

P-GW CDR Field Reference

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

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

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

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

Table 1: Dictionary Table Key 4

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.

• custom24 Dictionary, on page 1

custom24 Dictionary

In releases prior to 15, PGW-CDR fields are based on 3GPP TS 32.298 V8.5.0. In release 15 and later, PGW-CDR fields are fully compliant to 3GPP spec 32.298 V9.6.0 and partially compliant to Release 11 spec of 3GPP TS 32.298.

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
Record Type	0	M	P-GW IP CAN bearer record	Integer	1	80
Served IMSI	3	M	IMSI of the served party (if Anonymous Access Indicator is FALSE or not supplied)	BCD encoded octet string	3-8	83
P-GW Address	4	M	The control plane IP address of the P-GW used.	Octet String	6 or 18 bytes (depending on v4 or v6 address)	a4
Charging ID	5	M	IP CAN bearer identifier used to identify this IP CAN bearer in different records created by PCNs	Integer	1-5	85
Serving Node Address	6	M	List of serving node control plane IP addresses (e.g. SGSN, MME, etc.) used during this record.	Sequence	6-98 or 18-292 bytes	a6
Access Point Name Network Identifier	7	OM	The logical name of the connected access point to the external packet data network (network identifier part of APN).	IA5string	1-63	87

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
PDP/PDN Type	8	OM	Indicates PDP type (IP, PPP, or IHOSS:OSP) or PDN type (IPv4, IPv6, or IPv4v6).	Octet string	2	88
Served PDP/PDN Address	9	OC	IP address allocated for the PDP context / PDN connection (IPv4 or IPv6), if available.	Octet string	8 or 20	a9
Dynamic Address Flag	11	OC	Indicates whether served PDP/PDN address is dynamic, which is allocated during IP CAN bearer activation, initial attach (E-UTRAN or over S2x) and UE requested PDN connectivity. This field is missing if address is static.	Boolean	1	8b
Record Opening Time	13	M	Timestamp when IP CAN bearer is activated in this P-GW or record opening time on subsequent partial records.	BCD encoded octet string	9	8d

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
Duration	14	M	Duration of this record in the P-GW.	Integer	1-5	8e
Cause for Record Closing	15	M	The reason for the release of a record from this P-GW.	Integer	1	8f
Diagnostics	16	OC	Includes a more detailed technical reason (as defined in TS 32.250) for the release of the connection.	Integer	1-5	b0
Record Sequence Number	17	C	Partial record sequence number, only present in case of partial records.	Integer	1-5	91
Node ID	18	OM	Name of the recording entity.	IA5string	1-20	92
Local Sequence Number	20	OM	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.	Integer	1-5	94
APN Selection Mode	21	OM	An index indicating how the APN was selected.	Enumerated	1	95
Served MSISDN	22	OM	The primary MSISDN of the subscriber.	BCD encoded octet string	1-9	96

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
Charging Characteristics	23	M	The Charging Characteristics applied to the IP CAN bearer.	Octet string	2	97
Charging Characteristics Selection Mode	24	OM	Holds information about how Charging Characteristics were selected.	Enumerated	1	98
Serving Node PLMN Identifier	27	OM	Serving node PLMN Identifier (MCC and MNC) used during this record, if available.	Octet string	3	9b
PS Furnish Charging Information	28	OC	This field contains charging information sent by the OCS in the Diameter Credit Control Credit-Control-Answer messages as defined in 3GPP TS 32.251.	Sequence	Variable	BC

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
PS Free Format Data	28-0-1	OC	This field contains charging information sent by the OCS in the Diameter Credit Control CreditControlAnswer messages as defined in TS 32.251. The data can be sent either in one Diameter Credit Control CreditControlAnswer message or several Diameter Credit Control CreditControlAnswer messages with append indicator. This data is transferred transparently in the PS Furnish Charging Information field of the relevant call records.	Sequence	Variable	

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
PS Free Format Append Indicator	28-0-2	OC	This field contains an indicator whether PS free format data is to be appended to the PS free format data stored in previous partial CDR. This field is needed in CDR post processing to sort out valid PS free format data for that IP-CAN bearer from sequence of partial records. Creation of partial records is independent of received PS Free Format Data and thus valid PS free format data may be divided to different partial records.	Sequence	Variable	
Served IMEISV	29	OC	IMEISV of the ME, if available.	BCD encoded octet string	8	9d

