3GPP TSG CN Plenary Meeting #12 **Tdoc NP-010284**
Stockholm, Sweden, 13th - 15th June 2001

Source: TSG CN WG4

Title: CRs on Rel-4 Work Item CSSPLIT

Agenda item: 8.3

Document for: APPROVAL

Introduction:

This document contains 10 CRs on Rel-4 Work Item "CSSPLIT", that have been agreed by TSG CN WG4, and are forwarded to TSG CN Plenary meeting #12 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.205	004	1	N4-010678	Rel-4	Corrections to Call Clearing	F	4.0.0
23.205	006	1	N4-010680	Rel-4	Alignment of procedure names to TS 29.232 and editorial changes	F	4.0.0
23.205	002	1	N4-010676	Rel-4	Voice Processing Function Alignment/Clean Up for Call Handover and Relocation	F	4.0.0
23.153	024	1	N4-010683	Rel-4	Role of MSC server in FP UP version negotiation for TrFO	F	4.1.0
29.232	001	1	N4-010689	Rel-4	Text encoding of codec information on Mc interface	F	4.0.0
29.232	007	1	N4-010691	Rel-4	Clarification of Use of UP version property in 3GUP package	F	4.0.0
29.232	006	3	N4-010692	Rel-4	Clarifications in 3GUP package	F	4.0.0
29.232	008	1	N4-010693	Rel-4	Updates to UP Relay Function, Appendix A	F	4.0.0
29.232	005	1	N4-010694	Rel-4	Alignment of Procedure names to TS 23.205 and Q.1950	F	4.0.0
29.232	004	1	N4-010746	Rel-4	ATM-IP signalling transport Interworking	F	4.0.0

3GPP TSG-CN WG4 Meeting #8
Puerto Rico, 14th - 18th May 2001

Tdoc N4-010683

CR-Form-v3

CHANGE REQUEST

⌘ **23.153** **CR** **024** ⌘ rev **1** ⌘ Current version: **4.1.0** ⌘

*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:	⌘	Role of MSC server in FP UP version negotiation for TrFO.
Source:	⌘	CN4
Work item code:	⌘	Bearer Independent Call Control
Date:	⌘	2001-05-07
Category:	⌘	**F**
Release:	⌘	Rel 4

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)*

Reason for change:	⌘	Relatshionship between inband FP UP version negotiation and out-of-band TrFO negotiation unclear.
Summary of change:	⌘	Clarification of relatshionship between inband FP UP version negotiation and out-of-band TrFO negotiation
Consequences if not approved:	⌘	Interworking between MSC server, RNC and MGW not guranteed.

Clauses affected:	⌘	5.4.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.232, 25.413, 25.415
Other comments:	⌘			

First modified section

5.4 UP Framing Protocol Handling for TrFO

5.4.1 Framing Protocol Initialisation

For TrFO calls the compressed speech is carried end to end (RNC to RNC or between RNC and other compressed voice terminal). In 3GPP Core Networks compressed voice framing protocol shall be specified by the Nb User Plane specification. The specification for Iu interface is defined in [4], the specification for the Nb interface is defined in [12]. The framing protocol for these interfaces is the same, Iu framing and is thus described as such, for both the Iu interface and the Nb interface. For compressed voice only the support mode is used, thus for TrFO the UP Initialisation procedure defined for the Nb UP shall be supported by the CN, when a CN MGW is required to establish a connection.

When negotiating TrFO OoB, a given serving MSC server shall consider the capabilities of the RNCs and MGWs, which are candidates to handle the TrFO call and which are controlled by this MSC server via an Iu/Mc interface. For TrFO, the selected RNC and MGW have to be able to support at least one Iu/Nb UP version with TrFO capabilities. Each MGW and RNC that supports TrFO shall support Iu/Nb UP version 2. If an RNC only supports Iu UP version 1 without TrFO capabilities, the MSC server shall insert a transcoder at the MGW that is connected to this RNC. For a TrFO call, each MSC server shall indicate in the “RAB assignment”/”Add request” only UP versions with TrFO capabilities. In the inband UP framing protocol version negotiation during framing protocol initialisation, the informed RNCs/MGW shall only offer and/or accept UP version listed in the “RAB assignment”/”Add request”.

The Iu framing Protocol is established through the CN in a forward direction, independently of the bearer establishment direction. The Notify message to indicate bearer establishment shall not be sent until the Iu framing has been initialised. The continuity message (COT) shall not be sent forward until the Notify message has been received from the MGW and also the COT from the previous server has been received. The sequences for mobile originated calls are shown in figures 5.4/1 and 5.4/2 for forward bearer and backward bearer establishment, respectively. The parameters in the Add Request messages in the Figures are described in further detail in chapter 5.4.5.

3GPP TSG-CN4 Plenary #8 **Tdoc N4-010676**
San Juan, PUERTO RICO from 14th to 18th May 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.205** **CR** **002** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Voice Processing Function Alignment/Clean Up for Call Handover and Relocation
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT ***Date:*** ⌘ 14.05.01
Category:	⌘	**F** ***Release:*** ⌘ Rel-4

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)

Reason for change:	⌘	To clarify potential voice processing function activity associated with call handovers and relocations in section 8, minor cleanup in section 13.
Summary of change:	⌘	Updates in section 8 to show potential MGW voice processing function activity associated with handover and relocation.
Consequences if not approved:	⌘	Ambiguous or missing voice processing functions (e.g., hybrid echo cancellation) after handover or relocation.

Clauses affected:	⌘	Section 8, 13.13.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

****** NEXT MODIFIED SECTION ******

8 Handover/Relocation

NOTE: All message sequence charts in this clause are examples. All valid handover/relocation message sequences can be derived from the example message sequences and associated message pre-conditions.

8.1 UMTS to UMTS

8.1.1 Intra-MSC SRNS Relocation

The procedures specified in 3GPP TS 23.009 [8] for 'Intra-3G_MSC SRNS Relocation' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Relocation Required

When the Relocation Required message is received, the MSC server requests the MGW to provide a binding reference and a bearer address, using the Prepare Bearer procedure. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For non-speech calls the MSC server also provides the MGW with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. The MSC server uses the Change Flow Direction Procedure to request the MGW to set the Handover Device to initial state. The MSC server sends the Relocation Request message, containing the bearer address and the binding reference, to RNC-B (bullet 1 in figure 8.2/1).

Relocation Command/Relocation Detect

When the MSC server sends the Relocation Command message or alternatively if it receives the Relocation Detect message, the MSC server uses the Change Flow Direction procedure to request the MGW to set the Handover Device to intermediate state (bullet 2 in figure 8.2/1).

Relocation Complete

When the MSC server receives the Relocation Complete message, it requests RNC-A to release the IU. The MSC server also requests the MGW to set the Handover Device to its final state by removing the bearer termination towards RNC-A, using the Release Termination procedure (bullet 3 in figure 8.2/2).

Interworking function

The interworking function used by the MGW before relocation will also be used after relocation.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW may include or alter voice processing function(s) provided to each bearer termination after relocation.~~

After relocation, the MGW may continue or modify voice processing function(s) provided to each bearer termination.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers all procedures related to the handling of bearers and terminations described for the relocation of a single bearer shall be repeated for each bearer.

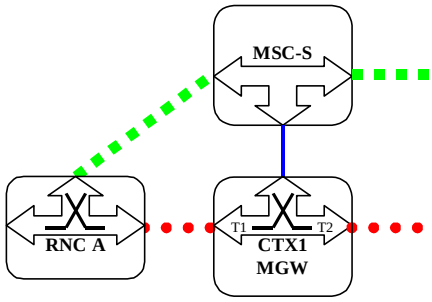
Failure Handling in MSC server

When a procedure between the MSC server and the MGW fails the MSC server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have been already seized at the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

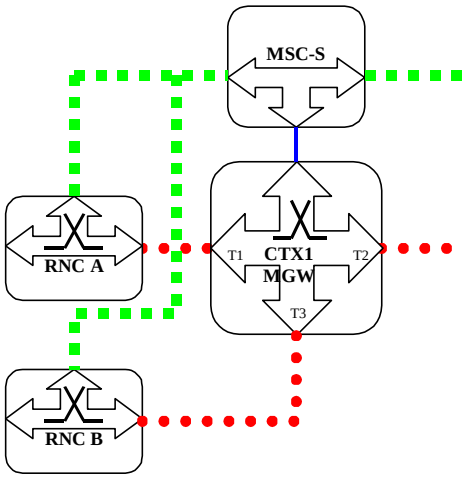
Example

Figure 8.1 shows the network model for the Intra-MSC SRNS Relocation. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling and the bearer. The bearer termination T1 is used for the bearer towards RNC-A, bearer termination T3 is used for the bearer towards RNC-B and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW.

Before Relocation:



During Relocation:



After Relocation:

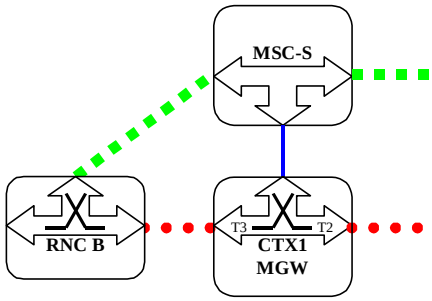


Figure 8.1 Intra-MSC SRNS Relocation (network model)

Figure 8.2 shows the message sequence example for the Intra-MSC SRNS Relocation.
It is assumed that the Handover Device is located in the MGW, which has been selected for the call establishment by the MSC server. The MSC server controls the call and the mobility management. It is also assumed that only one bearer has been established towards RNC-A.
In the example the MSC server requests seizure of RNC-B side bearer termination with specific flow directions. The MSC server orders the establishment of the bearer by sending Relocation Request towards RNC-B. When the relocation is detected in RNC-B the MSC server requests to change the flow directions between the terminations within the context. When the MSC server receives a Relocation Complete indication from RNC-B it orders RNC-A to release the IU. This action causes release of the bearer between the RNC and the MGW. Finally the MSC server requests the MGW to release RNC-A side bearer termination.

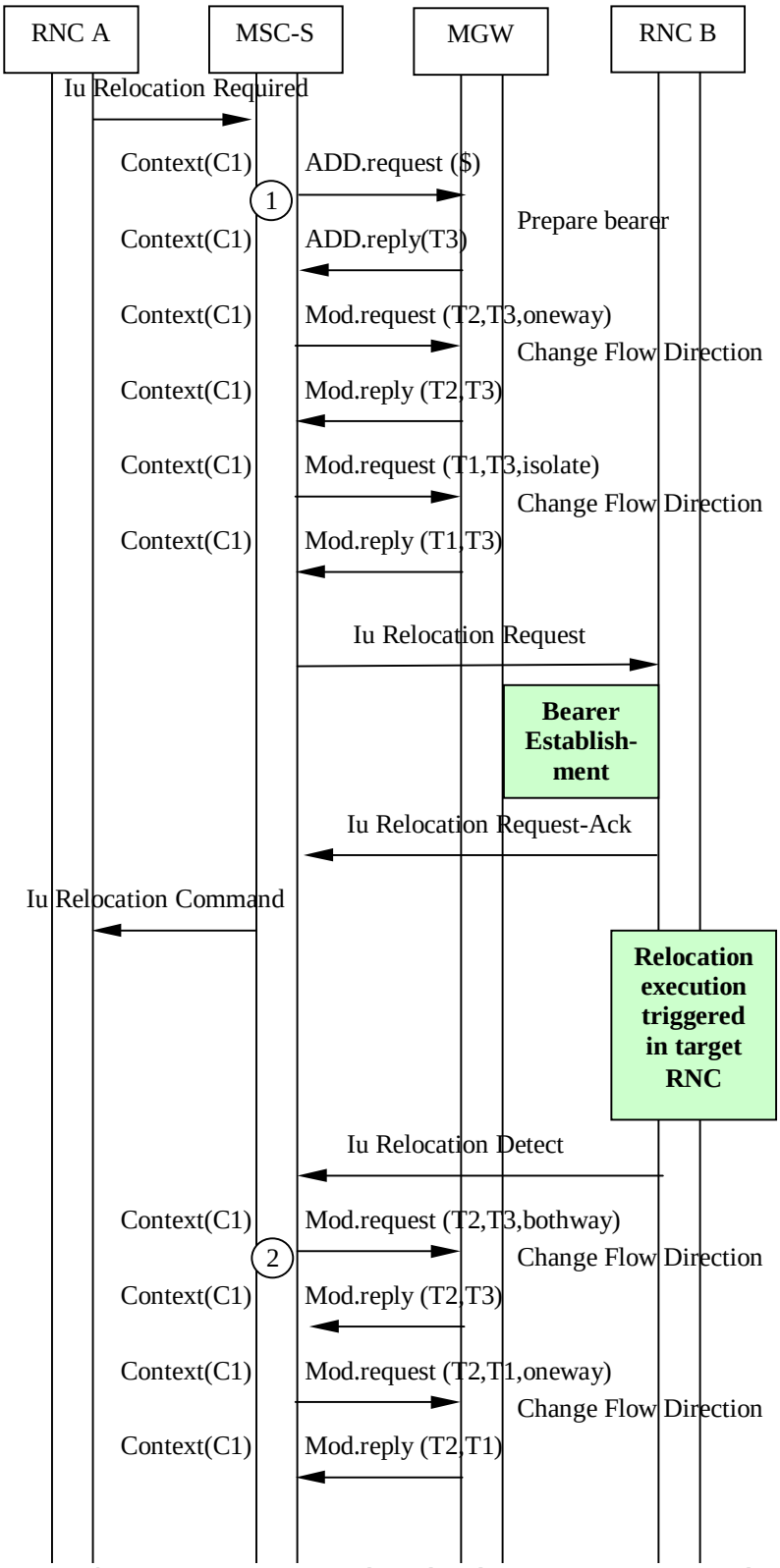


Figure 8.2/1 Intra-MSC SRNS Relocation (message sequence chart)

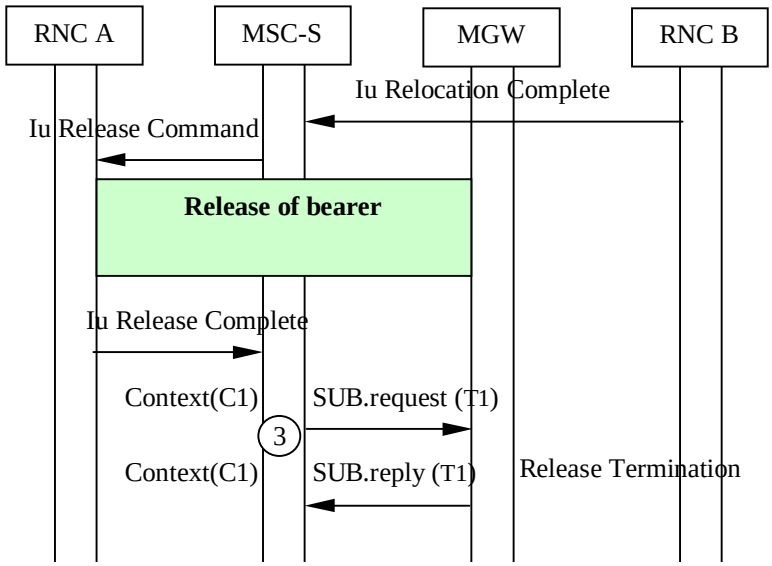


Figure 8.2/2 Intra-MSC SRNS Relocation (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.1.2 Basic Inter-MSC SRNS Relocation

The procedures specified in 3GPP TS 23.009 [8] for 'Basic Relocation Procedure Requiring a Circuit Connection between 3G_MSC-A and 3G_MSC-B' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.1.2.1 MSC-A/MGW-A

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment as described for a Basic Mobile Originating Call, using either forward or backward bearer establishment. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. The differences are that for non-speech calls, the MSC-A server also provides MGW-A with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. The MSC-A server also uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state (bullet 3 in figure 8.4/1).

Relocation Command/Relocation Detect

When the MSC-A server sends the Relocation Command message or alternatively if it receives the Relocation Detect message, the MSC-A server uses the Change Flow Direction procedure to requests MGW-A to set the Handover Device to intermediate state (bullet 4 in figure 8.4/2).

Relocation Complete

When the MSC-A server receives the Relocation Complete message, it requests RNC-A to release the IU. The MSC-A server also requests MGW-A to set the Handover Device to its final state by removing the bearer termination towards RNC-A, using the Release Termination procedure (bullet 5 in figure 8.4/2).

Interworking function

The interworking function used by MGW-A before relocation will also be used after relocation.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW-A may alter or disable voice processing function(s), previously~~ ~~provided by MGW-A, after relocation.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before relocation~~,~~ may be modified or disabled by MGW-A after relocation.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers all procedures related to the handling of bearers and terminations described for the relocation of a single bearer shall be repeated for each bearer.

Failure Handling in MSC server

When a procedure between the MSC-A server and MGW-A fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If call establishment towards MSC-B has already started then the call towards MSC-B server shall be cleared as described in subclause 7.3. If the original call is to be cleared, then it shall be handled as described in subclause 7.3.

8.1.2.2 MSC-B/MGW-B

MGW selection

The MSC-B server selects an MGW when it receives Prepare Handover Request message (bullet 1 in figure 8.4/1).

Bearer establishment towards RNC-B

When the MSC-B server has selected MGW-B it requests MGW-B to provide a binding reference and a bearer address, using the Prepare Bearer procedure. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. The MSC-B server sends the Relocation Request message to the RNC-B containing the bearer addresses and binding references (bullet 2 in figure 8.4/1).

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment is as described at Basic Mobile Terminating Call, using either forward or backward bearer establishment.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW-B may include or alter voice processing function(s), previously provided by MGW-A, after relocation.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before relocation~~,~~ may be continued or modified by MGW-B after relocation.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers all procedures related to the handling of bearers and terminations described for the relocation of a single bearer shall be repeated for each bearer.

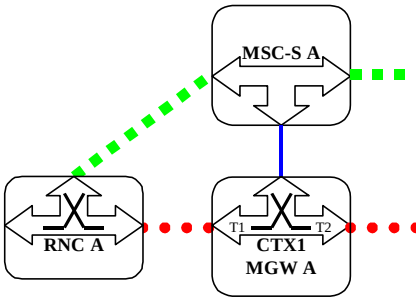
Failure Handling in MSC server

When a procedure between the MSC-B server and MGW-B fails the MSC-B server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW-B resources have been already seized at the target access side then the resources shall be released using the Release Termination procedure. The call from MSC-A server shall be released as described at subclause 7.1.

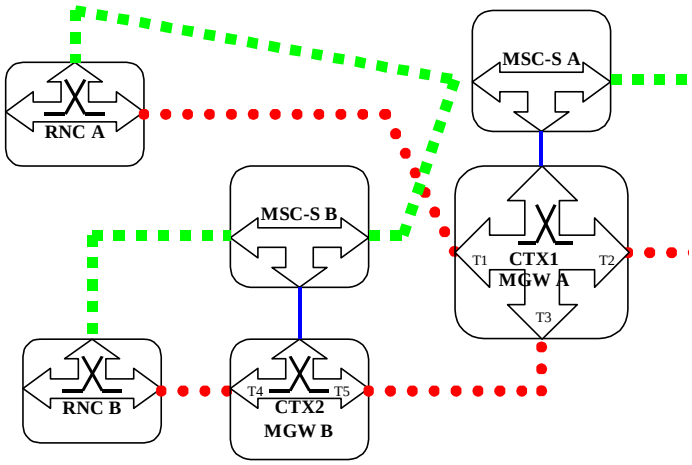
Example

Figure 8.3 shows the network model for the Basic Inter-MSC SRNS Relocation. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling and the bearer. In MGW-A the bearer termination T1 is used for the bearer towards RNC-A, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards RNC-B, bearer termination T5 is used for the bearer towards MGW-A.

Before Relocation:



During Relocation:



After Relocation:

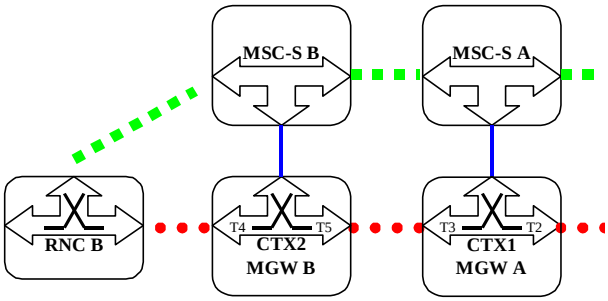


Figure 8.3 Basic Inter-MSC SRNS Relocation (network model)

Figure 8.4 shows the message sequence example for the Basic Inter-MSC SRNS Relocation. It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by the MSC server (MSC-A server) which controls the call and the mobility management. Also assumed that only one bearer has been established towards RNC-A. In the example the MSC-B server requests MGW-B to seize an RNC-B side bearer. The MSC-B server orders the establishment of the bearer towards RNC-B by sending Relocation Request. The call is established between MSC-A and MSC-B servers, and the bearer is established between MGW-A and MGW-B. When the relocation is detected in RNC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Relocation Complete indication from MSC-B server it orders RNC-A to release the IU. This action causes release of the bearer between RNC-A and MGW-A. Finally MSC-A server requests MGW-A to remove RNC-A side bearer termination.

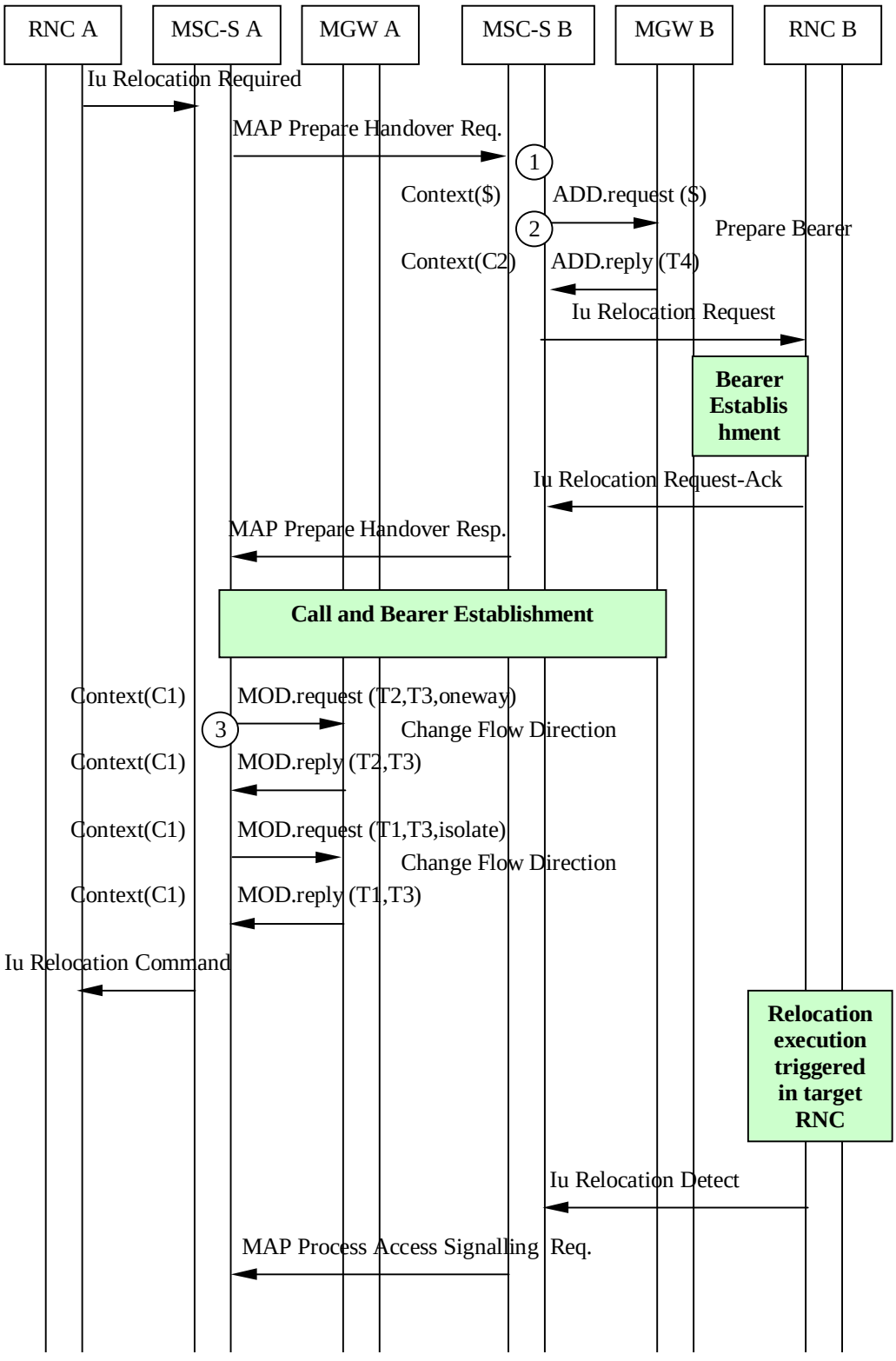


Figure 8.4/1 Basic Inter-MSC SRNS Relocation (message sequence chart)

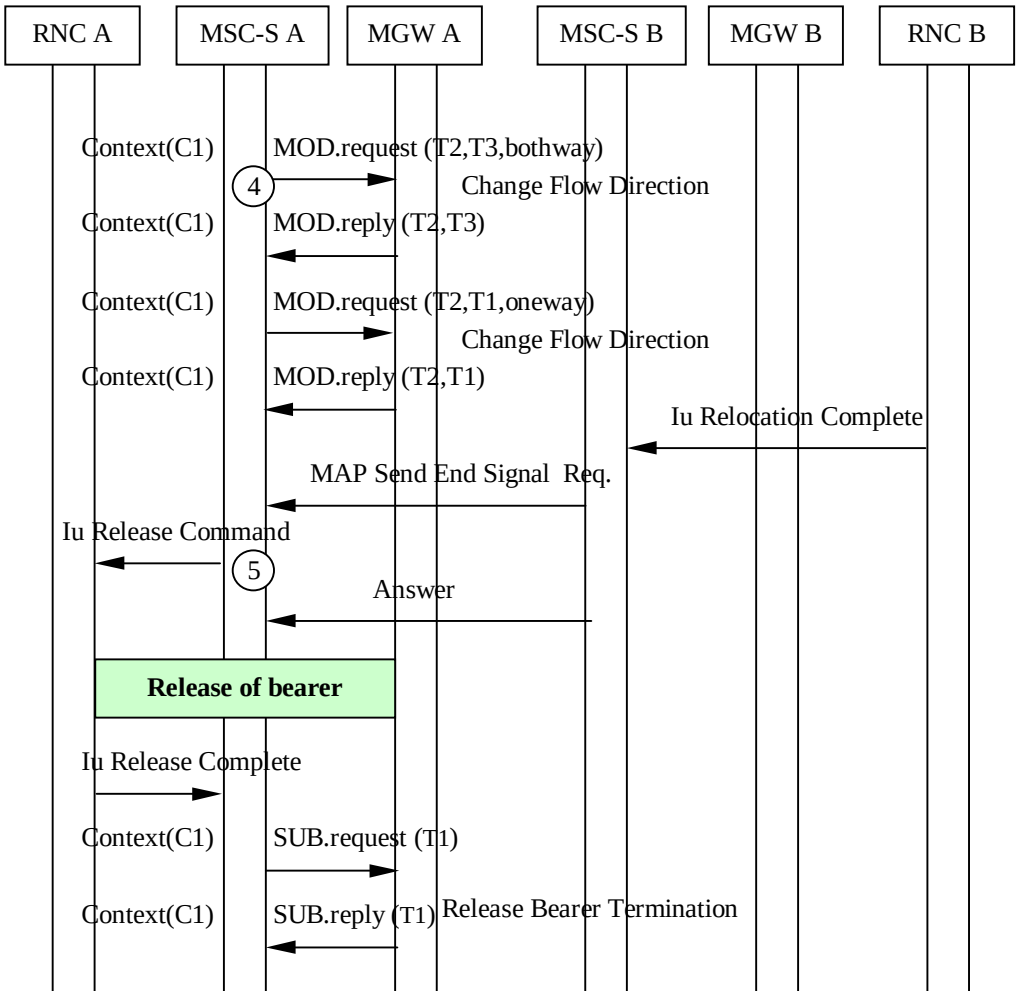


Figure 8.4/2 Basic Inter-MSC SRNS Relocation (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.1.3 Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC

The procedures specified in 3GPP TS 23.009 [8] for 'Subsequent Relocation from 3G_MSC-B to 3G_MSC-A requiring a Circuit Connection between 3G_MSC-A and 3G_MSC-B' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.1.3.1 MSC-A/MGW-A

Relocation Required

When the MSC-A server receives the Relocation Required message, it requests MGW-A to provide a binding reference and a bearer address for each established bearer, using the Prepare Bearer procedure. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For non-speech calls the MSC-A server also provides MGW-A with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. The MSC server uses the Change Flow Direction procedure to request the MGW to set the Handover Device to initial state. The MSC-A server sends the Relocation Request message, containing the bearer addresses and the binding references, to RNC-B (bullet 1 in figure 8.6/1).

Relocation Command/Relocation Detect

When the MSC-A server sends the Relocation Command message or alternatively if it receives the Relocation Detect message, the MSC-A server uses the Change Flow Direction procedure to requests MGW-A to set the Handover Device to intermediate state (bullet 2 in figure 8.6/1).

Relocation Complete

When the MSC-A server receives the Relocation Complete message, it informs the MSC-B server about reception of this message. The MSC-A server then initiates call clearing towards the MSC-B server as described in subclause 7.3.

Interworking function

The interworking function used by MGW-A before relocation will also be used after relocation.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW-A may include or alter the voice processing function(s), previously provided by MGW-A and MGW-B, after relocation.~~

Voice processing function(s) provided by MGW-A and MGW-B ~~prior to~~before relocation~~,~~ may be continued or modified by MGW-A after relocation.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers all procedures related to the handling of bearers and terminations described for the relocation of a single bearer shall be repeated for each bearer.

Failure Handling in MSC server

When a procedure between the MSC-A server and the MGW fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have already been seized at the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

8.1.3.2 MSC-B/MGW-B

Relocation Complete

When the MSC-B server receives the Relocation Complete message, it requests RNC-A to release the IU. The MSC-B server requests MGW-B to remove the bearer termination towards RNC-A using the Release Bearer Termination procedure (bullet 3 in figure 8.6/2).

Release of bearer towards MGW-A

When the MSC-B server receives a call clearing indication from the MSC-A server, the MSC-B server handles it as described in subclause 7.2.

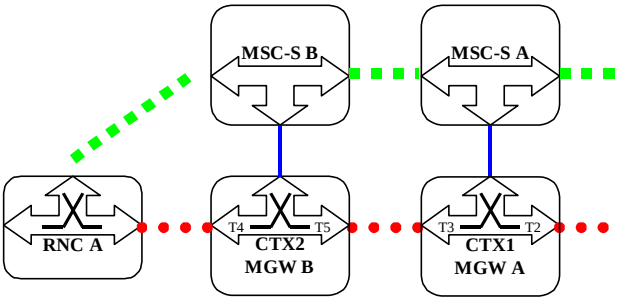
Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers all procedures related to the handling of bearers and terminations described for the relocation of a single bearer shall be repeated for each bearer.

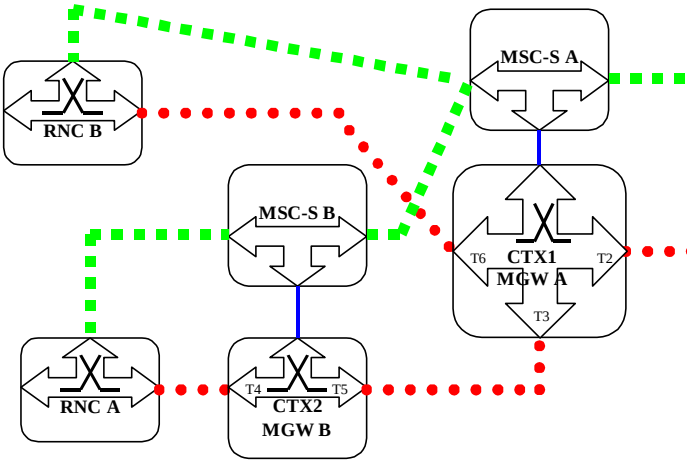
Example

Figure 8.5 shows the network model for the Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling and the bearer. In MGW-A the bearer termination T6 is used for the bearer towards RNC-B, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards RNC-A, bearer termination T5 is used for the bearer towards MGW-A.

Before Relocation:



During Relocation:



After Relocation:

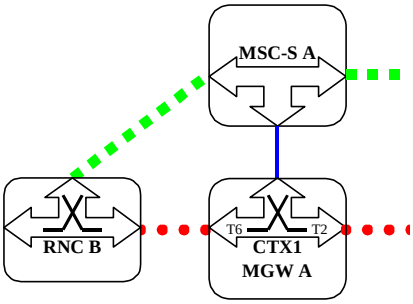


Figure 8.5 Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC (network model)

Figure 8.6 shows the message sequence example for the Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC. It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by

the MSC server (MSC-A server) which controls the call and the mobility management. Also assumed that only one bearer has been established towards RNC-A. In the example the MSC-A server requests MGW-A to seize RNC-B side bearer termination with specific flow directions. The MSC server orders the establishment of the bearer towards RNC-B by sending Relocation Request. When the relocation is detected in RNC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When the MSC-A server receives a Relocation Complete indication from RNC-B it transfers this indication to MSC-B server. MSC-B server orders RNC-A to release the IU. This action causes release of the bearer between RNC-A and the MGW-B. MSC-A server initiates call clearing towards MSC-B server.

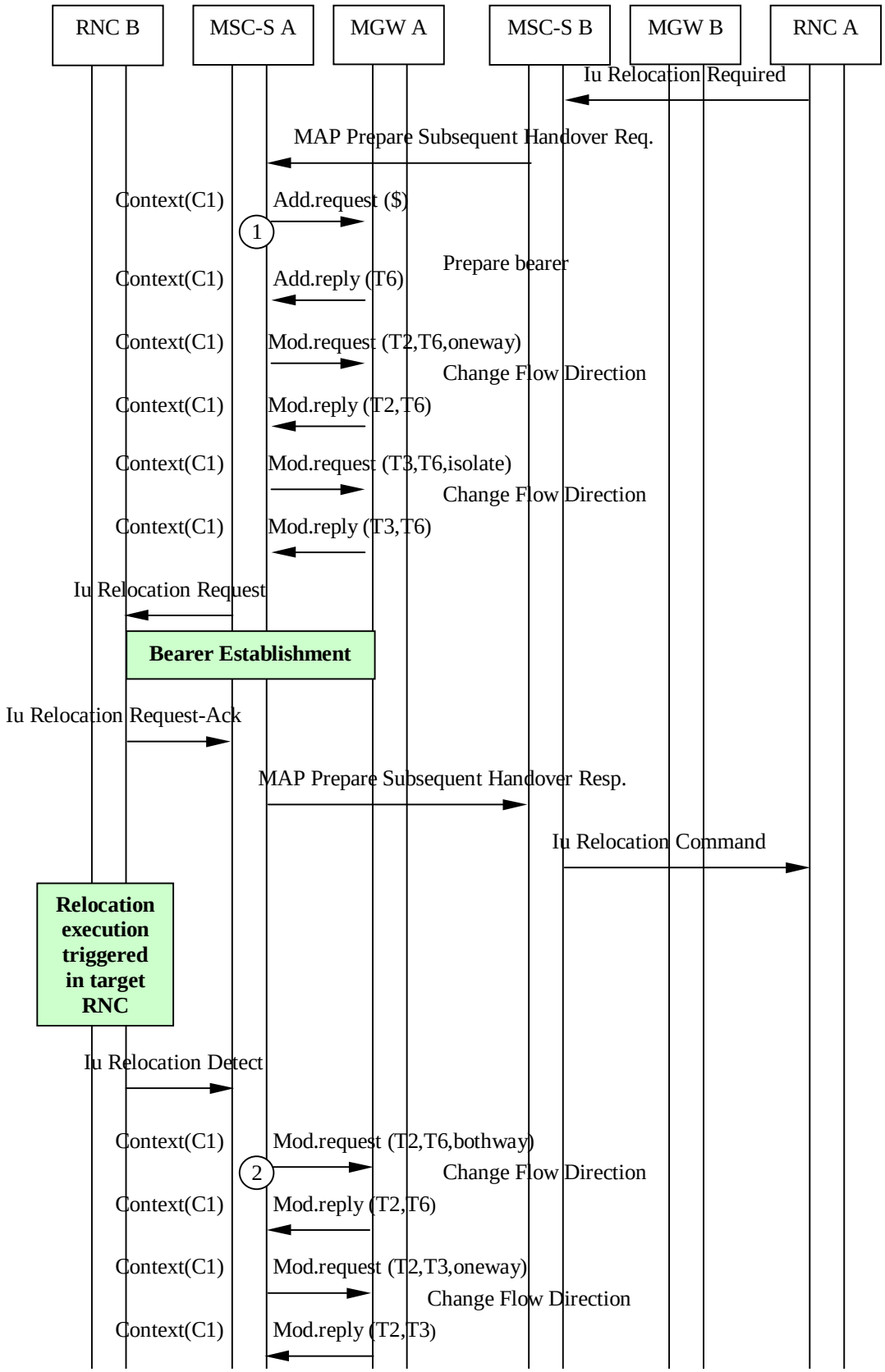


Figure 8.6/1 Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC (message sequence chart)

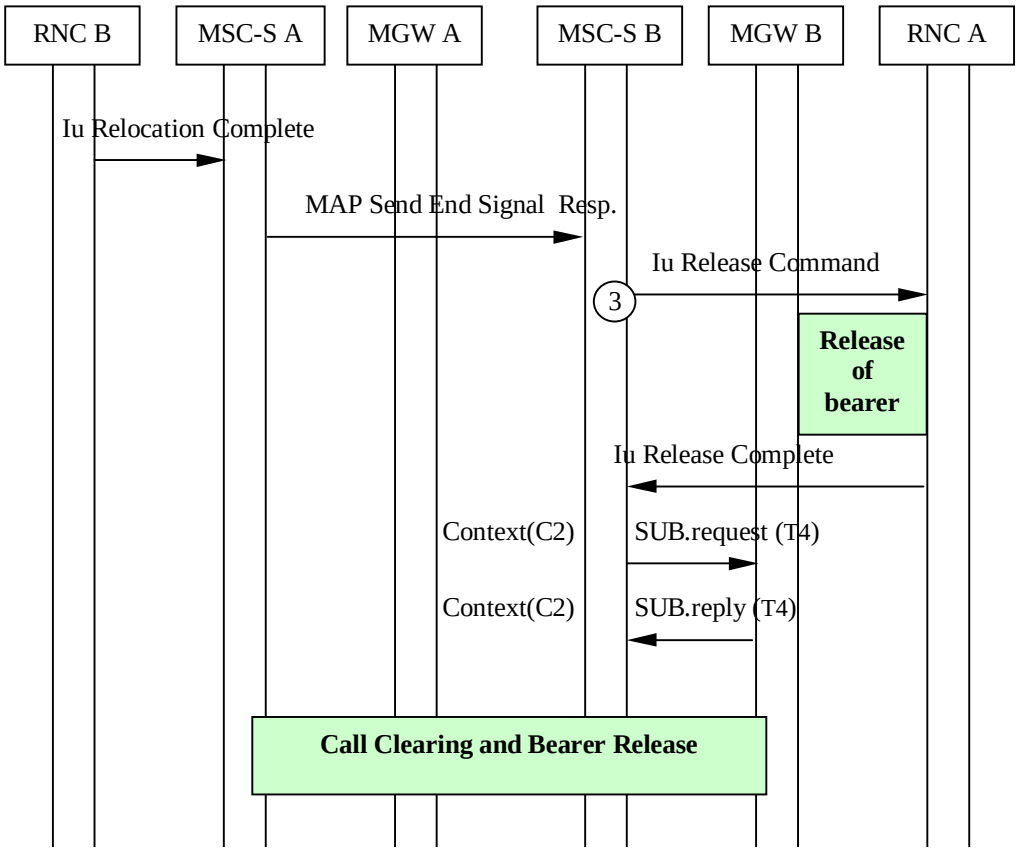


Figure 8.6/2 Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC (message sequence chart)

8.1.4 Subsequent Inter-MSC SRNS Relocation to a third MSC

The relocation to a third MSC server (from MSC-B server to MSC-B' server) is the combination of the two previous inter-MSC handover cases:

- for MSC-B server a subsequent relocation from MSC-B server back to MSC-A server as described in subclause 8.1.3; and
- for MSC-B' server a basic relocation from MSC-A server to MSC-B' server as described in subclause 8.1.2.

