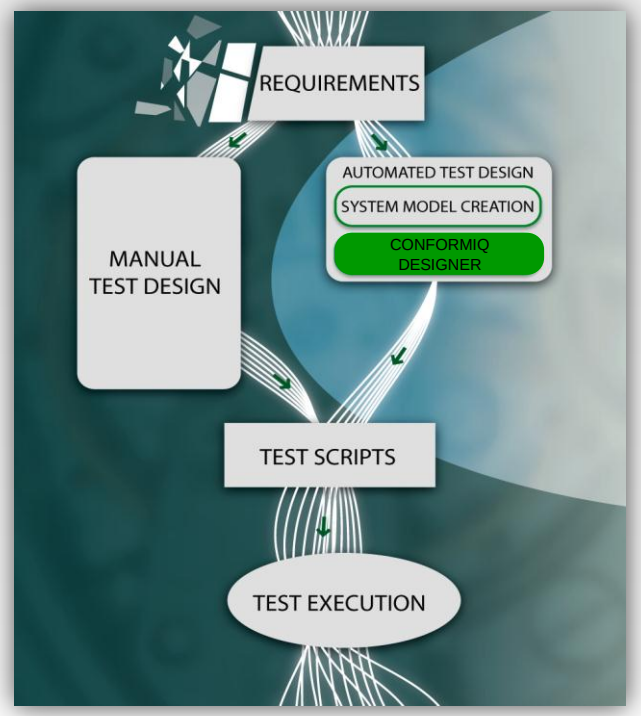
CONFORMIQ

Automated Test Design™

MBT Working Meeting Report



Stephan Schulz
MTS#56, Göttingen

About Meeting

- First meeting on MBT ES revision
  - Coordination with MBT STF
- All day on 14.5. in Göttingen
- 12 participants (including remote participants)
- Conformiq, Ericsson, Elvior, Giesecke & Devrient, Daimler, VTT, ALU, ISPRAS, FOKUS, U of G

Meeting Overview

- Detailed STF Review
  - ATM exercise + first ITS models with 4 tools
  - Early results
- G&D Presentation and standard feedback
- Conformiq presentation on open issues & new ideas
- Definition of next steps

Status ES 202 951

- Work finished early 2011 – published by summer
- Comments received after finalization
  - Formalization of concepts (in UML diagram)
  - Annex for flowchart/activity based modeling
  - “weak point is missing relation of modeling to testing”
  - Section on modeling from system vs test perspective
  - “Missing terms”
  - Missing modeling/coverage of specific test data

About Test Selection in ES 202 951

- Section 4: ”The model is then instrumented for the purpose of test generation by adding or selecting test selection criteria, i.e., coverage goals or test purposes specifying what is to be covered, and heuristics specifying how these goals are to be covered. Test selection is necessary since from every non-trivial model, an infinite or huge amount of tests can be derived. A model-based testing tool then automatically generates an abstract test suite that complies with these criteria.”
- ”NOTE: The specification of test selection criteria is beyond the scope of the present document.”

Next Steps Until Next Meeting

- Extend scope of MBT ES to go beyond modeling, i.e., to include test selection and test suite coverage
  - Concepts & terminology/dictionary for coverage and selection specifically in context of MBT
    - Revise notion of a state of MBT ES?
  - What is a test in the context of a model
    - When are tests effectively of same quality – provide means to measure & compare test quality
  - Test selection
    - Handling of parameterization
    - Definition of test case properties like redundancy, priority/cost, differences in general
  - Test Suite Coverage
    - Something may be measurable
    - Types of coverage: Loop (coverage once vs n-times), meaning of ”full coverage”
    - Coverage criteria/types including data and combinations thereof
    - Reachability vs trace/pattern/test purpose (data at certain point)
    - Differentiate model vs specification vs implementation vs usage coverage
- More formal concept definition with [OMG] MOF based meta model
- Next MBT working meeting Sep 18 in Sophia Antipolis, France

META MODELS IN ETSI [LANGUAGE] STANDARDIZATION?

