

TS 30.XX V0.1.1 (1999-04)

Technical Specification

**3rd Generation Partnership Project (3GPP);
TSG-SA Codec Working Group;
QoS for Speech and Multimedia Codec
Work Program and Open Issues**

3GPP

Reference

QoS for Speech and Multimedia Codec
(<Shortfilename>.PDF)

Keywords

Codec, QoS (Quality of Service), speech, video,
multimedia, performance

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Intellectual Property Rights

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project, Technical Specification Group Services and System Aspects, Working Group 4 (Codec).

The contents of this informal TS may be subject to continuing work within the 3GPP and may change following formal TSG-S4 approval. Should TSG-S4 modify the contents of this TS, it will be re-released with an identifying change of release date and an increase in version number as follows:

Version m.t.e

where:

- m indicates [major version number]
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated into the specification.

1 Scope

The present document describes the project schedule, key milestones and open issues for the completion of the TSG-S4 Work Item QoS for Speech and Multimedia Codec. It also lists the new specifications and necessary amendments to the existing 3GPP specifications for the technical realization of the corresponding function.

2 References

The following documents contain information supporting the provisions defined in this document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
 - For a specific reference, subsequent revisions do not apply.
 - For a non-specific reference, the latest version applies.
- [1] GSM 03.50: "Digital cellular telecommunications system (Phase 2+); Transmission Planning Aspects of the speech service in GSM PLMN System".
 - [2] UMTS 22.05: "Universal Mobile Telecommunications System (UMTS); Services and Service Capabilities".
 - [3] ARIB Volume 1 v.0.5
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3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Codec: a single media coder/decoder, or a multimedia system specific coder & decoder system. For example, 3GPP AMR (speech codec), ITU-T H.263 (video codec) or ITU-T H.32x (multimedia system with included media codecs) are understood to fulfil the definition of a codec.

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	Third Generation Mobile Network
BER	residual Bit Error Ratio
FER	Frame Error Ratio
PLMN	Public Land Mobile Network
QoS	Quality of Service
RAB	Radio Access Bearer

TS xx.xx "Acronyms and definitions" provides the definitions not listed in this section.

4 General

The purpose of the Work Item is to provide information that specifies transmission planning aspects for speech and multimedia services, and multimedia codec specific performance characterisation.

The aim of the Technical Reports to be created is performance characterisation of the speech and multimedia codec systems suggested to be used in 3GPP services. The produced information aims to act as a guideline for making rightful decisions, e.g., in selecting codec parameters, appropriate RAB service parameters and core network QoS service classes in order to achieve high-quality circuit and packet switched speech and multimedia services within 3GPP mobile networks. Time frame of the Work Item is finalise the specifications work for 3GPP Release 99 latest in December 1999.

5 Requirements

No requirements identified so far.

6 Functional Description

The technical scope of Work Item is

- Evaluation and characterisation of both circuit and packet switched speech and multimedia codecs planned to be used in 3G systems and
- Specifying the transmission planning aspects for the speech and multimedia services.

Fulfilling the agreed Stage 1 service requirements is related to achievable codec performance under such variable PLMN system circumstances as:

- Available 3G user bitrates for multimedia services
- Bit error rate (BER)
- Packet/frame erasure rate (FER)
- PLMN end-to-end delay

Individual input material from 3GPP members is preferred for creation of the characterisation documents, but further performance assessment through preparing joint simulations and respective evaluations is under consideration for the mandate of the Work Item. This requires firstly, availability of error patterns of planned 3GPP RAN circuit switched bearers with bit errors, and later packet switched bearers with typical packet loss behavior. Secondly, availability of suitable applications and analysis tools in addition to considerable amount of expert resources for completion of the tasks is required.

The output of the Work Item is recommended to be taken into account as guidance in the work of other 3GPP work groups or work items. Resulting 3GPP work outside the Work Item may include, e.g., conclusion on how to achieve detailed Stage 1 service requirements or suggestion of a set of recommended RAB parameters giving satisfactory user-to-user service.

7 Phased Development

Technical Report 26.116: Quantitative performance evaluation of H.324 Annex C over 3G

Start of Report	March 99
Approval of deliverable by WG4	April 99
Approval of deliverable by TSG	TSG SA #4 (June 99)

Technical Report 26.216: Quantitative performance evaluation of real-time packet switched multimedia services over 3G

Start of Report	May 99
Approval of deliverable by WG4	November 99
Approval of deliverable by TSG	TSG SA #6 (December 99)

TS 26.350: Transmission planning aspects of the speech and multimedia service in 3G PLMN System

Start of Specification	March 99
Approval of deliverable by WG4	November 99
Approval of deliverable by TSG	TSG SA #6 (December 99)

8 Technical Realization

This section lists the Work Item deliverables and existing and impacted specifications.

