
15	RAC (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

(2) If only two digits are included in the MNC, then bits 5–8 of octet 10 are coded as 1111.



Table 25 User Location Information Field for Service Area Identity (SAI) and Routing Area Identity (RAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 1	SAI 1	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	SAC (most significant octet)							
8	SAC (least significant octet)							
9	MCC digit 2				MCC digit 1			
10	MNC digit 3 ⁽²⁾				MCC digit 3			
11	MNC digit 2				MNC digit 1			
12	LAC (most significant octet)							
13	LAC (least significant octet)							
14	RAC (most significant octet)							
15	RAC (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

(2) If only two digits are included in the MNC, then bits 5–8 of octet 10 are coded as 1111.

Table 26 User Location Information Field for Tracking Area Identity (TAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 1	RAI 0	SAI 0	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	TAC (most significant octet)							
6	TAC (least significant octet)							
7	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.



Table 27 User Location Information Field for E-UTRAN CGI (E-CGI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 1	TAI 0	RAI 0	SAI 0	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	Spare				ECI			
6	ECI							
7	ECI							
8	ECI							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

Table 28 User Location Information Field for Tracking Area Identity (TAI) and E-UTRAN CGI (E-CGI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 1	TAI 1	RAI 0	SAI 0	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	TAC (most significant octet)							
6	TAC (least significant octet)							
7	MCC digit 2				MCC digit 1			
8	MNC digit 3 ⁽²⁾				MCC digit 3			
9	MNC digit 2				MNC digit 1			
10	Spare				ECI			
11	ECI							
12	ECI							
13	ECI							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

(2) If only two digits are included in the MNC, then bits 5–8 of octet 8 are coded as 1111.



Untrusted Non-3GPP Network access over S2b interface

In an untrusted Non-3GPP network access scenario, the PGW receives the UE location information (ULI) in the Create Session request message sent during the GTP tunnel establishment procedure. The ULI includes the following:

- The local IP address of the UE, mapped to the ECI part of the ECGI.
- The UDP port of the UE, mapped to the TAC part of the TAI.

Table 29 User Location Information Field for Untrusted Non-3GPP Network access over S2b interface

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 1	TAI 1	RAI 0	SAI 0	CGI 0
2	MCC digit 2				MCC digit 1			
3	MNC digit 3 ⁽¹⁾				MCC digit 3			
4	MNC digit 2				MNC digit 1			
5	UE UDP Port Number (most significant octet)							
6	UE UDP Port Number (least significant octet)							
7	MCC digit 2				MCC digit 1			
8	MNC digit 3 ⁽²⁾				MCC digit 3			
9	MNC digit 2				MNC digit 1			
10	UE Local IP Address digit 1 (most significant octet)							
11	UE Local IP Address digit 2							
12	UE Local IP Address digit 3							
13	UE Local IP Address digit 4 (least significant octet)							

(1) If only two digits are included in the MNC, then bits 5–8 of octet 3 are coded as 1111.

(2) If only two digits are included in the MNC, then bits 5–8 of octet 8 are coded as 1111.





6 CDR ASN.1 Tag Values

6.1 CallEventRecord

TAG Value	Description
H'A1	GGSNPDPRecord
H'B5	GGSNPDPRecord Release 6, Release 7
H'BC	EGSNPDPRecord Release 6
H'BF46	EGSNPDPRecord Release 7
H'BF4F	PGWRecord Release 8 and 13

6.2 GGSNPDP Record

6.2.1 Release 6

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	ggsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	sgsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpType
H'A9	servedPDPAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	dynamicAddressFlag
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)



TAG Value	Description
H'82	qoSNegotiated
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	imsSignalingContext
H'9B	sgsnPLMNIdentifier
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F20	userLocationInformation

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.

6.2.2 Release 7

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	ggsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	sgsnAddress
H'80	iPBinV4Address



TAG Value	Description
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpType
H'A9	servedPDPAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	dynamicAddressFlag
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'82	qoSNegotiated
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	iMSsignalingContext
H'9B	sgsnPLMNIdentifier
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F20	userLocationInformation

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.



