ETSI TS 102 950-2 V1.12.1 (2024-05)

Methods for Testing and Specification (MTS);

TTCN-3 Conformance Test Suite;

Part 2: Test Suite Structure and Test Purposes (TSS&TP)

**Technical Specification**

Reference

RTS/MTS-1029502v1.11.1

Keywords

testing, TSS&TP, TTCN-3

***ETSI***

650 Route des Lucioles

F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B

Association à but non lucratif enregistrée à la

Sous-Préfecture de Grasse (06) N° w061004871

***Important notice***

The present document can be downloaded from:
<https://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at [www.etsi.org/deliver](http://www.etsi.org/deliver).

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our

Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

***Notice of disclaimer & limitation of liability***

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or

other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

***Copyright Notification***

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.
The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2023.

All rights reserved.

Contents

Intellectual Property Rights 4

Foreword 4

Modal verbs terminology 4

1 Scope 5

2 References 5

2.1 Normative references 5

2.2 Informative references 5

3 Definition of terms, symbols and abbreviations 6

3.1 Terms 6

3.2 Symbols 6

3.3 Abbreviations 6

4 Test Suite Structure (TSS) 7

Annex A (normative): Description of Test Purposes 8

A.1 Introduction 8

A.1.1 Test Purposes (TP) 8

A.1.2 Test purpose naming convention 8

A.1.3 Test purpose structure 8

A.1.4 Test purpose format 8

A.2 Test purposes for the TTCN-3 conformance test suite 9

History 10

# Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM**® and the GSM logo are trademarks registered and owned by the GSM Association.

# Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS).

The present document is part 2 of a multi-part deliverable covering a TTCN-3 conformance test suite, as identified below:

Part 1: "Implementation Conformance Statement (ICS)";

**Part 2: "Test Suite Structure and Test Purposes (TSS&TP)";**

Part 3: "Abstract Test Suite (ATS) and Implementation eXtra Information for Testing (IXIT)".

# Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](https://portal.etsi.org/Services/editHelp%21/Howtostart/ETSIDraftingRules.aspx) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

# 1 Scope

The purpose of the present document is to provide Test Suite Structure and Test Purposes (TSS & TP) for conformance tests of the conformance test suite for TTCN-3 as defined in ETSI ES 201 873-1 [1] in compliance with the relevant guidance given in the pro forma for TTCN-3 reference test suite ETSI TS 102 995 [4]. In the present document only the core language features, specified in ETSI ES 201 873‑1 [1] have been considered but not the tool implementation (see ETSI ES 201 873-5 [i.1] and ETSI ES 201 873-6 [i.2]), language mapping (see ETSI ES 201 873‑7 [i.3], ETSI ES 201 873-8 [i.4] and ETSI ES 201 873-9 [i.5]) and language extension (see e.g. ETSI ES 202 781 [i.6], ETSI ES 202 784 [i.7] and ETSI ES 202 785 [i.8]) aspects.

# 2 References

## 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference/>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] [ETSI ES 201 873-1 (V4.15.1)](https://www.etsi.org/deliver/etsi_es/201800_201899/20187301/04.15.01_60/es_20187301v041501p.pdf): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[2] [ISO/IEC 9646-1:1994](https://www.iso.org/standard/17473.html): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework - Part 1: General concepts".

[3] [ISO/IEC 9646-7:1995](https://www.iso.org/standard/3084.html): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[4] [ETSI TS 102 995](https://www.etsi.org/deliver/etsi_ts/102900_102999/102995/): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Proforma for TTCN-3 reference test suite".

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI ES 201 873-5: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 5: TTCN-3 Runtime Interface (TRI)".

[i.2] ETSI ES 201 873-6: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 6: TTCN-3 Control Interface (TCI)".

[i.3] ETSI ES 201 873-7: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 7: Using ASN.1 with TTCN-3".

[i.4] ETSI ES 201 873-8: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 8: The IDL to TTCN-3 Mapping".

[i.5] ETSI ES 201 873-9: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 9: Using XML schema with TTCN-3".

[i.6] ETSI ES 202 781: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Configuration and Deployment Support".

[i.7] ETSI ES 202 784: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Advanced Parameterization".

[i.8] ETSI ES 202 785: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Behaviour Types".

# 3 Definition of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in ISO/IEC 9646-1 [2], ISO/IEC 9646‑7 [3], ETSI ES 201 873-1 [1] (TTCN‑3) and the following apply:

**Abstract Test Suite (ATS):** test suite composed of abstract test cases

**ICS pro forma:** document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS

**Implementation Conformance Statement (ICS):** statement made by the supplier of an implementation claimed to conform to a given specification, stating which capabilities have been implemented

**Implementation eXtra Information for Testing (IXIT):** statement made by a supplier or implementor of an IUT which contains or references all of the information related to the IUT and its testing environment, which will enable the test laboratory to run an appropriate test suite against the IUT

**Implementation Under Test (IUT):** implementation of one or more OSI protocols in an adjacent user/provider relationship, being part of a real open system which is to be studied by testing

**IXIT pro forma:** document, in the form of a questionnaire, which when completed for the IUT becomes the IXIT

## 3.2 Symbols

Void.

