3GPP TSG CT Meeting #28 **CP-050129**
1st – 3rd June 2005. Quebec, CANADA. ***(Revision of* CP-050027 and *C4-050897)***

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.232** **CR** **174** ⌘ **rev** **5** ⌘ 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:	⌘	Codec encoding
Source:	⌘	Lucent, Alcatel
Work item code:	⌘	TEI6
Date:	⌘	17/05/2005
Category:	⌘	**F**
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: ⌘ Q.1950 does not sufficiently specify without ambiguity how a 3GPP codec shall be encoded in GCP. The setting rules for the vsel and codecconfig parameters need to be made precise.
Chapter 15.1.3. specifying the TFO package leaves the text encoding of CodecList possible values as for further study. Though there exists already implementations with text encoding so the specification is needed to be able to have common and same functionality as with binary encoding.

Summary of change: ⌘ Statements are added in Section 11 to remove any ambiguity on how codecs shall be encoded in text encoding of H.248.

- the encoding of the "a=codecconfig:" line of text encoding, and ACodec property of binary encoding are clarified and illustrated by examples. The same encoding rules apply to both text and binary encodings.
- The encoding principles defined for ITU-T G.711 codecs also apply to the 3GPP codecs
- The setting of the 3GUP properties indicate whether 3GPP FP is applicable or not.
- This also allows to have similar rules whether the codec is encoded as a standalone codec cfg or within a list of codecs.

Encoding of the TFO codec list is specified in section 15.1.3.
The reference to the H.248 Annex C in the TFO package section is replaced by a reference to section 11.

Consequences if ⌘ There is a serious risk that MSC servers and MGWs provided by different

not approved:	suppliers do not interwork

Clauses affected:	⌘	11, 15.2.2, 15.2.2.1, 15.2.2.2, 15.2.2.5		
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘
			X	Test specifications
			X	O&M Specifications

Other comments: ⌘ **This CR takes as a basis 3GPP TS 29.232 v6.1.0 plus Tdoc CP-050130 (CR 29.232-208 rev4 revised from C4-050900). Hence it can be approved only under the condition that Tdoc CP-050130 is approved by CT Plenary. Text added by Tdoc CP-050130 is coloured in green in this CR for information and the additonal changes required by this CR are shown inserted appropriately.**

Q.1950 definitions :

*The **codec** is listed within the **vsel** command.*
The "**codecconfig**" attribute line parameter is used with codecs that require further specification of the characteristics of the codec as specified in ITU-T Rec. Q.765.5. This line is therefore optional. The format of the attribute line is as follows.

a = vsel:<encodingName #1> <packetLength #1><packetTime #1>
where:<encodingName> represents the name of a codec e.g. G.711 : encoding names are based on IANA formats – see RFC 1890

⇨ There is not a systematic encoding name for the different codec types defined in TS 26.103 (e.g. how to differentiate UMTS_AMR from UMTS_AMR2 ?. Besides, existing ones refer to codec encoding specified by IETF (e.g. RFC 3267 for AMR) which is not encoded the same way as AMR/Nb. On the other hand, TS 29.414 indicates :

"*The IuFP is registered with IANA as the MIME type "VND.3GPP.IuFP"of the "audio" category, however, this registration does not preclude the use of IuFP to transport "data".*

*a = codecconfig <value of **codec configuration** as per ITU-T Q.765.5>*

⇨ if this refers to the 'codec configuration' field defined in Q.765.5 section 11.1.7.2.1 (which is by the way specific to ITU-T codecs), it means that the Organization Identifier & Codec Type fields are excluded.

⇨ Or it may refer to how a codec is generally defined in Q.765.5, i.e. to Figure 14/Q.765.5. In such a case, the Organization Identifier & Codec Type fields are included and the added value of the vsel parameter is nearly null.

The Acodec ASN.1 definition does not have such ambiguity : a precise reference is given towards section ' 11.1.7/Q.765.5 for the format and the encoding of this string. The definition here corresponds to the second aforementioned interpretation.

The RFC 3108 definition of 'codecconfig' is also in line with the second interpretation.

*When present, the 'codecconfig' attribute is used to represent the **contents** of the single codec information element (IE) defined in ITU Q.765.5 [57]. The contents of this IE are: a single-octet*

Organizational Identifier (OID) field, followed by a single-octet Codec Type field, followed by zero or more octets of a codec configuration bit-map. The semantics of the codec configuration bit-map are specific to the organization [57, 58].

