3GPP TSG-CN Meeting #25   **NP-040335**
8th – 10th September 2004. Palm Springs, USA.

Source:	**TSG CN WG3**
Title:	**CRs to Rel-6 on Work Item "TEI6"**
Agenda item:	**9.21**
Document for:	**APPROVAL**

<u>**Introduction:**</u>

This document contains 1 CR to Rel-6 on Work Item "TEI6" that has been agreed by TSG CN WG3, and is forwarded to TSG CN Plenary for approval.

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver	Work Item
N3-040469	29.061	122		B	New sub-attributes 3GPP VSA passed on the Gi interface for charging purposes	Rel-6	6.1.0	TEI6

CR-Form-v7.1

CHANGE REQUEST

| ⌘ | **29.061** CR **122** | ⌘**rev** | **-** | ⌘ | Current version: | **6.1.0** | ⌘ |

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	New sub-attributes 3GPP VSA passed on the Gi interface for charging purposes	
Source: ⌘	TSG_CN WG3	
Work item code:⌘	CH	*Date:* ⌘ 16/08/2004
Category: ⌘ **B**		*Release:* ⌘ Rel-6

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:
    Ph2   *(GSM Phase 2)*
    R96   *(Release 1996)*
    R97   *(Release 1997)*
    R98   *(Release 1998)*
    R99   *(Release 1999)*
    Rel-4   *(Release 4)*
    Rel-5   *(Release 5)*
    Rel-6   *(Release 6)*
    Rel-7   *(Release 7)*

Reason for change: ⌘	CR 478 to 29.060 introduced a number of new IEs in GTP to enable GGSN based charging. It is proposed to pass this information via RADIUS over the Gi interface, to enable the operator to correlate the necessary information for the GGSN based charging. This CR is aligned with a set of CRs that have been approved in recent meetings to allow operators to use the information provided in the RADIUS messages by the GGSN to perform authentication, authorization and billing functions.

Summary of change:⌘	To export the required information, new 3GPP Vendor Specific Attibutes are defined:

- **RAT Type** – indicates what Radio Access Technology the subscriber is using. The coding is as in 3GPP TS 29.060.
- **User Location Information** – indicates either the CGI or SAI of where the user currently resides. The encoding is as in 3GPP TS 29.060.
- **MS Time Zone** – indicates the Time Zone (including any daylight saving time that is currently being used) of where the user currently resides. The encoding is as in 3GPP TS 29.060.
- **CAMEL Charging Information Container** – transparently send the CAMEL S-CDR information to the GGSN. The encoding is as in 3GPP TS 29.060.

The coding of the attributes is referred out to 3GPP TS 29.060 to avoid duplication and possible mis-aligned specification of the same data.

Consequences if not approved:	⌘	Stage 2 requirements are not fullfilled (According to 23.125 annex A, if RADIUS accounting is applied in the operator's network then it is recommended that this information ("SGSN type") is added to the appropriate RADIUS messages.) Correlation of all the necessary information needed for charging by the billing function connected to the GGSN via the Gi interface will not be possible.	

Clauses affected:	⌘	16.4.7			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

16.4.7   Sub-attributes of the 3GPP Vendor-Specific attribute

Table 7 describes the sub-attributes of the 3GPP Vendor-Specific attribute of the Access-Request, Access-Accept, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update and Disconnect-Request messages.
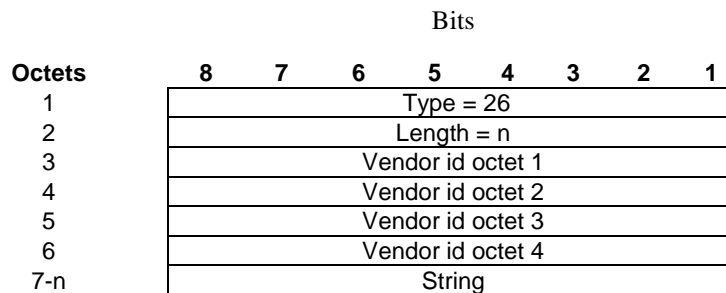
Table 7: List of the 3GPP Vendor-Specific sub-attributes

