

Linux Unveiled: A Novice's Guide to a Fresh Start on Your New PC with Ubuntu Linux

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Chapter 1: Introduction to the Fresh Start with Linux

Welcome to the exciting world of Linux, an open-source operating system that empowers you to take control of your PC, much like Microsoft Windows or Apple macOS. However, unlike these mainstream alternatives, Linux offers you complete ownership and control without the constraints imposed by corporate ownership.

Taking Ownership of Your PC

It might come as a surprise, but the moment you install the software supplied by your PC manufacturer, you're typically asked to consent to terms and conditions that grant rights to the manufacturer and place restrictions on your computer's use. But it doesn't have to be this way. In this book, you'll learn how to change that forever.

Why Linux?

- Linux does not need “drivers” for different hardware. All the device drivers are built in, enabling you to unplug your drive containing a fully installed Linux system and plug it into a completely different machine. It just works!
- Linux has full printer management built-in, no need for custom manufacturer's printer drivers!
- Linux runs on ancient computers and state-of-the-art new computers. There is no expiry date on your PC hardware. As long as your computer works, you can run the latest version of Linux with all of its modern security features built-in. Now you can decide whether you need to buy new hardware. It's no longer in the hands of software companies like Apple or Microsoft.
- Linux user interfaces can be customised to suit your usage and workflow. You can customise your whole desktop experience. You are in total control.
- Linux runs most applications over 10% faster than any other operating system.

If this all sounds great, you have found the right book, now read on.

A Fresh Start with Linux

This book guides you through the process of reclaiming your PC, regardless of the manufacturer, and liberates it from the constraints of proprietary software. The author has honed this procedure for the last two decades, transforming vintage PCs and brand-new purchases into powerful servers and desktop workstations. The knowledge shared here will empower you to take control of your computing experience.

Embracing Open Source Software

The book includes an appendix listing open-source applications that have matured to the point where they can handle all your day-to-day activities, from online banking and email to web browsing and document creation, including creative pursuits like audio and video production, photography, and computer animation.

Your PC, Your Terms

This book provides step-by-step instructions tailored to modern Gigabyte motherboards to give you confidence in the process. Keep in mind that different manufacturers may have their unique approaches and terminology within their BIOS settings. If you have a PC from another manufacturer, consult its user manual alongside this book's instructions to find synonyms for the terms referenced here.

IMPORTANT NOTE

This book is not applicable to Apple computers as they have non-standard subsystems built into their hardware. Also note that Apple operating system, macOS, already has much of the source-code in common with Linux. With Apple's recent review of their Privacy policy, there is less of a requirement to replace their operating system with something like Linux, as Apple computers give the user the option to stop all tracking and data gathering, by Apple and other third parties. Even though it is possible to install Linux on Apple hardware, we would not suggest that this is within the capability of a novice.

Why Ubuntu?

In this chapter, we'll explore the concept of starting afresh on your PC with Linux, understand the advantages it brings, and delve into why Ubuntu is an excellent choice for your Linux adventure.

Why a Fresh Start with Linux?

The Beauty of Starting Over: Have you ever wished to wipe the slate clean on your computer and begin anew? Whether you've just purchased a brand-new PC or are looking to refresh an older one, Linux offers a remarkable opportunity to do just that. With a fresh Linux installation, you can enjoy a clean, efficient, and secure operating system without the clutter and baggage of your previous setup.

Say Goodbye to Clutter: Most pre-installed operating systems, like Microsoft Windows, come with a lot of preloaded software and settings. Over time, this can lead to performance issues and a less-than-optimal user experience. With Linux, you have the power to start from scratch, only installing what you need and customising your system to suit your preferences.

Security and Privacy: Linux is renowned for its security features. By starting fresh with Linux, you eliminate the risk of any hidden vulnerabilities or malware that might have found its way onto your computer. Your data and privacy become a top priority, with control firmly in your hands.

The Benefits of Ubuntu

Ubuntu: A Household Name: Ubuntu is a popular and user-friendly Linux distribution that's perfect for newcomers. It has earned a reputation for being approachable, reliable, and well-supported.

User-Friendly Interface: Ubuntu boasts an intuitive and polished user interface, making it easy for users of all backgrounds to navigate their systems with confidence.

Vibrant Community: Ubuntu has a large and active user community. This means you can find answers to your questions and get help with any issues you encounter during your Linux journey.

Versatility: Ubuntu is versatile and can be tailored to suit various needs. Whether you're a student, professional, or hobbyist, Ubuntu can adapt to your requirements.

Stability: Canonical, the company that currently packages this version of Linux supports many industries and has strict release policy that allow comprehensive testing on many types of different hardware. The “LTS” suffix denotes “Long Term Support”. The release schedule is approximately every 6 months, but this does not stop you from updating to newer versions to meet your requirements. It is simply a very stable and tested release of the all the software packages included in a release.

In the chapters to come, we'll guide you through every step of installing Ubuntu on your PC, ensuring you understand the process in detail. By the end of this book, you'll not only have a fresh Ubuntu installation but also the knowledge and confidence to make the most of your new Linux system.

At the time of writing this book, both Ubuntu and Fedora received their major upgrades. All of the machines that I look after in the businesses that I work for, were upgraded to these releases. In my opinion, these are the very best software releases I have ever seen and I feel confident that you will be impressed with either of these on your new PC.

So, are you ready to take the plunge and unveil the world of Linux? Let's get started on your fresh start with Ubuntu!

Chapter 2: Preparing for Installation

Before we dive into the installation process, it's essential to ensure that your computer is ready for the fresh start with Ubuntu. In this chapter, we'll guide you through the steps to prepare your system, emphasising the importance of starting with a clean slate.

Ensuring a Clean Slate

No Need for Data Backup

One of the beauties of a fresh start with Linux is that you don't need to worry about backing up your data. We assume that your new PC has no personal data or important files that need saving. If you've used the computer previously and have data you want to keep, make sure to back it up to an external drive before proceeding.

Overwriting Previous Installations

Whether your PC came pre-installed with another operating system like Microsoft Windows or if you've previously experimented with different OSes, we'll be overwriting the previous installations during the Ubuntu installation process. This means you'll have a clean slate to work with.

Creating a Bootable USB Drive

To begin the installation process, you'll need a bootable USB drive containing the Ubuntu operating system. Here's how to create one:

What You'll Need:

1. A USB flash drive with at least 4GB of storage capacity.
2. The Ubuntu ISO file, which you can download from the official Ubuntu website.

Steps to Create a Bootable USB Drive

1. Insert your USB drive into an available USB port on your computer.
2. Download the Ubuntu ISO file from the official Ubuntu website (<https://ubuntu.com/download>).
3. Download and install a tool like Rufus (for Windows) or BalenaEtcher (for Windows, macOS and Linux) to create a bootable USB drive.
4. Open the tool and select your USB drive as the target device.
5. Browse to the location where you saved the Ubuntu ISO file and select it.

6. Click "Start" or "Flash" to create the bootable USB drive. This process may take a few minutes.

With your bootable USB drive prepared, you're now ready to move on to the Ubuntu installation process. In the following chapters, we'll guide you through each step, ensuring you understand the process thoroughly. By the end of this book, you'll have a clean and fresh Ubuntu installation, ready to be customised to your liking.

Are you excited to take the next step on your Linux journey? Let's proceed to Chapter Chapter 3:, where we'll explore why Ubuntu is an excellent choice for your fresh start.

Chapter 3: Choosing Ubuntu for Your Fresh Start

Now that you've prepared your computer for a fresh start, it's time to explore why Ubuntu is an excellent choice for your Linux journey. In this chapter, we'll delve into what Ubuntu is, its place in the Linux ecosystem, and why it's a popular and user-friendly distribution for newcomers.

What Is Ubuntu?

A Linux Distribution: Ubuntu is a Linux distribution, often referred to simply as a "distro." A Linux distribution is a complete operating system that includes the Linux kernel, essential system utilities, and a graphical desktop environment. Ubuntu is designed to be user-friendly and versatile, making it suitable for a wide range of users.

Based on Debian: Ubuntu is built upon the Debian Linux distribution, known for its stability and open-source principles. This means that Ubuntu inherits many of Debian's qualities while adding its unique features and enhancements.

Regular Releases: Ubuntu follows a regular release schedule, with new versions coming out every six months. These releases offer the latest software updates, security patches, and improvements, ensuring that your system stays up-to-date and secure.

Why Choose Ubuntu?

User-Friendly Interface: Ubuntu is known for its intuitive and user-friendly interface. Its default desktop environment, called GNOME, provides a sleek and modern experience that's easy to navigate. Whether you're a seasoned computer user or completely new to Linux, Ubuntu's interface will help you feel right at home.

Vibrant Community: Ubuntu boasts a large and active user community. This means you'll find plenty of online resources, forums, and communities where you can seek help, ask questions, and learn from experienced Ubuntu users. If you encounter any issues during your journey, you won't be alone.

Software Availability: Ubuntu features a vast software repository, the Ubuntu Software Center, where you can easily discover, install, and manage applications. From productivity tools and multimedia software to games and development tools, Ubuntu offers a wide range of software options to suit your needs.

Versatility: Ubuntu is versatile and adaptable. Whether you're a student, professional, or enthusiast, you can customise Ubuntu to meet your specific requirements. If you have a particular software or application need, chances are you'll find it in Ubuntu's software repository.

By choosing Ubuntu for your fresh start with Linux, you're opting for an operating system that's reliable, well-supported, and designed with the user in mind. In the following chapters, we'll guide you through the process of installing Ubuntu on your PC, ensuring you have a solid foundation for your Linux journey.

Before we move on to the next step, it is important to understand that Linux has an extensive user base and being open-source, has also many teams working worldwide to modify the distributions to suit different target user group needs. In the next chapter we will give you a quick overview of what is available, before we continue the installation of Ubuntu in Chapter 5:.

Chapter 4: Exploring Linux Distributions

Linux is a world of choices, with over 200 different distributions available to cater to a wide range of preferences and needs. In this chapter, we'll introduce you to the diverse landscape of Linux distributions, highlight some of the most prominent ones, and explain why we've chosen Ubuntu for the purpose of this book.

