3GPP TSG CN Plenary Meeting #15 **NP-020029**
6th – 8th March 2002. Cheju, Korea.

Source: TSG CN WG4

Title: CRs on Rel-4 Bearer Independent CS architecture

Agenda item: 8.3

Document for: APPROVAL

Introduction:

This document contains 8 CRs on Rel-4 Work Item ”CSSPLIT”, that have been agreed by TSG CN WG4, and are forwarded to TSG CN Plenary meeting #15 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.205	20		N4-020076	Rel-4	(G)MSC restoration	F	4.3.0
23.205	21		N4-020077	Rel-5	(G)MSC restoration	A	5.0.0
23.205	22	2	N4-020216	Rel-4	Correction of Bearer Modification Handling	F	4.3.0
23.205	23	2	N4-020217	Rel-5	Correction of Bearer Modification Handling	A	5.0.0
29.232	24	2	N4-020213	Rel-4	Naming convention for TDM resources	F	4.3.0
29.232	25	2	N4-020214	Rel-5	Naming convention for TDM resources	A	5.0.0
29.232	26	2	N4-020218	Rel-4	Correction of Bearer Modification Handling	F	4.3.0
29.232	27	1	N4-020219	Rel-5	Correction of Bearer Modification Handling	A	5.0.0

3GPP TSG CN WG4 Meeting #12 ***N4-020076***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v6.1

CHANGE REQUEST

⌘	23.205	CR	020	⌘ rev	-	⌘	4.3.0	⌘

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

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

Title:	⌘	(G)MSC restoration
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	18th January 2002
Category:	⌘	**F** (essential)
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 align with ITU SG 11 so interoperability will be achieved
Summary of change:	⌘	The CR align with the behavior with Q.1950 on two areas: – the action when timer Tw expires – the use of the normal release procedure after service restoration in the (G)MSC
Consequences if not approved:	⌘	Misalignment with Q.1950 and TDM terminations will be released in uncoordinated way between the (G)MSC and MGW

Clauses affected:	⌘	10.4.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

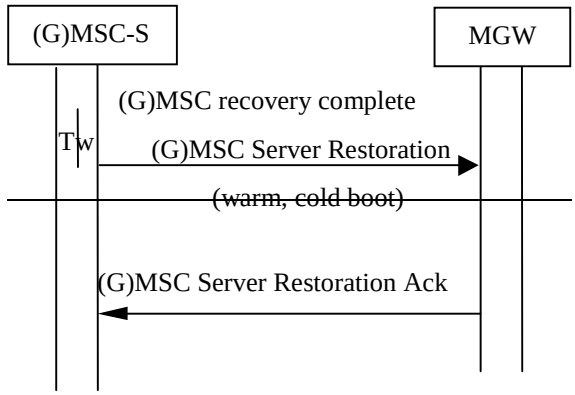
How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

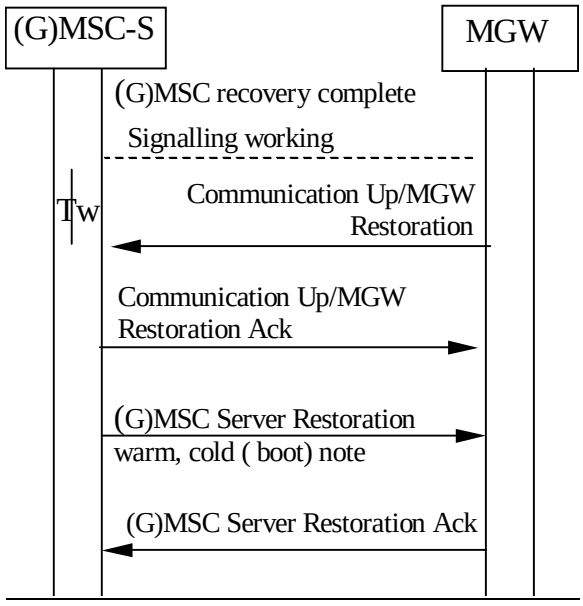
1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.4.2 (G)MSC Server Restoration





Note: Normal release procedure may also be initiated

Figure 10.6 (G)MSC Server Restoration

After the recovery action is complete and it is possible to signal to the MGW 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 Server Restoration~~ an Audit is sent. If the (G)MSC server receives a recovery indication or MGW communication up indication, it shall acknowledge the indication before the (G)MSC Server Restoration may be ~~is~~ sent or the release procedure is initiated.~~.~~

3GPP TSG-CN-WG4 Meeting #12 **N4-020219**
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v4

CHANGE REQUEST

⌘ **29.232** **CR** **027** ⌘ rev **1** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Correction of Bearer Modification Handling
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	29th January 2002
Category:	⌘	**A**
Release:	⌘	REL-5

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:	⌘	The current handling of RAB Assignment Modification is faulty when AAL2 CS2 not supporting MSLC (Modify Support For Link Characteristics) or AAL2 CS1 is applied on the Iu user plane. If MSLC is not supported and a RAB Modification is requested then the Transport would be released and then re-seized. This does not allow coordination between the change of the transport connection and the Bearer Properties of the MGW termination. It is desired to be able in such case to reserve a new termination prior to RAB Modification and request that the transport is moved to this new termination.
Summary of change:	⌘	Modification to the procedures used for RAB Assignment Modification. The procedure Prepare Bearer is updated to include possibility for new event descriptor for Bearer Modification. If the AAL2 link to MGW can be modified then the MGW will notify the MSC using new procedure Bearer Modification. This notification shall indicate to MSC that the modification of the bearer is possible. A new 3GPP package is introduced for this capability.
Consequences if not approved:	⌘	Faulty RAB Assignment Modification when MSLC not supported for AAL2 CS2 or AAL2 CS1 is applied on the Iu user plane.

Clauses affected:	⌘	10, 14.2, 14.2.5, new 14.2.39, new 15.1.5		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.205 CR023
Other comments:	⌘	Please refer to discussion paper N4-011076 which was previously submitted to		

	CN4 #10 meeting in Brighton.

How to create CRs using this form:
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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

10 Formats and codes

Table 1 shows the parameters which are required, in addition to those defined in the subclause "Formats and Codes" of ITU—T Recommendation Q.1950 (see 3GPP TS 29.205 **Error! Reference source not found.**).

The coding rules applied in ITU-T Recommendation H.248 **Error! Reference source not found.** for the applicable coding technique shall be followed for the UMTS capability set.

Table 1: Additional parameters required

Actprot	Signal descriptor	As for the signal "Activate protocol" in subclause **Error! Reference source not found.**
Mode	Local control	As for the property "UP mode of operation" in subclause **Error! Reference source not found.**
Version	Local control	As for the property "Upversion" in subclause **Error! Reference source not found.**
Value	Local control	As for the property " Delivery of errounous SDUs" in subclause **Error! Reference source not found.**
Interface	Local control	As for the property " Interface" in subclause **Error! Reference source not found.**
Initdirection	Local control	As for the property " Initialisation Direction" in subclause **Error! Reference source not found.**
PLMN bearer capability	Local control	As for the property "PLMN BC" in subclause **Error! Reference source not found.**
Coding	Local control	As for the property " GSM channel coding" in subclause **Error! Reference source not found.**
Tfoenable	Local control	As for the property " TFO activity control" in subclause **Error! Reference source not found.**
Codeclist	Local control	As for the property" TFO Codec List" in subclause **Error! Reference source not found.**
Result	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Protocol Negotiation Result" in subclause **Error! Reference source not found.**
Cause	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Protocol Negotiation Result" in subclause **Error! Reference source not found.**
Rate	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Rate Change" in subclause **Error! Reference source not found.**
Optimalcodec	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Optimal Codec Type" in subclause **Error! Reference source not found.**
Distlist	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Distant TFO List" in subclause **Error! Reference source not found.**
Off / value	Local control	As for the property "Echo cancelling" in subclause E.13.1 in ITU-T Recommendation H.248 **Error! Reference source not found.**
Error	Error descriptor	As defined in the subclause "Command error code" in ITU-T Recommendation H.248 **Error! Reference source not found.**
Bearer Modification Support	EventDescriptor	As for the EventsDescriptor in "Bearer Modification Support" in subclause 15.1.4.2.
Bearer modification possible	ObservedEvent descriptor	As for the ObserverdEventDescriptor in “Bearer Modification Support” in subclause ~~14.2.39~~15.1.4.2.

Next modified section

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 **Error! Reference source not found.**) and the corresponding stage 2 procedure defined in 3GPP TS 23.205 **Error! Reference source not found.**.

