Source:	**TSG-SA WG4 Chairman**
Title:	**TSG-SA WG4 Status Report at TSG-SA#15**
Document for:	**Information**
Agenda Item:	**7.4.1**

Executive Summary

Since TSG-SA#14, TSG-SA WG4 (SA4) has met once as SA4 plenary (SA4#20 on February 18th – 22nd, 2002). In addition, the SA4 PSM (Packet Switched Multimedia) and TFO (Tandem Free Operation) SWGs have both held one ad-hoc meeting outside the SA4 plenary.

Progress in Release 5 Work

- **Wideband Telephony Service – AMR**: Floating-point version of the AMR-WB codec has been finalised and TS 26.204 (ANSI-C Code for the Floating Point AMR-WB Speech Codec) is presented for approval. Verification Phase has been carried out to verify the high quality performance of the floating-point code. TFO for AMR-WB codec has been finalised and is brought into TS 28.062 (In-band Tandem Free Operation (TFO) of Speech Codecs). All SA4 tasks under the feature "Wideband Telephony Service – AMR" are now completed (except the last phase of Characterisation Testing covering PS applications). On the request of TSG-GERAN, SA4 has investigated the feasibility of defining a sub-set of AMR-WB modes to support for WB speech telephony service across GERAN-GMSK TCH/F, GERAN-8PSK TCH/F and TCH/H. A reduced set consisting of 5 modes has been identified in SA4. In ITU-T, the AMR-WB codec has been formally approved in January 2002 as the new ITU-T recommendation G.722.2.

- **Extended Transparent End-to-End Packet Switched Streaming Service (PSS-E):** Development of Rel-5 streaming (PSS-E) has been completed. The Rel-5 features for streaming are included through two CRs into Rel-5 versions of existing streaming specifications TS 26.233 (General Description) and TS 26.234 (Protocols and Codecs). The main additions in Rel-5 are: 1) Capability exchange has been included; 2) New media types have been addressed (Vector Graphics, Synthetic Audio, Timed Text); 3) Existing media types have been extended (PNG, XHTML mobile profile); 4) An optional video buffer model has been added; 5) A new module has been added to SMIL PSS Profile (Transitions Effects Module); 6) Clarifications and updates to a number of protocols have been done (SDP, RTP, RTSP); 7) Alignment with the upcoming ISO file format has been done. Work for the new TR on RTP Usage Model is still in a very initial drafting phase within SA4; not much effort has been put on it due to work needed in finalisation of the Rel-5 TSs.

- **Multimedia Messaging Service media formats and codecs (part of feature Messaging enhancements:** TS 26.140 (MMS media formats and codecs) has been finalised and is brought for approval. This TS is a new Rel-5 TS, and has resulted from T2 request to transfer the specification responsibility of MMS media formats and codecs from T2 to SA4. The MMS media formats and codecs have been aligned for interoperability with those chosen for other services, in particular for streaming (PSS-E), as was one motivation in T2 behind the transfer. A draft of TS 26.140 was reviewed by T2 and comments have been taken into account. T2 has secondary responsibility of the new specification.

- **Multimedia Codecs and Protocols for Conversational Packet Switched Services (part of feature Provisioning of IP Based Multimedia Services):** The work to produce TS 26.236 (Transport Protocols) has been completed and the TS is presented for approval. This TS gives definition of the required protocol usage within Conversational Packet Switched Multimedia Services (which is based on IM Subsystem). It defines media type requirements (e.g., RTP session description parameters) and gives pointers to the relevant call and bearer control specifications. Work for recommendation for QoS parameter values for various media types (as identified in the 3GPP Work Plan) is ongoing. A preliminary mapping of SDP parameters to UMTS QoS parameters has been prepared for both streaming application and for conversational application and are included as informative annex in the relevant TSs (26.234 and 26.236, respectively).

Change Requests are presented for

TS 06.74   (R98)
TS 26.101 (R99, Rel-4)
TS 26.103 (R99, Rel-4 and Rel-5)
TS 26.104 (R99, Rel-4)
TS 26.132 (R99, Rel-4 and Rel-5)
TS 26.173 (Rel-5)
TS 26.174 (Rel-5)
TS 26.191 (Rel-5)
TS 26.231 (Rel-5)
TS 26.233 (Rel-4 and Rel-5)
TS 26.234 (Rel-4 and Rel-5)
TS 26.235 (Rel-5)
TS 28.062 (Rel-4 and Rel-5)

Note on CRs 012-014 on TS 26.103: At SA4#20, it was felt useful to include in TS 26.103 explanation of the AMR codec types and how they are to be used for UTRAN radio access. CRs to 26.103 contain CRs on inclusion of UMTS AMR2 as default codec type in UTRAN access for R99 dual-mode (UMTS&GSM) terminals, and from Rel-4 onwards. The issue has been discussed earlier in CN1, T2 and TSG-T, and similar definition has been included in TS 23.153. It should be checked that the definition is consistent throughout TSs. Also, TS 26.103 may not be the most proper place for the requirement. This should be addressed at TSG-SA#15. (SA4 sent a LS to TSG-T informing them about the proposed change in TS 26.103.)

A proposed solution for the release inconsistency in TS 26.234 (Rel-4), identified at TSG-SA#14, is brought for approval. To solve the reference problem, SA4 requests TSG-SA that AMR-WB codec TSs used in Rel-4 PSS (and not related to network aspects) would be transferred to Rel-4 for use in Streaming.

Note: Annex B (separate file) of this report contains a copy of the slides presentation to TSG-SA#15.

1. General

1.1 Officials

There are no changes in TSG-SA WG4 (SA4) officials:

Chairman: Kari Järvinen   (Nokia / ETSI)
Vice Chairman: Tomoyuki Ohya (NTT DoCoMo / ARIB)
Secretary: Paolo Usai   (3GPP Support)
SWG Chairmen:

SQ (Speech Quality):	Paolo Usai
TFO (Tandem Free Operation):	Clemens Suerbaum (Siemens)
AMR-WB (AMR Wideband):	Imre Varga (Siemens)
PSM (Packet Switched Multimedia):	Rolf Hakenberg (Panasonic)

1.2 Meetings

Since TSG-SA#14, SA4 has held one plenary meeting. In addition, the TFO and PSM SWGs have both held one ad-hoc meeting outside SA4 plenaries.

Meetings held:

SA4 PSM SWG ad-hoc:	January 17-18, 2002	Host: Siemens, Venue: Munich, Germany
SA4 TFO SWG ad-hoc:	January 28-29, 2002	Host: Siemens, Venue: Garmisch, Germany
SA4#20:	February 18-22, 2002	Host: Ericsson, Venue: Luleå, Sweden

Calendar of future meetings:

SA4 TFO SWG ad-hoc:	April 22/23 or 23/24 (tbd)	Host: Vodafone, Venue: tbd
SA4#21:	May 20-24, 2002	Host: France Télécom R&D, Venue: Rennes, France
SA4#22:	July 22-26, 2002	Host: Nokia (preliminary offer, tbc), Venue: tbd
SA4#23:	Sept 30 - Oct 4, 2002	Host: VoiceAge, Venue: Montreal, Canada
SA4#24:	Nov 11-15, 2002	Host: Microsoft, Venue: tbd
SA4#25:	Early 2003	Host: AWS, Venue: USA (tbd)

During SA4#20 meeting, all the four SA4 SWGs met. Some SWGs had joint sessions. About 70 delegates participated in the meeting and around 230 documents were covered. There were 25 incoming LSs, and 9 LSs were sent out.

Annex A of this document contains a list of all SA4 input documents to TSG-SA#15. The input documents from SA4 are contained in Tdoc SP-020009 and in Tdocs SP-020071 until SP-020092. Annex B (in a separate file) contains a copy of the slides presentation of SA4 progress report at TSG-SA#15.

2. Progress in Release 5 Work

2.1 Wideband Telephony Service – AMR

2.1.1 AMR-WB floating-point version

The floating-point version of the AMR-WB codec has been completed and TS 26.204 "ANSI-C Code for the Floating Point AMR-WB Speech Codec" is presented for approval in Tdoc SP-020073. The high quality and good performance of the floating-point code has been verified during Verification Phase, into which several companies have participated.

A floating-point specification of the AMR narrowband codec was produced earlier, and now TS 26.204 defines a floating-point version also for the AMR-WB codec. The reason for specifying a floating-point codec version is that 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. The 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.

2.1.2 AMR-WB characterisation

Phases 1A and 1B of Characterisation Testing have been completed earlier and the results are included in draft version 0.6.0 of TR 26.976 "AMR-WB Speech Codec Performance Characterisation". This was presented for information at TSG-SA#14 (in Tdoc SP-010692). Phases 1A and 1B covered characterisation testing of AMR-WB for clean channel performance, GSM GMSK channels and 3G channels.

In Characterisation Phase 2, SA4 has agreed to use some results already made available at GERAN#8 to cover the 8-PSK aspects; hence only aspects of PS applications will be tested to complete the TR. Tests on PS applications will be carried out later, for which purpose new testing methodologies are under development in SA4. Phase 2 will complete the characterisation tests for AMR-WB and will lead into finalisation of TR 26.976.

2.1.3 AMR-WB Tandem Free Operation

Definition of TFO operation is completed for AMR-WB. CRs to include AMR-WB into TS 28.062 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" are presented for approval in Tdoc SP-020091 (Modification of TFO_Messages for AMR-WB introduction, Introduction of Generic Configuration Frames, Inclusion of AMR-WB and OHR_AMR).

The new GERAN 8-PSK codec types for AMR-WB (and AMR narrowband) are introduced to the AMR TFO decision rules C-code of TS 28.062 in Tdoc SP-020092 (AMR-WB codec types and codec type OHR_AMR into reference implementation C-Code of AMR TFO decision rules).