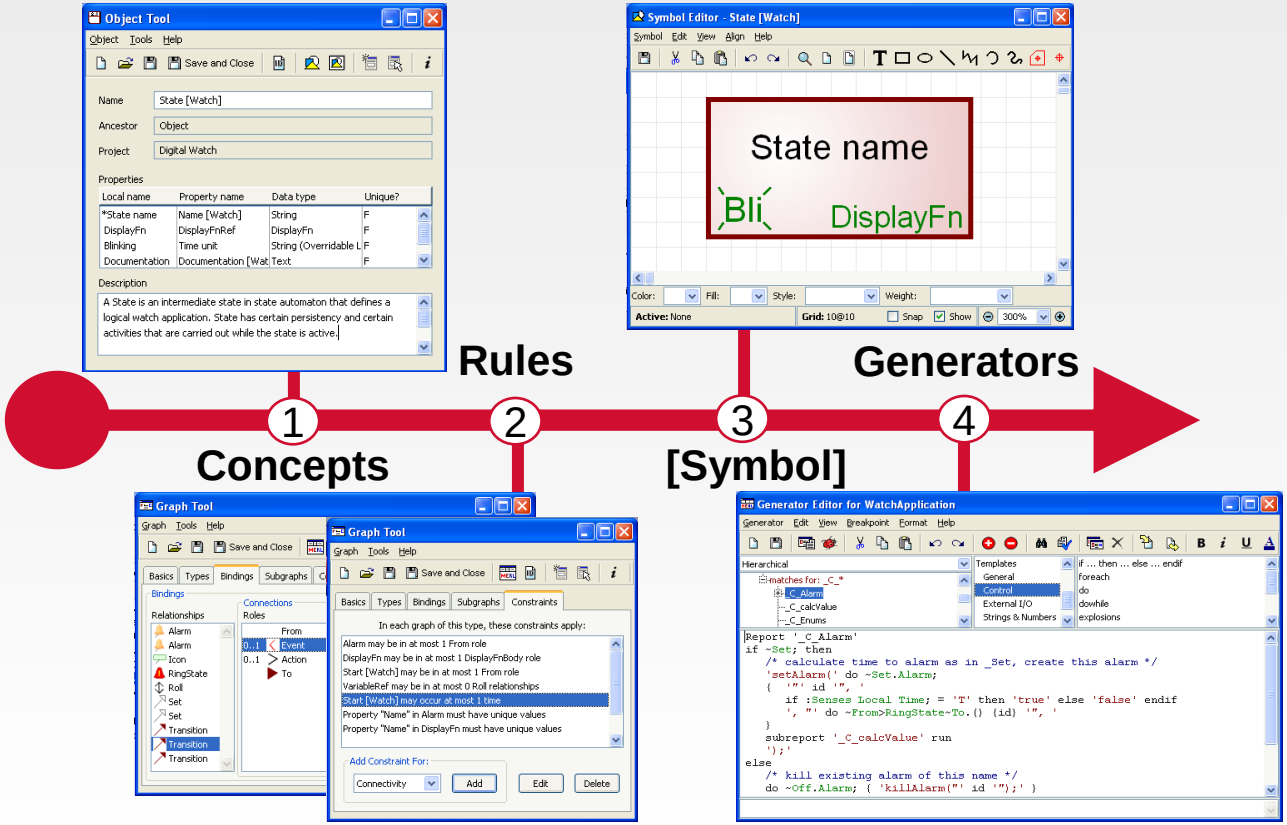
Test Language Specification and DSLs

- After years of ”unification” a clear & strong trend in industry to specialization in (modeling) languages, i.e., DSLs
  - So far deployments mainly in MDD
- UML, TTCN-3, etc – one size fits all?
  - One size is how many pages of standard?
  - One language ?= one compiler
  - XMI ?
- A(nother) domain specific modeling hype ?
  - Various understandings of what is a ”domain”
  - Presentation format vs actual language
  - Strong (Eclipse) open source initiative ”xtext”

What is a Domain Specific Modeling?