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** Error! Reference source not found. **and 23.153** Error! Reference source not found.	Comments
Change_Topology	Change Flow Direction	
Join	Join Bearer Terminations	
Isolate	Isolate Bearer Terminations	
Establish_BNC_notify+(tunnel)	Establish Bearer	
Prepare_BNC_notify+(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	
Detect digit(BIWF)	Report DTMF	
Confirm_char	Confirm char	
Modify_ Char	Modify char	
Reserve_Char	Reserve char	
BNC Modified	Bearer modified	
Echo canceller	Activate Voice Processing Function	
BNC connected	**[Editors note: No definition yet]**	
BNC modification failed	Bearer modified failed	
Tunnel (MGC-MGW)	Tunnel information down	
Tunnel (MGW-MGC)	Tunnel information up	
Insert tone	Stop tone	
Insert announcement	Stop announcement	
Detect digits	Stop DTMF detection	
Insert digit	Stop DTMF	
Insert tone	Tone completed	
Not defined	Reserve circuit	
Not defined	Command rejected	
Not defined	TFO activation	
Not defined	Codec_modify	
Not defined	Optimal codec and distant list_notify	
Not defined	Distant codec list	
Modify char	Modify bearer characteristics	
Not defined	IWF Protocol Indication	
Not defined	Bearer Modification Support	

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).

Next modified section

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 **Error! Reference source not found.**) 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") If indication on Bearer Modification requested: NotificationRequested (Event ID = x, "Bearer Modification Support")	PLMN bearer capability = PLMN capability GSM channel coding = coding

The parameter logical port is not used.

:

:

14.2.36 Modify bearer characteristics

This procedure is the same as that defined in the subclause "Modify Char" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 **Error! Reference source not found.**) 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

Next modified section

14.2.39 Bearer Modification Support

When the procedure "Bearer Modification Support" is required, the following procedure is initiated:

The MGW sends a NOT.req command with the following information to indicate that the bearer can be modified.

1 NOT.req (Bearer Modification Support) MGW to MGC

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

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

2 NOT.resp (Bearer Modification Support) MGC to MGW

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

Next modified section

15.1.5 Modification Of Link Characteristics Bearer Capability

PackageName: Modification of Link Characteristics Bearer Capability

PackageID: threegmlc(0x00~~33~~??) [Editor's note: This needs to be registered with IANA]

Description: This package contains an event that when requested by the MGC will cause the MG to notify the MGC that modification of the link characteristics is allowed. This notification is typically generated when the bearer has been established.

Version: 1

Extends: None

15.1.54.1 Properties

None

15.1.54.2 Events

Bearer Modification Support Event

EventID: mod~~ify~~_link_supp~~orted~~ (0x0001)

Description:
The event is used to notify the MGC that modification of the link characteristics of the current bearer connection is permitted.

EventsDescriptor Parameters: None

ObservedEventsDescriptor Parameters: None

15.1.54.3 Signals

None

15.1.54.4 Statistics

None

15.1.54.5 Procedures

~~None~~If the MGC is interested in determining whether or not the bearer associated with a termination supports modification of its link characteristics it shall send a request (Add/Modify/Move) with the Bearer Modification Support Event. When the bearer is established the MG will indicate in a Notify request to the MGC if~~that~~ modification of link characteristics is supported. A notify will NOT be generated if modification is NOT supported on the bearer.

End modified section

3GPP TSG-CN-WG4 Meeting #12 ***N4-020218***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v4

CHANGE REQUEST

⌘ **29.232** **CR** **026** ⌘ rev **2** ⌘ Current version: **4.3.0** ⌘

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

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

Title:	⌘	Correction of Bearer Modification Handling
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	29th January 2002
Category:	⌘	**F** (Essential)
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
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B *(Addition of feature),*
C *(Functional modification of feature)*
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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 current handling of RAB Assignment Modification is faulty when AAL2 CS2 not supporting MSLC (Modify Support For Link Characteristics) or AAL2 CS1 is applied on the Iu user plane. If MSLC is not supported and a RAB Modification is requested then the Transport would be released and then re-seized. This does not allow coordination between the change of the transport connection and the Bearer Properties of the MGW termination. It is desired to be able in such case to reserve a new termination prior to RAB Modification and request that the transport is moved to this new termination.
Summary of change:	⌘	Modification to the procedures used for RAB Assignment Modification. The procedure Prepare Bearer is updated to include possibility for new event descriptor for Bearer Modification. If the AAL2 link to MGW can be modified then the MGW will notify the MSC using new procedure Bearer Modification. This notification shall indicate to MSC that the modification of the bearer is possible. A new 3GPP package is introduced for this capability.
Consequences if not approved:	⌘	Faulty RAB Assignment Modification when MSLC not supported for AAL2 CS2 or AAL2 CS1 is applied on the Iu user plane.

Clauses affected:	⌘	10, 14.2, 14.2.5, new 14.2.39, new 15.1.5		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.205 CR022
Other comments:	⌘	Please refer to discussion paper N4-011076 which was previously submitted to		

	CN4 #10 meeting in Brighton.

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

First modified section

10 Formats and codes

Table 1 shows the parameters which are required, in addition to those defined in the subclause "Formats and Codes" of ITU—T Recommendation Q.1950 (see 3GPP TS 29.205 **Error! Reference source not found.**).

The coding rules applied in ITU-T Recommendation H.248 **Error! Reference source not found.** for the applicable coding technique shall be followed for the UMTS capability set.

Table 1: Additional parameters required

Actprot	Signal descriptor	As for the signal "Activate protocol" in subclause **Error! Reference source not found.**
Mode	Local control	As for the property "UP mode of operation" in subclause **Error! Reference source not found.**
Version	Local control	As for the property "Upversion" in subclause **Error! Reference source not found.**
Value	Local control	As for the property " Delivery of errounous SDUs" in subclause **Error! Reference source not found.**
Interface	Local control	As for the property " Interface" in subclause **Error! Reference source not found.**
Initdirection	Local control	As for the property " Initialisation Direction" in subclause **Error! Reference source not found.**
PLMN bearer capability	Local control	As for the property "PLMN BC" in subclause **Error! Reference source not found.**
Coding	Local control	As for the property " GSM channel coding" in subclause **Error! Reference source not found.**
Tfoenable	Local control	As for the property " TFO activity control" in subclause **Error! Reference source not found.**
Codeclist	Local control	As for the property" TFO Codec List" in subclause **Error! Reference source not found.**
Result	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Protocol Negotiation Result" in subclause **Error! Reference source not found.**
Cause	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Protocol Negotiation Result" in subclause **Error! Reference source not found.**
Rate	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Rate Change" in subclause **Error! Reference source not found.**
Optimalcodec	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Optimal Codec Type" in subclause **Error! Reference source not found.**
Distlist	ObservedEvent descriptor	As for the ObservedEventDescriptor parameter "Distant TFO List" in subclause **Error! Reference source not found.**
Off / value	Local control	As for the property "Echo cancelling" in subclause E.13.1 in ITU-T Recommendation H.248 **Error! Reference source not found.**
Error	Error descriptor	As defined in the subclause "Command error code" in ITU-T Recommendation H.248 **Error! Reference source not found.**
Bearer Modification Support	EventDescriptor	As for the EventsDescriptor in "Bearer Modification Support" in subclause 15.1.4.2.
Bearer modification possible	ObservedEvent descriptor	As for the ObserverdEventDescriptor in “Bearer Modification Support” in subclause ~~14.2.39~~15.1.4.2.

Next modified section

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 **Error! Reference source not found.**) and the corresponding stage 2 procedure defined in 3GPP TS 23.205 **Error! Reference source not found.**.

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** Error! Reference source not found. **and 23.153** Error! Reference source not found.	Comments
Change_Topology	Change Flow Direction	
Join	Join Bearer Terminations	
Isolate	Isolate Bearer Terminations	
Establish_BNC_notify+(tunnel)	Establish Bearer	
Prepare_BNC_notify+(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	
Detect digit(BIWF)	Report DTMF	
Confirm_char	Confirm char	
Modify_ Char	Modify char	
Reserve_Char	Reserve char	
BNC Modified	Bearer modified	
Echo canceller	Activate Voice Processing Function	
BNC connected	**[Editors note: No definition yet]**	
BNC modification failed	Bearer modified failed	
Tunnel (MGC-MGW)	Tunnel information down	
Tunnel (MGW-MGC)	Tunnel information up	
Insert tone	Stop tone	
Insert announcement	Stop announcement	
Detect digits	Stop DTMF detection	
Insert digit	Stop DTMF	
Insert tone	Tone completed	
Not defined	Reserve circuit	
Not defined	Command rejected	
Not defined	TFO activation	
Not defined	Codec_modify	
Not defined	Optimal codec and distant list_notify	
Not defined	Distant codec list	
Modify char	Modify bearer characteristics	
Not defined	IWF Protocol Indication	
Not defined	Bearer Modification Support	

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).