Q.765.5 definitions :

11.1.1 General layout

The general layout of the Encapsulated Application Information field of the Application Transport parameter (see [1] and [3]) is shown in Figure 7.

8=MSB 7 6 5 4 3 2 1=LSB	Octets
Identifier 1	1
Length indicator 1	2
Compatibility information 1	3
Contents 1	4
Identifier n	m
Length indicator n	
Compatibility information n	
Contents n	p

Figure 7/Q.765.5 – Encapsulated Application Information field

11.1.7 Single Codec

The Single Codec information element for a specific codec is coded as a variable length field with the following subfields:

- OID – Organization identifier subfield – (1 octet): Identifies standardization/private organizations;
- Codec Information subfield.

Figure 14 illustrates the layout of the Single Codec information element.

MSB 8 7 6 5 4 3 2 1 LSB	Octets
Organization Identifier	1
Codec Information	2 n

Figure 14/Q.765.5 – Single Codec

11.1.7.2 Codec Information subfield

11.1.7.2.1 ITU-T

The format of the Codec Information subfield in case of Organization ID = ITU-T is shown in Figure 15.

MSB 8 7 6 5 4 3 2 1 LSB	Octets
Codec Type	1
Codec Configuration	2 n

Figure 15/Q.765.5 – Codec Information subfield

Please also see TS 26.103 for the relevent encoding of 3GPP codec types.

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.

11 Mandatory Support of SDP and H.248 Annex C information elements

This section shall be in accordance with the subclause "Mandatory Support of SDP and H.248 Annex C information elements" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]), with the following requirements :

- Mc Single Codec encoding :

  The ACodec property in H.248 binary encoding and codecconfig attribute in H.248 text encoding are set as defined in ITU-T Recommendation Q.765.5 [24], for single codec information (figure 14/Q.765.5), where the Codec Information is defined either in ITU-T Recommendation Q.765.5 [24] or in another specification for the given Organization Identifier. For 3GPP codecs these are defined in 3GPP TS 26.103 [16]. The ACodec and codecconfig parameter contains the contents of the Single Codec information, excluding the Single Codec Identifier, Length Indication and Compatibility Information.

  The 'vsel' attribute is omitted in H.248 text encoding.

  Example of encoding of an AMR codec :

  Acodec = 0206959504 (binary encoding)

  codecconfig = 0206959504 (text encoding)

  where AMR parameters are: ETSI, UMTS_AMR_2, [ACS={4.75, 5.90, 7.4, 12.2}, SCS={4.75, 5.90, 7.4, 12.2}, OM=0, MACS=4]

  Example of encoding of the G.711 codec :

  Acodec = 0101 (binary encoding)

  codecconfig = 0101 (text encoding)

  Note: The "Mc Single Codec information" differs from the ITU-T defined "Single Codec information", while on the Nc interface (i.e. in OoBTC) the ITU-T Single Codec information is used without deviation.

15.2.2 TFO package

~~The addition of text encoding for the TFO codec list is for further study.~~

PackageID: threegtfoc (0x0031)

Version: 2

Extends: None

This package defines events and properties for Tandem Free Operation (TFO) control. TFO uses inband signalling and procedures for Transcoders to enable compressed speech to be maintained between a tandem pair of transcoders. This package allows an MGW, which has inserted a transcoder, to support TFO.

15.2.2.1 Properties

TFO Activity Control:

PropertyID: tfoenable (0x0001).

Description: Defines if TFO is enabled or not.

Type: Enumeration.

Possible Values:

- "On" (0x0001): TFO is enabled, TFO protocol is supported.
- "Off" (0x0002): TFO is not enabled, TFO protocol is not initiated or terminated.

Defined in: Local Control descriptor.

Characteristics: Read/Write.

TFO Codec List:

PropertyID: codeclist (0x0002).

Description: List of codecs for use in TFO protocol, the Local Used Codec (see 3GPP TS 28.062 [5]) is always the first entry in the list. The MSC Server may enable TFO without providing a TFO Codec List ; in this case, the MGW shall behave as if it had received a TFO Codec List composed of the selected codec of the opposing termination within the Context.

Type: Sub-list of Octet string

Possible Values:

List of codec types; each entry:

Mc Single Codec, similar to as defined in Q.765.5, for single codec information (Figure 14/Q.765.5), where the Codec Information is defined either in Q.765.5 or in another specification for the given Organisation Identifier. For 3GPP codecs these are defined in 3GPP TS 26.103 [16]. The ACodec property in H.248 binary encoding or codecconfig attribute in H.248 text encoding ~~parameters~~ contain the contents of the ITU-T Single Codec information, excluding the Single Codec Identifier, Length Indication and Compatibility Information.