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
RAT Type	30	OC	Indicates the Radio Access Technology (RAT) type currently used by the Mobile Station, when available.	Integer	1	9e
MS Time Zone	31	OC	Indicates the offset between universal time and local time in steps of 15 minutes where the MS currently resides.	Octet string	2	9f1f
User Location Information	32	OC	Contains the User Location Information of the MS as defined in TS 29.060 for GPRS case, and in TS 29.274 for EPC case, if available.	Octet string	5-13	9f20

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
List of Service Data	34	OM	List of changes in charging conditions for all service data flows within this IP CAN bearer categorized per rating group or per combination of the rating group and service ID. **Important** The List of Service Data field will be present in a P-GW CDR only if there is non-zero data consumption.	Sequence	Variable	bf22
Data Service Volume Block	34-0	OM	Service data container associated with a service condition change on a service data flow (categorized per rating group or per combination of the rating group and service id) within this IP CAN bearer.	Sequence	Variable	30
Rating Group	34-0-1	OM	Service flow identity 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	OC	Name of the Rulebase used for charging	IA5string	1-16	82
Result Code	34-0-3	OC	Result code shared by OCS	Integer	1-5	83
Local Sequence Number (LOSD)	34-0-4	OC	Service data container sequence number	Integer	1-5	84
Time of First Usage	34-0-5	OC	Timestamp for the first IP packet to be transmitted for the service data flow	BCD encoded octet string	9	85
Time of Last Usage	34-0-6	OC	Timestamp for the last IP packet to be transmitted for the service data flow	BCD encoded octet string	9	86
Time Usage	34-0-7	OC	Difference in seconds within range of 0 to 4294967295 between "time of first usage" and "time of last usage"	Integer	1-5	87
Service Condition Change	34-0-8	OC	Reason for closing the service data container	Bit string	5	88
QoS Information Negotiated	34-0-9	OC	Authorized QoS for the IP-CAN bearer	Sequence	Variable	a9
QCI	34-9-1	O		Integer	1-5	

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
Maximum Requested Bandwith UL	34-9-2	O		Integer	1-5	
Maximum Requested Bandwith DL	34-9-3	O		Integer	1-5	
Guaranteed Bitrate UL	34-9-4	O		Integer	1-5	
Guaranteed Bitrate DL	34-9-5	O		Integer	1-5	
ARP	34-9-6	O		Integer	1-5	
APN Aggregate Maximum Bitrate UL	34-9-7	O		Integer	1-5	
APN Aggregate Maximum Bitrate DL	34-9-8	O		Integer	1-5	
Extended Maximum Requested BW UL	34-9-9	O		Integer	1-5	0x89
Extended Maximum RequestedBW DL	34-9-10	O		Integer	1-5	0x8a
Extended GBR UL	34-9-11	O		Integer	1-5	0x8B
Extended GBR DL	34-9-12	O		Integer	1-5	0x8C
Extended APN AMBR UL	34-9-13	O		Integer	1-5	0x8D
Extended APN AMBR DL	34-9-14	O		Integer	1-5	0x8e

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
Serving Node Address (LOSD)	34-0-10	OC	IP address of the serving node (SGSN/S-GW) control plane	Octet string	6 or 18	aa
Data Volume FBC Uplink	34-0-12	OC	Number of octets received in the uplink direction for this container 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
Data Volume FBC Downlink	34-0-13	OC	Number of octets transmitted in the downlink direction for this container 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	OM	Timestamp defining the moment when the service data container is closed	BCD encoded octet string	9	8e
Failure Handling Continue	34-0-16	OC	Identifier for failure handling	Boolean	1	90
Service Identifier	34-0-17	OC	Identifier for a service	Integer	1-5	91
PS Furnish Charging Information	34-0-18	OC	This field includes charging information per rating group in case it is sent by OCS.	Sequence	Variable	b2

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
User Location Information (LOSD)	34-0-20	OC	Location of the user known at the time when container is created	Octet string	6-13	94
Serving node Type	35	M	List of serving node types in control plane. The serving node types listed here map to the serving node addresses listed in the field "Serving node Address" in sequence.	Sequence of serving Node Type	3-48	bf23
Served MNNAI	36	OC	Mobile Node Identifier in NAI format (based on IMSI), if available.	Set	Variable	bf24
P-GW PLMN Identifier	37	OC	PLMN identifier (MCC MNC) of the P-GW.	Octet string	3	9f25
Start Time	38	OC	The time when User IP-CAN session starts, available in the CDR for the first bearer in an IP-CAN session.	Octet string	9	9f26

