Chapter – 4 Working with X-Windows (Ubuntu)

x-Windows

The X Window System (X11) is an open source, cross platform, client-server computer software system that provides a GUI in a distributed network environment.

Used primarily on UNIX variants, X versions are also available for other operating systems. Features of the X window system include network transparency, the ability to link to different networks, and customizable graphical capabilities. The X window system was first developed in 1984, as part of project Athena, a collaboration between Stanford University and MIT. X.Org Foundation, an open group, manages the development and standardization of the X window system.

The X Window System is also known simply as X, X11 or X Windows.

Startx :

The xinit command is the one which actually starts the X Window System, but it usually needs certain options, which is where the startx command comes in. It is simply a shell script which sets up variables, performs any other tasks specific to the local system, and then calls xinit. Therefore you should use startx in preference to xinit if it is available.

Windows Manager :

♣ The x Window System achive its functionality by co-operation of separate components. The advantage of this is that a particular part of the system can be changed by replacing the relevant component.

♣ The best example of this is the concept of a Window Manager which is essentially the component which controls the appearance of windows and provides the means by which the user can interact with them. Virtually everything which appears on the screen in X is in a window, and a window manager quite simply *manages* them.

Purpose of Window Manager :

♣ Basic options, such as window movement, resizing, and focus
♣ Virtual screen settings, such as the number and separation
♣ Window, pointer, and ToolTip behavior
♣ Sound effects for window operations
♣ Special effects for window, desktop, and menu animation
♣ Distinct background settings for desktops
♣ Extensive ToolTips and pop-up help
♣ Keyboard shortcuts for nearly 80 actions, such as window handling, desktop navigation, or cursor movement.
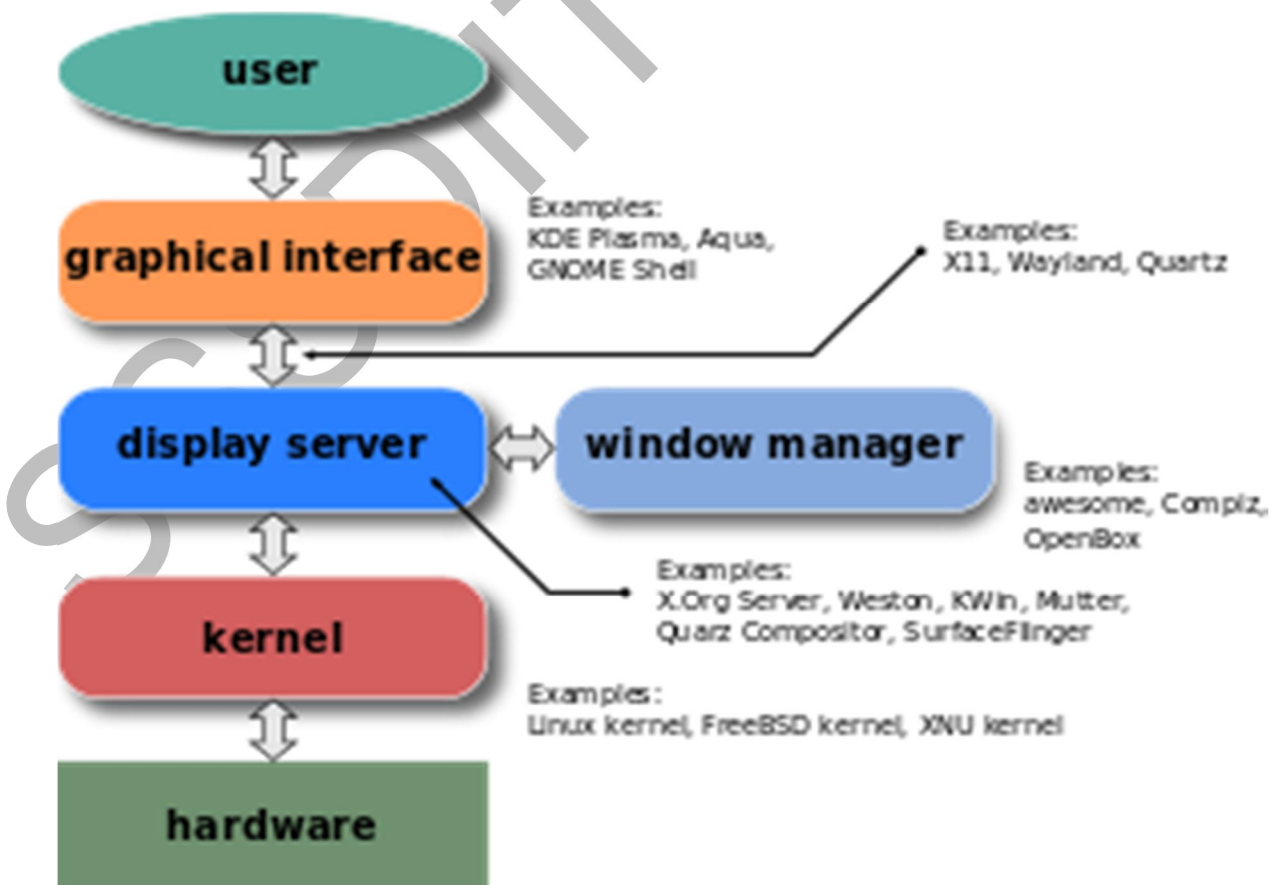
GNOME :
The GNOME X Environment
Features of GNOME :

♣ The software is fully Open Source and vendor neutral; commercial software may be built upon the software without purchasing a software license.

♣ Contributions, changes, and modifications may be made without control by a central source, and there are no licensing restrictions on making and distributing changes.

♣ The software supports multiple operating systems and external programming languages.

♣ The software works with any GNOME-aware X11 window manager, such as sawfish or Enlightenment.

What Is GNOME?

GNOME is a set of software libraries and X11 clients built to support an X11 desktop environment. GNOME can be used with any GNOME-aware window manager or any window manager that will support its panel component and client features, such as drag-and-drop desktop actions.

GNOME is initialized and runs before you start your window manager. Like KDE, GNOME provides a rich user environment with application frameworks, a file manager, a panel, a suite of applications with consistent look and feel, and *session management*, so that a working desktop is restored between X11 sessions.

GNOME Installation Components

GNOME consists of a number of software components and, is distributed in a series of RPM files. You can install GNOME using the gnorpm X11 client, KDE's kpackage client, or through the rpm command.

majority of the GNOME-specific clients for X11 are installed under the /usr/bin directory. System-wide configuration and support files will be installed under the /usr/share/gnome directory, but you may also find other GNOME client directories (such as those for gedit, gnibbles, or gnotepad+) under /usr/share.