Next modified section

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 **Error! Reference source not found.**) 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") If indication on Bearer Modification requested: NotificationRequested (Event ID = x, "Bearer Modification Support")	PLMN bearer capability = PLMN capability GSM channel coding = coding

The parameter logical port is not used.

:

:

14.2.36 Modify bearer characteristics

This procedure is the same as that defined in the subclause "Modify Char" in ITU-T Recommendation Q.1950 (see 3GPP TS 29.205 **Error! Reference source not found.**) 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

Next modified section

14.2.39 Bearer Modification Support

When the procedure "Bearer Modification Support" is required, the following procedure is initiated:

The MGW sends a NOT.req command with the following information to indicate that the bearer can be modified.

1 NOT.req (Bearer Modification Support) MGW to MGC

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

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

2 NOT.resp (Bearer Modification Support) MGC to MGW

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

Next modified section

15.1.5 Modification Of Link Characteristics Bearer Capability

PackageName: Modification of Link Characteristics Bearer Capability

PackageID: threegmlc(0x00~~33~~??) [Editor's note: This needs to be registered with IANA]

Description: This package contains an event that when requested by the MGC will cause the MG to notify the MGC that modification of the link characteristics is allowed. This notification is typically generated when the bearer has been established.

Version: 1

Extends: None

15.1.54.1 Properties

None

15.1.54.2 Events

Bearer Modification Support Event

EventID: mod~~ify~~_link_supp~~orted~~ (0x0001)

Description:
The event is used to notify the MGC that modification of the link characteristics of the current bearer connection is permitted.

EventsDescriptor Parameters: None

ObservedEventsDescriptor Parameters: None

15.1.54.3 Signals

None

15.1.54.4 Statistics

None

15.1.54.5 Procedures

~~None~~If the MGC is interested in determining whether or not the bearer associated with a termination supports modification of its link characteristics it shall send a request (Add/Modify/Move) with the Bearer Modification Support Event. When the bearer is established the MG will indicate in a Notify request to the MGC if~~that~~ modification of link characteristics is supported. A notify will NOT be generated if modification is NOT supported on the bearer.

End modified section

3GPP TSG CN WG4 Meeting #12 ***N4-020214***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v6.1

CHANGE REQUEST

⌘	29.232	CR	025	⌘	rev	2	⌘	Current version:	5.0.0	⌘

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

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

Title:	⌘	Naming convention for TDM resources
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	30.01.2002
Category:	⌘	**A**
Release:	⌘	Rel-5

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:	⌘	In the launch of MSC servers and MGWs will interworking issues between user and control plane NEs delivered by different vendors become important. This far the termination ID in the 29.232 is just specified being known by MSC server and MGW before or during the start-up of MGW. Therefore 29.232 leaves several possibilities to use termination ID which may result interworking problems in the future between products from different vendors.
Summary of change:	⌘	In order to achieve interoperability among multivendor equipments termination identifier structure used by MSC Server to reserve TDM resources are clarified.
Consequences if not approved:	⌘	Termination ID in the 29.232 is just specified being known by MSC server and MGW before or during the start-up of MGW. Therefore 29.232 leaves several possibilities to use Termination ID which will result lot of configuration work and inter-working problems in the future between products from different vendors. By defining Termination ID unambiguously for TDM circuit bearer number of inter-working problems can be decreased.

Clauses affected:	⌘	5.2
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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

5.2 Termination names

~~The Termination ID structure is provisioned in the MGC and MGW and is known by the MGW and the MGC at or before start-up. It should be possible to distinguish between ephemeral and physical terminations.~~

The Termination ID structure shall follow the guidelines of H.248 and the structure is either relevant or irrelevant for MGC and MGW.

The relevance depends on the utilized bearer type for termination. With ephemeral ATM/AAL2 and IP endpoint bearer types the internal structure of Termination ID is irrelevant for MGW and MGC and therefore Termination ID is only numeric identifier for termination. When bearer type is physical timeslot within TDM circuit the Termination ID structure shall follow the Termination naming convention for TDM circuit bearer.

5.2.1 Termination naming convention

The following general structure of termination ID shall be used:

ASN.1 coding:

4 octets shall be used for the termination ID. The following defines the general strucutre for the termination ID:

Termination type	X

Termination type:
Length 3 bits
Values:
000 Reserved
001 Ephemeral termination
010 TDM termination
011 - 110 Reserved
111 Reserved for ROOT termination Id

X:
Length 29 bits.
Usage dependent on Termination type. TDM terminations specified below in chapter 5.2.2. Other usage un-specified.

ABNF coding:

TerminationID = "ROOT" / pathName / "$" / "'*" ; According to H.248 Annex B

With ephemeral termination:

pathName = EphTokenUNDERSCORE(EPHsystem/"*")

EPHsystem : Usage is not specified

5.2.2 Termination naming convention for TDM terminations

ASN.1 coding:

Termination type (=010)	PCM system	Individual

PCM system:
Length 24 bits.
Usage unspecified. Uniquely identifies PCM interface in MGw

Individual:
Length: 5 bits
Max. of 32 individuals (timeslots) per PCM system (max. 24 for a 24 channel system)

ABNF coding:

pathName = TDMToken UNDERSCORE ((PCMsystem / "*") SLASH (Individual / "*"))

PCMsystem : Usage not specified

Individual = 1 * 2 (DIGIT) ; 0-31

3GPP TSG CN WG4 Meeting #12 ***N4-020213***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v6.1

CHANGE REQUEST

⌘	29.232	CR	024	⌘	rev	2	⌘	Current version:	4.3.0	⌘

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

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

Title:	⌘	Naming convention for TDM resources
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	30.01.2002
Category:	⌘	**F** (Agreed by consensus)
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:	⌘	In the launch of MSC servers and MGWs will interworking issues between user and control plane NEs delivered by different vendors become important. This far the termination ID in the 29.232 is just specified being known by MSC server and MGW before or during the start-up of MGW. Therefore 29.232 leaves several possibilities to use termination ID which may result interworking problems in the future between products from different vendors.
Summary of change:	⌘	In order to achieve interoperability among multivendor equipments termination identifier structure used by MSC Server to reserve TDM resources are clarified.
Consequences if not approved:	⌘	Termination ID in the 29.232 is just specified being known by MSC server and MGW before or during the start-up of MGW. Therefore 29.232 leaves several possibilities to use Termination ID which will result lot of configuration work and inter-working problems in the future between products from different vendors. By defining Termination ID unambiguously for TDM circuit bearer number of inter-working problems can be decreased.

Clauses affected:	⌘	5.2
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

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

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

5.2 Termination names

~~The Termination ID structure is provisioned in the MGC and MGW and is known by the MGW and the MGC at or before start-up. It should be possible to distinguish between ephemeral and physical terminations.~~

The Termination ID structure shall follow the guidelines of H.248 and the structure is either relevant or irrelevant for MGC and MGW.

The relevance depends on the utilized bearer type for termination. With ephemeral ATM/AAL2 and IP endpoint bearer types the internal structure of Termination ID is irrelevant for MGW and MGC and therefore Termination ID is only numeric identifier for termination. When bearer type is physical timeslot within TDM circuit the Termination ID structure shall follow the Termination naming convention for TDM circuit bearer.

5.2.1 Termination naming convention

The following general structure of termination ID shall be used:

ASN.1 coding:

4 octets shall be used for the termination ID. The following defines the general strucutre for the termination ID:

Termination type	X

Termination type:
Length 3 bits
Values:
000 Reserved
001 Ephemeral termination
010 TDM termination
011 - 110 Reserved
111 Reserved for ROOT termination Id

X:
Length 29 bits.
Usage dependent on Termination type. TDM terminations specified below in chapter 5.2.2. Other usage un-specified.

