Source: **TSG-S4 Chairman**[1]

Title: **TSG-S4 Status Report at TSG-SA#9**

Document for: **Information**

Agenda Item: **7.4.1**

Executive Summary

Since TSG-SA#8, TSG-S4 (Codec Working Group) has held one plenary meeting S4#12 (September 4th – 8th, 2000) and one Ad Hoc meeting on TFO (July 19th – 21st, 2000).

The key activity during this period has been the start of AMR wideband Selection Phase. All the necessary documents for the Selection Phase, such as selection test plan, have been completed enabling the selection testing to start. Results will be available by the next S4 meeting in late October. The selected codec and the related codec specifications are expected to be brought for approval at TSG-SA#10.

Work is also progressing for the AMR Characterization in 3G Channels. The test plan is now almost finalised and will be completed by the end of September. Contracts for the listening tests, processing, and global test analysis are being prepared. Testing is planned for October-November. The target is to complete TR on Performance Characterisation (TR 26.975) in time for approval at TSG-SA#10.

The AMR TFO definition and specification has been further progressed. However, it has not yet been possible to finalise a draft specification TS 28.062 for TSG-SA#9 as initially expected. A significant editorial work has been made to transfer and update the content of GSM 08.62 into the 3G specification, and many open issues have been closed. The target date for approval is kept as TSG-SA#10.

TSG-S4 proposes a new Work Item on "Multimedia codecs and protocols for conversational packet-switched services" for approval to TSG-SA#9. One objective of this work item is standardisation of default codecs for conversational packet-switched multimedia services. This work item is in line with the request at TSG-SA#8 for the definition of a default video codec for packet-switched services. (TSG-SA#8 asked S4 to provide a WI.)

In addition to the proposed new WI, S4 asks TSG-SA approval for three CRs and three LSs. (The LSs are intended to ITU-T and ISO MPEG).

Annex A of this report contains a copy of the slides presented to TSG-SA#9. Annex B contains an updated status list of TSG-S4 deliverables.

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1. Introduction

TSG-S4 (Codec) Working Group has held one plenary and one TFO Ad-Hoc meeting since TSG-SA#8. TSG-S4#12 meeting took place on September 4-8, 2000 in Bethesda, Maryland, USA. The meeting was hosted by Lockheed-Martin Global Communications.

Meetings held:

TFO Drafting Session:	July 19-21, 2000	hosted by Nokia in Helsinki, Finland
TSG-S4#12	Sep 4-8, 2000	hosted by Lockheed-Martin Global Communications, in Bethesda, Maryland, USA

Next Plenary Meetings calendar:

TSG-S4#13:	Oct 23-27, 2000	to be hosted by NTT DoCoMo in Osaka, Japan
TSG-S4#14:	Nov 27 - Dec 1, 2000[2]	to be hosted by British Telecom in Bath, UK
TSG-S4#15:	Jan 22-26, 2001	
TSG-S4#16:	Feb 26 – Mar 02, 2001	
TSG-S4#17:	Jun 04-08, 2001	
TSG-S4#18:	Sep 10-14, 2001	
TSG-S4#19:	Dec 03-07, 2001	

In addition, TFO Ad-Hoc meeting is planned before TSG-S4#13.

Annex A contains a copy of the slides presented at TSG-SA#9. Annex B contains an updated list of TSG-S4 deliverables providing status information and target approval dates for each specification.

2. Maintenance of Release 1999

2.1 Mandatory Speech Codec – AMR

TR on 3G AMR Performances Characterisation (TR 26.975) is the only pending Release 99 specification.

Characterisation Test Plan and the relating Characterisation Processing Plan are now almost finalised. Minor complementing will be done by the end of September. S4#12 formally agreed that the Characterisation Testing can now start.

The Characterisation Tests will consist of 2 main experiments divided into altogether 4 sub-experiments. Three of these test clean speech performance under static error conditions and one is used for testing the effect of car background noise in static error conditions. These tests in 3G channels complement the characterisation results obtained from the GSM AMR codec characterisation phase.

Several listening, processing and analysis laboratories will participate in the testing within the limit of expediture at 55 kEURO (approved PCG funding). Contracts for listening, processing and global analysis laboratories will be finalised by the end of September. Willingness for contracting for listening tests has been expressed by several organisations within S4: NTT-AT (Japanese language), Dynastat (English language), Lockheed-Martin Global Communications (Korean language), and ARCON (English language & processing of speech samples & global analysis of results). Error Patterns will be provided by the end of September by Nortel Networks and NTT DoCoMo. The target is to complete TR 26.975 by S4#14 (November) and present it for approval at TSG-SA#10 (December).

Deliverable	Title	Latest version	Comment/Status	Approval
TR 26.975	AMR Speech Codec Performances Characterization	1.1.0	Funding approved by PCG (55 kEURO). Testing Plan almost finalised. No major issues remain. To be completed by end of September. Tests to be performed in 4Q00 (Version 1.1.0 based on latest version GSM 06.75 was presented for information to SG-SA#6 in SP-000021)	Approval expected at TSG-SA#10 (December 2000)

Table 2.1: Status List of remaining AMR specifications

[2] The meeting dates of S4#14 have been moved 1 week later (as decided at S4#12)

As a consequence of CRs on AMR approved at TSG-SA#8, test sequences for AMR VAD2 need to be updated. Preparation is under way.

