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| ETSI_logo_Office_Colour_Small | ***STF 487 - Final Report for ETSI*** |
| **Final Report** | **Author:**  | Mr. Bogdan Stanca-Kaposta |
|  |  | **Date:**  | 02/09/2015  |
|  |  | **Version** | 0.0.1 |
| **Doc**  |  | page 1 of 10 |

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| **STF** | **487** |  | **STF leader** | Bogdan Stanca-Kaposta |
| **TB/WG** | MTS |  | **TB responsible** | Stephan Schulz |
|  |  |  | **STF Assistant** | Elodie Rouveroux |

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| **STF title:** | Extension of Conformance tests for TTCN-3 tools 2015 |

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| **Milestone** | **B** |  | **Status** | **Covers the period until (cut-off date)** | 31/10/2015 |
| **Template** |
| **Objective** | Final Report and final draft deliverables approved by MTS#66 (date tbd in October 2015). TC MTS will review the draft during the plenary and may request changes, before proceeding to an approval by Remote Consensus. The milestone will be achieved when the Final Report will be approved by TC MTS and the final draft deliverables accepted by the ETSI Secretariat for publication. |
| **Achieved** | Yes | *Standard documents and ATS uploaded to the ETSI server as MTS#66 contributions: 6 files Part1&9 ICS,TS,ATS* MTS(15)065\_029 until MTS(15)065\_034 |
| **Remarks** |  |

**Achieved dates**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Template** | **Draft report** | **ETSI approval** | **Sent to EC** | **EC approval** |
| 02/09/2015 | 29/09/2015 |  |  |  |

**Activities carried out by the STF in the period** **from 09/02/2015 to 31/10/2015**

# Executive summary

TTCN-3 is a living language, a new version is published by ETSI each year, the latest published version of Part 1 is v4.7.1 and Part 9 is 4.5.1. The TTCN-3 conformance test suite development is one release behind the language development.

The STF 487 target is to synchronize the development of the TTCN3 language (Part1 and Part9) and its conformance test suite. This would support that TTCN-3 test suites will also in the future compile on multiple TTCN-3 tools, by removing possible misunderstandings and ambiguities when implementing a new language feature in test tools.

STF 487 identified 84 (25%) changed sections of the TTCN-3 standard part 1 4.7.1 and 11 (8%) changed sections of the part 9 (XSD/XML Schema) 4.6.1 standard. We covered new/changed standards features and upgraded the test execution tools used for pre-processing and test adaptation.

**STF 487 created for Part 1 1221 new tests (2956 in total)** to enhance the coverage of the new and old features and reviewed tests in the changed sections .For the **Part 9 (XML Schema) 4.6.1 Standard we have 79 new tests (426 in total),** having more than half reviewed due changed sections.

The validation of tests we done with at two TTCN-3 Compilers and we got good feedback from the tool vendors (Elvior, Testing Technologies). 37 Change requests were filled to Evolution STF and 20 Change requests were processed by STF 487. Issues concerning the ATS were reported to Mantis one issue is acknowledged.

STF 487 updated the Execution tools and also the SVN structure to ETSI standards and compacted the ATS folder structure to match windows 260 chars path limitations as requested by stack holders.

Documents were uploaded as contributions to the MTS#66 Meeting: ICS, TSS/TP, IXIT, ATS, Progress Reports.

**STF 487 has fully met the tasks specified in the Terms of Reference.**

# Introduction

TTCN-3 is a living language, a new version is published by ETSI each year, the latest published version is 4.7.1 for Part1 and 4.5.1 for Part9. The TTCN-3 conformance test suite development is one release behind the language development.

The STF 487 target is to synchronize the development of the TTCN3 language (Part1 and Part9) and its conformance test suite. This would support that TTCN-3 test suites will also in the future compile on multiple TTCN-3 tools, by removing possible misunderstandings and ambiguities when implementing a new language feature in test tools.

## Scope, major aims of the STF work

The purpose of this work is to update the TTCN-3 tool conformance test specification to the latest

version under development of the TTCN-3 language, thus re-synchronizing language development

and the test suite development and to maintain full clause coverage of the core language. More

concretely, to revise and update the ICS, test purposes and the TTCN-3 tests.