MSC-A server implements the corresponding parts of each handover case; i.e. access handling in MSC-A server is not included.

8.2 UMTS to GSM

****** NEXT MODIFIED SECTION ******

8.2.1 Intra-MSC UMTS to GSM Handover

The procedures specified in 3GPP TS 23.009 [8] for 'Intra-3G_MSC Handover from UMTS to GSM' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Relocation Required

When the MSC server receives the Relocation Required message, it requests the MGW to seize a TDM circuit, using the Reserve Circuit procedure. For non-speech calls the MSC server also provides the MGW with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. For non-speech calls the MSC server also provides the MGW with the GSM Channel coding properties. The MSC server uses the Change Flow Direction procedure to request the MGW to set the Handover Device to initial state. The MSC server sends the Handover Request message, containing the CIC, to BSC-B (bullet 1 in figure 8.8/1).

Handover Request Acknowledge

For non-speech calls after receiving the Handover Request Acknowledge message if the assigned GSM Channel coding properties differ from the previously provided ones the MSC server provides the MGW with the assigned GSM Channel coding properties using the Modify Bearer Characteristics procedure (bullet 2 in figure 8.8/1).

Relocation Command/Handover Detect:

When the MSC server sends the Relocation Command message or alternatively if it receives the Handover Detect message, the MSC server uses the Change Flow Direction procedure to requests the MGW to set the Handover Device to intermediate state (bullet 3 in figure 8.8/1).

Handover Complete

When the MSC server receives the Handover Complete message, it requests RNC-A to release the IU. The MSC server also requests the MGW to set the Handover Device to its final state by removing the bearer termination towards RNC-A, using the Release Termination procedure (bullet 4 in figure 8.8/2).

Interworking function

The interworking function used by the MGW before handover will also be used after handover.

Voice Processing function

~~The MGW may include or alter voice processing function(s) provided to each bearer termination after handover.~~

After handover, the MGW may continue or modify voice processing function(s) provided to each bearer termination.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers then one bearer is selected to be handed over according to 3GPP TS 23.009 [8]. The calls carried by the bearers that have not been selected will be cleared after the reception of the Handover Complete message, as described in subclause 7.3.

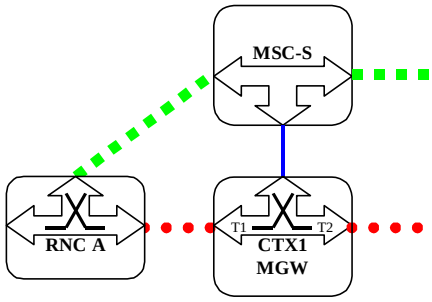
Failure Handling in MSC server

When a procedure between the MSC server and the MGW fails the MSC server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have been already seized at the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

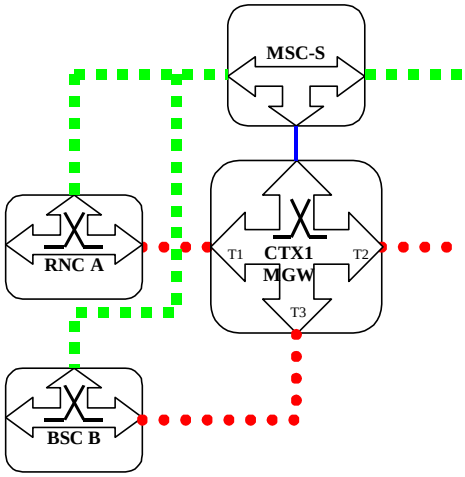
Example

Figure 8.7 shows the network model for the Intra-MSC UMTS to GSM Handover. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling (not applicable in case of GSM access) and the bearer. The bearer termination T1 is used for the bearer towards RNC-A, bearer termination T3 is used for the bearer towards BSC-B and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW.

Before Handover:



During Handover:



After Handover

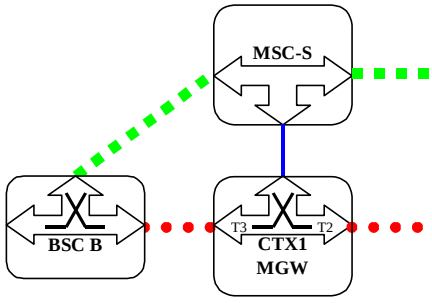


Figure 8.7 Intra-MSC UMTS to GSM Handover (network model)

Figure 8.8 shows the message sequence example for the Intra-MSC UMTS to GSM Handover.
It is assumed that the Handover Device is located in the MGW selected for the call establishment by the MSC server, which controls the call and the mobility management. It is also assumed that only one bearer has been established towards RNC-A and that MGW-A is capable to handle GSM access.
In the example the MSC server requests seizure of BSC-B side bearer termination with specific flow directions. The MSC server starts handover execution by sending Handover Request towards RNBSC-B. When the handover is detected in BSC-B the MSC server requests to change the flow directions between the terminations within the context.

When MSC server receives Handover Complete indication from BSC-B it orders RNC-A to release the IU. Finally the MSC server requests the MGW to release RNC-A side bearer termination.

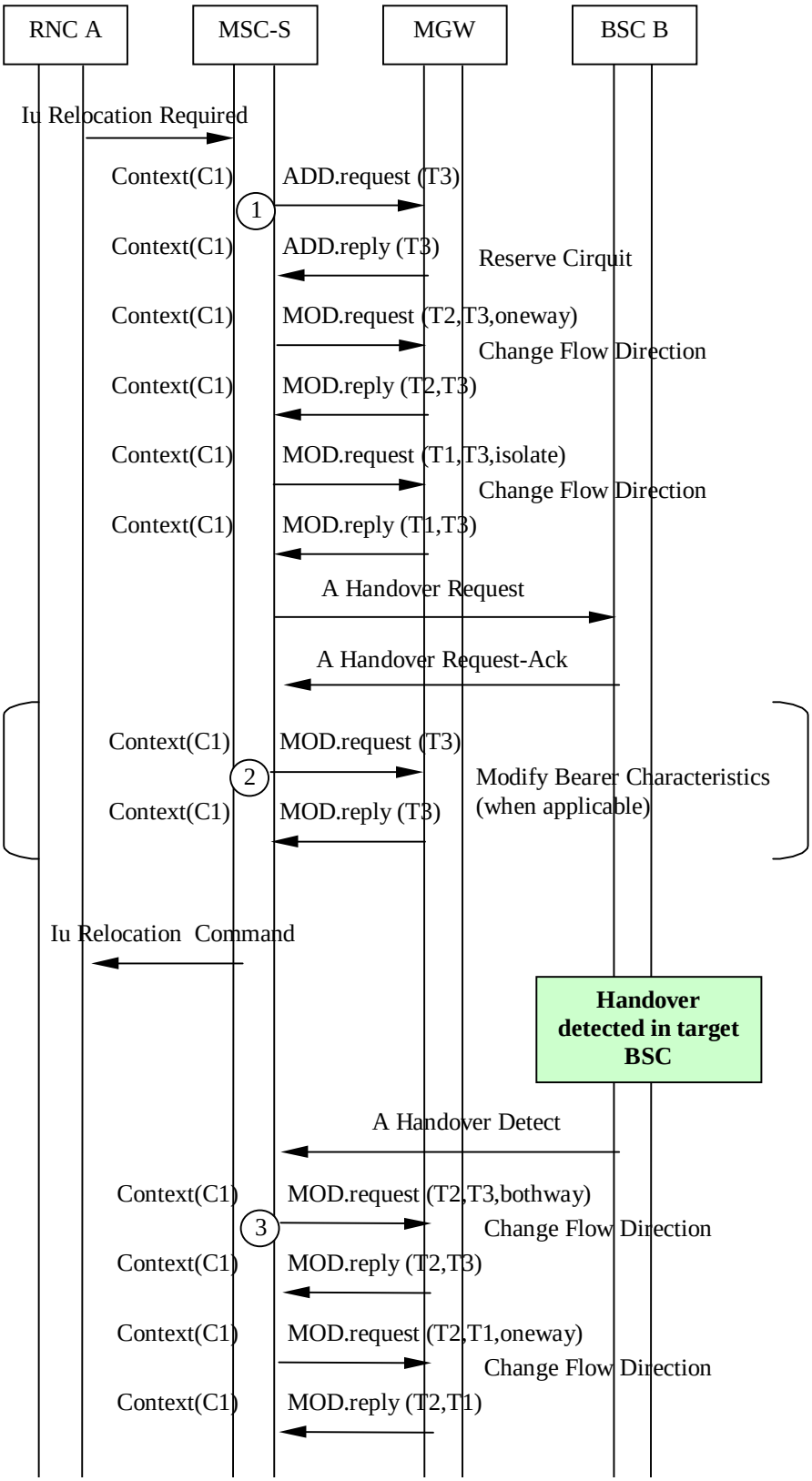


Figure 8.8/1 Intra-MSC UMTS to GSM Handover (message sequence chart)

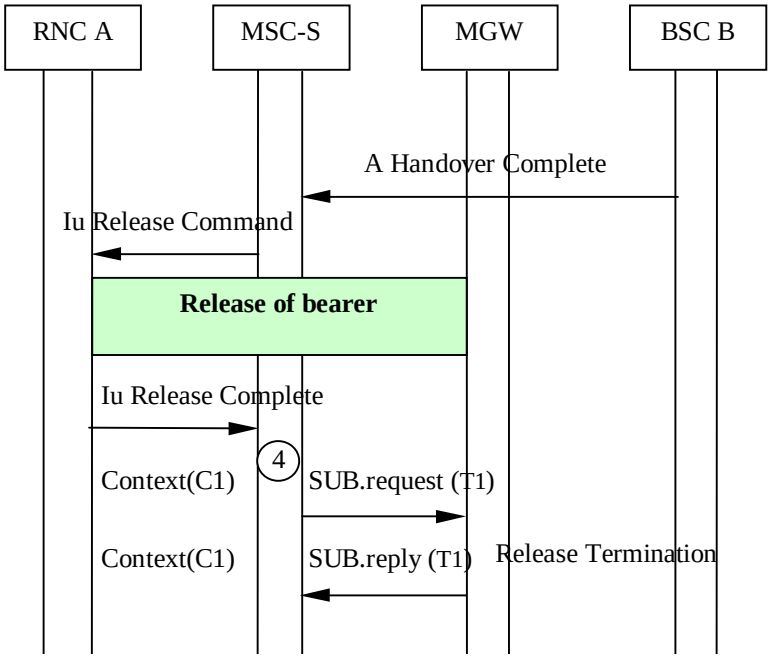


Figure 8.8/2 Intra-MSC UMTS to GSM Handover (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.2.2 Basic Inter-MSC UMTS to GSM Handover

The procedures specified in 3GPP TS 23.009 [8] for 'Basic Handover Procedure Requiring a Circuit Connection between 3G_MSC-A and MSC-B' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.2.2.1 MSC-A/ MGW-A

Bearer establishment between MGW-A and MGW-B.

The handling of the bearer establishment between MGW-A and MGW-B is as described for a Basic Mobile Originating Call, using either forward or backward bearer establishment. The differences are that for non-speech calls the MSC-A server also provides MGW-A with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. For non-speech calls the MSC-A server also provides MGW-A with the GSM Channel coding properties. The MSC-A server also uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state (bullet 3 in figure 8.10/1).

Relocation Command/Handover Detect

When the MSC-A server sends the Relocation Command message or alternatively if it receives the Handover Detect message, the MSC-A server uses the Change Flow Direction procedure to requests the MGW to set the Handover Device to intermediate state (bullet 2 in figure 8.10/1).

Handover Complete

When the MSC-A server receives the Relocation Complete message, it requests RNC-A to release the IU. The MSC-A also requests the MGW to set the Handover Device to its final state by removing the bearer termination towards RNC-A, using the Release Termination procedure (bullet 3 in figure 8.10/1).

Interworking function

The interworking function used by MGW-A before handover will also be used after handover.

Voice Processing function

~~MGW-A and/or MGW-B may include or alter voice processing function(s), previously provided by MGW-A, after handover.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before handover~~,~~ may be continued or modified by MGW-A and/or MGW-B after handover.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers then one bearer is selected to be handed over according to 3GPP TS 23.009 [8]. The calls carried by bearers that have not been selected will be cleared after the reception of Handover Complete message, as described in subclause 7.3.

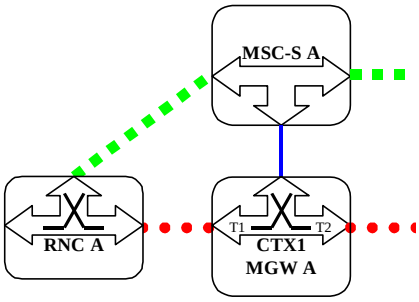
Failure Handling in MSC server

When a procedure between the MSC-A server and MGW-A fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW-A resources have been already seized for the bearer towards MGW-B then the resources shall be released using the Release Termination procedure. The call towards MSC-B server shall be cleared as described in subclause 7.3. If the original call is to be cleared, then it shall be handled as described in subclause 7.3.

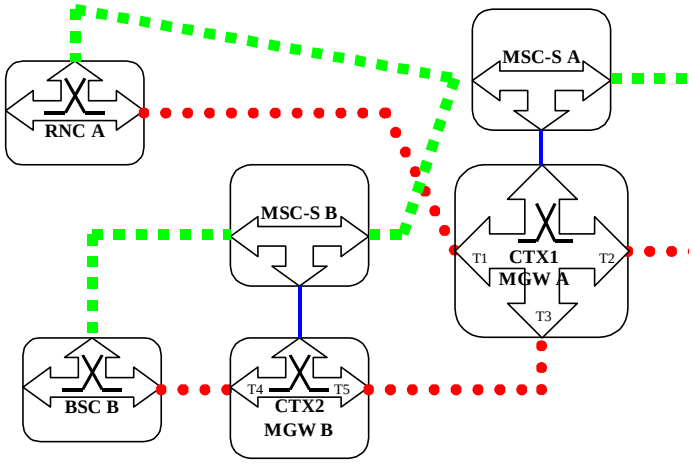
Example

Figure 8.9 shows the network model for the Basic Inter-MSC UMTS to GSM Handover. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling (not applicable in case of GSM access) and the bearer. In MGW-A the bearer termination T1 is used for the bearer towards RNC-A, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards BSC-B, bearer termination T5 is used for the bearer towards MGW-A.

Before Handover:



During Handover:



After Handover:

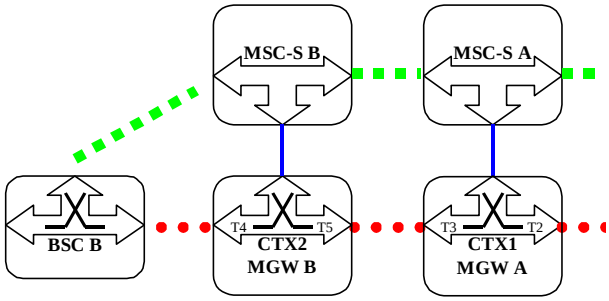


Figure 8.9 Basic Inter-MSC UMTS to GSM Handover (network model)

Figure 8.10 shows the message sequence example for the Basic Inter-MSC UMTS to GSM Handover.
It is assumed that the Handover Device is located in the MGW (MGW-A) which has been selected for the call establishment by the MSC server (MSC-A server). The MSC server controls the call and the mobility management. It is also assumed that only one bearer has been established towards RNC-A.
In the example the MSC-B server requests MGW-B to seize BSC-B side bearer termination. The call is established between MSC-A server and MSC-B server, and the bearer is established between MGW-A and MGW-B. When the handover is detected in BSC-B the MSC-A server requests to change the flow directions between the terminations

within the context in MGW-A. When MSC-A server receives Handover Complete indication from MSC-B server it orders RNC-A to release the IU. Finally MSC-A server requests MGW-A to remove RNC-A side bearer termination.

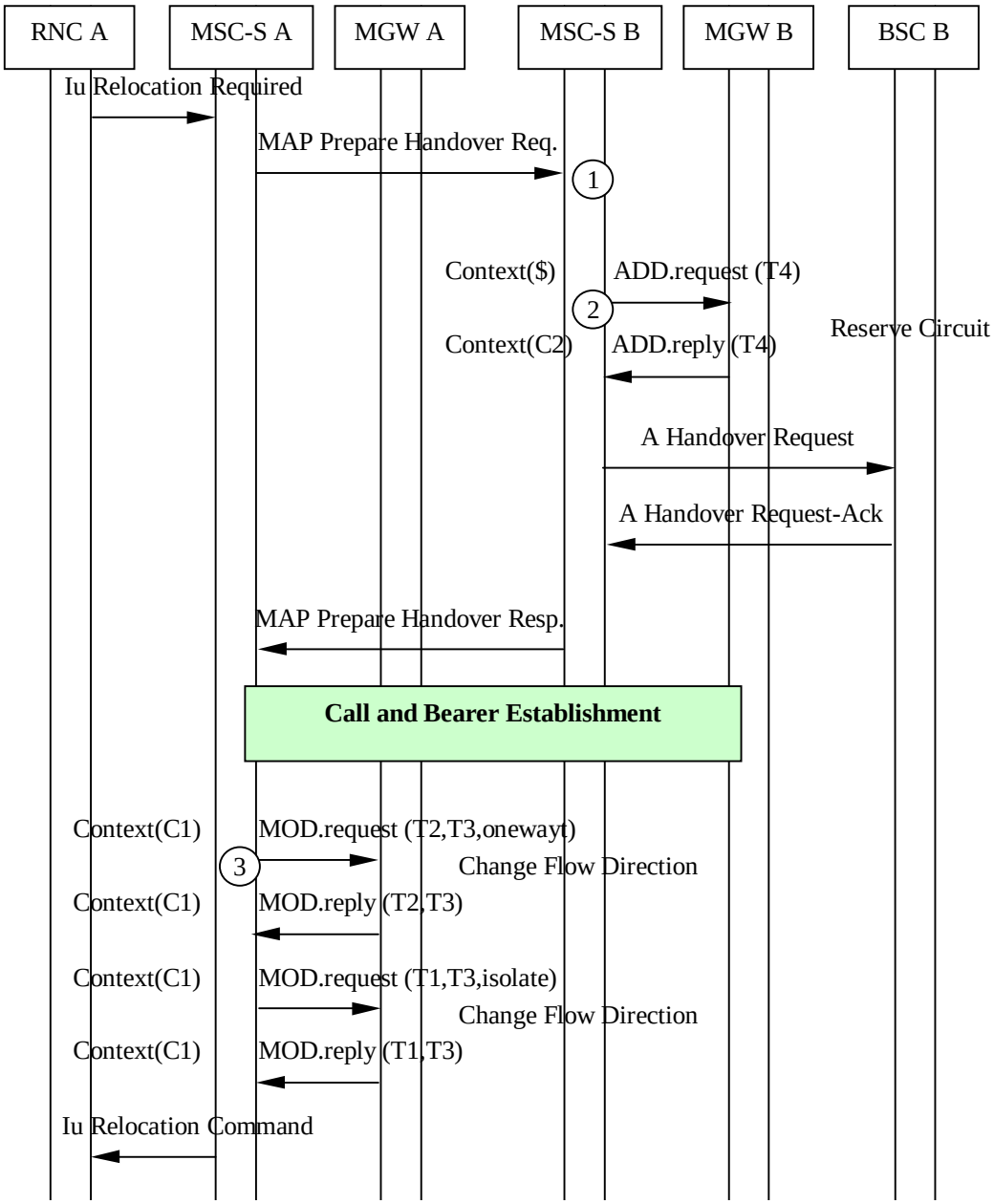


Figure 8.10/1 Basic Inter-MSC UMTS to GSM Handover (message sequence chart)

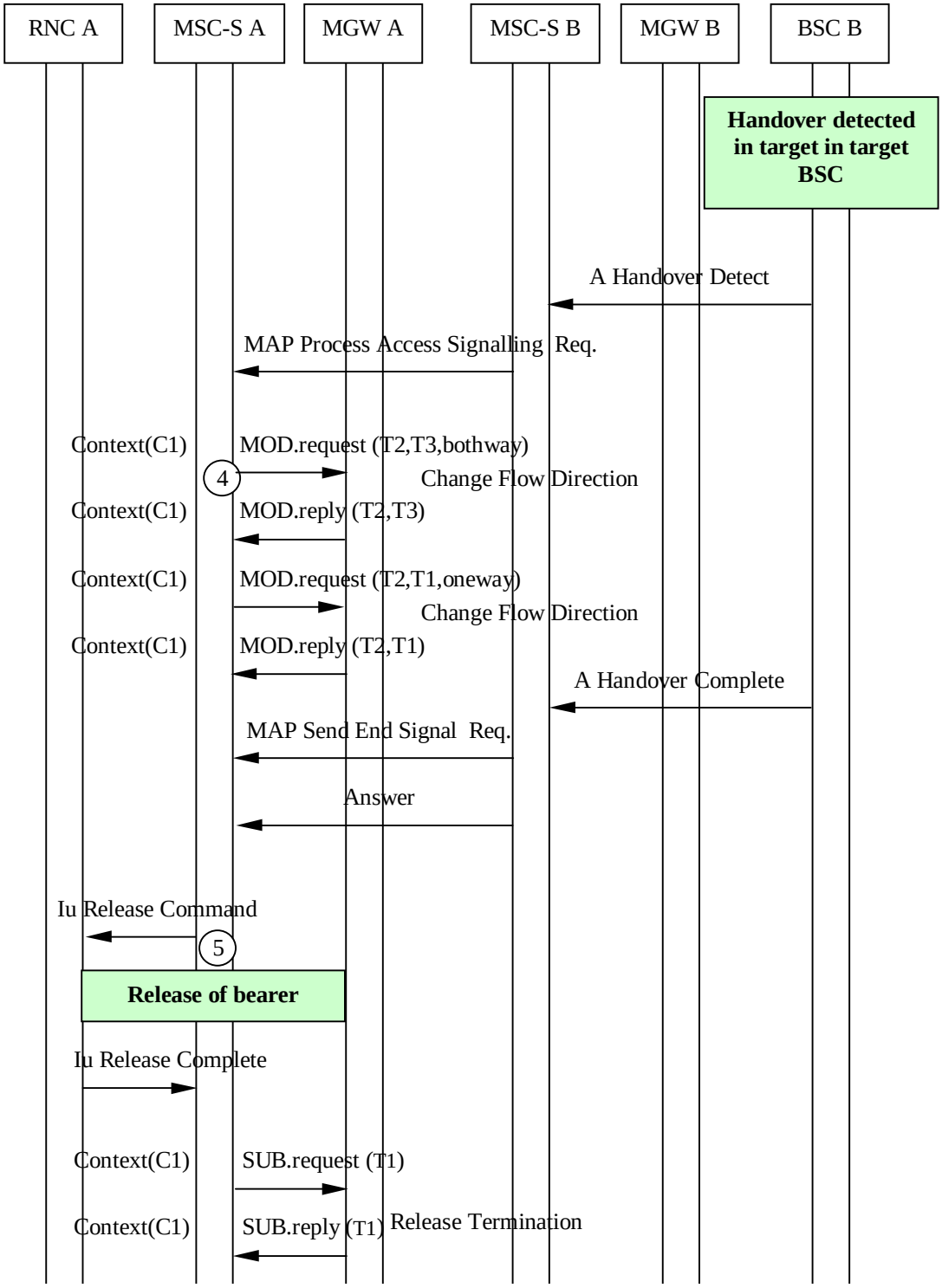


Figure 8.10/2 Basic Inter-MSC UMTS to GSM Handover (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.2.3 Subsequent Inter-MSC UMTS to GSM Handover back to the Anchor MSC

The following handling shall be applied for a call that started as UMTS call. The procedures specified in 3GPP TS 23.009 [8] for 'Subsequent UMTS to GSM handover requiring a Circuit Connection between 3G_MSC-A and

3G_MSC-B, 3G_MSC-B to MSC-A' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.2.3.1 MSC-A

Relocation Required

When the Relocation Required message is received, the MSC-A server requests MGW-A to seize a TDM circuit, using the Reserve Circuit procedure. For non-speech calls the MSC-A server also provides MGW-A with the same PLMN BC [4] as was provided at the last access bearer assignment. The MSC-A server also provides MGW-A with the GSM Channel coding properties. The MSC-A server uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state. The MSC-A server sends the Handover Request message, containing the CIC, to BSC-B (bullet 1 in figure 8.12/1).

Handover Request Acknowledge

For non-speech calls after receiving the Handover Request Acknowledge message if the assigned GSM Channel coding properties differ from the previously provided ones the MSC-A server provides MGW-A with the assigned GSM Channel coding properties using the Modify Bearer Characteristics procedure (bullet 2 in figure 8.12/1).

Relocation Command/Handover Detect

When the MSC-A server sends the Relocation Command message or alternatively if it receives the Handover Detect message, the MSC-A server uses the Change Flow Direction procedure to requests MGW-A to set the Handover Device to intermediate state (bullet 3 in figure 8.12/2).

Handover Complete

When the MSC-A server receives the Handover Complete message, it informs the MSC-B server about reception of this message (bullet 3 in figure 8.12). The MSC-A server then initiates call clearing towards the MSC-B server as described at Call Clearing.

Interworking function

The interworking function used by MGW-A before handover will also be used after handover.

Voice Processing function

~~The MGW-A may include or alter the voice processing function(s), previously provided by MGW-A and MGW-B, after handover.~~

Voice processing function(s) provided by MGW-A and MGW-B ~~prior to~~before handover~~,~~ may be continued or modified by MGW-A after handover.

Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers the selected bearer to be handed over is received from MSC-B server in the Handover Request message according to 3GPP TS 23.009 [8]. The calls carried by the bearers that have not been selected will be cleared by MSC-A server after the reception of the Handover Complete message, as described in subclause 7.3.

Failure Handling in MSC server

When a procedure between the MSC-A server and the MGW fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have already been seized at the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

8.2.3.2 MSC-B

Handover Complete

When the MSC-B server receives the Handover Complete message, it requests RNC-A to release the IU. The MSC-B server also requests MGW-B to remove the bearer termination towards RNC-A using the Release Termination procedure (bullet 4 in figure 8.12/2).

Release of bearer towards MGW-A

When the MSC-B server receives a call clearing indication from the MSC-A server, the MSC-B server handles it as described in subclause 7.2.

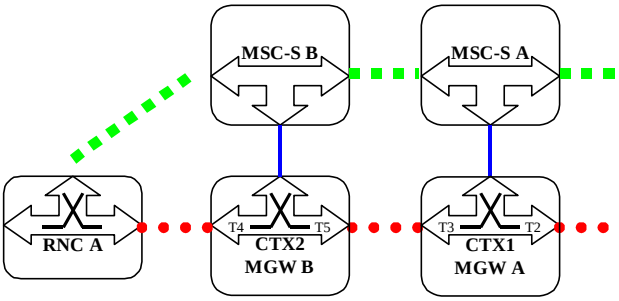
Handling of multiple bearers (multicall)

If the UE is engaged with multiple bearers then one bearer is selected by MSC-B server to be handed over according to 3GPP TS 23.009 [8].

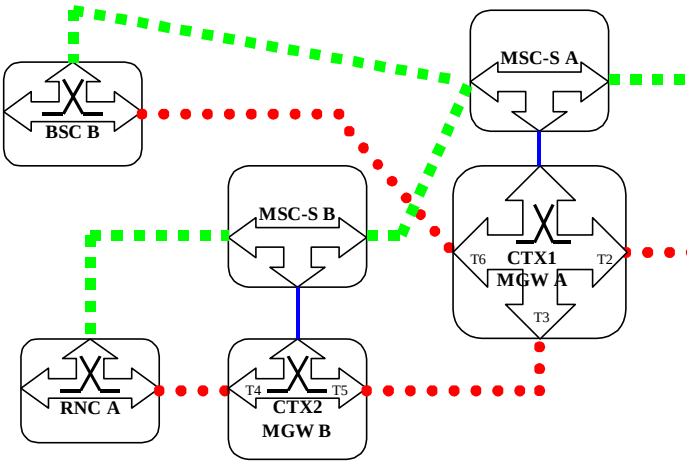
Example

Figure 8.11 shows the network model for the Subsequent Inter-MSC UMTS to GSM handover back to the Anchor MSC. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling (not applicable in case of GSM access) and the bearer. In MGW-A the bearer termination T6 is used for the bearer towards BSC-B, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards RNC-A, bearer termination T5 is used for the bearer towards MGW-A.

Before Handover:



During Handover:



After Handover:

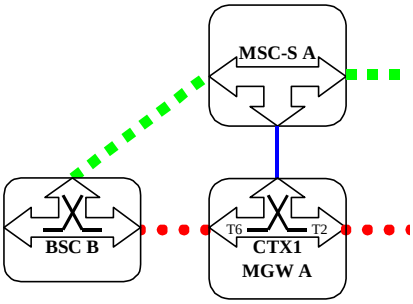


Figure 8.11 Subsequent Inter-MSC UMTS to GSM Handover back to the Anchor MSC (network model)

Figure 8.12 shows the message sequence example for the Subsequent Inter-MSC UMTS to GSM Handover back to the Anchor MSC. It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call

establishment by the MSC server (MSC-A server) which controls the call and the mobility management. Also assumed that only one bearer has been established towards RNC-A and that MGW-A is capable to handle GSM access. In the example the MSC-A server requests MGW-A to seize BSC-B side bearer termination with specific flow directions. When the relocation is detected in BSC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Handover Complete indication from BSC-B it transfers this indication to MSC-B server. MSC-B server orders RNC-A to release the IU. MSC-A server initiates call clearing towards MSC-B server.

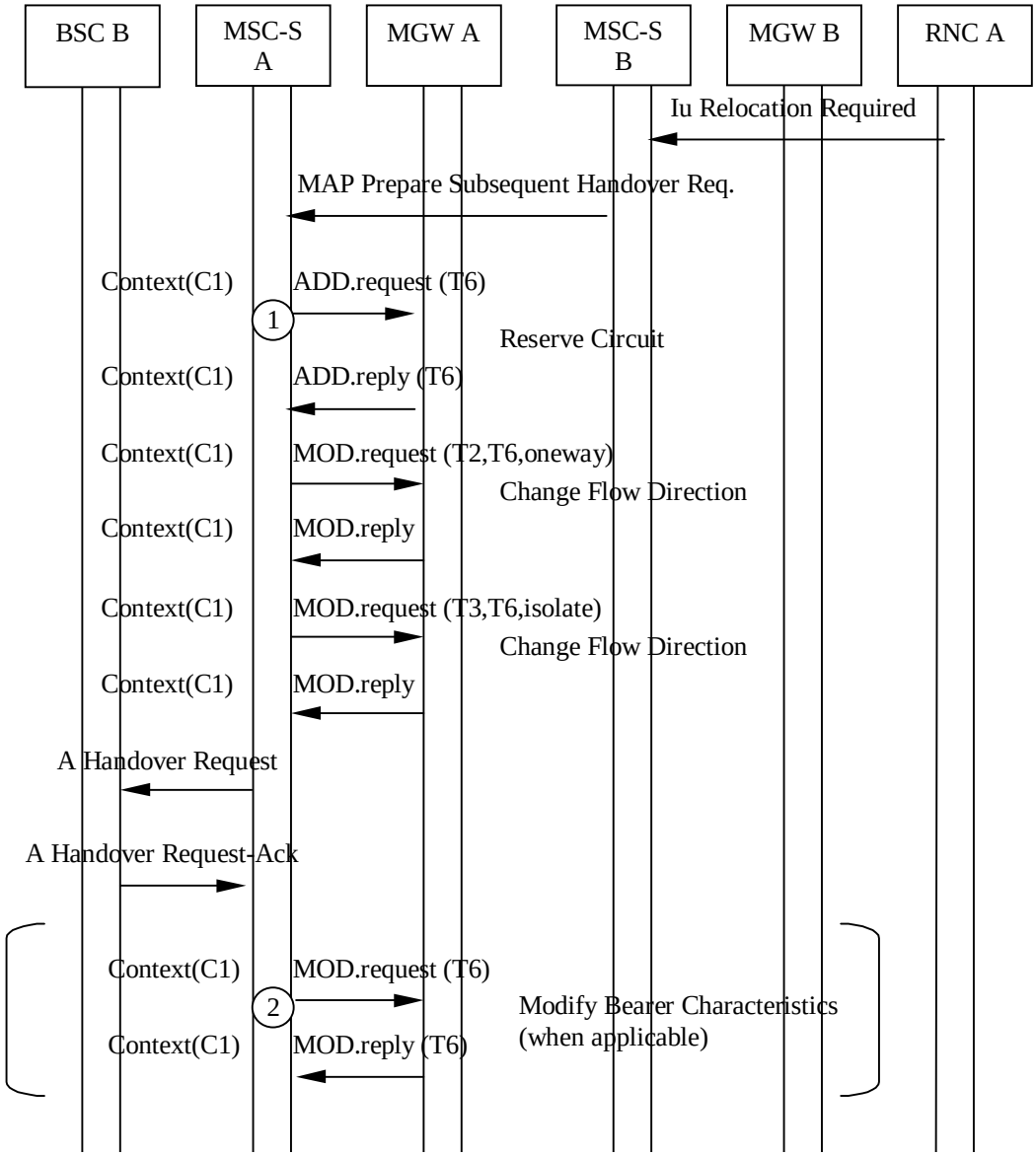


Figure 8.12/1 Subsequent Inter-MSC UMTS to GSM Handover back to the Anchor MSC (message sequence chart)

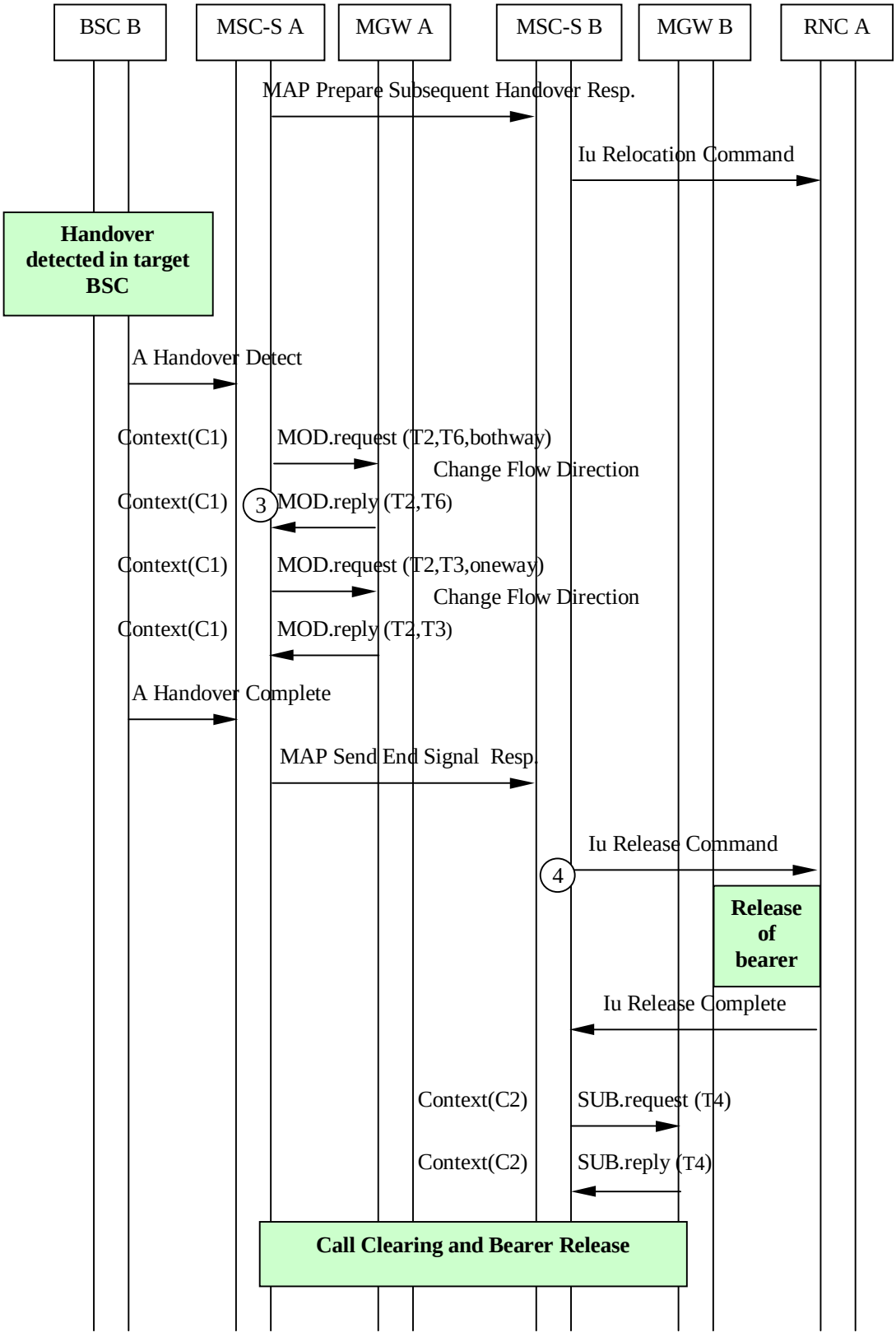


Figure 8.12/2 Subsequent Inter-MSC UMTS to GSM Handover back to the Anchor MSC (message sequence chart)

8.2.4 Subsequent Inter-MSC UMTS to GSM Handover to a third MSC

The UMTS to GSM handover to a third MSC server (from MSC-B server to MSC-B' server) is the combination of the two previous inter-MSC handover cases:

- for MSC-B server a subsequent UMTS to GSM handover from MSC-B server back to MSC-A server as described in subclause 8.2.3; and
- for MSC-B' server a basic UMTS to GSM handover from MSC-A server to MSC-B' server as described in subclause 8.2.2.

