

# CDR Format for the SGW

## PRINTOUT DESCRIPTION

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# 1 Introduction

This document describes the structure and content of the Charging Data Records (CDRs) generated by the EPG in the SGW role for GSM, WCDMA, and LTE.

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

This document only covers the SGW-CDRs. For information on G-CDRs, eG-CDRs, and PGW-CDRs, refer to *CDR Format for the GGSN and PGW*.

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

To facilitate the understanding of this document, refer to *CPI Library Readers' Guide*.

## 1.1 CDR Encoding

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

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

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

The ASN.1 tags assigned to CDR fields are specified in Section 6 on page 51.



### 1.1.1 ASN.1 BER Encoding of Integers

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

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

— Example 1

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

— Example 2

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

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

## 1.2 CDR Field Categories

The charging standard 3GPP TS 32.240 specifies the field categories. The following field categories are used:

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



## 2 CDR Content

Table 1 lists the fields that can be present in an SGW-CDR together with the field categories for the supported release of the charging standard and for the special closing CDR (Special). For information about the special closing CDR, refer to [Offline Charging](#).

**Note:** Special closing partial CDRs are generated for bearers handled by a failing SGW Session Controller (SSC). Under this specific condition, the SGW does not include certain mandatory fields from the 3GPP specifications. In order for the billing systems to remain fully compatible with the SGW, the affected fields are optional in the corresponding ASN.1 format descriptions.

- The field category can be: mandatory (M), conditional (C), and conditional and operator-configurable (O<sub>C</sub>).
- Yes: means that the field is included in the partial CDR generated at SGW failure (refer to [Offline Charging](#)), if supported by the applied version and configured to be included.

Table 1 CDR Fields and Subfields Presence

CDR Field	R9	R13	R15	Special
Access Point Name Network Identifier	C	C	C	No
Cause for Record Closing	M	M	M	Yes
Charging Characteristics	M	M	M	Yes
Charging ID	M	M	M	Yes
Indicator	-	O <sub>C</sub>	O <sub>C</sub>	No
Duration	M	M	M	Yes
IMSI Unauthenticated Flag	O <sub>C</sub>	O <sub>C</sub>	O <sub>C</sub>	No
List of Traffic Volumes	M	M	M	Yes
Data Volume GPRS Uplink	M	M	M	Yes
Data Volume GPRS Downlink	M	M	M	Yes
Change Condition	M	M	M	Yes
Change Time	M	M	M	Yes
User Location Information	C	C	C	No
EPC QoS Information	C	C	C	No
Serving PLMN Rate Control	-	O <sub>C</sub>	O <sub>C</sub>	No
List of RAN Secondary RAT Usage Reports	-	-	O <sub>C</sub>	No
Data Volume Uplink	-	-	M	No
Data Volume Downlink	-	-	M	No
RAN Start Time	-	-	M	No



Table 1 CDR Fields and Subfields Presence

CDR Field	R9	R13	R15	Special
RAN End Time	-	-	M	No
Secondary RAT Type	-	-	C	No
Local Record Sequence Number	M	M	M	Yes
Low Priority Indicator	-	O <sub>C</sub>	O <sub>C</sub>	No
MO Exception Data Counter	-	O <sub>C</sub>	O <sub>C</sub>	No
MS Time Zone	C	C	C	No
Node ID	M	M	M	Yes
PDN Connection Charging ID	C	C	C	No
PDP/PDN Type	C	C	C	No
PDP/PDN Type Extension	-	O <sub>C</sub>	O <sub>C</sub>	No
PGW IPv6 Address Used	O <sub>C</sub>	O <sub>C</sub>	O <sub>C</sub>	No
PGW PLMN Identifier	C	C	C	No
RAT Type	C	C	C	No
Record Opening Time	M	M	M	Yes
Record Sequence Number	C	C	C	Yes
Record Type	M	M	M	Yes
Served IMEISV	C	C	C	No
Served IMSI	C	C	C	Yes
Served MSISDN	C	C	C	No
Served PDP/PDN Address	C	C	C	No
Served PDP/PDN Address Extension	C	C	C	No
Serving Node Address	M	M	M	Yes <sup>(1)</sup>
Serving Node IPv6 Address	O <sub>C</sub>	O <sub>C</sub>	O <sub>C</sub>	No
Serving Node PLMN Identifier	C	C	C	No
Serving Node Type	M	M	M	Yes
SGW Address	M	M	M	Yes
Serving PLMN Rate Control	-	O <sub>C</sub>	O <sub>C</sub>	No
SGW IPv6 Address	O <sub>C</sub>	O <sub>C</sub>	O <sub>C</sub>	No
SGW Change	C	C	C	No
UNI PDU CP Only Flag	-	O <sub>C</sub>	O <sub>C</sub>	No

(1) Only the latest serving node address is included.



## 3 CDR Records

This section contains a description of the SGW records. The CDR fields that the SGW records contain are described in Section 4 on page 9.

### 3.1 Call Event Record

The basic structure of the CDRs is set up by the Call Event Record.

#### Release 9, 13, and 15

```
GPRSRecord ::= CHOICE
{
    sGWRecord          [78] SGWRecord
}
```

### 3.2 SGW Record

#### Contents

The SGW Record contains charging information in several CDR fields. The SGW supports Release 9, 13, and 15 of the charging standard.

The SGW-CDR structure is specified below as in SoC with 3GPP TS 32.298.

#### 3.2.1 Release 9

##### ASN.1 Format

```
sGWRecord          [78] SGWRecord
```

```
SGWRecord ::= SET
{
    recordType                [0] RecordType,
    servedIMSI                [3] IMSI OPTIONAL,
    s-GWAddress                [4] GSNAAddress,
    chargingID                 [5] ChargingID,
    servingNodeAddress         [6] SEQUENCE OF GSNAAddress,
    accessPointNameNI         [7] AccessPointNameNI OPTIONAL,
    pdpPDNType                 [8] PDPTType OPTIONAL,
    servedPDPPDNAddress        [9] PDPAddress OPTIONAL,
    listOfTrafficVolumes       [12] SEQUENCE OF ChangeOfCharCondition 0
    recordOpeningTime          [13] TimeStamp,
    duration                   [14] CallDuration,
    causeForRecClosing         [15] CauseForRecClosing,
```



```

recordSequenceNumber [17] INTEGER OPTIONAL,
nodeID [18] NodeID OPTIONAL,
localSequenceNumber [20] LocalSequenceNumber,
servedMSISDN [22] MSISDN OPTIONAL,
chargingCharacteristics [23] ChargingCharacteristics,
servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL,
servedIMEISV [29] IMEI OPTIONAL,
rATType [30] RATType OPTIONAL,
mSTimeZone [31] MSTimeZone OPTIONAL,
sGWChange [34] SGWChange OPTIONAL,
servingNodeType [35] SEQUENCE OF ServingNodeType,
p-GWAddressUsed [36] GSNAddress OPTIONAL,
p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL,
pDNConnectionChargingID [40] ChargingID OPTIONAL,
iMSIunauthenticatedFlag [41] NULL OPTIONAL
servedPDPPDNAddressExt [43] PDPAddress OPTIONAL
s-GWiPv6Address [48] GSNAddress OPTIONAL
servingNodeiPv6Address [49] SEQUENCE OF GSNAddress OPTIONAL
p-GWiPv6AddressUsed [50] GSNAddress OPTIONAL
}

