



## S-GW CDR Field Reference

This chapter provides a reference for CDR fields supported by the system for use in SGW-CDRs.

A complete list and descriptions of supported CDR fields is provided in the *S-GW CDR Field Descriptions* chapter of this reference.



### Important

This reference document contains information only on standard GTPP dictionaries. For information on custom dictionaries, contact your Cisco account representative.

The category column in all tables use keys described in the following table.

**Table 1: Dictionary Table Key 16**

| Abbreviation | Meaning                             | Description   |
|--------------|-------------------------------------|---|
| M            | Mandatory                           | A field that must be present in the CDR.  |
| C            | Conditional                         | A field that must be present in a CDR if certain conditions are met.                                    |
| OM           | Operator Provisionable: Mandatory   | A field that an operator has provisioned and must be included in the CDR for all conditions.            |
| OC           | Operator Provisionable: Conditional | A field that an operator has provisioned and must be included in the CDR if certain conditions are met. |

- [CDR Fields Supported in SGW-CDRs, on page 1](#)

## CDR Fields Supported in SGW-CDRs

The tables in this section list the SGW-CDR fields present in the available GTPP dictionaries.

## custom6 Dictionary

CDR fields are based on 3GPP TS 32.298 v8.7.0, 3GPP TS 32.251 v8.8.0, and 3GPP TS 32.298 v9.6.0.

| Field                                | Category | Description   |
|--------------------------------------|----------|---|
| Record Type                          | M        | S-GW IP CAN bearer record   |
| Served IMSI                          | M        | IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied)   |
| Served IMEISV                        | OC       | IMEISV of the ME, if available  |
| S-GW Address used                    | M        | The control plane IP address of the S-GW used.  |
| Charging ID                          | M        | IP CAN bearer identifier used to identify this IP CAN bearer in different records created by PCNs   |
| PDN Connection Id                    | OM       | The PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection.  |
| Serving Node Address                 | M        | List of serving node control plane IP addresses (e.g. SGSN, MME, etc.) used during this record.   |
| Serving Node Type                    | M        | List of serving node types in control plane. The serving node types listed here map to the serving node addresses listed in the field "Serving node Address" in sequence. |
| S-GW Change                          | OC       | Present if this is the first record after S-GW change.  |
| PGW PLMN Identifier                  | OM       | PLMN identifier (MCC MNC) of the P-GW used.   |
| Access Point Name Network Identifier | OM       | The logical name of the connected access point to the external packet data network (network identifier part of APN).  |
| PDP/PDN Type                         | OM       | Indicates PDN type (i.e IPv4, IPv6 or IPv4v6).  |
| Served PDP/PDN Address               | OC       | IP address allocated for the PDP context / PDN connection, i.e. IPv4 or IPv6, if available.   |

| Field                            | Category | Description   |
|----------------------------------|----------|---|
| Served PDP/PDN Address Extension | OC       | This field holds IPv4 address of the served IMSI, if available, when PDN Type is IPv4v6.  |
| Dynamic Address Flag             | OC       | Indicates whether served PDP/PDN address is dynamic, which is allocated during IP CAN bearer activation, initial attach (E-UTRAN or over S2x) and UE requested PDN connectivity. This field is missing if address is static.  |
| List of Traffic Data Volumes     | OM       | A list of changes in charging conditions for this QCI/ARP pair, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed.<br><br>Refer to the List of Data Traffic Volumes table in this chapter. |
| Record Opening Time              | M        | Time stamp when IP CAN bearer is activated in this S-GW or record opening time on subsequent partial records.   |
| MS Time Zone                     | OC       | Contains the MS Time Zone the MS is currently located as defined in TS 29.060, if available.  |
| Duration                         | M        | Duration of this record in the S-GW.  |
| Cause for Record Closing         | M        | The reason for the release of record from this S-GW.  |
| Diagnostics                      | OM       | A more detailed reason for the release of the connection.   |
| Record Sequence Number           | C        | Partial record sequence number, only present in case of partial records.  |
| Node ID                          | OM       | Name of the recording entity.   |

| Field                                   | Category | Description   |
|---|----------|---|
| Record Extensions                       | OC       | A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.   |
| Local Record Sequence Number            | OM       | Consecutive record number created by this node. The number is allocated sequentially including all CDR types.   |
| APN Selection Mode                      | OM       | An index indicating how the APN was selected.   |
| Served MSISDN                           | OM       | The primary MSISDN of the subscriber.   |
| User Location Information               | OC       | Contains the User Location Information of the MS as defined in TS 29.060 for GPRS case, and in TS 29.274 for EPC case, if available.  |
| Charging Characteristics                | M        | The Charging Characteristics applied to the IP CAN bearer.  |
| Charging Characteristics Selection Mode | OM       | Information about how Charging Characteristics were selected.   |
| IMS Signalling Context                  | OC       | Included if the IM-CN Subsystem Signalling Flag is set. IP CAN bearer is used for IMS signalling.   |
| P-GW Address used                       | OC       | The P-GW IP Address for the Control Plane.  |
| Serving Node PLMN Identifier            | OC       | Serving node PLMN Identifier (MCC and MNC) used during this record, if available.   |
| RAT Type                                | OC       | Indicates the Radio Access Technology (RAT) type currently used by the Mobile Station, when available. This RAT type is defined in TS 29.060 for GTP case, in TS 29.274 for eGTP case and in TS 29.275 for PMIP case. |
| Start Time                              | OC       | The time when User IP-CAN session starts, available in the CDR for the first bearer in an IP-CAN session.   |

| Field                | Category | Description   |
|----------------------|----------|---|
| Stop Time            | OC       | The time when User IP-CAN session is terminated, available in the CDR for the last bearer in an IP-CAN session.   |
| User CSG Information | OC       | Contains the User CSG Information (UCI) status of the user accessing a CSG cell. It includes CSG ID within the PLMN, access mode, and indication on CSG membership for the user when hybrid access applies, as defined in TS 29.060 for GPRS case, and in TS 29.274 for EPC case. |

Notes:

- All IP addresses are in ASCII format.

## List of Traffic Data Volumes

| Traffic Data Volume          | Category | Description   |
|------------------------------|----------|---|
| Change Of Charging Condition | M        | Each traffic volume container contains details related to a charging condition as described in the following subsections. A new container is usually created for a QoS change and for tariff changes.   |
| Data Volume GPRS Uplink      | M        | <p>The Data Volume GPRS Uplink field is a part of the ChangeOfCharCondition element in the List of Traffic Volumes. It includes the number of octets received in the uplink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.</p> <p>The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.</p> |

| Traffic Data Volume       | Category | Description  |
|---------------------------|----------|--|
| Data volume GPRS Downlink | M        | <p>The Data Volume GPRS Downlink field is a part of the ChangeOfCharCondition element in the List of Traffic Volumes. It includes the number of octets transmitted in the downlink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate.</p> <p>The data counted already includes the IP PDP bearer protocols i.e. IP or PPP.</p> |
| Change Condition          | M        | <p>The Change Condition field is part of the ChangeOfCharCondition element in the List of Traffic Volumes. It defines the reason for closing the container.</p>  |
| Change time               | M        | <p>The Change Time field is part of the ChangeOfCharCondition element in the List of Traffic Volumes. It provides the local time when a change condition (e.g. record closure) occurred and the container was closed.</p>  |

| Traffic Data Volume       | Category | Description   |
|---------------------------|----------|---|
| User Location Information | OC       | <p>This field contains the User Location Information as described in TS 29.274 for eGTP case (e.g. CGI, SAI, RAI TAI and ECGI).</p> <p>The field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.</p> <p>User Location Information contains the location (e.g. CGI/SAI, ECGI/TAI or RAI) where the UE is located and used during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is "user location change". Note the user location information in SGW-CDR main level contains the location where the UE was when CDR was opened.</p> |
| EPC Qos Requested         | OC       | <p>In case of IP-CAN bearer specific container this contains authorized QoS for the IP-CAN bearer. First container for each QCI/ARP pair includes this field. In following containers this field is present if previous change condition is "QoS change". This field is applicable only in SGW-CDR.</p>   |

