

# ETSI TS 102 950-2 V1.6.1 (2017-08)



**Methods for Testing and Specification (MTS);  
TTCN-3 Conformance Test Suite;  
Part 2: Test Suite Structure and Test Purposes (TSS & TP)**



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Reference

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**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 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

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# 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)".

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# 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 [i.1] and [i.2]), language mapping (see [i.3], [i.4] and [i.5]) and language extension (see e.g. [i.6], [i.7] and [i.8]) aspects.

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## 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.

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

- [1] ETSI ES 201 873-1 (V4.8.1): "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 (1992): "Information Technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 1: General concepts".
- [3] ISO/IEC 9646-7 (1994): "Conformance testing methodology and framework - Part 7: Implementation Conformance Statement".
- [4] ETSI TS 102 995: "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 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions 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

**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

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

**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

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

**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

### 3.2 Abbreviations

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

|          |  |
|----------|--|
| ATS      | Abstract Test Suite                          |
| ICS      | Implementation Conformance Statement         |
| IUT      | Implementation under Test                    |
| IXIT     | Implementation eXtra Information for Testing |
| TC       | Test Case                                    |
| TCI      | TTCN-3 Control Interface                     |
| TP       | Test Purpose                                 |
| TRI      | TTCN-3 Runtime Interface                     |
| TS       | Test System                                  |
| TSS      | Test Suite Structure                         |
| TSS & TP | Test Suite Structure and Test Purposes       |
| TTCN-3   | Testing and Test Control Notation edition 3  |

## 4 Test Suite Structure (TSS)

The Test Suite Structure is in close alignment with rev4.8.1 edition 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 A (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.

|                        |   |
|------------------------|---|
| <b>Test Purpose Id</b> | TP_NegSyn_0501_Identifier   |
| <b>Reference</b>       | ETSI ES 201 873-1 [1], Clause 5.1   |
| <b>ICS</b>             | None  |
| <b>Dependencies</b>    | None  |
| <b>Summary</b>         | Ensure that when the IUT loads a module containing an identifier named with a keyword then the module is rejected |
| <b>Expected Output</b> | Rejection as invalid  |
| <b>Notes</b>           |   |

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());
}

```



}

|                        |   |
|------------------------|---|
| <b>Test Purpose Id</b> | TP_Syn_0501_Identifier  |
| <b>Reference</b>       | ETSI ES 201 873-1 [1], Clause 5.1                             |
| <b>ICS</b>             | None  |
| <b>Dependencies</b>    | None  |
| <b>Summary</b>         | Ensure that the IUT handles the identifiers case sensitively. |
| <b>Expected Output</b> | TTCN-3 verdict "pass"   |
| <b>Notes</b>           |   |

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

The TTCN-3 library modules are contained in archive ts\_10295002v010601p0.zip which accompanies the present document.

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

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## History

| <b>Document history</b> |               |             |
|-------------------------|---------------|-------------|
| 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 |