The basic principle in TFO-operation for the AMR-WB codec is the same as for narrowband speech codecs. AMR-WB TFO-frames are carried in the LSBs of 64 kbit/s PCM-spech samples between TRAU/TCs (as for narrowband codecs). The following items are additionally considered for AMR-WB:
- A new size of 640 bits for the 32 kbit/s TFO frames format was needed for the highest AMR-WB modes (the related TRAU-format is defined in 48.060).
- The call is started with a narrowband codec until TFO is established (because it is not desirable to occupy radio resources unnecessarily with wideband signals, until TFO is operational). Once it is known that both sides support AMR-WB and that TFO is possible, both sides will perform handovers to AMR-WB.
- After AMR-WB TFO establishment, AMR-WB is transmitted between TRAU/TSs in (up to 4) LSBs of narrowband PSM signal (downsampled from AMR-WB).
- The TRAU/TC performs in uplink direction the wideband decoding and a successive lowpass-filtering, downsampling to 8kHz sampling rate and PCM (G.711) encoding, before its sends the narrowband version of the speech signal towards its destination. This downsampled signal allows interworking with the narrowband world (PSTN etc.).

2.1.4 Other AMR-WB work

Some issues in the CN4 WI "Introduction of AMR-WB Speech Service in 3GPP Standards Release 5 – Core Network Aspects" (Tdoc NP-010538) have been identified in the 3GPP Work Plan with SA4 as the prime responsible WG: 1) AMR-WB and narrowband interworking, 2) Interworking with fixed broadband networks and 3) Tones and announcements. For these, the work has been completed.

- The AMR-WB Characterisation Tests show that AMR-WB codec has good interworking performance with narrowband codecs. Up- and downsampling filters for AMR-WB ↔ narrowband PCM (G.711) conversion have been studied in SA4 for possible inclusion into AMR-WB 26-series TSs. An optimised filter solution was developed and presented at SA4#19 and SA4#20. However, at SA4#20, it was agreed that specification of the up- and downsampling filter is not necessary to be included in the TSs (mainly since the required filter is a rather basic low-pass filter).

- On Interworking with Fixed Network Wideband Legacy Codecs, SA1 in their LS (Tdoc S1-011328/S4-010583) states that interworking with the existing (virtually unused) G.722 is not required. CN4 does not see need for an immediate requirement for the specification of transcoding between AMR-WB and G.722.1 (N4-020269/S4-020130). Should interworking with G.722.1 be needed, transcoding should be employed (defined in TS 26.190) as stated in SA4 LS to SA1 and CN4 (Tdoc S4-010681). Interworking with G.722.2 is straightforward: no transcoding is needed since G.722.2 is the same AMR-WB speech coding algorithm.

- On tones and announcements, SA1 concluded in their LS (Tdoc S1-011328/S4-010583) that AMR-WB tones are not required, and AMR-WB announcements are required as a very low priority item (if at all) and are not needed in Rel-5. SA1 doesn't see that additional work would be justified at this stage (Rel-5) to support wideband announcements.

2.1.5 Reduced set of AMR-WB modes for speech telephony service

TSG-GERAN has requested SA4 to investigate the feasibility of defining a sub-set of AMR-WB modes to support for wideband speech telephony service across GERAN-GMSK TCH/F, GERAN-8PSK TCH/F and TCH/H (see LS in Tdoc SP-020004). SA4 was requested to consider selecting a sub-set of the 9 AMR-WB modes that could be used for WB telephony service; ideally this sub-set should not include more than 4 different modes and should be common to the three radio channel realizations. The main motivation is to reduce the number of different channel coding schemes required for the different Radio Access Technologies (RAT). The easiness of implementation of WB Telephony will significantly contribute to the proliferation of AMR-WB in mobile terminals, and is motivation behind the request. For use in other applications than wideband speech telephony, e.g., MMS or Packet Switched Streaming, all the AMR-WB modes will be kept in the source codec (as currently defined in TS 26.190). However, channel coding would be specified for a sub-set of the modes available for the WB speech telephony service.

SA4 agrees with TSG-GERAN that a reduction of the number of AMR-WB modes for speech telephony service is desirable and is also feasible. A reduced set consisting of 5 modes (23.85, 15.85, 12.65, 8.85 and 6.60 kbit/s) was identified at SA4#20. Reduction of modes to 4 (requested as ideal by TSG-GERAN) was discussed and was seen generally desirable. However, agreement of a subset containing only 4 modes could not be reached. Therefore, SA4 proposes a subset consisting of 5 modes. The three lowest modes are intended to be used as a common set for all RATs, while additionally the two upmost ones could be used in GERAN-8PSK TCH/F and UTRAN (that enable these higher bit-rates to be used). The three lowest modes will provide sufficient and easy TFO interoperability between all RATs.

A response LS stating the SA4 view is found in Tdoc SP-020009, and more details can be found in it.

2.1.6 Other issues

In ITU-T, the AMR-WB codec has now formally been approved as the new ITU-T recommendation G.722.2 (approved in January 2002).

CRs bringing minor corrections to AMR-WB are brought for approval: in Tdoc SP-020081 to TS 26.173 "ANSI-C code for the Adaptive Multi Rate (AMR) Wideband speech codec" (Correction of pitch calculation of AMR-WB encoder, Error concealment of high band gain in 23.85 kbit/s mode), in Tdoc SP-020082 to TS 26.174 "AMR Wideband Speech Codec test sequences" (Update of AMR-WB test sequences), and in Tdoc SP-020083 to TS 26.191 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames" (Error concealment of high band gain in 23.85 kbit/s mode).

Table 1: Status list of AMR-WB codec specifications under SA4 responsibility

Deliverable	Title	Latest version	Comment/Status	Approval

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	5.3.0	Approved at TSG-SA#11 in Tdoc SP-010083.	Approved at TSG-SA#11 *
TS 26.174	AMR-WB speech codec; test sequences	5.2.0	Approved at TSG-SA#11 in Tdoc SP-010084.	Approved at TSG-SA#11 *
TS 26.190	AMR Wideband Speech Codec; Transcoding Functions	5.1.0	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 Iu 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	2.0.0	Version 2.0.0 presented for approval at TSG-SA#15 in Tdoc SP-020073. (Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010693.)	Approval requested 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 under definition in SA4.	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).

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

Development of Rel-5 streaming (PSS-E) has been completed. The Rel-5 streaming features will be brought through two CRs into existing streaming specifications TS 26.233 "General Description" and TS 26.234 "Protocols and Codecs". The CRs are contained in Tdoc SP-020086 for TS 26.233 "Consolidated addition of Release 5 PSS-E features to TS 26.233 Rel-4" and in Tdoc SP-020088 for TS 26.234 "Addition of Release 5 functionality".

The main additions that have been included in Rel-5 are:
- Capability exchange has been added
- New media types have been addressed (Vector Graphics, Synthetic Audio, Timed Text)
- Existing media types have been extended (PNG for bitmap graphics, XHTML mobile profile for text)
- An optional video buffer model has been added
- A new module has been added to SMIL PSS Profile (Transistions Effects Module to describe transitions between media elements)
- Clarifications and updates to a number of protocols have been done (SDP, RTP, RTSP)
- Alignment with the upcoming ISO file format has been done.

Capability Exchange is the only completely new functionality over Rel-4 Streaming. The definition of capability exchange contains 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 (UAProf). The UAProf vocabulary is reused and an additional PSS specific vocabulary is defined. The PSS-E functionality for capability exchange is a subset of what is defined for MEXE. Importantly,

both use UAProf, which is an application of the CC/PP framework. The PSS-E capability exchange mechanism is a complete entity and without duplication of functionality in 3GPP. The subset is found complete for PSS applications while keeping the implementation complexity manageable.

The codings specified for streaming service offering a particular media type remain the same as in Rel-4 except that some new media types have been addressed: Synthetic Audio (Scalable Polyphony MIDI content should be supported), Vector Graphics (2D vector graphics format Scalable Vector Graphics with Tiny profile shall be supported), and Timed Text. Also, some extensions have been included in existing media types, e.g., PNG (Portable Networks Graphics) is added as recommended bitmap graphics. Rel-5 Streaming includes also several other additions. E.g., optional buffer model for video is included in Rel-5. For session set-up and control, clarifications and updates are done for SDP and for other protocols. Upload streaming is not a part of Rel-5.

As capability exchange is the only completely new functionality in Rel-5, the architectural impacts of PSS-E remain limited. Therefore, SA4 (prime responsible WG for PSS-E Stage 2) continues considering the architectural considerations in the two 26-series TSs as was done for Rel-4. SA2 has reviewed the two draft PSS-E Rel-5 TSs and has not identified any architectural problems with them. During the SA4 work, draft versions of the PSS-E Rel-5 specifications have been sent for review to relevant WGs (SA2, SA1 and T2) and comments have been taken into account.

As explained at TSG-SA#14, SA4 intends to produce a Technical Report on RTP usage model (since the IETF defined Real-Time Protocol (RTP/RTCP) for real-time multimedia transport over IP is just a general description of the functionality). This work is still in a very initial drafting phase due to work needed to finalise for the PSS-E TSs by TSG-SA#15, and other WGs are not involved in the work yet. The drafting will continue in future SA4 meetings in co-operation with all relevant WGs.

Table 2: Status list of specifications for Extended Transparent End-to-end PS Streaming Service

Deliverable	Title	Latest* Version	Comment/Status	Approval
TS 26.233	Packet-switched Streaming Services (PSS); General Description	4.1.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR presented for approval at TSG-SA#15
TS 26.234	Packet-switched Streaming Services (PSS); Protocols and Codecs	4.2.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR presented for approval at TSG-SA#15
TR 26.937	Packet-switched Streaming Services (PSS); RTP usage model	.	Initial drafting phase ongoing in SA4	tbd

*) Note: PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS. The Rel-4 versions do not include PSS-E.