## List of Secondary RAT Usage Reports

| Traffic Data Volume                     | Category | Description   |
|---|----------|---|
| List Of RAN Secondary RAT Usage Reports | OC       | Includes one or more containers reported from the RAN for a secondary RAT.  |
| RAN Secondary RAT Usage Report          | M        | Includes one or more containers reported from the RAN for a secondary RAT.  |
| Data Volume Uplink                      | M        | Includes the number of octets transmitted during the use of the packet data services in the uplink direction reported from RAN. The |

| Traffic Data Volume  | Category | Description   |
|----------------------|----------|---|
|                      |          | counting and reporting from RAN of uplink data volumes is optional.   |
| Data Volume Downlink | M        | Includes the number of octets transmitted during the use of the packet data services in the downlink direction reported from RAN. The counting and reporting from RAN of downlink data volumes is optional. |
| RAN Start Time       | M        | Includes the number of octets transmitted during the use of the packet data services in the downlink direction reported from RAN. The counting and reporting from RAN of downlink data volumes is optional. |
| Secondary RAT Type   | OC       | This field contains the RAT type for the secondary RAT.   |

## ASN.1 Definition for Fields in custom6

The following section provides the complete ASN.1 definition of all SGW-CDR related fields in this dictionary.

```
GPRS-SGW-Charging-DataTypes-REL8 DEFINITIONS IMPLICIT TAGS ::=
BEGIN

-----
--
--      GPRS RECORDS
--
-----

GPRSRecord ::= CHOICE
--
-- Record values 20, 22..27 are specific
-- Record values 76..77 are MBMS specific
-- Record values 78..79 are EPC specific
{
    sGWRecord[78] SGWRecord
}

SGWRecord ::= SET
{
    recordType                [0] RecordType,
    servedIMSI                [3] IMSI,
    s-GWAddress                [4] GSNAddress,
    chargingID                 [5] ChargingID,
    servingNodeAddress         [6] SEQUENCE OF GSNAddress,
    accessPointNameNI         [7] AccessPointNameNI OPTIONAL,
    pdpPDNType                 [8] PDPTYPE OPTIONAL,
    servedPDPDNAddress        [9] PDPAddress OPTIONAL,
    dynamicAddressFlag         [11] DynamicAddressFlag OPTIONAL,
}
```



```

listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTIONAL,

recordOpeningTime [13] TimeStamp,
duration [14] CallDuration,
causeForRecClosing [15] CauseForRecClosing,
diagnostics [16] Diagnostics OPTIONAL,
recordSequenceNumber [17] INTEGER OPTIONAL,
nodeID [18] NodeID OPTIONAL,
recordExtensions [19] ManagementExtensions OPTIONAL,
localSequenceNumber [20] LocalSequenceNumber OPTIONAL,
apnSelectionMode [21] APNSelectionMode OPTIONAL,
servedMSISDN [22] MSISDN OPTIONAL,
chargingCharacteristics [23] ChargingCharacteristics,
chChSelectionMode [24] ChChSelectionMode OPTIONAL,
imsSignalingContext [25] NULL OPTIONAL,
servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL,
servedIMEISV [29] IMEI OPTIONAL,
rATType [30] RATType OPTIONAL,
mSTimeZone [31] MSTimeZone OPTIONAL,
userLocationInformation [32] OCTET STRING OPTIONAL,
sGWChange [34] SGWChange OPTIONAL,
servingNodeType [35] SEQUENCE OF ServingNodeType,
p-GWAddressUsed [36] GSNAddress OPTIONAL,
p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL,
startTime [38] TimeStamp OPTIONAL,
stopTime [39] TimeStamp OPTIONAL,
pdnConnectionID [40] ChargingID OPTIONAL,
servedPDPAddressExt [43] PDPAddress OPTIONAL
listOfFRANSecondaryRATUsageReports [64] SEQUENCE OF RANSecondaryRATUsageReport OPTIONAL
}
RANSecondaryRATUsageReport ::= SEQUENCE
--]
{
    dataVolumeUplink [1] DataVolumeGPRS,
    dataVolumeDownlink [2] DataVolumeGPRS,
    rANStartTime [3] TimeStamp,
    rANEndTime [4] TimeStamp,
    secondaryRATType [5] SecondaryRATType OPTIONAL
}

SecondaryRATType ::= INTEGER
{
    reserved (0),
    nR (1) -- New Radio 5G
}

AccessPointNameNI ::= IA5String (SIZE(1..63))
--
-- Network Identifier part of APN in dot representation.
-- For example, if the complete APN is 'apn1a.apn1b.apn1c.mnc022.mcc111.gprs'
-- NI is 'apn1a.apn1b.apn1c' and is presented in this form in the CDR.

APNSelectionMode ::= ENUMERATED
{
    --
    -- See Information Elements TS 29.060, TS 29.274 or TS 29.275
    --
    mSorNetworkProvidedSubscriptionVerified (0),
    mSProvidedSubscriptionNotVerified (1),
    networkProvidedSubscriptionNotVerified (2)
}

CallDuration ::= INTEGER

```

```

--
-- The call duration is counted in seconds.
-- For successful calls /sessions / PDP contexts, this is the chargeable
duration.
-- For call attempts this is the call holding time.
--

```

```
CauseForRecClosing ::= INTEGER
```

```

{
  --
  -- In PGW-CDR and SGW-CDR the value servingNodeChange is used for partial record
  -- generation due to Serving Node Address list Overflow
  -- In SGSN servingNodeChange indicates the SGSN change
  --
  -- LCS related causes belong to the MAP error causes acc. TS 29.002
  --
  -- cause codes 0 to 15 are defined 'CauseForTerm' (cause for termination)
  -- All cause values are not relevant to SGW. Refer the spec to find out the
  -- cause values for SGW.
  normalRelease (0),
  abnormalRelease (4),
  cAMELInitCallRelease (5),
  volumeLimit (16),
  timeLimit (17),
  servingNodeChange (18),
  maxChangeCond (19),
  managementIntervention (20),
  intraSGSNIntersystemChange (21),
  rATChange (22),
  mSTimeZoneChange (23),
  sGSNPLMNIDChange (24),
  unauthorizedRequestingNetwork (52),
  unauthorizedLCSCClient (53),
  positionMethodFailure (54),
  unknownOrUnreachableLCSCClient (58),
  listOfDownstreamNodeChange (59)
}

```

```
ChangeCondition ::= ENUMERATED
```

```

{
  qosChange (0),
  tariffTime (1),
  recordClosure (2),
  cgi-SAICChange (6), -- bearer modification. CGI-SAI Change
  rAICChange (7), -- bearer modification. RAI Change
  dT-Establishment (8),
  dT-Removal (9),
  eCGICChange (10), -- bearer modification. ECGI Change
  tAICChange (11), -- bearer modification. TAI Change
  apnAmbrChange (50) -- apn-ambr change
}

```

```
ChangeOfCharCondition ::= SEQUENCE
```

```

{
  --
  -- qosRequested and qosNegotiated are used in S-CDR only
  -- ePCQoSInformation used in SGW-CDR only
  --
  qosRequested [1] QoSInformation OPTIONAL,
  qosNegotiated [2] QoSInformation OPTIONAL,
}