ABNF coding:

TerminationID = "ROOT" / pathName / "$" / "'*" ; According to H.248 Annex B

With ephemeral termination:

pathName = EphTokenUNDERSCORE(EPHsystem/"*")

EPHsystem : Usage is not specified

5.2.2 Termination naming convention for TDM terminations

ASN.1 coding:

Termination type (=010)	PCM system	Individual

PCM system:
Length 24 bits.
Usage unspecified. Uniquely identifies PCM interface in MGw

Individual:
Length: 5 bits
Max. of 32 individuals (timeslots) per PCM system (max. 24 for a 24 channel system)

ABNF coding:

pathName = TDMToken UNDERSCORE ((PCMsystem / "*") SLASH (Individual / "*"))

PCMsystem : Usage not specified

Individual = 1 * 2 (DIGIT) ; 0-31

3GPP TSG-CN-WG4 Meeting #12 ***N4-020217***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v4

CHANGE REQUEST

⌘ **23.205 CR 023** ⌘ rev **2** ⌘ Current version: **5.0.0** ⌘

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

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

Title:	⌘	Correction of Bearer Modification Handling
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	30th January 2002
Category:	⌘	**A**
Release:	⌘	REL-5

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:	⌘	The current handling of RAB Assignment Modification is faulty when AAL2 CS2 not supporting MSLC (Modify Support For Link Characteristics) or AAL2 CS1 is applied on the Iu user plane. If MSLC is not supported and a RAB Modification is requested then the Transport would be released and then re-seized. This does not allow coordination between the change of the transport connection and the Bearer Properties of the MGW termination. It is desirable to be able in such case to reserve a new termination prior to RAB Modification and request that the transport is moved to this new termination.
Summary of change:	⌘	Modification to the procedures describing RAB Assignment Modification. For access bearer assignment, the MSC shall indicate in procedure "Prepare Bearer" that the MGW gives a notification if the established bearer can be modified. This possible notification would be received after the AAL2 link towards the MGW is established. The new notification forms part of a new procedure "Bearer Modification Support", which would indicate support of MSLC to the MSC. For modification of the access bearer when MSLC is not supported by the current AAL2 link, the MSC server shall use a new access bearer termination in the existing MGW. The existing text for call hold, call waiting and Alternate Speech/Fax is modified to refer to the amended Bearer Modification subclause.
Consequences if not approved:	⌘	Faulty RAB Assignment Modification when MSLC not supported for AAL2 CS2 or AAL2 CS1 is applied on the Iu user plane.

Clauses affected:	⌘	2, 6.1.1, 6.1.2,13.5, 13.6, 13.17, 13.18.1, 16.2.5, new		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.232 CR027

Other comments:	⌘	Please refer to discussion paper N4-011076 which was previously submitted to CN4 #10 meeting in Brighton.

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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*.

:

:

[26] 3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling"

[27] 3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification"

Next modified section

6.1.1 Forward bearer establishment

The mobile originating call shall be established in accordance with 3GPP TS 23.108 [17]. 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].

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the access bearer assignment or the network side bearer establishment. This may happen either before sending the IAM or after receiving the Bearer Information message. In the latter case, the MGW selection may be based on a possibly received MGW-id from the succeeding node (bullet 1 or bullet 2 in figure 6.2).

Initial addressing

The MSC server shall indicate in the IAM that forward bearer establishment is to be used. If access bearer assignment has not been completed, the MSC server shall indicate that the Continuity message will follow. However, if late access bearer assignment (assignment after alerting or answer) is used the MSC server shall not indicate that the Continuity message will follow. The MSC server provides the bearer characteristics to the succeeding node in the IAM. If the MGW is selected at an earlier stage the MGW-id may also be provided in the IAM (bullet 1 in figure 6.2).

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).

Access bearer assignment

The MSC server shall select bearer characteristics for the access bearer.

For UTRAN, before the MSC server starts the access bearer assignment, the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests access bearer assignment using the provided bearer address and binding reference (bullet 3 in figure 6.2) in accordance with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied to the TDM circuit seizure, the MSC server requests access bearer assignment (bullet 4 in figure 6.2) in accordance with ~~[27]~~3GPP TS 48.008 [27].

Next modified section

6.1.2 Backward bearer establishment

The basic mobile originating call shall be established in accordance with 3GPP TS 23.108 [17]. 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].

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the access bearer assignment or the network side bearer establishment. This happens before sending the IAM (bullet 1 or 2 in figure 6.4).

Network side bearer establishment

The MSC server shall either select preferred bearer characteristics or requests the MGW to select and provide the bearer characteristics for the network side bearer connection before sending the IAM. The MSC server requests the MGW to prepare for the network side bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, and provides the MGW with the preferred bearer characteristics or requests the MGW to select and provide the bearer characteristics (bullet 3 in figure 6.4). After the MGW has replied with the bearer address, the binding reference and the bearer characteristics (if requested), the MSC server sends the IAM to the succeeding node.

Initial addressing

The MSC server shall indicate in the IAM that backward bearer establishment is to be used. If access bearer assignment has not been completed, the MSC server shall indicate that the Continuity message will follow. However, if late access bearer assignment (assignment after alerting or answer) is used the MSC server shall not indicate that the Continuity message will follow. The MSC server provides the bearer characteristics, the bearer address and the binding reference to the succeeding node in the IAM. The MSC server may also provide the MGW-id in the IAM (bullet 4 in figure 6.4).

Access bearer assignment

The MSC server shall select bearer characteristics for the access bearer.

For UTRAN, before the MSC server starts the access bearer assignment, the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests access bearer assignment using the provided bearer address and binding reference (bullet 1 in figure 6.4) in accordance

with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using the Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied the TDM circuit seizure the MSC server requests access bearer assignment (bullet 2 in figure 6.4) in accordance with ~~[27]~~3GPP TS 48.008 [27].

Next modified section

6.2 Basic Mobile Terminating Call

6.2.1 Forward bearer establishment

The basic mobile terminating call shall be established in accordance with 3GPP TS 23.108 [18]. 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].

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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 either of the following conditions is satisfied before sending the SETUP message (bullet 2 in figure 6.6):

1. 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.

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the network side bearer establishment or the access bearer assignment. This happens at latest after the UE has sent the Call Confirmed message. If the MSC server received an MGW-id from the preceding node, it may use this for the MGW selection (bullet 3 in figure 6.6).

Network side bearer establishment

The MSC server requests the MGW to prepare for the network side bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address, a binding reference and to notify when the bearer is established (bullet 3 in figure 6.6). The MSC server also provides the MGW with the bearer characteristics that was received from the preceding node in the IAM. After the MGW has replied with the bearer address and the binding reference, the MSC server provides the Bearer Information message to the preceding node. The MSC server may also provide the MGW-id in the Bearer Information message.

Access bearer assignment

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

1. Either:

a. 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).

The MSC server shall select bearer characteristics for the access bearer. For the access bearer assignment in UTRAN the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests the access bearer assignment using the provided bearer address and the binding reference (bullet 9 in figure 6.6) in accordance with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using the Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied the TDM circuit seizure the MSC server requests access bearer assignment (bullet 10 in figure 6.6) in accordance with ~~[27]~~3GPP TS 48.008 [27].

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].

:

:

6.2.2.2 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 the SETUP message that early access bearer assignment is used, if and only if, either of the following conditions are satisfied before sending the SETUP message (bullet 5 in figure 6.8):

1. If the 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.

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the network side bearer establishment or the access bearer assignment. This happens at latest after the UE has sent the Call Confirmed message. If the MSC server received an MGW-id from the preceding node, it may use this for the MGW selection (bullet 6 in figure 6.8).

Network side bearer establishment

The MSC server requests the MGW to establish a bearer to the given destination MGW and to notify when the bearer is established using the Establish Bearer procedure. The MSC server provides the MGW with the bearer address, the binding reference and the bearer characteristics that were received from the preceding node in the IAM (bullet 6 in figure 6.8).

Access bearer assignment

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

1. Either:
    a. 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).

The MSC server shall select bearer characteristics for the access bearer.

For the access bearer assignment in UTRAN the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests the access bearer assignment using the provided bearer address and the binding reference (bullet 8 in figure 6.8) in accordance with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using the Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied the TDM circuit seizure the MSC server requests access bearer assignment (bullet 9 in figure 6.8) in accordance with ~~[27]~~3GPP TS 48.008 [27].

Next modified section

13.5 Call Waiting (CW)

The procedures specified in 3GPP TS 23.083 [13] for the Call Waiting supplementary service shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Call confirmation to the waiting call

The MSC server shall, on reception of the call confirmation, select the MGW that will be used for the waiting call. The MSC server should select the MGW which is already in use for the active call. 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].

Existing call on hold

The paragraph 'Hold request' in subclause 13.6 applies.

Existing call released

If the active call is disconnected while another call is waiting, the bearer termination towards the waiting party (C) as well as to the called party (A) is not removed.

Acceptance of waiting call

If the mobile subscriber decides to accept the waiting call, it handles (according to 3GPP TS 23.083~~2~~ [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, if required the MSC server shall modify the access bearer as described in subclause 13.18.1.~~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 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].

