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Title: TSG-SA WG4 Status Report at TSG-SA#14
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Executive Summary

Since TSG-SA#13, TSG-SA WG4 (SA4) has met once as SA4 plenary (SA4#19 on December 3rd – 7th, 2001). In addition, the SA4 PSM (Packet Switched Multimedia) SWG has held one ad-hoc meeting and the TFO (Tandem Free Operation) SWG has held two ad-hoc meetings.

Progress in Release 5 Work

- **Wideband Telephony Service – AMR:** Phase 1B of AMR-WB codec characterisation testing (3G channels) has been finalised and an updated draft TR “AMR-WB Speech Codec Performance Characterisation” (TR 26.976, v.0.6.0) is presented for information at TSG-SA#14. Analysis of the results will continue in SA4. SA4 requests approval of the work of the listening laboratories of Phase 1B to authorise ETSI to pay the involved laboratories. Inclusion of AMR-WB codec into TS on “In-band Tandem Free Operation of Speech Codecs” (TS 28.062) is proceeding well and is expected to be completed by TSG-SA#15. Preparation of floating-point C-code version of the AMR-WB codec is in progress. The C-code has been developed and it has been under optimisation within several companies. Currently, testing is ongoing to verify the high quality performance of the optimised floating-point code. Draft TS “ANSI-C Code for the Floating Point AMR-WB Speech Codec” (TS 26.204, v.1.0.0) has been prepared and is presented for information at TSG-SA#14. This TS (with finalised C-code included) is expected for approval at TSG-SA#15. In ITU-T, the AMR-WB speech codec is under final formal approval process and is expected to become a new ITU-T recommendation G.722.2 early 2002.
- **Extended Transparent End-to-End Packet Switched Streaming Service (PSS-E):** The work for Rel-5 streaming is ongoing in SA4. Capability Exchange has been defined for Rel-5 PS streaming. This is expected to be the main new functionality over Rel-4 streaming. The codecs specified for streaming service offering a particular media type remain the same as in Rel-4 except that a new media type for Synthetic Audio is added, PNG has been added as an additional recommended coding for bitmap graphics, coding of vector graphics is included, and optional video buffer model is described. There are some other additions as well. Draft versions of Stage 1 description from SA1 have been taken as input to the PSS-E work in SA4. It is SA4’s intention to bring the PSS-E for Rel-5 at TSG-SA#15 through CRs to the existing Rel-4 versions of streaming specifications TS 26.233 (General Description) and TS 26.234 (Protocols and codecs). These CRs will contain the additions of features developed during the PSS-E work in SA4. The Rel-5 work is based on Rel-4 streaming, and Rel-5 streaming will provide full backward compatibility with Rel-4 streaming. Only capability exchange is expected to be included as a completely new functionality. Therefore, the architectural impacts in Rel-5 remain limited like in Rel-4. For these reasons, SA4 intends not to produce a separate TS for Stage 2 but plans to continue including the architectural considerations in the two 26-series TSs as was done for Rel-4. Furthermore, SA4 feels that it would be useful to prepare a new TR on RTP usage model for Rel-5 since the IETF defined Real-Time Protocol (RTP/RTCP) is a general description of the functionality that RTP can provide and there could be a need to provide description of how an application should use RTP/RTCP most efficiently.
- **Multimedia Messaging Service codecs/formats:** T2 has requested SA4 to undertake the responsibility for the definition of media formats and codecs for Multimedia Messaging Services (MMS), except for Text. T2 believes that this would allow to better ensure the alignment of MMS codecs/formats with those chosen for other services, in particular for streaming. SA4 is willing to take the task as requested by T2, and prepare a new SA4 specification for Rel-5 addressing the definition and usage of media codecs and formats in MMS. SA4 has started the work, and a draft specification for MMS codecs and formats (TS 26.140, v.1.0.0) is presented for information at TSG-SA#14. The target is to complete this TS in co-operation with T2 and bring it for approval at TSG-SA#15.

- **Multimedia Codecs and Protocols for Conversational Packet Switched Services (part of feature Provisioning of IP Based Multimedia Services):** TS on Default Codecs (TS 26.235) has already been finalised and approved by TSG-SA. A draft version of the other TS on "Transport Protocols for PS conversational multimedia applications" (TS 26.236, v.1.0.0) is brought for information to TSG-SA#14. This TS gives definition of the required protocol usage: it defines media type requirements (e.g., RTP session description parameters) and gives pointers to the relevant call and bearer control specifications. This TS is expected for approval at TSG-SA#15.

Change Requests are presented for

- **Rel-4 (and earlier releases):** TSs 06.73/26.073, 26.103, 26.233, 26.234, and 28.062.
- **Rel-5:** 26.173, 26.174, 26.190

Note: Annex B (separate file) of this report contains a copy of the slides presentation to TSG-SA#14.

1. Introduction

Since TSG-SA#13, TSG-SA WG4 (SA4) has held one plenary meeting. In addition, the TFO (Tandem Free Operation) and PSM (Packet Switched Multimedia) SWGs have held ad-hoc meetings outside SA4 plenaries.

During SA4#19 meeting, the Speech Quality (SQ), AMR Wideband (AMR-WB) and PSM SWGs met. Altogether about 70 delegates participated in SA4#19. About 150 documents were discussed.

Meetings held:

SA4 TFO SWG ad-hoc:	Oct 11-12, 2001	hosted by Siemens in Munich, Germany
SA4 PSM SWG ad-hoc:	Oct 30-31, 2001	hosted by Nokia in Helsinki, Finland
SA4 TFO SWG ad-hoc:	Nov 26-27, 2001	hosted by Ericsson in Monschau, Germany
SA4#19:	Dec 3-7, 2001	hosted by NTT DoCoMo in Tokyo, Japan

Calendar of next meetings:

SA4 PSM SWG ad-hoc:	17-18 Jan, 2002	Host: Siemens in Munich, Germany
SA4 TFO SWG ad-hoc:	28-29 Jan (tbc), 2002	Host: Siemens in Garmisch, Germany
SA4#20:	Feb 18 – 22, 2002	Host: tbd
SA4#21:	May 20 – 24, 2002	Host: tbd
SA4#22:	July 22 – 26, 2002	Host: tbd
SA4#23:	Sept 30 – Oct 4, 2002	Host: tbd
SA4#24:	Nov 11 – 15, 2002	Host: tbd

Annex A of this document contains a list of all SA4 input documents to TSG-SA#14. The input documents from SA4 are contained in Tdocs SP-010691 until SP-010704.

Annex B (in a separate file) contains a copy of the slides presentation of SA4 progress report at TSG-SA#14.

2. Progress in Release 5 Work

2.1 Wideband Telephony Service – AMR

2.1.1 AMR-WB Characterisation Phase

The Characterisation Phase of the AMR-WB codec is continuing. The characterisation consists of three phases of listening tests (Phase 1A, 1B and 2). The results of Phase 1A testing (clean channel performance, GSM GMSK channels) were presented at TSG-SA#12. Since then the characterisation Phase 1B (3G channels) has been carried out. Phase 2 (EDGE 8-PSK, PS applications) will be carried out later. Table 1 shows in detail the listening test experiments of the overall Characterisation Phase. The budget for the characterisation (250 kEuro) is available as funding from the codec proponents that participated in the AMR-WB Selection Phase

During the now completed Phase 1B, ARCON and LMGT acted as host laboratories (processing of speech samples). Listening laboratories were ARCON (American English), BT (British English), Dynastat (American English and Spanish), NTT-AT (Japanese), and T-Nova (German). The error patterns were provided by Ericsson and Siemens. The error conditions in the tests covered both uplink and downlink path with various speed profiles (vehicular 50 and 120 km/h, pedestrian 3 km/h, indoor 3 km/h) and QoS values (FER target values of 0.5%, 1.0% and 3%). The configurations correspond to parameter settings agreed by TSG-RAN1. Tests were carried out for both clean speech and speech with background noise (S/N = 10 dB Car, S/N = 15 dB Street and S/N = 15 dB Cafeteria noise). The results are contained in draft version of Technical Report on "AMR-WB Speech Codec Performance Characterisation" (TR 26.976, v.0.6.0) presented for information in Tdoc SP-010692. In the TR, experimental test results from the speech quality related testing are reported to illustrate the behaviour of the AMR-WB codec. Additional information is provided, e.g. on implementation complexity of the AMR-WB codec. Besides the Phase 1B draft results, the draft TR contains information from the earlier testing phases: Selection Phase, Verification Phase and Characterisation Phase 1A. (Results of these were included in draft TR version 0.3.0 presented for information at TSG-SA#12.)