On the request of CN3, SA4 has started work for defining recommended mapping of SDP parameters to UMTS bearer QoS for applications using codecs. Preliminary mapping rules for both streaming and conversational applications have been defined and sent to CN3 (and as Cc to other relevant WGs) for information.

It is generally felt within SA4 that Streaming work should continue for Rel-6. This is also indicated in the Rel-5 TSs where reference to further extensions (e.g., security, charging, digital rights management) in future releases is made. However, due to urgent Rel-5 work SA4 has not yet discussed the content of possible Rel-6 PSS work. Naturally, SA1 has to be strongly included in these discussions since they are the WG responsible for Service Requirements in 3GPP. Due to expected many new features, also SA2 should be included in the work in very early phase to ensure consistent overall architecture.

2.3 Multimedia Messaging Service (MMS) media formats and codecs (part of feature Messaging Enhancements)

TS 26.140 "MMS media formats and codecs" has been finalised and is brought for approval in Tdoc SP-020075. This TS is a new Rel-5 TS, and has resulted from T2 request to transfer the specification responsibility of MMS media formats and codecs from T2 to SA4. The MMS media formats and codecs have been aligned (and made non-contradicting) for the sake of interoperability with those chosen for other services, in particular for streaming (Rel-5 TS 26.234 "PSS: Protocols and Codecs") as was one motivation in T2 behind the transfer.

A draft version of TS 26.140 was presented at TSG-SA#14, and was sent to T2 (and SA1) for information and review. T2 provided comments to complete the TS (through LS and also by T2 delegates participating in

SA4#20 for finalisation of the TS). Since TSG-SA#14, T2 has decided to transfer also the responsibility of specification of MMS text formats to SA4 (to become part of TS 26.140). The definition of MMS/SMS interoperability has been removed from TS 26.140 and it remains in the responsibility of T2 (to be defined in TS 23.140 "MMS Functional Description; Stage 2"). At SA4#20, SA4 received inputs regarding the issue of media synchronization and presentation for MMS, in the form of liaison statements from SA1 and GSMA as well as direct company inputs. These contributions requested that an appropriate format is defined, and proposed requirements (also in reference to 22.140). The outcome of the discussion was that SMIL 3GPP profile has been chosen as the mandatory language, and XHTM Mobile profile has been chosen as optional language. The relevant groups will be kept closely informed on the work progress; SA4 will address requirements and comments coming from SA1 and T2 regarding the media formats and codecs for MMS and will regularly provide updated version of the specification 26.140 to SA1 and T2 for review. T2 has secondary responsibility of TS 26.140.

Table 3: Status list of specifications for MMS

Deliverable	Title	Latest Version	Comment/Status	Approval
TS 26.140	Multimedia Messaging Service (MMS): Media formats and codecs	2.0.0	Version 2.0.0 presented for approval at TSG-SA#15 in Tdoc SP-020075. (Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010695.)	Version 2.0.0 presented 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 26.235 "Default Codecs" has already been finalised earlier. The work to produce the other TS on "Transport Protocols" (TS 26.236) has been continued and is now completed. This TS gives definition of the required protocol usage within Conversational Packet Switched Multimedia Services (which is based on IM Subsystem). The TS defines media type requirements (e.g., RTP session description parameters) and gives pointers to the relevant call and bearer control specifications. The TS is presented for approval in Tdoc SP-020074. TR on performance characterization of default codecs for PS conversational multimedia applications remains to be prepared.

As explained above (in section 2.2), SA4 has started work for recommendation of the mapping of SDP parameters to UMTS bearer QoS for applications using codecs. Preliminary mapping rules for both streaming and conversational applications have been defined and sent to CN3 (and as Cc to other relevant WGs) for information and is also included as informative annex in the relevant Rel-5 TSs (26.234 and 26.236).

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	2.0.0	Version 2.0.0 presented for approval at TSG-SA#15 in Tdoc SP-020074. (Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010694.)	Version 2.0.0 presented for approval at TSG-SA#15
TR 26.xyz	Performance characterization of default codecs for PS conversational multimedia applications	-	-	tbd

CR to TS 26.235 on "Update of AMR & AMR-WB RTP payload format" is brought for approval in Tdoc SP-020089. The payload format is updated to align to the latest IETF draft.

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 were approved at 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.

One CR is brought for TS 26.231 on "Request to remove the CTM tandeming requirement for handsets in the Minimum Performance Requirements" in Tdoc SP-020084. With CTM (TTY support) enabled on the handset, the user only needs to connect the phone directly to the TTY machine. If the user has a TTY machine with CTM capability built in, then CTM (TTY support) is not even needed in the handset. In this case the user simply should not enable the TTY support in the handset. There is no reason to have CTM in tandem, and the requirement is not needed.

3. Maintenance of releases

3.1 Change Requests

The following CRs are brought for approval at TSG-SA#15:

Tdoc SP-020076: CRs to TS 06.74 "AMR Speech Codec Test Sequences"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
06.74	A002	1	R98	Correction to DTX test vectors	F	7.1.1	S4	TSG-SA WG4#20	S4-020188

- Alternative DTX test vectors using DAI interface (testing through channel coding/decoding) is added for AMR codec into Rel-98 (GSM). In testing through DAI, one NO_DATA frame disappears, and therefore additional DTX test sequence is needed. (More time was felt required for considering corresponding CRs to R99 and Rel-4 since these address other systems than GSM and the issue may be addressed better in other TSs than TS 26.074.)

Tdoc SP-020077: CRs to TS 26.101 "AMR Speech Codec Frame Structure"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.101	007	1	R99	Correction of AMR codec output bitstream	F	3.2.0	S4	TSG-SA WG4#20	S4-020190
26.101	008		REL-4	Correction of AMR codec output bitstream	A	4.1.0	S4	TSG-SA WG4#20	S4-020095

- Comfort Noise parameter bits are set to "0" for SID_FIRST frame type. This was not stated in the text, giving possibility for different interpretations.

Tdoc SP-020078: CRs to TS 26.103 "Codec lists"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.103	012	1	R99	UMTS_AMR2 is default Codec Type in R99 dual_mode terminals	F	3.1.0	S4	TSG-SA WG4#20	S4-020204
26.103	013	1	REL-4	UMTS_AMR2 is default Codec Type in all terminals of REL-4 and onwards	F	4.2.0	S4	TSG-SA WG4#20	S4-020205
26.103	014	1	REL-5	UMTS_AMR2 is default Codec Type in all terminals of REL-4 and onwards	A	5.0.0	S4	TSG-SA WG4#20	S4-020206
26.103	015		REL-5	Introduction of GERAN-8PSK Codec Types into Codec List	B	5.0.0	S4	TSG-SA WG4#20	S4-020101

| 26.103 | 017 | | REL-5 | Introduction of codepoint for Dummy Codec for CS Multi Media (3G 324M) | B | 5.0.0 | S4 | TSG-SA WG4#20 | S4-020123 |

- CRs 012-014: At SA4#20, it was felt useful to include in TS 26.103 explanation of the AMR codec types and how they are to be used for UTRAN radio access. CRs to 26.103 contain CRs on inclusion of UMTS AMR2 as default codec type in UTRAN access for R99 dual-mode (UMTS&GSM) terminals, and from Rel-4 onwards. The issue has been discussed earlier in CN1, T2 and TSG-T, and similar definition has been included in TS 23.153. It should be checked that the definition is consistent throughout TSs. Also, TS 26.103 may not be the most proper place for the requirement. The issue should be discussed at TSG-SA#15. SA4#20 sent a LS to TSG-T informing them about the proposed change in TS 26.103.

  Background: At TSG-SA#14, CR on "Inclusion of codec type UMTS AMR2 in 26.103 (R99)" was approved (Tdoc SP-010698). The inclusion was requested in LSs by CN1 and T2 (with TSG-T included in the communication) as they had agreed to include UMTS AMR2[1] codec type for R99 to be used in dual system (UMTS & GSM) terminals (not in single mode UMTS terminals). Explanation on the issue had been included earlier in TS 23.153 "Out of Band Transcoder Control - Stage 2" in Section 5.6, but for clarity it would be good to have explanation also in TS 26.103 where the codec types are explained. Care should be taken that consistency throughout TSs among the TSGs is kept.

- CR 015: Codec types for GERAN 8PSK have been added to Codec List (on request from TSG-GERAN). Three codec types have been added: AMR-WB for 8PSK HR and 8 PSK FR channel, and AMR narrowband for 8 PSK HR channel.

- CR 017: On the request from CN3, a codepoint for CS Multi Media is added for the use of OoBTC procedures. Out of Band Codec Negotiation is used to indicate CS Multi Media Service (for fallback to speech feature) and thus needs a codepoint in the BICC Codec List. There is no encoding properties or codec specification associated to this codec type; it is purely an indication for MuMe pipe. This makes the Service Change and UDI Fallback (SCUDIF) feature to work with the existing BICC CS2 protocol.

Tdoc SP-020079: CRs to TS 26.104 "ANSI-C code for the floating-point AMR speech codec"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.104	020		R99	Maintaining bit-exactness with TS 26.073	F	3.3.0	S4	TSG-SA WG4#20	S4-020066
26.104	019		REL-4	Maintaining bit-exactness with TS 26.073	A	4.2.0	S4	TSG-SA WG4#20	S4-020058

- The same corrections approved at TSG-SA#14 for the AMR narrowband fixed-point code (TS 26.073) are brought also to the floating-point code version. This will keep the bit-exactness between the two versions.

Tdoc SP-020080: CRs to TS 26.132 "Speech and video telephony terminal acoustic test specification"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.132	009	1	R99	Correction of references and editorial changes (wrong decimal separators)	F	3.3.0	S4	TSG-SA WG4#20	S4-020018
26.132	010	1	REL-4	Correction of references and editorial changes (wrong decimal separators)	A	4.1.0	S4	TSG-SA WG4#20	S4-020019
26.132	011	1	REL-5	Correction of references and editorial changes (wrong decimal separators)	A	5.1.0	S4	TSG-SA WG4#20	S4-020020

- Wrong references to formulas and tables etc. are corrected.

