TTF T003 - Final Report for ETSI			
Presented to ETSI meeting		**Author:**	Prof. Jens Grabowski
		Date:	26/02/2021
Doc ref		**Version**	

TTF	**T003**
TB/WG	**MTS**

TTF leader	Prof. Jens Grabowski
TB responsible	Dr. Philip Makedonski
Administrator	Ms. Elodie Rouveroux

TTF title:	TTCN-3 Maintenance and Testing 2020

Milestone	**D**		**Status Template**	**Covers the period until (cut-off date)**	31/03/2021
Objective	Final Report and final drafts of all remaining deliverables approved by TC MTS by correspondence				
Achieved	**Yes**				
Remarks					

Achieved dates

Template	Draft report	TB approval	ETSI approval		
26/02/2021					

1 Executive summary

The TTCN-3 testing language has intensively been developed by ETSI during the last 15 years, by today, it consists of 24 ETSI standards, altogether comprising almost 1800 pages and more than 3300 test cases in TTCN-3 code. The language is also endorsed by ITU-T as the Z.16x and Z.17x Recommendation series. By now TTCN-3 is used exceptionally as the formal specification language of standardized test suites and has also become an important testing technology at various ETSI member companies and in several industrial domains (http://www.ttcn-3.org/index.php/about/references/applicatio-domains) and standards organizations (http://www.ttcn-3.org/index.php/about/references).

Significant number of TTCN-3 test toolsets are available on the market. At least five commercial tools, five free or open source tools and one internal test tool of an industrial ETSI member are known to exist (http://www.ttcn-3.org/index.php/tools). This also indicates the high interest and use of the language. TTCN-3, as THE standard test language, serving several domains and application areas, is specified in very detail. For example, the TTCN-3 core language alone is estimated to contain about 5,000 requirements. It is of upmost importance for users of standard test suites as well as for industrial users that the TTCN-3 tools conform to the TTCN-3 language standards. This can be secured by TTCN-3 tool conformance test suites, in a similar way as implementations of other ETSI standards (e.g. protocol specifications) are checked by means of ETSI-developed conformance test suites. In the past, the TTCN-3 tool conformance test suite development process itself has led to several language standard clarifications.

TTF T003 573 "TTCN-3 Maintenance and Testing 2020" has two objectives. The first objective is to maintain the high quality of the language and at the same time keep it harmonized with the new requirements of the users, new application areas and new ways of working like Agile SW development. The second objective is to maintain and further develop the TTCN-3 tool conformance test suites in order to reach full test coverage of the TTCN-3 series of standards.

The TTF team consists of 9 experts. For health reasons, the expert Axel Rennoch was replaced by Ramon Barakat in January 2021.

During three working session for Task 1 "TTCN-3 maintenance and further development" TTF T003 closed and implemented 50 CRs in 9 documents. 14 CRs will remain open. They have to be resolved in the scope of the next TTCN-3 maintenance project. As part of the work on Task 1, TTF T003 organized two webinars for promoting TTCN-3 in general, the Object Oriented features of TTCN-3 and the TTF work in general. In addition, TTF T003 updated the TTCN-3 leaflet and contributed to the TTCN-3 webpage http://www.ttcn-3.org/.

The work on Task 2 "Conformance test suites for TTCN-3 tools and sub-tasks" has completed. All experts completed writing and validating the test cases according to their assignments. For Fraunhofer, the test cases were written by Ramon Barakat. The test suites were validated on multiple TTCN tools (by Agilent, Elvior, and Ericsson), and we reached consensus on the validation results. Several CRs for Task 1 were raised.

2 Introduction

2.1 Scope, major aims of the TTF work

The main aim of the TTF work was the maintenance and conformance testing of the the TTCN-3 language.

The maintenance task comprises the handling of TTCN-3 CRs which report defects, request clarifications and propose new language features. The CR handling implements the solutions to the CRs in the related ETSI standards. Maintenance also includes updates of the TTCN-3 leaflet and the TTCN-3 web pages.

The work on the TTCN-3 conformance testing task includes the maintenance and further development of the conformance test suites in order to reach full test coverage of the TTCN-3 series of standards. The application of the test suites ensures the conformance of TTCN-3 tools to the TTCN-3 language standards. Specifically, the following parts are validated by the conformance test suite: Core standard, XML, JSON, and Object Oriented extensions.

