3GPP TSG-CN Meeting #23 **NP-040086**
10th - 12th March 2004. Phoenix, USA.

Source: **TSG CN WG3**

Title: **CRs to Rel-6 on Work Item TEI_6**

Agenda item: **9.22**

Document for: **APPROVAL**

Introduction:

This document contains **1** CRs to **Rel-6 on Work Item TEI_6**, that have been agreed by **TSG CN WG3**, and are forwarded to TSG CN Plenary for approval.

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver
N3-040115	23.172	025	2	B	Network-Initiated Service Change for SCUDIF	Rel-6	5.4.0

3GPP TSG-CN WG3 Meeting #31 **N3-040115**
Atlanta, USA. 16th - 20th February 2004.

CR-Form-v7

CHANGE REQUEST

⌘ **23.172** **CR** **025** ⌘**rev** **2** ⌘ Current version: **5.4.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Network-Initiated Service Change
Source:	⌘	TSG_CN WG3
Work item code:	⌘	SCUDIF
Date:	⌘	05/02/2004
Category:	⌘	**B**
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:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	SA1 agreed new Requirement: • When the Multimedia call is no longer supported, for example due to degraded coverage conditions (including UTRAN to GERAN only transitions), service change shall occur automatically from a Multimedia call to speech. • When a Multimedia call can be supported, for example due to improved coverage conditions (including GERAN only to UTRAN or UTRAN/GERAN transitions), service change back to the Multimedia call may be initiated by the network.
Summary of change:	⌘	The serving MSC may initiate a sevice-change from multimedia to speech during the active call is sufficient resources for multimedia are no longer available. If these resources become available again at a later point in time, the network may initiate a service change from speech to multimedia.
Consequences if not approved:	⌘	SCUDIF does not satisfy all requirements

Clauses affected:	⌘	4.1, new clause 4.2.5, 4.3.5

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	22.101 (CR146)
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

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

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.153: "Out of Band Transcoder Control; Stage 2".

[3] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core network protocols; Stage 3".

[4] 3GPP TS 26.103: "Speech Codec List for GSM and UMTS".

[5] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[6] 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)".

[7] 3GPP TS 29.205: "Application of Q.1900 series to bearer-independent circuit-switched core network architecture; Stage 3".

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

[9] 3GPP TS 33.106: "3GPP Security; Lawful Interception Requirements".

[10] 3GPP TS 23.018: "Basic Call Handling; Technical realization".

[11] 3GPP TS 23.003: "Numbering, adressing and identification".

[12] 3GPP TS 29.232: "Media Gateway Controller (MGC) – Media Gateway (MGW) Interface; Stage 3".

[13] 3GPP TS 26.102: "Mandatory Speech Codec; AMR Speech Codec; Interface to Iu, Uu, Nb".

[14] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) ; Stage 2"

[15] 3GPP TS 25.413: “UTRAN Iu interface RANAP signalling”

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply:

~~Editor's note: To be completed.~~

fallback: when two services (multimedia and speech) are proposed but only one of them is available or wanted, only the service available (preferred or less preferred) is selected, and the other one is discarded

service change: when two services (multimedia and speech) are available during the active state of a call, users may request a service change to switch between the two services

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply:

BC	Bearer Capability
BC1	First Bearer Capability in a message (preferred service)
BC2	Second Bearer Capability in a message (less preferred service)
BCa	Bearer Capability of the currently selected service
BCb	Bearer Capability of the service to switch to
BCmm	Bearer Capability multimedia
BCSM	Basic Call State Model
BCsp	Bearer Capability speech
CAMEL	Customised Applications for Mobile network Enhanced Logic
DP	Detection Point
IE	Information Element
MMI	Man-Machine Interface
O-MSC	Originating MSC
OoBTC	Out-of-Band Transcoder Control
O-UE	Originating UE
RI	Repeat Indicator
SCUDIF	Service Change and UDI/RDI Fallback
T-MSC	Terminating MSC
T-UE	Terminating UE

