

Source: TSG CN WG 1
Title: CRs to Rel-5 on Work Item SCUDIF towards 23.972 and 24.008
Agenda item: 9.13
Document for: APPROVAL

Introduction:

This document contains 2 CRs on **Rel-5 to Work Item "SCUDIF"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #15 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level
23.972	001	2	Rel-5	Service change and fallback for UDI/RDI multimedia multimedia calls	C	3.0.0	5.0.0	N1-020439
24.008	551	2	Rel-5	Service change and fallback for UDI/RDI multimedia multimedia calls	C	5.2.0	5.3.0	N1-020440

CR-Form-v6.1

CHANGE REQUEST

⌘ **23.972 CR 001** ⌘ rev **2** ⌘ Current version: **3.0.0** ⌘
Spec Title: Circuit switched multimedia telephony ⌘

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:	⌘ Service change and fallback for UDI/RDI multimedia calls		
Source:	⌘ ERICSSON		
Work item code:	⌘ SCUDIF	Date:	⌘ 2002-01-31
Category:	⌘ C	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)

Reason for change:	⌘ Have a complete overview of the service change and fallback function
Summary of change:	⌘ Addition of a description for service change and fallback for UDI/RDI multimedia calls
Consequences if not approved:	⌘ There will be no overview of the complete service change and fallback functionality

Clauses affected:	⌘ 2, 3, Annex B added.	
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications	⌘ TS-24.008, TS-29.007, TS-27.001, TS-26.103
	<input type="checkbox"/> Test specifications	
	<input type="checkbox"/> O&M Specifications	
Other comments:	⌘	
	<ul style="list-style-type: none"> CN3 change to replace 'subscription' to 'provision' in N3-020091 reflected here also in chapters 3.8.1, 3.8.2. CN4 comments incorporated in chapters 3.8.3.2, 3.8.3.3. CN1 comments incorporated. 	

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://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 modified section *****

2 References

- [1] ITU-T Recommendation H.324: "Terminal for low bit-rate multimedia communication"
- [2] ITU-T Recommendation H.223: "Multiplexing protocol for low bit rate multimedia communication"
- [3] ITU-T Recommendation H.245: "Control protocol for multimedia communication"
- [4] ITU-T Recommendation V.8: "Procedures for starting sessions of data transmission over the public switched telephone network".
- [5] ITU-T Recommendation V.8bis: "Procedures for the identification and selection of common modes of operation between data circuit-terminating equipment (DCEs) and between data terminal equipment (DTEs) over the general public switched telephone network and on leased point-to-point telephone-type circuits".
- [6] ITU-T Recommendation V.140: "Procedures for establishing communication between two multiprotocol audio-visual terminals using digital channels at a multiple of 64 or 56 kbit/s".
- [7] ITU-T Recommendation Q.764: "Signalling System No. 7 – ISDN User Part Signalling Procedures".
- [8] ITU-T Recommendation Q.931: "Digital subscriber signalling system no. 1 (DSS1) – ISDN user-network interface layer 3 specification for basic call control".
- [9] 3GPP 24.008: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".
- [10] 3GPP 22.002: "Digital cellular telecommunications system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)"
- [11] 3GPP 22.972 "Real Time Multimedia" (Stage 1 description) – obsolete
- [12] 3GPP 23.960 " Framework of Network Functions to support multimedia services in UMTS " ('guide-lines for the production of standards')
- [13] 3GPP 26.111 " Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324"
- [14] 3GPP 26.112 " Codec for Circuit Switched Multimedia Telephony Service; Call Setup Requirements" – created in S4 Codec adhoc, to be incorporated in various N1 and N3 specifications (and terminated).
- [15] 3GPP 26.911 "Codec for Circuit Switched Multimedia Telephony Service"
- [16] N1-99748 "Call Setup Procedure for interworking with H.320"
- [17] N1-99749 "Indication for multimedia telephony in UMTS"
- [18] N1-99750 "Rate Negotiation Procedure for Multimedia Telephony"
- [19] N1-99971"Low rate 3G-H324M"
- [20] N1-99973 "Proposal for additional point codes in UMTS Bearer Capability Information Element"
- [21] N1-99A30 "CODEC Negotiation Procedure"
- [22] N1-99A98 "LS – Joint N1/N3 to S1,S2,S4,N2: Liaison Statement on 3G-H.324M "