You would then use the startx command to start your X session:

startx

The session will start the major GNOME components, such as the panel (a taskbar client from which to access root menus, configure your desktop, or launch X11 clients), along with desktop, keyboard, and mouse control software. Finally, the sawfish window manager is launched. Figure 5.3 shows what your X11 desktop might look like with several clients running.
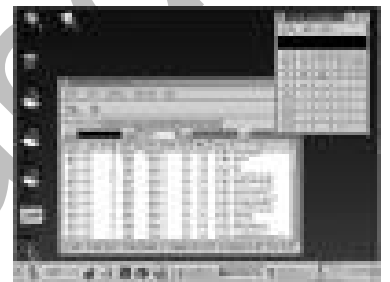
Using GNOME Clients and Tools

The most obvious and first GNOME client you'll see is the panel client, which offers a taskbar at the bottom of your X desktop. From the root menu of the taskbar (displayed by pressing the left mouse button, or mouse button 1 on the GNOME button), you can launch a variety of other GNOME clients:

♣ Programs— Menus for all GNOME clients

♣ Favorites— User-customized panel menu

♣ Applets— Menu of panel-specific clients

♣ KDE Menus— A submenu system providing access to KDE's panel menu

♣ Run program— A command-line dialog box

♣ Panel— The panel's configuration and control menu

♣ Lock screen— To lock (password protect) the desktop

♣ Log out— To end your X11 session

The Favorites panel menu may be customized with favorite clients by scrolling through the panel menus, then right-clicking a select menu item. From the pop-up menu, click the Add This to Favorites Menu menu item, and the client will appear under the Favorites menu. *Applets* are panel-specific GNOME clients that "dock" onto or into the panel to provide controls, information, status displays, even swimming fish!

Because many of the GNOME clients are installed in the Linux file system in the normal places (such as the /bin, /usr/bin, or /usr/X11R6/bin directories), you can also start them from the command line of an X11 terminal window. You'll quickly recognize a GNOME client because most clients follow the GNOME style guide.

GNOME clients, such as the gedit editor, generally have a consistent interface with a standard menu and toolbar.

Other features common among many GNOME clients include tear-off menus and toolbars. To tear off a menu bar, click and drag the mottled, vertical rectangle on the left end of the menu bar. The bar will drag with your mouse pointer. You can use this approach to rearrange the order of the controls of a GNOME client (such as placing the menu bar of a terminal at the bottom of the terminal window), or placing controls as floating tool windows beside a client's window. Each client will remember the toolbar or menu bar settings between launches.

Configuring Your Desktop with the GNOME Control Center

The GNOME Control Center, configures your system and desktop. The Control Center can be started by clicking the GNOME Configuration tool button on the desktop panel, or by clicking the Panel menu, selecting Settings, and then clicking the GNOME Control Center menu item.

For example, to configure your desktop's background, launch the Control Center and then click the Background item, or *capplet,* under the Desktop group in the left side of the Control Center's window. The right side of the Control Center will clear, and you'll have access to a dialog box (shown in Figure 5.5) to configure your desktop's background color or wallpaper.

GNOME Control Center

You can radically change your desktop's appearance by selecting other controls, such as the Theme Selector.

GNOME Panel Configuration

The GNOME Panel is an application and menu launcher for the GNOME desktop. By default, the panel is home for a number of important desktop elements, such as

- ♣ System menus for a dozen categories of clients, including menus for the AnotherLevel window manager and KDE desktop
- ♣ GNOME help
- ♣ GNOME configuration
- ♣ Virtual desktop navigation through the GNOME pager
- ♣ A taskbar container for currently running applications
- ♣ The date and time

The panel is configured by clicking the Panel menu item on the panel's pop-up menu, or by right-clicking a blank area of the panel. The pop-up Panel menu, shown in Figure 5.7, offers a choice of different configuration settings. You can create new panels on the top, bottom, left, or right edges of the display, and add or remove menus, drawers (to contain launcher applets), icons, or other applications. If you need a bit more screen real estate, click the Hide Panel button on either end of the panel to minimize or maximize the panel.


KDE :

Configuring KDE with the KDE Control Center

The KDE Control Center is the main dialog box through which you can change numerous settings of your desktop, get system information (such as the currently mounted devices and capacities), or (if logged in as the root operator) configure and control KDE's appearance, background, fonts, and sessions for all users.

Click the Application Starter button on your desktop's panel, and then click KDE Control Center to display the Control Center dialog box.
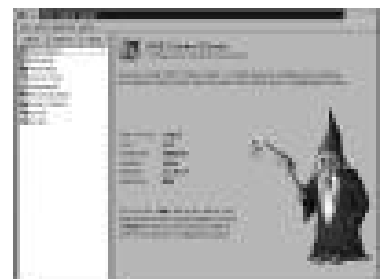
Using Display Manager Options

Use the Modules menu's Applications group login menu item in the Control Center to change the appearance or contents of the kdm login dialog box. You must be logged in as the root operator to access this portion of the Control Center, but you can get around this limitation without logging out of the current KDE session. Open a terminal window and type the su command, followed by the kcontrol client, on the command line:

$ -c kcontrol &

The Login Manager dialog box, shown in Figure 5.15, enables you to change how the kdm login dialog box appears when you set Linux to boot directly to X. You can change the greeting strings, the type of logo used, and even the language used for your KDE sessions. By clicking different tabs at the top of the dialog box, you can change the fonts, background, icons for users (perhaps using a scanned image of a person's face), and sessions using other window managers. After you make your changes, click Apply.

you can also control which users are permitted to log in. Click the Users tab in the Login Manager dialog box. The Users dialog box appears, as shown in Figure 5.16. To selectively control user logins, click the Show Only Selected Users button and then click and add users to the Selected Users section of the dialog box using the >> button.

To control reboot or shutdown through the kdm login screen, click the Sessions tab of the Login Manager dialog box and then click the Allow to Shutdown drop-down menu. Select None, All, Root Only, or Console Only. When finished, click the Apply button.

Changing Your Desktop's Wallpaper

KDE comes with nearly 150 different wallpapers to fill the root display or to fill your desktop's background. To configure the current desktop's wallpaper, again use the Control Center, then choose Look & Feel, Desktop, then Background from the Modules menus. You can also click a blank area of the desktop and select the Configure Background menu item. Additionally, you can click the Application Starter button on the desktop panel and select Preferences, Look & Feel, Desktop, then Background.

KDE wallpapers are in JPEG format and are stored under the /usr/share/ wallpapers directory.

The Background dialog box, enables you to set the name of each desktop, each desktop's colors, and whether the desktop uses a wallpaper. To set a different wallpaper, click the Wallpaper pop-up menu in the Wallpaper section of the dialog box and then click Apply. A random setting may be used to show wallpapers on the desktop from different directories in different order and at specified intervals.

Changing Your Screensaver

KDE comes with 20 different screensavers. To configure a screensaver for your KDE desktop, click Preferences, Look & Feel, then the Screensaver menu item on the Panel menu. You can also use KDE's Control Center.

