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

- CDR Fields Supported in G-CDRs, on page 2
- CDR Fields Supported in eG-CDRs, on page 55

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	Format	Size (in bytes)	ASN1 Code
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)	Integer	1	80
Network initiated PDP context	1	O	This field indicates that the PDP context was network initiated. The field is missing in case of mobile activated PDP context. Set to TRUE (0xFF) if PDP context was initiated from network side. This field is not yet supported by the SGSN.	Boolean	1	81

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Served IMSI	3	M	This field contains the International Mobile Subscriber Identity (IMSI) of the served party. The IMSI is formatted in accordance with 3GPP TS 23.003.	BCD encoded octet string	3-8	83
GGSN Address	4	M	This field provides the current serving GGSN IP Address for the Control Plane, which is equivalent to the configured ggsn-service address on the GGSN. The standard 3GPP 32.298 offers a choice for the encoding of the address to be either in binary or text format. The GGSN encodes the address in binary format and includes the Octet String.	Choice	6	a4

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
GGSN IPv4 Binary Address	4-0	M	The octet string included in the field described above includes the Gn address of the GGSN service in binary coding.	Octet string	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Charging ID	5	M		Integer	1-5	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			This field is a charging identifier, which can be used together with the GGSN address to identify all records produced in the GGSN involved in a single PDP context. The Charging ID is generated by the GGSN at PDP context activation and is transferred to the context requesting SGSN. At an inter-SGSN routing area update the charging ID is transferred to the new SGSN as part of each active PDP context. The possible values for the charging ID, which are defined in TS 29.060 are 1-4,294,967,295 and those values are encapsulated in following scheme in the CDR-field: 1 - 127			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			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 8505008000000-850500FFFFFFF			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
SGSN Address	6	M	This field contains one or several SGSN IP addresses. For an S-CDR, the SGSN address contains the control plane or user plane address of the current SGSN serving the PDP context. For a G-CDR and eG-CDR, in addition to the current SGSN being used, the field may contain additional SGSN addresses where the PDP context was located before and where it has moved away using the Inter-SGSN Routing Area Update Procedure. The maximum number of addresses in the list is 5.	Sequence	6-30	a6

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
SGSN IPv4 Binary Address	6-0	M	The octet string included in the field described above includes either control plane or user plane address of the SGSN in binary coding.	Octet String	4	80
Access Point Name Network Identifier	7	M	This field contains the Network Identifier part of the Access Point Name (APN). It is provided by the SGSN in the Create PDP Context Request message. For GGSN generated records, in case of a configured virtual APN, the virtual APN is included instead, unless this is overridden by the option **gcdr apn-name-to-be-included { gn | virtual }**	IA5string	1-63	87

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
PDP Type	8	M	This field defines the PDP type, e.g. IP or PPP, as received in the PDP context request from the SGSN. Supported values: • IP = f121 • PPP = f001	Octet string	2	88
Served PDP Address	9	O	This field contains the PDP address of the served IMSI for which the standard 3GPP TS 32.298 allows a choice of either IPAddress or ETSIAddress.	Choice	8	a9
PDP IP Address	9-0	M	This field contains the IP address for the PDP context.	Choice	6	a0
PDP IPv4 Binary Address	9-0-0	M	The octet string included in the field described above includes the IPv4 address assigned to the subscriber by the GGSN in binary coding.	Octet String	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Dynamic Address Flag	11	O	This field indicates that the PDP address has been dynamically allocated for that particular PDP context. In this case, the value is set to TRUE and encoded as "FF". This field is missing if the address allocation method was "static", i.e. part of PDP context subscription.	Boolean	1	8b
List of Traffic Volumes	12	M	This list includes one or more Traffic Volume containers related to a "Change of Charging Condition" as described in the next field. The maximum number of containers is configurable.	Sequence	Variable length	ac

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
ChangeOfChar Condition	12-0	M	Each traffic volume container contains details related to a charging condition as described in the following subsections. A new container is usually created for a QoS change and for tariff changes.	Sequence	Variable length	30
QoS Requested	12-0-1	O	This field contains the QoS desired by the MS at PDP context activation.	Octet String	4-15	81
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, in later containers the presence depends upon what was changed.	Octet String	4-15	82

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
GPRS Uplink data volume	12-0-3	M	This field includes the number of octets transmitted during the use of the packet data services in the uplink direction. The amount of data counted in the GGSN is the payload of the GTP-U protocol at the Gn interface. The data counted already includes the IP PDP bearer protocols i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	83

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
GPRS Downlink data volume	12-0-4	M	This field includes the number of octets transmitted during the use of the packet data services in the downlink direction. The amount of data counted in the GGSN is the payload of the GTP-U protocol at the Gn interface. The data counted already includes the IP PDP bearer protocols i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	84

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Change Condition	12-0-5	M		Enumerated (Integer)	1	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			This field defines the reason for closing the container such as tariff time change, QoS change or closing of the CDR. Supported values: • qoSChange: 0 • tariffTime: 1 • recordClosure: 2 • failureHandlingContinueOngoing: 3 • failureHandlingRetryAndTerminateOngoing: 4 • failureHandlingTerminateOngoing: 5 FailureHandling is a standard AVP element in DCCA. • Terminate: The online session is finished. The associated PDP Context is released (ongoing sessions) or not			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			established (new sessions). Failover for ongoing sessions is not supported. Failover for new sessions is always supported. • Partial Record: The online session is finished. The associated PDP Context is released (ongoing sessions) or not established (new sessions). Failover for ongoing sessions is supported. Failover for new sessions is always supported.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			• Continue: The online session is finished. The associated PDP Context is established (new sessions) or not released (ongoing sessions). Failover for ongoing sessions is supported. Failover for new sessions is always supported.			
Change time	12-0-6	M	This field is a time stamp, which defines the moment when the volume container is closed or the CDR is closed.	BCD encoded octet string	9	86

