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SERIES Z: LANGUAGES AND GENERAL SOFTWARE
ASPECTS FOR TELECOMMUNICATION SYSTEMS

Formal description techniques (FDT) – Testing and Test
Control Notation (TTCN)

Testing and Test Control Notation version 3 (TTCN-3): Using ASN.1 with TTCN-3

ITU-T Recommendation Z.146

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ITU-T Recommendation Z.146

Testing and Test Control Notation version 3 (TTCN-3): Using ASN.1 with TTCN-3

Summary

This Recommendation defines the way of using ASN.1 as defined in ITU-T Recs X.680, X.681, X.682 and X.683 with TTCN-3 (*Testing and Test Control Notation 3*) as defined in ITU-T Rec. Z.140.

Content of this Recommendation has been moved into this separate Recommendation from ITU-T Rec. Z.140 (04/2003). Since then, corrections and editorial changes have been made and included in this Recommendation.

Source

ITU-T Recommendation Z.146 was approved on 16 March 2006 by ITU-T Study Group 17 (2005-2008) under the ITU-T Recommendation A.8 procedure.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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ITU-T Recommendation Z.146

Testing and Test Control Notation version 3 (TTCN-3): Using ASN.1 with TTCN-3

1 Scope

This Recommendation defines a normative way of using of ASN.1 as defined in ITU-T Recs X.680 [2], X.681 [3], X.682 [4] and X.683 [5] with TTCN-3. The harmonization of other languages with TTCN-3 is not covered by this Recommendation.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [1] ITU-T Recommendation Z.140 (2006), *Testing and Test Control Notation version 3 (TTCN-3): Core language*.
- [2] ITU-T Recommendation X.680 (2002), *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*.
- [3] ITU-T Recommendation X.681 (2002), *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification*.
- [4] ITU-T Recommendation X.682 (2002), *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification*.
- [5] ITU-T Recommendation X.683 (2002), *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications*.
- [6] ITU-T Recommendation X.690 (2002), *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*.
- [7] ITU-T Recommendation X.691 (2002), *Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)*.
- [8] ITU-T Recommendation X.693 (2001), *Information technology – ASN.1 encoding rules: XML Encoding Rules (XER)*.
- [9] Void.
- [10] ITU-T Recommendation T.100 (1988), *International information exchange for interactive Videotex*.
- [11] ITU-T Recommendation T.101 (1994), *International interworking for Videotex services*.
- [12] ITU-T Recommendation X.660 (2004), *Information technology – Open Systems Interconnection – Procedures for the operation of OSI registration authorities: General procedures and top arcs of the ASN.1 Object Identifier tree*.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this Recommendation, the terms and definitions given in ITU-T Rec. Z.140 [1] apply.

3.2 Abbreviations

For the purposes of this Recommendation, the abbreviations given in ITU-T Rec. Z.140 [1] and the following apply:

ASN.1 Abstract Syntax Notation One

4 Introduction

When using ASN.1 with TTCN-3 all features of TTCN-3 and statements given in clause 4/Z.140 [1] still apply. In addition, when supporting this Recommendation, TTCN-3 becomes fully harmonized with ASN.1 which may be used with TTCN-3 modules as an alternative data type and value syntax. This Recommendation defines the use of ASN.1 in TTCN-3 modules. The approach used to combine ASN.1 and TTCN-3 could be applied to support the use of other type and value systems with TTCN-3. However, the details of this are not defined in this Recommendation.

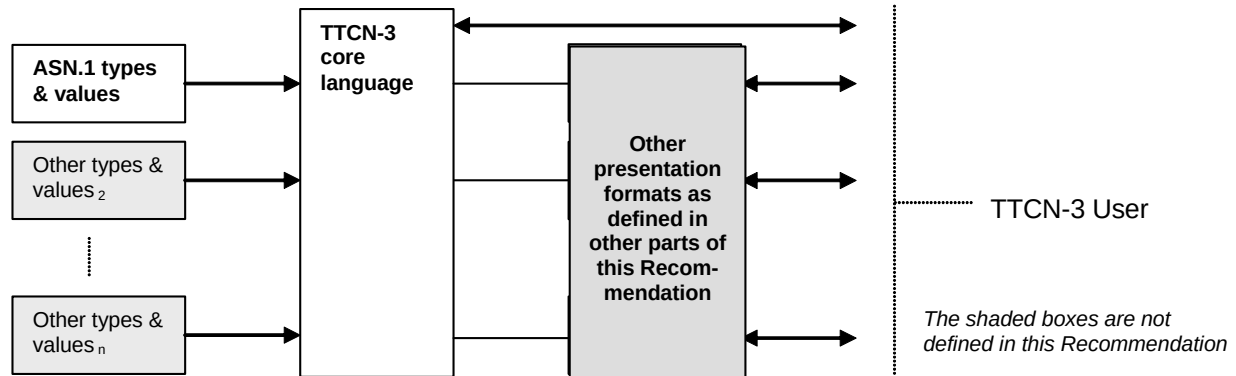


Figure 1/Z.146 – User's view of the core language and the various presentation formats

5 General

TTCN-3 provides a clean interface for using ASN.1 version 2002 (as defined in ITU-T Recs X.680 [2], X.681 [3], X.682 [4] and X.683 [5]) in TTCN-3 modules. XML related capabilities of ASN.1 are currently not considered. When importing from an ASN.1 module one of the following language identifier strings shall be used:

- "ASN.1:2002" for ASN.1 version 2002;
- "ASN.1:1997" for ASN.1 version 1997;
- "ASN.1:1994" for ASN.1 version 1994;
- "ASN.1:1988" for Blue Book version of ASN.1.

NOTE 1 – Language identifiers "ASN.1:1997", "ASN.1:1994" and "ASN.1:1988" refer to versions of ASN.1 based on superseded ITU-T Recommendations (including the base document and all published Amendments and Technical Corrigenda published so far amending the base document). The only purpose to include them into this Recommendation is to allocate unique identifiers if protocol modules based on these ASN.1 versions are used with TTCN-3. When ASN.1 version 1997 is supported, the support of Amendment 3 to ITU-T Rec. X.680 [2] is not considered.

NOTE 2 – When "ASN.1:1988" is supported, the ASN.1 items shall be imported from such modules according to the syntactical and semantical rules of ITU-T Rec. X.208 (*Blue Book*)

When ASN.1 is used with TTCN-3, the keywords listed in 11.18/X.680 [2] shall not be used as identifiers in a TTCN-3 module. ASN.1 keywords shall follow the requirements of ITU-T Rec. X.680 [2].

6 Amendments in the core language

When using ASN.1 definitions in TTCN-3 the amendments given in this clause to the TTCN-3 core language as defined in ITU-T Rec. Z.140 [1] shall also apply. **Clause numbers below refer to those in ITU-T Rec. Z.140 [1].**

Clause 3.1 Definitions

Change the definition "known types": with the following one:

known types: set of defined types, imported ASN.1 types and other imported external types.

Insert the following note after the definition "root type":

NOTE – In case of types based on imported ASN.1 types, the root type is determined from the associated TTCN-3 type (see clause 8).