Using TTworkbench at the University of Applied Sciences of the Saarland

Education & Research – Protocol Testing – Communications Engineering

About the University

The University of Applied Sciences in Saarbrücken currently offers 40 well structured degree programs. Students, usually learning in small groups, have access to modern, well-equipped laboratories, lecture halls and seminar rooms. Excellent supervision and close contact to the more than 120 members of the professorial staff are distinctive features of academic life at the university.

The university places considerable emphasis on high-quality, practical teaching that is closely mixed with real social, business and industrial applications. This enables the university to identify the changing needs of today's working environment at an early stage as well as to adapt and modify its teaching curricula accordingly.

Course Description

At the HTW, testing is hardly being addressed in courses, at most in terms of Unit testing. The master degree program "Computer Science and Communications Engineering" includes in the domain of protocol engineering a lecture about "Formal Methods in Telecommunications" (60 lessons) teaching our students details about ASN.1, MSC, SDL and TTCN-3. This is followed by the course "Software Development for Communication Networks" where students carry out a software project.

At the University of Applied Sciences it is our goal to put theory into practice. So far we have used the ASN.1 compiler of OSS Nokalva and the SDL tool SAFIRE of Solinet but we did not use any tool for protocol testing. Considering the increasing relevance of testing, we are going to focus more on this topic and also to integrate practical exercises.

Why TTworkbench

Professional development tools are often not suitable for educational purposes as they are designed for experienced developers and for real projects. Therefore I participated in Testing Technologies (now Spirent) three day TTCN-3 training course to get an impression of their test automation tool TTworkbench.

The tool is easy to handle, conform to the standard, and the integrated Addressbook example is a perfect exercise. TTworkbench turned out to be well suited for our master students, who are used to Eclipse based development environments.

The Educational License Agreement

The HTW highly appreciates the possibility to use Testing Technologies' (now Spirent) software tools free of charge via an educational license. This allows us to offer practice-oriented teaching. Our administration promptly signed the educational license agreement. Communication and processes of contract have been handled by Testing Technologies (now Spirent) fast and smoothly.

Installation

The access to TTworkbench Basic and the installation on a Windows terminal server were easy. It was helpful for the HTW to have a direct contact person at Testing Technologies (now Spirent) for the more complex part of licensing. Testing the installation, we realized that only ten instances of TTworkbench were able to run simultaneously.

The advantage of an installation on a terminal server is, that the software needs to be installed only once and not on all PCs of the computer room. Via a Sun Secure Global Desktop the students had access to the software from home or WLAN allowing a comfortable working environment.

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TTworkbench in Practice

During the winter semester 2009/2010, 13 students took part in the course. The limitation of having just ten simultaneously running instances of TTworkbench never caused any problems due to working in teams. I reorganized the course and limited the practical part about SDL considerably to enable students to spend one third of the course on protocol testing.

After a general introduction to protocol testing, students started learning concepts of TTCN-3 focusing on test-specific language elements. The exact language elements had to be acquired in self-study. For this purpose they had to build a TTCN-3 module for testing the Addressbook database analogue to the delivered Addressbook example. It was easy to explain TRI and TCI on the basis of the delivered examples with TTworkbench. Finally, several test cases realized in TTCN-3 were drawn manually in GFT format.

Résumé

TTworkbench is didactically well suited for our students. They showed a great interest in TTCN-3 and would like to go into this topic more intensively. It would be didactically welcome to have the GFT editor integrated into the educational version.

Our Plans for the Future

Testing and TTCN-3 have been gaining more and more relevance within the past years. Thus, I plan to extend the amount of courses addressing these topics. I would like to continue working with TTworkbench in order to complete classes with practical exercises. For future teaching we need to develop more basic exercises including the associated test adaptors and system under tests. This could be done within the scope of student projects.

"The HTW really appreciates the opportunity to use Testing Technologies' (now Spirent) software tools free of charge via educational licenses. This enables our university to offer a practice-oriented education."

(Reinhard Brocks, Professor for Computer Engineering, School of Engineering, HTW des Saarlandes, Germany)