Understanding Linux Distributions

The Rich Tapestry of Linux

Linux is more than just an operating system; it's a vibrant ecosystem of software projects and communities that have come together to create a wide variety of distributions, each with its own philosophy and goals. These distributions build upon the Linux kernel, which is the core component that manages hardware and system resources. However, what sets each distribution apart is the combination of software packages, desktop environments, and user interfaces that it offers.

Linux is a popular choice for both servers and desktop systems, and its usage has been growing steadily over the years. In fact, over 98% of the world's servers run on Linux, thanks to its stability, and security, and its ability to run on very powerful hardware. However, Linux is not limited to server environments; it's also an excellent option for desktop users who want a free, flexible, and highly customisable operating system.

Before we dive into the installation process of Ubuntu, let's take a look at the broader landscape of Linux distributions. A distribution, or "distro," is a collection of software components, including the kernel, device drivers, system libraries, system utilities, and application software, that are packaged together to make it easy to install and use Linux on a computer.

To get a bit of background as to the choice of Ubuntu, here is a selection of some of the most popular distributions at the time of writing. In each case, you will find motivations as to why one would choose one over the other.

Selection of Popular Distributions

Ubuntu

- User-friendly interface
- Large community support
- Easy installation process
- Pre-installed with popular software (e.g., LibreOffice, Firefox)
- Regular updates and security patches

- Suitable for: Both desktop and server environments

Motivation: Perfect for beginners who want a hassle-free Linux experience on their desktop.

The reason that this book focuses only on this distribution is that it has gained the attention of many hardware vendors such as Lenovo, HP and ASUS and is now starting to be pre-installed on many home and business PCs. It is the distribution on which many other distributions are based and has become well supported alternative to commercial systems on most PC hardware.

Debian

- Stable and reliable
- Huge software repository (over 59,000 packages)
- Strong focus on free and open-source software
- Wide hardware support
- Suitable for: Both desktop and server environments

Motivation: Ideal for those who value stability and a massive software collection, making it a popular choice for servers and desktop systems alike.

Fedora

- Bleeding-edge software releases (very well tested by a big organisation)
- Experimental and innovative features
- Strong community involvement
- Great for developers and power users
- Suitable for: Desktop systems

Motivation: Suitable for experienced users who want to stay on the cutting edge of Linux development and are comfortable with frequent updates and changes.

openSUSE

- Easy-to-use installer (YaST)
- Beautiful, customizable interface (KDE or GNOME)
- Large software repository
- Strong focus on system administration tools

- Suitable for: Both desktop and server environments

Motivation: A good choice for those who value ease of use and a rich set of system administration tools, making it suitable for both desktop systems and servers.

Linux Mint

- Based on Ubuntu, but with a more polished user experience
- Pre-installed with multimedia codecs and popular software
- Easy to install and configure
- Great for Windows refugees
- Suitable for: Desktop systems

Motivation: Perfect for users who want an easy-to-use, out-of-the-box Linux experience on their desktop with minimal setup.

CentOS

- Based on Red Hat Enterprise Linux (RHEL)
- Rock-solid stability and security
- Ideal for servers and enterprise environments
- Large community support
- Suitable for: Server environments

Motivation: Suitable for businesses or individuals who need a reliable, server-oriented distribution that's widely supported by the community.

Arch Linux

- Lightweight and highly customizable
- Rolling-release model (latest software packages always available)
- Strong focus on user control and flexibility
- Great for power users and tinkerers
- Suitable for: Desktop systems

Motivation: Ideal for experienced users who want complete control over their system and are willing to invest time in setup and configuration.

Lubuntu

- Lightweight variant of Ubuntu
- Fast and efficient
- Minimal resource usage
- Perfect for older hardware or netbooks
- Suitable for: Desktop systems

Motivation: A great choice for those with limited resources (e.g., old computers, netbooks) who still want a user-friendly Linux experience on their desktop.

Manjaro

- Based on Arch Linux, but with an easier installation process
- Access to the latest software packages
- User-friendly interface and configuration tools
- Great for those who want the benefits of Arch without the complexity
- Suitable for: Desktop systems

Motivation: Suitable for users who want the flexibility of Arch Linux without the steep learning curve.

Pop!_OS

- Developed by System76, a Linux hardware vendor
- Designed to be fast, efficient, and easy to use
- Pre-installed with popular software and drivers for System76 hardware
- Great for those who want a hassle-free, out-of-the-box experience
- Suitable for: Desktop systems

Motivation: Perfect for users who value ease of use and are interested in running a Linux distribution optimised for System76 hardware. However, since the System76 is industry standard hardware, you will find that this distribution will run well on most desktop and laptop PCs.

Puppy Linux

- Extremely lightweight (can run on very old hardware)

- Portable distribution (can be carried on a USB drive)
- Easy to install and use
- Great for reviving old computers or creating a portable Linux system
- Suitable for: Desktop systems

Motivation: Perfect for those who want to breathe new life into ancient hardware or create a portable Linux system.

FreeBSD

Not Quite Linux... Read on...

FreeBSD is an operating system used to power modern servers, desktops, and embedded platforms. A large community has continually developed it for more than thirty years. Its advanced networking, security, and storage features have made FreeBSD the platform of choice for many of the busiest web sites and most pervasive embedded networking and storage devices. The reason this is mentioned in this book, it that much of the code that runs within Linux is identical to FreeBSD, furthermore, FreeBSD is the basis for Apple macOS and the software running on Sony PlayStation. Since both FreeBSD and Linux are open-source, “Unix Based”, they are share code. This has helped Linux to achieve an extremely high level of security and a very solid and stable code base.

The Common Kernel, Different Interfaces

Unified Under the Kernel

Beneath the surface, all Linux distributions share the same kernel code—the core of the operating system. This common foundation ensures compatibility with a wide range of hardware. However, what sets distributions apart are their user interfaces, package management systems, and default software selections. These differences allow each distribution to cater to different needs and preferences.

Choosing Without Overwhelm

As you embark on your Linux journey, there's no need to feel overwhelmed by the abundance of choices. We've selected Ubuntu as the starting point for this guide because it offers an excellent end-to-end user experience, making it ideal for newcomers. The installation process described in this book can generally be adapted to most common distributions.

In most cases, you simply have to substitute the installation ISO file downloaded from the distributor's website, for the one in this guide. In the meantime, we suggest that you explore other distributions at a later stage in your Linux journey when you have a better understanding of needs in the context of the choices available.

Now that you have a broader understanding of the Linux distribution landscape. Let's continue your Linux journey with Ubuntu in Chapter 5:.

Chapter 5: Downloading Ubuntu

To embark on your fresh start with Ubuntu, you'll need to download the Ubuntu operating system. In this chapter, we'll guide you through the process of finding and downloading the official Ubuntu ISO file from the Ubuntu website.

Why Download Ubuntu from the Official Website?

Safety and Reliability: It's crucial to download Ubuntu from the official Ubuntu website (<https://ubuntu.com/download>). Doing so ensures that you receive a genuine and unaltered copy of Ubuntu. This reduces the risk of downloading compromised or modified versions of the operating system from unofficial sources.

Latest Updates: The official website provides the most up-to-date version of Ubuntu, including the latest software updates, security patches, and improvements. By downloading from the source, you'll start with the most recent and secure version of Ubuntu.

Steps to Download Ubuntu

Follow these steps to download Ubuntu:

Step 1: Visit the Official Ubuntu Website

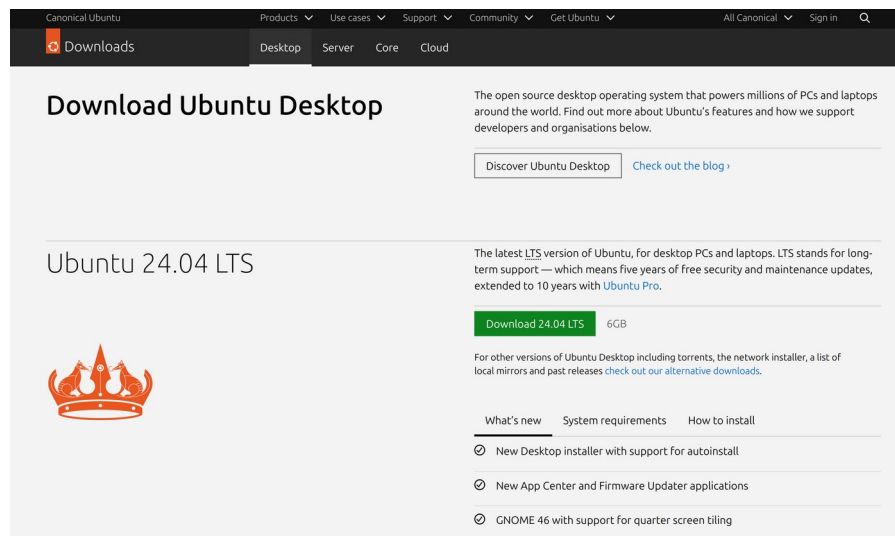
Open your web browser and go to the official Ubuntu website:
<https://ubuntu.com/download/desktop>.

Step 2: Choose Your Edition

You'll be presented with different Ubuntu editions. For most users, the standard Ubuntu Desktop edition is a great choice. Click on the "Download" button for this edition.

Step 3: Select the Version

Ubuntu typically offers two types of releases: Long-Term Support (LTS) and regular releases. LTS releases are recommended for most users due to their stability and long-term support. Click on the version you prefer. Here is a snapshot of the screen for the Ubuntu 24.04 release:



Step 4: Choose Download Method

You'll have the option to download Ubuntu via direct download or using a torrent file. For simplicity, we recommend the direct download option. Click "Download."

Step 5: Start Downloading

Your browser will initiate the download process. Depending on your internet connection, this may take some time. Be patient, and ensure that the download completes successfully.

Step 6: Verify the Download (Optional)

To enhance security, you can verify the downloaded Ubuntu ISO file's integrity using the provided checksums and instructions on the Ubuntu website. While optional, this step adds an extra layer of confidence in your download.

With the Ubuntu ISO file downloaded, you're one step closer to your fresh start with Ubuntu. In the next chapter, we'll explore how to create a bootable USB drive with the Ubuntu ISO, which is essential for the installation process.

