

TSG-S4 CODEC Working Group

Status Report

***TSG-SA#2
March 2-4, 1999
Fort-Lauderdale, FL-USA***

**Alain Ohana
TSG-S4 Chairman
GSM North America, T1**

**Kari Jarvinen
TSG-S4 Convenor
Nokia, ETSI**

TSG-S4 Documents

- ***SP-99057: TSG-S4 Status Report at TSG-SA#2***
- ***SP-99058: TSG-S4 Status Report (Slides)***
- ***SP-99059: Proposed Terms of Reference for TSG-S4 Codec Working Group***
- ***SP-99060: Proposed Work Items for Approval***
- ***SP-99061: Decision on Mandatory Speech Codec***

Meetings Schedule

- **2 Meetings held since TSG-SA#1**
 - **TSG-S4#1: January 21-22, 1999 in Helsinki, Finland
Co-located with SMG11#9, hosted by Nokia**
 - **TSG-S4#2: February 24-26, 1999 in Stockholm, Sweden
hosted by Ericsson**
- **Next Meetings Schedule**
 - **TSG-S4#3: March 24-26** **hosted by NTT DoCoMo**
 - **TSG-S4#4: April 21-23** **Possible host identified**
 - **TSG-S4#5: June 14-16** **host required**
 - **TSG-S4#6: September 8-10** **host required**
 - **TSG-S4#7: October 20-22** **host required**
 - **TSG-S4#8: December 1-3** **host required**

Highlights

- ***Review of Codec Activities in 3GPP Partners***
- ***Approval of the Terms of Reference***
- ***Definition and Approval of Preliminary Work Items***
- ***Liaisons Required with other TSG WGs***
- ***Review of Subjective Test Results of Mandatory Speech Codec Candidates***
- ***Decision for Mandatory Speech Codec***
- ***Election of Chairman and Vice-Chairmen***

Activities in 3GPP Partners

ARIB:

- *Evaluation of Mandatory Speech Codec Candidates*
- *Pre-selected candidates: GSM AMR (incl. GSM EFR and IS136 EFR), IS127 EVRC, G.729 Annex E, MPEG-4*
- *Test Results expected by end February*
- *Evaluation of candidate Video Codecs for circuit switched Multimedia services based on H.324M*
Results expected for March 1999

ETSI:

- *Selection and Approval of AMR*
- *AMR working assumption for 3G default speech codec*

TSG-S4 Terms of Reference

TSG-S4 Codec Working Group (WG4) responsibilities:

- Development and maintenance of specifications for Speech, Video and Multimedia Codecs**
- Guidance to other TSG WG regarding the Quality of Service and other system implications imposed by multimedia codecs in circuit-switched and packet environment**
- Speech, Video and Multimedia Quality Evaluation**
- End To end performances including terminal characteristics, of speech, video and multimedia services**
- Interoperability with existing fixed and mobile network from the codecs point of view**

Work Items

5 Work Items presented for approval:

WI S4-1: Mandatory Speech Codec for Narrow band Speech Telephony service

- **Codec Selection:** April 1999
- **Baseline Specifications** April 1999
- **Final Specifications Approval** December 1999

WI S4-2: Codec for Low bit rate Multimedia Telephony service

- **Baseline Specification (H.324/Annex C (CS) based)** April 1999
- **Specification Approval (H.324/Annex C based)** December 1999
- **Baseline Specification for H.323 (Packet) based** December 1999

Work Items

WI S4-3: QoS for Speech and Multimedia Codec

Scope: Evaluation of requirements (Bit Rate, BER, FER, delay) for Multimedia Services.

Specifications Approval

December 1999

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

Scope: Selection, Specification and Characterization of a wideband speech codec based on the results of the corresponding activities in 3GPP Partners

Codec Selection

April 2000

WI S4-6: Tandem free aspects for 3G and between 2G and 3G systems

Specifications Approval

December 1999

Other Activities

Work Items put on hold until next TSG-S4 meeting:

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- ***3G Audio-Visual Terminal Characteristics***
- ***Codecs for High Quality audio for AM/FM type broadcast services, including CD like music broadcasting services***
- ***Optional very low bit-rate codec for speech telephony service***

Liaisons Required with Other TSG WGs

Key Identified Liaisons:

- ***For WI S4-1: Mandatory Speech Codec:
Liaison required with TSG-RAN WG1 for definition of the Bearer Capabilities, Evaluation of Unequal Error Protection vs Equal Error Protection, etc***
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- ***For WI S4-2: Codec for low bit rate Multimedia Services
Liaison required with TSG-SA WG1 and WG2 and with TSG-CN for Service Requirements, Multimedia System Architecture, Requirements on Call set-up procedures in relation with the WI deliverables (Recommended video and speech codecs, H.324/Annex C Characteristics)***

Mandatory Speech Codec

- ***Subjective Test Results of Candidate Speech codecs based on ARIB Test Specification reviewed in TSG-S4#2***
- ***Results available from:***
 - ***Ericsson/Nokia (Tests performed by COMSAT, USA) on GSM AMR, G.729 and IS127 EVRC***
 - ***NTT DoCoMo on GSM AMR, G.729 and IS127 EVRC***
 - ***NEC on Evolution of MPEG-4***

Overview of Test Results

- *GSM EFR (Highest mode of GSM AMR) provides the best performances of all candidate codecs*
- *Other GSM AMR Internal modes are also best in class when compared with other candidates with equivalent source rate (Ex: AMR 7.95 kbit/s and 7.4 kbit/s essentially equivalent to IS-127 EVRC and G.729)*
- *Test results fully in line with previous evaluations from ETSI, T1-TIA-JTC*
- *As a result, TSG-S4 recommends to approve the selection of GSM AMR for the Mandatory 3G speech codec*

Election of Chairman and Vice-Chairmen

- ***One candidate for Chairman and 2 candidates for Vice-Chairmen: All nominated without vote***
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- ***TSG-S4 Chairman: Alain Ohana
GSM North America, T1***
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- ***TSG-S4 Vice-Chairmen: Kari Jarvinen
Nokia, ETSI***

***Hiroyuki Yamaguchi
NTT DoCoMo, ARIB***
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Documents for Approval

- **Proposed Terms of Reference for TSG-S4 Codec Working Group** **SP-99059**
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- **TSG-S4 Work Items** **SP-99060**
 - **S4-1: Mandatory Speech Codec for narrow band speech**
 - **S4-2: Codec for Low bit rate Multimedia services**
 - **S4-3: QoS for Speech and Multimedia Codec**
 - **S4-5: Codec(s) for Wideband Telephony services**
 - **S4-6: Tandem free aspects for 3G and between 2G/3G systems**

Required Decision

- **Adoption of GSM AMR for the Mandatory 3G Speech Codec: SP-99061**
 - **Decision required as soon as possible to meet Release 99**
 - **GSM AMR provides toll quality speech codecs equivalent to existing 2G systems and possibility to trade between quality and capacity without major performance impact**
 - **GSM EFR (Highest mode of GSM AMR) provides best performances of all tested candidates**
 - **Internal modes of GSM AMR are all best in class when compared with other codecs with equivalent source rates**
 - **Compatible with GSM networks: key advantage for 3G systems based on the evolution of the GSM Core Network**