Sub-attr #	Sub-attribute Name	Description	Presence Requirement	Associated attribute (Location of Sub-attr)
1	3GPP-IMSI	IMSI for this user	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
2	3GPP-Charging-Id	Charging ID for this PDP Context (this together with the GGSN-Address constitutes a unique identifier for the PDP context).	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
3	3GPP-PDP Type	Type of PDP context, e.g. IP or PPP	Conditional (mandatory if attribute 7 is present)	Access-Request Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
4	3GPP-CG-Address	Charging Gateway IP address	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
5	3GPP-GPRS-Negotiated-QoS-Profile	QoS profile applied by GGSN	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
6	3GPP-SGSN-Address	SGSN IP address that is used by the GTP control plane for the handling of control messages. It may be used to identify the PLMN to which the user is attached.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
7	3GPP-GGSN-Address	GGSN IP address that is used by the GTP control plane for the context establishment. It is the same as the GGSN IP address used in the GCDRs.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
8	3GPP-IMSI-MCC-MNC	MCC and MNC extracted from the user's IMSI (first 5 or 6 digits, as applicable from the presented	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update

Sub-attr #	Sub-attribute Name	Description	Presence Requirement	Associated attribute (Location of Sub-attr)
		IMSI).		
9	3GPP-GGSN- MCC-MNC	MCC-MNC of the network the GGSN belongs to.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
10	3GPP-NSAPI	Identifies a particular PDP context for the associated PDN and MSISDN/IMSI from creation to deletion.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP Accounting-Request Interim-Update
11	3GPP- Session-Stop-Indicator	Indicates to the AAA server that the last PDP context of a session is released and that the PDP session has been terminated.	Optional	Accounting Request STOP
12	3GPP- Selection-Mode	Contains the Selection mode for this PDP Context received in the Create PDP Context Request Message	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
13	3GPP-Charging-Characteristics	Contains the charging characteristics for this PDP Context received in the Create PDP Context Request Message (only available in R99 and later releases)	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
14	3GPP-CG-IPv6-Address	Charging Gateway IPv6 address	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
15	3GPP-SGSN-IPv6-Address	SGSN IPv6 address that is used by the GTP control plane for the handling of control messages. It may be used to identify the PLMN to which the user is attached.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
16	3GPP-GGSN-IPv6-Address	GGSN IPv6 address that is used by the GTP control plane for the context establishment.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
17	3GPP- IPv6-DNS-Servers	List of IPv6 addresses of DNS servers for an	Optional	Access-Accept

Sub-attr #	Sub-attribute Name	Description	Presence Requirement	Associated attribute (Location of Sub-attr)
		APN		
18	3GPP-SGSN-MCC-MNC	MCC and MNC extracted from the RAI within the Create PDP Context Request or Update PDP Context Request message.	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
19	3GPP-Teardown-Indicator	Indicate to the GGSN that all PDP contexts for this particular user and sharing the same user session need to be deleted.	Optional	Disconnect Request
20	3GPP-IMEISV	International Mobile Equipment Id and its Software Version	Optional	Accounting-Request START, Access-Request
21	3GPP-RAT-Type	Indicate which Radio Access Technology is currently serving the UE	Optional	Access-Request, Accounting-Request START, Accounting-Request STOP, Accounting-Request Interim-Update
22	3GPP-User-Location-Info	Indicate details of where the UE is currently located (e.g. SAI or CGI).	Optional	Accounting-Request START, Access-Request, Accounting-Request STOP, Accounting-Request Interim-Update
23	3GPP-MS-TimeZone	Indicate the offset between universal time and local time in steps of 15 minutes of where the MS currently resides.	Optional	Accounting-Request START, Access-Request, Accounting-Request STOP, Accounting-Request Interim-Update
24	3GPP-CAMEL-Charging-Info	Used to copy any CAMEL Information present in S-CDR(s).	Optional	Accounting-Request START, Access-Request

The RADIUS vendor Attribute is encoded as follows (as per RFC 2865 [38])

Bits

Octets	8	7	6	5	4	3	2	1
1	Type = 26							
2	Length = n							
3	Vendor id octet 1							
4	Vendor id octet 2							
5	Vendor id octet 3							
6	Vendor id octet 4							
7-n	String							

$n \geq 7$

3GPP Vendor Id = 10415

The string part is encoded as follows:

					Bits			
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	3GPP type =							
2	3GPP Length = m							
3 −m	3GPP value							

m ≥ 2 and m ≤ 248

The 3GPP specific attributes encoding is clarified below.