Waiting call released by calling subscriber (subscriber C)

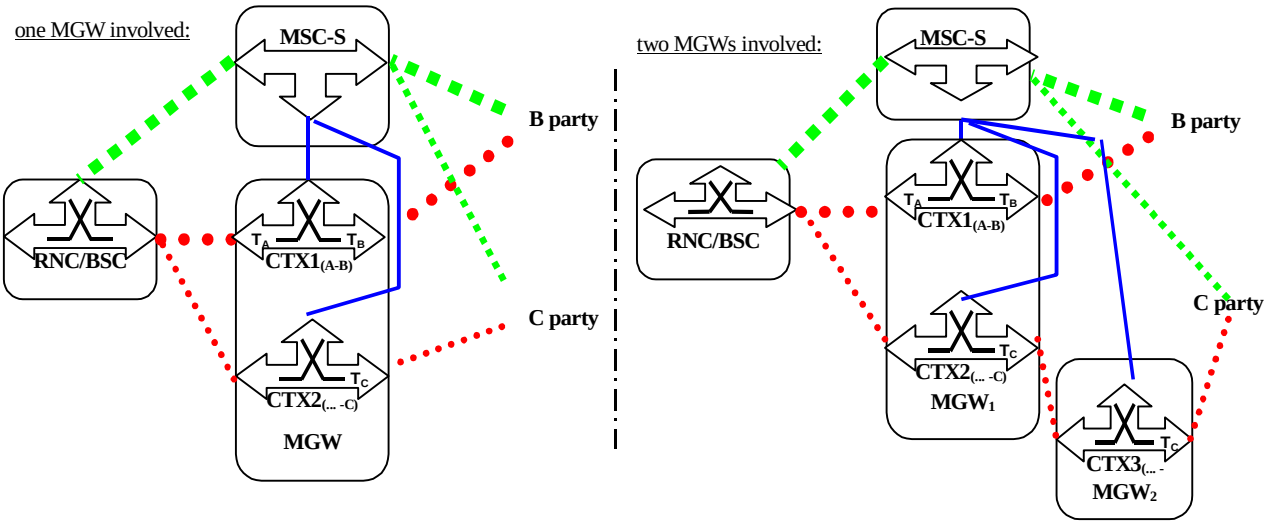
The respective resources already allocated at the selected MGW for the waiting call shall be released.

Example

Figure 13.13 shows the network model for a waiting call at the serving MSC server/MGW. The 'thick, squared' line represents the call control signalling for the existing call and, on the Iu interface, the already existing control plane toward the serving RNC. The 'thin, squared' line represents the call control signalling for the waiting call. The 'thick, dotted' line represents the bearer control signalling and the bearer for the existing call, whereas the 'thin, dotted' line represents the ones for the waiting call. Note that for a TDM access there is no separation of call and bearer control signalling.

Note that there shall be only one instance of bearer resource/bearer control signalling on the radio side.

If the CW condition applies, the MSC server seizes a new context with one bearer termination, T_C, in the MGW. T_A and T_B are the terminations of the already existing call.



Next modified section

13.6 Call Hold (CH)

The procedures specified in 3GPP TS 23.083 [13] for the Call Hold supplementary service shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Hold request

When the UE makes a request for the hold function the MSC server requests the MGW to interrupt the communication on the bearer by changing the through-connection of the bearer termination towards the served mobile subscriber to 'not through-connected'. Announcements may be applied to the held party as described in subclause 14.6.

Retrieval request

When the UE makes a request to retrieve a held call the MSC server requests the MGW to re-establish communication to the held party by changing the through-connection of the bearer termination towards the served mobile subscriber to be both-way through-connected.

Setting up another call

The call towards the C party is established as described for the mobile originating call. A new MGW may be selected in the course of setting up the new 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]. If required, the MSC server shall modify the access bearer for the new call as described in subclause 13.18.1. ~~If the existing access side bearer needs to be modified for the new call, 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 when setting up the new call, 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.~~The MSC server will request the MGW to connect the access side bearer termination to the bearer termination of the remote party.

Alternate from one call to the other

When the hold request for the active call is immediately followed by a retrieve request for the held call the MSC server shall request the MGW to connect the bearer termination of the served mobile subscriber to the bearer termination of the held party. The MSC server also requests the MGW to both-way through-connect the bearer for the previously held call.

Next modified section

13.17 Alternate Speech/Fax

The procedures for facsimile group 3 transparent/non-transparent shall be followed in accordance with GSM TS 03.45 [24] and 3GPP TS 23.146 [25]. 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].

Call and bearer establishment shall be handled as described in the Call Establishment clause. In order to change from speech to fax (or vice versa), the MSC server shall modify the access bearer as described in subclause 13.18.1. ~~the MSC server shall request the MGW either to modify the existing access side bearer termination using the Modify Bearer Characteristics procedure, or to create a new access side bearer termination. In both cases the MSC server will initiate an access bearer modification using either the existing bearer address and binding reference or the new bearer address and binding reference.~~

If the MGW responds with an error to any of the procedures initiated by the MSC server, or the MSC server receives a Bearer Failure procedure from the MGW, the MSC server may either clear the call or reject the change from speech to fax (or vice versa).

After this possible modification, the MGW shall seize an interworking function if a PLMN Bearer Capability [4] has been supplied to the access side bearer termination. When the MSC server receives an answer indication, it shall request activation of the interworking function using the Activate Interworking Function procedure.

Next modified section

13.18 Modification of the Access Bearer

13.18.1 Modification of Bearer Characteristics

The modification of the access bearer is possible during a call establishment and during an active call. If the MSC server needs to modify the access bearer, the existing access side bearer termination in the MGW is modified or a new access side bearer termination is created.~~using the Modify Bearer Characteristics procedure before the access bearer modification is initiated towards the UTRAN/GERAN. The MGW is provided with the new characteristics for the access bearer.~~ The modification of the access bearer shall be performed in accordance with ~~[26]~~3GPP TS 25.413 [26] or ~~[27]~~3GPP TS 48.008 [27].

UTRAN

If the link characteristics for the existing access bearer need to be changed and the MSC server previously received a notification from the MGW that modification of link characteristics of the current transport connection is supported [refer to 26], the MSC server shall use the Modify Bearer Characteristics procedure to provide the MGW with the new bearer characteristics for the existing access side bearer termination. After the MGW has replied, the MSC server shall initiate the access bearer modification towards UTRAN.

If the MSC server has not previously received a notification from the MGW that modification of existing link characteristics is supported, the MSC server shall use the Prepare Bearer procedure to request the MGW to add a new context and a new access side bearer termination, and to provide a bearer address and a binding reference. After the MGW has replied, the MSC server shall initiate the access bearer modification towards UTRAN using the provided bearer address and the binding reference. Upon successful access bearer modification, the MSC server shall connect the new access side bearer termination to the old context and release the old access side bearer termination.

If the user plane mode of the modified access bearer is ‘Support Mode’, the Iu UP will also be re-initialised as defined in [20].

GERAN

The MSC server shall use the Modify Bearer Characteristics procedure to the MGW to provide the new bearer characteristics for the existing access side bearer termination. After the MGW has replied, the MSC server shall initiate the access bearer modification towards GERAN.

Next modified section

16.2 Procedures between (G)MSC server and MGW

The clauses below indicate the procedures used between (G)MSC server and MGW in Mc interface. The procedures are logical, i.e. message identifiers are not part of the protocol. Several logical procedures can be combined into one H.248 command in order to perform required transactions. If several logical procedures are combined, only one context/context request and only one bearer termination/bearer termination request is sent in the H.248 command. Exemption is the Change Flow Direction procedure, where the two bearer terminations are related to a change of the context and not to a command of the bearer termination. All the procedures below describe a successful operation. If the procedure is rejected, a Command Reject is sent back to the entity that sent the command request.

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16.2.5 Prepare Bearer

This procedure is used to prepare for a bearer establishment.