- [23] N1-99B72 "LS – S2 to N1: Multimedia Call Control for UMTS R 99"
- [24] N3-99314 "Multimedia call Inter-working with H.320 and H.324/I"
- [25] 3GPP 26.103 "Speech Codec List for GSM and UMTS"

***** Next new section *****

3.8 Service change and fallback for UDI/RDI multimedia

3.8.1 Scope

Service change and fallback is a function available to UDI/RDI multimedia calls. The functionality shall support the following:

- a) Fallback to speech: allow a user to set up a multimedia call to a terminal with the assurance that a speech connection is set up as the minimum, if allowed by subscription. The call will not be rejected due to the lack of terminating end's terminal capability, subscription, or transit network support;
- b) Fallback to the less preferred service (speech or multimedia): allow the terminating user, via settings in the terminal, to accept or reject a multimedia call, without interrupting the call setup;
- c) BC negotiation at the terminating side: allow the terminating user, via settings in the terminal, to turn a speech call (with service change) into a multimedia call and vice-versa;
- d) Service change: allow a speech call to be turned to multimedia by either of parties, and back to speech, through a successful in call modification procedure;
- e) Allow any of the users to reject a multimedia request from the other party while in speech mode.

To fulfil:

- Service request signalling between the MS and the MSC;
- Service request signalling across the Core Network.

This functionality is not supported for UDI/RDI multimedia with Fixed Network User Rate set to 32 kbit/s. In this case, the MSC shall revert to a multimedia only call.

3.8.2 Call Control Signalling

Using a new repeat indicator value, "support of service change and fallback", as described in 3GPP TS 24.008, ch. 5.3.6 "Support of multimedia calls" (N1-020244), together with two BC-IEs, a UDI/RDI multimedia and a speech, it is possible to request a service change and fallback functionality, while still maintaining the backwards compatibility with non-supporting terminals.

3.8.2.1 Mobile originating side

By sending a SETUP message with a Repeat Indicator set to "support of service change and fallback", a UDI/RDI multimedia BC-IE, and a speech BC-IE, the terminal requests a call to be set up (the first BC-IE indicates the preferred service), with the capability to fallback to either a speech only or a multimedia only call, or to use service change later during the active state of the call.

After checking the provisioning, and verifying that the functionality is supported, the MSC replies in the CALL PROCEEDING message with either the two BCs in the same order, or with a single BC (multimedia or speech).

The originating MSC transmits the request to the terminating MSC. In case a transit node or the terminating MSC does not support multimedia, a fallback to speech shall occur. The fallback is reported to the originating MSC, and the call is set up as a normal speech call – see 3.8.2.3.

3.8.2.2 Mobile terminating side

When the terminating MSC receives a request for a multimedia call, it shall check the provisioning.

Both BC-IEs are sent in the same preference order received together with a Repeat Indicator set to "service change and fallback" to the terminating MS in the SETUP message.

The terminating MS, based on its capabilities and internal settings, may return the two BCs in the same order, reversed order, or just one BC (either speech or multimedia) to the terminating MSC in the CALL CONFIRMED message.

The terminating MSC returns this information to the originating MSC.

3.8.2.3 Mobile originating side – completion of call setup

If the preferred mode, that is the first BC-IE indicated by the originating MS, was selected as the result of negotiations, then the call is set up normally towards the originating MS.

If the negotiation resulted in a change of the selected mode, that is, the call was set up as "multimedia first" and changed during the negotiation to a speech call, or vice-versa, because of either fallback or change of selected mode, an In-Call Modification procedure (ref. to 3GPP TS 24.008 chapter 5.3.4.3) is initiated towards the originating MS after the call control entity has entered the active state, *i.e.* the CONNECT message has been sent.

