Technical Specification Group Services and System Aspects
Meeting #14, Kyoto, Japan, 17-20 December 2001

TSGS#14(01)0634

Source: **SA5 (Telecom Management)**

Title: **Rel-4 CR32.215 Charging (S5-010743)**

Document for: **Decision**

Agenda Item: **7.5.3**

	Spec	CR	R	Phase	Subject	Ca	Versi	Versi	Doc-2nd-	Workitem
SP-010634	32.215	003		Rel-4	**Correction of ASN.1 statements for backwards compatibility reason**	F	4.0.0	4.1.0	S5-010743	OAM-CH

CR-Form-v4

CHANGE REQUEST

⌘ **32.215** **CR** **003** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Correction of ASN.1 statements for backwards compatibility reason
Source:	⌘	SA5
Work item code:	⌘	OAM-CH
Date:	⌘	30/11/2001
Category:	⌘	**F**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	To ensure backwards compatibility between releases, it was found that the category of two fields in the CDRs, namely MSISDN and Durations, needs to be changed from Mandatory (M) to Operator provisioned mandatory (O_M). Note that in the scope of the G-CDR and S-CDR the "Duration" data item is kept being mandatory since this is the case for R99 already.
Summary of change:	⌘	Changes to the Tables and the ASN.1 code defining the CDRs.
Consequences if not approved:	⌘	Errors in decoding CDR may result when an older version CDR is decoded using a newer version of the decoder.

Clauses affected:	⌘	4 and 6
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	
Other comments:	⌘	

Table 1: SGSN PDP context data (S-CDR)

Field	Category	Description
Record Type	M	SGSN PDP context record.
Network Initiated PDP Context	O_C	A flag that is present if this is a network initiated PDP context.
Served IMSI	M	IMSI of the served party
Served IMEI	O_C	The IMEI of the ME, if available.
SGSN Address	O_M	The IP address of the current SGSN.
MS Network Capability	O_M	The mobile station Network Capability.
Routing Area Code (RAC)	O_M	RAC at the time of “Record Opening Time”
Location Area Code (LAC)	O_M	LAC at the time of “Record Opening Time”
Cell Identifier	O_M	Cell identity for GSM or Service Area Code (SAC) for UMTS at the time of “Record Opening Time”.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs
GGSN Address Used	M	The control plane IP address of the GGSN currently used. The GGSN address is always the same for an activated PDP context.
Access Point Name Network Identifier	O_M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O_M	PDP type, i.e. IP, PPP, IHOSS:OSP
Served PDP Address	O_C	PDP address of the served IMSI, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
List of Traffic Data Volumes	O_M	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per QoS/tariff period. Initial and subsequently changed QoS and corresponding data volumes are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this SGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the SGSN.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for closure of the record from this SGSN.
Diagnostics	O_M	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN. Only present in case of partial records.
Node ID	O_M	Name of the recording entity
Record Extensions	O_C	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O_M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O_M	An index indicating how the APN was selected.
Access Point Name Operator Identifier	O_M	The Operator Identifier part of the APN.
Served MSISDN	~~M~~O_M	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
System Type	O_C	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
CAMEL Information	O_C	Set of CAMEL information related to PDP context. For more information see Description of Record Fields. This field is present if CAMEL service is activated.
RNC Unsent Downlink Volume	O_C	The downlink data volume which the RNC has not sent to MS. This field is present when the RNC has provided unsent downlink volume count at RAB release.
Charging Characteristics Selection Mode	O_M	Holds information about how Charging Characteristics were selected.
Dynamic Address Flag	O_C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.

