3GPP TSG CT Meeting #28 **CP-050070**
1st – 3rd June 2005. Quebec, CANADA.

Source: **TSG CT WG1**

Title: **CR to Rel-6 WI "TEI6" for TS 24.008**

Agenda item: **9.24**

Document for: **APPROVAL**

This document contains 1 **CR for Rel-6 WI "TEI6"**, that has been agreed by TSG CT WG1 meeting #38 and forwarded to TSG CT Plenary meeting #28 for approval.

TDoc #	Tdoc Title	Spec	CR #	Rev	CAT	C_Version	WI	Rel
C1-050795	Transparent data call request in dual mode case	24.008	962	2	F	6.8.0	TEI6	Rel-6

3GPP TSG-CT1 Meeting #38 **Tdoc C1-050795**
Cancun, Mexico, 25 – 29 April, 2005 **Revision of C1-050448, C1-050733**

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **962** ⌘ **rev** **2** ⌘ Current version: **6.8.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Transparent data call request in dual mode case
Source:	⌘	Nokia
Work item code:	⌘	TEI6
Date:	⌘	14/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change:	⌘	Service based handover has been defined in stage 1 and stage 2, but A dual mode UE supporting transparent bearer services, e.g. CS multimedia, in UMTS but not in GSM, attached in a GSM radio network, has no means to indicate to the network that it would like to set up such a call. Consequently, the network does not get the indication that service based intersystem handover should be initiated to make the call setup successful.
Summary of change:	⌘	By setting all Acceptable Channel Codings to 'Not Acceptable' in the call setup BCIE, the UE indicates to the network that the UE does not support the requested service in A/Gb or GERAN Iu mode, and an intersystem handover is needed before the call creation can proceed. Similarily, while in UTRAN Iu mode, the network gets informed that the UE does not support the service in A/G or GERAN Iu mode.
Consequences if not approved:	⌘	As part of the stage 3 for service based handover is missing, there use of the already defined other feature (video call) is restricted unnecessarily. Many dual mode UEs supporting CS multimedia are not expected to support it in GSM where symmetric ECSD 64 kbit/s support would be required. Without a correction in the specifications a multimedia call is not possible, if the UE happens to be attached to a GSM radio network.

Clauses affected:	⌘	2, 5.3.6.2.1, 5.3.6.2.2, 10.5.4.5				
Other specs	⌘	Y [X] N [ ]	Other core specifications	⌘	27.001-CR#10, 48.008-CR#153	

affected:		X	Test specifications
		X	O&M Specifications
Other comments:	⌘	It is proposed to consider this CR as release independent and implementable on earlier releases too.	

How to create CRs using this form:

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

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

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

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

2 References

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

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

[1] Void.

[2] Void.

[2a] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications"

[3] 3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[4] 3GPP TS 22.003: "Teleservices supported by a Public Land Mobile Network (PLMN)".

[5] 3GPP TS 42.009: "Security aspects".

[5a] 3GPP TS 33.102: "3G security; Security architecture".

[6] 3GPP TS 22.011: "Service accessibility".

[7] 3GPP TS 42.017: "Subscriber Identity Modules (SIM); Functional characteristics".

[8] 3GPP TS 22.101: "Service aspects; Service principles".

[8a] 3GPP TS 22.001: "Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)".

[8b] 3GPP TS 23.038: "Alphabets and language-specific information".

[9] 3GPP TS 23.101: "General UMTS Architecture".

[9a] 3GPP TS 23.108: "Mobile radio interface layer 3 specification core network protocols; Stage 2 (structured procedures)".

[10] 3GPP TS 23.003: "Numbering, addressing and identification".

[11] 3GPP TS 43.013: "Discontinuous Reception (DRX) in the GSM system".

[12] 3GPP TS 23.014: "Support of Dual Tone Multi-Frequency (DTMF) signalling".

[12a] ETSI ES 201 235-2, v1.2.1: "Specification of Dual Tone Multi-Frequency (DTMF); Transmitters and Receivers; Part 2: Transmitters".

[13] 3GPP TS 43.020: "Security-related network functions".

[14] 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[15] 3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".

[16] 3GPP TS 44.003: "Mobile Station - Base Station System (MS - BSS) interface; Channel structures and access capabilities".

[17] 3GPP TS 44.004: "Layer 1; General requirements".

[18] 3GPP TS 44.005: "Data Link (DL) layer; General aspects".

[19] 3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[19a] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[19b] 3GPP TS 25.322: "Radio Link Control (RLC) protocol specification".