6.3 EGSNPDP Record

6.3.1 Release 6

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	ggsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	sgsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpType
H'A9	servedPDPAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	dynamicAddressFlag
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'82	qoSNegotiated
H'83	dataVolumeGPRSUpLink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode



TAG Value	Description
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	iMSSignalingContext
H'9B	sgsnPLMNIdentifier
H'BC	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F20	userLocationInformation
H'BF22	listOfServiceData
H'30	ChangeOfServiceCondition (SEQUENCE)
H'81	ratingGroup
H'83	resultCode
H'84	localSequenceNumber
H'85	timeOfFirstUsage
H'86	timeOfLastUsage
H'87	timeUsage
H'88	serviceConditionChange
H'89	qoSInformationNeg
H'AA	sgsn-Address
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	sGSNPLMNIdentifier
H'8C	datavolumeFBCUplink
H'8D	datavolumeFBCDownlink
H'8E	timeOfReport
H'8F	rATType
H'90	failureHandlingContinue
H'91	serviceIdentifier
H'B2	pSFurnishChargingInformation
H'81	pSFreeFormatData



TAG Value	Description
H'82	pSFFDAppendIndicator
H'B3	aFRecordInformation
H'04	OCTET STRING

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.

6.3.2 Release 7

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	ggsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	sgsnAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpType
H'A9	servedPDPAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	dynamicAddressFlag
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'82	qoSNegotiated
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing



TAG Value	Description
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	iMSsignalingContext
H'9B	sgsnPLMNIdentifier
H'BC	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F20	userLocationInformation
H'BF22	listOfServiceData
H'30	ChangeOfServiceCondition (SEQUENCE)
H'81	ratingGroup
H'83	resultCode
H'84	localSequenceNumber
H'85	timeOfFirstUsage
H'86	timeOfLastUsage
H'87	timeUsage
H'88	serviceConditionChange
H'89	qoSInformationNeg
H'AA	sgsn-Address
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	sGSNPLMNIdentifier
H'8C	datavolumeFBCUplink
H'8D	datavolumeFBCDownlink
H'8E	timeOfReport



TAG Value	Description
H'8F	rATType
H'90	failureHandlingContinue
H'91	serviceIdentifier
H'B2	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'B3	aFRecordInformation
H'04	OCTET STRING
H'94	userLocationInformation
H'B5	eventBasedChargingInformation
H'81	numberOfEvents
H'A2	eventTimeStamps (SEQUENCE)
H'04	timeStamp

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.

6.4 PGW Record

6.4.1 Release 8

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	p-GWAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpPDNType
H'A9	servedPDPPDNAddress
H'A0	IPAddress
H'80	iPBinV4Address



TAG Value	Description
H'81	ipBinV6Address
H'8B	dynamicAddressFlag
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'89	ePCQoSInformation
H'81	qCI
H'82	maxRequestedBandwidthUL
H'83	maxRequestedBandwidthDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	αRP
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	iMSsignalingContext
H'9B	servingNodePLMNIdentifier
H'BC	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'9D	servedIMEISV
H'9E	rATType



TAG Value	Description
H'9F1F	mSTimeZone
H'9F20	userLocationInformation
H'9F2A	3GPP2UserLocationInformation
H'BF22	listOfServiceData
H'30	ChangeOfServiceCondition (SEQUENCE)
H'81	ratingGroup
H'83	resultCode
H'84	localSequenceNumber
H'85	timeOfFirstUsage
H'86	timeOfLastUsage
H'87	timeUsage
H'88	serviceConditionChange
H'A9	qoSInformationNeg
H'81	qCI
H'82	maxRequestedBandwithUL
H'83	maxRequestedBandwithDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'AA	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8C	datavolumeFBCUplink
H'8D	datavolumeFBCDownlink
H'8E	timeOfReport
H'90	failureHandlingContinue
H'91	serviceIdentifier
H'B2	pSFurnishChargingInformation
H'81	pSFFreeFormatData
H'82	pSFFDAppendIndicator
H'B3	afRecordInformation
H'30	AFRecordInformation (SEQUENCE)
H'81	afChargingIdentifier
H'94	userLocationInformation



TAG Value	Description
H'98	3GPP2UserLocationInformation
H'B5	eventBasedChargingInformation
H'81	numberOfEvents
H'A2	eventTimeStamps
H'04	timeStamp
H'BF23	servingNodeType
H'0A	enumerated
H'9F25	p-GWPLMNIdentifier
H'9F26	startTime
H'9F27	stopTime
H'9F29	pDNConnectionID
H'BF2D	servedPDPPDNAddressExt
H'A0	IPAddress
H'80	iPBinV4Address

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.