1 - 3GPP-*IMSI*

					Bits			
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	3GPP type = 1							
2	3GPP Length= m							
3-m	IMSI digits 1-n (UTF-8 encoded)							

3GPP Type: 1

n ≤15

Length: m ≤ 17

IMSI value: Text:

This is the UTF-8 encoded IMSI; The definition of IMSI shall be in accordance with 3GPP TS 23.003 [40] and 3GPP TS 29.060 [24]. There shall be no padding characters between the MCC and MNC, and between the MNC and MSIN. If the IMSI is less than 15 digits, the padding in the GTP information element shall be removed by the GGSN and not encoded in this sub-attribute.

2 - 3GPP-*Charging ID*

					Bits			
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	3GPP type = 2							
2	3GPP Length= 6							
3	Charging ID value Octet 1							
4	Charging ID value Octet 2							
5	Charging ID value Octet 3							
6	Charging ID value Octet 4							

3GPP Type: 2

Length: 6

Charging ID value: 32 bits unsigned integer

3 - 3GPP-***PDP type***

Bits

Octets	8	7	6	5	4	3	2	1
1				3GPP type = 3				
2				3GPP Length= 6				
3				PDP type octet 1				
4				PDP type octet 2				
5				PDP type octet 3				
6				PDP type octet 4				

3GPP Type: 3

Length: 6

PDP type value: Unsigned 32 bits integer

PDP type octet possible values:

0 = IPv4

1 = PPP

2 = IPv6

4 - 3GPP-***Charging Gateway address***

Bits

Octets	8	7	6	5	4	3	2	1
1				3GPP type = 4				
2				3GPP Length= 6				
3				Charging GW addr Octet 1				
4				Charging GW addr Octet 2				
5				Charging GW addr Octet 3				
6				Charging GW addr Octet 4				

3GPP Type: 4

Length: 6

Charging GW address value: Address

5 - 3GPP-***GPRS Negotiated QoS profile***

Bits

Octets	8	7	6	5	4	3	2	1
1				3GPP type = 5				
2				3GPP Length= L				
3 -L				UTF-8 encoded QoS profile				

3GPP Type: 5

Length: L ≤ 33 (release 5) or L ≤ 27 (release 99) or L = 11 (release 98)

QoS profile value: Text

UTF-8 encoded QoS profile syntax:

"<Release indicator> – <release specific QoS IE UTF-8 encoding>"

<Release indicator> = UTF-8 encoded number :

"98" = Release 98

"99"= Release 99

"05"= Release 5

<release specific QoS profile UTF-8 encoding> = UTF-8 encoded QoS profile for the release indicated by the release indicator.

The UTF-8 encoding of a QoS IE is defined as follows: each octet is described by 2 UTF-8 encoded digits, defining its hexadecimal representation. The QoS profile definition is in 3GPP TS 24.008 [54].

The release 98 QoS profile data is 3 octets long, which then results in a 6 octets UTF-8 encoded string.

The release 99 QoS profile data is 11 octets long, which results in a 22 octets UTF-8 encoded string.

The release 5 QoS profile data is 14 octets long, which results in a 28 octets UTF-8 encoded string.

6 - 3GPP-*SGSN address*

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 6							
2	3GPP Length= 6							
3	SGSN addr Octet 1							
4	SGSN addr Octet 2							
5	SGSN addr Octet 3							
6	SGSN addr Octet 4							

3GPP Type: 6

Length: 6

SGSN address value: Address

7 - 3GPP-*GGSN address*

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 7							
2	3GPP Length= 6							
3	GGSN addr Octet 1							
4	GGSN addr Octet 2							
5	GGSN addr Octet 3							
6	GGSN addr Octet 4							

3GPP Type: 7

Length: 6

GGSN address value: Address

8 - 3GPP-***IMSI MCC-MNC***

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 8							
2	3GPP Length= n							
3	MCC digit1 (UTF-8 encoded)							
4	MCC digit2 (UTF-8 encoded)							
5	MCC digit3 (UTF-8 encoded)							
6	MNC digit1 (UTF-8 encoded)							
7	MNC digit2 (UTF-8 encoded)							
8	MNC digit3 if present (UTF-8 encoded)							

3GPP Type: 8

Length: n shall be 7 or 8 octets depending on the presence of MNC digit 3

MS address value: text

This is the UTF-8 encoding of the MS MCC-MNC values. In accordance with 3GPP TS 23.003 [40] and 3GPP TS 29.060 [24] the MCC shall be 3 digits and the MNC shall be either 2 or 3 digits. There shall be no padding characters between the MCC and MNC.