```

### Encoded ASN.1 Tag

H'BF4E sgwRecord

## 3.2.2

### Release 13

#### ASN.1 Format

sGWRecord [78] SGWRecord

SGWRecord ::= SET  
{

```

recordType [0] RecordType,
servedIMSI [3] IMSI OPTIONAL,
s-GWAddress [4] GSNAddress,
chargingID [5] ChargingID,
servingNodeAddress [6] SEQUENCE OF GSNAddress,
accessPointNameNI [7] AccessPointNameNI OPTIONAL,
pdpPDNType [8] PDPTType OPTIONAL,
servedPDPPDNAddress [9] PDPAddress OPTIONAL,
listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition OPTI
recordOpeningTime [13] TimeStamp,
duration [14] CallDuration,
causeForRecClosing [15] CauseForRecClosing,
recordSequenceNumber [17] INTEGER OPTIONAL,
nodeID [18] NodeID OPTIONAL,
localSequenceNumber [20] LocalSequenceNumber,
servedMSISDN [22] MSISDN OPTIONAL,
chargingCharacteristics [23] ChargingCharacteristics,

```



```

servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL,
servedIMEISV [29] IMEI OPTIONAL,
rATType [30] RATType OPTIONAL,
mSTimeZone [31] MSTimeZone OPTIONAL,
sGWChange [34] SGWChange OPTIONAL,
servingNodeType [35] SEQUENCE OF ServingNodeType,
p-GWAddressUsed [36] GSNAAddress OPTIONAL,
p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL,
pDNConnectionChargingID [40] ChargingID OPTIONAL,
iMSIunauthenticatedFlag [41] NULL OPTIONAL
servedPDPPDNAddressExt [43] PDPAddress OPTIONAL
lowPriorityIndicator [44] NULL OPTIONAL,
s-GWiPv6Address [48] GSNAAddress OPTIONAL
servingNodeiPv6Address [49] SEQUENCE OF GSNAAddress OPTIONAL
p-GWiPv6AddressUsed [50] GSNAAddress OPTIONAL
cPCIoTEPSOptimisationIndicator [59] CPCIoTEPSOptimisationIndicator OPTI
uNIPDUCPOnlyFlag [60] UNIPDUCPOnlyFlag OPTIONAL
servingPLMNRateControl [61] servingPLMNRateControl OPTIONAL
pDPPDNTypeExtension [62] PDPPDNTypeExtension OPTIONAL
mOExceptionDataCounter [63] MOExceptionDataCounter OPTIONAL
}

```

### Encoded ASN.1 Tag

H'BF4E sgwRecord

## 3.2.3

### Release 15

#### ASN.1 Format

sgwRecord [78] SGWRecord

SGWRecord ::= SET  
{

```

recordType [0] RecordType,
servedIMSI [3] IMSI OPTIONAL,
s-GWAddress [4] GSNAAddress,
chargingID [5] ChargingID,
servingNodeAddress [6] SEQUENCE OF GSNAAddress,
accessPointNameNI [7] AccessPointNameNI OPTIONAL,
pdpPDNType [8] PDPTType OPTIONAL,
servedPDPPDNAddress [9] PDPAddress OPTIONAL,
listOfTrafficVolumes [12] SEQUENCE OF ChangeOfCharCondition 0
recordOpeningTime [13] TimeStamp,
duration [14] CallDuration,
causeForRecClosing [15] CauseForRecClosing,
recordSequenceNumber [17] INTEGER OPTIONAL,
nodeID [18] NodeID OPTIONAL,

```



```
localSequenceNumber [20] LocalSequenceNumber,
servedMSISDN [22] MSISDN OPTIONAL,
chargingCharacteristics [23] ChargingCharacteristics,
servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL,
servedIMEISV [29] IMEI OPTIONAL,
rATType [30] RATType OPTIONAL,
mSTimeZone [31] MSTimeZone OPTIONAL,
sGWChange [34] SGWChange OPTIONAL,
servingNodeType [35] SEQUENCE OF ServingNodeType,
p-GWAddressUsed [36] GSNAddress OPTIONAL,
p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL,
pDNConnectionChargingID [40] ChargingID OPTIONAL,
iMSIunauthenticatedFlag [41] NULL OPTIONAL
servedPDPPDNAddressExt [43] PDPAddress OPTIONAL
lowPriorityIndicator [44] NULL OPTIONAL,
s-GWiPv6Address [48] GSNAddress OPTIONAL
servingNodeiPv6Address [49] SEQUENCE OF GSNAddress OPTIONAL
p-GWiPv6AddressUsed [50] GSNAddress OPTIONAL
cPCIoTEPSOptimisationIndicator [59] CPCIoTEPSOptimisationIndicator OPTIONAL
uNIPDUCPOnlyFlag [60] UNIPDUCPOnlyFlag OPTIONAL
servingPLMNRateControl [61] servingPLMNRateControl OPTIONAL
pDPPDNTypeExtension [62] PDPPDNTypeExtension OPTIONAL
mOExceptionDataCounter [63] MOExceptionDataCounter OPTIONAL
listOfRANSecondaryRATUsageReports [64] SEQUENCE OF RANSecondaryUsageReport OF
}
}
```

### Encoded ASN.1 Tag

H'BF4E sgwRecord



## 4 CDR Fields

This section contains a description of the CDR field listed in Section 2 on page 3. Also refer to, SoC with 3GPP TS 32.298.

### 4.1 Access Point Name Network Identifier

CDR Field	R15	R13	R9	Special
Access Point Name Network Identifier	C	C	C	No

#### Content

Contains the network identifier part of the Access Point Name (APN) provided by the S4-SGSN or MME.

#### 4.1.1 Release 9, 13, and 15

##### ASN.1 Format

accessPointNameNI [7] AccessPointNameNI OPTIONAL

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

#### Value

According to 3GPP TS 23.003, AccessPointNameNI can be encoded in either dot or digit notation.

In dot notation, the labels are separated by a dot.

For an example of dot notation ([www.ericsson.se](http://www.ericsson.se)) in hexadecimal representation, see Table 2.

Table 2 Dot Notation

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

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



- Octets 14 and 15 – 8-bit ASCII characters (here: s and e)

In digit notation, the label length precedes each label.

The syntax of the `AccessPointNameNI` follows the Name Syntax defined in IETF RFC 2181 and IETF RFC 1035. The `AccessPointNameNI` consists of one or more labels. Each label is coded as a 1-octet field followed by that number of octets coded as 8-bit ASCII characters. Following IETF RFC 1035 the labels consist only of the alphabetic characters (A–Z and a–z), digits (0–9), and the dash (–). The `AccessPointNameNI` is not terminated by a length byte of zero.

For an example of digit notation (`\03www\08ericsson\02se`) in hexadecimal representation, see Table 3.

Table 3 Digit Notation

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

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

### Encoded ASN.1 Tag

H'87 `accessPointNameNI`

## 4.2 Cause for Record Closing

CDR Field	R15	R13	R9	Special
Cause for Record Closing	M	M	M	Yes

### Contents

Indicates the reason for record closure.

