

3GPP TSG CN Plenary Meeting #13
Beijing, China, 19th-21st September 2001

NP-010420

Source: CN1
Title: LS IN on Amendments to CR on 23.153, for UMTS_AMR_2
Agenda item: 5.1
Document for: INFORMATION / APPROVAL / DISCUSSION / OTHER)

3GPP TSG-CN1 Meeting #19
Helsinki, Finland, 27-31. August 2001

Tdoc N1-011285

To: TSG-CN
cc: TSG-CN WG4
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1. Overall Description:

During the discussions of UMTS_AMR_2 introduction in TS 24.008 at CN1#19, CN1 discovered additional changes required to be incorporated to the CR 025 against 23.153 prepared by CN4#8 (N4-010644). CN1 was previously asked by CN4 to include the modifications to TS 24.008 with the aim to have these CRs (454 and mirror 475 against 24.008 R4 and R5 respectively, and CR 025 against 23.153) ready for presentation to TSG-CN#13. CN1 has taken the liberty to edit the 23.153 CR with some additional proposed changes required. The discussion paper (N1-011241) and both CRs are enclosed.

2. Actions:

To TSG-CN group.

ACTION: CN1 kindly asks TSG-CN to APPROVE these changes to TS 23.153 [contained within NP-010507] as the companion CRs to the 24.008 CR.

3. Date of Next CN1 Meetings:

CN1_20	15 th – 19 th October 2001	Brighton, U.K.
CN1_21	26 th – 30 th November 2001	Cancun, Mexico

4. Attachments:

N1-011241	[Discussion paper on introduction of UMTS_AMR_2].
N1-011258	[CR to 23.153 – including the CN1 amendments]
N1-011340	[Rel-4 CR to 24.008]
N1-011341	[Rel-5 CR to 24.008]

Source: L.M. Ericsson
Title: Introduction of UMTS_AMR_2 – default UMTS codec for GSM interworking
Agenda item: 7
Document for: APPROVAL

Introduction

SA4 has completed the standardisation for codec type UMTS_AMR_2. This codec has been introduced in order to solve the incompatibilities between the FR_AMR codec for GSM and the UMTS_AMR codec for UMTS. These codecs cannot operate together in TrFO or TFO, although the encoding algorithms are bit exact. The problem being in the rate control handling of these codecs; FR_AMR may only change between adjacent modes and only every other frame (40ms periodicity) whereas UMTS_AMR may change any frame and between any modes. It has been argued and agreed in SA4 that for systems interworking with both GSM and UMTS the compatibility for TrFO and TFO outweighs the advantage to freely change between any modes or at any frame.

UMTS_AMR_2 codec applies FR_AMR rate control rules on sending but can receive the rate control requests from UMTS_AMR (i.e. any mode, any frame).

It is thus desired that the UMTS_AMR_2 codec replaces the UMTS_AMR codec as default; only small changes to the rate control handling procedures for the Ue are required, no changes to the handling of codecs in the R99 core network is needed. For terminals that are developed for UMTS systems only there may be no desire to support this codec, however terminals that are produced for both UMTS & GSM systems in R99 will still not be able to interoperate in TFO or TrFO if they only support the default UMTS_AMR codec as specified in R99.

In R99, the specifications defining a default UMTS_AMR codec were: TS 26.103, TS24.008 and TR 21.904. The latter technical report (Entitled – Ue Capability Requirements) is the responsibility of TSG-T but has not been progressed into a TS. It is this document that would seem the most appropriate place to document default codecs for the terminals.

In LS SA-010243 CN4 & CN1 are informed about the UMTS_AMR_2 codec as default codec for UMTS from release 4 onwards. TSG-T has sent an LS (T2-010601) to SA4 stating that they accept the introduction of UMTS_AMR_2 but believe that SA4 should be responsible for documenting the default codec type.

The problem of identifying UMTS_AMR_2 in Rel4 for the MSC or the Ue can be easily resolved using the codec list codepoints in TS 26.103 and the Supported Codec List IE in 24.008. However this does not resolve the R99 issue where no supported codecs list IE exists, in other words when an R99 terminal attaches to a Rel4 MSC.

For a R99 MSC there is no need to detect if a terminal is supporting UMTS_AMR or UMTS_AMR_2 as there is no network support for TFO or TrFO. Thus it is probably unnecessary to make any changes to 24.008 R99, provided that the other specifications (26.103 and/or 21.904) for Rel99 Terminal Capabilities are updated.

UMTS_AMR_2 is fully backward compatible with UMTS_AMR, therefore if the UE supports UMTS_AMR_2 and the network is R99 and assumes UMTS_AMR then no interworking problems will occur.

Proposal

A number of proposals have been discussed in adhoc/informal meetings within the 3GPP standards community. The proposal recommended by this paper is that a change request is made to the R99 terminal specifications to define the default UMTS codec as the following:

- i) R99 UMTS only - UMTS_AMR supported as default.
- ii) R99 UMTS & GSM, if UMTS_AMR_2 supported as default then must indicate one or more GSM speech versions in Octet 3a.
- iii) R99 UMTS & GSM, if GSM speech version indicated in Octet 3a then must support UMTS_AMR_2 as default.

For Rel4 terminals (and onwards) the default UMTS codec type should be defined and indicated by the terminals according to the following:

- i) Rel4 UMTS only – shall support UMTS_AMR_2 as default codec type and shall indicate to the network via Supported Codecs List IE.
- ii) Rel4 UMTS & GSM – shall support UMTS_AMR_2 as default codec and shall indicate to the network via Supported Codecs List IE

For Rel4 MSC to detect terminals that support UMTS_AMR_2 the following principles should be applied to Rel4 DTAP protocol (24.008):

- i) If Supported Codec List received - use codec type from list.
- ii) If no Supported Codec List, check if GSM codepoints for Speech Versions are sent in Octet 3a:
 - a) If yes – Assume UMTS_AMR_2 as default
 - b) If no - Assume UMTS_AMR

The network shall assume UMTS_AMR if a dual system mobile does not indicate any GSM codec types in Octet 3a etc. The reason for this is that it is assumed that evaluation of Octet 3a etc is the only way the CC protocol can easily determine that the Ue is dual system.

This would require a CR to 24.008 Rel4 and possibly 26.103 (assuming this is the specification agreed by SA4 as to be where default codecs are described). The TR 21.904 should also possibly be updated if it is agreed by TSG-T that this document is still of relevance to R99 Ue Capability Requirements.

In order that the Core Network solution can support both R99 and Rel4 terminals without needing to identify which release of terminal, as described above, some changes have been made to the original assumptions. This has also resulted in some amendments to the CN4 CR to 23.153 being required. The proposed changes are attached to this contribution.

Conclusion

This contribution recommends that a CR to 24.008 Rel4 is agreed by CN1 describing the above default UMTS codec types for “UM TS only” and “Dual System” terminals. Secondly that a Liaison Statement is sent to SA4 and TSG-T, copied to CN4, indicating that CN1 would like to see a corresponding definition in either the TSG-T technical report or similar specification or if agreed between TSG-T and SA4 then in an SA4 specification (i.e requesting that a CR is made to R99 specifications by one or other WG.

A LS to CN4 should be sent with the modifications to CR N4-010644, changes to TS 23.153.