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
Stop Time	39	OC	The time when User IP-CAN session is terminated, available in the CDR for the last bearer in an IP-CAN session.	Octet string	9	9f27
PDN Connection Id	41	OM	PDN connection (IP-CAN session) identifier to identify different records belonging to same PDN connection.	Integer	1-5	9f29
Served PDP PDN Address Extension	45	OC	This field contains the IPv4 address allocated for the PDP context/PDN connection when dual-stack IPv4-IPv6 is used.	Octet string	8	bf2d
List of RAN Secondary RAT Usage Reports	73	OC	This field includes one or more containers reported from the RAN for a secondary RAT.	Sequence of RAN Secondary RAT Usage Report	Variable	0xbf49

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
RAN Secondary RAT Usage Report	73-0	M	This field includes one or more containers reported from the RAN for a secondary RAT.	Sequence	Variable	0x30
Data Volume Uplink	73-0-1	M	This field includes the number of octets transmitted during the use of the packet data services in the uplink direction reported from RAN. The counting and reporting from RAN of uplink data volumes is optional.	Integer	9	0x81
Data Volume Downlink	73-0-2	M	This field includes the number of octets transmitted during the use of the packet data services in the downlink direction reported from RAN. The counting and reporting from RAN of downlink data volumes is optional.	Integer	9	0x82

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
RAN Start Time	73-0-3	M	This field is a time stamp, which defines the moment when the volume container is opened by the RAN.	Timestamp	9	0x83
RAN End Time	73-0-4	M	This field is a time stamp, which defines the moment when the volume container is closed by the RAN.	Timestamp	9	0x84
Secondary RAT Type	73-0-5	OC	This field contains the RAT type for the secondary RAT.	Integer	1	0x85
UE Local IP Port Info	253	O	This field includes the S2b user Local IP Port information.	Sequence	34	0xbf817d
uELocalIPAddress	253-0	O	This field includes the UWAN user IP Address.	IP Address	32	0xa0
uDPSourcePort	253-1	O	This field includes the UWAN user Source Port.	Integer	2	0x81

Field	Tag Number	Category	Description	Format	Size (in bytes)	ASN1 Code
AF recordinformation	19	O	This field includes the AF Charging Identifier and associated flow identifiers generated by the AF, and received by the P-GW over Gx interfaces. **Note** 'Flows' information is not supported on Cisco P-GW .	Sequence	Variable	0xb3
AF chargingIdentifier	19-1	O	This field contains the AF Charging Identifier that is sent by the AF.	octetstring	Variable	0x81

Notes:

- Variable size vary depending on the **charging id** value sent by the PCRF.
- 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*.
- The PGW-CDR field "PS Furnish Charging Information" is available in the custom24 GTPP dictionary only when the CLI command **gtpp attribute furnish-charging-information** is configured in the GTPP Server Group Configuration mode.

  This field is also available in all 3GPP Rel.7 and Rel.8 dictionaries.
- In releases prior to 14.0, for a non-GBR bearer, MBR and GBR values were populated in PGW-CDR. In 14.0 and later releases, as per the standard specification for a non-GBR bearer, MBR and GBR values should be set to 0. Only for custom24 GTPP dictionary if "**gtpp attribute apn-ambr**" CLI command is configured then APN AMBR values are populated in MBR fields of PGW-CDR.
- In releases prior to 14.0, the CGISAIChange service condition is present in LOSDV of PGW-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 PGW-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 15.0, when a call is cleared from the chassis, the field "causeForRecordClosing" in a PGW-CDR shows "Normal Release". In 15.0 and later releases, the behavior has been changed to comply with 3GPP specifications. That is, the default "causeForRecordClosing" in PGW-CDR will be "Management Intervention". To support this, new keywords have been added to the CLI command "**gtpp egcdr**" to control the value of "causeForRecordClosing" of PGW-CDR when a call is cleared from the chassis.

  

  Important This behavioral change is limited to PGW-CDR Release 8 dictionaries only.

