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Test sequences
(3GPP TS 26.444 version 15.3.0 Release 15)

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Contents

Foreword

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1 Scope

The present document specifies the digital test sequences for the Enhanced Voice Services (EVS) Codec. These sequences test for a bit-exact implementation of the EVS Codec (3GPP TS 26.445), Voice Activity Detection (VAD) (3GPP TS.26.451), Comfort Noise Generation (3GPP TS 26.449), Discontinuous Transmission (DTX) (3GPP TS 26.450), Error Concealment of Lost Packets (3GPP TS 26.447), Jitter Buffer Management (JBM) (3GPP TS 26.448), and AMR-WB Interoperable Function (3GPP TS 26.446). In addition, the present document specifies conformance testing (FFS).

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present 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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 26.445: "Codec for Enhanced Voice Services (EVS); Detailed Algorithmic Description".

[3] 3GPP TS 26.451: "Codec for Enhanced Voice Services (EVS); Voice Activity Detection (VAD)".

[4] 3GPP TS 26.449: "Codec for Enhanced Voice Services (EVS); Comfort Noise Generation (CNG) Aspects".

[5] 3GPP TS 26.450: "Codec for Enhanced Voice Services (EVS); Discontinuous Transmission (DTX)".

[6] 3GPP TS 26.447: "Codec for Enhanced Voice Services (EVS); Error Concealment of Lost Packets".

[7] 3GPP TS 26.442: " Codec for Enhanced Voice Services (EVS); ANSI C code (fixed-point)".

[8] 3GPP TS 26.443: "Codec for Enhanced Voice Services (EVS); ANSI C code (floating-point)".

[9] 3GPP TS 26.174: "Adaptive Multi-Rate - Wideband (AMR-WB) Speech Codec Test Sequences".

[10] 3GPP TS 26.446: "Codec for Enhanced Voice Services (EVS); AMR-WB Backward Compatible Functions".

[11] 3GPP TS 26. 448: "Codec for Enhanced Voice Services (EVS); Jitter Buffer Management".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 26.445 [2], 3GPP TS 26.451 [3], 3GPP TS 26.449 [4], 3GPP TS 26.450 [5], 3GPP TS 26.447 [6], 3GPP TS 26.448 [11], and 3GPP TS 26.446 [10] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

ACELP	Algebraic Code-Excited Linear Prediction
AMR-WB	Adaptive Multi Rate Wideband (codec)
CNG	Comfort Noise Generator
DTX	Discontinuous Transmission
EVS	Enhanced Voice Services
FB	Fullband
FEC	Frame Erasure Concealment
IP	Internet Protocol
JBM	Jitter Buffer Management
MSB	Most Significant Bit
MTSI	Multimedia Telephony Service for IMS
NB	Narrowband
PS	Packet Switched
PSTN	Public Switched Telephone Network
SAD	Sound Activity Detection
SC-VBR	Source Controlled - Variable Bit Rate
SID	Silence Insertion Descriptor
SWB	Super Wideband
VAD	Voice Activity Detection
WB	Wideband
WMOPS	Weighted Millions of Operations Per Second

4 General

4.1 Introduction

Digital test sequences are necessary to test for a bit exact implementation of the EVS codec (TS 26.445 [2]), Voice Activity Detection (TS 26.451 [3]), Comfort Noise Generation (TS 26.449 [4]), Discontinuous Transmission (TS 26.450 [5]), and Concealment of Lost Packets (3GPP TS 26.447 [6]). Jitter Buffer Management (JBM) (3GPP TS 26.448 [11]), and AMR-WB Interoperable Function (3GPP TS 26.446 [10]) and for the testing of the bit exactness of installations of the ANSI C code in TS 26.442 [7]. In addition, test sequences for the testing of the bit exactness of installations of the ANSI C code in TS 26.443 [8] are provided. For a standard compliant implementation of the above specifications the encoder and decoder output sequences shall match the provided output test sequences in the attached ZIP file.
Clause 5 describes the format of the files, which contain the digital test sequences. Clause 6 describes the test sequences for the EVS codec, including error concealment of lost packets, the AMR-WB interoperable function. the VAD, comfort noise generation, discontinuous transmission, the AMR-WB interoperable function, the EVS jitter buffer management, Clause 7 describes the conformance testing for non-bit exact implementations of the EVS codec.

