Technical Specification Group Services and System Aspects   **TSGS#27(05)0113**
Meeting #27, 14 - 17 March 2005,Tokyo, Japan

Source: **TSG SA WG2**

Title: **CR(s) to 23.903**

Agenda item: **7.2.3**

Document for: **APPROVAL**

S2 Tdoc	Title	Spec	CR	Rev	Cat	C_Ver	Rel	WI
S2-050215	Incorrect sequence of events in 4..3.1.1	23.903	001		F	6.0.0	Rel-6	CSVV

CR-Form-v7.1

CHANGE REQUEST

| | ⌘ | **23.903** CR **001** | ⌘**rev** | **0** | ⌘ | Current version: | **6.0.0** | ⌘ |

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

Proposed change affects: | UICC apps⌘ ☐ | ME **X** | Radio Access Network ☐ | Core Network ☐

Title: ⌘	Incorrect sequence of events in 4.3.1.1	
Source: ⌘	3GPP TSG_SA WG2	
Work item code:⌘	CSVV	*Date:* ⌘ 15/01/2005
Category: ⌘ **F**		*Release:* ⌘ Rel-6

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

Use *one* of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change: ⌘	In the "fallback from video to voice" message sequence, there is text about the UE prompting the user to confirm the redial attempt. However this is incorrectly placed in step 3 instead of step 10.
Summary of change:⌘	Text is removed from step 3 and related text is added to step 10.
Consequences if not approved: ⌘	The message flow is misleading.

Clauses affected: ⌘	4.3.1.1

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	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/specs/CR.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.

4.3 Fallback to voice during an established video call

4.3.1 Signalling flows and procedures

4.3.1.1 Fallback from UTRAN Video to UTRAN Voice call

The successful case of the "radio degradation at UE 2 leading to fallback to voice" for UMTS is illustrated in Figure 2.
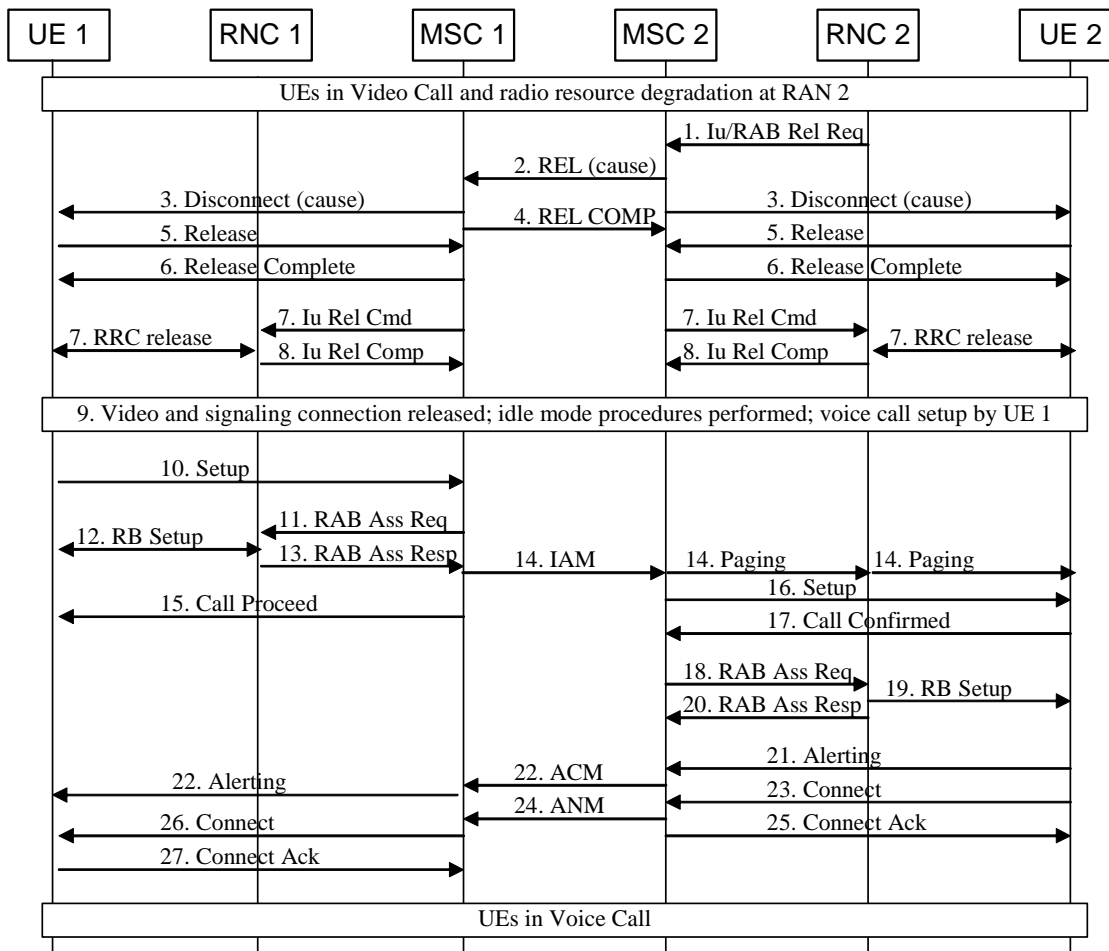
Figure 2: Radio degradation at UE 2 leading to fallback to voice

Note: Figure 2 does not show all of the RRC and Iu connection establishment messages.

1. RNC 2 is configured such that it knows that the local GERAN does not (or does) support video calls (i.e. does not (or does) support 64 kbit/s conversational QoS on the CS domain).