2.2 Codec for Multimedia Telephony Service

TS 26.111 (Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324) recommends the mandatory usage of ITU H.263 video codec but also allows the optional usage of ISO MPEG-4 video codec using visual simple profile level 1. However, due to very limited resources of mobile handsets and terminals only a subset of the ISO MPEG-4 visual simple profile level 1 capabilities are used in 3G. In order to achieve interoperability between all kinds of terminals S4 would like to ask ISO MPEG to introduce a new level (level 0) to the visual simple profile suit for a restricted use of level 1 as defined for 3G use in TS 26.111. A proposed liaison to ISO/IEC JTC 1/SC 29/WG 11 (MPEG) is brought for TSG-SA#9 approval (Tdoc SP-000401).

Also, S4 has approved during S4#12 a CR to TS 26.111 adding a specific reference to the proposed ISO MPEG-4 simple profile level 0 (Tdoc S4-000420). The CR is intended to be brought for approval at TSG-SA#10, provided that ISO MPEG has by then approved the introduction of simple profile level 0 as requested by S4. (ISO MPEG meets next time in October 2000.)

One new CR to TS 26.111 is brought to TSG-SA#9 for approval (Tdoc SP-000396). The CR brings a correction to add standardised H.223 multiplex interface for video bitstreams encoded with MPEG-4 codec. Similar interface has been already included for the H.263 video codec. The interface between H.263 video stream and H.223 multiplex is defined in 3G-324M (the specification of 3GPP Multimedia Telephony). The interface requires the start of an H.263 picture to align with the start of an H.223 AL-SDU. As a result, H.263 decoders can efficiently seek the picture start code. However, the corresponding interface between MPEG-4 video stream and H.223 multiplex is not yet defined. The CR adds the missing description to make 3G-324M specification complete.

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
SP-000396	26.111	v3.2.0	006		F	R99	MPEG-4 interface to multiplex

Table 2.2: List of CRs for "Codec for CS Multimedia Telephony Service" WI presented for approval at TSG-SA#9

2.3 3G Audio-Visual Terminal Characteristics

One CR is brought for approval at TSG-SA#9 (Tdoc SP-000397). This CR brings corrections to TS 26.132 (Terminal Acoustic Characteristics for Telephony; Test Specifications) on test setup configurations. These corrections were agreed already in editing session during the previous S4 meeting (June), but they were not completed in time for TSG-SA#8.

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
SP-000397	26.132	v3.0.0	001		F	R99	Handheld hands-free Test Setup

Table 2.3: List of CRs for "Audio-Visual Terminal Characteristics" WI presented for approval at TSG-SA#9

3. Release 2000

3.1 Codec(s) for Wideband Telephony service

Selection Phase is ongoing to assess the 5 AMR-WB (AMR Wideband) candidate codecs qualified at TSG-SA#8. The codecs are from Ericsson, FDNS, Motorola, Nokia, and Texas Instruments. (FDNS is a consortium consisting of France Télécom, Deutsche Telekom, Nortel Networks, and Siemens). All the necessary agreements for Selection Phase (test plans, processing functions, selection rules) have been reached and listening tests are under way.

The listening tests started in early September. Six laboratories are participating: ARCON, AT&T, Dynastat, France Télécom, Lockheed-Martin Global Communications, and NTT-AT. Testing is carried out in several languages: Japanese, North American English, French, Mandarin Chinese, and Spanish. The tests consist of 6 main experiments divided altogether into 19 sub-experiments. Testing will cover clean speech, channel errors for the different applications, background noise (car noise and street noise), dynamic conditions in GSM FR channel, and performance of VAD and source controlled operation. The results will be available in mid-October, and they will be reviewed and analysed at S4#13 (October).

During August, prior to starting the listening tests, the speech samples to be used in testing were processed through the candidate and reference codecs. Each proponent processed samples through their own codec. The processing was then cross checked by other candidates to verify correctness. Before processing started the candidates had to deliver an executable of their codec software to ETSI (by

August 6th) freezing the algorithm development.

Verification Phase to check the key characteristics of the selected codec (such as complexity) and the preparation/review of specifications will take place after S4#13 in late October and in November. As part of the deliverables for the selection phase, all candidates need to deliver draft specifications for S4#13. The codec and the related codec specifications are expected to be brought for approval at TSG-SA#10 (December).

The key project milestones are:

- Sending of final set of speech material to test houses — September 13th
- Delivery of complete IPR declaration to ETSI — October 8th
- End of listening tests — October 9th
- Delivery of test results (test raw data) to ETSI and Global Analysis Lab — October 9th
- Preparation and delivery of test results to the SA4 reflector — October 16st
- Delivery of all remaining Selection Deliverables to ETSI — October 18th
- Presentation of test results and codec selection at S4#13 — October 23rd – 27th
- Presentation of selection results and codec specifications for approval at TSG-SA#10 — December 11th –14th

Deliverable	Title	Latest version	Comment/Status	Approval
26.xxx	Wideband Speech Codec General Description	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec ANSI C-Code	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec Test Sequences	-	To be drafted by the winning candidate.	t.b.d.
26.xxx	Wideband Speech Codec Speech Transcoding Functions	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec Error Concealment of lost frames	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec Source Controlled Bit-Rate Operation	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec Voice Activity Detector	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec Frame Structure	-	To be drafted by the winning candidate.	TSG-SA#10
26.xxx	Wideband Speech Codec Performances Characterization	-	To be prepared after characterisation tests.	t.b.d

Table 3.1: Status List of Wideband codec specifications

3.2. Tandem Free aspects for 3G and between 2G and 3G systems

The AMR TFO specification (TS 28.062) was progressed in a dedicated Ad Hoc session on July 19-21 and during the last S4 plenary. Progress has been made but it is not yet possible to present a draft to TSG-SA, as initially expected. The number of open issues is decreasing, and it seems that the specification can be sent for approval to TSG-SA#10 in December 2000.

