

Chapter 4

Using the X Windows Interface

This chapter will introduce the basic GUI interface known as X Windows and various system level commands that may be used instead of those learned in Chapter 3.

Concepts Learned in this Chapter

- Basic X Window Screen
- X System Level Commands

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In the first chapter we learned the fundamental commands that one may use from the Command Line. Here we will learn the basics of the X-Windows system and a few of the commands that are available in the windowing environment.

4.1 The GUI Screen

As an alternative to the Command Line Interface, we also have a Graphical User Interface, often called a GUI. As we learned in Chapter 3, to initiate the GUI interface, we key in the command **startx**. After a short time of testing the hardware and initializing, we will be presented a screen, similar to that shown in Figure 4-1.



Figure 4-1: X Windows GUI Screen

X Windows is the Graphical User Interface system used by Unix and Linux, being the equivalent to Microsoft's "Windows". But that is where the similarity ends.

Microsoft's GUI is very tightly integrated into the total operating system and can not be separated out. If a change is to be made, an effect might be evident on the whole system. Unix and Linux take a different perspective to the GUI. Instead of being part of the operating system, it is an external application. This improves the GUI stability of the whole system because if X Windows should fail, it does not cause the operating system to crash – you only need to restart X Windows. Other non-GUI applications are not effected.

X Windows, or just “X”, in fact is not responsible for the screen’s appearance. Its responsibility is to act as a shell between the Window Manager and the Kernel. It interprets mouse movements and clicks. The Window manager is responsible for calls to the Kernel via X and to draw the necessary windows and images on the screen. Additionally, there is the Display Manager, which is responsible for the look and feel of the screen.

There are several different **Display Managers** available for the GUI interface, the one shown here is called KDE. Another very popular GUI interface is GNOME. Others are also available. Although there may be small differences between the different Display Managers, they will all basically function the same.

When we refer to the GUI interface under Unix and Linux, we commonly say X Windows, or just X. This is a program that runs or operates as a shell, like bash, that interprets not just keystrokes, but also mouse movements and clicks.

4.2 Basic Window Properties

Before we learn how to use X Windows (although not really different from that of Microsoft), we need to review the different parts of the screen.

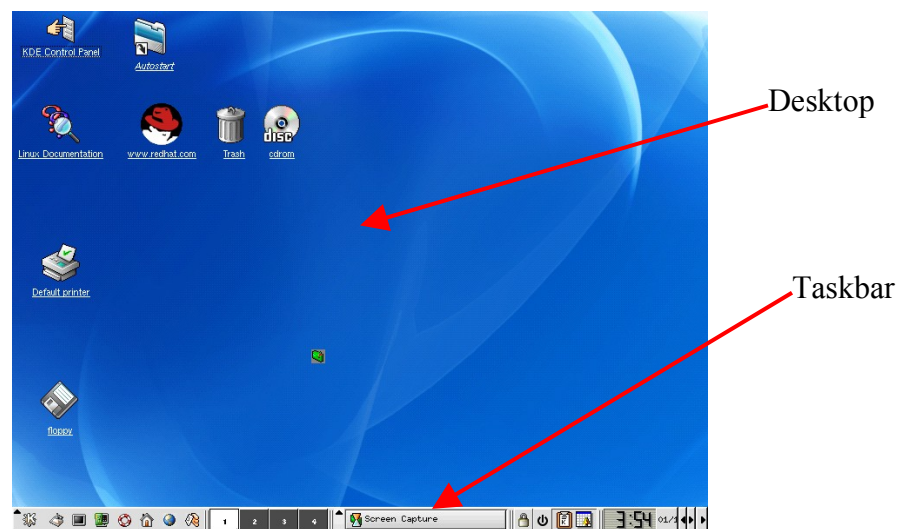


Figure 4-2: Basic Window Parts

4.2.1 Desktop

The basic background that the user works with is the Desktop. In this area appear various user icons and applications, which appear as windows. We will view various applications in later discussion.

The Desktop may be modified by right clicking on the background that does not have an image. This will open a window that will allow one to modify the Desktop operation, background, define the screen attributes, and setup the screen saver attributes.

Additional application icons may be created on the Desktop by one of two methods. First, if the application exists on the Menu, left clicking on it and dragging it to the desktop will create a new link to the application. Second, a new icon may be created by right clicking on the background, upon which a new

window will open. One may then create a new application by completing the requirements.

4.2.2 Taskbar

The Taskbar displays various icons which need to be explained.

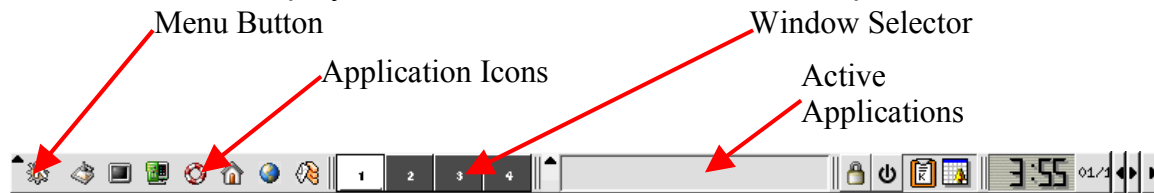


Figure 4-3: Taskbar

Right clicking on a blank area of the Taskbar allows one to make adjustments to its size, number of displayed Windows, if it should be hidden when the cursor moves off of the Taskbar, and other features.

Additional Application Icons may be added to the Taskbar by clicking on the Menu Button, selecting the desired application, and then dragging it to a blank area on the Taskbar; the location of the icon may then be moved by right clicking on it and selecting “Move”.

4.2.2.1 Menu Button

On the far left side is the menu button. For KDE, this is represented by a large “K” with a gear in the background or a red hat in newer versions. For GNOME, it is the footprint of the gnome (of course without shoes). Other window managers may use different symbols, but a single click on the icon will create a pop-up window for various tasks similar to Microsoft. In this review, we will concentrate on System tasks that have been reviewed in Chapter 3. Other tasks will be reviewed in later chapters, as appropriate. See Figure 4-3.

4.2.2.2 Application Icons

X Windows maintains a set of default application icons just to the right of the Menu Button. The user may configure the look of the Application Icons to their desire by adding or removing icons. See Figure 4-3.

4.2.2.3 Window Selector

By default, KDE and Gnome provide four different windows that the user may quickly switch between. Up to eight different windows may be set up. See Figure 4-3.

By left clicking on the desire **window selector**, the user may switch to a totally new desktop and then open new applications. Although multiple applications may be opened in any one window, this may be used to keep a “cleaner” desktop, yet allow the user to switch back and forth.

4.2.2.4 Active Applications

To the right of the Window Selector is the Active Applications tab area. Active applications that are running on the desktop have a tab display in this area (see Figure 4-1 for an example). An application may be running multiple times, that is

have multiple different independent windows on the desktop, but only one tab will appear in the Applications tab; each application tab, when left clicked, will open a small menu window that specifies each different application. See Figure 4-3.

4.3 Window Manager

What you observe on the monitor screen is a **Display Manager**, behind that is a **Window Manager**. Because of the flexibility of Unix and Linux, there are a variety of Window Managers to choose from. Some of the more common include:

Afterstep	Highly configurable with a small memory requirement.
FVWM95	Appearance similar to MS Windows 95, relatively outdated.
Enlightenment	Highly configurable and unique, high resource requirements.
Blackbox customizable.	Very fast, small memory requirement, not as
IceWM	Highly configurable, easy to emulate other GUIs.
KWM	Easy to use, well supported, high resource requirements, may be slow.
Sawfish	Based on Lisp language, easily customizable, easy to use.

Red Hat and Fedora Core commonly include the above Window Managers and several others, and others may be downloaded.

So why are there so many Window Managers and Display Managers? The best response is because someone wanted to do it differently – and thus provided you with choices. What is even better, if you are knowledgeable of programming, you too may develop your own and convince others that it is a better way of doing things. What you do is your choice.

4.4 Desktop Switcher

There comes a time when the user need to switch between the various desktops. One works better than the other in certain situations for a user. This is a relatively easy task, but does require the restarting of the Windows Manager. Selecting the Main Menu button, then select the System Tab. Finally, select the Desktop Switching Tool.



Figure 4-4: Desktop Switcher Selection

This opens the Desktop Switcher Window, where one may select between GNOME (Red Hat Default), KDE, or TWM. After the selection is made, to change to the new Desktop environment, close the Window Manager and start it again.

