3GPP TSG CN Plenary Meeting #14 **NP-010620**
Kyoto, JAPAN, 12th -14th December 2001

Source: TSG CN WG4

Title: CRs on Rel-4 Transcoder free operation

Agenda item: 8.6

Document for: APPROVAL

Introduction:

This document contains 4 CRs on Rel-4 Work Item "OoBTC", that have been agreed by TSG CN WG4, and are forwarded to TSG CN Plenary meeting #14 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.003	034		N4-011182	Rel-4	Introduction of Global CN-ID definition	F	4.2.0
23.003	035		N4-011185	Rel-5	Introduction of Global CN-ID definition	A	5.1.0
23.153	028		N4-011279	Rel-4	Removal of "No Data" SDUs	F	4.3.0
23.153	029		N4-011369	Rel-4	Clarification for Codec Modification in case of SS/IN interworking	F	4.3.0

3GPP TSG-CN-WG4 Meeting #10 **N4-011182**
Brighton, UK, 15th - 19th October 2001

CR-Form-v4

CHANGE REQUEST

⌘ **23.003** **CR** **034** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

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

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

Title:	⌘	Introduction of Global CN-ID definition
Source:	⌘	CN4
Work item code:	⌘	OoBTC
Date:	⌘	11th October 2001
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:	⌘	TSG RAN WG3 has introduced the concept of Global CN Id (see 25.413 v4.1.0 CR244r7 approved in TSG-RAN #13) to be used to uniquely identify a CN node. This concept consequently needs to be added to TS 23.003.
Summary of change:	⌘	Add a definition of the Global CN Id that consists of a PLMN-Id and a CN-Id that uniquely identifies a CN node within a PLMN.
Consequences if not approved:	⌘	Iu signalling connection handling in RNC will not be able to idenftify from which CN node it has received the Iu Signalling connection identifier.

Clauses affected:	⌘	12.4 (new clause)
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

****** FIRST MODIFIED SECTION ******

12 Identification of PLMN, RNC, Service Area, CN domain

The following clauses describe identifiers that are used by both CN and UTRAN across the Iu interface. For identifiers that are solely used within UTRAN, see 3GPP TS 25.401.

12.1 PLMN Identifier

A Public Land Mobile Network is uniquely identified by its PLMN identifier. PLMN-Id is made of Mobile Country Code (MCC) and Mobile Network Code (MNC).

- **PLMN-Id = MCC + MNC**

The MCC and MNC are predefined within a UTRAN, and set in the RNC via O&M.

12.2 CN Domain Identifier

A CN Domain Edge Node is identified within UTRAN by its CN Domain Identifier. The CN Domain identifier is used over UTRAN interfaces to identify a particular CN Domain Edge Node for relocation purposes. The CN Domain identifier for Circuit Switching (CS) is made of the PLMN-Id and the LAC, whereas for Packet Switching (PS) it is made of the PLMN-Id, the LAC, and the RAC of the first accessed cell in the target RNS.

The two following CN Domains Identifiers are defined:

- **CN CS Domain-Id = PLMN-Id + LAC**

- **CN PS Domain-Id = PLMN-Id + LAC+ RAC**

The LAC and RAC are defined by the operator, and set in the RNC via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

12.3 RNC Identifier

An RNC node is uniquely identified within UTRAN by its RNC Identifier (RNC-Id). RNC-Id together with the PLMN identifier is used to globally identify the RNC. RNC-Id or the RNC-Id together with the PLMN-Id is used as RNC identifier in UTRAN Iub, Iur and Iu interfaces. SRNC-Id is the RNC-Id of the SRNC. C-RNC-Id is the RNC-Id of the controlling RNC. D-RNC-Id is the RNC Id of the drift RNC.

- **Global RNC-Id = PLMN-Id + RNC-Id**

The RNC-Id is defined by the operator, and set in the RNC via O&M

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

12.4 Service Area Identifier

The Service Area Identifier (SAI) is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN.

The Service Area Code (SAC) together with the PLMN-Id and the LAC will constitute the Service Area Identifier.