The proposed CR's are attached:

CR-Form-v3

DRAFT CHANGE REQUEST

⌘ **23.153 CR 025** ⌘ rev **01-** ⌘ Current version: **4.1.0** ⌘

for

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

Title: ⌘ Default Codec Types For "UMTS only" and "UMTS & GSM dual systems" UEs

Source: ⌘ Ericsson L.M.

Work item code: ⌘ OoBTC

Date: ⌘ 2001-08-28

Category: ⌘ **F**

Release: ⌘ REL-4

Use one of the following categories:

- F** (essential 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: ⌘ SA4 approved a new codec type UMTS_AMR2, a superset of UMTS_AMR, to be used as default for dual system Ues in R99 and all Ues from REL4 onwards.

Summary of change: ⌘ Introduce text to describe the new default codec type and requirement for its selection by the Core Network

Consequences if not approved: ⌘ Interworking between TrFO and TFO will be hindered and unnecessary codec modifications may occur at inter-system handover.

Clauses affected: ⌘ 5.6

Other specs affected: ⌘ Other core specifications ⌘ Possible impacts to 24.008 where Default AMR codec is specified
 Test specifications
 O&M Specifications

Other comments: ⌘ Revision 1 of this CR is the additional proposed changes by CN1#19.

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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 Modified Section*****

5.6 CN Node handling of Codec Types & Codec Modes

The supported codec list received by the MSC in DTAP protocol [2] has no priority, whereas the list sent in the OoBTC procedures is sent with a level of preference.

The default Codec Type for “R99 UMTS only” terminals is UMTS AMR, the default Codec Type for “R99 dual system” (supporting GSM & UMTS radio accesses) and for all terminals from Release 4 onwards is UMTS AMR 2, see [5] for the detailed description. The UMTS AMR 2 is a superset of the UMTS AMR. It behaves as a FR AMR codec in the UL and as a UMTS AMR codec in the DL. This allows UMTS terminals to operate in TFO with GSM terminals. The UMTS AMR 2 is fully compatible with UMTS AMR in TFO and TrFO and fully compatible with R99 CN nodes (TC in MGW).

If the UE supports both Codec Types (UMTS AMR and UMTS AMR 2), then the MSC shall indicate only the UMTS AMR 2 in the OoBTC codec negotiation. If no Codec List IE is received and the UE is “UMTS only”, then the MSC shall assume UMTS AMR as supported Codec Type. If no Codec List IE is received, but the UE is “dual system”, then the MSC shall assume UMTS AMR 2 as the supported codec type. The MSC shall assume “dual system” support only if the UE indicates at least one GSM speech version in Octet 3a etc. of the Bearer Capability.

The codec type UMTS AMR2, see [5] for detailed description, shall always be given highest priority by the MSC. Dual system UEs (supporting GSM & UMTS radio accesses) shall support UMTS AMR2 as their default; only for ‘UMTS only’ terminals may the MSC assume UMTS AMR (R99 UMTS default codec) as their default. If no Codec List IE is received but the UE is dual system, the MSC shall assume UMTS AMR2 as the supported codec type and shall signal this in the OoBTC codec negotiation. The UMTS AMR2 codec type behaves as a FR AMR codec in the UL and as a UMTS AMR codec in the DL; this allows UMTS terminals to operate in TFO with a GSM terminal.

In order to support interworking with 2G systems it is recommended that MGWs support 2G EFR codecs (GSM EFR, PDC EFR, TDMA EFR) and for GSM the FR AMR codec. In order to avoid modifications during handover between 2G and 3G systems the MSC nodes may give preference to a suitable 2G codec.

The originating CN node, while performing speech service negotiation with a terminating CN node, shall indicate the maximum number of codec modes that shall be selected during speech codec negotiation. This maximum number of supported codec modes may depend on optimisation strategies applied by the originating CN node. The recommended value is “four” (see [10]).

The terminating CN node receiving this information compares the maximum number of codec modes received by the originating CN with its own one and shall decide on the minimum of both numbers to be applied as result of the negotiation.

The decision about the actual codec modes to be selected as the Active Codec Set (ACS) shall be left to the terminating CN node. In order to provide harmonisation of out of band codec negotiation (TrFO) and inband codec negotiation (TFO) very similar codec selection mechanisms as those being defined for TFO shall be applied for TrFO, see [10]. These rules shall be taken into account when forwarding a codec list from the originating node to proceeding node, both for TrFO and TFO.

Whenever one or several TrFO links have been already established and initialised, the CN node (e.g. the serving CN in case of Call Hold scenarios, the visited CN node in case of Call Forwarding scenarios, etc.) initiating a subsequent codec negotiation, shall give the already negotiated codec type, including its ACS, highest preference to reduce the possibility of performing bearer re-establishment or UP re-initialisation of the already established and initialised TrFO links.

When the MSC node requests a RAB assignment the Subflow Combinations provided shall either all be initialised by the RNC or all rejected with appropriate cause code.

The MSC shall always ~~define~~ assume “Discontinuous Transmission (DTX)” as mandatory and shall define “SID” and “No Data” SDUs in addition to the negotiated speech codec modes. This is because for TrFO the RAB requested by one RNC must match that requested by the peer RNC – they are effectively the same RAB. If one MSC requires DTX support then the RAB requested by the far end MSC must also support DTX (even if it is not desired by that MSC). As no Out Of Band negotiation for DTX is supported nor DTX control to the UE, DTX shall be mandatory for TrFO connections.

***** End of the document *****

3GPP TSG-CN1 Meeting #19
Helsinki, Finland, 27-31. August 2001

CR-Form-v3

CHANGE REQUEST

⌘ **24.008 CR 454** ⌘ rev **2** ⌘ Current version: **4.3.0** ⌘

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

Title:	⌘ Introduction of default codec UMTS_AMR_2		
Source:	⌘ LM Ericsson		
Work item code:	⌘ TFO-AMR	Date:	⌘ 2031.8.2001
Category:	⌘ F	Release:	⌘ REL-4
<i>Use one of the following categories:</i> F (essential 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)	

Reason for change:	⌘ SA4 have approved the definition of a new default UMTS AMR codec, named UMTS_AMR_2. This was conveyed in LS from SA4 (N1-0107834). The proposed changes are that from Release 4 onwards, UMTS_AMR_2 will be considered as the default codec, and given highest priority over all other narrow band codecs, when indicated. All mobiles from release 4 shall support this codec type and thus indicate this to the network. In order to be backward compatible with "UMTS only" mobiles produced in R99, the R99 default (UMTS_AMR) shall still be valid, but only for "UMTS only" mobiles. In R99 Terminals UMTS_AMR_2 shall also be supported by dual system terminals. As for R99 DTAP there was no Supported Codec List IE, then a definition of how the MSC shall detect UMTS_AMR_2 is added to support R99 terminals.
Summary of change:	⌘ Where default UMTS codec is indicated the text is changed to indicate UMTS_AMR for UMTS only UEs, but UMTS_AMR_2 for dual system UEs.
Consequences if not approved:	⌘ Misalignment of specifications, interworking between GSM & UMTS with TFO not possible.

