

	STF 514 – Progress Report for ETSI		
	Presented to ETSI meeting	Author:	Jens Grabowski
		Date:	10/01/2017
		Version	
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STF	514
TB/WG	MTS

STF leader	Prof. Dr. Jens Grabowski
TB responsible	Emmanuelle Chaulot-Talmon
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STF title:	TTCN-3 Evolution release 2016
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Milestone	B		Status Template	Covers the period until (cut-off date)	31/01/2017
Objective	Progress Report#2 approved by MTS#70 plenary (date tbd in Jan 2017). Report must be uploaded by the STF Leader on the TB contributions area of the ETSI Portal two weeks before the meeting				
Achieved	YES				
Remarks	NONE				

Achieved dates

Template	Draft report	TB approval	ETSI approval
10/01/2017			

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 and closed 101 Change Requests (CRs)**. These CRs have been implemented in the drafts of the corresponding TTCN-3 standard documents. These draft standard documents have been uploaded to the MTS Drafts area (<https://portal.etsi.org/tb.aspx?tbid=97&SubTB=97>) with the status "Final draft for approval". They also have been submitted as contributions for MTS#70.

Further 12 CRs have been progressed, but their resolution has been shifted to a future TTCN-3 maintenance STF in 2017.

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
- György Rethy, Ericsson
- Kristóf Szabados, Ericsson
- Tomáš 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 **B**, related to this Progress Report #2 is achieved by TB MTS approving this progress report.

4 Progress of the work

The work of STF 514 is based on the resolution of CRs. The progress of the work on CRs can be followed in detail by using the ETSI's Mantis system at http://forge.etsi.org/mantis/view_all_bug_page.php.

The STF session plan contained 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 have been:

- W29, 18–22 July 2016, Berlin
- W33, 16–19 August 2016, Berlin
- W46, 14–18 November 2016, Budapest

During the three working sessions in Berlin and Budapest STF 514 worked on the following CRs:

4.1 Resolved and closed CRs

The following 101 Change Requests (CRs) have been resolved and closed (i.e., implemented in the new versions of the TTCN-3 standard documents):

Part 01: TTCN-3 Core Language

(50 CRs)

- 7523 harmonized font for modifiers
- 7508 some corrections in BNF (section A.1)
- 7503 allowed elements in a permutation matching-mechanism
- 7493 Add Wrapper-Union capability to the standard
- 7492 duplication and ambiguity concerning actual par lists in BNF
- 7490 confusing example
- 7489 what does a permutation with repeating elements match on?
- 7488 incorrect examples in annex B
- 7487 inconsistent examples and naming in Annex B
- 7486 incorrect example for the display attribute
- 7485 duplicated example
- 7484 interesting timeout restriction
- 7483 incorrect description of behaviour when a receive operation is not successful
- 7482 example implies that a done component might still be running
- 7481 fuzzy variables/parameters should be excluded from receiving communication operations
- 7480 incorrect example for name clash
- 7479 invalid examples where records and record ofs are compatible
- 7478 incorrect subtyping example
- 7476 What does it mean to receive message from the null component?
- 7475 Incorrect example on indexing
- 7474 Editorial issues in the core standard that look easy to fix
- 7473 Chapter 6.2.1 inconsistencies in optional attribute "explicit omit"
- 7472 mixed parameter-style lists should be allowed
- 7471 editorial: inconsistency in the standard regarding partially initialized values
- 7464 Remove restriction on templates in external function return value
- 7462 encvalue/decvalue should also work directly with octet and hex-string values
- 7459 the overwriting rules for attributes and the examples should be written more consistent
- 7458 editorial: encvalue/decvalue are missing a parameter in section 16.1.2
- 7456 Terminology in compatibility rules for union and anytype
- 7453 Restriction on use of optional attributes in variables
- 7452 Function for displaying attribute content
- 7451 Multiple occurrence of an attribute
- 7450 enumerated types should be compatible on par with other structured types
- 7448 Allowing multiple encodings for TTCN-3 types
- 7446 definite overlapping of select cases should be disallowed or at least discouraged
- 7435 @decoded modifier is not compositional enough

- 7390 Misleading variable name
- 7367 Check the use of "may"-s in the standard
- 7353 attributes should be attachable to their definition only
- 7294 default values/templates of formal parameters should live in the runs-on scope
- 7288 Not described use cases for optional attribute
- 7272 matching symbols should be uniformly formatted
- 7271 template (present) restriction shall also apply to individual elements of complement, superset, subset, permutation lists
- 7217 Add language string for the coming version
- 7216 match operation should require type compatibility of the operands
- 7213 Example is wrong
- 7200 Allow ranges and value list for enumerated types
- 7196 start operation with altstep should be allowed
- 7195 interleave is much too restricted
- 7126 Semantics of anytype not really usable

