

Source: Alcatel, Ericsson, Lucent, Nokia, Siemens
Title: Clarification on Framing Protocol
Agenda item: 5.2
Document for: DISCUSSION

Introduction

This contribution is related to an incoming liaison statement from TSG SA WG 2 in (S2-030998), which is sent to TSG SA and copied to TSG CN. In their liaison statement SA2 state: "There are currently different interpretations on how G.711 may be carried over Nb according to existing standards." This contribution provides clarification on this issue.

The Issue

At the Nb reference point, the IuUP/NbUP framing protocol is used. The issue is whether 3GPP has specified both the use of support mode and transparent mode for G.711 (=PCM) encoded speech, or support mode only.

Discussion

In what follows, we summarise related statements in 3GPP specifications:

- ?? TS 25.415 defines IuUP framing protocol with transparent mode and support mode.
TS 25.415 does not state which mode is applicable in which situation.
- ?? TS 29.415 defines NbUP framing protocol based upon the IuUP framing protocol, also with transparent mode and support mode, and states that this protocol is applicable at the Nb interface. **TS 29.415 does not state which mode is applicable in which situation.**
- ?? TS 29.414 defines the transport of NbUP framing protocol, i.e. the layers below this protocol.
- ?? **TS 29.232** defines the "3GUP package", which is used by an MSC-Server to control of the NbUP and IuUP terminations of its CS-MGW. **The MSC-Server configures the mode of the IuUP or NbUP framing protocol to be applied with the "UP Mode of operation" property before the framing protocol becomes operational.**
- ?? **TS 26.102 specifies how the IuUP/NbUP framing protocol shall be applied to transport AMR and PCM coded speech. It specifies that the support mode shall be used.**
- ?? TS 26.202 specifies how the IuUP/NbUP framing protocol shall be applied to transport wideband AMR coded speech. It specifies that the support mode shall be used.
- ?? TS 29.007 specifies how the IuUP/NbUP framing protocol shall be applied to transport CS data services.
- ?? Stage 2 TS 23.205 of the CS core network does not contain any statements regarding the framing protocol mode.
- ?? Stage 2 TS 23.153 states that the NbUP framing protocol support mode shall be applied to transport compressed speech, but does not contain any related statement with respect to G.711 coded speech.

In summary, TS 26.102 states that G.711 encoded speech is transported in support mode, and other 3GPP specifications do not contain any contradicting statements. The relevant text from TS 26.102 is copied in the Annex below.

Conclusion

3GPP Release 4 and 5 specifications specify only the IuUP/NbUP protocol in support mode for G.711 encoded speech at the Nb reference point.

Proposal

It is proposed to inform TSG SA about the issue and the conclusion.

Annex

The following excerpts from TS 26.102 clarifies that G.711 is transported in support mode across the Nb interface. Note that PDU Type 0 is only defined for Support Mode (see TS 29.415).

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 PCM 64 kBit/s (ITU-T G.711 [9]) coded speech to the Nb Interface.

(...)

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.

(...)

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 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 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.

(...)

8.2.2 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].