Table 2: GGSN PDP context data (G-CDR)

Field	Category	Description
Record Type	M	GGSN PDP context record.
Network initiated PDP context	O_C	A flag that is present if this is a network initiated PDP context.
Served IMSI	M	IMSI of the served party
GGSN Address used	M	The control plane IP address of the GGSN used.
Charging ID	M	PDP context identifier used to identify this PDP context in different records created by GSNs
SGSN Address	M	List of SGSN addresses used during this record.
Access Point Name Network Identifier	O_M	The logical name of the connected access point to the external packet data network (network identifier part of APN).
PDP Type	O_M	PDP type, i.e. IP, PPP, or IHOSS:OSP
Served PDP Address	O_C	PDP address, i.e. IPv4 or IPv6. This parameter shall be present except when both the PDP type is PPP and dynamic PDP address assignment is used.
Dynamic Address Flag	O_C	Indicates whether served PDP address is dynamic, which is allocated during PDP context activation. This field is missing if address is static.
List of Traffic Data Volumes	O_M	A list of changes in charging conditions for this PDP context, each change is time stamped. Charging conditions are used to categorise traffic volumes, such as per tariff period. Initial and subsequently changed QoS and corresponding data values are listed.
Record Opening Time	M	Time stamp when PDP context is activated in this GGSN or record opening time on subsequent partial records.
Duration	M	Duration of this record in the GGSN.
Cause for Record Closing	M	The reason for the release of record from this GGSN.
Diagnostics	O_M	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number, only present in case of partial records.
Node ID	O_M	Name of the recording entity.
Record Extensions	O_C	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O_M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
APN Selection Mode	O_M	An index indicating how the APN was selected.
Served MSISDN	~~M~~O_M	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics applied to the PDP context.
Charging Characteristics Selection Mode	O_M	Holds information about how Charging Characteristics were selected.

Table 3: SGSN Mobile Station mobility management data (M-CDR)

Field	Category	Description
Record Type	M	SGSN mobility management record.
Served IMSI	M	IMSI of the MS.
Served IMEI	O_C	The IMEI of the ME, if available.
SGSN Address	O_M	The IP address of the current SGSN.
MS Network Capability	O_M	The mobile station network capability.
Routing Area Code	O_M	Routing Area at the time of the Record Opening Time.
Local Area Code	O_M	Location Area Code at the time of Record Opening Time.
Cell Identifier	O_M	The Cell Identity for GSM or Service Area Code (SAC) for UMTS at the time of the Record Opening Time.
Change of Location	O_C	A list of changes in Routing Area Code, each with a time stamp. This field is not required if partial records are generated when the location changes.
Record Opening Time	M	Timestamp when MS is attached to this SGSN or record opening time on following partial record.
Duration	~~M~~O_M	Duration of this record.
SGSN Change	C	Present if this is first record after SGSN change.
Cause for Record Closing	M	The reason for the closure of the record in this SGSN.
Diagnostics	O_M	A more detailed reason for the release of the connection.
Record Sequence Number	C	Partial record sequence number in this SGSN; only present in case of partial records.
Node ID	O_M	Name of the recording entity.
Record Extensions	O_C	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Local Record Sequence Number	O_M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Served MSISDN	~~M~~O_M	The primary MSISDN of the subscriber.
Charging Characteristics	M	The Charging Characteristics used by the SGSN.
CAMEL Information	O_C	Set of CAMEL information related to Attach/Detach session. For more information see Description of Record Fields. This field is present if CAMEL service is activated.
System Type	O_C	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Charging Characteristics Selection Mode	O_M	Holds information about how Charging Characteristics were selected.

Table 4: SGSN Mobile originated SMS record (S-SMO-CDR)

Field	Category	Description
Record Type	M	SGSN Mobile Originated SMS.
Served IMSI	M	The IMSI of the subscriber.
Served IMEI	O_C	The IMEI of the ME, if available.
Served MSISDN	~~M~~O_M	The primary MSISDN of the subscriber.
MS Network Capability	O_M	The mobile station network capability.
Service Centre	O_M	The address (E.164) of the SMS-service centre.
Recording Entity	O_M	The E.164 number of the SGSN.
Location Area Code	O_M	The Location Area Code from which the message originated.
Routing Area Code	O_M	The Routing Area Code from which the message originated.
Cell Identifier	O_M	The Cell Identity for GSM or Service Area Code (SAC) for UMTS from which the message originated.
Message Reference	M	A reference provided by the MS uniquely identifying this message.
Event Time Stamp	M	The time at which the message was received by the SGSN from the subscriber.
SMS Result	C	The result of the attempted delivery if unsuccessful.
Record Extensions	O_C	A set of network operator/ manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Node ID	O_M	Name of the recording entity.
Local Record Sequence Number	O_M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	M	The Charging Characteristics flag set used by the SGSN.
System Type	O_C	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Destination Number	O_M	The destination short message subscriber number.
CAMEL Information	O_C	Set of CAMEL information related to SMS session. For more information see Description of Record Fields. This field is present if CAMEL service is activated.
Charging Characteristics Selection Mode	O_M	Holds information about how Charging Characteristics were selected.

