

Source: TSG-SA WG4

Title: CRs TS 26.103 on Harmonisation of AMR Configurations & several Corrections (Releases 5 and 6)

Document for: Approval

Agenda Item: 7.4.3

The following CRs, agreed at the TSG-SA WG4 meeting #32, are presented to TSG SA #25 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.103	023	2	Rel-6	Harmonisation of AMR Configurations	C	5.4.0	S4	TSG-SA WG4#32	S4-040595
26.103	024	2	Rel-5	Codec Identifier (CoID) for the telephone-event	F	5.4.0	S4	TSG-SA WG4#32	S4-040552
26.103	025	1	Rel-6	Error Fixes	F	5.4.0	S4	TSG-SA WG4#32	S4-040573
26.103	028	1	Rel-5	Correction of Size and Reference of MuMe Codec	F	5.4.0	S4	TSG-SA WG4#32	S4-040572
26.103	029	1	Rel-6	Correction of Size and Reference of MuMe Codec	A	5.4.0	S4	TSG-SA WG4#32	S4-040553

CHANGE REQUEST

⌘ **TS 26.103 CR 024** ⌘ rev **2** ⌘ Current version: **5.4.0** ⌘

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

Title:	⌘ Codec Identifier (CoID) for the telephone-event		
Source:	⌘ TSG SA WG4		
Work item code:	⌘ IMS-CODEC	Date:	⌘ 14/09/2004
Category:	⌘ F	Release:	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4	(Release 4)
		Rel-5	(Release 5)
		Rel-6	(Release 6)

Reason for change:	⌘ 3GPP has not specified a codec identifier for the codec corresponding to the telephone-event MIME type defined in RFC 2833. As a consequence, the codec cannot be transferred over the H.248 based Mn interface when binary encoding is used. H.248 defines that the ACodec property value is defined in either in ITU-T Q.765.5 or in case of non ITU-T codec "Non-ITU-T codecs are defined with the appropriate standards organization under a defined Organizational Identifier". This codec is used only in IMS side but in order to maintain all CoIDs in a single 3GPP document it's proposed to be added to TS 26.103.
Summary of change:	⌘ Codec identifier for transferring DTMF in RTP payload has been added and also the reference list has been extended with RFC 2833
Consequences if not approved:	⌘ There is no mean to transfer the 'telephone-event' codec to the IM-MGW when binary encoding H.248 is used.

Clauses affected:	⌘ 2, 5.9						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<input checked="" type="checkbox"/>	Test specifications					
	<input checked="" type="checkbox"/>	O&M Specifications					
Other comments:	⌘						

First modified Section

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 26.090 : "AMR Speech Codec; Speech Transcoding Functions".
- [2] 3GPP TS 26.093 : "AMR Speech Codec; Source Controlled Rate Operation".
- [3] 3GPP TS 26.101 : "Mandatory Speech Codec Speech Processing Functions; AMR Speech Codec Frame Structure".
- [4] 3GPP 46.0xx: "Enhanced Full Rate Codec Recommendations".
- [5] 3GPP 26.0xx: "Adaptive Multi-Rate Codec Recommendations".
- [6] "ITU Q.765.5: "Use of Application Transport Mechanism for Bearer Independent Call Control"
- [7] 3GPP TS 28.062: "In-band Tandem Free Operation (TFO) of Speech Codecs, Stage 3 - Service Description".
- [8] 3GPP TS 23.153: "Out of Band Transcoder Control - Stage 2".
- [9] 3GPP TS 24.008: "Mobile radio interface layer 3 specifications, Core Network Protocols"
- [10] 3GPP TS 26.190: "AMR Wideband Speech Codec; Speech Transcoding Functions".
- [11] 3GPP TS 26.193: "AMR Wideband Speech Codec; Source Controlled Rate Operation".
- [12] 3GPP TS 26.201: "Mandatory Speech Codec Speech Processing Functions; AMR Wideband Speech Codec Frame Structure".
- [13] [IETF RFC 2833: "RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals"](#).

Second modified Section

5.98 RTP Telephone Event Codec

The Codec Identification (CoID) code is defined to be: RTP TE CoID:=0x1111 1110.

RTP Telephone Event codec [13] does not have any parameters.

This codec type is only for use in Mn-interface for IMS-interworking procedures and it shall NOT be used in CS domain.