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Failurehandling Continue	12-0-7	O	Failure handling continue element is present if failure handling procedure is executed by GGSN	Boolean	1	87
Record Opening Time	13	M	This field contains the time stamp when PDP context is activated in GGSN or when a subsequent record is opened after a partial record. The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off) this is translated into the timestamp which only shows the full seconds.	BCD encoded octet string	9	8d

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Duration	14	M	This field contains the relevant duration in seconds for PDP contexts with range of 0..4294967295 (2^32-1). It is the duration from Record Opening Time to the Change Time. This value is converted from the internal representation in milliseconds to an integer value representing only seconds. The mechanism for this conversion (ceiling, floor, round-off) can be configured. It is also possible to configure to use milliseconds in this field instead of seconds.	Integer	1-5	8e

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Cause for Record Closing	15	M	This field contains a reason for the closure of the CDR. Supported values: • normalRelease: 0 • abnormalRelease: 4 • volumeLimit: 16 • timeLimit: 17 • sGSNChange: 18 • maxChangeCond: 19 • managementIntervention: 20 • rATChange: 22 • mSTimeZoneChange: 23	Integer	1	8f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Diagnostics	16	O	This field is included in the CDR when the PDP context is released and when the option **gtpp attribute diagnostics** is configured. Only the choice of **gsm0408Value** is used. This field is supported for G-CDRs only (not eG-CDRs).	Choice	3	b0

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
gsm0408Cause	16-0	M		Integer	1	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			This cause is used in the Diagnostics field and contains one of the following values: • 36: If the SGSN sends Delete PDP context request • 38: If GGSN sends delete PDP context request due to GTP-C/U echo timeout with SGSN • 40: If the GGSN sends delete PDP context request due to receiving a RADIUS Disconnect request message. • 26: If the GGSN sends delete PDP context request			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			for any other reason			
Record Sequence Number	17	O	A running sequence number with range 1 through 4294967295 used to link partial records generated by the GGSN for a specific PDP context (characterized with the same Charging ID and GGSN address pair). This field is not present if the first record is also the final record.	Integer	1-5	91

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Node ID	18	M		IA5string	5-20	92

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			This field contains an identifier string for the node that had generated the CDR. On the ASR 5500 GGSN, this NodeID field is a printable string of the ndddSTRING format: n: The first digit is the Sessmgr restart counter having a value between 0 and 7. ddd: The number of the sessmgr instance generating the CDR STRING: This is a configured Node-ID-Suffix having any string between 1 to16 characters, defined using the **gtpp attribute node-id** command. If this node-id-suffix is not configured, the GGSN			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			uses the GTPP context name as the Node-id-suffix (truncated to 16 characters). For G-CDRs, this field is only included when the option **gtpp attribute local-record-sequence-number** is configured.			
Local Record Sequence Number	20	M	For each Node ID, this number with range 1..4294967295 is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR. For G-CDRs, this field is only included when the option **gtpp attribute local-record-sequence-number** is configured.	Integer	1-5	94

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
APN Selection Mode	21	M	An index indicating how the APN was selected. The following APN selection mode 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	Enumerated (Integer)	1	95
Served MSISDN	22	M	The field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is transparently copied from the Create PDP Context Request message and is TBCD encoded.	BCD encoded octet string	1-9	96

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Charging Characteristics	23	M	Lists the charging characteristics applied to the PDP context. The GGSN can accept charging characteristics from the SGSN or AAA or use its own configured value. GGSN configured charging characteristics are specified as part of the GGSN Service and are applied for G-CDRs to subscriber PDP contexts through APN templates.	Hex value octet string	2	97

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Charging Characteristics Selection Mode	24	O		Enumerated (Integer)	1	98

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			The charging characteristic type that the GGSN applied to the CDR. The following 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 characteristics supplied by the			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			SGSN. • Home default: GGSN configured charging characteristics for home subscribers are used. Home subscribers are those that belong to the same PLMN as the one on which the GGSN is located. • Visiting default: GGSN configured charging characteristics for visiting subscribers are used. Visiting subscribers are those that belong to a different PLMN than the one on which the GGSN is located.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
			• Roaming default: GGSN configured charging characteristics for roaming subscribers are used. Roaming subscribers are those that are serviced by an SGSN belonging to a different PLMN than the one on which the GGSN is located.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
SGSN PLMN Identifier	27	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a "home" SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead.	Octet string	3	9b
Served IMEISV	29	O	This field contains software version in addition to the IMEI defined before. This software version is encoded in the last byte replacing the spare digit and filler. The structure of the IMEISV is defined in TS 23.003.	BCD encoded octet string	8	9d

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
RAT Type	30	O	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station. This field is present in the CDR if provided by SGSN. RAT Type values: • Reserved: 0 • UTRAN: 1 • GERAN: 2 • WLAN: 3 • Spare: 4-255	Integer	1	9e

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
MS Time Zone	31	O	This field contains the "Time Zone" IE that the SGSN may provide to the GGSN during the PDP context activation/modification procedure. It is transparently copied from the message into the CDR. The Time Zone is used to indicate the offset between universal time and local time in steps of 15 minutes of where the MS current resides. It is coded as specified in 3GPP TS 29.060 (which refers to 24.008 for the time zone, which again refers to the TP Service Centre Time Stamp field in 23.040).	Octet string	2	9f1f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
User Location Information	32	O	The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure. Transparently copied from the PDP context request.	Octet string	8	9f20
List of Service Data Volumes	34	O	A list of the changes that occurred in charging conditions for all service data flows for the PDP context.	Sequence	Variable length	bf22
Service Data Volume Block	34-0	O		Sequence	Variable length	30
Rating group	34-0-1	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. This is also known as content-id.	Integer	1-5	81

