GGSN CDR Field Reference

This chapter provides a reference for CDR fields supported by the system for use in GGSN-CDRs (G-CDRs) and enhanced G-CDRs (eG-CDRs).

A complete list of supported CDR fields is provided in the *GGSN CDR Field Descriptions* chapter of this reference.

The specific CDRs reported in G-CDRs/eG-CDRs and their encoding are user-selectable via GTPP dictionaries.

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 0

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 C all conditions.
OC	Operator Provisionable: Conditional	A field that an operator has provisioned and must be included in the certain conditions are met.

CDR Fields Supported in G-CDRs

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

custom6 Dictionary

G-CDR fields based on 3GPP TS 32.298 V6.6.0 (2006-12) (R6).

Field	Tag number	Category	Description
Record Type	0	M	The field identifies the type of the record: • S-CDR (sgsnPDPRecord) 18 (0x12) • G-CDR (ggsnPDPRecord) 19 (0x13) • eG-CDR (egsnPDPRecord) 70 (0x46)
Network initiated PDP context	1	O	This field indicates that the PDP context was network PDP context. Set to TRUE (0xFF) if PDP context w This field is not yet supported by the SGSN.
Served IMSI	3	M	This field contains the International Mobile Subscril The IMSI is formatted in accordance with 3GPP TS
GGSN Address	4	M	This field provides the current serving GGSN IP Ad configured ggsn-service address on the GGSN. The of the address to be either in binary or text format. The GGSN encodes the address in binary format an
GGSN IPv4 Binary Address	4-0	M	The octet string included in the field described above coding.
Charging ID	5	M	This field is a charging identifier, which can be used produced in the GGSN involved in a single PDP con context activation and is transferred to the context re the charging ID is transferred to the new SGSN as p The possible values for the charging ID, which are de are encapsulated in following scheme in the CDR-fi 1 - 127 850101-85017F 128 – 32,767 85020080- 85027FFF 32,768 – 8,388,607 8503008000- 85037FFFFF 8,388,608 – 2,147,483,647 850400800000- 85047FI 2,147,483,648 – 4,294,967,295 85050080000000- 8
SGSN Address	6	M	This field contains one or several SGSN IP addresse For an S-CDR, the SGSN address contains the contro the PDP context. For a G-CDR and eG-CDR, in addition to the curren SGSN addresses where the PDP context was located b Routing Area Update Procedure. The maximum nun
SGSN IPv4 Binary Address	6-0	M	The octet string included in the field described abov the SGSN in binary coding.

Field	Tag number	Category	Description
Access Point Name Network Identifier	7	M	This field contains the Network Identifier part of in the Create PDP Context Request message. For GGSN generated records, in case of a configu this is overridden by the option **gcdr apn-name-**
PDP Type	8	M	This field defines the PDP type, e.g. IP or PPP, a Supported values: • IP = f121 • PPP = f001
Served PDP Address	9	O	This field contains the PDP address of the served choice of either IPAddress or ETSIAddress.
PDP IP Address	9-0	M	This field contains the IP address for the PDP co
PDP IPv4 Binary Address	9-0-0	M	The octet string included in the field described ab the GGSN in binary coding.
Dynamic Address Flag	11	O	This field indicates that the PDP address has bee this case, the value is set to TRUE and encoded as was "static", i.e. part of PDP context subscription
List of Traffic Volumes	12	M	This list includes one or more Traffic Volume co described in the next field. The maximum numbe
ChangeOfChar Condition	12-0	M	Each traffic volume container contains details re subsections. A new container is usually created f
QoS Requested	12-0-1	O	This field contains the QoS desired by the MS at
QoS Negotiated	12-0-2	O	This field indicates the applied QoS accepted by The QoS values may only be included in the firs what was changed.
GPRS Uplink data volume	12-0-3	M	This field includes the number of octets transmit direction. The amount of data counted in the GGSN is the p counted already includes the IP PDP bearer proto Note that a maximum of 2^32 bytes can be coun for this value to avoid an overflow, if not done a
GPRS Downlink data volume	12-0-4	M	This field includes the number of octets transmitt direction. The amount of data counted in the GGSN is the p counted already includes the IP PDP bearer proto Note that a maximum of 2^32 bytes can be coun for this value to avoid an overflow, if not done a

Field	Tag number	Category	Description
Change Condition	12-0-5	M	This field defines the reason for closing the containe the CDR. Supported values: • qoSChange: 0 • tariffTime: 1 • recordClosure: 2 • failureHandling ContinueOngoing: 3 • failureHandling RetryandTerminate Ongoing: 4 • failureHandling TerminateOngoing: 5 FailureHandling is a standard AVP element in DCC • Terminate: The online session is finished. The a or not established (new sessions). Failover for o sessions is always supported. • Retry&Terminate;: The online session is finish sessions) or not established (new sessions). Fail sessions is always supported. • Continue: The online session is finished. The a not released (ongoing sessions). Failover for or is always supported.
Change time	12-0-6	M	This field is a time stamp, which defines the momen closed.
Failurehandling Continue	12-0-7	O	Failure handling continue element is present if failu
Record Opening Time	13	M	This field contains the time stamp when PDP contex opened after a partial record. The timestamp is determined based on the internal t configured mechanism (ceiling, floor, round-off) thi full seconds.
Duration	14	M	This field contains the relevant duration in seconds f It is the duration from Record Opening Time to the representation in milliseconds to an integer value repre (ceiling, floor, round-off) can be configured. It is als instead of seconds.

Field	Tag number	Category	Description
Cause for Record Closing	15	M	This field contains a reason for the closure of the Supported values: • normalRelease: 0 • abnormalRelease: 4 • volumeLimit: 16 • timeLimit: 17 • sGSNChange: 18 • maxChangeCond: 19 • management Intervention: 20 • rATChange: 22 • mSTimeZoneChange: 23
Diagnostics	16	O	This field is included in the CDR when the PDP **diagnostics** is configured. Only the choice of **gsm0408Value** is used. This field is supported for G-CDRs only (not eG
gsm0408Cause	16-0	M	This cause is used in the Diagnostics field and co • 36: If the SGSN sends Delete PDP context • 38: If GGSN sends delete PDP context requ • 40: If the GGSN sends delete PDP context message. • 26: If the GGSN sends delete PDP context
Record Sequence Number	17	O	A running sequence number with range 1 throug GGSN for a specific PDP context (characterized field is not present if the first record is also the fi
Node ID	18	M	This field contains an identifier string for the noc On the ASR 5500 GGSN, this NodeID field is a n: The first digit is the Sessmgr restart counter ha ddd: The number of the sessmgr instance genera STRING: This is a configured Node-ID-Suffix h the **gtpp attribute node-id** command. If this node-id-suffix is not configured, the GGSN to 16 characters). For G-CDRs, this field is only included when the configured.
Local Record Sequence Number	20	M	For each Node ID, this number with range 1..429 with a Node ID uniquely identifies a CDR. For G-CDRs, this field is only included when the configured.

Field	Tag number	Category	Description
APN Selection Mode	21	M	An index indicating how the APN was selected. The • 0: MS or network provided APN, subscribed ve • 1: MS provided APN, subscription not verified • 2: Network provided APN, subscription not ver
Served MSISDN	22	M	The field tracks the Mobile Station (MS) ISDN num copied from the Create PDP Context Request messa
Charging Characteristics	23	M	Lists the charging characteristics applied to the PDP The GGSN can accept charging characteristics from GGSN configured charging characteristics are speci G-CDRs to subscriber PDP contexts through APN t
Charging Characteristics Selection Mode	24	O	The charging characteristic type that the GGSN appl defined in 3GPP TS 32.298: • sGSNSupplied (0) - For GGSN only • subscriptionSpecific (1) -For SGSN only • aPNSpecific (2) - For SGSN only • homeDefault (3) - For SGSN and GGSN • roamingDefault (4) - For SGSN and GGSN • visitingDefault (5) - For SGSN and GGSN • SGSN supplied: The GGSN is using the chargi • Home default: GGSN configured charging charac are those that belong to the same PLMN as the • Visiting default: GGSN configured charging ch subscribers are those that belong to a different • Roaming default: GGSN configured charging cl subscribers are those that are serviced by an SG the GGSN is located.
SGSN PLMN Identifier	27	O	RAI (optionally supplied by SGSN in the GTP create value. It is omitted if the SGSN does not supply the SGSNs without the RAI a locally configured PLMN
Served IMEISV	29	O	This field contains software version in addition to th in the last byte replacing the spare digit and filler. The structure of the IMEISV is defined in TS 23.00

Field	Tag number	Category	Description
RAT Type	30	O	This field indicates the Radio Access Technolog field is present in the CDR if provided by SGSN RAT Type values: • Reserved: 0 • UTRAN: 1 • GERAN: 2 • WLAN: 3 • Spare: 4-255
MS Time Zone	31	O	This field contains the "Time Zone" IE that the S activation/modification procedure. It is transparently copied from the message into th universal time and local time in steps of 15 minu in 3GPP TS 29.060 (which refers to 24.008 for t Time Stamp field in 23.040).
User Location Information	32	O	The User Location Information for the MS if pro activation/modification procedure. Transparently copied from the PDP context requ
List of Service Data Volumes	34	O	A list of the changes that occurred in charging co
Service Data Volume Block	34-0	O	
Rating group	34-0-1	M	This is the service flow identity and has to be us known as content-id.
Charging Rulebase name	34-0-2	M	The name of the Rulebase used for charging. Th
Result Code	34-0-3	O	The Diameter server sends result-codes for each use this to populate the eG-CDR bucket. This is request for a category.
Local Sequence number	34-0-4	M	A per service data container sequence number. It service date container generated for that service
Time of first usage	34-0-5	M	The time stamp for the first IP packet to be transm of Service Condition Change.
Time of last usage	34-0-6	M	The time stamp for the last IP packet to be transm of Service Condition Change.
Usage time	34-0-7	M	The difference between "time of first usage" and
Service condition change	34-0-8	M	The reason for closing the service data container time and volume triggers, etc.
QoS negotiated	34-0-9	O	The negotiated QoS applied for the service data
sgsn-Address	34-0-10	M	The valid SGSN IP address during the service da

