### 3GPP TSG CN Meeting #27 9th - 11th March 2005. Tokyo, Japan.

Source: CN3

Title: CRs to Rel-5(with mirror CR) on Work Item "Circuit Switched Data Bearer

Services"

Agenda item: 8.9

Document for: APPROVAL

#### **Introduction:**

This document contains 3 CRs to Rel-6 on Work Item "CS Data" that have been agreed by TSG CN WG3, and are forwarded to TSG CN Plenary for approval.

WG_tdoc	Spec	CR	R	Cat	Title	Rel	C_Ver	Work Item
N3-050197	23.910	050	3	F	Nb transport for handover between UMTS and GSM	Rel-5	5.4.0	CS Data
N3-050199	29.007	108	2	F	Nb transport for handover between UMTS and GSM	Rel-5	5.10.0	CS Data
N3-050201	29.007	109	3	Α	Nb transport for handover between UMTS and GSM	Rel-6	6,0,0	CS Data

## 3GPP TSG-CN WG3 Meeting #35

Sydney, Australia. 14th - 18th February 2005.

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Title: 第	Nb transport for hando	ver between UM	TS and GS	М		
Source: #	Siemens					
Work item code:	CS Data			Date:	01/2005	
Category: #	F  Jse <u>one</u> of the following cate  F (correction)  A (corresponds to a cor  B (addition of feature),	_	U	R96 (Relea	-	ases:
	C (functional modification D (editorial modification Detailed explanations of the a e found in 3GPP TR 21.900	) above categories ca	an	R98 (Relea	ase 1998) ase 1999) ase 4) ase 5) ase 6)	
Reason for change:	# Transport and Mc Control Handover GSM <-> For handover from An approtocol or A-TRAU	UMTS and vice v VGb mode to Ger	rersa, and Gran lu mode	SSM -> GSM. e, unclear wher	n ATRAU′	
Summary of change.	For Inter-MSC Hand packet transport is d lu Interfaces (compa provided. For handover from A applicable for the RA and the A-TRAU' prokbit/s and 57,6 kbit/s	escribed in a sim are to Clause 11.4 A/Gb mode to Gei AB subflows with otocol for the RAE	ilar manner 4), and Mc ran Iu mode 12 kbit/s, 24	as for Inter-Maconfiguration per A-TRAU" pro 4 kbit/s, 36 kbit	SC Hando parameter ptocol is t/s and 48	over with s are kbit/s
Consequences if not approved:	Missing specification problems for Inter-M Interface Unclear protocol for Geran Iu mode.	SC Handover GS	SM <-> UM7	ΓS and vice ve	rsa at the	Nb
Clauses affected:	第 10.2.1, 10.2.2, 10.2.	3. 10.2.4				
Other specs affected:	Y N  X Other core specificat X O&M Specificat	ecifications #ions	TS 29.00	07 CR 108		

Other comments: 

\*\*Corresponding CR 049 against Rel-4, except for GERAN lu-mode issue.

#### 10.2 User Plane

#### 10.2.1 Handover from Iu mode to A/Gb mode

After a handover from Iu mode to A/Gb mode the user plane between the anchor MSC and the visited MSC shall comply to:

- \_\_\_ the standard GSM A-interface protocols, i.e.:
  - A-TRAU or modified V.110 frames as defined in 3GPP TS 44.021 [18] and 3GPP TS 48.020 [19].
  - up to four 16kbit/s substreams are multiplexed in one 64 kbit/s channel (Split/Combine function and Multiplexing function as defined in 3GPP TS 44.021 [18] and 3GPP TS 48.020 [19]).
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [25]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case.

#### 10.2.2 Handover from A/Gb mode to UTRAN lu mode

After a handover from GSM to UMTS the user plane between the anchor MSC and the visited MSC shall comply to:

- the A-TRAU' protocol except for FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For both exceptions a plain 64 kbit/s channel is used between the MSCs.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [25]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s).

The A-TRAU' protocol is defined as follows:

- A-TRAU' frames are transmitted in regular intervals of 10 ms;
- an A-TRAU' frame consists of two consecutive A-TRAU frames (as defined in 3GPP TS 48.020 [19]) each with a length of 320 bit;
- the A-TRAU' protocol is used on a plain 64 kbit/s channel without substreams;
- the same A-TRAU' format is used for the transparent and non-transparent transmission mode;
- in transparent mode the number of data bits in an A-TRAU' frame depend on the user rate only, each user rate corresponds to a fixed number of data bits (see below);
- in non-transparent mode A-TRAU' frames contain always complete RLP frames, rate adaptation is performed by means of the M2 bit;
- the M1-bit is used to identify 1<sup>st</sup> and 2<sup>nd</sup> frame in both transmission modes.

