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| ETSI_logo_Office_Colour_Small | ToR STF DD (TC MTS) |
| Version: 1.2 |
| Author: Andras Kovacs – Date: 10 Oct 2018  |
| Last updated by: Youssouf Sakho – Date: 28 Feb 2019  |
| page 1 of 4 |

Terms of Reference - Specialist Task Force

STF DD (TC MTS)

Extension of Conformance tests for TTCN-3 tools

Summary information

|  |  |
| --- | --- |
| Approval status | Approved by TC MTS (doc ref: MTS(17)072037 ) Approved by Board#121 (30 January 2019) |
| Funding | **Maximum budget:** 106 000 **€ ETSI FWP** |
| Time scale | Apr 2019 to Dec 2019 |
| Work Items  | RTS/MTS-102950-1ed191T3Conf - TS 102 950-1 ed191RTS/MTS-102950-2ed191T3Conf - TS 102 950-2 ed191RTS/MTS-102950-3ed191T3Conf - TS 102 950-3 ed191RTS/MTS-103253ed161 - TS 103 253 ed161RTS/MTS-103254ed161 - TS 103 254 ed161RTS/MTS-103255ed161 - TS 103 255 ed161DTS/MTS-103663-1DTS/MTS-103663-2DTS/MTS-103663-3 |
| Board priority  |  Standards enablers/facilitators (conformance testing, interoperability, methodology) |

Part I – Reason for proposing the STF

# Rationale

* 1. Background information

Over the last decade TTCN-3 has become a significantly important testing technology with very high deployment at various ETSI member companies as well as other organizations internationally. With its established usage in 3GPP, ETSI, OMA and other standardisation bodies, its role in standardization is further growing. 3GPP is using TTCN-3 as the test specification language for UE conformance tests from Rel. 8 and onward to LTE and VoLTE, with NB-IoT on horizon. TC INT is using TTCN-3 for automating IMS core network interoperability testing. TC ITS is using TTCN-3 to specify all its test suites under the EC mandate M/453. In 2016 oneM2M hast started using TTCN-3 for IoT/M2M conformance test development.

Significant number of TTCN-3 test toolsets are available on the market (at least 7 commercial tools and 2 internal tools of industrial ETSI members) that also indicate the high interest and use of the language. Due to serving several domains and application areas, the TTCN-3 standards which provide the foundation for this testing technology, are quite complex and encompass multiple hundreds of pages. Part 1 of the TTCN-3 series, the TTCN-3 core language, alone is estimated to contain on the order of 5,000 requirements. Over the past 10 years the TTCN-3 community has repeatedly requested by for some kind of assurance that tools conform to TTCN-3 standards. A standardized testing language such as TTCN-3 should lead by example, i.e., tools that check conformance of systems to standards should also be tested for their compliance to standard.

* 1. Organization in phases

Based on the above requests, TC MTS developed a first conformance test suite in STF 409 which lead to the discovery of 19 issues or ambiguities in the TTCN-3 standard version v4.2.1 when covering about 1/3 of the clauses in the main standard with some tests. The test suite was extended, re-based to TTCN-3 v4.9.1 by STF433, STF454, STF470, STF487, STF521, and STF548 and a new coverage analysis approach, reaching 100 % coverage of the core language clauses, and synchronized with the up-to-date revision. TTCN-3 is, however, a living language. A new version is published by ETSI each year; the latest published version is v4.9.1.

TC MTS’s target with this STF request is to re-synchronize the development of the TTCN3 language and its conformance test suite, considering the changes being introduced in v4.10.1 and v4.11.1, and to validate the extensions of the conformance test suite over preliminary implementations in multiple TTCN-3 tools. This way the updated core language standard can be published together with the updated 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. In addition, this planned STF shall be developing (non-validated) conformance tests for the draft v4.11.1 of the TTCN-3 standard; the availability of such conformance test suite shall aid the work of the TTCN-3 tool implementers for avoiding mistakes or standard-related misunderstandings with the new tool upgrade.