2.2 TTF activity and expected output

The work on Task 1 "TTCN-3 maintenance and further development" comprises the following assignments:

- Review and resolve change requests reporting technical defects or requesting clarifications and new language features for all existing TTCN-3 language standards.

- Develop proposals for language extensions requested by ETSI TBs, 3GPP, oneM2M, ETSI members and the TTCN-3 community and consent the solution with the contributor(s).
- Implement agreed solutions.
- Manage the change request (CR) process.
- Manage the interim versions of the standard according to 3GPP needs (when requested), and the versions for approval.
- Present the TTCN-3 standards' status and the work of the TTF (previously STF) at the conference(s) associated with ETSI TB MTS and at ETSI TC MTS meetings.
- Providing input for the updates of the TTCN-3 leaflet and the TTCN-3 web pages.

The work on Task 2 "Conformance test suites for TTCN-3 tools and sub-tasks" comprises the following assignments:

- Analysis of the latest published versions of the relevant TTCN-3 standards and identifying new and changed requirements.
- Identifying affected existing test cases and define new test cases for the new requirements.
- Implement changes and additions in the textual part of the deliverables (PICS, TSS&TP, textual part of the ATS).
- Implement changes and additions in the code of the ATS.
- Verification of the test cases with test tools.

The expected output are
- the revised versions of the TTCN-3 standard documents, for which one or more CRs have been resolved,
- updated versions of the TTCN-3 leaflet and the TTCN-3 web pages, and
- revised and extended versions of the TTCN-3 conformance test deliverables.

Interim versions of TTCN-3 standard documents were not required by 3GPP and therefore not produced.

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

The reference TB for the TTF is TB MTS. TB MTS supervises the TTF work at regular TB meetings. TB MTS has also established a TTCN-3 Steering Group to resolve technical issues escalated by the TTF or any ETSI member to the TB. The work status of the TTF is reported to TB MTS after each TTF session (by mail correspondence on the MTS-GEN mail exploder list) and at each regular TB MTS meeting. TTF outputs will also be reviewed and approved by TB MTS. Some active TB MTS members have also been involved in this TTF and hence be in direct contact with TB MTS via the usual communication means (e.g., MTS-GEN mailing list, MTS face-to-face meetings, conference calls).

3 Overview of the organization of the activity

3.1 Team composition and experts' qualification

The TTF consists of the following experts:

Name	Organization/Company	Qualification
Ramon Barakat	Fraunhofer FOKUS	TTCN-3 user, researcher on test methods
Jens Grabowski	University of Goettingen	Researcher on test methods and test languages
Andras Kovacs	Broadbit	TTCN-3 user, test consultant
Lénárd Nagy	Ericsson Hungary	TTCN-3 user, tool provider
Axel Rennoch	Fraunhofer FOKUS	TTCN-3 user, researcher on test methods
György Réthy	Ericsson Hungary	TTCN-3 user, tool provider
Bogdan Stanca-Kaposta	Spirent Communications	TTCN-3 tool provider
Kristóf Szabados	Ericsson Hungary	TTCN-3 user, tool provider
Tomaš Urban	Elvior OU	TTCN-3 tool provider
Jacob Wieland	Spirent Communications	TTCN-3 tool provider

For health reasons, Axel Rennoch was replaced by Ramon Barakat in January 2021.

3.2 TTF teamwork, distribution of tasks, working methods

The TTF teamwork has been split into two main tasks:

Task 1 – TTCN-3 maintenance and further development

The work on Task 1 "TTCN-3 maintenance and further development" comprises the following assignments:

- Review and resolve change requests reporting technical defects or requesting clarifications and new language features for all existing TTCN-3 language standards.
- Develop proposals for language extensions requested by ETSI TBs, 3GPP, oneM2M, ETSI members and the TTCN-3 community and consent the solution with the contributor(s).
- Implement agreed solutions.
- Manage the change request (CR) process.
- Manage the interim versions of the standard according to 3GPP needs (when requested), and the versions for approval.
- Present the TTCN-3 standards' status and the work of the TTF (previously STF) at the conference(s) associated with ETSI TB MTS and at ETSI TC MTS meetings.
- Providing input for the updates of the TTCN-3 leaflet and the TTCN-3 web pages.