## Next modified Clause

#### 10.2.3 Handover from A/Gb mode to GERAN lu mode

#### 10.2.3.1 User plane for transparent services

After a handover from a GERAN A/Gb mode MSC to a GERAN Iu mode MSC the user plane <u>for transparent services</u> between the anchor MSC and the visited MSC shall <u>be identical comply</u> to:

- the A-TRAU' protocol except for FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC = UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64 kbit/s and 32 kbit/s is based on ITU-T Recommendation I.460 [26].
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [25]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s).

#### 10.2.3.2 User plane for non-transparent services

After a handover from a GERAN A/Gb mode MSC to a GERAN Iu mode MSC the user plane for non-transparent services between the anchor MSC and the visited MSC shall comply to:

- the A-TRAU' protocol as defined below for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU' protocol for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2 kbit/s and 57,6 kbit/s, if both MSCs are connected via a TDM interface.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [25]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' or A-TRAU' protocol).

#### 10.2.3.2.1 A-TRAU" frame format

For the handover scenario from GERAN A/Gb mode MSC to a GERAN Iu mode MSC, the existing A TRAU' frame format will be extended to support the new defined RAB subflow data rates of the GERAN Iu mode.

For the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s the The RLP frame length of 240 bit is used. For the transfer of this RLP frame length to A TRAU' protocol is modified. The the A-TRAU' protocol is introduced. An A-TRAU' frame has the same layout as the A-TRAU' frame and contains two A-TRAU frames.

One RLP frame with the length of 240 bit is contained in one A-TRAU frame. The A-TRAU'' protocol is only used for the non-transparent services.

In figure 9, the format of the A-TRAU frame for the RLP frame length of 240 is shown.

## Next modified Clause

#### 10.2.4 Handover within lu mode PLMNs

After a handover from an Iu mode MSC to a UTRAN Iu mode MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to

- the A-TRAU' protocol if both MSC are connected via a TDM interface except for the transparent cases FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64kbit/s and 32kbit/s is based on ITU-T Recommendation I.460 [26].
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The Nb UP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with annex P of ITU-T Recommendation I.366.2 [27]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s).

After a handover from an Iu mode MSC to a GERAN Iu mode MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to

- the A-TRAU' and or A-TRAU" protocol or a plain 64 kbit/s channel if both MSC are connected via a TDM interface. The A-TRAU' protocol shall be used for transparent services except for the transparent cases FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is shall be used between the MSCs. The rate adaptation between 64kbit/s and 32kbit/s is based on ITU-T Recommendation I.460 [26]. For non-transparent services, the A-TRAU' protocol shall be used for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU' protocol shall be used for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2 kbit/s and 57,6 kbit/s.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The Nb UP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with annex P of ITU-T Recommendation I.366.2 [27]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol, A-TRAU' protocol or plain 64kbits/s).

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Reason for change: # Transport and Mc Configuration for IP or ATM not clearly specified for Inter-MSC Handover GSM <-> UMTS and vice versa, and GSM -> GSM.

For non-64kbit transparent CS data calls, bandwidth information is missing at IWF.

For handover from A/Gb mode to Geran Iu mode, unclear when ATRAU" protocol or A-TRAU protocol is applicable for non-transparent data calls.

For Inter-MSC Handover GSM <-> UMTS and vice versa, and GSM -> GSM, Summary of change: ₩

packet transport is described in a similar manner as for Inter-MSC Handover with lu Interfaces (compare to Clause 11.4), and Mc configuration parameters are

provided.

PLMN-BC Parameter added at A-MSC for non-64kbit transparent CS data calls. For handover from A/Gb mode to Geran lu mode, A-TRAU" protocol is applicable for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU' protocol for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2

kbit/s and 57,6 kbit/s.

Consequences if not approved:

Missing specification of details of packet transport may lead to interoperability problems for Inter-MSC Handover GSM <-> UMTS and vice versa:

- At the Nb Interface
- At the Mc Interface

Non-64kbit transparent CS data calls are not supported at the Mc interface. Unclear protocol for non-transparent data calls for handover from A/Gb mode to Geran lu mode.