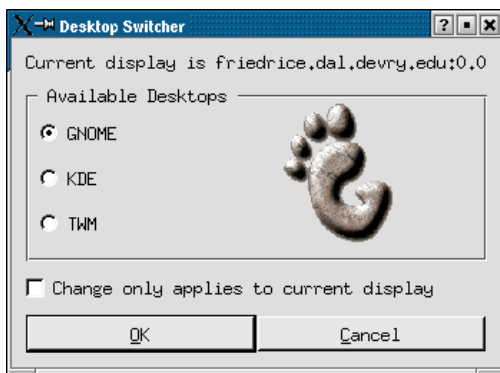


Figure 4-5: GNOME Desktop Selection

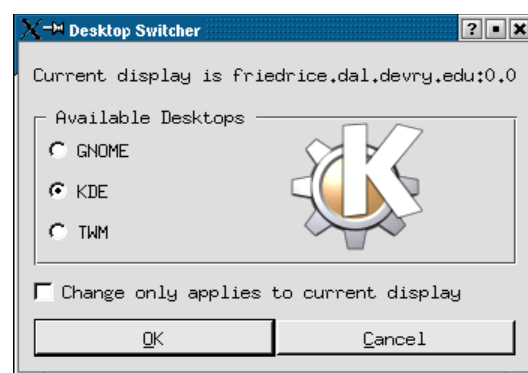


Figure 4-6: KDE Desktop Selection

The user's selection is maintained in the user's home directory, in the `/home/user/.Xclients-default` file. The configuration of the `.Xclients-default` file is, depending upon your Desktop Manager selections:

KDE:	FVWM:
exec startkde	/usr/X11R6/bin/FVWN
GNOME:	Enlightenment:
exec gnome-session	/usr/X11R6/bin/enlightenment
TWM:	WindowsMaker:
/usr/X11R6/bin/twm	/usr/bin/wmaker

4.5 System Configuration

As may be relevant, we will go back to Chapter 3 and learn what utilities are duplicated in the X Window environment. All commands are accessed by clicking on the menu button and then on the **System tab**, unless otherwise noted.

Before we start the commands, we need to open an **X Terminal Window** commonly referred to as **XTerm**. This is accomplished by single clicking on the small monitor on the Taskbar. (Later versions of Red Hat and Fedora Core may not include the X Terminal icon by default, but may be added.) A window will open similar to that shown in Figure 4-4.

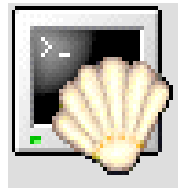


Figure 4.7: XTerm Icon

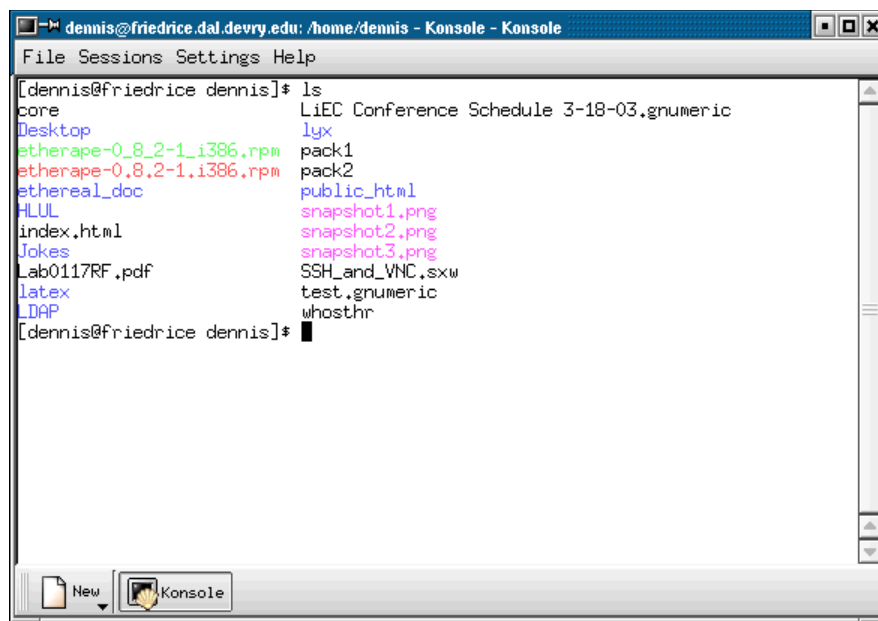


Figure 4-8: XTerm Window

This opens a Command Line Interface that is equivalent to what was utilized in Chapter 3.

4.5.1 Directory Structure

In an equivalent approach to MS Windows Explorer, the user may utilize a browser to view the file structure. Two common applications are commonly utilized, Konqueror or Nautilus.

4.5.1.1 Konqueror Browser

Konqueror is a very efficient web browser that requires minimal resources and operates very fast. With Red Hat 7, running KDE, it is the default web browser, whereas later versions have different browser applications. In addition to being a general browser, Konqueror may be used as directory viewer, similar to Microsoft's Explorer. To view a directory, enter into the URL the link:

file:/{directory-path}



Figure 4-9: Konqueror Icon

This will display a list of directories and files in the specified location. They may be viewed in various formats, in either an icon mode or detailed listing.

By single clicking on an icon, the user is able to dwell deeper into the directory structure. To move up in the directory structure, click on the left arrow in the upper left corner.

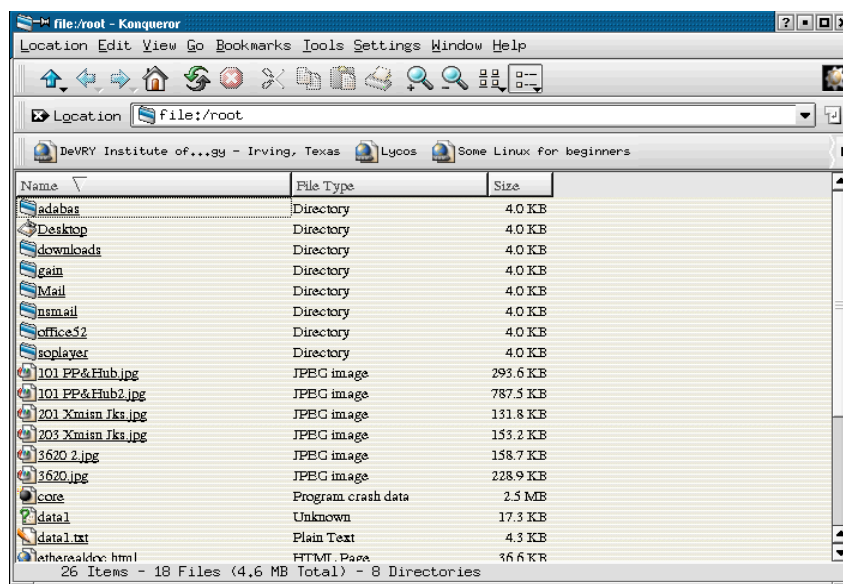


Figure 4-10: Konqueror Browser

4.5.1.2 Nautilus

Nautilus is very similar to Konqueror in selecting a directory to display, and operates under GNOME. Insert the directory location into Location bar, but this time the user does not need to add “file:”. Again the user may display the information in either an icon view or detailed view.

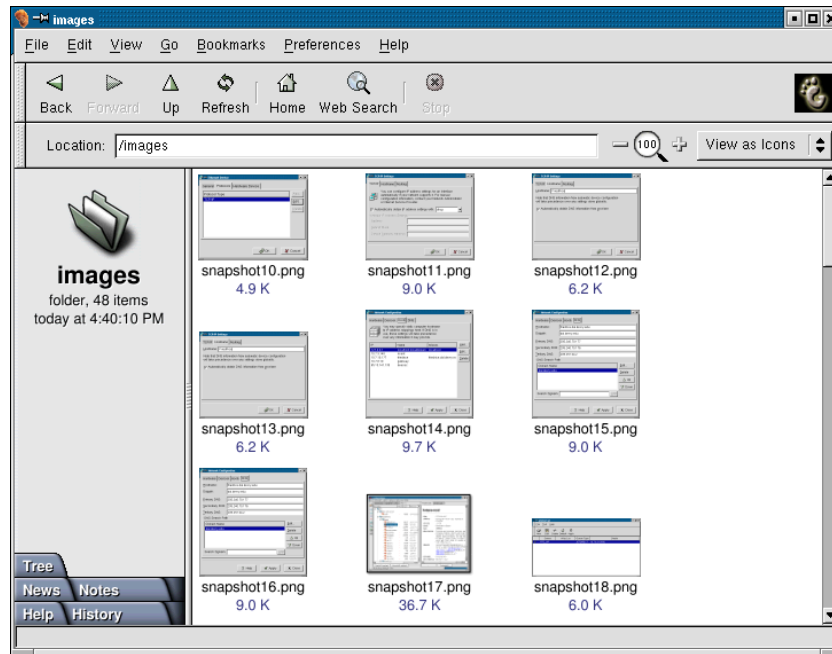


Figure 4-11: Nautilus Viewer

4.5.2 Editors

Several editors are available from within the X environment. These include **Kate**, **Advanced Editor**, **Text Editor**, **Gedit**, and **Xemacs**. These applications are accessed from the **Editors** tab. See Figures 4-12 and 4-13.

4.5.2.1 Kate Editor

Kedit is a very simple editor that supports basic pull-down menus and click-action icons.



Figure 4-13: Editor Selection Menu

Cut and Paste features are supported, but may be different in keystroke from their MS counterpart. See Figure 4-14.