- **SAI = PLMN-Id + LAC + SAC**

The SAC is defined by the operator, and set in the RNC via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413. 3GPP TS 25.423 and 3GPP TS 25.419 define the usage of this identifier in RNSAP and SABP signalling.

A cell may belong to one or two Service Areas. In the case that it belongs to two Service Areas, one is applicable in the BC domain and the other is applicable in both the CS and PS domains.

The broadcast (BC) domain requires that Service Area consist of one cell. This does not limit the usage of Service Area for other domains. Refer to 3GPP TS 25.410 for a definition of the BC domain.

12.3 CN Identifier

A CN node is uniquely identified within a PLMN by its CN Identifier (CN-Id). CN-Id together with the PLMN identifier is used to globally identify the CN node. CN-Id together with the PLMN-Id is used as CN node identifier in RANAP signalling over the Iu interface.

Global CN-Id = PLMN-Id + CN-Id

The CN-Id is defined by the operator, and set in the nodes via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

****** END OF MODIFICATIONS ******

3GPP TSG-CN-WG4 Meeting #10 **N4-011183**
Brighton, UK, 15th - 19th October 2001

CR-Form-v4

CHANGE REQUEST

⌘ **23.003** **CR** **035** ⌘ rev **-** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	Introduction of Global CN-ID definition
Source:	⌘	CN4
Work item code:	⌘	OoBTC
Date:	⌘	11th October 2001
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)*
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R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

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Consequences if not approved:	⌘	Iu signalling connection handling in RNC will not be able to idenftify from which CN node it has received the Iu Signalling connection identifier.

Clauses affected:	⌘	12.4 (new clause)
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

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For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

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- **Global RNC-Id = PLMN-Id + RNC-Id**

The RNC-Id is defined by the operator, and set in the RNC via O&M

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

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The Service Area Code (SAC) together with the PLMN-Id and the LAC will constitute the Service Area Identifier.

- **SAI = PLMN-Id + LAC + SAC**

The SAC is defined by the operator, and set in the RNC via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413. 3GPP TS 25.423 and 3GPP TS 25.419 define the usage of this identifier in RNSAP and SABP signalling.

A cell may belong to one or two Service Areas. In the case that it belongs to two Service Areas, one is applicable in the BC domain and the other is applicable in both the CS and PS domains.

The broadcast (BC) domain requires that Service Area consist of one cell. This does not limit the usage of Service Area for other domains. Refer to 3GPP TS 25.410 for a definition of the BC domain.

12.3 CN Identifier

A CN node is uniquely identified within a PLMN by its CN Identifier (CN-Id). CN-Id together with the PLMN identifier is used to globally identify the CN node. CN-Id together with the PLMN-Id is used as CN node identifier in RANAP signalling over the Iu interface.

Global CN-Id = PLMN-Id + CN-Id

The CN-Id is defined by the operator, and set in the nodes via O&M.

For syntax description and the usage of this identifier in RANAP signalling, see 3GPP TS 25.413.

****** END OF MODIFICATIONS ******

3GPP TSG CN WG4 Meeting #11 **N4-011279**
Cancun, Mexico, 26th - 30th November 2001

CR-Form-v4

CHANGE REQUEST

⌘ **23.153** **CR** **028** ⌘ rev **-** ⌘ 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:	⌘	Removal of "No Data" SDUs
Source:	⌘	CN4
Work item code:	⌘	OoBTC
Date:	⌘	16.11.2001
Category:	⌘	**F** (essential)
Release:	⌘	Rel4

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 TS 26.102 the usage of "No Data" SDUs at Iu and Nb interface has been removed, i.e. during DTX operation only SID SDUs should be sent. This CR is made to align TS 23.153 with TS 26.102.
Summary of change:	⌘	Usage of "No Data" SDUs is removed from chapters 5.6 and 5.7
Consequences if not approved:	⌘	TS 23.153 is not in line with TS 26.102. Mutually incompatible implementations may result, since 26.102 recommends to use only 'SID' SDUs for DTX and 23.153 states additionally 'No Data' is mandatory. Thus successfulness of TrFO operation is endangered.

