

| <b>TTF T003 - Progress Report for ETSI</b> |  |                |   |
|--|--|----------------|---|
| <b>Presented to ETSI meeting</b>           |  | <b>Author:</b> | Prof. Jens Grabowski<br>Mr. Andras Kovacs |
|  |  | <b>Date:</b>   | 13/10/2020                                |
| <b>Doc ref</b>                             |  | <b>Version</b> |   |

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|-------------|-------------|
| <b>TTF</b>  | <b>T003</b> |
| <b>TBWG</b> | <b>MTS</b>  |

|                       |                       |
|-----------------------|-----------------------|
| <b>TTF leader</b>     | Prof. Jens Grabowski  |
| <b>TB responsible</b> | Dr. Philip Makedonski |
| <b>Administrator</b>  | Ms. Elodie Rouveroux  |

|                   |                                     |
|-------------------|-------------------------------------|
| <b>TTF title:</b> | TTCN-3 Maintenance and Testing 2020 |
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|                  |   |  |                        |   |            |
|------------------|---|--|------------------------|---|------------|
| <b>Milestone</b> | <b>B</b>  |  | <b>Status Template</b> | <b>Covers the period until (cut-off date)</b> | 09/11/2020 |
| <b>Objective</b> | Progress Report approved by TC MTS by RC. Stable Drafts for T2 Deliverables made available. |  |                        |   |            |
| <b>Achieved</b>  | Yes   |  |                        |   |            |
| <b>Remarks</b>   |   |  |                        |   |            |

**Achieved dates**

| <b>Template</b> | <b>Draft report</b> | <b>TB approval</b> | <b>ETSI approval</b> |  |  |
|-----------------|---------------------|--------------------|----------------------|--|--|
| 13/10/2020      |                     |                    |                      |  |  |

## 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 STF team consists of 9 experts. During two working session for Task 1 “TTCN-3 maintenance and further development” TTF T003 progressed **44** CRs. The work on Task 2 “Conformance test suites for TTCN-3 tools and sub-tasks” continues as expected. The work is distributed among the experts and the experts are in the middle of writing tests according to their assignments.

## 2 Introduction

The work on Task 1 “TTCN-3 maintenance and further development” comprises the following tasks:

- 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 tasks:

- 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.

TTF T003 consists of the following nine experts:

- Jens Grabowski, University of Göttingen (TTF management)
- Andras Kovacs, Broadbit (TTF management)
- Lénárd Nagy, Ericsson
- Axel Rennoch, Fraunhofer FOKUS
- György Réthy, Ericsson

- Bogdan Stanca-Kaposta, Spirent Communications
- Kristóf Szabados, Ericsson
- Tomáš Urban, Elvior
- Jacob Wieland, Spirent Communications

### 3 Contractual milestone

The contractual milestone B is related to this progress report and the stable drafts of the T2 deliverables.

Milestone B is achieved by

- (1) TB MTS approving this report by RC and
- (2) stable drafts of the T2 deliverables made available by TTF T003.

### 4 Progress of the work

#### ***Progress of the work on Task 1 – TTCN-3 maintenance and further development***

The current TTF session plan for the work on Task 1 contains three online working sessions where all experts work 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.

Online working sessions for the work on Task 1 are planned for:

- Week 33: 10. - 14. Aug.2020 **(done)**
- Week 41: 05. - 09. Okt. 2020 **(done)**
- Week 50: 07. - 11. Dec. 2020 (planned)

Further working sessions may be organized on demand.

During the first online working session the **44** CRs listed below have been progressed:

#### **General: TTCN-3 Change Requests (2 CRs)**

- 7981 Support for REST APIs (HTTP)
- 7986 usage of the "data type" term is a bit confusing

#### **Part 01: TTCN-3 Core Language (13 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
- 7911 Correct TTCN-3 Parts list in Foreword
- 7919 testcase should be possible to be defined without runs on
- 7925 Non-abstract signature templates assigned
- 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

