MODEL-BASED TESTING AT ETSI

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ETSI TC MTS chair

Who is TC MTS?

ETSI

SCOPE of the Technical Committee

Methods for Testing and Specification (MTS) creates guidelines, frameworks, notations, and methodologies for specification and testing to help other ETSI committees to efficiently develop standards and tests.

TC MTS cooperates closely with ETSI's Center for Testing & Interoperability (CTI).

Past Achievements

Notations
TTCN-3, TPLan, Descriptive SDL

Test specifications for core IP technologies
SIP, SIGTRAN, IPv6 (core, sec, mob, 4to6), H.225, H.248

Methodologies & guidelines
Making Better Standards,
IP testing framework
Automated Interoperability Testing

Present Activities

TTCN-3 Evolution
Enhancements for LTE testing, continuous signals, TRI extension

Performance testing

Validation Techniques

Model Based Testing
Concepts for modelling
Methodology & case studies
Test Description Language

Security
e-Passport testing framework
Security & robustness testing

Possible Future Areas

Further TTCN-3 Development
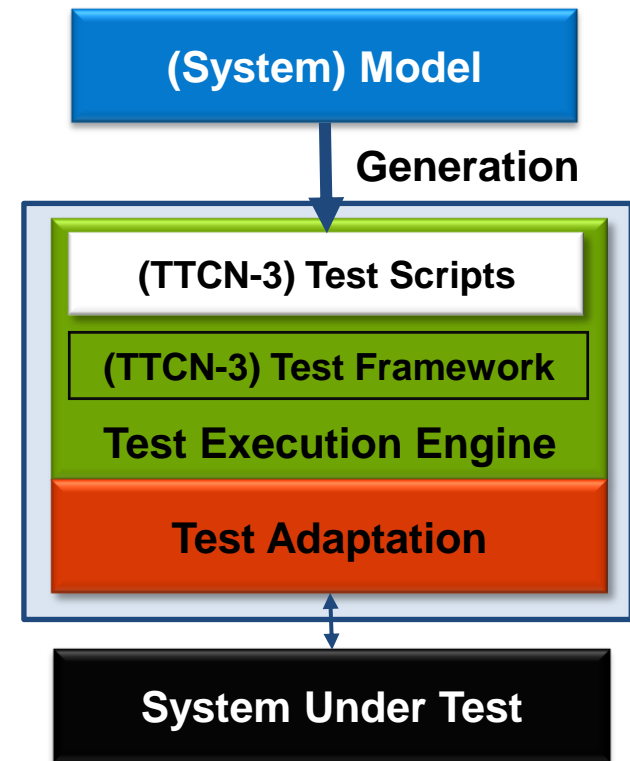
Update of best practice for specification

ETSI security framework

Further work on Model Based Testing

More info: http://portal.etsi.org/mts

About ETSI's MBT Initiative

- TC MTS has 20 years of experience and a unique reputation in creating global standards on testing
  - Brings together experts of major industrial users, test tool makers, research institutes, test service providers, and ETSI's CTI

- TC MTS has been creating standards on MBT since 2008
  - ETSI TR 102 840 "Model-Based Testing in Standardization"
  - ETSI TR 103 168 "Application of Model-Based Testing in the Telecoms Domain"
  - ETSI ES 202 951 "Requirements for Modelling Notations"

- Goal is to strengthen standing of MBT in industry
  - Promote its maturity and industrial deployment
  - Harmonize MBT tools and enable user accountability via standards
  - Create an industrial user community with yearly user conferences

- ETSI standard are free and publically available
  - Free download via http://pda.etsi.org/pda/queryform.asp

ETSI's Understanding of MBT

- Umbrella term for any approach that uses models for testing
- One of them is to use MBT for automating *test design*
  - Models reflect externally observable behavior of the system to be tested
  - MBT *complements* test execution
- Good time for standardization
  - Multiple tools available in the market
  - Interest by various stakeholders from different application domains to create standards

(System) Model

Generation

(TTCN-3) Test Scripts

(TTCN-3) Test Framework

Test Execution Engine

Test Adaptation

System Under Test

About ES 202 951

- First ETSI (wide) standard on MBT

- Identifies and collects all concepts of a modeling notation required for specifying models for functional testing

  - Essentially mandates modelling concepts that MBT tools need to support to facilitate the generation of functional tests
  - Independent of a specific modelling language

- Standard published in July 2011

  - Participation of key MBT tool vendors, industrial users, and research institutes active in this field
    (Ericsson, NSN, Siemens, SAP, Wipro, MS, Conformiq, Sepp.Med, Elvior, FOKUS, IRISA, ...)

- This standard is expected to be only the first in a series of ETSI standards on MBT

Current ETSI Approach to MBT

- Should not change ETSI's existing way of standardizing tests!
  - Merely offer a new method for test development, e.g., in STFs
- Models specify externally observable behavior as defined by a base specification
  - But should be part of *test* specifications - not base specifications
- It is the generated tests that should be standardized
  - Models should be considered *informative* testing artifacts
  - ETSI TCs should set requirements for test selection
- Perceived benefits of this approach include
  - Improved quality of ETSI test specifications
  - More transparency in the ETSI test specification process
  - Ability for ETSI members to reuse models for own test generation

Classic vs. MBT Test Development
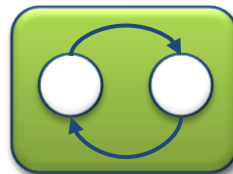
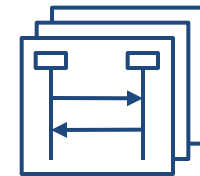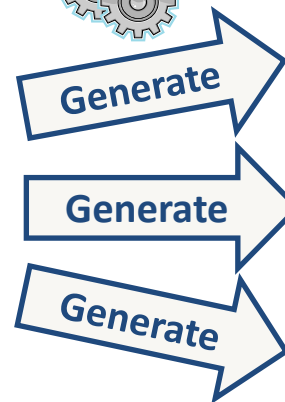Base Spec → **Reqs** → Test Purposes → **Specify** → TTCN-3 Tests

Base Spec → **Reqs** → System Model → **Generate** / **Generate** / **Generate** →

```
testcase t1() {
   …
}
```

The Road Ahead

- Creation of further ETSI standards on model-based testing
  - Further refinement of requirements for modelling notations
  - New ETSI test description language (MBT output)
- An ETSI TC MTS project (STF) for using MBT in case studies with other ETSI TCs/WGs in 2012
  - Guide on use of MBT for standardized test development
  - Report on application of different MBT tools in ETSI case studies
  - Case studies from IMS, intelligent transport, and potentially from mobile network application domain
- New MANTIS project for collection of feedback and ideas for extensions on ETSI MBT standards from public domain
  - http://t-ort.etsi.org

How can I follow or get involved?

- Visit the ETSI TC MTS Portal http://portal.etsi.org/portal/server.pt/community/MTS/323 to find next meetings and latest standard drafts

- Contact the TC MTS chair (via portal) to provide feedback to drafts standards and join ETSI's special interest group on MBT

- Attend the next ETSI TC MTS meeting either by attending in person (recommended) or by joining via GOTO meeting