New Specifications & Technical Reports (Provisional Number)						
Spec. No.	Title	Prime resp. TSG(s)	2ndary resp. TSG(s)	Presented for information at TSG#	Approved at TSG#	Comments/Status
TR 26.116	Quantitative performance evaluation of H.324 Annex C over 3G	TSG SA		TSG SA#	TSG SA #6	Editor: Olle Franceschi (Ericsson)
TR 26.216	Quantitative performance evaluation of real-time packet switched multimedia services over 3G	TSG SA			TSG SA #6	Editor: Harri Honko (Nokia)
TS 26.350	Transmission planning aspects of the speech and multimedia services in 3G PLMN System	TSG SA			TSG SA #6	Editor: Ian Goetz (Cellnet)
Existing Specifications Affected by the Work Item						
Spec. No.	CR	Subject			Approved at TSG#	Comments/Status
		TBD				

9 Work Program

Meeting	Objective	Comment
TSG-S4#2	<u>February 24-26, 1999</u> in Stockholm, Sweden Production and Approval of the Work Item	Achieved
TSG-SA#2	<u>February 2-4, 1999</u> in Stockholm, Sweden Approval of the Work Item	Achieved
TSG-S4#3	<u>March 24-26, 1999</u> in Tokyo, Japan Production of the WI Work Programme, dedicating editors for Reports and Specifications	Partly achieved, Work programme to be presented in TSG-S4#4
TSG-S4#4	<u>April 20-22, 1999</u> in Production and approval of baseline version of TR 26.116 (Quantitative performance evaluation of H.324 Annex C in 3G)	
TSG-SA#3	<u>April 26-28, 1999</u> in Tokyo, Japan	
TSG-S4#5	<u>June 14-16, 1999</u> in Production of draft Specification 26.350 (Transmission planning aspects of speech and multimedia services in 3G PLMN system)	
TSG-SA#4	<u>June 21-25, 1999</u> in Miami, FL-USA Presentation of the Baseline Report 26.116 (Quantitative performance evaluation of H.324 Annex C in 3G) for Approval	
TSG-S4#6	<u>September 8-10, 1999</u> in Production of draft Report 26.216 (Quantitative performance evaluation of real-time packet switched multimedia services in 3G), planning of simulation activities for purposes of TR 26.216	
TSG-SA#5	<u>September 20-24, 1999</u> in	
TSG-S4#7	<u>October 20-22, 1999</u> in Obtain simulation results for evaluation of real-time packet switched multimedia services. Elaboration of draft Report 26.216 and Specification 26.350	
TSG-S4#8	<u>December 1-3, 1999</u> in Approval of Report 26.216 (Quantitative performance evaluation of real-time packet switched multimedia services in 3G) and Specification 26.350 (Transmission planning aspects of speech and multimedia services in 3G PLMN system)	
TSG-SA#6	<u>December x-x, 1999</u> in Presentation of the 3GPP Specifications Release 99 for Approval	

10 Work Item History

This section should summarize the key decision taken in the course of the Work Item development

Meeting	Key Decisions
TSG-S4#1	February 24-26, 1999 in Helsinki, Finland WI was proposed to be created
TSG-S4#2	February 24-26, 1999 in Stockholm, Sweden Work Item Description approved, permanent rapporteur nominated
TSG-S4#3	March 24-26, 1999 in Yokosuka, Japan Editors were assigned for TS and TR to be produced by the WI
TSG-S4#4	April 20-22, 1999 in Munich, Germany Work programme approved, Draft Baseline 26.116 reviewed in TSG-S4#4

11 Open Issues

This section should list all open issues, which group is responsible for closing the issue and the time frame for the completion of the related action.

Open Issue	Description / History	Responsible/Deadline
Preparation of Initial Work Program	A detailed work program must be prepared for the Work Item	TSG-S4 WI Rapporteur for TSG-S4#4. Accomplished.

Annex A: Work Item Description

x.1 TSG SA Work Area

	Services
	Architecture
	Security
X	Codec
	Network Management

x.2 Justification

Successful provision of speech and multimedia services within the IMT-2000 network requires knowledge of the requirements that intended applications and codecs set for the PLMN network (bearers, network architecture, etc.). This Work Item results will target in assisting other 3GPP WGs to produce such requirements in 3GPP technical specifications where seen appropriate.

x.3 Intended Output of the Work Item

Technical Reports discussing the end-to-end QoS requirement issues and proposed solutions to provide adequate quality of service (QoS) for circuit switched and packet switched multimedia services within third generation mobile networks.

A Technical Specification for transmission planning aspects of speech (and multimedia) services on third generation mobile network.

