Title: **Document to TSG-SA#15 on "AMR-WB codec references in TS 26.234 Release 4"**

Source: **TSG-SA WG4 (drafted by SA4 Chairman)**

1. Introduction

At TSG-SA#14, Tdoc SP-010741 ("Release consistency: AMR-WB in Streaming Specifications") was presented [1]. This Tdoc requested the removal of references to AMR WB in TS 26.234 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs" version 4.1.0, since the AMR-WB codec is only available in Rel-5. The decision of TSG-SA was that the issue should be brought to the attention of TSG-SA WG4 (SA4), and that TSG-SA4 was asked to come back at the next TSG-SA meeting with a proposal for resolution of the issue.

2. Background

At SA4#16 (February, 2001), SA4 finalised TS 26.234 and the AMR-WB codec 26-series TSs. These were all put forward to TSG-SA#11 (March 2001) for approval to Rel-4. TS 26.234 was approved for Rel-4. At TSG-SA#11, Tdoc SP-010128 [2] expressed concern that certain network aspects of the whole AMR-WB feature "Wideband Telephony Service – AMR" (AMRWB) were not ready to be approved in Release 4: *"It [3GPP Feature AMRWB] consists of two building blocks, the specification of the codec and the implementation into the network. The codec specifications are finalized in S4. However, so far little work has been done for the implementation of the codec in the network.".* Consequently, as the whole AMR-WB feature was not ready for Rel-4, TSG-SA#11 approved the AMR-WB codec specifications for Rel-5, but acknowledged that the debate on inclusion of the whole AMR-WB feature (including the AMR-WB codec) in Rel-4 could be opened again, based on review at TSG-SA#12. However, the remaining network issues could not be finalised in time by TSG-SA#12, and the AMR-WB feature (including the AMR-WB codec part) remained in Rel-5. At TSG-SA#11, the AMR-WB codec TSs were functionally frozen (for Rel-5) and only essential corrections would be allowed to them. The specifications are:

- TS 26.171 "AMR Wideband Speech Codec; General description"
- TS 26.173 "AMR Wideband Speech Codec; C-source code"
- TS 26.174 "AMR-WB speech codec; test sequences"
- TS 26.190 "AMR Wideband Speech Codec; Transcoding Functions"
- TS 26.191 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames"
- TS 26.192 "AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels"
- TS 26.193 "AMR Wideband Speech Codec; Source Controlled Rate operation"
- TS 26.194 "AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels"
- TS 26.201 "AMR Wideband Speech Codec; Speech Codec Frame Structure"
- TS 26.202 "AMR-WB speech codec; interface to Iu and Uu"

3. Discussion

TS 26.234 specifies protocols and codecs for the Transparent Packet switched Streaming Service (PSS). In PSS, the AMR-WB frames are encapsulated in RTP packets and transported over UDP/IP. PSS only make use of the AMR-WB codec and not any of the parts relating to the integration of the AMR-WB codec in the network.

SA4 has assumed throughout the Rel-4 PSS work that the AMR-WB codec specifications are part of 3GPP Rel-4 Feature "Transparent End-to-End PS mobile streaming application" (PSTREAM). These AMR-WB codec TSs are needed and are used in Rel-4 PSS. (The AMR-WB codec should therefore have belonged to under PSTREAM in the 3GPP Work Plan.)

There could be two solutions for the inconsistent references between Release 4 and 5 in TS 26.234. One is to remove the AMR-WB codec references in TS 26.234 as requested in [1]. The other solution is to move the specifications related to the AMR-WB codec to Rel-4 (but to leave the ones relating to the inclusion of the codec in the network to Rel-5). Both were seen as possible solutions to the problem. SA4 agreed that the latter solution should be followed;one company expressed reservation to the agreement.

The SA4 position is motivated by the following:

1. The AMR-WB codec TSs should have belonged to the 3GPP Rel-4 Feature "Transparent End-to-End PS mobile streaming application" (PSTREAM), as they are used and needed in the Rel-4 PSS work. This was assumed during the Rel-4 PSS work at SA4. There exists a Rel-4 specification (TS 26.234) that utilises the AMR-WB codec.

2. The parts of the 3GPP Feature AMR-WB (i.e. the AMR-WB codec) used in TS 26.234 have been considered ready since Rel-4 was finalised in March 2001. It was only the integration of the AMR-WB codec into the network that was considered not stable enough. This part is not used in PSS since RTP/UDP/IP transport is used for AMR-WB.

3. The AMR-WB codec is a complete entity as such and possible to implement for use in 3GPP (as shown in its use in TS 26.234 Rel-4). AMR-WB codec is also ITU-T G.722.2 recommendation. TS 26.234 Rel-4 likewise refers to codec specifications of many non-3GPP defined codecs (e.g., MPEG-4 AAC and ITU-T H.263) without needing system support to be included for them in 3GPP specifications. Excluding the use of AMR-WB codec in Rel-4 puts the 3GPP AMR-WB codec unnecessarily in disadvantageous position compared to non-3GPP defined codecs (also used in TS 26.234 Rel-4).

4. Although taking place now, the inclusion of AMR-WB codec in Rel-4 is aligned with the specification preparation and approval timelines. Like Rel-4 specifications, the AMR-WB codec specifications were finalised, approved and frozen within the Rel-4 timeframe at TSG-SA#11 (in March 2001) although they were not formally included for Rel-4 at that time.

5. Moving AMR-WB codec specifications into Rel-4 is in-line with the packet switched streaming work in SA4 and the working assumptions there, thus allowing harmonious and consistent work progress in developing PSS services for 3GPP.

4. Request to TSG-SA#15

SA4 proposes the following actions to be taken at TSG-SA#15 (to correct the problem with the references to the Rel-5 specifications of the AMR-WB codec in TS 26.234 Rel-4):

Approve to transfer to Rel-4 the AMR-WB codec TSs used in Rel-4 PSS. From the list of the AMR-WB TSs, all except TS 26.202 are used in Rel-4 PSS and should be moved to Rel-4. (TS 26.202 should not be moved since it relates to the network aspects of the AMR-WB feature.) For clean-up, three CRs to the moved TS 26.171, TS 26.174 and TS 26.191 to remove the references to TS 26.202 will be provided by SA4 at next TSG-SA plenary.

References

[1] TD SP-010741 Consistency of Releases: Removal of AMR WB (Rel-5) References in Rel-4.
[2] TD SP-010128 On the inclusion of the feature AMR-WB in 3GPP Rel-4