SA4 requests TSG-SA#14 to approve the work done by the contracted listening laboratories in AMR-WB Characterisation Phase 1B, i.e. work related to Experiment 7 (The Effect of Static Errors under Clean Speech Conditions) and Experiment 8 (The Effect of Background Noise in Static C/I Conditions) to authorise ETSI to pay the involved laboratories. (The work and results of Phase 1B are explained in Tdoc SP-010692, with draft test results found in Chapters 14-15.)

Experiment 9 (EDGE 8-PSK) and Experiment 10 (PS conversational and streaming applications) will be carried out later.

Table 1: Summary of AMR-WB characterisation phase experiments

Ph.	Exp.	Characterises systems:	Test type	Title	No. of test conditions	No. of languages
1A	1	All systems	ACR	Input levels and self-tandeming	56	2
	2	All systems	ACR	Interoperability Performance in Real World Wideband Scenarios.	56	2
	3	All systems	ACR	Interoperability Performance in Real World Narrowband Scenarios.	56	1
	4	All systems (GSM GMSK)	DCR	Performance of VAD/DTX/CNG Algorithm	40	1
	5	GSM GMSK	ACR	The Effect of Static Errors under Clean Speech Conditions.	48	2
	6a	GSM GMSK	DCR	The Effect of Background Noise 1 in Static C/I Conditions.	40	1
1B	6b	GSM GMSK	DCR	The Effect of Background Noise 2 in Static C/I Conditions.	40	1
	7a	3G	ACR	The Effect of Static Errors under Clean Speech Conditions.	56	1
	7b	3G	ACR	The Effect of Static Errors under Clean Speech Conditions.	56	1
	8a	3G	DCR	The Effect of Background Noise 3 in Static C/I Conditions.	48	1
	8b	3G	DCR	The Effect of Background Noise 4 in Static C/I Conditions.	48	1
2	8c	3G	DCR	The Effect of Background Noise 5 in Static C/I Conditions.	48	1
	9a	EDGE 8-PSK (Note 1)	ACR	EDGE Characterisation, FR/HR-channel The Effect of Static Errors under Clean Speech Conditions, set 1	(tbd)	1
	9b	EDGE 8-PSK (Note 1)	ACR	EDGE Characterisation, FR/HR-channel The Effect of Static Errors under Clean Speech Conditions, set 2	(tbd)	1
	10	PS-systems (Note 1)	ACR (tbd)	Testing for Packet-Switched (PS) conversational and streaming applications	(tbd)	1
Total Number of experiments:						18

Note 1: Experiments 9 and 10 will be performed in Phase 2. The detailed test plan for these experiments is FFS.

Table 2: Status list of AMR-WB codec specifications under SA4 responsibility

Deliverable	Title	Latest version	Comment/Status	Approval
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Deliverable	Title	Latest version	Comment/Status	Approval
TS 26.171	AMR Wideband Speech Codec; General description	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010082.	Approved at TSG-SA#11*
TS 26.173	AMR Wideband Speech Codec; C-source code	5.2.0	Approved at TSG-SA#11 in Tdoc SP-010083.	Approved at TSG-SA#11 *
TS 26.174	AMR-WB speech codec; test sequences	5.1.1	Approved at TSG-SA#11 in Tdoc SP-010084.	Approved at TSG-SA#11 *
TS 26.190	AMR Wideband Speech Codec; Transcoding Functions	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010085.	Approved at TSG-SA#11 *
TS 26.191	AMR Wideband Speech Codec; Error concealment of erroneous or lost frames	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010086.	Approved at TSG-SA#11 *
TS 26.192	AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010087.	Approved at TSG-SA#11 *
TS 26.193	AMR Wideband Speech Codec; Source Controlled Rate operation	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010088.	Approved at TSG-SA#11 *
TS 26.194	AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010089.	Approved at TSG-SA#11 *
TS 26.201	AMR Wideband Speech Codec; Speech Codec Frame Structure	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010090.	Approved at TSG-SA#11 *
TS 26.202	AMR-WB speech codec; interface to lu and Uu	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010091.	Approved at TSG-SA#11 *
TS 26.204	Floating-Point ANSI-C Code for the AMR-WB Speech Codec	1.0.0	Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010693.	Approval expected at TSG-SA#15
TR 26.976	AMR-WB Speech Codec Performance Characterisation	0.6.0	Phase 1A carried out by TSG-SA#12. Draft TR v.0.3.0 presented for information at TSG-SA#12 in Tdoc SP-010302. Phase 1B is completed by TSG-SA#14 and updated draft TR v.0.6.0 is presented for information in Tdoc SP-010692. Phase 2 schedule and test plan is FFS.	tbd

*) Approved for Rel-5 at TSG-SA#11. (At TSG-SA#11, it was also decided that the AMR-WB Codec WI is functionally frozen and only corrections would be allowed to these specifications).

2.1.2 Preparation of Floating Point C-Code Version of AMR-WB

Preparation of floating-point C-code version of the AMR-WB codec is ongoing. This is new work approved at TSG-SA#13. The target is to prepare a floating-point specification of the AMR-WB codec similarly as has been done earlier for the AMR narrowband codec. The fixed-point C-code (given in TS 26.173 for AMR-WB) is meant for DSP implementations and it is therefore not efficient for an implementation on PC or other general-purpose processors often used as multimedia implementation platforms. A floating-point codec specification is therefore useful for multimedia applications. Like for AMR narrowband, the fixed-point specification will be the only allowed implementation of the AMR-WB codec for the speech service, and the use of the floating-point code is limited to other services. The bit-exact fixed-point C-code also remains the preferred implementation for all services.

Since TSG-SA#13, floating-point C-code version of AMR-WB has been prepared and it has been under optimisation within several companies. An optimised floating point code (in terms of execution speed) has been prepared during this work. At SA4#19, further work was started to verify, on the other hand, the high quality performance of the floating-point codec (equal to the performance of the fixed-point codec version), and, on the other hand, the quality and correctness of the C-code. Seven companies are participating in this verification work. Draft version of TS on "ANSI-C Code for the Floating Point AMR-WB Speech Codec" (TS 26.204, v.1.0.0) has been prepared and is presented for information in Tdoc SP-010693. The TS (with finalised floating point C-code included) is expected for approval at TSG-SA#15.

2.1.3 Other remaining SA4 issues for AMR-WB

In the 3GPP Work Plan, some issues from the new CN4 WI "Introduction of AMR-WB Speech Service in 3GPP Standards Release 5 – Core Network Aspects" (Tdoc NP-010538) have been identified after TSG-SA#13 as SA4 prime responsibilities: 1) Tones and announcements, 2) AMR-WB and narrowband

interworking, and 3) Interworking with fixed broadband networks.

SA1 has concluded in their LS (Tdoc S1-011328) that they do not see that additional work would be justified at this stage to support wideband announcements and that wideband tones are not required. If work for announcements is needed it is a very low priority item (if at all) and not necessary for Rel-5.

On AMR-WB and narrowband interworking, SA4 concludes that narrowband codecs are able to interwork with AMR-WB as proven in AMR-WB Characterisation Tests (draft TR 26.976). Definition of up- and downsampling filters for AMR-WB ↔ narrowband PCM (G.711) conversion, however, is needed and may be included in the 26-series speech coding TSs. SA4 is currently working on this.

For interworking with fixed network wideband codecs, SA1 in their LS (Tdoc S1-011328) states that interworking with the virtually unused G.722 is not required. For the more recent G.722.1 codec, if interworking is required, (SA4 view is that) just transcoding should be employed. For interworking with the forthcoming new G.722.2 standard, no transcoding is needed since G.722.2 reuses the AMR-WB speech coding algorithm (see Section 2.1.5).

TFO (or TrFO) operation is needed for AMR-WB, and SA4 is currently working on inclusion of AMR-WB codec into TS on "In-band Tandem Free Operation of Speech Codecs" (TS 28.062). This work is progressing well and is expected to be completed by TSG-SA#15.