4 Service change and fallback for UDI/RDI multimedia

4.1 General Requirements

The Service Change and UDI Fallback (SCUDIF) is a function which applies to UDI/RDI multimedia calls (see 3GPP TS 22.101 [8], clause 7.2.1), and shall support the following:

a) Fallback to speech during call setup: allow a user to attempt to set up a multimedia call, and try a speech connection if the former doesn't succeed;

b) Fallback to the less preferred service (speech or multimedia) during call setup: allow the terminating side via specific settings for this service in the terminal to accept or reject a multimedia call, without interrupting the call setup;

c) Fallback to the preferred service (speech or multimedia) or speech during call setup: allow the call setup to proceed with a single service if the transit network does not support the signalling of this functionality;

d) BC negotiation at the terminating side: allow the terminating side via specific settings for this service in the terminal to turn a speech call (with service change) into a multimedia call and vice-versa;

e) 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;

f) Allow any of the users to reject a multimedia request from the other party while in speech mode.

g) Network-initiated service change: The network shall initiate a sevice-change from multimedia to speech during the active call if a multimedia call can no longer be supported. If a multimedia call can again be supported at a later point in time, the network may initiate a service change from speech to multimedia.

To fulfil:

- service request signalling between the UE and the MSC;
- service request signalling across the Core Network.

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

Next modified Section

4.2.4 Service change in the active state

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

As a result, the MSC shall then invoke the service change procedure (see clause 4.3.5). If the request is accepted, the originating MSC sends a MODIFY COMPLETE message to the UE including the BC-IE of the mode to switch to (see figure 4.13). If the request is rejected, the MSC sends a MODIFY REJECT message to the UE including the BC-IE from the current active mode (see figure 4.14).

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 shall initiate an In-Call Modification procedure towards the terminal using the MODIFY message. The terminal shall request confirmation from the user unless configured differently. If the change is accepted, the UE shall reply to the MSC with a MODIFY COMPLETE message, whereas a MODIFY REJECT message shall be sent if the change is rejected.

NOTE: 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.