- 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.
- In StarOS release 21.16.7 and in later releases, the **aFChargingIdentifier** field is not part of the 3GPP 32.298 Release 6 and 7 specifications. This field is an Release15 attribute and it can be present in Release 8 dictionary if enabled through the **gtpp attribute af-record-info** CLI command. This attribute is available only for the dictionaries custom35, custom24, custom44, custom48, custom50,custom52,custom53, and custom34 when the CLI command **gtpp attribute af-record-info** is configured.

ASN.1 Definition for Fields in custom24 Dictionary

The following section provides a complete ASN.1 definition of PGW-CDR. It is based on the ASN.1 definition in 3GPP TS 32.298.

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

-------------------------------------------------------------------------------
--
--    GPRS RECORDS
--
-- 3GPP 32.298V8.7.0 AND 3GPP 32.251V8.8.0
-------------------------------------------------------------------------------

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

```
PGWRecord                ::= SET
{
    recordType                                          [0] RecordType,
    servedIMSI                                          [3] IMSI,
    p-GWAddress                                         [4] GSNAddress,
    chargingID                                          [5] ChargingID,
    servingNodeAddress                                  [6] SEQUENCE OF GSNAddress,
    accessPointNameNI                                   [7] AccessPointNameNI OPTIONAL,
    pdpPDNType                                          [8] PDPType OPTIONAL,
    servedPDPPDNAddress                                 [9] PDPAddress OPTIONAL,
    dynamicAddressFlag                                  [11] DynamicAddressFlag OPTIONAL,
    recordOpeningTime                                   [13] TimeStamp,
    duration                                            [14] CallDuration,
    causeForRecClosing                                  [15] CauseForRecClosing,
    diagnostics                                         [16] Diagnostics OPTIONAL,
    recordSequenceNumber                                [17] INTEGER OPTIONAL,
    nodeID                                              [18] NodeID OPTIONAL,
    localSequenceNumber                                 [20] LocalSequenceNumber OPTIONAL,
    apnSelectionMode                                    [21] APNSelectionMode OPTIONAL,
    servedMSISDN                                        [22] MSISDN OPTIONAL,
    chargingCharacteristics                             [23] ChargingCharacteristics,
    chChSelectionMode                                   [24] ChChSelectionMode OPTIONAL,
    servingNodePLMNIdentifier                           [27] PLMN-Id OPTIONAL,
    pSFurnishChargingInformation                        [28] PSFurnishChargingInformation
OPTIONAL,
    servedIMEISV                                        [29] IMEI OPTIONAL,
    rATType                                             [30] RATType OPTIONAL,
    mSTimeZone                                          [31] MSTimeZone OPTIONAL,
    userLocationInformation                             [32] OCTET STRING OPTIONAL,
   listOfServiceData                                   [34] SEQUENCE OF ChangeOfServiceCondition
 OPTIONAL,
    servingNodeType                                     [35] SEQUENCE OF ServingNodeType,
    servedMNNAI                                         [36] SubscriptionID OPTIONAL,
    p-GWPLMNIdentifier                                  [37] PLMN-Id OPTIONAL,
    startTime                                           [38] TimeStamp OPTIONAL,
    stopTime                                            [39] TimeStamp OPTIONAL,
    pDNConnectionID                                     [41] ChargingID OPTIONAL,
    servedPDPPDNAddressExt                              [45] PDPAddress OPTIONAL,
    listOfRANSecondaryRATUsageReports                   [73] SEQUENCE OF
RANSecondaryRATUsageReport OPTIONAL,
    uELocalIPAddressPort                                [253] UELocalIPPortInfo OPTIONAL

}

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

                -- NI is 'apn1a.apn1b.apn1c' and is presented in this form in the CDR..


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

CallDuration::= INTEGER
                --
```

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


CauseForRecClosing               ::= INTEGER
{
                --
                -- In PGW-CDR and SGW-CDR the value servingNodeChange is used for partial
record
                -- generation due to Serving Node Address list Overflow
                -- In SGSN servingNodeChange indicates the SGSN change
                --
                -- LCS related causes belong to the MAP error causes acc. TS 29.002 [60]
                --
                -- cause codes 0 to 15 are defined 'CauseForTerm' (cause for termination)
               -- All cause values are not relevent to SGW. Refer the spec to find out the