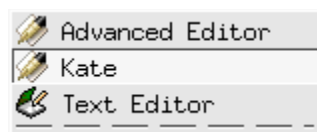


Figure 4-12: Menu Editor Selection

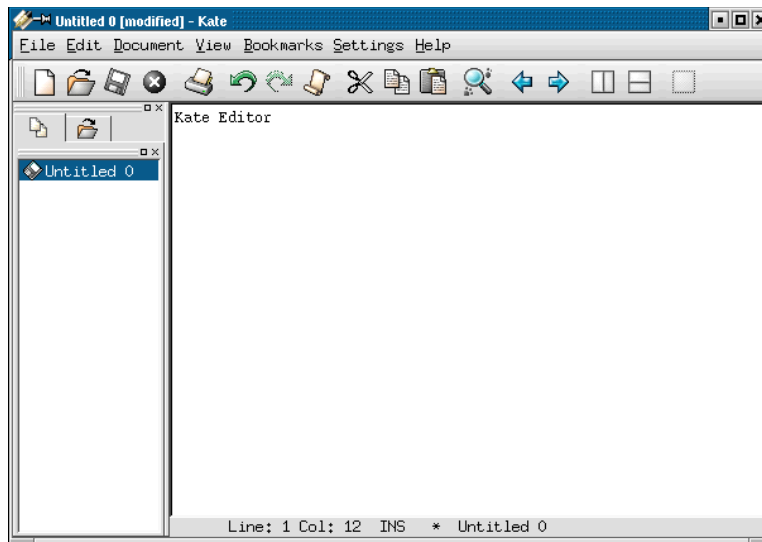


Figure 4-14: Kate Edit Menu

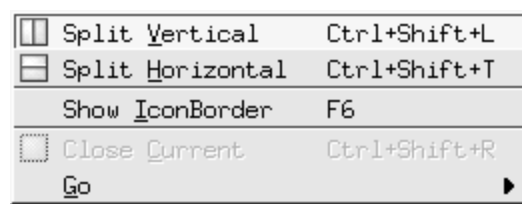


Figure 4-16: Kate View Menu

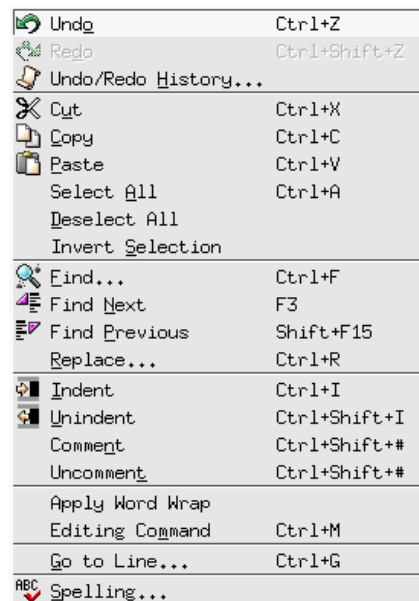


Figure 4-15: Kate View Menu

4.5.2.2 Advanced Editor

Advanced Editor is also a very simple editor that has some advanced features from Kedit. It is similar to MS WordPad, although the default file type is text.

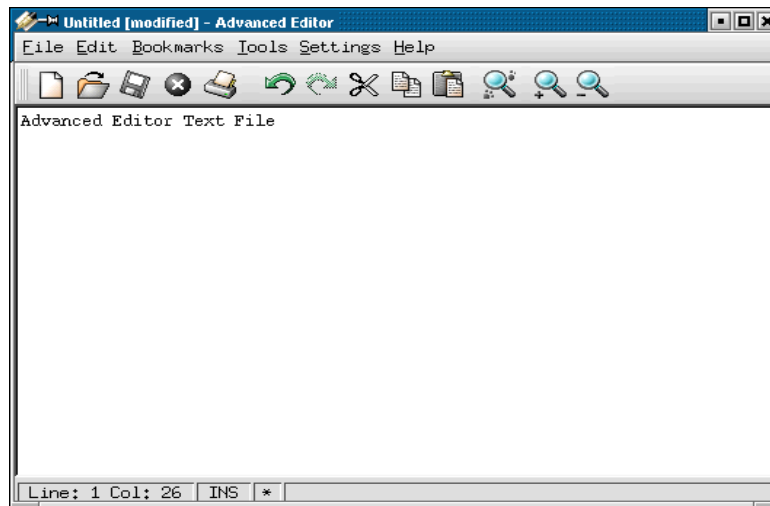


Figure 4-17: Advanced Editor Main Screen

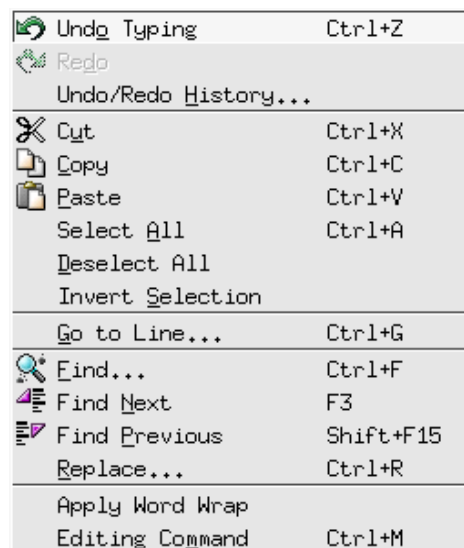


Figure 4-18: AE Edit Menu

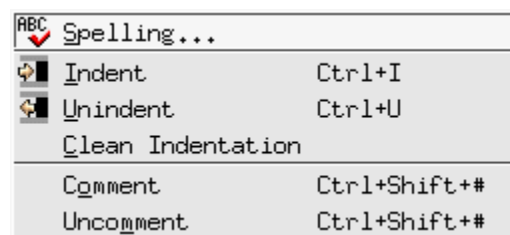


Figure 4-19: AE Tool Menu

4.5.2.3 Text Editor

The most basic editor is the Text Editor. This is the total equivalent to MS Notepad, with a very few basic enhancements, namely enhanced dropdown menus.

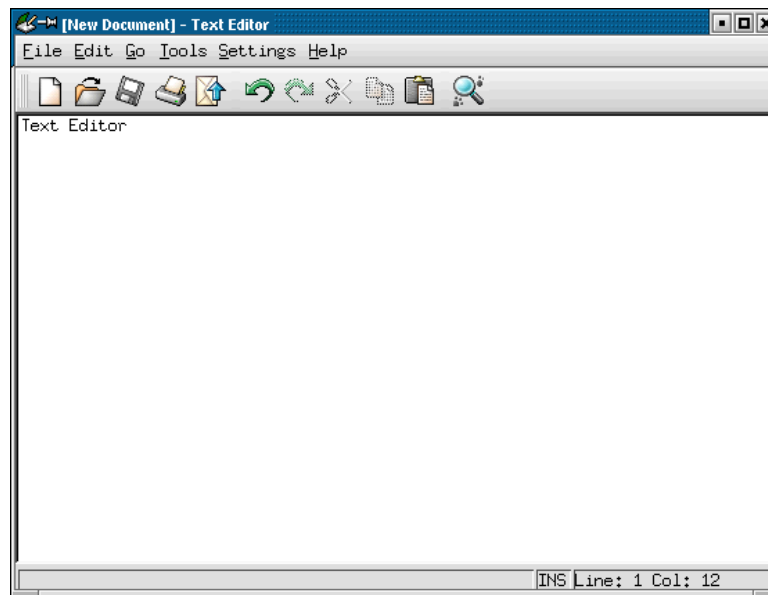


Figure 4-20: Text Editor Main Screen

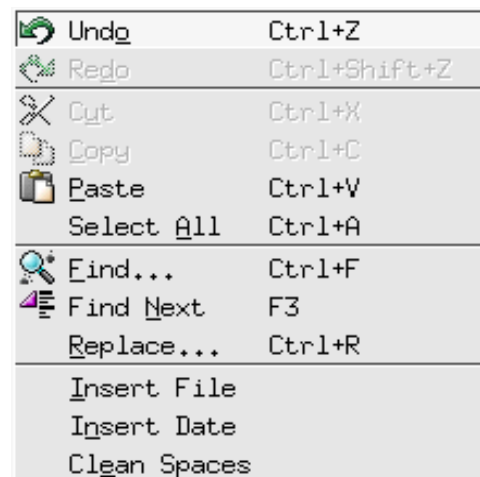


Figure 4-22:TE Tool Menu

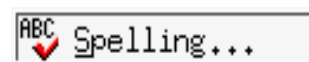


Figure 4-21: TE Edit Menu

4.5.2.4 XEmacs Editor

XEmacs is a very advanced text editor with many features. The major enhancement from its earlier CLI mode is that of pull-down menus. It is an excellent text editor for writing program code, providing automatic indentation

when desired. The options available to Xemacs are so extensive, that the user needs to investigate them on their own.

The main screen and some of the dropdown menus are shown.