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Charging Rulebase name	34-0-2	M	The name of the Rulebase used for charging. This is the group name of charging rules.	IA5string	1-63	82
Result Code	34-0-3	O	The Diameter server sends result-codes for each of the content-id for which quota is requested. The GGSN use this to populate the eG-CDR bucket. This is a Mandatory AVP that comes in response for every quota request for a category.	Integer	1-5	83
Local Sequence number	34-0-4	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service date container generated for that service within the lifetime of this PDP session.	Integer	1-5	84

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Time of first usage	34-0-5	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.	BCD encoded octet string	9	85
Time of last usage	34-0-6	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.	BCD encoded octet string	9	86
Usage time	34-0-7	M	The difference between "time of first usage" and "time of last usage".	Integer	1-5	87
Service condition change	34-0-8	M	The reason for closing the service data container for triggers like SGSN change, QoS change, Rat change, time and volume triggers, etc.	Bit string	5	88

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
QoS negotiated	34-0-9	O	The negotiated QoS applied for the service data flow.	Octet string	4-15	89
sgsn-Address	34-0-10	M	The valid SGSN IP address during the service data recording interval.	Choice	6	aa
SGSN-IPv4-Binary Address	34-0-10-0	M	The octet string included in the field "sgsn-Address" includes either control plane or user plane address of the SGSN in binary coding.	Octet string	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
SGSN PLMN identifier	34-0-11	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a "home" SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead.	Octet string	3	8b

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
FBC Data volume uplink	34-0-12	M	The number of octets transmitted during the use of the packet data services in the uplink direction. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	8c

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
FBC data volume downlink	34-0-13	M	The number of octets transmitted during the use of the packet data services in the downlink direction. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	8d
Time of report	34-0-14	M	A time stamp defining the moment when the service data container is closed.	BCD encoded octet string	9	8e
RAT Type	34-0-15	O	The valid radio access technology type during the service data recording interval.	Integer	1	8f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Failurehandling Continue	34-0-16	O	A Boolean expression included if the failure handling condition has been executed. This can be either configured on the GGSN using **failure-handling** CLI inside "credit-control" mode or can be received from the server in the "Credit-Control-Failure-Handling" AVP. Whatever is received from the server will have higher precedence. There is no negotiation with the Diameter server in this regard and the GGSN will use whatever the server provides.	Boolean	1	90

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 Code
Service Identifier	34-0-17	O	The service identifier may designate an end user service, a part of an end user service, or an arbitrarily formed group thereof. This field is only included if reporting is per combination of the rating group and service id	Integer	1-5	91

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.
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 different records created by GSNs.
SGSN Address	M	List of SGSN addresses used during this record.

Field	Category	Description
Access Point Name Network Identifier	OM	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP 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 except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	OC	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	OM	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise 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 record 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 records.
Node ID	OM	Name of the recording entity.

Field	Category	Description
Record Extensions	OC	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	OM	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	OM	An index indicating how the APN was selected.
Served MSISDN	OM	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	OM	Holds information about how Charging Characteristics were selected.
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	Format	Size (in bytes)	ASN1 code
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)	Integer	1	80
Network initiated PDP context	1	O	This field indicates that the PDP context was network initiated. The field is missing in case of mobile activated PDP context. Set to TRUE (0xFF) if PDP context was initiated from network side. This field is not yet supported by the SGSN.	Boolean	1	81

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Served IMSI	3	M	This field contains the International Mobile Subscriber Identity (IMSI) of the served party. The IMSI is formatted in accordance with 3GPP TS 23.003.	BCD encoded octet string	3-8	83
GGSN Address	4	M	This field provides the current serving GGSN IP Address for the Control Plane, which is equivalent to the configured ggsn-service address on the GGSN. The standard 3GPP 32.298 offers a choice for the encoding of the address to be either in binary or text format. The GGSN encodes the address in binary format and includes the Octet String shown in 0.	Choice	6	a4
GGSN IPv4 Binary Address	4-0	M		Octet string	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging ID	5	M		Integer	1-5	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This field is a charging identifier, which can be used together with the GGSN address to identify all records produced in the GGSN involved in a single PDP context. The Charging ID is generated by the GGSN at PDP context activation and is transferred to the context requesting SGSN. At an inter-SGSN routing area update the charging ID is transferred to the new SGSN as part of each active PDP context. The possible values for the charging ID, which are defined in TS 29.060 are 1-4,294,967,295 and those values are encapsulated in following scheme in the CDR-field: 1 - 127			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			850101-85017F 128 – 32,767 85020080 -85027FFF 32,768 – 8,388,607 8503008000 -85037FFFFF 8,388,608 – 2,147,483,647 850400800000 -85047FFFFF 2,147,483,648 – 4,294,967,295 85050080000000 -85050FFFFFFF			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN Address	6	M	This field contains one or several SGSN IP addresses. For an S-CDR, the SGSN address contains the control plane or user plane address of the current SGSN serving the PDP context. For a G-CDR and eG-CDR, in addition to the current SGSN being used, the field may contain additional SGSN addresses where the PDP context was located before and where it has moved away using the Inter-SGSN Routing Area Update Procedure. The maximum number of addresses in the list is 5.	Sequence	6-30	a6