For performing these tasks, the TTF orgnized three online working sessions in 2020 where all experts involved in Task 1 work in parallel at home and two weeks of (partially voluntary) homework spent for final CR cleaning and editorial work on the draft deliverables. Online working sessions of the TTF have been:

- W32, 04 – 09 August 2019, Tallinn
- W35, 26 – 28 August 2019 (3 days), Berlin
- W51, 16 – 18 December 2019 (3 days), Tallinn

The following online working sessions for the work on Task 1 have been carried out:

- Week 33: 10. - 14. Aug.2020
- Week 41: 05. - 09. Okt. 2020
- Week 50: 07. - 11. Dec. 2020

During the face-to-face working sessions, the TTF work was mainly based on the CR resolution process. Newly identified issues were reported in form of new CRs. The CR resolution process was executed in the following manner:

1. Discussion of the CR within the TTF and, where necessary drafting a rough resolution.
2. Assignment of the CR to a TTF member for developing a resolution.
3. Development of a CR resolution. The development may require:

   a. Further discussions with individual TTF members or with the whole TTF,
   b. Perform inquiries to the reporter of the CR in case of ambiguities, or
   c. Raising related CRs if several TTCN-3 language features or documents are affected.
4. Proofreading of the CR resolution by another TTF expert. Step 3 is re-entered in case of problems.
5. Implementation of the resolution by the editor of the TTCN-3 standard. The implementation includes another proofreading of the resolution.

Please note:

- Interim versions of TTCN-3 language standards were not required by 3GPP and therefore not produced.

Task 2 – Conformance test suites for TTCN-3 tools and sub-tasks

The work on Task 2 “Conformance test suites for TTCN-3 tools and sub-tasks” comprises the following assignments:

- Analysis of the latest published versions of the relevant TTCN-3 standards and identifying new and changed requirements.
- Identifying affected existing test cases and define new test cases for the new requirements.
- Implement changes and additions in the textual part of the deliverables (PICS, TSS&TP, textual part of the ATS).
- Implement changes and additions in the code of the ATS.
- Verification of the test cases with test tools.

Experts worked individually on the test case writing, with periodic coordination conference calls. The validation was initially run on one type of TTCN tool, and then repeated on an other type of TTCN tool. The unexpected validation outcomes were discussed with the involved test case authors, till a consensus was reached about the needed test case amendments.

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

There was no need to liaise.

3.4 Meetings attended on behalf of the TTF with the reference TB and other ETSI TBs

Date	Place	TB/Orga	Event description	Reason to attend	Expert(s)
08.09. – 09.09.20	Online	TC MTS	MTS#81 regular meeting	Presentation of progress report (milestone A)	Jens Grabowski, Andras Kovacs
06.10.20	Online	TC MTS	Webinar: TTCN-3 General Concepts and Applications	Promotion of TTCN-3 and work of TTF	TTF experts working on Task 1
09.10.20	Online	TC MTS	Webinar: TTCN-3 Language Extensions Object Oriented Features	Promotion of advanced TTCN-3 features and work of TTF	TTF experts working on Task 1
26.01. – 27.01.21	Online	TC MTS	MTS#82 regular meeting	Presentation of progress report (milestone C)	Jens Grabowski, Andras Kovacs

3.5 TTF communications, presentations, promotion, inside and outside ETSI, WEB pages etc

- TTF T003 organized two webinars for promoting TTCN-3 in general, the Object Oriented features of TTCN-3 and the TTF work in general. The webinars are accessible at:
  - TTCN-3 General Concepts and Applications: https://www.etsi.org/10-events/1795-2020-10-webinar-ttcn-3-general-concepts-and-applications
  - TTCN-3 Language Extensions Object Oriented Features: https://www.etsi.org/events/1790-2020-10-webinar-ttcn-3-language-extensions-object-oriented-features

- The TTF T003 webpage can be found on: https://portal.etsi.org/STF/STFs/STF-HomePages/T003

- TTF T003 continuously updates the TTCN-3 leaflet and contributes to the TTCN-3 webpage http://www.ttcn-3.org/.

