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Technical Specification

3rd Generation Partnership Project;

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Speech Enabled Services (SES);

Distributed Speech Recognition (DSR) extended advanced front-end test sequences

(Release 16)

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# Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

# 1 Scope

The present document specifies the digital test sequences for the DSR Extended Advanced Front-end speech codec. These sequences can be used to test for a bit exact implementation of the DSR Advanced Front-end codec and quantization (3GPP TS 26.243).

# 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 TS 26.243: "ANSI-C code for the Fixed-Point Distributed Speech Recognition Extended Advanced Front-end".

[2] ETSI ES 202 050 (2007-01) V1.1.5: "Speech Processing, Transmission and Quality Aspects (STQ); Distributed speech recognition; Advanced front-end feature extraction algorithm; Compression algorithms DSR advanced front end."

[3] ETSI ES 202 212 (2005-11) V1.1.2: "Speech Processing, Transmission and Quality Aspects (STQ); Distributed speech recognition; Extended advanced front-end feature extraction algorithm; Compression algorithms; Back-end speech reconstruction algorithm".

[4] 3GPP TS 26.074: "AMR speech codec test sequences"

[5] 3GPP TS 26.174: "Adaptive Multi-Rate (AMR) Wideband speech codec test sequences"

# 3 Abbreviations

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

AFE Advanced Front-end

AMR Adaptive Multi-Rate

AMR-NB AMR Narrowband

AMR-WB AMR Wideband

DSR Distributed Speech Recognition

ETSI European Telecommunications Standards Institute

GSM Global System for Mobile communications

SES Speech Enabled Services

VAD Voice Activity Detector

X-AFE eXtended Advanced Front-end

# 4 General

Digital test sequences are provided to test for a bit exact implementation of the Distributed Speech Recognition Extended Advanced Front-end (3GPP TS 26.243 [1]).

The test sequences may also be used to verify installations of the ANSI C code in 3GPP TS 26.243 [1].

Clause 5 describes the format of the files, which contain the digital test sequences.

# 5 Test sequence format

This clause provides information on the format of the digital test sequences for the DSR Extended Advanced Front-end (TS 26.243 [1]).

## 5.1 File format

The test sequence files in PC (little-endian) byte order are provided in archive files (ZIP format), which accompany the present document.

Following decompression, three types of file are provided:

\*.inp - Input to the speech encoder.

\*.cep – Cepstral output of the encoder, input to the quantizer.

\*.pitch – Pitch output of the encoder, input to the quantizer.

\*.class – Class output of the encoder, input to the quantizer.

\*.vad – VAD output of the encoder, input to the quantizer.

\*.bs – Output of the quantizer

Two test scripts are provided for exercising the Extended Advanced Front-end and quantizer functions.

All file formats are described in 3GPP TS 26.243 [1].

# 6 DSR test sequences

Forty-three encoder input sequences are provided, 22 with 8kHz sampling, 23 with 16kHz sampling.

8kHz sampling:

T00.INP - T21.INP as described in the AMR test sequences document TS 26.074 [4].

16kHz sampling:

T00.INP - T22.INP as described in the AMR WB test sequences document TS 26.174 [5].

Annex A (informative):  
Change history

| Change history | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **TSG SA#** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| 12-2004 | 26 | SP-040833 |  |  | Approved at TSG SA#26 | 1.0.0 | 6.0.0 |
| 06-2007 | 36 |  |  |  | Version for Release 7 | 6.0.0 | 7.0.0 |
| 12-2008 | 42 |  |  |  | Version for Release 8 | 7.0.0 | 8.0.0 |
| 12-2009 | 46 |  |  |  | Version for Release 9 | 8.0.0 | 9.0.0 |
| 03-2011 | 51 |  |  |  | Version for Release 10 | 9.0.0 | 10.0.0 |
| 09-2012 | 57 |  |  |  | Version for Release 11 | 10.0.0 | 11.0.0 |
| 12-2013 | 62 | SP-130568 | 0001 |  | Corrections to references | 11.0.0 | 11.1.0 |
| 09-2014 | 65 |  |  |  | Version for Release 12 | 11.1.0 | 12.0.0 |
| 12-2015 | 70 |  |  |  | Version for Release 13 | 12.0.0 | 13.0.0 |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2017-03 | 75 |  |  |  |  | Version for Release 14 | 14.0.0 |
| 2018-06 | 80 |  |  |  |  | Version for Release 15 | 15.0.0 |
| 2020-07 | - | - | - | - | - | Update to Rel-16 version (MCC) | **16.0.0** |