Technical Specification Group Services and System Aspects **TSGS#23(04)0645**
Meeting #25, Palm Springs, USA
13-16 September 2004

Source: **TSG-SA WG4**

Title: CR TS 26.102 on Mapping of GSM_EFR SID on Nb Interface (Release 6)

Document for: **Approval**

Agenda Item: **7.4.3**

The following CR, agreed at the TSG-SA WG4 meeting #32, is presented to TSG SA #25 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.102	016	1	Rel-6	Mapping of GSM_EFR SID on Nb Interface	F	5.2.0	S4	TSG-SA WG4#32	S4-040400

3GPP TSG-SA4 Meeting #32 ***Tdoc ⌘S4-040400***
Prague, Czech Republic, 16-20 August 2004

CR-Form-v7

CHANGE REQUEST

⌘ **TS 26.102 CR 016** ⌘**rev 1** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	Mapping of GSM_EFR SID on Nb Interface
Source:	⌘	TSG SA WG4
Work item code:	⌘	TrFO
Date:	⌘	2004-09-14
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:

2	*(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)*

Reason for change:	⌘	The Frames Structure for GSM_EFR SID is missing. SA has identified this missing specification in BARS, see TR 23.977.
Summary of change:	⌘	Specification of the Frame Structure for GSM_EFR SID.
Consequences if not approved:	⌘	GSM_EFR can not be used for TrFO on the Nb-Interface

Clauses affected:	⌘				
Other specs affected:	⌘	**Y**	**N**		
		X		Other core specifications	⌘ TS 26.101
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	These changes *could* be discussed for earlier releases as well.			

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.

FIRST CHANGE

1 Scope

The present document specifies the mapping of the AMR generic frame format (3GPP TS 26.101) to the Iu Interface (3GPP TS 25.415 [7]), the Uu Interface and the Nb Interface (3GPP TS 29.415). It further specifies the mapping of Enhanced Full Rate (GSM EFR) coded speech and of PCM 64 kBit/s (ITU-T G.711 [9]) coded speech to the Nb Interface.

NEXT CHANGE

4 General

The mapping of the AMR Speech Codec parameters to the Iu interface specifies the frame structure of the speech data exchanged between the RNC and the TC in case of normal operation. This mapping is independent from the radio interface in the sense that it has the same structure for both FDD and TDD modes of the UTRAN.

The mapping between the Speech Codec and the Radio Access Network within the UE is not an open interface and need not to be detailed.

The mapping on the Nb Interface is identical to the one on the Iu Interface in case of Transcoder Free Operation, with the MGW relaying the SDUs unaltered between Iu and Nb Interfaces.

In case of transcoding within the MGW the PCM coded speech is mapped onto the Nb Interface in packets of 40 octets.

The mapping of GSM EFR Speech Codec parameters is defined on the Nb Interface, but not on the Iu Interface.

NEXT SECTION FOR INFORMATION ONLY

6.2 Mapping of the bits

The mapping of the bits between the generic AMR frames and the PDU is the same for both uplink and downlink frames.

The following table gives the correspondence of the bit fields between the generic AMR frames at the TC interface and the PDU exchanged with the Iu transport layer.

Table 6-1: Mapping of generic AMR frames onto Iu PDUs

PDU field	Corresponding field within the generic AMR frame	Comment
PDU Type	N/A	Type 0
Frame Number	N/A	
FQC	Frame Quality Indicator	
RFCI	Frame Type	
Payload CRC	N/A	
Header CRC	N/A	
Payload Fields (N Sub-flows)	Class A or SID payload Class B Class C	
SDU #1	Most important speech bits come first	Mandatory
SDU #2	Next bits follow	Optional
…	…	Optional
SDU #N	Least important speech bits	Optional

The number of RAB sub-flows, their corresponding sizes, and their attributes such as "Delivery of erroneous SDUs" shall be defined at the RAB establishment and signalled in the RANAP RAB establishment request, as proposed in clause 5. The number of RAB sub-flows are corresponding to the desired bit protection classes. The total number of bits in all sub-flows for one RFC shall correspond to the total number given in 3GPP TS 26.101, generic AMR frame, format IF1, for the corresponding Codec Mode, respectively Frame Type.