3.8.2.4 Service change in the active state

At any given time, if either of call parties wants to change from the current active mode to the other mode via MMI, the terminal activates an In-Call Modification procedure. Using this procedure, described in 3GPP TS 24.008, ch. 5.3.4.3 "Changing the call mode", the MS sends a MODIFY message containing the BC-IE to change to. This BC-IE shall be one of those already negotiated at call setup.

The network then initiates the procedure for service change. If the procedure succeeds, the originating MS receives a MODIFY COMPLETE message including the BC of the mode to switch to. On the contrary, if the procedure fails, the MS receives a MODIFY REJECT message from the MSC including the BC from the current active mode.

In the case the MSC has determined that the other mode is unavailable (*e.g.* a fallback to either mode has occurred), it shall reject the MODIFY request at once by replying with a MODIFY REJECT message.

On the remote side, the MSC will initiate an In-Call Modification procedure towards the terminal using the MODIFY message. Under its default settings, the terminal shall request confirmation from the user. If the change is agreed, the MS replies to the MSC with a MODIFY COMPLETE message, whereas a MODIFY REJECT message is sent if the change is declined.

Privacy concerns strongly advise that any change to multimedia mode, unless explicitly allowed by the user in the terminal configuration settings, triggers a question to the user in order to confirm or decline the change. The details on how to provide the user interaction are left for implementation.

3.8.3 Core Network procedures

In order to provide the capability in the network to transmit the request for service change and fallback both at call setup and during the active state of a call, the normal Out-of-Band Transcoder Control procedures, described in 3GPP TS 23.153 are used. The following text describes the codec used, as well as the mapping between the terminal interface described above, and the different IEs used for the codec negotiation procedures, both at the originating and the terminating MSCs.

3.8.3.1 Multimedia codec

The codec negotiation procedures are transmitting an ordered list of preferred codecs from the originating to the terminating MSC. Each node may optionally remove the codecs it does not support, and the terminating MSC selects

the codec to use ("selected codec") and the list of available codecs for the call, based on the incoming list of codecs, and on the information given by the terminating MS in the CALL CONFIRMED message.

The codec used for service change and fallback to carry the information that a multimedia call is requested either as the preferred mode or as a second mode is the 3G-324.M codec defined in 3GPP TS 26.103 [25] (N3-020081).

This codec is only used in the Core Network, and is not sent from the terminal in the Supported Codec List IE. The use of the Repeat Indicator and the two BCs as described in 3.8.2 is sufficient to request the service from the MS.

ITU-T is currently defining a new means of signalling a UDI n x 64 kbit/s channel through BICC networks, which is described in Annex B.

3.8.3.2 Originating side

The originating MSC constructs a list of supported codec types, listed in order of preference.

If the SETUP message received from the MS contains a Repeat Indicator with a value of "service change and fallback", as well as a UDI/RDI multimedia BC and a speech BC, the MSC shall include a 3G-324.M codec in the list of supported codec types using the following rule:

- If the multimedia BC-IE is the first BC, then the 3G-324.M codec is the first codec in the list,
- If the speech BC-IE is the first BC, then the 3G-324.M codec is the last codec in the list. In the rare case that the maximum number of codecs is already reached before insertion of the 3G-324.M codec, the optional speech codec with the least preference shall be discarded.

The list is then sent according to the Out-of-Band Transcoder Control codec negotiation procedure. The TMR field is set to "64 kbit/s UDI". If a transit node does not support one of the codec types, it may remove it from the list. If the 3G-324.M codec is unsupported and removed, the call is turned to a normal speech call (fallback to speech), and the procedure continues normally.

3.8.3.3 Terminating side

The terminating MSC receives the list of supported codec types, including the 3G-324.M codec. It shall then send a SETUP message towards the terminating MS including a Repeat Indicator with the value "service change and fallback" and two BCs, according to the following rule:

- If the 3G-324.M codec is the first (preferred) codec in the list of supported codecs, then the first BC in the SETUP message is the multimedia BC, and the second BC is the speech BC;
- If the 3G-324.M codec is in the list of supported codec types, but not in the first position, then the first BC in the SETUP message is the speech BC, and the second BC is the multimedia BC.

