TTCN-3 Language Maintenance and Status

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TTCN-3 Maintenance in 2009

- **STF 380:** March 2009 – December 2009 (118 mDays)

- **Members:**
  - Gyorgy Rethy, Ericsson
  - Tibor Csondes, Ericsson
  - Jens Grabowski, University of Goettingen
  - *Ina Schieferdecker,* Fraunhofer FOKUS

- **Two TTCN-3 „Releases“**
  - TTCN-3 v4.2.1 *interim version* as an 3GPP/LTE maintenance update in 07/2009
  - TTCN-3 v4.2.1
STF 380 tasks

- Resolution of open CRs
  - Has addressed appr. 100 CRs

- TTCN-3 language extensions
  - Real-time and performance
  - Configuration and deployment support

- Framework for a TTCN-3 reference test suite
  (based on voluntary inputs from tool vendors)

- Preparation of the deliverables for ETSI publication

- Cooperation with STF 160 on LTE testing
Status of TTCN-3 standards
(05-2010)

- ES 201 873 series
  - ES 201 873-1 v4.2.1 TTCN-3 Core Language
  - ES 201 873-4 v4.2.1 TTCN-3 Operational Semantics
  - ES 201 873-5 v4.2.1 TTCN-3 Runtime Interface (TRI)
  - ES 201 873-6 v4.2.1 TTCN-3 Control Interface (TCI)
  - ES 201 873-7 v4.2.1 Using ASN.1 with TTCN-3
  - ES 201 873-8 v4.2.1 The IDL to TTCN-3 Mapping
  - ES 201 873-9 v4.2.1 Using XML schema with TTCN-3
  - ES 201 873-10 v4.2.1 TTCN-3 Documentation Comment Specification

Completed in Febr. 2010, all documents to be published soon
Status of TTCN-3 standards
(05-2010, contd)

- Published language extensions
  - ES 202 784 v1.1.1 (2009-07) Advanced Parameterization
  - ES 202 785 v1.1.1 (2010-01) Behaviour Types

- New language extensions
  - ES 202 781 v1.1.1 Configuration and Deployment Support
  - ES 202 782 v1.1.1 Real-Time and Performance Testing Support

Completed in Febr. 2010, both documents to be published soon

- Reference Test Suite
  - TS 102 995 v1.1.1 Proforma for TTCN-3 Test Suite

Completed in Febr. 2010, to be published soon
New in ES 201 873

- **TTCN-3 language**
  - Import of `import` statements
  - Special real values (infinity, -infinity, not_a_number)
  - Exclusive bounds for range subtyping
  - `ispresent()`, `str2hex()`, `testcase.stop`
  - Several smaller additions

- **TRI/TCI**
  - C# mapping

- **Language mappings**
  - Unambiguous mapping of real/float types from XSD and ASN.1
  - Full support of mapping ASN.1 (2008)
New in ES 201 873 (contd)

- Language mappings (contd)
  - Parts are re-structured to be “package-style”
    (e.g. TRI support for ASN.1->TTCN-3 is moved to Part-7)

- Source code documentation
  - New tags added (@priority, @requirement and @reference)
  - Documentation block for local definitions of component types

- Several clarifications, amendments and editorial corrections
Extension: Advanced Parameterization

- Allows
  - Static value parameterization of types
  - Static type parameterization of types, templates, functions, altsteps and testcases
  - Default type is allowed for type parameters, like default values/templates for value parameters

- Example use cases
  - Message types, where e.g. the payload (field) can be a structured data as well as an octetstring/charstring etc.
  - Message templates, supporting both positive and negative testing in one parameterized definition
  - Port types with parameterized in/out/inout lists
  - Component types, where the type(s) of port(s) are parameterized
  - Functions that execute some kind of user-defined actions on data of different types (e.g. inserting extra fields into encoded messages for negative testing)
  - Functions with parameterized runs on clauses
Extension: Behaviour Types

- Allows
  - Defining types of function, altstep and testcase (FAT) “prototypes”
  - Defining module parameters, constants, variables and templates of FAT types and storing references to “real” FATs in them
  - References to FATs can be stored, passed as parameters and sent to another component
  - Calling FATs via their references (including starting PTC behaviours)
  - “runs on self”: specific runs on compatibility checking rules and cannot be sent to another component