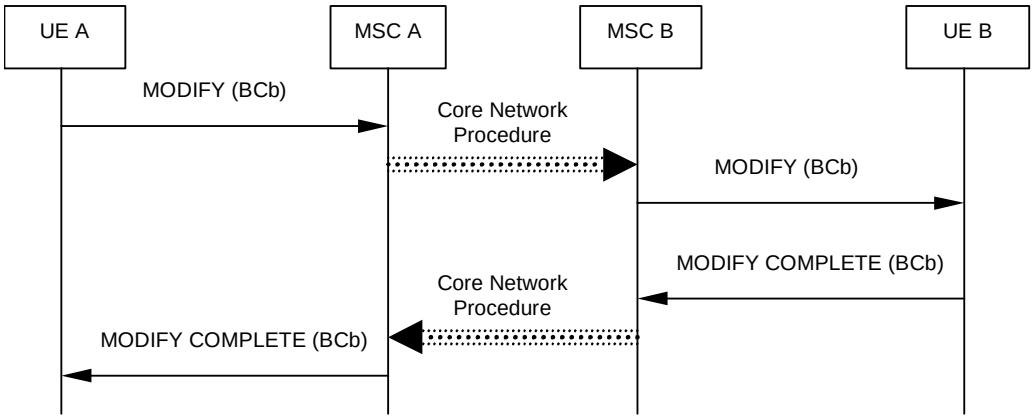

Figure 4.13: Service change requested, accepted

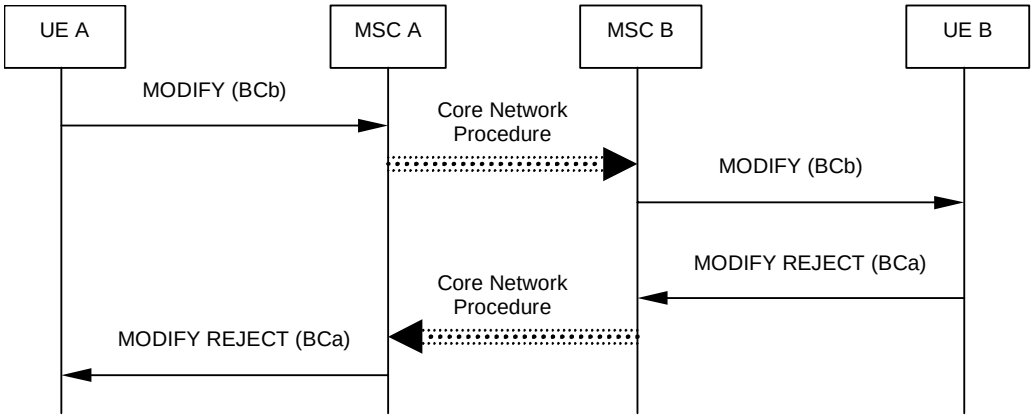

Figure 4.14: Service change requested, rejected

4.2.5 Network-initiated Service change in the active state

When the visited MSC of either party can no longer support an ongoing multimedia call, for example due to degraded coverage conditions (including UTRAN to GERAN only transitions), the visited MSC of this party shall initiate a sevice-change from multimedia to speech, following the procedures described below. If the visited MSC is again able to support the multimedia at a later point in time while the speech call is still ongoing, the same visited MSC may initiate a service change from speech to multimedia, again following the procedures described below. The visited MSC shall not initiate a service change from speech to multimedia, unless it initiated a service change from multimedia to speech before and no other service change was performed in between.

The visited MSC shall initiate an In-Call Modification procedure towards the terminal it serves using the MODIFY message. The visited MSC shall also invoke the service change procedure (see clause 4.3.5) towards the remote side. The terminals on both sides will react as described in Clause 4.2.4.

If the terminal on either side rejects the service change, the visited MSC shall either clear the call, or it shall initiate a service change procedure towards the other side to revert to the original service.