2.1.4 Change Requests

Tdoc SP-010699 contains two CRs to the AMR-WB C-code specification TS 26.173. These CRs bring minor corrections (correction for mode usage during DTX and correction of homing function for 23.85 kbit/s mode). The CR in Tdoc SP-010700 updates the test sequences in TS 26.174 respectively. Tdoc SP-010701 brings a correction to the transcoding functions in TS 26.190 for post-processing in order to remove inconsistency with the C-code (of TS 26.173).

2.1.5 New ITU-T wideband speech codec at bit rates around 16 kbit/s (G.722.2)

As reported earlier, the 3GPP AMR-WB speech codec has participated as one candidate for standardisation of ITU-T wideband speech codec at bit rates around 16 kbit/s. At rapporteur's meeting of ITU-T Q.7/16 in July 2001, ITU-T codec selection test results were reviewed and the AMR-WB codec was selected.

The November meeting of ITU-T Working Party 3 Study Group 16 (WP3 SG16) has now approved the selection of the rapporteur's meeting. The final formal approval procedure in ITU-T (the "consent" procedure) has been started and is expected to be finalised in early 2002. After that, the AMR-WB speech codec would become ITU-T Recommendation G.722.2.

As the same codec is to be standardised in both 3GPP and ITU-T, care should be taken in keeping the specifications (including the bit-exact reference C-code) aligned in both standardisation fora. This is a shared view and a matter of some concern both in SA4 and ITU-T WP3 SG16. As a short-term solution, the editors of the 3GPP and ITU-T AMR-WB codec specifications (from the same company) will keep the specifications aligned. However, SA4 feels that in the long run it would be beneficial to establish a more formal alignment procedure for common specifications in 3GPP and ITU-T. For optimal alignment, one unique specification would be preferable.

2.2 Extended Transparent End-to-end Packet Switched Streaming Service (PSS-E)

2.2.1 Status of the work

Development of Rel-5 streaming (PSS-E) has been continued. Draft versions of Stage 1 description from SA1 have been taken as input to the PSS-E work in SA4. The SA4 work has been done in response to, and in agreement with, the definition of the PSS-E Stage 1 in SA1.

The SA4 work has mainly focused on bringing Capability Exchange for Rel-5 streaming. This is expected to be the only completely new functionality over Rel-4 Streaming. The definition of capability exchange will contain a normative part which gives all the necessary requirements that a client or server shall conform to when implementing capability exchange in the PSS-E, and an informative part providing additional important information for understanding the concept and usage of the functionality. Rel-5 Capability Exchange follows the structure of W3C Composite Capability / Preference Profiles (CC/PP) and WAP User Agent Profile (UAPProf). The UAPProf vocabulary is reused and an additional PSS specific vocabulary is defined.

The codecs specified for streaming service offering a particular media type remain the same as in Rel-4 except that a new media type for Synthetic Audio is included in Rel-5 (Scalable Polyphony MIDI content format is recommended), PNG (Portable Networks Graphics) is added as an additional recommended bitmap graphics, coding of vector graphics is included (2D vector graphics format Scalable Vector Graphics

recommended), and optional video buffer model is given in Rel-5. For session set-up and control, Rel-5 defines additional SDP (Session Description Protocol) fields. Upload streaming will most likely be part of Rel-5.

During the work, SA4 seems unfortunately to have caused some confusion among other WGs by sending out LS to SA2 and SA5 (Cc: SA1) on “charging aspects”. Although not clearly enough stated in the LS, the SA4 intention was to request information and feedback on any architectural impacts of “charging” that SA4 should be aware of in the SA4 work - and not to signal that SA4 is doing work on “charging”. SA4 is not carrying out or planning to carry out any work on “charging”, and apologises any confusion. SA4 fully agrees that the detailed work in PSS-E charging aspects should be carried out in SA5 once Stage 1 is defined in SA1 (and that the work in SA5 as well as all work in PSS-E should be guided by the high-level requirements defined in Stage 1).

2.2.2 PSS-E specifications

During the work for PSS-E, SA4 has been keeping track of agreements and produced WG internal drafts of Rel-5 versions of streaming specifications: TS 26.233 (General Description) and TS 26.234 (Protocols and Codecs). These have been modified according to SA4 agreements to contain the new Rel-5 PSS-E feature(s). It is SA4’s intention to bring the PSS for Rel-5 through CRs to the existing Rel-4 versions of TS 26.233 and TS 26.234 at TSG-SA#15. These CRs will contain the additions of feature(s) developed during the PSS-E work in SA4.

According to the PSS-E WID (Tdoc SP-010392), SA4 is the prime responsible WG for a new Stage 2 specification, while SA2 has secondary responsibility. As TSG-SA is aware of, two SA4 specifications already exist in Rel-4 on Packet Switched Streaming Service: TS 26.233 and TS 26.234. During the work for PSS Rel-4, SA4 collaborated with SA2 regarding the architectural issues related to PSS. It was then concluded that there were only limited architectural impacts of PSS on the 3GPP network architecture and TS 26.233 and TS 26.234 cover these sufficiently. The Rel-5 work is based on Rel-4 streaming, and Rel-5 streaming will provide full backward compatibility with Rel-4 streaming. Only capability exchange is expected to be included as a completely new functionality in Rel-5. Therefore, the architectural impacts in Rel-5 remain limited like in Rel-4. For these reasons, SA4 intends not to produce a separate TS for Stage 2 but plans to continue including the architectural considerations in the two 26-series TSs as was done for Rel-4. This will provide a full description of streaming (beyond the necessary Stage 1 Service Requirements) including architectural considerations in the same TSs for both Rel-4 and Rel-5.

In addition to the 26-series TSs 26.233 and 26.234, SA4 feels that it would be useful to introduce in Rel-5 a Technical Report on RTP usage model. The motivation for such a TR is that the IETF defined Real-Time Protocol (RTP/RTCP) for real-time multimedia transport over IP is a general description of the functionality that RTP can provide, but the specification itself does not define how an application should use RTP/RTCP most efficiently in a given network environment. The objective in such a TR would be to provide an "RTP usage model" for the PS Streaming Service. In doing so, the TR would also consider how a 3G network could be optimally configured for transporting the RTP traffic, and how the streaming mechanism itself should be designed and optimised given an understanding of the underlying transport characteristics.

The scope of this document would include consideration of (non-exhaustive):

- Trade-off between radio usage efficiency and streaming QoS
- Feedback of network conditions and adaptation of stream and/or the transmission of the stream
- Optimal packetisation of the media stream in line with the segmentation within the transport mechanism
- Error robustness mechanisms (such as retransmission)
- Client buffering to ease the QoS requirements on the network and enable more flexibility in how the network transport resources are applied
- Optimal selection of media and bearer based on prior knowledge in session establishment

Although such a TR is not explicitly mentioned as work output in the WI description for PSS-E, SA4 feels that it is in line with the objectives of the PSS-E WI (which include enhanced transport aspects) and would like to start drafting it and also provisionally take prime responsibility of preparing it in co-operation with all relevant WGs - especially with SA2 who should have secondary responsibility of the TR.

Table 3: Status list of specifications for Extended Transparent End-to-end PS Streaming Service

Deliverable	Title	Latest Version	Comment/Status	Approval
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Deliverable	Title	Latest Version	Comment/Status	Approval
	Stage 2 (SA4, SA2)	-	Pending upon finalisation of Stage 1 in SA1. SA4 intends not to prepare separate Stage 2 TS but continue to include the architectural considerations in the 26-series TSs as done for Rel-4.	-
TS 26.233	Packet-switched Streaming Services (PSS); General Description	4.0.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR approval expected at TSG-SA#15
TS 26.234	Packet-switched Streaming Services (PSS); Protocols and Codecs	4.1.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR approval expected at TSG-SA#15

2.3 Multimedia Messaging Service (MMS) codecs/formats [on the request of T2]

Codecs and formats for MMS services has been addressed within TS 23.140 (Multimedia Messaging Service (MMS); Functional description; Stage 2) owned by T2. This TS contains a part that is dedicated to the codecs/formats. During T2#14 meeting (September 2001) T2 sent a LS (T2-010814) to SA4 requesting that the responsibility for the specification of codecs and formats to be used in MMS services (except Text) would be transferred to SA4 starting from Rel-5. The motivation behind the request is that T2 believes that this reorganization would allow better ensure the alignment of MMS codecs/formats with those chosen for other services, in particular for streaming. This would result in a new SA4 specification for Rel-5, addressing the selection and the usage of media codecs/formats in the MMS framework.