MSC-A server implements the corresponding parts of each handover case; i.e. access handling in MSC-A server is not included.

8.3 GSM to UMTS

****** NEXT MODIFIED SECTION ******

8.3.1 Intra-MSC GSM to UMTS Handover

The procedures specified in 3GPP TS 23.009 [8] for 'Intra-3G_MSC GSM to UMTS Handover' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Handover Required

When the MSC server receives the Handover Required message, it requests the MGW to provide a binding reference and a bearer address using the Prepare Bearer procedure. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For non-speech calls the MSC server also provides the MGW with the same PLMN Bearer Capability [4] as was provided at the last channel assignment. The MSC server uses the Change Flow Direction procedure to request the MGW to set the Handover Device to initial state. The MSC server sends the Relocation Request message to the RNC-B containing the bearer address and binding reference (bullet 1 in figure 8.14).

Handover Command/Relocation Detect

When the MSC server sends the Handover Command message or alternatively if it receives a Relocation Detect message, the MSC server uses the Change Flow Direction procedure to requests the MGW to set the Handover Device to intermediate state (bullet 2 in figure 8.14).

Relocation Complete

When the MSC server receives the Relocation Complete message, it releases the A-interface line towards BSC-A and requests the MGW to set the Handover Device to its final state by releasing the bearer between the MSC server and the MGW (bullet 3 in figure 8.14).

Interworking function

The interworking function used by the MGW before handover will also be used after handover.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW may include or alter voice processing function(s) provided to each bearer termination after handover.~~

After handover, the MGW may continue or modify voice processing function(s) provided to each bearer termination.

Failure Handling in MSC server

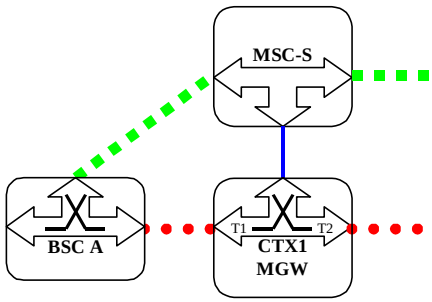
When a procedure between the MSC server and the MGW fails the MSC server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have already been seized at

the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

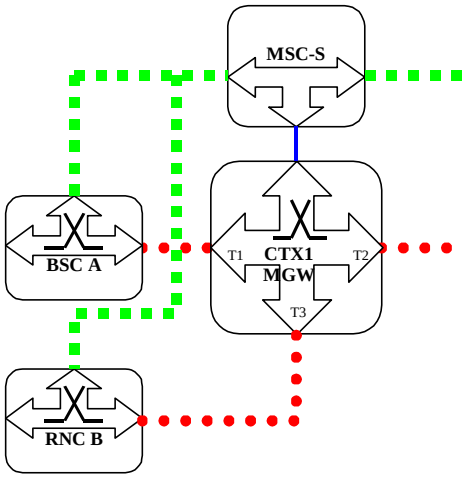
Example

Figure 8.13 shows the network model for the Intra-3G_MSC GSM to UMTS Handover. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling and the bearer. The bearer termination T1 is used for the bearer towards the BSC-A (connected through the MSC server), the bearer termination T3 is used for the bearer towards the RNC-B and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW.

Before Handover:



During Handover:



After Handover:

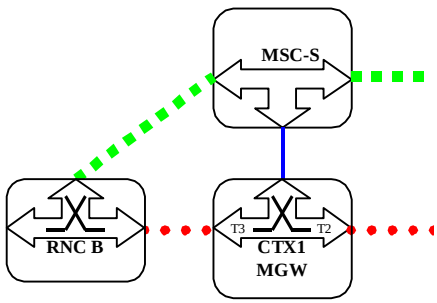


Figure 8.13 Intra-3G_MSC GSM to UMTS Handover (network model)

Figure 8.14 shows the message sequence example for the Intra-MSC GSM to UMTS Handover.
It is assumed that the Handover Device is located in the MGW selected for the call establishment by the MSC server, which controls the call and the mobility management. In the example the MSC server requests seizure of RNC-B side bearer termination with specific flow directions. The MSC server starts handover execution by sending Relocation Request towards RNC-B. When the relocation is detected in RNC-B the MSC server requests to change the flow directions between the terminations within the context. When MSC server receives Relocation Complete indication from RNC-B it releases the A-interface line towards the BSC-A. Finally the MSC server requests the MGW to release BSC-A side bearer termination.

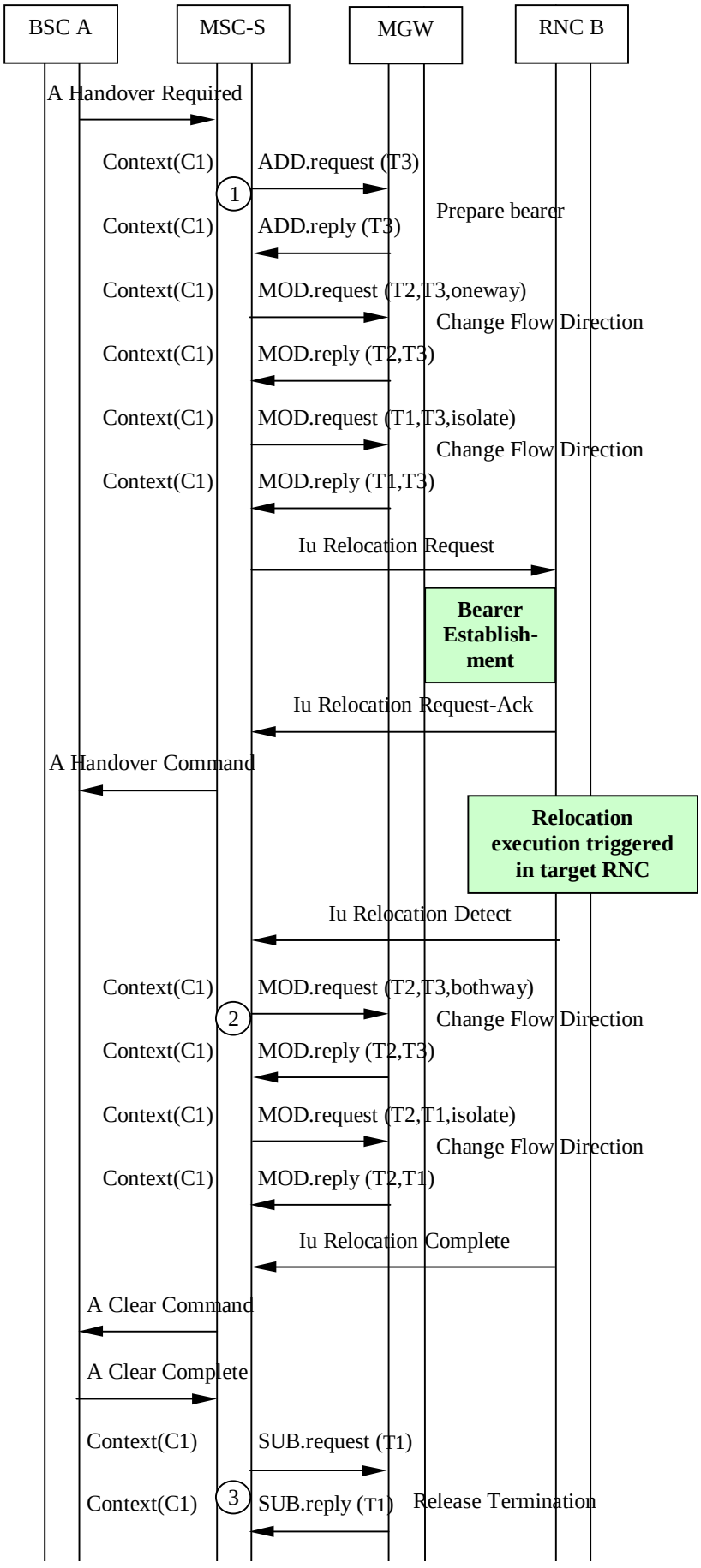


Figure 8.14 Intra-3G_MSC GSM to UMTS Handover (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.3.2 Basic Inter-MSC GSM to UMTS Handover

The following handling shall be applied for a call that started as UMTS call. The procedures specified in 3GPP TS 23.009 [8] for 'Basic Handover Procedure Requiring a Circuit Connection between MSC-A and 3G_MSC-B' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.3.2.1 MSC-A

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment between MGW-A and MGW-B is as described for a Basic Mobile Originating Call, using either forward or backward bearer establishment. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. The differences are that for non-speech calls the MSC-A server also provides MGW-A with the same PLMN Bearer Capabilities [4] as were provided at the last access bearer assignment. The MSC-A server also uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state (bullet 3 in figure 8.16/1).

Handover Command/Handover Detect

When the MSC-A server sends the Handover Command message or alternatively if it receives the Handover Detect message, the MSC-A server uses the Change Flow Direction procedure to requests MGW-A to set the Handover Device to intermediate state (bullet 4 in figure 8.16/2).

Handover Complete

When the MSC-A server receives the Handover Complete message, it releases the A-interface line towards BSC-A and requests MGW-A to set the Handover Device to its final state by releasing the bearer between the MSC-A server and MGW-A (bullet 5 in figure 8.16).

Interworking function

The interworking function used by MGW-A before handover will also be used after handover.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW-A may alter or disable voice processing function(s), previously provided by MGW-A, after handover.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before handover~~,~~ may be modified or disabled by MGW-A after handover.

Failure Handling in MSC server

When a procedure between the MSC-A server and MGW-A fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW-A resources have already been seized for the bearer towards MGW-B then the resources shall be released using the Release Termination procedure. The call towards MSC-B server shall be cleared as described in subclause 7.3. If the original call is to be cleared, then it shall be handled as described in subclause 7.3.

8.3.2.2 MSC-B

MGW selection

The MSC-B server selects an MGW when it receives Prepare Handover Request message (bullet 1 in figure 8.16).

Bearer establishment towards RNC-B

When the MSC-B server has selected MGW-B it requests MGW-B to provide a binding reference and a bearer address using the Prepare Bearer procedure. . For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. The MSC-B server sends the Relocation Request message to the RNC-B containing the bearer address and binding reference (bullet 2 in figure 8.16).

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment is as described at Basic Mobile Terminating Call, using either forward or backward bearer establishment.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~MGW-B may include or alter voice processing function(s), previously provided by MGW-A, after handover.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before handover~~,~~ may be continued or modified by MGW-B after handover.

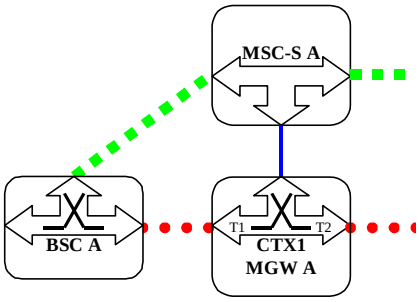
Failure Handling in MSC server

When a procedure between the MSC-B server and MGW-B fails the MSC-B server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW-B resources have already been seized at the target access side then the resources shall be released using the Release Termination procedure. The call from MSC-A server shall be released as described at subclause 7.1.

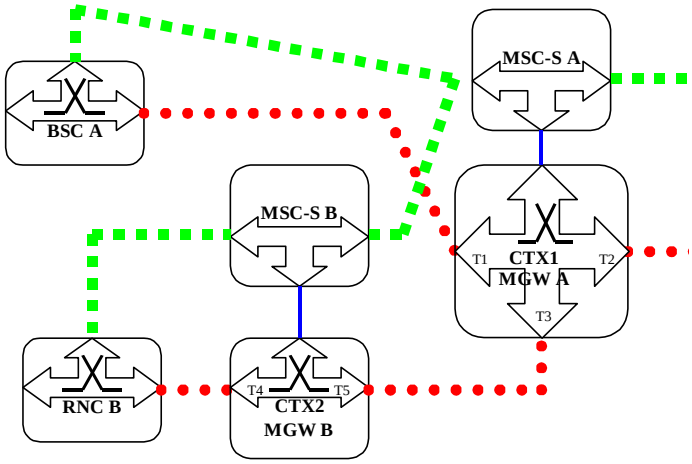
Example

Figure 8.15 shows the network model for the Basic Inter-MSC GSM to UMTS Handover. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling (not applicable in case of GSM access) and the bearer. In MGW-A the bearer termination T1 is used for the bearer towards BSC-A, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards RNC-B, bearer termination T5 is used for the bearer towards MGW-A.

Before Handover:



During Handover:



After Handover:

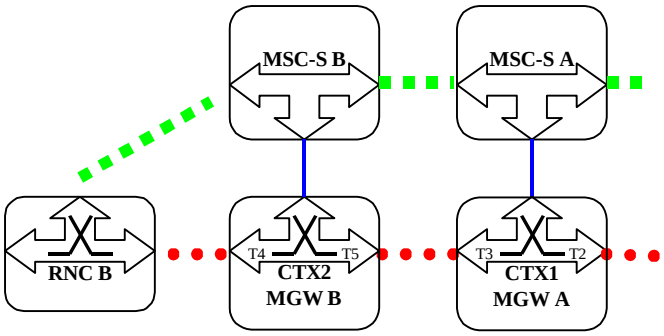


Figure 8.15 Basic Inter-MSC GSM to UMTS Handover (network model)

Figure 8.16 shows the message sequence example for the Basic Inter-MSC GSM to UMTS Handover.
It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by the MSC server (MSC-A server) which controls the call and the mobility management.

In the example the MSC-B server requests MGW-B to seize RNC-B side bearer termination. The call is established between MSC-A server and MSC-B server, and the bearer is established between MGW-A and MGW-B. When the relocation is detected in RNC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Handover Complete indication from MSC-B server it releases the A-interface line towards the BSC-A. Finally MSC-A server requests MGW-A to remove BSC-A side bearer termination.

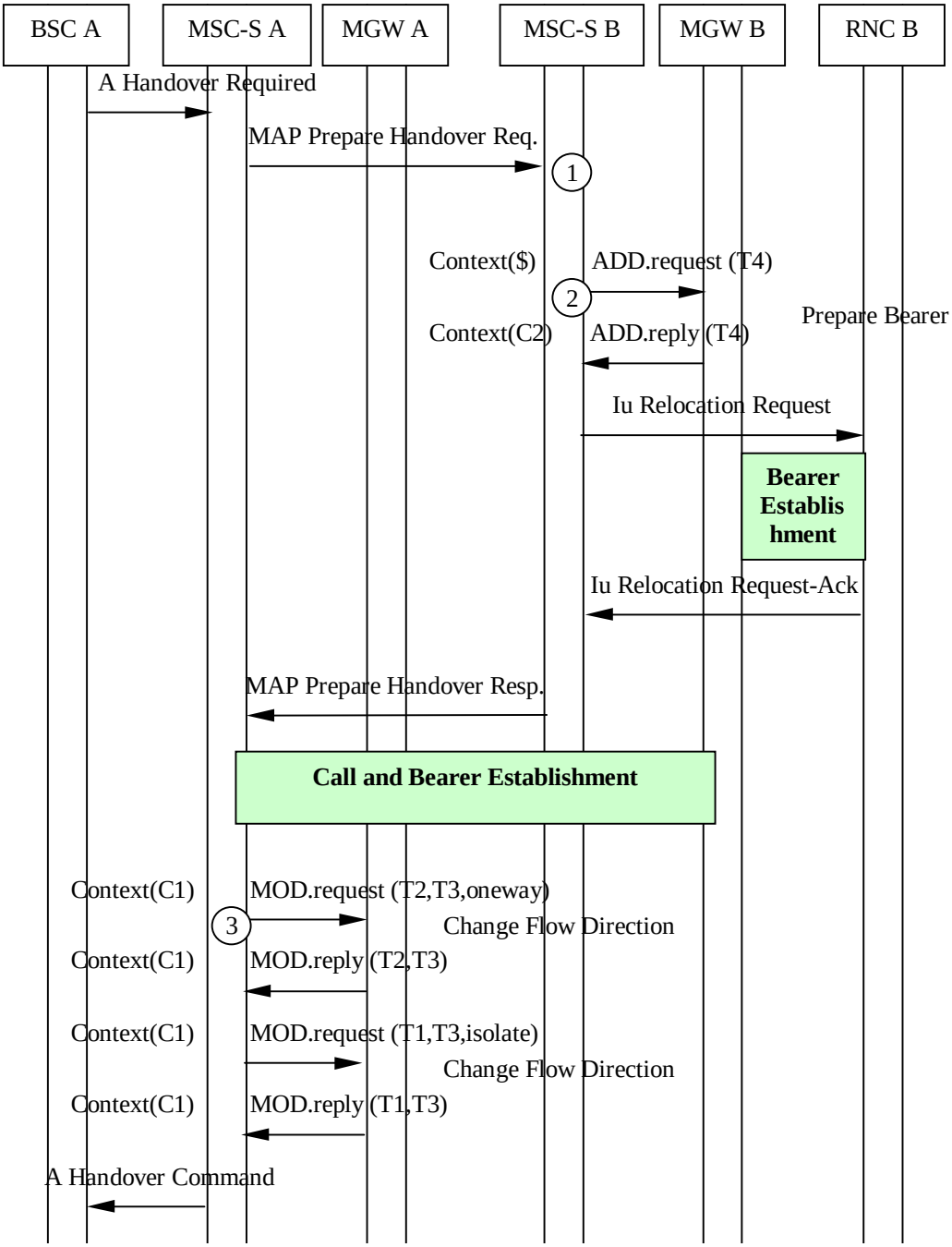


Figure 8.16/1 Basic Inter-MSC GSM to UMTS Handover (message sequence chart)

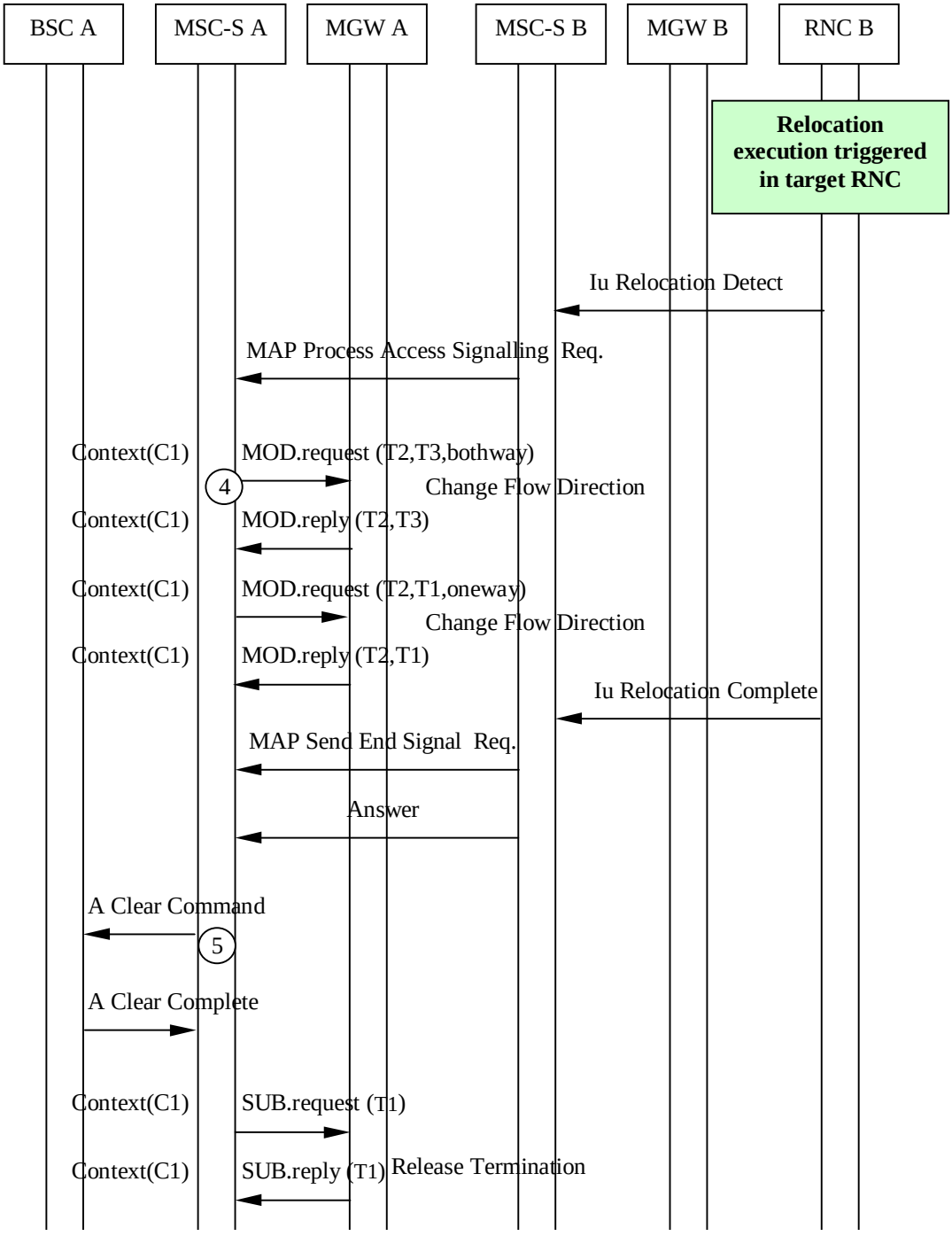


Figure 8.16/2 Basic Inter-MSC GSM to UMTS Handover (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.3.3 Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC

The following handling shall be applied for a call that started as UMTS call. The procedures specified in 3GPP TS 23.009 [8] for 'Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.3.3.1 MSC-A

Handover Required

When the MSC server receives a Handover Required message from BSC-A (via MSC-B server), it requests the MGW to provide a binding reference and a bearer address using the Prepare Bearer procedure. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For non-speech calls the MSC-A server also provides MGW-A with the same PLMN Bearer Capability [4] as was provided at the last channel assignment. The MSC server uses the Change Flow Direction Procedure to request the MGW to set the Handover Device to initial state. The MSC server sends the Relocation Request message to the RNC-B containing the bearer address and binding reference (bullet 1 in figure 8.18/1).

Handover Command/Relocation Detect

When the MSC-A server sends the Handover Command message or alternatively if it receives a Relocation Detect message, the MSC-A server uses the Change Flow Direction procedure to requests the MGW to set the Handover Device to intermediate state (bullet 2 in figure 8.18/2).

Relocation Complete

When the MSC-A server receives a Relocation Complete message, it informs the MSC-B server about reception of this message. MSC-A server then initiates call clearing towards the MSC-B server as described in subclause 7.3.

Interworking function

The interworking function used by MGW-A before handover will also be used after handover.

Codec handling

The MGW may include a speech transcoder based upon the speech coding information provided to each bearer termination.

Voice Processing function

~~The MGW-A may include or alter the voice processing function(s), previously provided by MGW-A and MGW-B, after handover.~~

Voice processing function(s) provided by MGW-A and MGW-B ~~prior to~~before handover~~,~~ may be continued or modified by MGW-A after handover.

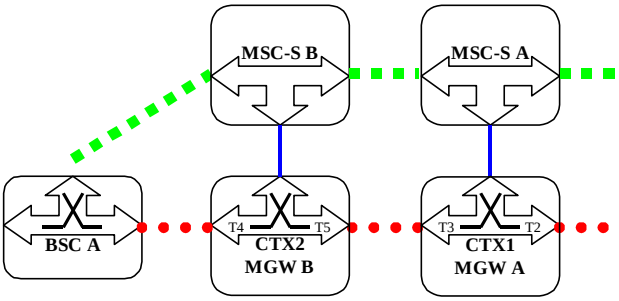
Failure Handling in MSC server

When a procedure between the MSC-A server and the MGW fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have been already seized at the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

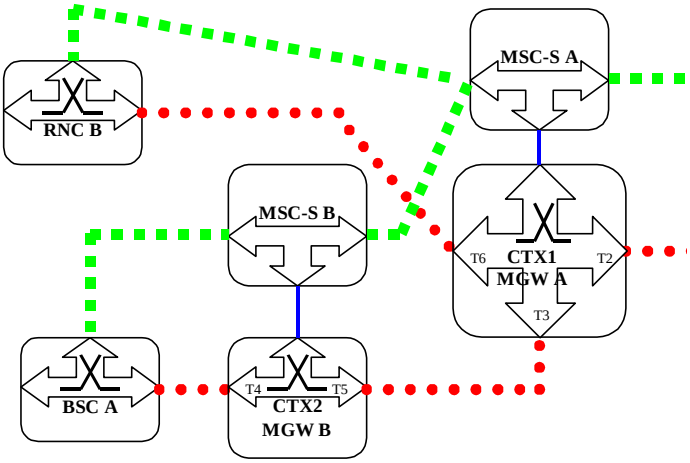
Example

Figure 8.17 shows the network model for Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling (not applicable in case of GSM access) and the bearer. In the MGW the bearer termination T1 is used for the bearer towards RNC-B, the bearer termination T3 is used for the bearer towards MSC-A server, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards BSC-A, bearer termination T5 is used for the bearer towards MGW-A.

Before Handover:



During Handover:



After Handover:

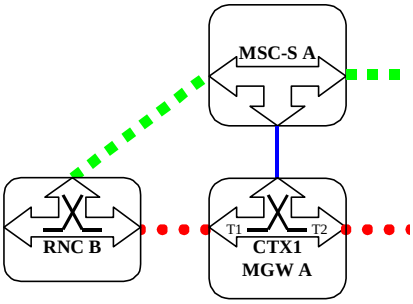


Figure 8.17 Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC (network model)

Figure 8.18 shows the message sequence example for the Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC. It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by the MSC server (MSC-A server) which controls the call and the mobility management.

In the example the MSC-A server requests MGW-A to seize RNC-B side bearer termination with specific flow directions. When the relocation is detected in RNC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Handover Complete indication from RNC-B it transfers this indication to MSC-B server. MSC-B server releases the A-interface line towards the BSC-A. MSC-A server initiates call clearing towards MSC-B server.

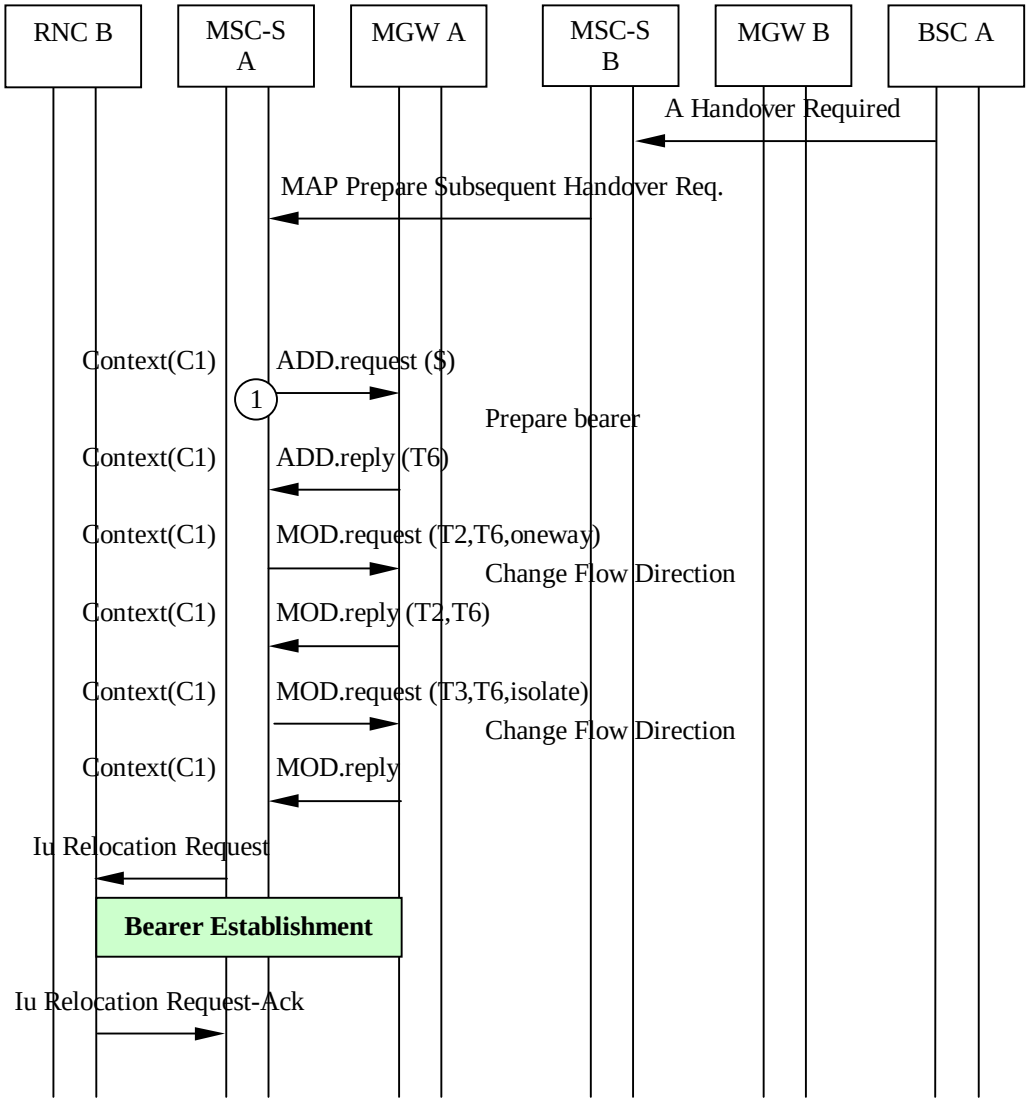


Figure 8.18/1 Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC (message sequence chart)

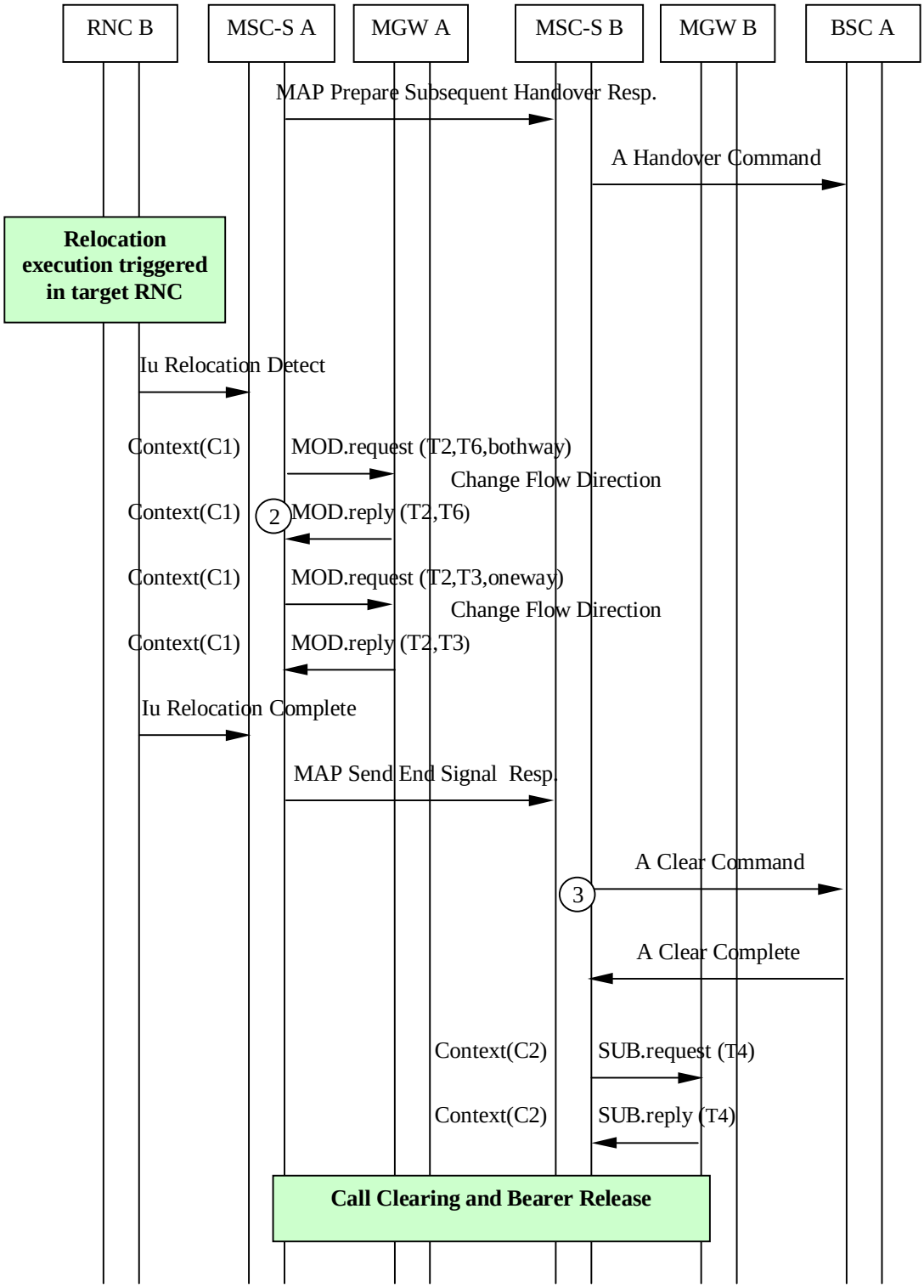


Figure 8.18/2 Subsequent Inter-MSC GSM to UMTS Handover back to the Anchor MSC (message sequence chart)

8.3.4 Subsequent Inter-MSC GSM to UMTS Handover to a third MSC

The GSM to UMTS handover to a third MSC server (from MSC-B server to MSC-B' server) is the combination of the two previous inter-MSC handover cases:

- for MSC-B server a subsequent GSM to UMTS handover from MSC-B server back to MSC-A server as described in subclause 8.3.3; and

- for MSC-B' server a basic GSM to UMTS handover from MSC-A server to MSC-B' server as described in subclause 8.3.2.

MSC-A server implements the corresponding parts of each handover case; i.e. access handling in MSC-A server is not included.

8.4 GSM to GSM

****** NEXT MODIFIED SECTION ******

8.4.1 Intra-MSC GSM to GSM Handover

The procedures specified in 3GPP TS 23.009 [8] for 'Intra-MSC Handover' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Handover Required

When the MSC server receives a Handover Required message, it requests the MGW to seize a TDM circuit, using the Reserve Circuit procedure. For non-speech calls the MSC server also provides the MGW with the same PLMN BC [4] as was provided at the last access bearer assignment. The MSC server also provides the MGW with the GSM Channel coding properties. The MSC server uses the Change Flow Direction procedure to request the MGW to set the Handover Device to initial state. The MSC server sends the Handover Request message to the BSC-B containing the CIC (bullet 1 in figure 8.20/1).

Handover Request Acknowledge

For non-speech calls after receiving Handover Request Acknowledge message if the assigned GSM Channel coding properties differ from the previously provided ones the MSC server provides the MGW-A with the assigned GSM Channel coding properties using the Modify Bearer Characteristics procedure. (Bullet 2 in figure 8.20/1.)

Handover Command/Handover Detect

When the MSC server sends the Handover Command message or alternatively if it receives the Handover Detect message, the MSC server uses the Change Flow Direction procedure to requests the MGW to set the Handover Device to intermediate state (bullet 3 in figure 8.20/1).

Handover Complete

When the MSC server receives the Handover Complete message, it releases the A-interface line towards BSC-A. The MSC server also requests the MGW to set the Handover Device to its final state by removing the bearer termination towards the BSC-A, using the Release Termination procedure (bullet 4 in figure 8.20/2).

Interworking function

The interworking function used by the MGW before handover will also be used after handover.

Voice Processing function

~~The MGW may include or alter voice processing function(s) provided to each bearer termination after handover.~~

After handover, the MGW may continue or modify voice processing function(s) provided to each bearer termination.