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[1] UMTS AMR2 codec type is the same as UMTS AMR, except for rate control. An UMTS AMR2 encoder is allowed to perform codec mode change only every 2nd 20 ms 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.

Tdoc SP-020081: CRs to 26.173 "ANSI-C code for the Adaptive Multi Rate (AMR) Wideband speech codec"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.173	011	2	REL-5	Correction of mode reading and memory usage	F	5.3.0	S4	TSG-SA WG4#20	S4-020175
26.173	012		REL-5	Correction of pitch calculation of AMR-WB encoder	F	5.3.0	S4	TSG-SA WG4#20	S4-020060
26.173	013		REL-5	Error concealment of high band gain in 23.85 kbit/s mode	F	5.3.0	S4	TSG-SA WG4#20	S4-020172

- These are Rel-5 CRs bringing corrections to AMR-WB codec C-code => See description under Rel-5 work in Section 2.1.6.

Tdoc SP-020082: CRs to TS 26.174 "AMR Wideband Speech Codec test sequences"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.174	003		REL-5	Update of AMR-WB test sequences	F	5.2.0	S4	TSG-SA WG4#20	S4-020061

- This is Rel-5 CR bringing corrections to test sequences (due to CRs 11 and 12 to 26.173) => See description under Rel-5 work in Section 2.1.6.

Tdoc SP-020083: CRs to TS 26.191"AMR Wideband Speech Codec; Error concealment of erroneous or lost frames"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.191	001		REL-5	Error concealment of high band gain in 23.85 kbit/s mode	F	5.0.0	S4	TSG-SA WG4#20	S4-020173

- This is Rel-5 CR bringing corrections to the description of error concealment => See description under Rel-5 work in Section 2.1.6.

Tdoc SP-020084: CRs toTS 26.231 "Cellular Text Telephone Modem; Minimum Performance Requirements"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.231	002		REL-5	Request to remove the CTM tandeming requirement for handsets in the Minimum Performance Requirements	F	5.1.0	S4	TSG-SA WG4#20	S4-020071

- This is Rel-5 CR bringing correction to minimum performance requirements (removal of unnecessary tandeming requirement) => See description under Rel-5 work in Section 2.5.

Tdoc SP-020085: CRs to 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	002	1	REL-4	Correction of missing use case example: PSS service activation via MMS	F	4.1.0	S4	TSG-SA WG4#20	S4-020202

- Explanatory text is added for streaming session originated via MMS, and also a new related figure is added showing MMS Server/Relay MMS service element. (The change resulted from T2 review of PSS Rel-5 draft TSs, and is valid also for Rel-4.)

Tdoc SP-020086: CRs to 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	003		REL-5	Consolidated addition of Release 5 PSS-E features to TS 26.233 Rel-4	B	4.1.0	S4	TSG-SA WG4#20	S4-020201

- This is Rel-5 CR adding Rel-5 Streaming features => See description under Rel-5 work in Section 2.2.

Tdoc SP-020087: CRs to 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	011		REL-4	Specification of missing limit for number of AMR Frames per Sample	F	4.2.0	S4	TSG-SA WG4#20	S4-020038
26.234	013	2	REL-4	Removing of the reference to TS 26.235	F	4.2.0	S4	TSG-SA WG4#20	S4-020161
26.234	014		REL-4	Correction to the reference for the XHTML MIME media type	F	4.2.0	S4	TSG-SA WG4#20	S4-020041
26.234	015	1	REL-4	Correction to MPEG-4 references	F	4.2.0	S4	TSG-SA WG4#20	S4-020144
26.234	018	1	REL-4	Correction to the width field of H263SampleEntry Atom in Section D.6	F	4.2.0	S4	TSG-SA WG4#20	S4-020192
26.234	019		REL-4	Correction to the definition of "b=AS"	F	4.2.0	S4	TSG-SA WG4#20	S4-020146
26.234	020		REL-4	Clarification of the index number's range in the referred MP4 file format	F	4.2.0	S4	TSG-SA WG4#20	S4-020150
26.234	021		REL-4	Correction of SDP attribute 'C='	F	4.2.0	S4	TSG-SA WG4#20	S4-020164

- These CRs bring several corrections: Missing Limit for the number of AMR frames per frame inside MPEG-4 file is included, Annex E is moved from TS 26.235 (to avoid referring to Rel-5 TS in Rel-4 TS), reference to XHTML media type in Annex C is replaced with reference to new IETF RFC 3236, MPEG-references are updated, the use of width field in MPEG-4 files is corrected, the definition of SDP attribute has been corrected to align with IETF definition, some index numberings in MPEG-4 file are clarified to start with index number one, requirement for support for NULL parameter in the SDP attribute "c=" is included.

Tdoc SP-020088: CRs to 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	022	2	REL-5	Addition of Release 5 functionality	B	4.2.0	S4	TSG-SA WG4#20	S4-020226

- This is Rel-5 CR adding Rel-5 Streaming features => See description under Rel-5 work in Section 2.2.

Tdoc SP-020089: CRs to TS 26.235 " Packet Switched Conversational Multimedia Applications; Default Codecs"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.235	003	2	REL-5	Update of AMR & AMR-WB RTP payload format	F	5.0.0	S4	TSG-SA WG4#20	S4-020222

- This is Rel-5 CR updating AMR & AMR-WB RTP payload format (to align to the latest IETF draft) => See description under Rel-5 work in Section 2.4.

Tdoc SP-020090: CRs to 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	004		REL-4	Correction of OM & OD bits mapping in TFO 16k frames	F	4.2.0	S4	TSG-SA WG4#20	S4-020026
28.062	005	1	REL-4	Inclusion of the Non_Speech TFO frames in conditions for TFO_Frame	F	4.2.0	S4	TSG-SA WG4#20	S4-020176
28.062	007	2	REL-4	Corrections in TFO Protocol Tables	F	4.2.0	S4	TSG-SA WG4#20	S4-020180

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
28.062	013		REL-4	Corrected C-Code for AMR TFO decision rules	F	4.2.0	S4	TSG-SA WG4#20	S4-020142
28.062	016		REL-4	Corrections	F	4.2.0	S4	TSG-SA WG4#20	S4-020141

- These CRs bring several corrections: Bit-mapping is corrected in TFO-frames, non-speech TFO frames (e.g. SID FIRST) are included in conditions for TFO-frames, correction is made for TFO protocol tables, C-code for TFO decision rules is corrected etc.

Tdoc SP-020091: CRs to 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	009		REL-5	Modification of TFO_Messages for AMR-WB introduction	B	4.2.0	S4	TSG-SA WG4#20	S4-020107
28.062	010	2	REL-5	Introduction of Generic Configuration Frames into TS 28.062, Annex H	B	4.2.0	S4	TSG-SA WG4#20	S4-020182
28.062	015	1	REL-5	Inclusion of AMR-WB codec types and codec type OHR_AMR (AMR-NB on 8PSK-HR channel) into TFO	B	4.2.0	S4	TSG-SA WG4#20	S4-020217

- These are Rel-5 CRs bringing TFO for AMR-WB codec => See description under Rel-5 work in Section 2.1.3.

Tdoc SP-020092: CRs to 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	014		REL-5	AMR-WB codec types and codec type OHR_AMR into reference implementation C-Code of AMR TFO decision rules	B	4.2.0	S4	TSG-SA WG4#20	S4-020166

- These are Rel-5 CRs bringing TFO for AMR-WB codec (into C-code of AMR TFO decision rules) => See description under Rel-5 work in Section 2.13.

3.2 AMR-WB codec references in TS 26.234 Release 4

At TSG-SA#14, Tdoc SP-010741 ("Release consistency: AMR-WB in Streaming Specifications") identified release inconsistency in TS 26.234 (Rel-4). 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 was requested, since the AMR-WB codec is only available in Rel-5. The decision of TSG-SA was that TSG-SA4 was asked to come back at the next TSG-SA meeting with a proposal for resolution of the issue.

SA4 feels that 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. 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 discussed the issue at SA4#20, and agreed that the latter solution is preferable and 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.

Consequently, SA4 proposes the following actions to be taken at TSG-SA#15: Approve to transfer to Rel-4 the AMR-WB codec TSs used in Rel-4 PSS. From the list of AMR-WB codec TSs approved and functionally frozen at TSG-SA#11 (March 2001), all except TS 26.202 are used in Rel-4 PSS and should be moved to Rel-4. The TSs are: 26.171, 26.173, 26.174, TS 26.190, 26.191, 26.192, 26.193, 26.194 and 26.201. (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.

Full description of SA4 view and position in the issue is given in Tdoc SP-020072 "AMR-WB codec references in TS 26.234 Release 4".

4. Summary of Rel-5 work status in SA4

- All Rel-5 TSs from SA4 are finalised; the remaining ones are in approval at TSG-SA#15.

- All the Rel-5 work is completed except:

    1. Completion of some Technical Reports:
    TR 26.976 "AMR-WB Speech Codec Performance Characterisation", TR 26.937 "RTP usage model", and TR 26.xyz "Performance characterization of default codecs for PS conversational multimedia applications". As TRs these are not "release-critical", and not necessary to be finalised along with the related TSs. (Performance Characterisation TRs are always completed after approval of the corresponding TSs, as they characterise the coding algorithms in the TSs.)

    2. Recommendation for QoS parameter values for various PS media types is ongoing jointly with other relevant WGs. This needs some work (and guidance from relevant WGs would be appreciated on what output is exactly expected).