[19c] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[20] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[21] 3GPP TS 24.010: "Mobile radio interface layer 3; Supplementary services specification; General aspects".

[22] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23] 3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a] 3GPP TS 44.071: "Location Services (LCS); Mobile radio interface layer 3 specification."

[23b] 3GPP TS 44.031 "Location Services LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)".

[23c] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification"

[24] 3GPP TS 24.080: "Mobile radio Layer 3 supplementary service specification; Formats and coding".

[25] 3GPP TS 24.081: "Line identification supplementary services; Stage 3".

[26] 3GPP TS 24.082: "Call Forwarding (CF) supplementary services; Stage 3".

[27] 3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[28] 3GPP TS 24.084: "MultiParty (MPTY) supplementary services; Stage 3".

[29] 3GPP TS 24.085: "Closed User Group (CUG) supplementary services; Stage 3".

[30] 3GPP TS 24.086: "Advice of Charge (AoC) supplementary services; Stage 3".

[31] 3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[32] 3GPP TS 45.002: "Multiplexing and multiple access on the radio path".

[33] 3GPP TS 45.005: "Radio transmission and reception".

[34] 3GPP TS 45.008: "Radio subsystem link control".

[35] 3GPP TS 45.010: "Radio subsystem synchronization".

[36] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[36a] 3GPP TS 27.060: "Mobile Station (MS) supporting Packet Switched Services ".

[37] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[38] 3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39] 3GPP TS 51.010: "Mobile Station (MS) conformance specification".

[40] 3GPP TS 51.021: "GSM radio aspects base station system equipment specification".

[41] ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42] ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43] ISO 8348 (1987): "Information technology -- Open Systems Interconnection -- Network Service Definition".

[44] ITU-T Recommendation E.163: "Numbering plan for the international telephone service".

[45] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[46] ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[47] ITU-T Recommendation F.69 (1993): "The international telex service - Service and operational provisions of telex destination codes and telex network identification codes".

[48] ITU-T Recommendation I.330: "ISDN numbering and addressing principles".

[49] ITU-T Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50] ITU-T Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51] ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52] ITU-T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information interchange".

[53] ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54] ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55] ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56] ITU-T Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57] Void.

[58] ITU-T Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59] ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60] ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".

[61] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[62] ITU-T Recommendation X.21: "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for synchronous operation on public data networks".

[63] Void.

[64] Void.

[65] ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[66] ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67] Void.

[68] Void.

[69] ITU-T Recommendation X.121: "International numbering plan for public data networks".

[70] ETSI ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[71] ETSI ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control; Specification Description Language (SDL) diagrams".

[72] ISO/IEC 10646: "Information technology -- Universal Multiple-Octet Coded Character Set (UCS)".

[73] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75] 3GPP TS 43.064: "General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76] 3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[77] IETF RFC 1034: "Domain names - concepts and facilities".

[78] 3GPP TS 44.065: "Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[78a] 3GPP TS 44.064: "Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification".

[79] ITU Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[80] 3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[81] 3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[82] 3GPP TS 43.022: "Functions related to Mobile Station (MS) in idle mode and group receive mode".

[83] 3GPP TS 26.103: "Speech Codec List for GSM and UMTS".

[84] 3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[85] 3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification".

[86] 3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[87] 3GPP TS 43.055: "Dual Transfer Mode (DTM); Stage 2".

[88] 3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2".

[88a] 3GPP TS 23.093: "Technical realization of Completion of Calls to Busy Subscriber (CCBS); Stage 2".

[89] 3GPP TS 22.042: "Network Identity and Time Zone (NITZ), Stage 1".

[90] 3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[91] 3GPP TS 44.056: "GSM Cordless Telephony System (CTS), (Phase 1) CTS Radio Interface Layer 3 Specification".

[92] 3GPP TS 23.226: "Global Text Telephony; Stage 2 "

[93] 3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description "

[94] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[95] 3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP"

[96] 3GPP TS 23.205: "Bearer-independent circuit-switched core network; Stage 2".

[97] 3GPP TS 23.172: "UDI/RDI Fallback and Service Modification; Stage 2".

[98] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

[99] RFC 3513 (April 2003): "Internet Protocol Version 6 (IPv6) Addressing Architecture".

[100] 3GPP TS 29.207: "Policy control over Go interface".

[101] 3GPP TS 21.111: "USIM and IC card requirements".

[102] RFC 1661 (July 1994): "The Point-to-Point Protocol (PPP)".

[103] RFC 3232 (January 2002): "Assigned Numbers: RFC 1700 is Replaced by an On-line Database".

