Eine Dissertation der Universität Regensburg:

System Administration Training in the Virtual Unix Lab

An e-learning system with diagnosis via a domain specific language as base for an architecture for tutorial assistance and user adaption

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Preface

Development of the basic training system was funded as part of the HWP-project of the German government, the system was implemented at the Computer Science department of the University of Applied Sciences (Fachhochschule, FH) Regensburg, Germany.

As the basic system used in this work was developed in German language, usage examples, exercises and screenshots are in that language. This work as a whole is written in English to match the intended audience. The male gender is used throughout the text for consistency and simplicity.

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Hubert Feyrer
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Abstract

This work covers training of system administration by introducing a system called the Virtual Unix Lab, and illustrates advanced topics based on it. The work is divided into three parts.

In the first part, the goals of the Virtual Unix Lab is illustrated and compared to related works, followed by observations about education of system administration. General learning theories are observed and compared to an existing lecture on system administration, showing that there is demand for practical exercises in advanced topics.

The second part describes how diagnosis of the Virtual Unix Lab exercise results and feedback to the user are realized with the help of a domain specific language. After observing the fundamentals of domain specific languages, the design of diagnosis and feedback to the learner is presented, the Verification Unit Domain Specific Language (VUDSL) is described, and architecture and implementation within the existing Virtual Unix Lab are shown. An evaluation of the system was performed and shows that repeated exercises show improved performance of the students, and that the system is regarded as useful by students in general.

The third part adds tutoring and user adaption. Based on the fundamentals of tutoring and user adaption, an architecture for a tutoring component for the Virtual Unix Lab based on an overlay architecture is described. Aspects discussed include on-line diagnosis, feedback, assistance to the user, considerations for the user model, and impact on the user interface. User adaption is based on the user model built by the tutoring component. It observes structural and longitudinal consistency, and provides personalized feedback to the student. An architecture is described that fits in the overall Virtual Unix Lab architecture, and possible extensions for the VUDSL used for diagnosis and feedback are proposed.

Contents (short)

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