6.4.2 Release 13

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	p-GWAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpPDNType
H'A9	servedPDPPDNAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	dynamicAddressFlag



TAG Value	Description
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'89	ePCQoSInformation
H'81	qCI
H'82	maxRequestedBandwithUL
H'83	maxRequestedBandwithDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	iMSsignalingContext
H'9B	servingNodePLMNIdentifier
H'BC	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F20	userLocationInformation



TAG Value	Description
H'9F2C	3GPP2UserLocationInformation
H'BF22	listOfServiceData
H'30	ChangeOfServiceCondition (SEQUENCE)
H'81	ratingGroup
H'83	resultCode
H'84	localSequenceNumber
H'85	timeOfFirstUsage
H'86	timeOfLastUsage
H'87	timeUsage
H'88	serviceConditionChange
H'A9	qoSInformationNeg
H'81	qCI
H'82	maxRequestedBandwidthUL
H'83	maxRequestedBandwidthDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'AA	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8C	datavolumeFBCUplink
H'8D	datavolumeFBCDownlink
H'8E	timeOfReport
H'90	failureHandlingContinue
H'91	serviceIdentifier
H'B2	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'B3	aFRecordInformation
H'30	AFRecordInformation (SEQUENCE)
H'81	afChargingIdentifier
H'94	userLocationInformation
H'98	3GPP2UserLocationInformation
H'B5	eventBasedChargingInformation



TAG Value	Description
H'81	numberOfEvents
H'A2	eventTimeStamps
H'04	timeStamp
H'BF23	servingNodeType
H'0A	enumerated
H'9F25	p-GWPLMNIIdentifier
H'9F26	startTime
H'9F27	stopTime
H'9F29	pDNConnectionID
H'BF2D	servedPDPPDNAddressExt
H'A0	IPAddress
H'80	iPBinV4Address
H'92E	Low Priority Indicator
H'9F40	GiPtPTunnellingMethod
H'9F41	UNIPDUCPOnlyFlag
H'9F44	DPPDNTYPEExtension
H'9F47	sCSASAddress
H'81	sCSAddress
H'82	sCSRealm

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.

6.4.3 Release 15

TAG Value	Description
H'80	recordType
H'83	servedIMSI
H'A4	p-GWAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI



TAG Value	Description
H'88	pdpPDNType
H'A9	servedPDPPDNAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8B	dynamicAddressFlag
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'89	ePCQoSInformation
H'81	qCI
H'82	maxRequestedBandwithUL
H'83	maxRequestedBandwithDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'B3	recordExtensions ⁽¹⁾
H'94	localSequenceNumber
H'95	apnSelectionMode
H'96	servedMSISDN
H'97	chargingCharacteristics
H'98	chChSelectionMode
H'99	iMSSignalingContext
H'9B	servingNodePLMNIdentifier
H'BC	pSFurnishChargingInformation



TAG Value	Description
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F20	userLocationInformation
H'9F2C	3GPP2UserLocationInformation
H'BF22	listOfServiceData
H'30	ChangeOfServiceCondition (SEQUENCE)
H'81	ratingGroup
H'83	resultCode
H'84	localSequenceNumber
H'85	timeOfFirstUsage
H'86	timeOfLastUsage
H'87	timeUsage
H'88	serviceConditionChange
H'A9	qoSInformationNeg
H'81	qCI
H'82	maxRequestedBandwidthUL
H'83	maxRequestedBandwidthDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'AA	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'8C	datavolumeFBCUplink
H'8D	datavolumeFBCDownlink
H'8E	timeOfReport
H'90	failureHandlingContinue
H'91	serviceIdentifier
H'B2	pSFurnishChargingInformation
H'81	pSFreeFormatData
H'82	pSFFDAppendIndicator