Failure Handling in MSC server

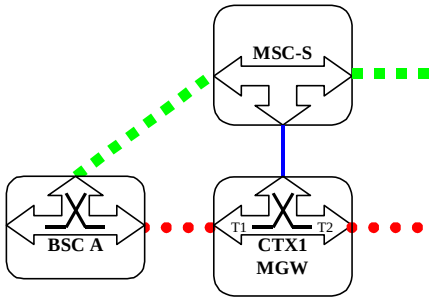
When a procedure between the MSC server and the MGW fails the MSC server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW resources have already been seized at

the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

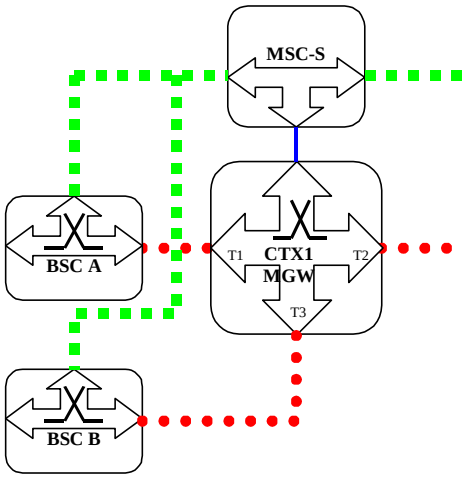
Example

Figure 8.19 shows the network model for the Intra-MSC GSM to GSM Handover. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer. The bearer termination T1 is used for the bearer towards BSC-A, bearer termination T3 is used for the bearer towards BSC-B and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW.

Before Handover:



During Handover:



After Handover:

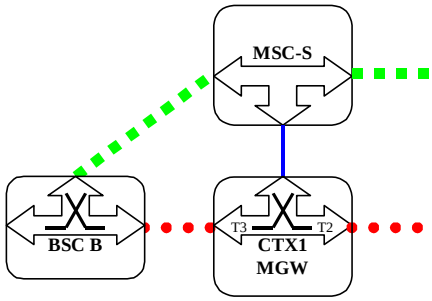


Figure 8.19 Intra-MSC GSM to GSM Handover (network model)

Figure 8.20 shows the message sequence example for the Intra-MSC GSM to GSM Handover. It is assumed that the Handover Device is located in the MGW selected for the call establishment by the MSC server, which controls the call and the mobility management.

In the example the MSC server requests seizure of BSC-B side bearer termination with specific flow directions. The MSC server starts handover execution by sending Handover Request towards BSC-B. When the handover is detected in BSC-B the MSC server requests to change the flow directions between the terminations within the context. When MSC server receives Handover Complete indication from BSC-B it releases the A-interface line towards the BSC-A. Finally the MSC server requests the MGW to release BSC-A side bearer termination.

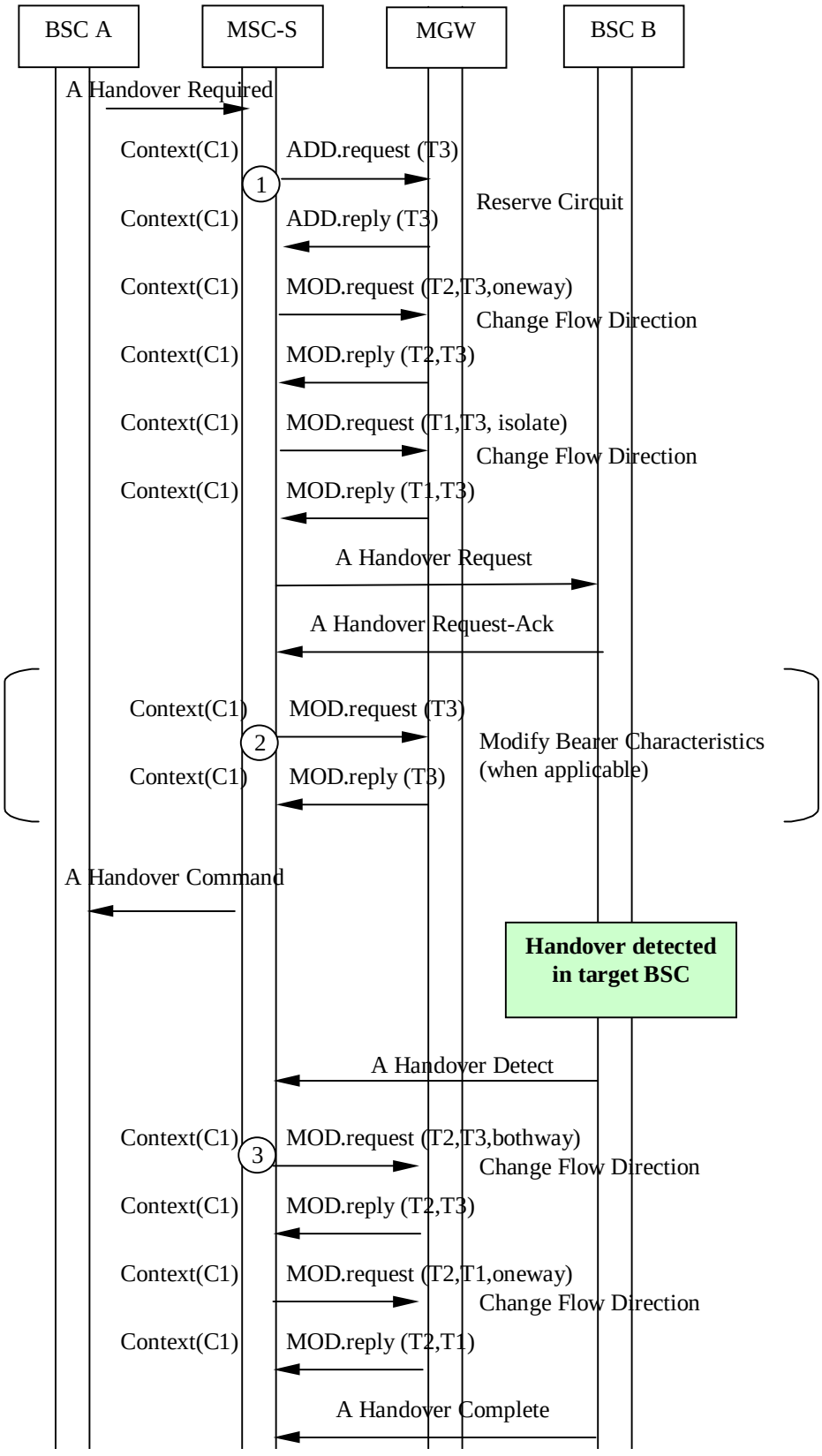


Figure 8.20/1 Intra-MSC GSM to GSM Handover (message sequence chart)

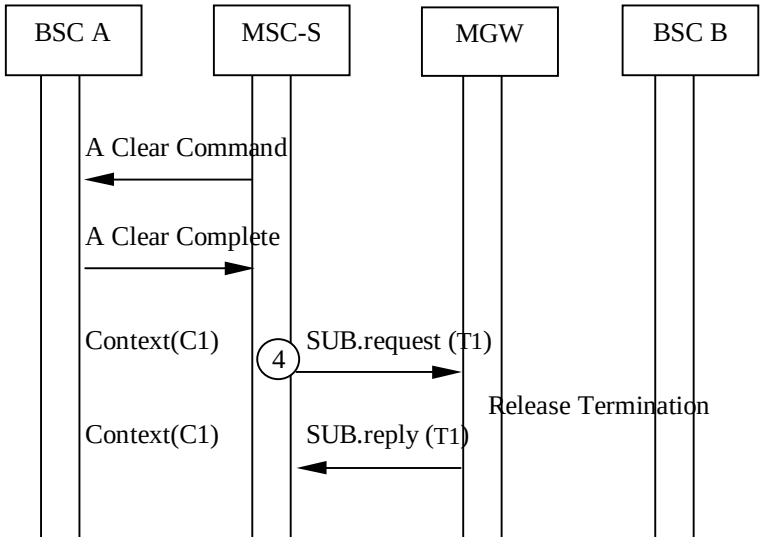


Figure 8.20/2 Intra-MSC GSM to GSM Handover (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.4.2 Basic Inter-MSC GSM to GSM Handover

The procedures specified in 3GPP TS 23.009 [8] for 'Basic Handover Procedure Requiring a Circuit Connection between MSC-A and MSC-B' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.4.2.1 MSC-A / MGW-A

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment between MGW-A and MGW-B is as described for a Basic Mobile Originating Call, using either forward or backward bearer establishment. The differences are that for non-speech calls the MSC-A server also provides MGW-A with the GSM Channel coding properties. The MSC-A server also uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state (bullet 3 in figure 8.22/2).

Handover Command/Handover Detect

When the MSC-A server sends the Handover Command message or alternatively if it receives the Handover Detect message, the MSC-A server uses the Change Flow Direction procedure to requests MGW-A to set the Handover Device to intermediate state (bullet 4 in figure 8.22/2).

Handover Complete

When the MSC-A server receives the Handover Complete message, it releases the A-interface line towards the BSC-A. The MSC-A server also requests MGW-A to set the Handover Device to its final state by removing the bearer termination towards the BSC-A, using the Release Termination procedure (bullet 5 in figure 8.22/2).

Interworking function

The interworking function used by MGW-A before handover will also be used after handover.

Voice Processing function

~~The MGW-A may alter or disable the voice processing function(s), previously provided by MGW-A, after handover.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before handover~~,~~ may be modified or disabled by MGW-A after handover.

Failure Handling in MSC server

When a procedure between the MSC-A server and MGW-A fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If call establishment towards the MSC-B server has already started then the call towards MSC-B server shall be cleared as described in subclause 7.3. If the original call is to be cleared, then it shall be handled as described in subclause 7.3.

8.4.2.2 MSC-B / MGW-B

MGW selection

The MSC-B server selects an MGW when it receives Prepare Handover Request message (bullet 1 in figure 8.4).

Bearer establishment towards BSC-B

When the MSC-B server has selected MGW-B it requests MGW-B to seize a TDM circuit, using the Reserve Circuit procedure. The MSC-B server sends the Handover Request message to the BSC-B containing the CIC (bullet 2 in figure 8.22/1).

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment between MGW-A and MGW-B is as described for a Basic Mobile Terminating Call, using either forward or backward bearer establishment.

Voice Processing function

~~The MGW-B may include or alter the voice processing function(s), previously provided by MGW-A, after handover.~~

Voice processing function(s) provided by MGW-A ~~prior to~~before handover~~,~~ may be continued or modified by MGW-B after handover.

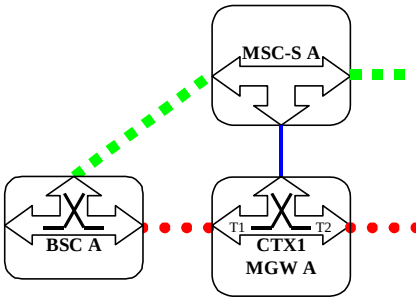
Failure Handling in MSC server

When a procedure between the MSC-B server and MGW-B fails the MSC-B server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW-B resources have already been seized at the target access side then the resources shall be released using the Release Termination procedure. The call from MSC-A server shall be released as described at subclause 7.1.

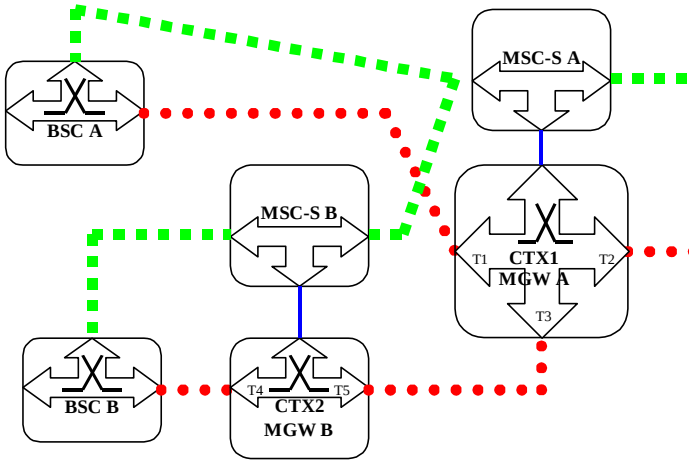
Example

Figure 8.21 shows the network model for the Basic Inter-MSC GSM to GSM. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer. In MGW-A the bearer termination T1 is used for the bearer towards BSC-A, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards BSC-B, bearer termination T5 is used for the bearer towards MGW-A.

Before Handover:



During Handover:



After Handover:

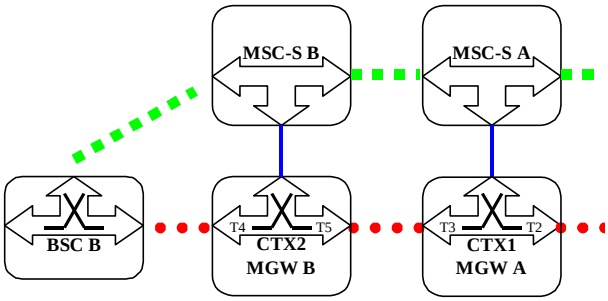


Figure 8.21 Basic Inter-MSC GSM to GSM Handover (network model)

Figure 8.22 shows the message sequence example for the Basic Inter-MSC GSM to GSM Handover.

It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by the MSC server (MSC-A server) which controls the call and the mobility management.

In the example the MSC-B server requests MGW-B to seize BSC-B side bearer termination. The call is established between MSC-A server and MSC-B server, and the bearer is established between MGW-A and MGW-B. When the handover is detected in BSC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Relocation Complete indication from MSC-B server it releases the A-interface line towards the BSC-A. Finally MSC-A server requests MGW-A to remove BSC-A side bearer termination.

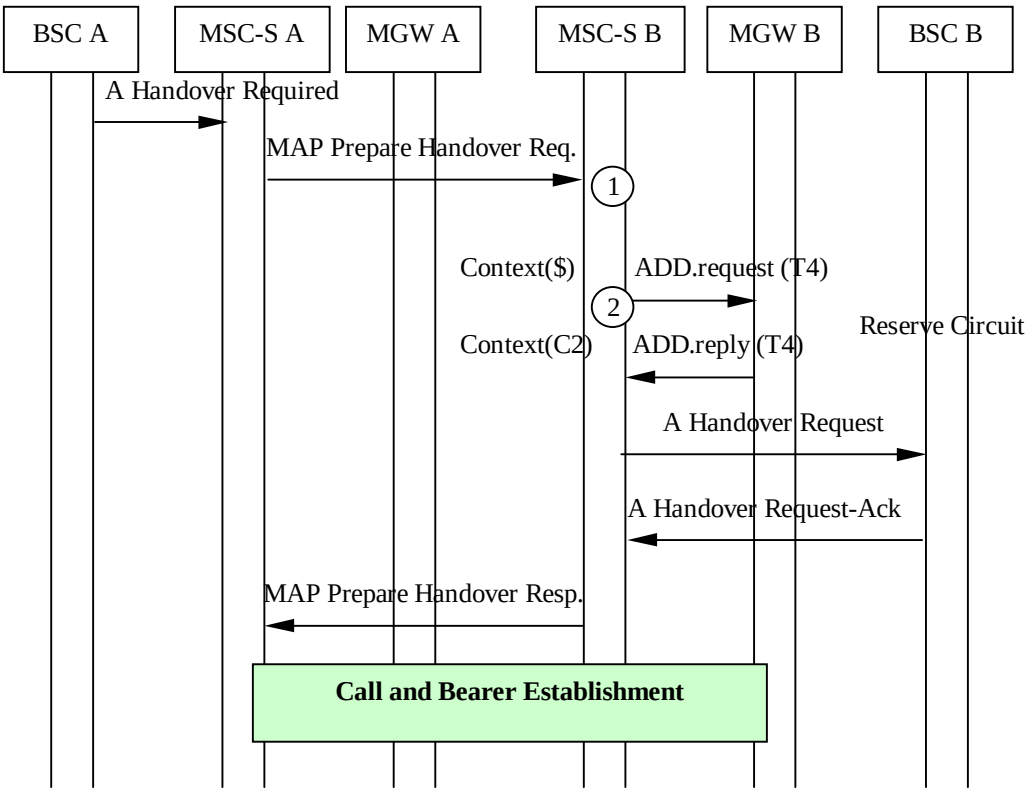


Figure 8.22/1 Basic Inter-MSC GSM to GSM Handover (message sequence chart)

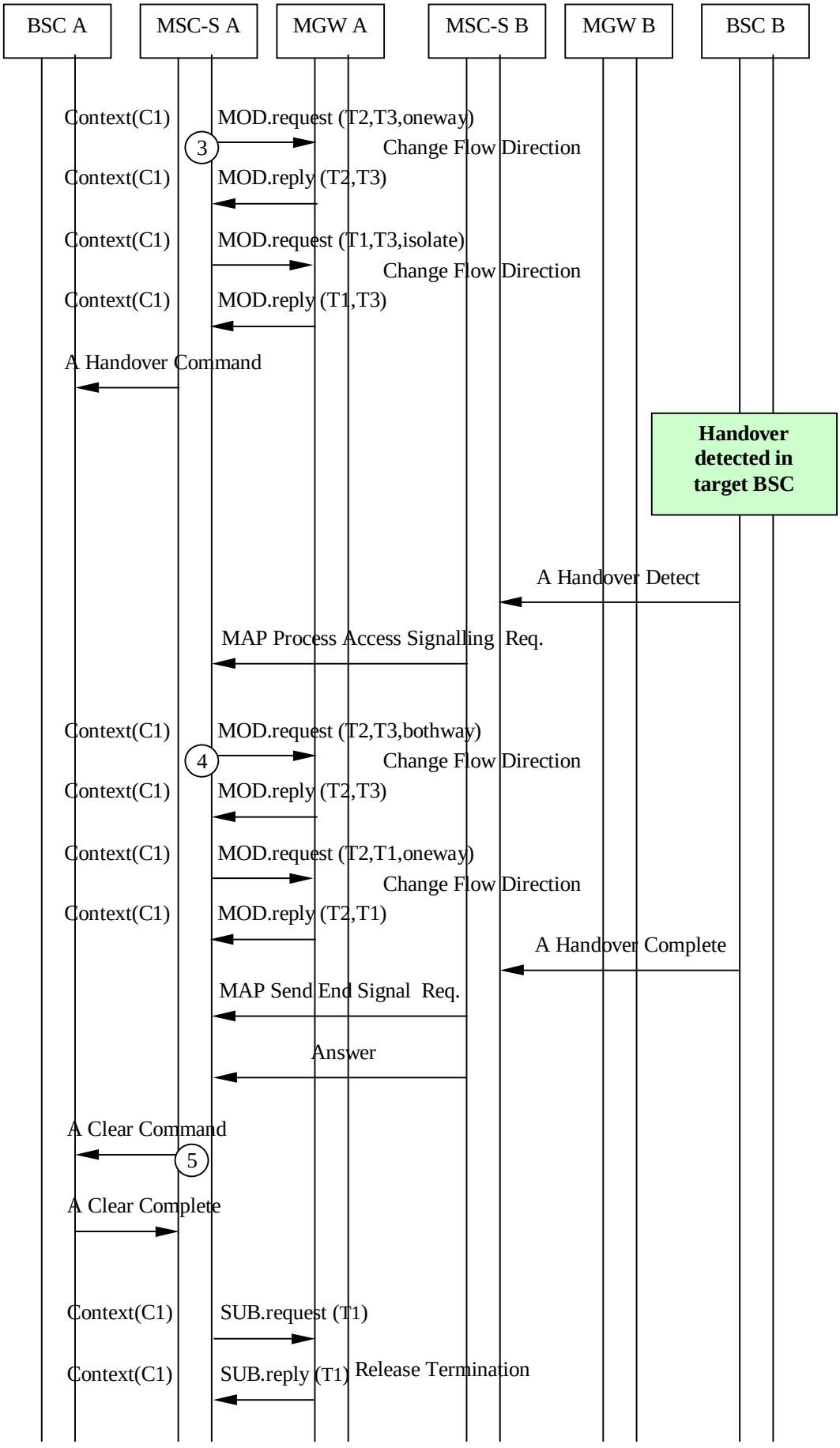


Figure 8.22/2 Basic Inter-MSC GSM to GSM Handover (message sequence chart)

****** NEXT MODIFIED SECTION ******

8.4.3 Subsequent Inter-MSC GSM to GSM Handover back to the Anchor MSC

The procedures specified in 3GPP TS 23.009 [8] for 'Subsequent Handover from MSC-B to MSC-A requiring a Circuit Connection between 3G_MSC-A and 3G_MSC-B' shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

8.4.3.1 MSC-A / MGW-A

Handover Required

When the MSC-A server receives the Handover Required message, it requests MGW-A to seize a TDM circuit, using the Reserve Circuit procedure. For non-speech calls the MSC-A server also provides MGW-A with the same PLMN BC [4] as was provided at the last access bearer assignment. The MSC-A server also provides MGW-A with the GSM Channel coding properties. The MSC-A server uses the Change Flow Direction Procedure to request MGW-A to set the Handover Device to initial state. The MSC-A server sends the Handover Request message to the BSC-B containing the CIC (bullet 1 in figure 8.24/1).

Handover Request Acknowledge

For non-speech calls after receiving Handover Request Acknowledge message if the assigned GSM Channel coding properties differ from the previously provided ones the MSC-A server provides the MGW-A with the assigned GSM Channel coding properties using the Modify Bearer Characteristics procedure. (Bullet 2 in figure 8.24/2.)

Handover Command/Handover Detect

When the MSC-A server sends the Handover Command message or alternatively if it receives the Handover Detect message, the MSC-A server uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to intermediate state (bullet 3 in figure 8.24/2).

Handover Complete

When the MSC-A server receives the Handover Complete message, it informs the MSC-B server about reception of this message. The MSC-A server then initiates call clearing towards the MSC-B server as described in subclause 7.3.

Interworking function

The interworking function used by MGW-A before handover will also be used after handover.

Voice Processing function

~~The MGW-A may include or alter the voice processing function(s), previously provided by MGW-A and MGW-B, after handover.~~

Voice processing function(s) provided by MGW-A and MGW-B ~~prior to~~before handover~~,~~ may be continued or modified by MGW-A after handover.

Failure Handling in MSC server

When a procedure between the MSC-A server and MGW-A fails the MSC-A server shall handle the failure as an internal error in accordance with 3GPP TS 23.009 [8] and 3GPP TS 29.010 [23]. If MGW-A resources have already been seized at the target access side then the resources shall be released using the Release Termination procedure. If the call is to be cleared, then it shall be handled as described in subclause 7.3.

8.4.3.2 MSC-B / MGW-B

Handover Complete

When the MSC-B server receives the Handover Complete message, it releases the A-interface line towards the BSC-A and requests the MGW-B to remove the bearer termination towards the BSC-A using the Release Bearer Termination procedure (bullet 4 in figure 8.24/2).

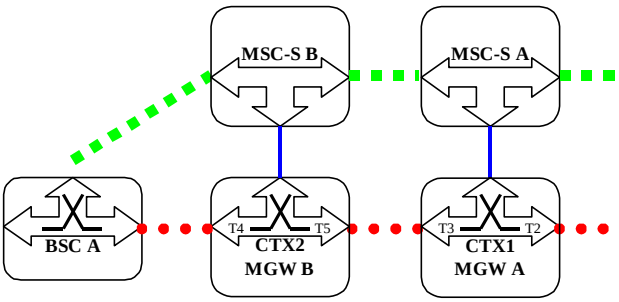
Release of bearer towards MGW-A

When the MSC-B server receives a call clearing indication from the MSC-A server, the MSC-B server handles it as described in subclause 7.2.

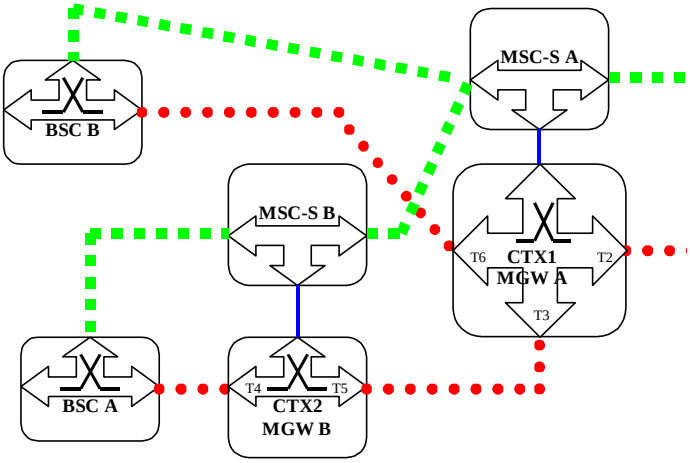
Example

Figure 8.24 shows the network model for the Subsequent Inter-MSC GSM to GSM Handover back to the Anchor MSC. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer. In MGW-A the bearer termination T6 is used for the bearer towards BSC-B, bearer termination T3 is used for the bearer towards MGW-B, and the bearer termination T2 is used for the bearer towards the succeeding/preceding MGW. In MGW-B the bearer termination T4 is used for the bearer towards BSC-A, bearer termination T5 is used for the bearer towards MGW-A.

Before Handover:



During Handover:



After Handover:

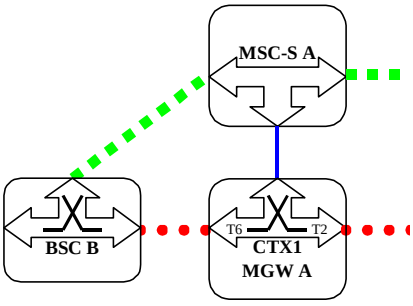


Figure 8.23 Subsequent Inter-MSC GSM to GSM Handover back to the Anchor MSC (network model)

Figure 8.24 shows the message sequence example for the Subsequent Inter-MSC GSM to GSM Handover back to the Anchor MSC. It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by the MSC server (MSC-A server) which controls the call and the mobility management.

In the example the MSC-A server requests MGW-A to seize BSC-B side bearer termination with specific flow directions. When the handover is detected in BSC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Relocation Complete indication from BSC-B it transfers this indication to MSC-B server. MSC-B server releases the A-interface line towards the BSC-A. MSC-A server initiates call clearing towards MSC-B server.

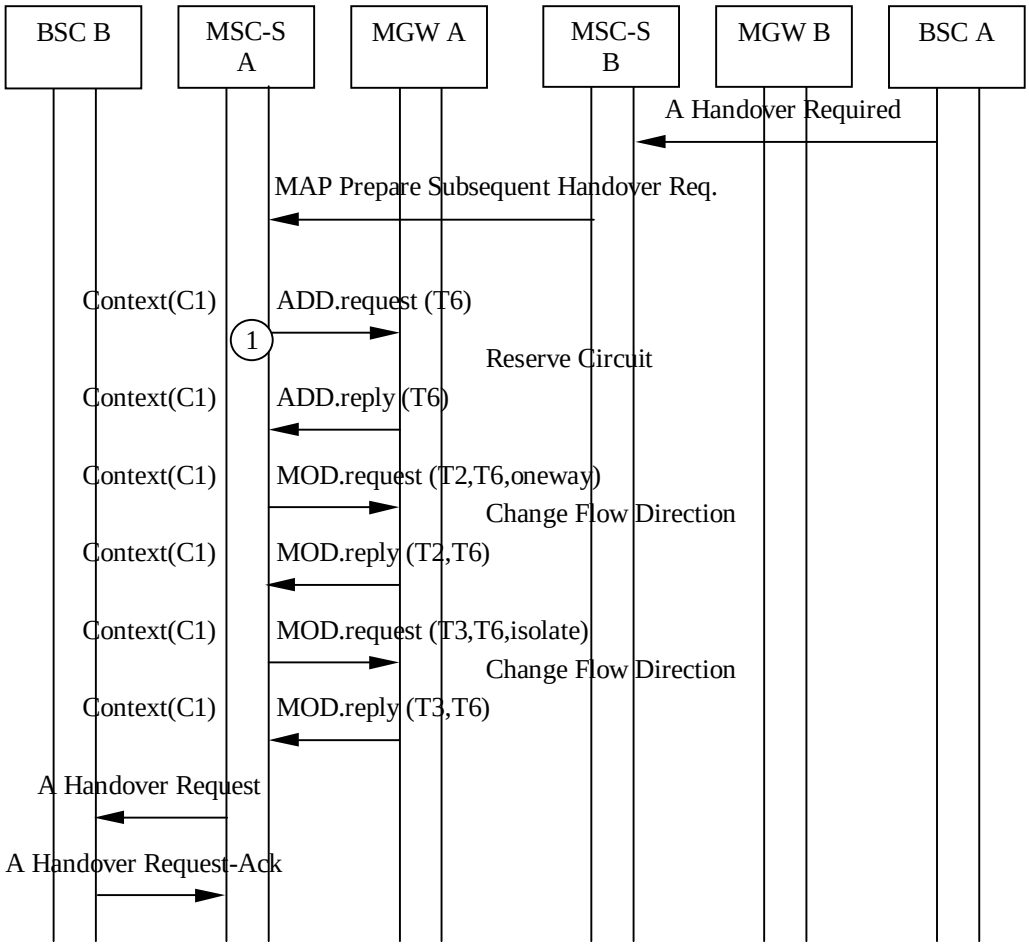


Figure 8.24/1 Subsequent Inter-MSC GSM to GSM Handover back to the Anchor MSC (message sequence chart)

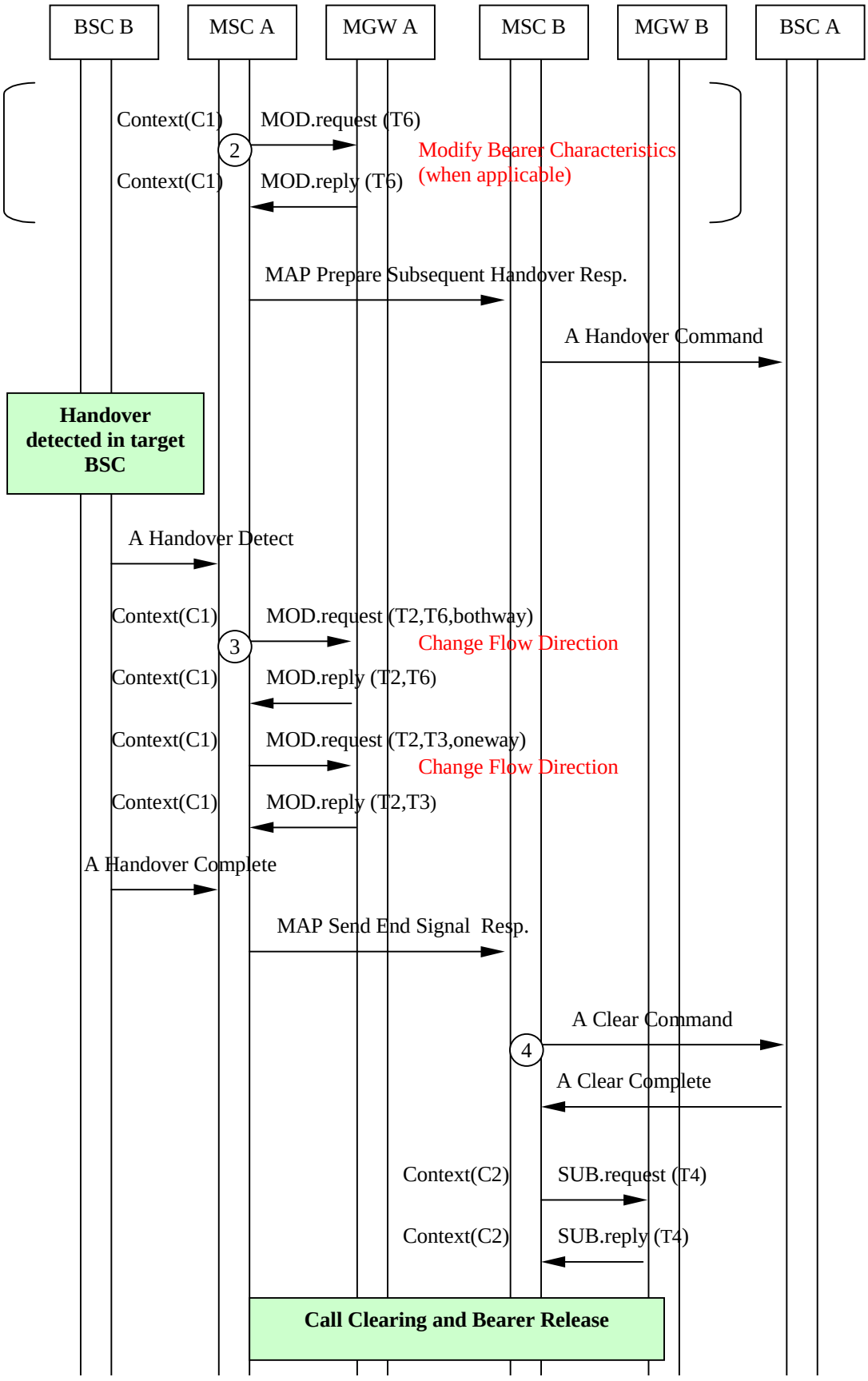


Figure 8.24/2 Subsequent Inter-MSC GSM to GSM Handover back to the Anchor MSC (message sequence chart)

****** NEXT MODIFIED SECTION ******

13.13.2 Network initiated mobile originated call

The call is established as described in subclause 6.1 for basic mobile originating call.

13.13.2.1 Early Traffic Channel Assignment

Within CCBS there is an option for a CCBS call to establish a bearer before setup in state "CC-establishment confirmed". In this case the MSC server shall to check whether an access bearer assignment modification has to be performed after receiving the setup message from UE.

Example

For the network model, please refer to figure 6.1.

Figure 13.26 shows the message sequence chart for the network initiated mobile originating call using the option assignment after A and B party alerting. In the following, the case with backward bearer establishment is considered.

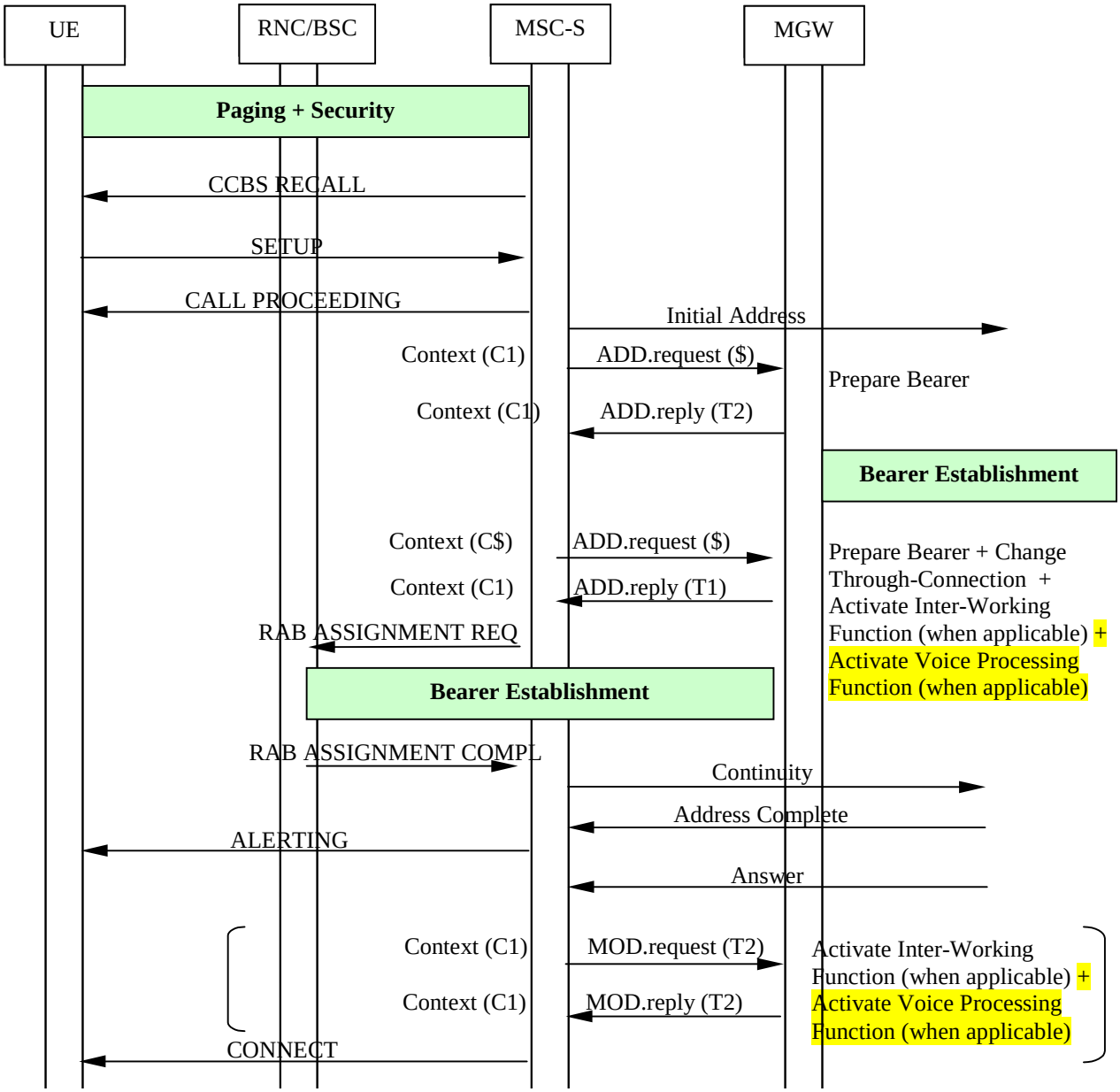


Figure 13.26 Network initiated mobile originating call establishment with assignment after A and B party alerting (message sequence chart)

3GPP TSG-CN WG4 Meeting #08 ***Tdoc N4-010678***
Rio Grande, Puerto Rico, 14-18 May 2001 **(revision of *Tdoc N4-010609*)**

CR-Form-v3

CHANGE REQUEST

⌘ **23.205** **CR** **004** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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 **X**

Title:	⌘	Corrections to Call Clearing
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	14/05/01
Category:	⌘	**F**
Release:	⌘	REL-4

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)

Reason for change:	⌘	Confusion between direction of establishment of original call and direction of propagation of Release message.
Summary of change:	⌘	Definition of the terms “incoming” and “outgoing” for propagation of Release message, removed User Initiated-GMSC server subclause, for (G)MSC server initiated subclause the terms “destination” and “originating” have been used to replace “outgoing” and “incoming”.
Consequences if not approved:	⌘	Confusing specification

Clauses affected:	⌘	7.1, 7.2, 7.3, 7.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	The unnumbered subclause headings in clause 7 have been replaced by numbered subclause headings, for better cross-referencing

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.