The Screensaver dialog box, shown in Figure 5.18, has a number of settings, such as the type of screensaver, the time delay before activating the screensaver, a random setting to cycle through installed screensavers, and whether you want to require a password to go back to work. After you make your changes, click Apply; click OK to close the dialog box.

Changing Keyboard and Mouse Settings

Click Keyboard from the Peripherals menu in the Control Center's Modules menu to toggle keyboard character repeat (repeated printing of a character when a key is held down), and whether each key-press generates a key-click sound. Click Apply when you finish with your selection.

You can also access keyboard and mouse settings through the panel's Preferences menu or KDE's Control Center. The Mouse dialog's Advanced tab lets you change how fast your mouse cursor moves across the screen. To change the sequence of mouse buttons for right- or left-handed users, use the General tab. These functions are similar to using the xset and xmodmap commands from the command line.

Mouse behavior when clicking on windows may also be configured by using the Look & Feel, Windows Behavior, Mouse Behavior menu item in the Control Center.

Changing Windows Actions

Click the Look & Feel, Windows Behavior, Actions menu item under the Control Center's Modules menu. The dialog is used to set how windows are placed and to determine focus policy.

The Focus Policy section tells KDE how to make a window active. The default action is that you must click a window to activate it or enable it to receive keyboard input; other policies make a window active when your mouse pointer is over the window.

Controlling the Cursor with the Keyboard

A new feature for KDE is the Accessibility dialog. This feature allows you to use your computer's keyboard to move the mouse using the numeric keypad (laptop users may find this a trifle inconvenient, but it works). Select the Module menu's Personalization menu, then click the Accessibility menu item. Next, click the Mouse tab in the dialog and click the Move Mouse with Keyboard (Using the Num Pad) check box.

Other accessibility options include a visual bell, and sticky, slow, and bounce keys (useful to help people enter keys one-handed when two or more keys are required simultaneously).

Controlling KDE Desktop Borders

The Borders dialog box, accessed through the Control Center's Modules menu, then Look & Feel, Desktop and Borders menu item, is used to

control cursor movement between virtual desktops. By default, you'll have to click a virtual desktop button on your desktop's panel to move between desktops. If you click the Enable Active Desktop Borders item in the Borders dialog box (shown in Figure 5.23) and then click the Apply button, you can move to a different desktop by moving your mouse cursor to the edge of the current desktop.

You can also drag the different sliders to set the time delay for desktop switching and the width of the sensitive edge of each desktop.

Choosing Window Manager :

Different desktop environments have different strengths and weaknesses. Ubuntu's default Unity desktop environment is designed to provide a single interface that will work well on computers, tablets, smartphones and TVs, while Linux Mint's Cinnamon desktop environment is designed to provide a more traditional Linux desktop experience. The LXDE desktop environment included with Lubuntu is designed to be fast and use little resources.
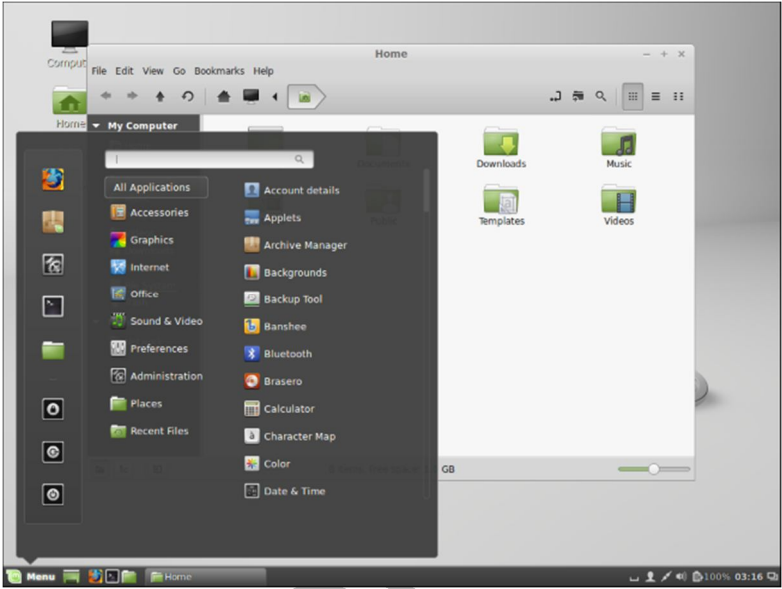
How to Install Another Desktop Environment

To install a different desktop environment, you'll just need to open your Linux distribution's package manager and install the appropriate package. This will be similar on al distributions, but we'll use Ubuntu 14.04 and Linux Mint 17 as examples here.

For example, let's say you wanted to install another desktop environment on Ubuntu. You'd open the Ubuntu Software Center, search for the name of the desktop environment's package, select it, and click the Install button. To install **Xfce**, you'd search for xfce4. To install the full, customized Xubuntu desktop system, you'd search for xubuntu-desktop instead.

Search for another desktop environment's name to install it. For example, you might type **lxde** or lubuntu-desktop for LXDE/Lubuntu or kde-full or kubuntu-desktop for KDE/Kubuntu. Some desktop environments may not be provided in your Linux distribution's repositories. The Cinnamon and MATE desktop environments included with Linux Mint aren't available in Ubuntu's repositories, so you'd have to use a PPA to install them on Ubuntu.
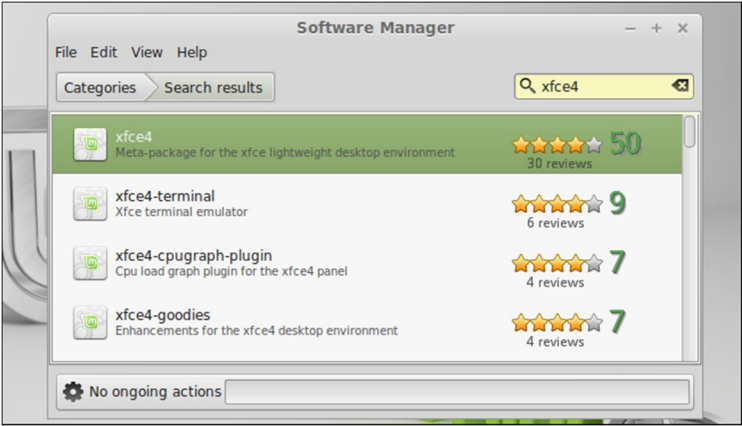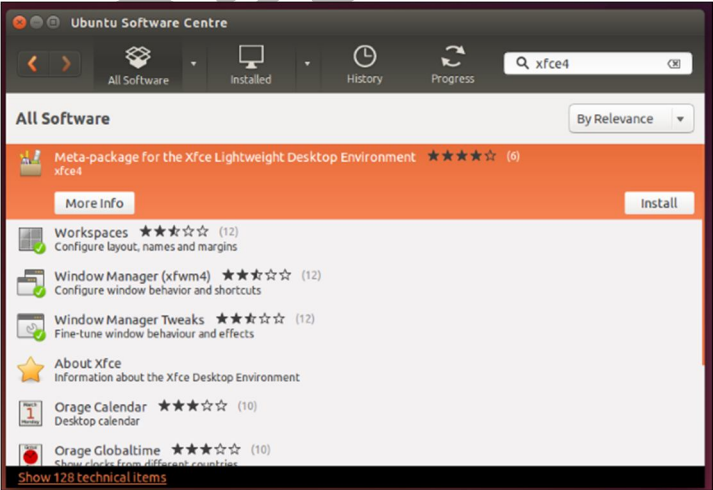
Here's how you'd install XFCE from the terminal on Ubuntu:

$ apt-get install xfce4

The above command would give you the standard XFCE desktop environment. However, you might want Xubuntu's customized XFCE desktop environment instead:

$ apt-get install xubuntu-desktop

Enter your password after running the command. The package manager will want to install all the packages that make up the desktop environment — type y to confirm.