[104] 3GPP TS 23.034: "High Speed Circuit Switched Data (HSCSD) – Stage 2".

[105] 3GPP TS 23.271: "Functional stage 2 description of LCS".

[106] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and Functional Description".

[107] RFC 3376 (October 2002): "Internet Group Management Protocol, Version 3".

[108] RFC 2710 (October 1999): "Multicast Listener Discovery (MLD) for IPv6".

[109] 3GPP TS 23.251: "Network Sharing; Architecture and Functional Description".

[110] 3GPP TS 25.346: “Introduction of the Multimedia Broadcast Multicast Service (MBMS) in the Radio Access Network”

[111] 3GPP TS 44.118: "Radio Resource Control (RRC) protocol; Iu mode".

[112] 3GPP TS 31.102: "Characteristics of the USIM Application".

[113] 3GPP TS 43.129: "Packet-switched handover for GERAN A/Gb mode; Stage 2".

[114] 3GPP TS 23.009: "Handover procedures".

5.3.6 Support of multimedia calls

5.3.6.1 Service description

The 3GPP 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 (see 3GPP TS 23.172 [97]).

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 subclauses.

For further description of the function of MSC/IWF in the following clauses, 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 two *bearer capability IEs*, 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".

If the *bearer capability IE* received from the MS indicates no A/Gb mode support for the requested bearer service, the network shall consider it as a request to perform an inter-system handover to UTRAN Iu mode, as described in TS 23.009 [114] subclause 14.2.

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

If the MS requested for an analogue multimedia call with fallback to speech, or for a UDI/RDI multimedia call with fallback and service change, and the network accepts the call, the network has the following options for the inclusion of *bearer capability IEs* in the CALL PROCEEDING message:

- if the network accepts the requested analogue multimedia call and supports fallback to speech, both multimedia and speech *bearer capability IEs* shall be included;
- if the network accepts the requested UDI/RDI multimedia call and supports fallback and service change, both multimedia and speech *bearer capability IEs* shall be included. The order of the *bearer capability* IEs determines the preferred service, and the network may reverse the order of these IEs (see 3GPP TS 23.172 [97], subclause 4.2.1);
- if the network accepts a multimedia (only) call, a multimedia *bearer capability IE* shall be included;
- if the network accepts a speech (only) call, a speech *bearer capability IE* shall be included;
- for a UDI/RDI multimedia call, if the network accepts the requested speech call and supports service change, both multimedia and speech *bearer capability IEs* shall be included. The order of the *bearer capability* IEs

determines the preferred service, and the network may reverse the order of these IEs (see 3GPP TS 23.172 [97], subclause 4.2.1);

- if the network received a UDI/RDI multimedia *bearer capability* IE with FNUR equal to 32kbit/s and a speech *bearer capability* IE in the SETUP message, the network shall not release the call, but shall reply with one *bearer capability* IE only, as specified in 3GPP TS 23.172 [97].

NOTE: Service change and fallback for UDI/RDI multimedia calls is not supported with Fixed Network User Rate set to 32 kbit/s (see 3GPP TS 23.172 [97]).

If the MS requested for a multimedia call only, and the network accepts the call, the network shall always include a single multimedia *bearer capability IE* in the CALL PROCEEDING message.

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 "3,1 kHz audio ex PLMN". Additionally required modem type is indicated (Other Modem Type = V.34).

5.3.6.2.1.1 Fallback

If the network, during the setup of an 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 subclause 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.

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 '3,1 kHz audio ex PLMN' or 'UDI/RDI'.

For analogue multimedia, if the network supports fallback to speech and the subscriber has subscription to speech, two *bearer capability* IEs, 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".

If the *bearer capability IE* received from the MS indicates no A/Gb mode support for the requested bearer service, the network shall consider it as a request to perform an inter-system handover to UTRAN Iu mode, as described in TS 23.009 [114] subclause 14.2.

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 indicate the supported call type(s) in the CALL CONFIRMED message, which is the acknowledgement to SETUP. If the network offered an analogue multimedia call with fallback to speech, or a UDI/RDI multimedia call with fallback and service change, the MS has the following options for the inclusion of *bearer capability IEs* in the CALL CONFIRMED message:

- if the MS/user accepts the offered analogue multimedia call and supports fallback to speech, both multimedia and speech *bearer capability IEs* shall be included;

- if the MS/user accepts the offered UDI/RDI multimedia call, and supports fallback and service change, both multimedia and speech *bearer capability IEs* shall be included. The order of the BC IEs determines the preferred service, and the MS/user may reverse the order of these IEs;

- if the MS/user accepts the offered multimedia call, but does not support 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;

- for a UDI/RDI multimedia call, if the MS/user accepts the offered speech call and supports service change, both speech and multimedia *bearer capability IEs* shall be included. The order of the BC IEs determines the preferred service, and the MS/user may reverse the order of these IEs.