Changes to developing 3GPP specifications may result depending upon the output of the study.

x.4 Impact on other Technical Specifications and Technical Reports

Affects:	USIM	ME	NW	Others
Yes		X	X	
No	X			
Don't know				

x.5 Technical Scope, including the field of application of the intended output

Evaluation of requirements on quality, bitrates, bit error rates, frame erasure rate, delay etc. for speech and multimedia services. The output of the work item should be utilised by other 3GPP groups as guidance for setting requirements for satisfactory user-to-user service.

The technical requirements of speech and multimedia codecs found out in Technical Reports of this Work Item should be satisfied by the related QoS parameters and other system implications, and by the speech and/or multimedia codec implementations in mobile terminals. The scope includes speech and multimedia services both in circuit switched and packet switched environments.

x.6 Linked 3GPP Work Items

TSG-S4 Codec for Low-bitrate Video Telephony Service, TSG-S4 3G Audio-visual Terminal Characteristics, TSG-S1 Quality of Service Requirements

x.7 Schedule of Tasks to be Performed

Work Item to be approved in: TSG SA #2 (March 99)

Technical Reports

Quantitative performance evaluation of H.324 Annex C over 3G

Start of Report March 99

Approval of deliverable by WG4 April 99

Approval of deliverable by TSG TSG SA #1 (June 99)

Quantitative performance evaluation of real-time packet switched multimedia services over 3G

Start of Report March 99

Approval of deliverable by WG4 November 99

Approval of deliverable by TSG TSG SA #6 (December 99)

Technical Specifications

Transmission planning aspects of the speech and multimedia service in 3G PLMN System

Start of Specification March 99

Approval of deliverable by WG4 November 99

Approval of deliverable by TSG TSG SA #6 (December 99)

New specifications						
Spec No.	Title	Prime rsp. TSG	2ndary rsp. TSG(s)	Presented for information at TSG#	approved at TSG#	Comments
XX	Quantitative performance evaluation of H.324 Annex C over 3G	TSG SA			TSG SA#4 (June 99)	Editor: xx
XX	Quantitative performance evaluation of real-time packet switched multimedia services over 3G	TSG SA			TSG SA#6 (December 99)	Editor: xx
XX	Transmission planning aspects of the speech service in 3G PLMN System	TSG SA			TSG SA#6 (December 99)	Editor: xx
Affected existing specifications						
Spec No.	CR	Subject		Approved at TSG#		Comments

x.8 Supporting Members

Individual Member Organization	Representing Partner
Cellnet	ETSI
Ericsson	ETSI
NEC	ARIB
Nokia	ETSI
Nortel Networks	ETSI
NTT-DoCoMo	ARIB
Siemens	ETSI
Sony	ARIB
Toshiba	ARIB

x.9 Work Item Rapporteur(s)

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x.10 Responsible TSGs

TSG SA4 (Codec) in conjunction with the relevant TSG-SA1 (Services), TSG-SA2 (Architecture) and TSG-CN1 (CC/SS/MM) experts plus 3GPP TSG-T2 (Terminal Services & Capabilities)

x.11 Existing Reference Documentation

[1] GSM 03.50 5.2.0, ETSI

[2] UMTS 22.05 3.2.0 Chapter 5.4, ETSI SMG1

[3] Volume 1 v.0.5, ARIB

Candidates for baseline documents

For TS *Transmission planning aspects of the speech service in UMTS/IMT-2000 PLMN System*:

[1] GSM 03.50 5.2.0, ETSI

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available) gives supporting information.

Pre-existing Reference Documents

1	GSM 03.50: "Digital cellular telecommunications system (Phase 2+); Transmission Planning Aspects of the speech service in GSM PLMN System"

List of Related 3GPP Temporary Documents

TSG-S4#2 meeting:

Reference	Title	Source
S4-99016	QoS for Speech and Multimedia Codec; Work Item Description	WI Rapporteur

TSG-S4#3 meeting:

Reference	Title	Source
S4-99053	Report of ARIB IMT-2000 Video Multimedia Codec Simulation Test	ARIB
S4-99057	Some Observations from the ARIB Multimedia Simulations	Ericsson
S4-99065	Required Channel Bit Error Rate and H.223 level for Multimedia Telephony	NTT DoCoMo

TSG-S4#4 meeting:

Reference	Title	Source
S4-99095	3G Transmission Plan.	Cellnet, BT
S4-99125	QoS for Speech and Multimedia Codec; Work Programme	WI Rapporteur
S4-99109	TS 26.116 V.0.0.1; Quantitative performance evaluation of H.324 Annex C over 3G	TR Editor

History

Document history		
V.0.1.0	1999-04-21	Published in TSGS4#4
V.0.1.1	1999-04-22	Approved to be presented for information in TSG-SA#3