Are you ready to proceed? Let's move on to Chapter 6:, where we'll guide you through creating a bootable USB drive with Ubuntu.

Chapter 6: Creating a Bootable USB Drive with Ubuntu

Now that you have downloaded the Ubuntu ISO file, the next step on your journey to a fresh start with Ubuntu is to create a bootable USB drive. This bootable USB drive will serve as the installation media for Ubuntu. In this chapter, we'll guide you through the process of turning your USB drive into a powerful tool for installing Ubuntu.

What You'll Need

Before we get started, here's what you'll need:

- **A USB Flash Drive:** You'll need a USB flash drive with a capacity of at least 4GB. Make sure there's no important data on it, as creating a bootable drive will erase its contents.
- **The Ubuntu ISO File:** You should have already downloaded the Ubuntu ISO file from the official Ubuntu website (as explained in Chapter 5:).
- **A Computer:** You'll need access to a computer to perform the USB drive creation process. You can even use your new Computer to do this, if it is supplied with Microsoft Windows. Once the USB Flash Drive is created, you won't be needing "another computer" again.

Steps to Create a Bootable USB Drive

Follow these steps to create a bootable USB drive with the Ubuntu ISO:

Step 1: Insert the USB Drive

Insert your USB flash drive into an available USB port on your computer.

Step 2: Download Rufus (For Windows Users) or BalenaEtcher (For Windows, macOS and Linux Users)

You'll need a tool to write the Ubuntu ISO file to the USB drive. For Windows users, we recommend using Rufus, while macOS and Linux users can use BalenaEtcher. Both tools are user-friendly and free to use.

For Rufus (Windows):

Download Rufus from the official website (<https://rufus.ie/>).

For BalenaEtcher (Windows, macOS and Linux):

Download BalenaEtcher from the official website (<https://etcher.balena.io/>).

Step 3: Launch the USB Creation Tool

Open Rufus (for Windows) or BalenaEtcher (for Windows, macOS and Linux).

Step 4: Select Your USB Drive

In the USB creation tool, select your USB drive as the target device. Make sure you choose the correct drive, as the process will erase all data on it. Typically, you can identify the drive by the size. If you are in doubt which the correct drive is, unplug the drive and note which new one appears when you plug it back in.

Step 5: Choose the Ubuntu ISO File

Click on the option to select the Ubuntu ISO file you downloaded in Chapter 4. Browse to the location where you saved the file and select it.

Step 6: Configure Additional Settings

Most of the time, you can leave the default settings as they are. Ensure that the partition scheme is set to "MBR" or "GPT" (depending on your computer's BIOS/UEFI mode) and that the file system is set to "FAT32."

Step 7: Start the Creation Process

Click the "Start" or "Flash" button to begin the process. You may receive a warning that all data on the USB drive will be destroyed. Confirm and proceed.

Step 8: Wait for Completion

The tool will now copy the Ubuntu ISO file to the USB drive and make it bootable. This process may take a few minutes.

If you are doing this on a Windows system, you may get a standard Windows dialogue box, during the creation process that asks you what you want to do with the "USB drive". This is a standard feature of Windows when it detects an unformatted drive, or a drive that does not have a standard Windows ntfs or fat32 filesystem. Since we are not trying to use the drive in Windows, we can safely ignore this message and dialogue box.

Once the process is complete, you'll have a bootable USB drive ready to start the Ubuntu installation. In the next chapter, we'll guide you through the steps to make the fresh start with Ubuntu, starting with the installation process.

Are you ready to move on? Let's proceed to Chapter 7:, where we'll walk you through the Ubuntu installation process on your PC.

Chapter 7: Making the Fresh Start with Ubuntu

With your bootable USB drive prepared, you're now ready to embark on the journey of installing Ubuntu on your PC. In this chapter, we'll guide you through each step of the installation process, ensuring you understand what's happening along the way. By the end of this chapter, you'll have Ubuntu up and running, replacing any previous installations on your computer.

Have Your Manufacturers Handbook Ready

As indicated in the introduction, your computer has a tiny operating system built into the motherboard. It is called the BIOS (Basic Input Output System). All modern computers now have very user friendly version of their BIOS that has a graphic user interface which can be operated with a keyboard and a mouse. Since there are no standards in place for what to call particular things on a motherboard, they are all different.

The operating system installation procedure we are about to describe, has not changed for the last 20 years, so you will be able to follow along, even if the screens shown here do not match what appears on your computer. Snapshots of screens are provided here only to provide context to the steps that need to be undertaken.

Booting from the USB Drive

All drives attached to a computer are scanned by the motherboard BIOS only once, as soon as power is applied. They are not scanned again, so remember that this step needs planning. With the computer turned off, plug in the USB drive into a USB port, then turn on the power. If you need to change anything, turn off the computer, change the USB drive, then power it on again. If you don't do this, before powering up the PC, your USB memory stick will not appear on any list shown in the BIOS!

All devices that are connected to a PC have a human readable name. In some cases, this name makes sense, in other cases, it is vague. Your PC manufacturer does not specify that name. It is created during manufacture of the device. Make a note of what you think the PC is calling your attached device, as you will refer to it on a number of different screens in your BIOS GUI.

To illustrate the inconsistent nature of these names, consider these sample names found when plugging in a USB thumb drive:

- USB
- USB Extreme
- Extreme Pro
- Toshiba 6S
- and many more....

So you can see, we have a challenge to work out what to look for. If you cannot guess which one matches your specific USB drive, then simply go through the steps to show connected drives without

your drive plugged in and then repeat with the new USB drive plugged in. It will obviously be the one that is new to the list.

Example 1: Here is an actual example taken from a PC with a number of internal and external drives attached.

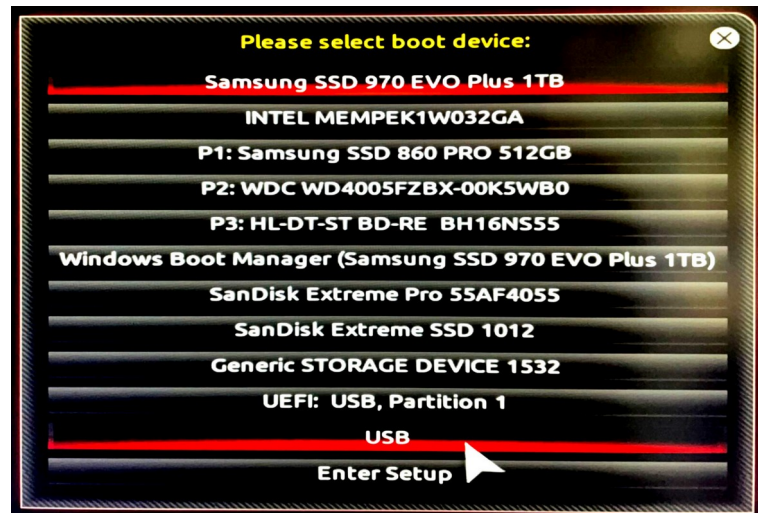


Figure 1: Gigabyte Motherboard - Boot Menu

The item labelled “Windows Boot Manager” is created by the Microsoft Windows and should always be ignored. In this case, the drive that we are looking for is simply labelled “USB” but this was name that was hard-programmed into the USB flash drive, a “SanDisk Ultra USB 3.0 Flash Drive”. Of note, you can see on this example, that there are two other SanDisk devices, again, they happened to be plugged into the USB ports on the machine when this screenshot was taken, but are larger external SSD drives. This is a good example of the completely inconsistent naming conventions used in device manufacture. Do not be disillusioned, there are some patterns that can help narrow down which is the your new USB thumb drive.

As a guide, you would expect to see the following listed on a computer which has no DVD drive, one SSD drive and Windows 10 installed.

1. The manufacturer’s name for the SSD drive
2. Windows Boot Manager (SSD drive manufacturer’s name for the SSD drive)

If the machine had a DVD drive, then you would typically see

1. The SSD drive manufacturer’s name for their SSD drive
2. The DVD drive manufacturer's name for their DVD drive
3. Windows Boot Manager (SSD drive manufacturer’s name for the SSD drive)

Example 2: Here is another boot drive menu taken from a different machine made by Intel.

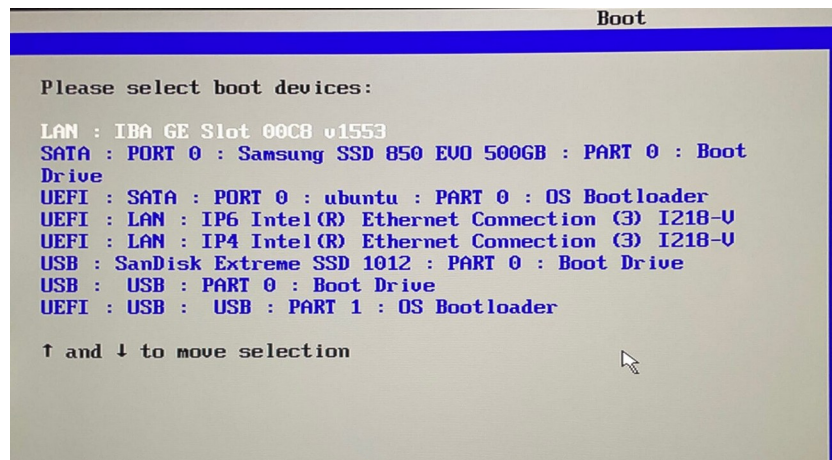


Figure 2: Intel Motherboard - Boot Menu

This machine does not have Windows 10 installed, hence there is no reference to Windows Boot Manager. The USB thumb drive shown in the first example was plugged into this machine to illustrate that the name of the drive is again only known as “USB”, in this case, the motherboard manufacturer stated that it was found on a USB port. This may look confusing, but in the context of the whole menu, you can tell that that the first column is the interface type, in this case, then the name of the actual item that was plugged into that port. The other USB entry you can see in this example was an external SSD drive, used in the first example, to show you that it is always possible to deduce the device, based on the name shown in the menu.

Don't Be Afraid To Explore

With these two examples, you can see that if you were to plug your USB thumb drive into the machine and power up, you should get another entry, usually on the bottom of the list, with the name given by the thumb drive manufacturer. This is the one you will need to take a note of, when you continue with these instructions.