If the network offered a multimedia call only, and the MS/user accepts the call, the MS shall always include a single multimedia *bearer capability IE* in the CALL CONFIRMED message.

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 subclause 5.3.6.2.1.

10.5.4.5 Bearer capability

The purpose of the bearer capability information element is to describe a bearer service. The use of the bearer capability information element in relation to compatibility checking is described in annex B.

The bearer capability information element is coded as shown in figure 10.5.88/3GPP TS 24.008 and tables 10.5.102/3GPP TS 24.008 to 10.5.115/3GPP TS 24.008.

The bearer capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 16 octets.

8	7	6	5	4	3	2	1	
	Bearer capability IEI							octet 1
Length of the bearer capability contents								octet 2
0/1 ext	radio channel requirement		co-ding std	trans fer mode	information transfer capability			octet 3
0/1 ext	0 co-ding	CTM	0 spare		speech version indication			octet 3a *
0/1 ext	0 co-ding	0 spare	0 spare		Speech version Indication			octet 3b etc*
1 ext	comp -ress.	structure		dupl. mode	confi gur.	NIRR	esta-bli.	octet 4*
0/1 ext	0 access id.	0	rate adaption		signalling access protocol			octet 5*
0/1 ext	Other ITC		Other rate adaption		0 Spare	0	0	octet 5a*
1 ext	Hdr/ noHdr	Multi frame	Mode	LLI	Assig nor/e	Inb. neg	0 Spare	octet 5b*
0/1 ext	0 layer 1 id.	1	User information layer 1 protocol				sync/ async	octet 6*
0/1 ext	numb. stop bits	nego-tia-tion	numb. data bits	user rate				octet 6a*
0/1 ext	intermed. rate		NIC on TX	NIC on RX	Parity			octet 6b*
0/1 ext	connection element		modem type					octet 6c*
0/1 ext	Other modem type		Fixed network user rate					octet 6d*
0/1 ext	Acceptable channel codings				Maximum number of traffic channels			octet 6e*
0/1 ext	UIMI			Wanted air interface user rate				octet 6f*
1 ext	Acceptable channel codings extended			Asymmetry Indication		0 Spare	0	octet 6g*
1 ext	1 layer 2 id.	0	User information layer 2 protocol					octet 7*

Figure 10.5.88/3GPP TS 24.008 Bearer capability information element

NOTE 1: The coding of the octets of the bearer capability information element is not conforming to ITU Q.931.

An MS shall encode the Bearer Capability infomation element according to A/Gb mode call control requirements also if it is requesting for a service in Iu mode, with the following exceptions:

1. A mobile station not supporting A/Gb mode and GERAN Iu mode for the requested bearer service shall set the following parameters to the value "0":

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)

2. Furthermore, a mobile station not supporting A/Gb mode and GERAN Iu mode for the requested bearer service shall also set the following parameters to the value "0", if the respective octets have to be included in the bearer capability information element according to subclause 10.5.4.5.1 and 3GPP TS 27.001 [36]:
   - UIMI, User initiated modification indication (octet 6f, bits 5-7)
   - Acceptable Channel Codings extended (octet 6g, bits 5-7)

For UTRAN Iu mode the following parameters are irrelevant for specifying the radio access bearer, because multiple traffic channels (multislot) are not deployed, see 3GPP TS 23.034 [104]. However, the parameters if received, shall be stored in the MSC, and used for handover to A/Gb or GERAN Iu mode:

- Maximum number of traffic channels (octet 6e, bits 1-3)
- Acceptable Channel coding(s) (octet 6e, bits 4, 5 and 7)
- UIMI, User initiated modification indication (octet 6f, bits 5-7)
- Acceptable Channel Codings extended (octet 6g, bits 5-7)

NOTE 2: The following parameters are relevant in UTRAN Iu mode for non transparent data calls for deciding which RLP version to negotiate in order to avoid renegotiation of RLP version in case of inter-system handover from UTRAN Iu mode to A/Gb or GERAN Iu mode, see 3GPP TS 24.022 [9]:
- Maximum number of traffic channels (octet 6e, bits 1-3)
- Wanted air interface user rate (octet 6f, bits 1- 4)
- UIMI, User initiated modification indication (octet 6f, bits 5-7).