******Start of Modified Section ******

7 Call Clearing

NOTE: All message sequence charts in this clause are examples. All valid call establishment message sequences can be derived from the example message sequences and associated message pre-conditions.

7.1 Network Initiated

The terms “incoming” and “outgoing” in the following text refers to the direction of propagation of the Release message, not to the direction of establishing the original call~~The network initiated call clearing shall be performed in accordance with 3GPP TS 23.108 [18]. The following paragraphs describe the additional requirements for the bearer independent CS core network~~.

7.1.1 GMSC server

7.1.1.1 Call clearing from the incoming side

Once the Release message has been received from the preceding node, the GMSC server releases any MGW allocated resources for the incoming side. If any resources were seized in the MGW and the GMSC server had previously requested the MGW to establish a bearer, the GMSC server uses the Release Bearer procedure to request the MGW to release the bearer towards the preceding MGW. Finally, if any resources were seized in the MGW, the GMSC server uses the Release Termination procedure to request the MGW to remove the incoming side bearer termination. After the resources in the MGW are released the GMSC server sends the Release Complete message to the preceding node.

7.1.1.2 Call clearing to the outgoing side

The GMSC server sends the Release message to the succeeding node. Once the succeeding node has sent the Release Complete message, the GMSC server releases any MGW allocated resources for the outgoing side. If any resources were seized in the MGW and the GMSC server had previously requested the MGW to establish a bearer, the GMSC server uses the Release Bearer procedure to request the MGW to release the bearer towards the succeeding MGW. Finally, if any resources were seized in the MGW, the GMSC server uses the Release Termination procedure to request the MGW to remove the outgoing side bearer termination.

7.1.2 MSC server

The network initiated call clearing shall be performed in accordance with 3GPP TS 23.108 [18]. The following paragraphs describe the additional requirements for the bearer independent CS core network.

7.1.2.1 Call clearing from the network side

Once the Release message has been received from the preceding/succeeding node, the MSC server releases any MGW allocated resources for the network side. If any resources were seized in the MGW and the MSC server had previously requested the MGW to establish a bearer, the MSC server uses the Release Bearer procedure to request the MGW to release the bearer towards the preceding/succeeding MGW. Finally, if any resources were seized in the MGW, the MSC server uses the Release Termination procedure to request the MGW to remove the network side bearer termination. After the resources in the MGW are released the MSC server sends the Release Complete message to the preceding/succeeding node (bullet 1 in figure 7.2).

7.1.2.2 Call clearing to the UE

The MSC server initiates call clearing towards the UE and requests release of the associated radio resources as described in 3GPP TS 23.108[18]. Once the call clearing and the release of the associated radio resources have been completed, the MSC server releases any MGW allocated resources for the access side. If any resources were seized in

the MGW, the MSC server uses the Release Termination procedure to requests the MGW to remove the access side bearer termination (bullet 2 or bullet 3 in figure 7.2).

Example

Figure 7.1 shows the network model for a network initiated clearing of the mobile call. The ‘squared’ line represents the call control signalling. The ‘dotted’ line represents the bearer control signalling (not applicable in A-interface) and the bearer. The MSC server seizes one context with two bearer terminations in the MGW. Bearer termination T1 is used for the bearer towards RNC/BSC and bearer termination T2 is used for the bearer towards succeeding MGW.

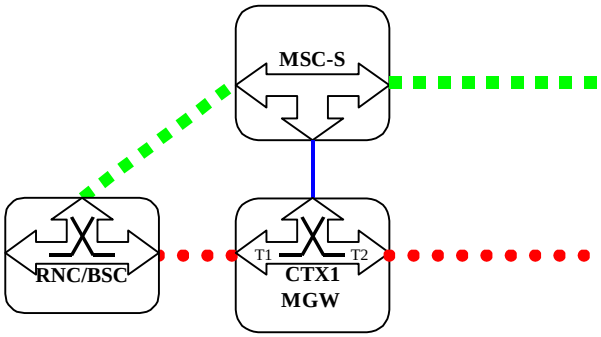
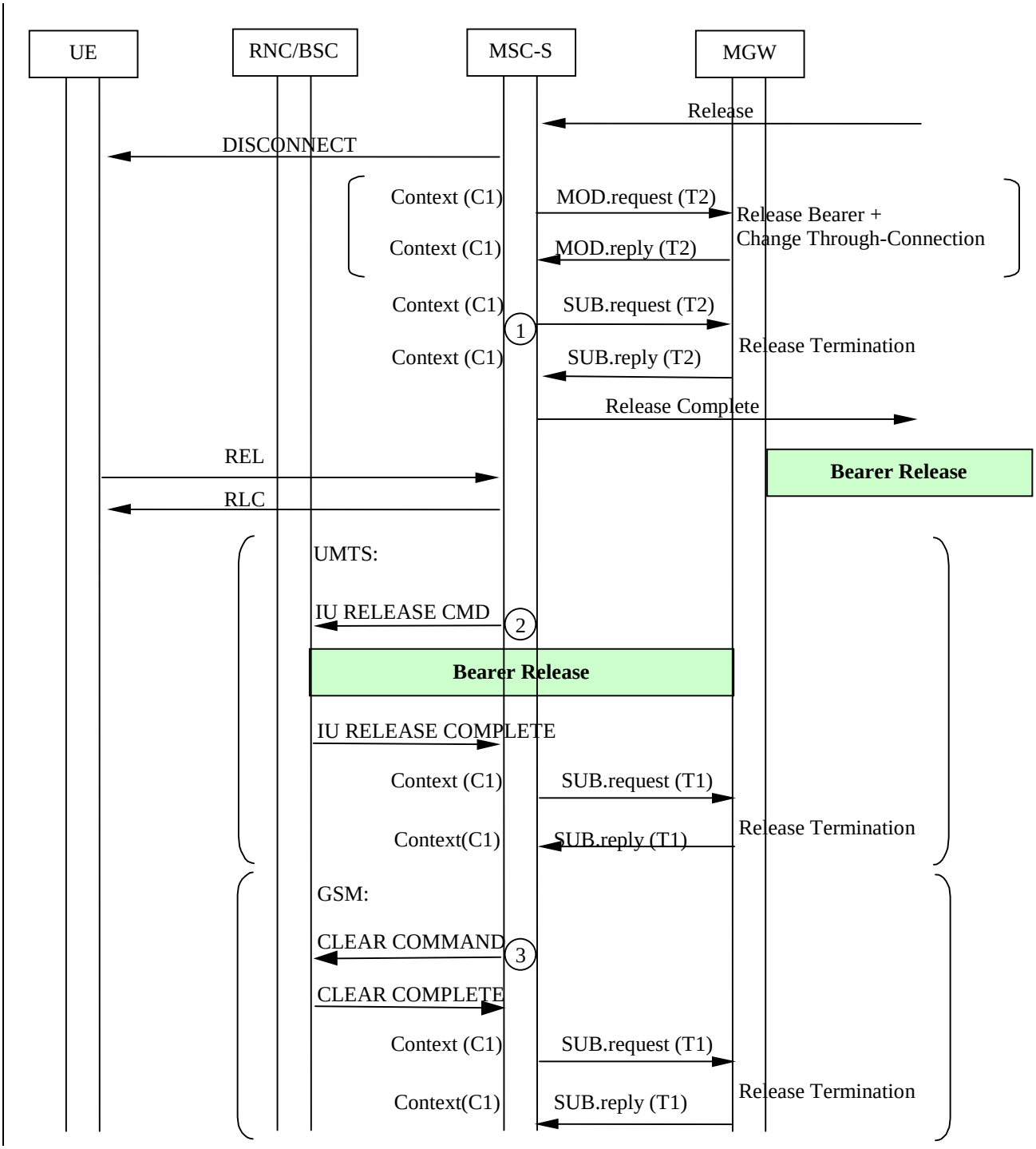


Figure 7.1 Network Initiated Call Clearing (Network model)

Figure 7.2 shows the message sequence example for the network initiated clearing of a mobile call. In the example the MSC server requests release of the network side bearer, if establishment of the bearer was requested by the MSC server, and release of the bearer termination when the call clearing indication is received from the preceding/succeeding node. After the release of the network side bearer termination ~~then~~ the MSC server indicates to the preceding/succeeding node that call clearing has been completed. The MSC server initiates call clearing towards the UE and requests release of the radio resource. After the response of the radio resource release is received then the MSC server requests release of the access side bearer termination.


UE
RNC/BSC
MSC-S
MGW
Release
DISCONNECT
Context (C1)
MOD.request (T2)
Release Bearer +
Change Through-Connection
Context (C1)
MOD.reply (T2)
Context (C1)
SUB.request (T2)
1
Release Termination
Context (C1)
SUB.reply (T2)
Release Complete
REL
Bearer Release
RLC
UMTS:
IU RELEASE CMD
2
Bearer Release
IU RELEASE COMPLETE
Context (C1)
SUB.request (T1)
Release Termination
Context(C1)
SUB.reply (T1)
GSM:
CLEAR COMMAND
3
CLEAR COMPLETE
Context (C1)
SUB.request (T1)
Release Termination
Context(C1)
SUB.reply (T1)

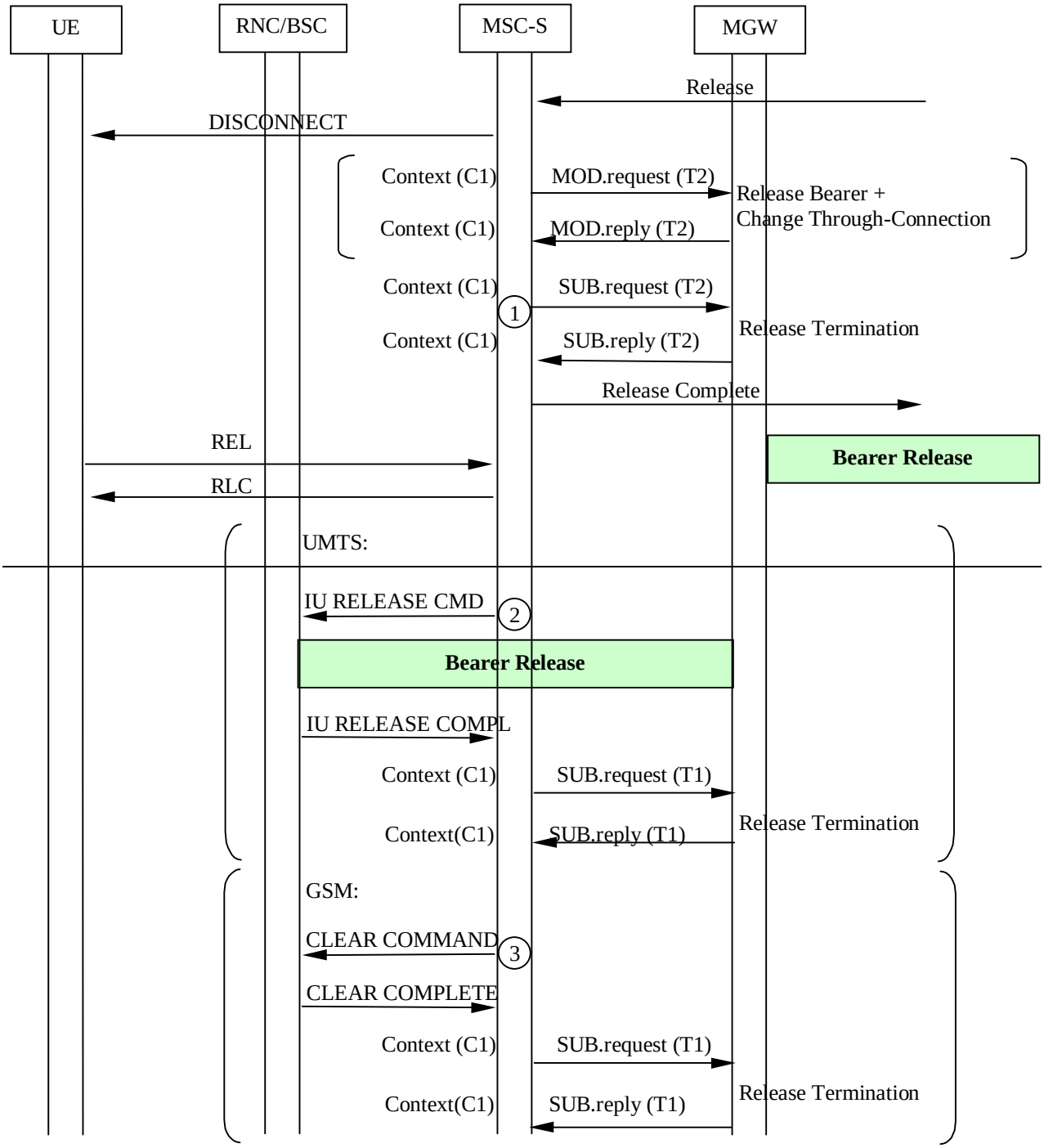


Figure 7.2 Network Initiated Call Clearing (message sequence chart)

7.2 User Initiated

The user initiated call clearing shall be performed in accordance with 3GPP TS 23.108 [18]. The following paragraphs describe the additional requirements for the bearer independent CS core network.

7.2.1 Void~~GMSC server~~

~~Call clearing from the outgoing side~~

~~Call clearing from the outgoing side is performed as described in subclause 7.1, call clearing from the incoming side.~~

~~Call clearing to the incoming side~~

~~Call clearing to the incoming side is performed as described in subclause 7.1, call clearing to the outgoing side.~~

7.2.2 MSC server

7.2.2.1 Call clearing from the UE

The UE initiated call clearing is performed and the release of the associated radio resources is performed as described in 3GPP TS 23.108 [18]. Once the call clearing and the associated radio resources release have been completed, the MSC server releases any MGW allocated resources for the access side. If any resources were seized in the MGW the MSC server uses the Release Termination procedure to requests the MGW to remove the access side bearer termination (bullet 1 or bullet 2 in figure 7.4).

7.2.2.2 Call clearing to the network side

The MSC server sends the Release message to the preceding/succeeding node. Once the preceding/succeeding node has sent the Release Complete, the MSC server releases any MGW allocated resources for the network side. If any resources were seized in the MGW and the MSC server had previously requested the MGW to establish a bearer the MSC server uses the Release Bearer procedure to request the MGW to release the bearer towards the preceding/succeeding MGW. Finally, if any resources were seized in the MGW, the MSC server uses the Release Termination procedure to request the MGW to remove the network side bearer termination (bullet 3 in figure 7.4).

Example

Figure 7.3 shows the network model for a user initiated clearing of a mobile call. The ‘squared’ line represents the call control signalling. The ‘dotted’ line represents the bearer control signalling (not applicable in A-interface) and the bearer. The MSC server seizes one context with two bearer terminations in the MGW. Bearer termination T1 is used for the bearer towards RNC/BSC and bearer termination T2 is used for the bearer towards succeeding MGW.

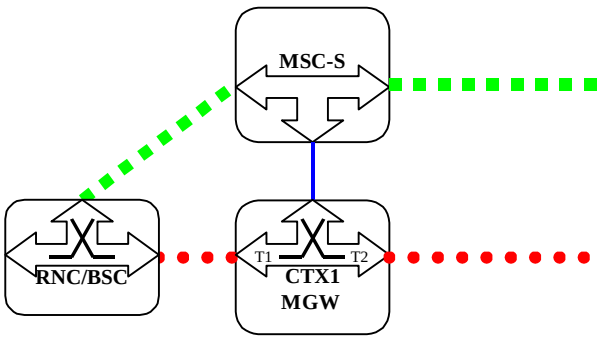
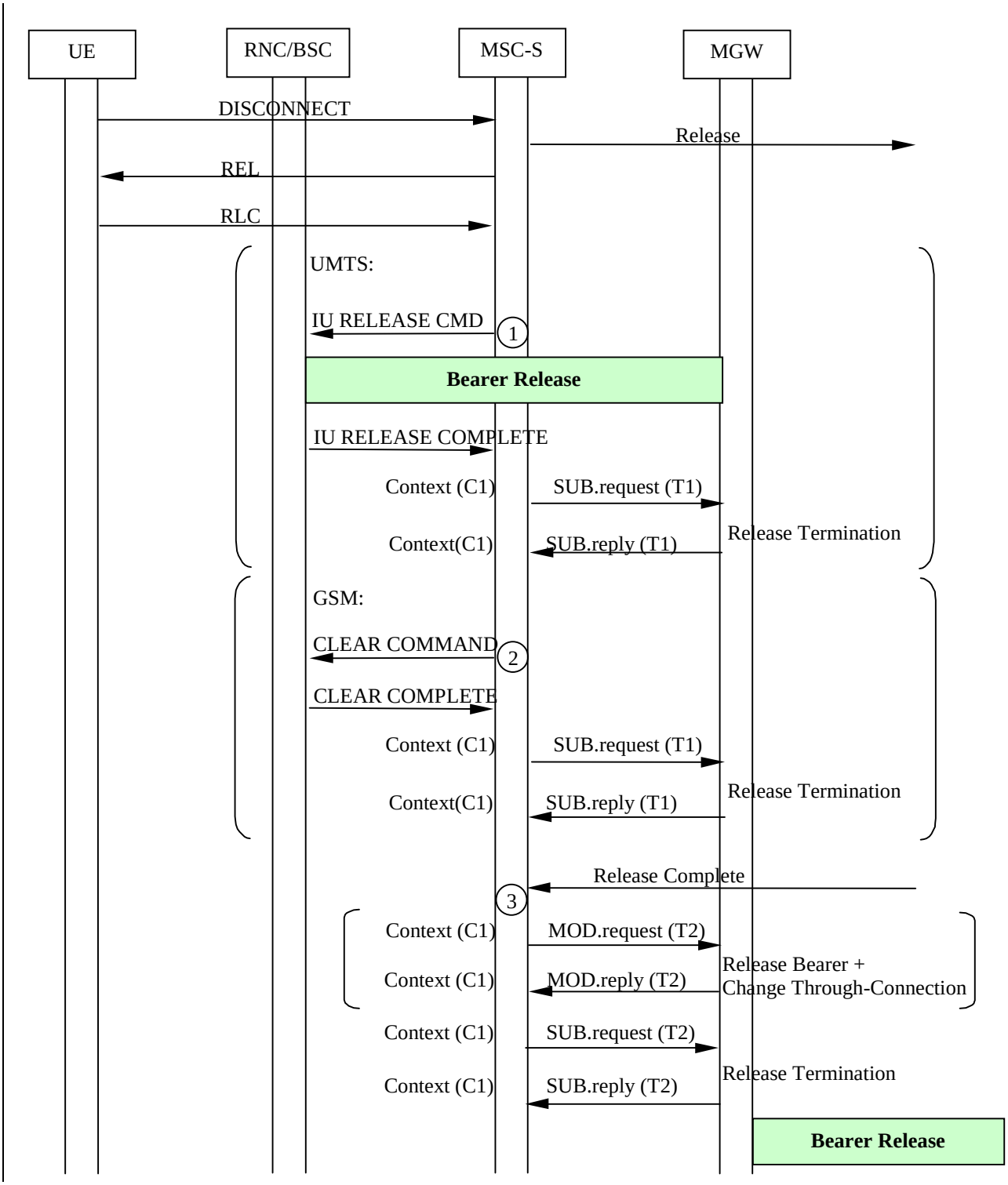


Figure 7.3 User Initiated Call Clearing (Network model)

Figure 7.4 shows the message sequence example for the user initiated clearing of a mobile call. In the example the UE initiates call clearing towards the MSC server and the MSC server requests release of the radio resource. After the response of the radio resource release is received the MSC server requests the release of the access side bearer termination. The MSC server initiates call clearing towards the preceding/succeeding node. Once the preceding/succeeding node has indicated that call clearing has been completed, the MSC server requests the release of the network side bearer, if establishment of the bearer was requested by the MSC server, and release of the bearer termination.


UE
RNC/BSC
MSC-S
MGW
DISCONNECT
Release
REL
RLC
UMTS:
IU RELEASE CMD
1
Bearer Release
IU RELEASE COMPLETE
Context (C1)
SUB.request (T1)
Release Termination
Context(C1)
SUB.reply (T1)
GSM:
CLEAR COMMAND
2
CLEAR COMPLETE
Context (C1)
SUB.request (T1)
Release Termination
Context(C1)
SUB.reply (T1)
Release Complete
3
Context (C1)
MOD.request (T2)
Release Bearer +
Change Through-Connection
Context (C1)
MOD.reply (T2)
Context (C1)
SUB.request (T2)
Release Termination
Context (C1)
SUB.reply (T2)
Bearer Release

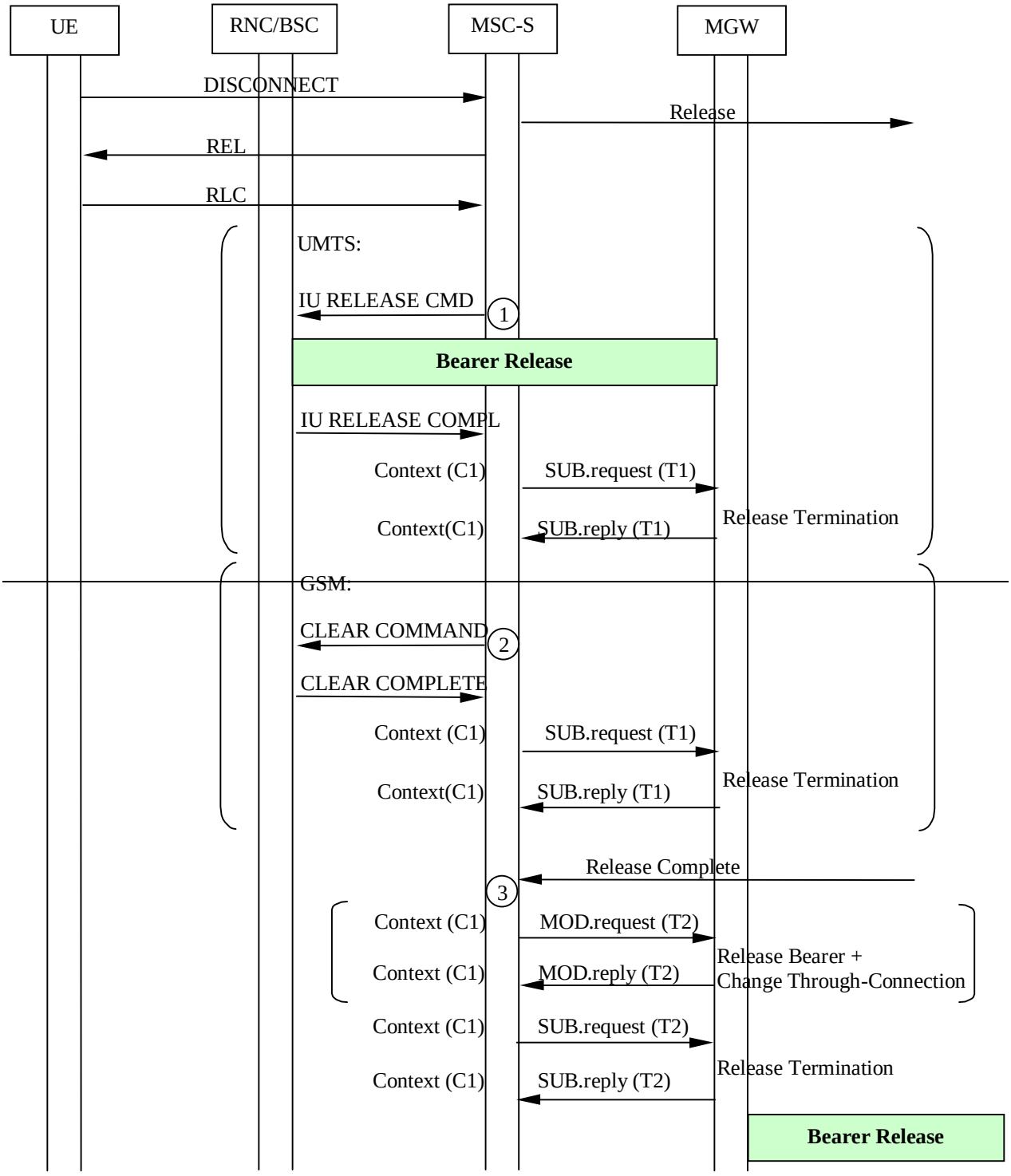


Figure 7.4 User Initiated Call Clearing (message sequence chart)

7.3 (G)MSC server Initiated

The following paragraphs describe the additional requirements for (G)MSC server initiated call clearing in the bearer independent CS core network.

7.3.1 GMSC server

7.3.1.1 Call clearing to the destination ~~outgoing~~ side

If the call is already established towards the destination~~outgoing side~~, ~~the~~ call clearing ~~to the outgoing side~~ is performed as described in subclause 7.1.1.2, call clearing to the outgoing side.

7.3.1.2 Call clearing to the originating ~~incoming~~ side

~~The~~ Call clearing to the originating ~~incoming~~ side is performed as described in subclause 7.1.1.2, call clearing to the outgoing ~~incoming~~ side.

7.3.2 MSC server

7.3.2.1 Call clearing to the UE

The call clearing to the UE is performed as described in subclause 7.12.2, call clearing to the UE (bullet 1 and bullet 2 in figure 7.6).

7.3.2.2 Call clearing to the network side

If the call is already established towards the network side, the call clearing to the network side is performed as described in subclause 7.2, call clearing to the network side (bullet 3 in figure 7.6).

Example

Figure 7.5 shows the network model for the MSC server initiated clearing of the mobile call. The 'squared' line represents the call control signalling. The 'dotted' line represents the bearer control signalling (not applicable in A-interface) and the bearer. The MSC server seizes one context with two bearer terminations in the MGW. Bearer termination T1 is used for the bearer towards RNC/BSC and bearer termination T2 is used for the bearer towards succeeding MGW.

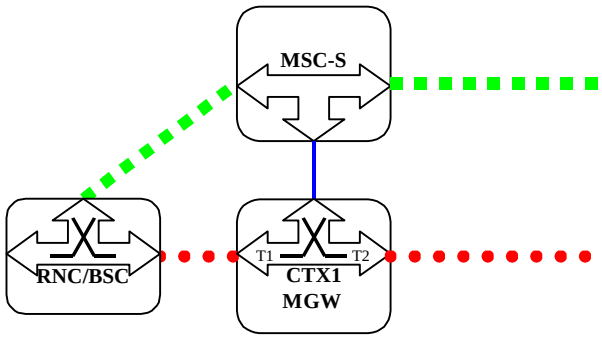
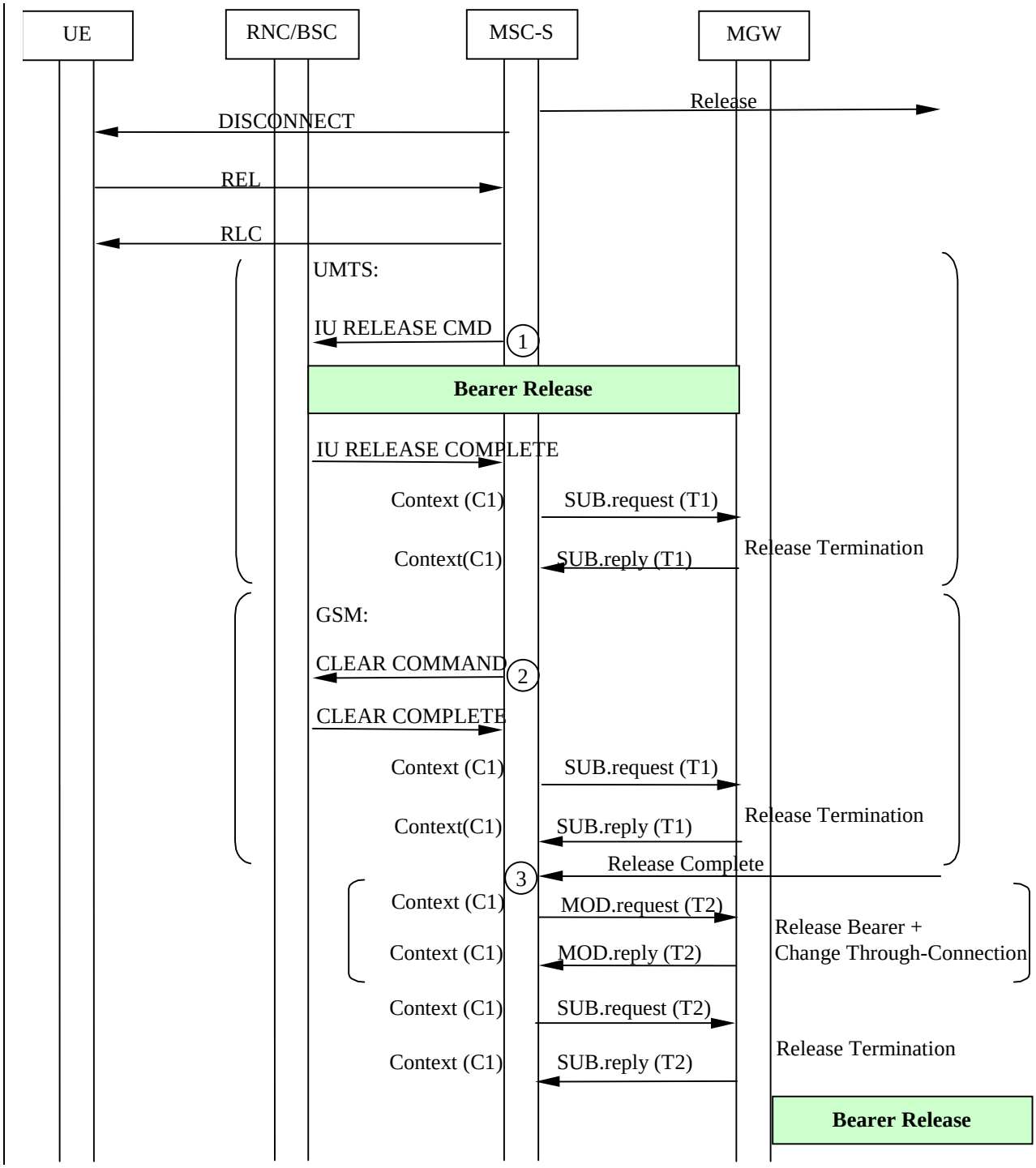


Figure 7.5 MSC server Initiated Call Clearing (Network model)

Figure 7.6 shows the message sequence example for the MSC server initiated clearing of a mobile call. In the example the MSC server initiates call clearing of the network side and the access side. After the call clearing towards the UE and the release of the radio resource have been completed the MSC server requests release of the access side bearer termination. Once the preceding/succeeding node has indicated that call clearing has been completed, the MSC server requests the release of the network side bearer, if establishment of the bearer was requested by the MSC server, and release of the bearer termination.


UE
RNC/BSC
MSC-S
MGW
Release
DISCONNECT
REL
RLC
UMTS:
IU RELEASE CMD
1
Bearer Release
IU RELEASE COMPLETE
Context (C1)
SUB.request (T1)
Context(C1)
SUB.reply (T1)
Release Termination
GSM:
CLEAR COMMAND
2
CLEAR COMPLETE
Context (C1)
SUB.request (T1)
Context(C1)
SUB.reply (T1)
Release Termination
Release Complete
3
Context (C1)
MOD.request (T2)
Context (C1)
MOD.reply (T2)
Release Bearer +
Change Through-Connection
Context (C1)
SUB.request (T2)
Context (C1)
SUB.reply (T2)
Release Termination
Bearer Release

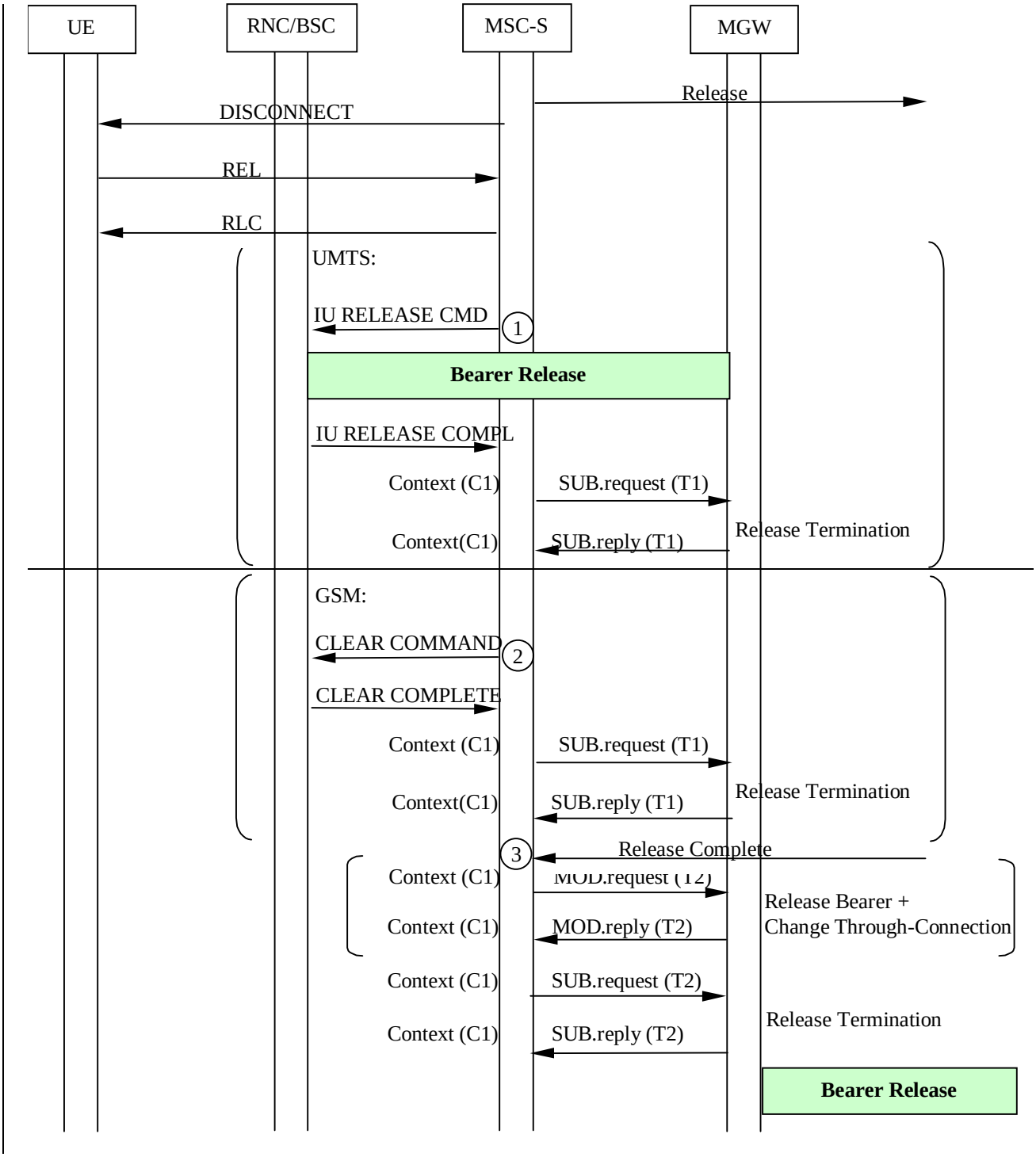


Figure 7.6 MSC server Initiated Call Clearing (message sequence chart)

7.4 MGW Initiated

The following paragraphs describe the additional requirements for MGW initiated call clearing in the bearer independent CS core network.

7.4.1 GMSC server

7.4.1.1 Bearer released on ~~in~~ the destination ~~outgoing~~ side

After the GMSC server has received the Bearer Released procedure from the MGW, it shall send the Release message to the succeeding node. Once the succeeding node has sent the Release Complete message, the GMSC server releases any MGW allocated resources for the destination ~~outgoing~~ side. The GMSC server uses the Release Termination procedure to request the MGW to remove the destination ~~outgoing~~ side bearer termination.

The call clearing to the incoming side is performed as described in subclause 7.1.1.2, call clearing to the outgoing side.

7.4.1.2 Bearer released on ~~in~~ the originating ~~incoming~~ side

After the GMSC server has received the Bearer Released procedure from the MGW, the GMSC server sends the Release message to the preceding node. Once the preceding node has sent the Release Complete message, the GMSC server releases any MGW allocated resources for the originating ~~incoming~~ side. The GMSC server uses the Release Termination procedure to request the MGW to remove the originating ~~incoming~~ side bearer termination.

If the call is already established towards the destination ~~outgoing~~ side, ~~the~~ call clearing to the destination ~~outgoing~~ side is performed as described in subclause 7.1.1.2, call clearing to the outgoing ~~incoming~~ side.

7.4.2 MSC server

7.4.2.1 Bearer released on the access side

After the MSC server has received the Bearer Released procedure from the MGW, the MSC server initiates the call clearing towards the UE and requests release of the allocated radio resources as described in 3GPP TS 23.108 [18]. Once the call clearing and the radio resources release have been completed, the MSC server releases any MGW allocated resources for the access side. The MSC server uses the Release Termination procedure to request the MGW to remove the access side bearer termination.

If the call is already established towards the network side, ~~the~~ call clearing to the network side is performed as described in subclause 7.2, call clearing to the network side.

7.4.2.1 Bearer released on ~~in~~ the network side

After the MSC server has received the Bearer Released procedure from the MGW, the MSC server sends the Release message to the preceding/succeeding node. Once the preceding/succeeding node has sent the Release Complete message, the MSC server releases any MGW allocated resources for the network side. The MSC server uses the Release Termination procedure to request the MGW to remove the network side bearer termination (bullet 1 and bullet 2 in figure 7.8).

