Chapter 4

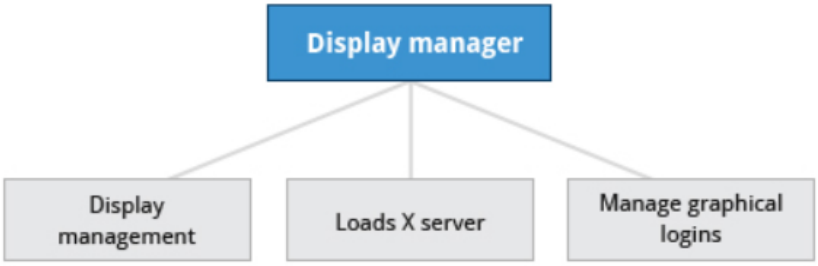
You can use either a **C**ommand **L**ine **I**nterface (**CLI**) or a **G**raphical **U**ser **I**nterface (**GUI**) when using Linux. To work at the CLI, you have to remember which programs and commands are used to perform tasks, and how to quickly and accurately obtain more information about their use and options. On the other hand, using the GUI is often quick and easy. It allows you to interact with your system through graphical icons and screens. For repetitive tasks, the CLI is often more efficient, while the GUI is easier to navigate if you do not remember all the details or do something only rarely.

X Window System

Generally, in a Linux desktop system, the X Window System is loaded as one of the final steps in the boot process. It is often just called X.

A service called the **Display Manager** keeps track of the displays being provided and loads the X server (so-called, because it provides graphical services to applications, sometimes called X clients). The display manager also handles graphical logins and starts the appropriate desktop environment after a user logs in.

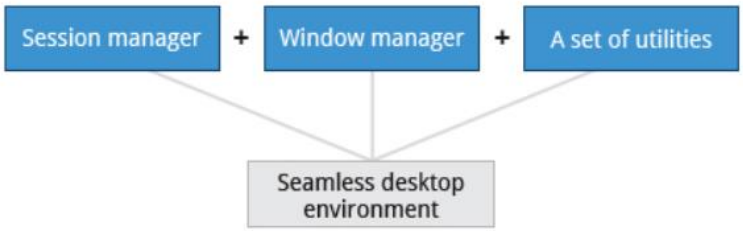
X is rather old software; it dates back to the mid 1980s and, as such, has certain deficiencies on modern systems (for example, with security), as it has been stretched rather far from its original purposes. A newer system, known as Wayland, is gradually superseding it and is the default display system for Fedora, RHEL 8, and other recent distributions. For the most part, it looks just like X to the user, although under the hood it is quite different.



A desktop environment consists of a session manager, which starts and maintains the components of the graphical session, and the window manager, which controls the placement and movement of windows, window title-bars, and controls.

Although these can be mixed, generally a set of utilities, session manager, and window manager are used together as a unit, and together provide a seamless desktop environment.

If the display manager is not started by default in the default runlevel, you can start the graphical desktop different way, after logging on to a text-mode console, by running **startx** from the command line. Or, you can start the display manager (**gdm**, **lightdm**, **kdm**, **xdm**, etc.) manually from the command line. This differs from running **startx** as the display managers will project a sign in screen.



GUI Startup

When you install a desktop environment, the X display manager starts at the end of the boot process. It is responsible for starting the graphics system, logging in the user, and starting the user's desktop environment. You can often select from a choice of desktop environments when logging in to the system.

The default display manager for GNOME is called **gdm**. Other popular display managers include **lightdm** (used on Ubuntu before version 18.04 LTS) and **kdm** (associated with KDE).

GNOME Desktop Environment

GNOME is a popular desktop environment with an easy-to-use graphical user interface. It is bundled as the default desktop environment for most Linux distributions, including Red Hat Enterprise Linux (RHEL), Fedora, CentOS, SUSE Linux Enterprise, Ubuntu and Debian. GNOME has menu-based navigation and is sometimes an easy transition to accomplish for Windows users. However, as you will see, the look and feel can be quite different across distributions, even if they are all using GNOME.