```

```

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

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

ChargingID ::= INTEGER (0..4294967295)
--
-- Generated in P-GW, part of IP CAN bearer
-- 0..4294967295 is equivalent to 0..2**32-1
--

ChChSelectionMode ::= ENUMERATED
{
    servingNodeSupplied          (0), -- For S-GW/P-GW
    subscriptionSpecific        (1), -- For SGSN only
    aPNSpecific                  (2), -- For SGSN only
    homeDefault                  (3), -- For SGSN, S-GW and P-GW
    roamingDefault               (4), -- For SGSN, S-GW and P-GW
    visitingDefault              (5) -- For SGSN, S-GW and P-GW
}

DataVolumeGPRS ::= INTEGER
--
-- The volume of data transferred in octets.
--

DynamicAddressFlag ::= BOOLEAN

EPCQoSInformation ::= SEQUENCE
{
    --
    -- See TS 29.212 for more information
    --
    qCI                           [1] INTEGER,
    maxRequestedBandwidthUL        [2] INTEGER OPTIONAL,
    maxRequestedBandwidthDL        [3] INTEGER OPTIONAL,
    guaranteedBitrateUL           [4] INTEGER OPTIONAL,
    guaranteedBitrateDL           [5] INTEGER OPTIONAL,
    arP                            [6] INTEGER OPTIONAL
        apnAmbrUplink              [7] INTEGER OPTIONAL,
        apnAmbrDownlink            [8] INTEGER OPTIONAL
    extendedMaxRequestedBWUL       [9] INTEGER OPTIONAL,
    extendedMaxRequestedBWDL      [10] INTEGER OPTIONAL,
    extendedGBRUL                 [11] INTEGER OPTIONAL,
    extendedGBRDL                 [12] INTEGER OPTIONAL,
    extendedAPNAMBRUL             [13] INTEGER OPTIONAL,
    extendedAPNAMBRDL             [14] INTEGER OPTIONAL
}

ETSIAddress ::= AddressString
--
-- First octet for nature of address, and numbering plan indicator (3 for X.121)
-- Other octets TBCD
-- See TS 29.002
--

GSNAddress ::= IPAddress

```

```

IA5String ::= OCTET STRING

MSNetworkCapability ::= OCTET STRING (SIZE(1..8))
-- see TS 24.008

NetworkInitiatedPDPContext ::= BOOLEAN
--
-- Set to true if PDP context was initiated from network side
--

NodeID ::= IA5String (SIZE(1..20))

NumberOfDPEncountered ::= INTEGER

PDPAddress ::= CHOICE
{
    ipAddress          [0] IPAddress,
    eTSIAddress         [1] ETSIAddress
}

PDPTType ::= OCTET STRING (SIZE(2))
--
-- OCTET 1: PDP Type Organization
-- OCTET 2: PDP Type Number
-- See TS 29.060 for GTP, TS 29.274 for eGTP and TS 29.275 for PMIP
--

PLMN-Id ::= OCTET STRING (SIZE (3))
--
-- This is a 1:1 copy from the Routing Area Identity (RAI) IE specified in 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
--

QoSInformation ::= OCTET STRING (SIZE (4..255))
--
-- This octet string
-- is a 1:1 copy of the contents (i.e. starting with octet 5) of the "Bearer Quality of
-- Service" information element specified in TS 29.274
--

RATType ::= INTEGER (0..255)
--
-- This integer is 1:1 copy of the RAT type value as defined in TS 29.060 for GTP,
-- TS 29.274 for eGTP and TS 29.275 for PMIP.
--

RecordType ::= INTEGER
{
    -- Record values 0..17 are CS specific.
    -- The contents are defined in TS 32.250

    sGWRecord          (84)
}

ResultCode ::= INTEGER
-- charging protocol return value, range of 4 byte (0...4294967259)
-- see Result-Code AVP as used in 3GPP 32.299
--

```

```

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

SGWChange ::= BOOLEAN
--
-- present if first record after inter S-GW change
--

Diagnostics ::= CHOICE
{
    gsm0408Cause                [0] INTEGER,
    -- See TS 24.008
    gsm0902MapErrorValue        [1] INTEGER,
    -- Note: The value to be stored here corresponds to
    -- the local values defined in the MAP-Errors and
    -- MAP-DialogueInformation modules, for full details
    -- see TS 29.002
    itu-tQ767Cause              [2] INTEGER,
    -- See ITU-T Q.767
    networkSpecificCause        [3] ManagementExtension,
    -- To be defined by network operator
    manufacturerSpecificCause   [4] ManagementExtension,
    -- To be defined by manufacturer
    positionMethodFailureCause  [5] PositionMethodFailure-Diagnostic,
    -- see TS 29.002
    unauthorizedLCSCClientCause [6] UnauthorizedLCSCClient-Diagnostic
    -- see TS 29.002
}

IPAddress ::= CHOICE
{
    ipBinaryAddress             IPBinaryAddress,
    ipTextRepresentedAddress    IPTextRepresentedAddress
}

IPBinaryAddress ::= CHOICE
{
    ipBinV4Address             [0] OCTET STRING (SIZE(4)),
    ipBinV6Address             [1] OCTET STRING (SIZE(16))
}

IPTextRepresentedAddress ::= CHOICE
{
    --
    -- IP address in the familiar "dot" notation
    --
    ipTextV4Address            [2] IA5String (SIZE(7..15)),
    ipTextV6Address            [3] IA5String (SIZE(15..45))
}

PositionMethodFailure-Diagnostic ::= ENUMERATED
{
    congestion                                (0),
    insufficientResources                      (1),
    insufficientMeasurementData                (2),

```

```

        inconsistentMeasurementData (3),
        locationProcedureNotCompleted (4),
        locationProcedureNotSupportedByTargetMS (5),
        qosNotAttainable (6),
        positionMethodNotAvailableInNetwork (7),
        positionMethodNotAvailableInLocationArea (8)
    }

LocalSequenceNumber ::= INTEGER (0..4294967295)
--
-- Sequence number of the record in this node
-- 0.. 4294967295 is equivalent to 0..2**32-1, unsigned integer in four octets

ManagementExtension ::= SEQUENCE
{
    identifier OBJECT IDENTIFIER,
    significance [1] BOOLEAN DEFAULT FALSE,
    information [2] ANY DEFINED BY identifier
}

ManagementExtensions ::= SET OF ManagementExtension

MSISDN ::= ISDN-AddressString
--
-- See TS 23.003

MSTimeZone ::= OCTET STRING (SIZE (2))
--
-- 1.Octet: Time Zone and 2. Octet: Daylight saving time, see TS 29.060

TimeStamp ::= OCTET STRING (SIZE(9))
--
-- The contents of this field are a compact form of the UTCTime format
-- containing local time plus an offset to universal time. Binary coded
-- decimal encoding is employed for the digits to reduce the storage and
-- transmission overhead
-- e.g. YYMMDDhhmmssShhmm
-- where
-- YY = Year 00 to 99 BCD encoded
-- MM = Month 01 to 12 BCD encoded
-- DD = Day 01 to 31 BCD encoded
-- hh = hour 00 to 23 BCD encoded
-- mm = minute 00 to 59 BCD encoded
-- ss = second 00 to 59 BCD encoded
-- S = Sign 0 = "+", "-" ASCII encoded
-- hh = hour 00 to 23 BCD encoded
-- mm = minute 00 to 59 BCD encoded
--

UnauthorizedLCSCClient-Diagnostic ::= ENUMERATED
{
    noAdditionalInformation (0),
    clientNotInMSPrivacyExceptionList (1),
    callToClientNotSetup (2),
    privacyOverrideNotApplicable (3),
    disallowedByLocalRegulatoryRequirements (4),
    unauthorizedPrivacyClass (5),
    unauthorizedCallSessionUnrelatedExternalClient (6),
    unauthorizedCallSessionRelatedExternalClient (7)
}

```

```

TBCDSTRING ::= OCTET STRING
ISDN-AddressString ::= OCTET STRING
IMEI ::= TBCDSTRING (SIZE(8))
IMSI ::= TBCDSTRING (SIZE(3..8))
maxAddressLength INTEGER ::= 20
AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
END

```

## custom24 Dictionary

In releases prior to 16, CDR fields in this dictionary are compliant to 3GPP TS 32.298 v8.7.0 and 3GPP TS 32.251 v8.8.0, and also partially compliant to 3GPP TS 32.298 v10.11.0. In release 16 and later, the CDR fields are fully compliant to 3GPP spec 32.298 v10.11.0.