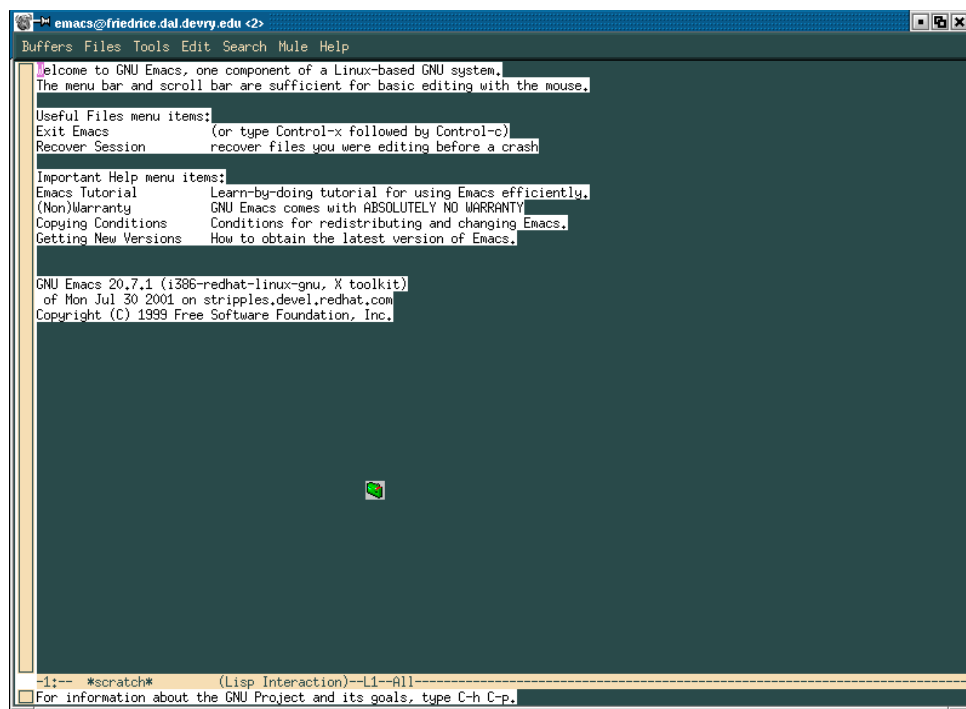


Figure 4-23: XEmacs Main Screen



Figure 4-24: XEmacs Tools Menu

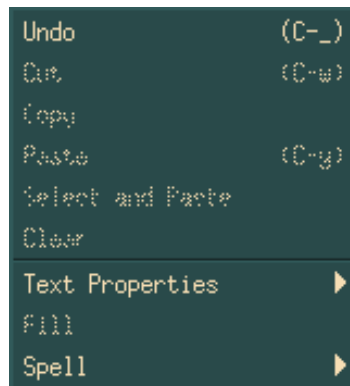


Figure 4-25: Xemacs Edit Menu

4.5.2.5 Gedit

Gedit might be considered a little more like Microsoft's Wordpad. It offers many excellent features including cut and paste. When in the GUI mode, it provides an excellent alternative to the other editors for ease of use. Since gedit does not normally appear on the desktop or on the task bar, it must be initiated from an XTerm window. Additionally, it should be started in the background, by issuing the command:

```
$ gedit &
```