How to Switch Between Desktop Environments

Log out of your Ubntu desktop after installing another desktop environment.

When you see the login screen, click the Session menu and select your preferred desktop environment. You can adjust this option each time you log in to choose your preferred desktop environment.

On Ubuntu's default login screen — known as a display manager — this menu can be accessed by clicking an icon next to your user name. The icon only appears if multiple desktop environments are available. On other display managers, you may need to click a "Session" menu or a similar icon. You'll find the option somewhere on the screen.

You'll see a list of the desktop environments

you have installed. Click one to select it and set it as your user account's default desktop environment.
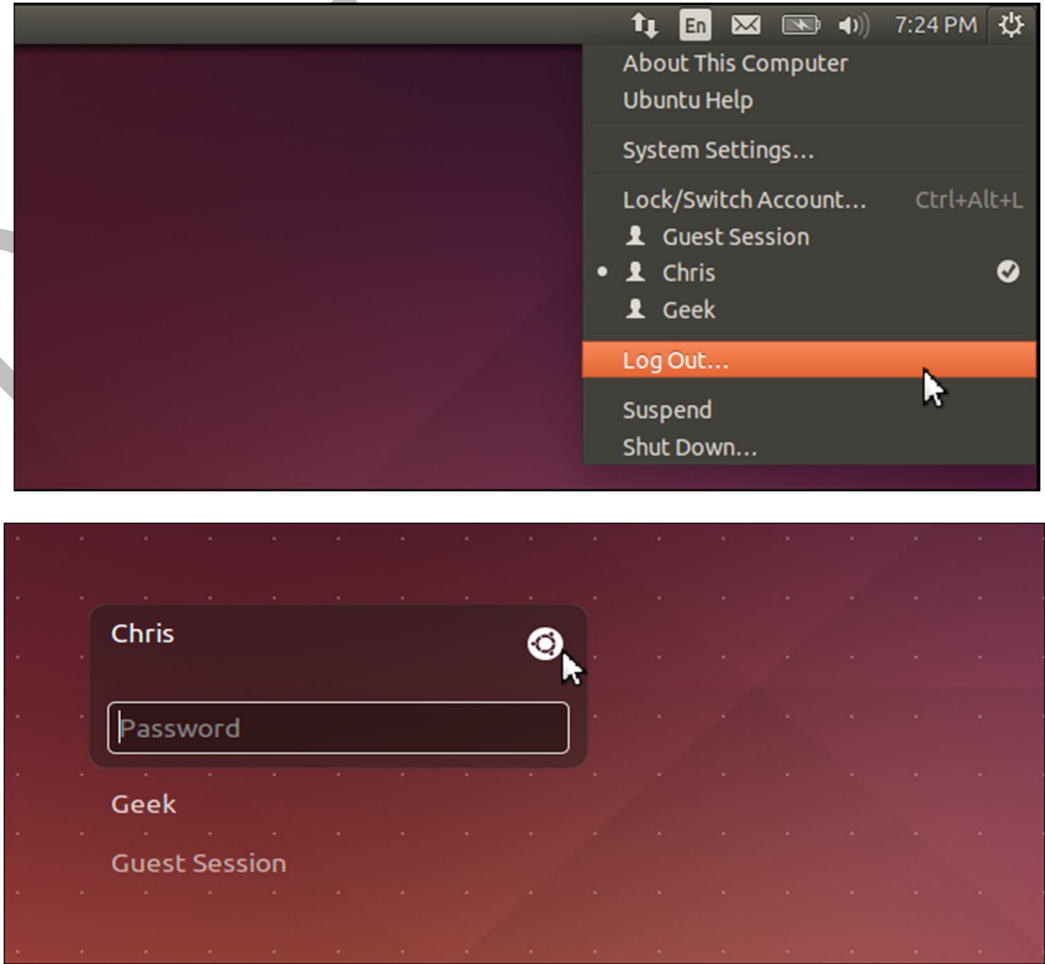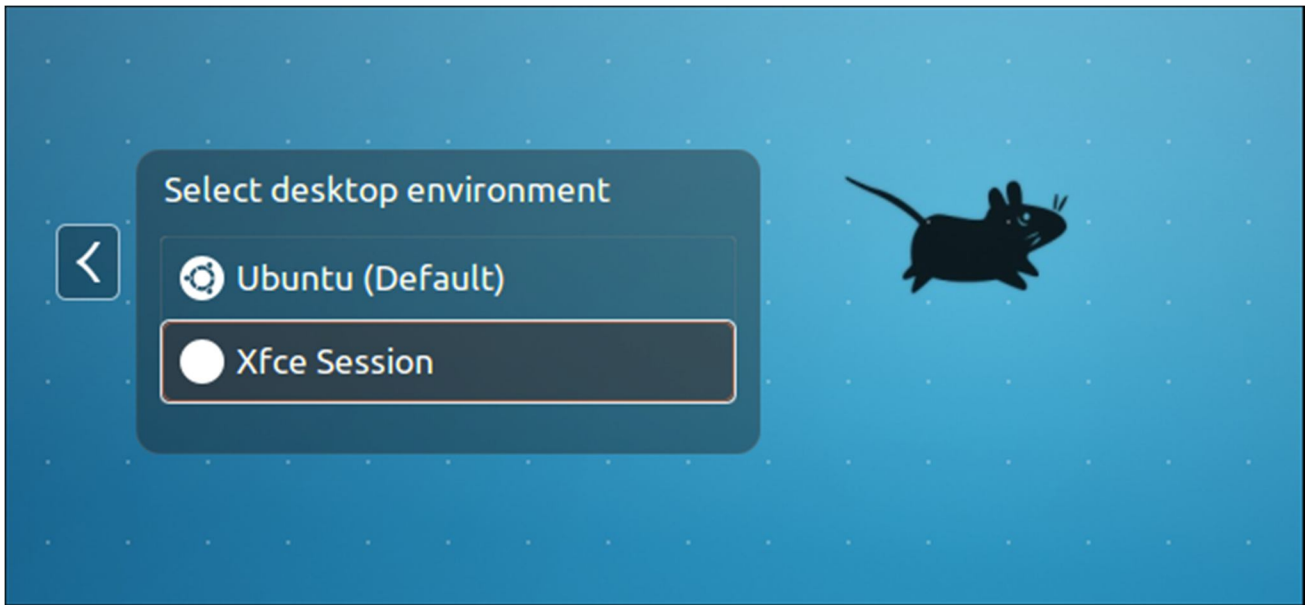
Sign in and you'll see the desktop environment you chose. All desktop environments have access to your home folder and files, so they can share data. They're basically just different programs with their own individual settings.
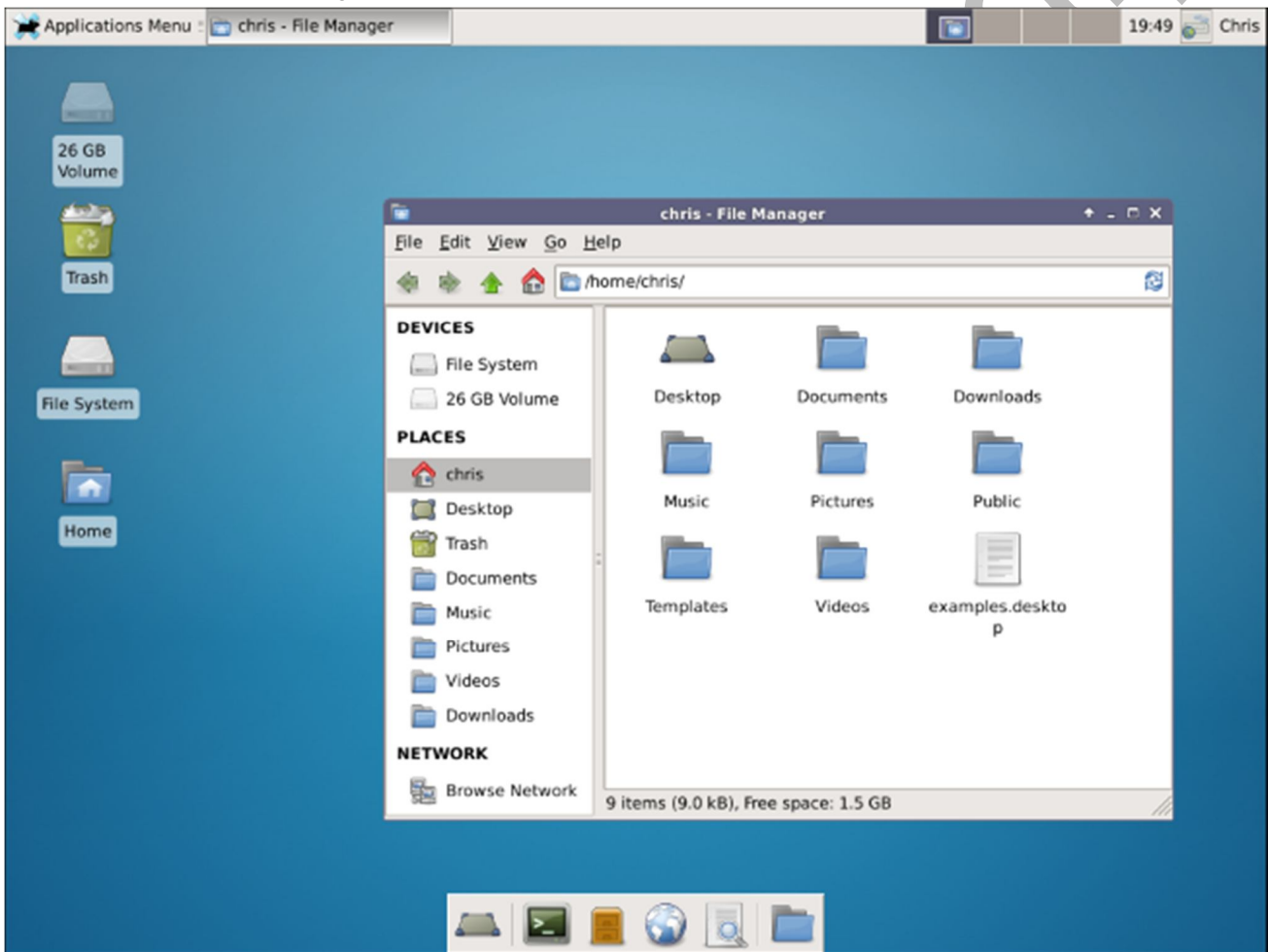
Different desktop environments can interfere with each other. Fore example, Ubuntu 14.04 sets a default GTK theme that doesn't work well with the XFCE desktop environment we installed as an example. XFCE's panels look ugly and many icons are missing by default. To fix this, we clicked Applications Menu > Settings > Settings Manager > Appearance and select the Xfce-4.0 style and Tango icons.