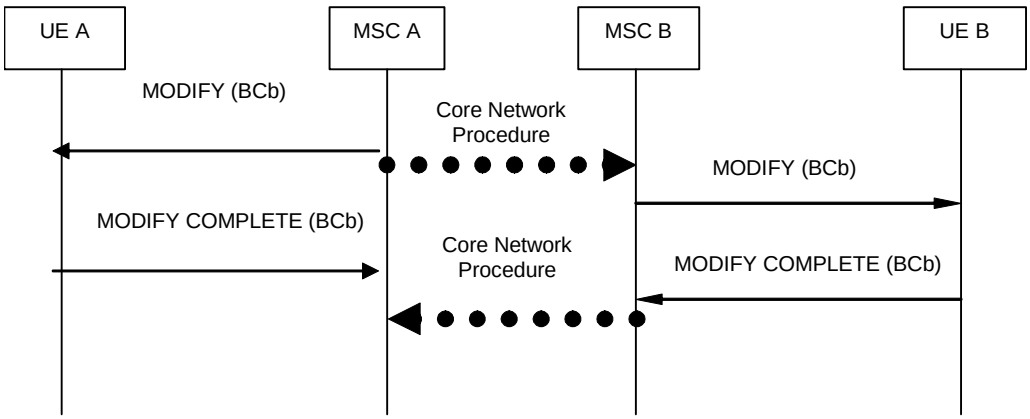

Figure 4.14a: Network-Initiated Service change requested, accepted

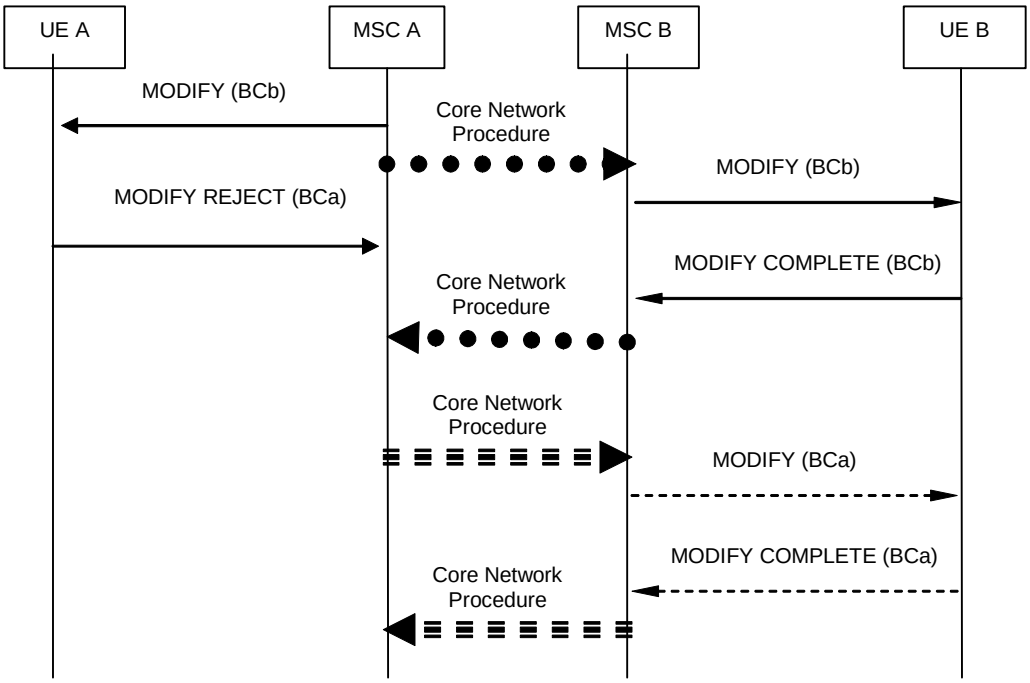

Figure 4.14b: Network-Initiated Service change requested, rejected by UE A

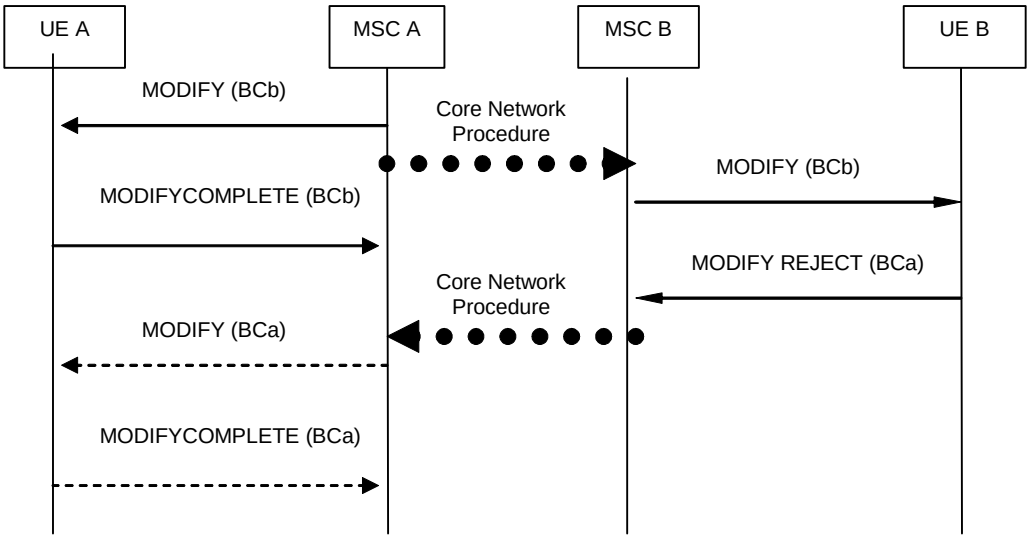

Figure 4.14c: Network-Initiated Service change requested, rejected by UE B

4.2.5.1 Network-initiated Service change in the active state starting with multimedia in Iu mode

For a network initiated service change from multimedia in Iu mode to speech, the visited MSC shall use the following procedure.

In order to be able to detect a lack of sufficient resources, the visited MSC shall include a Service Handover IE in the RANAP RAB Assignment Request or RANAP Relocation Request message indicating "Handover to GSM should not be performed" (see 3GPP TS 25.413 [15]), when it allocates or modifies the radio access bearer for multimedia at the Iu interface.

When the radio access network initiates an inter-system handover to A/Gb mode by sending a RANAP Relocation Required message (see 3GPP TS 25.413 [15]), the visited MSC shall

- terminate the procedure by sending a RANAP Relocation Preparation Failure;
- initiate an In-Call Modification procedure to speech towards the terminal it serves using the MODIFY message; and
- invoke the service change procedure (see clause 4.3.5) towards the remote side.