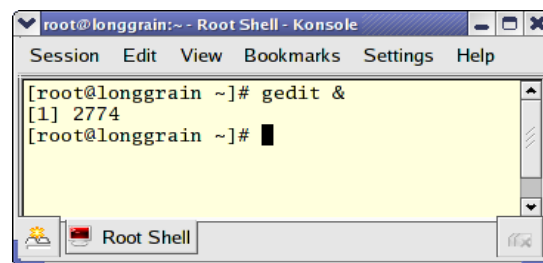


Figure 4-26: Starting gedit

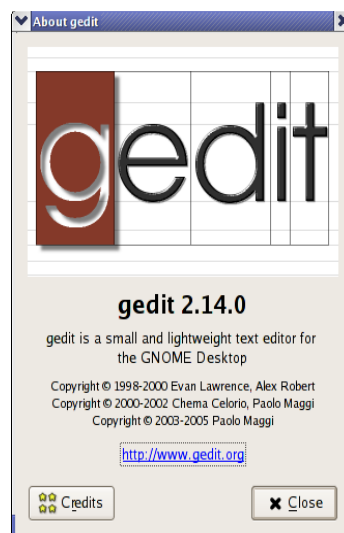


Figure 4-27: Credit Screen

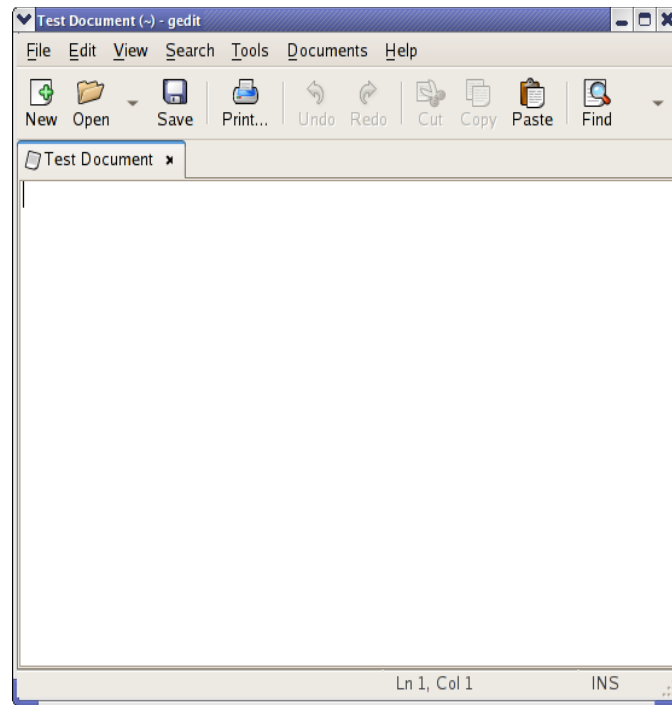


Figure 4-28: Opening Screen

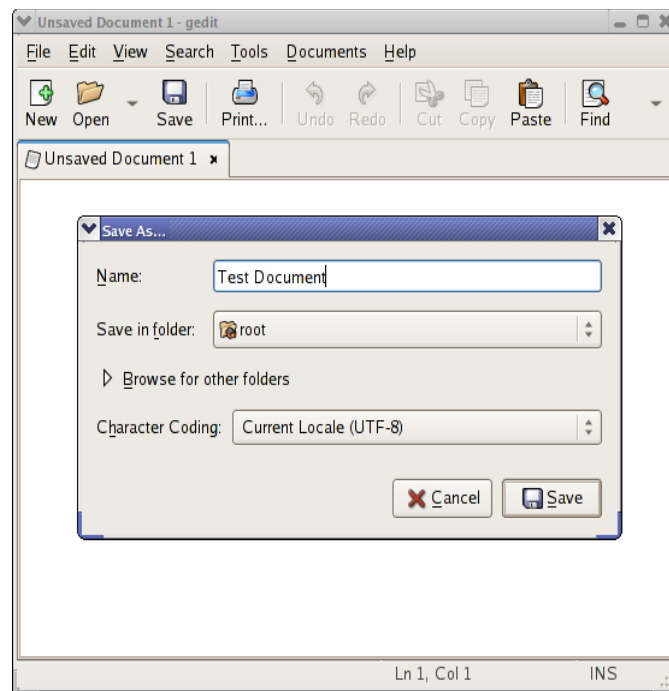


Figure 4-29: Saving a New Document

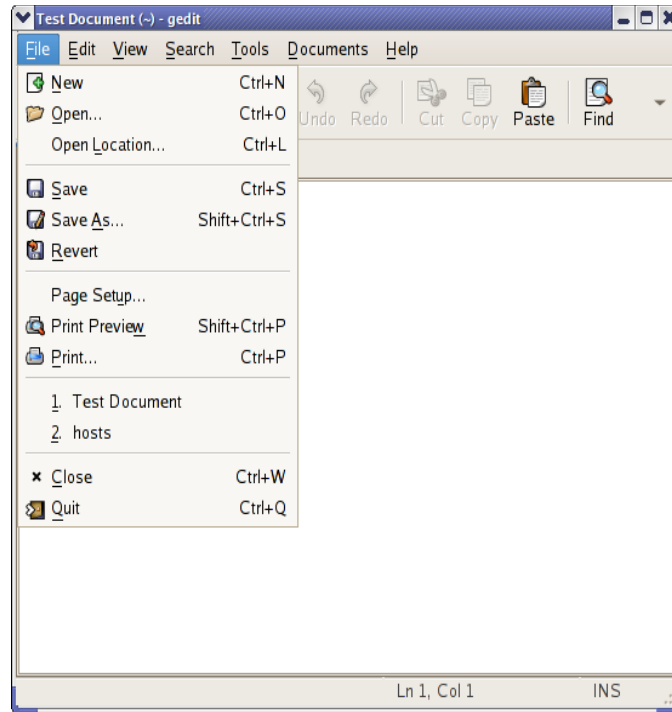


Figure 4-30: File Dropdown Menu

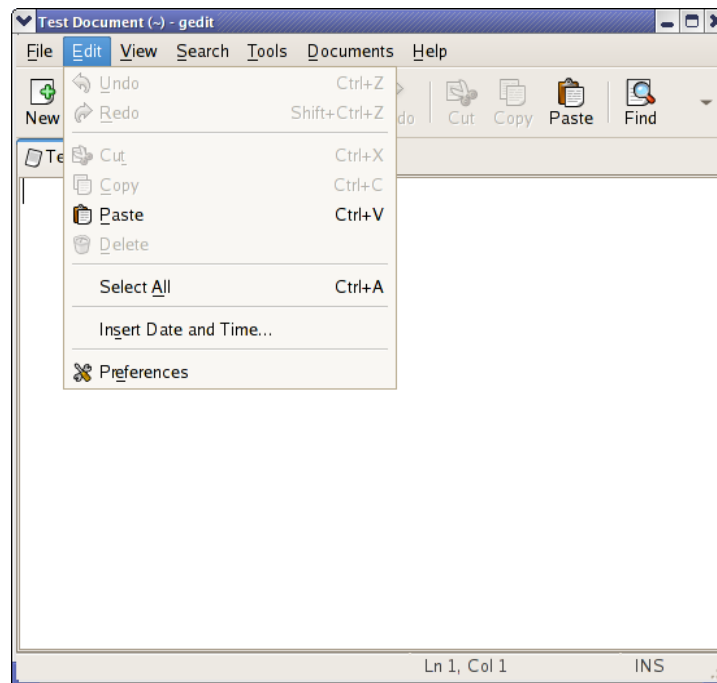


Figure 4-31: Edit Dropdown Menu

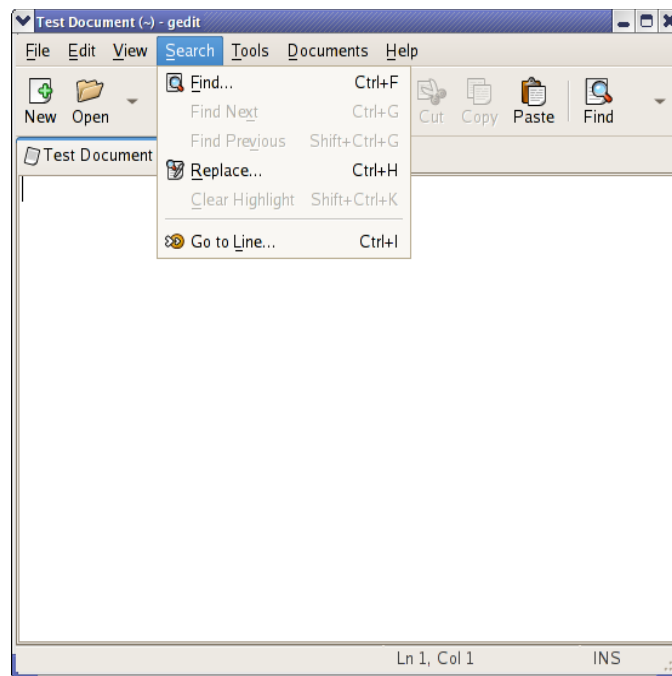


Figure 4-32: Search Dropdown Menu

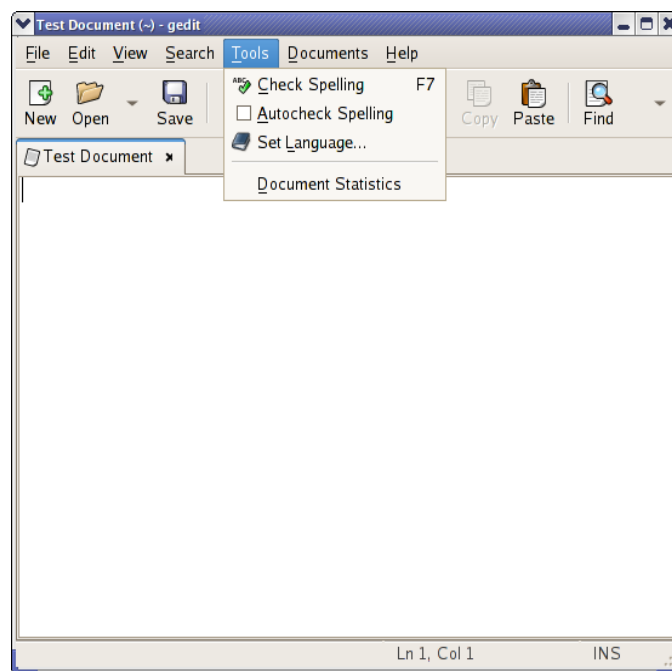


Figure 4-33: Tools Dropdown Menu

4.5.3 File Content Display

Going back to the Directory Display, using either Konqueror or Nautilus, by single clicking on a file (assuming it is a text type file), it will be opened for viewing in the default text editor.

4.5.4 Adding Users

Users may be added using one of several window utilities. Probably the best is the **User Manager**.

When the User Manager is first opened, the screen as displayed in Figure 4-23 will be displayed. To add a new user, click on the “User-Add” Button.

This will open a new window to enter the user information.

Initially for adding a new user, the username screen is first brought up, then the screen for entering details.

After which, a new password may be entered.



