STF	**514**
TB/WG	**MTS**

STF leader	Jens Grabowski
TB responsible	Dirk Tepelmann
STF Assistant	Elodie Rouveroux

STF title:	TTCN-3 Evolution release 2016

Milestone	**A**		**Status** **Template**	**Covers the period until (cut-off date)**	30/09/2016
Objective	Progress Report#1 approved by MTS#69 (28-29 Sep 2016) plenary. Report must be uploaded by the STF Leader on the TB contributions area of the ETSI Portal two weeks before the meeting.				
Achieved	Yes/No	*Indicate whether the objective has been achieved* *If the objective is not achieved, give a short explanation in the "remarks"*			
Remarks					

Achieved dates

Template	Draft report	TB approval	ETSI approval	Sent to EC	EC approval
31/08/2016					

1 Executive summary

The TTCN-3 testing language has intensively been developed by ETSI during the last decade and, by today, it consists of 14 ETSI standards, altogether more than 1400 pages. 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 choice for 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).

TTCN-3 has an important role in standardization; it is an enabling technology in many areas. Several conformance test standards have been and are being developed by **3GPP**, ETSI TBs **INT**, **ERM**, and **ITS**. 3GPP is using TTCN-3 for UE conformance tests from Rel. 8 and onward to **LTE** and **VoLTE**, for **IMS** call control and supplementary services. For the **ITS** area, several TTCN-3 test suites have also been developed and further features and new areas like IoT/M2M are expected to come in the near future.

The **purpose of STF514** – "TTCN-3 evolution 2016" is to maintain the high quality of the language – that currently consists of 14 ETSI standards - 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. In addition STF514 produces the new TTCN-3 extension "Advanced Matching".

The STF team consists of 6 experts. During its first two working sessions, the STF has **resolved 29** CRs and **progressed 25** other CRs.

2 Introduction

The TTCN-3 language evolution work 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 3GPP, OMA, ETSI members and the TTCN-3 community and agreed on 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, and the versions for approval.
- Present the TTCN-3 standards' status and the work of the STF at the conference(s) associated with ETSI TB MTS and at ETSI TB MTS meetings.
- Develop the new TTCN-3 extension "Advanced Matching".

The STF consists 6 experts:

- Jens Grabowski, University of Göttingen
- Axel Rennoch, Fraunhofer FOKUS
- Gyorgy Rethy, Ericsson
- Kristóf Szabados, Ericsson
- Tomaš Urban, Elvior OU
- Jacob Wieland, Spirent

György Rethy does not physically participate in the STF sessions, but contributes by following the ongoing work in Mantis and providing useful feedback via Email and telephone.

3 Contractual milestone

The contractual milestone M1, related to this Progress Report #1 is achieved by TB MTS approving this progress report.

4 Progress of the work

The STF session plan contains 3 one-week working sessions with all experts present and one week of voluntary work spent for final CR cleaning and editorial work on the draft deliverables. Working sessions of the STF are:

- W29, 18–22 July 2016, Berlin (**done**)
- W33, 16–19 August 2016, Berlin (**done**)

- W46, 14–18 November 2016, Budapest (planned)

During the first two working sessions in Berlin the CRs below have been resolved:

Part 01: TTCN-3 Core Language

0006801 Visibility of component definitions
0007195 interleave is much too restricted
0007271 template(present) restriction shall also apply to individual elements of complement, superset, subset, permutation lists
0007288 Not described use cases for optional attribute
0007294 default values/templates of formal parameters should live in the runs-on scope
0007446 definite overlapping of select cases should be disallowed or at least discouraged
0007450 enumerated types should be compatible on par with other structured types
0007452 Function for displaying attribute content

0007456 Terminology in compatibility rules for union and anytype
0007462 encvalue/decvalue should also work directly with octet and hex-string values
0007472 mixed parameter-style lists should be allowed
0007475 Incorrect example on indexing
0007476 What does it mean to receive message from the null component?
0007479 invalid examples where records and record ofs are compatible
0007481 fuzzy variables/parameters should be excluded from receiving communication operations
0007482 example implies that a done component might still be running
0007483 incorrect description of behaviour when a receive operation is not successful
0007484 interesting timeout restriction
0007487 inconsistent examples and naming in Annex B
0007488 incorrect examples in annex B
0007489 what does a permutation with repeating elements match on?
0007490 confusing example

Part 04: TTCN-3 Operational Semantics

0007454 Operational semantics for default parameters

Ext Pack: Advanced Parametrization (ES 202 784)

0007436 Allow 'all' wildcard also as actual type parameter inside port type definitions

Ext Pack: Behaviour Types (ES 202 785)

0007372 types/variables for startable/executable behaviors should be possible

Part 05: TTCN-3 Runtime Interface

0007467 Handling of NumberOfBits in TriAddressType is missing in C# mapping
0007468 Handling of NumberOfBits in TriParameterType is missing in C# mapping
0007469 Handling of NumberOfBits in TriExceptionType is missing in C# mapping

Part 07: Using ASN.1 with TTCN-3

0007463 Support for named bits

In addition STF514 sketched the contents of the new TTCN-3 extension package on "Advanced Matching" and started the technical work on the new extension package. The extension package will cover the following topics:

1. **Logical operators for combining matching mechanisms**
   See: “CR0007175 No easy way to describe conjunction matching mechanism." for further details

2. **Dynamic Matching Templates (i.e., matching by function)**
   See: “CR 0007174 New matching mechanism: matching by function" for further details)

3. **Templates with variable bindings**
   See "CR 0007438 Templates with variable bindings." for further details

4. **Matching multiple items in arrays, records and sets of single types**
   See "CR 0007167 Matching mechanism to match multiple items in arrays, records and sets of single types." for further details

The status of the CRs and also the work of the STF can be followed in detail in ETSI’s Mantis system at http://forge.etsi.org/mantis/view_all_bug_page.php.

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

STF514 will only meet for one last joint working session in November in Budapest. There are still 25 unresolved CRs and the new TTCN-3 extension package "Advanced Matching" has to be finalized. In

addition new CRs tend to be submitted before work sessions. The finalization of the new TTCN-3 extension package will receive highest priority for the last working session. This means that STF514 may not be able to resolve all open CRs. The resolution of some CRs may be left for succeeding STFs. The STF will 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). **At this point in time no action is seen to be required from TB MTS**.

No other technical risk or difficulties has been encountered.

6 Proposed changes in the STF work plan

No proposed change.

7 Resources requirements

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

8 Changes in the STF Team

There was no change in the STF'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)
28.-29.09 2016	Tallin	MTS#69	TB MTS#66 regular meeting	STF 514 milestone M1, Approval of Progress Report#1.	György Réthy

10 Meetings/events planned to be attended

Date	Place	TB/Orga	Event description	Reason to attend	Expert(s)
Q1 2017	TBD	MTS#70	TB MTS#70 regular meeting	STF 514 milestone M2, Progress report#2.	Jens Grabowski

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

External communication is currently done via Mantis and emails.

12 Technical advice required from the reference Technical Body

There is no issue requiring TB decision.

13 Status of the deliverables

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 are 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.

14 Next report

The next report is scheduled for: TB MTS#70 regular meeting, beginning of 2017 (date, place TBD).

15 Any other business

None