Clauses affected:	⌘ 5.2.1, 5.2.1.2, 5.2.1.11, 5.2.2.3.1, 5.2.2.3.2, 5.2.3.3, 5.3.3, 5.3.4.3.2, 9.3.2.2, 9.3.2.6, 9.3.8.1, 9.2.8.3, 9.3.17b.2, 9.3.17b.4, 9.3.23.1.16		
Other specs affected:	<input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	Corresponding CR to TS 23.153 (CR025)
Other comments:	⌘ For information the CRs from CN4 – Tdoc N4-010644 attached		

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- 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 Modified Section*****

5.2.1 Mobile originating call establishment

The call control entity of the mobile station initiates establishment of a CC connection by requesting the MM sublayer to establish a mobile originating MM connection and entering the "MM connection pending" state. There are two kinds of a mobile originating call: basic call and emergency call. The request to establish an MM connection shall contain a parameter to specify whether the call is a basic or an emergency call. This information may lead to specific qualities of services to be provided by the MM sublayers. Timer T303 is started when the CM SERVICE REQUEST message is sent.

For mobile stations supporting eMLPP basic calls may optionally have an associated priority level as defined in 3GPP TS 23.067. This information may also lead to specified qualities of service to be provided by the MM sublayers.

While being in the "MM connection pending" state, the call entity of the mobile station may cancel the call prior to sending the first call control message according to the rules given in section 4.5.1.7.

The mobile station supporting multicall that is initiating an emergency call shall release one or more existing call to ensure the emergency call can be established if the multicall supported information stored in the mobile station described in section 5.2.1.2 and 5.2.2.1 indicates the network doesn't support multicall and some ongoing calls exists.

Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the mobile station sends a setup message to its peer entity. This setup message is

- a SETUP message, if the call to be established is a basic call, and
- an EMERGENCY SETUP message, if the call to be established is an emergency call.

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*. For a ME which supports GSM and UMTS and supports more than GSM speech version 1 then speech versions for GSM shall be included in *Bearer Capability IE*. For a UMTS established call these GSM speech versions shall be used by the network for handover to GSM. A ME which supports UMTS codecs different from more than the default UMTS AMR codec shall include a list of supported codecs in *Supported Codec List IE*. Otherwise default UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed by the network.

For a GSM established call the list shall be used by the network for handover to UMTS.

‡The mobile station then enters the "call initiated" state. Timer T303 is not stopped.

The setup message shall contain all the information required by the network to process the call. In particular, the SETUP message shall contain the called party address information. If the mobile station supports multicall, it shall include the Stream Identifier (SI) information element. For the first call i.e. when there are no other ongoing calls the SI value shall be 1.

If timer T303 elapses in the "MM connection pending" state, the MM connection in progress shall be aborted and the user shall be informed about the rejection of the call.

*****Next Modified Section*****

5.2.1.2 Receipt of a setup message

In the "null" or "recall present" states, upon receipt of a setup message (a SETUP message or an EMERGENCY SETUP message, see section 5.2.1.1), the call control entity of the network enters the "call initiated" state. It shall then analyse the call information contained in the setup message.

In UMTS, network shall include the SI received in the SETUP message into the RABid and send it back to the mobile station. For RABid see 3GPP TS 25.413. If the network receives the SETUP message with no SI, the network shall set the SI value to 1.

- i) If, following the receipt of the setup message, the call control entity of the network determines that the call information received from the mobile station is invalid (e.g. invalid number), then the network shall initiate call clearing as defined in section 5.4 with one of the following cause values:

- # 1 "unassigned (unallocated) number"
- # 3 "no route to destination"
- # 22 "number changed"
- # 28 "invalid number format (incomplete number)"

- ii) If, following the receipt of the setup message, the call control entity of the network determines that a requested service is not authorized or is not available, it shall initiate call clearing in accordance with section 5.4.2 with one of the following cause values:

- # 8 "operator determined barring",
- # 57 "bearer capability not authorized",
- # 58 "bearer capability not presently available",
- # 63 "service or option not available, unspecified", or
- # 65 "bearer service not implemented".

- iii) Otherwise, the call control entity of the network shall either:

- send a CALL PROCEEDING message to its peer entity to indicate that the call is being processed; and enter the "mobile originating call proceeding" state.
- or: send an ALERTING message to its peer entity to indicate that alerting has been started at the called user side; and enter the "call received" state.
- or: send a CONNECT message to its peer entity to indicate that the call has been accepted at the called user side; and enter the "connect request" state.

The call control entity of the network may insert bearer capability information element(s) in the CALL PROCEEDING message to select options presented by the mobile station in the Bearer Capability information element(s) of the SETUP message. The bearer capability information element(s) shall contain the same parameters as received in the SETUP except those presenting a choice. Where choices were offered, appropriate parameters indicating the results of those choices shall be included.

The CALL_PROCEEDING message shall also contain the priority of the call in the case where the network supports eMLPP. Mobile stations supporting eMLPP shall indicate this priority level to higher sublayers and store this information for the duration of the call for further action. Mobile stations not supporting eMLPP shall ignore this information element if provided in a CALL_PROCEEDING message.

NOTE: If the network supports only R98 or older versions of this protocol and the priority is not included in the CALL_PROCEEDING message, this does not imply that the network does not support eMLPP.

- The CALL_PROCEEDING message shall contain the multicall supported information in the network call control capabilities in the case where the network supports multicall and there are no other ongoing calls to the MS. Mobile stations supporting multicall shall store this information until the call control state for all calls returns to null. Mobile stations not supporting multicall shall ignore this information if provided in a CALL

PROCEEDING message. If the multicall supported information is not sent in the CALL_PROCEEDING message, the mobile station supporting multicall shall regard that the network doesn't support multicall.

The call control entity of the network having entered the "mobile originating call proceeding" state, the network may initiate the assignment of a traffic channel according to section 5.2.1.9 (early assignment).

For UMTS speech calls no UMTS speech versions shall be included in *Bearer eCapability IE*; if the SETUP includes a list of supported codecs in *Supported Codec List IE* then the network shall use this list to select the required codec type, see Chapter 5.2.1.11. Otherwise the default UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed.

For a GSM established call the list shall be used by the network for handover to UMTS.

GSM speech versions received by the network in *Bearer Capability IE* shall be used by the network for GSM call establishment and handover to GSM. For GSM speech calls where no speech versions are included in *Bearer eCapability IE* the network shall assume GSM speech version 1.

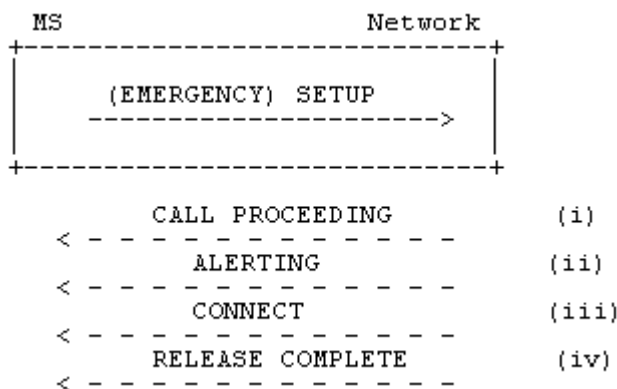


Figure 5.2/3GPP TS 24.008 Mobile originated call initiation and possible subsequent responses.