~~The~~ C~~c~~all clearing to the UE is performed as described in subclause 7.1.2.2, call clearing to the UE (bullet 3 in figure 7.8).

Example

Figure 7.7 shows the network model for an MGW initiated clearing of a mobile call. The ‘squared’ line represents the call control signalling. The ‘dotted’ line represents the bearer control signalling (not applicable in A-interface) and the bearer. The MSC server seizes one context with two bearer terminations in the MGW. Bearer termination T1 is used for the bearer towards RNC/BSC and bearer termination T2 is used for the bearer towards succeeding MGW.

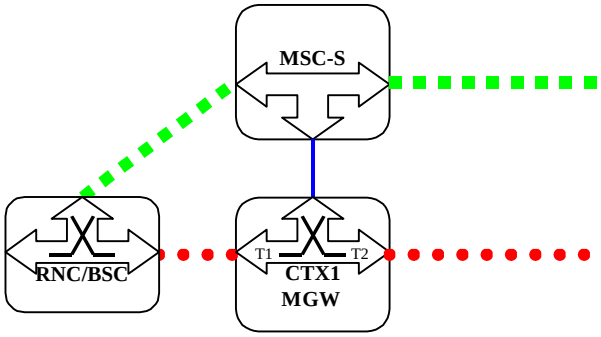
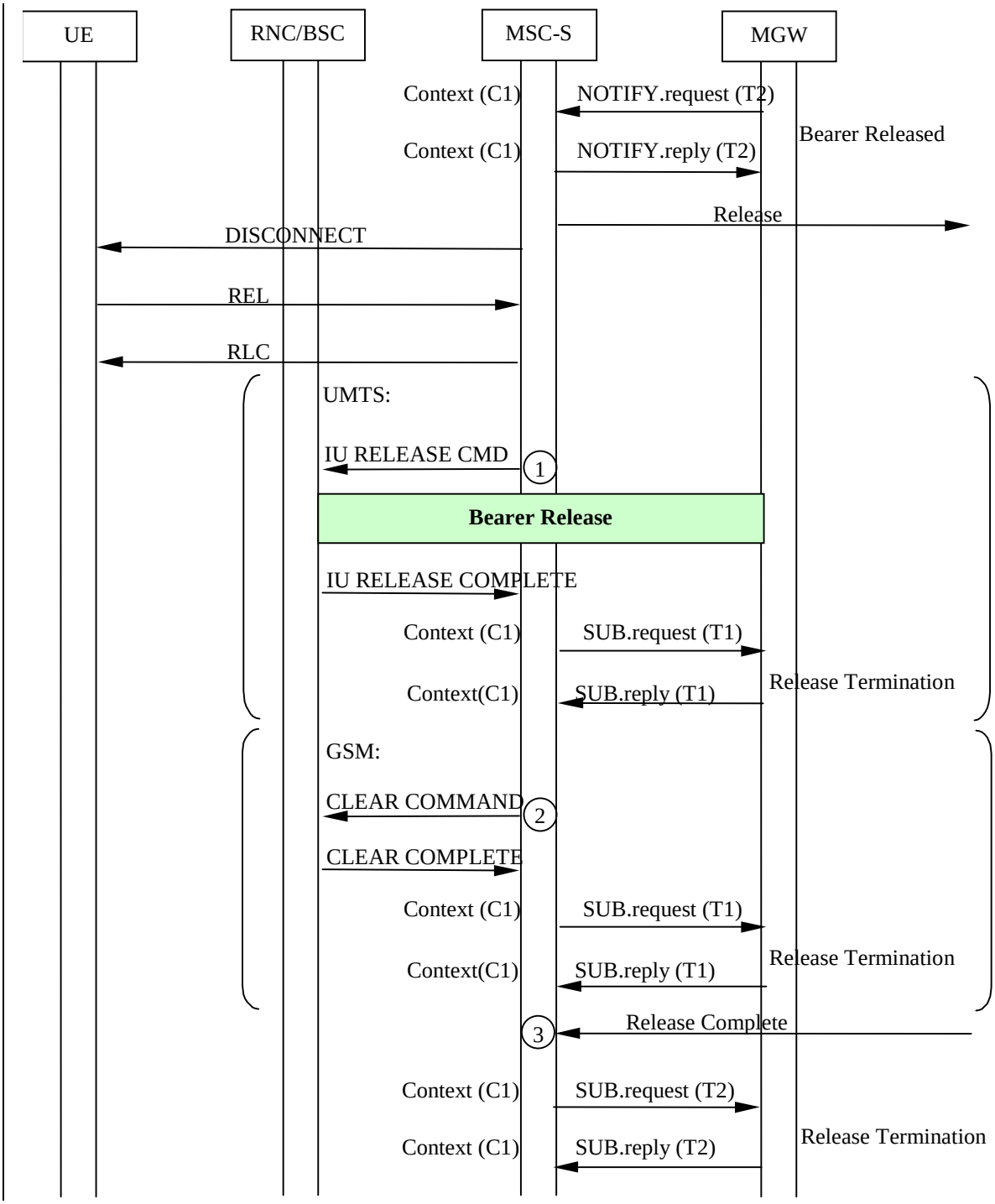


Figure 7.7 MGW Initiated Call Clearing (Network model)

Figure 7.8 shows the message sequence example for the MGW initiated clearing of a mobile call. After the MSC server is notified that the MGW has released the network side bearer, the MSC server initiates call clearing of the network side and the access side. After the call clearing towards the UE and the radio resource release have been completed the MSC server requests release of the access side bearer termination. Once the preceding/succeeding node has indicated that call clearing has been completed, the MSC server requests the release of the network side bearer termination.


UE
RNC/BSC
MSC-S
MGW
Context (C1)
NOTIFY.request (T2)
Bearer Released
Context (C1)
NOTIFY.reply (T2)
Release
DISCONNECT
REL
RLC
UMTS:
IU RELEASE CMD
1
Bearer Release
IU RELEASE COMPLETE
Context (C1)
SUB.request (T1)
Release Termination
Context(C1)
SUB.reply (T1)
GSM:
CLEAR COMMAND
2
CLEAR COMPLETE
Context (C1)
SUB.request (T1)
Release Termination
Context(C1)
SUB.reply (T1)
Release Complete
3
Context (C1)
SUB.request (T2)
Release Termination
Context (C1)
SUB.reply (T2)

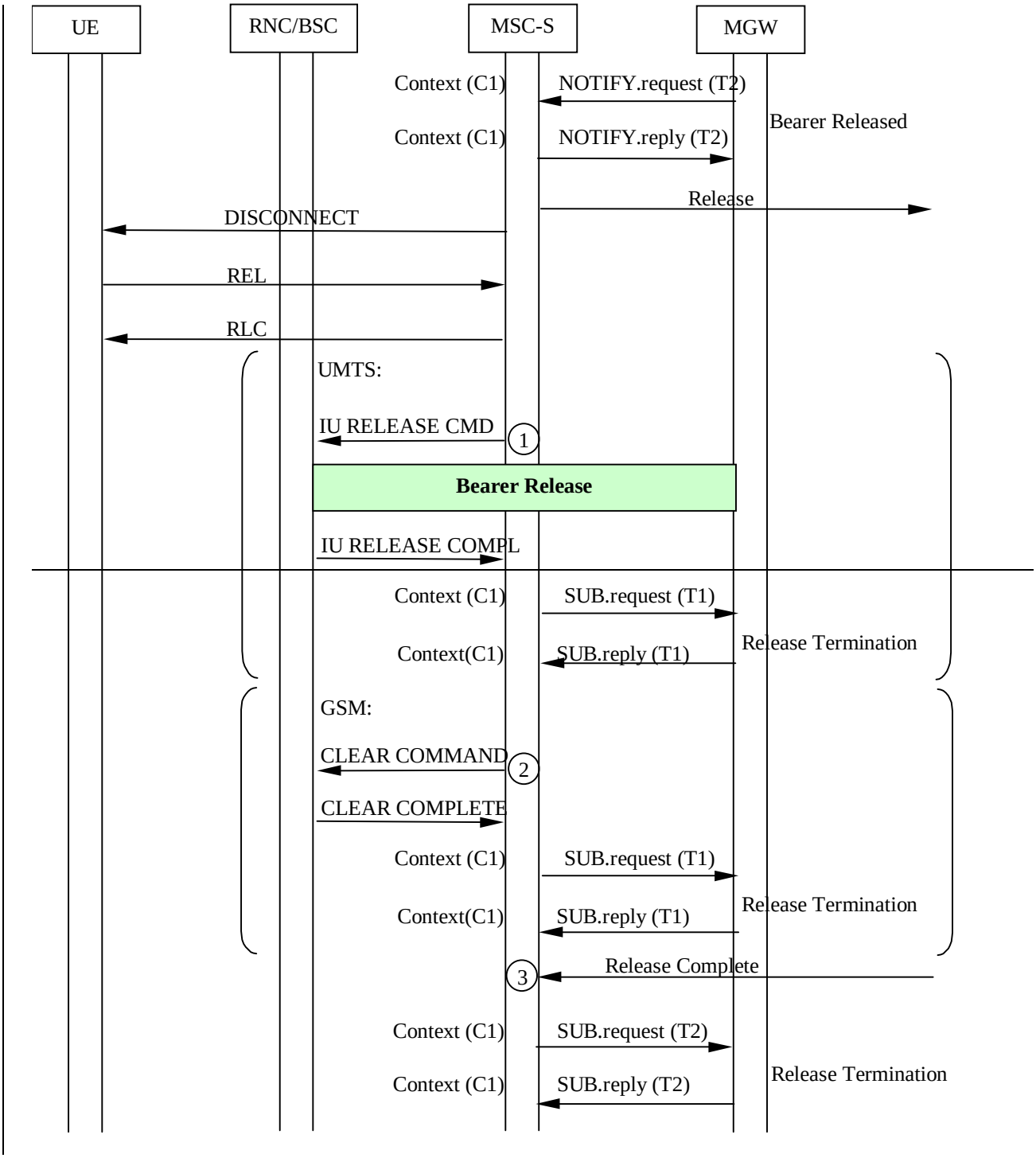


Figure 7.8 MGW Initiated Call Clearing (message sequence chart)

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

****** Need to clean up the wording for multiple conditions ******

3GPP TSG-CN WG4 Meeting #08 ***Tdoc N4-010680***

Rio Grande, Puerto Rico, 14-18 May 2001 **(revision of *Tdoc N4-010611)***

CR-Form-v3

CHANGE REQUEST

⌘ **23.205** **CR** **006** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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 **X**

Title:	⌘	Alignment of procedure names to TS 29.232 and editorial changes
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	15/05/01
Category:	⌘	**F**
Release:	⌘	REL-4

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)*

Reason for change:	⌘	There is a misalignment between a number of procedure names in TS 23.205, TS 29.232, and Q.1950. In addition, there are a number of minor editorials that need correcting.
Summary of change:	⌘	The alignment of several procedure names in relation to TS29.232 and Q.1950. The correction of editorials. Deletion of subclause 10.11, which is a duplicate of 10.6. Clarification of conditions for sending the Continuity message.
Consequences if not approved:	⌘	Misalignment between Stage 2 and Stage 3 specifications

Clauses affected:	⌘	5, 6, 8, 10, 13, 14, 16
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

******Start of Modified Section ******

5 General Circuit Switched Core Network Domain Architecture

…

5.1.1.3 Media Gateway

The media gateway terminates the signalling over the Mc interface from the (G)MSC servers. It also terminates the bearer part of the signalling over the Iu interface and the Nb interface. ~~It~~

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

6 Call Establishment

…

6.1.1 Forward bearer establishment

Network side bearer establishment

The MSC server shall either select bearer characteristics or requests the MGW to select and provide the bearer characteristics for the network side bearer connection before sending the IAM. In the latter case the MSC server uses the Prepare Bearer procedure to request the MGW to select the bearer characteristics. After the succeeding node has provided a bearer address and a binding reference in the Bearer Information message the MSC server uses the Establish Bearer procedure to request the MGW to establish a bearer towards the destination MGW. The MSC server provides the MGW with the bearer address, the binding reference and the bearer characteristics (bullet 2 in figure 6.2).

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

6.2 Basic Mobile Terminating Call

…

6.2.1.1 GMSC server

Initial addressing

The GMSC server shall indicate in the IAM that forward bearer establishment is to be used. The GMSC server shall also indicate in the IAM that the Continuity message will follow~~,~~ if ~~and only if,~~ either of the following conditions is satisfied before sending the IAM:

1. ~~If t~~The incoming IAM indicated that the Continuity message will follow, but no Continuity message has been received~~;~~.
2. ~~If t~~The GMSC server selected an MGW, but a notification of successful bearer establishment on the incoming side has not been received from the MGW.

The GMSC server shall provide the bearer characteristics to the succeeding node in the IAM. If the MGW is selected at an early stage the MGW-id may also be provided in the IAM (bullet 1 in figure 6.6).

...

Confirmation of bearer establishment

If the IAM~~,~~ which was ~~-~~sent to the succeeding node~~,~~ indicated that the Continuity message will follow, the Continuity message shall be sent ~~-~~when both of the following conditions are satisfied:

1. ~~If t~~Either:

   a. The incoming IAM indicated that the Continuity message will follow, and a Continuity message has been received from the preceding node (bullet 8 in figure 6.6)~~.~~, or

   b. The incoming IAM did not indicate that the Continuity message will follow;

2. ~~If~~ Either:

   a. ~~t~~The GMSC server has selected an MGW, and a notification of successful bearer establishment in the incoming side has been received from the MGW (bullet 7 in figure 6.6), or

   b. The GMSC server has not selected an MGW.

...

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

6.2.1.2 MSC server

Call setup

The MSC server indicates to the UE in the SETUP message that early access bearer assignment is used in order to establish the bearer end-to-end before the UE starts alerting. The MSC server indicates to the UE in SETUP message that early access bearer assignment is used~~,~~ if ~~and only if,~~ either of the following conditions ~~are~~ is satisfied before sending the SETUP message (bullet 2 in figure 6.6):

1. ~~If t~~The incoming IAM indicated that the Continuity message will follow, but no Continuity message has been received~~;~~.

2. A notification of successful bearer establishment in the network side has not been received from the MGW.

...

Access bearer assignment

The access bearer assignment may be started when both of the following conditions are satisfied:

1. ~~If~~Either:

   a. ~~t~~The incoming IAM indicated that the Continuity message will follow, and a Continuity message has been received from the preceding node~~,~~. or

   b. The incoming IAM did not indicate that the Continuity message will follow;

2. A notification of successful bearer establishment in the network side has been received from the MGW (bullet 6 in figure 6.6).

...

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

6.2.2 Backward bearer establishment

The basic mobile terminating call shall be established in accordance with 3GPP TS 23.108 [4]. The following paragraphs describe the additional requirements for the bearer independent CS core network. If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3].

6.2.2.1 GMSC server

...

Initial addressing

The GMSC server shall indicate in the IAM that backward bearer establishment is to be used. The GMSC server shall also indicate in the IAM that the Continuity message will follow~~,~~ if ~~and only if,~~ either of the following conditions ~~are~~ is satisfied before sending the IAM:

1. ~~If t~~The incoming IAM indicated that the Continuity message will follow, but no Continuity message has been received, or~~.~~
2. ~~If t~~The GMSC server selected an MGW, but a notification of successful bearer establishment on the incoming side has not been received from the MGW.

...

Confirmation of bearer establishment

If the IAM~~,~~ which was sent to the succeeding node~~,~~ indicated that the Continuity message will follow, the Continuity message shall be sent when both of the following conditions are satisfied:

1. Either:
   a. ~~If t~~The incoming IAM indicated that the Continuity message will follow, and a Continuity message has been received from the preceding node~~.~~, or
   b. The incoming IAM did not indicate that the Continuity message will follow;
2. Either:
   a. ~~If t~~The GMSC server has selected an MGW, and a notification of successful bearer establishment in the incoming side has been received from the MGW (bullet 2 in figure 6.8), or
   b. The GMSC server has not selected an MGW.

...

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

6.2.2.2 MSC server

...

Access bearer assignment

The access bearer assignment may be started when both of the following conditions are satisfied:

1. Either:
   a. ~~If t~~The incoming IAM indicated that the Continuity message will follow, and a Continuity message has been received from the preceding node~~.~~, or
   b. The incoming IAM did not indicate that the Continuity message will follow;

2. A notification of successful bearer establishment in the network side has been received from the MGW (bullet 7 in figure 6.8).

...

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

8.1.2 Basic Inter-MSC SRNS Relocation

…

8.1.2.1 MSC-A/MGW-A

Bearer establishment between MGW-A and MGW-B

The handling of the bearer establishment is as described for a Basic Mobile Originating Call, using either forward or backward bearer establishment. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. The differences are that for non-speech calls, the MSC-A server also provides MGW-A with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. The MSC-A server also uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state (bullet 3 in figure 8.4/1).

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

8.1.2.2 MSC-B/MGW-B

…

Example

…

Figure 8.4 shows the message sequence example for the Basic Inter-MSC SRNS Relocation. It is assumed that the Handover Device is located in the MGW (MGW-A) selected for the call establishment by the MSC server (MSC-A server) which controls the call and the mobility management. It is a~~A~~lso assumed that only one bearer has been established towards RNC-A. In the example the MSC-B server requests MGW-B to seize an RNC-B side bearer. The MSC-B server orders the establishment of the bearer towards RNC-B by sending Relocation Request. The call is established between MSC-A and MSC-B servers, and the bearer is established between MGW-A and MGW-B. When the relocation is detected in RNC-B the MSC-A server requests to change the flow directions between the terminations within the context in MGW-A. When MSC-A server receives Relocation Complete indication from MSC-B server it orders RNC-A to release the IU. This action causes release of the bearer between RNC-A and MGW-A. Finally MSC-A server requests MGW-A to remove RNC-A side bearer termination.

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

8.1.3 Subsequent Inter-MSC SRNS Relocation back to the Anchor MSC

…

8.1.3.1 MSC-A/MGW-A

…

8.1.3.2 MSC-B/MGW-B

Relocation Complete

When the MSC-B server receives the Relocation Complete message, it requests RNC-A to release the IU. The MSC-B server requests MGW-B to remove the bearer termination towards RNC-A using the Release ~~Bearer~~ Termination procedure (bullet 3 in figure 8.6/2).

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

8.2 UMTS to GSM

8.2.1 Intra-MSC UMTS to GSM Handover

…

Figure 8.8 shows the message sequence example for the Intra-MSC UMTS to GSM Handover.
It is assumed that the Handover Device is located in the MGW selected for the call establishment by the MSC server, which controls the call and the mobility management. It is also assumed that only one bearer has been established towards RNC-A and that MGW-A is capable of handling ~~to handle~~ GSM access.
In the example the MSC server requests seizure of BSC-B side bearer termination with specific flow directions. The MSC server starts handover execution by sending Handover Request towards ~~RN~~BSC-B. When the handover is detected in BSC-B the MSC server requests to change the flow directions between the terminations within the context. When MSC server receives Handover Complete indication from BSC-B it orders RNC-A to release the IU. Finally the MSC server requests the MGW to release RNC-A side bearer termination.

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

8.2.2 Basic Inter-MSC UMTS to GSM Handover

…

8.2.2.1 MSC-A/ MGW-A

Bearer establishment between MGW-A and MGW-B.

The handling of the bearer establishment between MGW-A and MGW-B is as described for a Basic Mobile Originating Call, using either forward or backward bearer establishment. The differences are that for non-speech calls the MSC-A server also provides MGW-A with the same PLMN Bearer Capability [4] as was provided at the last access bearer assignment. For non-speech calls the MSC-A server also provides MGW-A with the GSM Channel coding properties. The MSC-A server also uses the Change Flow Direction procedure to request MGW-A to set the Handover Device to initial state (bullet 3 in figure 8.10/1).

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

8.3.2 Basic Inter-MSC GSM to UMTS Handover

…

8.3.2.1 MSC-A

…

8.3.2.2 MSC-B

Bearer establishment towards RNC-B

When the MSC-B server has selected MGW-B it requests MGW-B to provide a binding reference and a bearer address using the Prepare Bearer procedure. ~~.~~For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. The MSC-B server sends the Relocation Request message to the RNC-B containing the bearer address and binding reference (bullet 2 in figure 8.16).

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

10 General (G)MSC server-MGW Procedures

…

10.1 MGW Unavailable

…

2. The MGW indicates the failure condition to all connected (G)MSC servers

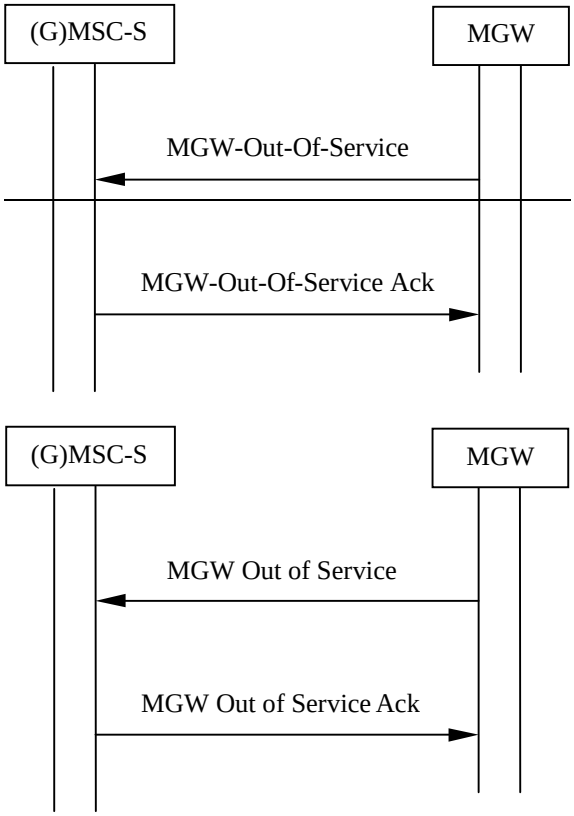


Figure 10.2 MGW indicates the Failure

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

10.2 MGW Available

The (G)MSC server discovers that the MGW is available when it receives an MGW Communication Up message or an MGW Restoration message. When the (G)MSC server discovers that the MGW is available the following shall occur:

1. Signalling recovery

…

2. MGW restoration indication.

…

3. The (G)MSC server recognises that the MGW is now functioning correctly, e.g. because there is a reply on periodic sending of Audits.

After this the (G)MSC server can use the MGW. If the corresponding devices of the surrounding network are blocked, unblocked messages are sent to the nodes concerned.

If none of 1,2, and 3 happens the (G)MSC server can initiate the (G)MSC Sserver Ordered Re-register ~~re-registration~~ procedure.

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

10.3 MGW Recovery

If the MGW recovers from a failure or it has been restarted, it registers to its known (G)MSC servers using the MGW Restoration procedure. The MGW can indicate whether it has restarted with a cold or warm boot. The response sent to the MGW indicates a signalling address to be used by the MGW.

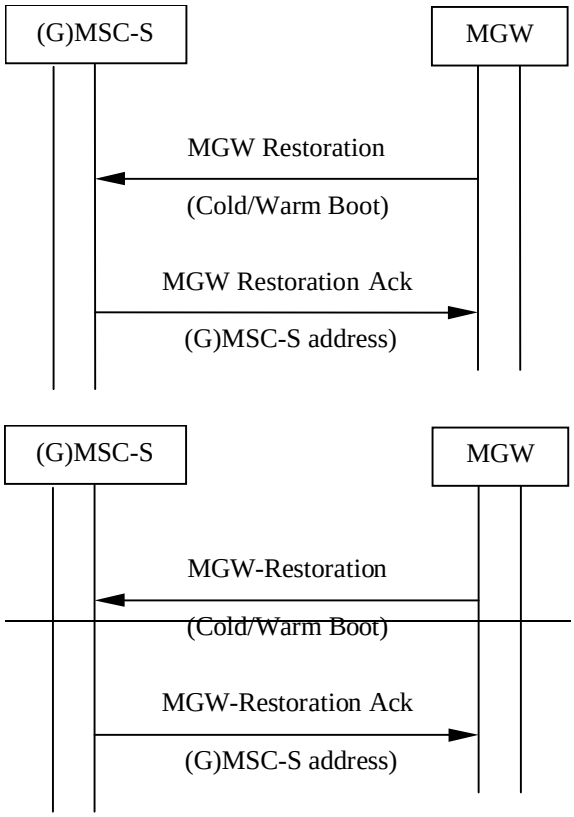


Figure 10.5 MGW Registration

After the recovery the (G)MSC server can use the MGW. If the corresponding devices of the surrounding network are blocked, unblocked messages are sent to the nodes concerned.

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

10.4 (G)MSC server Recovery

10.4.1 General

If an MGW-unavailable condition is provoked by a failure/recovery action, the (G)MSC server recovery sequence will, from an information flow point of view, look like MGW unavailable and then MGW available. If an MGW-unavailable condition is not provoked, the (G)MSC server recovery sequence will look like MGW available.

After the information flow, the terminations affected by the recovery action are released.

10.4.2 (G)MSC Sserver ~~service~~ Rrestoration

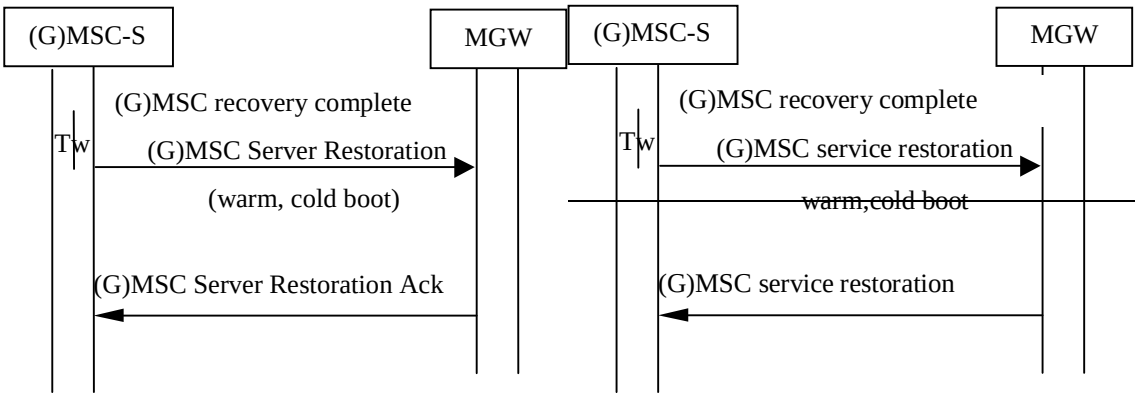


Figure 10.6 (G)MSC server service restoration

After the recovery action is complete the (G)MSC server starts a timer Tw. If recovery indications are not received (MGW Communication Up or MGW Restoration) from the MGW during Tw the (G)MSC Sserver Rrestoration is sent. If the (G)MSC server receives a recovery indication, it shall acknowledge the indication before the (G)MSC Sserver Rrestoration is sent.

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

10.5 MGW Re-register

When the (G)MSC requests an MGW to perform a registration (see subclause 10.11), the MGW performs a re-registration to the (G)MSC which is defined in the (G)MSC address.

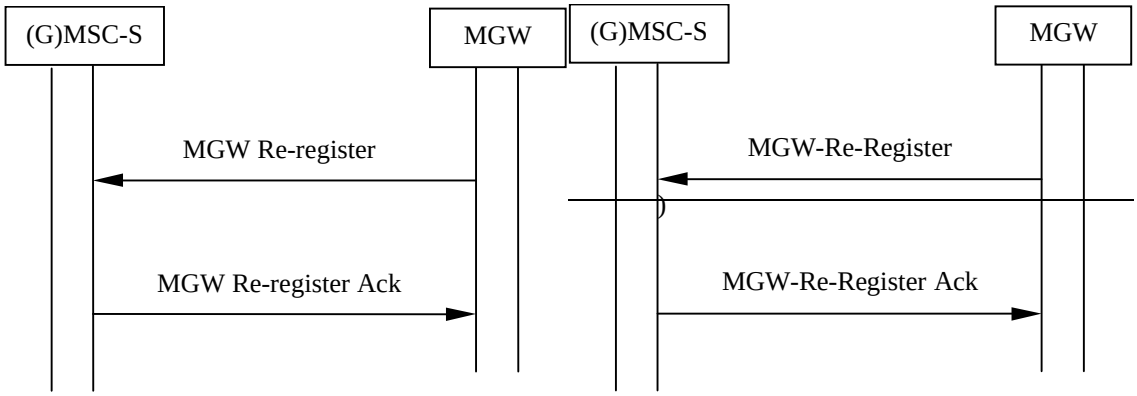


Figure 10-7 Re-registration of an MGW

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

10.6 MGW Re-registration Ordered by (G)MSC server

If the (G)MSC server knows that communication is possible, but the MGW has not registered, the (G)MSC server can order re-registration of the MGW.

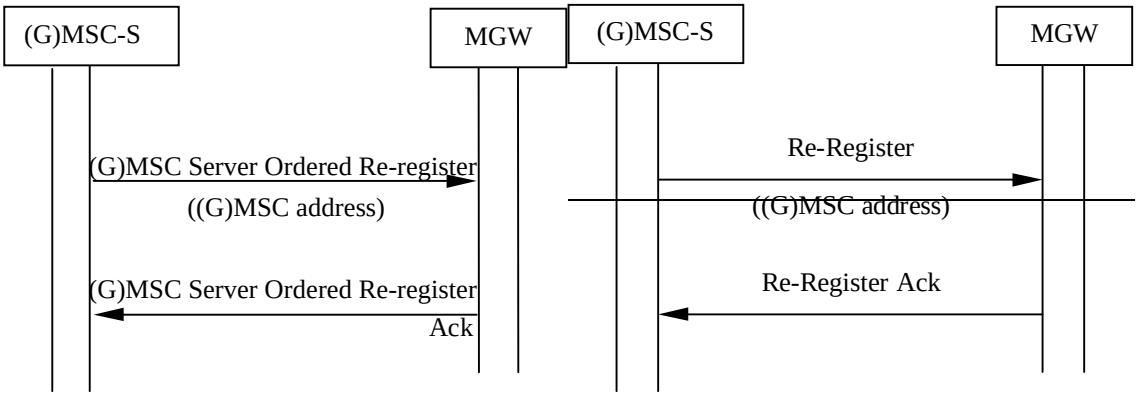


Figure 10.8 Re-registration ordered by the (G)MSC server

If the re-registration request is accepted the MGW uses the MGW R~~r~~egister~~r~~~~ration~~ procedure to register with the (G)MSC server.

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

10.7 Removal from Service of a Physical Termination

The MGW indicates the removal from service of a physical termination using the Termination Out-of-Service procedure. In this procedure the MGW indicates which termination is to be removed from service and whether the 'graceful' or 'forced' method will be used. In the graceful method a possible connection is cleared when the corresponding call is disconnected. In the forced method the possible connection is cleared immediately.

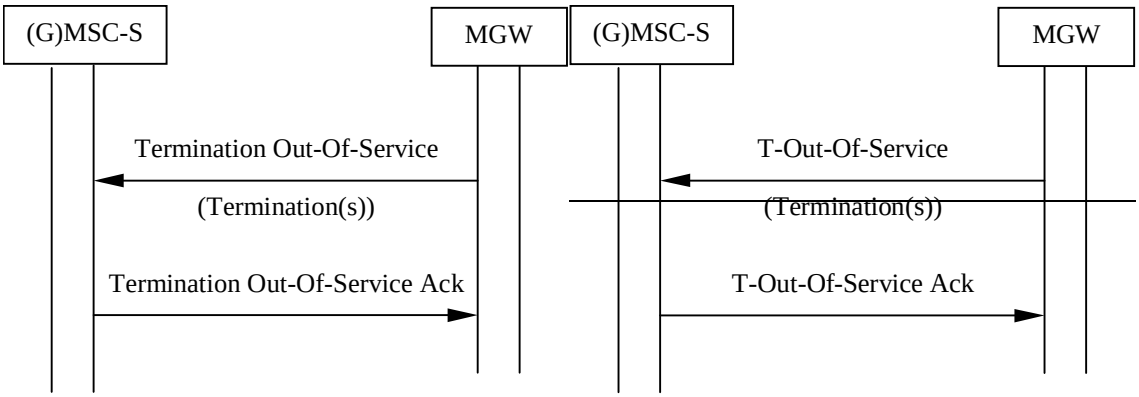


Figure 10.9 Removal from service of a Physical Termination

The (G)MSC server shall prevent the use of the Termination(s) concerned until the physical termination is restored to service.

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

10.8 Restoration to Service of a Physical Termination

If the physical termination is restored to service, the MGW shall report it to the (G)MSC server(s) using the Termination Restoration procedure.

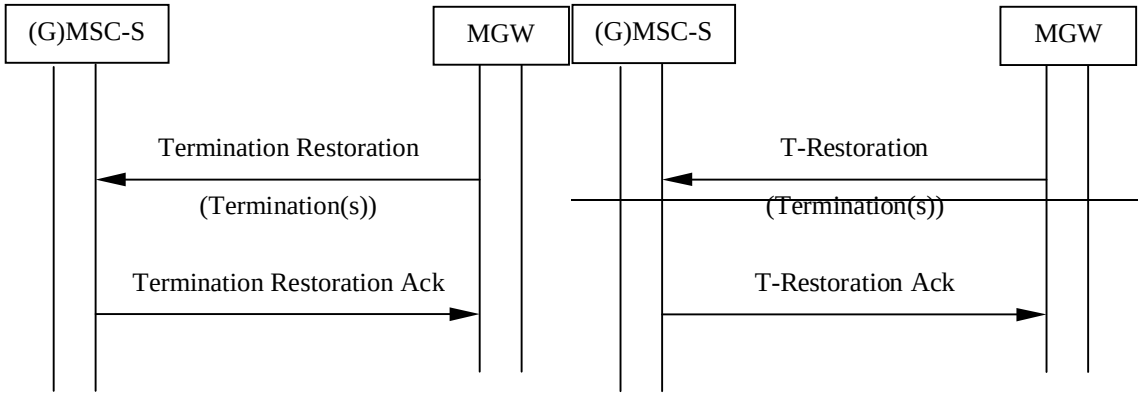


Figure 10.10 Restoration to service of a Physical Termination

The (G)MSC server can use the physical termination when the termination has been restored to service. If the corresponding devices of the surrounding network are blocked, the (G)MSC server sends an unblocked message to each node concerned.

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

10.9 Audit of MGW

10.9.1 Audit of Value

The (G)MSC server may request the MGW to report the current values assigned to distinct objects in the MGW. Objects, which can be addressed, are listed in 3GPP TS 29.232 [6].

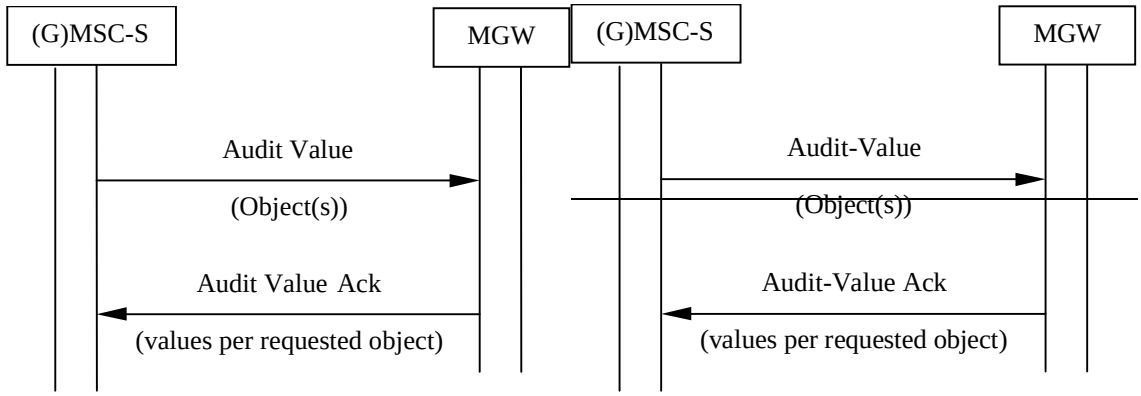


Figure 10.11 Audit Value

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

10.9.2 Audit of Capability

The (G)MSC server may request the MGW to report the capabilities of distinct objects in the MGW. Objects, which can be addressed, are listed in 3GPP TS 29.232 [6].

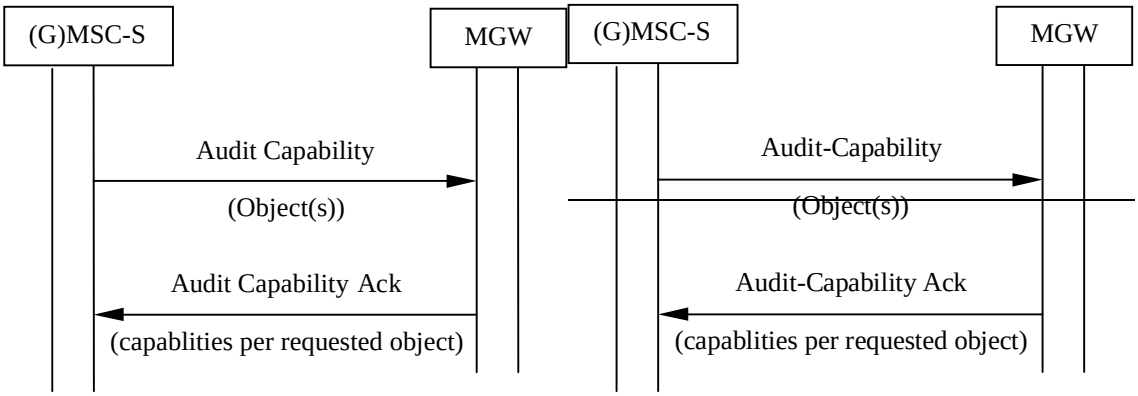


Figure 10.12 Audit Capability

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

10.10 MGW Capability Change

The MGW reports a change of capability of distinct objects in the MGW. Objects, which can be addressed, are listed in 3GPP TS 29.232 [6].