A significant editorial work has been made to transfer and update the content of GSM 08.62 into the 3G specification, and the work is progressing. Agreement has also been achieved for the section related to the Codec Mismatch Resolution and Codec Optimization (set of rules to follow in case of mismatch between the Codecs at call set-up). However, details need some work and the specification must still be updated accordingly. A new open issue for 3G-GSM interoperability was identified at S4#12: the codec mode control rate is different in 3G and in GSM (20 ms in 3G, 40 ms in GSM). This could be overcome by introducing a separate Codec Type in 3G with codec mode change restricted to 40 ms (as in GSM). Another solution could be to use GSM AMR as default codec type to start with for 3G calls in networks with a high rate of 3G-GSM calls.

S4 received a LS from TSG-GERAN on removal of RATSCCH (Robust AMR Traffic Synchronized Control Channel) from the GSM specifications or making it optional. The issue was debated but needs more consideration and will be discussed at the next TFO Ad Hoc and S4#13 meetings (still before the next TSG-GERAN meeting).

The TFO subgroup will hold an Ad-Hoc meeting just before S4#13 (and will not meet during S4#13).

Deliverable	Title	Latest Version	Comment/Status	Approval
TS 22.053	Tandem Free Operation of speech codecs; Stage 1 service description	0.1.1	Evolution of GSM 02.53 Sent to TSG-S1 for review	t.b.d.
TR 26.920	Architectural Model for the 3G Transcoders	0.1.1	Sent to TSG-S2 for comments. Necessity of this report still tbd	t.b.d.
TS 28.062	Technical Specification for Tandem Free Operation of 2G and 3G networks	-	Drafting continues. A significant editorial work made to transfer the content of the GSM 08.62 into TS 28.062. Agreement on the section related to the Codec Mismatch Resolution. Details need some work and the specification must be updated accordingly. No draft yet to be presented to TSG-SA.	TSG-SA#10 (December 2000)

Table 3.2: Status List of TFO Specifications

3.3. Transparent End-to-End Packet Switched Mobile Streaming Applications

Streaming refers to the ability of an application to play synchronised media streams like audio and video streams in a continuous way while those streams are being transmitted to the client over a data network. The objectives of this Work Item, approved at TSG-SA#8, are to standardise the components of a mobile streaming service, including especially multimedia codecs, but also streaming and media transport protocols.

Presentation of first technical inputs took place at S4#12. Harmonisation with existing and emerging 3GPP multimedia applications was seen generally important. Codecs are needed for speech, audio, video, still images, bitmap graphics, vector graphics and text. To use standardised Internet protocols for data transfer (UDP and TCP) and session setup (RTSP) seems preferable in order to achieve interoperability with existing internet streaming standards. The definition of the codecs and protocols is for further study. Initial first drafts of two TSs (General Description, Protocols and Codecs) were prepared and revised during S4#12. Both TSs are targeted for Release 2000.

Deliverable	Title	Latest Version	Comment/Status	Approval
26.xxx	Mobile streaming application: General description	Initial draft	Drafting started at S4#12 (September)	TSG-SA#10
26.yyy	Mobile streaming application: Protocols and codecs	Initial draft	Drafting started at S4#12 (September)	TSG-SA#10

Table 3.3: Status List of specifications for "Transparent End-to-End Packet Switched Mobile Streaming Applications" WI

3.4 Global Text Telephony (TS 26.226)

For this WI, one specification is under the responsibility of S4: TS 26.226 "Global Text Telephony; transport of text in the voice channel". S4#12 reviewed T1P1 CTM (Cellular Text Telephone Modem) standard on Transport of Text in the Voice Channel. T1P1 requests this to be considered as basis for 3GPP work. A draft TS 26.226 based on T1P1 standard was presented at S4#12. Time until next S4 meeting in October is required for a proper review of this draft TS.

CR to TS 26.110 (Codec for Circuit Switched Multimedia Telephony Service; General Description) on CS real time text conversation was agreed and is presented for approval (Tdoc SP-000395). This CR adds section for text conversion for the use of Global Text Telephony feature. Real time text conversation is implemented by applying ITU-T T.140 presentation protocol.

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
SP-000395	26.110	v3.0.1	001		F	R00	CS Multimedia Codec specification for real time text conversation

Table 3.4.1: List of GTT CRs presented for approval at TSG-SA#9

Deliverable	Title	Latest Version	Comment/Status	Approval

Deliverable	Title	Latest Version	Comment/Status	Approval
26.226	Global Text Telephony, transport of text in the voice channel	0.0.9 (based on T1P1 standard)	To be fully reviewed by S4#13 (October 2000)	TSG-SA#10

Table 3.4.2: Status List for GTT Specifications (under the responsibility of S4)

4. New Work Items

A new Work Item on "*Multimedia Codecs and Protocols for Conversational Packet-Switched Services*" is presented for approval at TSG-SA#9 (Tdoc SP-000398). This work item is in line with the request at TSG-SA#8 for the definition of a default video codec for packet-switched services. (S4 was asked to provide a WI.)

