TTCN-3 Language Maintenance and Status

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Standards for Business

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 or via
  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)

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Thank you for your attention.

Questions?