How to Uninstall a Desktop Environment

To remove the desktop environment, search for the same package you installed earlier and uninstall it. On Ubuntu, you can do this from the Ubuntu Software Center or with the sudo apt-get remove packagename command.

To uninstall other applications the desktop environment pulled in, you'll probably want to visit the terminal and run the following command on:

apt-get autoremove

The autoremove bit of the command instructs apt-get to automatically remove packages that were
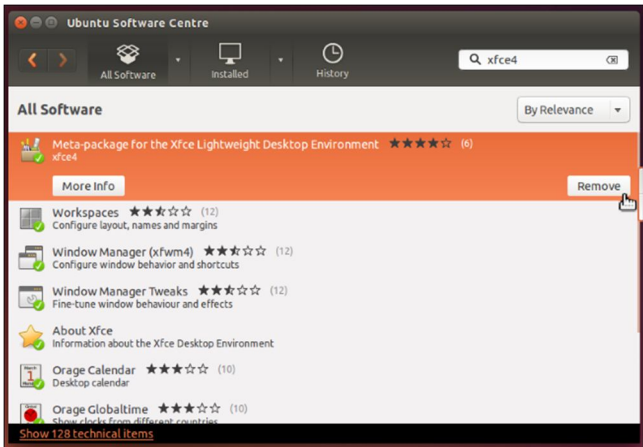
installed as dependencies for the desktop environment, so it will remove the additional packages the desktop environment pulled onto your system.

Configuring X

Introduction

Xorg supports several mechanisms for supplying/obtaining configuration and run-time parameters: command line options, environment variables, the xorg.conf configuration file, auto-detection, and fallback defaults.

Structure of xorg.conf file :

The xorg.conf file is composed of a number of sections which may be present in any order. Each section has the form:

Section "*SectionName*"

SectionEntry

    ...