9 - 3GPP-***GGSN MCC-MNC***

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 9							
2	3GPP Length= n							
3	MCC digit1 (UTF-8 encoded)							
4	MCC digit2 (UTF-8 encoded)							
5	MCC digit3 (UTF-8 encoded)							
6	MNC digit1 (UTF-8 encoded)							
7	MNC digit2 (UTF-8 encoded)							
8	MNC digit3 if present (UTF-8 encoded)							

3GPP Type: 9

Length: n shall be 7 or 8 octets depending on the presence of MNC digit 3

GGSN address value: text

This is the UTF-8 encoding of the GGSN MCC-MNC values. In accordance with 3GPP TS 23.003 [40] and 3GPP TS 29.060 [24] the MCC shall be 3 digits and the MNC shall be either 2 or 3 digits. There shall be no padding characters between the MCC and MNC.

10 - 3GPP-***NSAPI***

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 10							
2	3GPP Length= 3							
3	NSAPI							

3GPP Type: 10

Length: 3

NSAPI value: text

It is the value of the NSAPI of the PDP context the RADIUS message is related to. It is encoded as its hexadecimal representation, using 1UTF-8 encoded digit.

11 - 3GPP-*Session Stop Indicator*

Bits

Octets	8	7	6	5	4	3	2	1
1				3GPP type = 11				
2				3GPP Length= 3				
3			1 1 1 1 1 1 1 1					

3GPP Type: 11

Length: 3

Value is set to all 1.

12 - 3GPP-*Selection-Mode*

Bits

Octets	8	7	6	5	4	3	2	1
1				3GPP type = 12				
2				3GPP Length= 1				
3			UTF-8 encoded Selection mode string					

3GPP Type: 12

Length: 3

Selection mode value: Text

The format of this attribute shall be a character string consisting of a single digit, mapping from the binary value of the selection mode in the Create PDP Context message (3GPP TS 29.060 [24]). Where 3GPP TS 29.060 [24] provides for interpretation of the value, e.g. map '3' to '2', this shall be done by the GGSN.

13 - 3GPP-*Charging-Characteristics*

Bits

Octets	8	7	6	5	4	3	2	1
1				3GPP type = 13				
2				3GPP Length= 6				
3-6			UTF-8 encoded Charging Characteristics value					

3GPP Type: 13

Length: 6

Charging characteristics value: Text

> The charging characteristics is value is the value of the 2 octets value field taken from the GTP IE described in 3GPP TS 29.060 [24], subclause 7.7.23.

> Each octet of this IE field value is represented via 2 UTF-8 encoded digits, defining its hexadecimal representation.

14 - 3GPP-*Charging Gateway IPv6 address*

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 14							
2	3GPP Length= 18							
3	Charging GW IPv6 addr Octet 1							
4	Charging GW IPv6 addr Octet 2							
5-18	Charging GW IPv6 addr Octet 3-16							

3GPP Type: 14

Length: 18

Charging GW IPv6 address value: IPv6 Address

15 - 3GPP-*SGSN IPv6 address*

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 15							
2	3GPP Length= 18							
3	SGSN IPv6 addr Octet 1							
4	SGSN IPv6 addr Octet 2							
5-18	SGSN IPv6 addr Octet 3-16							

3GPP Type: 15

Length: 18

SGSN IPv6 address value: IPv6 Address

16 - 3GPP-*GGSN IPv6 address*

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 16							
2	3GPP Length= 18							
3	GGSN IPv6 addr Octet 1							
4	GGSN IPv6 addr Octet 2							
5-18	GGSN IPv6 addr Octet 3-16							

3GPP Type: 16

Length: 18

GGSN IPv6 address value: IPv6 Address

17 - 3GPP-*IPv6-DNS-Servers*

Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 17							
2	3GPP Length= m							
3-18	(1st) DNS IPv6 addr Octet 1-16							
19-34	(2nd) DNS IPv6 addr Octet 1-16							
k-m	(n-th) DNS IPv6 addr Octet 1-16							

3GPP Type: 17

Length: m = n × 16 + 2; n ≥ 1 and n ≤ 15; k = m-15

IPv6 DNS Server value: IPv6 AddressThe 3GPP- IPv6-DNS-Servers Attribute provides a list of one or more ('n') IPv6 addresses of Domain Name Server (DNS) servers for an APN. The DNS servers are listed in the order of preference for use by a client resolver, i.e. the first is 'Primary DNS Server', the second is 'Secondary DNS Server' etc. The attribute may be included in Access-Accept packets.