TAG Value	Description
H'B3	afRecordInformation
H'30	AFRecordInformation (SEQUENCE)
H'81	afChargingIdentifier
H'94	userLocationInformation
H'98	3GPP2UserLocationInformation
H'B5	eventBasedChargingInformation
H'81	numberOfEvents
H'A2	eventTimeStamps
H'04	timeStamp
H'BF23	servingNodeType
H'0A	enumerated
H'9F25	p-GWPLMNIdentifier
H'9F26	startTime
H'9F27	stopTime
H'9F29	pDNConnectionChargingID
H'BF2D	servedPDPPDNAddressExt
H'A0	IPAddress
H'80	iPBinV4Address
H'92E	Low Priority Indicator
H'9F40	GiPtPTunnellingMethod
H'9F41	UNIPDUCPOnlyFlag
H'9F44	DPPDNTYPEExtension
H'9F48	sCSASAddress
H'81	sCSAddress
H'82	sCSRealm

(1) For the contents of the recordExtensions field, see Section 6.5 on page 117.

6.5 Record Extensions

6.5.1 Release 6 and 7

TAG Value	Description
H'B3	recordExtensions
H'30	ManagementExtension (SEQUENCE)



TAG Value	Description
H'06	identifier
H'81	significance
H'A2	GprsCdrExtensions
H'A2	creditControlInfo
H'A6	creditControlFailureReport
H'80	requestType
H'81	requestStatus
H'82	resultCode
H'8C	ccRequestNumber
H'87	creditControlSessionId
H'88	ccsRealm
H'A3	policyControlInfo
H'A4	policyControlFailureReport
H'80	requestType
H'81	requestStatus
H'82	resultCode
H'85	stopTime
H'86	pcsRealm
H'87	policyControlSessionId
H'85	userCategory
H'86	ruleSpaceId
H'A7	serviceContainers
H'30	ServiceContainer (SEQUENCE)
H'81	ratingGroup
H'82	serviceIdentifier
H'83	localSequenceNumber
H'84	method
H'85	inactivity
H'86	resolution
H'87	ccRequestNumber
H'88	serviceSpecificUnits
H'A9	listOfURI (SEQUENCE)
H'30	URI (SEQUENCE)
H'81	count INTEGER



TAG Value	Description
H'82	uri IA5String
H'83	uriIdentifier INTEGER
H'84	uriDataVolumeUplink INTEGER
H'85	uriDataVolumeDownlink INTEGER
H'30	listOfUriTimeStamps (SET)
H'81	uriTimeStamp
H'A8	timeReports
H'30	TimeReport (SEQUENCE)
H'81	ratingGroup
H'82	startTime
H'83	endTime
H'84	dataVolumeUplink
H'85	dataVolumeDownlink

6.5.2 Release 8, 13, and 15

TAG Value	Description
H'B3	recordExtensions
H'30	ManagementExtension (SEQUENCE)
H'06	identifier
H'81	significance
H'A2	GprsCdrExtensions
H'A2	creditControlInfo
H'A6	creditControlFailureReport
H'80	requestType
H'81	requestStatus
H'82	resultCode
H'8C	ccRequestNumber
H'87	creditControlSessionId
H'88	ccsRealm
H'A3	policyControlInfo
H'A4	policyControlFailureReport
H'80	requestType
H'81	requestStatus



TAG Value	Description
H'82	resultCode
H'85	stopTime
H'86	pcsRealm
H'87	policyControlSessionId
H'85	userCategory
H'86	ruleSpaceId
H'A7	serviceContainers
H'30	ServiceContainer (SEQUENCE)
H'81	ratingGroup
H'82	serviceIdentifier
H'83	localSequenceNumber
H'84	method
H'85	inactivity
H'86	resolution
H'87	ccRequestNumber
H'88	serviceSpecificUnits
H'A9	listOfURI (SEQUENCE)
H'30	URI (SEQUENCE)
H'81	count INTEGER
H'82	uri IA5String
H'83	uriIdentifier INTEGER
H'84	uriDataVolumeUplink INTEGER
H'85	uriDataVolumeDownlink INTEGER
H'30	listOfUriTimeStamps (SET)
H'81	uriTimeStamp
H'AA	listOfIPFlow (SEQUENCE)
H'30	IPFlow (SEQUENCE)
H'81	uEAddress
H'82	uEPort
H'83	networkAddress
H'84	networkPort
H'85	protocol
H'86	dataVolumeUplink
H'87	dataVolumeDownlink