Field	Tag number	Category	Description
SGSN-IPv4-Binary Address	34-0-10-0	M	The octet string included in the field "sgsn-Address" the SGSN in binary coding.
SGSN PLMN identifier	34-0-11	O	RAI (optionally supplied by SGSN in the GTP create value. It is omitted if the SGSN does not supply the SGSNs without the RAI a locally configured PLMN
FBC Data volume uplink	34-0-12	M	The number of octets transmitted during the use of t Note that a maximum of 2^32 bytes can be counted for this value to avoid an overflow, if not done alrea
FBC data volume downlink	34-0-13	M	The number of octets transmitted during the use of t Note that a maximum of 2^32 bytes can be counted for this value to avoid an overflow, if not done alrea
Time of report	34-0-14	M	A time stamp defining the moment when the service
RAT Type	34-0-15	O	The valid radio access technology type during the se
Failurehandling Continue	34-0-16	O	A Boolean expression included if the failure handlin This can be either configured on the GGSN using **fa** be received from the server in the "Credit-Control-F server will have higher precedence. There is no nego GGSN will use whatever the server provides.
Service Identifier	34-0-17	O	The service identifier may designate an end user serv group thereof. This field is only included if reporting

Notes:

- The subfields included in other fields are marked MANDATORY even if the main field is optional. For example, the list of service containers is optional, but if there is at least one container, then all subfields for the container that are marked as MANDATORY will be included.
- The field "Served PDP PDN Address Extension"(servedPDPPDNAddressExt) is not part of the 3GPP 32.298 v8.5.0 specification. This field will be available in the CDR only when the CLI command **gtpp attribute served-pdp-pdn-address-extension** is configured in the GTPP Server Group Configuration Mode. This field is disabled by default. For more information on this command, refer to the *Command Line Interface Reference*.
- In releases prior to 14.0, the CGISAIChange service condition is present in LOSDV of GGSN CDR even if ULI Change trigger is disabled. In 14.0 and later releases, if the ULI Change trigger is disabled and if the ULI is changed, the CGISAIChange service condition is not present in LOSDV of GGSN CDR.

ASN.1 Definition for Fields in custom6 Dictionary

Below is a complete ASN.1 definition of G-CDR fields down to the basic types described in ITU X.690. It is based on the ASN.1 definition in 3GPP TS 32.298, with imported types taken from 3GPP TS 29.002. The definition from the standard has been modified to reflect the fields which are not supported currently on the ASR 5500 platform, and to reflect other differences such as in the category (mandatory versus optional).

```
GGSN-Charging-DataTypes-REL6 DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- ASN.1 definitions of the ASR 5500 GGSN Charging implementation
--
-- based on 3GPP TS 32.298 v6.4.1
--
-- for some fields, only the values relevant to GGSN charging
-- are shown (such as CallEventRecordType)
--
-- some types are imported from 29.002 and are shown below as well
-- with the definition copied from that standard (such as IMSI)

GPRSCallEventRecord ::= CHOICE
{
        ggsnPDPRecord [21] GGSNPDPRecord
}

-- ------------------------------------------------------------
-- GGSN record (same definition used for G-CDR and eG-CDR)
-- ------------------------------------------------------------

GGSNPDPRecord ::= SET
{
        recordType                              [0] CallEventRecordType,
        networkInitiation                 [1] NetworkInitiatedPDPContext OPTIONAL,
        servedIMSI                              [3] IMSI,
        ggsnAddress                             [4] GSNAddress,
        chargingID                              [5] ChargingID,
        sgsnAddress                             [6] SEQUENCE OF GSNAddress,
        accessPointNameNI                 [7] AccessPointNameNI,
        pdpType                                       [8] PDPType,
        servedPDPAddress                  [9] PDPAddress OPTIONAL,
        dynamicAddressFlag              [11] DynamicAddressFlag OPTIONAL,
        listOfTrafficVolumes          [12] SEQUENCE OF ChangeOfCharCondition,
        recordOpeningTime                 [13] TimeStamp,
        duration                                  [14] CallDuration,
        causeForRecClosing              [15] CauseForRecClosing,
        diagnostics                             [16] Diagnostics OPTIONAL,
        recordSequenceNumber          [17] INTEGER OPTIONAL,
        nodeID                                        [18] NodeID,
        localSequenceNumber             [20] LocalSequenceNumber,
        apnSelectionMode                  [21] APNSelectionMode,
        servedMSISDN                          [22] MSISDN,
        chargingCharacteristics     [23] ChargingCharacteristics,
        chChSelectionMode                 [24] ChChSelectionMode OPTIONAL,
        sgsnPLMNIdentifier              [27] PLMN-Id OPTIONAL,
        servedIMEISV                          [29] IMEI OPTIONAL,
        rATType                                       [30] RATType OPTIONAL,
        mSTimeZone                              [31] MSTimeZone OPTIONAL,
        userLocationInformation     [32] OCTET STRING OPTIONAL,
        listOfServiceData                [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL
}



-- ------------------------------------------------------------
-- Alphabetical listing of all field types above
-- ------------------------------------------------------------

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.
        --

AccessPointNameOI ::= IA5String (SIZE(1..37))
        --
        -- Operator Identifier part of APN in dot representation.
        -- In the 'apn1a.apn1b.apn1c.mnc022.mcc111.gprs' example, the OI
        -- portion is 'mnc022.mcc111.gprs' and is presented in this form
        -- in the CDR.
        --

AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
        -- This type is used to represent a number for addressing
        -- purposes. It is composed of
        -- a) one octet for nature of address, and numbering plan
        -- indicator.
        -- b) digits of an address encoded as TBCD-String.
        -- a) The first octet includes a one bit extension indicator, a
        -- 3 bits nature of address indicator and a 4 bits numbering
        -- plan indicator, encoded as follows:
        -- bit 8: 1 (no extension)
        -- bits 765: nature of address indicator
        -- 000 unknown
        -- 001 international number
        -- 010 national significant number
        -- 011 network specific number
        -- 100 subscriber number
        -- 101 reserved
        -- 110 abbreviated number
        -- 111 reserved for extension
        -- bits 4321: numbering plan indicator
        -- 0000 unknown
        -- 0001 ISDN/Telephony Numbering Plan (Rec ITU-T E.164)
        -- 0010 spare
        -- 0011 data numbering plan (ITU-T Rec X.121)
        -- 0100 telex numbering plan (ITU-T Rec F.69)
        -- 0101 spare
        -- 0110 land mobile numbering plan (ITU-T Rec E.212)
        -- 0111 spare
        -- 1000 national numbering plan
        -- 1001 private numbering plan
        -- 1111 reserved for extension
        -- all other values are reserved.
        -- b) The following octets representing digits of an address
        -- encoded as a TBCD-STRING.

APNSelectionMode::= ENUMERATED
{
        --
        -- See Information Elements TS 29.060
        --
        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.
        --
```

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

CauseForRecClosing ::= INTEGER
{
        --
        -- In GGSN the value sGSNChange should be used for partial record
        -- generation due to SGSN Address List Overflow
        --
        -- cause codes 0 to 15 are defined 'CauseForTerm' (cause for
        -- termination)
        --
        normalRelease                                   (0),
        abnormalRelease                                (4),
        volumeLimit                                        (16),
        timeLimit                                          (17),
        sGSNChange                                         (18),
        maxChangeCond                                   (19),
        managementIntervention                (20),
        rATChange                                          (22),
        mSTimeZoneChange                               (23)
}

CellId ::= OCTET STRING (SIZE(2))
        --
        -- Coded according to TS 24.008
        --

ChangeCondition ::= ENUMERATED
{
        --
        -- Failure Handling values used in eG-CDR only
        --
        qoSChange                                                                       (0),
        tariffTime                                                                      (1),
        recordClosure                                                                (2),
        failureHandlingContinueOngoing                                    (3),
        failureHandlingRetryandTerminateOngoing         (4),
        failureHandlingTerminateOngoing                           (5)
}

ChangeOfCharCondition ::= SEQUENCE
{
        --
        -- Used in PDP context record only
        -- failureHandlingContinue field used in eG-CDR only
        --
        qosRequested                                    [1] QoSInformation OPTIONAL,
        qosNegotiated                                  [2] QoSInformation OPTIONAL,
        dataVolumeGPRSUplink                [3] DataVolumeGPRS,
        dataVolumeGPRSDownlink            [4] DataVolumeGPRS,
        changeCondition                             [5] ChangeCondition,
        changeTime                                        [6] TimeStamp,
        failureHandlingContinue         [7] FailureHandlingContinue OPTIONAL
}

ChangeOfServiceCondition ::= SEQUENCE
{
        --
        -- Used for Flow based Charging service data container
```

```
        --
        ratingGroup                                [1]    RatingGroupId,
        chargingRuleBaseName                [2]    ChargingRuleBaseName,
        resultCode                                    [3]    ResultCode OPTIONAL,
        localSequenceNumber                 [4]    LocalSequenceNumber,
        timeOfFirstUsage                        [5]    TimeStamp,
        timeOfLastUsage                         [6]    TimeStamp,
        timeUsage                                     [7]    CallDuration,
        serviceConditionChange            [8]    ServiceConditionChange,
        qoSInformationNeg                    [9]    QoSInformation OPTIONAL,
        sgsn-Address                                 [10] GSNAddress,
        sGSNPLMNIdentifier                   [11] PLMN-Id OPTIONAL,
        datavolumeFBCUplink                [12] DataVolumeGPRS,
        datavolumeFBCDownlink              [13] DataVolumeGPRS,
        timeOfReport                                 [14] TimeStamp,
        rATType                                         [15] RATType OPTIONAL,
        failureHandlingContinue         [16] FailureHandlingContinue OPTIONAL,
        serviceIdentifier                       [17] ServiceIdentifier OPTIONAL
}

ChargingCharacteristics ::= OCTET STRING (SIZE(2))
        --
        -- Bit 0-3: Profile Index
        -- Bit 4-15: For Behavior
        --

ChargingID ::= INTEGER (0..4294967295)
        --
        -- Generated in GGSN, part of PDP context, see TS 23.060
        -- 0..4294967295 is equivalent to 0..2**32-1
        --

ChargingRuleBaseName ::= IA5String (SIZE(1..63))
        --
        -- identifier for the group of charging rules
        -- see Charging-Rule-Base-Name AVP as defined in 3GPP TS 29.210
        --

ChChSelectionMode ::= ENUMERATED
{
        --
        -- values below show the additional, non-standard values
        -- requested by customer
        --
        sGSNSupplied                 (0),     -- For GGSN only
        homeDefault                    (3),     -- For SGSN and GGSN
        roamingDefault             (4),     -- For SGSN and GGSN
        visitingDefault            (5),     -- For SGSN and GGSN
        aAASupplied                    (6),     -- For GGSN only, CC provided by AAA
        gGSNOverride                 (7)        -- For GGSN only, CC configured on GGSN
}