| Field Name                        | Tag Number | Category | Description   | Format                      | Size (in bytes)          | ASN1 code |
|-----------------------------------|------------|----------|---|-----------------------------|--------------------------|-----------|
| Record Type                       | 0          | M        | S-GW IP<br>CAN bearer<br>record.  | Integer                     | 1                        | 0x80      |
| Served IMSI                       | 3          | M        | IMSI of the<br>served party.  | BCD encoded<br>octet string | 3-8                      | 0x83      |
| S-GW<br>Address                   | 4          | M        | The control<br>plane IP<br>address of the<br>S-GW used.   | Choice                      | 6 (IPv4) or 18<br>(IPv6) | 0xa4      |
| S-GW<br>BINARY<br>IPV4<br>ADDRESS | 4-0        | M        | The octet<br>string<br>includes the<br>Gn address of<br>the GGSN<br>service in<br>binary coding.  | Octet string                | 4                        | 0x80      |
| S-GW<br>BINARY<br>IPV6<br>ADDRESS | 4-0        | M        | The octet<br>string<br>included in<br>the field<br>described<br>includes the<br>Gn address of<br>the GGSN<br>service in<br>binary coding. | Octet string                | 16                       | 0x81      |

| Field Name                           | Tag Number | Category | Description  | Format       | Size (in bytes) | ASN1 code |
|--------------------------------------|------------|----------|--|--------------|-----------------|-----------|
| Charging ID                          | 5          | M        | IP CAN bearer identifier used to identify IP CAN bearer in different records created by PCNs.                        | Integer      | 1-5             | 0x85      |
| List of Serving Node Address         | 6          | M        | List of serving node control plane IP addresses (e.g. SGSN, MME ) used during this record.                           | Sequence     | 6 to 90         | 0xa6      |
| Serving Node BINARY IPV4 ADDRESS     | 6-0        | M        | The octet string included in the field described above includes the IPV4 address of the MME.                         | Octet string | 4               | 0x80      |
| Serving Node BINARY IPV6 ADDRESS     | 6-0        | M        | The octet string included in the field described above includes the IPV6 address of the MME.                         | Octet string | 16              | 0x81      |
| Access Point Name Network Identifier | 7          | M        | The logical name of the connected access point to the external packet data network (network identifier part of APN). | IA5 string   | 1-63            | 0x87      |



| Field Name             | Tag Number | Category | Description   | Format                 | Size (in bytes)       | ASN1 code |
|------------------------|------------|----------|---|------------------------|-----------------------|-----------|
| PDP/PDN Type           | 8          | M        | This field indicates PDN type (i.e IPv4, IPv6 or IPv4v6).   | Octet string (SIZE(2)) | 2                     | 0x88      |
| Served PDP/PDN Address | 9          | M        | IP address allocated for the PDP context / PDN connection, if available, i.e. IPv4 when PDN Type is IPv4 or IPv6 when PDN Type is IPv6 or IPv4v6. | Choice                 | 8 (IPv4) or 20 (IPv6) | 0xa9      |
| PDP IP Address         | 9-0        | M        | This field contains the IP address for the PDP context.   | Choice                 | 6 (IPv4) or 18 (IPv6) | 0xa0      |
| PDP IPV4 Address       | 9-0-0      | M        | The octet string included in the field described above includes the IPv4 address assigned to the subscriber by the S-GW in binary coding.         | Octet string           | 4                     | 0x80      |

| Field Name           | Tag Number | Category | Description  | Format       | Size (in bytes) | ASN1 code |
|----------------------|------------|----------|--|--------------|-----------------|-----------|
| PDP IPV6 Address     | 9-0-0      | M        | The octet string included in the field described above includes the IPv6 address assigned to the subscriber by the S-GW in binary coding.  | Octet string | 16              | 0x81      |
| Dynamic Address Flag | 11         | O        | Indicates whether served PDP/PDN address is dynamic, which is allocated during IP CAN bearer activation, initial attach (E-UTRAN or over S2x) and UE requested PDN connectivity. This field is missing if address is static. | Boolean      | 1               | 0x8b      |

| Field Name                   | Tag Number | Category | Description   | Format   | Size (in bytes) | ASN1 code |
|------------------------------|------------|----------|---|----------|-----------------|-----------|
| List of Traffic Data Volumes | 12         | M        | A list of changes in charging conditions for this QCI/ARP pair, each change is time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are also listed. | Sequence |                 | 0xac      |
| Change of charging condition | 12-0       | M        | Each traffic volume container contains details related to a charging condition. A new container is usually created for a QoS change and for tariff changes.   | Sequence |                 | 0x30      |

| Field Name                 | Tag Number | Category | Description  | Format  | Size (in bytes) | ASN1 code |
|----------------------------|------------|----------|--|---------|-----------------|-----------|
| Data Volume<br>GPRS Uplink | 12-0-3     | M        | The Data Volume GPRS Uplink field is a part of the <del>ChgOfInCm</del> element in the List of Traffic Volumes. It includes the number of octets received in the uplink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate. | Integer | 1-5             | 0x83      |

| Field Name                      | Tag Number | Category | Description   | Format     | Size (in bytes) | ASN1 code |
|---------------------------------|------------|----------|---|------------|-----------------|-----------|
| Data Volume<br>GPRS<br>Downlink | 12-0-4     | M        | The Data Volume GPRS Downlink field is a part of the <del>ChangeCondition</del> element in the List of Traffic Volumes. It includes the number of octets transmitted in the downlink direction during the timeframe specified by the container. For each new container, the counter is reset and does not accumulate. | Integer    | 1-5             | 0x84      |
| Change<br>Condition             | 12-0-5     | M        | The Change Condition field is part of the <del>ChangeCondition</del> element in the List of Traffic Volumes. It defines the change in user plane to UE.   | Enumerated | 1               | 85 01     |

| Field Name                | Tag Number | Category | Description   | Format                   | Size (in bytes) | ASN1 code |
|---------------------------|------------|----------|---|--------------------------|-----------------|-----------|
| Change Time               | 12-0-6     | M        | The Change Time field is part of the <del>Change Time</del> element in the List of Traffic Volumes. It provides the local time when a change condition (e.g. record closure) occurred and the container was closed. | BCD encoded octet string | 9               | 0x86      |
| User Location Information | 12-0-8     | O        | This field contains the User Location Information.  | Octet string             | 8-33            | 0x88      |

| Field Name          | Tag Number | Category | Description  | Format       | Size (in bytes) | ASN1 code |
|---------------------|------------|----------|--|--------------|-----------------|-----------|
| EPC QoS Information | 12-0-9     | O        | In case of IP-CAN bearer specific container this contains authorized QoS for the IP-CAN bearer. First container for each QCI/ARP pair includes this field. In the following containers this field is present if previous change condition is "QoS change". This field is applicable only in SGW-CDR. | Octet string | 18-42           | 0xa9      |

| Field Name                         | Tag Number | Category | Description   | Format  | Size (in bytes) | ASN1 code |
|------------------------------------|------------|----------|---|---------|-----------------|-----------|
| CP ClOT EPS Optimisation Indicator | 12-0-19    | O        | The CP ClOT EPS Optimisation Indicator field indicates whether Control Plane ClOT EPS optimisation is used for the transfer of the data volume captured by the container. This is included in the Traffic data container only if previous container's change condition is "change in user plane to UE". Note, the CP ClOT EPS Optimisation indicator field in SGW-CDR main level contains the CP ClOT EPS optimisation indicator value when SGW-CDR was opened. | Boolean | 1               | 93 01     |
| QCI                                | 12-9-1     | M        |   | Integer | 1-5             | 0x81      |
| Uplink MBR                         | 12-9-2     | O        |   | Integer | 1-5             | 0x82      |
| Down link MBR                      | 12-9-3     | O        |   | Integer | 1-5             | 0x83      |
| Uplink GBR                         | 12-9-4     | O        |   | Integer | 1-5             | 0x84      |
| Down link GBR                      | 12-9-5     | O        |   | Integer | 1-5             | 0x85      |