Another common desktop environment very important in the history of Linux and also widely used is KDE, which has often been used in conjunction with SUSE and openSUSE. Other alternatives for a desktop environment include Unity (present on older Ubuntu, but still based on GNOME), XFCE and LXDE. Most desktop environments follow a similar structure to GNOME.

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LAB Exercise

The easiest way to customize your desktop is to right-click your desktop which should open a menu. At this point, select **Change Desktop Background** or **Default Desktop Settings** depending upon which distribution of Linux you are running.

This will open a window where you can then select available background pictures, a solid color background, or use a picture of your own that you Add to your Pictures folder in your home directory.

To change your **theme**, you may have noticed a tab in the window where you changed the background labeled **Theme**. If it is present, you can click on this tab and select one of the available themes or click on Customize to experiment with your own creations.

However, for **GNOME 3**, you can no longer do anything this way except to set the background. Instead you have to run **gnome-tweaks** (or **gnome-tweak-tool**) and then scroll down to **Theme** or **Appearance->Theme**.

Note that many other settings one might expect to actually be in the **Settings** menu are now configurable only through **gnome-tweaks**. This can cause a lot of hair-pulling until you discover this fact.

Switching Users

Linux is a true multi-user operating system, which allows more than one user to be simultaneously logged in. If more than one person uses the system, it is best for each person to have their own user account and password. This allows for individualized settings, home directories, and other files. Users can take turns using the machine, while keeping everyone's sessions alive, or even be logged in simultaneously through the network.

Basic Operations:

Applications are found at different places in Linux (and within GNOME):

- From the **Applications** menu in the upper-left corner
- From the **Activities** menu in the upper-left corner
- In some **Ubuntu** versions, from the **Dash** button in the upper-left corner
- For **KDE**, and some other environments, applications can be opened from the button in the lower-left corner.

Default Applications

To set default applications, enter the **Settings** menu (on all recent Linux distributions) and then click on **Details->System->Default Applications**. The exact list will vary from what is shown here in the Ubuntu screenshot according to what is actually installed and available on your system.

Editing a file: gedit

Removing a file

There are several ways to delete files and directories using Nautilus.

1. Select all the files and directories that you want to delete
2. Press **CTRL-Delete** on your keyboard, or right-click the file
3. Select **Move to Trash.**

To *permanently* delete a file:

1. On the left panel inside a Nautilus file browser window, right-click on the **Trash** directory.
2. Select *Empty Trash*.

Alternatively, select the file or directory you want to permanently delete and press **Shift-Delete**.

Viewing the file sort option

You will have to open the file browser window and navigate to the **/var/log** directory. This will vary somewhat from distribution to distribution. On most recent distributions you will click on **Other Locations -> Computer**.

Navigate to the **/var/log** directory. Set the view option to **List** rather than **Icon**, and then click on the date.

Recovering a deleted file

The basic operations will be the same here, whether you have a GNOME or KDE desktop, although exact procedures and choices may differ slightly.

1. Create a new text file on the desktop named **lab.txt**, using the graphical file manager.
2. Delete the file by sending it to **Trash**.
3. Verify the file is now in **~/.local/share/Trash**, or a subdirectory thereof. ***Note***: You will have to get your file browser to show hidden files and directories, those that start with a **.**).
4. Recover the file and make sure it is in its original location.

Summary

- **GNOME** is a popular desktop environment and graphical user interface that runs on top of the Linux operating system.
- The default display manager for GNOME is called **gdm**.
- The gdm display manager presents the user with the login screen, which prompts for the login username and password.
- Logging out through the desktop environment kills all processes in your current **X** session and returns to the display manager login screen.

- Linux enables users to switch between logged-in sessions.
- Suspending puts the computer into sleep mode.
- For each key task, there is generally a default application installed.
- Every user created in the system will have a **home** directory.
- The *Places* menu contains entries that allow you to access different parts of the computer and the network.
- **Nautilus** gives three formats to view files.
- Most text editors are located in the *Accessories* submenu.
- Each Linux distribution comes with its own set of desktop backgrounds.
- GNOME comes with a set of different themes which can change the way your applications look.

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