For a description of the applicable values, refer to the section on Record Data in *Offline Charging*.



### 4.2.1 Release 9, 13, and 15

#### ASN.1 Format

causeForRecClosing [15] CauseForRecClosing

```
CauseForRecClosing ::= INTEGER
{
    normalRelease          (0),
    abnormalRelease       (4),
    volumeLimit           (16),
    timeLimit             (17),
    servingNodeChange     (18),
    rATChange             (22),
    sGSNPLMNIDChange     (24),
    sGWChange             (25)
}
```

#### Encoded ASN.1 Tag

H'8F causeForRecClosing

## 4.3 Charging Characteristics

CDR Field	R15	R13	R9	Special
Charging Characteristics	M	M	M	Yes

#### Contents

Determines the charging method to apply for the bearer.

### 4.3.1 Release 9, 13, and 15

#### ASN.1 Format

chargingCharacteristics [23] ChargingCharacteristics

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

#### Value

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

Table 4 describes the structure of the charging characteristics octets.



Table 4 Structure of Charging Characteristics

Octet	Bit							
	8	7	6	5	4	3	2	1
1	B4	B3	B2	B1	P3	P2	P1	P0
2	B12	B11	B10	B9	B8	B7	B6	B5

**Encoded ASN.1 Tag**

H'97 chargingCharacteristics

## 4.4 Charging ID

CDR Field	R15	R13	R9	Special
Charging ID	M	M	M	Yes

**Contents**

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

The charging ID is generated by the PGW upon bearer activation and transferred to the related SGWs. Mediation devices or billing systems can use the charging ID with the PGW address to consolidate CDRs.

### 4.4.1 Release 9, 13, and 15

**ASN.1 Format**

chargingID [5] ChargingID

ChargingID ::= INTEGER (0..4294967295)

**Value**The value range is from 0 – 2<sup>32</sup>-1.**Encoded ASN.1 Tag**

H'85 ChargingID



## 4.5 CP CIoT EPS Optimisation Indicator

CDR Field	R15	R13	Special
CP CIoT EPS Optimisation Indicator	O <sub>c</sub>	O <sub>c</sub>	No

### Contents

Contains indication on whether Control Plane CIoT EPS Optimisation is used by the PDN connection during the data transfer with the UE (Control Plane NAS PDU through S11-U between SGW and MME) or not (User Plane through S1-U between SGW and eNB).

This is included in the Traffic data container only if previous container's change condition is change in user plane to UE.

### 4.5.1 Release 13 and 15

#### ASN.1 Format

```
cPCIoTEPSOptimisationIndicator [59] CPCIoTEPSOptimisationIndicator OPTIONAL
```

```
CPCIoTEPSOptimisationIndicator ::= BOOLEAN
```

#### Value

The value range is either True or False.

#### Encoded ASN.1 Tag

```
H'9F3B CPCIoTEPSOptimisationIndicator
```

## 4.6 Duration

CDR Field	R15	R13	R9	Special
Duration	M	M	M	Yes

### Contents

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



### 4.6.1 Release 9, 13, and 15

#### ASN.1 Format

duration [14] CallDuration

CallDuration ::= INTEGER

#### Encoded ASN.1 Tag

H'8E duration

## 4.7 IMSI Unauthenticated Flag

CDR Field	R15	R13	R9	Special
IMSI Unauthenticated Flag	O <sub>c</sub>	O <sub>c</sub>	O <sub>c</sub>	No

#### Contents

This field indicates that the provided served IMSI is not authenticated. This field is missing if IMSI is authenticated, or if IMSI is not provided for the bearer.

**Note:** The IMSI Unauthenticated Flag field can be configured to be included or excluded.

### 4.7.1 Release 9, 13, and 15

#### ASN.1 Format

iMSIunauthenticatedFlag [41] NULL OPTIONAL

#### Encoded ASN.1 Tag

H'9F29 iMSIunauthenticatedFlag

## 4.8 List of Traffic Volumes

CDR Field	R15	R13	R9	Special
List of Traffic Volumes	M	M	M	Yes
Data Volume GPRS Uplink	M	M	M	Yes
Data Volume GPRS Downlink	M	M	M	Yes
Change Condition	M	M	M	Yes
Change Time	M	M	M	Yes



CDR Field	R15	R13	R9	Special
User Location Information	C	C	C	No
EPC QoS Information	C	C	C	No
Serving PLMN Rate Control	C	C	-	No

## Contents

Includes one traffic volume container, which includes the following subfields:

- Data Volume GPRS Uplink, Data Volume GPRS Downlink

Volume use reported on bearer level.

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

- Change Condition

Indicates the reason for container closure.

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

- Change Time

Indicates the time when the traffic volume container is closed.

Contains a time stamp as described in [Section 5.2 on page 44](#).

- User Location Information

Includes the previously received GTP User Location Information IE, excluding the GTP header, from the S4-SGSN or MME.

Contains user location information as described in [Section 5.3 on page 45](#).

- EPC QoS Information

Includes the authorized QoS for the EPS bearer.

Contains QoS information as described in [Section 5.1 on page 43](#).

- Serving PLMN Rate Control

Includes the [Serving PLMN Rate Control](#) information applied by MME during the transfer of the data volume captured by the container.

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



## 4.8.1 Release 9, 13, and 15

### ASN.1 Format

```

listOfTrafficVolumes          [12] SEQUENCE OF ChangeOfCharCondition OPTIONAL
ChangeOfCharCondition ::= SEQUENCE,
{
    dataVolumeGPRSUplink      [3] DataVolumeGPRS,
    dataVolumeGPRSDownlink    [4] DataVolumeGPRS,
    changeCondition           [5] ChangeCondition,
    changeTime                [6] TimeStamp,
    userLocationInformation    [8] OCTET STRING OPTIONAL,
    ePCQoSInformation         [9] EPCQoSInformation
}
DataVolumeGPRS ::= INTEGER
ChangeCondition ::= ENUMERATED
{
    recordClosure              (2)
}
TimeStamp ::= OCTET STRING (SIZE(9))
EPCQoSInformation
    See section on shared data type QoS Information for further details.

```

### Encoded ASN.1 Tag

```

H'AC listOfTrafficVolumes
  H'30 (sequence indicator)
    H'83 dataVolumeGPRSUplink
    H'84 dataVolumeGPRSDownlink
    H'85 changeCondition
    H'86 changeTime
    H'88 userLocationInformation
    H'A9 ePCQoSInformation
    See section on shared data type QoS Information for further details.

```

## 4.9 List of RAN Secondary RAT Usage Reports

CDR Field	R15	Special
List of RAN Secondary RAT Usage Reports	O <sub>C</sub>	No
Data Volume Uplink	M	No
Data Volume Downlink	M	No
RAN Start Time	M	No
RAN End Time	M	No
Secondary RAT Type	C	No



## Contents

Includes one or more containers reported from the RAN for a secondary RAT. The RAN secondary RAT usage report includes the following subfields:

- Data Volume Uplink

Includes the number of octets transmitted during the use of the packet data services in the uplink direction reported from the RAN.

- Data Volume Downlink

Includes the number of octets transmitted during the use of the packet data services in the downlink direction reported from the RAN.