Clauses affected:	⌘	5.6 and 5.7
Other specs Affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

5.6 CN Node handling of Codec Types & Codec Modes

The supported codec list received by the MSC in DTAP protocol [2] has no priority, whereas the list sent in the OoBTC procedures is sent with a level of preference.

The default Codec Type for “R99 UMTS only” terminals is UMTS_AMR, the default Codec Type for all terminals supporting GSM and UMTS radio access is UMTS_AMR_2, see [5] for the detailed description. The UMTS_AMR_2 is a superset of the UMTS_AMR. It behaves as a FR_AMR codec in the UL and as a UMTS_AMR codec in the DL. This allows UMTS terminals to operate in TFO with GSM terminals. The UMTS_AMR_2 is fully compatible with UMTS_AMR in TFO and TrFO and fully compatible with R99 CN nodes (TC in MGW).

If the UE supports both Codec Types (UMTS_AMR and UMTS_AMR_2), then the MSC shall indicate only the UMTS_AMR_2 in the OoBTC codec negotiation. If no Codec List IE is received and the UE is“UMTS only”, then the MSC shall assume UMTS_AMR as supported Codec Type. If no Codec List IE is received, but the UE is “dual system”, then the MSC shall assume UMTS_AMR_2 as the supported codec type. The MSC shall assume “dual system” support only if the UE indicates at least one GSM speech version in Octet 3a etc. of the Bearer Capability.

In order to support interworking with 2G systems it is recommended that MGWs support 2G EFR codecs (GSM_EFR, PDC_EFR, TDMA_EFR). In order to avoid modifications during handover between 2G and 3G systems the MSC nodes may give preference to a suitable 2G codec.

The originating CN node, while performing speech service negotiation with a terminating CN node, shall indicate the maximum number of codec modes that shall be selected during speech codec negotiation. This maximum number of supported codec modes may depend on optimisation strategies applied by the originating CN node. The recommended value is “four” (see [10]).

The terminating CN node receiving this information compares the maximum number of codec modes received by the originating CN with its own one and shall decide on the minimum of both numbers to be applied as result of the negotiation.

The decision about the actual codec modes to be selected as the Active Codec Set (ACS) shall be left to the terminating CN node. In order to provide harmonisation of out of band codec negotiation (TrFO) and inband codec negotiation (TFO) very similar codec selection mechanisms as those being defined for TFO shall be applied for TrFO, see [10]. These rules shall be taken into account when forwarding a codec list from the originating node to proceeding node, both for TrFO and TFO.

Whenever one or several TrFO links have been already established and initialised, the CN node (e.g. the serving CN in case of Call Hold scenarios, the visited CN node in case of Call Forwarding scenarios, etc.) initiating a subsequent codec negotiation, shall give the already negotiated codec type, including its ACS, highest preference to reduce the possibility of performing bearer re-establishment or UP re-initialisation of the already established and initialised TrFO links.

When the MSC node requests a RAB assignment the Subflow Combinations provided shall either all be initialised by the RNC or all rejected with appropriate cause code.

The MSC shall always assume "Discontinuous Transmission (DTX)" as mandatory and shall define “SID” ~~and "No Data"~~ SDUs in addition to the negotiated speech codec modes. This is because for TrFO the RAB requested by one RNC must match that requested by the peer RNC – they are effectively the same RAB. If one MSC requires DTX support then the RAB requested by the far end MSC must also support DTX (even if it is not desired by that MSC). As no Out Of Band negotiation for DTX is supported nor DTX control to the UE, DTX shall be mandatory for TrFO connections.

5.7 Inband Rate Control

Inband rate control shall only allow the RNCs to set the maximum codec mode (maximum bitrate) from the set of codec modes that have been negotiated out of band. This procedure is called Maximum Rate Control. The final maximum mode selected results from a rate control request from one side and the maximum rate supported at the receiving side; the lower rate of these is selected. This is known as Distributed Rate Decision. In TrFO maximum rate control shall be supported through the Iu Framing protocol and through transit networks supporting compressed voice. The maximum rate control procedures are further defined within the Iu Framing protocol [4].