Clauses affected: 第 11.1, 11.2, 11.4, 11.6.3, 11.6.3.1, 11.6.3.2

Other specs affected:	¥ X X	Other core specifications # Test specifications O&M Specifications	TR 23.910 CR 050
Other comments:	₩ Corr	esponding CR 107 against Rel-4,	except for GERAN lu-mode issue.

# 11 Interworking between A/Gb mode MSC and Iu mode MSC

#### 11.1 Handover from lu mode MSC to A/Gb mode MSC

After a handover from an Iu mode MSC or an A/Gb mode MSC to an A/Gb mode MSC the user plane between the anchor MSC and the visited MSC shall comply to:

- the standard GSM A-interface protocols if both MSCs are connected via a TDM interface, i.e.:
  - A-TRAU or modified V.110 frames as defined in 3GPP TS 44.021 [27] and 3GPP TS 48.020 [28];
  - up to four 16kbit/s substreams are multiplexed in one 64kbit/s channel (Split/Combine function and Multiplexing function as defined in 3GPP TS 44.021 [27] and 3GPP TS 48.020 [28]).
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case. Furthermore, Clause 11.6.3 is applicable.

#### 11.2 Handover from A/Gb mode MSC to UTRAN lu mode MSC

After a handover from A/Gb mode MSC to an UTRAN Iu mode MSC the user plane between the anchor MSC and the visited MSC shall comply to:

- the A-TRAU' protocol <u>if both MSCs are connected via a TDM interface</u> except for FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For both exceptions a plain 64 kbit/s channel is used between the MSCs.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s). Furthermore, Clause 11.6.3 is applicable.

The A-TRAU' protocol is defined as follows:

- A-TRAU' frames are transmitted in regular intervals of 10ms;
- an A-TRAU' frame consists of two consecutive A-TRAU frames (as defined in 3GPP TS 48.020 [28]) each with a length of 320 bit;
- the A-TRAU' protocol is used on a plain 64 kbit/s channel without substreams;
- the same A-TRAU' format is used for the transparent and non-transparent transmission mode;
- in transparent mode the number of data bits in an A-TRAU' frame depend on the user rate only, each user rate corresponds to a fixed number of data bits (see below);
- in non-transparent mode A-TRAU' frames contain always complete RLP frames, rate adaptation is performed by means of the M2 bit;

- the M1-bit is used to identify 1<sup>st</sup> and 2<sup>nd</sup> frame in both transmission modes.

## Next modified Clause

#### 11.3 Handover from A/Gb mode MSC to GERAN lu mode MSC

#### 11.3.1 User plane for transparent services

After a handover from a GERAN A/Gb mode MSC to a GERAN Iu mode MSC the user plane <u>for transparent services</u> between the anchor MSC and the visited MSC shall <u>be identical</u>comply to:

- the A-TRAU' protocol except for FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC = UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64 kbit/s and 32 kbit/s is based on ITU-T Recommendation I.460.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s). Furthermore, Clause 11.6.3 is applicable.

### 11.3.2. User plane for non-transparent services

After a handover from a GERAN A/Gb mode MSC to a GERAN Iu mode MSC the user plane for non-transparent services between the anchor MSC and the visited MSC shall comply to:

- the A-TRAU' protocol as defined below for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU' protocol for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2 kbit/s and 57,6 kbit/s, if both MSCs are connected via a TDM interface.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' or A-TRAU' protocol). Furthermore, Clause 11.6.3 is applicable.

For the handover scenario from GERAN A/Gb mode MSC to a GERAN Iu mode MSC, the existing A TRAU' frame format will be extended to support the new defined RAB subflow data rates of the GERAN Iu mode.

#### 11.3.2.1 A-TRAU" frame format

For the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s tThe RLP frame length of 240 bit is shall be used. For the transfer of this RLP frame length to A TRAU' protocol is modified. The the A-TRAU' protocol is introduced. An A-TRAU' frame has the same layout as the A-TRAU' frame and contains two A-TRAU frames.

One RLP frame with the length of 240 bit is contained in one A-TRAU frame. The A-TRAU'' protocol is only used for the non-transparent services.