- RAN Start Time

Defines the time when the volume container is opened by the RAN.

Is a time stamp as described in Section 5.2 on page 44.

- RAN End Time

Defines the time when the volume container is closed by the RAN.

Is a time stamp as described in Section 5.2 on page 44.

- Secondary RAT Type

Contains the RAT type for the secondary RAT.

## 4.9.1

### Release15

#### ASN.1 Format

```

listOfRANSecondaryRATUsageReports          [64] SEQUENCE OF RANSecondaryR
RANSecondaryRATUsageReport ::= SEQUENCE,
{
    dataVolumeUplink                        [1] DataVolumeGPRS,
    dataVolumeDownlink                      [2] DataVolumeGPRS,
    rANStartTime                            [3] TimeStamp,
    rANEndTime                              [4] TimeStamp,
    secondaryRATType                        [5] SecondaryRATType OPTIONAL
}
SecondaryRATType ::= INTEGER
{
    reserved                                (0),
    5gNR                                    (1),
}

```

**Encoded ASN.1 Tag**

```

H'BF40 listOfRANSecondaryRATUsageReports
  H'30 (sequence indicator)
    H'81 dataVolumeUplink
    H'82 dataVolumeDownlink
    H'83 rANStartTime
    H'84 rANEndTime
    H'85 secondaryRATType

```

## 4.10 Local Record Sequence Number

CDR Field	R15	R13	R9	Special
Local Record Sequence Number	M	M	M	Yes

**Contents**

Includes a unique record number created by the SGW. The number is allocated sequentially.

### 4.10.1 Release 9, 13, and 15

**ASN.1 Format**

```
localSequenceNumber [20] LocalSequenceNumber
```

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

**Encoded ASN.1 Tag**

```
H'94 localSequenceNumber
```

## 4.11 Low Priority Indicator

CDR Field	R15	R13	Special
SGW Address	O <sub>C</sub>	O <sub>C</sub>	No

**Contents**

Indicates if this IP-CAN session has a low priority, for example, for Machine Type Communication.



### 4.11.1 Release 13 and 15

#### ASN.1 Format

lowPriorityIndicator [44] NULL OPTIONAL

#### Value

NULL

#### Encoded ASN.1 Tag

H'92C lowPriorityIndicator

## 4.12 MO Exception Data Counter

CDR Field	R15	R13	Special
MO Exception Data Counter	O <sub>c</sub>	O <sub>c</sub>	No

#### Contents

Contains the number of receptions of MO Exception Data and the time when the cause MO Exception Data is received for the first time.

### 4.12.1 Release 13 and 15

#### ASN.1 Format

MOExceptionDataCounter [63] MOExceptionDataCounter OPTIONAL

```
MOExceptionDataCounter ::= SEQUENCE
{
  counterValue      [0] INTEGER,
  counterTimestamp [1] TimeStamp
}
```

#### Value

NULL

#### Encoded ASN.1 Tag

H'BF3F MOExceptionDataCounter



## 4.13 MS Time Zone

CDR Field	R15	R13	R9	Special
MS Time Zone	C	C	C	No

### Contents

Contains the MS Time Zone information received from the S4-SGSN or MME at the bearer activation and modification procedure. If a changed MS time zone is received from the S4-SGSN in an Update PDP Context Request message or from the MME in a Modify Bearer Request message, a partial CDR is closed with the cause MS time zone change. Included if the information has been received from the S4-SGSN or MME.

### 4.13.1 Release 9, 13, and 15

#### ASN.1 Format

mSTimeZone [31] MSTimeZone OPTIONAL

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

#### Value

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

#### Encoded ASN.1 Tag

H'9F1F mSTimeZone

## 4.14 Node ID

CDR Field	R15	R13	R9	Special
Node ID	M	M	M	Yes

### Contents

Contains an operator-configurable identifier string for the SGW that generated the CDR.



#### 4.14.1 Release 9, 13, and 15

##### ASN.1 Format

nodeID [18] NodeID OPTIONAL

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

##### Value

Configured node identifier.

##### Encoded ASN.1 Tag

H'92 nodeID

### 4.15 PDN Connection Charging ID

CDR Field	R15	R13	R9	Special
PDN Connection Charging ID	C	C	C	No

##### Contents

Includes the Charging ID of the first bearer activated within the PDN connection. Uniquely identifies the PDN connection together with the PGW address.

#### 4.15.1 Release 9, 13, and 15

##### ASN.1 Format

pDNConnectionChargingID [40] ChargingID OPTIONAL

ChargingID ::= INTEGER (0..4294967295)

##### Encoded ASN.1 Tag

H'9F28 pDNConnectionChargingID

### 4.16 PDP/PDN Type

CDR Field	R15	R13	R9	Special
PDP/PDN Type	C	C	C	No

**Contents**

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

**4.16.1 Release 9, 13, and 15****ASN.1 Format**

pdpPDNType [8] PDPTYPE OPTIONAL

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

**Value**

The **PDP/PDN Type** field contains two octets according to SoC with 3GPP TS 32.298. One is defined by SoC with 3GPP TS 29.274, refer to Information Element (IE) PDN Type, octet 5. The other octet contains 0xFF.

The following values are applicable for the octet that contains the retrieved value from GTP message:

1	IPv4
2	IPv6
3	IPv4v6

**Encoded ASN.1 Tag**

H'88 pdpPDNType

**4.17 PDP PDN Type Extension**

CDR Field	R15	R13	Special
PDPPDNTypeExtension	o c	o c	No

**Contents**

This field indicates Non-IP PDN type.

**4.17.1 Release 13 and 15****ASN.1 Format**

pDPPDNTypeExtension [62] PDPPDNTypeExtension OPTIONAL

PDPPDNTypeExtension ::= INTEGER



### Value

The value is only integer.

### Encoded ASN.1 Tag

H'9F3E pDPPDNTYPEExtension

## 4.18 PGW Address Used

CDR Field	R15	R13	R9	Special
PGW Address Used	C	C	C	No

### Contents

Contains the PGW IPv4 or IPv6 address for the control plane.

When Dual Stack IPv4v6 is used, the IPv4 address is included in the **PGW Address Used** field, and the IPv6 address is included in the PGW IPv6 Address Used field.