When the MSC requests for a RAB to be assigned, it shall always define 1 speech mode SDU (lowest rate), and DTX SDU ~~and no data SDU~~ as non-rate controllable. Other SDU formats for higher rates shall be defined as rate controllable.

At SRNS relocation the new RNC shall send a rate control frame at Relocation Detect indicating its current maximum rate, it will receive in the acknowledgement the current maximum rate from the far end. This procedure is called Immediate Rate Control. Again the distributed rate decision means both RNCs will operate within a common limit.

3GPP TSG-CN-WG4 Meeting #11 **N4-011369**
Cancun, Mexico, 26th – 30th November 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.153 CR 029** ⌘ rev **-** ⌘ 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:	⌘	Clarification for Codec Modification in case of SS/IN interworking
Source:	⌘	CN4
Work item code:	⌘	OoBTC
Date:	⌘	2001-11-19
Category:	⌘	**F**
Release:	⌘	Rel-4

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

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

Reason for change:	⌘	In chapter 6.3.1 “TrFO interworking with SS (VMSC = service interworking node)” the description of the modification of leg B-C lacks of the Mc-interface interactions of terminations B and C and therefor differs from the level of description for all the other involved terminations.
Summary of change:	⌘	In figure 6.3.1/2 the Mc-interface interactions for terminations B and C are clarified.
Consequences if not approved:	⌘	Without this corrections figure 6.3.1/2 will remain incorrect or at least incomplete. Strictly following figure 6.3.1/2, some implementations might assume that the affected MGWs have to treat terminations B and C in a special way (perform bearer modification without receiving a related command from the MSC-server, etc.), which is not intended.

Clauses affected:	⌘	6.3.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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.