SA4 agreed at SA4#19 to take over this responsibility (and has responded this back to T2). Drafting of such a new specification for MMS codecs and formats was started based on TS 23.140. A draft of the new TS 26.140 (v.1.0.0) is presented for information at TSG-SA#14 in Tdoc SP-010695. The relevant sections from TS 23.140 have been used as the starting point for the new TS. For the sake of interoperability, the draft TS has been aligned and made non-contradicting with PSS-E Rel-5 draft TS 26.234 (Protocols and Codecs) which is under preparation in SA4. The draft TS has been sent to T2 for review and comments. The target is to complete this TS in co-operation with T2 and bring it for approval at TSG-SA#15.

2.4 Multimedia Codecs and Protocols for Conversational Packet Switched Services (part of feature Provisioning of IP Based Multimedia Services)

TS on "Default Codecs" (TS 26.235) has already been finalised. It was approved at TSG-SA#11 (and was corrected to belong to Rel-5 at TSG-SA#12). The work to produce the other TS on "Transport Protocols" (TS 26.236) has been continued. This TS will give definition of the required protocol usage within Conversational Packet Switched Multimedia Services (which is based on IM Subsystem). The TS will define media type requirements (e.g., RTP session description parameters) and gives pointers to the relevant call and bearer control specifications. A draft version of this TS is presented for information in Tdoc SP-010694. It is expected for approval at TSG-SA#15.

Table 4: Status list of specifications for Multimedia Codecs and Protocols for Conversational PS Services

Deliverable	Title	Latest Version	Comment/Status	Approval
TS 26.235	Packet Switched Conversational Multimedia Applications; Default Codecs	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010095.	Approved at TSG-SA#11 for Rel-4. Moved to Rel-5 at TSG-SA#12.
TS 26.236	Packet Switched Conversational Multimedia Applications; Transport Protocols	1.0.0	Version 1.0.0 presented for information in Tdoc SP-010694.	Approval expected at TSG-SA#15
TR 26.xyz	Performance characterization of default codecs for PS conversational multimedia applications	-	-	tbd

2.5 Cellular Text telephone Modem (part of feature Global Text Telephony)

All three Cellular Text Telephone Modem (CTM) specifications under the responsibility of SA4 have been

finalised. They were approved during TSG-SA#10 and TSG-SA#11. The feature GTT was completed and closed at TSG SA#12.

Table 5: Status list of Global Text Telephony specifications under the responsibility of SA4

Deliverable	Title	Latest Version	Comment/Status	Approval
TS 26.226	GTT Cellular Text Telephone Modem; General Description	5.0.0	Approved at TSG-SA#10 in Tdoc SP-000569.	Approved at TSG-SA#10 for Rel-4. Moved to Rel-5 at TSG-SA#11.
TS 26.230	GTT Cellular Text Telephone Modem; Transmitter C-code Description	5.0.1	Approved at TSG-SA#10 in Tdoc SP-000570.	Approved at TSG-SA#10 for Rel-4. Moved to Rel-5 at TSG-SA#11.
TS 26.231	GTT Cellular Text Telephone Modem; Minimum Performance Specification	5.1.0	Approved at TSG-SA#11 in Tdoc SP-010092.	Approved at TSG-SA#11 for Rel-5.

3. Maintenance of earlier releases

The following maintenance CRs (Rel-4 or earlier) are presented for approval:

- SP-010696 CRs to TS 06.73 and TS 26.073 "AMR speech Codec; C-source code" on Correction of RX-DTX handling of NO_DATA frames in AMR decoder (R98, R99, Release 4). This is a bug correction which improves the comfort noise performance in frame error conditions (when RX_NO_DATA frame type is used to signal frame erasures).
- SP-010697 CRs to TS 06.73 and TS 26.073 "AMR speech Codec; C-source code" on Correction in AMR decoder to avoid division by zero in RX-DTX handling (R98, R99, Release 4).
- SP-010698 CRs to TS 26.103 "Codec lists" on Inclusion of codec type UMTS AMR2 in R99 codec list (R99), and Removal of AMR-WB codec type (Release 4):
 - It has been agreed by CN1, T2 and TSG-T to include UMTS AMR2¹ codec type for R99 to be used in dual system (UMTS & GSM) terminals (not in single mode UMTS terminals). CN1 and T2 are updating their TSs specifying the UE codec type usage accordingly. One SA4 TS has been identified by CN1 and T2 to need modification as well. This is the "Codec lists" specification TS 26.103 which documents all the codec types included for each release. UMTS AMR2 codec type needs to be included in TS 26.103 for R99. (It has been included for Rel-4 earlier.) This modification was requested to SA4 from CN1 and T2.
- SP-010702 CRs to TS 26.233 "Transparent end-to-end packet switched streaming services (PSS); General description" on Correction of one protocol flow in Figure 1 (Release 4). The RTSP TEARDOWN request is given from the client to the server (and not the other way around as incorrectly indicated in the figure).
- SP-010703 CRs to TS 26.234 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs (Release 4). There are several corrections:
 - Only decoders are needed in the streaming client (not encoders)
 - Implementation guidelines for RTP and RTSP use are added in informative Annex A
 - The order of the SDP fields in informative Annex A is corrected
 - Normative Annex D is corrected for alignment to ISO/IEC specifications and for clearer identification of 3GPP files and MP4 files.
- SP-010704 CRs to TS 28.062 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4). These contain inclusion of missing control bit, missing definitions and some other corrections.

¹ UMTS AMR2 codec type is similar to UMTS AMR, except for rate control. An UMTS AMR2 encoder is allowed to perform codec mode change only every 2nd frame similar to GSM AMR Codec Types. On the decoder direction, an UMTS AMR2 codec can accept mode changes in every frame. This codec type is compatible (in TFO and TrFO sense) with all UMTS and GSM AMR codec types (i.e., UMTS AMR, UMTS AMR2, FR AMR and HR AMR). It allows TFO operation not only between UMTS UEs but also between UMTS and GSM UEs - unlike UMTS AMR.

4. Summary of documents and issues brought to TSG-SA's attention

4.1. Documents presented for information

The following Rel-5 draft TSs and TRs are presented for information to TSG-SA#14:

- Draft TR 26.976 version 0.6.0 "AMR-WB Speech Codec Performance Characterisation" in Tdoc SP-010692 (See Section 2.1.1)
- Draft TS 26.204 version 1.0.0 "ANSI-C Code for the Floating-Point AMR Wideband Speech Codec" in Tdoc SP-010693 (See Section 2.1.2)
- Draft TS 26.236 version 1.0.0 "Packet Switched Conversational Multimedia Applications; Transport Protocols" in Tdoc SP-010694 (See Section 2.4)
- Draft TS 26.140 version 1.0.0 "Multimedia Messaging Service (MMS); Media Formats and Codecs" in Tdoc SP-010695 (See Section 2.3)

4.2. Issues for information/guidance

- The same AMR-WB codec is to be standardised in both 3GPP and ITU-T, and care should be taken in keeping the specifications fully aligned in both standardisation fora. (Some formal procedure could be beneficial to establish in order to avoid any misalignment in 3GPP and ITU-T.) (See Section 2.1.5)
- The Rel-5 streaming work is based on Rel-4 streaming. Rel-5 will provide full backward compatibility with Rel-4. It is expected that only "capability exchange" will be included as a completely new functionality. Therefore, the architectural impacts in Rel-5 remain limited (like in Rel-4). For these reasons, SA4 intends not to produce a separate TS for Stage 2 but plans to continue including the architectural considerations in the two 26-series TSs as was done for Rel-4. (See Section 2.2.2)
- For PSS-E Rel-5, a new TR on RTP usage model could be useful to describe how an application should use RTP/RTCP most efficiently, as the IETF defined Real-Time Protocol (RTP/RTCP) is only a general description of the functionality that RTP can provide. Although such a TR is not explicitly mentioned as work output in the WI description for PSS-E, SA4 feels that it would be in line with the objectives of the PSS-E WI (which include enhanced transport aspects) and would like start drafting such a TR and also provisionally take prime responsibility of preparing it in co-operation with all relevant WGs - especially with SA2 who should have secondary responsibility of the TR. (See Section 2.2.2)