To recap, look at the boot devices without your new USB thumb drive plugged in, turn off the power, plug in your new USB thumb drive and turn the power on again. When you follow along on the following steps, you can then confidently identify which device to install the new operating system from.

Accessing BIOS/UEFI Settings

Turn on or restart your computer.

During the startup process, you'll need to access the BIOS or UEFI settings. The specific key to press (e.g., F2, Del, F12) to enter these settings varies depending on your computer's manufacturer. Common keys are typically displayed on the screen during boot, or you can refer to your computer's

manual. You will certainly have to refer to your manufacturer's manual, if all you just see on power up, is a full screen manufacturer's logo, rather than a menu of keys to access the BIOS.

Configuring Boot Order

Once in the BIOS/UEFI settings, navigate to the "Boot" or "Boot Order" section. Here, you'll specify the boot order priority. Set your USB drive as the first boot option, ensuring that your computer will boot from the USB drive before other devices.

Saving and Exiting

Save the changes you've made to the boot order and exit the BIOS/UEFI settings. Your computer will now restart.

Beginning the Ubuntu Installation

As your computer restarts, it should boot from the USB drive, and you'll see the Ubuntu installation screen. Here, you have the option to "try Ubuntu" without installing it, or proceed with the installation. Choose "Install Ubuntu" to begin the installation process.

- 1. You can also choose "try Ubuntu" which will allow you to look at the new desktop without making any permanent changes. If you do this, you will again be given the opportunity within the trial GNOME environment, to actually run the installation by clicking on the appropriate icon on the GNOME desktop. Doing this gives you a perfect opportunity to get a preview of what Ubuntu will look like on your actual hardware.*
- 2. During the installation process, you are likely to see some error messages flashing on the screen. This is normal and they can safely be ignored. The process of setting up a new Linux installation involves loading all possible device drivers, even if your computer does not have those devices. This avoids the need for you to worry about installing extra device drivers, just to try out the software or to install the new system on your PC. When the driver loads and cannot find the device (because it does not exist on your specific hardware), it will generally unload and give an error message. This is the expected behaviour.*

Understanding Partitions and File Systems

Before we proceed further with the installation, let's briefly explore the concepts of partitions and file systems:

Partitions: A partition is a logical division of your computer's storage space. Think of it as a separate container for data. Operating systems and data are stored in different partitions. During the installation, Ubuntu will create partitions to organise your data and system files.

File Systems: A file system is the format used to store and manage data on a partition. For Windows, you may be familiar with the NTFS (New Technology File System) file system. In the Linux world, the

ext4 (Fourth Extended File System) and btrfs (B-tree File System) file systems are commonly used. Ubuntu will use either ext4 or btrfs as the file system for your fresh installation.

Compatibility: It's important to note that Linux has excellent compatibility with various file systems, including NTFS (used by Windows) and FAT (File Allocation Table). This means that you can access and read data from USB drives or external storage devices formatted with these file systems without any issues.

Preparing for Installation

Updates and Additional Software

You have the option to install updates and third-party software during the installation. Selecting both options is recommended for a smoother experience.

Installation Type

Ubuntu will prompt you to select an installation type. Since our goal is a fresh start, choose the option that says "Erase disk and install Ubuntu." This will remove any existing operating system and install Ubuntu as the sole operating system on your computer.

If you happen to have a PC with multiple SSDs, or a SSD and a HDD, you can still select the "Erase disk and install Ubuntu" option, however, when you hit continue, you will be asked which of the drives attached to the PC that you want the new system installed on. Choose carefully as selected drive will be erased in the installation process.

Understanding Automatic Partitioning

Ubuntu offers an automatic partitioning option that sets up a typical partition structure with sizes best matched to the size of the SSD installed on your computer. This ensures that your system operates efficiently. You can trust this automatic setup unless you have specific partitioning requirements.

Confirming Changes

A confirmation screen will appear, summarising the changes to your disk. Review the changes carefully, and if everything looks correct, click "Install Now."

Location and User Details

Time Zone

Choose your time zone or city to ensure that Ubuntu displays the correct time and date.

Keyboard Layout (Again)

Confirm your keyboard layout once more.

User Details

Enter your name, computer name, username, and password. This information will be used to create your user account.

Installation Progress

Sit back and relax while Ubuntu is installed. The process may take some time, depending on your computer's speed and the installation options you selected.

Completing the Installation

Once the installation is complete, you'll be prompted to remove the installation media (the USB drive) and press "Enter" to continue.

First Boot into Ubuntu

After removing the USB drive and pressing "Enter," your computer will restart. It will now boot into your fresh Ubuntu installation.

Congratulations! You've successfully made a fresh start on your PC with Ubuntu. In Chapter 9:, we'll guide you through the essential post-installation setup steps, including configuring your desktop environment, installing software, and making your Ubuntu system truly yours.

Chapter 8: HELP – I Want To Try Again!

If you have never installed a fresh operating system on a PC, this experience can be both rewarding and frustrating. So this chapter has been inserted here, to give you a very clear path to follow if you encounter problems in the actual installation process, or don't like what you have done, or just want to try again for fun! Most operating system installers really only give you a very smooth experience on a clean machine which has a new hard disc and nothing installed at all.

If an operating system already resides on your computer's hard drive, the installer is designed to alert you as many times as possible that what you are trying to do is "not a good idea". Starting again from scratch, requires that you accept that these messages will come up and ignore them! Ultimately, you do not want any remnants of previous installations left when you finished. This is called a "clean installation".

Don't Worry About Scary Messages

As you proceed with the installation, you'll encounter messages that might seem intimidating or alarming. Don't worry! These messages are designed to protect your data, but since you've already backed up your valuable files and understood the concept of partitions (from previous chapters), you can safely ignore these warnings.

When You See "Are You Sure?" - Just Click Yes

During the installation process, you might see prompts asking if you're sure about overwriting or erasing data. Remember, you've taken steps to protect your important files, and this is a necessary step to replace your existing operating system with Ubuntu.

Don't Be Afraid to Click "Erase Everything"

When prompted, choose the option to erase everything on the installation disk. This will delete all partitions on your hard drive and prepare it for the Ubuntu installation. Yes, it sounds drastic, but trust us - this is what you want to do.

Just Keep Going - Nothing Will Break

If you encounter any errors or warnings during this process, don't panic! You won't break anything or lose data. Simply acknowledge the message and continue with the installation. Remember, your goal is to replace your existing operating system with Ubuntu, and this is a necessary step to achieve that.

Persistence Pays Off

Keep going, even if you encounter multiple warnings or prompts. Your persistence will be rewarded when the Ubuntu installation begins, and your entire installation drive is reformatted and ready for the new software to install. Once you see the "installing" message, you are good to go. Now enjoy the fruits of your persistence in the next chapter.

Chapter 9: Understanding User Privileges

As a MS Windows user, you're likely accustomed to having full control over your computer without any restrictions. You can install software, make system changes, and access all areas of your computer without needing to log in or authenticate yourself. This seems convenient, but it's actually a major security risk.

System vs User Resources

In the world of computing, there are two main concepts: **system resources** and **user resources**. System resources refer to the operating system itself, including critical files, directories, and configurations that keep your computer running smoothly. User resources, on the other hand, include your personal files, documents, and settings.

In MS Windows, the lack of separation between system and user resources means that any malware or virus can potentially access and modify sensitive system files, putting your entire system at risk. This has led to a plethora of problems, including:

- The proliferation of **bots**, which are compromised computers used for malicious activities like DDoS attacks and spamming.
- The spread of **malware** and **viruses**, which can steal personal data, corrupt system files, or even take control of your computer.
- **Ransomware** attacks, where hackers encrypt your files and demand payment in exchange for the decryption key.
- **Data breaches**, where sensitive information is stolen from compromised systems.

These issues are so prevalent that they've become a major concern for individuals, businesses, and governments alike. So, how can we prevent these problems?

Solid University Heritage

Linux, on the other hand, has a long history of prioritising security and stability. In the early days of Unix (the precursor to Linux), university researchers and developers recognised the importance of separating system resources from user resources. This led to the development of a robust authentication system that ensures users don't have unrestricted access to sensitive areas of the operating system.

In Linux, each user has their own account, which is separate from the **root** account (also known as the superuser). The root account has elevated privileges, allowing it to make system-wide changes and access critical files. However, this power comes with great responsibility, and it's not recommended for everyday use.

What is SUDO?

To strike a balance between convenience and security, Linux introduced the concept of **sudo** (short for "superuser do"). Sudo allows authorised users to run specific commands with elevated privileges, but only after authenticating themselves using their password. This additional step serves as a reminder that the command being executed has escalated privileges and should be used with caution.

In Ubuntu, the "user account" that you specified in Chapter Chapter 7: creates a single user account to access your new system. By default, this user account is granted sudo privileges, allowing you to perform administrative tasks without needing to log in as root. This design decision ensures that you can still make system changes when necessary, while protecting the system from potential security risks.

It's worth noting that you cannot log in directly as root on a Linux system. This restriction is in place to prevent accidental or malicious modifications to critical system files. Instead, you'll use sudo to run specific commands with elevated privileges, ensuring that you're aware of the implications and take necessary precautions.

Practical Examples: Understanding Sudo in Action

Now that we've covered the basics of sudo, let's see it in action through some practical examples.

Example 1: Installing Software through the Software Manager

When you open the Ubuntu Software Manager and search for an application to install, you'll notice that it doesn't ask for your password. This is because the Software Manager is designed to work with sudo privileges behind the scenes. When you click the "Install" button, Ubuntu temporarily elevates the Software Manager's privileges using sudo, allowing it to make changes to the system.

Example 2: Installing Software through the Command Line

Let's say you want to install the **vim** text editor using the command line. You open a terminal and type:

```
sudo apt-get install vim
```

You'll be prompted to enter your password, which is used to authenticate the sudo request. Once you've entered your password correctly, Ubuntu will install **vim** for you.