Part 04: TTCN-3 Operational Semantics (4 CRs)

- 7454 Operational semantics for default parameters
- 7214 Lazy and Fuzzy evaluation of variables and parameters is not mentioned in the operational semantics
- 7212 Update Operational Semantics: Visibility of Definitions (public, friend, private)
- 6803 Implementation of CR 0006775: getverdict from other component in Part 4

Part 05: TTCN-3 Runtime Interface (4 CRs)

- 7469 Handling of NumberOfBits in TriExceptionType is missing in C# mapping
- 7468 Handling of NumberOfBits in TriParameterType is missing in C# mapping
- 7467 Handling of NumberOfBits in TriAddressType is missing in C# mapping

Part 06: TTCN-3 Control Interface (10 CRs)

- 7501 Missing mapping of several methods of abstract TTCN-3 data types and values
- 7497 Support for optional fields in RecordValue
- 7505 The C mapping of several TCI function is wrong
- 7504 Invalid syntax in C mapping
- 7502 Missing semicolon in C# mapping of Permutation
- 7506 Typo in C# Type mapping
- 7507 Typos in C# ITciValue definition
- 7511 C# mapping of matching mechanisms contains wrong parent type
- 7510 Invalid return type in C# ITciMatchingMechanism.MatchingType
- 7524 TCI extension for multiple attributes

Part 07: Using ASN.1 with TTCN-3 (2 CRs)

- 7463 Support for named bits
- 7291 Update introduction text

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

- 7292 Update introduction text

Part 09: Using XML with TTCN-3 (13 CRs)

- 6752 Rules for transformation of enumerated facet applied to union content
- 7057 Extend the mapping of XSD any element and any Attribute element to TTCN-3 anytype
- 7368 Check the use of "may"-s in the standard
- 7293 Update introduction text
- 7470 editorial: inconsistent namespace names
- 7520 Error in union example clause 7.5.3
- 7427 Type substitution is limiting replacing built-in XSD types
- 7239 Change element substitution generation rules to support backward compatibility
- 7421 How to achieve full backward compatibility in case of element- and/or type-substitution
- 7466 editorial: indentation, hyperlink, typo fixes in part
- 6389 Variant overwriting rules are not correct

- 7238 Follow-up on date/time changes in XSD 1.1
- 7188 Presence of the XSD module

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

- 7526 BNF correction following update in core BNF

Ext Pack: Advanced Parametrization (ES 202 784) (6 CRs)

- 7573 Default types shall not refer to value parameters
- 7436 Allow 'all' wildcard also as actual type parameter inside port type definitions
- 7457 external functions with type parameters should be allowed
- 7527 BNF correction following update in core BNF
- 7356 allow bounded formal type parameters also for non-component types
- 5449 Add mapping for parameterized ASN.1 types

Ext Pack: Behaviour Types (ES 202 785) (2 CRs)

- 7372 types/variables for startable/executable behaviors should be possible
- 7528 BNF correction following update in core BNF

Ext Pack: Continuous signal support (ES 202 786) (1 CR)

- 7529 BNF correction following update in core BNF

Ext Pack: Advanced Matching (ES 203 022) (7 CRs)

- 6737 Allow equality operator also on omit symbol and templates with restriction omit.
- 7167 Matching mechanism to match multiple items in arrays, records and sets of single types
- 7175 No easy way to describe conjunction matching mechanism.
- 7438 Templates with variable bindings.
- 7174 New matching mechanism: matching by function
- 7531 Checking and Harmonization of BNF for the Advanced Matching Extension Package
- 7494 TRI and TCI extensions for advanced matching

4.2 Progressed CRs

The following 12 CRs have been progressed, but their resolution has been shifted to a future TTCN-3 maintenance STF in 2017:

Part 01: TTCN-3 Core Language (9 CRs)

- 7530 keywords should be escapable to be used as a TTCN-3 identifier.
- 7491 confusing/incorrect texts related to anytype behaviour
- 6801 Visibility of component definitions
- 7445 usage of encode/variant attributes should be enhanced
- 7187 Allow null-value for all value variables with the same semantics as uninitialized.
- 7495 out, inout and return value should be assignable via the done/killed statement redirect
- 7496 Formal parameters and return values should also be declarable as arrays.
- 7465 control part should be able to have a runs on clause and call other control parts
- 7455 The type of formal in parameters of external functions should be allowed to be 'any'

Part 06: TTCN-3 Control Interface (2 CRs)

- 7512 XML mapping of matching symbols
- 7519 Ifpresent and length matching attributes not defined in XML mapping

Part 09: Using XML with TTCN-3

- 6798 TTCN-3 Alias_or_Synonym Type Def. of an XSD Type

Ext Pack: Advanced Matching (ES 203 022) (1 CR)