# Objective

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 and the XML handling parts. Additional goals are to develop the conformance testing suite for the object oriented extensions and the JSON handling parts. In the course of this work, the STF shall revise and update the ICS, test purposes and the TTCN-3 tests.

# Relation with ETSI strategy and priorities

This STF directly supports the ETSI strategic objectives: Standards enablers/facilitators (conformance testing, interoperability, methodology)

Market impact, benefits to be gained

Strategic importance behind the work: the decisions by 3GPP RAN5 to move to TTCN-3 from Release 8 onwards, TC TISPAN to develop NGN test suites, TC INT to develop core IMS network test suites, and TC ITS to develop conformance and interoperability test suites in TTCN-3, all required the availability of a number of different, high quality, commercial TTCN-3 tools and well as the ability for ETSI members to assess that these TTCN-3 tools really comply to the ETSI TTCN-3 standards.

* 1. Interest of ETSI Members and other stakeholders

Today as 3GPP, INT, and ITS test teams have started to use TTCN-3 as their conformance, interoperability and benchmarking test suites development language, the biggest potential stakeholders are the mobile telecommunication and intelligent transport systems communities: operators, network and user equipment manufacturers, chipset and ITS infrastructure vendors, automotive companies, and test equipment manufacturers.

* 1. Relation with other activities within ETSI and/or related organizations

TTCN-3 is THE standard programming language used by all ETSI TCs producing conformance test suites. It is also used for benchmarking test suites, interoperability test suites and interworking test suites.

* 1. Priority within the TC

This STF proposal has a HIGH priority in order to support further growth of TTCN-3 in 3GPP, ETSI, OMA, AUTOSAR and other bodies and to response to user requirements in a timely fashion.

# Context of the proposal

## ETSI Members support

The following ETSI Members support the creation of this STF:

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| Telefon AB LM Ericsson | Dr. Gyorgy Rethy | TTCN-3 is extensively used and plays a strategic role in all phases of product development. |
| Institut fuer Informatik, Universitaet Goettingen | Dieter Hogrefe | The University of Goettingen is interested in the further development of TTCN-3, because we are involved in several research and development projects where testing with TTCN-3 plays a central role. |
| Fraunhofer FOKUS | Ina Schieferdecker | TTCN-3 plays a central role in our R&D projects and in our training programs, so that TTCN-3 tools compliance to the standard and their interoperability is important to us. |
| Spirent | Stephan Pietsch | Spirent promotes TTCN-3 since the very beginning nore than 10 years ago with tools and services. From end-users we understand that the compatibility of TTCN-3 tools applied is crucial for the further deployment of TTCN-3, at companies and at standardisation bodies and for gremias. |
| Elvior | Andres Kull | Elvior as TTCN-3 tool vendor is interested in evolving of the language.It is important that different tool vendors interpret all aspects of TTCN-3 language in a similar way, output of this STF will help to achive this target. |
| Broadbit | Andras Kovacs | Broadbit is using TTCN-3 tools for providing testing and integration services for ITS (Intelligent Transportation Systems) and V2G (Vehicle-to-Grid) technologies. When working with emerging technologies, it is especially important that the testing tool must be reliable and unambiguous. |

## Market impact

The common motivation of the supporting organizations is to increase the overall use of TTCN-3 and respond to user community duly and timely.

## Tasks for which the STF support is necessary

Earlier attempts by TC MTS to create an official test suite based on voluntary contributions, e.g. by collecting regression tests from tool vendors, have not lead to a fruitful output. There are many different factors and reasons. Tool vendors consider regression tests maybe as their most important asset over their competition. Also differences in regression test approaches, structures of test suites and granularity of test cases have had disallowed creating a meaningful test suite. The excellent results of STF 409, STF 433, STF 454, and STF 470, STF 487, STF 521 and STF 548 have shown that the STF model works for this purpose very well.

Also, the nature of the work (analysis of programming languages, interworking of different notation languages, coding technologies, test scripting) requires mixed and specialized expertise that is not common and partly available by delegates attending ETSI meetings.