5 Test sequence format

5.1 Introduction to test sequence format

This clause provides information on the format of the digital test sequences for the EVS codec (TS 26.445 [2]), Voice Activity Detection (TS 26.451 [3]), Comfort Noise Generation (TS 26.449 [4]), Discontinuous Transmission (TS 26.449 [5]), and Error Concealment of Lost Packets (TS 26.447 [6]), Jitter Buffer Management (JBM) (3GPP TS 26.448 [11]), and AMR-WB Interoperable Function (3GPP TS 26.446 [10]).

5.2 File format

The test sequence files in PC (little-endian) byte order are provided in archive files (ZIP format, see the pointer file Readme.txt which accompanies the present document).

Following decompression, three types of file are provided:

- Files for input to the speech encoder: *.INP
- Files for comparison with the encoder output and for input to the speech decoder: *.COD
- Files for comparison with the decoder output: *.OUT
- Files for input to the speech decoder with JBM *.RTP
- One mode control file for the mode switching test *.MOD
- Instructions how to operate the test sequences *TXT

6 EVS codec test sequences including error concealment of lost packets

6.1 Introduction to test sequences

This clause provides information on the test sequences designed to exercise the EVS codec (TS 26.445 [2]).

6.2 Codec configuration

The speech encoder shall be configured as instructed in the readme file attached.

6.3 EVS codec test sequences

6.3.1 EVS encoder test sequences

The test sequences are provided and described in the ZIP archive.

The test sequences for encoder testing and instructions to operate the encoder are summarized in Readme_EVS_enc.txt.

6.3.2 EVS decoder test sequences

The test sequences for decoder testing and instructions to operate the decoder are summarized in Readme_EVS_dec.txt.

6.3.3 Test sequences for AMR-WB interoperable function

The test sequences for the AMR-WB interoperable function include the test sequences defined in TS 26.174 [9], but *.COD and *.OUT files are not identical to those provided by TS 26.174.

Readme_AMRWB_IO_enc.txt and Readme_AMRWB_IO_dec.txt summarized the input test sequences, output test sequences, and instructions to execute the AMR-WB interoperable function test.

6.3.4 Test sequences for jitter buffer management

The input test sequences, the output sequences, and instructions to run the jitter buffer management test are summarized in the Readme_JBM_dec.txt.

7 Conformance Testing

Conformance Testing is for further study.

Annex A (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2014-09	SA#65	SP-140459				Presented at TSG#65 for approval	1.0.0
2014-09	SA#65					Approved at TSG#65	12.0.0
2014-12	SA#66	SP-140725	0001			Update of existing test vectors for the fixed-point EVS codec	12.1.0
2014-12	SA#66	SP-140725	0002	1		Inclusion of test vectors for the floating-point EVS codec	12.1.0
2015-03	SA#67	SP-150085	0003			Update of test vectors for the EVS codec	12.2.0
2015-06	SA#68	SP-150202	0004			Update of test vectors for the EVS codec	12.3.0
2015-09	SA#69	SP-150434	0005	1		Update of test vectors for the EVS codec	12.4.0
2015-12	SA#70	SP-150639	0006			Update of test vectors for the EVS codec	12.5.0
2015-12	SA#70					Version for Release 13	13.0.0
2016-03	SA#71	SP-160064	0008			Update of test vectors for the EVS codec	13.1.0
2016-06	SA#72	SP-160257	0010		A	Update of test vectors for the EVS codec	13.2.0
2016-09	SA#73	SP-160589	0012		A	Update of test vectors for the EVS codec	13.3.0
2017-03	SA#75					Alignment of source code and test vectors versions (update of Readme.txt file)	13.3.1

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2017-03	75					Version for Release 14	14.0.0
2017-12	78	SP-170820	0017	2	A	Update of test vectors for the EVS codec	14.1.0
2018-06	80	SP-180261	0020	-	A	Update of test vectors for the EVS codec	14.2.0
2018-06	80			-		Version for Release 15	15.0.0
2018-12	82	SP-180965	0024	-	A	Update of test vectors for the EVS codec	15.1.0
2020-06	SA#88-e	SP-200585	0033	-	A	Update of test vectors for the EVS codec	15.2.0
2021-09	SA#93-e	SP-210825	0039	1	A	Update of test vectors for the EVS codec	15.3.0

History

Document history		
V15.0.0	July 2018	Publication
V15.1.0	April 2019	Publication
V15.2.0	September 2020	Publication
V15.3.0	October 2021	Publication