### 4.18.1 Release 9, 13, and 15

#### ASN.1 Format

```
p-GWAddressUsed [36] GSNAddress OPTIONAL

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

### Value

A binary IPv4 address or binary IPv6 address.

### Encoded ASN.1 Tag

```
H'BF24 p-GWAddressUsed
H'80 iPBinV4Address
H'81 iPBinV6Address
```



## 4.19 PGW IPv6 Address Used

CDR Field	R15	R13	R9	Special
PGW IPv6 Address Used	O <sub>c</sub>	O <sub>c</sub>	O <sub>c</sub>	No

### Contents

Contains the PGW IPv6 address for the control plane received in the signaling messages from the PGW when Dual Stack IPv4v6 is used.

When Dual Stack IPv4v6 is used, the IPv4 address is included in the PGW Address Used field, and the IPv6 address is included in the **PGW IPv6 Address Used** field.

### 4.19.1 Release 9, 13, and 15

#### ASN.1 Format

```

p-GWiPv6AddressUsed                [50] GSNAddress OPTIONAL

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

```

#### Value

A binary IPv6 address.

#### Encoded ASN.1 Tag

```

H'BF32 p-GWiPv6AddressUsed
H'81 iPBinV6Address

```

## 4.20 PGW PLMN Identifier

CDR Field	R15	R13	R9	Special
PGW PLMN Identifier	C	C	C	No

### Contents

Contains the PGW PLMN ID.



### 4.20.1 Release 9, 13, and 15

#### ASN.1 Format

p-GWPLMNIdentifier [37] PLMN-Id OPTIONAL

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

#### Value

Contains the APN Operator Identifier extracted from the Access Point Name (APN) IE in the Create Session Request message. The PLMN ID contains MCC and MNC, which are stored in Binary Coded Decimal (BCD) and encoded as presented in Table 5. The MCC and MNC should have three digits in the APN Operator Identifier as specified in Section Structure of APN in 3GPP TS 23.003.

Table 5 PLMN Identifier

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

#### Encoded ASN.1 Tag

H'9F25 p-GWPLMNIdentifier

### 4.21 RAT Type

CDR Field	R15	R13	R9	Special
RAT Type	C	C	C	No

#### Contents

Indicates the Radio Access Technology (RAT) type currently used by the UE.

### 4.21.1 Release 9, 13, and 15

#### ASN.1 Format

rATType [30] RATType OPTIONAL

RATType ::= INTEGER (0..255)

**Value**

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

0	reserved
1	UTRAN
2	GERAN
4	GAN
5	HSPA Evolution
6	E-UTRAN
8	NB-IoT
9 – 255	spare

**Encoded ASN.1 Tag**

H'9E rATType

## 4.22 Record Opening Time

CDR Field	R15	R13	R9	Special
Record Opening Time	M	M	M	Yes

**Contents**

Indicates the time when the record is opened.

### 4.22.1 Release 9, 13, and 15

**ASN.1 Format**

recordOpeningTime [13] TimeStamp

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

**Value**

Contains a time stamp as described in Section 5.2 on page 44.

**Encoded ASN.1 Tag**

H'8D recordOpeningTime



## 4.23 Record Sequence Number

CDR Field	R15	R13	R9	Special
Record Sequence Number	C	C	C	Yes

### Contents

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

### 4.23.1 Release 9, 13, and 15

#### ASN.1 Format

```
recordSequenceNumber [17] INTEGER OPTIONAL
```

#### Value

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

**Note:** For single CDRs, the record sequence number field is excluded, unless specified otherwise by configuration to be included. For information on enabling the inclusion of record sequence numbers in single CDRs, see [Offline Charging Configuration](#).

#### Encoded ASN.1 Tag

```
H'91 recordSequenceNumber
```

## 4.24 Record Type

CDR Field	R15	R13	R9	Special
Record Type	M	M	M	Yes

### Contents

Identifies the type of the CDR.

### 4.24.1 Release 9, 13, and 15

#### ASN.1 Format

```
recordType [0] RecordType
```

```
RecordType ::= INTEGER  
{
```



```

    sGWRecord          (84)
  }

```

**Value**

**84** sGWRecord

**Encoded ASN.1 Tag**

H'80 recordType

## 4.25 Served IMEISV

CDR Field	R15	R13	R9	Special
Served IMEISV	C	C	C	No

**Contents**

Contains the International Mobile Station Equipment Identity and Software Version (IMEISV) of the served party. The term served party is used to describe the mobile subscriber initiating the bearer. Present if IMEISV is provided by the S4-SGSN or MME.

### 4.25.1 Release 9, 13, and 15

**ASN.1 Format**

```
servedIMEISV [29] IMEI OPTIONAL
```

```

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

```

**Value**

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

The IMEI consists of the following elements:

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

Each element consists of decimal digits only. The elements are concatenated and BCD encoded in the order TAC, SNR, and SVN, see Table 6.



Table 6 IMEI Format

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

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

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

### Encoded ASN.1 Format

H'9D servedIMEISV

## 4.26 Served IMSI

CDR Field	R15	R13	R9	Special
Served IMSI	C	C	C	Yes

### Contents

Contains the IMSI of the served party. The term served party is used to describe the mobile subscriber initiating the bearer.

The format of the **Served IMSI** field reflects the IMSI format as received from the S4-SGSN or MME. This section describes the format of **Served IMSI**, as would result from interworking with S4-SGSNs or MMEs implemented according to standard 3GPP TS 23.003.

The **Served IMSI** field is excluded,

- If the IMSI is not provided by the SGSN or MME;
- If the IMSI is provided by the SGSN or MME but is unauthenticated, and the IMSI Unauthenticated Flag is configured to be excluded.



## 4.26.1 Release 9, 13, and 15

### ASN.1 Format

servedIMSI [3] IMSI OPTIONAL

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

TBCD-STRING ::= OCTET STRING

### Value

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

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

The IMSI components are concatenated in the following order: MCC, MNC, and MSIN. The value and encoding for TBCD-STRING is presented in Table 7.

Table 7 TBCD-STRING

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

- Digits 0–9, two digits per octet, each digit coded as 0000–1001.
- Overdecadic digits H'A–H'E, two digits per octet, each digit coded as 1010–1110.
- Filler when an odd number of digits occurs, coded as 1111.

### Encoded ASN.1 Tag

H'83 servedIMSI

## 4.27 Served MSISDN

CDR Field	R15	R13	R9	Special
Served MSISDN	C	C	C	No



## Contents

Contains the Mobile Subscriber ISDN Number (MSISDN) of the served party (including an address indicator octet), if available. The term served party is used to describe the mobile subscriber initiating the bearer.

**Note:** The format of the **Served MSISDN** field reflects the MSISDN format as received from the S4-SGSN or MME. This section describes the format of MSISDN, as would result from interworking with S4-SGSNs or MMEs implemented according to standard 3GPP TS 23.003

### 4.27.1

## Release 9, 13, and 15

### ASN.1 Format

servedMSISDN [22] MSISDN OPTIONAL

```
MSISDN ::= ISDN-AddressString
ISDN-AddressString ::= AddressString (SIZE(1..9))
AddressString ::= OCTET STRING (SIZE (1..20))
```

### Value

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

The maximum length is nine octets, of which eight stand for the TBCD digits and one for the Extension Indication, Nature of Address Indicator and Numbering Plan Indicator (NPI).

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

The data type AddressString is specified in 3GPP TS 29.002, see also Table 8.

Table 8 AddressString

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



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

(1) If this octet is not received from the S4-SGSN or MME, the EPG inserts the Extension Indicator, Nature of Address Indicator, and Numbering Plan Indicator (0x91).

### Encoded ASN.1 Tag

H'96 servedMSISDN

## 4.28 Served PDP/PDN Address

CDR Field	R15	R13	R9	Special
Served PDP/PDN Address	C	C	C	No

### Contents

Contains the IPv4 or IPv6 address for the PDN connection.

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

The field for non-IP PDN connections is not included in the Served PDP/PDN Address Extension.

### 4.28.1 Release 9, 13, and 15

#### ASN.1 Format

servedPDPAddress [9] PDPAddress OPTIONAL

PDPAddress ::= CHOICE