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN IPv4 Binary Address	6-0	M	The octet string included in the field described above includes either control plane or user plane address of the SGSN in binary coding.	Octet String	4	80
Access Point Name Network Identifier	7	M	This field contains the Network Identifier part of the Access Point Name (APN). It is provided by the SGSN in the Create PDP Context Request message. For GGSN generated records, in case of a configured virtual APN, the virtual APN is included instead, unless this is overridden by the option **gcdr apn-name -to-be-included { gn | virtual }**	IA5string	1-63	87

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
PDP Type	8	M	This field defines the PDP type, e.g. IP or PPP, as received in the PDP context request from the SGSN. Supported values: • IP = f121 • PPP = f001	Octet string	2	88
Served PDP Address	9	O	This field contains the PDP address of the served IMSI for which the standard 3GPP TS 32.298 allows a choice of either IPAddress or ETSIAddress.	Choice	8	a9
PDP IP Address	9-0	M	This field contains the IP address for the PDP context.	Choice	6	a0
PDP IPv4 Binary Address	9-0-0	M	The octet string included in the field described above includes the IPv4 address assigned to the subscriber by the GGSN in binary coding.	Octet String	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Dynamic Address Flag	11	O	This field indicates that the PDP address has been dynamically allocated for that particular PDP context. In this case, the value is set to TRUE and encoded as "FF". This field is missing if the address allocation method was "static", i.e. part of PDP context subscription.	Boolean	1	8b
List of Traffic Volumes	12	M	This list includes one or more Traffic Volume containers related to a "Change of Charging Condition" as described in the next field. The maximum number of containers is configurable.	Sequence		ac

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
ChangeOfChar Condition	12-0	M	Each traffic volume container contains details related to a charging condition as described in the following subsections. A new container is usually created for a QoS change and for tariff changes.	Sequence		30
QoS Requested	12-0-1	O	This field contains the QoS desired by the MS at PDP context activation.	Octet String	4-15	81
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, in later containers the presence depends upon what was changed.	Octet String	4-15	82

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
GPRS Uplink data volume	12-0-3	M	This field includes the number of octets transmitted during the use of the packet data services in the uplink direction. The amount of data counted in the GGSN is the payload of the GTP-U protocol at the Gn interface. The data counted already includes the IP PDP bearer protocols i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	83

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
GPRS Downlink data volume	12-0-4	M	This field includes the number of octets transmitted during the use of the packet data services in the downlink direction. The amount of data counted in the GGSN is the payload of the GTP-U protocol at the Gn interface. The data counted already includes the IP PDP bearer protocols i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	84

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Change Condition	12-0-5	M		Enumerated (Integer)	1	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This field defines the reason for closing the container such as tariff time change, QoS change or closing of the CDR. Supported values: • qoSChange: 0 • tariffTime: 1 • recordClosure: 2 • failureHandlingContinueOngoing 3 • failureHandlingRetryAndTerminateOngoing 4 • failureHandlingTerminateOngoing 5 FailureHandling is a standard AVP element in DCCA. • Terminate: The online session is finished. The associated PDP Context is released (ongoing sessions) or not established			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			(new sessions). Failover for ongoing sessions is not supported. Failover for new sessions is always supported. • Reached Time Limit: The online session is finished. The associated PDP Context is released (ongoing sessions) or not established (new sessions). Failover for ongoing sessions is supported. Failover for new sessions is always supported.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			• Continue: The online session is finished. The associated PDP Context is established (new sessions) or not released (ongoing sessions). Failover for ongoing sessions is supported. Failover for new sessions is always supported.			
Change time	12-0-6	M	This field is a time stamp, which defines the moment when the volume container is closed or the CDR is closed.	BCD encoded octet string	9	86

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Failurehandling Continue	12-0-7	O	Failure handling continue element is present if failure handling procedure is executed by GGSN	Boolean	1	87
Record Opening Time	13	M	This field contains the time stamp when PDP context is activated in GGSN or when a subsequent record is opened after a partial record. The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off) this is translated into the timestamp which only shows the full seconds.	BCD encoded octet string	9	8d

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Duration	14	M	This field contains the relevant duration in seconds for PDP contexts with range of 0..4294967295 (2^32-1). It is the duration from Record Opening Time to the Change Time. This value is converted from the internal representation in milliseconds to an integer value representing only seconds. The mechanism for this conversion (ceiling, floor, round-off) can be configured. It is also possible to configure to use milliseconds in this field instead of seconds.	Integer	1-5	8e

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Cause for Record Closing	15	M	This field contains a reason for the closure of the CDR. Supported values: • normalRelease: 0 • abnormalRelease: 4 • volumeLimit: 16 • timeLimit: 17 • sGSNChange: 18 • maChangeCond: 19 • managementIntervention: 20 • rATChange: 22 • mSTimeZoneChange: 23	Integer	1	8f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Diagnostics	16	O	This field is included in the CDR when the PDP context is released and when the option **gtpp attribute diagnostics** is configured. Only the choice of **gsm0408Value** is used. This field is supported for G-CDRs only (not eG-CDRs).	Choice	3	b0

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
gsm0408Cause	16-0	M		Integer	1	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This cause is used in the Diagnostics field and contains one of the following values: • 36: If the SGSN sends Delete PDP context request • 38: If GGSN sends delete PDP context request due to GTP-C/U echo timeout with SGSN • 40: If the GGSN sends delete PDP context request due to receiving a RADIUS Disconnect request message. • 26: If the GGSN sends delete PDP context request			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			for any other reason			
Record Sequence Number	17	O	A running sequence number with range 1 through 4294967295 used to link partial records generated by the GGSN for a specific PDP context (characterized with the same Charging ID and GGSN address pair). This field is not present if the first record is also the final record.	Integer	1-5	91

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Node ID	18	M		IA5string	5-20	92