6.3.1 TrFO interworking with SS (VMSC = service interworking node)

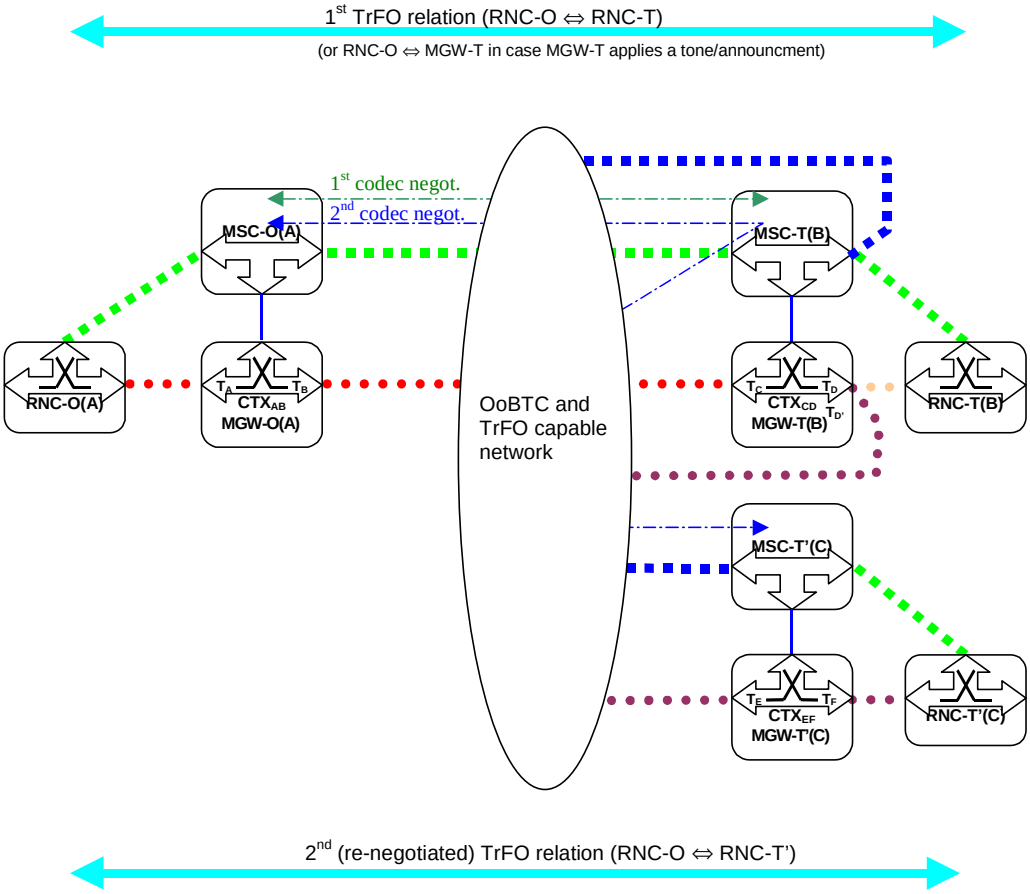


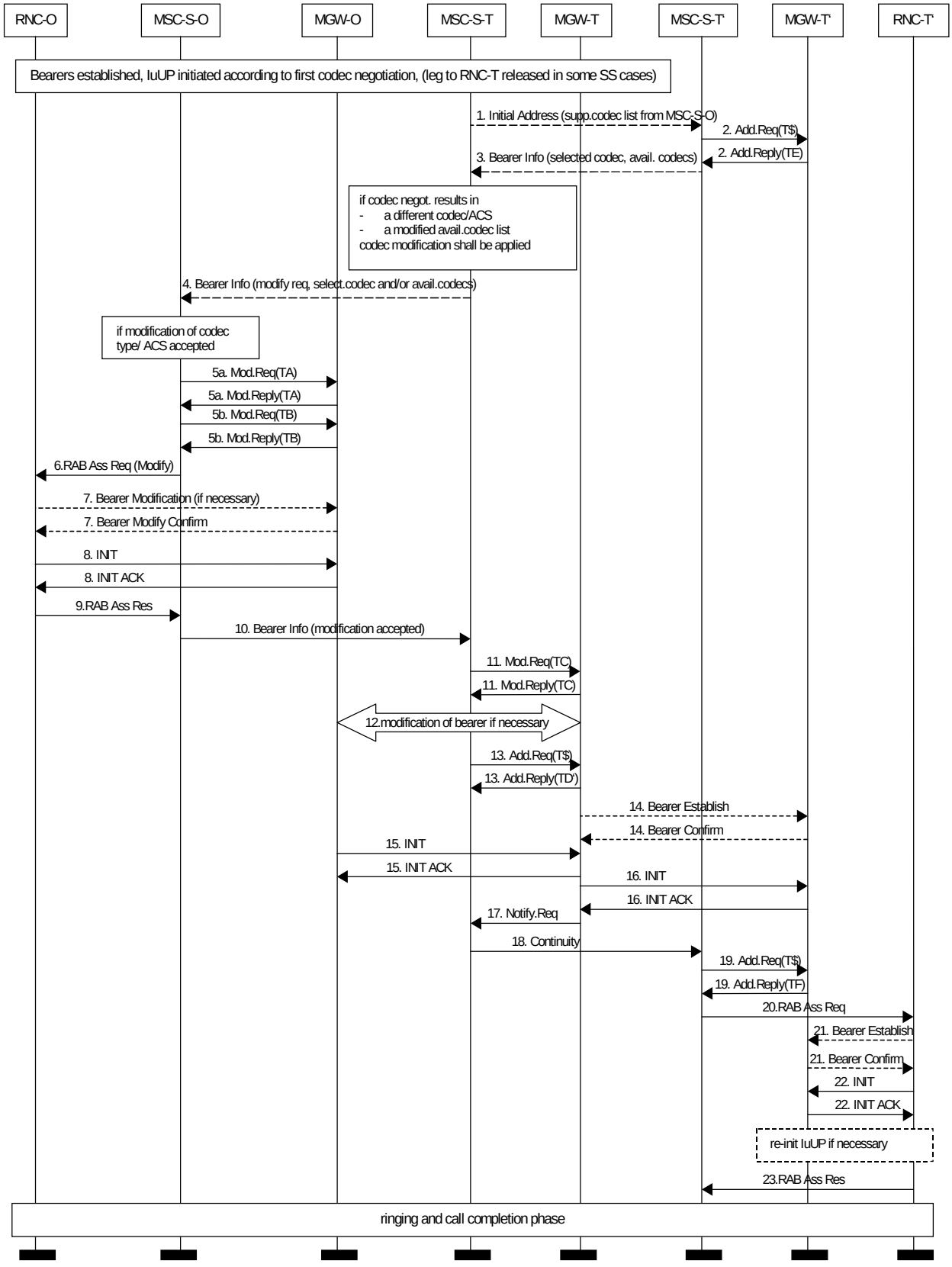
Figure 6.3.1/1. Codec Modification in case of SS interworking

