Towards a Task-Based System Administration Tool for Linux Systems

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Abstract

The growing popularity of computers in all areas of daily life leads to the situation that an increasing number of people with diverse know-how of computers and software use these systems. The more computers leave specialized usage areas but get literally everywhere, the more knowledge and skill is needed in the user community to administer these systems. While wide-spread user interface desktops claim to be „end-user friendly“, easy to administer and to maintain, or even close to being self-administering, reality shows that this is not the case. In this research we seek to find out about what the task in system administration are, how they are supported currently, and which properties a task-based system for helping users to maintain their system should provide. As a test-bed for this research we primarily use Linux, as an open and flexible operating system with growing popularity in industry, academia, and on private computers.

1   Users have to be System Administrators

The use of computer has profilerated in almost all areas of our work and private life. Although most of the time the users interact with the computer doing their work, they also have to administer their system to some degree. There are devices and supporting tools for these tasks on the market, claiming to be „easy to use“. Therefore, users tend to operate everything by themselves and start acting as the system administrator, at least for their own computer. Currently, Linux gains strongly in popularity in competition to the market-leader, the Microsoft Windows[tm] systems. The Linux system offers a high flexibility in the configuration of user interface. There is a trade-off, however, with the complexity of configuring and administering the system. With Linux gaining popularity, however, the end user now has to do the system administrator ("sysadmin") tasks himself.

2   Tools for System Administration Tasks

Various tools have been proposed to help users in administering their system; usually these tools employ various dialog models. One possibility is that the user directly edits configuration files using the command line interface. Other user administering systems use text-based menus, yet other special sysadmin programs come with a Graphical User Interface (GUI). Comparing the different interaction styles, we found that the GUI approach does not always provide a better mechanism for performing sysadmin tasks. Although in some situations a visual representation of the system helps the administrator, it can create problems in other situations in terms of precision and clear semantics. If we seek to support system administration for a large group of tasks and users, we need to adopt the system to the type of dialogue model the user is familiar with and which is appropriate for correct and efficient performance of the task.

3   First Findings

We conducted a two-phase study, making use of observations combined with interviews with new Linux users. In the first phase, we wanted to find out what the typical administration tasks are and look into different user interface design alternatives for sysadmin tasks.

Typical tasks we found were: **User Management** (using account and password, create a user, etc), **File Management** (creating or opening a file, copying or deleting a file), **Hardware Management** (using and installing devices, etc), **System Management** (installing, adding or removing tools or applications from the system, etc), and **Network Management** (connecting to the Internet, browsing, reading, replying or managing email). Interestingly enough, we found that users tend to be willing to do some administrating system jobs motivated by the chance of having more control over the system. As stated by Thimbleby [], users invest "a lot of themselves" to learn how to handle a system, even if the system is bad.

With respect to different user interface styles, we found that one alternative can be optimal for some types of users while performing poorly for others. Systems which are easy to learn may cause users to dive into the system more eagerly, after passing the basic learning steps. User skills grow over a period of time while using the system, and many users show high adaptability to a system since they continue using it after few months and learn to use the system on their own without any formal training.

In the second phase, using the results from the first phase, we tried to isolate a profile of those users who are currently performing sysadmin tasks on their own machines on whatever system they use. We found that they are people who use computers in their daily work. Their computer experience level is quite high, with practical computer exposure for at least the last 3 years. They are mainly close to academia, research and education environments, or in Internet related business. All have used MS Windows in their working environment and have a clear picture of the concepts found in MS Windows. Most of them have already heard about the Linux system, but only a small part of the participants use it. Participants responded positively to Linux, finding that the system offered powerful functionality needed to maintain, manage, and administer it. They expressed their intention to use it in the future, as they needed a stronger and more stable system. There are still problems, however, when switching to Linux: For one thing, there are significant conceptual differences to systems like MS Windows. Second, people criticized the help and documentation information of not being well organized.

4   Future Work

We are currently evaluating the data gathered on a more precise and formal basis. This will enable us to find variables influencing the user acceptance to Linux. Also, we will look into the sysadmin tasks and find critical points that need further analysis to make them more simple. We will turn our findings into a formal task model and a user model of the sysadmin job in a computer system, thus yielding information on properties an appropriate tool should have. We think that the task model of sysadmin for the „home user" has to be parameterized to different user classes; hence, we aim at creating a user interface which adjusts itself to the user and his tasks.

Bibliography

1. Thimbleby, H. (1990): User Interface Design. ACM Press, London, p. 41.

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