## Related voluntary activities in the TB

The ETSI Members supporting the creation of the STF are prepared to provide the following voluntary contribution:

* Telefon AB LM Ericsson: participation in Steering Committee, review of documents.
* Universitaet Goettingen: input in form of TTCN-3 CRs, providing voluntary resources in addition to STF resources for reviewing the draft documents, participation in TTCN-3 steering committee
* Fraunhofer FOKUS: reviewing the draft documents, participation in TTCN-3 steering committee
* Spirent: participation in Steering Committee, provision of TTCN-3 tool for validation & voluntary resource for STF work.
* Elvior: participation in Steering Committee, provision of TTCN-3 tool for validation & voluntary resource for STF work.

## Previous funded activities in the same domain

TC MTS developed a first conformance test suite in STF 409, covering about 1/3 of the clauses in the main standard with some tests. The test suite was extended, re-based to TTCN-3 v4.5.1 by STF433, STF454, and STF470 and a new coverage analysis approach, reaching 100 % coverage of the core language clauses, and synchronized with the up-to-date revision. TTCN-3 is, however, a living language; a new version is published by ETSI each year; the latest published version is v4.9.1. STF487, STF521, and STF548 has kept the conformance test suite up to date with the new TTCN-3 language revisions, and also developed a test suite for testing the XML handling of the language. The scope of successive STFs is planned through consultation with the MTS and TTCN-3 tool user communities.

A total of about 250 k€ have been spent under ETSI FWP budget for STFs on TTCN tools testing, in the last 6 years.

## Consequences if not agreed

The further adoption of TTCN-3 at ETSI, 3GPP, OMA, and other standardisation bodies are put at risk, if this continuation work is not done. As tool support of the required features is dependent on the standardization of the features, not agreeing this proposal would have an unfavourable effect on the above domains. Also, further uptake and usefulness of the language will be adversely affected, thus jeopardizing ETSI’s significant contribution to this work.

Part II - Execution of the work

# Technical Bodies and other stakeholders

## Reference TB

TC MTS.

## Other interested ETSI Technical Bodies

3GPP LTE, TC BRAN, TC ITS, TC INT, TC ERM: these TCs use TTCN-3 for test suite development and their members are impacted by TTCN-3 tools’ compatibility.

## Other stakeholders

OMA is using TTCN-3 to develop and maintain conformance test suites.

ISO/IEC 15118 committee is using TTCN-3 to develop and maintain V2G conformance test suites.