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

Diagnostics ::= CHOICE
{
        -- Only the option gsm0408Cause is used for this field
        --
        gsm0408Cause [0] INTEGER
}
```

```
DynamicAddressFlag ::= BOOLEAN

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

GSNAddress ::= IPAddress

IMSI ::= TBCD STRING (SIZE (3..8))
        --
        -- from 29.002
        -- digits of MCC, MNC, MSIN are concatenated in this order.
        --

IMEI ::= TBCD STRING (SIZE (8))
        --
        -- Refers to International Mobile Station Equipment Identity
        -- and Software Version Number (SVN) defined in TS 3GPP TS 23.003
        -- If the SVN is not present the last octet shall contain the
        -- digit 0 and a filler.
        -- If present the SVN shall be included in the last octet.
        --

IPAddress ::= CHOICE
{
        iPBinaryAddress IPBinaryAddress
}

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

ISDN-AddressString ::= AddressString
                                            (SIZE (1..maxISDN-AddressLength))
        --
        -- This type is used to represent ISDN numbers.
        --

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

MSISDN ::= ISDN-AddressString
        --
        -- see definitions below for ISDN-AddressString and AddressString
        -- copied from 29.002
        --

maxISDN-AddressLength INTEGER ::= 9
maxAddressLength INTEGER ::= 20

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

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

NodeID ::= IA5String (SIZE(5..20))

PDPAddress ::= CHOICE
{
        iPAddress [0] EXPLICIT IPAddress
}

PDPType ::= OCTET STRING (SIZE(2))
        --
        -- OCTET 1: PDP Type Organization
        -- OCTET 2: PDP Type Number
        -- See TS 29.060
        --

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..15))
        --
        -- This octet string
        -- is a 1:1 copy of the contents (i.e. starting with octet 4) of
        -- the "Quality of service Profile" information element specified
        -- in 3GPP TS 29.060.
        --

RatingGroupId ::= INTEGER
        --
        -- IP service flow identity (DCCA), range of 4 byte
        -- (0...4294967259)
        -- see Rating-Group AVP as used in 3GPP TS 32.299
        --

RATType ::= INTEGER (0..255)
        --
        -- This integer is 1:1 copy of the RAT type value as defined in
        -- 3GPP TS 29.060.
        --

ResultCode ::= INTEGER
        --
        -- charging protocol return value, range of 4 byte
        -- (0...4294967259)
        -- see Result-Code AVP as used in 3GPP 29.210
        --

ServiceConditionChange ::= BIT STRING
{
        -- Bits 0-5 are cause values for Gn update/release and TTS
        -- Bits 6-9 are cause values for service stop
        -- Bits 10-14 are cause values for service reauthorization
        --                          request
        -- Bits 15-17 are cause values for quota return
```

```
        -- Bits 18-20: are cause values for Failure Handling Procedure
        -- Bits 21-32: are unused and will always be zero
        -- some of the values are non-exclusive
        -- serviceIdledOut    bit 6 is equivalent to service release by QHT
        qoSChange                                              (0),
        sGSNChange                                             (1),
        sGSNPLMNIDChange                                    (2),
        tariffTimeSwitch                                    (3),
        pDPContextRelease                                  (4),
        rATChange                                              (5),
        serviceIdledOut                                     (6),
        qCTExpiry                                              (7),
        timeThresholdReached                             (10),
        volumeThresholdReached                          (11),
        timeExhausted                                          (13),
        volumeExhausted                                   (14),
        continueOngoingSession                          (18),
        retryAndTerminateOngoingSession (19),
        terminateOngoingSession                        (20)
}

ServiceIdentifier ::= INTEGER (0..4294967295)
        --
        -- The service identifier is used to identify the service or the
        -- service component the service data flow relates to. See
        -- Service-Identifier AVP as defined in 3GPP TS 29.210
        --