*****Next Modified Section*****

5.2.1.11 Speech Codec Selection

The network can receive *Supported Codec List IE* in call establishment messages from the ME to inform the network of the codec types that it supports.

If the network does not receive *Supported Codec List IE* then default UMTS AMR speech version shall be assumed.

The default UMTS AMR speech version for "R99 UMTS only" terminals is UMTS_AMR. The default UMTS AMR speech version for terminals supporting GSM & UMTS radio accesses and all terminals from Release 4 onwards is UMTS_AMR_2. For further details see 3G TS 26.103.

Note: 'UMTS_AMR_2' is fully backward compatible with 'UMTS_AMR', therefore if the UE supports 'UMTS_AMR_2' and the network is R99 and assumes 'UMTS_AMR' then no interworking problems will occur.

The network shall determine the default UMTS AMR speech version by the following:

- i) If no GSM Speech Version codepoints are received in octet 3a etc. of the Bearer Capabilities IE then a "UMTS only" terminal is assumed and the default UMTS AMR speech version shall be UMTS_AMR.
- ii) If at least one GSM Speech Version codepoint is received in octet 3a etc. of the Bearer Capabilities IE then a terminal supporting GSM and UMTS is assumed and the default UMTS AMR speech version shall be UMTS_AMR_2.

If the *Supported Codec List IE* is received, the network shall select a codec from the list of codecs and indicate this to the ME via RANAP and RRC protocol in NAS Synchronisation Indicator IE. See 3GPP TS 25.413 and 3GPP TS 25.331.

Coding of the codec type (CoID) shall be, as defined in 3GPP 3GPP TS 26.103.

The network shall determine the preference for the selected codec type; codec type prioritisation is not provided by the ME.

The ME shall activate the codec type received in the NAS Synchronisation Indicator IE.

If the mobile station does not receive the NAS Synchronisation Indicator IE (RRC protocol) then it shall assume default UMTS AMR speech version.

For adaptive multirate codec types no indication of subsets of modes is supported in this protocol, from the ME or to the ME. It is a pre-condition that the support of such codec types by the ME implicitly includes all modes defined for that codec type.

Next Modified Section

5.2.2.3.1 Response to SETUP

Having entered the "call present state" the call control entity of the mobile station shall - with the exception of the cases described below - acknowledge the SETUP message by a CALL CONFIRMED message, and enter the "mobile terminating call confirmed" state.

If the mobile station supports multicall, it shall include the Stream Identifier (SI) information element in the CALL CONFIRMED message.

- If the mobile station is located in the network supporting multicall, it shall never include the SI that is in use and shall include with either of the following two values:
- SI="no bearer"
- SI=new value (not used by any of the existing bearers)

If the mobile station supporting multicall is located in the network not supporting multicall, it shall include the SI with value 1.

The call control entity of the mobile station may include in the CALL CONFIRMED message to the network one or two bearer capability information elements to the network, either preselected in the mobile station or corresponding to a service dependent directory number (see 3GPP TS 29.007). The mobile station may also include one or two bearer capabilities in the CALL CONFIRMED message to define the radio channel requirements. For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*. For a ME which supports GSM and UMTS and supports more than GSM speech version 1 then speech versions for GSM shall be included in *Bearer Capability IE*. For a UMTS established call these GSM speech versions shall be used by the network for handover to GSM. A ME which supports *UMTS codecs different from the more than* UMTS AMR codec shall include the supported codecs in *Supported Codec List IE* in the CALL CONFIRMED message, otherwise *default* UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed *by the network*. In any case the rules specified in section 9.3.2.2 shall be followed.

NOTE: The possibility of alternative responses (e.g., in connection with supplementary services) is for further study.

A busy MS which satisfies the compatibility requirements indicated in the SETUP message shall respond either with a CALL CONFIRMED message if the call setup is allowed to continue or a RELEASE COMPLETE message if the call setup is not allowed to continue, both with cause #17 "user busy".

If the mobile user wishes to refuse the call, a RELEASE COMPLETE message shall be sent with the cause #21 "call rejected".

In the cases where the mobile station responds to a SETUP message with RELEASE COMPLETE message the mobile station shall release the MM connection and enter the "null" state after sending the RELEASE COMPLETE message.

The network shall process the RELEASE COMPLETE message in accordance with section 5.4.

*****Next Modified Section*****

5.2.2.3.2 Receipt of CALL CONFIRMED and ALERTING by the network

The call control entity of the network in the "call present" state, shall, upon receipt of a CALL CONFIRMED message: stop timer T303, start timer T310 and enter the "mobile terminating call confirmed" state.

In UMTS, network shall include the SI received in the CALL CONFIRMED message into the RABid and send it back to the mobile station. For RABid see 3GPP TS 25.413. If the network receives the CALL CONFIRMED message with no SI, the network shall set the SI value to 1.

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*; if the CALL CONFIRMED message includes a list of supported codecs in *Supported Codec List IE* then the network shall use this list to select the required codec type, see Chapter 5.2.1.11. If no *Supported Codec List IE* is received by the network then default UMTS AMR ([see Chapter 5.2.1.11](#)) speech version shall be assumed.

GSM speech versions received by the network in *Bearer Capability IE*. Shall be used by the network for GSM call establishment and handover to GSM. For GSM speech calls where no speech versions are included in *bearer capability IE* the network shall assume GSM speech version 1.

The call control entity of the mobile station having entered the "mobile terminating call confirmed" state, if the call is accepted at the called user side, the mobile station proceeds as described in 5.2.2.5. Otherwise, if the signal information element was present in the SETUP message user alerting is initiated at the mobile station side; if the signal information element was not present in the SETUP message, user alerting is initiated when an appropriate channel is available.

Here, initiation of user alerting means:

- the generation of an appropriate tone or indication at the mobile station; and
- sending of an ALERTING message by the call control entity of the MS to its peer entity in the network and entering the "call received" state.

The call control entity of the network in the "mobile terminated call confirmed" state shall, upon receipt of an ALERTING message: send a corresponding ALERTING indication to the calling user; stop timer T310; start timer T301, and enter the "call received" state.

In the "mobile terminating call confirmed" state or the "call received" state, if the user of a mobile station is User Determined User Busy then a DISCONNECT message shall be sent with cause #17 "user busy". In the "mobile terminating call confirmed" state, if the user of a mobile station wishes to reject the call then a DISCONNECT message shall be sent with cause #21 "call rejected".

*****Next Modified Section*****

5.2.3.3 CC-Establishment confirmation

The call control entity of the network in the "CC-establishment present" state, shall, upon receipt of a CC-ESTABLISHMENT CONFIRMED message, stop timer T333 and enter the "CC-establishment confirmed" state.

In the "CC-establishment confirmed" state, the network sends a RECALL message. This message initiates user alerting and also shall include the Facility IE (providing additional information to be presented to the user for notification). The network starts timer T334 and enters the 'recall present' state.

Upon reception of the RECALL message the Mobile station stops T335 and enters the "recall present" state.

Additionally, for UMTS speech calls a ME which supports more than UMTS AMR codec shall include the list of supported codecs in *Supported Codec List* IE in the ESTABLISHMENT CONFIRMED message.

If a *Supported Codec List* IE is received the network shall use the codec list for codec selection. See 5.2.1.11. If no *Supported Codec List* IE is received by the network then default UMTS AMR ~~codec~~ (See Chapter 5.2.1.11) ~~speech version shall be~~ assumed.