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This field contains an identifier string for the node that had generated the CDR. On the ASR 5500 GGSN, this NodeID field is a printable string of the ndddSTRING format: n: The first digit is the Sessmgr restart counter having a value between 0 and 7. ddd: The number of the sessmgr instance generating the CDR STRING: This is a configured Node-ID-Suffix having any string between 1 to16 characters, defined using the **gtpp attribute node-id** command. If this node-id-suffix is not configured, the GGSN			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			uses the GTPP context name as the Node-id-suffix (truncated to 16 characters). For G-CDRs, this field is only included when the option **gtpp attribute local-record -sequence-number** is configured.			
Local Record Sequence Number	20	M	For each Node ID, this number with range 1..4294967295 is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR. For G-CDRs, this field is only included when the option **gtpp attribute local-record -sequence-number** is configured.	Integer	1-5	94

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
APN Selection Mode	21	M	An index indicating how the APN was selected. The following APN selection mode 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	Enumerated (Integer)	1	95
Served MSISDN	22	M	The field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is transparently copied from the Create PDP Context Request message and is TBCD encoded.	BCD encoded octet string	1-9	96

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging Characteristics	23	M	Lists the charging characteristics applied to the PDP context. The GGSN can accept charging characteristics from the SGSN or AAA or use its own configured value. GGSN configured charging characteristics are specified as part of the GGSN Service and are applied for G-CDRs to subscriber PDP contexts through APN templates.	Hex value octet string	2	97

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging Characteristics Selection Mode	24	O		Enumerated (Integer)	1	98

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			The charging characteristic type that the GGSN applied to the CDR. The following 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 characteristics supplied by the			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			SGSN. • Home default: GGSN configured charging characteristics for home subscribers are used. Home subscribers are those that belong to the same PLMN as the one on which the GGSN is located. • Visiting default: GGSN configured charging characteristics for visiting subscribers are used. Visiting subscribers are those that belong to a different PLMN than the one on which the GGSN is located.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			• Roaming default: GGSN configured charging characteristics for roaming subscribers are used. Roaming subscribers are those that are serviced by an SGSN belonging to a different PLMN than the one on which the GGSN is located.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN PLMN Identifier	27	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a "home" SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead.	Octet string	3	9b
Served IMEISV	29	O	This field contains software version in addition to the IMEI defined before. This software version is encoded in the last byte replacing the spare digit and filler. The structure of the IMEISV is defined in TS 23.003.	BCD encoded octet string	8	9d

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
RAT Type	30	O	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station. The field is present in the CDR if provided by SGSN. RAT Type values: • Reserved: 0 • UTRAN: 1 • GERAN: 2 • WLAN: 3 • Spare: 4-255	Integer	1	9e

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
MS Time Zone	31	O	This field contains the "Time Zone" IE that the SGSN may provide to the GGSN during the PDP context activation/modification procedure. It is transparently copied from the message into the CDR. The Time Zone is used to indicate the offset between universal time and local time in steps of 15 minutes of where the MS current resides. It is coded as specified in 3GPP TS 29.060 (which refers to 24.008 for the time zone, which again refers to the TP Service Centre Time Stamp field in 23.040)	Octet string	2	9f1f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
User Location Information	32	O	The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure. Transparently copied from the PDP context request.	Octet string	8	9f20
List of Service Data Volumes	34	O	A list of the changes that occurred in charging conditions for all service data flows for the PDP context	Sequence		bf22
ChangeOfService Condition	34-0	O		Sequence		30
Rating group	34-0-1	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. Also known as content-id.	Integer	1-5	81
Charging Rulebase name	34-0-2	M	The name of the Rulebase used for charging. This is the group name of charging rules.	IA5string	1-63	82

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Result Code	34-0-3	O	The result code AVP. This contains the result code after the interconnection with the CRF.	Integer	1-5	83
Local Sequence number	34-0-4	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service date container generated for that service within the lifetime of this PDP session.	Integer	1-5	84
Time of first usage	34-0-5	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.	BCD encoded octet string	9	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Time of last usage	34-0-6	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.	BCD encoded octet string	9	86
Usage time	34-0-7	M	The difference between "time of first usage" and "time of last usage".	Integer	1-5	87
Service condition change	34-0-8	M	The reason for closing the service data container for triggers like SGSN change, QoS change, RAT change, time and volume triggers, etc.	Bit string	5	88

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
QoS negotiated	34-0-9	O		Octet string	4-15	89

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			The negotiated QoS applied for the service data flow. In 16.0 and earlier releases, if in the CDRs there are multiple LOSDVs with same content-id and different service-identifiers, then the QOS-Info Information Element (IE) is included only in the very first LOSDV and not in the subsequent LOSDVs unless its previous LOSDV is closed for QoS change. In 17.0 and later releases, this implementation has been modified to include QOS-Info in all LOSDVs having different combination of service-id and content-id. Thus if there			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			are multiple LOSDVs with same content-id but different service-id, 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 interval.	Choice	6	aa
SGSN-IPv4-Binary Address	34-0-10-0	M		Octet string	4	80
SGSN PLMN identifier	34-0-11	O	The valid SGSN PLMN ID during the service data recording interval.	Octet string	3	8b

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
FBC Data volume uplink	34-0-12	M	The number of octets transmitted during the use of the packet data services in the uplink direction. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	8c

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
FBC data volume downlink	34-0-13	M	The number of octets transmitted during the use of the packet data services in the downlink direction. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	8d
Time of report	34-0-14	M	A time stamp defining the moment when the service data container is closed.	BCD encoded octet string	9	8e
RAT Type	34-0-15	O	The valid RAT type during the service data recording interval.	Integer	1	8f
Failurehandling Continue	34-0-16	O	A Boolean expression included if the failure handling condition has been executed.	Boolean	1	90