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
        --
TBCDSTRING ::= OCTET STRING
END
```

standard Dictionary

G-CDR fields based on 3GPP TS 32.215 V4.6.0 (2003-12) (R4).

Field	Category	Description
Record Type	M	GGSN PDP context record.
Network initiated PDP context	OC	A flag that is present if this is a network-initiated PDP context
Served IMSI	M	IMSI of the served party.

Field	Category	Description
GGSN Address	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in differe records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	OM	The logical name of the connected access point to the external pac data network (network identifier part of APN).
PDP Type	OM	PDP type, i.e. IP, PPP, or IHOSS:OSP
Served PDP Address	OC	PDP address, i.e. IPv4 or IPv6. This parameter shall be present ex when both the PDP type is PPP and dynamic PDP address assignr is used.
Dynamic Address Flag	OC	Indicates whether served PDP address is dynamic, which is alloca during PDP context activation. This field is missing if address is s
List of Traffic Data Volumes	OM	A list of changes in charging conditions for this PDP context, eacl change is time stamped. Charging conditions are used to categoris traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or recor opening time on subsequent partial records.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
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 rec
Node ID	OM	Name of the recording entity.
Record Extensions	OC	A set of network operator/manufacturer specific extensions to the re Conditioned upon the existence of an extension.
Local Record Sequence Number	OM	Consecutive record number created by this node. The number is alloc 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.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	OM	Holds information about how Charging Characteristics were selec
SGSN PLMN Identifier	OM	SGSN PLMN identifier (MCC and MNC) used during this record

CDR Fields Supported in eG-CDRs

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

custom6 Dictionary

eG-CDR fields based on 3GPP TS 32.298 V6.6.0 (2006-12) (R6).

Field	Tag number	Category	Description
Record Type	0	M	The field identifies the type of the record: • S-CDR (sgsnPDPRecord) 18 (0x12) • G-CDR (ggsnPDPRecord) 19 (0x13) • eG-CDR (egsnPDPRecord) 70 (0x46)
Network initiated PDP context	1	O	This field indicates that the PDP context was netw mobile activated PDP context. Set to TRUE (0xFF side. This field is not yet supported by the SGSN.
Served IMSI	3	M	This field contains the International Mobile Subsc The IMSI is formatted in accordance with 3GPP T
GGSN Address	4	M	This field provides the current serving GGSN IP A equivalent to the configured ggsn-service address offers a choice for the encoding of the address to b The GGSN encodes the address in binary format a
GGSN IPv4 Binary Address	4-0	M	

Field	Tag number	Category	Description
Charging ID	5	M	This field is a charging identifier, which can be used to all records produced in the GGSN involved in a single P by the GGSN at PDP context activation and is transfe an inter-SGSN routing area update the charging ID is each active PDP context. The possible values for the charging ID, which are de and those values are encapsulated in following schem 1 - 127 850101-85017F 128 – 32,767 85020080 -85027FFF 32,768 – 8,388,607 8503008000 -85037FFFFF 8,388,608 – 2,147,483,647 850400800000 -85047FFFFFF 2,147,483,648 – 4,294,967,295 85050080000000 -850500FFFFFFFF
SGSN Address	6	M	This field contains one or several SGSN IP addresses. For an S-CDR, the SGSN address contains the control SGSN serving the PDP context. For a G-CDR and eG-CDR, in addition to the current additional SGSN addresses where the PDP context wa away using the Inter-SGSN Routing Area Update Proce in the list is 5.
SGSN IPv4 Binary Address	6-0	M	The octet string included in the field described above i address of the SGSN in binary coding.
Access Point Name Network Identifier	7	M	This field contains the Network Identifier part of the A by the SGSN in the Create PDP Context Request mes For GGSN generated records, in case of a configured instead, unless this is overridden by the option **gcdr a** **}**
PDP Type	8	M	This field defines the PDP type, e.g. IP or PPP, as rece SGSN. Supported values: • IP = f121 • PPP = f001

Field	Tag number	Category	Description
Served PDP Address	9	O	This field contains the PDP address of the served I allows a choice of either IPAddress or ETSIAddre
PDP IP Address	9-0	M	This field contains the IP address for the PDP cont
PDP IPv4 Binary Address	9-0-0	M	The octet string included in the field described abo subscriber by the GGSN in binary coding.
Dynamic Address Flag	11	O	This field indicates that the PDP address has been c context. In this case, the value is set to TRUE and address allocation method was "static", i.e. part of
List of Traffic Volumes	12	M	This list includes one or more Traffic Volume cont Condition" as described in the next field. The max
ChangeOfChar Condition	12-0	M	Each traffic volume container contains details rela the following subsections. A new container is usua changes.
QoS Requested	12-0-1	O	This field contains the QoS desired by the MS at P
QoS Negotiated	12-0-2	O	This field indicates the applied QoS accepted by th The QoS values may only be included in the first c depends upon what was changed.
GPRS Uplink data volume	12-0-3	M	This field includes the number of octets transmitte in the uplink direction. The amount of data counted in the GGSN is the pa interface. The data counted already includes the IP Note that a maximum of 2^32 bytes can be counte defined at least for this value to avoid an overflow traffic.
GPRS Downlink data volume	12-0-4	M	This field includes the number of octets transmitte in the downlink direction. The amount of data counted in the GGSN is the pa interface. The data counted already includes the IP Note that a maximum of 2^32 bytes can be counte defined at least for this value to avoid an overflow traffic.

Field	Tag number	Category	Description
Change Condition	12-0-5	M	This field defines the reason for closing the container or closing of the CDR. Supported values: • qoSChange: 0 • tariffTime: 1 • recordClosure: 2 • failureHandling ContinueOngoing: 3 • failureHandling RetryandTerminateOngoing: 4 • failureHandling TerminateOngoing: 5 FailureHandling is a standard AVP element in DCCA. • Terminate: The online session is finished. The ass sessions) or not established (new sessions). Failov Failover for new sessions is always supported. • Retry&Terminate;: The online session is finished (ongoing sessions) or not established (new sessio supported. Failover for new sessions is always su • Continue: The online session is finished. The ass sessions) or not released (ongoing sessions). Fail Failover for new sessions is always supported.
Change time	12-0-6	M	This field is a time stamp, which defines the moment the CDR is closed.
Failurehandling Continue	12-0-7	O	Failure handling continue element is present if failure h
Record Opening Time	13	M	This field contains the time stamp when PDP context is record is opened after a partial record. The timestamp is determined based on the internal tim Depending on the configured mechanism (ceiling, floo timestamp which only shows the full seconds.
Duration	14	M	This field contains the relevant duration in seconds for P (2^32-1). It is the duration from Record Opening Time to the Ch the internal representation in milliseconds to an intege mechanism for this conversion (ceiling, floor, round-o to configure to use milliseconds in this field instead of

Field	Tag number	Category	Description
Cause for Record Closing	15	M	This field contains a reason for the closure of the C Supported values: • normalRelease: 0 • abnormalRelease: 4 • volumeLimit: 16 • timeLimit: 17 • sGSNChange: 18 • maxChangeCond: 19 • management Intervention: 20 • rATChange: 22 • mSTimeZone Change: 23
Diagnostics	16	O	This field is included in the CDR when the PDP co **attribute diagnostics** is configured. Only the choice of **gsm0408Value** is used. This field is supported for G-CDRs only (not eG-C
gsm0408Cause	16-0	M	This cause is used in the Diagnostics field and con • 36: If the SGSN sends Delete PDP context re • 38: If GGSN sends delete PDP context reques • 40: If the GGSN sends delete PDP context req request message. • 26: If the GGSN sends delete PDP context re
Record Sequence Number	17	O	A running sequence number with range 1 through generated by the GGSN for a specific PDP contex and GGSN address pair). This field is not present i
Node ID	18	M	This field contains an identifier string for the node On the ASR 5500 GGSN, this NodeID field is a pr n: The first digit is the Sessmgr restart counter hav ddd: The number of the sessmgr instance generatin STRING: This is a configured Node-ID-Suffix hav defined using the **gtpp attribute node-id** comman If this node-id-suffix is not configured, the GGSN Node-id-suffix (truncated to 16 characters). For G-CDRs, this field is only included when the c **-sequence-number** is configured.
Local Record Sequence Number	20	M	For each Node ID, this number with range 1..4294 CDR. This along with a Node ID uniquely identifi For G-CDRs, this field is only included when the c **-sequence-number** is configured.

Field	Tag number	Category	Description
APN Selection Mode	21	M	An index indicating how the APN was selected. The f are possible: • 0: MS or network provided APN, subscribed ver • 1: MS provided APN, subscription not verified • 2: Network provided APN, subscription not verif
Served MSISDN	22	M	The field tracks the Mobile Station (MS) ISDN numb transparently copied from the Create PDP Context Re
Charging Characteristics	23	M	Lists the charging characteristics applied to the PDP c The GGSN can accept charging characteristics from the value. GGSN configured charging characteristics are s are applied for G-CDRs to subscriber PDP contexts th
Charging Characteristics Selection Mode	24	O	The charging characteristic type that the GGSN applie this field are defined in 3GPP TS 32.298: • sGSNSupplied (0) - For GGSN only • subscriptionSpecific (1) -For SGSN only • aPNSpecific (2) - For SGSN only • homeDefault (3) - For SGSN and GGSN • roamingDefault (4) - For SGSN and GGSN • visitingDefault (5) - For SGSN and GGSN • SGSN supplied: The GGSN is using the charging • Home default: GGSN configured charging charac Home subscribers are those that belong to the san is located. • Visiting default: GGSN configured charging char used. Visiting subscribers are those that belong to the GGSN is located. • Roaming default: GGSN configured charging cha used. Roaming subscribers are those that are servi PLMN than the one on which the GGSN is locate
SGSN PLMN Identifier	27	O	RAI (optionally supplied by SGSN in the GTP create PLMN Identifier value. It is omitted if the SGSN does as a "home" SGSN. For home SGSNs without the RA sent instead.
Served IMEISV	29	O	This field contains software version in addition to the IM is encoded in the last byte replacing the spare digit and The structure of the IMEISV is defined in TS 23.003.

Field	Tag number	Category	Description
RAT Type	30	O	This field indicates the Radio Access Technology Station. The field is present in the CDR if provide RAT Type values: • Reserved: 0 • UTRAN: 1 • GERAN: 2 • WLAN: 3 • Spare: 4-255
MS Time Zone	31	O	This field contains the "Time Zone" IE that the SG PDP context activation/modification procedure. It is transparently copied from the message into th the offset between universal time and local time in resides. It is coded as specified in 3GPP TS 29.06 which again refers to the TP Service Centre Time
User Location Information	32	O	The User Location Information for the MS if prov PDP context activation/modification procedure. Transparently copied from the PDP context reques
List of Service Data Volumes	34	O	A list of the changes that occurred in charging con context
ChangeOfService Condition	34-0	O	
Rating group	34-0-1	M	This is the service flow identity and has to be used Also known as content-id.
Charging Rulebase name	34-0-2	M	The name of the Rulebase used for charging. This
Result Code	34-0-3	O	The result code AVP. This contains the result code
Local Sequence number	34-0-4	M	A per service data container sequence number. It s 1 for each service date container generated for that s
Time of first usage	34-0-5	M	The time stamp for the first IP packet to be transm current instance of Service Condition Change.
Time of last usage	34-0-6	M	The time stamp for the last IP packet to be transmi current instance of Service Condition Change.
Usage time	34-0-7	M	The difference between "time of first usage" and "
Service condition change	34-0-8	M	The reason for closing the service data container f RAT change, time and volume triggers, etc.

Field	Tag number	Category	Description
QoS negotiated	34-0-9	O	The negotiated QoS applied for the service data flow. In 16.0 and earlier releases, if in the CDRs there are m and different service-identifiers, then the QOS-Info In in the very first LOSDV and not in the subsequent LOS for QoS change. In 17.0 and later releases, this implementation has bee LOSDVs having different combination of service-id a LOSDVs with same content-id but different service-id LOSDV.
sgsn-Address	34-0-10	M	The valid SGSN IP address during the service data rec
SGSN-IPv4-Binary Address	34-0-10-0	M	
SGSN PLMN identifier	34-0-11	O	The valid SGSN PLMN ID during the service data rec
FBC Data volume uplink	34-0-12	M	The number of octets transmitted during the use of the p Note that a maximum of 2^32 bytes can be counted in defined at least for this value to avoid an overflow, if traffic.
FBC data volume downlink	34-0-13	M	The number of octets transmitted during the use of the direction. Note that a maximum of 2^32 bytes can be counted in defined at least for this value to avoid an overflow, if traffic.
Time of report	34-0-14	M	A time stamp defining the moment when the service d
RAT Type	34-0-15	O	The valid RAT type during the service data recording
Failurehandling Continue	34-0-16	O	A Boolean expression included if the failure handling
Service Identifier	34-0-17	O	The service identifier may designate an end user servi arbitrarily formed group thereof.

Notes:

- The subfields included in other fields are marked Mandatory even if the main field is optional. For example, the list of service containers is optional, but if there is at least one container, then all subfields for the container that are marked as Mandatory will be included.
- The field "Served PDP PDN Address Extension"(servedPDPPDNAddressExt) is not part of the 3GPP 32.298 v8.5.0 specification. This field will be available in the CDR only when the CLI command **gtpp attribute served-pdp-pdn-address-extension** is configured in the GTPP Server Group Configuration Mode. This field is disabled by default. For more information on this command, refer to the *Command Line Interface Reference*.

- Record Extensions (recordExtensions) is a customer-specific field. This field will be available in the CDR only when the CLI command **gtpp trigger direct-tunnel** is configured in the GTPP Server Group Configuration Mode. This field is disabled by default. For more information on this command, refer to the *Command Line Interface Reference*.
- In releases prior to 14.0, the CGISAIChange service condition is present in LOSDV of GGSN CDR even if ULI Change trigger is disabled. In 14.0 and later releases, if the ULI Change trigger is disabled and if the ULI is changed, the CGISAIChange service condition is not present in LOSDV of GGSN CDR.
- Rulebase change triggered from any external interface e.g. OCS/PCRF, will generate CDR with closure reason "Management Intervention". This change is applicable to all standard dictionaries except for custom42 GTPP dictionary as it is customized to suppress interim CDR.
- In releases prior to 16, if there was a LOSDV bucket created between the packet arrival time and service-idle-out expiry time, no data counts were reported. So, a zero-volume LOSDV was generated for service idle timeout scenario. In 16 and later releases, if there are no data counts available for a service flow, the LOSDV for service idle timeout will not be created. The service-idle timeout will be started only when the next data packet arrives.

  This behavior change is applicable to eG-CDRs and PGW-CDRs for all GTPP dictionaries except custom5 and custom40 dictionaries.

ASN.1 Definition for Fields in custom6 Dictionary

Below is a complete ASN.1 definition of eG-CDR fields down to the basic types described in ITU X.690. It is based on the ASN.1 definition in 3GPP TS 32.298, with imported types taken from 3GPP TS 29.002. The definition from the standard has been modified to reflect the fields which are not supported currently on the ASR 5500 platform, and to reflect other differences such as in the category (mandatory versus optional).

```
GPRS-PGW-Charging-DataTypes-REL6 DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- ASN.1 definitions of the ASR 5500 GGSN Charging implementation
--
-- based on 3GPP TS 32.298 v6.4.1
--
-- for some fields, only the values relevant to GGSN charging
-- are shown (such as CallEventRecordType)
--
-- some types are imported from 29.002 and are shown below as well
-- with the definition copied from that standard (such as IMSI)

GPRSCallEventRecord ::= CHOICE
{
        ggsnPDPRecord [21] GGSNPDPRecord
}

-- ------------------------------------------------------------
-- GGSN record (same definition used for G-CDR and eG-CDR)
-- ------------------------------------------------------------

GGSNPDPRecord ::= SET
{
        recordType                              [0] CallEventRecordType,
        networkInitiation                   [1] NetworkInitiatedPDPContext OPTIONAL,
        servedIMSI                              [3] IMSI,
        ggsnAddress                             [4] EXPLICIT GSNAddress,
        chargingID                              [5] ChargingID,
        sgsnAddress                             [6] SEQUENCE OF GSNAddress,
        accessPointNameNI                   [7] AccessPointNameNI,
```

```
        pdpType                                 [8] PDPType,
        servedPDPAddress                [9] EXPLICIT PDPAddress OPTIONAL,
        dynamicAddressFlag            [11] DynamicAddressFlag OPTIONAL,
        listOfTrafficVolumes        [12] SEQUENCE OF ChangeOfCharCondition,
        recordOpeningTime               [13] TimeStamp,
        duration                              [14] CallDuration,
        causeForRecClosing            [15] CauseForRecClosing,
        diagnostics                           [16] Diagnostics OPTIONAL,
        recordSequenceNumber         [17] INTEGER OPTIONAL,
        nodeID                                [18] NodeID,
        localSequenceNumber           [20] LocalSequenceNumber,
        apnSelectionMode                [21] APNSelectionMode,
        servedMSISDN                        [22] MSISDN,
        chargingCharacteristics    [23] ChargingCharacteristics,
        chChSelectionMode               [24] ChChSelectionMode OPTIONAL,
        sgsnPLMNIdentifier            [27] PLMN-Id OPTIONAL,
        servedIMEISV                        [29] IMEI OPTIONAL,
        rATType                               [30] RATType OPTIONAL,
        mSTimeZone                          [31] MSTimeZone OPTIONAL,
        userLocationInformation    [32] OCTET STRING OPTIONAL,
        listOfServiceData               [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL
}



