Fokus!MBT and ModelBus
– Heading Towards Test Automation

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Agenda

- Introduction
- Technology Overview
- Test Requirements-driven approach
- Demo
- Conclusion
What’s wrong with testing?
Introduction
What’s wrong with testing?

- Time-/Resource consuming
  - Mostly manual, repetitive work
  - Tends to be unstructured and intransparent to the developers
  - Test case derivation is often bound to a tester’s ingenuity (implicit knowledge)
  - Lack of documentation

- Testing do not receive appropriate recognition
  - Testing is destructive (and disruptive)
  - Testing is not an engineering discipline and testers are opponents
  - Lack of communication between tester and developer due to different expertise

- Testing (and all its related activities) can easily extend the development budget
  - Extends time to market
  - Efforts for testing are often underestimated, hence, testing starts too late
Technology Overview
Fokus!MBT – Flexible, Extensible, Interoperable, Automatable

- Comprises a compound set of domain-independent testing services for model-based testing purposes
- Allows the realization of tailored, domain-/project-specific tool chains to establish model-based testing scenarios
- Supports several activities of a test process
  - Test analysis and design
  - Test realization and execution
  - Test result analysis
- Based on a proprietary metamodel for testing purposes (TestingMM)
  - Conceptual merge of UML, SysML, UTP, TTCN-3
Technology Overview

ModelBus

- ModelBus is a service-oriented architecture platform based on WebServices
  - Deals with tool heterogeneity
  - Allows effective process automation

- Support for modeling services (e.g. transformations)

- Model aware repository service (svn for Models)

- Services are plugged into the ModelBus via adapters

- Process automation is controlled by service orchestration
  - Business Process Modeling Notation (BPMN)
  - Business Process Execution Language (BPEL)
Technology Overview
Fokus!MBT Service Integration

- Fokus!MBT Services
- Fokus!MBT Service Implementations
- Model Repository
- External Service Extensions
- Model Flow
- External Tool

Diagram:
- UML State Machine
- UML Interaction
- CoDOG
- JUnit
- TTCN-3
- XML
- Test Case Generator
- Test Data Generator
- Test Code Generator
- Test Management Tool
- Test Execution Environment
- Model Bus Adapter
- System & Test Model Repository
- OCL Guidelines
- (Test) Model Quality Tools
- Requirements Engineering Tool
- MS Excel
- DOORS
- MS Word
Technology Overview
Eclipse Inside

- Fokus!MBT and Modelbus both heavily rely on Eclipse technologies
  - Equinox
  - EMF
  - Eclipse RCP & EMF Databinding
  - Eclipse M2M and M2T technologies (Acceleo, QVT-O)
  - ...

- The tool chain integrates several Eclipse based applications
  - ProR / RMF
  - Papyrus UML
  - IBM Rational Software Architect
  - TTWorkbench

http://eclipse.org/rmf/
Methodology and Scenarion

Test Requirements-driven approach

- Testing efforts are often underestimated and starts too late
  - Testing should take place as early as possible
  - Depends on the level of testing

- The consolidated requirements specification is the earliest point in time were testing activities make sense and are purposeful for acceptance and system testing

- Based on the system requirements dedicated test requirements are defined
  - An item or event that can be verified by one or more test cases
  - Semi-informal specification of what a test case should verify

- Allows prioritization and assessment of testing activities before detailed system design is specified
A LITTLE DEMONSTRATION

Source:
http://www.bi-luechow-dannenberg.de/chronologisch/bi-on-tour/freiburg-atom-endlager-erkundung-erfolgreich
Demo Scenario - ModelBus and FOKUS!MBT

- Requirements Development
  - ReqEng
  - ProR

- System Development
  - SysDev
  - System Modeling
  - State Charts

- Test Analysis & Design
  - TestDev
  - Test Requirements
  - Test Artifacts
  - Papyrus UML
  - Test Case & Data Generator

- Test Realization & Execution
  - TestDev
  - TestingMM
  - FOKUS!MBT Feedback GUI
  - IEEE829 Word Report
  - TTCN-3
  - Result Feedback
  - Result.tlz
  - TWb

Arrows indicate:\n- In/Output
- Transformer
Summary
Model-based test automation

- Modeling and test modeling based on well-known, proven and established standards
- Early testing based on (test) requirements
- Requirements traceability from initial elicitation all the way down to test code
- Several autarkic services worked together to realize a tool chain for a particular methodology
- Orchestration was done via BPMN
- Generation of fully executable test cases
- Result analysis and report generation with Fokus!MBT Core Editor and Word
Thanks for your attention

QUESTIONS?

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