Figure 4-34: User Menu form Menu System

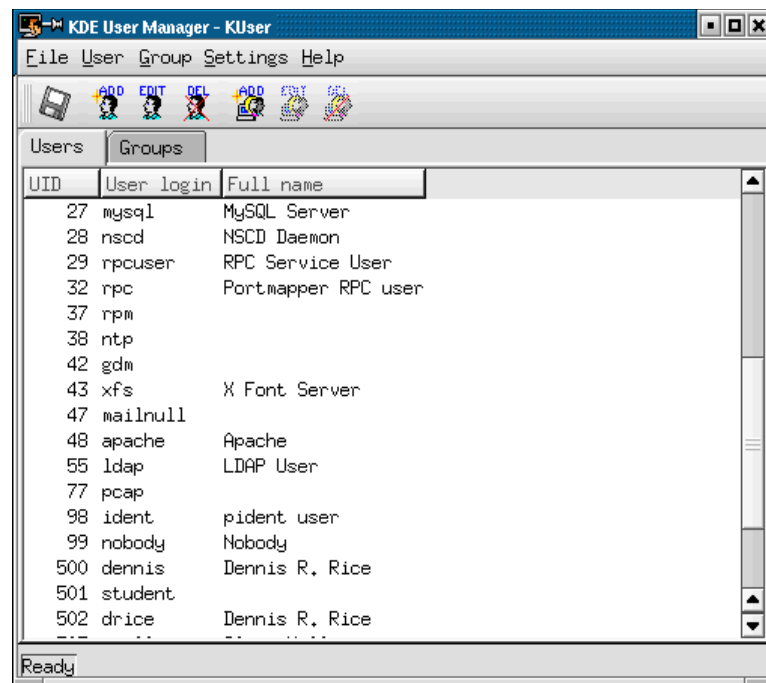


Figure 4-35: User Manager

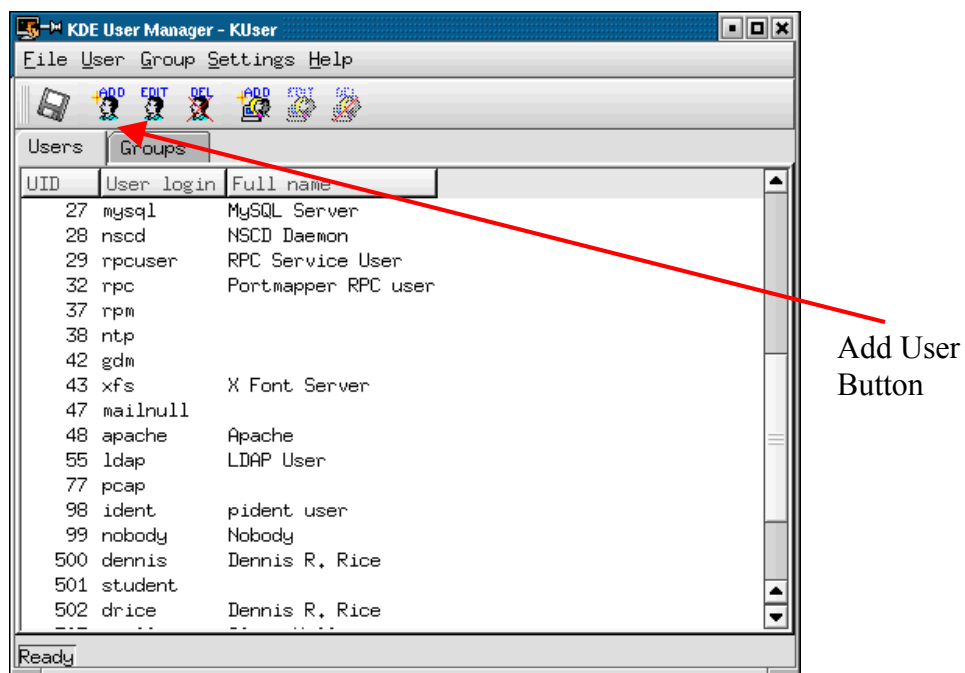


Figure 4-36: Add User Button

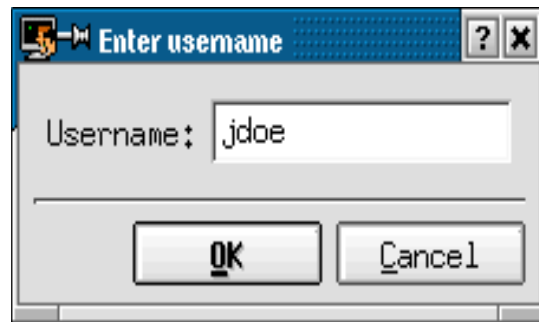


Figure 4-37: Username Entry

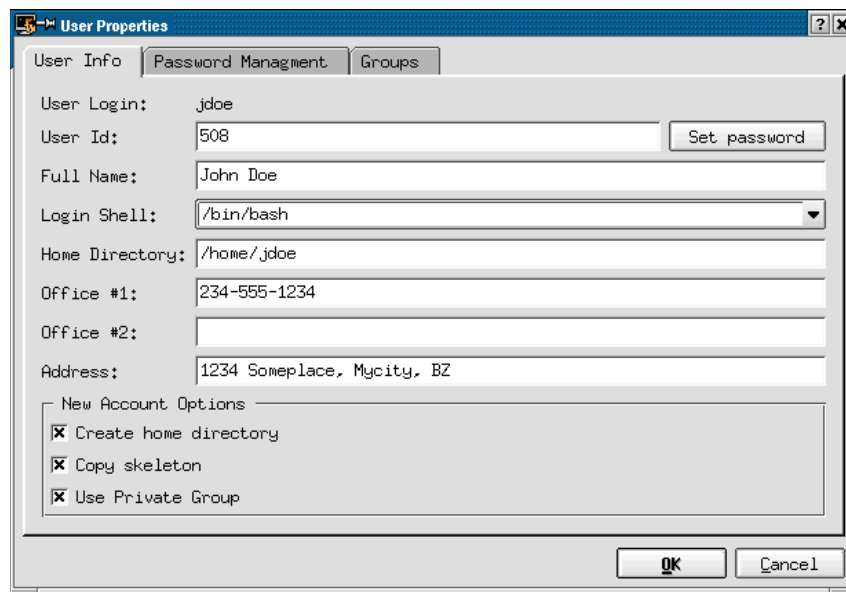


Figure 4-38: User Information Entry

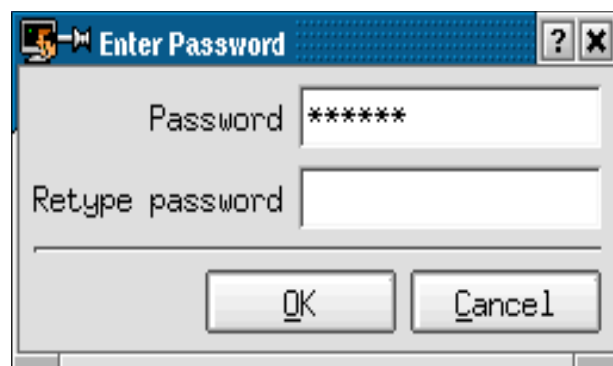


Figure 4-39: Password Entry

If the administrator needs to edit a user, click on the Edit button and then enter the appropriate data for the respective user.

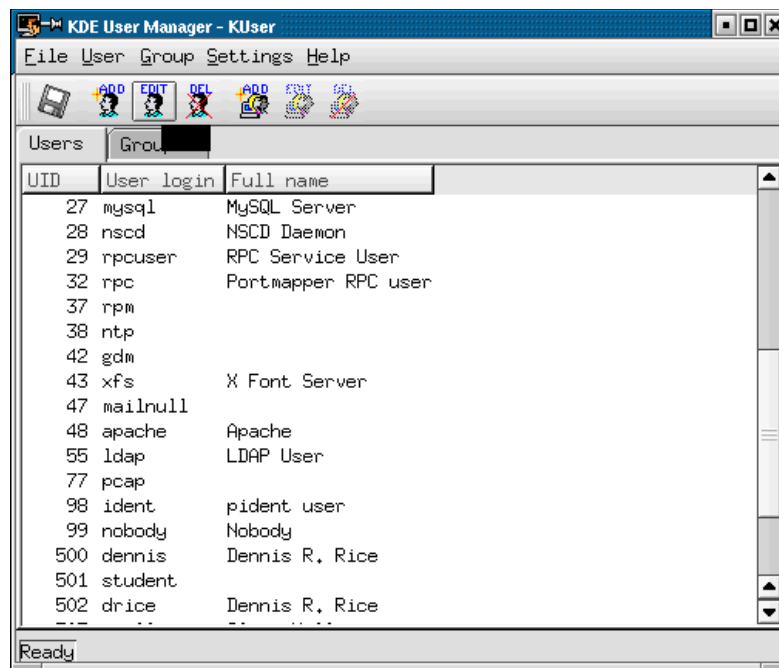


Figure 4-40: Editing User Information

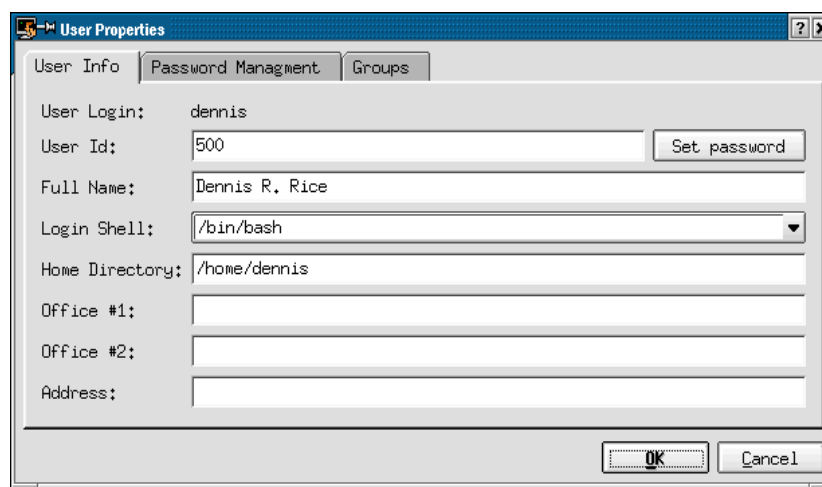


Figure 4-41: Editing a User

After the basic information has been created, the administrator may manage the password properties. Recall that these values are maintained in the **/etc/shadow** file.

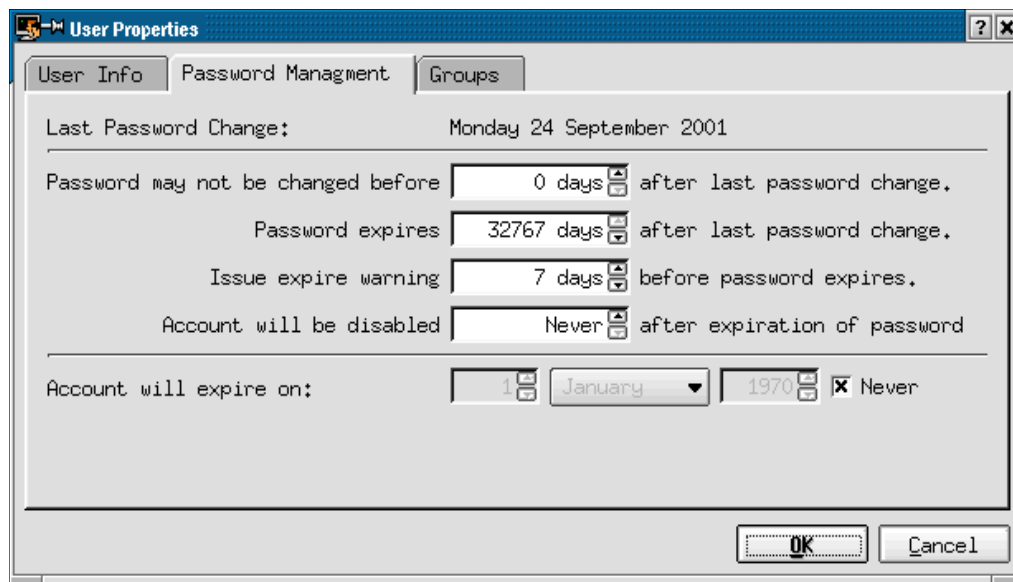


Figure 4-42: Password Management

Finally, we are also able to assign a user to different groups if so desired.