```
{
  iPAddress [0] IPAddress,
}
```



```

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

```

### Value

A binary IPv4 address or binary IPv6 address.

### Encoded ASN.1 Tag

```

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

```

## 4.29 Served PDP/PDN Address Extension

CDR Field	R15	R13	R9	Special
Served PDP/PDN Address Extension	C	C	C	No

### Contents

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

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

### 4.29.1 Release 9, 13, and 15

#### ASN.1 Format

```

servedPDPPDNAddressExt          [43] PDPAddress OPTIONAL

PDPAddress ::= CHOICE
{
    IPAddress                    [0] IPAddress,
}
IPAddress ::= CHOICE
{

```



```

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

```

**Value**

A binary IPv4 address.

**Encoded ASN.1 Tag**

```

H'BF2B servedPDPPDNAddressExt
  H'A0 IPAddress
  H'80 iPBinV4Address

```

## 4.30 Serving Node Address

CDR Field	R15	R13	R9	Special
Serving Node Address	M	M	M	Yes <sup>(1)</sup>

(1) Only the latest serving node address is included.

**Contents**

Contains the IPv4 or IPv6 control plane address of the involved S4-SGSN or MME received in the signaling messages from the S4-SGSN or MME. The serving node address listed here is mapped to the serving node type listed in the Serving Node Type field.

When Dual Stack IPv4v6 is used, the IPv4 address is included in the **Serving Node Address** field, and the IPv6 address is included in the Serving Node Address (IPv6) field.

### 4.30.1 Release 9, 13, and 15

**ASN.1 Format**

```

servingNodeAddress          [6] SEQUENCE OF GSNAddress

GSNAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress          IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{

```



```

    iPBinV4Address          [0] OCTET STRING (SIZE(4)),
    iPBinV6Address          [1] OCTET STRING (SIZE(16))
}

```

### Value

A binary IPv4 address or binary IPv6 address.

### Encoded ASN.1 Format

```

H'A6 servingNodeAddress
  H'80 iPBinV4Address
  H'81 iPBinV6Address

```

## 4.31 Serving Node IPv6 Address

CDR Field	R15	R13	R9	Special
Serving Node IPv6 Address	O <sub>c</sub>	O <sub>c</sub>	O <sub>c</sub>	No

### Contents

Contains the IPv6 control plane address of the involved S4-SGSN or MME received in the signaling messages from the S4-SGSN or MME when Dual Stack IPv4v6 is used.

When Dual Stack IPv4v6 is used, the IPv4 address is included in the Serving Node Address field, and the IPv6 address is included in the **Serving Node IPv6 Address** field.

### 4.31.1 Release 9, 13, and 15

#### ASN.1 Format

```

servingNodeIPv6Address          [49] SEQUENCE OF GSNAAddress OPTIONAL

GSNAAddress ::= IPAddress
IPAddress ::= CHOICE
{
    iPBinaryAddress              IPBinaryAddress,
}
IPBinaryAddress ::= CHOICE
{
    iPBinV6Address                [1] OCTET STRING (SIZE(16))
}

```

**Value**

A binary IPv6 address.

**Encoded ASN.1 Format**

```
H'BF31 servingNodeIPv6Address
H'81 ipBinV6Address
```

## 4.32 Serving Node PLMN Identifier

CDR Field	R15	R13	R9	Special
Serving Node PLMN Identifier	C	C	C	No

**Contents**

Contains the Public Land Mobile Network (PLMN) identifier, that is, Mobile Country Code (MCC) and Mobile Network Code (MNC), for the S4-SGSN or MME connected during the record.

### 4.32.1 Release 9, 13, and 15

**ASN.1 Format**

```
servingNodePLMNIdentifier [27] PLMN-Id OPTIONAL
```

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

**Value**

The value is abstracted from the *Serving Network* IE specified in SoC with 3GPP TS 29.274. The field is specified as follows:

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

The PLMN ID contains MCC and MNC, which are stored Binary Coded Decimal (BCD) encoded as presented in Table 9.

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



Table 9 PLMN Identifier

Octet	Bit							
	8	7	6	5	4	3	2	1
1	MCC Digit 2				MCC Digit 1			
2	MNC Digit 3 <sup>(1)</sup>				MCC Digit 3			
3	MNC Digit 2				MNC Digit 1			

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

### Encoded ASN.1 Tag

H'9B servingNodePLMNIdentifier

## 4.33 Serving Node Type

CDR Field	R15	R13	R9	Special
Serving Node Type	M	M	M	Yes

### Contents

Contains the serving node type of the involved S4-SGSNs or MME. The serving node type listed here is mapped to the serving node address listed in the Serving Node Address field.

The number of serving node addresses is not configurable and can only be one, so there can only be one serving node type as well.

### 4.33.1 Release 9, 13, and 15

#### ASN.1 Format

servingNodeType [35] SEQUENCE OF ServingNodeType

```
ServingNodeType ::= ENUMERATED
{
  sGSN      (0),
  mME      (5)
}
```

#### Value

0	S4-SGSN
5	MME

**Encoded ASN.1 Tag**

H'BF23 servingNodeType

## 4.34 Serving PLMN Rate Control

CDR Field	R15	R13	Special
Serving PLMN Rate Control	O <sub>c</sub>	O <sub>c</sub>	No

**Contents**

Contains the Serving PLMN Rate Control applied by MME during the transfer of the data volume captured by the container (applicable only to the SGW-CDR). This is included in the Traffic data container only if previous container's change condition is Serving PLMN Rate Control change.

**Note:** The Serving PLMN Rate Control field in SGW-CDR main level contains the Serving PLMN Rate Control when SGW-CDR was opened.

### 4.34.1 Release 13 and 15

**ASN.1 Format**

```
servingPLMNRateControl [61] servingPLMNRateControl OPTIONAL
```

```
servingPLMNRateControl ::= SEQUENCE
{
  sPLMNDLRateControlValue [0] INTEGER,
  sPLMNDLRateControlValue [1] INTEGER
```

**Value**

NULL

**Encoded ASN.1 Tag**

H'BF3D servingPLMNRateControl

## 4.35 SGW Address

CDR Field	R15	R13	R9	Special
SGW Address	M	M	M	Yes



## Contents

Contains the IPv4 or IPv6 address of the SGW for the control plane provided in the signaling messages towards the involved S4-SGSNs or MMEs.

When Dual Stack IPv4v6 is used, the IPv4 address is included in the **SGW Address** field, and the IPv6 address is included in the SGW IPv6 Address field.

### 4.35.1 Release 9, 13, and 15

#### ASN.1 Format

```
s-GWAddress [4] GSNAddress

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

#### Value

A binary IPv4 address or a binary IPv6 address.

#### Encoded ASN.1 Tag

```
H'A4 s-GWAddress
H'80 iPBinV4Address
H'81 iPBinV6Address
```

### 4.36 SGW IPv6 Address

CDR Field	R15	R13	R9	Special
SGW IPv6 Address	O <sub>c</sub>	O <sub>c</sub>	O <sub>c</sub>	No

## Contents

Contains the IPv6 address of the SGW for the control plane provided in the signaling messages towards the involved S4-SGSNs or MMEs when Dual Stack IPv4v6 is used.

When Dual Stack IPv4v6 is used, the IPv4 address is included in the SGW Address field, and the IPv6 address is included in the **SGW IPv6 Address** field.