TAG Value	Description
H'A8	listOfUri (SEQUENCE)
H'A8	timeReports
H'30	TimeReport (SEQUENCE)
H'81	ratingGroup
H'82	startTime
H'83	endTime
H'84	dataVolumeUplink
H'85	dataVolumeDownlink





7 Mapping of PGW-CDR Release 8 or 13 Formats to Release 7 or 6 Formats

This section describes how PGW maps the PGW-CDR format into release 7 or release 6 eG-CDR and G-CDR format when this is required by configuration.

7.1 Mapping to eG-CDR Release 7

The PGW-CDR attributes are mapped to the corresponding eG-CDR attributes. Table 30 provides information on how the content of PGW-generated, Release 7 eG-CDRs should be interpreted.

Note: Only supported CDR attributes which differ between the PGW-CDRs and eG-CDRs are listed.

Table 30 Interpretation of eG-CDR Content at PGW Generation of eG-CDR (Release 7)

PGW-CDR Attribute	Corresponding eG-CDR Rel 7 Attribute	Difference between PGW-CDR and eG-CDR Rel 7 Attribute	Content of PGW Generated eG-CDR Rel 7 Attribute	
			SGSN Access	SGW Access
recordType	recordType	Changed name and value from pGWRecord (85) to egsnPDPRecord (70).	As eG-CDR (Value 70)	As eG-CDR (Value 70)
p-GWAddress	ggsnAddress	Changed name.	As eG-CDR	As eG-CDR
servingNodeAddress	sgsnAddress	Changed name.	As eG-CDR	As eG-CDR
pdpPDNTType	pdpType	New format used for S5/S8 access (covers IPv4v6).	As eG-CDR	As eG-CDR (covers IPv4v6).
servedPDPPDNAddress	servedPDPAddress	Changed name.	As eG-CDR	As eG-CDR
-	listOfTrafficVolumes	Not Applicable for PGW-CDRs.	As eG-CDR	As eG-CDR
causeForRecClosing	inguseForRecClosing	Changed name from serving NodeChange to sGSNChange.	As eG-CDR	As eG-CDR (sGSNChange is also used for SGW change)
chChSelectionMode	chChSelectionMode	Changed name from servingNodeSupplied to sgsnSupplied.	As eG-CDR	As eG-CDR



Table 30 Interpretation of eG-CDR Content at PGW Generation of eG-CDR (Release 7)