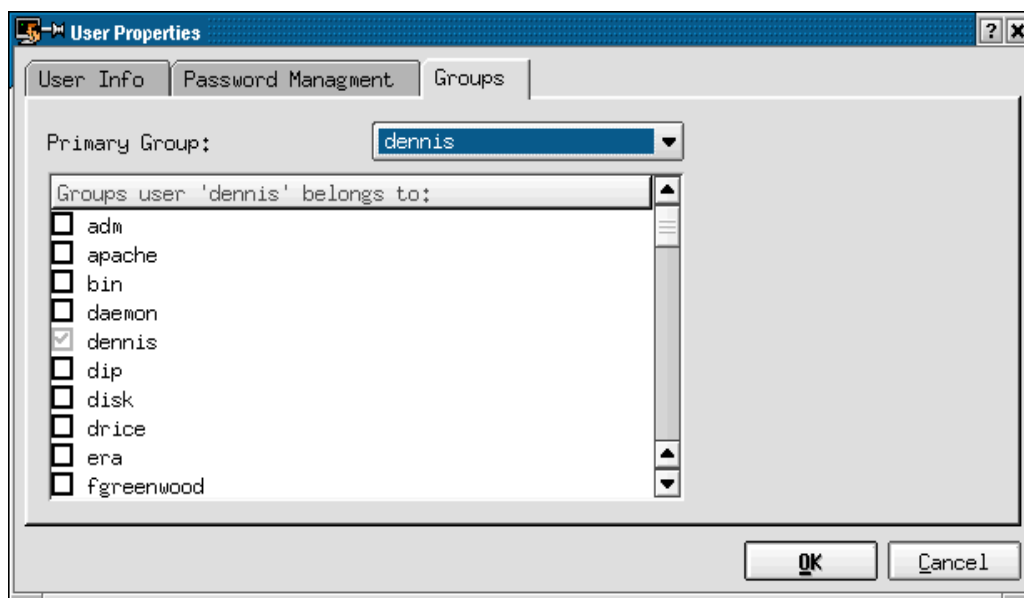


Figure 4-43: User Group Assignment

Additional features include the ability to delete a user, and to create or modify groups.

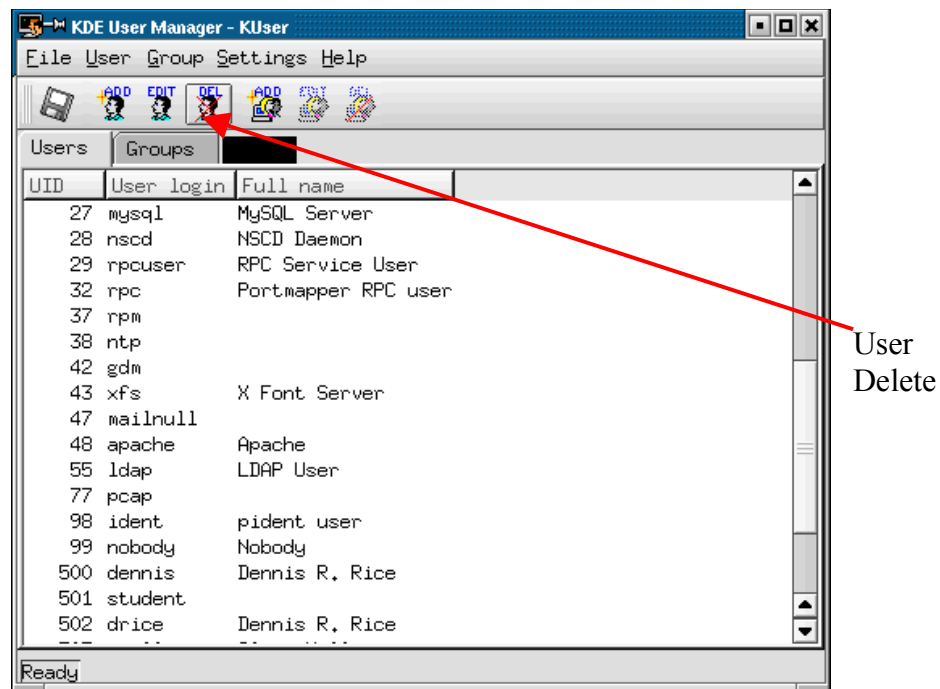


Figure 4-44: Deleting a User

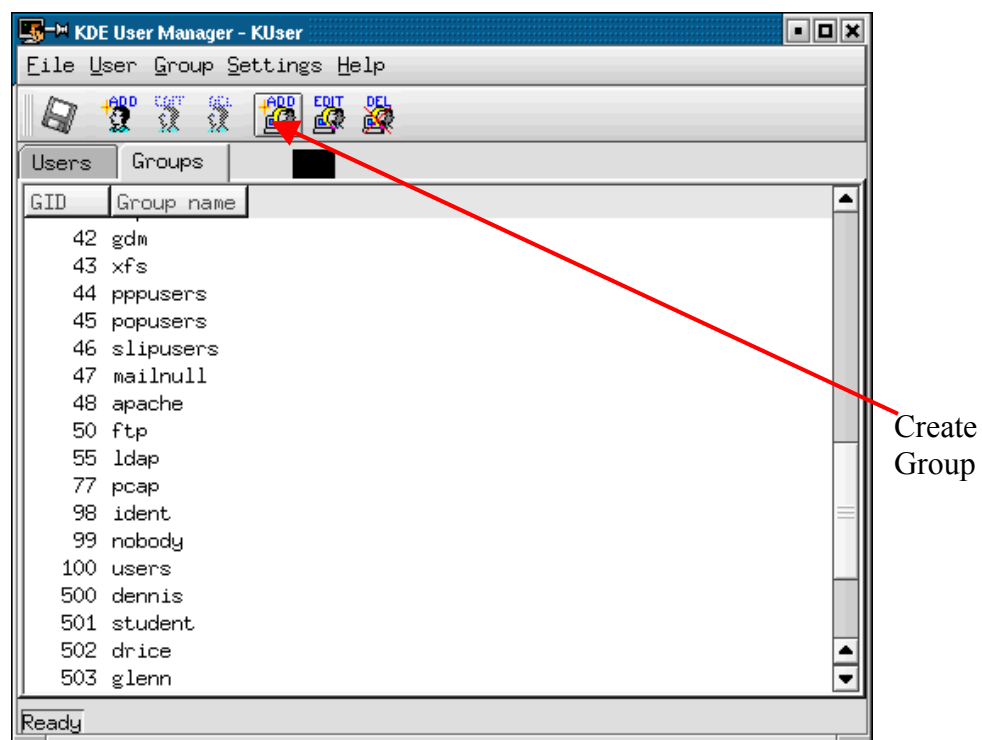


Figure 4-45: Creating a Group

4.5.5 Print Configuration

To configure a printer, the administrator is able to select the Print Configurator from the System Menu Tab. Doing such opens the screen shown in Figure 4-34.

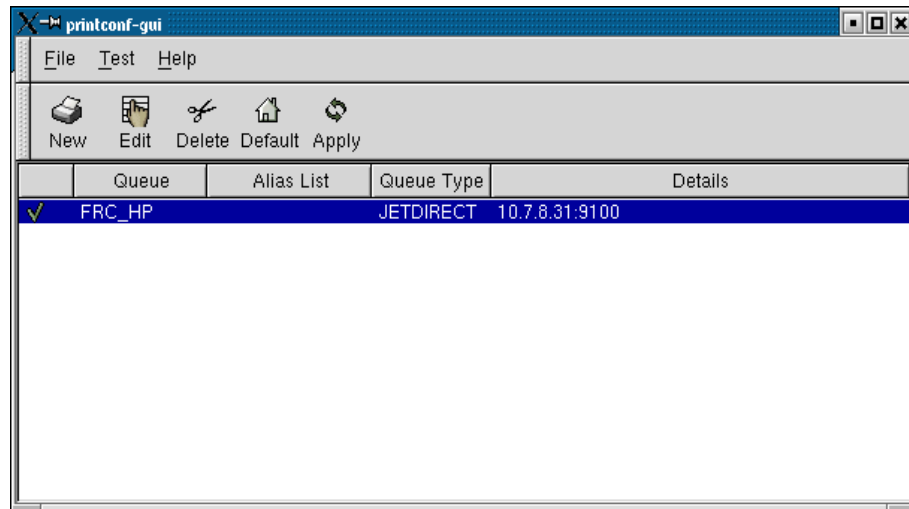


Figure 4-46: GUI Print Configurator Opening Screen

Clicking on the **New** button, the first of several screens opens to add a new printer (Figure 4-35).