Example 3: Attempting to Change System Files

Suppose you want to modify a system configuration file, such as **/etc/network/interfaces**. You open a terminal and try to edit the file using:

```
nano /etc/network/interfaces
```

However, you'll encounter an error message indicating that you don't have permission to modify the file. This is because system files are owned by the root user, and you're trying to access them with your regular user account.

To overcome this limitation, you can use sudo:

```
sudo nano /etc/network/interfaces
```

This time, you'll be prompted to enter your password, and once authenticated, you'll gain temporary write access to the system file.

Example 4: Running a Command with Elevated Privileges

Let's say you want to run a command that requires root privileges, such as listing all running processes:

```
ps -ef
```

By default, this command won't show you all running processes, since it requires elevated privileges. To overcome this limitation, you can use sudo:

```
sudo ps -ef
```

This time, the ps command will run with root privileges, showing you a complete list of running processes.

These examples illustrate how sudo works in various scenarios:

- When using graphical tools like the Software Manager, Ubuntu uses sudo behind the scenes to ensure that system changes are made securely.
- When working with command-line tools, you need to explicitly use sudo to gain elevated privileges.
- Sudo prevents accidental or malicious modifications to system files and ensures that you're aware of the implications when making system-wide changes.

Example 5: Attempting to Become “root”.

You may see instructions on some websites that suggest that you type the following command to allow you to become root:

```
su -
```

On Ubuntu, the root account has a randomly assigned password that you won't know. This means that even if you try to type in this command, you won't be able to provide the correct password. This is done to protect you from yourself. Most modern websites will encourage you never to try this and specify that you use “sudo” to gain temporary elevated privileges.

You will also encounter this on the login screen if you try to login as “root”.

Example 6: Web Browsing (Everybody's Most Popular Software Tool)

Let's consider a common scenario: opening a web browser like Firefox, Chrome or Brave. When you browse the internet, you may unknowingly visit malicious websites or encounter phishing attempts. On MS Windows, this can lead to malware installations, as browsers often have elevated privileges. However, on your new Ubuntu system, your web browser (like Firefox) runs as a user-only program, without elevated privileges. This means that even if you accidentally download malware while browsing, it won't be able to make changes to system files or compromise your system's security.

Conclusion

In summary, understanding user privileges and sudo is essential for securely using your new Ubuntu system. By separating system resources from user resources and implementing a robust authentication system, Linux provides a more secure computing environment.

In the following chapters, we will use this information to install extra software and make system changes. Since you will always be prompted for a password before making system changes, your understanding of computer security will grow.

Before we move on, there is one more thing that needs to be considered to maintain a healthy relationship with your new PC.

Linux Insider, Security Tip: Balancing Convenience and Protection

On Ubuntu, you have the option to automatically log in as a user without requiring a password. This is either set as one of the installation steps or subsequently in the Gnome Setting panel. While this may seem convenient, it's essential to evaluate this feature carefully. If your computer is going to be physically accessed by others, such as children or visitors, or if it will leave your home, you should **never enable automatic login**. This is because anyone with **physical access** to your computer can use it without needing a password. Since the unauthorised person can run all of your programs, they may be able delete valuable data, view your passwords or cause other mischief. Don't take the risk, this is a very small inconvenience when you first turn on your PC.

Chapter 10: Post-Installation Setup in Ubuntu

Now that you have gone through the tricky steps and have Ubuntu installed on your hard drive, we'll guide you through the essential post-installation setup steps, including configuring your desktop environment, installing software, and customising Ubuntu to suit your preferences.

Updates Waiting Already!

Before we even get a chance to have a look at our new system, you may be prompted to install updates. This is good news. Firstly, you will know that you have an Internet connection, and secondly, you will get a chance to freshen up the software that you just installed from the ISO file. The ISO images on the website are highly likely, out-of-date. Completing all the necessary system updates now, will streamline your new Linux experience in the future. Go ahead and hit "OK" to install the updates.

Before we continue exploring our new system, there is an important thing to be aware of. This is a side-step in this guide, as it only really affects the readers who have nVidia graphics processors in their new computers. In any case, you are encouraged to read over the next section in any case to help understand the context.

If this does not apply to you, feel free to skip to Chapter Chapter 13:.

Chapter 11: Understanding Graphics Processing Units (GPUs)

As you prepare to switch from MS Windows to Ubuntu Linux, it's essential to understand one of the critical components inside your computer: the Graphics Processing Unit (GPU). In this chapter, we'll demystify GPUs, explain their importance, and introduce you to the three major GPU manufacturers.

What is a GPU?

A Graphics Processing Unit (GPU) is a specialised electronic circuit designed to quickly manipulate and alter memory to accelerate the creation of images on your computer screen. In simpler terms, a GPU is responsible for rendering the visual aspects of your computing experience, including graphics, videos, and games.

Why are GPUs important?

GPUs are no longer just optional components; they're an integral part of modern computers. Every laptop and desktop computer sold today comes with a built-in GPU or has one integrated into the processor (more on that later). The GPU plays a crucial role in:

- Rendering graphics and videos
- Powering games and other graphical applications
- Enhancing overall system performance
- Adds the capability to perform vector maths at exceptional speeds. This is traditionally utilised in 3D rendering and more recently essential in accelerated calculations used in local Artificial Intelligent programs such as Ollama.

The Three Major GPU Manufacturers

When it comes to GPUs, there are only three significant players in the market:

1. **nVidia:** Known for their high-performance GeForce GPUs, nVidia is a popular choice among gamers and professionals.
2. **AMD (formerly ATI):** AMD's Radeon GPUs offer competitive performance and power efficiency, making them a favorite among enthusiasts and budget-conscious users.
3. **Intel (Integrated GPUs):** Intel's processors come with built-in GPUs, which provide sufficient graphics performance for general computing tasks, such as web browsing, office work, and media consumption.

Why does it matter?

When installing Ubuntu Linux on your new computer, it's crucial to identify the type of GPU installed. This information will help you:

- Ensure the correct drivers are installed
- Optimise system settings for smooth performance
- Avoid compatibility issues with specific software or hardware

By understanding what GPU is inside your computer, you'll be able to make informed decisions about your Linux setup and enjoy a seamless transition from MS Windows.

Chapter 12: Understanding GPU Drivers

Now that you know what a GPU is and who the major manufacturers are, it's essential to understand how these components are driven by software. In this section, we'll explore the different types of GPU drivers and their implications for your Linux setup.

What are GPU drivers?

GPU drivers are software components that allow your operating system and applications to communicate with your computer's GPU. They enable your GPU to perform tasks efficiently and effectively. There are two primary sources of GPU drivers:

1. **Open-source community:** The open-source community develops and maintains GPU drivers, which are freely available and customisable.
2. **Manufacturer-provided drivers:** GPU manufacturers like nVidia create proprietary drivers, which are optimized for their specific hardware.

The Open-Source Advantage

If your computer has a GPU from AMD or Intel, you're in luck! Both of these manufacturers have always provided open-source GPU drivers for Linux, making it easy to get started with your new operating system. You won't need to worry about choosing between open-source and proprietary drivers.

nVidia's Shift towards Open-Source

However, if your computer has an nVidia GPU, you'll need to make a choice. Until recently, nVidia's GPU drivers were only available as proprietary software. However, they've begun to transition towards open-source drivers, which is a significant step forward for the Linux community. While this shift is still in progress, it's an encouraging sign of things to come.

Choosing the Right Driver for Your New Linux Setup

When installing Ubuntu Linux on a computer with an nVidia GPU, you'll be prompted to choose between open-source and proprietary GPU drivers. For now, we recommend selecting the proprietary drivers. These drivers provide:

- Full access to your GPU's capabilities
- Optimised performance for demanding applications like gaming and AI

While the open-source drivers are a great option, they might not yet unlock the full potential of your nVidia GPU. By choosing the proprietary drivers, you'll ensure that your system can take advantage of all the features and performance enhancements available.

The Future of Open-Source GPU Drivers

Based on recent announcements from nVidia, we expect to see significant progress towards fully open-source GPU drivers in the near future – possibly within the next year or so. This development will bring even more flexibility and customisation options to the Linux community.

Rest assured that as the Linux ecosystem continues to evolve, you'll be able to take advantage of these advancements and enjoy a seamless computing experience.

Installing Proprietary nVidia Drivers

If you've chosen to install proprietary nVidia drivers, as recommended earlier, don't worry about the extra steps involved in the process. We'll guide you through what to expect.

What Happens During Bootup

When you boot up your Linux system with proprietary nVidia drivers, you might notice a slight delay and some additional screens or error messages before the graphical user interface appears. This is normal behavior!

Here's what's happening behind the scenes:

1. **Driver integration:** The latest nVidia drivers need to be integrated with the kernel (the core of your Linux system) before your GPU can be used to present the graphical user interface.
2. **Kernel module loading:** The proprietary driver is loaded as a kernel module, which requires a brief extra step during bootup.

The "Tainted Kernel" Message

You might see a message indicating that your kernel is "tainted." Don't worry; this is not an error or a cause for concern! It simply means that the proprietary nVidia driver has been loaded as a kernel module, which can affect the kernel's stability and debuggability. However, in this case, it's a normal and safe process. Remember that most of the world's laptop and desktop PCs have nVidia GPU, so the kernel behaviour with this hardware and modules is extremely stable and predictable.

Additional Error Messages

You might also see some additional error messages or warnings during bootup. These are usually related to the driver loading process and can be safely ignored.

Rest assured that these extra steps and messages are a normal part of the proprietary nVidia driver installation process on Linux. Your system is not compromised, and you'll still enjoy a seamless computing experience once the graphical user interface appears. As previously indicated, as nVidia work with the Linux community to make their drivers open-source, this will change.

Chapter 13: Post-Installation Setup - Continued

Getting to Know Ubuntu

The Desktop Environment

Ubuntu uses the GNOME desktop environment by default. Learn about the features and layout of the GNOME desktop, including the Activities overview, application launcher, and system menu. There are many well-written tutorials and books available on using GNOME. We recommend that at this point, you should review some of the tutorials online, as this user environment is evolving rapidly and tutorials and reviews are posted on a regular basis to illustrate the new and improved features offered.

Basic Navigation

Explore how to navigate through your desktop, open applications, and interact with the user interface elements. If you start clicking on icons on the desktop and in the menus, you will quickly see that navigation is a breeze and not that different from what you may have used in a Windows or macOS system.