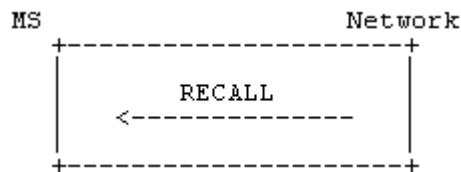


Figure 5.7b/3GPP TS 24.008 Recall

Next Modified Section

5.3.3 Codec Change Procedure

If a ME supports ~~UMTS codecs different from the more than~~ UMTS AMR speech codec (*Supported Codec List* IE received by the network) the network can modify the codec due to Out Of Band Transcoder Control procedures. If this is the case, the network shall send a codec type in RANAP NAS Synchronisation Indicator IE in order to inform the mobile station to change codec. See 5.2.1.11.

Next Modified Section

5.3.4.3.2 Successful completion of in-call modification

If the destination network/mobile station receives a MODIFY message with a new mode which is already the actual one of the call the network/mobile station shall remain in the "active" state; send a MODIFY COMPLETE message with the actual mode; and shall not initiate anything else.

If the requested mode is a speech mode and the call is UMTS then if the ME supports ~~UMTS codecs different from the more than~~ UMTS AMR codec (*Supported Codec List* IE received by the network) then the network shall select a codec from this list, otherwise default UMTS AMR (see Chapter 5.2.1.11) ~~speech version shall be~~ assumed. If a codec is selected other than default AMR, the network shall send the selected codec type to the ME via RANAP NAS Synchronisation Indicator IE (see 5.2.1.11),.

If the requested mode is speech and the call is GSM then if speech versions are included in *Bearer Capability IE* then the network shall use these speech versions, if none are included then GSM speech version 1 shall be assumed.

If the requested mode is not the actual one and can be supported by the destination interface it shall change the channel configuration, if required, and step on to any internal resources necessary to support the next call mode. If the requested mode is a data or facsimile mode, it shall also perform the appropriate means to take the direction of the data call into account. After successful change of the channel configuration it shall start sending user information according to the next call mode and start interpreting received user channel information according to the next call mode; send a MODIFY COMPLETE message with the new call mode included and enter the "active" state (mobile station or network side). If the MODIFY message had contained a *reverse call setup direction* IE, the same IE shall be included in the MODIFY COMPLETE message.

In case of an alternate speech/facsimile group 3 service (refer to section 5.3.4) the old resources may still be kept reserved.

Upon receipt of the MODIFY COMPLETE message the originating side shall: initiate the alternation to those resources necessary to support the next call mode; stop timer T323; and enter the "active" state (mobile station or network side). The reaction of the originating side if it had included a reverse call setup direction IE in the MODIFY message, but the destination side did not include the IE in the MODIFY COMPLETE message is implementation dependent.

*****Next Modified Section*****

9.3.2.2 Bearer capability 1 and bearer capability 2

The *bearer capability 1* information element shall be included if and only if at least one of the following five cases holds:

- the mobile station wishes another bearer capability than that given by the *bearer capability 1* information element of the incoming SETUP message;
- the *bearer capability 1* information element is missing or not fully specified in the SETUP message;
- the *bearer capability 1* information element received in the SETUP message is accepted and the "radio channel requirement" of the mobile station is other than "full rate support only mobile station";
- the *bearer capability 1* information element received in the SETUP message indicates speech and is accepted and the mobile station supports other speech versions than GSM version 1; Except in the case of UMTS speech where (if no *Supported Codec List* IE is included) ~~default~~ UMTS AMR speech version shall be assumed.
- the *bearer capability 1* information element received in the SETUP message included the "fixed network user rate" parameter.

When the *bearer capability 1* information element is followed by the *bearer capability 2* IE in the SETUP, the above rules apply to both *bearer capability 1* IE and bearer capability 2 IE. Except those cases identified in 3GPP TS 27.001, if either *bearer capability* needs to be included, both shall be included.

Furthermore, both *bearer capability* information elements may be present if the mobile station wishes to reverse the order of occurrence of the *bearer capability* information elements (which is referred to in the *repeat indicator* information element, see section 10.5.4.22) in cases identified in 3GPP TS 27.001.

If the mobile station wishes to indicate capability for an alternative call mode, which can be entered during the call through in-call modification, this is indicated by adding a *bearer capability information element* (bearer capability) 2 element (see section 5.3.6).

*****Next Modified Section*****

9.3.2.6 Supported Codecs

This information element shall be included by the ME for UMTS speech calls for a ME which supports [UMTS codecs different from the more than UMTS AMR codec types](#).

*****Next Modified Section*****

9.3.8.1 Bearer capability

If the element is not included, the network shall by default assume speech and select full rate speech version 1. If this information element is included, it shall indicate speech, the appropriate speech version(s) and have the appropriate value of radio channel requirement field.

For UMTS speech if no *Supported Codec List* IE is included then the default UMTS AMR ([see chapter 5.2.1.11](#)) speech version shall be assumed [by the network](#).

*****Next Modified Section*****

9.3.8.3 Supported Codecs

This information element ~~shall~~^{may} be included by the mobile station for UMTS speech calls for a ME which supports [UMTS codecs different from ~~more than~~](#) the ~~default~~ UMTS AMR codec ~~type~~. If this information element is not included then the network shall assume default UMTS AMR ([see chapter 5.2.1.11](#)) speech codec.

*****Next Modified Section*****

9.3.17b.2 Bearer capability 1 and bearer capability 2

If, in any subsequent SETUP message to be sent on this transaction the *bearer capability 1* information element is to be followed by the *bearer capability 2* IE, then the *bearer capability 2* IE shall be included in this message.

For UMTS speech if no *Supported Codec List* IE is included then the default UMTS AMR ([see chapter 5.2.1.11](#)) speech version shall be assumed [by the network](#).

*****Next Modified Section*****

9.3.17b.4 Supported Codecs

This information element shall be included by the mobile station for UMTS speech calls for a ME which supports [UMTS codecs different from ~~themore than~~](#) UMTS AMR codec ~~type~~.

*****Last Modified Section*****

9.3.23.2.16 Supported Codecs

This information element shall be included by the mobile station for UMTS speech calls for a ME which supports [UMTS codecs different from ~~themore than~~](#) UMTS AMR codec ~~type~~.

CR-Form-v3

CHANGE REQUEST

⌘ **24.008 CR 475** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

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

Title:	⌘ Introduction of default codec UMTS_AMR_2		
Source:	⌘ Ericsson		
Work item code:	⌘ TFO-AMR	Date:	⌘ 31.8.2001
Category:	⌘ A	Release:	⌘ REL-5
<p>Use <u>one</u> of the following categories:</p> <p>F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>		<p>Use <u>one</u> of the following releases:</p> <p>2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)</p>	

Reason for change:	⌘ SA4 have approved the definition of a new default UMTS AMR codec, named UMTS_AMR_2. This was conveyed in LS from SA4 (N1-010783). The proposed changes are that from Release 4 onwards, UMTS_AMR_2 will be considered as the default codec, and given highest priority over all other narrow band codecs, when indicated. All mobiles from release 4 shall support this codec type and thus indicate this to the network. In order to be backward compatible with "UMTS only" mobiles produced in R99, the R99 default (UMTS_AMR) shall still be valid, but only for "UMTS only" mobiles. In R99 Terminals UMTS_AMR_2 shall also be supported by dual system terminals. As for R99 DTAP there was no Supported Codec List IE, then a definition of how the MSC shall detect UMTS_AMR_2 is added to support R99 terminals.
Summary of change:	⌘ Where default UMTS codec is indicated the text is changed to indicate UMTS_AMR for UMTS only UEs, but UMTS_AMR_2 for dual system UEs.
Consequences if not approved:	⌘ Misalignment of specifications, interworking between GSM & UMTS with TFO not possible.