-- ------------------------------------------------------------
-- Alphabetical listing of all field types above
-- ------------------------------------------------------------

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.
        --

AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
        -- This type is used to represent a number for addressing
        -- purposes. It is composed of
        -- a) one octet for nature of address, and numbering plan
        -- indicator.
        -- b) digits of an address encoded as TBCD-String.
        -- a) The first octet includes a one bit extension indicator, a
        -- 3 bits nature of address indicator and a 4 bits numbering
        -- plan indicator, encoded as follows:
        -- bit 8: 1 (no extension)
        -- bits 765: nature of address indicator
        -- 000 unknown
        -- 001 international number
        -- 010 national significant number
        -- 011 network specific number
        -- 100 subscriber number
        -- 101 reserved
        -- 110 abbreviated number
        -- 111 reserved for extension
        -- bits 4321: numbering plan indicator
        -- 0000 unknown
        -- 0001 ISDN/Telephony Numbering Plan (Rec ITU-T E.164)
        -- 0010 spare
        -- 0011 data numbering plan (ITU-T Rec X.121)
        -- 0100 telex numbering plan (ITU-T Rec F.69)
        -- 0101 spare
```

```
        -- 0110 land mobile numbering plan (ITU-T Rec E.212)
        -- 0111 spare
        -- 1000 national numbering plan
        -- 1001 private numbering plan
        -- 1111 reserved for extension
        -- all other values are reserved.
        -- b) The following octets representing digits of an address
        -- encoded as a TBCD-STRING.

APNSelectionMode::= ENUMERATED
{
        --
        -- See Information Elements TS 29.060
        --
        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.
        --

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

CauseForRecClosing ::= INTEGER
{
        --
        -- In GGSN the value sGSNChange should be used for partial record
        -- generation due to SGSN Address List Overflow
        --
        -- cause codes 0 to 15 are defined 'CauseForTerm' (cause for
        -- termination)
        --
        normalRelease                                 (0),
        abnormalRelease                             (4),
        volumeLimit                                     (16),
        timeLimit                                         (17),
        sGSNChange                                      (18),
        maxChangeCond                                 (19),
        managementIntervention                (20),
        rATChange                                         (22),
        mSTimeZoneChange                            (23)
}

ChangeCondition ::= ENUMERATED
{
        --
        -- Failure Handling values used in eG-CDR only
        --
        qoSChange                                                                       (0),
        tariffTime                                                                      (1),
        recordClosure                                                                 (2),
        failureHandlingContinueOngoing                                  (3),
        failureHandlingRetryandTerminateOngoing         (4),
        failureHandlingTerminateOngoing                           (5)
```

```
}

ChangeOfCharCondition ::= SEQUENCE
{
        --
        -- Used in PDP context record only
        -- failureHandlingContinue field used in eG-CDR only
        --
        qosRequested                                [1] QoSInformation OPTIONAL,
        qosNegotiated                             [2] QoSInformation OPTIONAL,
        dataVolumeGPRSUplink               [3] DataVolumeGPRS,
        dataVolumeGPRSDownlink           [4] DataVolumeGPRS,
        changeCondition                          [5] ChangeCondition,
        changeTime                                    [6] TimeStamp,
        failureHandlingContinue         [7] FailureHandlingContinue OPTIONAL
}

ChangeOfServiceCondition ::= SEQUENCE
{
        --
        -- Used for Flow based Charging service data container
        --
        ratingGroup                                  [1]    RatingGroupId,
        chargingRuleBaseName                [2]    ChargingRuleBaseName,
        resultCode                                     [3]    ResultCode OPTIONAL,
        localSequenceNumber                 [4]    LocalSequenceNumber,
        timeOfFirstUsage                        [5]    TimeStamp,
        timeOfLastUsage                         [6]    TimeStamp,
        timeUsage                                     [7]    CallDuration,
        serviceConditionChange            [8]    ServiceConditionChange,
        qoSInformationNeg                     [9]    QoSInformation OPTIONAL,
        sgsn-Address                                [10] EXPLICIT GSNAddress,
        sGSNPLMNIdentifier                    [11] PLMN-Id OPTIONAL,
        datavolumeFBCUplink                [12] DataVolumeGPRS,
        datavolumeFBCDownlink             [13] DataVolumeGPRS,
        timeOfReport                                [14] TimeStamp,
        rATType                                        [15] RATType OPTIONAL,
        failureHandlingContinue         [16] FailureHandlingContinue OPTIONAL,
        serviceIdentifier                      [17] ServiceIdentifier OPTIONAL
}

ChargingCharacteristics ::= OCTET STRING (SIZE(2))
        --
        -- Bit 0-3: Profile Index
        -- Bit 4-15: For Behavior
        --

ChargingID ::= INTEGER (0..4294967295)
        --
        -- Generated in GGSN, part of PDP context, see TS 23.060
        -- 0..4294967295 is equivalent to 0..2**32-1
        --

ChargingRuleBaseName ::= IA5String (SIZE(1..63))
        --
        -- identifier for the group of charging rules
        -- see Charging-Rule-Base-Name AVP as defined in 3GPP TS 29.210
        --

ChChSelectionMode ::= ENUMERATED
{
        --
        -- values below show the additional, non-standard values
        -- requested by customer
```

```
        --
        sGSNSupplied                (0),     -- For GGSN only
        homeDefault                   (3),     -- For SGSN and GGSN
        roamingDefault             (4),     -- For SGSN and GGSN
        visitingDefault            (5),     -- For SGSN and GGSN
        aAASupplied                   (6),     -- For GGSN only, CC provided by AAA
        gGSNOverride                (7)        -- For GGSN only, CC configured on GGSN
}

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

Diagnostics ::= CHOICE
{
        -- Only the option gsm0408Cause is used for this field
        --
        gsm0408Cause [0] INTEGER
}

DynamicAddressFlag ::= BOOLEAN

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

GSNAddress ::= IPAddress

IMSI ::= TBCD STRING (SIZE (3..8))
        --
        -- from 29.002
        -- digits of MCC, MNC, MSIN are concatenated in this order.
        --

IMEI ::= TBCD STRING (SIZE (8))
        --
        -- Refers to International Mobile Station Equipment Identity
        -- and Software Version Number (SVN) defined in TS 3GPP TS 23.003
        -- If the SVN is not present the last octet shall contain the
        -- digit 0 and a filler.
        -- If present the SVN shall be included in the last octet.
        --

IPAddress ::= CHOICE
{
        iPBinaryAddress IPBinaryAddress
}

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

ISDN-AddressString ::= AddressString
                                              (SIZE (1..maxISDN-AddressLength))
        --
        -- This type is used to represent ISDN numbers.
        --
```

```
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

MSISDN ::= ISDN-AddressString
        --
        -- see definitions below for ISDN-AddressString and AddressString
        -- copied from 29.002
        --

maxISDN-AddressLength INTEGER ::= 9
maxAddressLength INTEGER ::= 20

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

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

NodeID ::= IA5String (SIZE(5..20))

PDPAddress ::= CHOICE
{
        iPAddress [0] EXPLICIT IPAddress
}

PDPType ::= OCTET STRING (SIZE(2))
        --
        -- OCTET 1: PDP Type Organization
        -- OCTET 2: PDP Type Number
        -- See TS 29.060
        --

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..15))
        --
        -- This octet string
        -- is a 1:1 copy of the contents (i.e. starting with octet 4) of
        -- the "Quality of service Profile" information element specified
        -- in 3GPP TS 29.060.
        --

RatingGroupId ::= INTEGER
        --
        -- IP service flow identity (DCCA), range of 4 byte
        -- (0...4294967259)
        -- see Rating-Group AVP as used in 3GPP TS 32.299
        --
```

```
RATType ::= INTEGER (0..255)
        --
        -- This integer is 1:1 copy of the RAT type value as defined in
        -- 3GPP TS 29.060.
        --

ResultCode ::= INTEGER
        --
        -- charging protocol return value, range of 4 byte
        -- (0...4294967259)
        -- see Result-Code AVP as used in 3GPP 29.210
        --

ServiceConditionChange ::= BIT STRING
{
        -- Bits 0-5 are cause values for Gn update/release and TTS
        -- Bits 6-9 are cause values for service stop
        -- Bits 10-14 are cause values for service reauthorization
        --                         request
        -- Bits 15-17 are cause values for quota return
        -- Bits 18-20: are cause values for Failure Handling Procedure
        -- Bits 21-32: are unused and will always be zero
        -- some of the values are non-exclusive
        -- serviceIdledOut    bit 6 is equivalent to service release by QHT
        qoSChange                                               (0),
        sGSNChange                                              (1),
        sGSNPLMNIDChange                                    (2),
        tariffTimeSwitch                                    (3),
        pDPContextRelease                                 (4),
        rATChange                                               (5),
        serviceIdledOut                                     (6),
        qCTExpiry                                               (7),
        timeThresholdReached                            (10),
        volumeThresholdReached                        (11),
        timeExhausted                                           (13),
        volumeExhausted                                    (14),
        continueOngoingSession                        (18),
        retryAndTerminateOngoingSession (19),
        terminateOngoingSession                     (20)
}

ServiceIdentifier ::= INTEGER (0..4294967295)
        --
        -- The service identifier is used to identify the service or the
        -- service component the service data flow relates to. See
        -- Service-Identifier AVP as defined in 3GPP TS 29.210
        --