- Further external communication is done via Mantis (http://forge.etsi.org/mantis/main_page.php) and emails.

4 Final status of the activity

4.1 Overview of the TTF work

Achievements of the work on Task 1 – TTCN-3 maintenance and further development

For working on Task 1, the TTF organized three online working sessions where all experts worked in parallel, as well as individual homework of the experts and one week of voluntary work spent for final CR cleaning and editorial work on the draft deliverables.

The following online working sessions for the work on Task 1 have been carried out:

- Week 33: 10. - 14. Aug.2020
- Week 41: 05. - 09. Okt. 2020
- Week 50: 07. - 11. Dec. 2020

The work of theTTF was mainly based on the resolution of CRs. The progress of the work on CRs can be followed in detail by using ETSI's Mantis system at http://oldforge.etsi.org/mantis/view_all_bug_page.php.

The TTF has delivered the following final drafts for TB approval of the revised ETSI standards in time:

- RES/MTS-201873-1v4.13.1 (ES 201 873-1) TTCN-3 Part 1: TTCN-3 Core Language
- RES/MTS-201873-7v491 (ES 201 873-7) TTCN-3 Part 7: Using ASN.1 with TTCN-3
- RES/MTS-201873-8T3ed481 (ES 201 873-8) TTCN-3 Part 8: Using IDL with TTCN-3
- RES/MTS-201873-9v4121 (ES 201 873-9) TTCN-3 Part 9: Using XML schema with TTCN-3
- RES/MTS-201873-11 v4.9.1 (ES 201 873-11) TTCN-3 Part 11: Using JSON with TTCN-3
- RES/MTS-202784ed181 (ES 202 784) TTCN-3 extension: Advanced Parameterization
- RES/MTS-202781ConfDeplv181 (ES 202 781) TTCN-3 extension: Configuration & Deployment support
- RES/MTS-202785v181 (ES 202 785) TTCN-3 extension: Behaviour Types
- RES/MTS-203790v131 (ES 203 790) TTCN-3 extension: Object-Oriented Features

Other deliverables in the ToR didn't receive any CR or no CR was resolved, therefore according to the TTF's ToR, no new version was produced and published.

During the working sessions, the 50 CRs listed below have been closed and implemented in final draft documents:

Part 01: TTCN-3 Core Language (21 CRs)

7874 Reintroduce restriction on restricted modified templates
7890 module parameters should behave like variables during control part execution
7892 Allow modification of matching symbols on static template level
7893 Allow use of non-deterministic functions in alt-statement header
7910 Allow parallel control parts/components
7911 Correct TTCN-3 Parts list in Foreword
7919 testcase should be possible to be defined without runs on
7925 Non-abstract signature templates
7958 semantic of interleave altsteps
7959 language keyword strings
7964 Assigning a universal charstring value to a charstring variable is now allowed, but very error prone
7971 typo in 5.2.2
7972 bad formatting in 16.1.5
7973 Update of Figure 1 in TTCN-3 part 1
7986 usage of the "data type" term is a bit confusing
7988 Clarification of a restriction on map types
7989 Incorrect references to compatibility rules
7990 lengthof for maps
7991 @nodefault for interleave
7992 Only signature parameters are restricted to be data types, return types not
7996 Are the keys of a set type unique?

Part 07: Using ASN.1 with TTCN-3 (1 CR)

7974 Update of Figure 1 in TTCN-3 part 7

Part 08: Using IDL with TTCN-3 (1 CR)

7975 Update of Figure 1 in TTCN-3 part 8

Part 09: Using XML with TTCN-3 (3 CRs)

7969 Ambiguity with decoding of embed_values
7976 Update of Figure 1 in TTCN-3 part 9
7982 Ambiguous decoding of xml

Part 11: Using JSON with TTCN-3 (7 CRs)

7913 conflicting examples for solidus encoding
7914 conflicting definition and examples for usi encoding
7915 Wrong field older in the example union
7916 The name "Values" does not seem to follow the naming convention of other types
7917 please add an example for number forbidden in JSON
7968 unclear description on what can be inside of a default
7977 Update of Figure 1 in TTCN-3 part 11