Table 5: SGSN Mobile terminated SMS record (S-SMT-CDR)

Field	Category	Description
Record Type	M	SGSN Mobile Terminated SMS.
Served IMSI	M	The IMSI of the subscriber.
Served IMEI	O_C	The IMEI of the ME, if available.
Served MSISDN	~~M~~O_M	The primary MSISDN of the subscriber.
MS Network Capability	O_M	The mobile station network capability
Service Centre	O_M	The address (E.164) of the SMS-service centre.
Recording Entity	O_M	The E.164 number of the SGSN.
Location Area Code	O_M	The Location Area Code to which the message was delivered.
Routing Area Code	O_M	The Routing Area Code to which the message was delivered.
Cell Identifier	O_M	The Cell Identity for GSM or Service Area Code (SAC) for UMTS to which the message was delivered.
Event Time Stamp	M	Delivery time stamp, time at which message was sent to the MS by the SGSN.
SMS Result	C	The result of the attempted delivery if unsuccessful.
Record Extensions	O_C	A set of network operator/manufacturer specific extensions to the record. Conditioned upon the existence of an extension.
Node ID	O_M	Name of the recording entity.
Local Record Sequence Number	O_M	Consecutive record number created by this node. The number is allocated sequentially including all CDR types.
Charging Characteristics	M	The Charging Characteristics flag set used by the SGSN.
System Type	O_C	Indicates the type of air interface used, e.g. UTRAN. This field is present when either the UTRAN or GERAN air-interface is used. It is omitted when the service is provided by a GSM air interface.
Charging Characteristics Selection Mode	O_M	Holds information about how Charging Characteristics were selected.