PGW-CDR Attribute	Corresponding eG-CDR Rel 7 Attribute	Difference between PGW-CDR and eG-CDR Rel 7 Attribute	Content of PGW Generated eG-CDR Rel 7 Attribute	
			SGSN Access	SGW Access
servingNodePLMNIdentifier	servingPLMNIdentifier	Changed name.	As eG-CDR	As eG-CDR
rATType	rATType	New value in PGW-CDR (EUTRAN).	As eG-CDR	As eG-CDR. Use EUTRAN=6 (spare value)
userLocationInformation	userLocationInformation	Changed format.	As eG-CDR	As eG-CDR. eCGI stored in SAI and TAI stored in RAI. ⁽¹⁾
listOfServiceDataRecordsInformationNegosInformation	listOfServiceDataRecordsInformationNegosInformation	New format in PGW-CDR according to SoC with 3GPP TS 29.274	As eG-CDR	As eG-CDR . EPS format mapped to GPRS format according to SoC with 3GPP TS 23.401
listOfServiceDataRecordsInformation.servingNodeAddress	listOfServiceDataRecordsInformation.sgsnAddress	SGW or SGSN address used in PGW-CDR instead of SGSN Address in eG-CDR.	As eG-CDR (SGSN address)	As eG-CDR (SGW address)
-	listOfServiceDataRecordsInformation.sgsnPLMNIdentifier	Not Applicable for PGW-CDRs.	As eG-CDR	As eG-CDR (same as at CDR level)
-	listOfServiceDataRecordsInformation.rATType	Not Applicable for PGW-CDRs.	As eG-CDR	As eG-CDR (same as CDR level)
listOfServiceDataRecordsInformation.aFRecordInformation	listOfServiceDataRecordsInformation.aFRecordInformation	Format changed in PGW-CDR: AFRecordInformation instead of OCTET STRING.	As eG-CDR	As eG-CDR
listOfServiceDataRecordsInformation.userLocationInformation	listOfServiceDataRecordsInformation.userLocationInformation	Not supported by the PGW.	As eG-CDR	As eG-CDR. eCGI stored in SAI and TAI stored in RAI. ⁽¹⁾
servingNodeType	-	New field in PGW-CDR.	Omitted	Omitted
p-GWPLMNIdentifier	-	New field in PGW-CDR.	Omitted	Omitted



Table 30 Interpretation of eG-CDR Content at PGW Generation of eG-CDR (Release 7)

PGW-CDR Attribute	Corresponding eG-CDR Rel 7 Attribute	Difference between PGW-CDR and eG-CDR Rel 7 Attribute	Content of PGW Generated eG-CDR Rel 7 Attribute	
			SGSN Access	SGW Access
startTime	-	New field in PGW-CDR.	Omitted	Omitted
stopTime	-	New field in PGW-CDR.	Omitted	Omitted
pDNConnectionID	-	New field in PGW-CDR.	Omitted	Omitted
servedPDPPDNAddressExt	-	New field in PGW-CDR.	Omitted	Omitted

(1) Both eCGI and TAI cannot be reported, and eCGI has highest priority.

7.2 Mapping to eG-CDR Release 6

The PGW-CDR attributes are mapped to the corresponding eG-CDR attributes. Table 31 and Table 30 provide information on how the content of PGW-generated, release 6 eG-CDRs should be interpreted.

Note: Only supported CDR attributes which differ between the release 7 eG-CDRs and release 6 eG-CDRs are listed in Table 31. The content of the remaining supported release 6 eG-CDR attributes correspond to the release 7 eG-CDR attributes included in Table 30.

Table 31 Interpretation of eG-CDR Content at PGW Generation of eG-CDR (Release 6)

eG-CDR Rel 7 Attribute	Corresponding eG-CDR Rel 6 Attribute	Difference between PGW-CDR and eG-CDR Rel 6 Attribute	Content of PGW Generated eG-CDR Rel 6 Attribute	
			Gn Access	SGW Access
causeForReclosing	causeForReclosing	Cause pLMNChange (101) changed to SGSNPLMNIDChange (24) in Rel 7.	As eG-CDR Rel 6 (Value 101)	As eG-CDR Rel 6 (Value 101)



Table 31 Interpretation of eG-CDR Content at PGW Generation of eG-CDR (Release 6)

eG-CDR Rel 7 Attribute	Corresponding eG-CDR Rel 6 Attribute	Difference between PGW-CDR and eG-CDR Rel 6 Attribute	Content of PGW Generated eG-CDR Rel 6 Attribute	
			Gn Access	SGW Access
listOfServiceDataEventBasedChargingInformation		New field in Rel 7.	Field omitted	Field omitted
listOfServiceDataServiceConditionChange	listOfServiceDataServiceConditionChange	New bit-string in Rel 7: <ul style="list-style-type: none"> dCCAServicespecificUnitThresholdReached (12) dCCAServicespecificUnitExhausted (23) recordClosure (24) 	Value omitted	Value omitted

7.3 Mapping to G-CDR Release 6 and Release 7

The PGW-CDR attributes are mapped to the corresponding G-CDR attributes. Table 32, Table 31, and Table 30 provide information on how the content of PGW-generated, release 6, or release 7 G-CDRs should be interpreted.