### 4.36.1 Release 9, 13, and 15

#### ASN.1 Format

```

s-GWIPv6Address [48] GSNAddress OPTIONAL

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

```

#### Value

A binary IPv6 address.

#### Encoded ASN.1 Tag

```

H'BF30 s-GWIPv6Address
H'81 iPBinV6Address

```

## 4.37 SGW Change

CDR Field	R15	R13	R9	Special
SGW Change	C	C	C	No

#### Contents

Indicates if this is the first record after an SGW change.

### 4.37.1 Release 9, 13, and 15

#### ASN.1 Format

```

sGWChange [34] SGWChange OPTIONAL

SGWChange ::= BOOLEAN

```

#### Value

The value is either true or false.



### Encoded ASN.1 Tag

H'9F22 sGWChange

## 4.38 UNI PDU CP Only Flag

CDR Field	R15	R13	Special
UNI PDU CP Only Flag	O <sub>c</sub>	O <sub>c</sub>	No

### Contents

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

### 4.38.1 Release 13 and 15

#### ASN.1 Format

uNIPDUCPOnlyFlag [60] UNIPDUCPOnlyFlag OPTIONAL

UNIPDUCPOnlyFlag ::= BOOLEAN

#### Value

The value range is either True or False.

#### Encoded ASN.1 Tag

H'9F3C UNIPDUCPOnlyFlag





## 5 Shared Data Types

This section contains a description of shared data types used between CDR fields and subfields listed in Section 4 on page 9.

### 5.1 QoS Information

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

- EPC QoS Information, based on the QoS format used in EPS systems, in Release 9, 13, and 15. For more information, refer to *SoC with 3GPP TS 29.274*.

QoS information is included in CDRs in the following fields:

- In the List of Traffic Volumes field, in the **EPC QoS Information** subfield.

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

#### 5.1.1 EPC QoS Information

##### Contents

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

##### 5.1.1.1 Release 9 and 13

##### ASN.1 Format

```

EPCQoSInformation ::= SEQUENCE
{
    qCI                               [1] INTEGER,
    maxRequestedBandwidthUL           [2] INTEGER OPTIONAL,
    maxRequestedBandwidthDL           [3] INTEGER OPTIONAL,
    guaranteedBitrateUL                [4] INTEGER OPTIONAL,
    guaranteedBitrateDL                [5] INTEGER OPTIONAL,
    aRP                                [6] INTEGER OPTIONAL
}

```

##### Encoded ASN.1 Tag - List of Traffic Volumes

```

H'A9 ePCQoSInformation
  H'81 qCI
  H'82 maxRequestedBandwidthUL

```



H'83 maxRequestedBandwithDL  
H'84 guaranteedBitrateUL  
H'85 guaranteedBitrateDL  
H'86 aRP

### 5.1.1.2

### Release 15

#### ASN.1 Format

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

#### Encoded ASN.1 Tag - List of Traffic Volumes

H'A9 ePCQoSInformation  
H'81 qCI  
H'82 maxRequestedBandwithUL  
H'83 maxRequestedBandwithDL  
H'84 guaranteedBitrateUL  
H'85 guaranteedBitrateDL  
H'86 aRP  
H'87 aPNAggregateMaxBitrateUL  
H'88 aPNAggregateMaxBitrateDL  
H'89 extendedMaxRequestedBWUL  
H'8A extendedMaxRequestedBWDL  
H'8B extendedGBRUL  
H'8C extendedGBRDL  
H'8D extendedAPNAMBRUL  
H'8E extendedAPNAMBRDL



## 5.2 Time Stamp

### Description

Time stamps indicate the time an event occurs.

Time stamps are included in CDRs in the following fields:

- In the Record Opening Time field.
- In the List of Traffic Volumes field, in the **Change Time** subfield.
- In the List of RAN Secondary RAT Usage Reports field, in the **RAN Start Time** and **RAN End Time** subfields.

### Value

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

YY	=	Year 00 to 99	BCD encoded
MM	=	Month 01 to 12	BCD encoded
DD	=	Day 01 to 31	BCD encoded
hh	=	hour 00 to 23	BCD encoded
mm	=	minute 00 to 59	BCD encoded
ss	=	second 00 to 59	BCD encoded
S	=	Sign 0 = "+", "-"	ASCII encoded
hh	=	hour 00 to 23	BCD encoded
mm	=	minute 00 to 59	BCD encoded

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

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

TimeStamp = 010502154500+0200

## 5.3 User Location Information

User location information indicates where the UE is located. User location information is retrieved from the GTPv2 User Location Information IE.

The user location information can take the form of one of the following location types, depending on release and bearer type:



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

The following location types are supported for the SGW-CDRs:

- RAI
- CGI + RAI
- SAI + RAI
- ECGI
- TAI
- ECGI + TAI

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

User location information is included in CDRs in the following fields:

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

The following subsections describe the user location information formats supported by the EPG.

### 5.3.1 Release 9 and 13

Table 10 User Location Information Field for Routing Area Identity (RAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 1	SAI 0	CGI 0
2	MCC Digit 2				MCC Digit 1			
3	MNC Digit 3 <sup>(1)</sup>				MCC Digit 3			
4	MNC Digit 2				MNC Digit 1			



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

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

Table 11 User Location Information Field for Cell Global Identification (CGI) and Routing Area Identity (RAI)

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

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

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

Table 12 User Location Information Field for Service Area Identity (SAI) and Routing Area Identity (RAI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 0	TAI 0	RAI 1	SAI 1	CGI 0



Octet	Bit							
	8	7	6	5	4	3	2	1
2	MCC Digit 2				MCC Digit 1			
3	MNC Digit 3 <sup>(1)</sup>				MCC Digit 3			
4	MNC Digit 2				MNC Digit 1			
5	LAC (most significant octet)							
6	LAC (least significant octet)							
7	SAC (most significant octet)							
8	SAC (least significant octet)							
9	MCC Digit 2				MCC Digit 1			
10	MNC Digit 3 <sup>(2)</sup>				MCC Digit 3			
11	MNC Digit 2				MNC Digit 1			
12	LAC (most significant octet)							
13	LAC (least significant octet)							
14	RAC (most significant octet)							
15	RAC (least significant octet)							

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

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

Table 13 User Location Information Field for Tracking Area Identity (TAI)

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

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



Table 14 User Location Information Field for E-UTRAN CGI (E-CGI)

Octet	Bit							
	8	7	6	5	4	3	2	1
1	Spare			ECGI 1	TAI 0	RAI 0	SAI 0	CGI 0
2	MCC Digit 2				MCC Digit 1			
3	MNC Digit 3 <sup>(1)</sup>				MCC Digit 3			
4	MNC Digit 2				MNC Digit 1			
5	Spare				ECI			
6	ECI							
7	ECI							
8	ECI							

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

Table 15 User Location Information Field for Tracking Area Identity (TAI) and E-UTRAN CGI (E-CGI)

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

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

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





## 6 CDR ASN.1 Tag Values

### 6.1 CallEventRecord

H'BF4E SGWRecord Release 9, 13, and 15

### 6.2 SGWRecord

#### 6.2.1 Release 9

<b>TAG Value</b>	<b>Description</b>
H'80	recordType
H'83	servedIMSI
H'A4	s-GWAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpPDNType
H'A9	servedPDPPDNAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'A9	ePCQoSInformation
H'BF14	ServingPLMNRateControl