~~RTP Telephone Event codec indicates that RTP Telephone Events can be used on the Mb interface to transfer in-band signalling information, e.g. DTMF tones, between IMS terminal and IM-MGW. This codec type is used with a speech codec, e.g. UMTS AMR2.~~

Praha, CZ, August 16-20, 2004

CR-Form-v7

CHANGE REQUEST⌘ **26.103 CR 029** ⌘ rev **1** ⌘ Current version: **5.4.0** ⌘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

Title:	⌘ Correction of Size and Reference of MuMe Codec	
Source:	⌘ TSG SA WG4	
Work item code:	⌘ SCUDIF	Date: ⌘ 14/09/2004
Category:	⌘ A	Release: ⌘ Rel-6
	Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:
	F (correction)	2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)
	B (addition of feature),	R97 (Release 1997)
	C (functional modification of feature)	R98 (Release 1998)
	D (editorial modification)	R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4 (Release 4)
		Rel-5 (Release 5)
		Rel-6 (Release 6)

Reason for change:	⌘ Wrong size of MuMe Codec IE and wrong Reference
Summary of change:	⌘ Correct size of MuMe IE and reference
Consequences if not approved:	⌘ If implementations use the specified wrong size for the MuMe Codec IE, OoBTC procedures may ignore subsequent codecs in the codec list. The SCUDIF-feature does not work.

Clauses affected:	⌘ 2. 5.8									
Other specs affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘
Y	N									
<input type="checkbox"/>	<input checked="" type="checkbox"/>									
<input type="checkbox"/>	<input checked="" type="checkbox"/>									
<input type="checkbox"/>	<input checked="" type="checkbox"/>									
Other comments:	⌘									

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- [9] 3GPP TS 24.008: "Mobile radio interface layer 3 specifications, Core Network Protocols"
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- [12] 3GPP TS 26.201: "Mandatory Speech Codec Speech Processing Functions; AMR Wideband Speech Codec Frame Structure".
- [13**] [3GPP TS 23.172: "multimedia service UDI/RDI fallback and service modification; Stage 2"](#)

next modified Section

5.8 MuMe Dummy Codec (3G.324M)

The Codec Identification (CoID) code is defined to be: MuMe_CoID:= 0x1111.1111.

The MuMe codec has one additional mandatory parameter:

B/W Multiplier, BWM: eight bits.

This defines the required bandwidth for the bearer; the value is a factor of 64K b/s when not equal to 0. When equal to zero then a 32k b/s.

The "Single Codec" information element consists of 6 octets in case of the MuMe Dummy Codec (table 5.8):

Table 5.8: Coding of "Single Codec" for the MuMe Dummy Codec Type

Octet	Parameter	MSB 8	7	6	5	4	3	2	1 LSB
1 m	Single Codec	Single Codec (see ITU-T Q.765.5)							
2 m	Length Indication	84							
3 m	Compat. Info	Compatibility Information							
4 m	OID	ETSI OID (See ITU-T Q.765.5 [6])							
5 m	CoID	MuMe_CoID							
6 m	BWM	BandWidth Multiplier – see note1							

with "m" = mandatory

Note 1:

$BWM == 0 \Rightarrow 32Kb/s$

$BWM == 1-255 \Rightarrow \text{factor } n \text{ (multiplier of } 64Kb/s)$

The procedures for use of this codec are defined in [TR-TS 23.972172 \[x*13\]](#).

This MuMe Dummy codec type is only for use in Core Network OoBTC procedures it shall NOT be used across the radio interface.

The MuMe Dummy codec indicates that an Unrestricted multimedia path (UDI) is required, subsequent codec negotiation may occur within this path using MuMe protocols, e.g H.324M. There are no encoding properties or codec specifications associated to this codec type; it is purely an indication for a MuMe pipe.

Praha, CZ, August 16-20, 2004

CR-Form-v7

CHANGE REQUEST⌘ **26.103 CR 028** ⌘ rev **1** ⌘ Current version: **5.4.0** ⌘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

Title:	⌘ Correction of Size and Reference of MuMe Codec	
Source:	⌘ TSG SA WG4	
Work item code:	⌘ SCUDIF	Date: ⌘ 14/09/2004
Category:	⌘ F	Release: ⌘ Rel-5
	Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:
	F (correction)	2 (GSM Phase 2)
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Reason for change:	⌘ Wrong size of MuMe Codec IE and wrong Reference
Summary of change:	⌘ Correct size of MuMe IE and reference
Consequences if not approved:	⌘ If implemenations use the specified wrong size for the MuMe Codec IE, OoBTC procedures may ignore subsequent codecs in the codec list. The SCUDIF-feature does not work.