Clauses affected:	⌘ 5.2.1, 5.2.1.2, 5.2.1.11, 5.2.2.3.1, 5.2.2.3.2, 5.2.3.3, 5.3.3, 5.3.4.3.2, 9.3.2.2, 9.3.2.6, 9.3.8.1, 9.2.8.3, 9.3.17b.2, 9.3.17b.4, 9.3.23.1.16	
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ Corresponding CR to TS 23.153 (CR025)
Other comments:	⌘ For information the CRs from CN4 – Tdoc N4-010644 attached	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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 Modified Section

5.2.1 Mobile originating call establishment

The call control entity of the mobile station initiates establishment of a CC connection by requesting the MM sublayer to establish a mobile originating MM connection and entering the "MM connection pending" state. There are two kinds of a mobile originating call: basic call and emergency call. The request to establish an MM connection shall contain a parameter to specify whether the call is a basic or an emergency call. This information may lead to specific qualities of services to be provided by the MM sublayers. Timer T303 is started when the CM SERVICE REQUEST message is sent.

For mobile stations supporting eMLPP basic calls may optionally have an associated priority level as defined in 3GPP TS 23.067. This information may also lead to specified qualities of service to be provided by the MM sublayers. While being in the "MM connection pending" state, the call entity of the mobile station may cancel the call prior to sending the first call control message according to the rules given in section 4.5.1.7.

The mobile station supporting multicall that is initiating an emergency call shall release one or more existing call to ensure the emergency call can be established if the multicall supported information stored in the mobile station described in section 5.2.1.2 and 5.2.2.1 indicates the network doesn't support multicall and some ongoing calls exists. Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the mobile station sends a setup message to its peer entity. This setup message is

- a SETUP message, if the call to be established is a basic call, and
- an EMERGENCY SETUP message, if the call to be established is an emergency call.

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*. For a ME which supports GSM and UMTS and supports more than GSM speech version 1 then speech versions for GSM shall be included in *Bearer Capability IE*. For a UMTS established call these GSM speech versions shall be used by the network for handover to GSM. A ME which supports UMTS codecs different from more than the default UMTS AMR codec shall include a list of supported codecs in *Supported Codec List IE*. Otherwise default UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed by the network.

For a GSM established call the list shall be used by the network for handover to UMTS.

#The mobile station then enters the "call initiated" state. Timer T303 is not stopped.

The setup message shall contain all the information required by the network to process the call. In particular, the SETUP message shall contain the called party address information. If the mobile station supports multicall, it shall include the Stream Identifier (SI) information element. For the first call i.e. when there are no other ongoing calls the SI value shall be 1.

If timer T303 elapses in the "MM connection pending" state, the MM connection in progress shall be aborted and the user shall be informed about the rejection of the call.

Next Modified Section

5.2.1.2 Receipt of a setup message

In the "null" or "recall present" states, upon receipt of a setup message (a SETUP message or an EMERGENCY SETUP message, see section 5.2.1.1), the call control entity of the network enters the "call initiated" state. It shall then analyse the call information contained in the setup message.

In UMTS, network shall include the SI received in the SETUP message into the RABid and send it back to the mobile station. For RABid see 3GPP TS 25.413. If the network receives the SETUP message with no SI, the network shall set the SI value to 1.

- i) If, following the receipt of the setup message, the call control entity of the network determines that the call information received from the mobile station is invalid (e.g. invalid number), then the network shall initiate call clearing as defined in section 5.4 with one of the following cause values:

1 "unassigned (unallocated) number"
 # 3 "no route to destination"
 # 22 "number changed"
 # 28 "invalid number format (incomplete number)"

- ii) If, following the receipt of the setup message, the call control entity of the network determines that a requested service is not authorized or is not available, it shall initiate call clearing in accordance with section 5.4.2 with one of the following cause values:

8 "operator determined barring",
 # 57 "bearer capability not authorized",
 # 58 "bearer capability not presently available",
 # 63 "service or option not available, unspecified", or
 # 65 "bearer service not implemented".

- iii) Otherwise, the call control entity of the network shall either:

- send a CALL PROCEEDING message to its peer entity to indicate that the call is being processed; and enter the "mobile originating call proceeding" state.
- or: send an ALERTING message to its peer entity to indicate that alerting has been started at the called user side; and enter the "call received" state.
- or: send a CONNECT message to its peer entity to indicate that the call has been accepted at the called user side; and enter the "connect request" state.

The call control entity of the network may insert bearer capability information element(s) in the CALL PROCEEDING message to select options presented by the mobile station in the Bearer Capability information element(s) of the SETUP message. The bearer capability information element(s) shall contain the same parameters as received in the SETUP except those presenting a choice. Where choices were offered, appropriate parameters indicating the results of those choices shall be included.

The CALL_PROCEEDING message shall also contain the priority of the call in the case where the network supports eMLPP. Mobile stations supporting eMLPP shall indicate this priority level to higher sublayers and store this information for the duration of the call for further action. Mobile stations not supporting eMLPP shall ignore this information element if provided in a CALL_PROCEEDING message.

NOTE: If the network supports only R98 or older versions of this protocol and the priority is not included in the CALL_PROCEEDING message, this does not imply that the network does not support eMLPP.

- The CALL_PROCEEDING message shall contain the multicall supported information in the network call control capabilities in the case where the network supports multicall and there are no other ongoing calls to the MS. Mobile stations supporting multicall shall store this information until the call control state for all calls returns to null. Mobile stations not supporting multicall shall ignore this information if provided in a CALL_PROCEEDING message. If the multicall supported information is not sent in the CALL_PROCEEDING message, the mobile station supporting multicall shall regard that the network doesn't support multicall.

The call control entity of the network having entered the "mobile originating call proceeding" state, the network may initiate the assignment of a traffic channel according to section 5.2.1.9 (early assignment).

For UMTS speech calls no UMTS speech versions shall be included in *Bearer eCapability IE*; if the SETUP includes a list of supported codecs in *Supported Codec List IE* then the network shall use this list to select the required codec type, see Chapter 5.2.1.11. Otherwise the default UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed. For a GSM established call the list shall be used by the network for handover to UMTS.

GSM speech versions received by the network in *Bearer Capability IE* shall be used by the network for GSM call establishment and handover to GSM. For GSM speech calls where no speech versions are included in *Bearer Capability IE* the network shall assume GSM speech version 1.