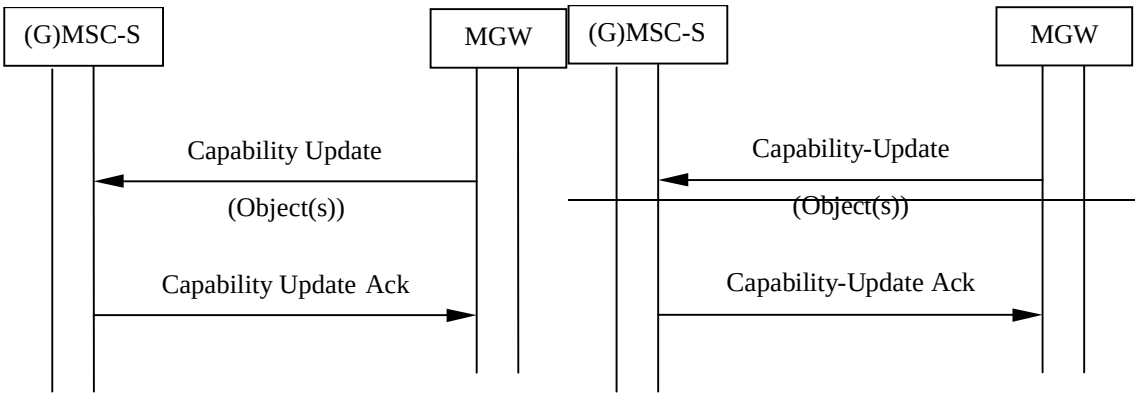


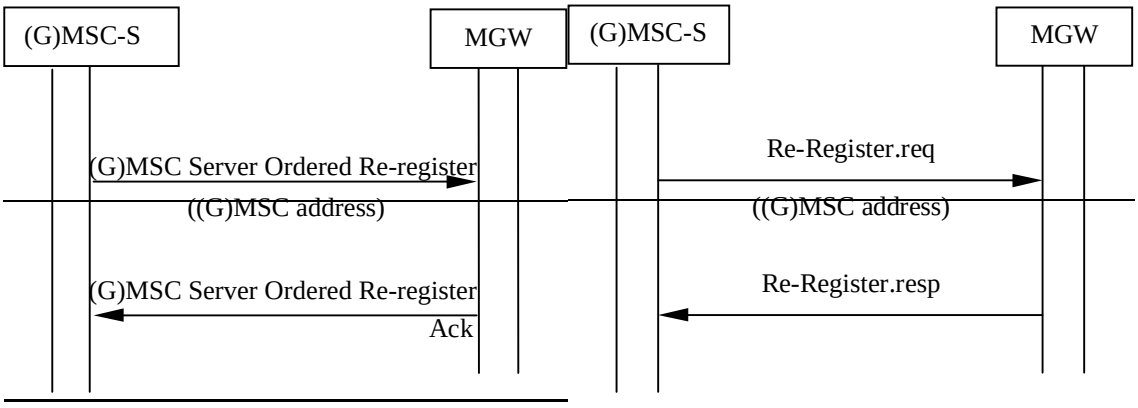
Figure 10.13 Capability Update

The (G)MSC server can use the Audit Value and/or Audit Capability procedures to obtain further information, about the objects whose capabilities have changed.

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

10.11 ~~(G)MSC S~~server ~~O~~ordered Re-registervoid

~~If the (G)MSC server knows that communication is possible, but the MGW has not registered, the (G)MSC server can order the re-registration of the MGW.~~



~~Figure 10.14 (G)MSC server ordered Re-registration~~

~~The MGW initiates an MGW Rre-register procedure as described subclause 10.5.~~

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

10.12 (G)MSC Sserver Out of service

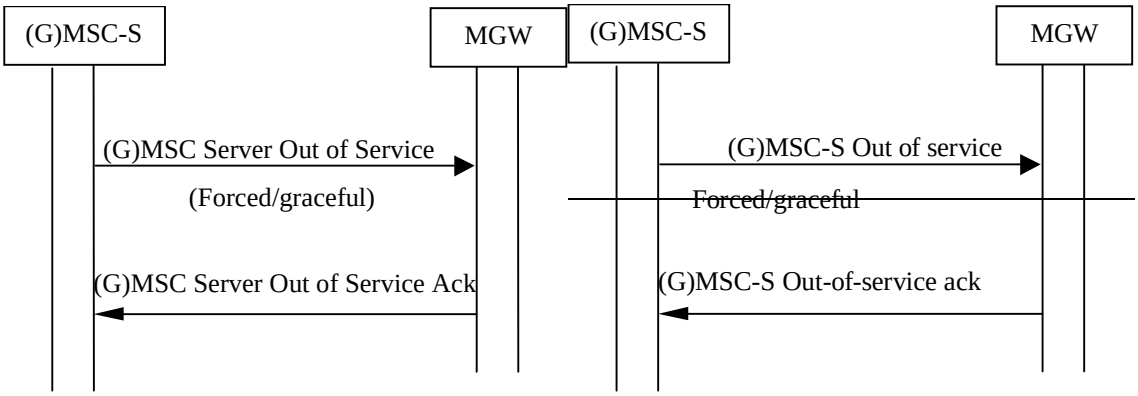


Figure 10.15 (G)MSC Sserver Ooout of Sservice

If a (G)MSC server discovers that it wants to go out of service it starts a (G)MSC Sserver Ooout- of- Sservice procedure. The (G)MSC server can indicate whether it requires the context to be cleared immediately (forced) or cleared as the bearer control protocol clears the bearer (Graceful). Physical terminations are always cleared when the (G)MSC Sserver Ooout- of- Sservice indication reaches the MGW.

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

13.4.2 Call Forwarding on mobile subscriber Busy (CFB)

The procedures specified in 3GPP TS 23.082 [12] for the Call Forwarding on Busy supplementary service shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

13.4.2.1 Network Determined User Busy (NDUB)

...

Initial addressing

The call towards the forwarded-to subscriber is established as for basic call. If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]. After the possible generation of in-band

information has been completed, the MSC server shall indicate in the IAM that the Continuity message will follow from the preceding node, in order to withhold the call completion until the establishment of the bearer is complete.

The MSC server shall indicate in the IAM that the Continuity message will follow from the preceding node if either of the following conditions ~~are~~ is satisfied before sending the IAM:

1. ~~If t~~The incoming IAM indicated that the Continuity message will follow, but no Continuity message has been received~~.~~, or
2. The incoming side bearer has not been established.

...

Confirmation of bearer establishment

If the outgoing IAM indicated that the Continuity message will follow, the Continuity message is sent when both of the following conditions are satisfied:

1. Either:
   a. ~~If t~~The ~~outgoing~~ incoming IAM indicated that the Continuity message will follow, and a Continuity message ~~shall~~ has been received~~.~~, or
   b. The incoming IAM did not indicate that the Continuity message will follow;
2. Either:
   a. ~~If t~~The MSC server has selected an MGW, and a notification indicating successful completion of the incoming side bearer set-up ~~shall~~ has been received from the MGW using the Bearer Established procedure~~.~~, or
   b. The GMSC server has not selected an MGW.

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

13.4.2.2 User Determined User Busy (UDUB)

...

Initial addressing

The call towards the forwarded-to subscriber is established as basic call. If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]. After the possible generation of in-band information has been completed, the MSC server shall indicate in the IAM that the Continuity message will follow from the preceding node in order to withhold the call completion until the establishment of the bearer is complete.

The MSC server shall indicate in the IAM that the Continuity message will follow from the preceding node~~,~~ if either of the following conditions ~~are~~ is satisfied before sending the IAM:

1. ~~If t~~The incoming IAM indicated that the Continuity message will follow, but no Continuity message has been received~~.~~, or
2. The incoming side bearer has not been established.

...

Confirmation of bearer establishment

If the outgoing IAM indicated that the Continuity message will follow, the Continuity message is sent when both of the following conditions are satisfied:

1. If the outgoing IAM indicated that the Continuity message will follow, and a Continuity message shall be received.

2. If the MSC server selected an MGW, and a notification indicating successful completion of the incoming side bearer set-up shall be received from the MGW using the Bearer Established procedure.

...

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

13.4.4 Call Forwarding on mobile subscriber Not Reachable (CFNRc)

...

13.4.4.2 Rerouting by VLR

...

Initial addressing

The call towards the forwarded-to subscriber is established as a basic call. If out-of-band transcoder control is applied for a speech call, it shall be performed in accordance with 3GPP TS 23.153 [3]. After the possible generation of in-band information has been completed, the MSC server shall indicate in the IAM that the Continuity message will follow from the preceding node in order to withhold the call completion until the establishment of the bearer is complete.

The MSC server shall indicate in the IAM that the Continuity message will follow from the preceding node, if either of the following conditions ~~are~~ is satisfied before sending the IAM:

1. ~~If t~~The incoming IAM indicated that the Continuity message will follow, but no Continuity message has been received~~.~~, or
2. The incoming side bearer has not been established.

…

Confirmation of bearer establishment

If the outgoing IAM indicated that a Continuity message will follow, the Continuity message ~~is~~ shall be sent when both of the following conditions are satisfied:

1. Either:
   a. ~~If T~~the incoming IAM indicated that the Continuity message will follow, and a Continuity message has ~~shall~~ been received, or~~.~~
   b. The incoming IAM did not indicate that the Continuity message will follow;
2. ~~If~~ Either:
   a. T~~t~~he MSC server has selected an MGW, and a notification indicating successful completion of the incoming side bearer set-up has been ~~shall be~~ received from the MGW using the Bearer Established procedure, or
   b. The MSC server has not selected an MGW.

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

13.5 Call Waiting (CW)

…

Acceptance of waiting call

If the mobile subscriber decides to accept the waiting call, it handles (according to 3GPP TS 23.082 [12]) the existing call as described in subclause 13.5 (i.e. it either puts the call on hold or the call is released). When the MSC server receives the connect indication from subscriber A, it modifies the existing access side bearer if required. If the existing access side bearer needs to be modified, either the existing bearer termination is modified using the Modify Bearer Characteristics procedure or a new access side bearer termination is created. In both cases, the MSC server shall initiate the access bearer modification using either the existing bearer address and binding reference or the new bearer address and binding reference. Finally, the MSC server shall connect the access side bearer termination to the previously created bearer termination of the remote party in the waiting call and modify the waiting call's bearer termination so that it is both-way through-connected.

If a different MGW is ~~are~~ selected for the incoming call, then a bearer from the new MGW (MGW2) shall be connected towards the old MGW (MGW1) before offering the call to the subscriber A.

If out-of-band transcoder control is applied for the waiting speech call, it shall be performed in accordance with 3GPP TS 23.153[3].

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

13.7 Multiparty (MPTY)

…

Example 2

…

For the purposes of the information flow diagrams it is assumed that there are only two remote parties. Party A is the subscriber controlling the Multi Party service (served mobile subscriber). Party B is the held party and party C is the active party.

It is assumed that the Multi Party bridge is located in the MGW and an active context that has been selected for the served mobile subscriber.

The figure 13.22 below shows the message sequence example for the beginning of multi party call. When the served mobile subscriber invokes a Multi Party service the MSC server requests the MGW to move the bearer termination for the held party into the active context. The held party is informed about the retrieval of the held call, and ~~the~~ both remote parties are informed about the multi party call establishment.

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

14.3.2 Barring of Incoming Calls

...

~~The following two conditions need to be satisfied before providing the i~~In-band information may be provided to the calling subscriber only when both of the following conditions are satisfied:

1. Either:

   a. ~~If t~~The incoming IAM indicated that the Continuity message will follow, and a Continuity message ~~shall~~ has been received~~.~~, or

b. The incoming IAM did not indicate that the Continuity message will follow;

2. Notification indicating successful completion of the incoming side bearer set-up ~~shall~~ has been received from the MGW using the Bearer Established procedure.

...

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

14.6 Providing tones or announcements

It shall be assumed that the MGW selected for the call has the capabilities to provide announcements/tones.

Preconditions when providing in-band information to the calling subscriber

For a mobile terminating/forwarded call, ~~the following two conditions need to be satisfied before providing~~ announcements/tones may be provided to the calling subscriber only when both of the following conditions are satisfied:

1. Either:

   a. ~~If t~~The incoming IAM indicated that the Continuity message will follow, and a Continuity message ~~shall~~ has been received~~.~~, or

   b. The incoming IAM did not indicate that the Continuity message will follow;

2. Notification indicating successful completion of the incoming side bearer set-up ~~shall~~ has been received from the MGW using the Bearer Established procedure.

If mobile originating call, the traffic channel assignment shall be completed before providing the in-band information to the calling subscriber.

...

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

16 Messages/Procedures and their contents

…

16.1 Messages between (G)MSC servers

…

16.2 Procedures between (G)MSC server and MGW

16.2.31 (G)MSC S~~s~~erver O~~o~~rdered Re-r~~R~~egister

This procedure is used by the (G)MSC server to request the MGW to register itself.

Table 16.32: Procedures between (G)MSC server and MGW: (G)MSC server ordered Re-rRegister

Procedure	Initiated	Information element name	Information element required	Information element description
(G)MSC Sserver Oordered Re-rRegister	(G)MSC-S	Context	M	This information element indicates the context for the command.
		Bearer Termination	M	This information element indicates the bearer termination(s) for the command.
		Reason	M	This information element indicates the reason for the service change.
		(G)MSC-S Address	O	This information element indicates the (G)MSC server signalling address.
(G)MSC Sserver Oordered Re-rRegister Ack	MGW	Context	M	This information element indicates the context where the command was executed.
		Bearer Termination	M	This information element indicates the bearer termination where the command was executed.

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

16.2.32 (G)MSC Sserver Rrestoration

This procedure is used to indicate the (G)MSC server failure or recovery.

Table 16.33: Procedures between (G)MSC server and MGW: (G)MSC server restoration

Procedure	Initiated	Information element name	Information element required	Information element description
(G)MSC Sserver Rrestoration	(G)MSC-S	Context	M	This information element indicates the context for the command.
		Bearer Termination	M	This information element indicates the bearer termination(s) for the command.
		Reason	M	This information element indicates the reason for the service change.
		Method	M	This information element indicates the method for service change.
(G)MSC Sserver Rrestoration Ack	MGW	Context	M	This information element indicates the context where the command was executed.
		Bearer Termination	M	This information element indicates the bearer termination where the command was executed.

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

16.2.33 (G)MSC Sserver Out- of- Service

This procedure is used to indicate that (G)MSC server has gone out of service.

Table 16.34: Procedures between (G)MSC server and MGW: (G)MSC Sserver Out-of-Service

Procedure	Initiated	Information element name	Information element required	Information element description
(G)MSC Sserver Out-of-Service	(G)MSC-S	Context	M	This information element indicates the context for the command.
		Bearer Termination	M	This information element indicates the bearer termination(s) for the command.
		Reason	M	This information element indicates the reason for the service change.
		Method	M	This information element indicates the method for service change.
(G)MSC Sserver Out-of-Service Ack	MGW	Context	M	This information element indicates the context where the command was executed.
		Bearer Termination	M	This information element indicates the bearer termination where the command was executed.

******End of Modified Sections ******

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Rio Grande, Puerto Rico, 14-18 May 2001 **(Revision of *Tdoc N4-010613*)**

CR-Form-v3

CHANGE REQUEST

⌘ **29.232** **CR** **005** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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 **X**

Title:	⌘	Alignment of Procedure names to TS 23.205 and Q.1950
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	15/05/01
Category:	⌘	**F**
Release:	⌘	REL-4

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)*

Reason for change:	⌘	There is a misalignment between the naming of a number of procedure names in TS 23.205, TS 29.232, and Q.1950.
Summary of change:	⌘	Alignment of Procedure names in relation to TS23.205 and Q.1950
Consequences if not approved:	⌘	Misalignment between Stage 2 and Stage 3 specifications

Clauses affected:	⌘	14		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

******Start of Modified Section ******

14 H.248 standard packages

…

14.1 Call independent H.248 transactions

Table 2 shows the relationship between each non call-related procedure in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) and the corresponding stage 2 procedure defined in 3GPP TS 23.205 [2].

Table 2: Correspondence between Q.1950 non call-related transactions and TS 23.205 procedures

Transaction used in Q.1950	Procedure defined in 3GPP TS 23.205 [2]	Comments
BIWF_Service_Cancellation_Indication	MGW Out- of- Service	
BIWF_Lost_Communication	MGW Communication Up	
BIWF_Service_Restoration_Indication	MGW Restoration	
BIWF_Registration	MGW Rregister	
BIWF_Re-Registration	MGW Rre-register	
CCU Ordered BIWF Re-Registration	(G)MSC Server Oordered Rre-register	
CCU Initiated Service Restoration	(G)MSC Server Rrestoration	
CCU Initiated Service Cancellation	(G)MSC Server Oout of Sservice	
BIWF_Service_Cancellation_Indication	Termination Out-of-Service	Is a part of BIWF Service cancellation in Q.1950
BIWF_Service_Restoration_Indication	Termination Restoration	Is a part of BIWF Service cancellation in Q.1950
Audit_Values	Audit Value	
Audit_Capabilities	Audit Capability	
BIWF_Capability_Change	Capability Update	

14.1.1 MGW Oout- of- Sservice

This procedure is the same as described in the subclause "BIWF Service Cancellation Indication" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]), with the following clarification.

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = Null Termination ID = Root Service Change Reason = MGW impending failure Service Change Method = Graceful / Forced	

Delay is not used.

14.1.2 MGW Ccommunication Uup

This procedure is the same as described in the subclause "BIWF Lost Communication" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.1.3 MGW Rrestoration

This procedure is the same as described in the subclause "BIWF Service Restoration Indication" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification.

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = Null Termination ID = Root	

Delay is not used.

14.1.4 MGW Rregister

This procedure is the same as that described in the subclause "BIWF Registration" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.1.5 MGW Rre-register

This procedure is the same as that described in the subclause "BIWF Re-Registration" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.1.6 (G)MSC Server Oordered Rre-register

This procedure is the same as described in the subclause "CCU Ordered BIWF Re-registration" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following correction.

Address Information	Control information	Bearer information
Use New MGC Control Address: Service Change Address = MGC Control Address	Service Change Reason = MGC impending failure	

14.1.7 (G)MSC Server Rrestoration

This procedure is the same as described in the subclause "CCU Iinitiated Sservice Rrestoration" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification.

Address Information	Control information	Bearer information
	Context ID = Null Termination ID = Root Service Change Reason = Cold Boot / Warm Boot Service Change Method = Restart	

Delay is not used.

14.1.8 Termination Oout-of-Sservice

This procedure is the same as described in the subclause "BIWF Service Cancellation Indication" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification.

ServiceChange.req (Termination Out-of-Service) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = Contexts / Null / All Termination ID = Termination(s) Service Change Reason = Transmission failure / Termination malfunctioning / Loss of lower layer connectivity / Termination taken out of service Service Change Method = Graceful / Forced	

Delay is not used.

14.1.9 Termination Rrestoration

This procedure is the same as described in the subclause "BIWF Service Restoration Indication" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = Contexts / Null / All Termination ID = Termination(s) Service Change Reason = Service Restored Service Change Method = Restart	

14.1.10 Audit Vvalue

This procedure is the same as described in the subclause "Audit Values" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.1.11 Audit Ccapability

This procedure is the same as described in the subclause "Audit Capabilities" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.1.12 MGW Ccapability UupdateChange

This procedure is the same as described in the subclause "BIWF Capability Change" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.1.13 (G)MSC Server Out of Service

This procedure is the same as that described in the subclause "CCU Initiated Service Cancellation" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2 Call related H.248 transactions

Table 3 shows the relationship between each call-related procedure in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) and the corresponding stage 2 procedure defined in 3GPP TS 23.205 [2].

Table 3: Correspondence between Q.1950 call-related transactions and 3GPP TS 23.205 and 23.153 procedures

Transaction used in Q.1950	Procedure defined in 3GPP TS 23.205 [2] and 23.153 [1]	Comments
Change_Topology	Change Flow Direction	
Join	Join Bearer Terminations	
Isolate	Isolate Bearer Terminations	
Establish_BNC_Nnotify+(tunnel)	Establish Bearer	
Prepare_BNC_Nnotify+(tunnel)	Prepare Bearer	
Cut_Through	Change Through-Connection	
Not defined in Q.1950	Activate Interworking Function	
Cut_BNC (include several procedures).	Release Bearer (Release Bearer and Release termination)	
BNC Established	Bearer Established	
BNC Release	Bearer Released	
Insert_Tone	Send Tone	
Insert_Annoucement	Play Announcement	
Signal Completion	Announcement Completed	
Detected_Digit	Detect DTMF	
Insert_Digit	Send DTMF	
Detected_-digit(BIWF)	Report DTMF	
Confirm_Cchar	Confirm Cchar	
Modify_ Char	Modify Cchar	
Reserve_Char_Notify	Reserve Cchar	
BNC Modified	Bearer Mmodified	
Echo Ccanceller	Activate Voice Processing Function	
BNC Cconnected	**[Editors note: No definition yet]**	
BNC Mmodification failureed	Bearer Mmodified Ffailed	
Tunnel (MGC-MGW)	Tunnel Iinformation Ddown	
Tunnel (MGW-MGC)	Tunnel Iinformation Uup	
Insert Ttone	Stop Ttone	
Insert_-Aannouncement	Stop Aannouncement	
Detect_-Ddigits	Stop DTMF Ddetection	
Insert_-Ddigit	Stop DTMF	
Signal.CompletionInsert tone	Tone Ccompleted	
Not defined	Reserve Ccircuit	
Not defined	Command Rrejected	
Not defined	TFO Aactivation	
Not defined	Codec_Mmodify	
Not defined	Optimal Ccodec and Ddistant Llist_Nnotify	
Not defined	Distant Ccodec Llist	
Modify_-Cchar	Modify Bbearer Ccharacteristics	
Not defined	IWF Protocol Indication	

NOTE: A procedure defined in table 3 can be combined with another procedure in the same action. This means that they can share the same contextID and termination ID(s).

14.2.1 Change Fflow Ddirection

This procedure is the same as that defined in the subclause "Change Connection Topology" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following additions.

Address Information	Control information	Bearer information
	Context ID = c1,? Connection Configuration = (TerminationID= x1, ? TerminationID=x2,? [type = x]),…	

14.2.2 Isolate Bbearer Tterminations

This procedure is the same as that defined in the subclause "Isolate" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.3 Join Bbearer Tterminations

This procedure is the same as that defined in the subclause "Join" in Q.1950 (see 3GPP TS 29.205 [7]).

14.2.4 Establish Bbearer

This procedure is the same as that defined in the subclause "Establish BNC_notify" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with additions as shown below.

Address Information	Control information	Bearer information
	UP mode = Mode UP version = version Delivery of erroneous SDUs = value Interface = interface Initdirerection = initdirection If indication on Protocol Negotiation Result requested: NotificationRequested (Event ID = x, "Prot Negotiation Result") If indication on Rate Change requested: NotificationRequested (Event ID = x, "RateChange")	PLMN bearer capability = PLMN capability GSM channel coding = coding

The parameter logical port is not used.

14.2.5 Prepare Bearer

This procedure is the same as that defined in the subclause "Prepare_BNC_notify" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with additions as shown below:

Address Information	Control information	Bearer information
	UP mode = mode UP version = version Delivery of erroneous SDUs = value Interface = interface Initdirerection = initdirection If indication on Protocol Negotiation Result requested: NotificationRequested (Event ID = x, "Prot Negotiation Result") If indication on Rate Change requested: NotificationRequested (Event ID = x, "RateChange")	PLMN bearer capability = PLMN capability GSM channel coding = coding

The parameter logical port is not used.

14.2.6 Change Tthrough--Cconnection

This procedure is the same as that defined in the subclause "Cut Tthrough" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification and deletion.

The BIWF controlled cut through, as defined in the subclause "Cut Through" - "BIWF controlled" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]), is used as well as the MGC controlled cut through for the change through connection procedure.

NotificationRequested = (Event ID = x,"Cut Through") is deleted.

14.2.7 Activate Iinterworking Ffunction

When the procedure "Activate Interworking Ffunction" is required the following procedure is initiated:

The MGC sends a MOD.req command with the following information.

1 MOD.req (Activate Interworking function) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Signal=actpro If indication on Protocol Negotiation Result requested: NotificationRequested (Event ID = x, "Prot Negotiation Result") If indication on Rate Change requested: NotificationRequested (Event ID = x, "RateChange")	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 MOD.resp (Activate Interworking function) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 TerminationID = bearer1	

14.2.8 Release procedures

This subclause includes a number of procedures.

14.2.8.1 Release Bbearer

This procedure is the same as that defined in the subclause "ReleaseCut_BNC" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) including the Modify command in the transaction.

14.2.8.2 Release Ttermination

This procedure is the same as that defined in the subclause "ReleaseCut_BNC"in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) including a Subtract command in the transaction.

NOTE: Release bearer and release termination should be sent in the same transaction.

14.2.9 Bearer Rreleased

This procedure is the same as that defined in the subclause "BNC Release" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.10 Bearer Eestablished

This procedure is the same as that defined in the subclause "BNC Established" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.11 Send Ttone

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Tone" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following additions.

Address Information	Control information	Bearer information
	If CAMEL Prepaid Warning Tone Signal = warning tone	

14.2.12 Play Aannouncement

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Announcement" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.13 Send DTMF

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.14 Detect DTMF

This procedure is the same as that defined in the subclause "Media Content Detection" - "Detect Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.15 Report DTMF

This procedure is the same as that defined in the subclause "Detected Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.16 Announcement Ccompleted

This procedure is the same as that defined in the subclause "Signal. Completion" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.17 Activate Vvoice Pprocessing Ffunction

When the procedure "Activate Voice Processing Function" (VPF) is required the following procedure is initiated:

The MGC sends an ADD.req, MOD.req or MOV.req command with the following information.

1 ADD.req/MOD.req/MOV.req (…, Activate Voice Processing Function) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 VPF Type ActivateVPF = off / value	

When the MGW receives the command, it shall associate the relevant voice processing function resources with the specified termination.

When the processing of command (1) is complete, the MGW may initiate the "Voice Processing Function Ack" procedure.

2 ADD.resp/MOD.resp/MOV.resp (Voice Processing Function Ack) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1	

14.2.18 Reserve Ccircuit

This procedure is activated when the "Reserve Circuit" procedure is initiated.

An ADD.req, MOD.req or MOV.req command is sent with the following information.

1 ADD.req/MOD.req/MOV.req (Reserve_Circuit) CSM to BIWF

Address Information	Control information	Bearer information
	Transaction ID = z Termination ID = bearer1 Context Requested: Context ID = ? Context Provided: Context ID = c1 If indication on Protocol Negotiation Result requested: NotificationRequested (Event ID = x, "Prot Negotiation Result") If indication on Rate Change requested: NotificationRequested (Event ID = x, "RateChange")	Bearer Service Characteristics If data call PLMN capabilities GSM channel coding = coding

Upon completion of processing command (1) an ADD.resp, MOD.resp or MOV.resp command (2) is sent.

2 ADD.resp/MOD.resp/MOV.resp BIWF to CSM

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 TerminationID = bearer1	

14.2.19 Tunnel Iinformation Uup

This procedure is the same as that defined in the subclause "Tunnel" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

NOTE: This procedure is always initiated from the MGW.

14.2.20 Tunnel Iinformation Ddown

This procedure is the same as that defined in the subclause "Tunnel" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

NOTE: This procedure is always initiated from the MGC.

14.2.21 Tone Ccompleted

This procedure is the same as that defined in the subclause "Signal.Completion" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.22 Stop Aannouncement

This procedure is the same as that defined in the subclause "Insert Announcement" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification. The signal descriptor shall not include any signal.

14.2.23 Stop Ttone

This procedure is the same as that defined in the subclause "Insert Tone" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification. The signal descriptor shall not include any signal.

14.2.24 Stop DTMF Ddetection

This procedure is the same as that defined in the subclause "Detect Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with the following clarification. The eventDescriptor shall not include any event.

14.2.25 Stop DTMF

This procedure is the same as that defined in the subclause "Media Content Insertion" - "Insert Digit" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7])-. The signal descriptor shall not include any signal.

14.2.26 Confirm Cchar

This procedure is the same as that defined in the subclause "Confirm Char" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.27 Modify Cchar

This procedure is the same as that defined in the subclause "Modify Char" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.28 Reserve Cchar

This procedure is the same as that defined in the subclause "Reserve Char" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.29 Bearer Mmmodified

This procedure is the same as that defined in the subclause "BNC Mmmodified" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.30 Bearer Mmmodification Ffailed

This procedure is the same as that defined in the subclause "BNC Mmmodification Failurefailed" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]).

14.2.31 TFO Activation

When the procedure "TFO activation" is required the following procedure is initiated:

The MGC sends a MOD.req command with the following information.

1 MOD.req (TFO activation) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Tfoenable = Off / value	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 MOD.resp (TFO activation) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 TerminationID=bearer1	

14.2.32 Optimal Ccodec Aand Ddistant Llist_Nnotify

When the procedure "Optimal Ceodec Aand Ddistant Llist" is required the following procedure is initiated:

The MGC sends a MOD.req command with the following information.

1 MOD.req (Codec modify and distant list) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Property= codeclist NotificationRequested (Event ID = x, "Codec modify") NotificationRequested (Event ID = x, "Distant List")	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 MOD.resp (Optimal codec and codec list) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 TerminationID= bearer1	

14.2.33 Codec Mmodify

When the procedure "Codec Mmodify" is required the following procedure is initiated:

The MGW sends a NOT.req command with the following information.

1 NOT.req (Codec modify) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Event_ID (Event ID = x, "Optimal codec")	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 NOT.resp (Codec modify) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1	

14.2.34 Distant Ccodec Llist

When the procedure "Distant Ccodec Llist" is required the following procedure is initiated:

The MGW sends a NOT.req command with the following information.

1 NOT.req (Distant codec list) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Event_ID (Event ID = x, "Distant list")	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 NOT.resp (Distant codec list) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1	

14.2.35 Command Rrejected

When the procedure "Command Rrejected" is required the following procedure is initiated:

The MGW/MGC sends .resp to any command.-req. with the following information.

1 ANYcommand.resp (command rejected) MGW/MGC to MGC/MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 or no context Reason=Error	

14.2.36 Modify Bbearer Ccharacteristics

This procedure is the same as that defined in the subclause "Modify Char" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 [7]) with additions as shown below.

Address Information	Control information	Bearer information
	If framing protocol used: UP mode = mode UPversion =version Delivery of erroneous SDUs=value Interface=interface Initdirerection=initdirection If indication on Protocol Negotiation Result requested: NotificationRequested (Event ID = x, "Prot Negotiation Result") If indication on Rate Change requested: NotificationRequested (Event ID = x, "RateChange")	If data call: PLMN bearer capbility = PLMN capability GSM channel coding=coding

14.2.37 Protocol Nnegotiation Rresult

When the procedure "Protocol Nnegotiation Rresult" is required the following procedure is initiated:

The MGW sends a NOT.req command with the following information.

1 NOT.req (Protocol negotiation result) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Event_ID (Event ID = x, "Result", "Cause")	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 NOT.resp (Protocol negotiation result) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1	

14.2.38 Rate Cchange

When the procedure "Rate Cchange" is required the following procedure is initiated:

The MGW sends a NOT.req command with the following information.

1 NOT.req (Rate change) MGW to MGC

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1 Event_ID (Event ID = x, "Rate")	

When the processing of command (1) is complete, the MGW initiates the following procedure.

2 NOT.resp (Rate change) MGC to MGW

Address Information	Control information	Bearer information
	Transaction ID = z Context ID = c1 Termination ID = bearer1	

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

3GPP TSG-CN4 Meeting #8
Puerto Rico, USA, 14-18th May 2001

Tdoc N4-010689

CR-Form-v3

CHANGE REQUEST

⌘ **29.232 CR 1** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Text encoding of codec information on Mc interface
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT ***Date:*** ⌘ 17/05/01
Category:	⌘	**F** ***Release:*** ⌘ 4

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)

Reason for change:	⌘	This clarifies technical ambiguities in the encoding of the codec list information elements.
Summary of change:	⌘	Improved description of codec list information elements.
Consequences if not approved:	⌘	Multi-vendor implementations may not interwork due to ambiguities in the specification.

Clauses affected:	⌘	15.1.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

*** First Modified Section ***

15.1.3 TFO package

The addition of text encoding for the TFO codec list is for further study.

PackageID: 3gtfoc (0x####)

[Editor's note: PackageID to be allocated by IANA]

Version: 1

Extends: None

This package defines events and properties for Tandem Free Operation (TFO) control. TFO uses inband signalling and procedures for Transcoders to enable compressed speech to be maintained between a tandem pair of transcoders. This package allows an MGW which has inserted a transcoder to support TFO.

15.1.3.1 Properties

TFO Activity Control

PropertyID: tfoenable (0x0001)

Description: Defines if TFO is enabled or not.

Type: Enumeration

Possible Values:

"On" (0x0001): TFO is enabled, TFO protocol is supported

"Off" (0x0002): TFO is not enabled, TFO protocol is not initiated or terminated

Defined in: Local Control descriptor

Characteristics: Read/Write

TFO Codec List

PropertyID: codeclist (0x0002)

Description: List of codecs for use in TFO protocol, the active codec is always the first entry in the list.

Type: Octet string

Possible Values:

List of codec types; each entry:

As defined in Q.765.5, for single codec information (Figure 14/Q.765.5), where the Codec Information is either defined within the Q.765.5 or within another specification for the given Organisation Identifier.~~As defined in Q.765.5 (see 3GPP TS 29.205 [7]), or~~

~~As defined by an appropriate regional standards development organisation, identified by an Organisational Identifier in Q.765.5 (see 3GPP TS 29.205 [7]).~~

Defined in: Local Control descriptor

Characteristics: Read/Write

15.1.3.2 Events

Optimal Codec Event

EventID: codec_modify (0x0010)

Description:
The event is used to notify the MGC that TFO negotiation has resulted in an optimal codec type being proposed.

EventsDescriptor Parameters: None

ObservedEventsDescriptor Parameters:

Optimal Codec Type

ParameterID: optimalcodec (0x0011)

Description: indicates which is the proposed codec type for TFO

Type: Octet string

Possible Values:

Codec Type:

As defined in Q.765.5, for single codec information (Figure 14/Q.765.5), where the Codec Information is either defined within the Q.765.5 or within another specification for the given Organisation Identifier.~~As defined in Q.765.5 (see 3GPP TS 29.205 [7]), or~~

~~As defined by an appropriate regional standards development organisation, identified by an Organisational Identifier in Q.765.5 (see 3GPP TS 29.205 [7]).~~

Codec List Event

EventID: distant codec_list (0x0012)

Description: The event is used to notify the MGC of the distant TFO partner's supported codec list..

EventsDescriptor Parameters: None

ObservedEventsDescriptor Parameters:

Distant Codec List

ParameterID: distlist(0x0013)

Description: indicates the codec list for TFO

Type: Octet string

Possible Values:

List of codecs of type Codec Type:

As defined in Q.765.5, for single codec information (Figure 14/Q.765.5), where the Codec Information is either defined within the Q.765.5 or within another specification for the given Organisation Identifier.~~As defined in Q.765.5 (see 3GPP TS 29.205 [7]), or~~

~~As defined by an appropriate regional standards development organisation, identified by an Organisational Identifier in Q.765.5 (see 3GPP TS 29.205 [7]).~~

The first Codec Type in the list is the one proposed for use (Optimal Codec Type).

15.1.3.3 Signals

None

15.1.3.4 Statistics

None

15.1.3.5 Procedures

For the procedures for TFO see 3GPP TS 28.062 **Error! Reference source not found.**.

The use of the properties in this package is applicable only when the MGW Termination to which the package properties are applied has the media stream property for Codec Type set to ITU-T G.711 (see Annex C of ITU-T Recommendation H.248). Furthermore, the package properties are applicable only if the Codec Type property of the media stream at the opposing MGW Termination is not set to ITU G.711.

15.1.4 3G Expanded Call Progress Tones Generator Package

PackageID: 3gxcg(0x####)

[Editor's note: PackageID to be allocated by IANA]

Version: 1

Extends: xcg version1

This package extends "Expanded Call Progress Tones Generator Package", as defined in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 **Error! Reference source not found.**). The package adds a new toneId for CAMEL prepaid warning tone.

15.1.4.1 Properties

None

15.1.4.2 Events

None

15.1.4.3 Signals

CAMEL Prepaid Warning Tone

SignalID: cpwt (0x004f)

Description:
Generate CAMEL prepaid warning tone to inform the party that the Max Call Period Duration is about to expire. CAMEL prepaid warning tone is defined in TS 23.078. The physical characteristic of CAMEL prepaid warning tone is available in the gateway.

Signal type: Brief

Duration: Provisioned, Not Auditable

Additional parameters:

Tone Direction

ParameterID: td (0x0010)

Type: Enumeration

Values:

"Ext" (0x01): external,

"Int" (0x02): internal,

"Both" (0x03): Both

Default: "Ext"

15.1.4.4 Statistics

None

15.1.4.5 Procedures

None

*** Last Modified Section ***

3GPP TSG_CN_WG4, Meeting #07 **Tdoc N4-010746**
Sophia Antipolis, FRANCE, 26th February - 2nd March 2001

CR-Form-v3

CHANGE REQUEST

⌘ **29.232** **CR** **004** ⌘ rev **2** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	ATM-IP signalling transport Interworking
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	17/05/09
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:	⌘	The signalling transport for the 3GPP application of H.248 is defined for a pure ATM environment and pure IP enviroment. However interworking is not defined
Summary of change:	⌘	The CR proposes to add M3UA on top of SCTP in the IP enviroment for interworking with ATM
Consequences if not approved:	⌘	Interworking not possible

Clauses affected:	⌘			
Other specs affected:	⌘	[X] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘	29.205 CR 001
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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 ******

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] 3GPP TS 23.153: "3rd Generation Partnership Project; Technical Specification Group Core Network; Out of Band Transcoder Control - Stage 2"

[2] 3GPP TS 23.205: "3rd Generation Partnership Project; Technical Specification Group Core Network; Bearer Independent CS Core Network – Stage 2"

[3] 3GPP TS 24.008: "3rd Generation Partnership Project; Technical Specification Group Core Network; Mobile radio interface layer 3 specification"

[4] 3GPP TS 25.415: "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface user plane protocols".