The objective of the proposed WI is the standardisation of default codecs for conversational packet-switched multimedia services by TSG-SA#10 (December 2000). Part of the work is the identification of additional components required for conversational packet-switched multimedia services that are within the responsibility of S4 (e.g., elements of protocols for transport, session and bearer control.) Harmonisation with existing and emerging 3GPP multimedia applications will be considered whenever possible.

Conversational services will form an important component of the packet-switched multimedia services offered by 3G systems. The definition of default codecs for conversational packet-switched services will realise a number of benefits, including: guaranteed interoperability across terminals and networks; consistent quality of service can be more easily provided; optimum coding will help to minimise the use of the radio resource; codecs can be implemented efficiently, improving battery life, reducing manufacturing cost, and exploiting overlap with other services. (It should be noted that the standardisation of default codecs will not stop the use of other codecs through the network if the end user or end application require it.)

The WI will produce 3 specifications: Default codecs for PS conversational multimedia applications (TSG-SA#10), Performance characterisation of default codecs for PS conversational multimedia applications (TSG-SA#14), and Protocols for PS conversational multimedia applications (TSG-SA#14).

TSG-SA is kindly asked to approve this new Work Item.

5. Miscellaneous

Two LSs for 3GPP external bodies (in addition to the LS to ISO MPEG regarding 3G-324M - see section 2.2) are proposed for approval:

a) A reply to ITU-T SG16 on fixed point C-code library basic operators (that are used in describing details of speech codec algorithms such as AMR) (Tdoc SP-000400). This LS explains the use of basic operators in AMR-WB codec and future plans.

b) A reply to ITU-T Q.15/16 on H.263 Annex X (Tdoc SP-000399). Annex X describes planned new video coding profiles that are customised to specific key applications. S4 gives requested feedback on two planned new profiles targeted for wireless multimedia terminals.

Preparation of Test Plan for GSM AMR Noise Suppressor (Annex to GSM 06.77, Minimum Performance Requirements for Noise Suppresser Application to the AMR Speech Encoder) is ongoing. CR is expected for TSG-SA#10.

6. Approval requested

TSG-SA#9 is requested to approve the following:

a) Change Requests:

1. Tdoc SP-000395: CR 001 to TS 26.110 on CS Multimedia Codec specification for real time text conversation (R00)
2. Tdoc SP-000396: CR 006 to TS 26.111 on MPEG-4 interface to multiplex (R99)
3. Tdoc SP-000397: CR 001 to TS 26.132 on Handheld hands-free Test Setup (R99) in

b) New WI Description:

4. Tdoc SP-000398: Proposed WI description on Multimedia codecs for conversational packet-switched services

c) Communication to 3GPP external bodies:

5. Tdoc SP-000399: Proposed LS to ITU-T Q. 15/16 on H.263 Annex X
6. Tdoc SP-000400: Proposed LS to ITU-T SG16 on basic operators
7. Tdoc SP-000401: Proposed LS to ISO MPEG regarding 3G-324M

7. List of input documents

SA#9 TD	Title	Source	A. I.	TD for
SP-000394	TSG-S4 Status Report to TSG-SA#9	SA WG4 Chairman	7.4.1	Information
SP-000395	CR 001 to TS 26.110 on CS Multimedia Codec specification for real time text conversation (R00)	SA WG4	7.4.3	Approval
SP-000396	CR 006 to TS 26.111 on MPEG-4 interface to multiplex (R99)	SA WG4	7.4.3	Approval
SP-000397	CR 001 to TS 26.132 on Handheld hands-free Test Setup (R99)	SA WG4	7.4.3	Approval
SP-000398	Proposed WI description on Multimedia codecs for conversational packet-switched services	SA WG4	7.4.3	Approval
SP-000399	Proposed LS to ITU-T Q. 15/16 on H.263 Annex X	SA WG4	7.4.3	Approval
SP-000400	Proposed LS to ITU-T SG16 on basic operators	SA WG4	7.4.3	Approval
SP-000401	Proposed LS to MPEG-4 regarding 3G-324M	SA WG4	7.4.3	Approval

Table 7.1: List of documents to TSG-SA#9 from TSG-S4

Source: TSG-S4 Chairman *TSGS#0(00)0394 Annex A*

TSG-S4 (CODEC) Working Group

Status Report

TSG-SA#9
September 25-28, 2000
Hawaii, USA

Kari Järvinen
TSG-S4 Chairman
Nokia

3GPP TSG-S4

Content of presentation

- TSG-S4 input documents, Meeting shedule, Highlights
- Progress in release 1999 WIs
- Progress in release 2000 WIs
- Documents presented for approval (WID, CRs, LSs)

TSG-S4 Documents

- **SP-000394: TSG-S4 Status Report to TSG-SA#9**
  Annex A: Slides of TSG-S4 work progress
  Annex B: Updated list of deliverables at TSG-SA#9 (TSs and TRs)
- **SP-000395: CR 001 to TS 26.110 on CS Multimedia Codec specification for real time text conversation (R00)**
- **SP-000396: CR 006 to TS 26.111 on MPEG-4 interface to multiplex (R99)**
- **SP-000397: CR 001 to TS 26.132 on Handheld hands-free Test Setup (R99)**
- **SP-000398: Proposed WID on multimedia codecs for conversational packet-switched services**
- **SP-000399: Proposed LS to ITU-T Q. 15/16 on H.263 Annex X**
- **SP-000400: Proposed LS to ITU-T SG16 on basic operators**
- **SP-000401: Proposed LS to MPEG-4 regarding 3G-324M**

