

Migration: USER ADMINISTRATION IN GOOD COMPANY

Windows 98 was primarily designed for single-user machines, although it is quite possible to set up several user accounts. As Anja M. Wagner explains, Linux is basically a multi-user system, which is why user administration is more sophisticated and user-friendly than in Windows

The multi-user approach is already evident during the installation of Linux, when the system administrator, or superuser "root", and at least one additional "normal" user must be created. In this workshop we are going to show you how to create additional users and groups and how to assign access permissions to files and directories, in short, how to administer Linux users. For the purpose of this tutorial we will be referring to Linux SuSE 7.2 Professional with a KDE 2.1.2 desktop.

The philosophy of Windows 98 is fundamentally different from that of Linux. The operating system is primarily designed for one user on a single-user machine. However, Windows 98 also offers the facility to set up multiple users. What is the point of that? Even a computer without a network connection could potentially be used by several people, for instance, different members of a family or flatmates. In this case it is useful to be able to create a user account for each person. Each user can then create his or her own individual desktop and My Documents folder. However, under Windows 98 this folder is not protected against access by co-users, as it would be with Linux.

Under Windows 98, additional users are created in the Passwords section of the Control Panel. By enabling this option Users can customise their preferences and desktop settings. Windows switches to your personal settings when you log on via the

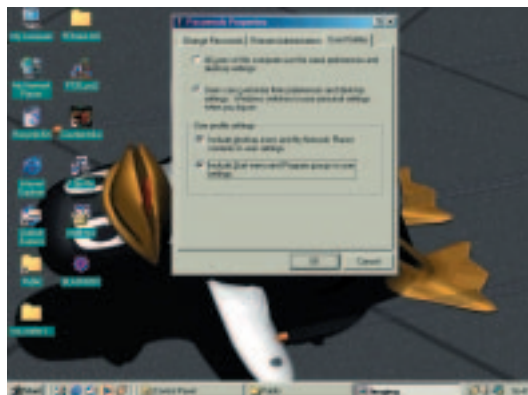


Figure 1: Under Windows, individual user profiles have to be enabled

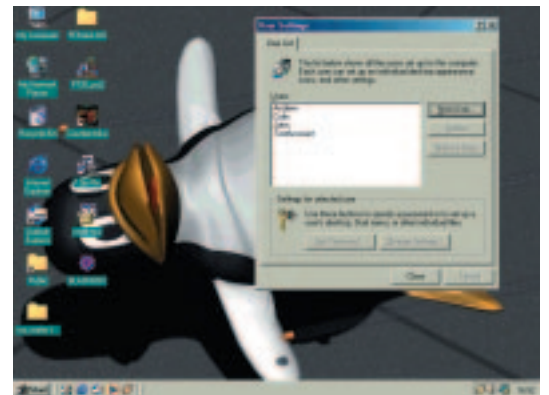


Figure 2: All users happily united on one list

User Profiles tab.

If the desktop icons, the Network Neighborhood contents, the Start menu and the program groups are to be included in the user settings, you also need to tick the relevant options on the same tab. After confirming with OK, you then need to open the Users section, which is also in the control panel. All existing users are listed under User Settings.

By clicking on the New User button you can start a wizard, which will help you to create additional users. There is no point in setting up a password, by the way, it will not protect against access and manipulation by other users. In the step Personalized

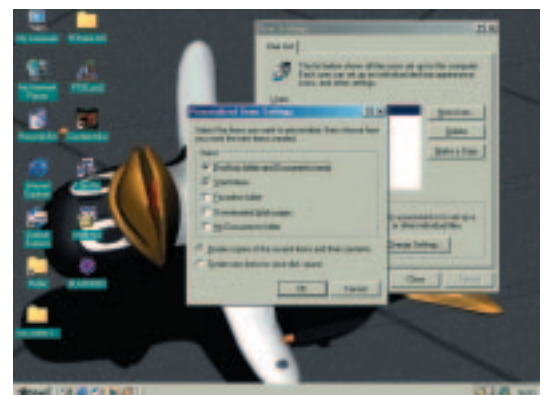


Figure 3: A small selection of items for personalised settings

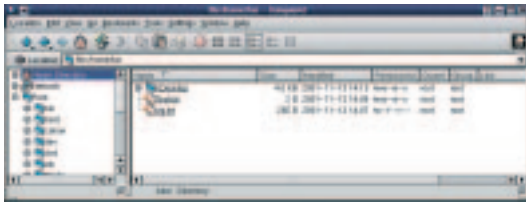


Figure 4: The file manager shows the file permissions for "tux"