The terminating MS answers according to its capabilities in the CALL CONFIRMED message. The terminating MSC shall determine the Selected Codec and construct the list of available codecs according to the following rules:

- If no Repeat Indicator is included, and only a speech BC is received, the MSC chooses a speech codec as the Selected Codec according to the normal mechanism, and no 3G-324.M codec is inserted in the list of available codecs;
- If no Repeat Indicator is included, and only a multimedia BC is received, the MSC chooses the 3G-324.M codec as the Selected Codec, and only the 3G-324.M codec is inserted in the list of available codecs;
- If the Repeat Indicator is included, and the speech BC is the first BC and the multimedia BC is the second BC, the MSC chooses a speech codec as the Selected Codec according to the normal mechanism, and both the 3G-324.M codec and speech codecs are inserted in the list of available codecs;
- If the Repeat Indicator is included, and the multimedia BC is the first BC and the speech BC is the second BC, the Selected Codec is the 3G-324.M codec, and both the 3G-324.M codec and speech codecs are inserted in the list of available codecs.

The Selected Codec and the list of available codecs are sent back to the originating MSC according to the normal codec negotiation procedure.

3.8.3.4 Originating side – completion of call setup

The originating MSC receives the Selected Codec and the list of available codecs, and, depending on the active mode, shall do the following:

The call was set up with a multimedia BC first:

- If the Selected Codec is the 3G-324.M codec, no In-Call Modification procedure is necessary. If no speech codecs are included in the list of available codecs, all In-Call Modification procedures initiated by the UE using the speech BC shall be rejected with a MODIFY REJECT message;
- If the Selected Codec is a speech codec, an In-Call Modification procedure to change to speech mode shall take place. If the 3G-324.M codec is not included in the list of available codecs, all In-Call Modification procedures initiated by the MS using the multimedia BC shall be rejected with a MODIFY REJECT message;

The call was set up with a speech BC first:

- If the Selected Codec is the 3G-324.M codec, an In-Call Modification procedure to change to multimedia mode shall take place. If no speech codecs are included in the list of available codecs, all In-Call Modification procedures initiated by the UE using the speech BC shall be rejected with a MODIFY REJECT message;
- If the Selected Codec is a speech codec, no In-Call Modification procedure is necessary. If the 3G-324.M codec is not included in the list of available codecs, all In-Call Modification procedures initiated by the MS using the multimedia BC shall be rejected with a MODIFY REJECT message.

3.8.3.5 Service change during the active state

Whenever an In-Call Modification procedure is initiated by a terminal, unless it is not allowed as determined at call setup, the following shall take place:

- If the current mode is the speech mode and the MODIFY message contains a multimedia BC, the normal Out-of-Band Transcoder Control procedures take place to change the Selected Codec to the 3G-324.M codec;
- If the current mode is the multimedia mode and the MODIFY message contains a speech BC, the normal Out-of-Band Transcoder Control procedures take place to change the Selected Codec to the preferred speech codec.

When an MSC detects through an Out-of-Band Transcoder Control procedure that the selected codec has changed from a speech codec to the 3G-324.M codec, or vice-versa, it shall initiate an In-Call Modification procedure towards the MS with a MODIFY message containing the multimedia BC (resp. the speech BC), unless the new mode has been disallowed at call setup.

***** Next new section *****

Annex B:

Multimedia codec

There is an ongoing work in ITU-T SG11 to add a "clear mode" codec to Q.765.5 (described in N1-020245), which could be used to signal the request for multimedia through BICC networks.

