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Methods for Testing and Specification (MTS); TTCN-3 Conformance Test Suite;

Part 1: Implementation Conformance Statement (ICS)

# Reference RTS/MTS-132-1ed121-T3Conf\_IC

Keywords
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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 1 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)".

#### 1 Scope

The present document provides the Implementation Conformance Statement (ICS) proforma for the conformance test suite for TTCN-3 as defined in ES 201 873-1 [1] in compliance with the relevant guidance given in the proforma for TTCN-3 reference test suite TS 102 995 [4]. In the present document only the core language features, specified in 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.

The supplier of an implementation which is claimed to conform to ES 201 873-1 [1] is required to complete a copy of the ICS proforma provided in annex A of the present document.

#### 2 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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#### 2.1 Normative references

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

- [1] ETSI ES 201 873-1 (V4.3.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".
- [2] ISO/IEC 9646-7 (1995): "Information Technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".
- [3] ISO/IEC 9646-1 (1994): "Information Technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".
- [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

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 [3], ISO/IEC 9646-7 [2], ES 201 873-1 [1] (TTCN-3) and the following apply:

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

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

#### 3.2 Abbreviations

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

ATS Abstract Test Suite BNF Backus Naur Form

ICS Implementation Conformance Statement

IUT Implementation under Test

IXIT Implementation eXtra Information for Testing

SUT System Under Test

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 Conformance requirement concerning ICS

If it claims to conform to the present document, the actual ICS proforma to be filled in by a supplier shall be technically equivalent to the text of the ICS proforma given in annex A, and shall preserve the numbering/naming and ordering of the proforma items.

An ICS which conforms to the present document shall be a conforming ICS proforma completed in accordance with the instructions for completion given in clause A.1.

# Annex A (normative): TTCN-3 conformance ICS proforma

#### A.1 Instructions for completing the ICS proforma

#### A.1.1 Other information

More detailed instructions are given at the beginning of the different clauses of the ICS proforma.

The supplier of the implementation shall complete the ICS proforma in each of the spaces provided. If necessary, the supplier may provide additional comments separately in clause A.4.

#### A.1.2 Purposes and structure

The purpose of this ICS proforma is to provide a mechanism whereby a TTCN-3 tool vendor of the TTCN-3 core language [1] may provide information about the implementation in a standardized manner.

The ICS proforma is subdivided into clauses for the following categories of information:

- instructions for completing the ICS proforma;
- identification of the implementation;
- ICS proforma tables (containing the global statement of conformance).

#### A.1.3 Conventions

The ICS proforma is composed of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7 [2].

#### Item column

It contains a number that identifies the item in the table.

#### Item description column

It describes each respective item (e.g. parameters, timers, etc.).

#### Reference column

It gives reference to the TTCN-3 core language [1], except where explicitly stated otherwise.

#### Status column

The following notations, defined in ISO/IEC 9646-7 [2], are used for the status column:

- m mandatory the capability is required to be supported.
- n/a not applicable in the given context, it is impossible to use the capability. No answer in the support column is required.
- o optional the capability may be supported or not.
- o.i qualified optional for mutually exclusive or selectable options from a set. "i" is an integer which identifies a unique group of related optional items and the logic of their selection which is defined immediately following the table.

ci conditional - the requirement on the capability ("m", "o" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying a unique conditional status expression that is defined immediately following the table. For nested conditional expressions, the syntax "IF ... THEN (IF ... THEN ... ELSE...) ELSE ..." shall be used to avoid ambiguities. If an ELSE clause is omitted, "ELSE n/a" shall be implied.

NOTE: Support of a capability means that the capability is implemented in conformance to the TTCN-3 core language [1].

#### Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7 [2], are used for the support column:

- Y or y supported by the implementation.
- N or n not supported by the implementation.
- N/A or n/a or "no answer required" (allowed only if the status is N/A, directly or after evaluation of a conditional status).

#### Values allowed column

This column contains the values or the ranges of values allowed.

#### Values supported column

The support column shall be filled in by the supplier of the implementation. In this column the values or the ranges of values supported by the implementation shall be indicated.

#### References to items

For each possible item answer (answer in the support column) within the ICS proforma, a unique reference exists. It is defined as the table identifier, followed by a slash character "/", followed by the item number in the table. If there is more than one support column in a table, the columns shall be discriminated by letters (a, b, etc.) respectively.

EXAMPLE: 5/4 is the reference to the answer of item 4 in Table 5.

### A.2 Identification of the implementation

Identification of the Implementation under Test (IUT) and the system in which it resides - the System Under Test (SUT) should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the ICS should be named as the contact person.