Clauses affected:	⌘ 2. 5.8									
Other specs affected:	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘
Y	N									
<input type="checkbox"/>	<input checked="" type="checkbox"/>									
<input type="checkbox"/>	<input checked="" type="checkbox"/>									
<input type="checkbox"/>	<input checked="" type="checkbox"/>									
Other comments:	⌘									

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with "m" = mandatory

Note 1:

BWM == 0 => 32Kb/s

BWM == 1-255 => factor n (multiplier of 64Kb/s)

The procedures for use of this codec are defined in [TR-TS 23.972172 \[xx13\]](#).

This MuMe Dummy codec type is only for use in Core Network OoBTC procedures it shall NOT be used across the radio interface.

The MuMe Dummy codec indicates that an Unrestricted multimedia path (UDI) is required, subsequent codec negotiation may occur within this path using MuMe protocols, e.g H.324M. There are no encoding properties or codec specifications associated to this codec type; it is purely an indication for a MuMe pipe.

CR-Form-v7

CHANGE REQUEST

⌘ **TS 26.103 CR 025** ⌘ rev **1** ⌘ Current version: **5.4.0** ⌘

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

Title:	⌘ Error Fixes		
Source:	⌘ TSG SA WG4		
Work item code:	⌘ TrFO	Date:	⌘ 2004-09-14
Category:	⌘ F	Release:	⌘ REL-6
	<i>Use <u>one</u> of the following categories:</i> 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 .		<i>Use <u>one</u> of the following releases:</i> 2 (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)

Reason for change:	⌘ Now, after several years of discussion, some of the Options and Formulations from the early days are not longer valid or true, so here is a proposal to fix that.
Summary of change:	⌘ Correction of some statement on Codec Type support on GERAN and UTRAN; Editorial corrections.
Consequences if not approved:	⌘ Some wrong statements remain, with may lead to confusion and unnecessary questions.

Clauses affected:	⌘ all										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="text-align: center; padding: 2px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center; padding: 2px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="text-align: center; padding: 2px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
	Y	N									
	<input type="checkbox"/>	<input checked="" type="checkbox"/>									
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
<input type="checkbox"/>	<input checked="" type="checkbox"/>										
		Test specifications	⌘								
		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/](http://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.

FIRST CHANGES

3 Definitions and Abbreviations

3.1 Definitions

Codec Type: — defines a specific type of a speech Coding algorithms, [applied on a specific radio access technology](#) (e.g. GSM FR, [\(GSM\) FR AMR](#)).

Codec Mode: defines a specific mode of a Codec Type (e.g. 12,2 kBit/s Mode of the [\(GSM\) FR AMR](#)).

Codec Configuration: [defines a specific set of attributes to a certain Codec Type \(e.g. the combination of ACS and DTX="on" for \(GSM\) FR AMR\).](#)

Organisation Identifier (OID): Identifies the standard organisation (e.g. 3GPP) producing a specification for a Codec List. ITU-T is responsible for maintaining the list of Organisation Identifiers.

System Identifier (SysID): Identifies the radio access technology (e.g. GSM or UMTS) for which the supported Codec List is defined.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACS	Active Codec (mode) Set
BWM	BandWidth Multiplier
CoID	Codec IDentifier
DTX	Discontinuous Transmission
GSM	Global System for Mobile communication
MuMe	Multi-Media
OID	Organisation IDentifier (e.g. ITU-T, 3GPP)
OoBTC	Out of Band Transcoder Control
PDC	Personal Digital Communication (synonym for ...)
RX	Receive
SCR	Source Controlled Rate operation (synonym to DTX)
SID	Silence Descriptor
SysID	System Identifier
TDMA	Time Division Multiple Access (synonym for ...)
TFO	T andem F ree O peration (also sometimes called "Transcoder-Through" or "Codec-Bypass")
TrFO	T ranscoder F ree O peration
TX	Transmit
UMTS	Universal Mobile Telecommunications System

4 General

The present Technical Specification outlines the 3GPP internal Codec Lists for both, GSM and UMTS, to be used by the Out of Band Transcoder Control (OoBTC) protocol to set up a call or modify a call in Transcoder Free Operation (TrFO).

It further specifies the coding of the Supported Codec List Information Elements as defined in 3GPP TS 24.008 for the UMTS radio access technology.