Guidance for setting the number of bits in each RAB sub-flow according to their relative subjective importance is given in 3GPP TS 26.101.

The following two tables are examples of mapping of RAB sub-flows.

Table 6-2 gives three examples of sub-flow mapping.
The RFCI definition is given in order of increasing SDU sizes.

- Example 1 describes Codec Type UMTS_AMR, with all eight codec modes foreseen in the Active Codec Set (ACS) and provision for Source Controlled Rate operation (SCR). In this example, Blind Transport Format Detection is supported and the sub-flow mapping follows the 26.101 class division guidance.

- Example 2 describes Codec Type GSM_EFR, with one codec mode, including SCR.

- Example 3 describes Codec Type FR_AMR, including AMR SCR

Table 6-2: Example for AMR with SCR and three sub-flows, according to subjective class division indication of 3GPP TS 26.101

UMTS_AMR	GSM_EFR	FR_AMR	RAB sub-flows			Total size of bits/RAB sub-flows combination (Mandatory)	Source rate
RFCI Example 1	RFCI Example 2	RFCI Example 3	RAB sub-flow 1 (Optional)	RAB sub-flow 2 (Optional)	RAB sub-flow 3 (Optional)		
2		2	42	53	0	95	AMR 4,75 kbps
3			49	54	0	103	AMR 5,15 kbps
4		3	55	63	0	118	AMR 5,9 kbps
5		4	58	76	0	134	AMR 6,7 kbps
6			61	87	0	148	AMR 7,4 kbps
7			75	84	0	159	AMR 7,95 kbps
8		5	65	99	40	204	AMR 10,2 kbps
9	2		81	103	60	244	AMR 12,2 kbps
1		1	39	0	0	39	AMR SID
	1		43	0	0	43	GSM-EFR SID

NEXT CHANGE

8 Nb Interface User Plane (CN)

The data structures exchanged on the Nb interface are symmetrical, i.e. the structures of the sent and received data frames are identical.

8.1 Frame structure on the Nb UP transport protocol

Delivery of erroneous SDUs for AMR and GSM_EFR data and PCM coded speech on the Nb interface shall be set to: "YES".

Erroneous speech frames may be used to assist the error concealment procedures. Therefore, according to [1] and [7], PDU Type 0 (with payload CRC) shall be used for the transport of AMR and GSM_EFR coded speech on the Nb interface.
PDU Type 0 (with payload CRC) shall be used for the transport of PCM coded speech on the Nb interface, too.

8.1.1 Initialisation

The initialisation procedure is used for support mode. At the initialisation several parameters are set by the CN. The initialisation procedure for the Nb Interface is described in [7].

8.1.2 Time Alignment Procedure

The handling of Time Alignment on the Nb Interface is described in [7].

The Time alignment procedure shall be dismissed in case of TFO and TrFO.

8.2 Mapping of the bits

8.2.1 Mapping for AMR frames

The mapping of the bits between the generic AMR frames and the PDU for the Nb Interface is identical to the mapping on the Iu Interface. In case of TrFO the MGW relays the AMR frames from the Iu Interface unaltered to the Nb Interface and vice versa, as described in [7].

8.2.2 Mapping for PCM Coded Speech

In case of transcoding within the MGW from PCM coded speech to AMR frames and vice versa the mapping for the PCM coded speech on the Nb Interface shall be as defined in Table 8-1.

Table 8-1: Mapping of PCM Coded Speech onto Nb PDU, Type 0

PDU field	**Comment**
PDU Type	Type 0 (with Payload CRC)
Frame Number	as defined in [7]
FQC	set to "good"
RFCI	initialise by MGW, see [7], one value required
Header CRC	as defined in [7]
Payload CRC	as defined in [7]
Payload Field	40 octets of PCM coded speech, in accordance with [8].

8.2.3 Mapping for GSM_EFR frames

The mapping of the bits between the generic GSM_EFR frames and the PDUs for the Nb Interface follows the same principles as the mapping of AMR frames. The PDU for the GSM_EFR speech frame is identical to the PDU for AMR Mode 12.2 kbps. The PDU for the GSM_EFR SID frame is similar to the PDU for AMR SID, with 43 instead of 39 bits in the payload field.

END OF CHANGES