Ext Pack: Advanced Parametrization (ES 202 784) (1 CR)

7912 Missing reference

Ext Pack: Config & Deployment Support (ES 202 781) (1 CR)

7978 Dealing with parallel control components

Ext Pack: Behaviour Types (ES 202 785) (1 CR)

7984 sequence of RunsOnSpec, MtcSpec, SystemSpec in BehaviourType definitions

Ext Pack: Object-Oriented Features (Draft ES 203 790) (14 CR)s

7862 Allow trait classes and multiple inheritance
7864 Allow overloading for object methods.
7870 Allow definition of class properties
7871 Class templates to be added to the language?
7920 Clarification request: how should equality/inequality work for objects?

7952 ispresent, isvalue and isbound on objects
7957 add equals function to the object
7961 type in function description
7962 type in Queue description
7963 incorect text formatting in section B.1.0
7965 typo in B.1.8
7983 tliObj*Enter/Leave events should also get the class scope name
7985 allow objects inside record of/array
7993 Ambiguous description and example for constructors

Achievements of the work on Task 2 – Conformance test suites for TTCN-3 tools and sub-tasks

The work of Task 2 “Conformance test suites for TTCN-3 tools and sub-tasks” has completed. All experts completed writing and validating the test cases according to their assignments. For Fraunhofer, the test cases were written by Ramon Barakat - replacing Axel Rennoch. The test suites were validated on multiple TTCN tools (by Agilent, Elvior, and Ericsson), and we reached consensus on the validation results. Several CRs for Task 1 were raised.

Each expert used their own TTCN tool in the first round for the validation of conformance test cases, and then Spirent’s compiler was used for validation in the second round. One exception is the validation of Object Oriented test cases, as the Object Oriented extensions are presently supported only by Spirent’s compiler. We are grateful for Jacob Wieland’s help, who validated these test cases (even though not directly involved in the development of the conformance tests).

4.2 Technical risk, difficulties encountered and corrective actions taken

Task 1 – TTCN-3 maintenance and further development

During the work on Task 1, no technical risks or difficulties have been encountered.

As expected and similar to previous work on TTCN-3 maintenance, the resolution of 14 CRs (23.03.2021), has been left open for a future TTF working on TTCN-3 maintenance. The open CRs are:

General: TTCN-3 Change Requests (1 CRs)
7981 Support for REST APIs (HTTP)

Part 01: TTCN-3 Core Language (10 CRs)
7994 Allow coordinated shared access to component variables.
7998 lengthof for maps
7999 Evaluation of function calls in templates
8000 ES 201 873-1, clause 5.4.1.1, EXAMPLE 5 - v_int
8003 Typo in Section 6.2.16
8004 Unassigned variables in return statements
8005 It should be possible to reactivate a default
8006 Unnecessary Restriction 15.6.1 should be removed.
8007 Nested maps should be allowed
8009 Missing rule for no optional attribute (or default value of the optional attribute)

Part 06: TTCN-3 Control Interface (1 CR)
8010 When does tliModulePar trigger?

Ext Pack: Object-Oriented Features (Draft ES 203 790) (2 CRs)
8001 Syntax Error in Constructor invocation

8002 Operation "Select class" is missing in Overview of program statements and operations

The CR 7999 "Evaluation of function calls in templates" was submitted by MCC TF160 after completion of the deliverable RES/MTS-201873-1v4.13.1 (ES 201 873-1). After internal TTF discussions and a video conference with MCC TF160, an agreement was found on the way for the CR solution. Based on an estimate of the effort required to resolve the CR, the TTF decided to postpone the resolution to a future TTCN-3 maintenance TTF.

Task 2 – Conformance test suites for TTCN-3 tools and sub-tasks

The preceding TTCN-3 conformance testing TTFs have provided a sound methodological basis for the work of this TTF. The TTF work has started late in August 2020, but nevertheless the test case writing was catching up with the original project plan - except for Fraunhofer's contribution. The main unexpected event was the resignation of Axel Rennoch from Fraunhofer for health reasons from the TTF team at the beginning of December. After some delay, it was decided in January 2021 that his contribution will be covered by Ramon Barakat from Fraunhofer. Fortunately, the task handover to Ramon Barakat was successful, and he managed to complete Fraunhofer's planned contribution on time.