| Field Name                       | Tag Number | Category | Description   | Format                   | Size (in bytes) | ASN1 code |
|----------------------------------|------------|----------|---|--------------------------|-----------------|-----------|
| arp                              | 12-9-6     | O        |   | Integer                  | 1-5             | 0x86      |
| APN AMBR Uplink                  | 12-9-7     | O        |   | Integer                  | 1-5             | 0x87      |
| APN AMBR Downlink                | 12-9-8     | O        |   | Integer                  | 1-5             | 0x88      |
| Extended Maximum Requested BW UL | 12-9-9     | O        |   | Integer                  | 1-5             | 0x89      |
| Extended Maximum Requested BW DL | 12-9-10    | O        |   | Integer                  | 1-5             | 0x8a      |
| Extended GBR UL                  | 12-9-11    | O        |   | Integer                  | 1-5             | 0x8b      |
| extendedGBRDL                    | 12-9-12    | O        |   | Integer                  | 1-5             | 0x8c      |
| Extended APN AMBR UL             | 12-9-13    | O        |   | Integer                  | 1-5             | 0x8d      |
| Extended APN AMBR DL             | 12-9-14    | O        |   | Integer                  | 1-5             | 0x8e      |
| Record Opening Time              | 13         | M        | Time stamp when IP CAN bearer is activated in this S-GW or record opening time on subsequent partial records. | BCD encoded octet string | 9               | 0x8d      |
| Duration                         | 14         | M        | This field contains the duration in seconds for the record.   | Integer                  | 1-5             | 0x8e      |

| Field Name               | Tag Number | Category | Description   | Format     | Size (in bytes) | ASN1 code |
|--------------------------|------------|----------|---|------------|-----------------|-----------|
| Cause for Record Closing | 15         | M        | This field contains a reason for the closure of the CDR.  | Integer    | 1               | 0x8f      |
| Diagnostics              | 16         | O        | This field is included in the CDR when the bearer context is released and when the option <b>gtp attribute diagnostics</b> is configured. | Choice     | 3               | 0xb0      |
| gsm408cause              | 16-0       | M        |   | Integer    | 1               | 0x80      |
| Record Sequence Number   | 17         | O        | Partial record sequence number, only present in case of partial records.  | Integer    | 1-5             | 0x91      |
| Node ID                  | 18         | O        | Name of the recording entity.   | IA5 string | 5-20            | 0x92      |
| Record Extensions        | 19         | O        | A set of network <del>operator</del> specific extensions to the record. Conditioned upon the existence of an extension.                   | Sequence   | N/A             | 0xb3      |

| Field Name                              | Tag Number | Category | Description   | Format                 | Size (in bytes) | ASN1 code |
|---|------------|----------|---|------------------------|-----------------|-----------|
| Local Record Sequence Number            | 20         | O        | Consecutive record number created by this node. The number is allocated sequentially including all CDR types. | Integer                | 1-5             | 0x94      |
| APN Selection Mode                      | 21         | M        | An index indicating how the APN was selected.   | Enumerated             | 1               | 0x95      |
| Served MSISDN                           | 22         | M        | The primary MSISDN of the subscriber.   | Integer                | 1-9             | 0x96      |
| Charging Characteristics                | 23         | M        | The Charging Characteristics applied to the IP CAN bearer.  | Hex Value Octet string | 2               | 0x97      |
| Charging Characteristics Selection Mode | 24         | O        | Holds information about how Charging Characteristics were selected.   | Enumerated             | 1               | 0x98      |
| IMS Signaling Context                   | 25         | O        | Included if the IM-CN Subsystem Signalling Flag is set, see [201] IP CAN bearer is used for IMS signalling.   | Null                   | 0               | 0x99      |

| Field Name                   | Tag Number | Category | Description   | Format                   | Size (in bytes) | ASN1 code |
|------------------------------|------------|----------|---|--------------------------|-----------------|-----------|
| Serving Node PLMN Identifier | 27         | O        | Serving node PLMN Identifier (MCC and MNC) used during this record, if available.                                 | Octet string             | 3               | 0x9b      |
| Served IMEISV                | 29         | O        | IMEISV of the ME, if available.   | BCD encoded octet string | 8               | 0x9d      |
| RAT Type                     | 30         | O        | This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station, when available. | Integer                  | 1               | 9e        |
| MS Time Zone                 | 31         | O        | The "Time Zone" IE that the MME may provide to the S-GW during the PDN context activation/modification procedure. | Octet string (SIZE (2))  | 2               | 9f1f      |

| Field Name                | Tag Number | Category | Description  | Format       | Size (in bytes) | ASN1 code |
|---------------------------|------------|----------|--|--------------|-----------------|-----------|
| User Location Information | 32         | O        | <p>This field contains the User Location Information as described in TS 29.274 for eGTP case (e.g. CGI, SAI, RAI TAI and ECGI).</p> <p>This field is provided by the SGSN/MME and transferred to the S-GW/P-GW during the IP-CAN bearer activation/modification.</p> | Octet string | 8-33            | 9f20      |
| S-GW Change               | 34         | O        | <p>This field is present only in the SGW-CDR to indicate that this is the first record after an S-GW change. In this case, it is set to TRUE ("FF").</p>   | Boolean      | 1               | 9f22      |

| Field Name               | Tag Number | Category | Description  | Format               | Size (in bytes)       | ASN1 code |
|--------------------------|------------|----------|--|----------------------|-----------------------|-----------|
| Serving Node Type        | 35         | M        | These fields contain one or several serving node types in control plane of S-GW or P-GW, which have been connected during the record. The serving node types listed here map to the serving node addresses listed in the field "Serving node Address" in sequence. | Sequence             |                       | bf23      |
| Serving Node Type enum   | 35-1       | M        |  | Sequence: Enumerated |                       | 0x0a      |
| P-GW Address Used        | 36         | M        | This field is the P-GW IP Address for the Control Plane.   | Choice               | 6 (IPv4) or 18 (IPv6) | bf24      |
| P-GW Binary IPV4 Address | 36-0       | M        | The octet string included in the field described above includes the IPv4 address assigned to the subscriber by of the P-GW in binary coding.   | Octet String         | 4                     | 0x80      |

| Field Name               | Tag Number | Category | Description  | Format                   | Size (in bytes) | ASN1 code |
|--------------------------|------------|----------|--|--------------------------|-----------------|-----------|
| P-GW Binary IPV6 Address | 36-0       | M        | The octet string included in the field described above includes the IPv6 address assigned to the subscriber by of the P-GW in binary coding. | Octet String             | 16              | 0x81      |
| P-GW PLMN Identifier     | 37         | O        |  | Octet string             | 3               | 9f25      |
| Start Time               | 38         | O        | This field holds the time when User IP-CAN session starts, available in the CDR for the first bearer in an IP-CAN session.                   | BCD encoded octet string | 9               | 9f26      |
| Stop Time                | 39         | O        | This field holds the time when User IP-CAN session is terminated, available in the CDR for the last bearer in an IP-CAN session.             | BCD encoded octet string | 9               | 9f27      |

| Field Name           | Tag Number | Category | Description  | Format   | Size (in bytes) | ASN1 code |
|----------------------|------------|----------|--|----------|-----------------|-----------|
| PDN Connection ID    | 40         | O        | This field holds the PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection.  | Integer  | 1-5             | 9f28      |
| Unauthorized         | 41         | O        | This field indicates the provided served IMSI is not authenticated (emergency bearer service situation).   | Null     | 0               | 9f29      |
| User CSG Information | 42         | O        | This field contains the "User CSG Information" status of the user accessing a CSG cell. It comprises CSG ID within the PLMN, Access mode and indication on CSG membership for the user when hybrid access applies, as defined in TS 29.060 for GPRS case, and in TS 29.274 for EPC case. | Sequence |                 | bf2a      |



| Field Name                       | Tag Number | Category | Description   | Format       | Size (in bytes) | ASN1 code |
|----------------------------------|------------|----------|---|--------------|-----------------|-----------|
| cSGId                            | 42-0       | O        | A CSG ID is a unique identifier within the scope of PLMN which identifies a Closed Subscriber Group (CSG) in the PLMN associated with a CSG cell or group of CSG cells.                                       | Octet string | 4               | 80        |
| cSGAccessMode                    | 42-1       | O        | cSGAccessMode will be either CLOSED or HYBRID.  | Enumerated   | 1               | 81        |
| <del>cSMultiplicity</del>        | 42-2       | O        | This field provides an indication on CSG membership for the user.   | Null         | 0               | 82        |
| Served PDP PDN Address Extension | 43         | O        | This field contains the IPv4 address for the PDN connection (PDP context, IP-CAN bearer) when dual-stack IPv4 IPv6 is used, and the IPv6 address is included in Served PDP Address or Served PDP/PDN Address. | Choice       | 8 (IPv4)        | bf2b      |