- 7525 allow repetition (and maybe other regular expression syntax) also for binary string types

4.3 New CRs

The following 6 CRs have been newly submitted since the last working session of STF 514 (Mantis status: 10. January 2017):

Part 01: TTCN-3 Core Language (2 CRs)

7590 BNF for select-case is not correct
7561 Allow finally block or shutdown hook

Part 04: TTCN-3 Operational Semantics (1 CR)

7593 Part-1, Sec.15.11: Template concatenation drops omit and type restrictions

Part 06: TTCN-3 Control Interface (3 CRs)

7554 Wrong text in the list of C# abstract data type Value mapping
7553 Invalid return type in java MatchingMechanism.getMatchingType()
7552 Invalid C# mapping of tliRnd

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

The technical work of the STF has been finalized. During the finalization of the work, no technical risk or difficulties have been encountered.

As expected and similar to previous TTCN-3 maintenance STFs, the resolution of a few CRs, i.e., 12 CRs, has been left open for a future TTCN-3 maintenance STF.

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)
25.-26.1.2017	Berlin	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 by Emails.

12 Technical advice required from the reference Technical Body

There is no issue requiring TB decision.

13 Status of the deliverables

New drafts of the following TTCN-3 standard documents have been uploaded to the ETSI MTS Drafts area:

Part 01: TTCN-3 Core Language

Name:	RES/MTS-201873 -1 T3ed491 (ES 201 873-1) TTCN-3 Core V491
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873 -1 T3ed491/MTS-201873%20-1%20T3ed491v483.docx

Part 04: TTCN-3 Operational Semantics

Name:	RES/MTS-201873-4 T3 ed461 OS (ES 201 873-4) TTCN-3 Edition 4.6.1: OS
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-4 T3 ed461 OS/MTS-201873-4%20T3%20ed461%20OSv001.docx

Part 05: TTCN-3 Runtime Interface

Name:	RES/MTS-201873-5 T3ed481TRI (ES 201 873-5) TTCN-3 TRI V481
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-5 T3ed481TRI/MTS-201873-5%20T3ed481TRIV472.docx

Part 06: TTCN-3 Control Interface

Name:	RES/MTS-201873-6 T3ed4A1 (ES 201 873-6) TTCN-3 TCI V481
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-6 T3TCI_ed491/MTS-201873-6%20T3TCI%20ed491v482.docx

Part 07: Using ASN.1 with TTCN-3

Name:	RES/MTS-201873-7 T3ed461 (ES 201 873-7) TTCN-3: the use of ASN.1
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-7_T3ed461/MTS-201873-7%20T3ed461v452.doc

Part 08: Using IDL with TTCN-3

Name:	RES/MTS-201873-8 ed471IDL (ES 201 873-8) TTCN-3 AIDL V471
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-8_ed471IDL/MTS-201873-8%20ed471IDLv462.docx

Part 09: Using XML with TTCN-3

Name:	RES/MTS-201873-9 T3XSD ed481 (ES 201 873-9) TTCN-3: Use of XML ed.V4.8.1
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00201873-9_T3XSD_ed481/MTS-201873-9%20T3XSD%20ed481v472.docx

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

Name:	RES/MTS-202781 ed151ConfDepl (ES 202 781) TTCN-3 ConfDepl V151
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00202781_ed151ConfDepl/MTS-202781%20ed151ConfDeplv001.docx

Ext Pack: Advanced Parametrization (ES 202 784)

Name:	RES/MTS-202784 ed161AdvParam (ES 202 784) TTCN-3 AdvParam V161
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00202784_ed161AdvParam/MTS-202784%20ed161AdvParamv153.docx

Ext Pack: Behaviour Types (ES 202 785)

Name:	RES/MTS-202785 ed151BehTypes (ES 202 785) TTCN-3 BehTypes V151
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00202785_ed151BehTypes/MTS-202785%20ed151BehTypesv142.docx

Ext Pack: Continuous signal support (ES 202 786)

Name:	RES/MTS-202786 ed141ContSign (ES 202 786) TTCN-3 extension: Continuous Signal support
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00202786_ed141ContSign/MTS-202786%20ed141ContSignv001.docx

Ext Pack: Advanced Matching (ES 203 022)

Name:	DES/MTS-203022AdvMatch ed111 (ES 203 022) TTCN-3 extension: Advanced Matching ed1.1.1
Status:	Final draft for approval
Link	http://docbox.etsi.org/MTS/MTS/07-Drafts/00203022AdvMatch_ed111/MTS-203022AdvMatch%20ed111v001.docx

14 Next report

The next report is scheduled for March 2017: STF Final Report

15 Any other business

None