5. Approval requested

TSG-SA WG4 requests TSG-SA#14 to:

1. Approve the work done by the contracted listening laboratories in AMR-WB Characterisation Phase 1B, i.e, work related to Experiment 7 (The Effect of Static Errors under Clean Speech Conditions) and Experiment 8 (The Effect of Background Noise in Static C/I Conditions)
2. Approve the CRs in Tdocs SP-010696 to SP-010704

ANNEX A: List of input documents to TSG-SA#14 from TSG-SA WG4

Tdoc	Title	Source	A.I.	Document for
SP-010691	TSG S4 Status Report at TSG-SA#14	SA WG4 Chairman	7.4.1	Information
SP-010692	3GPP Draft TR 26.976 AMR-WB Speech Codec Performance Characterization version 0.6" (Release 5)	SA WG4	7.4.3	Information / Approval
SP-010693	3GPP Draft TS 26.204 version 1.0.0 "ANSI-C code for the floating-point AMR wideband speech codec" (Release 5)	SA WG4	7.4.3	Information
SP-010694	3GPP TS 26.236 version 1.0.0 Updated Transport Protocol specification for PS Conversational Multimedia (Release 5)	SA WG4	7.4.3	Information
SP-010695	3GPP TS 26.140 version 1.0.0 "TSG-SA4 PSM SWG internal working Draft Multimedia Messaging Service (MMS) Media formats and codecs (Release 5)	SA WG4	7.4.3	Information
SP-010696	CRs to TS 06.73 and TS 26.073 on Correction of RX-DTX handling of NO_DATA frames in AMR decoder (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010697	CRs to TS 06.73 and TS 26.073 on Correction in AMR decoder to avoid division by zero in RX- DTX handling (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010698	CRs to TS 26.103 on Inclusion of codec type UMTS AMR_2 in R99 codec list (R99), and Removal of AMR-WB codec type (Release 4)	SA WG4	7.4.3	Approval
SP-010699	CRs to TS 26.173 on "Incorrect mode usage during DTX" and "Correction of homing function for 23.85 kbit/s mode"(Release 5)	SA WG4	7.4.3	Approval
SP-010700	CRs to TS 26.174 on "Update of AMR-WB test sequences" (Release 5)	SA WG4	7.4.3	Approval
SP-010701	CRs to TS 26.190 on "Inconsistency between TS 26.190 and TS 26.173" (Release 5)	SA WG4	7.4.3	Approval
SP-010702	CRs to TS 26.233 "Transparent end-to-end packet switched streaming service; General description" on Correction of RTSP TEARDOWN protocol flow in Figure 1 (Release 4)	SA WG4	7.4.3	Approval
SP-010703	CRs to TS 26.234 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs": Corrections and "Implementation guidelines for RTSP and RTP" (Release 4)	SA WG4	7.4.3	Approval
SP-010704	CRs to TS 28.062 Corrections to "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4)	SA WG4	7.4.3	Approval

*TSG-SA Tdoc TSGS#14(01)0691 – Annex B
Meeting #14, Kyoto, Japan, 17-20 December 2001*




***TSG-SA WG4 (SA4)
Status Report
at TSG-SA#14***

***Kari Järvinen
TSG-SA WG4 Chairman***

A GLOBAL INITIATIVE

Content

- **Review of work progress** 
- **Documents for information**
- **Approval requested**

Review of work progress

- **Input documents, SA4 meetings, meeting statistics**
- **Rel-5 Work Progress**
 - Wideband Telephony Service (AMR-WB)
 - Characterisation of the AMR-WB codec
 - Development of Floating Point version of the AMR-WB codec
 - Extended Transparent End-to-end PS Streaming Service (PSS-E)
 - Multimedia Codecs and Protocols for Conversational PS Services (part of feature Provisioning of IP Based Multimedia Services)
 - Specification of MMS codecs and formats (except Text)
 - T2 request to transfer responsibility from T2 to SA4 starting from Rel-5
- **Maintenance of earlier releases**

Input documents

Tdoc	Title	Source	A.I.	Document for
SP-010691	TSG S4 Status Report at TSG-SA#14	SA WG4 Chairman	7.4.1	Information
SP-010692	3GPP Draft TR 26.976 AMR-WB Speech Codec Performance Characterization version 0.6" (Release 5)	SA WG4	7.4.3	Information / Approval
SP-010693	3GPP Draft TS 26.204 version 1.0.0 "ANSI-C code for the floating-point AMR wideband speech codec" (Release 5)	SA WG4	7.4.3	Information
SP-010694	3GPP TS 26.236 version 1.0.0 Updated Transport Protocol specification for PS Conversational Multimedia (Release 5)	SA WG4	7.4.3	Information
SP-010695	3GPP TS 26.140 version 1.0.0 "TSG-SA4 PSM SWG internal working Draft Multimedia Messaging Service (MMS) Media formats and codecs (Release 5)	SA WG4	7.4.3	Information
SP-010696	CRs to TS 06.73 and TS 26.073 on Correction of RX-DTX handling of NO_DATA frames in AMR decoder (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010697	CRs to TS 06.73 and TS 26.073 on Correction in AMR decoder to avoid division by zero in RX- DTX handling (R98, R99, Release 4)	SA WG4	7.4.3	Approval
SP-010698	CRs to TS 26.103 on Inclusion of codec type UMTS AMR_2 in R99 codec list (R99), and Removal of AMR-WB codec type (Release 4)	SA WG4	7.4.3	Approval
SP-010699	CRs to TS 26.173 on "Incorrect mode usage during DTX" and "Correction of homing function for 23.85 kbit/s mode"(Release 5)	SA WG4	7.4.3	Approval
SP-010700	CRs to TS 26.174 on "Update of AMR-WB test sequences" (Release 5)	SA WG4	7.4.3	Approval
SP-010701	CRs to TS 26.190 on "Inconsistency between TS 26.190 and TS 26.173" (Release 5)	SA WG4	7.4.3	Approval
SP-010702	CRs to TS 26.233 "Transparent end-to-end packet switched streaming service; General description" on Correction of RTSP TEARDOWN protocol flow in Figure 1 (Release 4)	SA WG4	7.4.3	Approval
SP-010703	CRs to TS 26.234 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs": Corrections and "Implementation guidelines for RTSP and RTP" (Release 4)	SA WG4	7.4.3	Approval
SP-010704	CRs to TS 28.062 Corrections to "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" (Release 4)	SA WG4	7.4.3	Approval

SA4 meetings

- **Meetings held:**

- SA4 TFO SWG ad-hoc: Oct 11-12, 2001 Munich, Germany (Siemens)
- SA4 PSM SWG ad-hoc: Oct 30-31, 2001 Helsinki, Finland (Nokia)
- SA4 TFO SWG ad-hoc: Nov 26-27, 2001 Monschau, Germany (Ericsson)
- SA4#19: Dec 3-7, 2001 Tokyo, Japan (NTT DoCoMo)

- **Future meetings:**


- SA4 PSM SWG ad-hoc: 17-18 Jan, 2002 Munich, Germany (Siemens)
- SA4 TFO SWG ad-hoc: 28-29 Jan (tbc), 2002 Garmisch, Germany (Siemens)
- SA4#20: Feb 18 – 22, 2002 Host: tbd
- SA4#21: May 20 – 24, 2002 Host: tbd
- SA4#22: July 22 – 26, 2002 Host: tbd
- SA4#23: Sept 30 – Oct 4, 2002 Host: tbd
- SA4#24: Nov 11 – 15, 2002 Host: tbd

- **Meeting statistics:**

- SA4#19: 1 week, ~70 participants, ~150 input documents
- SWG sessions during SA4#19: PSM, SQ & AMR-WB
- 33 input LSs, 11 output LSs
- More than 400 people are registered on the SA4 e-mail list

Wideband Telephony Service (AMR-WB)