## STF activity and expected output

STF487’s Terms of Reference does not specify quantitative targets. The ongoing progress of STF487 work fully meets the main STF target of producing by the end of this STF work an updated version of well documented TTCN-3 reference test specification.

Following tasks were agreed by the Terms of Reference

* Task 1: Listing of changes between the V4.6.1 and V4.7.1 revisions of the TTCN-3 core

language and XML schema handling standards, and corresponding assignment of Task 2-4 work among STF experts

* Task 2: Extension of the TTCN-3 core language conformance test suite by writing tests for the new/changed core language features
* Task 3: Extension of the TTCN-3 conformance test suite by writing tests for the new/changed XML schema handling features
* Task 4: Extension of the TTCN-3 conformance test execution tools, as needed, to support changed language features relating to external functions, pre-processing, ports ...etc.
* Task 5: Validation of the extended TTCN-3 conformance test suite over at least two TTCN-3 compilers
* Task 6: Discussion of validation results with involved tool vendors, assignment of TTCN-3 conformance test suite refinement tasks as needed.
* Task 7: Correction and refinement of the extended TTCN-3 core language tests, based on the validation feedback.
* Task 8: Correction and refinement of the extended TTCN-3 XML schema handling tests, based on the validation feedback.
* Task 9: Raising of CRs to the TTCN-3 developers over the observed language issues/ambiguities
* Task 10: Presentation of results to TC MTS, documentation of the TSS/TP and PIXIT structure of the resulting test suite, submission of results to corresponding work items, write-up of STF work reports.

**STF 487 has fully met the tasks specified in the Terms of Reference.**

Following the Task list from above: STF 487 identified 84 (25%) changed sections of the TTCN-3 standard part 1 4.7.1 and 11 (8%) changed sections of the part 9 (XSD/XML Schema) 4.6.1 standard. We covered new/changed standards features and upgraded the test execution tools used for pre-processing and test adaptation.

**STF 487 created for Part 1 1221 new tests (2956 in total)** to enhance the coverage of the new and old features and reviewed tests in the changed sections .For the **Part 9 (XML Schema) 4.6.1 Standard we have 79 new tests (426 in total),** having more than half reviewed due changed sections.

The validation of tests we done with at two TTCN-3 Compilers and we got good feedback from the tool vendors (Elvior, Testing Technologies). 37 Change requests were filled to Evolution STF and 20 Change requests were processed by STF 487. Issues concerning the ATS were reported to Mantis one issue is acknowledged.

STF 487 updated the Execution tools and also the SVN structure to ETSI standards and compacted the ATS folder structure to match windows 260 chars path limitations as requested by stack holders.

Documents were uploaded as contributions to the MTS#66 Meeting: ICS, TSS/TP, IXIT, ATS, Progress Reports.

## Relation with the reference TB and with other bodies, inside and outside ETSI

STF 487 communicated with the TTCN-3 Evolution STF and submitted change requests for the observed issues. There were good feedback (also in form of change requests) from the Evolution STF that improved both documents and test cases.

The results were presented to MTS#65 Budapest (remotely via web conference) and MTS#66 Berlin (in person).

# Overview of the organization of the activity

## Team composition and experts’ qualification

*Kovács, András, Broadbit Slovakia,* *andras.kovacs@broadbit.com*

 TTCN-3 Expert involved in different ETSI STFs, being also STF leader to one of a previous conformance STF

Stanca-Kaposta, Bogdan, Testing Technologies, stanca@testingtech.com

 TTCN-3 Tool Developer Expert involved in different ETSI STFs but also in a variety of customer projects, being also STF leader to one of a previous conformance STF

*Urban, Tomaš, Elvior,* *tomas.urban@elvior.ee*

 TTCN-3 Compiler Expert involved in different ETSI STFs, being also STF leader to one of a previous conformance STF

## STF teamwork, distribution of tasks, working methods

The work atmosphere within the team was pleasant and productive. Since we all were already working on one of the previous Conformance STFs, we start the work right away without need for introduction.