6 Charging Data Record Structure

6.1 ASN.1 definitions for CDR information

The ASN.1 definitions are based on ISO8824 (90)/X.208 (88) [17], which has been superseded by ISO8824-1 (94)/X.680 (94)[18]. This newer version not only includes new features but also removes some that were present in ISO8824 (90)/X.208 (88) [17]. Where possible, the GPRS work would be based on those ASN.1 features to both. However, where necessary, the new features in ISO8824-1 (94)/X.680 (94) [18] be used in some places. ISO8824 (90)/X.208 (88) [17] features that are no longer in ISO8824-1 (94)/X.680 (94) [18] will not be used.

```
TS32215-DataTypes {itu-t (0) identified-organization (4) etsi (0) mobileDomain (0) umts-Operation-
Maintenance (3) ts-32-215 (215) informationModel (0) asn1Module (2) version1 (1)}


DEFINITIONS IMPLICIT TAGS   ::=

BEGIN

-- EXPORTS everything

IMPORTS

CallEventRecordType, CellId, Diagnostics, CallDuration, ManagementExtensions, TimeStamp, MSISDN,
LocationAreaCode, MessageReference, RecordingEntity, SMSResult, LevelOfCAMELService, CalledNumber,
CallingNumber, CallEventRecord
FROM TS32205-DataTypes {itu-t (0) identified-organization (4) etsi(0) mobileDomain (0)
umts-Operation-Maintenance (3) ts-32-205 (205) informationModel (0) asn1Module (2) version1 (1)}

IMSI, IMEI
FROM MAP-CommonDataTypes { ccitt identified-organization (4) etsi(0) mobileDomain (0) gsm-Network
(1) modules (3) map-CommonDataTypes (18) version6 (6) }

DefaultGPRS-Handling, DefaultSMS-Handling, ServiceKey
FROM MAP-MS-DataTypes    { ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-MS-DataTypes (11) version6 (6)  }

ManagementExtension
FROM Attribute-ASN1Module {joint-iso-ccitt ms(9) smi(3) part2 (2) asn1Module(2) 1}
;

--
-------------------------------------------------------------------------------
--
--  CALL AND EVENT RECORDS
--
-------------------------------------------------------------------------------

GGSNPDPRecord   ::= SET
{
    recordType                  [0] CallEventRecordType,
    networkInitiation           [1] NetworkInitiatedPDPContext OPTIONAL,
    servedIMSI                  [3] IMSI,
    ggsnAddress                 [4] GSNAddress,
    chargingID                  [5] ChargingID,
    sgsnAddress                 [6] SEQUENCE OF GSNAddress,
    accessPointNameNI           [7] AccessPointNameNI OPTIONAL,
    pdpType                     [8] PDPType OPTIONAL,
    servedPDPAddress            [9] PDPAddress OPTIONAL,
    dynamicAddressFlag          [11] DynamicAddressFlag OPTIONAL,
    listOfTrafficVolumes        [12] SEQUENCE OF ChangeOfCharCondition OPTIONAL,
    recordOpeningTime           [13] TimeStamp,
    duration                    [14] CallDuration,
    causeForRecClosing          [15] CauseForRecClosing,
    diagnostics                 [16] Diagnostics OPTIONAL,
    recordSequenceNumber        [17] INTEGER OPTIONAL,
    nodeID                      [18] NodeID OPTIONAL,
    recordExtensions            [19] ManagementExtensions OPTIONAL,
    localSequenceNumber         [20] LocalSequenceNumber OPTIONAL,
    apnSelectionMode            [21] APNSelectionMode OPTIONAL,
    servedMSISDN                [22] MSISDN OPTIONAL,
    chargingCharacteristics     [23] ChargingCharacteristics,
    chChSelectionMode           [24] ChChSelectionMode OPTIONAL
```

```
    }

SGSNMMRecord    ::= SET
{
    recordType                  [0] CallEventRecordType,
    servedIMSI                  [1] IMSI,
    servedIMEI                  [2] IMEI OPTIONAL,
    sgsnAddress                 [3] GSNAddress OPTIONAL,
    msNetworkCapability         [4] MSNetworkCapability OPTIONAL,
    routingArea                 [5] RoutingAreaCode OPTIONAL,
    locationAreaCode            [6] LocationAreaCode OPTIONAL,
    cellIdentifier              [7] CellId OPTIONAL,
    changeLocation              [8] SEQUENCE OF ChangeLocation OPTIONAL,
    recordOpeningTime           [9] TimeStamp,
    duration                    [10] CallDuration OPTIONAL,
    sgsnChange                  [11] SGSNChange OPTIONAL,
    causeForRecClosing          [12] CauseForRecClosing,
    diagnostics                 [13] Diagnostics OPTIONAL,
    recordSequenceNumber        [14] INTEGER OPTIONAL,
    nodeID                      [15] NodeID OPTIONAL,
    recordExtensions            [16] ManagementExtensions OPTIONAL,
    localSequenceNumber         [17] LocalSequenceNumber OPTIONAL,
    servedMSISDN                [18] MSISDN OPTIONAL,
    chargingCharacteristics     [19] ChargingCharacteristics,