Table 16.6: Procedures between (G)MSC server and MGW: Prepare Bearer

Procedure	Initiated	Information element name	Information element required	Information element description
Prepare Bearer	(G)MSC-S	Context/Context Request	M	This information element indicates the existing context or requests a new context for the bearer termination.
		Bearer Termination Request	M	This information element requests a new bearer termination for the bearer to be established.
		Binding Reference Request	M	This information element requests the bearer identifier in the MGW.
		Bearer Address Request	M	This information element requests the bearer address of the MGW.
		Sender Binding Reference	O	This information element indicates the bearer identifier of the sending MGW.
		Sender Bearer Address	O	This information element indicates the bearer address of the sending MGW.
		Bearer Characteristics/ Bearer Characteristics Requests	M	This information element indicates the preferred characteristics of the bearer connection or requests the MGW to select and provide the bearer characteristics.
		Bearer Service Characteristics	C	This information element indicates the bearer service requested by the user. This information element is included if neither Codec information element nor Circuit Switched Data information elements are provided.
		Notify Established Bearer	O	This information element requests a notification of an established bearer.
		Notify Bearer Modification	O	This information element requests a notification that bearer modification of the established bearer is allowed. This information element is included for access bearer assignment.
		Tunnel Support	O	This information element indicates the support of tunnel data transfer and when to send tunnel data.
		Circuit Switched Data	C	This information element indicates the PLMN bearer capabilities and when applicable GSM channel coding. This information element is included for a non-speech call by the MSC server, or by the anchor-MSC in case of inter-MSC handover, for a radio access network side bearer termination.
		Codec	C	This information element indicates the speech coding format to be used for the bearer. This information element is included for a speech call for a radio access network side bearer termination.
		Framing Protocol	O	This information element indicates the framing protocol to be used for the bearer.
Prepare Bearer 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.
		Binding Reference	M	This information element indicates the bearer identifier in the MGW.
		Bearer Address	M	This information element indicates the bearer address of the MGW

		Bearer Characteristics	C	This information element indicates the characteristics of the bearer connection. This information element is included, if requested by the (G)MSC server or changed from the (G)MSC server preferred one.
		Tunnel Usage	O	This information element indicates the usage of tunnel data transfer in the call control protocol.

Next modified section

16.2.x Bearer Modification Support

This procedure is used to notify that the established bearer can be modified.

Table 16.x: Procedures between (G)MSC server and MGW: Bearer Modification

Procedure	Initiated	Information element name	Information element required	Information element description
Bearer Modification Support	MGW	Context	M	This information element indicates the context for the bearer termination.
		Bearer Termination	M	This information element indicates the bearer termination where the bearer was established.
		Bearer Modification	M	This information element notifies that the established bearer can be modified.
Bearer Modification Support Ack	(G)MSC-S	Context	M	This information element indicates the context where the command was executed.

End modified section

3GPP TSG-CN-WG4 Meeting #12 ***N4-020216***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v4

CHANGE REQUEST

⌘ **23.205 CR 022** ⌘ rev **2** ⌘ Current version: **4.3.0** ⌘

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

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

Title:	⌘	Correction of Bearer Modification Handling
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	30th January 2002
Category:	⌘	**F** (Essential)
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:	⌘	The current handling of RAB Assignment Modification is faulty when AAL2 CS2 not supporting MSLC (Modify Support For Link Characteristics) or AAL2 CS1 is applied on the Iu user plane. If MSLC is not supported and a RAB Modification is requested then the Transport would be released and then re-seized. This does not allow coordination between the change of the transport connection and the Bearer Properties of the MGW termination. It is desirable to be able in such case to reserve a new termination prior to RAB Modification and request that the transport is moved to this new termination.
Summary of change:	⌘	Modification to the procedures describing RAB Assignment Modification. For access bearer assignment, the MSC shall indicate in procedure "Prepare Bearer" that the MGW gives a notification if the established bearer can be modified. This possible notification would be received after the AAL2 link towards the MGW is established. The new notification forms part of a new procedure "Bearer Modification Support", which would indicate support of MSLC to the MSC. For modification of the access bearer when MSLC is not supported by the current AAL2 link, the MSC server shall use a new access bearer termination in the existing MGW. The existing text for call hold, call waiting and Alternate Speech/Fax is modified to refer to the amended Bearer Modification subclause.
Consequences if not approved:	⌘	Faulty RAB Assignment Modification when MSLC not supported for AAL2 CS2 or AAL2 CS1 is applied on the Iu user plane.

Clauses affected:	⌘	2, 6.1.1, 6.1.2,13.5, 13.6, 13.17, 13.18.1, 16.2.5, new		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	29.232 CR026

Other comments:	⌘	Please refer to discussion paper N4-011076 which was previously submitted to CN4 #10 meeting in Brighton.

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.*

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[26] 3GPP TS 25.413: "UTRAN Iu Interface RANAP Signalling"

[27] 3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification"

Next modified section

6.1.1 Forward bearer establishment

The mobile originating call shall be established in accordance with 3GPP TS 23.108 [17]. 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].

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the access bearer assignment or the network side bearer establishment. This may happen either before sending the IAM or after receiving the Bearer Information message. In the latter case, the MGW selection may be based on a possibly received MGW-id from the succeeding node (bullet 1 or bullet 2 in figure 6.2).

Initial addressing

The MSC server shall indicate in the IAM that forward bearer establishment is to be used. If access bearer assignment has not been completed, the MSC server shall indicate that the Continuity message will follow. However, if late access bearer assignment (assignment after alerting or answer) is used the MSC server shall not indicate that the Continuity message will follow. The MSC server provides the bearer characteristics to the succeeding node in the IAM. If the MGW is selected at an earlier stage the MGW-id may also be provided in the IAM (bullet 1 in figure 6.2).

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).

Access bearer assignment

The MSC server shall select bearer characteristics for the access bearer.

For UTRAN, before the MSC server starts the access bearer assignment, the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests access bearer assignment using the provided bearer address and binding reference (bullet 3 in figure 6.2) in accordance with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied to the TDM circuit seizure, the MSC server requests access bearer assignment (bullet 4 in figure 6.2) in accordance with ~~[27]~~3GPP TS 48.008 [27].

Next modified section

6.1.2 Backward bearer establishment

The basic mobile originating call shall be established in accordance with 3GPP TS 23.108 [17]. 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].

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the access bearer assignment or the network side bearer establishment. This happens before sending the IAM (bullet 1 or 2 in figure 6.4).

Network side bearer establishment

The MSC server shall either select preferred bearer characteristics or requests the MGW to select and provide the bearer characteristics for the network side bearer connection before sending the IAM. The MSC server requests the MGW to prepare for the network side bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, and provides the MGW with the preferred bearer characteristics or requests the MGW to select and provide the bearer characteristics (bullet 3 in figure 6.4). After the MGW has replied with the bearer address, the binding reference and the bearer characteristics (if requested), the MSC server sends the IAM to the succeeding node.

Initial addressing

The MSC server shall indicate in the IAM that backward bearer establishment is to be used. If access bearer assignment has not been completed, the MSC server shall indicate that the Continuity message will follow. However, if late access bearer assignment (assignment after alerting or answer) is used the MSC server shall not indicate that the Continuity message will follow. The MSC server provides the bearer characteristics, the bearer address and the binding reference to the succeeding node in the IAM. The MSC server may also provide the MGW-id in the IAM (bullet 4 in figure 6.4).

Access bearer assignment

The MSC server shall select bearer characteristics for the access bearer.

For UTRAN, before the MSC server starts the access bearer assignment, the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests access bearer assignment using the provided bearer address and binding reference (bullet 1 in figure 6.4) in accordance

with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using the Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied the TDM circuit seizure the MSC server requests access bearer assignment (bullet 2 in figure 6.4) in accordance with ~~[27]~~3GPP TS 48.008 [27].

Next modified section

6.2 Basic Mobile Terminating Call

6.2.1 Forward bearer establishment

The basic mobile terminating call shall be established in accordance with 3GPP TS 23.108 [18]. 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].

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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 either of the following conditions is satisfied before sending the SETUP message (bullet 2 in figure 6.6):

1. 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.

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the network side bearer establishment or the access bearer assignment. This happens at latest after the UE has sent the Call Confirmed message. If the MSC server received an MGW-id from the preceding node, it may use this for the MGW selection (bullet 3 in figure 6.6).

Network side bearer establishment

The MSC server requests the MGW to prepare for the network side bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address, a binding reference and to notify when the bearer is established (bullet 3 in figure 6.6). The MSC server also provides the MGW with the bearer characteristics that was received from the preceding node in the IAM. After the MGW has replied with the bearer address and the binding reference, the MSC server provides the Bearer Information message to the preceding node. The MSC server may also provide the MGW-id in the Bearer Information message.

Access bearer assignment

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

1. Either:

a. 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).

The MSC server shall select bearer characteristics for the access bearer. For the access bearer assignment in UTRAN the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests the access bearer assignment using the provided bearer address and the binding reference (bullet 9 in figure 6.6) in accordance with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using the Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied the TDM circuit seizure the MSC server requests access bearer assignment (bullet 10 in figure 6.6) in accordance with ~~[27]~~3GPP TS 48.008 [27].