Terminal Window

If you are a novice, you may not have ever seen a “Terminal Window”. This is an application which mimics the old television type terminals connected to old computer systems, hence the name “terminal”.

Terminal windows are still available on all operating systems today, as they allow a user to give the operating system detailed commands that may not be available on any graphical menus.

When reading instructions which say “Open a terminal window”, all you have to do is click on the desktop with the right mouse button and select “Open in Terminal”. A window will open up and display your username, the machine name and then a “\$” symbol. This is called the command line. There is then a flashing cursor waiting for you to type in your command.

When books, instructional videos or other sources, say “type in a command”, they will show exactly what has to be typed into the command line. In many cases, you can simply copy and paste the text verbatim from your source to the command line. Then hit the “Enter” key to execute the command.

Our explanation of “sudo” in Chapter 9: illustrated some command line instructions which are only available using this “Terminal Window”.

Customising Your Desktop

Your first step to customise your new system is to open up the “Settings” menu item in your GNOME menu. Here you will find customisation options for the whole system including:

Appearance and Themes

Personalise the look and feel of your Ubuntu desktop by changing themes, backgrounds, and system fonts.

Configuring Your Desktop

Adjust system settings to tailor your desktop environment to your preferences. Configure options like display settings, sound, and keyboard shortcuts. In addition to built-in settings for configuring your desktop, you also have the ability to complete reshape the look and feel and behaviour of the desktop using Gnome Extensions. This feature is described in more detail in Chapter Chapter 15:.

User Accounts and Privacy

Manage user accounts, passwords, and privacy settings to ensure your Ubuntu system aligns with your needs. The default installation is set up with:

- **one human user:** which you specified in the installation procedure in Chapter Chapter 7: (*User Details*), which then becomes the only “login” account available on your new system after installation.
- **multiple “system” users:** which allow various subsystems within the operating system to run with restricted file access privileges (this is what protects your system from unauthorised access to main system operations). These “system” users cannot login to your system in a default installation.
- **one superuser (root):** who has complete unrestricted access to all systems and files on your machine

Furthermore, your default installation has set up a method for your restricted and safe, “human user” account, to temporarily elevate privileges in order to do system operations, such and modify system settings, or install software that requires access to critical system resources. This method is called “sudo” and details on when and how to use this is outlined in Chapter Chapter 9:.

Internet Access

During the installation procedure, would have been asked for a Wi-Fi password, or if you plugged the computer into your router, it will have been connected automatically to your own local area network. If this was done correctly, on your new system, you should now be able to immediately connect to the Internet using the Firefox web browser, which is installed by default. Firefox is not built-in to your system. It is merely a default application. If you don’t like Firefox, then you can

select another browser from the “software” install menu. Many well known ones, such as Chrome and Brave are available for installation on Linux systems.

Chapter 14: Application Software Management in Ubuntu

Installing Application Software

Congratulations on completing your Ubuntu installation! Now it's time to explore the world of Linux software and learn how to install applications on your new system.

Linux Software Distribution

In Linux, software is typically distributed in pre-compiled packages, which make it easy to install and manage applications. If you have installed software on a MS Windows system, this is very similar to the “msi” or “exe” files you would have seen.

There are several package formats available, each with its own strengths and weaknesses. In this chapter, we'll focus on four popular package formats: deb, AppImage, Flatpak, and Snap.

***deb* Packages**

Strengths:

- Easy to manage and update using the Ubuntu Software Center or command-line tools like **apt**
- Well-integrated into Ubuntu releases. These are normally well tested and all libraries are perfectly matched with those of that specific Ubuntu version on which they are released.

Weaknesses:

- Often out-of-date, especially for rapidly evolving applications. Ubuntu releases occur generally only every 6 months, so this is how long you would have to wait for a current application release.
- Limited to Ubuntu-based and Debian systems, making it less portable across different Linux distributions.

***AppImage* Packages**

Strengths:

- Standalone, self-contained files that contain everything an application needs to run.
- Easy to use and install, with minimal system modifications.

Weaknesses:

- These are relatively large files, as they contain all the required system libraries and dependencies. Having many of these files, makes your system difficult to manage and soon fills up your system drive.
- May not integrate well with the underlying operating system or Gnome in general, leading to potential issues, missing icons and other problems.

Flatpak Packages

Strengths:

- Provide a sandboxed environment for applications, improving security
- Allow small, independent developers to package software that runs on all variations of Linux, regardless of version.
- Easy to install and manage using the Flatpak installer and Software Manager

Weaknesses:

- Can limit access to devices such as microphones, cameras, or GPU cards, which may be required by the application. This is a side-effect of having a sandboxed application. There are tools available such as “Flatseal” which help to overcome the restrictions imposed by the sandbox.
- These packages also contain copies of the system libraries to function. This makes them large files and this too can lead to rapidly filling up the system storage.

Snap Packages

Strengths:

- Developed by Canonical, providing a high level of integration with Ubuntu-based systems
- Easy to use and manage, with automatic updates

Weaknesses:

- These are controlled by Canonical. Many regard this as both a strength and a weakness. Canonical’s control of the “snap” architecture and the authorisation of software to be packaged in this format goes against the general openness of Linux software.

Installing Software: A Step-by-Step Guide

To ensure a smooth installation experience, follow these steps:

1. **Install the Flatpak installer:** Open the Terminal and run

```
sudo apt install flatpak gnome-software-plugin-flatpak gnome-software
flatpak remote-add --if-not-exists flathub
https://flathub.org/repo/flathub.flatpakrepo
```

2. **Browse for software in the Software Manager:** Launch the Software Manager (GNOME Software) and browse for the application you want to install. If available, click "Install" to download and install the package.
3. **Try the command line or developer's website:** If you can't find the application in the Software Manager, try installing it using the command line or follow the instructions on the developer's website. Many developers provide links that trigger the GNOME installer.

Challenges and Workarounds

While installing software on Linux is generally straightforward, you may encounter issues due to differences in packaging configurations or sandboxing restrictions. In such cases, you may need to:

- Research additional steps to grant access to required devices
- Try alternative package formats or distribution methods
- Build the application from source code, which can be a more involved process but often provides a solution when other installation methods fail

The Linux Advantage

One of the significant advantages of Linux is its flexibility and customisability. When faced with installation challenges, you can usually find instructions on the developer's site to build the application from source code. This option may require some technical expertise, but it allows you to get an application running even when other methods fail.

Conclusion

In this chapter, we've explored four popular package formats in Linux: deb, AppImage, Flatpak, and Snap. While each format has its strengths and weaknesses, they can also present challenges due to differences in packaging configurations or sandboxing restrictions. By understanding these potential complexities and the workarounds available, you'll be better equipped to navigate any installation issues that may arise. Remember, Linux offers a unique advantage in its flexibility and customisability, allowing you to find solutions even when other methods fail.

Unlike other operating systems, installing and uninstalling applications leaves next to no residual files. This should give you confidence to try out new applications and if you don't like them, to delete them again using the software manager the you used to install it.

Chapter 15: Customising Your Desktop Environment

You've probably noticed that your Ubuntu system has a distinct look and feel, with features like the top bar, launchers, and windows that can be moved around. This is all part of the GNOME desktop environment, which provides a comprehensive framework for interacting with your computer.

Introducing GNOME Extensions

One of the most exciting aspects of using GNOME is its extensibility. You can customise almost every aspect of your desktop experience using extensions. These are small pieces of software that add new features or modify existing ones to suit your preferences.

To get started, you'll need to install the **GNOME Extensions** application. If it's not already installed, follow these steps:

1. Open the **Ubuntu Software Center** or search for "Software" in the Dash.
2. Search for "**GNOME Extensions**" and click on the result.
3. Click the **Install** button to add the extension manager to your system.

Once you have the extension manager, you can browse through the list of available extensions and install new ones. Some examples of what you can do with GNOME extensions include:

- Changing the look and feel of your desktop with themes
- Adding custom widgets or dashboards
- Modifying window behaviour, such as snapping windows to corners
- Integrating external services, like weather forecasts or social media

Safely Experimenting with Extensions

One of the best things about GNOME extensions is that you can experiment with them without worrying about causing system instability. Here's why:

- **Easy disablement:** If an extension doesn't work as expected, you can simply toggle it off with a single button.
- **No leftovers:** When you remove an extension, it leaves no traces behind, ensuring your system remains clean and tidy.

This level of flexibility is where Linux desktops truly shine. So, don't be afraid to try out new extensions and see what they can do for you!

Browser Integration

Did you know that you can also manage GNOME extensions directly from your web browser? The **GNOME Extensions** website (extensions.gnome.org) allows you to browse and install extensions using a browser plugin.

To get started:

1. Open the **GNOME Extensions** website in your favourite browser.
2. Click on an extension that interests you and click the **Install** button.
3. Follow the prompts to add the extension to your system.

With browser integration, you can easily discover new extensions, read reviews, and install them with just a few clicks.

Now, go ahead and start experimenting with GNOME extensions!

Chapter 16: A Pragmatic Approach to Software Updating in Ubuntu Linux

As a MS Windows user, you're probably used to the constant stream of updates and patches that can sometimes disrupt your workflow. In contrast, Ubuntu Linux takes a more measured approach to software updating, giving you more control over when and how your system is updated.

Security Updates: Not All Are Created Equal

In Ubuntu Linux, security updates are not treated as a one-size-fits-all solution. While some security threats may be hypothetical or not actively exploited, others require immediate attention. By understanding the severity of each update, you can make informed decisions about when to apply them.

Operating System Updates: A Matter of Personal Preference

Unlike Windows, Ubuntu Linux doesn't force you to upgrade to the latest version just because it's available. You have the freedom to choose when and if you want to take advantage of new features, ensuring that your system remains stable and familiar.

Application Updates: Your Workflow, Your Decision

Applications are an essential part of your workflow, and updating them without your consent can be counterproductive. In Ubuntu Linux, application updates are not forced upon you, allowing you to decide when and if you want to upgrade. This ensures that you're not caught off guard by changes in behaviour or potential disruptions to your work.

