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TECHNICAL SPECIFICATION

**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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# 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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# 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](#) (Verbal forms for the expression of provisions).

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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 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.

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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 \(V4.14.1\)](#): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".
- [2] [ISO/IEC 9646-1:1994](#): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework - Part 1: General concepts".
- [3] [ISO/IEC 9646-7:1995](#): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".
- [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 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

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## 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 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());
}
}

```

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## 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].

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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
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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