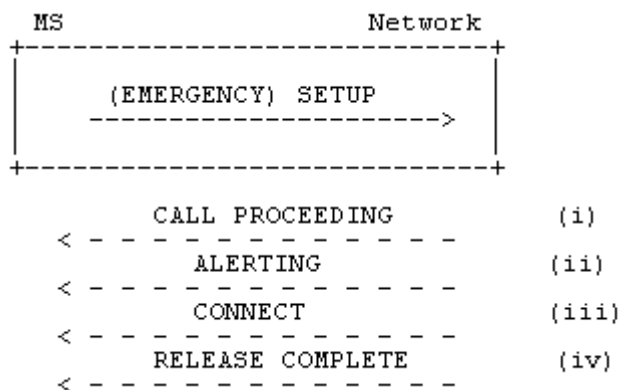


Figure 5.2/3GPP TS 24.008 Mobile originated call initiation and possible subsequent responses.

******Next Modified Section ******

5.2.1.11 Speech Codec Selection

The network can receive *Supported Codec List IE* in call establishment messages from the ME to inform the network of the codec types that it supports.

If the network does not receive *Supported Codec List IE* then default UMTS AMR speech version shall be assumed.

The default UMTS AMR speech version for “R99 UMTS only” terminals is UMTS_AMR. The default UMTS AMR speech version for terminals supporting GSM & UMTS radio accesses and all terminals from Release 4 onwards is UMTS_AMR_2. For further details see 3G TS 26.103.

Note: ‘UMTS_AMR_2’ is fully backward compatible with ‘UMTS_AMR’, therefore if the UE supports ‘UMTS_AMR_2’ and the network is R99 and assumes ‘UMTS_AMR’ then no interworking problems will occur.

The network shall determine the default UMTS AMR speech version by the following:

- i) If no GSM Speech Version codepoints are received in octet 3a etc. of the *Bearer Capabilities IE* then a “UMTS only” terminal is assumed and the default UMTS AMR speech version shall be UMTS_AMR.
- ii) If at least one GSM Speech Version codepoint is received in octet 3a etc. of the *Bearer Capabilities IE* then a terminal supporting GSM and UMTS is assumed and the default UMTS AMR speech version shall be UMTS_AMR_2.

If the *Supported Codec List IE* is received, the network shall select a codec from the list of codecs and indicate this to the ME via RANAP and RRC protocol in NAS Synchronisation Indicator IE. See 3GPP TS 25.413 and 3GPP TS 25.331.

Coding of the codec type (CoID) shall be, as defined in 3GPP 3GPP TS 26.103.

The network shall determine the preference for the selected codec type; codec type prioritisation is not provided by the ME.

The ME shall activate the codec type received in the NAS Synchronisation Indicator IE.

If the mobile station does not receive the NAS Synchronisation Indicator IE (RRC protocol) then it shall assume default UMTS AMR speech version.

For adaptive multirate codec types no indication of subsets of modes is supported in this protocol, from the ME or to the ME. It is a pre-condition that the support of such codec types by the ME implicitly includes all modes defined for that codec type.

*****Next Modified Section*****

5.2.2.3.1 Response to SETUP

Having entered the "call present state" the call control entity of the mobile station shall - with the exception of the cases described below - acknowledge the SETUP message by a CALL CONFIRMED message, and enter the "mobile terminating call confirmed" state.

If the mobile station supports multicall, it shall include the Stream Identifier (SI) information element in the CALL CONFIRMED message.

- If the mobile station is located in the network supporting multicall, it shall never include the SI that is in use and shall include with either of the following two values:
- SI="no bearer"
- SI=new value (not used by any of the existing bearers)

If the mobile station supporting multicall is located in the network not supporting multicall, it shall include the SI with value 1.

The call control entity of the mobile station may include in the CALL CONFIRMED message to the network one or two bearer capability information elements to the network, either preselected in the mobile station or corresponding to a service dependent directory number (see 3GPP TS 29.007). The mobile station may also include one or two bearer capabilities in the CALL CONFIRMED message to define the radio channel requirements. For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*. For a ME which supports GSM and UMTS and supports more than GSM speech version 1 then speech versions for GSM shall be included in *Bearer Capability IE*. For a UMTS established call these GSM speech versions shall be used by the network for handover to GSM. A ME which supports UMTS codecs different from the more than UMTS AMR codec shall include the supported codecs in *Supported Codec List IE* in the CALL CONFIRMED message, otherwise default UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed by the network. In any case the rules specified in section 9.3.2.2 shall be followed.

NOTE: The possibility of alternative responses (e.g., in connection with supplementary services) is for further study.

A busy MS which satisfies the compatibility requirements indicated in the SETUP message shall respond either with a CALL CONFIRMED message if the call setup is allowed to continue or a RELEASE COMPLETE message if the call setup is not allowed to continue, both with cause #17 "user busy".

If the mobile user wishes to refuse the call, a RELEASE COMPLETE message shall be sent with the cause #21 "call rejected".

In the cases where the mobile station responds to a SETUP message with RELEASE COMPLETE message the mobile station shall release the MM connection and enter the "null" state after sending the RELEASE COMPLETE message. The network shall process the RELEASE COMPLETE message in accordance with section 5.4.

*****Next Modified Section*****

5.2.2.3.2 Receipt of CALL CONFIRMED and ALERTING by the network

The call control entity of the network in the "call present" state, shall, upon receipt of a CALL CONFIRMED message: stop timer T303, start timer T310 and enter the "mobile terminating call confirmed" state.

In UMTS, network shall include the SI received in the CALL CONFIRMED message into the RABid and send it back to the mobile station. For RABid see 3GPP TS 25.413. If the network receives the CALL CONFIRMED message with no SI, the network shall set the SI value to 1.

For UMTS speech calls no UMTS speech versions shall be included in *bearer capability IE*; if the CALL CONFIRMED message includes a list of supported codecs in *Supported Codec List IE* then the network shall use this

list to select the required codec type, see Chapter 5.2.1.11. If no *Supported Codec List IE* is received by the network then default UMTS AMR (see Chapter 5.2.1.11) speech version shall be assumed.

GSM speech versions received by the network in *Bearer Capability IE*. Shall be used by the network for GSM call establishment and handover to GSM. For GSM speech calls where no speech versions are included in *bearer capability IE* the network shall assume GSM speech version 1.

The call control entity of the mobile station having entered the "mobile terminating call confirmed" state, if the call is accepted at the called user side, the mobile station proceeds as described in 5.2.2.5. Otherwise, if the signal information element was present in the SETUP message user alerting is initiated at the mobile station side; if the signal information element was not present in the SETUP message, user alerting is initiated when an appropriate channel is available.

Here, initiation of user alerting means:

- the generation of an appropriate tone or indication at the mobile station; and
- sending of an ALERTING message by the call control entity of the MS to its peer entity in the network and entering the "call received" state.

The call control entity of the network in the "mobile terminated call confirmed" state shall, upon receipt of an ALERTING message: send a corresponding ALERTING indication to the calling user; stop timer T310; start timer T301, and enter the "call received" state.

In the "mobile terminating call confirmed" state or the "call received" state, if the user of a mobile station is User Determined User Busy then a DISCONNECT message shall be sent with cause #17 "user busy". In the "mobile terminating call confirmed" state, if the user of a mobile station wishes to reject the call then a DISCONNECT message shall be sent with cause #21 "call rejected".