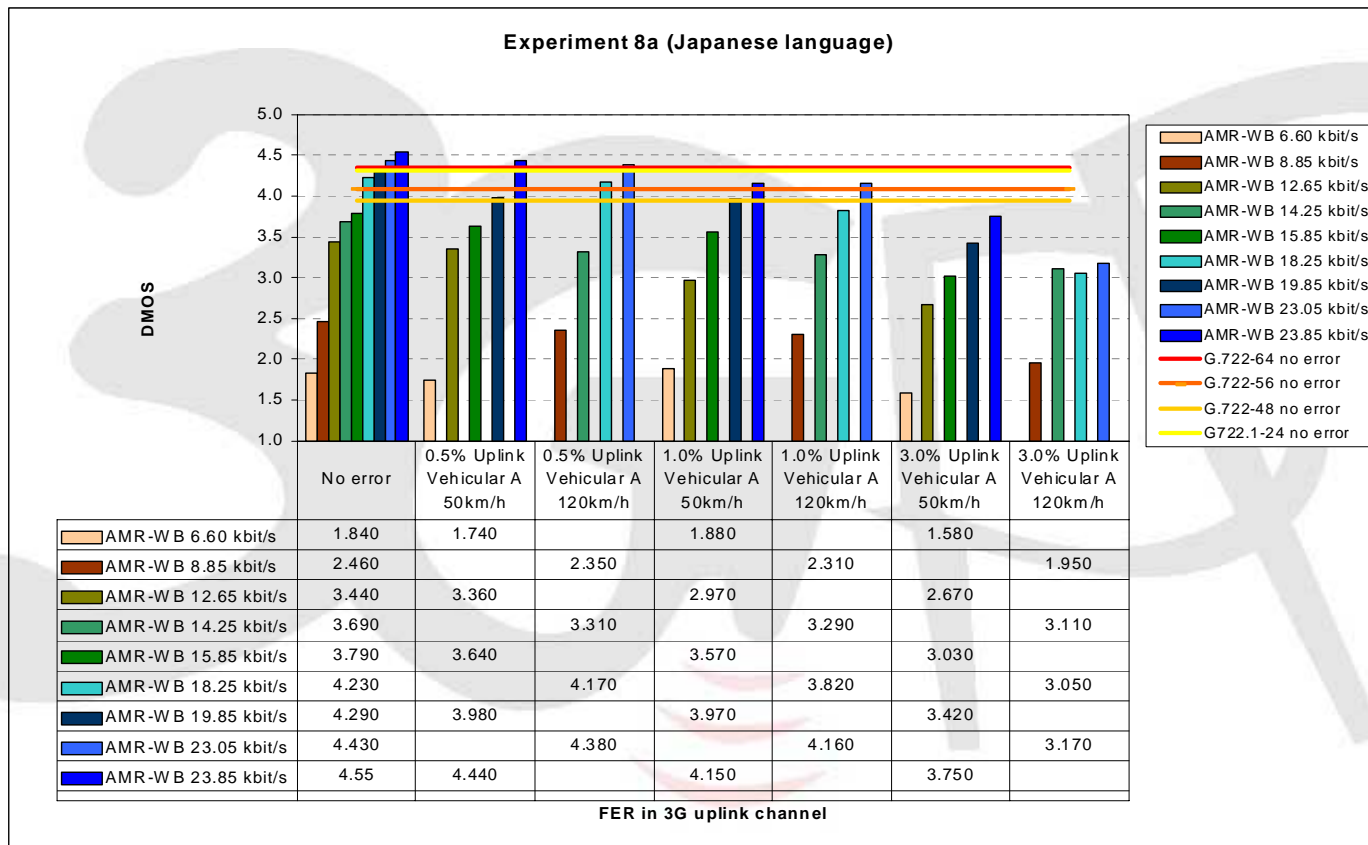
Characterisation Phase

- Status:
 - Phase 1A - completed by TSG-SA#12
 - Performance without channel errors (all applications)
 - Performance in GSM FR GMSK channel
 - Phase 1B - completed by TSG-SA#14 
 - Performance in 3G WCDMA channel
 - Phase 2 - to be carried out later
 - Performance in EDGE 8-PSK channels
 - Performance in PS applications (conversational, streaming)
- Phase 1B listening laboratories: ARCON (American English), BT (British English), Dynastat (American English and Spanish), NTT-AT (Japanese), and T-Nova (German).
- Error Patterns provided by Ericsson and Siemens
- Experiments 7&8: The Effect of Static Errors under Clean Speech Conditions, The Effect of Background Noise in Static C/I Conditions
- Uplink and downlink path with various speed profiles (vehicular 50 and 120 km/h, pedestrian 3 km/h, indoor 3 km/h) and QoS values (FER target values of 0.5%, 1%, and 3%).
- Background noise (S/N = 10 dB Car, S/N = 15 dB Street and S/N = 15 dB Cafeteria noise).

Wideband Telephony Service (AMR-WB)

- Updated draft TR on “AMR-WB Speech Codec Performance Characterisation” (TR 26.976, v.0.6.0) presented for information in Tdoc SP-010692
 - Experimental test results from the speech quality related testing to illustrate the behaviour of the AMR-WB codec. (Additional information provided, e.g., on implementation complexity.)
 - Contains also information from the earlier testing phases: Selection Phase, Verification Phase and Characterisation Phase 1A. (Draft TR v.0.3.0 presented for information at TSG-SA#12.)
- SA4 requests TSG-SA#14 to approve the work done by the contracted listening laboratories in AMR-WB Characterisation Phase 1B, i.e., work related to
 - Experiment 7 (The Effect of Static Errors under Clean Speech Conditions), and
 - Experiment 8 (The Effect of Background Noise in Static C/I Conditions)...in order to authorise payment to the involved laboratories.
- The work and results of Phase 1B are explained in Tdoc SP-010692, with draft test results found in Chapters 14-15.
- Experiment 9 (EDGE 8-PSK) and Experiment 10 (PS conversational and streaming applications) to be carried out later.

Wideband Telephony Service (AMR-WB)



Extract from Phase 1B results: Experiment 8a, 3G channel with Japanese language (background noise: Car noise, S/N=10 dB)

Wideband Telephony Service (AMR-WB)

Floating Point C-Code Version of AMR-WB

- New work approved at TSG-SA#13 is ongoing:
 - The target is to prepare a floating-point specification of the AMR-WB codec similarly as has been done earlier for the AMR narrowband codec.
 - Intended for efficient implementation on PC or other general-purpose processors often used as multimedia implementation platforms.
 - The fixed-point specification will be the only allowed implementation of the codec for the speech service, and the use of the floating-point code is limited to other services.
- An optimised floating point code (in terms of execution speed) has been prepared
- Further work started to verify the high quality performance of the floating-point codec (equal to the performance of the fixed-point codec version), and the quality and correctness of the C-code.
- Seven companies are participating in the verification work.
- Draft version of TS on “ANSI-C Code for the Floating Point AMR-WB Speech Codec” (TS 26.204, v.1.0.0) presented for information in Tdoc SP-010693.
- Expected for approval at TSG-SA#15 (with finalised floating point C-code included)

Wideband Telephony Service (AMR-WB)

Remaining SA4 work

- Work ongoing for issues of the CN4 WI “Introduction of AMR-WB Speech Service in 3GPP Standards Release 5 – Core Network Aspects” identified as SA4 prime responsibilities in 3GPP Work Plan.
 - E.g., definition of up- and downsampling filters for AMR-WB ↔ narrowband PCM (G.711) conversion needed. Could be included in the 26-series speech coding TSs.
- Inclusion of AMR-WB codec into TS on “In-band Tandem Free Operation of Speech Codecs” (TS 28.062) is proceeding well and is expected to be completed by TSG-SA#15.