5. Approval requested

TSG-SA WG4 requests TSG-SA#15 to:

1. Approve the following new TSs:
    a) TS 26.204 "ANSI-C Code for the Floating-Point AMR Wideband Speech Codec" in Tdoc SP-020073
    b) TS 26.236 "Packet Switched Conversational Multimedia Applications; Transport Protocols" in Tdoc SP-020074
    c) TS 26.140 "Multimedia Messaging Service (MMS); Media Formats and Codecs" in Tdoc SP-020075

2. Approve the Rel-5 CRs bringing Extended Streaming into Rel-5:
    a) in Tdoc SP-020086 to TS 26.233 "General Description"
    b) in Tdoc SP-020088 to TS 26.234 "Protocols and Codecs"

3. Approve the Rel-5 CRs on introduction of the AMR-WB codec:
    a) in Tdocs SP-020091 and SP-020092 on inclusion of AMR-WB into TFO

   b) in Tdocs SP-020081, SP-020082 and SP-020083 on corrections to AMR-WB codec

4. Approve the other CRs in Tdocs SP-020076 to SP-020080, SP-020084, SP-020085, SP-020087, SP-020089 and SP-020090

5. In order to solve the reference problem in Rel-4 version of TS 26.234, approve to transfer to Rel-4 the AMR-WB codec TSs used in Rel-4 PSS (TSs 26.171, 26.173, 26.174, TS 26.190, 26.191, 26.192, 26.193, 26.194 and 26.201) as proposed by SA4 in Tdoc SP-020072.

ANNEX A: List of input documents to TSG-SA#15 from TSG-SA WG4

Tdoc	Title	Source	Agenda item	Document for
SP-020009	Liaison for information: Reduction of the number of AMR-WB modes for speech telephony service	SA WG4	7.4.2	Information
SP-020071	TSG S4 Status Report at TSG-SA#15	SA WG4 Chairman	7.4.1	Information
SP-020072	AMR-WB codec references in TS 26.234 Release 4	SA WG4	7.4.3	Approval
SP-020073	3GPP TS 26.204 version 2.0.0 "ANSI-C code for the Floating-point Adaptive Multi-Rate Wideband (AMR-WB) speech codec" (Release 5)	SA WG4	7.4.3	Approval
SP-020074	3GPP TS 26.236 version 2.0.0 "Packet Switched Conversational Multimedia Applications; Transport Protocols" (Release 5)	SA WG4	7.4.3	Approval
SP-020075	3GPP TS 26.140 version 2.0.0 "Multimedia Messaging Service (MMS); Media formats and codecs" (Release 5)	SA WG4	7.4.3	Approval
SP-020076	CRs to TS 06.74 on Correction to DTX text vectors (R98)	SA WG4	7.4.3	Approval
SP-020077	CRs to TS 26.101 on Correction of AMR codec output bit-stream (R99, Release 4)	SA WG4	7.4.3	Approval
SP-020078	CRs to TS 26.103 on Default Codec Type UMTS AMR_2 (R99, Release 4 and 5), Introduction of GERAN-8PSK Codec Types into Codec List (Release 5), and Introduction of codepoint for Dummy Codec for CS Multi Media (3G 324M) (Release 5)	SA WG4	7.4.3	Approval
SP-020079	CRs to TS 26.104 on Maintaining bit-exactness with TS 26.073 (R99, Release 4)	SA WG4	7.4.3	Approval
SP-020080	CRs to TS 26.132 on Correction of references and editorial changes (wrong decimal separators) (R99, Release 4, Release 5)	SA WG4	7.4.3	Approval
SP-020081	CRs to TS 26.173 on "Correction of mode reading and memory usage", "Correction of pitch calculation of AMR-WB encoder", and "Error concealment of high band gain in 23.85 kbit/s mode" (Release 5)	SA WG4	7.4.3	Approval
SP-020082	CRs to TS 26.174 on "Update of AMR-WB test sequences" (Release 5)	SA WG4	7.4.3	Approval
SP-020083	CR to TS 26.191 on "Error concealment of high band gain in 23.85 kbit/s mode" (Release 5)	SA WG4	7.4.3	Approval
SP-020084	CR to TS 26.231 on "Request to remove the CTM tandeming requirement for handsets in the Minimum Performance Requirements" (Release 5)	SA WG4	7.4.3	Approval
SP-020085	CRs to TS 26.233 on "Correction of missing use case example: PSS service activation via MMS" (Release 4)	SA WG4	7.4.3	Approval
SP-020086	CRs to TS 26.233 on "Consolidated addition of Release 5 PSS-E features to TS 26.233 Rel-4" (Release 5)	SA WG4	7.4.3	Approval
SP-020087	CRs to TS 26.234 on "Corrections and Clarifications" (Release 4)	SA WG4	7.4.3	Approval
SP-020088	CRs to TS 26.234 on "Addition of Release 5 functionality" (Release 5)	SA WG4	7.4.3	Approval
SP-020089	CR to TS 26.235 on "Update of AMR & AMR-WB RTP payload format" (Release 5)	SA WG4	7.4.3	Approval
SP-020090	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
SP-020091	CRs to TS 28.062 on "Modification of TFO_Messages for AMR-WB introduction", on "Introduction of Generic Configuration Frames", and on "Inclusion of AMR-WB and OHR_AMR" (Release 5)	SA WG4	7.4.3	Approval
SP-020092	CRs to TS 28.062 on "AMR-WB codec types and codec type OHR_AMR into reference implementation C-Code of AMR TFO decision rules" (Release 5)	SA WG4	7.4.3	Approval

TSG-SA WG4 (SA4) Status Report at TSG-SA#15

Kari Järvinen
TSG-SA WG4 Chairman

1

Content

- **General issues**

- **Review of SA4 work progress and Rel-5 status**

- **Documents for information**

- **Approval requested**

General: SA4 officials

(no changes)

- **Chairman:** **Kari Järvinen (Nokia / ETSI)**

- **Vice Chairman:** **Tomoyuki Ohya (NTT DoCoMo / ARIB)**

- **Secretary:** **Paolo Usai (3GPP Support)**

- **Sub Working Groups:**
  - **Speech Quality (SQ):** **Paolo Usai**
  - **Tandem Free Operation (TFO):** **Clemens Suerbaum (Siemens)**
  - **AMR Wideband (AMR-WB):** **Imre Varga (Siemens)**
  - **Packet Switched Multimedia (PSM): Rolf Hakenberg (Panasonic)**

General: SA4 meetings

- **Meetings held:**

SA4 PSM SWG ad-hoc:	January 17-18, 2002	Host: Siemens, Venue: Munich, Germany
SA4 TFO SWG ad-hoc:	January 28-29, 2002	Host: Siemens, Venue: Garmisch, Germany
SA4#20:	February 18-22, 2002	Host: Ericsson, Venue: Luleå. Sweden

- **Future meetings:**

SA4 TFO SWG ad-hoc:	April 22/23 or 23/24	Host: Vodafone, Venue tbd.
SA4#21:	May 13-17, 2002	Host: France Télécom R&D, Venue: Rennes, France
SA4#22:	July 22-26, 2002	Host: Nokia (preliminary offer, tbc)
SA4#23:	Sept 30 - Oct 4, 2002	Host: VoiceAge, Venue: Montreal, Canada
SA4#24:	Nov 11-15, 2002	Host: Microsoft, Venue: tbd
SA4#25:	Early 2003	Host: AWS, Venue: USA (tbd)

- **Meeting statistics:**

  – SA4#20: 1 week, ~70 participants, ~230 input documents

  – SWG sessions during SA4#20: PSM, SQ, AMR-WB, TFO

  – 25 input LSs, 9 output LSs

General: Input documents

- **Input documents in SP-020009 and SP-020071 … SP-020092**

  <u>Tdoc: Title; Source; Agenda item; Document for</u>

  – SP-020009: Liaison for information: Reduction of the number of AMR-WB modes for speech telephony service; SA WG4; 7.4.2; Information

  – SP-020071: TSG S4 Status Report at TSG-SA#15; SA WG4 Chairman; 7.4.1; Information

  – SP-020072: AMR-WB codec references in TS 26.234 Release 4; SA WG4; 7.4.3; Approval

  – SP-020073: 3GPP TS 26.204 version 2.0.0 "ANSI-C code for the Floating-point Adaptive Multi-Rate Wideband (AMR-WB) speech codec" (Release 5); SA WG4; 7.4.3; Approval

  – SP-020074: 3GPP TS 26.236 version 2.0.0 "Packet Switched Conversational Multimedia Applications; Transport Protocols" (Release 5); SA WG4; 7.4.3; Approval

  – SP-020075: 3GPP TS 26.140 version 2.0.0 "Multimedia Messaging Service (MMS); Media formats and codecs" (Release 5); SA WG4; 7.4.3; Approval

  – SP-020076 … SP-020092: [documents containing CRs]; SA WG4; 7.4.3; Approval

5

Content

- **General issues**

- **Review of SA4 work progress and Rel-5 status**

- **Documents for information**

- **Approval requested**

Review of work progress

- **Rel-5 Work Progress:**

  - **Wideband Telephony Service – AMR (AMR-WB)**
    - AMR-WB Floating Point version finalised ->TS 26.204 "ANSI-C code for AMR-WB" for approval
    - TFO for AMR-WB completed -> CRs to TSs 28.062 "In-band TFO" for approval
    - Reduced set of AMR-WB modes for speech telephony service (requested by TSG GERAN)
    - AMR-WB codec now formally approved as ITU-T recommendation G.722.2

  - **Extended Transparent End-to-end PS Streaming Service (PSS-E)**
    - Rel-5 streaming completed -> CRs to TSs 26.233 "General Description" and 26.234 "Protocols and Codecs" for approval

  - **Multimedia Codecs and Protocols for Conversational PS Services (part of feature "Provisioning of IP Based Multimedia Services")**
    - TS 26.236 "Transport protocols" for approval

  - **MMS media formats and codecs (part of feature "Messaging enhancements")**
    - TS 26.140 "Media Formats and Codecs" for approval

- **Rel-5 work is in a good shape: All intended Rel-5 TSs are completed. (The remaining ones are brought for approval at TSG-SA#15.)**

Wideband Telephony Service – AMR

- **AMR-WB floating-point version**
  - The floating-point version of the AMR-WB codec completed. (A floating-point specification of the AMR narrowband codec was produced earlier.)
  - The high quality and good performance verified during Verification Phase, into which several companies have participated.
  - TS 26.204 "ANSI-C Code for the Floating Point AMR-WB Speech Codec" presented for approval in Tdoc SP-020073.
  - The floating-point code is efficient for an implementation on PC or other general-purpose processors often used as multimedia implementation platforms. (The fixed-point C-code in TS 26.173 is meant for DSP implementations.)
  - 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.