#### A.2.1 Date of the statement

Date of the statement:	
------------------------	--

#### A.2.2 Implementation under Test (IUT) identification

IUT name:	
IUT version:	

### A.2.3 System under Test (SUT) identification

SUT name:	
Hardware configuration:	
Operating system:	

#### A.2.4 Product supplier

Name:	
Address:	
Telephone number:	
Facsimile number:	
E-mail address:	
Additional information:	

#### A.2.5 Client

Name:	
Address:	
Telephone number:	
Facsimile number:	
E-mail address:	
Additional information:	

#### A.2.6 ICS contact person

Name:	
Telephone number:	
Facsimile number:	
E-mail address:	
Additional information:	

### A.3 ICS proforma tables

#### A.3.1 Global statement of conformance

	(Yes/No)
Are all mandatory capabilities implemented?	

NOTE: Answering "No" to this question indicates non-conformance to the TTCN-3 core language.

Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming.

### A.3.2 Basic language elements

Table A.1: Basic language elements

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support case sensitive identifiers?	Clause 5.1	m	
2	support the nine basic scope units?	Clause 5.2	m	
3	support the scope rules?	Clause 5.2	m	
4	support uniqueness of identifiers?	Clause 5.2.2	m	
5	support arbitrary order of language elements?	Clause 5.3	m	
6	support formal parameters of kind value?	Clause 5.4.1.1	m	
7	support formal parameters of kind template?	Clause 5.4.1.2	m	
8	support formal parameters of kind timer?	Clause 5.4.1.3	m	
9	support formal parameters of kind port?	Clause 5.4.1.4	m	
10	support for selected cases of cyclic definitions?	Clause 5.5	m	

### A.3.3 Types and values

Table A.2: Types and values

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
	support for all simples basic types and values?	Clause 6.1	m	
2	support subtyping of basic types?	Clause 6.1.2	m	
3	support list of values subtyping?	Clause 6.1.2.1	m	

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
4	support list of types subtyping?	Clause 6.1.2.2	m	
5	support range subtyping?	Clause 6.1.2.3	m	
6	support string length restriction subtyping?	Clause 6.1.2.4	m	
7	support pattern subtyping of character string types?	Clause 6.1.2.5	m	
8	support mixing of subtyping mechanisms?	Clause 6.1.2.6	m	
9	support record type and values?	Clause 6.2.1	m	
10	support set type and values?	Clause 6.2.2	m	
11	support records and sets of single types?	Clause 6.2.3	m	
12	support enumerated type and values?	Clause 6.2.4	m	
13	support unions?	Clause 6.2.5	m	-
14	support the anytype?	Clause 6.2.6	m	
15	support arrays?	Clause 6.2.7	m	
16	support the default type?	Clause 6.2.8	m	
17	support communication port types?	Clause 6.2.9	m	
18	support component type definitions?	Clause 6.2.10	m	
19	support the reuse of component definitions?	Clause 6.2.10.2	m	
20	support component references?	Clause 6.2.11	m	
21	support addressing of entities inside the SUT?	Clause 6.2.12	m	
22	support length subtyping of record of and set of?	Clause 6.2.13.1	m	
23	support list subtyping of structured types and anytype?	Clause 6.2.13.2	m	
24	support subtyping of the iterated type of record of and set of?	Clause 6.2.13.3	m	
25	prohibits the mixing of structured type subtyping mechanisms?	Clause 6.2.13.4	m	
26	support the type compatibility rules of non-structured types?	Clause 6.3.1	m	
27	support the type compatibility rules of structured types?	Clause 6.3.2	m	
28	support the type compatibility rules of component types?	Clause 6.3.3	m	
29	support the type compatibility rules of communication operations?	Clause 6.3.4	m	
30	support type conversion?	Clause 6.3.5	m	
31	support type synonyms?	Clause 6.4	m	

### A.3.4 Expressions

**Table A.3: Expressions** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support all arithmetic operators?	Clause 7.1.1	m	
2	support the list operator?	Clause 7.1.2	m	
3	support all relational operators?	Clause 7.1.3	m	
4	support all logical operators?	Clause 7.1.4	m	
5	support all bitwise operators?	Clause 7.1.5	m	
6	support all shift operators?	Clause 7.1.6	m	
7	support all rotate operators?	Clause 7.1.7	m	