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
        --
TBCDSTRING ::= OCTET STRING
END
```

custom19 Dictionary

eG-CDR fields for TS 32.298 v7.4.0 (R7).

Field	Tag number	Category	Description
Record Type	0	M	The field identifies the type of the record: • S-CDR(sgsnPDPRecord) 18 (0x12) • G-CDR(ggsnPDPRecord) 19 (0x13) • eG-CDR(egsnPDPRecord) 70 (0x46)
Network initiated PDP context	1	O	This field indicates that the PDP context was network initiate in case of mobile activated PDP context. Set to TRUE (0xF initiated from network side. This field is not yet supported by the SGSN.
Served IMSI	3	M	This field contains the International Mobile Subscriber Identit party. The IMSI is formatted in accordance with 3GPP TS 23.003.
GGSN Address	4	M	This field provides the current serving GGSN IP Address fo which is equivalent to the configured ggsn-service address o standard 3GPP 32.298 offers a choice for the encoding of th in binary or text format. The GGSN encodes the address in binary format and includ
GGSN IPv4 Binary Address	4-0	M	The octet string included in the field described above includ the GGSN service in binary coding.
Charging ID	5	M	This field is a charging identifier, which can be used togethe address to identify all records produced in the GGSN involv context. The Charging ID is generated by the GGSN at PDP is transferred to the context requesting SGSN. At an inter-SGS the charging ID is transferred to the new SGSN as part of eac The possible values for the charging ID, which are defined i 1-4,294,967,295 and those values are encapsulated in follow CDR-field: 1 - 127 850101-85017F 128 – 32,767 85020080 -85027FFF 32,768 – 8,388,607 8503008000 -85037FFFFF 8,388,608 – 2,147,483,647 850400800000 -85047FFFFFF 2,147,483,648 – 4,294,967,295 85050080000000- 850500F

Field	Tag number	Category	Description
SGSN Address	6	M	This field contains one or several SGSN IP addresses. For an S-CDR, the SGSN address contains the control pl of the current SGSN serving the PDP context. For a G-CDR and eG-CDR, in addition to the current SG may contain additional SGSN addresses where the PDP c and where it has moved away using the Inter-SGSN Routin The maximum number of addresses in the list is 5.
SGSN IPv4 Binary Address	6-0	M	The octet string included in the field described above inc or user plane address of the SGSN in binary coding.
Access Point Name Network Identifier	7	M	This field contains the Network Identifier part of the Acc It is provided by the SGSN in the Create PDP Context R For GGSN generated records, in case of a configured virt is included instead, unless this is overridden by the optio **-included { gn | virtual }**
PDP Type	8	M	This field defines the PDP type, e.g. IP or PPP, as receiv request from the SGSN. Supported values: • IP = f121 • PPP = f001
Served PDP Address	9	O	This field contains the PDP address of the served IMSI for TS 32.298 allows a choice of either IPAddress or ETSIA
PDP IP Address	9-0	M	This field contains the IP address for the PDP context.
PDP IPv4 Binary Address	9-0-0	M	The octet string included in the field described above inc assigned to the subscriber by the GGSN in binary coding
Dynamic Address Flag	11	O	This field indicates that the PDP address has been dynam particular PDP context. In this case, the value is set to TR This field is missing if the address allocation method was context subscription.
List of Traffic Volumes	12	M	This list includes one or more Traffic Volume containers Charging Condition" as described in the next field. The n containers is configurable.
ChangeOfCharCondition	12-0	M	Each traffic volume container contains details related to described in the following subsections. A new container QoS change and for tariff changes.
QoS Requested	12-0-1	O	This field contains the QoS desired by the MS at PDP co

Field	Tag number	Category	Description
QoS Negotiated	12-0-2	O	This field indicates the applied QoS accepted by the network The QoS values may only be included in the first container, presence depends upon what was changed.
GPRS Uplink data volume	12-0-3	M	This field includes the number of octets transmitted during t data services in the uplink direction. The amount of data counted in the GGSN is the payload of t the Gn interface. The data counted already includes the IP P i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this fi should be defined at least for this value to avoid an overflow for a smaller amount of traffic.
GPRS Downlink data volume	12-0-4	M	This field includes the number of octets transmitted during t data services in the downlink direction. The amount of data counted in the GGSN is the payload of t the Gn interface. The data counted already includes the IP P i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this fi should be defined at least for this value to avoid an overflow for a smaller amount of traffic.
Change Condition	12-0-5	M	This field defines the reason for closing the container such a QoS change or closing of the CDR. Supported values: • qoSChange: 0 • tariffTime: 1 • recordClosure: 2 • failureHandling ContinueOngoing: 3 • failureHandling RetryandTerminateOngoing: 4 • failureHandling TerminateOngoing: 5 FailureHandling is a standard AVP element in DCCA. • Terminate: The online session is finished. The associate released (ongoing sessions) or not established (new ses ongoing sessions is not supported. Failover for new ses supported. • Retry&Terminate;: The online session is finished. The as is released (ongoing sessions) or not established (new s ongoing sessions is supported. Failover for new session • Continue: The online session is finished. The associate established (new sessions) or not released (ongoing ses ongoing sessions is supported. Failover for new session
Change time	12-0-6	M	This field is a time stamp, which defines the moment when t is closed or the CDR is closed.

Field	Tag number	Category	Description
Failurehandling Continue	12-0-7	O	Failure handling continue element is present if failure hand by GGSN
User Location Information	12-0-8	O	The User Location Information for the MS if provided b during the PDP context activation/modification procedu Transparently copied from the GTP message.
Record Opening Time	13	M	This field contains the time stamp when PDP context is ac a subsequent record is opened after a partial record. The timestamp is determined based on the internal timer 10ms. Depending on the configured mechanism (ceiling, translated into the timestamp which only shows the full s
Duration	14	M	This field contains the relevant duration in seconds for PI 0..4294967295 (2^32-1). It is the duration from Record Opening Time to the Char converted from the internal representation in millisecond representing only seconds. The mechanism for this conv round-off) can be configured. It is also possible to config this field instead of seconds.
Cause for Record Closing	15	M	This field contains a reason for the closure of the CDR. Supported values: • normalRelease: 0 • abnormalRelease: 4 • volumeLimit: 16 • timeLimit: 17 • sGSNChange: 18 • maxChangeCond: 19 • managementIntervention: 20 • rATChange: 22 • mSTimeZoneChange: 23
Diagnostics	16	O	This field is included in the CDR when the PDP context option **gtpp attribute diagnostics** is configured. Only the choice of **gsm0408Value** is used. This field is supported for G-CDRs only (not eG-CDRs)
gsm0408Cause	16-0	M	This cause is used in the Diagnostics field and contains on • 36: If the SGSN sends Delete PDP context request • 38: If GGSN sends delete PDP context request due t with SGSN • 40: If the GGSN sends delete PDP context request du Disconnect request message. • 26: If the GGSN sends delete PDP context request f

Field	Tag number	Category	Description
Record Sequence Number	17	O	A running sequence number with range 1 through 4294967 records generated by the GGSN for a specific PDP context (same Charging ID and GGSN address pair). This field is not record is also the final record.
Node ID	18	M	This field contains an identifier string for the node that had g On the ASR 5500 GGSN, this NodeID field is a printable strin format: n: The first digit is the Sessmgr restart counter having a valu ddd: The number of the sessmgr instance generating the CD STRING: This is a configured Node-ID-Suffix having any s characters, defined using the **gtpp attribute node-id** comma If this node-id-suffix is not configured, the GGSN uses the C the Node-id-suffix (truncated to 16 characters). For G-CDRs, this field is only included when the option **gtpp a -sequence-number** is configured.
Local Record Sequence Number	20	M	For each Node ID, this number with range 1..4294967295 is for each CDR. This along with a Node ID uniquely identifie For G-CDRs, this field is only included when the option **gtpp a -sequence-number** is configured.
APN Selection Mode	21	M	An index indicating how the APN was selected. The followin indexes are possible: • 0: MS or network provided APN, subscribed verified • 1: MS provided APN, subscription not verified • 2: Network provided APN, subscription not verified
Served MSISDN	22	M	The field tracks the Mobile Station (MS) ISDN number (MSIS which is transparently copied from the Create PDP Context is TBCD encoded.
Charging Characteristics	23	M	Lists the charging characteristics applied to the PDP context The GGSN can accept charging characteristics from the SGS own configured value. GGSN configured charging character part of the GGSN Service and are applied for G-CDRs to sub through APN templates.

Field	Tag number	Category	Description
Charging Characteristics Selection Mode	24	O	The charging characteristic type that the GGSN applied to values for this field are defined in 3GPP TS 32.298: • sGSNSupplied (0) - For GGSN only • subscriptionSpecific (1) -For SGSN only • aPNSpecific (2) - For SGSN only • homeDefault (3) - For SGSN and GGSN • roamingDefault (4) - For SGSN and GGSN • visitingDefault (5) - For SGSN and GGSN • SGSN supplied: The GGSN is using the charging ch the SGSN. • Home default: GGSN configured charging characteri are used. Home subscribers are those that belong to one on which the GGSN is located. • Visiting default: GGSN configured charging charac subscribers are used. Visiting subscribers are those PLMN than the one on which the GGSN is located. • Roaming default: GGSN configured charging chara subscribers are used. Roaming subscribers are those SGSN belonging to a different PLMN than the one located.
SGSN PLMN Identifier	27	O	RAI (optionally supplied by SGSN in the GTP create PD as SGSN PLMN Identifier value. It is omitted if the SGSN and is not identified as a "home" SGSN. For home SGSNs configured PLMN-ID can be sent instead.
Served IMEISV	29	O	This field contains software version in addition to the IM software version is encoded in the last byte replacing the The structure of the IMEISV is defined in TS 23.003.
RAT Type	30	O	This field indicates the Radio Access Technology (RAT) the Mobile Station. This field is present in the CDR if pr RAT Type values: • Reserved: 0 • UTRAN: 1 • GERAN: 2 • WLAN: 3 • Spare: 4-255
MS Time Zone	31	O	This field contains the "Time Zone" IE that the SGSN m during the PDP context activation/modification procedur It is transparently copied from the message into the CDR to indicate the offset between universal time and local tir of where the MS current resides. It is coded as specified in refers to 24.008 for the time zone, which again refers to th Stamp field in 23.040).

Field	Tag number	Category	Description
User Location Information	32	O	The User Location Information for the MS if provided by th during the PDP context activation/modification procedure. Transparently copied from the PDP context request.
List of Service Data Volumes	34	O	A list of the changes that occurred in charging conditions for for the PDP context.
Service Data Volume Block	34-0	O	
Rating group	34-0-1	M	This is the service flow identity and has to be used for differ user's traffic. This is also known as content-id.
Charging Rulebase name	34-0-2	M	The name of the Rulebase used for charging. This is the grou rules.
Result Code	34-0-3	O	The Diameter server sends result-codes for each of the conte is requested. The GGSN use this to populate the eG-CDR bu Mandatory AVP that comes in response for every quota requ
Local Sequence number	34-0-4	M	A per service data container sequence number. It starts from increasing by 1 for each service date container generated for lifetime of this PDP session.
Time of first usage	34-0-5	M	The time stamp for the first IP packet to be transmitted for th referred to the current instance of Service Condition Change
Time of last usage	34-0-6	M	The time stamp for the last IP packet to be transmitted for th referred to the current instance of Service Condition Change
Usage time	34-0-7	M	The difference between "time of first usage" and "time of las
Service condition change	34-0-8	M	The reason for closing the service data container for triggers QoS change, Rat change, time and volume triggers, etc.
QoS negotiated	34-0-9	O	The negotiated QoS applied for the service data flow. In 16.0 and earlier releases, if in the CDRs there are multiple content-id and different service-identifiers, then the QOS-Info (IE) is included only in the very first LOSDV and not in the unless its previous LOSDV is closed for QoS change. In 17.0 and later releases, this implementation has been mod QOS-Info in all LOSDVs having different combination of serv Thus if there are multiple LOSDVs with same content-id bu QOS-Info will be present in every such LOSDV.
sgsn-Address	34-0-10	M	The valid SGSN IP address during the service data recording
SGSN-IPv4-Binary Address	34-0-10-0	M	The octet string included in the field "sgsn-Address" include or user plane address of the SGSN in binary coding.

Field	Tag number	Category	Description
SGSN PLMN identifier	34-0-11	O	RAI (optionally supplied by SGSN in the GTP create PD as SGSN PLMN Identifier value. It is omitted if the SGSN and is not identified as a "home" SGSN. For home SGSNs configured PLMN-ID can be sent instead.
FBC Data volume uplink	34-0-12	M	The number of octets transmitted during the use of the pa uplink direction. Note that a maximum of 2^32 bytes can be counted in th should be defined at least for this value to avoid an overf for a smaller amount of traffic.
FBC data volume downlink	34-0-13	M	The number of octets transmitted during the use of the pa downlink direction. Note that a maximum of 2^32 bytes can be counted in th should be defined at least for this value to avoid an overf for a smaller amount of traffic.
Time of report	34-0-14	M	A time stamp defining the moment when the service data
RAT Type	34-0-15	O	The valid radio access technology type during the servic
Failurehandling Continue	34-0-16	O	A Boolean expression included if the failure handling con This can be either configured on the GGSN using **failure** "credit-control" mode or can be received from the server "Credit-Control-Failure-Handling" AVP. Whatever is rec have higher precedence. There is no negotiation with the regard and the GGSN will use whatever the server provi
Service Identifier	34-0-17	O	The service identifier may designate an end user service, service, or an arbitrarily formed group thereof. This field is is per combination of the rating group and service id
User Location Information	34-0-20	O	The User Location Information for the MS if provided by during the PDP context activation/modification procedur Transparently copied from the GTP message
Time Quota Mechanism	34-0-22	O	Time Quota Mechanism contains two further subfields ar reporting is required: • Time Quota Type identifies the mechanism by which be reported - as defined in TS 32.299. • Base Time Interval identifies the length of the base tim the reporting of time based usage, in seconds

Notes:

- LOTV related changes:
  - A new IE is included for LOTV container i.e. User location information.

- The list of traffic data volumes now supports RAI and CGI/SAI changes, i.e. whenever RAI and/or CGI/SAI changes are detected; it will result in a "List of Traffic Data Volumes" container being added to the CDR, if location reporting is required and a report of CGI/SAI change is received.

- LOSDV related changes:
  - Time Quota mechanism: Contains two further subfields and is included if envelope reporting is required:
    - Time Quota Type identifies the mechanism by which time-based usage should be reported — as defined in TS 32.299.
    - Base Time Interval identifies the length of the base time interval, for controlling the reporting of time-based usage, in seconds.
  - User location information will be included in the LOSDV container in the R7 eG-CDRs.
  - The "Service Change Condition" cause changes are as follows:
    - Time limit eG-CDRs where the corresponding service change condition now has been changed to "Time Limit". Earlier there was no specific service change condition and instead "Time Exhausted" was used.
    - Volume limit eG-CDRs where the corresponding service change condition now has been changed to "Volume Limit". Earlier there was no specific service change condition and instead "Volume Exhausted" was used.
    - eG-CDRs that are generated as a result of MS-TimeZone change will have service change condition as "Record closure".
  - custom19 dictionary has Rel. 7 related changes.

- The field "Served PDP PDN Address Extension"(servedPDPPDNAddressExt) is not part of the 3GPP 32.298 v8.5.0 specification. This field will be available in the CDR only when the CLI command **gtpp attribute served-pdp-pdn-address-extension** is configured in the GTPP Server Group Configuration Mode. This field is disabled by default. For more information on this command, refer to the *Command Line Interface Reference*.
- Record Extensions (recordExtensions) is a customer-specific field. This field will be available in the CDR only when the CLI command **gtpp trigger direct-tunnel** is configured in the GTPP Server Group Configuration Mode. This field is disabled by default. For more information on this command, refer to the *Command Line Interface Reference*.
- In releases prior to 14.0, the CGISAIChange service condition is present in LOSDV of GGSN CDR even if ULI Change trigger is disabled. In 14.0 and later releases, if the ULI Change trigger is disabled and if the ULI is changed, the CGISAIChange service condition is not present in LOSDV of GGSN CDR.
- Rulebase change triggered from any external interface e.g. OCS/PCRF, will generate CDR with closure reason "Management Intervention". This change is applicable to all standard dictionaries except for custom42 GTPP dictionary as it is customized to suppress interim CDR.
- In releases prior to 16, if there was a LOSDV bucket created between the packet arrival time and service-idle-out expiry time, no data counts were reported. So, a zero-volume LOSDV was generated for service idle timeout scenario. In 16 and later releases, if there are no data counts available for a service

flow, the LOSDV for service idle timeout will not be created. The service-idle timeout will be started only when the next data packet arrives.

This behavior change is applicable to eG-CDRs and PGW-CDRs for all GTPP dictionaries except custom5 and custom40 dictionaries.

ASN.1 Definition for Fields in custom19 Dictionary

Below is a complete ASN.1 definition of eG-CDR fields down to the basic types described in ITU X.690. It is based on the ASN.1 definition in 3GPP TS 32.298, with imported types taken from 3GPP TS 29.002.

