Using TTCN-3 to standardize the test automation chain

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Test automation chain
chains, domains, and standards

TTCN-3
specification and other parts of the chain

Case study
how we applied it to financial systems
Test automation chain

Test automation goes from test case generation to reporting with at its heart test execution.

Data between steps of the chain must be specified in a format understood by both ends of a step.
Different domains may have comparable test automation chains in theory, but differ in the realization of their steps.
Test automation chains of different domains are in practice not very compatible, while there would be much to gain if they would be more standardized.
Example advantage

Testing systems on the borders of different domains could be easier done with a single, standardized approach.
Test automation chain

Example advantage
With a standardized format in place, the best tools from each domain could be combined to make the optimal chain for each project regardless of domain.
Agenda

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We propose to standardize the different steps of the test automation chain by using TTCN-3.
TTCN-3 is the Testing and Test Control Notation version 3

A language for test specification.
Internationally standardized by ETSI.
Its origins are in the telecoms domain.
Its application fields go further …
TTCN-3 could serve as the language in which specifications are directly written by testers.

Its core notation is designed just for that.
There is a set of presentation formats available, and this set is extendable.

Furthermore, types and values can be imported from other notations.
TTCN-3 can be used for more than specification alone.

Let’s look at the software architecture.
TTCN-3 is compiled to a test executable…

… that is at the centre of an architecture for automated test environments…

… with standardized interfaces.
TTCN-3

With these interfaces we can standardize the others parts of the automation chain.
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ITEA
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TT-Medal

The ITEA project TT-Medal developed generic standardised automated testing methodologies and tools based on the TTCN-3 testing language from ETSI to make the European industry test more efficient and effective.

Press Release
Helsinki, 13 October 2005

Software test breakthrough wins ITEA Achievement Award 2005

The Board of ITEA – Information Technology for European Advancement – has selected the TT-Medal (Test & testing methodologies for advanced languages) project as the winner of the

SOLUTIONS THAT MATTER
Case study

Financial sector

The goal of the case study was to show if and how TTCN-3 could be applied in this domain.

In two areas:

1. user test specifications
2. execution on financial systems
It is common for testers in the financial domain to take a more end-user-oriented approach.

Test specifications should therefore be written on the same higher abstract level.

So we use TestFrame Language (TFL).
We provided a mapping from TFL to the TTCN-3 core notation – this makes TFL a new presentation format.

Furthermore, we implemented an automated translator based on these mapping rules.
In this case study we have focused our efforts on testing the graphical user interfaces (GUIs) of financial applications.

Two reasons:

1. These are representative of the domain.

2. GUI-testing is an unexplored field by the TTCN-3 community.
To communicate with GUI applications we have integrated a GUI test module from TestFrame into the TTCN-3 test execution architecture…

…by providing it with a TTCN-3 codec and system adapter interface.
Case study

Summary

Between specification and execution we created a mapping from TFL to TTCN-3.

Between execution steps we integrated TestFrame software in the TTCN-3 architecture.
Conclusions

- TTCN-3 can have a presentation format on a high-level of abstraction
- Easy creation of new presentation format (language mapping)
- Easy creation of new test architecture components
- TTCN-3 is applicable to the whole test automation chain
- TTCN-3 has proven to be applicable to different domains
Recommendations

- Mappings to other proprietary languages
- Different presentation formats for test reporting (logging)
- Standardization for extending the test architecture to other domains
- Support by large test tools vendors
- Standardization input to ETSI from other domains than telecoms
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Book
An introduction to TTCN-3