Kernel Updates: Independence and Flexibility

The Linux kernel operates independently of most applications, making it possible to update the kernel without affecting other updates. There are only two scenarios where a kernel update is mandatory: when a major problem has been discovered and reported, or if you rely on a specific kernel module that requires a newer version of the kernel. In these cases, tools like "mainline" allow you to update only the kernel, minimising disruptions.

Triggering Updates: Your Call

In Ubuntu Linux, application updates are not forced upon you. Instead, you have the power to trigger updates for specific applications when you need them, such as when a problem has been fixed or a new feature is essential to your workflow.

Additional Benefits of a Pragmatic Approach

- **Stability:** By exercising control over updates, you can ensure that your system remains stable and predictable, reducing the likelihood of unexpected downtime.
- **Performance:** Avoid unnecessary updates that may slow down your system or consume valuable resources.
- **Customization:** With a pragmatic approach to software updating, you can tailor your system to your specific needs, rather than being forced into a one-size-fits-all solution.

Conclusion

In Ubuntu Linux, software updating is not a heavy-handed process. By understanding the reasons behind each update and exercising control over when and how they're applied, you can maintain a stable, efficient, and customised system that meets your unique needs. In the next chapter, we'll explore the practical steps to update Ubuntu Linux, empowering you to take charge of your system's maintenance.

Rest assured if none of the concerns in this chapter affect you, then it's perfectly alright to tell your new operating system to check for updates and install them for you once a day, just like MS Windows does.

Chapter 17: Keeping Your System Up-to-Date

In the previous chapter we explained that “updating” your new Linux installation is totally in your control. If you do nothing, your system will attempt to update all of the installed software once a day. This is just the default behaviour.

In this chapter, we'll show you how better manage the update process to match your needs.

Software Updater

The easiest way to keep your system up-to-date is by using the Software Updater application. You can find it in the Dash or by searching for "Software Updater" in the Applications menu.

1. Open the Software Updater application.
2. Click on the "Check for updates" button.
3. Review the list of available updates and select the ones you want to apply.
4. Click on the "Install Now" button to begin the update process.

Additional Tools

While the Software Updater takes care of most updates, there are a few additional tools that can help you manage your system:

1. **Synaptic Package Manager:** This application provides a more detailed view of your system's packages and allows you to install or remove software manually. You can find it in the Ubuntu Software Center or by searching for "Synaptic" in the Applications menu.
2. **Ubuntu Update Manager:** This tool allows you to schedule updates at a specific time or frequency. You can find it in the Ubuntu Software Center or by searching for "Update Manager" in the Applications menu.

Tips and Reminders

- Regularly check for updates using the Software Updater application.
- Consider enabling automatic updates for critical packages.
- Keep your system clean by removing unnecessary software and files.

By following these simple steps, you'll be able to keep your Ubuntu system up-to-date and secure.

Chapter 18: Troubleshooting Common Issues

In this chapter, we'll address common problems that readers might encounter during the Ubuntu installation process or while using their freshly installed Ubuntu system. We'll provide solutions and resources to help you navigate and resolve these issues effectively.

Common Installation Issues

Booting from USB

If your computer doesn't boot from the USB drive, revisit Chapter 7:, where we explained the steps to configure your computer's BIOS/UEFI settings for booting from USB. Ensure that your USB drive is properly prepared as a bootable device.

Installation Freezing or Crashing

If the installation process freezes or crashes, it might be due to hardware compatibility issues. Restart the installation and choose the "Try Ubuntu" option to see if Ubuntu runs smoothly without installation. Since Ubuntu is actually running on your hardware, if it works when you "Try Ubuntu" and fails when it installs on the hard disc, you can assume that the problem lies with the SSD drive or controller on your PC.

Post-Installation Issues

Mouse Point Does Not Respond To Mouse

This is extremely common. While it seem severe, it is the easiest to solve. Linux has drives for most commercially available external pointing devices (mice, tablets, etc.) when they are plugged into the PS/2 port or the USB port. If your built-in touchpad, your screen or your bluetooth mouse doesn't work, then the best initial solution is to buy the cheapest wired USB mouse from your local office supplier and plug that in.

Now that you have a working mouse, you can use the "bluetooth" settings the the Gnome Settings to pair the mouse. Once paired, it should work as expected.

The built-in touchpad works for most reputable laptop manufacturers, so you will not needs special drivers, however, if the touchpad does not work, then you have two options.

1. Buy a wireless or wired mouse and use that.
2. Seek out a driver (kernel module) which supports your manufacturer's touchpad.

Wireless Network Not Working

If you're having trouble with your wireless network, check your network settings. Most Wi-Fi adaptors are recognised by the Linux kernel, however, in the event no adaptor is visible, then you may have a model that is not supported with the default kernel modules. I quick check on the Internet, on another machine, searching for Linux and the model number of the Wi-Fi hardware should give a clue on possible solutions.

In the unlikely event that this is not the case, an interim solution is to either plug the PC in directly to an Ethernet port on your router and/or plug in a portable USB Wi-Fi adaptor (most are supported by Linux).

If you tried the “Live USB” before installation, you would have immediately identified a problem, as this live system has all of the current Wi-Fi drivers for that version of Ubuntu included. Wi-Fi drivers are frequently updated in all Linux distributions so even if your Wi-Fi does not work when you try the Live USB then it is still possible that an system “update” when you have installed it, will get the new drivers for you specific adaptor installed.

Graphics Considerations

Outdated graphics drivers are the number one problem in having a properly working MS Windows system. Linux is no different. Fortunately, in Linux, the graphics drivers are supplied as part of the installation and subsequently, as part of your distribution’s updates. As of the time of writing, all current nVidia, AMD and Intel systems are well supported and should work correctly. If the “Live USB” system runs on your PC as detailed in the start of this guide, then you should not have problems with your particular graphics card.

Sound Problems

If you're experiencing issues with sound, check your audio settings and ensure that the correct sound device is selected. Ubuntu generally provides support for a wide range of audio hardware. The sound architecture has recently been revised and it handles almost all audio devices found on PCs, correctly. Linux also properly supports HDMI audio built into many PC monitors so there should be no issues with any version of Ubuntu equal to or later than the one tested for this guide (24.04 LTS).

Software Installation Failures

If software installation fails or encounters dependency issues, you will get a message to indicate that the application is missing a file or module. In most cases, it will automatically download and install the required dependencies. In the event that it doesn't, write down the detailed error message and seek out the “package” that contains the missing module or file. Again, searching on the Internet for a filename or package will quickly reveal which one is required.

Abnormally Slow System Performance

If your Ubuntu system is running slower than usual, simply type in “top” at the command line in a terminal. This utility will show the processes that are using the top resources on your system. From that you can identify whether there is a process or application that is running that is using excessive resources. Again, a quick search on the Internet for the running program name will reveal the application that owns the process using the top resources and you can then decide whether that is to be expected or abnormal. This very rarely happens on modern Linux installations using standard packaged applications. Knowing that this built-in command is available whenever you need it, empowers you in the future, in the event that something like this goes wrong.

Where to Find Help

Online Resources

Ubuntu has a vibrant online community with forums, websites, and wikis where users share their experiences and solutions. Websites like Ask Ubuntu (<https://askubuntu.com/>) are great places to seek answers to specific questions.

Official Documentation

Ubuntu provides comprehensive official documentation (<https://help.ubuntu.com/>) that covers a wide range of topics, from troubleshooting to advanced configuration.

Ubuntu Forums and Community Support

Joining the Ubuntu Forums (<https://ubuntuforums.org/>) and participating in discussions can be an excellent way to get help and share experiences with other Ubuntu users.

Seeking Professional Assistance

In rare cases, you might encounter complex issues that require professional assistance. Consider consulting with a local IT expert or contacting Canonical, the company behind Ubuntu, for commercial support options.

Conclusion

By addressing and resolving common issues, you'll become more confident in managing your Ubuntu system. Troubleshooting is a valuable skill, and Ubuntu's extensive community and resources provide excellent support for users at all levels.

In the Chapter Chapter 20:, we'll recap the key points of this book, encourage you to explore Ubuntu further, and provide additional resources for your journey with Ubuntu.

Chapter 19: Getting Technical Support for Your Linux System

One of the most significant advantages of using Linux is that it's free and open-source. However, you might wonder how you can get technical support for your system if you need it. The good news is that there are options available to ensure you receive the help you require.

Canonical's Subscription-Based Support

Canonical, the company behind Ubuntu, offers a range of subscription-based support options for individuals and businesses. These subscriptions provide access to expert technical support, ensuring that you can get help when you need it most. (Note that if you are following this guide but have chosen to install Fedora, Red Hat have a similar resource available for your new system)

With a Canonical subscription, you'll enjoy benefits like:

- **Priority support:** Get quick responses to your questions and issues from experienced technicians.
- **Dedicated resources:** Access a team of experts who will work with you to resolve complex problems.
- **Proactive maintenance:** Receive regular system checks and recommendations to prevent issues before they occur.

Why Choose Subscription-Based Support?

You might be wondering why you'd need subscription-based support if Linux is free. Here are a few scenarios where this option makes sense:

- **Critical dependence:** If your Linux system is critical to your work or daily life, having access to priority support can provide peace of mind and minimise downtime.
- **Limited technical expertise:** If you're not comfortable troubleshooting issues yourself or don't have the time to search for solutions online, a subscription-based support option can be a lifesaver.
- **Enterprise environments:** Businesses and organisations often require guaranteed support levels to ensure their systems are always available. Canonical's subscriptions cater specifically to these needs.

Conclusion

While Linux is free, having access to expert technical support can be invaluable in certain situations. Canonical's subscription-based support options provide an additional layer of comfort and security for individuals and businesses alike. If you're critically dependent on your system or want the reassurance of knowing that help is always available, consider exploring these options.

Chapter 20: Conclusion and Next Steps

In this final chapter, we'll recap what you've learned in this book, explore the world of Ubuntu and Linux distributions, and provide you with the resources you need to continue your journey into open-source computing.

Recap of Key Points

Your Journey So Far

Throughout this book, you've embarked on a transformative journey to take ownership of your PC and break free from the constraints of corporate control. You've learned how to liberate your computer and embark on a fresh start.