***** End of new section *****

CR-Form-v5

CHANGE REQUEST

⌘ **24.008 CR 551** ⌘ rev **2** ⌘ Current version: **5.2.0** ⌘

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:	⌘ Service change and fallback for UDI/RDI multimedia calls		
Source:	⌘ Ericsson		
Work item code:	⌘ SCUDIF	Date:	⌘ 2002-01-31
Category:	⌘ C	Release:	⌘ REL-5
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> 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:	⌘ Allow service change and fallback for UDI/RDI 3G.324M multimedia calls.		
Summary of change:	⌘ The support for multimedia calls is updated : <ul style="list-style-type: none"> • A service change and fallback procedure between UDI/RDI multimedia and speech is added ; • In order to support mobiles without service change/fallback capability, a new Repeat Indicator value is needed ; Additionally, the sections 5.3.6.3.1, 5.3.6.3.2, 5.3.6.3.3, 5.3.6.3.3.1 and 5.3.6.3.3.2 were removed as they are redundant with the "changing the call mode" procedure in 5.3.4.3.		
Consequences if not approved:	⌘ Limited CS multimedia functionality		

Clauses affected:	⌘ 5.3.6.1, 5.3.6.2.1, 5.3.6.2.1.1, 5.3.6.2.2, 5.3.6.2.2.1, 5.3.6.3, 5.3.6.3.1, 5.3.6.3.2, 5.3.6.3.3, 5.3.6.3.3.1, 5.3.6.3.3.2, 10.5.4.22		
Other specs affected:	⌘ <input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘ TS 29.007, TS 27.001	
Other comments:	⌘		

*** Start of Modified Section ***

5.3.6 Support of multimedia calls

5.3.6.1 Service description

The GSM-UMTS circuit-switched multimedia call is based on the 3G-324M [26.111], which is a 3GPP-variant of the ITU-T H.324 recommendation. CS Multimedia telephony is a Bearer Service, which utilizes the Synchronous Transparent Data service (BS30) [3].

At the multimedia call setup the required call type, 3G-324M, is indicated, for the network to be able to invoke appropriate interworking functionality. In the peer end the H.324 information is used to invoke the terminal application. In addition to H.324 indication the terminal must select Information Transfer Capability (ITC) for the multimedia call. The 'correct' ITC depends on the peer end and the transporting networks; an all-ISDN call is a UDI/RDI call, and a call, which involves PSTN, is an analog '3.1 kHz audio' call.

For the case when the setup of a multimedia call is not successful, fallback to speech is specified.

Users may also request a service change between UDI/RDI multimedia and speech modes during a call.

5.3.6.2 Call establishment

For both mobile originating and mobile terminating calls, the normal call establishment procedures apply, with the exceptions specified in the following sections.

For further description of the function of MSC/IWF in the following sections, see 3GPP TS 29.007 [38].

5.3.6.2.1 Mobile originated multimedia call establishment

At call setup the required call type, 3G-324M, is indicated by the originating MS in the SETUP message, with the *bearer capability IE* parameter Other Rate Adaptation set to 'H.223 and H.245'.

For analogue multimedia, the support of a fallback to speech is requested by including also *two bearer capability IEs, 2 with speech indication*, multimedia first and speech as the second BC in the SETUP message. The MS shall indicate fallback to speech by these two BC IEs and the associated Repeat Indicator set to "support of fallback".

For UDI/RDI multimedia, the support of a fallback and service change is requested by including *two bearer capability IEs*, with the first BC as the preferred service in the SETUP message. The MS shall indicate service change and fallback by these two BC IEs and the associated Repeat Indicator set to "support of service change and fallback".

The bearer compatibility checking in the network is according to 5.3.4.2.1.

~~The network shall examine each mode described in the *bearer capability IEs* included in the SETUP message by performing compatibility checking as defined in Annex B. If as a result of this compatibility checking the network decides to reject the call, then the network shall initiate call clearing as specified in section 5.4 with the following causes:~~

- ~~a) #57 "bearer capability not authorized"~~
- ~~b) #58 "bearer capability not presently available"~~
- ~~e) #65 "bearer service not implemented"~~
- ~~d) #70 "only restricted digital information bearer capability is available"~~

The originating user shall determine (possibly by pre-configuration of the terminal) whether a digital connection is required or if the call will be an analog modem call. If the call is expected to be digital the *multimedia bearer capability IE* parameter ITC is set to UDI/RDI. In an analog call the *multimedia bearer capability IE* parameter ITC is set to '3.1kHz audio ex PLMN'. Additionally required modem type is indicated (Other Modem Type = V.34).