In case of supplementary service interworking, it may become necessary to apply codec modification out of band. Figure 6.3.1/1 shows the network model, that may apply for a certain set of SS's (call deflection (CD), call forwarding on no reply (CFNRy), CF on user determined busy (CFUB), etc.). Common to these scenarios is:

- the service interworking is controlled by the VMSC (this is common to all SSs).
- MSC-T extends the call towards MSC-T' according to the forwarded-/deflected-to-number.

An intermediate TrFO relation will in general already exist between two RNC's (RNC-O and RNC-T in figure 6.3.1/1) before the call is diverted to another node, as the ringing tone was applied in backward direction.

In order to perform codec negotiation with the third node (MSC-T') as well it is necessary to forward the supported codec list from MSC-O. MSC-T' signals back the codec it selected and the available codec list. If the codec negotiation result is different from the previously performed codec negotiation between MSC-O and MSC-T, MSC-O shall be informed. MSC-O shall be able to decide based on the received modified codec type whether Iu Framing re-initialisation and bearer modification is required. This scenario is depicted in Figure 6.3.1/2 below. If no codec modification has to be applied, MSC-T(B) shall extend the UP initialisation towards MSC-T'(C), i.e. MSC-T(B) shall initialise a termination (TC) with the property Initialisation Procedure = incoming. MSC-T' (C) shall also initialise a termination TC with the property Initialisation Procedure = incoming. Further call handling follows the mobile to mobile call establishment (see clause 6.1).


RNC-O
MSC-S-O
MGW-O
MSC-S-T
MGW-T
MSC-S-T'
MGW-T'
RNC-T'
Bearers established, IuUP initiated according to first codec negotiation, (leg to RNC-T released in some SS cases)
1. Initial Address (supp.codec list from MSC-S-O)
2. Add.Req(T$)
3. Bearer Info (selected codec, avail. codecs)
2. Add.Reply(TE)
if codec negot. results in
- a different codec/ACS
- a modified avail.codec list
codec modification shall be applied
4. Bearer Info (modify req, select.codec and/or avail.codecs)
if modification of codec type/ ACS accepted
5a. Mod.Req(TA)
5a. Mod.Reply(TA)
5b. Mod.Req(TB)
5b. Mod.Reply(TB)
6.RAB Ass Req (Modify)
7. Bearer Modification (if necessary)
7. Bearer Modify Confirm
8. INIT
8. INIT ACK
9.RAB Ass Res
10. Bearer Info (modification accepted)
11. Mod.Req(TC)
11. Mod.Reply(TC)
12.modification of bearer if necessary
13. Add.Req(T$)
13. Add.Reply(TD')
14. Bearer Establish
14. Bearer Confirm
15. INIT
15. INIT ACK
16. INIT
16. INIT ACK
17. Notify.Req
18. Continuity
19. Add.Req(T$)
19. Add.Reply(TF)
20.RAB Ass Req
21. Bearer Establish
21. Bearer Confirm
22. INIT
22. INIT ACK
re-init IuUP if necessary
23.RAB Ass Res
ringing and call completion phase