As an operator option, the visited MSC may then indicate to the radio access network that handover to GSM should be performed by sending an appropriate RAB assignment Request. If the radio access network initiates another inter-system handover to A/Gb mode, the visited MSC may progress the inter-system handover.

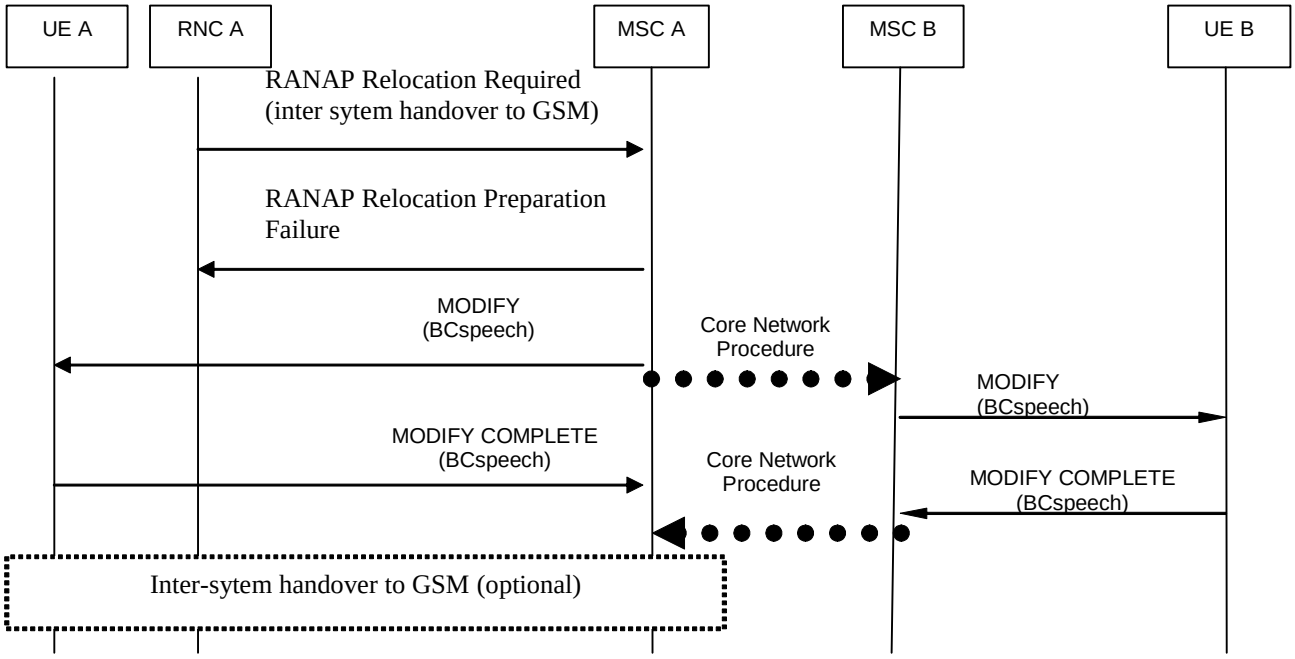

Figure 4.14d: Network-Initiated Service change from UTRAN multimedia to speech requested, accepted

Next modified Section

4.3.5 Service change during the active state

Whenever an In-Call Modification procedure is invoked 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-IE, the normal Out-of-Band Transcoder Control procedures shall be invoked in order 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-IE, the normal Out-of-Band Transcoder Control procedures shall be invoked in order to change the Selected Codec to the preferred speech codec.

When a visited MSC invokes Network-initiated Service change in the active state (see Clause 4.2.5), this visited MSC shall also invoke the normal Out-of-Band Transcoder Control procedures in order to change the Selected Codec to speech or to the 3G-324.M codec, respectively.

The Codec Modification procedure shall be supported for service change. The use of mid-call codec negotiation procedure is optional for service change.

When a 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 UE with a MODIFY message containing the multimedia BC-IE (or the speech BC-IE), unless the new mode has been denied at call setup (see clause 4.2.4).