- **AMR-WB characterisation**
  - Phases 1A and 1B (clean channel performance, GSM GMSK channels and 3G channels) completed earlier. Results included in TR 26.976 "AMR-WB Speech Codec Performance Characterisation" (draft v0.6.0)
  - Phase 2 (GERAN 8-PSK, PS applications): Some results available from GERAN#8 to cover the 8-PSK aspects. For PS applications tests will be carried out later; new testing methodologies are under development in SA4.
  - Phase 2 will complete the characterisation tests for AMR-WB and will lead into finalisation of TR 26.976.

8

Wideband Telephony Service – AMR

- **AMR-WB Tandem Free Operation**
  - Definition of TFO operation is completed for AMR-WB.

  - The basic principle same as for narrowband speech codecs. TFO-frames are carried in LSBs of 64 kbit/s PCM-spech samples between TRAU/TCs.The following items are additionally considered:
    - A new size of 640 bits for the 32 kbit/s TFO frames format needed for the highest AMR-WB modes (defined in TS 48.060).

    - Call is started with a narrowband codec until TFO is established (not desirable to occupy radio resources unnecessarily with WB signals until TFO is operational). Once it is known that both sides support AMR-WB and that TFO is possible, both sides will start using AMR-WB.

    - After AMR-WB TFO establishment, AMR-WB is transmitted between TRAU/TSs in (up to 4) LSBs of narrowband PSM signal (downsampled AMR-WB).

    - The TRAU/TC performs in uplink direction the wideband decoding and a successive lowpass-filtering, downsampling to 8kHz sampling rate and PCM (G.711) encoding, before its sends the narrowband version of the speech signal towards its destination. This downsampled signal allows interworking with the narrowband world (PSTN etc.).

  - CRs to include AMR-WB into TS 28.062 "In-band Tandem Free Operation (TFO) of Speech Codecs; Stage 3 - Service Description" presented for approval in Tdoc SP-020091 and SP-020092

9

Wideband Telephony Service – AMR

- **Other AMR-WB work (under SA4 responsibility in Work Plan) completed:**

  1) AMR-WB and narrowband interworking,

  – Characterisation Tests show good interworking performance

  – Up- and downsampling filters for AMR-WB ↔ narrowband PCM (G.711) conversion studied in SA4 for possible inclusion into 26-series TSs. Optimised filter solution developed and presented in SA4. Specification not seen necessary in TS (mainly since the required filter is a rather basic low-pass filter).

  2) Interworking with fixed broadband networks

  – SA1/CN4 LSs: SA1 does not see interworking with the existing (virtually unused) wideband codec G.722 to be required. CN4 does not see need for an immediate requirement for the specification of transcoding between AMR-WB and G.722.1. Interworking with G.722.2 is straightforward: no transcoding is needed since G.722.2 is the same AMR-WB speech coding algorithm.

  3) Tones and announcements

  SA1 LS: AMR-WB tones are not required, and AMR-WB announcements are required as a very low priority item (if at all) and are not needed in Rel-5. Additional work seen not justified at this stage (Rel-5).

10

Wideband Telephony Service – AMR

- **Reduced set of AMR-WB modes for speech telephony service**

  – TSG-GERAN asked SA4 to investigate the feasibility of defining a sub-set of AMR-WB modes to support for wideband speech telephony service across GERAN-GMSK TCH/F, GERAN-8PSK TCH/F and TCH/H

  – Request in LS in Tdoc SP-020004:

    - SA4 is requested to consider selecting a sub-set of the 9 AMR-WB modes that could be used for WB telephony service; ideally this sub-set should not include more than 4 different modes and should be common to the three radio channel realizations.

    - Main motivation is to reduce the number of different channel coding schemes required for the different Radio Access Technologies (RAT).

    - For use in other applications than wideband speech telephony, e.g., MMS or Packet Switched Streaming, all the AMR-WB modes will be kept in the source codec (as currently defined in TS 26.190). However, channel coding would be specified for a sub-set of the modes available for the WB speech telephony service.

Wideband Telephony Service – AMR

- **Response LS from SA4 is found in Tdoc SP-020009.**
  - SA4 agrees with TSG-GERAN that a reduction of the number of AMR-WB modes for speech telephony service is desirable and also feasible.
  - A reduced set consisting of 5 modes (23.85, 15.85, 12.65, 8.85 and 6.60 kbit/s) was identified at SA4#20.
  - Reduction of modes to 4 (requested as ideal by TSG-GERAN) was discussed and was seen generally desirable. However, agreement of a subset containing only 4 modes could not be reached. Therefore, SA4 proposes a subset consisting of 5 modes.
  - The three lowest modes are intended to be used as a common set for all RATs, while additionally the two upmost ones could be used in GERAN-8PSK TCH/F and UTRAN (that enable these higher bit-rates to be used). The three lowest modes will provide sufficient and easy TFO interoperability between all RATs.

- **More details in Tdoc SP-020009!**

12

Wideband Telephony Service – AMR

- **In ITU-T, the AMR-WB codec has now formally been approved as the new ITU-T recommendation G.722.2 (approved in January 2002).**

- **Change Requests**
  - CRs bringing minor corrections to AMR-WB are brought for approval:
    - in Tdoc SP-020081 to TS 26.173 "ANSI-C code for the Adaptive Multi Rate (AMR) Wideband speech codec"
    - in Tdoc SP-020082 to TS 26.174 "AMR Wideband Speech Codec test sequences"
    - in Tdoc SP-020083 to TS 26.191 "AMR Wideband Speech Codec; Error concealment of erroneous or lost frames"

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

- **Development of Rel-5 streaming (PSS-E) completed.**

- **Two CRs into existing PSS specifications: TS 26.233 "General Description" and TS 26.234 "Protocols and Codecs"**

- **The CRs are contained in Tdoc SP-020086 (for TS 26.233) and in Tdoc SP-020088 (for TS 26.234)**

- **The main additions that have been included in Rel-5 are:**
  - Capability exchange has been added
  - New media types have been addressed (Vector Graphics, Synthetic Audio, Timed Text)
  - Existing media types have been extended (PNG for bitmap graphics, XHTML mobile profile for text)
  - An optional video buffer model has been added
  - A new module has been added to SMIL PSS Profile (Transistions Effects Module to describe transitions between media elements)
  - Clarifications and updates to a number of protocols have been done (SDP, RTP, RTSP)
  - Alignment with the upcoming ISO file format has been done

- **Capability Exchange is the only completely new functionality over Rel-4 Streaming.**

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

- **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 an additional PSS specific vocabulary is defined.)**

- **The PSS-E functionality for capability exchange is a subset of what is defined for MExE. Importantly, both use UAProf, which is an application of the CC/PP framework.**

  - The PSS-E capability exchange mechanism is a complete entity and without duplication of functionality in 3GPP. The subset is found complete for PSS applications, while keeping the implementation complexity reasonable.

- **The codings specified for streaming service offering a particular media type remain the same as in Rel-4 except that some new media types have been addressed:**

  - Synthetic Audio (Scalable Polyphony MIDI content should be supported)
  - Vector Graphics (2D vector graphics format Scalable Vector Graphics Tiny profile shall be supported)
  - Timed Text is included

  Also, some extensions in existing media types, e.g., PNG (Portable Networks Graphics) added as recommended bitmap graphics

- **Work for new TR on "RTP usage model" still in a very initial drafting phase.**

15

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

- **SA2 has reviewed the two draft PSS-E Rel-5 TSs (and has not identified any architectural problems).**

- **Rel-6 PSS work:**
  - It is generally felt within SA4 that Streaming work should continue for Rel-6 as indicated in the Rel-5 TSs where reference to further extensions (e.g., security, charging, digital rights management) in future releases is made. However, due to urgent Rel-5 work SA4 has not yet specifically discussed the content of possible Rel-6 PSS work.
    - SA1 has to be strongly included in these discussions since they are the WG responsible for Service Requirements.
    - Due to expected many new features, also SA2 should be included in the work in early phase to ensure consistent overall architecture.

16

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

- **Status of specifications:**

Deliverable	Title	Latest* Version	Comment/Status	Approval
TS 26.233	Packet-switched Streaming Services (PSS); General Description	4.1.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR presented for approval at TSG-SA#15
TS 26.234	Packet-switched Streaming Services (PSS); Protocols and Codecs	4.2.0	PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.	CR presented for approval at TSG-SA#15
TR 26.937	Packet-switched Streaming Services (PSS); RTP usage model	.	Initial drafting phase ongoing in SA4	tbd

*)   Note: PSS-E for Rel-5 will be brought through CRs to the existing Rel-4 TS.

17

Multimedia Messaging Service (MMS) media formats and codecs (part of feature Messaging Enhancements)

- **TS 26.140 "MMS media formats and codecs" finalised and brought for approval in Tdoc SP-020075.**

- **Work resulted from T2 request to transfer the specification responsibility of MMS media formats and codecs from T2 to SA4.**

  – The MMS media formats and codecs have been aligned (and made non-contradicting) for the sake of interoperability with those chosen for other services, in particular for streaming (Rel-5 TS 26.234 "PSS: Protocols and Codecs") as was one motivation in T2 behind the transfer.

- **A draft version of TS 26.140 was presented at TSG-SA#14, and also sent to T2 and SA1 for information and review.**

  – T2 provided comments to complete the TS (through LS and also by T2 delegates participating in SA4#20 for finalisation of the TS).