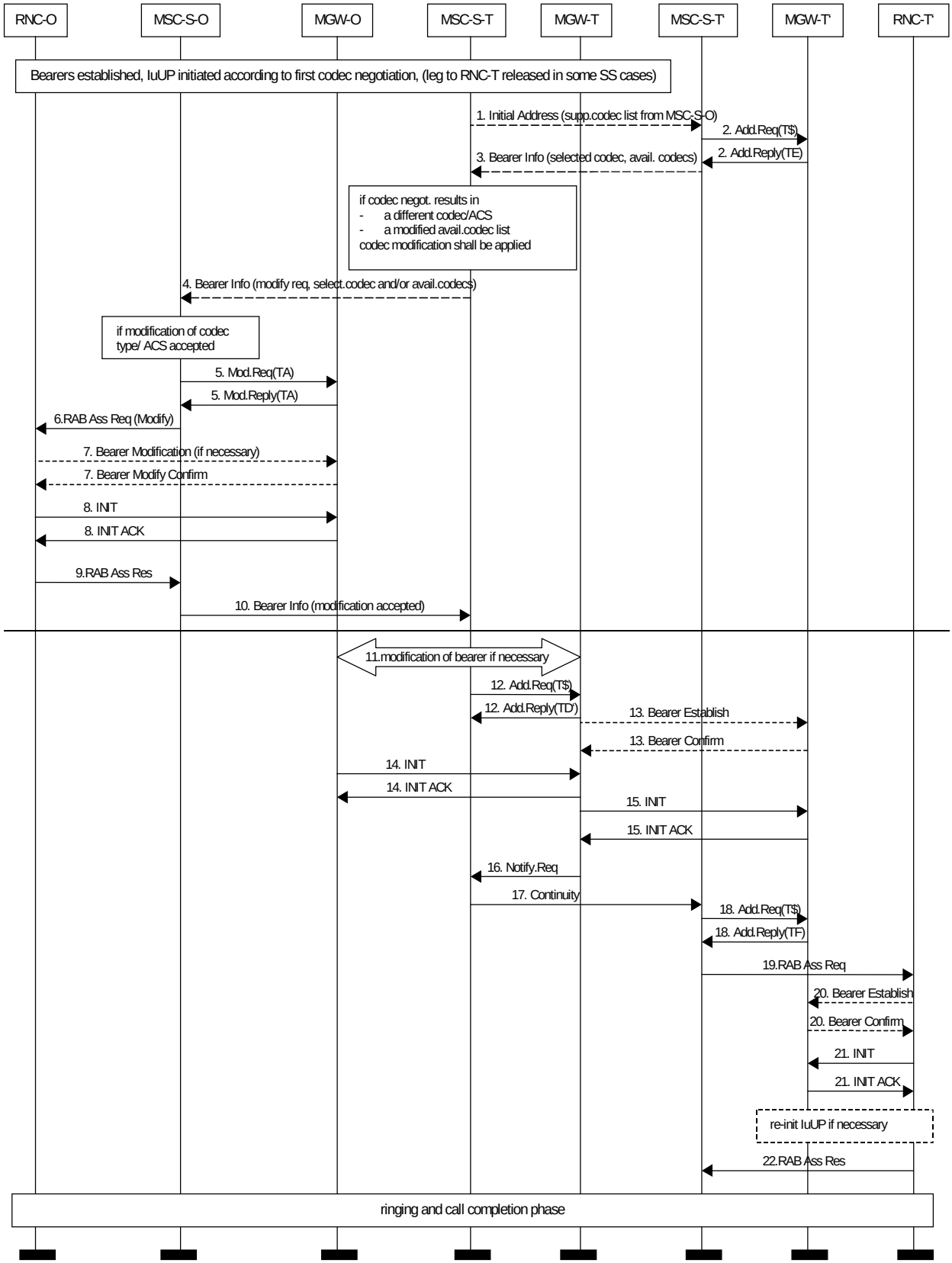


Figure 6.3.1/2: Codec Modification for SS-interworking & UP re-initialisation.