#### A.3.5 Modules

**Table A.4: Modules** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the definition of modules?	Clause 8.1	m	
2	support module parameters?	Clause 8.2.1	m	
3	support groups of definitions?	Clause 8.2.2	m	
4	support the import of single definitions?	Clause 8.2.3.2	m	
5	support the import of groups?	Clause 8.2.3.3	m	
6	support the import of definitions of the same kind?	Clause 8.2.3.4	m	
7	support the import of all definitions of a module?	Clause 8.2.3.5	m	
8	support the import of definitions from other TTCN-3 editions?	Clause 8.2.3.6	m	
9	support the import of import statements?	Clause 8.2.3.7	m	
10	support the compatibility of language specifications in imports?	Clause 8.2.3.8	m	
11	support friend modules?	Clause 8.2.4	m	
12	support visibility of definitions?	Clause 8.2.5	m	
13	support the module control part?	Clause 8.3	m	

### A.3.6 Port types, component types and test configurations

Table A.5: Port types, component types and test configurations

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support communication ports?	Clause 9.1	m	
2	support all allowed connections?	Clause 9.1	m	
3	prohibit disallowed connections?	Clause 9.1	m	
4	support the test system interface?	Clause 9.2	m	

### A.3.7 Declaring constants

**Table A.6: Declaring constants** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the declaration of constants?	Clause 10	m	

### A.3.8 Declaring variables

Table A.7: Declaring variables

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support value variables?	Clause 11.1	m	
2	support templates variables?	Clause 11.2	m	

#### A.3.9 Declaring timers

**Table A.8: Declaring timers** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the declaration of timers?	Clause 12	m	

### A.3.10 Declaring messages

**Table A.9: Declaring messages** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the declaration of messages?	Clause 13	m	

#### A.3.11 Declaring procedure signatures

Table A.10: Declaring procedure signatures

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the declaration of procedure	Clause 14	m	
	signatures?			

### A.3.12 Declaring templates

Table A.11: Declaring procedure signatures

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the declaration of message templates?	Clause 15.1	m	
2	support the declaration of signature templates?	Clause 15.2	m	
3	support global and local templates?	Clause 15.3	m	
4	support in-line templates?	Clause 15.4	m	
5	support modified templates?	Clause 15.5	m	
6	support the referencing of elements of templates or template fields?	Clause 15.6	m	
7	support template matching with specific values?	Clause 15.7.1	m	
8	support template matching with special symbols that can be used instead of values?	Clause 15.7.2	m	
9	support template matching with special symbols that can be used inside values?	Clause 15.7.3	m	
10	support template matching with special symbols which describe attributes of values?	Clause 15.7.4	m	
11	support all template restrictions?	Clause 15.8	m	
12	support the match operation?	Clause 15.9	m	
13	support the valueof operation?	Clause 15.10	m	
14	Support the concatenation of templates of string and list types?	Clause 15.11	m	

### A.3.13 Functions, altsteps and testcases

Table A.12: Functions, altsteps and testcases

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support functions?	Clause 16.1	m	
2	support the invocation of functions?	Clause 16.1.1	m	
3	support all predefined functions?	Clause 16.1.2	m	
4	support external functions?	Clause 16.1.3	m	
5	prohibit the invocation of functions from all forbidden places?	Clause 16.1.4	m	
6	support altsteps?	Clause 16.2	m	
7	support the invocation of altsteps?	Clause 16.2.1	m	
8	support test cases?	Clause 16.3	m	

#### A.3.14 Basic program statements

Table A.13: Overview of program statements and operations

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support assignments?	Clause 19.1	m	
2	support the if-else statement?	Clause 19.2	m	
3	support the select case statement?	Clause 19.3	m	
4	support the for statement?	Clause 19.4	m	
5	support the while statement?	Clause 19.5	m	
6	support the do-while statement?	Clause 19.6	m	
7	support the label statement?	Clause 19.7	m	
8	support the goto statement?	Clause 19.8	m	
9	support the stop execution statement?	Clause 19.9	m	
10	support the return statement?	Clause 19.10	m	
11	support the log statement?	Clause 19.11	m	
12	support the break statement?	Clause 19.12	m	
13	support the continue statement?	Clause 19.13	m	
14	Support statement blocks?	Clause 19.14	m	

### A.3.15 Statement and operations for alternative behaviours

Table A.14: Statement and operations for alternative behaviours

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the snapshot mechanism?	Clause 20.1	m	
2	support alt statements?	Clause 20.2	m	
3	support the repeat statement?	Clause 20.3	m	
4	support the interleave statement?	Clause 20.4	m	
5	support the default mechanism?	Clause 20.5	m	
6	support the activation of defaults?	Clause 20.5.2	m	
7	Support the deactivation of defaults?	Clause 20.5.3	m	