Note: For an interim period, an alternative solution is that MSC 2 sets the Service Handover IE to 'Handover to GSM shall not be performed' in the RAB Assignment Request message. However, this solution is not future proof if (all or part of) the network's GERAN is upgraded to support CS Video telephony.

When RNC 2 detects that the 64kbit/s bearer cannot be maintained any longer (e.g. radio link failure, 3GPP TS 25.331 [4]), RNC 2 sends either an Iu RELEASE REQUEST message or a RAB Release Request message to MSC 2, indicating that the Iu connection should be released

2. MSC 2 sends a REL message with the release cause. This cause value in the REL message might be changed by transit networks prior to arrival at MSC 1.

3. The MSCs send Disconnect messages to the UEs. ~~UE 1 should first confirm the Redial attempt (not shown here) with its user.~~

In case RNC 2 sent Iu Release Request in step 1 but not a RAB Release Request, MSC 2 will not perform step 3. (i.e. not send Disconnect, which causes that also steps 5 and 6 are not performed), but MSC 2 will immediately proceed with step 7 (i.e. send Iu Release Command).

4. MSC 1 sends a Release Complete message to MSC 2.

5. The UEs release the Video Call.

6. The MSCs confirm the release of the Video Call.

7. The MSCs request the release of all resources and the RNCs release the RRC connections (unless their UE is in PMM connected state).

8. The RNCs confirm the release of all resources.

9. When the signalling connections with the UEs are released, UE 1 and UE 2 camp on suitable cells and perform the required idle mode tasks.

10. UE 1 prompts its user to attempt a Redial. When UE 1 gets the Redial confirmation from its user it sends a SETUP message (containing the Redial indication) to MSC 1 to setup a Voice call.

11. A RAB Assignment Request message is sent from the MSC 1 to the RNC 1, requesting the setup of a RAB for a Voice call.

12. The radio bearer is established between RNC 1 and UE 1.

13. RNC 1 responds to MSC 1 with an RAB Assignment Response message.

14. MSC 1 sends an IAM message to MSC 2 to establish a Voice Call with UE 2. MSC 2 pages RNC 2 and RNC 2 pages UE 2.

15. MSC 1 sends a Call Proceeding message to UE 1.

16. The MSC 2 sends a Setup message to UE 2 indicating the establishment of a Voice Call.

17. UE 2 sends Call Confirmed to MSC 2.

18. The RAB Assignment Request message is sent from MSC 2 to the RNC 2, requesting the establishment of a RAB for a Voice Call.

19. The radio bearer is established between the RNC 2 and UE 2.

20. RNC 2 responds to MSC 2 with a RAB Assignment Response message.

21. UE 2 sends Alerting message to MSB 2.

22. MSC 2 sends ACM message to MSC 1. MSC 1 sends Alerting to UE 1.

23. User 2 accepts the Voice Call and UE 2 sends Connect message to MSC 2.

24. MSC 2 sends ANM message to MSC 1.

25. MSC 2 sends Connect Ack message to UE 2.

26. MSC 1 sends Connect message to UE 1.

27. UE 1 acknowledges with a Connect Ack message to MSC 1 and the Voice call is established.

4.3.1.2   Fallback from UTRAN Video to GERAN Voice call

The procedure in 4.3.1.1 can also be used if UE 2 drops out of UTRAN coverage into GERAN coverage. However there are additional complications:

a) If the UTRAN and GERAN cells are attached to different MSCs then problems are likely to occur due to the time required for the UE 2 to perform Location Area and Routeing Area updating.

In particular, if UE 2 is updating with a new MSC and/or new SGSN, UE 2 will not respond to MSC 2's paging. This will only become known to UE 1 when MSC 2's "no response to paging" timer expires. Typically, an operator configures this timer with values in the range of 8 to 25 seconds. When this timer expires, it is quite likely that UE 2 will have "call forward on not reachable" set and so UE 1's call will be diverted to a voice mail server. To avoid these problems, it seems important that the operator configures the UTRAN to minimise the number of video calls that lead to fallback to GERAN coverage and/or to configure the network such that geographically similar UTRAN and GERAN cells are in the same Routeing Area.

b) In order to avoid useless handover attempts, the RNCs are frequently configured so that no GERAN neighbour cells are given to the mobile during a video call. This will slow down re-selection from 3G to 2G in the case of total loss of 3G coverage. Conversely, in many other scenarios the lack of 2G neighbour cells might force UE 2 to camp on the 3G cell for long enough for it to receive the paging for the voice call.

Overall, the operator may need to adapt the neighbour cell lists provided in video calls on cell by cell basis and/or dependent upon whether or not combined 2G/3G MSCs AND combined SGSNs are in use.

4.3.2 Future enhancements

4.3.2.1 RRC behaviour following degradation of the video RAB

Additional study may be beneficial on how to 'synchronise' the release of the RRC connection in the RNC and in the mobile when the radio connection is degraded or lost. If synchronisation cannot be guaranteed then timers may be needed to delay the redial attempt by the A party.

4.3.2.2 Interaction with voice mail servers

If a redial attempt is unsuccessful, it may (or may not) be appropriate to avoid being forwarded to a voice mail server.

One potential solution to this is that the A party signals (e.g. by appending a suffix to the dialled digits) to MSC-A and MSC-A then uses the Call Diversion Not Allowed setting in the Call Diversion Treatment Indicators to inhibit call forwarding. One problem with the use of a suffix in the dialled digits is that the digit analysis in MSC-A usually only examines the leading digits. Conversely, if the UE adds a prefix to the dialled digits, then the call will not be handled properly if MSC-A does not support this functionality.