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Service Identifier	34-0-17	O	The service identifier may designate an end user service, a part of an end user service or an arbitrarily formed group thereof.	Integer	1-5	91

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	Format	Size (in bytes)	ASN1 code
Record Type	0	M	The field identifies the type of the record: • [illegible] 18 (0x12) • [illegible] 19 (0x13) • [illegible] 70 (0x46)	Integer	1	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Network initiated PDP context	1	O	This field indicates that the PDP context was network initiated. The field is missing in case of mobile activated PDP context. Set to TRUE (0xFF) if PDP context was initiated from network side. This field is not yet supported by the SGSN.	Boolean	1	81
Served IMSI	3	M	This field contains the International Mobile Subscriber Identity (IMSI) of the served party. The IMSI is formatted in accordance with 3GPP TS 23.003.	BCD encoded octet string	3-8	83

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
GGSN Address	4	M	This field provides the current serving GGSN IP Address for the Control Plane, which is equivalent to the configured ggsn-service address on the GGSN. The standard 3GPP 32.298 offers a choice for the encoding of the address to be either in binary or text format. The GGSN encodes the address in binary format and includes the octet string.	Choice	6	a4
GGSN IPv4 Binary Address	4-0	M	The octet string included in the field described above includes the Gn address of the GGSN service in binary coding.	Octet string	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging ID	5	M		Integer	1-5	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This field is a charging identifier, which can be used together with the GGSN address to identify all records produced in the GGSN involved in a single PDP context. The Charging ID is generated by the GGSN at PDP context activation and is transferred to the context requesting SGSN. At an inter-SGSN routing area update the charging ID is transferred to the new SGSN as part of each active PDP context. The possible values for the charging ID, which are defined in TS 29.060 are 1-4,294,967,295 and those values are encapsulated in following scheme in the CDR-field: 1 - 127			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			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 8505008000000- 850500FFFFFFF			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN Address	6	M	This field contains one or several SGSN IP addresses. For an S-CDR, the SGSN address contains the control plane or user plane address of the current SGSN serving the PDP context. For a G-CDR and eG-CDR, in addition to the current SGSN being used, the field may contain additional SGSN addresses where the PDP context was located before and where it has moved away using the Inter-SGSN Routing Area Update Procedure. The maximum number of addresses in the list is 5.	Sequence	6-30	a6

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN IPv4 Binary Address	6-0	M	The octet string included in the field described above includes either control plane or user plane address of the SGSN in binary coding.	Octet String	4	80
Access Point Name Network Identifier	7	M	This field contains the Network Identifier part of the Access Point Name (APN). It is provided by the SGSN in the Create PDP Context Request message. For GGSN generated records, in case of a configured virtual APN, the virtual APN is included instead, unless this is overridden by the option **gcdr ~~apn-name-to-be~~ -included { gn | virtual }**	IA5string	1-63	87

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
PDP Type	8	M	This field defines the PDP type, e.g. IP or PPP, as received in the PDP context request from the SGSN. Supported values: • IP = f121 • PPP = f001	Octet string	2	88
Served PDP Address	9	O	This field contains the PDP address of the served IMSI for which the standard 3GPP TS 32.298 allows a choice of either IPAddress or ETSIAddress.	Choice	8	a9
PDP IP Address	9-0	M	This field contains the IP address for the PDP context.	Choice	6	a0
PDP IPv4 Binary Address	9-0-0	M	The octet string included in the field described above includes the IPv4 address assigned to the subscriber by the GGSN in binary coding.	Octet String	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Dynamic Address Flag	11	O	This field indicates that the PDP address has been dynamically allocated for that particular PDP context. In this case, the value is set to TRUE and encoded as "FF". This field is missing if the address allocation method was "static", i.e. part of PDP context subscription.	Boolean	1	8b
List of Traffic Volumes	12	M	This list includes one or more Traffic Volume containers related to a "Change of Charging Condition" as described in the next field. The maximum number of containers is configurable.	Sequence	Variable length	ac

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
ChangeOfCharCondition	12-0	M	Each traffic volume container contains details related to a charging condition as described in the following subsections. A new container is usually created for a QoS change and for tariff changes.	Sequence	Variable length	30
QoS Requested	12-0-1	O	This field contains the QoS desired by the MS at PDP context activation.	Octet String	4-15	81
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, in later containers the presence depends upon what was changed.	Octet String	4-15	82

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
GPRS Uplink data volume	12-0-3	M	This field includes the number of octets transmitted during the use of the packet data services in the uplink direction. The amount of data counted in the GGSN is the payload of the GTP-U protocol at the Gn interface. The data counted already includes the IP PDP bearer protocols i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	83

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
GPRS Downlink data volume	12-0-4	M	This field includes the number of octets transmitted during the use of the packet data services in the downlink direction. The amount of data counted in the GGSN is the payload of the GTP-U protocol at the Gn interface. The data counted already includes the IP PDP bearer protocols i.e. IP or PPP. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	84

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Change Condition	12-0-5	M		Enumerated (Integer)	1	85

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This field defines the reason for closing the container such as tariff time change, QoS change or closing of the CDR. Supported values: • qoSChange: 0 • tariffTime: 1 • recordClosure: 2 • failureHandlingContinueOngoing: 3 • failureHandlingRetryAndTerminateOngoing: 4 • failureHandlingTerminateOngoing: 5 FailureHandling is a standard AVP element in DCCA. • Terminate: The online session is finished. The associated PDP Context is released (ongoing sessions) or not established			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			(new sessions). Failover for ongoing sessions is not supported. Failover for new sessions is always supported. • Ratv&Time, The online session is finished. The associated PDP Context is released (ongoing sessions) or not established (new sessions). Failover for ongoing sessions is supported. Failover for new sessions is always supported.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			• Continue: The online session is finished. The associated PDP Context is established (new sessions) or not released (ongoing sessions). Failover for ongoing sessions is supported. Failover for new sessions is always supported.			
Change time	12-0-6	M	This field is a time stamp, which defines the moment when the volume container is closed or the CDR is closed.	BCD encoded octet string	9	86