Meetings Schedule

- **1 S4 Plenary and 1 TFO Ad Hoc since TSG-SA#8**
  - TFO Drafting Session: July 19-21, Helsinki, Finland, hosted by Nokia
  - TSG-S4#12: September 4-8, Bethesda, Maryland, USA, hosted by Lockheed-Martin Global Communications
- **Future meeting schedule**
  - TSG-S4#13: Oct 23-27, 2000, hosted by NTT DoCoMo in Osaka, Japan
  - TSG-S4#14: Nov 27 - Dec 1, 2000, hosted by British Telecom in Bath, UK (Note changed dates!)
  - TSG-S4#15: Jan 22-26, 2001
  - TSG-S4#16: Feb 26 – Mar 02, 2001
  - TSG-S4#17: Jun 04-08, 2001
  - TSG-S4#18: Sep 10-14, 2001
  - TSG-S4#19: Dec 03-07, 2001
- **Meeting statistics**
  - ~50 Participants, 1 week, ~100 Documents

Highlights

Release 1999:

- **One pending TR: AMR 3G Characterisation Report (expected for 12/2000)**
  - Test plan almost complete, to be finalised by end of September
  - Testing to start in October, TR expected for TSG-SA#10

Release 2000:

- **AMR Wideband Selection Phase ongoing**
  - Test plan finalised, listening tests in progress
  - Codec selection and codec specifications expected for approval at TSG-SA#10
- **Some progress in AMR TFO (now expected for 12/2000)**

For approval:

- **New WI proposal on PS Multimedia Codecs**
- **3 CRs**
- **3 LSs (to ITU-T and ISO MPEG)**

Release 1999: AMR Speech Codec

- **The only pending Release 1999 issue is the AMR 3G Performance Characterization Report (TR 26.975)**
  - Test Plan almost finalised. Minor complementing by end of September. (S4#12 formally agreed that the Characterisation Testing can now start.)
  - Contracts for listening, processing and global analysis laboratories are being prepared (by the end of September). Limit of expediture at 55 kEURO (approved PCG funding).
  - Error Patterns to be provided by the end of September by Nortel Networks and NTT DoCoMo.
  - Listening tests to be carried out during October-November.
    - Complement the characterisation results obtained from the GSM AMR codec characterisation phase.
    - Several languages (English, Japanese, and Korean planned)
    - Tests cover clean speech performance under static error conditions (1 experiment / 3 sub-experiments) and the effect of car background noise in static error conditions (1 experiment)
  - TR 26.975 to be finalised for approval at TSG-SA#10 in December

Release 2000: AMR Wideband Speech Codec

- **Selection Phase ongoing (July-October)**
- **Test plan finalisation during July**
- **Algorithms frozen on August 6th (delivery to ETSI)**
- **Processing of speech samples during August**
- **Listening tests started in early September**
  - 5 codec candidates (Ericsson, FDNS, Motorola, Nokia, Texas Instruments)
  - 6 laboratories (ARCON, AT&T, Dynastat, France Télécom, LMGC, NTT-AT)
  - 5 languages: Japanese, English (North American), French, Mandarin Chinese, and Spanish
  - 6 experiments, divided altogether into 19 sub-experiments
  - Tests cover: clean speech, channel errors for the different applications, background noise (car noise and street noise), dynamic conditions in GSM FR channel, and performance of VAD and source controlled operation.
  - Results analysed and solution selected at TSG-S4#13 (October 23-27, 2000)
- **Verification Phase and preparation of Codec Specifications over October-November time-frame**
- **Approval of selection results and codec specifications at TSG-SA#10**

Release 2000: AMR TFO

- **1 Drafting Session in addition to S4#12 Plenary to progress AMR TFO (TS 28.062)**
- **2 Joint session with S2, R3, N4 on Harmonization with TrFO**
- **Progress has been obtained but it is not yet possible to present a draft to TSG-SA, as initially expected.**
  - **A significant editorial work** made to update the content of GSM 08.62 to create 3G specification
  - **Agreement on Codec Mismatch Resolution** (set of rules to follow in case of mismatch between the codecs at call set-up). Details need some work and the specification must be updated accordingly. Draft exists within S4.
  - **An open issue for 3G-GSM interoperability** due to different codec mode control rates in 3G and GSM (20 ms in 3G, 40 ms in GSM). This could be overcome by introducing a separate Codec Type in 3G with codec mode change restricted to 40 ms (as in GSM). Another solution could be to use GSM AMR as default codec type to start with for 3G calls in networks with high interest of 3G-GSM calls.
- **LS from TSG-GERAN received on removal of RATSCCH from GSM specifications or making it optional. To be still debated at TFO Ad Hoc and S4#13.**
- **TS 28.062 now expected for presentation and approval at TSG-SA#10**

Release 2000: Transparent End-to-End Packet Switched Mobile Streaming Applications