*****Next Modified Section*****

5.2.3.3 CC-Establishment confirmation

The call control entity of the network in the "CC-establishment present" state, shall, upon receipt of a CC-ESTABLISHMENT CONFIRMED message, stop timer T333 and enter the "CC-establishment confirmed" state.

In the "CC-establishment confirmed" state, the network sends a RECALL message. This message initiates user alerting and also shall include the Facility IE (providing additional information to be presented to the user for notification). The network starts timer T334 and enters the 'recall present' state.

Upon reception of the RECALL message the Mobile station stops T335 and enters the "recall present" state.

Additionally, for UMTS speech calls a ME which supports more than UMTS AMR codec shall include the list of supported codecs in *Supported Codec List IE* in the ESTABLISHMENT CONFIRMED message.

If a *Supported Codec List IE* is received the network shall use the codec list for codec selection. See 5.2.1.11. If no *Supported Codec List IE* is received by the network then default UMTS AMR ~~codec~~ (See Chapter 5.2.1.11) ~~speech version shall be~~ assumed.

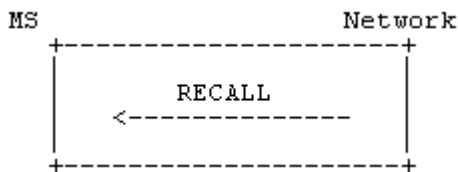


Figure 5.7b/3GPP TS 24.008 Recall

*****Next Modified Section*****

5.3.3 Codec Change Procedure

If a ME supports ~~UMTS codecs different from the more than~~ UMTS AMR speech codec (*Supported Codec List IE* received by the network) the network can modify the codec due to Out Of Band Transcoder Control procedures. If this

is the case, the network shall send a codec type in RANAP NAS Synchronisation Indicator IE in order to inform the mobile station to change codec. See 5.2.1.11.

*****Next Modified Section*****

5.3.4.3.2 Successful completion of in-call modification

If the destination network/mobile station receives a MODIFY message with a new mode which is already the actual one of the call the network/mobile station shall remain in the "active" state; send a MODIFY COMPLETE message with the actual mode; and shall not initiate anything else.

If the requested mode is a speech mode and the call is UMTS then if the ME supports [UMTS codecs different from the more than](#) UMTS AMR codec (*Supported Codec List* IE received by the network) then the network shall select a codec from this list, otherwise default UMTS AMR ([see Chapter 5.2.1.11](#)) speech version shall be assumed. If a codec is selected other than default AMR, the network shall send the selected codec type to the ME via RANAP NAS Synchronisation Indicator IE (see 5.2.1.11),.

If the requested mode is speech and the call is GSM then if speech versions are included in *Bearer Capability IE* then the network shall use these speech versions, if none are included then GSM speech version 1 shall be assumed.

If the requested mode is not the actual one and can be supported by the destination interface it shall change the channel configuration, if required, and step on to any internal resources necessary to support the next call mode. If the requested mode is a data or facsimile mode, it shall also perform the appropriate means to take the direction of the data call into account. After successful change of the channel configuration it shall start sending user information according to the next call mode and start interpreting received user channel information according to the next call mode; send a MODIFY COMPLETE message with the new call mode included and enter the "active" state (mobile station or network side). If the MODIFY message had contained a *reverse call setup direction* IE, the same IE shall be included in the MODIFY COMPLETE message.

In case of an alternate speech/facsimile group 3 service (refer to section 5.3.4) the old resources may still be kept reserved.

Upon receipt of the MODIFY COMPLETE message the originating side shall: initiate the alternation to those resources necessary to support the next call mode; stop timer T323; and enter the "active" state (mobile station or network side).

The reaction of the originating side if it had included a reverse call setup direction IE in the MODIFY message, but the destination side did not include the IE in the MODIFY COMPLETE message is implementation dependent.

*****Next Modified Section*****

9.3.2.2 Bearer capability 1 and bearer capability 2

The *bearer capability 1* information element shall be included if and only if at least one of the following five cases holds:

- the mobile station wishes another bearer capability than that given by the *bearer capability 1* information element of the incoming SETUP message;
- the *bearer capability 1* information element is missing or not fully specified in the SETUP message;
- the *bearer capability 1* information element received in the SETUP message is accepted and the "radio channel requirement" of the mobile station is other than "full rate support only mobile station";
- the *bearer capability 1* information element received in the SETUP message indicates speech and is accepted and the mobile station supports other speech versions than GSM version 1; Except in the case of UMTS speech where (if no *Supported Codec List* IE is included) ~~default~~ UMTS AMR speech version shall be assumed.
- the *bearer capability 1* information element received in the SETUP message included the "fixed network user rate" parameter.

When the *bearer capability 1* information element is followed by the *bearer capability 2* IE in the SETUP, the above rules apply to both *bearer capability 1* IE and *bearer capability 2* IE. Except those cases identified in 3GPP TS 27.001, if either *bearer capability* needs to be included, both shall be included.

Furthermore, both *bearer capability* information elements may be present if the mobile station wishes to reverse the order of occurrence of the *bearer capability* information elements (which is referred to in the *repeat indicator* information element, see section 10.5.4.22) in cases identified in 3GPP TS 27.001.

If the mobile station wishes to indicate capability for an alternative call mode, which can be entered during the call through in-call modification, this is indicated by adding a *bearer capability information element* (bearer capability) 2 element (see section 5.3.6).

******Next Modified Section ******

9.3.2.6 Supported Codecs

This information element shall be included by the ME for UMTS speech calls for a ME which supports [UMTS codecs different from the more than](#) UMTS AMR codec ~~types~~.

******Next Modified Section ******

9.3.8.1 Bearer capability

If the element is not included, the network shall by default assume speech and select full rate speech version 1. If this information element is included, it shall indicate speech, the appropriate speech version(s) and have the appropriate value of radio channel requirement field.

This information element shall be included by an ME supporting CTM text telephony.

For UMTS speech if no *Supported Codec List* IE is included then the default UMTS AMR ([see chapter 5.2.1.11](#)) speech version shall be assumed [by the network](#).

******Next Modified Section ******

9.3.8.3 Supported Codecs

This information element ~~shall~~[may](#) be included by the mobile station for UMTS speech calls for a ME which supports [UMTS codecs different from more than](#) the ~~default~~ UMTS AMR codec ~~type~~. If this information element is not included then the network shall assume default UMTS AMR ([see chapter 5.2.1.11](#)) speech codec.

******Next Modified Section ******

9.3.17b.2 Bearer capability 1 and bearer capability 2

If, in any subsequent SETUP message to be sent on this transaction the *bearer capability 1* information element is to be followed by the *bearer capability 2* IE, then the *bearer capability 2* IE shall be included in this message.

For UMTS speech if no *Supported Codec List* IE is included then the default UMTS AMR ([see chapter 5.2.1.11](#)) speech version shall be assumed [by the network](#).

******Next Modified Section ******

9.3.17b.4 Supported Codecs

This information element shall be included by the mobile station for UMTS speech calls for a ME which supports UMTS codecs different from the~~more than~~ UMTS AMR codec ~~type~~.

*****Last Modified Section*****

9.3.23.2.16 Supported Codecs

This information element shall be included by the mobile station for UMTS speech calls for a ME which supports UMTS codecs different from the~~more than~~ UMTS AMR codec ~~type~~.