5.3.6.2.1.1 ~~Fallback to speech~~

If the network, during ~~the~~ setup of an ~~analogue~~ H.324 call, detects that ~~the transit network or~~ the called end does not support an H.324 call (*e.g.* because of a failure in the modem handshaking in case of an analogue multimedia call), then ~~the~~ network initiates the in-call modification procedure (see section 5.3.4.3) towards the MS to modify the call mode to speech, if the MS had included a speech *bearer capability IE* in the SETUP message.

In case of a UDI/RDI multimedia call with service change and fallback, if the network detects that the called end does not support speech, then it initiates an in-call modification procedure towards the MS to modify the call mode to multimedia, if the first *bearer capability IE* was for a speech call.

NOTE — : ~~fallback from digital (UDI) H.324 call to speech is not supported.~~

5.3.6.2.2 Mobile terminating multimedia call

At call setup the required call type, 3G-324M, is indicated by the network in the SETUP message, with the *bearer capability IE* parameter Other Rate Adaptation set to 'H.223 and H.245'. ITC is either '3.1kHz audio ex PLMN' or 'UDI/RDI'.

For analogue multimedia, if the network supports fallback to speech, and if the subscriber has subscription to speech, two *bearer capability IEs*, with multimedia first and speech as the second BC are included in the SETUP message. The network shall indicate fallback to speech by these two BC IEs and the associated Repeat Indicator set to "support of fallback".

For UDI/RDI multimedia, if the network supports fallback and service change, and the subscriber has subscription to speech, two *bearer capability IEs*, with the first BC as the preferred service are included in the SETUP message. The network shall indicate service change and fallback by these two BC IEs and the associated Repeat Indicator set to "service change and fallback".

~~The *bearer capability IE(s)* may (in the case of the single numbering scheme) be missing from the SETUP message.~~

~~The *bearer compatibility checking* in the MS is according to 5.3.4.2.2. The MS shall perform the compatibility checking as defined in Annex B for the required mode(s) if indicated in the SETUP message. If as a result of compatibility checking the MS decides to reject the call, the MS shall initiate call clearing according to the procedure of section 5.4 with one of the following causes:~~

- ~~a) #57 "bearer capability not authorized"~~
- ~~b) #58 "bearer capability not presently available"~~
- ~~e) #65 "bearer service not implemented"~~
- ~~d) #88 "incompatible destination"~~

The MS shall indicate the supported call type(s) in the CALL_CONFIRMED message, which is the acknowledgement to SETUP. The MS has following options for the inclusion of *bearer capability IE* in the CALL_CONFIRMED message:

- if the MS/user accepts the offered multimedia call, and supports ~~speech~~ fallback (analogue) or service change (UDI/RDI), none or both multimedia and speech *bearer capability IEs* shall be included. In the case of UDI/RDI, the order of the BC IEs determines the preferred service
- if the MS/user accepts the offered multimedia call, but does not support ~~speech~~ fallback or service change, only a multimedia *bearer capability IE* shall be included
- if the MS/user wishes a speech (only) call a speech *bearer capability IE* is included
- if the MS/user accepts the offered speech call in case of a UDI/RDI multimedia call, and supports service change, none or both speech and multimedia *bearer capability IEs* shall be included. The order of the BC IEs determines the preferred service

If the SETUP contained no *bearer capability IE* the network shall perform compatibility checking of the CALL_CONFIRMED message in the same way as the compatibility checking of the SETUP message in the mobile originating call case, described in section 5.3.6.2.1.

5.3.6.2.2.1 Fallback to speech

If modem handshaking fails (in a modem call), the call mode will be modified to speech if a speech bearer capability IE was included. The modem signalling is inband, so the call must have reached the active state, when these conclusions about the presence of modems can be done. The call modifications are realized through the in-call modification procedure, by which the network requests the MS to modify the call mode (see section 5.3.4.3).

NOTE: Fallback from digital (UDI) H.324-call to speech after call setup is not supported a valid case at the terminating side.