EndSection

The **section names** are:

Files   File pathnames

ServerFlags   Server flags

Module   Dynamic module loading

InputDevice   Input device description

Device   Graphics device description

VideoAdaptor   Xv video adaptor description

Monitor   Monitor description

Modes   Video modes descriptions

Screen   Screen configuration

ServerLayout   Overall layout

DRI   DRI-specific configuration

Vendor   Vendor-specific configuration

Config file keywords are case-insensitive, and "_" characters are ignored. Most strings (including Option names) are also case-insensitive, and insensitive to white space and "_" characters.

Each config file entry usually takes up a single line in the file. They consist of a keyword, which is possibly followed by one or more arguments, with the number and types of the arguments depending on the keyword. The argument types are:

Integer   an integer number in decimal, hex or octal

Real   a floating point number

String   a string enclosed in double quote marks (")

Note: hex integer values must be prefixed with "0x", and octal values with "0".

A special keyword called Option may be used to provide free-form data to various components of the server. The Option keyword takes either one or two string arguments. The first is the option name, and the optional second argument is the option value. Some commonly used option value types include:

Integer   an integer number in decimal, hex or octal

Real   a floating point number

String   a sequence of characters

Boolean   a boolean value (see below)

Frequency a frequency value (see below)

Note that *all* Option values, not just strings, must be enclosed in quotes.

Boolean options may optionally have a value specified. When no value is specified, the option's value is TRUE. The following boolean option values are recognised as TRUE:

1, on, true, yes and the following boolean option values are recognised as FALSE:

0, off, false, noIf an option name is prefixed with "No", then the option value is negated.

Files Section

The Files section is used to specify some path names required by the server. Some of these paths can also be set from the command line. The command line settings override the values specified in the config file. The Files section is optional, as are all of the entries that may appear in it.

Serverflags Section

The ServerFlags section is used to specify some global Xorg server options. All of the entries in this section are Options, although for compatibility purposes some of the old style entries are still recognised. Those old style entries are not documented here, and using them is discouraged. The ServerFlags section is optional, as are the entries that may be specified in it.

Module Section

The Module section is used to specify which Xorg server modules should be loaded. This section is ignored when the Xorg server is built in static form. The types of modules normally loaded in this section are Xorg server extension modules, and font rasteriser modules. Most other module types are loaded automatically when they are needed via other mechanisms. The Module section is optional, as are all of the entries that may be specified in it.

Entries in this section may be in two forms. The first and most commonly used form is an entry that uses the Load keyword, as described here:

Load "modulename"

The second form of entry is a SubSection, with the subsection name being the module name, and the contents of the SubSection being Options that are passed to the module when it is loaded.

Inputdevice Section

The config file may have multiple InputDevice sections. There will normally be at least two: one for the core (primary) keyboard, and one of the core pointer. If either of these two is missing, a default configuration for the missing ones will be used. Currently the default configuration may not work as expected on all platforms.

InputDevice sections have the following format:

Section "InputDevice"

    Identifier "*name*"

    Driver   "*inputdriver*"

    options

    ...

EndSection

The Identifier and Driver entries are required in all InputDevice sections. All other entries are optional.

Monitor Section

The config file may have multiple Monitor sections. There should normally be at least one, for the monitor being used, but a default configuration will be created when one isn't specified.
Monitor sections have the following format:
Section "Monitor"
    Identifier "*name*"
    entries
    ...
EndSection
The only mandatory entry in a Monitor section is the Identifier entry.
The Identifier entry specifies the unique name for this monitor. The Monitor section provides information about the specifications of the monitor, monitor-specific Options, and information about the video modes to use with the monitor.

Screen Section

The config file may have multiple Screen sections. There must be at least one, for the "screen" being used. A "screen" represents the binding of a graphics device (Device section) and a monitor (Monitor section). A Screen section is considered "active" if it is referenced by an active ServerLayout section or by the -screen command line option. If neither of those is present, the first Screen section found in the config file is considered the active one.
Screen sections have the following format:
Section "Screen"
    Identifier "*name*"
    Device   "*devid*"
    Monitor   "*monid*"
    entries
    ...
    SubSection "Display"
      entries
      ...
    EndSubSection
    ...
EndSection
The Identifier and Device entries are mandatory. All others are optional.
The Identifier entry specifies the unique name for this screen. The Screen section provides information specific to the whole screen, including screen-specific Options. In multi-head configurations, there will be multiple active Screen sections, one for each head.

Uninstall / Remove Any Installed Software

GUI Package Management Tool

synaptic is graphical management tool of software packages. It allows you to perform all actions of the command line tool apt-get in a graphical environment. This includes installing, upgrading, downgrading and removing of single packages or even upgrading your whole system.

Just click on System > Administration > Synaptic Package Manager
Now you can select any package and click on Mark for Removal popup menu. You can also start GUI tool from command line, enter:
$ synaptic &

Command Line Package Management Tool

The *apt-get* command is a powerful command-line tool, which works with Ubuntu's *Advanced Packaging Tool* (APT) performing such functions as installation of new software packages, upgrade of existing software packages, updating of the package list index, and even upgrading the entire Ubuntu system.

Being a simple command-line tool, *apt-get* has numerous advantages over other package management tools available in Ubuntu for server administrators. Some of these advantages include ease of use over simple terminal connections (SSH), and the ability to be used in system administration scripts, which can in turn be automated by the *cron* scheduling utility.

Some examples of popular uses for the *apt-get* utility:

1. *Install a Package*: Installation of packages using the *apt-get* tool is quite simple. For example, to install the network scanner *nmap*, type the following:

2. apt-get install nmap

3. *Remove a Package*: Removal of a package (or packages) is also straightforward. To remove the package installed in the previous example, type the following:

4. apt-get remove nmap

Multiple Packages: You may specify multiple packages to be installed or removed, separated by spaces.

Also, adding the *--purge* option to apt-get remove will remove the package configuration files as well. This may or may not be the desired effect, so use with caution.

5. *Update the Package Index*: The APT package index is essentially a database of available packages from the repositories defined in the /etc/apt/sources.list file and in the /etc/apt/sources.list.d directory. To update the local package index with the latest changes made in the repositories, type the following:

6. apt-get update

7. *Upgrade Packages*: Over time, updated versions of packages currently installed on your computer may become available from the package repositories (for example security updates). To upgrade your system, first update your package index as outlined above, and then type:

8. apt-get upgrade

For information on upgrading to a new Ubuntu release see Upgrading.