# Base documents and deliverables

## Base documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Document** | **Title** | **Current Status** | **Expected date for stable document** |
| ETSI ES 201 873-1 V4.10.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3;Part 1: TTCN-3 Core Language | Under development |  |
| ETSI ES 201 873-4 V4.10.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 4: TTCN-3 Operational Semantics | Under development |  |
| ETSI ES 201 873-11 V4.6.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 7: Using JSON with TTCN-3 | Under development |  |
| ETSI ES 201 873-9 V4.A.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 9: Using XML schema with TTCN-3 | Under development |  |
| ETSI ES 201 873-10 V4.10.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 10: TTCN-3 Documentation Comment Specification | Under development |  |
| ETSI ES 201 873-1 V4.11.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3;Part 1: TTCN-3 Core Language | Under development |  |
| ETSI ES 203 790 (DES/MTS-203790-00F\_ed111) | Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; TTCN-3 Language Extensions: Object Orientation Features | Under development |  |
| ETSI ES 201 873-4 V4.11.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 4: TTCN-3 Operational Semantics | Under development |  |
| ETSI ES 201 873-11 V4.7.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 7: Using JSON with TTCN-3 | Under development |  |
| ETSI ES 201 873-9 V4.A.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 9: Using XML schema with TTCN-3 | Under development |  |
| ETSI ES 201 873-10 V4.11.1 | Methods for Testing and Specification (MTS);The Testing and Test Control Notation version 3; Part 10: TTCN-3 Documentation Comment Specification | Under development |  |
| ETSI TS 102 950-1 V1.7.1 | Methods for Testing and Specification (MTS);TTCN-3 Conformance Test Suite;Part 1: Implementation Conformance Statement (ICS) | Published  |  |
| ETSI TS 102 950-2 V1.7.1  | Methods for Testing and Specification (MTS);TTCN-3 Conformance Test Suite; Part 2: Test Suite Structure and Test Purposes (TSS&TP) | Published  |  |
| ETSI TS 102 950-3 V1.7.1  | Methods for Testing and Specification (MTS);TTCN-3 Conformance Test Suite; Part 3: Abstract Test Suite (ATS) and Implementation eXtra Information for Testing (IXIT) | Published  |  |
| ETSI TS 103 253 V1.4.1 | Methods for Testing and Specification (MTS); Conformance test suite for using XML schema with TTCN-3; Part 1: Implementation Conformance Statement (ICS) | Published  |  |
| ETSI TS 103 254 V1.4.1  | Methods for Testing and Specification (MTS); Conformance test suite for using XML schema with TTCN-3; Part 2: Test Suite Structure and Test Purposes (TSS&TP) | Published  |  |
| ETSI TS 103 255 V1.4.1  | Methods for Testing and Specification (MTS); Conformance test suite for using XML schema with TTCN-3; Part 3: Abstract Test Suite (ATS) and Implementation eXtra Information for Testing (IXIT) | Published  |  |

## Deliverables

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code****Standard number** | **Working title****Scope** |
| D1 | RTS/MTS-00132-1ed181 TS 102 950-1 ed181 | TTCN-3 Core Language Conformance Test Suite - Part 1 : Implementation Conformance Statement |
| D2 | RTS/MTS-00132-2ed181 TS 102 950-2 ed181 | TTCN-3 Core Language Conformance Test Suite - Part 2: Test Suite Structure & Test Purpose |
| D3 | RTS/MTS-00132-3ed1712ed181 TS 102 950-3 ed181 | TTCN-3 Core Language Conformance Test Suite - Part 3: Abstract Test Suite & IXIT |
| D4 | RTS/MTS-103253ed151TS 103 253 ed151 | Conformance test suite for using XML schema and JSON with TTCN-3 - Part 1: Implementation Conformance Statement |
| D5 | RTS/MTS-103254ed151TS 103 254 ed151 | Conformance test suite for using XML schema and JSON with TTCN-3 - Part 2: Test Suite Structure and Test Purposes |
| D6 | RTS/MTS-103255ed151TS 103 255 ed151 | Conformance test suite for using XML schema and JSON with TTCN-3; Part 3 - Abstract Test Suite (ATS) and IXIT |
| D7 | DTS/MTS-103663-1 | TTCN-3 Object Oriented extensions Conformance Test Suite - Part 1 : Implementation Conformance Statement |
| D8 | DTS/MTS-103663-2 | TTCN-3 Object Oriented extensions Conformance Test Suite - Part 2: Test Suite Structure & Test Purpose |
| D9 | DTS/MTS-103663-3 | TTCN-3 Object Oriented extensions Conformance Test Suite - Part 3: Abstract Test Suite & IXIT |

## Deliverables schedule:

The general timeline of milestones for all deliverables produced in this STF is defined as follows:

* **M0: Start of work - April 2019**
* **M1: Stable Draft of deliverables - July 2019**

Stable draft deliverables mentioned in section 6.3 ready for review by TC#MTS. STF Draft Report uploaded to docbox.

* **M2: Deliverables published, STF closed - December 2019**

Final draft of deliverables mentioned in section 6.3 approved by TC#MTS and accepted by the ETSI Secretariat for publication. STF Final Report approved by TC ITS (RC). All deliverables are published.

# Work plan, time scale and resources

## Organization of the work

The goal of this STF is the updating and extension of conformance test suite for TTCN-3 tools. Therefore the work is organized around the usual stages of conformance test suite development, i.e. delivery of an early draft, stable draft, and final draft that are defined as milestones M1–M4 below. The STF consists of just one single phase of development.