18 - 3GPP-*SGSN MCC-MNC*

	Bits							
Octets	8	7	6	5	4	3	2	1
1	3GPP type = 18							
2	3GPP Length= n							
3	MCC digit1 (UTF-8 encoded)							
4	MCC digit2 (UTF-8 encoded)							
5	MCC digit3 (UTF-8 encoded)							
6	MNC digit1 (UTF-8 encoded)							
7	MNC digit2 (UTF-8 encoded)							
8	MNC digit3 if present (UTF-8 encoded)							

3GPP Type: 18

Length: n shall be 7 or 8 octets depending on the presence of MNC digit 3

SGSN address value: text

This is the UTF-8 encoding of the RAI MCC-MNC values. In accordance with 3GPP TS 23.003 [40] and 3GPP TS 29.060 [24] the MCC shall be 3 digits and the MNC shall be either 2 or 3 digits. There shall be no padding characters between the MCC and MNC.

19 - 3GPP-*Teardown Indicator*

	Bits							
Octets	8	7	6	5	4	3	2	1
1	3GPP type = 19							
2	3GPP Length= 3							
3	spare							TI

3GPP Type: 19

Length: 3

If the value of TI is set to "1", then all PDP contexts that share the same user session with the PDP context identified by the NSAPI included in the Delete PDP Context Request Message shall be torn down. Only the PDP context identified by the NSAPI included in the Delete PDP context Request shall be torn down if the value of TI is "0".

20 - 3GGP- IMEISV

Bits								
Octets	8	7	6	5	4	3	2	1
1	3GPP Type = 20							
2	3GPP Length = 18							
3	IMEISV digits 1 - n							

3GPP Type: 20

n = 16 where TAC = 8 digits SNR = 6 digits & SVN = 2 digits

21 - 3GPP-*RAT-Type*

	Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 21							
2	3GPP Length= 3							
3	RAT							

3GPP Type: 21

The 3GPP-RAT-Type attribute indicates which Radio Access Technology is currently serving the UE.

RAT field: Radio Access Technology type values. It shall be coded as specified in TS 29.060 [24]

22 - 3GPP-*User-Location-Info*

	Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 22							
2	3GPP Length= m							
3	Geographic Location Type							
4-m	Geographic Location							

3GPP Type: 22

Length=m, where m depends on the Geographic Location Type

       m= 11 in the CGI and SAI types.

Geographic Location Type filed is used to convey what type of location information is present in the 'Geographic Location' field. The geographic loction type values and coding are as defined in TS 29.060 [24].

Geographic Location filed is used to convey the actual geographic information as indicated in the Geographic Location Type. The coding of this field is as specified in TS 29.060 [24]

23 - 3GPP-*MS-TimeZone*

	Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 23							
2	3GPP Length= 4							
3	Time Zone							
4	Daylight Saving Time							

3GPP Type: 23

Length=4

The Time Zone field and the Dyalight Saving Time fields are used to indicate the offset between universal time and local time in steps of 15 minutes of where the MS current resides. Both fields are coded as specified in 3GPP TS 29.060 [24].

24 - 3GPP-*Camel-Charging-Info*

	Bits

Octets	8	7	6	5	4	3	2	1
1	3GPP type = 24							
2	3GPP Length= m							
3-m	CAMEL Charging Information Container							

3GPP Type: 24

Length=m

   m depends on the size of the CAMELInformationPDP IE.

The CAMEL Charging Information Container field is used to copy the CAMELInformationPDP IE including Tag and Length from the SGSN's CDR (S-CDR). The coding of this field is as specified in 3GPP TS 29.060 [24]

Octets	8	7	6	5	4	3	2	1
1								
2								
3-m								