The tasks were split evenly to all 3 members:

* Detect changes of the TTCN-3 Standard Part 1 and Part 9 (Tomas Urban)
	+ Part 1 4.7.1
	+ Part 9 (XSD/XML Schema) 4.6.1
* Cover new/changed Part 1 and Part 9 Features (all)
* Upgrade test execution tools (all)
	+ pre-processing, test adaptation
* Validation of tests with at least two TTCN-3 Compilers (all)
	+ Tool vendors feedback (Elvior, Testing Technologies)
	+ Raising of CRs (Tomas Urban)
* Document and publish the results (Bogdan Stanca-Kaposta, supported by Andras Kovacs)
	+ ICS, TSS/TP, IXIT, ATS, Progress Reports

## Liaison with the reference TB and/or the Steering Group

The results were presented to MTS#65 Budapest (remotely via web conference) and MTS#66 Berlin (in person).

## Meetings attended on behalf of the STF with the reference TB and other ETSI TBs

Presented the STF487 results to the meetings:

MTS#65 meeting (Budapest 9-10.June 2015)

MTS#66 meeting (Berlin 30.Sept - 1.October 2015)

## STF communications, presentations, promotion, inside and outside ETSI, WEB pages etc

Conformance STF ATS was linked on the TTCN-3 community page

 <http://www.ttcn-3.org/index.php/downloads/standards/conformance-test-suites>

We created a website to present our work: <https://portal.etsi.org/STF/stfs/STFHomePages/STF487>

# Final status of the activity

## Overview of the STF work

STF 487 completed all 10 tasks defined by the Terms of Reference. The result of the work is checked in into the ETSI SVN repositories and the deliverables have been uploaded onto the ETSI portal among MTS#66 meeting contributions.

<https://portal.etsi.org/Contribution.aspx?MeetingId=16424>

MTS(15)066\_015, MTS(15)066\_014, MTS(15)065\_029, MTS(15)065\_030, MTS(15)065\_031, MTS(15)065\_032, MTS(15)065\_033, MTS(15)065\_034

**STF 487 created for Part 1 1221 new tests (2956 in total)** to enhance the coverage of the new and old features and reviewed tests in the changed sections .For the **Part 9 (XML Schema) 4.6.1 Standard we have 79 new tests (426 in total),** having more than half reviewed due changed sections.

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## Technical risk, difficulties encountered and corrective actions taken

There have been no difficulties, nor risks.

## Lessons learnt

Since the Conformance ATS is based on the section numbers, it would be great to keep the numbering in the TTCN-3 standards. This issue has being raised at least once by each previous STF.

## Recommendations for future activities in related domains

The same test approach can be applied to other TTCN-3 Standard Parts (like ASN.1) using also similar tooling to test ASN.1 mapping and encoding of values. Since ASN.1 is widely spread over the telecommunication domains and now is moving also towards ITS (Intelligent Transport Systems) it would be for interest to make sure the mappings are conform to the ETSI standard.

# ETSI deliverables

The deliverables produced by STF 487 were uploaded as contributions to the MTS#65 and MTS#66 meetings. The following table shows this list.

|  |  |
| --- | --- |
| Deliverable: Work Item / Number RTS/MTS-102950-1ed151T3Conf - TS 102 950-1 ed151RTS/MTS-102950-2ed151T3Conf - TS 102 950-2 ed151RTS/MTS-102950-3ed151T3Conf - TS 102 950-3 ed151Current status: Final draft for approvalWorking title TTCN-3 tool conformance | **Achieved date** |
| Creation of WI by WG/TB | 2014-10-08 |
| TB adoption of WI | 2014-10-17 |
| Start of work | 2015-02-09 |
| Early draft |  |
| Stable draft | 2015-06-08 |
| Final draft for approval | 2015-09-29 |
| TB approval |  |
| Draft receipt by ETSI Secretariat |  |
| Publication |  |
| Deliverable: Work Item / NumberRTS/MTS-103253ed121 - TS 103 253 ed121RTS/MTS-103254ed121 - TS 103 254 ed121RTS/MTS-103255ed121 - TS 103 255 ed121Current status: Final draft for approvalWorking title TTCN-3 tool conformance in using XML Schema | **Achieved date** |
| Creation of WI by WG/TB | 2014-09-29 |
| TB adoption of WI | 2014-10-20 |
| Start of work | 2015-02-09 |
| Early draft |  |
| Stable draft | 2015-06-08 |
| Final draft for approval | 2015-09-29 |
| TB approval |  |
| Draft receipt by ETSI Secretariat |  |
| Publication |  |