- **WI approved at TSG-SA#8 with objective to standardize the components of a mobile streaming service (codecs, protocols)**
- **Presentation of first technical inputs at S4#12**
  - Harmonization with existing and emerging 3GPP multimedia applications seen generally important.
  - Codecs are needed for speech, audio, video, still images, bitmap graphics, vector graphics and text.
  - To use standardised internet protocols for data transfer and session setup seems preferable in order to achieve interoperability with existing internet streaming standards (e.g., IETF) .
  - Definition of codecs and protocols is for further work.
- **Initial first drafts of two TSs were prepared during S4#12**
  - General Description
  - Protocols and Codecs
- **TSs are targeted for TSG-SA#10**

Release 2000: Global Text Telephony

- TS 26.226 (Global Text Telephony; transport of text in the voice channel) is under S4 responsibility
- A draft TS 26.226 v0.0.9 based on T1P1 standard was discussed at S4#12. Time until next S4 meeting is required for a full review of this draft specification.

New Work Item proposal: Multimedia Codecs and Protocols for Conversational Packet-Switched Services

- **Definition of a default PS video codec requested at TSG-SA#8, and S4 was asked to provide a WI (in Tdoc SP-000398)**
- **Objectives:**
  - **Standardisation** of default codecs for conversational packet-switched multimedia services by TSG-SA#10 (December 2000)
  - **Identification** of additional components required for conversational packet-switched multimedia services that are under the responsibility of S4 (e.g. elements of protocols for transport, session and bearer control.)
  - **Harmonisation** with existing and emerging 3GPP multimedia applications will be considered whenever possible.
- **Benefits:** guaranteed interoperability across terminals and networks; consistent quality of service can be more easily provided; optimum coding will help to minimise the use of the radio resources; etc. (Note: The standardisation of default codecs will not stop the use of other codecs through the network if the end user or end application require it.)
- **3 specifications:**
  - Default codecs for PS conversational multimedia applications (TSG-SA#10)
  - Performance charact. of default codecs for PS conversational MM applications (TSG-SA#14)
  - Protocols for PS conversational multimedia applications (TSG-SA#14).

Communication to 3GPP external bodies (for approval)

- **Tdoc SP-000399: Proposed LS to ITU-T Q. 15/16 on H.263 Annex X**
  - A reply to ITU-T Q.15/16 on H.263 video codec Annex X giving requested comments on two planned profiles targeted for wireless multimedia terminals. (The annex describes planned new video coding profiles that are customised to specific key applications.)
- **Tdoc SP-000400: Proposed LS to ITU-T SG16 on basic operators**
  - A reply to ITU-T SG16 on fixed point C-code library basic operators (that are used in describing details of speech codec algorithms such as AMR). This LS explains the use of basic operators in AMR-WB codec and future plans as a response to LS received from ITU SG16.

Communication to 3GPP external bodies (for approval)

- **Tdoc SP-000401: Proposed LS to ISO MPEG regarding 3G-324M**
  - TS 26.111 (Codec for CS Multimedia Telephony Service; Modifications to H.324) recommends the mandatory usage of ITU H.263 video codec but also allows the optional usage of ISO MPEG-4 video codec with visual simple profile level 1. However, due to very limited resources of mobile handsets and terminals only a subset of the ISO MPEG-4 visual simple profile level 1 capabilities are defined for use in 3G.
  - In order to achieve interoperability between all kinds of terminals S4 would like to ask ISO MPEG to introduce a new level (level 0) to the visual simple profile suit for a restricted use of level 1 (as defined for use of MPEG-4 in 3GPP TS 26.111).
    - Note: S4 has approved during S4#12 a CR to TS 26.111 making a specific reference to the proposed ISO MPEG-4 simple profile level 0 (Tdoc S4-000420). The CR is intended to be brought for approval at TSG-SA#10, provided that ISO MPEG has by then approved the introduction of simple profile level 0 as requested by S4. (ISO MPEG meets next time in October 2000.)

Change Requests for approval

Release 1999

- **Tdoc SP-000396: CRs on TS 26.111 (Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324)**

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
SP-000396	26.111	v3.2.0	006		F	R99	MPEG-4 interface to multiplex

  - The CR brings a correction to add standardised H.223 multiplex interface for video bitstreams encoded with MPEG-4 codec. Similar interface has been already included for H.263 video codec. (H.263 is mandatory video codec, and MPEG-4 an optional video codec.)
  - The interface between H.263 video stream and H.223 multiplex is defined in 3G-324M (the specification of 3GPP Multimedia Telephony). It requires the start of an H.263 picture to align with the start of an H.223 AL-SDU. As a result, H.263 decoders can efficiently seek the picture start code. However, the corresponding interface between MPEG-4 video stream and H.223 multiplex is not yet defined. The CR adds the missing description to make 3G-324M specification complete.

- **Tdoc SP-000397: CR for TS 26.132 (Terminal Acoustic Characteristics for Telephony; Test Specification)**

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
SP-000397	26.132	v3.0.0	001		F	R99	Handheld hands-free Test Setup

  - This CR brings corrections to test setup configurations. These corrections were agreed already in editing session during the previous S4 meeting (June), but they were not completed in time for TSG-SA#8.

Change Requests for approval

Release 2000

- **Tdoc SP-000395: CR to TS 26.110 (Codec for Circuit Switched Multimedia Telephony Service; General Description)**

S4 Tdoc.	Spec.	Ver.	CR	Rev.	Cat.	Rel.	Subject
SP-000395	26.110	v3.0.1	001		F	R00	CS Multimedia Codec specification for real time text conversation

  - This CR adds section for text conversion for the use of Global Text Telephony feature. (Real time text conversion is implemented in CS multimedia by applying ITU-T T.140 presentation protocol.)