In H.248 text encoding, the value of the codeclist property shall be encoded as:

LBRKT codecconfig *(COMMA codecconfig) RBRKT

Example: H.248 text encoding of the TFO codec list (UMTS_AMR_2 with Preferred Configuration set 1, and UMTS_AMR-WB with Preferred Configuration set 0):

Threegtfoc/codeclist = { 0206959504 , 020A00 }

Where:

- UMTS_AMR_2 parameters are: ETSI, UMTS_AMR_2, ACS={12.2, 7.4, 5.9, 4.75}, SCS={12.2, 7.4, 5.9, 4.75}, OM=0 plus MACS=4
- UMTS_AMR_WB parameters are: ETSI, UTMS_AMR_WB, Config-WB-Code=00

Defined in: Local Control descriptor.

Characteristics: Read/Write.

15.2.2.2 Events

Optimal Codec Event:

EventID: codec_modify (0x0010).

Description: The event is used to notify the MGC that TFO negotiation has resulted in an optimal codec type being proposed.

EventsDescriptor Parameters: None.

ObservedEventsDescriptor Parameters:

- Optimal Codec Type.
  - ParameterID: optimalcodec (0x0011).
  - Description: indicates which is the proposed codec type for TFO.
  - Type: Octet string.
  - Possible Values:

    Mc Single Codec;

    Similar to as defined in Q.765.5, for the ITU-T single codec information (Figure 14/Q.765.5), where the Codec Information is defined either in Q.765.5 or in another specification for the given Organisation Identifier. For 3GPP codecs these are defined in 3GPP TS 26.103 [16]. The ACodec property in H.248 binary encoding or codecconfig attribute in H.248 text encoding ~~parameters~~ contain the contents of the ITU-T Single Codec information, excluding the Single Codec Identifier, Length Indication and Compatibility Information.

Codec List Event:

EventID: distant codec_list (0x0012).

Description: The event is used to notify the MGC of the distant TFO partner's supported codec list.

EventsDescriptor Parameters: None.

ObservedEventsDescriptor Parameters:

- Distant Codec List:
  - ParameterID: distlist(0x0013).
  - Description: indicates the codec list for TFO.
  - Type: Sub-list of Octet string.
  - Possible Values:

    List of codec types; each entry:

    Mc Single Codec similar to as defined in Q.765.5, for single codec information (Figure 14/Q.765.5), where the Codec Information is defined either in Q.765.5 or in another specification for the given Organisation Identifier. For 3GPP codecs these are defined in 3GPP TS 26.103 [16]. The ACodec property in H.248 binary encoding or codecconfig attribute in H.248 text encoding ~~parameters~~ contain the contents of the ITU-T Single Codec information, excluding the Single Codec Identifier, Length Indication and Compatibility Information

  - The first Codec Type in the list is the Distant Used Codec, received from the distant TFO partner (see 3GPP TS 28.062 [5]).

    In H.248 text encoding, the value of the distlist parameter shall be encoded as:

    LBRKT codecconfig *(COMMA codecconfig) RBRKT

TFO Status Event:

EventID: TFO_status (0x0014).

Description: The event is used to notify the MGC that a TFO link has been established or broken.

EventsDescriptor Parameters: None.

ObservedEventsDescriptor Parameters:

- TFO Status:
  - ParameterId: tfostatus (0x0015).
  - Description: reports whether TFO has been established or broken. Upon TFO activation, no notification is sent if TFO has not been established. A TFO_Off notification is only reported when a TFO link previously established is broken. The MGW should not report transient TFO status change.
  - Type: Boolean
  - Possible Values:
    - "TFO_On" : TFO has been established.
    - "TFO_Off" : TFO is no more established.

15.2.2.3 Signals

None.

15.2.2.4 Statistics

None.

15.2.2.5 Procedures

For the procedures for TFO see 3GPP TS 28.062 [5].

To enable TFO, the MSC Server shall configure the properties of this package on a MGW Termination with the media stream property for Codec Type set to ITU-T Recommendation G.711 [25] (see sub-clause 11~~annex C of ITU-T Recommendation H.248 [10]~~); in this case, the Codec Type property of the media stream at the opposing Termination within the Context shall not be set to ITU-T Recommendation G.711 [25]. The MSC Server shall properly terminate TFO if the call configuration becomes no longer TFO compatible or if the Codec Type property of the media stream at the opposing termination in the Context is reconfigured to G.711.