    cAMELInformationMM          [20] CAMELInformationMM OPTIONAL,
    systemType                  [21] SystemType OPTIONAL,
    chChSelectionMode           [22] ChChSelectionMode OPTIONAL
}

SGSNPDPRecord   ::= SET
{
    recordType                  [0] CallEventRecordType,
    networkInitiation           [1] NetworkInitiatedPDPContext OPTIONAL,
    servedIMSI                  [3] IMSI,
    servedIMEI                  [4] IMEI OPTIONAL,
    sgsnAddress                 [5] GSNAddress OPTIONAL,
    msNetworkCapability         [6] MSNetworkCapability OPTIONAL,
    routingArea                 [7] RoutingAreaCode OPTIONAL,
    locationAreaCode            [8] LocationAreaCode OPTIONAL,
    cellIdentifier              [9] CellId OPTIONAL,
    chargingID                  [10] ChargingID,
    ggsnAddressUsed             [11] GSNAddress,
    accessPointNameNI           [12] AccessPointNameNI OPTIONAL,
    pdpType                     [13] PDPType OPTIONAL,
    servedPDPAddress            [14] PDPAddress OPTIONAL,
    listOfTrafficVolumes        [15] SEQUENCE OF ChangeOfCharCondition OPTIONAL,
    recordOpeningTime           [16] TimeStamp,
    duration                    [17] CallDuration,
    sgsnChange                  [18] SGSNChange OPTIONAL,
    causeForRecClosing          [19] CauseForRecClosing,
    diagnostics                 [20] Diagnostics OPTIONAL,
    recordSequenceNumber        [21] INTEGER OPTIONAL,
    nodeID                      [22] NodeID OPTIONAL,
    recordExtensions            [23] ManagementExtensions OPTIONAL,
    localSequenceNumber         [24] LocalSequenceNumber OPTIONAL,
    apnSelectionMode            [25] APNSelectionMode OPTIONAL,
    accessPointNameOI           [26] AccessPointNameOI OPTIONAL,
    servedMSISDN                [27] MSISDN OPTIONAL,
    chargingCharacteristics     [28] ChargingCharacteristics,
    systemType                  [29] SystemType OPTIONAL,
    cAMELInformationPDP         [30] CAMELInformationPDP OPTIONAL,
    rNCUnsentDownlinkVolume     [31] DataVolumeGPRS OPTIONAL,
    chChSelectionMode           [32] ChChSelectionMode OPTIONAL,
    dynamicAddressFlag          [33] DynamicAddressFlag OPTIONAL
}

SGSNSMORecord   ::= SET
{
    recordType                  [0] CallEventRecordType,
    servedIMSI                  [1] IMSI,
    servedIMEI                  [2] IMEI OPTIONAL,
    servedMSISDN                [3] MSISDN OPTIONAL,
    msNetworkCapability         [4] MSNetworkCapability OPTIONAL,
    serviceCentre               [5] AddressString OPTIONAL,
    recordingEntity             [6] RecordingEntity OPTIONAL,
    locationArea                [7] LocationAreaCode OPTIONAL,
    routingArea                 [8] RoutingAreaCode OPTIONAL,
    cellIdentifier              [9] CellId OPTIONAL,
```

```
    messageReference            [10] MessageReference,
    eventTimeStamp              [11] TimeStamp,
    smsResult                   [12] SMSResult OPTIONAL,
    recordExtensions            [13] ManagementExtensions OPTIONAL,
    nodeID                      [14] NodeID OPTIONAL,
    localSequenceNumber         [15] LocalSequenceNumber OPTIONAL,
    chargingCharacteristics     [16] ChargingCharacteristics,
    systemType                  [17] SystemType OPTIONAL,
    destinationNumber           [18] CalledNumber OPTIONAL,
    cAMELInformationSMS         [19] CAMELInformationSMS OPTIONAL,
    chChSelectionMode           [20] ChChSelectionMode OPTIONAL
}

SGSNSMTRecord   ::= SET
{
    recordType              [0] CallEventRecordType,
    servedIMSI              [1] IMSI,
    servedIMEI              [2] IMEI OPTIONAL,
    servedMSISDN            [3] MSISDN OPTIONAL,
    msNetworkCapability     [4] MSNetworkCapability OPTIONAL,
    serviceCentre           [5] AddressString OPTIONAL,
    recordingEntity         [6] RecordingEntity OPTIONAL,
    locationArea            [7] LocationAreaCode OPTIONAL,
    routingArea             [8] RoutingAreaCode OPTIONAL,
    cellIdentifier          [9] CellId OPTIONAL,
    eventTimeStamp          [10] TimeStamp,
    smsResult               [11] SMSResult OPTIONAL,
    recordExtensions        [12] ManagementExtensions OPTIONAL,
    nodeID                  [13] NodeID OPTIONAL,
    localSequenceNumber     [14] LocalSequenceNumber OPTIONAL,
    chargingCharacteristics [15] ChargingCharacteristics,
    systemType              [16] SystemType OPTIONAL,
    chChSelectionMode       [17] ChChSelectionMode OPTIONAL
}
```