Wideband Telephony Service (AMR-WB)

Deliverable	Title	Latest version	Comment/Status	Approval
TS 26.171	AMR Wideband Speech Codec; General description	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010082.	Approved at TSG-SA#11*
TS 26.173	AMR Wideband Speech Codec; C-source code	5.2.0	Approved at TSG-SA#11 in Tdoc SP-010083.	Approved at TSG-SA#11 *
TS 26.174	AMR-WB speech codec; test sequences	5.1.1	Approved at TSG-SA#11 in Tdoc SP-010084.	Approved at TSG-SA#11 *
TS 26.190	AMR Wideband Speech Codec; Transcoding Functions	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010085.	Approved at TSG-SA#11 *
TS 26.191	AMR Wideband Speech Codec; Error concealment of erroneous or lost frames	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010086.	Approved at TSG-SA#11 *
TS 26.192	AMR Wideband Speech Codec; CN for AMR Speech Traffic Channels	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010087.	Approved at TSG-SA#11 *
TS 26.193	AMR Wideband Speech Codec; Source Controlled Rate operation	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010088.	Approved at TSG-SA#11 *
TS 26.194	AMR Wideband Speech Codec; VAD for AMR Speech Traffic Channels	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010089.	Approved at TSG-SA#11 *
TS 26.201	AMR Wideband Speech Codec; Speech Codec Frame Structure	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010090.	Approved at TSG-SA#11 *
TS 26.202	AMR-WB speech codec; interface to lu and Uu	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010091.	Approved at TSG-SA#11 *
TS 26.204	Floating-Point ANSI-C Code for the AMR-WB Speech Codec	1.0.0	Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010693.	Approval expected at TSG-SA#15
TR 26.976	AMR-WB Speech Codec Performance Characterisation	0.6.0	<u>Phase 1A</u> carried out by TSG-SA#12. Draft TR v.0.3.0 presented for information at TSG-SA#12 in Tdoc SP-010302. <u>Phase 1B</u> is completed by TSG-SA#14 and updated draft TR v.0.6.0 is presented for information in Tdoc SP-010692. <u>Phase 2</u> schedule and test plan is FFS.	tbd

*) Approved for Rel-5 at TSG-SA#11. (At TSG-SA#11, it was also decided that the AMR-WB Codec WI is functionally frozen and only corrections would be allowed to these specifications).

Wideband Telephony Service (AMR-WB)

CRs

- Tdoc SP-010699 contains two CRs to the AMR-WB C-code specification TS 26.173. These CRs bring minor corrections (correction for mode usage during DTX and correction of homing function for 23.85 kbit/s mode).
- The CR in Tdoc SP-010700 updates the test sequences in TS 26.174 respectively.
- Tdoc SP-010701 brings a correction to transcoding functions TS 26.190 for description of post-processing in order to align the TS with the C-code (of TS 26.173).

Wideband Telephony Service (AMR-WB)

New ITU-T wideband speech codec at bit rates around 16 kbit/s (G.722.2)

- AMR-WB participated as one candidate for standardisation of ITU-T “wideband speech codec at bit rates around 16 kbit/s”.
- At rapporteur’s meeting of ITU-T Q.7/16 in July 2001, AMR-WB codec was selected.
- In November, ITU-T Working Party 3 Study Group 16 approved the selection (of the rapporteur’s meeting).
- The final formal approval procedure in ITU-T (the “consent” procedure) started and is expected to be finalised in early 2002. After that, the AMR-WB speech codec would become ITU-T Recommendation G.722.2.
- As the same codec is to be standardised in both 3GPP and ITU-T, care should be taken in keeping the specifications (including the bit-exact reference C-code) aligned in both standardisation fora.
- SA4 feels that in the long run it could be beneficial to establish some formal alignment procedure in 3GPP and ITU-T.

Extended Transparent End-to-end PS Streaming Service

Work Status

- Work mainly focused on bringing Capability Exchange for Rel-5 streaming. This is expected to be the only completely new functionality over Rel-4 Streaming.
- Rel-5 Capability Exchange follows the structure of W3C Composite Capability / Preference Profiles (CC/PP) and WAP User Agent Profile (UAProf). The UAProf vocabulary is reused and additional PSS specific vocabulary is defined.
- The codecs specified for Streaming Service offering a particular media type remain the same as in Rel-4 except that a new media type for Synthetic Audio is included in Rel-5 (Scalable Polyphony MIDI content format is recommended), PNG (Portable Networks Graphics) is added as an additional recommended bitmap graphics, coding of vector graphics is included (2D vector graphics format Scalable Vector Graphics recommended), and optional video buffer model is given.
- For session set-up and control, Rel-5 defines additional SDP (Session Description Protocol) fields.
- Provides full backward compatibility with Rel-4 streaming.
- Upload streaming will most likely be part of Rel-5.

Extended Transparent End-to-end PS Streaming Service

- Draft versions of Stage 1 description from SA1 have been taken as input to the PSS-E work in SA4. The SA4 work has been done in response to, and in agreement with, the definition of the PSS-E Stage 1 in SA1.
- During the work, SA4 seems unfortunately have caused some confusion among other WGs by sending out LS to SA2 and SA5 (Cc: SA1) on “charging aspects”.
 - Although not clearly enough stated in the LS, SA4 intention was to request information and feedback on any architectural impacts of “charging” that SA4 should be aware of in the SA4 work - and not to signal that SA4 is doing work on “charging”.
 - SA4 is not carrying out or planning to carry out any work on “charging”, and apologises for any confusion.

Extended Transparent End-to-end PS Streaming Service

PSS-E specifications

- During the work, SA4 has been keeping track of internal agreements and produced internal drafts of Rel-5 versions of streaming specifications: TS 26.233 (General Description) and TS 26.234 (Protocols and Codecs).
- These TSs have been modified accordingly to contain the new Rel-5 PSS-E feature(s).
- It is SA4's intention to bring PSS-E for Rel-5 through CRs to the existing Rel-4 versions of TS 26.233 and TS 26.234 at TSG-SA#15. These CRs will contain the additions of feature(s) developed during the PSS-E work in SA4.
- The Rel-5 work is based on Rel-4 streaming, Rel-5 streaming will provide full backward compatibility with Rel-4 streaming. Only capability exchange will be included as a completely new functionality in Rel-5. Therefore, the architectural impacts in Rel-5 remain limited like in Rel-4.
- For the above reasons, SA4 intends not to produce a separate TS for Stage 2 but plans to continue including the architectural considerations in the two 26-series TSs as was done for Rel-4. This will provide a full description of streaming (beyond the necessary Stage 1 Service Requirements) including architectural considerations in the same TSs for both Rel-4 and Rel-5.

Extended Transparent End-to-end PS Streaming Service

- SA4 feels that it would be useful to introduce in Rel-5 a TR on RTP usage model. The IETF defined Real-Time Protocol (RTP/RTCP) for real-time multimedia transport over IP is a general description of the functionality that RTP can provide, but the specification itself does not define how an application should use RTP/RTCP most efficiently in a given network environment.
- The objective in such a TR would be to provide "RTP usage model" for the PS Streaming Service. The TR would also consider how a 3G network could be optimally configured for transporting the RTP traffic, and how the streaming mechanism itself should be designed and optimised given an understanding of the underlying transport characteristics.
- Although such a TR is not explicitly mentioned as output in the PSS-E WID, SA4 feels that it is in line with the objectives of the PSS-E WID (which include enhanced transport aspects) and would like to start drafting it, and also provisionally take prime responsibility of preparing it in co-operation with all relevant WGs - especially with SA2 who could have secondary responsibility of the TR.

Extended Transparent End-to-end PS Streaming Service

Deliverable	Title	Latest Version	Comment/Status	Approval
	Stage 2 (SA4, SA2)	-	Pending upon finalisation of Stage 1 in SA1. SA4 intends not to prepare separate Stage 2 TS but continue to include the architectural considerations in the 26-series TSs as done for Rel-4.	-
TS 26.233	Packet-switched Streaming Services (PSS); General Description	4.0.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR approval expected at TSG-SA#15
TS 26.234	Packet-switched Streaming Services (PSS); Protocols and Codecs	4.1.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR approval expected at TSG-SA#15

T2 request for Multimedia Messaging Service (MMS) codecs/formats

- Codecs and formats for MMS service are addressed in TS 23.140 (Multimedia Messaging Service (MMS); Functional description; Stage 2) owned by T2. This contains a part that is dedicated to the codecs/formats.
- T2#14 (Sept) sent a LS to SA4 requesting that the responsibility for the specification of codecs and formats to be used in MMS service (except Text) would be transferred to SA4 starting from Rel-5.
 - This would allow better ensure the alignment of MMS codecs/formats with those chosen for other services, in particular for streaming.
 - Would result in a new SA4 specification for Rel-5, addressing the selection and the usage of media codecs/formats in MMS.
- SA4 agreed at SA4#19 to take over this responsibility. A draft TS on MMS codecs and formats prepared in SA4 (TS 26.140, v1.0.0). This is presented for information at TSG-SA#14 in Tdoc SP-010695.
- Relevant sections from TS 23.140 are used as the starting point for the new TS. For the sake of interoperability, some alignment done with PSS-E Rel-5 draft TS 26.234.
- Draft TS 26.140 has been sent to T2 for review and comments. The target is to complete this TS in co-operation with T2 and bring it for approval at TSG-SA#15.