5.3.6.3 In-call modification in the "active" state

The in-call modification procedure as described in chapter 5.3.4.3 shall be used to:

- trigger a service change between speech and UDI/RDI multimedia modes, when service change has been agreed at call setup, or
- In order to change modify the multimedia bearer capability for a multimedia call without service change (restricted to the network initiated in-call modification only), the following in-call modification procedure shall be used. In this case, the network shall send a MODIFY message including immediate modification indicator IE and the new Bearer Capability to be changed to. The following bearer capability parameters can be modified with the procedure (see 3GPP TS 29.007 [38]):
 - Fixed Network User Rate

Only network side of the radio interface may act as the requesting user to invoke the in-call modification.

5.3.6.3.1 VoidInitiation of in-call modification

The procedure is initiated by the network in the "active" state of the call. The network shall send a MODIFY message including Immediate modification indicator IE and the new bearer capability to be changed to; start timer T323; and enter the "mobile terminating modify" state. Any internal resources necessary to support the new bearer capability shall be reserved. The detailed operation of the MODIFY originating side is described in 3GPP TS 29.007.

Upon receipt of the MODIFY message with Immediate modification indicator IE, the MS shall check to ensure that the requested bearer capability can be supported and if so, it shall initiate the reservation of any resources necessary to support the new bearer capability and enter the "mobile terminating modify" state.

5.3.6.3.2 VoidSuccessful completion of in-call modification

If the MS can support the requested bearer capability the MS shall perform actions defined in 3GPP TS 27.001 [37]. After successful modifications defined in 3GPP TS 27.001 [37] the MS shall send a MODIFY COMPLETE message with the new bearer capability included and enter the "active" state.

Upon receipt of the MODIFY COMPLETE message the network shall: initiate the alternation to those resources necessary to support the new bearer capability; stop timer T323; and enter the "active" state.

5.3.6.3.3 VoidFailure of in-call modification

5.3.6.3.3.1 VoidMS rejection of in-call modification

If the MS cannot support the requested bearer capability, the MS shall: release any resources which had been reserved for the modification; send a MODIFY REJECT message with the old bearer capability and cause # 58 "bearer capability not presently available", and enter the "active" state.

Upon receipt of the MODIFY REJECT message the network shall: stop timer T323, release any resources which had been reserved for the modification, enter the "active" state and perform activities defined in 3GPP TS 29.007 [38].

5.3.6.3.3.2 VoidTime-out recovery

Upon expiration of T323 in the network the procedures for call clearing shall be initiated with cause # 102 "recovery on timer expiry".

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

10.5.4.22 Repeat indicator

The purpose of the repeat indicator information element is to indicate how the associated repeated information elements shall be interpreted, when included in a message. The repeat indicator information element is included immediately before the first occurrence of the associated information element which will be repeated in a message. "Mode 1" refers to the first occurrence of that information element, "mode 2" refers to the second occurrence of that information element in the same message.

The repeat indicator information element is coded as shown in figure 10.5.109/3GPP TS 24.008 and table 10.5.129/3GPP TS 24.008.

The repeat indicator is a type 1 information element.

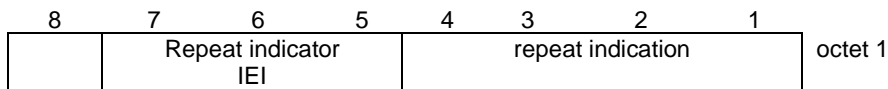


Figure 10.5.109/3GPP TS 24.008 Repeat indicator information element

Table 10.5.129/3GPP TS 24.008: Repeat indicator information element

Repeat indication (octet 1)				
Bits				
4	3	2	1	
0	0	0	1	Circular for successive selection "mode 1 alternate mode 2"
0	0	1	0	Support of fallback – mode 1 preferred, mode 2 selected if setup of mode 1 fails
0	0	1	1	reserved: was allocated in earlier phases of the protocol
<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>Service change and fallback – mode 1 alternate mode 2, mode 1 preferred</u>

***** End of Modified Section *****