Summary of documents presented for approval

- **New WI Description:**
  - Tdoc SP-000398: Proposed WI description on multimedia codecs for conversational packet-switched services
- **Communication to 3GPP external bodies:**
  - Tdoc SP-000399: Proposed LS to ITU-T Q. 15/16 on H.263 Annex X
  - Tdoc SP-000400: Proposed LS to ITU-T SG16 on basic operators
  - Tdoc SP-000401: Proposed LS to MPEG-4 regarding 3G-324M
- **Change Requests:**
  - Tdoc SP-000395: CR 001 to TS 26.110 on CS Multimedia Codec specification for real time text conversation (R00)
  - Tdoc SP-000396: CR 006 to TS 26.111 on MPEG-4 interface to multiplex (R99)
  - Tdoc SP-000397: CR 001 to TS 26.132 on Handheld hands-free Test Setup (R99)

End of presentation

Source: **TSG-S4 Chairman**[1]

Title: **Updated List of Deliverables at TSG-SA#9**

Document for: **Information**

This document contains an updated list of TSG-S4 deliverables for TSG-SA#9 (September, 2000). (Deliverables under preparation are marked with yellow shading.)

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Table 1: List of TSG-S4 Specifications: **Version: 0.9, 2000-19-09**

Deliverable	Title	Features completed/under study	Editor	Date for approval	WI/Rapporteur	Comment/Status
TS 26.071	AMR Speech Codec; General Description	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#4	AMR Erik Ekudden Ericsson	Version 3.0.1 as approved by TSG-SA#4 in Tdoc SP-99244
TS 26.090	AMR Speech Codec; Transcoding functions	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#4		Version 3.1.0 following TSG-SA#6
TS 26.073	AMR Speech Codec; ANSI C-Code	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#6		Version 3.0.0 as approved by TSG-SA#6 in Tdoc SP-99560. 1 CR presented to TSG-SA#7 in SP-000025
TS 26.074	AMR Speech Codec; Test Sequences	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#6		Version 3.0.0 as approved by TSG-SA#6 in Tdoc SP-99559
TS 26.091	AMR Speech Codec; Error Concealment of lost frames	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#4		Version 3.1.0 following TSG-SA#6
TS 26.092	AMR Speech Codec; Comfort noise aspects	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#4		Version 3.0.1 as approved by TSG-SA#4 in Tdoc SP-99247
TS 26.093	AMR Speech Codec Source Controlled Rate operation	No Open Issue	Erik Ekudden Ericsson	Approved at TSG-SA#4		Version 3.1.0 following TSG-SA#6
TS 26.094	AMR Speech Codec Voice Activity Detector	No Open Issue	Jari Hagqvist Nokia	Approved at TSG-SA#5		Version 3.0.0 as approved by TSG-SA#5 in Tdoc SP-99353.
TS 26.101	AMR Speech Codec Frame Structure	No Open Issue	Jari Hagqvist Nokia	Approved at TSG-SA#6		Version 3.0.0 as approved by TSG-SA#6 in Tdoc SP-99562. 4 CRs presented to TSG-SA#7 in SP-000025
TS 26.102	AMR Speech Codec Interface to Iu and Uu	SDU Error Ratio and RBER values to be aligned with TS 23.107	Frederic Gabin Nortel Networks	Approved at TSG-SA#6		Version 3.0.0 as approved by TSG-SA#6 in Tdoc SP-99563 3 CRs presented to TSG-SA#7 in SP-000025
TR 26.975	AMR Speech Codec Performances Characterization	Preparation of contracts for the testing is ongoing. Preparation of Error Patterns is ongoing.	Alain Ohana BellSouth Mobility DCS	TSG-SA#10 (Release 2000)		Funding approved by PCG (55 kEURO). Test Plan almost finalised, and to be completed by end of September. Tests to be performed in 4Q00 (Version 1.1.0 based on latest version GSM 06.75 was presented for information to SG-SA#6 in SP-000021)
TS 26.103	Speech Codec List for GSM and UMTS	No Open Issue	Karl Hellwig Ericsson	Approved at TSG-SA#6	TrFO/OoBC TSG-N2 Work Item	Version 3.0.0 as approved by TSG-SA#6 in Tdoc SP-99564
TS 26.104	AMR Speech Codec; Floating Point C-Code	No Open Issue	Petri Haavisto Nokia	Approved at TSG-SA#8	Low Bit Rate Codec for Multimedia	Version 3.0.0 as approved by TSG-SA#8 in Tdoc **SP-000261**
TS 26.110	Codec(s) for Circuit Switched Multimedia Telephony Service General Description	No Open Issue	Barry Aronson Toshiba	Approved at TSG-SA#4	Barry Aronson Toshiba	Version 3.0.1 as approved by TSG-SA#4 in Tdoc SP-99249