For further information about the use of *APT*, :

apt-get help

Shutting Down the Linux System

shutdown

The primary command to stop Linux is the shutdown command. Like most UNIX commands, shutdown has a number of options. A man page for the shutdown command is included with Red Hat Linux, but you can quickly read its command-line syntax if you use an illegal option, such as -z. Thanks to the programmer, here it is:

```
Usage:    shutdown [-akrhfnc] [-t secs] time [warning message]
            -a:      use /etc/shutdown.allow
            -k:      don't really shutdown, only warn.
            -r:      reboot after shutdown.
            -h:       halt after shutdown.
            -f:      do a 'fast'reboot (skip fsck).
            -F:       Force fsck on reboot.
            -n:       do not go through "init" but go down real fast.
            -c:      cancel a running shutdown.
            -t secs: delay between warning and kill signal.
            ** the "time" argument is mandatory! (try "now") **
```

To properly shut down your system immediately, use the -h option, followed by the word now or the numeral 0:
$ shutdown -h now   or
$ shutdown -h 0

If you want to wait for a while, use the -t option, followed by a number (in seconds) before shutdown or reboot. If you want to restart your computer, use the -r option, along with the word now or the numeral 0:
$ shutdown -r now   s   or
$ shutdown   -r 0

You can also use linuxconf to shut down your computer. If you're logged in as the root operator, enter the following from the command line of your console or an X11 terminal window:

linuxconf --shutdown

linuxconf presents a shutdown dialog box, as shown in Figure 9.4. To restart your system, press the Tab key until you highlight the Accept button, and then press the Enter key. You can also enter a time delay or halt your system immediately, and specify a message to broadcast to all your users when you execute the shutdown.

Different Desktops available with Ubantu

Gnome 3

Gnome is one of the two major desktop environments available, alongside KDE. It was the top dog during the heyday of Gnome 2, but its market share has declined since the introduction of Gnome 3. For users who enjoyed Gnome 2, some developers forked the old project into MATE – keep reading to learn more about that.
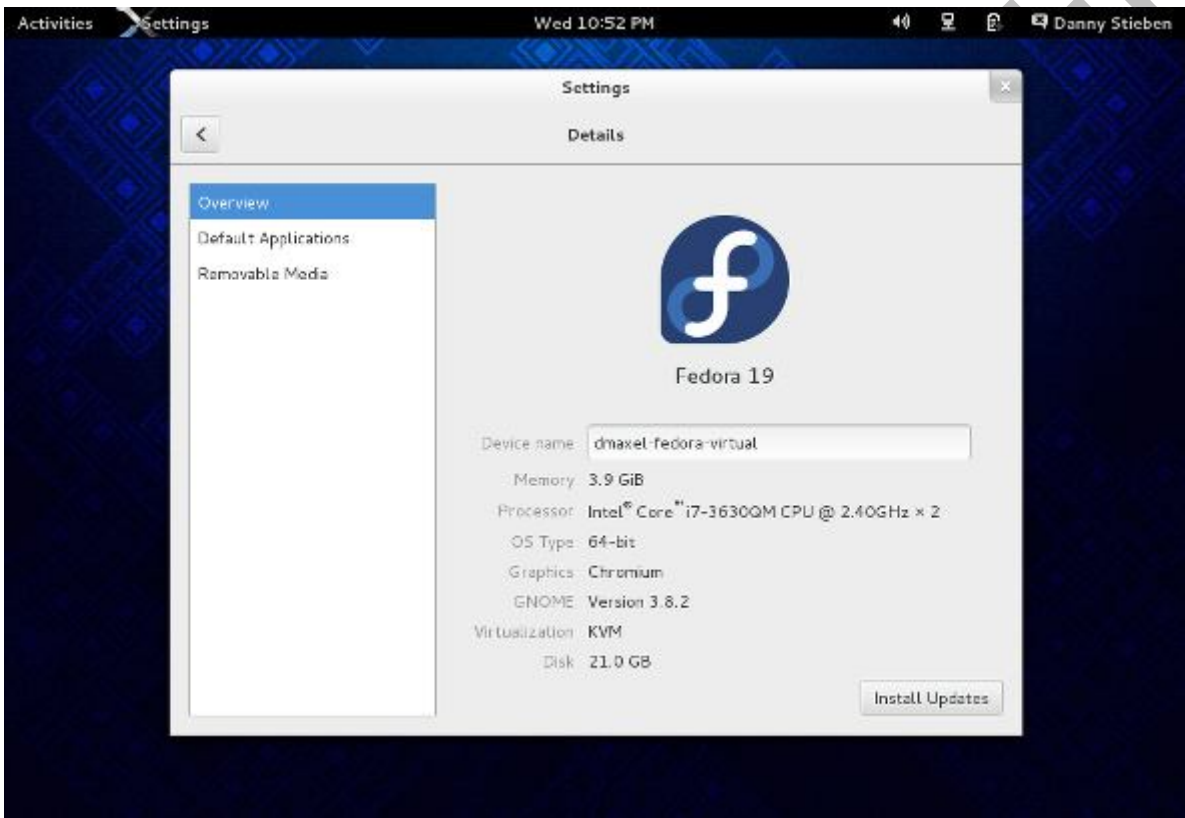
Gnome 3 features Gnome Shell, a new paradigm for a computer desktop. Most of the interaction with the desktop environment is hidden in the "Activities" view, which some love and others hate. Additionally, Gnome has been leaning towards a simplification of the desktop. For example, there are no maximize or minimize buttons, and a handful of settings that most Linux users have been accustomed to having were removed as well.

KDE

KDE is the other major desktop environment, alongside Gnome. It is considered to be the flashiest and most resource-heavy desktop environment of them all. It's also the one that looks closest to Windows' desktop without any special modifications or themes. KDE has the most features, as well as a massive amount of settings you can change to customizeyour experience. There are also a lot of themes available for KDE, so you can really benefit from KDE's features and still have it look the way you want it to.
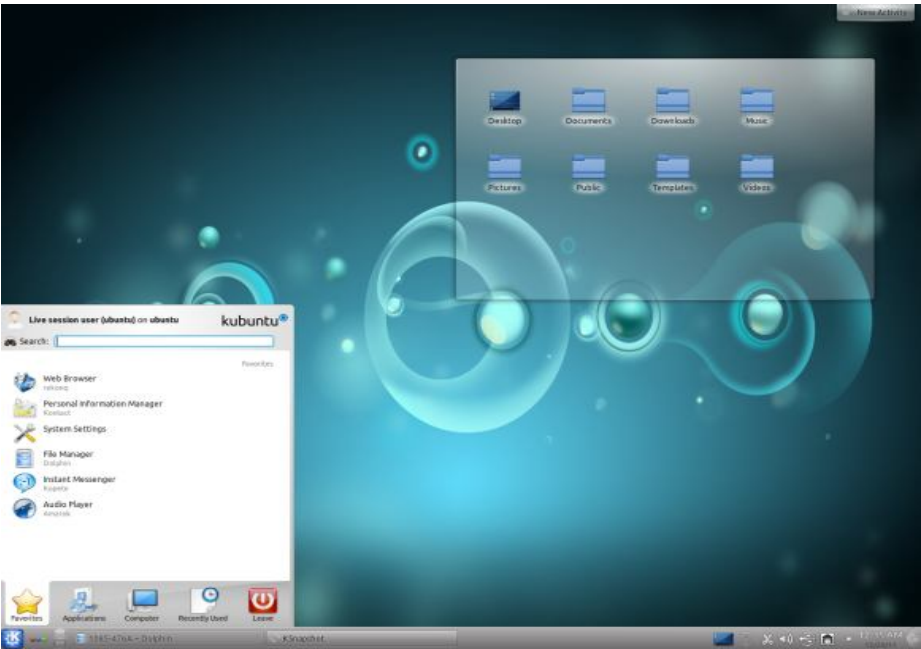
The desktop environment uses the Qt (pronounced "cute") framework, which isn't used quite as often as GTK is for applications (though there are many apps made specifically for KDE).