[5] 3GPP TS 28.062: "3rd Generation Partnership Project; Technical Specification Group Services & System Aspects; In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 – Service Description"

[6] 3GPP TS 29.007: "3rd Generation Partnership Project; Technical Specification Group Core Network; 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: "3rd Generation Partnership Project; Technical Specification Group Core Network; Application of Q.1900 series to Bearer Independent CS Network architecture; Stage 3"

[8] 3GPP TS 29.415: "3rd Generation Partnership Project; Technical Specification Group Core Network; CN Nb interface user plane protocols".

[9] 3GPP TS 48.008: "3rd Generation Partnership Project; Technical Specification Group GSM EDGE Radio Access Network; Mobile-services Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".

[10] ITU-T Recommendation H.248 (06/00): "Media Gateway Control Protocol"

[11] ITU-T Recommendation Q.2210 (07/96): "Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140"

[12] RFC 2960 "Stream Control Transmission Protocol"

[13] 3G TS 29.202: "SS7 signalling transport in core network"

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

3.3 Abbreviations

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

BICC	Bearer Independent Call Control
MGC	Media Gateway Controller
MTP3	Message Transfer Part layer 3
RFC	Request For Comment; this includes both discussion documents and specifications in the IETF domain
SCTP	Stream Control Transmission Protocol
TFO	Tandem Free Operation
TrFO	Transcoder Free Operation
M3UA	SS7 MTP3 – User Adaptation Layer

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

8 Transport

Each implementation of the Mc interface should provide the appropriate protocol options: MTP3B as defined in ITU—T Recommendation Q.2210 [11] (for ATM signalling transport) or SCTP as defined in RFC2960 [12] (for IP signalling transport) and ~~shall be used as the transport protocol. I~~in the case where the signalling relation consists of both ATM signalling transport and IP signalling transport the M3UA protocol layer [13] shall be added to SCT~~C~~P to provide interworking. In summary:

i) For pure IP connections, H.248/SCTP/IP should be used,

ii) For pure ATM connections, H.248/MTP3b/SSCF/SSCOP/AAL5/ATM should be used,

iii) For mixed IP&ATM connections, H.248/M3UA/SCTP/IP shall be used as the IP transport.

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

3GPP TSG-CN WG4 Meeting #08
Puerto Rico, 14th - 18th May 2001

Tdoc N4-010692

CR-Form-v3

CHANGE REQUEST

⌘ **29.232** **CR** **006** ⌘ rev **3** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Clarifications in 3GUP package
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	2001-05-07
Category:	⌘	**F**
Release:	⌘	Rel 4

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)*

Reason for change:	⌘	Specification is open to misunderstanding
Summary of change:	⌘	Renaming of Initialisation Direction property and further clarifications
Consequences if not approved:	⌘	Specification is open to misunderstanding

Clauses affected:	⌘	15.1.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.153
Other comments:	⌘	This CR is an alternative solution to N4-010615		

First modified section

15.1.1 3GUP package.

PackageID: 3gup (0x####)
[Editor's note: PackageID to be allocated by IANA]
Version: 1
Extends: None
This package identifies that the User Plane package is used for the termination. It also contains some parameters for the User Plane functions in the MGW.
The UP Protocol operates independently of the stream mode property, i.e. type 14 UP PDUs (which are used for inband UP signalling) can be transported between UP peers, irrespective of the stream mode direction. However, other types of UP PDUs shall be handled according to the stream mode property.

15.1.1.1 Properties

UP Mode of operation:
PropertyID: mode (0x0001)

Description: Defines the mode of operation of the User Plane functions , for further definitions see 3GPP TS 25.415 **Error! Reference source not found.** and 29.415 **Error! Reference source not found.**.

Type: Enumeration

Possible Values:

"Trans" (0x0001) Transparent mode

"Supp" (0x0002) Support mode for predefined SDU sizes

Default: "Trans" (0x0001) Transparent mode

Defined in: Local Control descriptor

Characteristics: Read/Write

UP versions:
PropertyID: upversions (0x0002)

Description: Defines the versions of the UP mode of operation which is used.

Type: Sub-list

Possible Values:

{1,..., 16}

Default: {1}

Defined in: Local Control descriptor

Characteristics: Read/Write

Delivery of erroneous SDUs:
PropertyID: delerrsdu (0x0003)

Description:
Indicates how erroneous SDUs should be handled. If it is set to YES then the UP entity implements error checking and sets Frame Quality Classification (FQC) bits accordingly; bad frames are delivered to the UP layer. If it is set to NO then the UP entity performs error checking and if a bad frame is detected then it is discarded. These settings are required only when the payload is to be examined by upper layer

services; an. MGW may ignore the settings of this parameter if it passes frames transparently through the UP entities. If it is set to NA then no checking is performed.

Type: Enumeration

Possible Values:

"Yes" (0x0001) Yes

"No" (0x0002) No

"NA" (0x0003) Not Applicable

Default: "NA" (0x0003) Not Applicable

Defined in: Local Control descriptor

Characteristics: Read/Write

Interface:

PropertyID: interface (0x0004)

Description: Indicates the type of interface on which the termination is used.

Type: Enumeration

Possible Values:

"RAN" (0x0001) Iu interface

"CN" (0x0002) Nb interface

Defined in: Local Control descriptor

Characteristics: Read/Write

Initialisation Direction

PropertyID: initdir (0x0005)

Description:

Indicates whether or not the termination in the MGW should expect Initialisation initialisation information, or initiate UP initialisation itself.

For a termination with property the Nb "interface = CN":

- If Initialisation Direction is set to Incoming then the UP entityMGW shall expect to receive an initialisation from an external UP peer or from an internal UP entityeither at this termination or from an other Nb or Iu termination in the same context.

- If Initialisation Direction is set to outgoing, then the UP entityMGW shall generate an initialisation procedure at this termination independently of the other termination in the same context.

For a termination with property the Iu "interface = Iu":

- If Initialisation Direction is set to "incoming", then the initialisation received at this termination is from the originating RAN and can be forwarded internally to other terminations for subsequent UP initialisations.

- If Initialisation Direction is set to "outgoing", then initialisations received are from the terminating RAN and cannot be forwarded internally. RFCI value correction can be performed at this termination, and initialisations can be sent out to the RAN.

Examples for the usage of this property are given in Annex B.

Type: Enumeration

Possible Values:

"In" (0x0001) Incoming

"Out" (0x0002) Outgoing

Defined in: Local Control descriptor

Characteristics: Read/Write

15.1.1.2 Events

None

15.1.1.3 Signals

None

15.1.1.4 Statistics

None

15.1.1.5 Procedures

The MGC uses this package to indicate to the MGW that the Iu (or Nb) User Plane is used between the RNC (or distant MGW) and the MGW. The package is sent in the Establish bearer and Prepare bearer procedures. For more information on the User Plane and for a description of ' UP mode of operation', 'UP versions' and 'Delivery of erroneous SDUs' see 3GPP TS 25.415 **Error! Reference source not found.**.
The following procedures are valid for UP in Support Mode:

- TheMGW shall be able to initiate and respond to the UP control procedures (PDU type 14 frames) independently of the Stream Mode during the call establishment phase, i.e. when not in TrFO.

- Otherwise, during TrFO the MGW shall be able to forward UP control procedures (PDU type 14 frames) received at one termination to the other termination.

- The UP Initialisation procedure is always acknowledged between MGW peers. If an MGW receives a request for a notification for the bearer establishment then the MGW shall not send the notification until after it has sent the acknowledgement for the UP initialisation.

- The MGW shall always store RFCI parameters against the MGW termination which received the UP initialisation.

- If an MGW has the UP termination property Initialisation Direction = Incoming then it expects to receive an Initialisation (either internally or externally).

- If an MGW has UP termination property Initialisation Direction = Outgoing and interface CN, then it generates a network originated Initialisation PDU.

- If an MGW has UP termination property Initialisation Direction = Outgoing and interface RAN, then it expects to receive an Initialisation externally. It shall not pass the initialisation parameters internally. It may initiate RFCI Value Correction out from this termination.

- If an MGW has two terminations in the same context defined as supporting the UP package and with Initialisation Direction incoming, then when it receives an Initialisation procedure from one side (provided the bearer connection from the other termination to its peer MGW is established) it shall start the UP initialisation procedure towards the peer MGW. The MGW shall perform this procedure independently of the through-connection of the terminations in the context. The MGW shall relay control information from the first initialisation to the UP peer for use at the subsequent initialisation. Also, subsequent control procedures received on one UP shall be relayed to the other UP entity when the two UP entities are connected within the MGW. This behaviour is termed as a "UP Relay Function"; it is described in more detail in Annex A.

- If an MGW has one termination with properties "interface = Iu" and "initialisation direction = outgoing" and another termination with ~~3G UP~~ property "~~(~~initialisation direction = Incoming"~~)~~ in the same context, then the MGW shall not forward the UP initialisation from the Incoming termination until it has received a UP initialisation at the "Iu"/"~~Outgoing~~outgoing" side. If the RFCI values stored at the ~~Nb~~ "incoming" termination do not match the RFCI values stored at the "outgoing" Iu side then "RFCI Value Correction"

may be performed to the "outgoing" Iu side: ~~the~~ The MGW starts UP initialisation with the RFCI values 'relayed' from the "Incoming" side. No "RFCI Value Correction" is permitted at ~~the~~ a "incoming" Iu termination or at any Nb ~~side~~termination.

- As an implementation option, "RFCI Value Correction" may be delayed if terminations are not through-connected; it will be triggered by connection modification. Otherwise it shall be performed immediately
- If "RFCI Value Correction" is not performed the MGW "UP Relay Function" shall map the indexes for frames from one side to the RFCI indexes for frames from the other side.
- If an MGW has two Iu terminations connected to the same context then the "RFCI Value Correction" is performed by the Outgoing termination.
- If an MGW has two terminations which support the UP package connected to the same context and both RFCI sets match then the MGW may pass frames transparently through the UP entities; no monitoring of the frames is performed, provided that the terminations are through-connected. The "UP Relay Function" may then also be bypassed.
- If the MGW is passing frames transparently, no UP monitoring is performed. When the MGW receives an H.248 procedure request which requires interpretation or interaction with the UP, then it shall resume its UP protocol responsibilities, i.e. perform monitoring or termination of the UP protocol.

Next modified section

Annex B (informative): Examples for Usage of the 3GUP Package "Initialisation Direction" Property

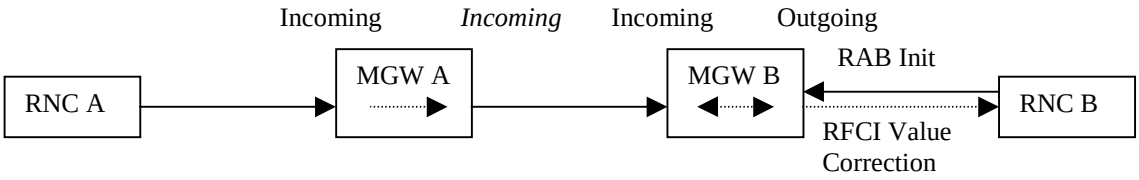

Figure B.1: Mobile to Mobile Call (A to B)

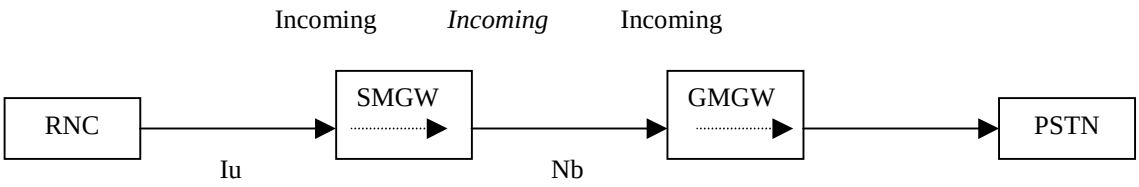

Figure B.2: Mobile Originating Call

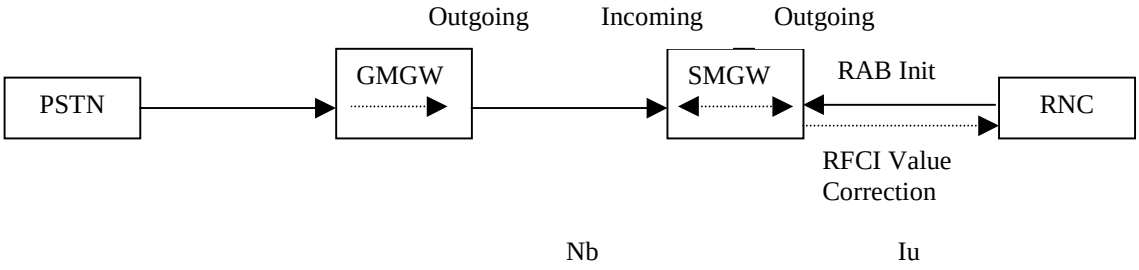

Figure B.3: Mobile Terminating Call

Annex ~~B~~ C (informative): Change history

3GPP TSG-CN WG4 Meeting #08
Puerto Rico, 14th - 18th May 2001

Tdoc N4-010691

CR-Form-v3

CHANGE REQUEST

⌘ **29.232** **CR** **007** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

*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:	⌘	Clarification of Use of UP version property in 3GUP package
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	2001-05-07
Category:	⌘	**F**
Release:	⌘	Rel 4

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)*

Reason for change:	⌘	Relatshionship between inband FP UP version negotiation and signalling over Mc unclear.
Summary of change:	⌘	Clarify this relatshionship
Consequences if not approved:	⌘	Interworking between MSC server, RNC and MGW not guranteed.

Clauses affected:	⌘	15.1.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.153, 25.413, 25.415
Other comments:	⌘	Discussion in TDOC , Related CR for 23.153 proposed.		

First modified section

15.1.1 3GUP package.

PackageID: 3gup (0x####)

[Editor's note: PackageID to be allocated by IANA]

Version: 1

Extends: None

This package identifies that the User Plane package is used for the termination. It also contains some parameters for the User Plane functions in the MGW.

The UP Protocol operates independently of the stream mode property, i.e. UP PDUs can be transported between UP peers, irrespective of the stream mode direction.

15.1.1.1 Properties

UP Mode of operation:

PropertyID: mode (0x0001)

Description: Defines the mode of operation of the User Plane functions , for further definitions see 3GPP TS 25.415 **Error! Reference source not found.** and 29.415 **Error! Reference source not found.**.

Type: Enumeration

Possible Values:

"Trans" (0x0001) Transparent mode

"Supp" (0x0002) Support mode for predefined SDU sizes

Default: "Trans" (0x0001) Transparent mode

Defined in: Local Control descriptor

Characteristics: Read/Write

UP versions:

PropertyID: upversions (0x0002)

Description: Defines the required versions of the UP mode of operation ~~which is used~~.

Type: Sub-list

Possible Values:

{1,..., 16}

Default: {1}

Defined in: Local Control descriptor

Characteristics: Read/Write

Delivery of erroneous SDUs:

PropertyID: delerrsdu (0x0003)

Description:
Indicates how erroneous SDUs should be handled. If it is set to YES then the UP entity implements error checking and sets Frame Quality Classification (FQC) bits accordingly; bad frames are delivered to the UP layer. If it is set to NO then the UP entity performs error checking and if a bad frame is detected then it is discarded. These settings are required only when the payload is to be examined by upper layer services. If it is set to NA then no checking is performed.

Type: Enumeration

Possible Values:

"Yes" (0x0001) Yes

"No" (0x0002) No

"NA" (0x0003) Not Applicable

Default: "NA" (0x0003) Not Applicable

Defined in: Local Control descriptor

Characteristics: Read/Write

Interface:

PropertyID: interface (0x0004)

Description: Indicates the type of interface on which the termination is used.

Type: Enumeration

Possible Values:

"RAN" (0x0001) Iu interface

"CN" (0x0002) Nb interface

Defined in: Local Control descriptor

Characteristics: Read/Write

Initialisation Direction

PropertyID: initdir (0x0005)

Description:
Indicates whether or not the termination in the MGW should expect Initialisation information, or initiate UP itself. For the Nb interface:

- If Initialisation Direction is set to Incoming then the UP entity shall expect to receive an initialisation from an external UP peer or from an internal UP entity.
- If Initialisation Direction is set to outgoing then the UP entity shall generate an initialisation procedure.

For the Iu interface:

- If Initialisation Direction is set to incoming then the initialisation received at this termination is from the originating RAN and can be forwarded internally to other terminations for subsequent UP initialisations.
- If Initialisation Direction is set to outgoing then initialisations received are from the terminating RAN and cannot be forwarded internally. RFCI value correction can be performed at this termination, and initialisations can be sent out to the RAN.

Type: Enumeration

Possible Values:

"In" (0x0001) Incoming

"Out" (0x0002) Outgoing

Defined in: Local Control descriptor

Characteristics: Read/Write

15.1.1.2 Events

None

15.1.1.3 Signals

None

15.1.1.4 Statistics

None

15.1.1.5 Procedures

The MGC uses this package to indicate to the MGW that the Iu (or Nb) User Plane is used between the RNC (or distant MGW) and the MGW. The package is sent in the Establish bearer and Prepare bearer procedures. For more information on the User Plane and for a description of ' UP mode of operation', 'UP versions' and 'Delivery of erroneous SDUs' see 3GPP TS 25.415 **Error! Reference source not found.**.

The following procedures are valid for UP in Support Mode:

- TheMGW shall be able to initiate and respond to the UP control procedures (PDU type 14 frames) independently of the Stream Mode during the call establishment phase, i.e. when not in TrFO.
- Otherwise, during TrFO the MGW shall be able to forward UP control procedures (PDU type 14 frames) received at one termination to the other termination.
- The UP Initialisation procedure is always acknowledged between MGW peers. If an MGW receives a request for a notification for the bearer establishment then the MGW shall not send the notification until after it has sent the acknowledgement for the UP initialisation.
- The MGW shall always store RFCI parameters against the MGW termination which received the UP initialisation.
- If an MGW has the UP termination property Initialisation Direction = Incoming then it expects to receive an Initialisation (either internally or externally).
- If an MGW has UP termination property Initialisation Direction = Outgoing and interface CN, then it generates a network originated Initialisation PDU.
- If an MGW has UP termination property Initialisation Direction = Outgoing and interface RAN, then it expects to receive an Initialisation externally. It shall not pass the initialisation parameters internally. It may initiate RFCI Value Correction out from this termination.
- If an MGW has two terminations in the same context defined as supporting the UP package and with Initialisation Direction incoming, then when it receives an Initialisation procedure from one side (provided the bearer connection from the other termination to its peer MGW is established) it shall start the UP initialisation procedure towards the peer MGW. The MGW shall perform this procedure independently of the through-connection of the terminations in the context. The MGW shall relay control information from the first initialisation to the UP peer for use at the subsequent initialisation. Also, subsequent control procedures received on one UP shall be relayed to the other UP entity when the two UP entities are connected within the MGW. This behaviour is termed as a "UP Relay Function"; it is described in more detail in Annex A.
- If an MGW has one termination with interface = Iu and initialisation direction outgoing and another termination with 3G UP property (initialisation direction Incoming) in the same context, then the MGW shall not forward the UP initialisation from the Incoming termination until it has received a UP initialisation at the Iu/Outgoing side. If the RFCI values stored at the Nb termination do not match the RFCI values stored at the Iu side then

"RFCI Value Correction" may be performed to the Iu side: the MGW starts UP initialisation with the RFCI values 'relayed' from the Incoming side. No "RFCI Value Correction" is permitted at the Nb side.

- As an implementation option, "RFCI Value Correction" may be delayed if terminations are not through-connected; it will be triggered by connection modification. Otherwise it shall be performed immediately

- If "RFCI Value Correction" is not performed the MGW "UP Relay Function" shall map the indexes for frames from one side to the RFCI indexes for frames from the other side.

- If an MGW has two Iu terminations connected to the same context then the "RFCI Value Correction" is performed by the Outgoing termination.

- - If an MGW has two terminations which support the UP package connected to the same context and both RFCI sets match then the MGW may pass frames transparently through the UP entities; no monitoring of the frames is performed, provided that the terminations are through-connected. The "UP Relay Function" may then also be bypassed
  If the MGW is passing frames transparently, no UP monitoring is performed. When the MGW receives an H.248 procedure request which requires interpretation or interaction with the UP, then it shall resume its UP protocol responsibilities, i.e. perform monitoring or termination of the UP protocol.

- If an MGW sends an FP UP initialisation message from a termination, the MGW shall only offer versions of the FP UP, which are given in the property “UP versions” of this termination and which are supported by the MGW for this termination.

- If an MGW receives an FP UP initialisation message at a termination, the MGW shall only positively acknowledge this initialisation message, if versions of the FP UP are offered, which are given in the property “UP versions” and which are supported at the MGW for this termination. In the positive FP UP initialisation acknowledge message, the MGW shall select one of these versions. If none of these versions are offered in the FP UP initialisation message, the MGW shall send a negative FP UP acknowledge message and it shall not forward the initialisation to a possible second FP UP termination in the same context.

3GPP TSG-CN WG4 Meeting #08 **Tdoc N4-010693**
Rio Grande, Puerto Rico, 14-18 May 2001

CR-Form-v3

CHANGE REQUEST

⌘ **TS 29.232 CR 008** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

*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 **X**

Title:	⌘	Updates to UP Relay Function, Appendix A
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	2001-05-09
Category:	⌘	**F**
Release:	⌘	REL-4

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)*

Reason for change:	⌘	Unclear existing text – open to misinterpretation
Summary of change:	⌘	Relay Function changed to Interworking function. MGW tasks clarified for transparent relaying of frames and mapping of frame data between UP interfaces.
Consequences if not approved:	⌘	Possible faulty implementation

Clauses affected:	⌘	15.1.1.5, Appendix A		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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 ******

15.1.1.5 Procedures

The MGC uses this package to indicate to the MGW that the Iu (or Nb) User Plane is used between the RNC (or distant MGW) and the MGW. The package is sent in the Establish bearer and Prepare bearer procedures. For more information on the User Plane and for a description of ' UP mode of operation', 'UP versions' and 'Delivery of erroneous SDUs' see 3GPP TS 25.415 **Error! Reference source not found.**.

The following procedures are valid for UP in Support Mode:

- TheMGW shall be able to initiate and respond to the UP control procedures (PDU type 14 frames) independently of the Stream Mode during the call establishment phase, i.e. when not in TrFO.
- Otherwise, during TrFO the MGW shall be able to forward UP control procedures (PDU type 14 frames) received at one termination to the other termination.
- The UP Initialisation procedure is always acknowledged between MGW peers. If an MGW receives a request for a notification for the bearer establishment then the MGW shall not send the notification until after it has sent the acknowledgement for the UP initialisation.
- The MGW shall always store RFCI parameters against the MGW termination which received the UP initialisation.
- If an MGW has the UP termination property Initialisation Direction = Incoming then it expects to receive an Initialisation (either internally or externally).
- If an MGW has UP termination property Initialisation Direction = Outgoing and interface CN, then it generates a network originated Initialisation PDU.
- If an MGW has UP termination property Initialisation Direction = Outgoing and interface RAN, then it expects to receive an Initialisation externally. It shall not pass the initialisation parameters internally. It may initiate RFCI Value Correction out from this termination.
- If an MGW has two terminations in the same context defined as supporting the UP package and with Initialisation Direction incoming, then when it receives an Initialisation procedure from one side (provided the bearer connection from the other termination to its peer MGW is established) it shall start the UP initialisation procedure towards the peer MGW. The MGW shall perform this procedure independently of the through-connection of the terminations in the context. The MGW shall relay control information from the first initialisation to the UP peer for use at the subsequent initialisation. Also, subsequent control procedures received on one UP shall be relayed to the other UP entity when the two UP entities are connected within the MGW. This behaviour is ~~termed as a "UP Relay Function"; it is~~ described in more detail in Annex A.
- If an MGW has one termination with interface = Iu and initialisation direction outgoing and another termination with 3G UP property (initialisation direction Incoming) in the same context, then the MGW shall not forward the UP initialisation from the Incoming termination until it has received a UP initialisation at the Iu/Outgoing side. If the RFCI values stored at the Nb termination do not match the RFCI values stored at the Iu side then "RFCI Value Correction" may be performed to the Iu side: the MGW starts UP initialisation with the RFCI values 'relayed' from the Incoming side. No "RFCI Value Correction" is permitted at the Nb side.
- As an implementation option, "RFCI Value Correction" may be delayed if terminations are not through-connected; it will be triggered by connection modification. Otherwise it shall be performed immediately
- If "RFCI Value Correction" is not performed the MGW ~~"UP Relay Function"~~ shall map the indexes for frames from one side to the RFCI indexes for frames from the other side. This behaviour is described in more detail in Annex A.
- If an MGW has two Iu terminations connected to the same context then the "RFCI Value Correction" is performed by the Outgoing termination.
- If an MGW has two terminations which support the UP package connected to the same context and both RFCI sets match then the MGW may pass frames transparently through the UP entities; no monitoring of the frames is

performed, provided that the terminations are through-connected. ~~The "UP Relay Function" may then also be bypassed.~~This behaviour is described further in Annex A.

If the MGW is passing frames transparently, no UP monitoring is performed. When the MGW receives an H.248 procedure request which requires interpretation or interaction with the UP, then it shall resume its UP protocol responsibilities, i.e. perform monitoring or termination of the UP protocol.

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

Annex A (informative):

The Framing protocol Interworking Function (FPIF)

A.1 Introduction

SDUs transmitted over an Iu or Nb interface and received at a MGW whose outgoing UP is also Iu or Nb shall be relayed to the outgoing UP MGW termination. ~~When~~If no interworking function (other than the FPIF) or transcoder device is inserted by the ~~MGW then SDUs~~MGW, and if UP terminations are present, then PDUs and control procedures are passed between MGW terminations by the ~~FIF. The FIF~~FPIF. The FPIF is the functional entity responsible for aligning or mapping control procedures (including RFCIs, frame numbers etc) on the separate UP interfaces according to the package procedures described in the main text. The ~~FIF determines if PDUs can be relayed unmodified or if some mapping is required, by this the FIF~~FPIF determines if the two UP configurations are identical and thus the UP PDUs may be passed transparently. If the FPIF determines that the two UP configurations are not identical it applies the required mapping. The relaying of PDUs transparently can also be considered as FPIF bypass.

NOTE: the implementation in the MGW can perform a more efficient processing of the PDUs in this case. The MGW switching and bypassing of the protocol functions during TrFO is left to the manufacturer's implementation.

~~The FIF becomes operational after the UP Initialisation procedure has been performed by at least one Termination in the MGW's Context.~~ UP initialisations are not handled by the FPIF, only receipt of the Subflow combinations and the RFCI allocations are received by the FPIF for each UP ~~Initialisation.~~

The RFCIs are relayed by the FPIF as described in main text for the UP package procedures.

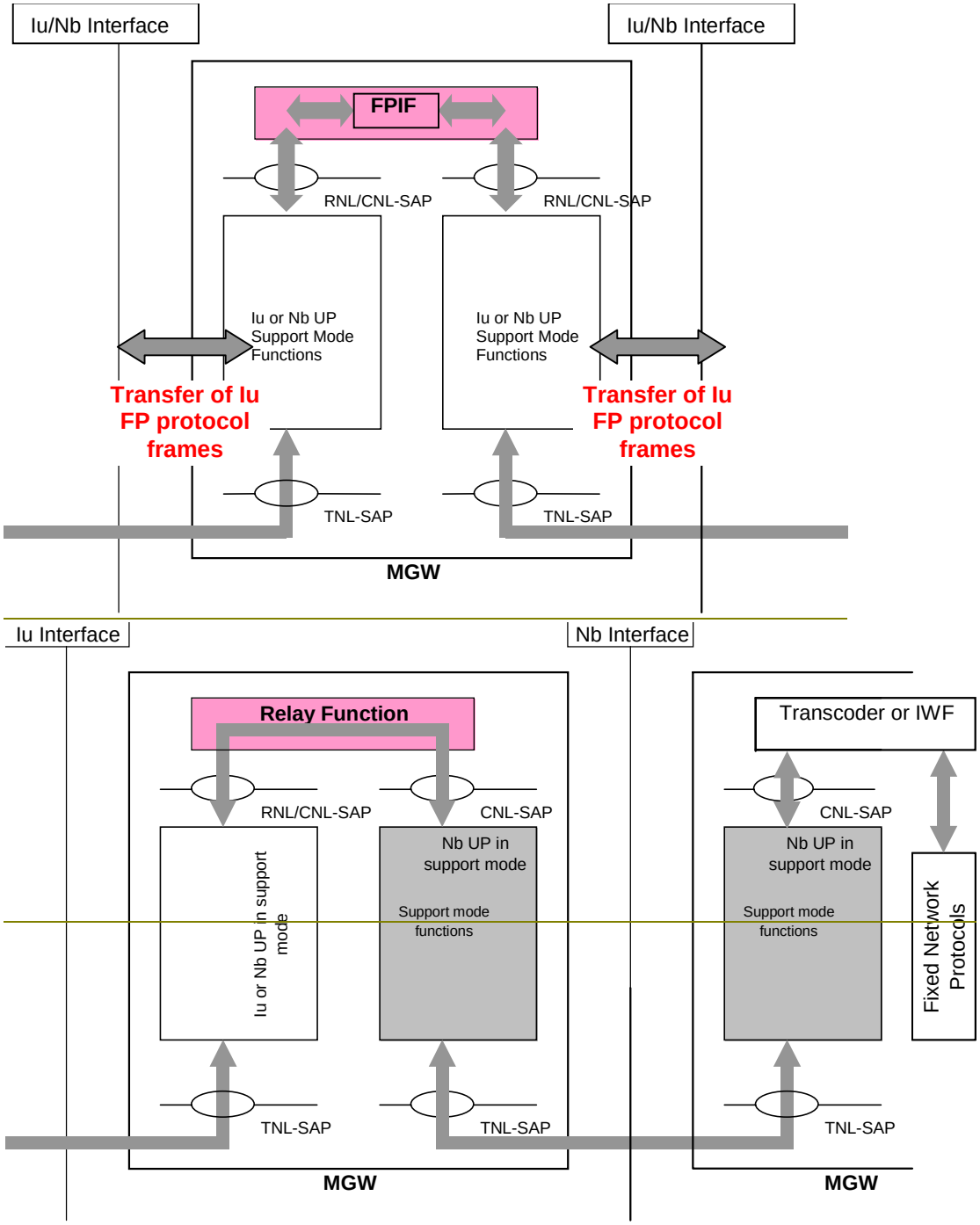

Figure A.1: The ~~Relay Function in support mode~~Framing Protocol Interworking Function

A.2 FPIF procedures with respect to Iu framing protocol

This section handles relay of user data indicated to the ~~Relay Function~~FPIF in a Nb- or Iu-UP-data-indication message and transmitted between peer UP layer entities in PDU types 0 and 1. The ~~Relay Function~~FPIF passes this information to the UP layer on the sending side in a Nb- or Iu-UP-data-request message.

A.2.1 Payload

Received SDUs shall be forwarded unmodified to the next MGW. Note that if "delivery of erroneous SDUs" is set to 'no', faulty SDUs are already discarded by the Iu or Nb support mode functions and, hence, not delivered to the ~~Relay Function.~~FPIF.

A.2.2 RFCIs

If the RFCI values on the outgoing UP interface match those initialised on the incoming UP interface then the RFCI indicated by the lower layer (i.e., Iu or Nb) on the receiving side shall be forwarded unmodified to lower layer on the sending side.

If the RFCI sets on the outgoing UP interface do not match those initialised on the incoming UP interface then the FPIF performs mapping between the RFCIs on each UP for the same initialised Subflow Combination.

The FPIF is the entity that may perform the RFCI value correction procedure as described in the main text, after ~~the~~this procedure then relaying of the received RFCI shall be performed.

A.2.3 FQC

The FQC indicated by the lower layer (i.e., Iu or Nb) on the receiving side shall be forwarded unmodified to lower layer on the sending side.

A.2.4 Frame number

The frame number indicated by the lower layer (i.e., Iu or Nb) on the receiving side shall be forwarded unmodified to lower layer on the sending side.

A discontinuity in framing protocol support mode frame numbers is allowed at the end of the TrFO break.

A.3 Relay of status information

This section handles relay of status information indicated to the ~~Relay Function~~FPIF in a Nb- or Iu-UP-status-indication message and transmitted between peer UP layer entities in PDU type 14. The ~~Relay Function~~FPIF in general passes this information to the UP layer on the sending side.

A.3.1 ~~Initialisation~~Void

~~Initialisation requests and acknowledgements are generated locally by the UP protocol entities and are not indicated to the upper layer. However the initialisation information shall be provided to the FIF in order to be relayed for use by the outgoing Termination.~~

A.3.2 Rate Control Frames

The FPIF shall pass rate control request and rate control acknowledgement frames transparently between incoming UP interface and outgoing UP interface.

~~When~~Before a MGW reverts from TrFO break operation (for example during handover or relocation where the rate control procedures may have been operating independently between each UP interface) the ~~FIF shall~~FPIF may perform rate control procedures to each UP peer. It shall then use the Maximum rate and Current rate settings from the opposite UP configurations. This is performed to align the UP's on each side of the MGW to enable relaying of all subsequent PDUs as described ~~in above.~~above.

Optionally, the UP layer protocol entity on the sending side may substitute the frame number received in a status request by another number, but shall then substitute the initial number back in the status indication containing the acknowledgement. Figure 8 shows an example of the relay of the rate control procedure.

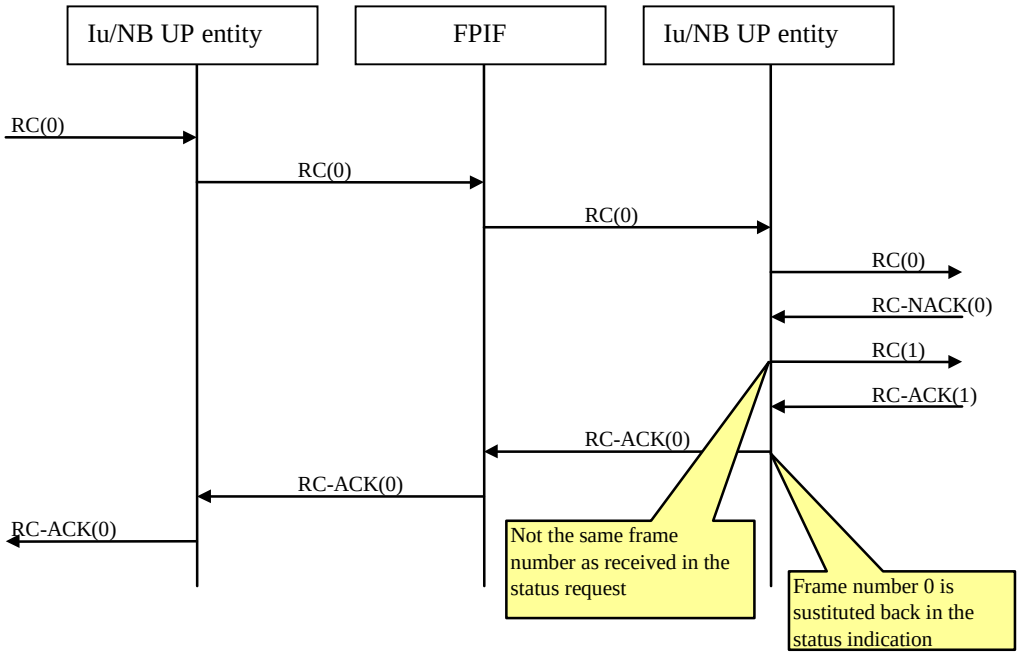

Figure A.2: Relay of a control procedure

A.3.2 Time Alignment

Time alignment frames shall be relayed unmodified.

~~History~~

~~Document history~~		
~~V0.0.1~~	~~September 2000~~	~~Initial draft created after N4#4 based on N4-000620~~
~~V0.1.0~~	~~October 2000~~	~~Updated after N4 R2000 Ad Hoc Stockholm based on N4-00823 and N4-000842~~
~~V0.2.0~~	~~November 2000~~	~~Reference for MTP 3B corrected; RFC reference for SCTP added~~
~~V0.3.0~~	~~November 2000~~	~~Updated according to N4-000996, N4-000998, N4-000999, N4-001000, N4-001021, N4-001028 & N4-001097 as agreed in CN4 #5~~
~~V1.0.0~~	~~November 2000~~	~~To TSG-CN Plenary #10 for information~~
~~V1.1.0~~	~~January 2001~~	~~Updated according to NJ-010069, NJ-010030, NJ-010098, NJ-010094, NJ-010033, NJ-010097, NJ-010095, NJ-010112 as agreed in the Joint CN3/CN4 Meeting held during the CN4#6~~

~~v1.1.1~~	~~January 2001~~	~~References ordered by specification/recommendation number; references to 3GPP specifications include full titles as shown on the title page; literal reference numbers and references to subclauses replaced with fields; all table cells outlined with 0.5pt lines; appropriate 3GPP paragraph styles applied.~~
~~v1.2.0~~	~~February 2001~~	~~Updated according to N4-010245, N4-010248, N4-010249, N4-010303, N4-010304, N4-010305, agreed in CN4 Release 4 ad hoc, Madrid.~~ ~~References to Q.1902.x replaced by references to 29.205; 3GPP styles applied consistently; form for ITU-T recommendations in text is now "ITU-T Recommendation A.NNNN".~~
~~v1.3.0~~	~~March 2001~~	~~Updated according to N4-010384, N4-010401 (part) & N4-010472, agreed in CN4 in Sophia Antipolis.~~ ~~References to Q.1950, Q.1970 and Q.1990 replaced by reference to 29.205. Reference to SIP-T deleted. Editor's note in 15.1.2.3 deleted.~~ ~~Editorial clean-up.~~
~~V2.0.0~~	~~March 2001~~	~~Sent to TSG CN#11 for approval~~

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