| Field Name       | Tag Number | Category | Description   | Format       | Size (in bytes) | ASN1 code |
|------------------|------------|----------|---|--------------|-----------------|-----------|
| PDP IP Address   | 43-0       | M        | This field contains the IP address for the PDP context.   | Choice       | 6 (IPv4)        | 0xa0      |
| PDP IPV4 Address | 43-0-0     | M        | The octet string included in the field described above includes the IPv4 address assigned to the subscriber by S-GW in binary coding. | Octet String | 4 (IPv4)        | 0x80      |
| Low Priority     | 44         | O        | This field indicates if the PDN connection has a low priority, i.e. for Machine Type Communication.                                   | Null         | 0               | 9f2c      |

| Field Name              | Tag Number | Category | Description  | Format       | Size (in bytes) | ASN1 code |
|-------------------------|------------|----------|--|--------------|-----------------|-----------|
| Dynamic IP Address      | 47         | O        | This field indicates whether served IPv4 PDP/PDN address is dynamic, which is allocated during IP CAN bearer activation, initial attach (E-UTRAN or over S2x) and UE requested PDN connectivity with PDP/PDN type IPv4v6. This field is missing if IPv4 address is static. | Boolean      | 1               | 9f2f      |
| sGWIPv6Address          | 48         | O        | The control plane IPv6 address, in case of IPv4v6 dual stack, of the S-GW.   | Choice       | 18(IPv6)        | bf 30     |
| SGW BINARY IPV6 ADDRESS | 48-0       | O        | The octet string in this field includes the Gn address of the GGSN service in binary coding.   | Octet string | 16(IPv6)        | 0x81      |

| Field Name                       | Tag Number | Category | Description   | Format       | Size (in bytes) | ASN1 code |
|----------------------------------|------------|----------|---|--------------|-----------------|-----------|
| List of Serving Node IPv6Address | 49         | O        | List of serving node control plane IPv6 addresses, in case of IPv4v6 dual stack, (e.g. S4-SGSN, MME) used during this record. | Sequence     | 18 to 270       | bf31      |
| Serving Node BINARY IPV6 ADDRESS | 49-0       | M        | The octet string in this field includes the IPV6 address of the MME.  | Octet string | 16(ipv6)        | 0x81      |
| <del>P-GW IPv6 Address</del>     | 50         | O        | This field is the P-GW IPv6 Address, in case of IPv4v6 dual stack, for the Control Plane.                                     | Choice       | 18(IPv6)        | bf32      |
| PGW BINARY IPV6 ADDRESS          | 50-0       | O        | The octet string in this field includes the IPV6 address assigned to the subscriber by of the P-GW in binary coding.          | Octet string | 16(IPv6)        | 0x81      |
| lastUserLocation Information     | 55         | O        | Indicates the UE's last user location information during bearer deactivation or session release.                              | Octet string | 13              | 9f39      |

| Field Name                         | Tag Number | Category | Description  | Format       | Size (in bytes) | ASN1 code |
|------------------------------------|------------|----------|--|--------------|-----------------|-----------|
| lastMSTimeZone                     | 56         | O        | Indicates the Latest timezone of UE while bearer deactivation or session release.  | Octet string | 2               | 9f3a      |
| CP CIoT EPS Optimisation Indicator | 59         | O        | The <del>CP CIoT EPS Optimisation Indicator</del> field indicates whether Control Plane CIoT EPS optimisation is used by the PDN connection during data transfer with the UE (that is, Control Plane NAS PDU via S11-U between S-GW and MME) or not (that is, User Plane via S1-U between S-GW and eNB). | Boolean      | 1               | 9f3b      |

| Field Name                              | Tag Number | Category | Description  | Format                                     | Size (in bytes) | ASN1 code |
|---|------------|----------|--|--|-----------------|-----------|
| UNI PDU CP Only Flag                    | 60         | O        | The <del>UNI PDU CP Only</del> field indicates whether this PDN connection is applied with "Control Plane Only flag", that is, transferred using Control Plane NAS PDUs only, when Control Plane CIoT EPS Optimisation is enabled. This field is not flagged when both user plane and control plane UNI for PDU transfer (that is, S1-U and S11-U from S-GW) are allowed, when Control Plane CIoT EPS Optimisation is enabled. | Boolean                                    | 1               | 9f3c      |
| List of RAN Secondary RAT Usage Reports | 64         | OC       | This field includes one or more containers reported from the RAN for a secondary RAT.  | Sequence of RAN Secondary RAT Usage Report | Variable        | 0xbf40    |

| Field Name                     | Tag Number | Category | Description  | Format   | Size (in bytes) | ASN1 code |
|--------------------------------|------------|----------|--|----------|-----------------|-----------|
| RAN Secondary RAT Usage Report | 64-0       | M        | This field includes one or more containers reported from the RAN for a secondary RAT.  | Sequence | Variable        | 0x30      |
| Data Volume Uplink             | 64-0-1     | M        | This field includes the number of octets transmitted during the use of the packet data services in the uplink direction reported from RAN. The counting and reporting from RAN of uplink data volumes is optional.     | Integer  | 9               | 0x81      |
| Data Volume Downlink           | 64-0-2     | M        | This field includes the number of octets transmitted during the use of the packet data services in the downlink direction reported from RAN. The counting and reporting from RAN of downlink data volumes is optional. | Integer  | 9               | 0x82      |

| Field Name            | Tag Number | Category | Description  | Format     | Size (in bytes) | ASN1 code |
|-----------------------|------------|----------|--|------------|-----------------|-----------|
| RAN Start Time        | 64-0-3     | M        | This field is a time stamp, which defines the moment when the volume container is opened by the RAN. | Timestamp  | 9               | 0x83      |
| RAN End Time          | 64-0-4     | M        | This field is a time stamp, which defines the moment when the volume container is closed by the RAN. | Timestamp  | 9               | 0x84      |
| Secondary RAT Type    | 64-0-5     | OC       | This field contains the RAT type for the secondary RAT.  | Integer    | 1               | 0x85      |
| UE Local IP Port Info | 253        | O        | This field includes the S2b user local IP port information.  | Sequence   | 34              | 0xbf817d  |
| UE Local IP Address   | 253-0      | O        | This field includes the UWAN user IP address.  | IP Address | 32              | 0xa0      |
| UDP Source Port       | 253-1      | O        | This field includes the UWAN user source port.   | Integer    | 2               | 0x81      |

Notes:

- All IP addresses are encoded in binary format.