Once draft versions of the conformance test suite for TTCN-3 tools become available, they will be sent out to ETSI MTS and tool vendors outside of ETSI for review and feedback. Since there are two milestones M1 and M2 foreseen to solicit feedback, there is sufficient room for delivering an enhanced and improved conformance test suite for TTCN-3 tools that fits the needs of tool vendors.

The existing conformance test suite for TTCN-3 tools will be enhanced by updating and extending it, in order to bring it in line with v4.10.1 (validated) and v4.11.1 (non-validated) of the core language standard.

Effort estimation for the various tasks of the STF is centered around the number of sessions that can be organized within the timeframe of this STF and the number of experts involved in each task:

* STF leader performs Tasks 1 and 14
* Other tasks are equally shared among involved experts, with Tasks 2 to 8 comprising the main effort in this STF.

MTS Committee has established a TTCN-3 Steering Group for the direct steering of STFs for TTCN-3 evolution and conformance tests that will closely follow the progress of this STF. STF outputs will also be reviewed and approved by TC MTS. It is very likely that some active TC MTS members will apply to be involved in this STF and will hence be in direct contact with TC MTS via the usual communication means (MTS\_GEN mailing list, MTS face-to-face meetings, conference calls). Support from the CTI department will also be requested and is seen as being vital to the success of this work.

## Task description

Task 0 – Project management

Objectives

* Planning, organisation, and preparation of STF meetings
* On-going reporting
* Participation at SG and TC meetings
* Delivery of the STF reports

Input

* This ToR
* Information from the preparatory meeting
* TTCN-3 CRs in the ETSI Mantis system
* Expertise availability information and other project management data

Output

* Session plan
* Reporting STF session plan and working progress after sessions to TC MTS
* Materials for SG and TC meetings
* Progress reports
* Final report

Interactions

* The STF leader will interact with the SG and TC MTC
* Communicating with other interested bodies and STFs, in particular TTCN-3 evolution STF
* Additional support will be provided by the ETSI secretariat

**Task 1** –  **Listing of changes**

**Objectives**

Listing of changes between the V4.9.1 and V4.10.1 and between the V4.10.1 and V4.11.1 revisions of the TTCN-3 core standard and of the XML part, listing of test cases for the new object-oriented language features and for the JSON part, and corresponding assignment of Task 2-4 work among STF experts.

**Input**

V4.9.1, V4.10.1, and V4.11.1 versions of the TTCN-3 core standard, and the corresponding versions of the TTCN-3 Object Oriented, XML, and JSON standards.

**Task 2 – TTCN-3 Part 1 new/changed features**

**Objectives**

Extension of the TTCN-3 conformance test suite by writing tests for the new/changed core language features. The tests are divided into test cases corresponding to V4.10.1 (to be validated in Task 7) and test cases corresponding to V4.11.1 (shall remain non-validated in this STF).

**Input**

Output from Task 1, work allocation by STF leader.

**Task 3 – TTCN-3 Object Oriented features**

**Objectives**

Extension of the TTCN-3 conformance test suite by writing tests for the newly introduced Object Oriented language features. The tests are divided into test cases corresponding to the published standard version (to be validated in Task 7) and test cases corresponding to the latest draft standard version (shall remain non-validated in this STF).

**Input**

Output from Task 1, work allocation by STF leader.

**Task 4 – TTCN-3 Part 9 new/changed features**

**Objectives**

Extension of the TTCN-3 conformance test suite by writing tests for the new/changed language features for the XML part. The tests are divided into test cases corresponding to the published standard version (to be validated in Task 7) and test cases corresponding to the latest draft standard version (shall remain non-validated in this STF).

**Input**

Results from Task 1, work allocation by STF leader.