In figure 15a, the format of the A-TRAU frame for the RLP frame length of 240 is shown.

## Next modified Clause

#### 11.4 Handover within lu mode PLMNs

After a handover from an Iu mode MSC to a UTRAN Iu mode MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to:

- the A-TRAU' protocol if both MSCs are connected via a TDM interface except for the transparent case FNUR = 32 kbit/s (ITC = UDI or RDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64 kbit/s and 32 kbit/s is based on ITU-T Recommendation I.460 [2].
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s).

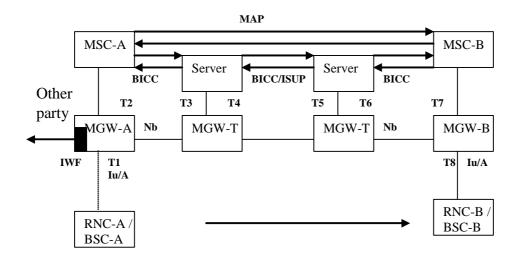
After a handover from an Iu mode MSC to a GERAN Iu mode MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to

- the A-TRAU' and or A-TRAU" protocol or a plain 64 kbit/s channel if both MSC are connected via a TDM interface. The A TRAU' protocol shall be used for transparent services except for the transparent cases FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is shall be used between the MSCs. The rate adaptation between 64kbit/s and 32kbit/s is based on ITU-T Recommendation I.460. For non-transparent services, the A-TRAU' protocol shall be used for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU' protocol shall be used for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2 kbit/s and 57,6 kbit/s.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (ATRAU'' protocol, A-TRAU' protocol or plain 64kbits/s). Furthermore, Clause 11.6.3 is applicable.

## Next modified Clause

## 11.6.3 Transport on the access side of the IWF after inter-MSC relocation

Clauses 11.1 to 11.4 is are applicable. Furthermore, the Nb UP is used in support mode; all interim Server nodes are assumed not to be aware of the relocation case – i.e. receive BICC IAM with same information as for connections beyond the IWF (clause 11.6.2). Figure 17 indicates the relevant connections, where MSC-A/MGW-A are the Anchor nodes and MSC-B/MGW-B are the Non-Anchor nodes.



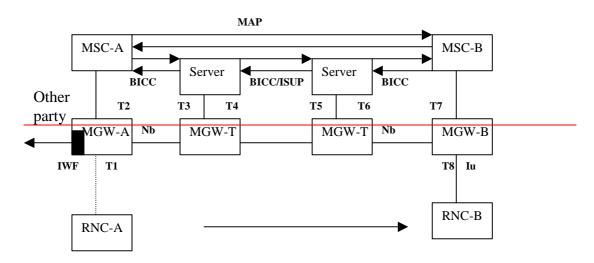


Figure 17: Bearer Independent connections for Inter-MSC SRNS Relocation

The IuUP shall be initialised on each Nb leg in a forward direction (regardless if Forward Bearer or Backward Bearer procedures are used), i.e. in the direction of the IAM. For further details see TS 23.205 [83]

#### 11.6.3.1 Non-Transparent CSD

Table 14: Non-Transparent CSD MGW Termination Properties For Inter-MSC SRNS Relocation

Termination Packages/Parameters		MSC-A				Intermediate Nodes	
	T1 <u>(lu)</u>	<u>T1 (A)</u>	T2	T7	T8 <u>(lu)</u>	T8 (A)	T3, T4, T5, T6
TMR	-	<u>=</u>	-	UDI	-	<u>=</u>	UDI
threegcsd:plmnbc	PLMN_BC	PLMN_BC	PLMN_BC	-	-	<u>:</u>	-
threegup:interface	RAN	Ξ	CN	CN	RAN	<u>:</u>	CN
			(NOTE 2)	(NOTE 2)			(NOTE 2)
threegup:initdir	IN	Ξ.	OUT	IN	OUT	Ξ	IN
			(NOTE 2)	(NOTE 2)			(NOTE 2)
threegup:mode	support	Ξ	Support	Support	support	<u>:</u>	support
			(NOTE 2)	(NOTE 2)			(NOTE 2)
threegcsde:bitrate	-		-	-	BITRATE	11	-
threegcsd:gsmchancod	_	GSM CC	GSM CC	=	Ξ.		_
			(NOTE 1)				

NOTE 1: GSM CC shall only be provided if T8 is an A interface. GSM CC shall not be provided if T8 is an Iu interface.