```
GGSN-Charging-DataTypes-REL7 DEFINITIONS IMPLICIT TAGS ::=
BEGIN
-- ASN.1 definitions of the Cisco GGSN Charging implementation
--
-- based on 3GPP TS 32.298 v7.4.0
--
-- for some fields, only the values relevant to GGSN charging
-- are shown (such as CallEventRecordType)
--
-- some types are imported from 29.002 and are shown below as well
-- with the definition copied from that standard (such as IMSI)


GPRSRecord ::= CHOICE
{
        egsnPDPRecord [70] EGSNPDPRecord
}

EGSNPDPRecord ::= SET
{
        recordType                              [0] CallEventRecordType,
        networkInitiation                  [1] NetworkInitiatedPDPContext OPTIONAL,
        servedIMSI                              [3] IMSI,
        ggsnAddress                             [4] EXPLICIT GSNAddress,
        chargingID                              [5] ChargingID,
        sgsnAddress                             [6] SEQUENCE OF GSNAddress,
        accessPointNameNI                  [7] AccessPointNameNI,
        pdpType                                    [8] PDPType,
        servedPDPAddress                   [9] EXPLICIT PDPAddress OPTIONAL,
        dynamicAddressFlag               [11] DynamicAddressFlag OPTIONAL,
        listOfTrafficVolumes           [12] SEQUENCE OF ChangeOfCharCondition,
        recordOpeningTime                  [13] TimeStamp,
        duration                                  [14] CallDuration,
        causeForRecClosing               [15] CauseForRecClosing,
        diagnostics                             [16] Diagnostics OPTIONAL,
        recordSequenceNumber           [17] INTEGER OPTIONAL,
        nodeID                                     [18] NodeID,
        localSequenceNumber              [20] LocalSequenceNumber,
        apnSelectionMode                   [21] APNSelectionMode,
        servedMSISDN                          [22] MSISDN,
        chargingCharacteristics    [23] ChargingCharacteristics,
        chChSelectionMode                  [24] ChChSelectionMode OPTIONAL,
        sgsnPLMNIdentifier               [27] PLMN-Id OPTIONAL,
        servedIMEISV                          [29] IMEI OPTIONAL,
        rATType                                    [30] RATType OPTIONAL,
        mSTimeZone                           [31] MSTimeZone OPTIONAL,
        userLocationInformation    [32] OCTET STRING OPTIONAL,
        listOfServiceData                [34] SEQUENCE OF ChangeOfServiceCondition OPTIONAL
}

-- ------------------------------------------------------------
```

```
-- Alphabetical listing of all field types above
-- ------------------------------------------------------------
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.
        --

AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
        -- This type is used to represent a number for addressing
        -- purposes. It is composed of
        -- a) one octet for nature of address, and numbering plan
        -- indicator.
        -- b) digits of an address encoded as TBCD-String.
        -- a) The first octet includes a one bit extension indicator, a
        -- 3 bits nature of address indicator and a 4 bits numbering
        -- plan indicator, encoded as follows:
        -- bit 8: 1 (no extension)
        -- bits 765: nature of address indicator
        -- 000 unknown
        -- 001 international number
        -- 010 national significant number
        -- 011 network specific number
        -- 100 subscriber number
        -- 101 reserved
        -- 110 abbreviated number
        -- 111 reserved for extension
        -- bits 4321: numbering plan indicator
        -- 0000 unknown
        -- 0001 ISDN/Telephony Numbering Plan (Rec ITU-T E.164)
        -- 0010 spare
        -- 0011 data numbering plan (ITU-T Rec X.121)
        -- 0100 telex numbering plan (ITU-T Rec F.69)
        -- 0101 spare
        -- 0110 land mobile numbering plan (ITU-T Rec E.212)
        -- 0111 spare
        -- 1000 national numbering plan
        -- 1001 private numbering plan
        -- 1111 reserved for extension
        -- all other values are reserved.
        -- b) The following octets representing digits of an address
        -- encoded as a TBCD-STRING.