<b>TAG Value</b>	<b>Description</b>
H'80	sPLMNDLRateControlValue
H'81	sPLMNULRateControlValue
H'81	qCI
H'82	maxRequestedBandwithUL
H'83	maxRequestedBandwithDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'94	localSequenceNumber
H'96	servedMSISDN
H'97	chargingCharacteristics
H'9B	servingNodePLMNIdentifier
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F22	sGWChange
H'BF23	servingNodeType
H'BF24	p-GWAddressUsed
H'80	iPBinV4Address
H'81	iPBinV6Address
H'9F25	p-GWPLMNIdentifier
H'9F28	pDNConnectionChargingID
H'9F29	iMSIunauthenticatedFlag
H'BF2B	servedPDPPDNAddressExt
H'A0	IPAddress
H'80	iPBinV4Address
H'BF30	s-GWiPv6Address
H'81	iPBinV6Address
H'BF31	servingNodeiPv6Address



<b>TAG Value</b>	<b>Description</b>
H'81	iPBinV6Address
H'BF32	p-GWiPv6AddressUsed
H'81	iPBinV6Address

## 6.2.2 Release 13

<b>TAG Value</b>	<b>Description</b>
H'80	recordType
H'83	servedIMSI
H'A4	s-GWAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpPDNType
H'A9	servedPDPPDNAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'83	dataVolumeGPRSUpLink
H'84	dataVolumeGPRSDownLink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'A9	ePCQoSInformation
H'81	qCI
H'82	maxRequestedBandwidthUL
H'83	maxRequestedBandwidthDL
H'84	guaranteedBitrateUL



<b>TAG Value</b>	<b>Description</b>
H'85	guaranteedBitrateDL
H'86	aRP
H'BF14	ServingPLMNRateControl
H'80	sPLMNDLRateControlValue
H'81	sPLMNULRateControlValue
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'94	localSequenceNumber
H'96	servedMSISDN
H'97	chargingCharacteristics
H'9B	servingNodePLMNIdentifier
H'9D	servedIMEISV
H'9E	rATType
H'9F1F	mSTimeZone
H'9F22	sGWChange
H'92C	lowpriorityindicator
H'BF23	servingNodeType
H'BF24	p-GWAddressUsed
H'80	iPBinV4Address
H'81	iPBinV6Address
H'9F25	p-GWPLMNIdentifier
H'9F28	pDNConnectionChargingID
H'9F29	iMSIunauthenticatedFlag
H'BF2B	servedPDPPDNAddressExt
H'A0	IPAddress
H'80	iPBinV4Address
H'BF30	s-GWiPv6Address
H'BF3D	servingPLMNRateControl
H'80	sPLMNULRateControlValue
H'81	sPLMNULRateControlValue
H'BF31	servingNodeiPv6Address



<b>TAG Value</b>	<b>Description</b>
H'81	iPBinV6Address
H'BF32	p-GWiPv6AddressUsed
H'BF3F	MOExceptionDataCounter
H'9F3B	CPCIoToptimisationIndicator
H'9F3C	UNIPDUCPonlyFlag
H'9F3E	pDPPDNTYPEExtension

### 6.2.3 Release 15

<b>TAG Value</b>	<b>Description</b>
H'80	recordType
H'83	servedIMSI
H'A4	s-GWAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'85	chargingID
H'A6	servingNodeAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'87	accessPointNameNI
H'88	pdpPDNTYPE
H'A9	servedPDPDNAddress
H'A0	IPAddress
H'80	iPBinV4Address
H'81	iPBinV6Address
H'AC	listOfTrafficVolumes
H'30	(sequence indicator)
H'83	dataVolumeGPRSUplink
H'84	dataVolumeGPRSDownlink
H'85	changeCondition
H'86	changeTime
H'88	userLocationInformation
H'A9	ePCQoSInformation
H'81	qCI



<b>TAG Value</b>	<b>Description</b>
H'82	maxRequestedBandwithUL
H'83	maxRequestedBandwithDL
H'84	guaranteedBitrateUL
H'85	guaranteedBitrateDL
H'86	aRP
H'87	aPNAggregateMaxBitrateUL
H'88	aPNAggregateMaxBitrateDL
H'89	extendedMaxRequestedBWUL
H'8A	extendedMaxRequestedBWDL
H'8B	extendedGBRUL
H'8C	extendedGBRDL
H'8D	extendedAPNAMBRUL
H'8E	extendedAPNAMBRDL
H'BF14	ServingPLMNRateControl
H'80	sPLMNDLRateControlValue
H'81	sPLMNULRateControlValue
H'BF40	listOfFRANSecondaryRATUsageReports
H'30	(sequence indicator)
H'81	dataVolumeUplink
H'82	dataVolumeDownlink
H'83	rANStartTime
H'84	rANEndTime
H'85	secondaryRATType
H'8D	recordOpeningTime
H'8E	duration
H'8F	causeForRecClosing
H'91	recordSequenceNumber
H'92	nodeID
H'94	localSequenceNumber
H'96	servedMSISDN
H'97	chargingCharacteristics
H'9B	servingNodePLMNIdentifier
H'9D	servedIMEISV
H'9E	rATType



<b>TAG Value</b>	<b>Description</b>
H'9F1F	mSTimeZone
H'9F22	sGWChange
H'92C	lowpriorityindicator
H'BF23	servingNodeType
H'BF24	p-GWAddressUsed
H'80	iPBinV4Address
H'81	iPBinV6Address
H'9F25	p-GWPLMNIdentifier
H'9F28	pDNConnectionChargingID
H'9F29	iMSIunauthenticatedFlag
H'BF2B	servedPDPPDNAddressExt
H'A0	IPAddress
H'80	iPBinV4Address
H'BF30	s-GWiPv6Address
H'BF3D	servingPLMNRateControl
H'80	sPLMNULRateControlValue
H'81	sPLMNULRateControlValue
H'BF31	servingNodeiPv6Address
H'81	iPBinV6Address
H'BF32	p-GWiPv6AddressUsed
H'BF3F	MOExceptionDataCounter
H'9F3B	CPCIoTOptimisationIndicator
H'9F3C	UNIPDUCPOnlyFlag
H'9F3E	pDPPDNTypeExtension





## Reference List

### Standards

- [1] 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Numbering, addressing and identification, 3GPP TS 23.003
- [2] 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobile Application Part (MAP) specification, 3GPP TS 29.002
- [3] 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Charging architecture and principles, 3GPP TS 32.240
- [4] Domain names – Implementation and Specification, IETF RFC 1035
- [5] Clarifications to the DNS Specification, IETF RFC 2181
- [6] SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS; OSI networking and system aspects - Abstract Syntax Notation One (ASN.1); Information technology – ASN.1: Specification of basic notation, ITU-T Recommendation X.680
- [7] SERIES X: DATA NETWORKS AND OPEN SYSTEM COMMUNICATIONS; OSI networking and system aspects - Abstract Syntax Notation One (ASN.1); Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER), ITU-T Recommendation X.690