Note: Only supported CDR attributes which differ between the release 6 and release 7 eG-CDRs and release six and seven G-CDRs are listed in Table 32. The content of the remaining supported release 6 and release 7 G-CDR attributes correspond to the release 6 and 7 eG-CDR attributes included in Table 31 and Table 30 .

Table 32 Interpretation of G-CDR Content at PGW Generation of G-CDR (Release 6 and 7)

eG-CDR Rel 6 and 7 Attribute	Corresponding G-CDR Rel 6 and 7 Attribute	Difference between eG-CDR Rel 6 and 7 and G-CDR Rel 6 and 7 Attribute	Content of PGW Generated G-CDR Rel 6 and 7 Attributes	
			Gn Access	SGW Access
pSFurnishChargingInformation		New field in eG-CDR.	Omitted	Omitted
listOfServiceData		New field in eG-CDR.	Omitted. N/A for G-CDR.	Omitted. N/A for G-CDR.



8 Mapping of PGW-CDR Release 15 Format to Release 13 and Release 8 Formats

This section describes how PGW maps the release 15 PGW-CDR format into release 13 or release 8 format when this is required by configuration.

8.1 Mapping to PGW-CDR Release 13 and Release 8

The PGW-CDR attributes are mapped to the corresponding earlier attributes. Table 33 provides information on how the content of PGW-generated, release 13 and release 8 PGW-CDRs should be interpreted.

Note: Only supported CDR attributes which differ between the PGW-CDRs are listed.

Table 33 Interpretation of eG-CDR Content at PGW Generation of eG-CDR (Release 13 and Release 8)

PGW-CDR Attribute in Rel 15	Corresponding PGW-CDR Attribute in Rel 13 and Rel 8	Difference between Rel 15 and Rel 13 PGW-CDR Attribute	Content of PGW Generated eG-CDR Rel 7 Attribute	
			SGSN Access	SGW Access
pDNConnectionChapID	pDNConnectionID	Changed name.	As eG-CDR	As eG-CDR
sCSASAddress	sCSASAddress	Cause sCSASAddress (72) changed to sCSASAddress e (71) in Rel 15.	As eG-CDR	As eG-CDR





Reference List

Statements of Compliance

- [1] SoC with 3GPP TS 23.107, Statement of Compliance, Quality of Service (QoS) concept and architecture, 13/174 02-CSA 113 35/4
- [2] SoC with 3GPP TS 29.060, Statement of Compliance, GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface, 16/174 02-CSA 113 35/4
- [3] SoC with 3GPP TS 29.274 for the PGW S5/S8 Interface, Statement of Compliance, Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C), 5/174 02-AXB 250 12
- [4] SoC with 3GPP TS 32.298 for Release 6, 7 G-CDRs and Release 6, 7 eG-CDRs, Statement of Compliance, Charging Data Record (CDR) parameter description, 5/174 02-CSA 113 35/4
- [5] SoC with 3GPP TS 32.298 for Release 8 PGW-CDRs, Statement of Compliance, Charging Data Record (CDR) parameter description, 4/174 02-AXB 250 12

Standards

- [6] 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Numbering, addressing and identification, 3GPP TS 23.003
- [7] 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobile radio interface Layer 3 specification, 3GPP TS 24.008
- [8] 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobile Application Part (MAP) specification, 3GPP TS 29.002
- [9] 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging architecture and principles, 3GPP TS 32.240
- [10] 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging Data Record (CDR) parameter description, 3GPP TS 32.298
- [11] Domain names – Implementation and Specification, IETF RFC 1035
- [12] Assigned Numbers, IETF RFC 1700



- [13] Clarifications to the DNS Specification, IETF RFC 2181
- [14] SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS;
OSI networking and system aspects - Abstract Syntax Notation One
(ASN.1); Information technology – ASN.1: Specification of basic notation,
ITU-T Recommendation X.680
- [15] SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS;
OSI networking and system aspects - Abstract Syntax Notation One (ASN.1);
Information technology – ASN.1 encoding rules: Specification of Basic
Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished
Encoding Rules (DER), ITU-T Recommendation X.690