5 ETSI deliverables

Deliverables of Task 1 – TTCN-3 maintenance and further development

Deliverable: **RES/MTS-201873-1v4.13.1** Current status: **TB approval** Working title: **TTCN-3 Core V4121**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	2020-04-15
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-18
TB approval	2021-03-15
Draft receipt by ETSI Secretariat	
Publication	

RES/MTS-201873-1v4.13.1 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-1v4.13.1/MTS-201873-1v4.13.1v4123.docx

Deliverable: **RES/MTS-201873-7v491** Current status: **Start of Membership Vote** Working title: **TTCN-3: the use of ASN.1**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	2020-04-15
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-17
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-09
Publication	

RES/MTS-201873-7v491 can be found at:
https://www.etsi.org/deliver/etsi_es/201800_201899/20187307/04.09.01_50/es_20187307v040901m.pdf

Deliverable: **RES/MTS-201873-8T3ed481** Current status: **Draft receipt by ETSI Secretariat** Working title: **TTCN-3: IDL**	**Achieved date**
Creation of WI by WG/TB	2016-11-07
TB adoption of WI	2016-11-18
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-17
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-09
Publication	

RES/MTS-201873-8T3ed481 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-8T3ed481/MTS-201873-8T3ed481v472.docx

Deliverable: **RES/MTS-201873-9v4121** Current status: **Draft receipt by ETSI Secretariat** Working title: **TTCN-3 XSD V4111**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	2020-04-15
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-17
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-10
Publication	

RES/MTS-201873-9v4121 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-9v4121/MTS-201873-9v4121v4112.docx

Deliverable: **RES/MTS-201873-11 v4.9.1** Current status: **Draft receipt by ETSI Secretariat** Working title: **TTCN-3 ed. V4.9.1: Use of JSON**	**Achieved date**
Creation of WI by WG/TB	2018-11-12
TB adoption of WI	2018-11-26
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-17
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-10
Publication	

RES/MTS-201873-11 v4.9.1 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-11_v4.9.1/MTS-201873-11%20v4.9.1v482.docx

Deliverable: **RES/MTS-202784ed181** Current status: **Draft receipt by ETSI Secretariat** Working title: **TTCN-3 extension: Advanced Parameterization**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	2020-04-15
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-18
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-17
Publication	

RES/MTS-202784ed181 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00202784ed181/MTS-202784ed181v172.docx

Deliverable: **RES/MTS-202781ConfDeplv181** Current status: **Draft receipt by ETSI Secretariat** Working title: **TTCN-3 extension: Configuration & Deployment support**	**Achieved date**
Creation of WI by WG/TB	2018-11-12
TB adoption of WI	2018-11-26
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-18
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-10
Publication	

RES/MTS-202781ConfDeplv181 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00202781ConfDeplv181/MTS-202781ConfDeplv181v172.docx

Deliverable: **RES/MTS-202785v181** Current status: **Draft receipt by ETSI Secretariat** Working title: **TTCN-3 BehTypes V171**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	2020-04-15
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-18
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-17
Publication	

RES/MTS-202785v181 can be found at:
https://docbox.etsi.org/MTS/MTS/07-Drafts/00202785v181/MTS-202785v181v172.docx

Deliverable: **RES/MTS-203790v131** Current status: **Start of Membership Vote** Working title: **TTCN3ext_OOed111**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	2020-04-15
Start of work	
Early draft	
Stable draft	
Final draft for approval	2020-12-28
TB approval	2021-01-27
Draft receipt by ETSI Secretariat	2021-02-17
Publication	

RES/MTS-203790v131 can be found at:
https://www.etsi.org/deliver/etsi_es/203700_203799/203790/01.03.01_50/es_203790v010301m.pdf