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Failurehandling Continue	12-0-7	O	Failure handling continue element is present if failure handling procedure is executed by GGSN	Boolean	1	87
User Location Information	12-0-8	O	The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure. Transparently copied from the GTP message.	Octet string	8	88

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Record Opening Time	13	M	This field contains the time stamp when PDP context is activated in GGSN or when a subsequent record is opened after a partial record. The timestamp is determined based on the internal timer which has an accuracy of 10ms. Depending on the configured mechanism (ceiling, floor, round-off) this is translated into the timestamp which only shows the full seconds.	BCD encoded octet string	9	8d

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Duration	14	M	This field contains the relevant duration in seconds for PDP contexts with range of 0..4294967295 (2^32-1). It is the duration from Record Opening Time to the Change Time. This value is converted from the internal representation in milliseconds to an integer value representing only seconds. The mechanism for this conversion (ceiling, floor, round-off) can be configured. It is also possible to configure to use milliseconds in this field instead of seconds.	Integer	1-5	8e

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Cause for Record Closing	15	M	This field contains a reason for the closure of the CDR. Supported values: • normalRelease: 0 • abnormalRelease: 4 • volumeLimit: 16 • timeLimit: 17 • sGSNChange: 18 • maxChangeCond: 19 • managementIntervention: 20 • rATChange: 22 • mSTimeZoneChange: 23	Integer	1	8f
Diagnostics	16	O	This field is included in the CDR when the PDP context is released and when the option **gtpp attribute diagnostics** is configured. Only the choice of **gsm0408Value** is used. This field is supported for G-CDRs only (not eG-CDRs).	Choice	3	b0

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
gsm0408Cause	16-0	M		Integer	1	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This cause is used in the Diagnostics field and contains one of the following values: • 36: If the SGSN sends Delete PDP context request • 38: If GGSN sends delete PDP context request due to GTP-C/U echo timeout with SGSN • 40: If the GGSN sends delete PDP context request due to receiving a RADIUS Disconnect request message. • 26: If the GGSN sends delete PDP context request			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			for any other reason			
Record Sequence Number	17	O	A running sequence number with range 1 through 4294967295 used to link partial records generated by the GGSN for a specific PDP context (characterized with the same Charging ID and GGSN address pair). This field is not present if the first record is also the final record.	Integer	1-5	91

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Node ID	18	M		IA5string	5-20	92

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			This field contains an identifier string for the node that had generated the CDR. On the ASR 5500 GGSN, this NodeID field is a printable string of the ndddSTRING format: n: The first digit is the Sessmgr restart counter having a value between 0 and 7. ddd: The number of the sessmgr instance generating the CDR STRING: This is a configured Node-ID-Suffix having any string between 1 to16 characters, defined using the **gtpp attribute node-id** command. If this node-id-suffix is not configured, the GGSN			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			uses the GTPP context name as the Node-id-suffix (truncated to 16 characters). For G-CDRs, this field is only included when the option **gtpp attribute local-record -sequence-number** is configured.			
Local Record Sequence Number	20	M	For each Node ID, this number with range 1..4294967295 is allocated sequentially for each CDR. This along with a Node ID uniquely identifies a CDR. For G-CDRs, this field is only included when the option **gtpp attribute local-record -sequence-number** is configured.	Integer	1-5	94

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
APN Selection Mode	21	M	An index indicating how the APN was selected. The following APN selection mode 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	Enumerated (Integer)	1	95
Served MSISDN	22	M	The field tracks the Mobile Station (MS) ISDN number (MSISDN) of the subscriber which is transparently copied from the Create PDP Context Request message and is TBCD encoded.	BCD encoded octet string	1-9	96

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging Characteristics	23	M	Lists the charging characteristics applied to the PDP context. The GGSN can accept charging characteristics from the SGSN or AAA or use its own configured value. GGSN configured charging characteristics are specified as part of the GGSN Service and are applied for G-CDRs to subscriber PDP contexts through APN templates.	Hex value octet string	2	97

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging Characteristics Selection Mode	24	O		Enumerated (Integer)	1	98

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			The charging characteristic type that the GGSN applied to the CDR. The following 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 characteristics supplied by the			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			SGSN. • Home default: GGSN configured charging characteristics for home subscribers are used. Home subscribers are those that belong to the same PLMN as the one on which the GGSN is located. • Visiting default: GGSN configured charging characteristics for visiting subscribers are used. Visiting subscribers are those that belong to a different PLMN than the one on which the GGSN is located.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			• Roaming default: GGSN configured charging characteristics for roaming subscribers are used. Roaming subscribers are those that are serviced by an SGSN belonging to a different PLMN than the one on which the GGSN is located.			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN PLMN Identifier	27	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a "home" SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead.	Octet string	3	9b
Served IMEISV	29	O	This field contains software version in addition to the IMEI defined before. This software version is encoded in the last byte replacing the spare digit and filler. The structure of the IMEISV is defined in TS 23.003.	BCD encoded octet string	8	9d

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
RAT Type	30	O	This field indicates the Radio Access Technology (RAT) type currently used by the Mobile Station. This field is present in the CDR if provided by SGSN. RAT Type values: • Reserved: 0 • UTRAN: 1 • GERAN: 2 • WLAN: 3 • Spare: 4-255	Integer	1	9e