NOTE 2: Only applicable for a BICC network

#### Transparent CSD 11.6.3.2

Table 15: Transparent CSD MGW Termination Properties For Inter-MSC SRNS Relocation

Termination Packages/Parameters		MSC-A			Intermediate Nodes		
	T1 <u>(iu)</u>	<u>T1 (A)</u>	T2	T7	T8 <u>(iu)</u>	T8 (A)	T3, T4, T5, T6
TMR	-	<u>=</u>	UDI	UDI	-	=	UDI
threegcsd:plmnbc	PLMN_BC	PLMN_BC	PLMN_BC	-	-	<u>:</u>	-
threegup:interface	RAN	Ξ	CN (NOTE 3)	CN (NOTE 3)	RAN	Ξ	CN (NOTE 3)
threegup:mode	transparent	Ξ	support (NOTE 3)	support (NOTE 3)	transparent	Ξ	support (NOTE 3)
threegup:initdir	-	Ξ	OUT (NOTE 3)	IN (NOTE 3)	-	Ξ	IN (NOTE 3)
threegcsden:bitrate	-	П	-	-	BITRATE (note NOTE_1)	Ξ	-
threegcsd:gsmchancod	-	GSM CC	GSM CC (NOTE 2)	=	=	Ξ	=

NOTE 1: This is optional for the case when rate is 64kb/s then no rate adaptation is required.

NOTE 2: GSM CC shall only be provided if T8 is an A interface. GSM CC shall not be provided if T8 is an Iu interface.

NOTE 3: Only applicable for a BICC network

Note 1: This is optional for the case when rate is 64kb/s then no rate adaptation is required.

## 3GPP TSG-CN WG3 Meeting #35

Sydney, Australia. 14<sup>th</sup> - 18<sup>th</sup> February 2005.

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# 11 Interworking between A/Gb mode MSC and lu mode MSC

#### 11.1 Handover from lu mode MSC to A/Gb mode MSC

After a handover from an Iu mode MSC or an A/Gb mode MSC to an A/Gb mode MSC the user plane between the anchor MSC and the visited MSC shall comply to:

- the standard GSM A-interface protocols if both MSCs are connected via a TDM interface, i.e.:
  - A-TRAU or modified V.110 frames as defined in 3GPP TS 44.021 [27] and 3GPP TS 48.020 [28];
  - up to four 16kbit/s substreams are multiplexed in one 64kbit/s channel (Split/Combine function and Multiplexing function as defined in 3GPP TS 44.021 [27] and 3GPP TS 48.020 [28]).
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case. Furthermore, Clause 11a.1.3 is applicable.

#### 11.2 Handover from A/Gb mode MSC to UTRAN lu mode MSC

After a handover from A/Gb mode MSC to an UTRAN Iu mode MSC the user plane between the anchor MSC and the visited MSC shall comply to:

- the A-TRAU' protocol <u>if both MSCs are connected via a TDM interface</u> except for FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For both exceptions a plain 64 kbit/s channel is used between the MSCs.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s). Furthermore, Clause 11a.1.3 is applicable.

The A-TRAU' protocol is defined as follows:

- A-TRAU' frames are transmitted in regular intervals of 10ms;
- an A-TRAU' frame consists of two consecutive A-TRAU frames (as defined in 3GPP TS 48.020 [28]) each with a length of 320 bit;
- the A-TRAU' protocol is used on a plain 64 kbit/s channel without substreams;
- the same A-TRAU' format is used for the transparent and non-transparent transmission mode;
- in transparent mode the number of data bits in an A-TRAU' frame depend on the user rate only, each user rate corresponds to a fixed number of data bits (see below);
- in non-transparent mode A-TRAU' frames contain always complete RLP frames, rate adaptation is performed by means of the M2 bit;

- the M1-bit is used to identify 1<sup>st</sup> and 2<sup>nd</sup> frame in both transmission modes.

## Next modified Clause

### 11.3 Handover from A/Gb mode MSC to GERAN lu mode MSC

#### 11.3.1 User plane for transparent services

After a handover from a GERAN A/Gb mode MSC to a GERAN Iu mode MSC the user plane <u>for transparent services</u> between the anchor MSC and the visited MSC shall <u>be identical</u>comply to:

- the A-TRAU' protocol except for FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC = UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64 kbit/s and 32 kbit/s is based on ITU-T Recommendation I.460.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s). Furthermore, Clause 11a.1.3 is applicable.