**Task 5 – TTCN-3 Part 11 new/changed features**

**Objectives**

Extension of the TTCN-3 conformance test suite by writing tests for the JSON part. These tests are newly introduced to conformance test suite. The tests are divided into test cases corresponding to the published standard version (to be validated in Task 7) and test cases corresponding to the latest draft standard version (shall remain non-validated in this STF).

**Input**

Results from Task 1, work allocation by STF leader.

**Task 6 – Tools/Adaptation**

**Objectives**

Extension of the TTCN-3 conformance test execution tools, as needed, to support changed language features relating to external functions, pre-processing, ports ...etc. Tool adaptation is needed to handle the JSON mapping related tests, which are developed for the first time in this STF scope.

**Input**

Feedbacks from Tasks 2 to 5.

**Task 7 – Validation**

**Objectives**

Validation of the extended TTCN-3 conformance test suite over at least two TTCN-3 compilers.

**Input**

Results from Tasks 2 to 5.

**Task 8 – Discussion of validation results**

**Objectives**

Discussion of validation results with involved tool vendors, assignment of TTCN-3 conformance test suite refinement tasks as needed.

**Input**

Results from Task 7.

**Output**

Test correction plan for Tasks 9 to 12.

**Interactions**

The STF leader will involved tool vendors

Issue resolution proposals from participating STF experts and external tool vendors’ experts will be discussed via iterative issue resolution process.

**Task 9 – TTCN-3 Part 1 Correction of tests**

**Objectives**

Correction and refinement of the extended core language conformance test suite, based on the validation feedback.

**Input**

Feedbacks from Task 8.

**Task 10 – TTCN-3 Object Oriented Correction of tests**

**Objectives**

Correction and refinement of the object oriented conformance tests, based on the validation feedback.

**Input**

Feedbacks from Task 8.

**Task 11 – TTCN-3 Part 9 Correction of tests**

**Objectives**

Correction and refinement of the extended XML part conformance test suite, based on the validation feedback.

**Input**

Feedbacks from Task 8.

**Task 12 – TTCN-3 Part 11 Correction of tests**

**Objectives**

Correction and refinement of the JSON part conformance test suite, based on the validation feedback.

**Input**

Feedbacks from Task 8.

**Task 13 – Change requests**

**Objectives**

Raising of CRs to the TTCN-3 developers over the observed language issues/ambiguities

**Input**

Feedbacks from Tasks 2 to 12.

**Task 14 – Presentation of results**

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.

## Milestones

* **M0: Start of work - March 2019**
* **M1: Stable Draft of deliverables - July 2019**

Stable draft deliverables mentioned in section 6.3 ready for review by TC#MTS. STF Draft Report uploaded to docbox.

Tasks 1-6 completed

* **M2: Deliverables published, STF closed - December 2019**

Final draft of deliverables mentioned in section 6.3 approved by TC#MTS and accepted by the ETSI Secretariat for publication. STF Final Report approved by TC ITS (RC). All deliverables are published.

Tasks 0-14 completed

## Task summary

|  |  |  |
| --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date |
| EUR |
| M0 | Start of work | March 2019 |  |
| T0 | Project management | 22-Apr-2019 - 31-Dec-2019 | 3500 |
| T1 | Listing of changes | April 2019 | 700 |
| T2 | TTCN-3 Part 1 new/changed features | 22-Apr-2019 - 31-Jul-2019 | 30800 |
| T3 | TTCN-3 Object Oriented features | 22-Apr-2019 - 31-Jul-2019 | 24500 |
| T4 | TTCN-3 Part 9 new/changed features | 22-Apr-2019 - 31-Jul-2019 | 5600 |
| T5 | TTCN-3 Part 11 new/changed features | 22-Apr-2019 - 31-Jul-2019 | 14700 |
| T6 | Tools/Adaptation | 22-Apr-2019 - 31-Jul-2019 | 3500 |
| T7 | Validation | 01-Aug-2019 - 31-Aug-2019 | 2100 |
| A | Stable Draft availableProgress Report A to be uploaded on 09-Aug, presented and approved at MTS#78 | 12-Sep-19 |  |
| T8 | Discussion of validation results | 01-Aug-2019 - 30-Oct-2019 | 2800 |
| T9 | TTCN-3 Part 1 Correction of tests | 01-Aug-2019 - 30-Oct-2019 | 4550 |
| T10 | TTCN-3 Object Oriented Correction of tests | 01-Aug-2019 - 30-Oct-2019 | 3850 |
| T11 | TTCN-3 Part 9 Correction of tests | 01-Aug-2019 - 30-Oct-2019 | 1050 |
| T12 | TTCN-3 Part 11 Correction of tests | 01-Aug-2019 - 30-Oct-2019 | 2450 |
| T13 | Change requests | 01-Nov-2019 - 30-Nov-2019 | 2100 |
| T14 | Presentation of results | 01-Dec-2019 - 31-Dec-2019 | 2800 |
| B | Final draft to be uploaded on DecFinal report and deliverables to be presented and approved at MTS#79Deliverables published, STF closed | 31-Jan-2020 |  |
| **Total** | **105 000** |