  – T2 has decided to transfer also the responsibility of specification of MMS text formats

  – The definition of MMS/SMS interoperability removed from TS 26.140 and remains in T2 (in TS 23.140 "MMS Stege2")

  – Input on media synchronization and presentation for MMS received, in LSs from SA1 and GSMA, as well as direct company inputs. The outcome of the discussion is that SMIL 3GPP profile is chosen as the mandatory language, and XHTM Mobile profile is optional language.

18

Multimedia Messaging Service (MMS) media formats and codecs (part of feature Messaging Enhancements)

- **T2 has secondary responsibility of TS 26.140.**

- **Status of specifications:**

Deliverable	Title	Latest Version	Comment/Status	Approval
TS 26.140	Multimedia Messaging Service (MMS): Media formats and codecs	2.0.0	Version 2.0.0 presented for approval at TSG-SA#15 in Tdoc SP-020075. (Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010695.)	Version 2.0.0 presented for approval at TSG-SA#15

Multimedia Codecs and Protocols for Conversational PS Services (part of feature Provisioning of IP Based Multimedia Services, IMS)

- **TS 26.235 "Default Codecs" finalised earlier.**

- **Work on TS on "Transport Protocols" (TS 26.236) continued and is now completed. The TS is presented for approval in Tdoc SP-020074**
    - This TS 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. The TS is presented for approval in Tdoc SP-020074.

- **TR on performance characterization of default codecs for PS conversational multimedia applications remains to be prepared.**

- **Work for recommendation of the mapping of SDP parameters to UMTS bearer QoS for applications using codecs ongoing.**
    - Preliminary mapping rules for both streaming and conversational applications have been defined and sent to CN3 (and as Cc to other relevant WGs) for information and are also included as informative annex in the relevant TSs (26.234 and 26.236).

- **CR to TS 26.235 on "Update of AMR & AMR-WB RTP payload format" is brought for approval in Tdoc SP-020089. (The payload format is updated to align to the latest IETF draft.)**

20

Multimedia Codecs and Protocols for Conversational PS Services (part of feature Provisioning of IP Based Multimedia Services, IMS)

- **Status of specifications:**

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	2.0.0	Version 2.0.0 presented for approval at TSG-SA#15 in Tdoc SP-020074. (Version 1.0.0 presented for information at TSG-SA#14 in Tdoc SP-010694.)	Version 2.0.0 presented for approval at TSG-SA#15
TR 26.xyz	Performance characterization of default codecs for PS conversational multimedia applications	-	-	tbd

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

- **The feature GTT was completed and closed at TSG SA#12.**

- **Status of specifications under SA4 responsibility:**

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.

- **One CR is brought for TS 26.231 on "Request to remove the CTM tandeming requirement for handsets in the Minimum Performance Requirements" in Tdoc SP-020084.**

22

Summary of Rel-5 work status in SA4

- **All Rel-5 TSs from SA4 are finalised; the remaining ones are in approval at TSG-SA#15.**

- **All the SA4 Rel-5 work is completed except:**

  - TR 26.976 "AMR-WB Speech Codec Performance Characterisation", TR 26.937 "RTP usage model", and TR 26.xyz "Performance characterization of default codecs for PS conversational multimedia applications".

    As TRs these are not release critical. (Performance Characterisation TRs are always completed after approval of the corresponding TSs, as they characterise the algorithms in the TSs.)

  - Recommendation for QoS parameter values for various PS media types is ongoing jointly with other relevant WGs.

Change Requests

- **TS 06.74   (R98)**
- **TS 26.101 (R99, Rel-4)**
- **TS 26.103 (R99, Rel-4 and Rel-5) ***
- **TS 26.104 (R99, Rel-4)**
- **TS 26.132 (R99, Rel-4 and Rel-5)**
- **TS 26.173 (Rel-5)**
- **TS 26.174 (Rel-5)**
- **TS 26.191 (Rel-5)**
- **TS 26.231 (Rel-5)**
- **TS 26.233 (Rel-4 and Rel-5)**
- **TS 26.234 (Rel-4 and Rel-5)**
- **TS 26.235 (Rel-5)**
- **TS 28.062 (Rel-4 and Rel-5)**

*) Note: At SA4#20, it was felt useful to include in TS 26.103 (Codec Lists) explanation of the AMR codec types and how they are to be used for UTRAN radio access. CRs to 26.103 contain CRs on inclusion of UMTS_AMR2 as default codec type in UTRAN access for R99 dual-mode (UMTS&GSM) terminals, and from Rel-4 onwards. The issue has been discussed earlier in CN1, T2 and TSG-T, and similar definition has been included in TS 23.153. It should be checked that the definition is consistent throughout TSs. Also, TS 26.103 may not be the most proper place for the requirement. The issue should be addressed at TSG-SA#15.

24

AMR-WB codec references in TS 26.234 Release 4

- **At TSG-SA#14, Tdoc SP-010741 ("Release consistency: AMR-WB in Streaming Specifications") identified release inconsistency in TS 26.234 (Rel-4).**
  - 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 was requested, since the AMR-WB codec is only available in Rel-5.

- **The decision of TSG-SA was that SA4 was asked to come back at the next TSG-SA meeting with a proposal for resolution of the issue.**

- **SA4 feels that 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.
  - 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 discussed the issue at SA4#20, and agreed that the latter solution should be followed; one company expressed reservation to the agreement.**

AMR-WB codec references in TS 26.234 Release 4

- **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.

AMR-WB codec references in TS 26.234 Release 4

- **Concequently, SA4 proposes the following actions to be taken at TSG-SA#15:**

  - **Approve to transfer to Rel-4 the AMR-WB codec TSs used in Rel-4 PSS. From the list of AMR-WB codec TSs approved and functionally frozen at TSG-SA#11 (March 2001), all except TS 26.202 are used in Rel-4 PSS and should be moved to Rel-4.**

    - The TSs are: 26.171, 26.173, 26.174, TS 26.190, 26.191, 26.192, 26.193, 26.194 and 26.201. (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.

- **Full description on SA4 view and position on the issue is given in Tdoc SP-020072 "AMR-WB codec references in TS 26.234 Release 4", Source: SA4**

Content

- **General issues**

- **Review of SA4 work progress and Rel-5 status**

- **Documents for information**

- **Approval requested**

Documents presented for information

- **Tdoc SP-020009: "Liaison for information: Reduction of the number of AMR-WB modes for speech telephony service", from SA WG4**
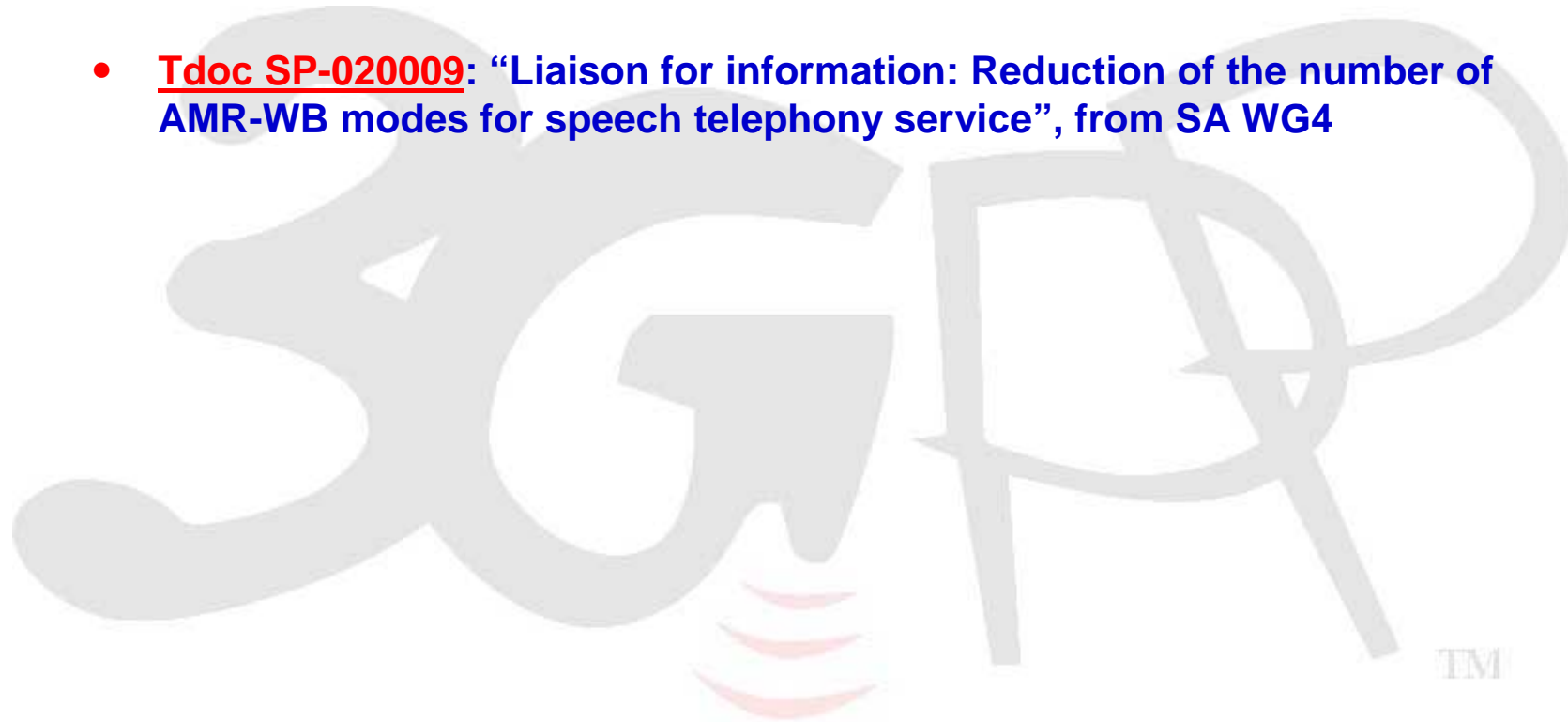
Approval Requested