             -- cause values for SGW.
                normalRelease                                    (0),
                abnormalRelease                                  (4),
                cAMELInitCallRelease                             (5),
                volumeLimit                                      (16),
                timeLimit                                        (17),
                servingNodeChange                                (18),
                maxChangeCond                                    (19),
                managementIntervention                           (20),
                intraSGSNIntersystemChange                       (21),
                rATChange                                        (22),
                mSTimeZoneChange                                 (23),
                sGSNPLMNIDChange                                 (24)
}

ChangeOfServiceCondition               ::= SEQUENCE
{
                --
                -- Used for Flow based Charging service data container
                --
                ratingGroup                                       [1] RatingGroupId,
                chargingRuleBaseName                              [2] ChargingRuleBaseName
OPTIONAL,
                resultCode                                        [3] ResultCode OPTIONAL,
                localSequenceNumber                               [4] LocalSequenceNumber
OPTIONAL,
                timeOfFirstUsage                                  [5] TimeStamp OPTIONAL,
                timeOfLastUsage                                   [6] TimeStamp OPTIONAL,
                timeUsage                                         [7] CallDuration OPTIONAL,
                serviceConditionChange                            [8] ServiceConditionChange,
               qoSInformationNeg                                [9] EPCQoSInformation OPTIONAL,

                servingNodeAddress                                [10] GSNAddress OPTIONAL,
               datavolumeFBCUplink                              [12] DataVolumeGPRS OPTIONAL,

               datavolumeFBCDownlink                            [13] DataVolumeGPRS OPTIONAL,

                timeOfReport                                      [14] TimeStamp,
                failureHandlingContinue                           [16] FailureHandlingContinue
 OPTIONAL,
             serviceIdentifier                                [17] ServiceIdentifier OPTIONAL,

               pSFurnishChargingInformation                     [18]
PSFurnishChargingInformation OPTIONAL,
```

```
                aFRecordInformation                             [19] SEQUENCE OF
AFRecordInformation OPTIONAL,
                userLocationInformation                         [20] OCTET STRING OPTIONAL,
                datapacketsFBCUplink                          [254] DataPacketGPRS OPTIONAL,

                datapacketsFBCDownlink                        [255] DataPacketGPRS OPTIONAL

                   }
AFChargingIdentifier            ::= OCTET STRING
AFRecordInformation               ::= SEQUENCE
{
      aFChargingIdentifier             [1] AFChargingIdentifier
}
   ChangeCondition                 ::= ENUMERATED
{
                qoSChange                       (0),
                tariffTime                      (1),
                recordClosure                   (2),
                cGI-SAICHange                   (6),                -- bearer modification.
 "CGI-SAI Change"
                rAIChange                       (7),                -- bearer modification.
 "RAI Change"
                dT-Establishment                (8),
                dT-Removal                      (9),
                eCGIChange                     (10),                -- bearer modification.
 "ECGI Change"
                tAIChange                      (11),                -- bearer modification.
 "TAI Change"
                userLocationChange             (12)                 -- bearer modification.
 "User Location Change"
}



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

ChargingID                ::= INTEGER (0..4294967295)
                --
                -- Generated in P-GW, part of IP CAN bearer
                -- 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 TS 29.212
                --

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

DataVolumeGPRS                ::= INTEGER
```

```
                --
                -- The volume of data transferred in octets.
                --

DataPacketGPRS                ::= INTEGER
                --
                -- The packets counts of data transferred.
                --

DynamicAddressFlag                ::= BOOLEAN


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

FFDAppendIndicator         ::= BOOLEAN

FreeFormatData             ::= OCTET STRING (SIZE(1..160))
                --
--
-- Free formatted data as sent in the FurnishChargingInformationGPRS
-- see TS 29.078 [217]
                --
GSNAddress::= IPAddress

--IA5String::= OCTET STRING

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

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



PDPAddress                ::= CHOICE
{
                iPAddress                [0] IPAddress
```

```
                --
        -- eTSIAddress as specified in 32.298 is not supported
        --
}

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

PLMN-Id                                 ::= OCTET STRING (SIZE (3))
                --
                --                This is a 1:1 copy from the Routing Area Identity (RAI)
IE specified in TS 29.060
                --            as follows:
                --                OCTET 1 of PLMN-Id = OCTET 2 of RAI
                --                OCTET 2 of PLMN-Id = OCTET 3 of RAI
                --                OCTET 3 of PLMN-Id = OCTET 4 of RAI
                --