## ASN.1 Definition for Fields in custom24

The following section provides the complete ASN.1 definition of all SGW-CDR related fields in this dictionary.



```

GPRS-SGW-Charging-DataTypes-REL8 DEFINITIONS IMPLICIT TAGS ::=
BEGIN

-----
--
--      GPRS RECORDS
--
-----

GPRSRecord ::= CHOICE
--
-- Record values 20, 22..27 are specific
-- Record values 76..77 are MBMS specific
-- Record values 78..79 are EPC specific
{
    sGWRecord[78] SGWRecord
}

SGWRecord ::= SET
{
    recordType                [0] RecordType,
    servedIMSI                [3] IMSI,
    s-GWAddress               [4] GSNAddress,
    chargingID                [5] ChargingID,
    servingNodeAddress        [6] SEQUENCE OF GSNAddress,
    accessPointNameNI         [7] AccessPointNameNI OPTIONAL,
    pdpPDNType                [8] PDPTType OPTIONAL,
    servedPDPDNAddress        [9] PDPAddress OPTIONAL,
    dynamicAddressFlag        [11] DynamicAddressFlag OPTIONAL,
    listOfTrafficVolumes      [12] SEQUENCE OF ChangeOfCharCondition
OPTIONAL,
    recordOpeningTime         [13] TimeStamp,
    duration                   [14] CallDuration,
    causeForRecClosing        [15] CauseForRecClosing,
    diagnostics                [16] Diagnostics OPTIONAL,
    recordSequenceNumber      [17] INTEGER OPTIONAL,
    nodeID                     [18] NodeID OPTIONAL,
    recordExtensions          [19] ManagementExtensions OPTIONAL,
    localSequenceNumber       [20] LocalSequenceNumber OPTIONAL,
    apnSelectionMode          [21] APNSelectionMode OPTIONAL,
    servedMSISDN              [22] MSISDN OPTIONAL,
    chargingCharacteristics    [23] ChargingCharacteristics,
    chChSelectionMode         [24] ChChSelectionMode OPTIONAL,
    iMSSignalingContext        [25] NULL OPTIONAL,
    servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL,
    servedIMEISV              [29] IMEI OPTIONAL,
    rATType                   [30] RATType OPTIONAL,
    mSTimeZone                 [31] MSTimeZone OPTIONAL,
    userLocationInformation    [32] OCTET STRING OPTIONAL,
    sGWChange                  [34] SGWChange OPTIONAL,
    servingNodeType            [35] SEQUENCE OF ServingNodeType,
    p-GWAddressUsed           [36] GSNAddress OPTIONAL,
    p-GWPLMNIdentifier        [37] PLMN-Id OPTIONAL,
    startTime                  [38] TimeStamp OPTIONAL,
    stopTime                   [39] TimeStamp OPTIONAL,
    pdnConnectionID           [40] ChargingID OPTIONAL,
    servedPDPDNAddressExt     [43] PDPAddress OPTIONAL,
    lowAccessPriorityIndicator [44] NULL OPTIONAL,
    dynamicAddressFlagExt     [47] DynamicAddressFlag OPTIONAL,
    s-GWiPv6Address           [48] GSNAddress OPTIONAL,
    servingNodeiPv6Address    [49] SEQUENCE OF GSNAddress OPTIONAL,
    p-GWiPv6AddressUsed       [50] GSNAddress OPTIONAL,
    lastUserLocationInformation [55] OCTET STRING OPTIONAL,
    lastMSTimeZone            [56] MSTimeZone OPTIONAL,
}

```

```

        cPCIoTEFPOptimisationIndicator          [59] BOOLEAN OPTIONAL,
        uNIPDUCOnlyFlag                        [60] BOOLEAN OPTIONAL,
        listOfRANSecondaryRATUsageReports      [64] SEQUENCE OF RANSecondaryRATUsageReport
OPTIONAL,
        uELocalIPAddressPort                   [253] SEQUENCE OF UELocalIPPortInfo OPTIONAL
    }

AccessPointNameNI ::= IA5String (SIZE(1..63))
--
-- Network Identifier part of APN in dot representation.
-- For example, if the complete APN is 'apn1a.apn1b.apn1c.mnc022.mcc111.gprs'
-- NI is 'apn1a.apn1b.apn1c' and is presented in this form in the CDR.

APNSelectionMode ::= ENUMERATED
{
--
-- See Information Elements TS 29.060, TS 29.274 or TS 29.275
--
    mSorNetworkProvidedSubscriptionVerified    (0),
    mSProvidedSubscriptionNotVerified          (1),
    networkProvidedSubscriptionNotVerified     (2)
}

CallDuration ::= INTEGER
--
-- The call duration is counted in seconds.
-- For successful calls /sessions / PDP contexts, this is the chargeable
duration.
-- For call attempts this is the call holding time.
--

CauseForRecClosing ::= INTEGER
{
--
-- In PGW-CDR and SGW-CDR the value servingNodeChange is used for partial record
-- generation due to Serving Node Address list Overflow
-- In SGSN servingNodeChange indicates the SGSN change
--
-- LCS related causes belong to the MAP error causes acc. TS 29.002
--
-- cause codes 0 to 15 are defined 'CauseForTerm' (cause for termination)
-- All cause values are not relevant to SGW. Refer the spec to find out the
-- cause values for SGW.
    normalRelease                          (0),
    abnormalRelease                         (4),
    cAMELInitCallRelease                    (5),
    volumeLimit                             (16),
    timeLimit                              (17),
    servingNodeChange                       (18),
    maxChangeCond                           (19),
    managementIntervention                  (20),
        intraSGSNIntersystemChange          (21),
    rATChange                               (22),
    mSTimeZoneChange                        (23),
    sGSNPLMNIDChange                       (24),
    unauthorizedRequestingNetwork           (52),
    unauthorizedLCSCClient                  (53),
    positionMethodFailure                   (54),
    unknownOrUnreachableLCSCClient         (58),
    listofDownstreamNodeChange              (59)
}

```

```

ChangeCondition ::= ENUMERATED
{
    qosChange                (0),
    tariffTime                (1),
    recordClosure             (2),
    cgi-SAIChange            (6),    -- bearer modification. CGI-SAI Change
    rAIChange                 (7),    -- bearer modification. RAI Change
    dT-Establishment         (8),
    dT-Removal                (9),
    eCGIChange                (10),   -- bearer modification. ECGI Change
    tAIChange                 (11),   -- bearer modification. TAI Change
    apnAmbrChange            (50)    -- apn-ambr change
}

ChangeOfCharCondition ::= SEQUENCE
{
    --
    -- qosRequested and qosNegotiated are used in S-CDR only
    -- ePCQoSInformation used in SGW-CDR, PGW-CDR, IPE-CDR, TWAG-CDR and ePDG-CDR only
    -- userLocationInformation is used only in S-CDR, SGW-CDR and PGW-CDR
    -- chargingID used in PGW-CDR only when Charging per IP-CAN session is active
    -- accessAvailabilityChangeReason and relatedChangeOfCharCondition applicable only
in PGW-CDR
    -- cPCIoToptimisationIndicator is used in SGW-CDR only
    --
    qosRequested                [1] QoSInformation OPTIONAL,
    qosNegotiated                [2] QoSInformation OPTIONAL,
    dataVolumeGPRSUplink        [3] DataVolumeGPRS OPTIONAL,
    dataVolumeGPRSDownlink      [4] DataVolumeGPRS OPTIONAL,
    changeCondition              [5] ChangeCondition,
    changeTime                   [6] TimeStamp,
    userLocationInformation      [8] OCTET STRING OPTIONAL,
    ePCQoSInformation           [9] EPCQoSInformation OPTIONAL,
    chargingID                   [10] ChargingID OPTIONAL,
    userCSGInformation           [12] UserCSGInformation OPTIONAL,
    diagnostics                  [13] Diagnostics OPTIONAL,
    rATType                      [15] RATType OPTIONAL,
    uWANUserLocationInformation  [17] UWANUserLocationInfo OPTIONAL,
    cPCIoTEPSOptimisationIndicator [19] CPCIoTEPSOptimisationIndicator OPTIONAL
}

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

ChargingID ::= INTEGER (0..4294967295)
--
-- Generated in P-GW, part of IP CAN bearer
-- 0..4294967295 is equivalent to 0..2**32-1
--

ChChSelectionMode ::= ENUMERATED
{
    servingNodeSupplied        (0), -- For S-GW/P-GW
    subscriptionSpecific        (1), -- For SGSN only
    aPNSpecific                 (2), -- For SGSN only
    homeDefault                 (3), -- For SGSN, S-GW and P-GW
    roamingDefault              (4), -- For SGSN, S-GW and P-GW
    visitingDefault             (5) -- For SGSN, S-GW and P-GW
}