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
MS Time Zone	31	O	This field contains the "Time Zone" IE that the SGSN may provide to the GGSN during the PDP context activation/modification procedure. It is transparently copied from the message into the CDR. The Time Zone is used to indicate the offset between universal time and local time in steps of 15 minutes of where the MS current resides. It is coded as specified in 3GPP TS 29.060 (which refers to 24.008 for the time zone, which again refers to the TP Service Centre Time Stamp field in 23.040).	Octet string	2	9f1f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
User Location Information	32	O	The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure. Transparently copied from the PDP context request.	Octet string	8	9f20
List of Service Data Volumes	34	O	A list of the changes that occurred in charging conditions for all service data flows for the PDP context.	Sequence	Variable length	bf22
Service Data Volume Block	34-0	O		Sequence	Variable length	30
Rating group	34-0-1	M	This is the service flow identity and has to be used for differentiated evaluation of user's traffic. This is also known as content-id.	Integer	1-5	81

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Charging Rulebase name	34-0-2	M	The name of the Rulebase used for charging. This is the group name of charging rules.	IA5string	1-63	82
Result Code	34-0-3	O	The Diameter server sends result-codes for each of the content-id for which quota is requested. The GGSN use this to populate the eG-CDR bucket. This is a Mandatory AVP that comes in response for every quota request for a category.	Integer	1-5	83
Local Sequence number	34-0-4	M	A per service data container sequence number. It starts from 1 for each service, increasing by 1 for each service date container generated for that service within the lifetime of this PDP session.	Integer	1-5	84

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Time of first usage	34-0-5	M	The time stamp for the first IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.	BCD encoded octet string	9	85
Time of last usage	34-0-6	M	The time stamp for the last IP packet to be transmitted for the service data flow referred to the current instance of Service Condition Change.	BCD encoded octet string	9	86
Usage time	34-0-7	M	The difference between "time of first usage" and "time of last usage".	Integer	1-5	87
Service condition change	34-0-8	M	The reason for closing the service data container for triggers like SGSN change, QoS change, Rat change, time and volume triggers, etc.	Bit string	5	88

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
QoS negotiated	34-0-9	O		Octet string	4-15	89

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			The negotiated QoS applied for the service data flow. In 16.0 and earlier releases, if in the CDRs there are multiple LOSDVs with same content-id and different service-identifiers, then the QOS-Info Information Element (IE) is included only in the very first LOSDV and not in the subsequent LOSDVs unless its previous LOSDV is closed for QoS change. In 17.0 and later releases, this implementation has been modified to include QOS-Info in all LOSDVs having different combination of service-id and content-id. Thus if there			

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
			are multiple LOSDVs with same content-id but different service-id, 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 interval.	Choice	6	aa
SGSN-IPv4-Binary Address	34-0-10-0	M	The octet string included in the field "sgsn-Address" includes either control plane or user plane address of the SGSN in binary coding.	Octet string	4	80

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
SGSN PLMN identifier	34-0-11	O	RAI (optionally supplied by SGSN in the GTP create PDP context request) is used as SGSN PLMN Identifier value. It is omitted if the SGSN does not supply the RAI and is not identified as a "home" SGSN. For home SGSNs without the RAI a locally configured PLMN-ID can be sent instead.	Octet string	3	8b

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
FBC Data volume uplink	34-0-12	M	The number of octets transmitted during the use of the packet data services in the uplink direction. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	8c

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
FBC data volume downlink	34-0-13	M	The number of octets transmitted during the use of the packet data services in the downlink direction. Note that a maximum of 2^32 bytes can be counted in this field. A volume trigger should be defined at least for this value to avoid an overflow, if not done already for a smaller amount of traffic.	Integer	1-5	8d
Time of report	34-0-14	M	A time stamp defining the moment when the service data container is closed.	BCD encoded octet string	9	8e
RAT Type	34-0-15	O	The valid radio access technology type during the service data recording interval.	Integer	1	8f

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Failurehandling Continue	34-0-16	O	A Boolean expression included if the failure handling condition has been executed. This can be either configured on the GGSN using **failure-handling** CLI inside "credit-control" mode or can be received from the server in the "Credit-Control-Failure-Handling" AVP. Whatever is received from the server will have higher precedence. There is no negotiation with the Diameter server in this regard and the GGSN will use whatever the server provides.	Boolean	1	90

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Service Identifier	34-0-17	O	The service identifier may designate an end user service, a part of an end user service, or an arbitrarily formed group thereof. This field is only included if reporting is per combination of the rating group and service id	Integer	1-5	91
User Location Information	34-0-20	O	The User Location Information for the MS if provided by the SGSN to the GGSN during the PDP context activation/modification procedure. Transparently copied from the GTP message	Octet string	8	94

Field	Tag number	Category	Description	Format	Size (in bytes)	ASN1 code
Time Quota Mechanism	34-0-22	O	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	Sequence	Variable length	96

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 FALSE or 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 different 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 packet data network (network identifier part of APN).

Field	Category	Description
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 allocated during PDP context activation.
List of Traffic Data Volumes	M	A list of changes in charging conditions for this PDP context, each time stamped. Charging conditions are used to categorize traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed. In GSM, data volumes are in octets above the GTP layer and are separated for uplink and downlink traffic. In 3G, data volumes are in octets above the GTP-U layer and are 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 records.
Node ID	O	Name of the recording entity.

Field	Category	Description
Local Record Sequence Number	O	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	C	The Charging Characteristics flag retrieved from subscriber's data as described in TS 32.015 sub clause 6.1.6.5.