### 11.3.2. User plane for non-transparent services

After a handover from a GERAN A/Gb mode MSC to a GERAN Iu mode MSC the user plane for transparent services between the anchor MSC and the visited MSC shall comply to:

- the A-TRAU" protocol as defined below for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU protocol for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2 kbit/s and 57,6 kbit/s, if both MSCs are connected via a TDM interface.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' or A-TRAU' protocol). Furthermore, Clause 11a.1.3 is applicable.

For the handover scenario from GERAN A/Gb mode MSC to a GERAN Iu mode MSC, the existing A TRAU' frame format will be extended to support the new defined RAB subflow data rates of the GERAN Iu mode.

#### 11.3.2.1 A-TRAU" frame format

For the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s tThe RLP frame length of 240 bit is shall be used. For the transfer of this RLP frame length to A TRAU' protocol is modified. The the A-TRAU' protocol is introduced. An A-TRAU' frame has the same layout as the A-TRAU' frame and contains two A-TRAU frames.

One RLP frame with the length of 240 bit is contained in one A-TRAU frame. The A-TRAU'' protocol is only used for the non-transparent services.

In figure 15a, the format of the A-TRAU frame for the RLP frame length of 240 is shown.

## Next modified Clause

#### 11.4 Handover within lu mode PLMNs

After a handover from an Iu mode MSC to a UTRAN Iu mode MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to:

- the A-TRAU' protocol if both MSCs are connected via a TDM interface except for the transparent case FNUR = 32 kbit/s (ITC = UDI or RDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64 kbit/s and 32 kbit/s is based on ITU-T Recommendation I.460 [2].
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (A-TRAU' protocol or plain 64kbits/s).

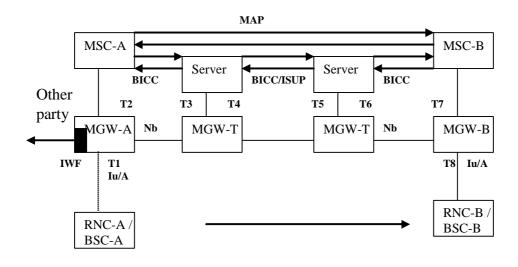
After a handover from an Iu mode MSC to a GERAN Iu mode MSC the user plane between the anchor MSC or MGW and the visited MSC or MGW shall comply to

- the A-TRAU' and or A-TRAU" protocol or a plain 64 kbit/s channel if both MSC are connected via a TDM interface. The A-TRAU' protocol shall be used for transparent services except for the transparent cases FNUR = 32 kbit/s (ITC = UDI), FNUR = 56 kbit/s (ITC=RDI) and FNUR = 64 kbit/s (ITC=UDI). For these exceptions a plain 64 kbit/s channel is used between the MSCs. The rate adaptation between 64kbit/s and 32kbit/s is based on ITU-T Recommendation I.460. For non-transparent services, the A-TRAU' protocol shall be used for the RAB subflows with 12 kbit/s, 24 kbit/s, 36 kbit/s and 48 kbit/s and the A-TRAU' protocol shall be used for the RAB subflows with 14,4 kbit/s, 28,8 kbit/s, 43,2 kbit/s and 57,6 kbit/s.
- the Nb UP protocol if the anchor MSC or MGW and the visited MSC or MGW are connected via an ATM interface or IP interface. The NbUP shall be configured in support mode, the data is transported in a 64 kbit/s bit stream, formatted in SDUs of 40 octets and transmitted every 5 ms, in accordance with Annex P of ITU-T Recommendation I.366.2 [81]. PDU type 0 is used, i.e., payload CRC is applied. This is needed for the framing to be handled the same for all transports but the Frame Quality Classification control shall be ignored (3GUP property Delivery Of Erroneous SDUs = yes) and therefore interim nodes shall only pass on the CRC. The data is encoded between MSC-B/MGW-B (non-Anchor) and MSC-A/MGW-A (Anchor) as for the TDM case (ATRAU'' protocol, A-TRAU' protocol or plain 64kbits/s). Furthermore, Clause 11a.1.3 is applicable.