- Example use cases
  - Efficient handling of state machines; the actual state is an integer number that – in case of an event - allows calling the function executing the action from an array of function references, instead of using e.g. select case to determine the actual state; also allows easy dynamic changing of the FSM
  - Using dynamically registrable callback functions in TTCN-3 SW libraries
  - Flexible test configuration by e.g. passing PTC behaviour function references to MTC configuration functions
Extension: Configuration and Deployment Support

- **Allows**
  - Defining special “static” test configurations, creating and destroying them from the control part
  - Testcases (identified by `execute on`) may be called on a created static test configuration sequentially
  - Testcases may add “dynamic” PTCs and connections to the test configuration but shall not destroy any part of the static test configuration

- **Example use cases**
  - Semi-automatic (interactive) execution of test cases, where the SUT state may change due to loosing connections and/or missing keep-alive signals for a long time
  - Automatic test execution, where loosing connections raise unwanted alarm signals and/or blockings/resets
Extension: Real-Time and Performance Testing Support

- Allows
  - Identifying the required precision of the system time
  - `now`: getting the actual system time (from starting the test case)
  - `wait`: suspends the execution of a component until a given point in time (from starting the test case)
  - Identifying ports with real-time requirements; timestamp of entering messages in the TSI shall be stored and sent to the TE
  - Retrieving the timestamp of the receiving in the TTCN-3 code

- Example use cases
  - Set the required system preciseness by the writer of a TTCN-3 module (e.g. by a SW library module)
  - More precise time measurements, e.g. round-trip delays
  - More precise and convenient handling of timing-related actions
TTCN-3 Maintenance in 2010

- **STF 393:** January (March) 2010 – December 2010 (78 mDays)

- **Members:**
  - Gyorgy Rethy, Ericsson
  - Jens Grabowski, University of Goettingen
  - Ina Schieferdecker, Fraunhofer FOKUS
  - Jacob Wieland, TestingTech
  - Benjamin Zeiss, University of Goettingen

- **Sessions**
  - 22-26 March 2010
  - 28 June- 02 July 2010 (planned)
  - 13-17 September 2010 (planned)
  - 08-12 November 2010 (planned)

- **Planned TTCN-3 release(s)**
  - TTCN-3 v4.3.1 (beginning of 2011)
  - Extension packages v1.2.1, conditional on CRs (beginning of 2011)
  - Proforma for TTCN-3 Test Suite v1.2.1, conditional on CRs (beg. of 2011)
STF 393 tasks

- Resolution and implementation of CRs
  - For 8 of the 10 parts of the ES 201 873 series (parts 2 and 3 are not included)
  - For the 4 extension packages (see last slide)
  - For the “Proforma for TTCN-3 reference test suite“
  - As of 17-05-2010, 50 CRs in Mantis
    (26 „old“ ones are closed in March, 24 open)

- Cooperation with STF 160 on LTE testing

- Preparation of the deliverables for ETSI publication
TTCN-3 maintenance
Working procedures

- Decided by TB MTS

- CRs can be submitted and followed in Mantis
  [http://t-ort.etsi.org/view_all_bug_page.php](http://t-ort.etsi.org/view_all_bug_page.php) or via
  [http://www.ttcn3.org/ChangeRequest.htm](http://www.ttcn3.org/ChangeRequest.htm)

- CR priorities
  - **high**: bug fixes and clarifications
  - **normal**: minor additions
  - **low**: major additions

- CRs are processed according to class priorities
  - within the class according to submission date (FIFO)
  - MTS can “fast track” specific CRs: using the **urgent** Mantis priority for them
TTCN-3 working procedures (contd)

- **Notifications on the MTS-GEN mailing list**
  - CR classification summary at the beginning of each session
  - CR resolution summary at the end of each session
  - FYI: if a CR affects more than 1 document, it will be cloned per person (rapporteur)

- **After the 2nd STF session**
  - Cumulative CR resolution summary will be sent over the MTS-GEN mailing list
  - CR summary meeting (by phone), invitation to be sent over the MTS-GEN mailing list, planned date is 7th July
  - A „state-of-the-art“ snapshot version will be made available in ETSI‘s docbox at TB MTS‘s drafts area

- **CR admittance is closed**
  - At the beginning of the last session
  - For the last session only bugfix CRs are admitted (as new ones)
  - Last session is mainly to “clean up” CRs already being processed (final agreements and drafting of text)
Thank you for your attention.

Questions?