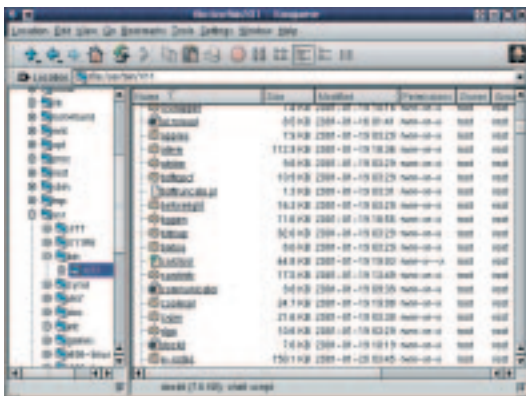


Figure 5: Permissions for the system administrator "root" are a little more complex

Items Settings you can select to personalise favourites, downloaded Web pages and the My Documents folder. You can also choose between starting off with a copy of the existing desktop or with new, empty desktop items.

Now every Windows user can log in with their own name and password at start up. The operating system will create the folder *Windows/Profiles/username*, in which the individual settings are stored.

Grass roots

Under Linux, two users exist right from the start, the system administrator "root" and a "normal" user who we shall call "tux". All users are assigned to a group by the system and can have different permissions. Only the superuser "root" has all permissions for all files and directories, i.e. read = r, write = w and execute = x. This is the reason why system files can only be amended when logged in as "root", as only this user has the necessary permissions to make such changes. For directories the execute permission "x" indicates the ability to access the directory at all and "w" means being allowed to create new subdirectories and files. If even "root" does not have execute permission for a file then it is not an executable file, for instance it could be a text or image file.

In SuSE Linux, to start off all normal users belong to the group "users". Red Hat, however, creates a new group for each user, where the name of the group is the same as that of the user account. This is then the standard group for that user.

If you want to know the permissions for a directory or file, start the file manager Konqueror by clicking

on your home directory icon in the KDE panel. Your home directory under Linux is roughly equivalent to the My Documents folder under Windows. Activate the detailed list view under View/View Mode on the Konqueror menu bar. The Permissions column contains a nine part combination of the characters "r", "w", "x" and "-".

The first three elements show the permissions for the owner of a file or directory. The first triple "rwx" on a file created by "tux" and stored in his home directory indicates that the owner "tux" has all permissions for this file. The second triple shows the group permissions assigned to the file, in this case for the group "users". Permissions for all other users can be seen in the last triple. The hyphen indicates the absence of a permission in the "rwx" sequence. For example, if "tux" was able to read and execute a file, but not to change it, the triple would be "r-x".

To display permissions on the command line you first need to open a terminal emulator window by clicking on the window and shell icon on the KDE panel. At the prompt, type "ls -l" and press Enter.

The character in front of the familiar nine bit combination of r, w and x indicates the file type: a hyphen "-" represents a file, "d" represents a directory.

Admin or not admin

Returning briefly to the system login: the graphical login shows all existing users, in this case "root" and "tux". You have to decide right at the start of a session whether you want to work with Linux as the administrator or as a normal user. You should only log in as "root" if you are intending to make system changes and if you know what you are doing; otherwise you might damage the system. Each user is identified by their username and a password.

We are assuming for this workshop that you have installed Linux on a single-user machine. Even if you are the only user of this machine it still makes sense to create several "normal" users. This will give you more freedom to experiment with the uses and design possibilities of the graphical Linux interface. For instance, "tux1" could use a different KDE theme to "tux", and "tux2" could default to using GNOME instead of KDE.

We discussed how to customise the KDE graphical



Figure 6: File listing in the terminal window

Figure 7: The administrator "conducts" the system

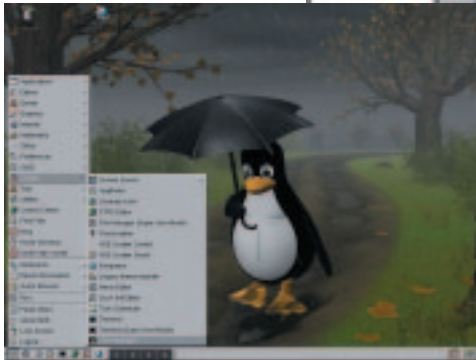
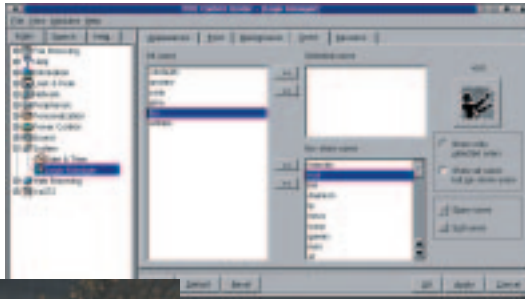