```

```

DataVolumeGPRS ::= INTEGER
--
-- The volume of data transferred in octets.
--

DynamicAddressFlag ::= BOOLEAN

EPCQoSInformation ::= SEQUENCE
{
  --
  -- See TS 29.212 for more information
  --
  qCI [1] INTEGER,
  maxRequestedBandwithUL [2] INTEGER OPTIONAL,
  maxRequestedBandwithDL [3] INTEGER OPTIONAL,
  guaranteedBitrateUL [4] INTEGER OPTIONAL,
  guaranteedBitrateDL [5] INTEGER OPTIONAL,
  aRP [6] INTEGER OPTIONAL,
  apnAmbrUplink [7] INTEGER OPTIONAL,
  apnAmbrDownlink [8] INTEGER OPTIONAL,
  extendedMaxRequestedBWUL [9] INTEGER OPTIONAL,
  extendedMaxRequestedBWDL [10] INTEGER OPTIONAL,
  extendedGBRUL [11] INTEGER OPTIONAL,
  extendedGBRDL [12] INTEGER OPTIONAL,
  extendedAPNAMBRUL [13] INTEGER OPTIONAL,
  extendedAPNAMBRDL [14] INTEGER OPTIONAL
}

ETSIAddress ::= AddressString
--
-- First octet for nature of address, and numbering plan indicator (3 for X.121)
-- Other octets TBCD
-- See TS 29.002
--

GSNAddress ::= IPAddress

MSNetworkCapability ::= OCTET STRING (SIZE(1..8))
-- see TS 24.008

NetworkInitiatedPDPContext ::= BOOLEAN
--
-- Set to true if PDP context was initiated from network side
--

NodeID ::= IA5String (SIZE(1..20))

NumberOfDPENcoutered ::= INTEGER

PDPAddress ::= CHOICE
{
  iPAddress [0] IPAddress,
  eTsiAddress [1] ETSIAddress
}

PDPTType ::= OCTET STRING (SIZE(2))
--
-- OCTET 1: PDP Type Organization
-- OCTET 2: PDP Type Number
-- See TS 29.060 for GTP, TS 29.274 for eGTP and TS 29.275 for PMIP

```

```

--
PLMN-Id ::= OCTET STRING (SIZE (3))
--
-- This is a 1:1 copy from the Routing Area Identity (RAI) IE specified in 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
--

QoSInformation ::= OCTET STRING (SIZE (4..255))
--
-- This octet string
-- is a 1:1 copy of the contents (i.e. starting with octet 5) of the "Bearer Quality of
-- Service" information element specified in TS 29.274
--

RANSecondaryRATUsageReport ::= SEQUENCE
-- ]
{
    dataVolumeUplink [1] DataVolumeGPRS,
    dataVolumeDownlink [2] DataVolumeGPRS,
    rANStartTime [3] TimeStamp,
    rANEndTime [4] TimeStamp,
    secondaryRATType [5] SecondaryRATType OPTIONAL
}

SecondaryRATType ::= INTEGER
{
    reserved (0),
    nR (1) -- New Radio 5G
}

RATType ::= INTEGER (0..255)
--
-- This integer is 1:1 copy of the RAT type value as defined in TS 29.060 for GTP,
-- TS 29.274 for eGTP and TS 29.275 for PMIP.
--

UWANUserLocationInfo ::= SEQUENCE
{
    uELocalIPAddress [0] IPAddress,
    uDPSourcePort [1] OCTET STRING (SIZE(2)) OPTIONAL,
    sSID [2] OCTET STRING OPTIONAL, -- see format in IEEE Std 802.11-2012
[408]
    bSSID [3] OCTET STRING OPTIONAL -- see format in IEEE Std 802.11-2012
[408]
}

RecordType ::= INTEGER
{
    -- Record values 0..17 are CS specific.
    -- The contents are defined in TS 32.250

    sGWRecord (84)
}

ResultCode ::= INTEGER
-- charging protocol return value, range of 4 byte (0...4294967259)
-- see Result-Code AVP as used in 3GPP 32.299
--

```

```

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

SGWChange ::= BOOLEAN
--
-- present if first record after inter S-GW change
--

Diagnostics ::= CHOICE
{
    gsm0408Cause                [0] INTEGER,
    -- See TS 24.008
    gsm0902MapErrorValue        [1] INTEGER,
    -- Note: The value to be stored here corresponds to
    -- the local values defined in the MAP-Errors and
    -- MAP-DialogueInformation modules, for full details
    -- see TS 29.002
    itu-tQ767Cause              [2] INTEGER,
    -- See ITU-T Q.767
    networkSpecificCause        [3] ManagementExtension,
    -- To be defined by network operator
    manufacturerSpecificCause   [4] ManagementExtension,
    -- To be defined by manufacturer
    positionMethodFailureCause  [5] PositionMethodFailure-Diagnostic,
    -- see TS 29.002
    unauthorizedLCSCClientCause [6] UnauthorizedLCSCClient-Diagnostic
    -- see TS 29.002
}

IPAddress ::= CHOICE
{
    iPBinaryAddress            IPBinaryAddress,
    iPTextRepresentedAddress   IPTextRepresentedAddress
}

CPCIoTEPSOptimisationIndicator ::= BOOLEAN

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

IPTextRepresentedAddress ::= CHOICE
{
    --
    -- IP address in the familiar "dot" notation
    --
    iPTextV4Address           [2] IA5String (SIZE(7..15)),
    iPTextV6Address           [3] IA5String (SIZE(15..45))
}

PositionMethodFailure-Diagnostic ::= ENUMERATED
{
    congestion                (0),
    insufficientResources      (1),
    insufficientMeasurementData (2),
}

```

```

        inconsistentMeasurementData          (3),
        locationProcedureNotCompleted       (4),
        locationProcedureNotSupportedByTargetMS (5),
        qoSNotAttainable                    (6),
        positionMethodNotAvailableInNetwork (7),
        positionMethodNotAvailableInLocationArea (8)
    }

LocalSequenceNumber ::= INTEGER (0..4294967295)
--
-- Sequence number of the record in this node
-- 0.. 4294967295 is equivalent to 0..2**32-1, unsigned integer in four octets

ManagementExtension ::= SEQUENCE
{
    identifier OBJECT IDENTIFIER,
    significance [1]          BOOLEAN DEFAULT FALSE,
    information [2]          ANY DEFINED BY identifier
}

ManagementExtensions ::= SET OF ManagementExtension

MSISDN ::= ISDN-AddressString
--
-- See TS 23.003

MSTimeZone ::= OCTET STRING (SIZE (2))
--
-- 1.Octet: Time Zone and 2. Octet: Daylight saving time, see TS 29.060

TimeStamp ::= OCTET STRING (SIZE(9))
--
-- The contents of this field are a compact form of the UTCTime format
-- containing local time plus an offset to universal time. Binary coded
-- decimal encoding is employed for the digits to reduce the storage and
-- transmission overhead
-- e.g. YYMMDDhhmmssShhmm
-- where
-- YY      =          Year 00 to 99          BCD encoded
-- MM      =          Month 01 to 12        BCD encoded
-- DD      =          Day 01 to 31          BCD encoded
-- hh      =          hour 00 to 23        BCD encoded
-- mm      =          minute 00 to 59      BCD encoded
-- ss      =          second 00 to 59     BCD encoded
-- S       =          Sign 0 = "+", "-"    ASCII encoded
-- hh      =          hour 00 to 23        BCD encoded
-- mm      =          minute 00 to 59     BCD encoded
--
--
UELocalIPPortInfo ::= SEQUENCE
{
    --
    -- The S2b user Local IP Port Information
    --
    uELocalIPAddress [0] IPADDRESS OPTIONAL,
    uDPSourcePort [1] INTEGER OPTIONAL
}

UELocalIPAddress ::= IPADDRESS
UDPSourcePort ::= INTEGER

```

```

UnauthorizedLCSCClient-Diagnostic ::= ENUMERATED
{
    noAdditionalInformation (0),
    clientNotInMSPrivacyExceptionList (1),
    callToClientNotSetup (2),
    privacyOverrideNotApplicable (3),
    disallowedByLocalRegulatoryRequirements (4),
    unauthorizedPrivacyClass (5),
    unauthorizedCallSessionUnrelatedExternalClient (6),
    unauthorizedCallSessionRelatedExternalClient (7)
}

CSGAccessMode ::= ENUMERATED
{
    closedMode (0),
    hybridMode (1)
}

CSGId ::= OCTET STRING (SIZE(4))
--
-- Defined in 23.003. Coded according to TS 29.060 for GTP, and in TS
29.274
-- for eGTP.
-- 24.008
--

UserCSGInformation ::= SEQUENCE
{
    cSGId [0] CSGId,
    cSGAccessMode [1] CSGAccessMode,
    cSGMembershipIndication [2] NULL OPTIONAL
}

TBCDSTRING ::= OCTET STRING
ISDN-AddressString ::= OCTET STRING
IMEI ::= TBCDSTRING (SIZE(8))
IMSI ::= TBCDSTRING (SIZE(3..8))
maxAddressLength INTEGER ::= 20
AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
END

```