Multimedia Codecs and Protocols for Conversational PS Services

- Preparation of TS on "Transport Protocols" (TS 26.236) has been continued.
- Gives definition of the required protocol usage within Conversational Packet Switched Multimedia Services (which is based on IM Subsystem).
- Defines media type requirements (e.g., RTP session description parameters) and gives pointers to the relevant call and bearer control specifications.
- A draft version of this TS is presented for information in Tdoc SP-010694.
- TS on "Default Codecs" (TS 26.235) has already been finalised and approved by TSG-SA.

Deliverable	Title	Latest Version	Comment/Status	Approval
TS 26.235	Packet Switched Conversational Multimedia Applications; Default Codecs	5.0.0	Approved at TSG-SA#11 in Tdoc SP-010095.	Approved at TSG-SA#11 for Rel-4. Moved to Rel-5 at TSG-SA#12.
TS 26.236	Packet Switched Conversational Multimedia Applications; Transport Protocols	1.0.0	Version 1.0.0 presented for information in Tdoc SP-010694.	Approval expected at TSG-SA#15
TR 26.xyz	Performance characterization of default codecs for PS conversational multimedia applications	-	-	tbd

Maintenance of earlier releases

- Tdocs SP-010696...SP-010698 and SP-010702...SP-010704
- These bring corrections to TSs 06.73/26.073, 26.103, 26.233, 26.234, and 28.062.

Content

- Review of work progress
- Documents for information
- Approval requested



Summary of documents presented for information


- **The following Rel-5 draft TSs and TRs are presented for information to TSG-SA#14:**
 - Draft TR 26.976 version 0.6.0 “AMR-WB Speech Codec Performance Characterisation” in Tdoc SP-010692
 - Draft TS 26.204 version 1.0.0 “ANSI-C Code for the Floating-Point AMR Wideband Speech Codec” in Tdoc SP-010693
 - Draft TS 26.236 version 1.0.0 “Packet Switched Conversational Multimedia Applications; Transport Protocols” in Tdoc SP-010694
 - Draft TS 26.140 version 1.0.0 “Multimedia Messaging Service (MMS); Media Formats and Codecs” in Tdoc SP-010695

Summary of SA4 issues for information/guidance

To TSG-SA's attention:

- The same AMR-WB codec is to be standardised in both 3GPP and ITU-T, and care should be taken in keeping the specifications fully aligned in both standardisation fora. (Some formal procedure could be beneficial to establish in order to avoid any misalignment in 3GPP and ITU-T.) *(Slide 13)*
- The Rel-5 PSS-E work is based on Rel-4 streaming and Rel-5 streaming will provide full backward compatibility with Rel-4 streaming. Only capability exchange will be included as a completely new functionality in Rel-5. Therefore, the architectural impacts in Rel-5 remain limited like in Rel-4. SA4 intends not to produce a separate TS for Stage 2 for PSS-E, but plans to continue including the architectural considerations in the two 26-series TSs as was done for Rel-4. *(Slide 16)*
- SA4 feels that it would be useful to prepare a new TR on RTP usage model for Rel-5 PSS-E since the IETF defined Real-Time Protocol is only a general description of the functionality. SA4 would like start drafting such a TR and also provisionally take prime responsibility of preparing it in co-operation with all relevant WGs - especially with SA2. *(Slide 17)*

Content

- Review of work progress
- Documents for information
- Approval requested 

Approval Requested

TSG-SA WG4 requests TSG-SA#14 to:

- 1) Approve the work done by the contracted listening laboratories in AMR-WB Characterisation Phase 1B, i.e., work related to Experiments 7 and 8 (The Effect of Static Errors under Clean Speech Conditions, The Effect of Background Noise in Static C/I Conditions)**
- 2) Approve the CRs in Tdocs SP-010696 to SP-010704**

Approval requested for (CRs)

- Tdoc SP-010696: TS 06.73/TS 26.073 “AMR speech Codec; C-source code”

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
06.73	A28		R98	Correction of RX-DTX handling of NO_DATA frames in AMR decoder	F	7.5.0	S4	TSG-SA WG4#19	S4-010668
26.073	013		R99	Correction of RX-DTX handling of NO_DATA frames in AMR decoder	A	3.2.0	S4	TSG-SA WG4#19	S4-010669
26.073	014		REL-4	Correction of RX-DTX handling of NO_DATA frames in AMR decoder	A	4.0.0	S4	TSG-SA WG4#19	S4-010670

- Tdoc SP-010697: TS 06.73/TS 26.073 “AMR speech Codec; C-source code”

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
06.73	A29		R98	Correction in AMR decoder to avoid division by zero in RX-DTX handling	F	7.5.0	S4	TSG-SA WG4#19	S4-010671
26.073	015		R99	Correction in AMR decoder to avoid division by zero in RX-DTX handling	A	3.2.0	S4	TSG-SA WG4#19	S4-010672
26.073	016		REL-4	Correction in AMR decoder to avoid division by zero in RX-DTX handling	A	4.0.0	S4	TSG-SA WG4#19	S4-010673

Approval requested for (CRs)

- Tdoc SP-010698: TS 26.103 “Codec lists”

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.103	011		R99	Inclusion of codec type UMTS AMR_2 in R99 codec list	F	3.0.0	S4	TSG-SA WG4#19	S4-010692 (R)
26.103	010		REL-4	Removal of AMR-WB codec type	F	4.1.0	S4	TSG-SA WG4#19	S4-010629 (R)

- Tdoc SP-010699: TS 26.173 “ANSI-C Code for the AMR-WB Speech Codec”

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.173	009		REL-5	Incorrect mode usage during DTX	F	5.2.0	S4	TSG-SA WG4#19	S4-010590
26.173	010		REL-5	Correction of homing function for 23.85 kbit/s mode	F	5.2.0	S4	TSG-SA WG4#19	S4-010591

- Tdoc SP-010700: TS 26.174 “AMR-WB Speech Codec; Test Sequences”

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.174	002		REL-5	Update of AMR-WB test sequences	F	5.1.1	S4	TSG-SA WG4#19	S4-010593

- Tdoc SP-010701: TS 26.190 “AMR-WB; Transcoding Functions”

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.190	001		REL-5	Inconsistency between TS 26.190 and TS 26.173	F	5.0.0	S4	TSG-SA WG4#19	S4-010592

Approval requested for (CRs)

- Tdoc SP-010702: TS 26.233 "Transparent end-to-end packet switched streaming services (PSS); General description"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.233	001	1	REL-4	Correction of RTSP TEARDOWN protocol flow in Figure 1	F	4.0.0	S4	TSG-SA WG4#19	S4-010690

- Tdoc SP-010703: TS 26.234 "Transparent end-to-end packet switched streaming services (PSS); Protocols and codecs"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.234	007		REL-4	Correction of SDP Usage	F	4.1.0	S4	TSG-SA WG4#19	S4-010638 (R2)
26.234	008	1	REL-4	Implementation guidelines for RTSP and RTP	F	4.1.0	S4	TSG-SA WG4#19	S4-010657
26.234	009		REL-4	Correction to media type decoder support in the PSS client	F	4.1.0	S4	TSG-SA WG4#19	S4-010658
26.234	010		REL-4	Amendments to file format support for 26.234 release 4	F	4.1.0	S4	TSG-SA WG4#19	S4-010589 (R)

- Tdoc SP-010704: TS 28.062 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
28.062	002		REL-4	Corrections	F	4.1.1	S4	TSG-SA WG4#19	S4-010626
28.062	003		REL-4	Corrections	F	4.1.1	S4	TSG-SA WG4#19	S4-010627

(end of presentation)