Figure 8: This way to the user manager

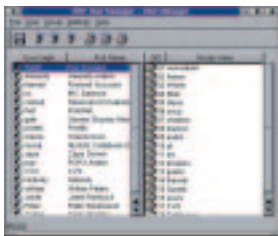


Figure 9: The user manager clearly lists users and groups

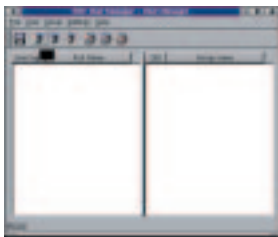


Figure 10: User administration is accessed by button or menu

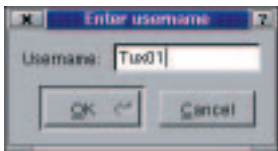


Figure 11: A new user is born...



Figure 12: ...and equipped with vital information

login in the workshop "Tailor-made desktop, part 2" in issue 13 of Linux Magazine.

In the field containing images for the different users the system administrator is represented by a conductor. This normally needs to be activated after an installation. Log in as "root" and open the KDE control centre using the K

icon on the panel. Select System/ Login Manager in the left column and then select the Users tab. By default "root" is set to be one of the users that is not displayed during graphical login. This is a security precaution to make it harder and less tempting to log in as superuser. Click on the entry "root" in the list of no-show users and then on the button with the double left chevron to remove it. The stylised conductor will now appear at the next graphical login and you only need to click on it to enter "root" in the login field.

User administration is one of the classic tasks of a system administrator. Log in as "root" to create new users. Click on the K icon in the panel and select System/ User Manager. This starts a tool that makes administration tasks much easier.

The user manager window is split into two halves. On the left all existing users are listed with their login and their full names. At the end of the list is the "normal" user "tux" that you created during the installation. On the right are all existing groups with their group IDs (GID).

New user

In order to create a new user, click on the Add user icon or select User/ Add from the menu bar.

A small window pops up and you are prompted to enter the new username. We are going to use the name "Tux01".

In the following step you will specify the properties of the new user. Enter the full name. Additional information such as the address can be entered in the text fields Office1, Office2 and Address.

An important part is the selection of the login shell. A shell is basically the interface between the user and the operating system. It provides a command line on which you can enter commands. The login shell is the shell that the respective user is given to work with.

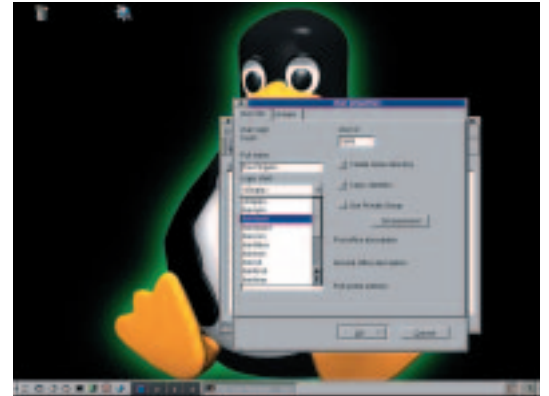


Figure 13: The login shell determines the user's working environment on the command line

Normally this is the "bash" (*/bin/bash*) – "Bourne Again shell", but there are others, for instance the C shell (csh) or the Z shell (zsh).

Equally as important as the specification of the login shell is the creation of a home directory for the newcomer. The user manager creates this automatically. It is called */home/username*, in our case */home/Tux01*. The user ID (UID) is also assigned automatically by the system. You should not change this number, as this is how Linux recognises the user. In order to simplify the configuration task you should ensure that the options Create home directory and Copy skeleton are ticked. The second option provides the new home directory with a number of standard configuration files that are copied from the skeleton directory */etc/ skel/*.

Passwords

If you want to set a password for the new account, click on the button *Set password and enter it twice*.

The groups to which "Tux01" belongs can be set on the Groups tab. More on this later. The primary group for a normal user (for SuSE) is logically called "users". User properties are changed in User/ Edit, and if you want to get rid of an account, select User/ Delete. The user manager only saves your entries after confirmation once you exit the program.