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].

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6.2.2.2 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 the SETUP message that early access bearer assignment is used, if and only if, either of the following conditions are satisfied before sending the SETUP message (bullet 5 in figure 6.8):

1. If the 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.

MGW selection

The MSC server shall select an MGW for the bearer connection before it performs the network side bearer establishment or the access bearer assignment. This happens at latest after the UE has sent the Call Confirmed message. If the MSC server received an MGW-id from the preceding node, it may use this for the MGW selection (bullet 6 in figure 6.8).

Network side bearer establishment

The MSC server requests the MGW to establish a bearer to the given destination MGW and to notify when the bearer is established using the Establish Bearer procedure. The MSC server provides the MGW with the bearer address, the binding reference and the bearer characteristics that were received from the preceding node in the IAM (bullet 6 in figure 6.8).

Access bearer assignment

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

1. Either:

    a. 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).

The MSC server shall select bearer characteristics for the access bearer.

For the access bearer assignment in UTRAN the MSC server requests the MGW to prepare for the access bearer establishment using the Prepare Bearer procedure. The MSC server requests the MGW to provide a bearer address and a binding reference, ~~and~~ provides the MGW with the bearer characteristics and requests notification that the bearer can be modified. For speech calls, the MSC server shall provide the MGW with the speech coding information for the bearer. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4]. After the MGW has replied with the bearer address and the binding reference the MSC server requests the access bearer assignment using the provided bearer address and the binding reference (bullet 8 in figure 6.8) in accordance with ~~[26]~~3GPP TS 25.413 [26]. The MSC shall only be notified by the MGW using the Bearer Modification Support procedure if the existing link characteristics of the access bearer can be modified at a later stage, see subclause 13.18.1.

For GERAN, before the MSC server starts the access bearer assignment, the MSC server uses the Reserve Circuit procedure to seize a TDM circuit. For a non-speech call the MSC server also provides the MGW with a PLMN Bearer Capability [4] and a GSM channel coding. After the MGW has replied the TDM circuit seizure the MSC server requests access bearer assignment (bullet 9 in figure 6.8) in accordance with ~~[27]~~3GPP TS 48.008 [27].

Next modified section

13.5 Call Waiting (CW)

The procedures specified in 3GPP TS 23.083 [13] for the Call Waiting supplementary service shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Call confirmation to the waiting call

The MSC server shall, on reception of the call confirmation, select the MGW that will be used for the waiting call. The MSC server should select the MGW which is already in use for the active call. 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].

Existing call on hold

The paragraph 'Hold request' in subclause 13.6 applies.

Existing call released

If the active call is disconnected while another call is waiting, the bearer termination towards the waiting party (C) as well as to the called party (A) is not removed.

Acceptance of waiting call

If the mobile subscriber decides to accept the waiting call, it handles (according to 3GPP TS 23.083~~2~~ [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, if required the MSC server shall modify the access bearer as described in subclause 13.18.1.~~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 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].

Waiting call released by calling subscriber (subscriber C)

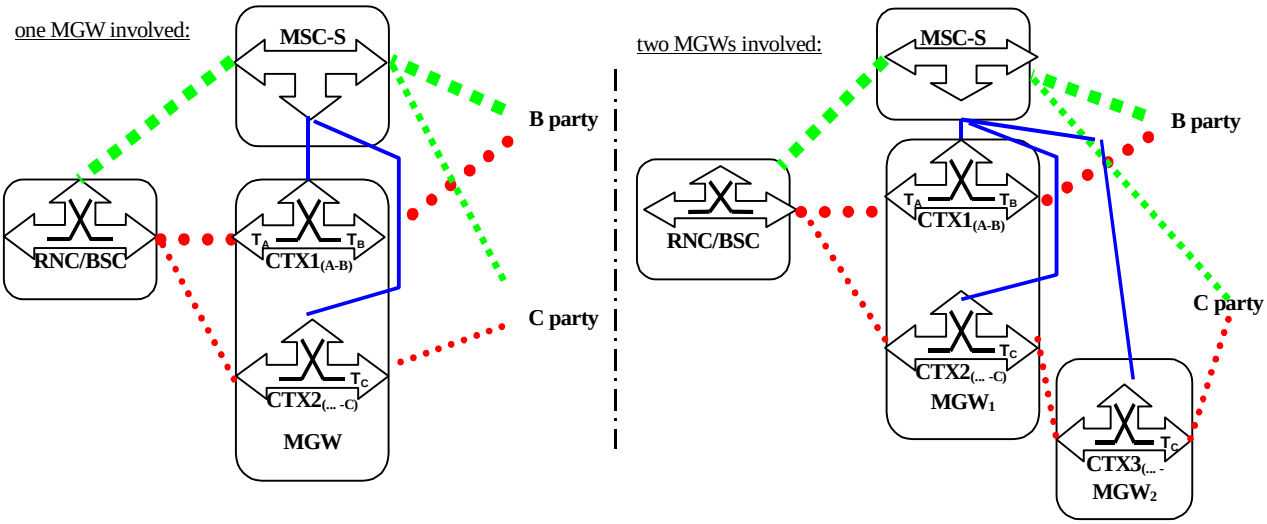
The respective resources already allocated at the selected MGW for the waiting call shall be released.

Example

Figure 13.13 shows the network model for a waiting call at the serving MSC server/MGW. The 'thick, squared' line represents the call control signalling for the existing call and, on the Iu interface, the already existing control plane toward the serving RNC. The 'thin, squared' line represents the call control signalling for the waiting call. The 'thick, dotted' line represents the bearer control signalling and the bearer for the existing call, whereas the 'thin, dotted' line represents the ones for the waiting call. Note that for a TDM access there is no separation of call and bearer control signalling.

Note that there shall be only one instance of bearer resource/bearer control signalling on the radio side.

If the CW condition applies, the MSC server seizes a new context with one bearer termination, T_C, in the MGW. T_A and T_B are the terminations of the already existing call.



Next modified section

13.6 Call Hold (CH)

The procedures specified in 3GPP TS 23.083 [13] for the Call Hold supplementary service shall be followed. The following paragraphs describe the additional requirements for the bearer independent CS core network.

Hold request

When the UE makes a request for the hold function the MSC server requests the MGW to interrupt the communication on the bearer by changing the through-connection of the bearer termination towards the served mobile subscriber to 'not through-connected'. Announcements may be applied to the held party as described in subclause 14.6.

Retrieval request

When the UE makes a request to retrieve a held call the MSC server requests the MGW to re-establish communication to the held party by changing the through-connection of the bearer termination towards the served mobile subscriber to be both-way through-connected.

Setting up another call

The call towards the C party is established as described for the mobile originating call. A new MGW may be selected in the course of setting up the new 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]. If required, the MSC server shall modify the access bearer for the new call as described in subclause 13.18.1. ~~If the existing access side bearer needs to be modified for the new call, 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 when setting up the new call, 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.~~The MSC server will request the MGW to connect the access side bearer termination to the bearer termination of the remote party.

Alternate from one call to the other

When the hold request for the active call is immediately followed by a retrieve request for the held call the MSC server shall request the MGW to connect the bearer termination of the served mobile subscriber to the bearer termination of the held party. The MSC server also requests the MGW to both-way through-connect the bearer for the previously held call.

Next modified section

13.17 Alternate Speech/Fax

The procedures for facsimile group 3 transparent/non-transparent shall be followed in accordance with GSM TS 03.45 [24] and 3GPP TS 23.146 [25]. 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].

Call and bearer establishment shall be handled as described in the Call Establishment clause. In order to change from speech to fax (or vice versa), the MSC server shall modify the access bearer as described in subclause 13.18.1. ~~the MSC server shall request the MGW either to modify the existing access side bearer termination using the Modify Bearer Characteristics procedure, or to create a new access side bearer termination. In both cases the MSC server will initiate an access bearer modification using either the existing bearer address and binding reference or the new bearer address and binding reference.~~

If the MGW responds with an error to any of the procedures initiated by the MSC server, or the MSC server receives a Bearer Failure procedure from the MGW, the MSC server may either clear the call or reject the change from speech to fax (or vice versa).

After this possible modification, the MGW shall seize an interworking function if a PLMN Bearer Capability [4] has been supplied to the access side bearer termination. When the MSC server receives an answer indication, it shall request activation of the interworking function using the Activate Interworking Function procedure.