Table 1: List of TSG-S4 Specifications: **Version: 0.9, 2000-19-09**

Deliverable	Title	Features completed/under study	Editor	Date for approval	WI/Rapporteur	Comment/Status
TS 26.111	Codec(s) for Circuit Switched Multimedia Telephony Service Modifications to H.324	No Open Issue	Hirokazu Tanaka Toshiba	Approved at TSG-SA#4		Version 3.1.0 following TSG-SA#6.
TR 26.911	Codec(s) for Packet Switched Multimedia Telephony Service Terminal Implementor's Guide	No Open Issue	Petri Haavisto Nokia	Approved at TSG-SA#4		Version 3.2.0 following TSG-SA#6
TR 26.912	Quantitative performance evaluation of H.324 Annex C over 3G	No Open Issue	Olle Franceschi, Ericsson	Approved at TSG-SA#7	QoS for Speech and Multimedia Coecs Harri Honko Nokia	Version 3.0.0 approved at TSG-SA#7 in Tdoc SP-00019
TR 26.913	Quantitative performance evaluation of real-time packet switched multimedia services over 3G	Evaluation Test Results to be provided.	Harri Honko Nokia	TSG-SA#10 (Release 2000)		No significant inputs received so far. Version 0.0.1 reviewed in TSG-S4#5 (S4-99160)
TR 26.915	Echo Control For Speech and Multi-Media Services	No Open Issue	Ian Goetz Tellabs	Approved at TSG-SA#7		Version 3.0.0 approved at TSG-SA#7 in Tdoc SP-00020
TS 26.131	Terminal Acoustic Characteristics for Telephony; Requirements	DAI References may need to be removed.	Paul Barrett BT	Approved at TSG-SA#6	3G Terminal Acoustic Characteristics Ian Goetz Tellabs	Version 3.0.0 as approved by TSG-SA#6 in Tdoc SP-99565
TS 26.132	Terminal Acoustic Characteristics for Telephony; Test Specifications	No Open Issue	Ian Goetz Tellabs	Approved at TSG-SA#8		Version 3.0.0 as approved by TSG-SA#8 in Tdoc **SP-000260**
TS 22.053	Tandem Free Operation of speech codecs; Stage 1 service description	Evolution of GSM 02.53 Sent to TSG-S1 for review	No Editor Identified	TSG-SA#10 (Release 2000)	TFO No Rapporteur Identified	Version 0.1.1 reviewed in TSG-S4#4 (S4-99138)
TR 26.920	Architectural Model for the 3G Transcoders	Version 0.1.1 sent to TSG-S2 for comments. Necessity of this report still pending	No Editor Identified	TSG-SA#10 (Release 2000)		Version 0.1.1 reviewed in TSG-S4#4 (S4-99147)
TS 28.062	Technical Specification for Tandem Free Operation of 2G and 3G networks	Editorial finalisation. Some open issues remain.	Clemens Suerbaum Siemens AG	TSG-SA#10 (Release 2000)		Drafting continues. A significant editorial work made to transfer the content of the GSM 08.62 into TS 28.062. Agreement on the section related to the Codec Mode Mismatch resolution. Details need some work and the specification must be updated accordingly. No draft yet to be presented to TSG-SA.

Table 1: List of TSG-S4 Specifications: **Version: 0.9, 2000-19-09**

Deliverable	Title	Features completed/under study	Editor	Date for approval	WI/Rapporteur	Comment/Status
TS 26.xxx	Wideband Speech Codec General Description	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)	Wideband codec Imre Varga Siemens	To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec ANSI C-Code	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)		To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec Test Sequences	Selection Phase ongoing	Editor from the winning proponent	t.b.d.		To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec Speech Transcoding Functions	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)		To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec Error Concealment of lost frames	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)		To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec Source Controlled Bit-Rate Operation	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)		To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec Voice Activity Detector	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)		To be drafted by the winning candidate.
TS 26.xxx	Wideband Speech Codec Frame Structure	Selection Phase ongoing	Editor from the winning proponent	TSG-SA#10 (Release 2000)		To be drafted by the winning candidate.
TR 26.xxx	Wideband Speech Codec Performances Characterization		t.b.d.	t.b.d		To be prepared after characterisation tests.
TS 26.xxx	Mobile Streaming application: General Description		Provisional editor defined	TSG-SA#10 (Release 2000)	Transparent End-to-End Packet Switched Mobile Streaming Application N.N. (Ericsson)	Drafting started at S4#12 (September)
TS 26.xxx	Mobile Streaming application: Protocols and Codecs		Provisional editor defined	TSG-SA#10 (Release 2000)		Drafting started at S4#12 (September)
TS 26.226	Global Text Telephony: transport of text in the voice channel		No Editor Identified	TSG-SA#10 (Release 2000)	Global Text Telephony TSG-S2 Work Item	Latest version 0.0.9 (based on T1P1 standard). To be fully reviewed at S4 by S4#13 (October 2000)

Work Items:

WI-S4-1: Mandatory Speech Codec for Narrowband Speech Telephony Service / AMR
(Work Item completed except for 3G Characterization)

Table 1: List of TSG-S4 Specifications:

WI-S4-2: Codec for Low bit rate Multimedia Telephony Service
(Work Item completed.)

WI-S4-3: QoS for Speech and Multimedia Codec

WI-S4-4: 3G Audio-Visual Terminal Characteristics

WI-S4-5: Codec(s) for Wideband Telephony Services

WI-S4-6: Tandem Free Operation in 3G systems and between 2G and 3G systems

WI-S4: Transparent End-to-End Packet Switched Mobile Streaming Application

WI-S4: Global Text Telephony (S2 WI)