1. Performance indicators
	1. Performance Indicators objectives achieved

*Report here the EC/EFTA requirements as they result from the ToR, and the objectives actually achieved e.g.:*

**Effectiveness:**

*Benchmarks: objectives defined in the ToR and level of achievement*

**Stakeholder engagement, including dissemination of results:**

*Benchmarks: objectives defined in the ToR and level of achievement*

**Impact:**

*Benchmarks: objectives defined in the ToR and level of achievement*

* 1. Performance Indicators objectives not achieved

*Not applicable*

1. Resources allocated and spent

**Author: STF Administration**

**Period covered: From: dd-mmm-yyyy To: dd-mmm-yyyy**

**Status: Draft / Final**

**Status date: dd-mmm-yyyy**

Comments:

* 1. EC/EFTA contract conditions
		1. Total action cost

Reproduce here the financial tables in the corresponding section of the STF ToR (typically §8.1 Total action costs).

* + 1. Travels

Reproduce here the corresponding section of the STF ToR (typically §8.3 Travel costs), including the details of the travel estimate.

* + 1. Contribution in kind

Reproduce here the corresponding section of the STF ToR (typically §8.8 Contribution in kind).

* 1. Summary of resources allocated and spent (real cost)

The following tables present the summary of the activities carried out by the STF in the period from dd-mmm-yyyy to . Status date:

Table 1: Status of EC/EFTA resources funded and spent

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| **EC/EFTA contribution (funded)** |
|  | **Manpower** | **Travel** | **Subc.** | **Other** | **Total** |
|  | Days | Rate | EUR | EUR | EUR | EUR | EUR |
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|  |  |  |  |  |  |  |  |
| **Total funded** |  |  |  |  |  |  |  |
| **EC/EFTA contribution (spent)** |
|  | **Manpower** | **Travel** | **Subc.** | **Other** | **Total** |
|  | Days | Rate | EUR | EUR | EUR | EUR | EUR |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| **Total spent** |  |  |  |  |  |  |  |
| **Balance** |  |  |  |  |  |  |  |

Notes (e.g. if there are provisional figures for some items, indicate the reason)

Table 2: Partner contribution

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| **ETSI contribution (equivalent amount)** |
| **In-kind** | **Days** | **Rate** | **EUR** | **Notes** |
| Required |  |  |  |  |
| **Achieved** |  |  |  |  |
| Delegates participation |  |  |  |  |
| Experts’ voluntary work |  |  |  | Exclusive voluntary work (no remunerated contract) |
| **Eligible IK contribution** |  |  |  |  |
| **% Achieved** |  |  |  |  |
| **Additional voluntary work**  | **Days** | **Rate** | **EUR** | **Notes** |
| Experts |  |  |  | Other experts, exceeding remunerated contract |
| CTI |  |  |  |  |
| **Total voluntary work** |  |  |  |  |

Table 3a: Time spent by experts (remunerated)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company / ETSI Member** | **Expert** | **Work days** | **Rate** | **Cost****(EUR)** |
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| **Total** |  |  |  |  |

Table 3b: Time spent by ETSI Secretariat / CTI (remunerated)

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| --- | --- | --- | --- | --- |
| **CTI contribution** | **Expert** | **Work days** | **Rate** | **Cost****(EUR)** |
| ETSI |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Total** |  |  |  |  |

Table 4a: Time spent by experts (voluntary)

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| --- | --- | --- | --- | --- |
| **Company / ETSI Member** | **Expert** | **Work days** | **Equiv. rate** | **Equiv. amount****(EUR)** |
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| **Total** |  |  |  |  |

Table 4b: Time spent by ETSI Secretariat / CTI (voluntary)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CTI contribution** | **Expert** | **Work days** | **Equiv. rate** | **Equiv. amount****(EUR)** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Total** |  |  |  |  |

Table 5: Travels

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| --- | --- | --- | --- | --- | --- | --- |
| **Expert** | **Event** | **Place** | **Date****from** | **Dur. days** | **Cost****(EUR)** | **Notes** |
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| **Total** |  |  |  |  |  |  |