PSFurnishChargingInformation          ::= SEQUENCE
{
                pSFreeFormatData              [1] FreeFormatData,
                pSFFDAppendIndicator          [2] FFDAppendIndicator OPTIONAL
}

UELocalIPPortInfo                ::= SEQUENCE
{
    --
    -- The S2b user Local IP Port Information
    --
    uELocalIPAddress                          [0] IPAddress OPTIONAL,
    uDPSourcePort                             [1] INTEGER OPTIONAL
}

UELocalIPAddress        ::= IPAddress
UDPSourcePort           ::= INTEGER

RatingGroupId           ::= INTEGER

QoSInformation          ::= OCTET STRING (SIZE (4..255))
--
-- This octet string
-- is a 1:1 copy of the contents (i.e. starting with octet 5) of the "Bearer Quality of
-- Service" information element specified in TS 29.274 [92].
--

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

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

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

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

    pGWRecord         (85)
}

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


ServiceConditionChange                ::= BIT STRING
{
    qoSChange                                           (0),        -- bearer modification
    sGSNChange                                          (1),        -- bearer modification
    sGSNPLMNIDChange                                    (2),        -- bearer modification
    tariffTimeSwitch                                    (3),        -- tariff time change
    pDPContextRelease                                   (4),        -- bearer release
    rATChange                                           (5),        -- bearer modification
    serviceIdledOut                                    (6),        -- IP flow idle out, DCCA
 QHT expiry
    reserved1                                           (7),        -- old: QCTexpiry is no
report event
    configurationChange                                 (8),        -- configuration change
    serviceStop                                         (9),        -- IP flow termination
    dCCATimeThresholdReached                            (10),       -- DCCA quota
reauthorization
    dCCAVolumeThresholdReached                          (11),       -- DCCA quota
reauthorization
    dCCAServiceSpecificUnitThresholdReached             (12),       -- DCCA quota
reauthorization
    dCCATimeExhausted                                   (13),       -- DCCA quota
reauthorization
    dCCAVolumeExhausted                                 (14),       -- DCCA quota
reauthorization
    dCCAValidityTimeout                                 (15),       -- DCCA quota validity
time (QVT expiry)
    reserved2                                          (16),       -- reserved due to no use
 case,
                -- old: return Requested is covered by (17),(18)
    dCCAReauthorisationRequest                          (17),       -- DCCA quota
reauthorization request by OCS
    dCCAContinueOngoingSession                          (18),       -- DCCA failure handling
 (CCFH), continue IP flow
    dCCARetryAndTerminateOngoingSession                 (19),       -- DCCA failure handling
 (CCFH), terminate IP flow after DCCA retry
    dCCATerminateOngoingSession                        (20),       -- DCCA failure handling,
 terminate IP flow
    cGI-SAIChange                                       (21),       -- bearer modification
    rAIChange                                           (22),       -- bearer modification
    dCCAServiceSpecificUnitExhausted                    (23),       -- DCCA quota
reauthorization
    recordClosure                                       (24),       -- PGW-CDR closure
```

```
    timeLimit                                           (25),       -- intermediate recording

    volumeLimit                                         (26),       -- intermediate recording

    serviceSpecificUnitLimit                            (27),       -- intermediate recording

    envelopeClosure                                      (28),
    eCGIChange                                           (29),       -- bearer modification.
"ECGI Change"
    tAIChange                                            (30),       -- bearer modification.
"TAI Change"
    userLocationChange                                   (31)        -- bearer modification.
"User Location Change"
}

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 29.212

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


SubscriptionID                ::= SET
{
                subscriptionIDType              [0]           SubscriptionIDType,
                subscriptionIDData              [1]           UTF8String
}
SubscriptionIDType                ::= ENUMERATED
{
                eND-USER-E164                   (0),
                eND-USER-IMSI                   (1),
                eND-USER-SIP-URI                (2),
                eND-USER-NAI                    (3),
                eND-USER-PRIVATE                (4)
}

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

IPAddress::= CHOICE
{
                iPBinaryAddress                                 IPBinaryAddress

        --Currently only IPBinaryAddress is supported in PGWCDR
}

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

```
                iPBinV6Address                      [1] OCTET STRING (SIZE(16))
}


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 TS 23.003
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
[75]


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
ISDN-AddressString ::= OCTET STRING
IMEI ::= TBCDSTRING (SIZE(8))
IMSI ::= TBCDSTRING (SIZE(3..8))
END
```