## Next modified Clause

## 11a.1.3 Transport on the access side of the IWF after inter-MSC relocation

Clause 11.4 is applicable. Furthermore, the Nb UP is used in support mode; all interim Server nodes are assumed not to be aware of the relocation case – i.e. receive BICC IAM with same information as for connections beyond the IWF (Celause 11a.1.2). Figure 17 indicates the relevant connections, where MSC-A/MGW-A are the Anchor nodes and MSC-B/MGW-B are the Non-Anchor nodes.



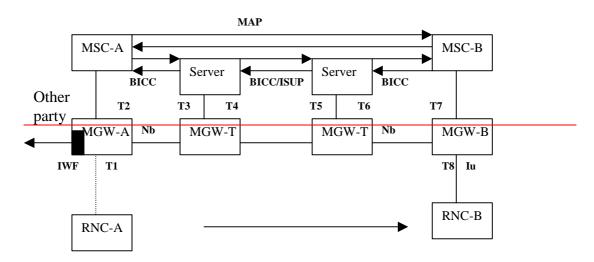


Figure 17: Bearer Independent connections for Inter-MSC SRNS Relocation

The IuUP shall be initialised on each Nb leg in a forward direction (regardless if Forward Bearer or Backward Bearer procedures are used), i.e. in the direction of the IAM. For further details see TS 23.205 [83]

#### 11a.1.3.1 Non-Transparent CSD

Table 14: Non-Transparent CSD MGW Termination Properties For Inter-MSC SRNS Relocation

Termination Packages/Parameters		MSC-A				Intermediate Nodes	
	T1 <u>(lu)</u>	<u>T1 (A)</u>	T2	T7	T8 <u>(lu)</u>	T8 (A)	T3, T4, T5, T6
TMR	-	<u>=</u>	-	UDI	-	<u>=</u>	UDI
threegcsd:plmnbc	PLMN_BC	PLMN_BC	PLMN_BC	-	-	<u>:</u>	-
threegup:interface	RAN	Ξ	CN	CN	RAN	<u>:</u>	CN
			(NOTE 2)	(NOTE 2)			(NOTE 2)
threegup:initdir	IN	Ξ.	OUT	IN	OUT	Ξ	IN
			(NOTE 2)	(NOTE 2)			(NOTE 2)
threegup:mode	support	Ξ	Support	Support	support	<u>:</u>	support
			(NOTE 2)	(NOTE 2)			(NOTE 2)
threegcsde:bitrate	-		-	-	BITRATE	11	-
threegcsd:gsmchancod	_	GSM CC	GSM CC	=	Ξ.		_
			(NOTE 1)				

NOTE 1: GSM CC shall only be provided if T8 is an A interface. GSM CC shall not be provided if T8 is an Iu interface.

NOTE 2: Only applicable for a BICC network

#### Transparent CSD 11a.1.3.2

Table 15: Transparent CSD MGW Termination Properties For Inter-MSC SRNS Relocation

Termination Packages/Parameters		MSC-A			Intermediate Nodes		
	T1 <u>(iu)</u>	<u>T1 (A)</u>	T2	T7	T8 <u>(iu)</u>	T8 (A)	T3, T4, T5, T6
TMR	-	<u>=</u>	UDI	UDI	-	=	UDI
threegcsd:plmnbc	PLMN_BC	PLMN_BC	PLMN_BC	-	-	<u>:</u>	-
threegup:interface	RAN	Ξ	CN (NOTE 3)	CN (NOTE 3)	RAN	Ξ	CN (NOTE 3)
threegup:mode	transparent	Ξ	support (NOTE 3)	support (NOTE 3)	transparent	Ξ	support (NOTE 3)
threegup:initdir	-	Ξ	OUT (NOTE 3)	IN (NOTE 3)	-	Ξ	IN (NOTE 3)
threegcsden:bitrate	-	П	-	-	BITRATE ( <del>note</del> <u>NOTE</u> 1)	Ξ	-
threegcsd:gsmchancod	Ξ	GSM CC	GSM CC (NOTE 2)	=	=	Ξ	Ξ

NOTE 1: This is optional for the case when rate is 64kb/s then no rate adaptation is required.

NOTE 2: GSM CC shall only be provided if T8 is an A interface. GSM CC shall not be provided if T8 is an Iu interface.

NOTE 3: Only applicable for a BICC network

Note 1: This is optional for the case when rate is 64kb/s then no rate adaptation is required.