Xfce

Xfce is a much lighter desktop environment that is based on the GTK framework. It looks quite similar to Gnome 2/MATE, but it's a lighter option than those two. It's also much lighter than Gnome 3 and KDE, so it's perfect for low-powered devices or for systems whose owners seek to attain maximum performance. It's not the lightest option available – keep reading for that – but Xfce does   achieve a balance of performance and function.

LXDE

LXDE is arguably the lightest option available for a desktop environment, at least among those that the traditional desktop paradigm. This GTK-based desktop environment replaces all of the default applications with even lighter options (think Abiword, Gnumeric, etc. instead of LibreOffice), and it offers no flashy visual effects – nor does it have very good aesthetics in general, without heavy tweaks. However, it's still a functional desktop that you should consider using if you want something simple and fast.
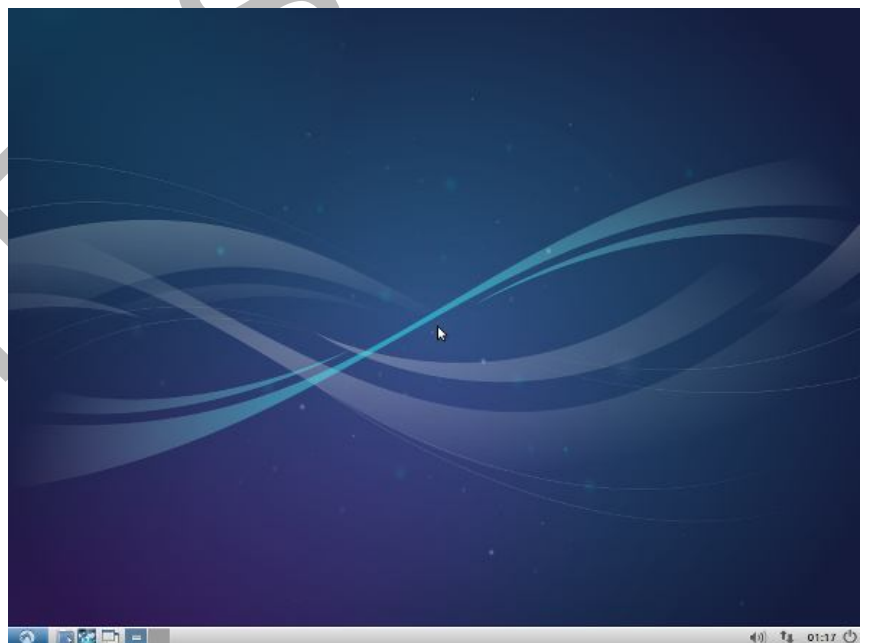
Unity

Unity is the default desktop for Ubuntu, and piggybacks off of Gnome. In fact, everything about it is the same as Gnome except that the desktop shell is different. The supplementary programs such as the file manager and the control center are all shared. Unity is only officially supported on Ubuntu, and it's unofficially available on a few distributions like Fedora and Arch Linux, both via third-party repositories. It's a pretty good desktop environment to use because it's rather simple to learn, and the Dash can be extended through the use of scopes.
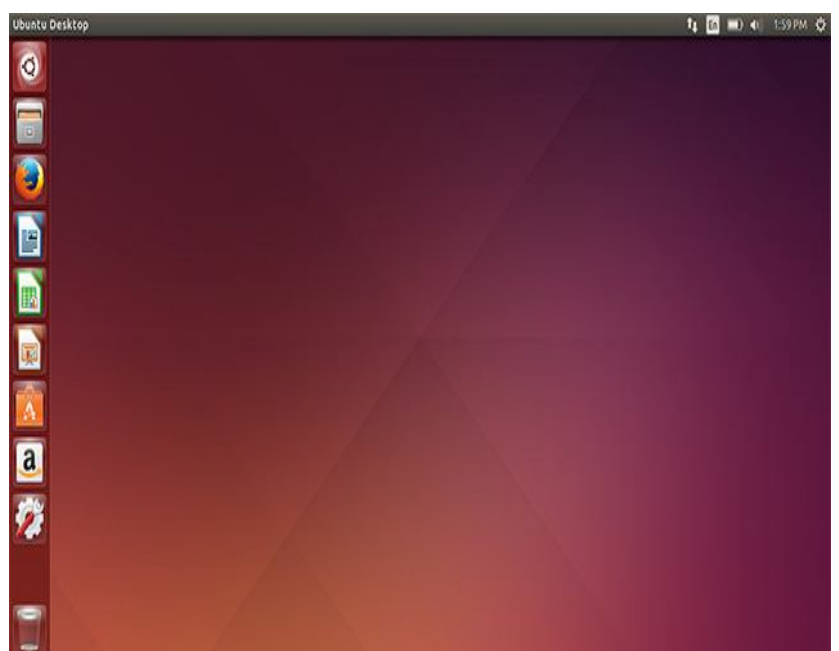
Cinnamon

Cinnamon is another alternative to Gnome. It tries to use the new technologies included in Gnome 3 but look more like Gnome 2. This desktop is primarily made for Linux Mint, and is unofficially available on a few other distributions as well. It's similar to Unity in availability and goal – to replace Gnome Shell with something else. If you're coming from Windows, it's probably going to feel more familiar than Gnome 3 or Unity.

MATE

MATE is a continuation of the Gnome 2 codebase. When Gnome 3 was released, Gnome 2 was officially considered dead and a lot of people were recommended to upgrade or move to a different supported desktop environment. However, there were quite a few people who liked Gnome 2 and wanted to continue to use it, so they forked it and named the new project "MATE." This was done to continue development on the desktop environment, not only to add new features to it but to make improvements like fix bugs and rework some code.

Openbox

Is LXDE not light enough? Give Openbox a try. It steps away from the traditional desktop paradigm and operates on completely minimalistic principles. While Openbox is highly customizable, the default setup will be very bare. In fact, if you're used to traditional desktops, you might at first think that your desktop never loads, but in fact it loads very quickly and has nothing to show for it. Applications are opened via a right-click menu, which open up in normal windows in the seemingly endless, empty space. This desktop environment is great for those who run on extremely low-powered devices or just don't care for any of the features that other desktop environments provide.