Deliverables of Task 2 – Conformance test suites for TTCN-3 tools and sub-tasks

Deliverable: **RTS/MTS-102950-1v181 (TS 102 950-1)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; Core Standard Part: ICS**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-102950-2v181 (TS 102 950-2)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; Core Standard Part: TSS & TP**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-102950-3v181 (TS 102 950-3)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; Core Standard Part: ATS & IXIT**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-103253v161 (TS 103 253)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; XML and JSON Parts: ICS**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-103254v161 (TS 103 254)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; XML and JSON Parts: TSS & TP**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-103255v161 (TS 103 255)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; XML and JSON Parts: ATS & IXIT**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-103663-1v121 (TS 103 663-1)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; Object Oriented Part: ICS**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-103663-2v121 (TS 103 663-2)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; Object Oriented Part: TSS & TP**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Deliverable: **RTS/MTS-103663-3v121 (TS 103 663-3)** Current status: **Final draft completed** Working title: **TTCN-3 Conformance Test Suite; Object Oriented Part: ATS & IXIT**	**Achieved date**
Creation of WI by WG/TB	2020-04-07
TB adoption of WI	
Start of work	2020-08-01
Early draft	
Stable draft	2020-11-10
Final draft for approval	2021-03-29
TB approval	
Draft receipt by ETSI Secretariat	
Publication	

Annex A Performance indicators

A.1. Performance Indicators objectives achieved

Contribution from ETSI Members to TTF work

- Voluntary work of experts (free of charge or with partial remuneration)
  - The TTF experts provided voluntary work for email discussions between joint work sessions and for implementing resolutions in the TTCN-3 standard documents.
- Steering Group meetings (number of participants/duration)
  - TTCN-3 steering has been done during TB MTS meetings. There was no issue that needed escalation to the SG.
- Direct contribution of delegates (e.g. number of documents/comments/e-mail)
  - *CRs have been raised from TTCN-3 users, tool providers and ETSI TTFs. All CRs have been treated equally. The number of contributions raised from delegates has not been counted. Experts in this TTF also contributed to other TTF and raised CRs in the scope of the other TTFs.*

Liaison with other stakeholders

- TTCN-3 Change Requests are received in the CR handling tool (Mantis)
  - CRs have been raised from TTCN-3 users, tool providers and ETSI TTFs. All CRs have been treated equally.
- The TTF may liaise with 3GPP MCC TF160 and any other users within or outside ETSI
  - The TTF has regularly exchanged emails with MCC TF160 to clarify urgency of MCC TF160 CRs; also participated at MCC TF160s TTCN-3 tool vendors meetings.

Quality of deliverables

- Approval of deliverables according to schedule
  - The TTF met all deadlines specified in the ToR.
- Respect of time scale, with reference to start/end dates in the approved ToR
  - The TTF met all deadlines specified in the ToR.
- Quality review by TB
  - The quality of the work and progress of the TTF was monitored by the TB based on the mandatory progress reports and on verbal reports of the TTF during the MTS meetings.

Time recording

- The TTF experts reported in the days spent for the performance of the services in TAM.

A.2. Performance Indicators objectives not achieved

- Contribution from other ETSI TBs
  - No CR is received directly from other TB (though several CRs received from MCC TF160).
- Contributing the TTCN-3 standards to ITU-T SG17 for endorsement and assisting the endorsement process
  - This issue didn't require any specific action from the TTF, it will be handled by TB MTS according to the normal procedure.
- TTCN-3 tools implementing newest TTCN-3 features
  - New features added by this TTF will be implemented only after publishing the TTF's deliverables. The TTF does not receive information directly about which language features are implemented by which tool vendor.
- Quality review by ETSI Secretariat
  - The TTF is not aware of specific actions required for a quality review by ETSI

Annex B Resources allocated and spent

Author:	**ETSI - Funded Activities**	
Period covered:	**From: 15/07/2020**	**To: 31/05/2021**
Status:	**Final**	
Status date:	**26/02/2021**	

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

The resources allocated though the ETSI FWP was 98 900,00 € in total.
These have been divided into Manpower and travel budgets. The total expenses are summarized in the table below.

Table 1: Summary of resources spent

	Expertise Service Provision	Travel	Total
Resource Available	95 300,00€	3 600,00€	98 900,00€
Resource Usage	95 300,00€	0,00€	95 300,00€
Variance (Avail. - Usage)	0,00€	3 600,00€	**3 600,00€**

Travels

No Travels have been done. Budget travels has not been spent.