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

- 7974 Update of Figure 1 in TTCN-3 part 7

|   |                 |
|---|-----------------|
| <b>Part 08: Using IDL with TTCN-3</b>   | <b>(1 CR)</b>   |
| 7975 Update of Figure 1 in TTCN-3 part 8  |                 |
| <b>Part 09: Using XML with TTCN-3</b>   | <b>(3 CRs)</b>  |
| 7969 Ambiguity with decoding of embed_values  |                 |
| 7976 Update of Figure 1 in TTCN-3 part 9  |                 |
| 7982 Ambiguous decoding of xml  |                 |
| <b>Part 11: Using JSON with TTCN-3</b>  | <b>(7 CRs)</b>  |
| 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   |                 |
| <b>Ext Pack: Advanced Parametrization (ES 202 784)</b>                              | <b>(1 CR)</b>   |
| 7912 Missing reference  |                 |
| <b>Ext Pack: Config &amp; Deployment Support (ES 202 781)</b>                       | <b>(2 CRs)</b>  |
| 7978 Dealing with parallel control components                                       |                 |
| 7910 Allow parallel control parts/components assigned                               |                 |
| <b>Ext Pack: Behaviour Types (ES 202 785)</b>                                       | <b>(1 CR)</b>   |
| 7984 sequence of RunsOnSpec, MtcSpec, SystemSpec in BehaviourType definitions       |                 |
| <b>Ext Pack: Object-Oriented Features (Draft ES 203 790)</b>                        | <b>(13 CR)s</b> |
| 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 incorrect 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   |                 |

### ***Progress of the work on 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” continues as expected. The work is distributed among the experts and the experts are in the middle of writing tests according to their assignments.

## **5 Assessment of technical risk, difficulties encountered/expected, unresolved issues**

### **· Task 1 – TTCN-3 maintenance and further development**

Currently, the number of unresolved CRs is manageable and should not cause major problems. However, new CRs tend to be submitted before work sessions and the number of new CRs submitted

in 2020 cannot be predicted. If the number of new CRs becomes big, TTF T003 may not be able to resolve all open CRs. The resolution of some CRs may be left for succeeding TTFs. TTF T003 will then prioritize the open CRs and resolve them in order of priority as long as possible (some high priority CRs may need long discussions, while low priority, e.g. trivial CRs may be handled quickly and thus may overtake the resolution of higher priority CRs).

TTF T003 received via Mantis CR 7981 “Support for REST APIs (HTTP)” from STF 576. This CR may require the development of a new TTCN-3 extension. A new TTCN-3 extension cannot be implemented in the context of TTF T003. TTF T003 plans to continue the discussion with STF 576 on CR 7981 and plans at least collect requirements for a new TTCN-3 extension.

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

The preceding TTCN-3 conformance testing STFs have provided a sound methodological basis for the work of this TTF. The TTF work has started late in August 2020 and currently no technical risk or other difficulties are expected.

At this point in time no action is seen to be required from TC MTS.

**6 Proposed changes in the STF work plan**

No proposed change.

**7 Resources requirements**

There is no change foreseen in the TTF resource requirements related to the TTF's ToR.

**8 Changes in the STF Team**

There was no change in the TTF's composition and no change is foreseen or required.

**9 Meetings/events attended on behalf of the STF**

| 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 |

## 10 Meetings/events planned to be attended

| Date          | Place | TB/Orga | Event description                                     | Reason to attend                                     | Expert(s)                     |
|---------------|-------|---------|---|--|-------------------------------|
| Jan/Feb 2021  | tba   | TC MTS  | MTS#82 regular meeting                                | Presentation of progress report (milestone C)        | Jens Grabowski, Andras Kovacs |
| May/June 2021 | tba   | TC MTS  | MTS#83 regular meeting                                | Presentation of TTF finalization (milestone D and E) | Jens Grabowski, Andras Kovacs |
| tba           | tba   | TC MTS  | User Conference on Advanced Automated Testing (UCAAT) | Participation at ETSI booth                          | tba                           |

## 11 STF 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](http://forge.etsi.org/mantis/main_page.php)) and emails.

## 12 Technical advice required from the reference Technical Body

There is no issue requiring TB decision.

## 13 Status of the deliverables

### · Task 1 – TTCN-3 maintenance and further development

TTCN-3 standards are stable documents. The way of working of TTCN-3 evolution STFs is approved by ETSI TC MTS, is based on change requests submitted to ETSI's Mantis CR handling system. Technical resolution and proposed changes in the texts of deliverables are publically available in Mantis during the year. Agreed text of resolved CRs is implemented in drafts of deliverables at, and after the last working session of the STF. Therefore, the output drafts of the deliverables are available at the end of the project.

The actual status of the CRs can be found at [http://forge.etsi.org/mantis/main\\_page.php](http://forge.etsi.org/mantis/main_page.php).

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

Drafts for Task 2 deliverables are available as part of Milestone B (cut-off date 09/11/2020)

#### **14 Next report**

The next report is scheduled for 31. January 2021.

#### **15 Any other business**

None