### A.3.16 Configuration operations

**Table A.15: Configuration operations** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the connect operation?	Clause 21.1.1	m	
2	support the map operation?	Clause 21.1.1	m	
3	support the disconnect operation?	Clause 21.1.2	m	
4	support the unmap operation?	Clause 21.1.2	m	
5	support the test case stop operation?	Clause 21.2.1	m	
6	support the create operation?	Clause 21.3.1	m	
7	support the start test component operation?	Clause 21.3.2	m	
8	support the stop test behaviour operation?	Clause 21.3.3	m	
9	support the kill test component operation?	Clause 21.3.4	m	
10	support the alive operation?	Clause 21.3.5	m	
11	support the running operation?	Clause 21.3.6	m	
12	support the done operation?	Clause 21.3.7	m	
13	support the killed operation?	Clause 21.3.8	m	

### A.3.17 Communication operations

**Table A.16: Communication operations** 

Item	Is the implementation able to	s the implementation able to Reference in ES 201 873-1 [1] Status		Support
1	support message-based communication?	Clause 22.1.1	m	
2	support procedure-based	Clause 22.1.2	m	
	communication?			
3	support unicast communication?	Clause 22.1.3	m	
4	support multicast communication?	Clause 22.1.3	m	
5	support broadcast communication?	Clause 22.1.3	m	
6	support the send operation?	Clause 22.2.1	m	
7	support the receive operation?	Clause 22.2.2	m	
8	support the trigger operation?	Clause 22.2.3	m	
9	9 support the call operation? Clause 22.3.1 r		m	
10	support the getcall operation?	Clause 22.3.2	m	
11	support the reply operation?	Clause 22.3.3	m	
12	support the getreply operation?	Clause 22.3.4	m	
13	support the raise operation?	Clause 22.3.5	m	
14	support the catch operation?	Clause 22.3.6	m	
15	support the check operation?	Clause 22.4	m	
16	support the clear port operation?	Clause 22.5.1	m	
17	support the start port operation?	Clause 22.5.2	m	
18	support the stop port operation?	Clause 22.5.3	m	
19	support the use of any and all with ports?			

### A.3.18 Timer operations

**Table A.17: Timer operations** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the timer mechanism?	Clause 23.1	m	
2	support the start timer operation?	Clause 23.2	m	
3	support the stop timer operation?	Clause 23.3	m	
4	support the read timer operation?	Clause 23.4	m	
5	support the running timer operation?	Clause 23.5	m	
6	support the timeout operation?	Clause 23.6	m	

#### A.3.19 Test verdict operations

**Table A.18: Test verdict operations** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the verdict mechanism?	Clause 24.1	m	
2	support the setverdict operation?	Clause 24.2	m	
3	support the getverdict operation?	Clause 24.3	m	

#### A.3.20 External actions

**Table A.19: External actions** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the external actions?	Clause 25	m	

#### A.3.21 Module control

**Table A.20: Module control** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the module control part?	Clause 26/Clause 26.2	m	
2	support all valid TTCN-3 statements in the module control part?	Clause 26	m	
3	support the execute statement?	Clause 26.1	m	

### A.3.22 Specifying attributes

Table A.21: Specifying attributes

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support the attribute mechanism?	Clause 27.1	m	
2	2 support the scope rules for attributes? Clause 27.1.1		m	
3	support the overwriting rules for attributes?  Clause 27.1.2 m		m	
4	support the changing of attributes of imported language elements?	Clause 27.1.3	m	
5	support the with statement?	Clause 27.2	ause 27.2 m	
6	support the display attributes?	Clause 27.3	m	
7	support the encoding attributes?	Clause 27.4	m	
8	support the variant attributes?	Clause 27.5	m	
9	support the extension attributes?	Clause 27.6	m	
10	10 Support the optional attributes? Clause 27.7 m		m	

### A.3.23 BNF and static semantics

Table A.22: BNF and static semantics

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	Prohibit inputs that do not conform to the BNF?	Annex A	m	
2	support the inclusion of comments?	Annex A.1.4	m	
3	support only valid identifiers?	Annex A.1.3	m	
4	support the static semantics rules that are part of the BNF?	Annex A.1.6	m	

### A.3.24 Preprocessing macros

**Table A.23: Preprocessing macros** 

Item	Is the implementation able to	Reference in ES 201 873-1 [1]	Status	Support
1	support all preprocessing macros?	Annex D	m	

### A.4 Additional information for ICS

This clause contains all additional comments provided by the supplier of the implementation.

## History

	Document history		
V1.1.1	April 2011	Publication	
V1.2.1	April 2012	Publication	