Next modified section

13.18 Modification of the Access Bearer

13.18.1 Modification of Bearer Characteristics

The modification of the access bearer is possible during a call establishment and during an active call. If the MSC server needs to modify the access bearer, the existing access side bearer termination in the MGW is modified or a new access side bearer termination is created.~~using the Modify Bearer Characteristics procedure before the access bearer modification is initiated towards the UTRAN/GERAN. The MGW is provided with the new characteristics for the access bearer.~~ The modification of the access bearer shall be performed in accordance with ~~[26]~~3GPP TS 25.413 [26] or ~~[27]~~3GPP TS 48.008 [27].

UTRAN

If the link characteristics for the existing access bearer need to be changed and the MSC server previously received a notification from the MGW that modification of link characteristics of the current transport connection is supported [refer to 26], the MSC server shall use the Modify Bearer Characteristics procedure to provide the MGW with the new bearer characteristics for the existing access side bearer termination. After the MGW has replied, the MSC server shall initiate the access bearer modification towards UTRAN.

If the MSC server has not previously received a notification from the MGW that modification of existing link characteristics is supported, the MSC server shall use the Prepare Bearer procedure to request the MGW to add a new context and a new access side bearer termination, and to provide a bearer address and a binding reference. After the MGW has replied, the MSC server shall initiate the access bearer modification towards UTRAN using the provided bearer address and the binding reference. Upon successful access bearer modification, the MSC server shall connect the new access side bearer termination to the old context and release the old access side bearer termination.

If the user plane mode of the modified access bearer is ‘Support Mode’, the Iu UP will also be re-initialised as defined in [20].

GERAN

The MSC server shall use the Modify Bearer Characteristics procedure to the MGW to provide the new bearer characteristics for the existing access side bearer termination. After the MGW has replied, the MSC server shall initiate the access bearer modification towards GERAN.

Next modified section

16.2 Procedures between (G)MSC server and MGW

The clauses below indicate the procedures used between (G)MSC server and MGW in Mc interface. The procedures are logical, i.e. message identifiers are not part of the protocol. Several logical procedures can be combined into one H.248 command in order to perform required transactions. If several logical procedures are combined, only one context/context request and only one bearer termination/bearer termination request is sent in the H.248 command. Exemption is the Change Flow Direction procedure, where the two bearer terminations are related to a change of the context and not to a command of the bearer termination. All the procedures below describe a successful operation. If the procedure is rejected, a Command Reject is sent back to the entity that sent the command request.

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16.2.5 Prepare Bearer

This procedure is used to prepare for a bearer establishment.

Table 16.6: Procedures between (G)MSC server and MGW: Prepare Bearer

Procedure	Initiated	Information element name	Information element required	Information element description
Prepare Bearer	(G)MSC-S	Context/Context Request	M	This information element indicates the existing context or requests a new context for the bearer termination.
		Bearer Termination Request	M	This information element requests a new bearer termination for the bearer to be established.
		Binding Reference Request	M	This information element requests the bearer identifier in the MGW.
		Bearer Address Request	M	This information element requests the bearer address of the MGW.
		Sender Binding Reference	O	This information element indicates the bearer identifier of the sending MGW.
		Sender Bearer Address	O	This information element indicates the bearer address of the sending MGW.
		Bearer Characteristics/ Bearer Characteristics Requests	M	This information element indicates the preferred characteristics of the bearer connection or requests the MGW to select and provide the bearer characteristics.
		Bearer Service Characteristics	C	This information element indicates the bearer service requested by the user. This information element is included if neither Codec information element nor Circuit Switched Data information elements are provided.
		Notify Established Bearer	O	This information element requests a notification of an established bearer.
		Notify Bearer Modification	O	This information element requests a notification that bearer modification of the established bearer is allowed. This information element is included for access bearer assignment.
		Tunnel Support	O	This information element indicates the support of tunnel data transfer and when to send tunnel data.
		Circuit Switched Data	C	This information element indicates the PLMN bearer capabilities and when applicable GSM channel coding. This information element is included for a non-speech call by the MSC server, or by the anchor-MSC in case of inter-MSC handover, for a radio access network side bearer termination.
		Codec	C	This information element indicates the speech coding format to be used for the bearer. This information element is included for a speech call for a radio access network side bearer termination.
		Framing Protocol	O	This information element indicates the framing protocol to be used for the bearer.
Prepare Bearer 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.
		Binding Reference	M	This information element indicates the bearer identifier in the MGW.
		Bearer Address	M	This information element indicates the bearer address of the MGW

		Bearer Characteristics	C	This information element indicates the characteristics of the bearer connection. This information element is included, if requested by the (G)MSC server or changed from the (G)MSC server preferred one.
		Tunnel Usage	O	This information element indicates the usage of tunnel data transfer in the call control protocol.

Next modified section

16.2.x Bearer Modification Support

This procedure is used to notify that the established bearer can be modified.

Table 16.x: Procedures between (G)MSC server and MGW: Bearer Modification

Procedure	Initiated	Information element name	Information element required	Information element description
Bearer Modification Support	MGW	Context	M	This information element indicates the context for the bearer termination.
		Bearer Termination	M	This information element indicates the bearer termination where the bearer was established.
		Bearer Modification	M	This information element notifies that the established bearer can be modified.
Bearer Modification Support Ack	(G)MSC-S	Context	M	This information element indicates the context where the command was executed.

End modified section

3GPP TSG CN WG4 Meeting #12 ***N4-020077***
Sophia Antipolis, FRANCE, 28th Jan. – 1st Feb. 2002

CR-Form-v6.1

CHANGE REQUEST

⌘	23.205	CR	021	⌘ rev	-	⌘	5.0.0	⌘

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

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

Title:	⌘	(G)MSC restoration
Source:	⌘	CN4
Work item code:	⌘	CSSPLIT
Date:	⌘	18th January 2002
Category:	⌘	**A**
Release:	⌘	REL-5

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 align with ITU SG 11 so interoperability will be achieved
Summary of change:	⌘	The CR align with the behavior with Q.1950 on two areas: – the action when timer Tw expires – the use of the normal release procedure after service restoration in the (G)MSC
Consequences if not approved:	⌘	Misalignment with Q.1950 and TDM terminations will be released in uncoordinated way between the (G)MSC and MGW

Clauses affected:	⌘	10.4.2
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

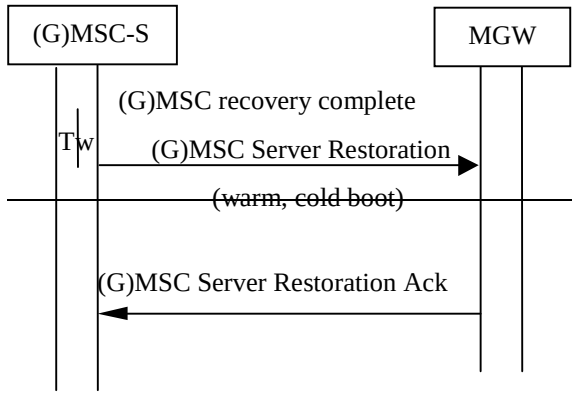
How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

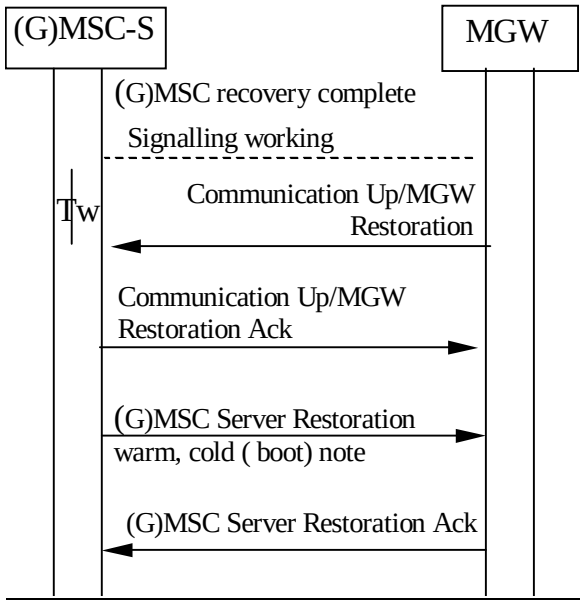
1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.4.2 (G)MSC Server Restoration





Note: Normal release procedure may also be initiated

Figure 10.6 (G)MSC Server Restoration

After the recovery action is complete and it is possible to signal to the MGW 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 Server Restoration~~ an Audit is sent. If the (G)MSC server receives a recovery indication or MGW communication up indication, it shall acknowledge the indication before the (G)MSC Server Restoration may be ~~is~~ sent or the release procedure is initiated.~~.~~