Transcoder Free Operation allows the transport of speech signals in the coded domain from one user equipment (UE) to the other user equipment through the radio access network (RAN) and core network (CN), possibly through a transit network (TN). This enables high speech quality, low transmission costs and high flexibility.

The necessary Codec Type selection and resource allocation are negotiated out of band before and after call setup. Possible Codec (re-)configuration, Rate Control and DTX signalling may be performed after call setup by additional inband signalling or a combination of inband and out-of-band signalling.

Up to release '99 GSM does not support Transcoder Free Operation, but specifies the Tandem Free Operation (TFO). Tandem Free Operation enables similar advantages, but is based on pure inband signalling after call setup. The parameters defined in this Technical Specification allow interaction between TrFO and TFO. They further provide an evolutionary path for GSM towards Transcoder Free Operation.

The GERAN and UTRAN standards define fourteen different Codec Types, see table 4.1.

Table 4.1: Support of Codec Types in Radio Access Technologies

	TDMA EFR	UMTS AMR 2	UMTS AMR	(GSM) HR AMR	(GSM) FR AMR	GSM EFR	GSM HR	GSM FR
CoID	0x07	0x06	0x05	0x04	0x03	0x02	0x01	0x00
GERAN GMSK	not defined	not possible	not possible	yes, 1.4 modi	yes, 1.4 modi	yes	yes	yes
GERAN 8PSK	not defined	not possible	not possible	not defined	not defined	not defined	not defined	not defined
UTRAN	yes not defined	yes, 1.8 modi 1.4 modi recomm.	R99, UTRAN- only UEs	not defined	not defined	yes not defined	not defined	not defined

			OHR AMR-WB	OFR AMR-WB	OHR AMR	UMTS AMR-WB	FR AMR-WB	PDC EFR
CoID	0x0F	0x0E	0x0D	0x0C	0x0B	0x0A	0x09	0x08
GERAN GMSK			not defined	not defined	not defined	not possible	yes 3.4-modi	not defined
GERAN 8PSK			yes, 3.4 modi	yes, 3.4 modi	yes, 1.4 modi	not possible	not defined	not defined
UTRAN			not defined	not defined	not defined	yes 93.4 modi	not defined	yes not defined

CoID is reprinted here in hexadecimal notation. It is defined in section 5.

END OF CHANGES

CHANGE REQUEST

⌘ **TS 26.103 CR 023** ⌘ rev **2** ⌘ Current version: **5.4.0** ⌘

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

Title:	⌘ Harmonisation of AMR Configurations		
Source:	⌘ TSG SA WG4		
Work item code:	⌘ TEI6	Date:	⌘ 2004-09-14
Category:	⌘ C	Release:	⌘ REL-6
	<i>Use one of the following categories:</i> 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 .	<i>Use one of the following releases:</i> 2 (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)	

Reason for change:	⌘ Without a single recommended configuration for AMR the risk is high that different vendors in GERAN and UTRAN apply different, not-compatible AMR Configurations. This would lead to additional transcoding
Summary of change:	⌘ Introduction of recommended AMR Configuration, with reference to TS 28.062.
Consequences if not approved:	⌘ Harmonisation of AMR among operators and RANs is not guaranteed, with an unnecessary loss of voice quality and additional waste of DSP resources.

Clauses affected:	⌘ all										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </table> Other core specifications Test specifications O&M Specifications	Y	N	X						⌘ TS 28.062	
Y	N										
X											
Other comments:	⌘ SA2 has identified the need for these harmonisation in BARS, see TR 23.977. These changes could be discussed for earlier releases as well.										

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.

FIRST CHANGE

5.4 Five Adaptive Multi-Rate Codec Types (FR AMR, HR AMR, UMTS AMR, UMTS AMR2, OHR AMR)

The Adaptive Multi-Rate Codec algorithm is applied in GERAN-GMSK, GERAN-8PSK and UTRAN in five different Codec Types.

The Codec IDentification (CoID) codes are defined to be:

FR_AMR_CoID := 0x0000.0011.
HR_AMR_CoID := 0x0000.0100.
UMTS_AMR_CoID := 0x0000.0101.
UMTS_AMR_2_CoID := 0x0000.0110.
OHR_AMR_CoID := 0x0000.1011.

The AMR Codec Types can be used in conversational speech telephony services in a number of different configurations. The set of preferred configurations is defined in TS 28.062, Table 7.11.3.1.3-2. One of these preferred configurations, Config-NB-Code 1, is recommended for TFO-TrFO harmonisation between GSM and UMTS networks.

END OF CHANGES