APNSelectionMode::= ENUMERATED
{
        --
        -- See Information Elements TS 29.060
        --
        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.
        --

CallEventRecordType ::= INTEGER
```

```
{
        ggsnPDPRecord (19),
        egsnPDPRecord (70)
}

CauseForRecClosing ::= INTEGER
{
        --
        -- In GGSN the value sGSNChange should be used for partial record
        -- generation due to SGSN Address List Overflow
        --
        -- cause codes 0 to 15 are defined 'CauseForTerm' (cause for
        -- termination)
        --
        normalRelease                                   (0),
        abnormalRelease                                 (4),
        volumeLimit                                         (16),
        timeLimit                                             (17),
        sGSNChange                                            (18),
        maxChangeCond                                   (19),
        managementIntervention                (20),
        rATChange                                             (22),
        mSTimeZoneChange                                (23)
}

ChangeCondition ::= ENUMERATED
{
        --
        -- Failure Handling values used in eG-CDR only
        --
        qoSChange                                                                       (0),
        tariffTime                                                                      (1),
        recordClosure                                                                 (2),
        failureHandlingContinueOngoing                              (3),
        failureHandlingRetryandTerminateOngoing         (4),
        failureHandlingTerminateOngoing                           (5),
        --
        -- New values from 3GPP Rel 7.
        -- Supported in Release 8.1 in custom19 dictionary only
        --
        cGI-SAICHange                                                                 (6),
        rAIChange                                                                       (7)
}

ChangeOfCharCondition ::= SEQUENCE
{
        --
        -- Used in PDP context record only
        -- failureHandlingContinue field used in eGCDR only
        --
        qosRequested                                    [1] QoSInformation OPTIONAL,
        qosNegotiated                                 [2] QoSInformation OPTIONAL,
        dataVolumeGPRSUplink                [3] DataVolumeGPRS,
        dataVolumeGPRSDownlink            [4] DataVolumeGPRS,
        changeCondition                           [5] ChangeCondition,
        changeTime                                      [6] TimeStamp,
        failureHandlingContinue         [7] FailureHandlingContinue OPTIONAL,
        --
        -- New value from 3GPP Rel 7.
        -- Supported in Release 8.1 in custom19 dictionary only
        --
        userLocationInformation         [8] OCTET STRING OPTIONAL
}
```

```
ChangeOfServiceCondition ::= SEQUENCE
{
        --
        -- Used for Flow based Charging service data container
        --
        ratingGroup                                  [1]    RatingGroupId,
        chargingRuleBaseName                [2]    ChargingRuleBaseName,
        resultCode                                      [3]    ResultCode OPTIONAL,
        localSequenceNumber                 [4]    LocalSequenceNumber,
        timeOfFirstUsage                        [5]    TimeStamp,
        timeOfLastUsage                         [6]    TimeStamp,
        timeUsage                                    [7]    CallDuration,
        serviceConditionChange            [8]    ServiceConditionChange,
        qoSInformationNeg                     [9]    QoSInformation OPTIONAL,
        sgsn-Address                                 [10] EXPLICIT GSNAddress,
        sGSNPLMNIdentifier                  [11] PLMN-Id OPTIONAL,
        datavolumeFBCUplink                 [12] DataVolumeGPRS,
        datavolumeFBCDownlink             [13] DataVolumeGPRS,
        timeOfReport                                 [14] TimeStamp,
        rATType                                         [15] RATType OPTIONAL,
        failureHandlingContinue         [16] FailureHandlingContinue OPTIONAL,
        serviceIdentifier                    [17] ServiceIdentifier OPTIONAL,
        --
        -- New values from 3GPP Rel 7.
        -- Supported in Release 8.1 in custom19 dictionary only
        --
        userLocationInformation         [20] OCTET STRING OPTIONAL,
        timeQuotaMechanism                   [22] TimeQuotaMechanism OPTIONAL
}

ChargingCharacteristics ::= OCTET STRING (SIZE(2))
        --
        -- Bit 0-3: Profile Index
        -- Bit 4-15: For Behavior
        --

ChargingID ::= INTEGER (0..4294967295)
        --
        -- Generated in GGSN, part of PDP context, see TS 23.060
        -- 0..4294967295 is equivalent to 0..2**32-1
        --

ChargingRuleBaseName ::= IA5String (SIZE(1..63))
        --
        -- identifier for the group of charging rules
        -- see Charging-Rule-Base-Name AVP as defined in 3GPP TS 29.210
        --

ChChSelectionMode ::= ENUMERATED
{
        --
        -- values below show the additional, non-standard values
        -- requested by VFD2
        --
        sGSNSupplied                (0),     -- For GGSN only
        homeDefault                   (3),     -- For SGSN and GGSN
        roamingDefault             (4),     -- For SGSN and GGSN
        visitingDefault            (5)     -- For SGSN and GGSN
}

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

```
Diagnostics ::= CHOICE
{
        -- Only the option gsm0408Cause is used for this field
        --
        gsm0408Cause [0] INTEGER
}

DynamicAddressFlag ::= BOOLEAN

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

GSNAddress ::= IPAddress

IMSI ::= TBCDSTRING (SIZE (3..8))
        --
        -- from 29.002
        -- digits of MCC, MNC, MSIN are concatenated in this order.
        --

IMEI ::= TBCDSTRING (SIZE (8))
        --
        -- Refers to International Mobile Station Equipment Identity
        -- and Software Version Number (SVN) defined in TS 3GPP TS 23.003
        -- If the SVN is not present the last octet shall contain the
        -- digit 0 and a filler.
        -- If present the SVN shall be included in the last octet.
        --

IPAddress ::= CHOICE
{
        iPBinaryAddress IPBinaryAddress
}

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

ISDN-AddressString ::= AddressString
                                              (SIZE (1..maxISDN-AddressLength))
        --
        -- This type is used to represent ISDN numbers.
        --

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

MSISDN ::= ISDN-AddressString
        --
        -- see definitions below for ISDN-AddressString and AddressString
        -- copied from 29.002
        --

maxISDN-AddressLength INTEGER ::= 9
```

```
maxAddressLength INTEGER ::= 20

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

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

NodeID ::= IA5String (SIZE(5..20))

PDPAddress ::= CHOICE
{
        iPAddress [0] EXPLICIT IPAddress
}

PDPType ::= OCTET STRING (SIZE(2))
        --
        -- OCTET 1: PDP Type Organization
        -- OCTET 2: PDP Type Number
        -- See TS 29.060
        --

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..15))
        --
        -- This octet string
        -- is a 1:1 copy of the contents (i.e. starting with octet 4) of
        -- the "Quality of service Profile" information element specified
        -- in 3GPP TS 29.060.
        --

RatingGroupId ::= INTEGER
        --
        -- IP service flow identity (DCCA), range of 4 byte
        -- (0...4294967259)
        -- see Rating-Group AVP as used in 3GPP TS 32.299
        --

RATType ::= INTEGER (0..255)
        --
        -- This integer is 1:1 copy of the RAT type value as defined in
        -- 3GPP TS 29.060
        --

ResultCode ::= INTEGER
        --
        -- charging protocol return value, range of 4 byte
        -- (0...4294967259)
        -- see Result-Code AVP as used in 3GPP 29.210
        --

ServiceConditionChange ::= BIT STRING
```

```
{
        -- Bits 0-5 are cause values for Gn update/release and TTS
        -- Bits 6-9 are cause values for service stop
        -- Bits 10-14 are cause values for service reauthorization
        --                        request
        -- Bits 15-17 are cause values for quota return
        -- Bits 18-20: are cause values for Failure Handling Procedure
        -- Bits 21-32: are unused in custom 6 and will always be zero
        -- some of the values are non-exclusive
        -- serviceIdledOut    bit 6 is equivalent to service release by QHT
        qoSChange                                              (0),
        sGSNChange                                             (1),
        sGSNPLMNIDChange                                    (2),
        tariffTimeSwitch                                    (3),
        pDPContextRelease                                  (4),
        rATChange                                              (5),
        serviceIdledOut                                     (6),
        qCTExpiry                                              (7),
        timeThresholdReached                             (10),
        volumeThresholdReached                          (11),
        timeExhausted                                        (13),
        volumeExhausted                                    (14),
        timeout                                                   (15),
        continueOngoingSession                          (18),
        retryAndTerminateOngoingSession (19),
        terminateOngoingSession                        (20),
        --
        -- New values from 3GPP Rel 7.
        -- Supported in custom19 dictionary only
        --
        recordClosure                                       (24),               -- eG-CDR
closure
        timeLimit                                              (25),               --
intermediate recording
        volumeLimit                                          (26)               --
intermediate recording
}

ServiceIdentifier ::= INTEGER (0..4294967295)
        --
        -- The service identifier is used to identify the service or the
        -- service component the service data flow relates to. See
        -- Service-Identifier AVP as defined in 3GPP TS 29.210
        --
TimeQuotaMechanism              ::= SEQUENCE
{
        --
        -- New field from 3GPP Rel 7.
        -- Supported in Release 8.1 in custom19 dictionary only
        --
                timeQuotaType
         [1] TimeQuotaType,
                baseTimeInterval
      [2] INTEGER
}

TimeQuotaType               ::= ENUMERATED
{
        --
        -- New field from 3GPP Rel 7.
        -- Supported in Release 8.1 in custom19 dictionary only
        --
                dtp                                                    (0),
                ctp                                                    (1)
```

```
}

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
        --
TBCDSTRING ::= OCTET STRING

END
```

standard Dictionary

eG-CDR fields for TS 32.215 v 4.6.0 (R4).

Field	Category	Description
Record Type	M	GPRS GGSN PDP context record.
Network initiated PDP context	C	Present if this is a network-initiated PDP context.
Served IMSI	M	IMSI of the served party (if Anonymous Access Indicator is FALS not supplied).
Served MSISDN	O	The primary MSISDN of the subscriber.
GGSN Address	M	The IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in differe records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	M	The logical name of the connected access point to the external pac data network (network identifier part of APN).
APN Selection Mode	O	An index indicating how the APN was selected.
PDP Type	M	PDP type, i.e. IP, PPP, or IHOSS:OSP.
Served PDP Address	M	PDP address, i.e. IPv4 or IPv6 address.
Dynamic Address Flag	C	Indicates whether served PDP address is dynamic, which is alloca during PDP context activation.

Field	Category	Description
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, e stamped. Charging conditions are used to categorize traffic vo such as per tariff period. Initial and subsequently changed QoS corresponding data values are listed. In GSM, data volumes are in octets above the GTP layer and a separated for uplink and downlink traffic. In 3G, data volumes are in octets above the GTP-U layer and a separated for uplink and downlink traffic. **Important** Only one LOTV container per eG-CDR.
Record Opening Time	M	Time stamp when this record was opened.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Record Sequence Number	C	Partial record sequence number, only present in case of partial
Node ID	O	Name of the recording entity.
Local Record Sequence Number	O	Consecutive record number created by this node. The number is a sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's described in TS 32.015 sub clause 6.1.6.5.