## Working methods and travel cost

Several online coordination sessions shall be organized by the STF leader in order to synchronize and allow new members an easy introduction to the STF tools and processes. Test suite synchronization and progress tracking will be managed through an SVN repository.

The travel costs to one MTS meeting are budgeted for the presentation and discussion of final STF results. The interim STF results will be presented to the MTS group via online presentation.

# Expertise required

## Team structure

Applicants must ensure the following mix of competences:

* Availability of high expertise competence in TTCN-3
* At least one with expertise competence in XML Schema Definition (XSD) and in JSON
* Experience in conformance test development.
* Additional competence in mobile telecommunication technologies would be appreciated.

The actual number of applicants depends on the actual mix of skills in the applications received and will be decided when setting up the STF.

* Support from the CTI team will be vital to the success of this work.

Part III: Financial conditions

# Maximum budget

## Manpower cost

The base estimation for the manpower costs to be expected is 105 000 €.

## Travel cost

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate (EUR)** |
| Attending MTS plenary meeting to present STF results for approval (1 travel within Europe) | 1 000 |
| **Total cost** | **1 000** |

## Other Costs

– none –

Part IV: STF performance evaluation criteria

# Key Performance Indicators

The STF shall base its work on the yet unpublished TTCN-3 standard. In the cases when clarification of the standards is needed, the STF shall coordinate with TTCN-3 evolution STF. Validation of the developed test specification – in particular the TTCN-3 code – is considered to be a task performed by the STF but is also expected to be assisted and supported by MTS TTCN-3 tool vendor members including but not limited to Elvior, Testing Technologies, Tool vendors will provide licenses, required tool versions, and tool usage support to the STF members as necessary. The results will be presented in the Final Report. The following indicators will be used:

Contribution from the ETSI Members

* Voluntary work of experts provided free of charge in form of CRs being provided and CR resolutions being reviewed
* Steering Group meetings
* Provision of TTCN-3 tools & support
* Contribution from other ETSI TBs

Interests of ETSI and non-ETSI stakeholders

* Feedback from TTCN-3 tool vendors
* Number of tools compliant to test suite

Quality of the STF results

* Approval of deliverables according to schedule
* Respect of time scale, with reference to start/end dates in the approved ToR
* Comments from Quality review by TB
* Comments from Quality review by ETSI Secretariat

Time recording

For reporting purposes the STF experts shall fill in the time sheet provided by ETSI with the days spent for the performance of the services

In the course of the activity, the STF Leader shall collect the relevant information, as necessary to measure the performance indicators. The result will be presented in the Final Report.

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 04-Sept-2018 | 1. Kovacs
 | Draft |  |
| 0.2 | 10-Oct-2018 | 1. Kovacs
 | Draft |  |
| 1.0 | 13-Dec-2018 | 1. Kovacs
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| 1.2 | 28-Feb-2019 | Youssouf Sakho | Board Approved | Updates before CL publication |