## 3.3 Abbreviations

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

ATS Abstract Test Suite

ICS Implementation Conformance Statement

ISO International Organization for Standardization

IUT Implementation Under Test

IXIT Implementation eXtra Information for Testing

MTS Methods for Testing and Specification

OSI Open Systems Intercommunication

STF Special Task Force

TP Test Purpose

TS Test System

TSS Test Suite Structure

TSS&TP Test Suite Structure and Test Purposes

TTCN Testing and Test Control Notation

TTCN-3 Testing and Test Control Notation edition 3

# 4 Test Suite Structure (TSS)

The Test Suite Structure is in close alignment with V4.14.1 of ETSI ES 201 873-1 [1], containing:

a) positive syntactical tests ("Syn" filename prefix of the test case name);

b) positive semantical tests ("Sem" filename prefix of the test case name);

c) negative syntactical tests ("NegSyn" filename prefix of the test case name); and

d) negative semantical tests ("NegSem" filename prefix of the test case name).

The execution order of the TTCN-3 tool conformance test cases is specified in the dependencies section of test purpose descriptions.

Annex (normative):
Description of Test Purposes

# A.1 Introduction

## A.1.1 Test Purposes (TP)

For each test requirement a Test Purpose (TP) is defined. Test purposes shall be defined in a dedicated test purpose document as well as with TTCN-3 documentation tags in each test case of the ATS. Both documentations shall convey the same information for each test purpose.

## A.1.2 Test purpose naming convention

The test purpose naming scheme corresponds to the test case identifier naming scheme and vice-versa.

## A.1.3 Test purpose structure

The test purpose structure is according to the Test Suite Structure (TSS).

## A.1.4 Test purpose format

In the following, examples for tabular test purpose descriptions are shown that shall be defined in the test purpose document. This representation is a direct mapping of the contents of the document tags in the ATS (such as @purpose, @remark, or @verdict). The tabular descriptions are presented along with their corresponding TTCN-3 documentation tag equivalent. The test purpose reference shall be provided in a machine-readable format.

|  |  |
| --- | --- |
| Test Purpose Id | TP\_NegSyn\_0501\_Identifier |
| Reference | ETSI ES 201 873-1 [1], clause 5.1 |
| ICS | None |
| Dependencies | None |
| Summary | Ensure that when the IUT loads a module containing an identifier named with a keyword then the module is rejected |
| Expected Output | Rejection as invalid |
| Notes |  |

A corresponding TTCN-3 module addressing TP\_NegSyn\_0501\_Identifier is the following:

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
 \*\* @author STF 521
 \*\* @version 0.0.1
 \*\* @purpose 1:5.1, Ensure that when the IUT loads a module containing an
 identifier named with a keyword then the module is rejected.
 \*\* @verdict pass Rejection as invalid
 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

module NegSyn\_0501\_Identifier\_001 {

type component GeneralComp {
}

testcase TC\_NegSyn\_0501\_Identifier\_001() runs on GeneralComp {
 var integer component := 1;
}

control{
 execute(TC\_NegSyn\_0501\_Identifier\_001());
}

}

|  |  |
| --- | --- |
| Test Purpose Id | TP\_Syn\_0501\_Identifier |
| Reference | ETSI ES 201 873-1 [1], clause 5.1 |
| ICS | None |
| Dependencies | None |
| Summary | Ensure that the IUT handles the identifiers case sensitively |
| Expected Output | TTCN-3 verdict "pass" |
| Notes |  |

A corresponding TTCN-3 module for TP\_Syn\_0501\_Identifier is the following:

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

 \*\* @author STF 521

 \*\* @version 0.0.1

 \*\* @purpose 1:5.1, Ensure that the IUT handle the identifiers case sensitively.

 \*\* @verdict pass TTCN-3 verdict

 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

module Syn\_0501\_Identifier\_001 {

type component IdComp {

 const integer c\_int := 0;

}

testcase TC\_Syn\_0501\_Identifier\_001() runs on IdComp {

 const integer C\_INT := 1;

 if (c\_int == 0){

 setverdict(pass);

 }

 else {

 setverdict(fail);

 }

}

control{

 execute(TC\_Syn\_0501\_Identifier\_001());

}

}

# A.2 Test purposes for the TTCN-3 conformance test suite

This ATS has been produced using the Testing and Test Control Notation (TTCN) according to ETSI ES 201 873‑1 [1].

# History

|  |
| --- |
| **Document history** |
| V1.1.1 | April 2011 | Publication |
| V1.2.1 | April 2012 | Publication |
| V1.3.1 | October 2013 | Publication |
| V1.4.1 | August 2014 | Publication |
| V1.5.1 | February 2016 | Publication |
| V1.6.1 | August 2017 | Publication |
| V1.7.1 | November 2018 | Publication |
| V1.8.1 | February 2020 | Publication |
| V1.9.1 | May 2021 | Publication |
| V1.10.1 | June 2022 | Publication |
| V1.11.1 | May 2023 | Publication |
| V1.12.1 | April 2024 | Final draft |