A new group is created in a similar manner: click on Group/ Add and specify a meaningful name. The

UID The user ID is a number between 0 and 65535, which the system uses to recognise and identify the user and to administer his or her account. The system assigns the UID automatically when a new user is created. This number should not be changed.

GID The group ID is similar to the UID. It is also a number between 0 and 65535. Each new user is initially assigned to a primary group, in SuSE it is called "users".

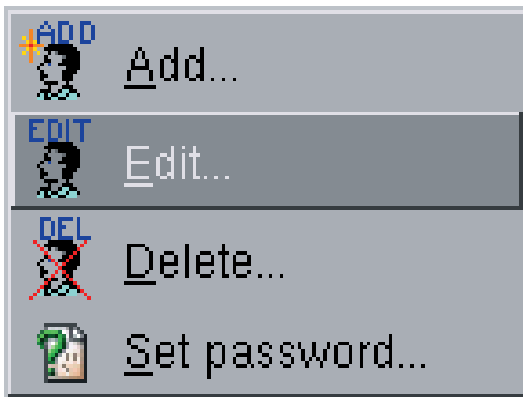


Figure 14: The final goodbye: deleting a user

system also identifies groups by their group ID (GID). This number is assigned automatically by the system.

We are going to use an example to explain how you can apply user and group administration:

Big brother

Andrew, Colin and John share a flat. Andrew owns a computer and since he is a friendly sort of chap he creates user accounts for both of his flatmates. Each account has a password so that all directories and files in the respective home directories are protected from the curiosity of the others. He himself has, of course, all access rights, because he is also the system administrator "root". Well, someone's got to do the job.

However, the three flatmates want to make certain files available to everyone. They all need to be able to read the cleaning rota and to enter who did the

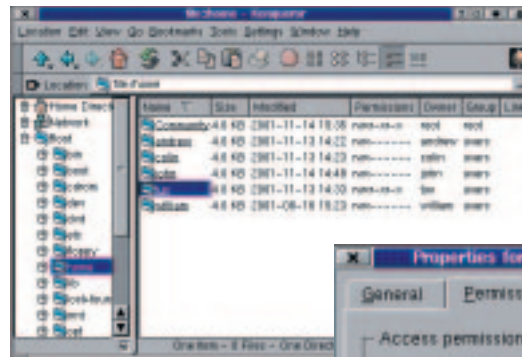


Figure 17: To avoid confusion the "Community" gets its own directory

cleaning and when. Andrew, alias "root", therefore creates a group called "Community" with the user manager.

He then amends the user groups to which Andrew, Colin and John belong. To do this, he first clicks on the new group, Community, on the right side of the user manager and then either clicks on the Edit icon or selects Group/ Edit from the menu bar. This opens the field Group properties in which he selects his flatmates on the left one by one and assigns them to the Community group by clicking on the arrow pointing to the right. Finally, "root" also becomes a member of the group.



Figure 18: Defining access permissions for the group

Community

To avoid confusion, and to make sure that the common files can be accessed, "root" now creates a directory `/home/Community`, in which the files and directories to which Andrew, Colin and John all have access are going to be placed.

He creates this directory with the file manager Konqueror. Permissions to the directory and its contents for the three are set by "root" through right-clicking on the directory and selecting Properties/ Permissions.

At first only the owner has all r, w and x permissions. So that Colin, John and Andrew can also access Community, "root" puts three ticks in the Group line and changes the group from "root" to "Community" in the Ownership section. There is no point in ticking the option Apply changes to all subdirectories and their contents, because KDE will not save this yet.

If one of the flatmates now puts a file into the directory that is meant to be accessible to everyone in the Community group, they then need to right-click and select Properties from the context menu and set the permissions, i.e. give read, write and, depending on the file type, execute permission to the Community group. If a member of the group amends a file, permissions do not have to be reset.



Figure 15: A new group called Community is created

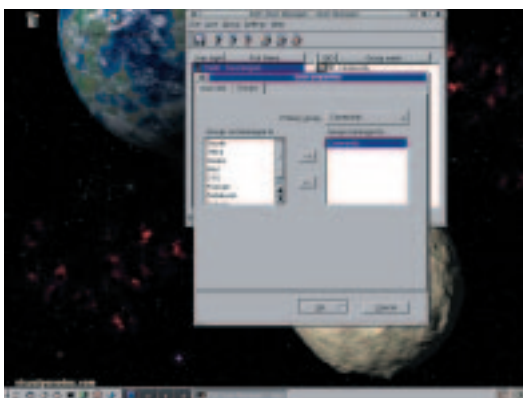


Figure 16: Members are assigned to the new group