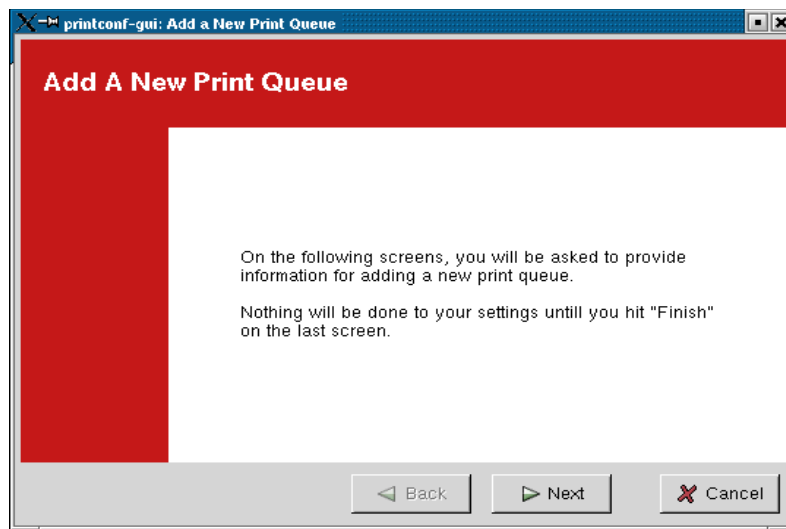


Figure 4-47: Add a New Printer

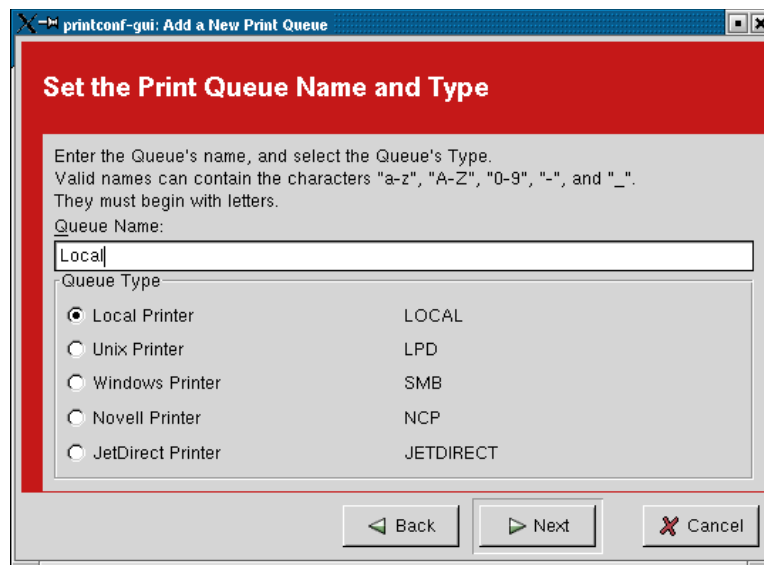


Figure 4-48: Naming and Printer Connection

After the Printer has been named (any description that the administrator desires), the Printer vendor is selected.

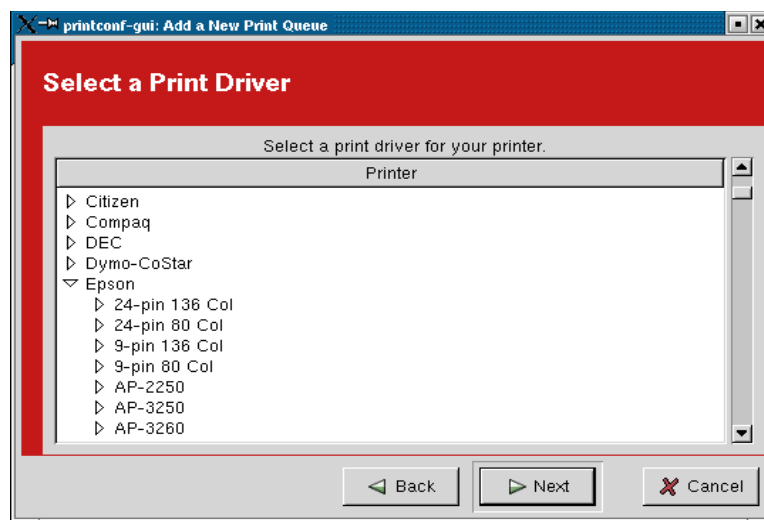


Figure 4-49: Selecting

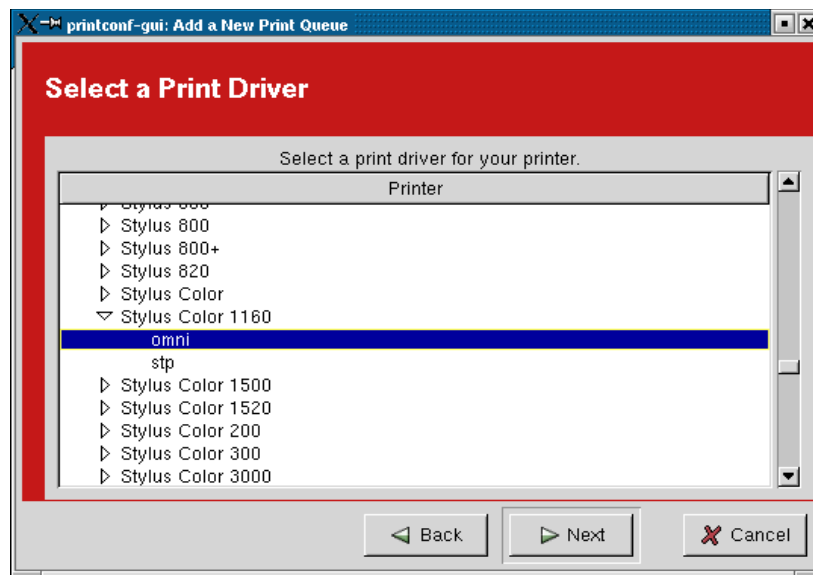


Figure 4-50: Selecting Printer Vendor Printer Model

Finally, the administrator is given a summary of the printer configuration.

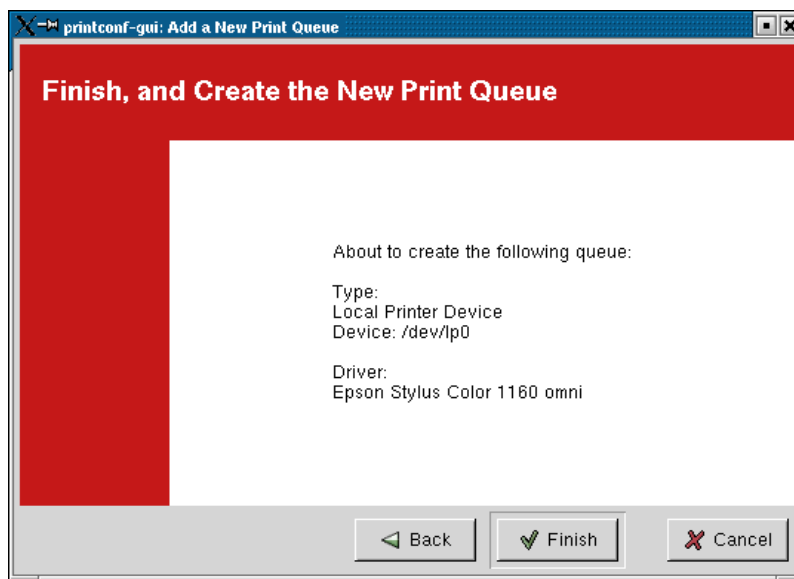


Figure 4-51: Printer Configuration Summary

Before the configuration is finalized, the administrator needs to click on the **Apply** button. This writes the configuration to the correct files and activates the service.

Finally, the printer needs to be tested. Click on the **Test** dropdown menu bar and select the desired paper type. You then need to go to the printer and verify the printer created the correct output.



Figure 4-52: Test Printer Dropdown Menu

4.6 Commands Used in this Chapter

This is the world of “Click and Play”, so there were no commands directly issued. But you do need to know which tab or button to click ..

4.7 Chapter Review Questions

1. Printers may be administered using which application?
 - a. Menu
 - b. System Configuration
 - c. Print Manager
 - d. Network Manager
2. In a default configuration, how many desktop windows are available?
 - a. 1
 - b. 2
 - c. 4
 - d. 8
3. A updated windows version of Emacs is which application?
 - a. vim
 - b. joe
 - c. Text Editor
 - d. XEmacs
4. Common application icons, such as web browser and email, are located where?
 - a. Menu
 - b. Taskbar
 - c. Window Selector
 - d. Desktop

5. Users and groups may be administered using which application?
 - a. User Manager
 - b. Network Configurator
 - c. Print Configurator
 - d. Group Manager
6. When using KDE on Red Hat 7, the Menu Button is represented by what Icon?
 - a. Foot Button
 - b. K Button
 - c. Start Button
 - d. World Button
7. To only view the file structure, allowing the user to move between directories or to select a data file to be opened is which application?
 - a. XTerm
 - b. Konqueror
 - c. Outlook
 - d. Nautilus
8. The Display Manager is an application that runs on top of what other application?
 - a. Window Manager
 - b. Screen Manager
 - c. X Windows
 - d. Window Properties
9. A fast and light weight web browser that may also be used to view the file structure is what?
 - a. Nautilus
 - b. XEmacs
 - c. Konqueror
 - d. Vim
10. In order to issue Command Line Interface commands, what application must be utilized?
 - a. Terminal
 - b. Nautilus
 - c. Konqueror
 - d. XTerminal
11. Which editor most closely emulates Microsoft's WordPad?
 - a. Alpha
 - b. Gedit
 - c. Vim
 - d. Xemacs

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