1) Approve the following new TSs:

a) TS 26.204 "ANSI-C Code for the Floating-Point AMR Wideband Speech Codec" in Tdoc SP-020073

b) TS 26.236 "Packet Switched Conversational Multimedia Applications; Transport Protocols" in Tdoc SP-020072

c) TS 26.140 "Multimedia Messaging Service (MMS); Media Formats and Codecs" in Tdoc SP-020075

Approval Requested

2) Appprove the Rel-5 CRs bringing Extended Streaming into Rel-5:

a) in Tdoc SP-020086 to TS 26.233 "General Description"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.233	003		REL-5	Consolidated addition of Release 5 PSS-E features to TS 26.233 Rel-4	B	4.1.0	S4	TSG-SA WG4#20	S4-020201

b) in Tdoc SP-020088 to TS 26.234 "Protocols and Codecs"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.234	022	2	REL-5	Addition of Release 5 functionality	B	4.2.0	S4	TSG-SA WG4#20	S4-020226

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31

Approval Requested

3) Approve the Rel-5 CRs on introduction of the AMR-WB codec:

a) in Tdocs SP-020091 and SP-020092

Tdoc SP-020091: CRs to 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	009		REL-5	Modification of TFO_Messages for AMR-WB introduction	B	4.2.0	S4	TSG-SA WG4#20	S4-020107
28.062	010	2	REL-5	Introduction of Generic Configuration Frames into TS 28.062, Annex H	B	4.2.0	S4	TSG-SA WG4#20	S4-020182
28.062	015	1	REL-5	Inclusion of AMR-WB codec types and codec type OHR_AMR (AMR-NB on 8PSK-HR channel) into TFO	B	4.2.0	S4	TSG-SA WG4#20	S4-020217

Tdoc SP-020092: CRs to 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	014		REL-5	AMR-WB codec types and codec type OHR_AMR into reference implementation C-Code of AMR TFO decision rules	B	4.2.0	S4	TSG-SA WG4#20	S4-020166

Approval Requested

b) in Tdocs SP-020081, SP-020082 and SP-020083 on corrections to AMR-WB codec

Tdoc SP-020081: CRs to 26.173 "ANSI-C code for the Adaptive Multi Rate (AMR) Wideband speech codec"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.173	011	2	REL-5	Correction of mode reading and memory usage	F	5.3.0	S4	TSG-SA WG4#20	S4-020175
26.173	012		REL-5	Correction of pitch calculation of AMR-WB encoder	F	5.3.0	S4	TSG-SA WG4#20	S4-020060
26.173	013		REL-5	Error concealment of high band gain in 23.85 kbit/s mode	F	5.3.0	S4	TSG-SA WG4#20	S4-020172

Tdoc SP-020082: CRs to TS 26.174 "AMR Wideband Speech Codec test sequences"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.174	003		REL-5	Update of AMR-WB test sequences	F	5.2.0	S4	TSG-SA WG4#20	S4-020061

Tdoc SP-020083: CRs to TS 26.191"AMR Wideband Speech Codec; Error concealment of erroneous or lost frames"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.191	001		REL-5	Error concealment of high band gain in 23.85 kbit/s mode	F	5.0.0	S4	TSG-SA WG4#20	S4-020173

33

Approval Requested

4) Approve the other CRs in Tdocs SP-020076 to SP-020080, SP-020084, SP-020085, SP-020087, SP-020089 and SP-020090

Tdoc SP-020076: CRs to TS 06.74 "AMR Speech Codec Test Sequences"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
06.74	A002	1	R98	Correction to DTX test vectors	F	7.1.1	S4	TSG-SA WG4#20	S4-020188

Tdoc SP-020077: CRs to TS 26.101 "AMR Speech Codec Frame Structure"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.101	007	1	R99	Correction of AMR codec output bitstream	F	3.2.0	S4	TSG-SA WG4#20	S4-020190
26.101	008		REL-4	Correction of AMR codec output bitstream	A	4.1.0	S4	TSG-SA WG4#20	S4-020095

Tdoc SP-020078: CRs to TS 26.103 "Codec lists"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.103	012	1	R99	UMTS_AMR2 is default Codec Type in R99 dual_mode terminals	F	3.1.0	S4	TSG-SA WG4#20	S4-020204
26.103	013	1	REL-4	UMTS_AMR2 is default Codec Type in all terminals of REL-4 and onwards	F	4.2.0	S4	TSG-SA WG4#20	S4-020205
26.103	014	1	REL-5	UMTS_AMR2 is default Codec Type in all terminals of REL-4 and onwards	A	5.0.0	S4	TSG-SA WG4#20	S4-020206
26.103	015		REL-5	Introduction of GERAN-8PSK Codec Types into Codec List	B	5.0.0	S4	TSG-SA WG4#20	S4-020101
26.103	017		REL-5	Introduction of codepoint for Dummy Codec for CS Multi Media (3G 324M)	B	5.0.0	S4	TSG-SA WG4#20	S4-020123

Note on CRs 012-014 on TS 26.103: At SA4#20, it was felt useful to include in TS 26.103 explanation of the AMR codec types and how they are to be used for UTRAN radio access. CRs to 26.103 contain CRs on inclusion of UMTS_AMR2 as default codec type in UTRAN access for R99 dual-mode (UMTS&GSM) terminals, and from Rel-4 onwards. The issue has been discussed earlier in CN1, T2 and TSG-T, and similar definition has been included in TS 23.153. It should be checked that the definition is consistent throughout TSs. Also, TS 26.103 may not be the most proper place for the requirement. The issue should be addressed at TSG-SA#15.

34

Approval Requested

Tdoc SP-020079: CRs to TS 26.104 "ANSI-C code for the floating-point AMR speech codec"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.104	020		R99	Maintaining bit-exactness with TS 26.073	F	3.3.0	S4	TSG-SA WG4#20	S4-020066
26.104	019		REL-4	Maintaining bit-exactness with TS 26.073	A	4.2.0	S4	TSG-SA WG4#20	S4-020058

Tdoc SP-020080: CRs to TS 26.132 "Speech and video telephony terminal acoustic test specification"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.132	009	1	R99	Correction of references and editorial changes (wrong decimal separators)	F	3.3.0	S4	TSG-SA WG4#20	S4-020018
26.132	010	1	REL-4	Correction of references and editorial changes (wrong decimal separators)	A	4.1.0	S4	TSG-SA WG4#20	S4-020019
26.132	011	1	REL-5	Correction of references and editorial changes (wrong decimal separators)	A	5.1.0	S4	TSG-SA WG4#20	S4-020020

Tdoc SP-020084: CRs toTS 26.231 "Cellular Text Telephone Modem; Minimum Performance Requirements"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.231	002		REL-5	Request to remove the CTM tandeming requirement for handsets in the Minimum Performance Requirements	F	5.1.0	S4	TSG-SA WG4#20	S4-020071

Tdoc SP-020085: CRs to 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	002	1	REL-4	Correction of missing use case example: PSS service activation via MMS	F	4.1.0	S4	TSG-SA WG4#20	S4-020202

35

Approval Requested

Tdoc SP-020087: CRs to 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	011		REL-4	Specification of missing limit for number of AMR Frames per Sample	F	4.2.0	S4	TSG-SA WG4#20	S4-020038
26.234	013	2	REL-4	Removing of the reference to TS 26.235	F	4.2.0	S4	TSG-SA WG4#20	S4-020161
26.234	014		REL-4	Correction to the reference for the XHTML MIME media type	F	4.2.0	S4	TSG-SA WG4#20	S4-020041
26.234	015	1	REL-4	Correction to MPEG-4 references	F	4.2.0	S4	TSG-SA WG4#20	S4-020144
26.234	018	1	REL-4	Correction to the width field of H263SampleEntry Atom in Section D.6	F	4.2.0	S4	TSG-SA WG4#20	S4-020192
26.234	019		REL-4	Correction to the definition of "b=AS"	F	4.2.0	S4	TSG-SA WG4#20	S4-020146
26.234	020		REL-4	Clarification of the index number's range in the referred MP4 file format	F	4.2.0	S4	TSG-SA WG4#20	S4-020150
26.234	021		REL-4	Correction of SDP attribute 'C='	F	4.2.0	S4	TSG-SA WG4#20	S4-020164

36

Approval Requested

Tdoc SP-020089: CRs to TS 26.235 " Packet Switched Conversational Multimedia Applications; Default Codecs"

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.235	003	2	REL-5	Update of AMR & AMR-WB RTP payload format	F	5.0.0	S4	TSG-SA WG4#20	S4-020222

Tdoc SP-020090: CRs to 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	004		REL-4	Correction of OM & OD bits mapping in TFO 16k frames	F	4.2.0	S4	TSG-SA WG4#20	S4-020026
28.062	005	1	REL-4	Inclusion of the Non_Speech TFO frames in conditions for TFO_Frame	F	4.2.0	S4	TSG-SA WG4#20	S4-020176
28.062	007	2	REL-4	Corrections in TFO Protocol Tables	F	4.2.0	S4	TSG-SA WG4#20	S4-020180
28.062	013		REL-4	Corrected C-Code for AMR TFO decision rules	F	4.2.0	S4	TSG-SA WG4#20	S4-020142
28.062	016		REL-4	Corrections	F	4.2.0	S4	TSG-SA WG4#20	S4-020141

Approval Requested

5) **In order to solve the reference problem in Rel-4 version of TS 26.234, approve to transfer to Rel-4 the AMR-WB codec TSs used in Rel-4 PSS (TSs 26.171, 26.173, 26.174, TS 26.190, 26.191, 26.192, 26.193, 26.194 and 26.201) - as proposed in Tdoc SP-020072.**

(end of presentation)