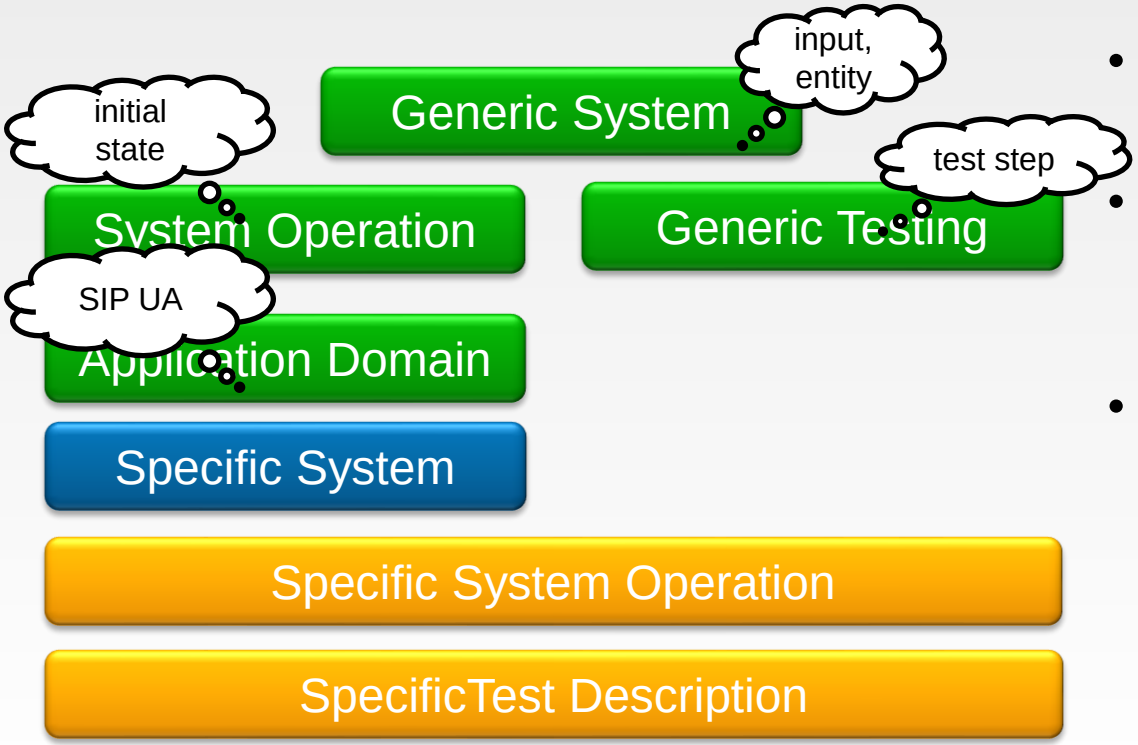
- Modeling with a Domain Specific Modeling Language
- What is a Domain Specific Modeling Language (DSML)?
  - A formal language defined on a custom, limited set of domain specific concepts, symbols, and rules in a so called meta model
  - Attempts to achieve a higher level of abstraction than a general purpose language like, e.g., UML
- Conceptual foundation dating back to the 80s (ISO 10027)
  - Later on popularized in 90s by OMG as “Meta Object Facility” (MOF)

[Example] Anatomy of a DSML or Meta-Model



A Layered Definition of ETSI Testing DSLs?

[based on Oligschläger, LACTOSE 2012]



- A DSML definition in multiple levels
- A new level can add new concepts, properties, relationships etc
- A new level can refine or restrict already existing concepts, properties, relationships, etc

Why DSML(s) in Standardization?

- Not a new idea in context of TTCN-3
- A fast way to nice & free text editors available for anybody (via xtext)
  - One of the challenges of the ExTRA aka TPLan
- A nice way to formalize dependencies and ensure consistency between different abstraction levels
  - ExTRA -> System operation or TDL -> TTCN-3 ?
- Allow space for tool proprietary presentation formats and even refinements, and extensions
  - At same time enables enforcing ”tool independent single language” for use in standardization