Ubuntu Installation

You've discovered the step-by-step process of installing Ubuntu, a user-friendly Linux distribution that empowers you to control your computer and enjoy a stable, reliable, and secure operating system.

Post-Installation Setup

We've covered essential post-installation tasks, including configuring your desktop environment, managing software, customising settings, and understanding driver management.

Exploring Linux Distributions

Before choosing Ubuntu as our guide's distribution, we explored the rich tapestry of Linux distributions. You've gained insights into some prominent distributions, each offering its unique strengths and philosophy.

The Power of Ubuntu

Ubuntu: Your Fresh Start

Ubuntu has been selected as the starting point for your Linux journey in this guide. Its end-to-end user experience, stability, and vast software repository make it an ideal choice for newcomers.

Open Source Philosophy

Remember that Linux, including Ubuntu, is built on the principles of open-source software, promoting collaboration, transparency, and freedom.

Versatility and Software Availability

Ubuntu's versatility ensures it can handle a wide range of tasks, from everyday productivity to creative pursuits and development.

Stability and Security

Ubuntu's reputation for stability and security ensures that your computing experience remains smooth and safe.

Your Journey Continues

Exploring Ubuntu

As you move forward, consider exploring Ubuntu further. Experiment with different software, discover the wealth of applications and tools available, and make your Linux experience uniquely yours.

Learning Resources

If you're hungry for more knowledge, we've provided additional resources for learning Ubuntu. Explore websites, forums, books, and tutorials to deepen your understanding.

Staying Updated

Emphasise the importance of regularly updating your Ubuntu system to keep it secure, stable, and up-to-date with the latest software and drivers.

Ubuntu: Your Fresh Start

Confidence in Computing

By the end of this book, you've gained the knowledge and skills to take control of your computing experience with Ubuntu. You're now equipped to enjoy a fresh start on your PC.

The Ubuntu Community

Always remember that the Ubuntu community is here to assist, support, and inspire you. Your Linux adventure is enriched by the welcoming and helpful community that shares your passion.

As you reflect on your journey so far, you'll realise that you've not only learned how to install Ubuntu but also discovered the broader world of Linux distributions. We chose Ubuntu as your starting point because of its user-friendly approach, but you now have the knowledge to explore other distributions as well. With Ubuntu, you've taken the first step toward full control of your computer.

Welcome to the world of Ubuntu, your fresh start in the realm of open-source computing!

Thank you for joining us on this adventure, and may your Linux journey be a rewarding and fulfilling one.

Chapter 21: Appendices

Appendix A: Glossary of Terms

This glossary provides definitions and explanations for technical terms and concepts used throughout the book.

- **BIOS:** The Basic Input/Output System, a firmware interface that controls a computer's hardware components.
- **UEFI:** Unified Extensible Firmware Interface, a modern replacement for BIOS that provides advanced boot and system management capabilities.
- **ISO File:** A disk image file that contains a complete copy of a CD, DVD, or Blu-ray disc. In the context of this book, it refers to the Ubuntu installation file.
- **Hard Drive:** On most modern laptop and desktop PC, the hard drive is actually a “Solid State Drive” or SSD. The term hard drive simply refers to the permanent system drive internal to the computer, that is used to contain the operating system and user data.
- **Bootable USB Drive:** A USB flash drive configured to start a computer and launch an operating system installation or live environment.
- **Partition:** A logical division of a computer's storage space, used to organise data and system files.
- **File System:** The format used to store and manage data on a partition, such as NTFS, ext4, or btrfs.
- **Driver:** Software that allows the operating system to communicate with and control hardware devices.
- **Open Source:** Software that is distributed with a license that allows anyone to view, modify, and distribute its source code.
- **Desktop Environment:** The graphical user interface (GUI) used to interact with the operating system, including elements like the desktop, windows, and taskbar.
- **Repository:** A collection of software packages and updates maintained by Ubuntu, accessible for installation via package management tools.
- **Terminal:** A text-based interface for entering commands directly into the operating system.
- **Package Manager:** A tool used to install, update, and manage software packages on a Linux system.

- **Sandboxing:** In computing, sandboxing creates a controlled and isolated environment where untrusted or potentially malicious code can run without harming the rest of the system. It's like a virtual "playground" where unknown or suspicious code can execute without accessing sensitive data or modifying system settings.

By using sandboxing, users can test new software, open email attachments from unknown senders, or run untrusted code without putting their entire system at risk. This security technique is commonly used in web browsers, virtualization, and security software to contain potential threats and prevent damage to the system or data.

Appendix B: Additional Resources for Learning Ubuntu

This section provides a list of recommended websites, forums, books, and other resources where readers can further their understanding of Ubuntu and Linux.

Websites:

- Ubuntu Official Documentation (<https://help.ubuntu.com/>)
- Ask Ubuntu (<https://askubuntu.com/>)
- Ubuntu Forums (<https://ubuntuforums.org/>)

Books:

- "Ubuntu Unleashed" by Matthew Helmke
- "The Official Ubuntu Book" by Matthew Helmke, Elizabeth K. Joseph, and José Antonio Rey

Online Tutorials:

- YouTube channels specializing in Ubuntu and Linux tutorials.

Linux Communities:

- Reddit's r/Ubuntu and r/linux subreddits.
- Linux User Groups (LUGs) in your local area.

Appendix C: Recommended Software and Tools for Ubuntu

This appendix provides a list of software applications and tools that can enhance your Ubuntu experience. It covers categories such as productivity, multimedia, development, and system utilities.

Productivity:

- **LibreOffice:** An open-source office suite. It is more powerful than MS Office 365 but has the capability to share documents with other MS Office users. For full compatibility consider ONLYOFFICE.
- **ONLYOFFICE:** An open-source office suite boasting 100% compatibility with MS Office 365
- **Thunderbird:** An email client.
- **Ollama + Open WebUI:** A local Large Language Model (LLM), Artificial Intelligent application and a ChatGPT replacement that requires no internet access.
- **GIMP:** An image editing program.
- **KeePassXC:** A popular, standard format, password manager.
- **Chrome/Firefox/Brave:** Versions of web browsers commonly used by other operating systems.
- **Obsidian:** The best markup notepad
- **Planify:** TO DO manager

Multimedia:

- **VLC Media Player:** A versatile media player.
- **Shotcut:** A video editor.
- **Audacity:** An audio editor.
- **OBS:** A comprehensive video broadcast system.
- **Blender:** A comprehensive 3D animation and video creation suite.

Development:

- **Visual Studio Code:** A code editor.
- **Git:** Version control system.
- **Docker:** Containerisation platform.

System Utilities:

- **Timeshift:** Backup and restore tool.
- **BleachBit:** System cleaner and privacy tool.
- **Synaptic Package Manager:** A more advanced package manager.

APPENDIX D: Starting Again With Another Distribution

As indicated in our earlier chapters, with Linux you are not committed to stick with a “distribution”. They are merely a convenient way to get the core software, complete with a user-friendly interface, on your new hardware, a means to manage the update of Linux and your applications and finally, a way to add, or delete, any applications that wish to use.

Linux, by design, separates your personal “user” data from the programs and system files in a very clearly defined way, usually by storing both, your settings and all of your other files, in a “home” directory. As such, you can backup all of your data to an external drive at any time (from one place), then start completely from scratch, using these instructions and then restore your data and you should be able to continue with your work immediately.

All Linux distributions have this ability. As a consequence, you can backup your personal data on a portable drive and do a clean installation of another Linux distribution by simply substituting the ISO file from that distribution onto the installation USB drive, in place of the Ubuntu version detailed in Chapter Chapter 2: and install a completely different distribution. The installation screens will look different, but the intent of getting the right information from your for a correct installation does not change. Then once the installation has completed, all that you need to do is install the same application that you used to create the backup, from your new repository and “Restore From Backup”, all of the data that you saved in the previous step.

The reason that this is possible is that the “Linux” community that develops the distributions, welcomes the ability for you to try out their work in the hope of adding you to their “team”. Since no money changes hands in the process, you are never locked-in by licence restrictions or proprietary data storage mechanisms. This has become one of the major arguments in favour of choosing open-source operating systems such as Linux.

APPENDIX E: Proprietary Software Available For Linux

Linux is legally free to use, as you wish, forever. Linux is efficient and runs very well on old computer hardware and most of the current technology hardware.

Because of this, it is widely used by many individuals and organisations around the world.

This has attracted the attention of number of larger software companies who develop specialist professional software. You may find that some of them also have a version of their software available for Linux, often with significant speed and performance improvements over other operating

systems. Since their software may contain their intellectual property, they are legally able to charge for the use of their products in addition to support and are under no obligation to share their source code.

If the functionality you are looking for is not available in “community developed” open-source projects, you should not hesitate to see if the commercial software you are looking for is available for Linux. If it is, it will almost certainly be available as a binary file and will only work with a specific version of Linux, so you need to take some extra care if you wish to use it and maintain it on your system.

APPENDIX F: Understanding the Shift from X to Wayland

As you explore your new Linux system, you might have heard about the transition from "X" to Wayland. In this section, we'll demystify these terms and explain why they're important for your computing experience.

The Evolution of X

X, also known as X11 or Xorg, has been the traditional display server on Linux systems for decades. It's responsible for managing graphical user interfaces (GUIs) and communicating with hardware components like graphics cards. Over time, X has become a bit outdated, and its architecture has shown limitations in terms of security, performance, and modernisation.

The Rise of Wayland

Wayland is a new display server designed to replace X. It's a more robust, secure, and modern alternative that addresses the shortcomings of X. Wayland provides better support for touchscreens, multi-monitor setups, and high-performance graphics. Major Linux distributions, including Ubuntu, are gradually adopting Wayland as their default display server.

Implications for Your System

Here's why this matters to you:

- **Software compatibility:** As packagers replace X with Wayland, some open-source applications might not be backwardly compatible with X or might not yet run under Wayland. This means that certain software might not work on your system if you switch to Wayland prematurely.
- **nVidia support:** Currently, Ubuntu is defaulting to Wayland for installations that don't use the nVidia proprietary driver. However, we recommend holding off on switching to Wayland until public announcements confirm that the combination of Linux, Wayland, and nVidia is well supported and stable for all GPU applications.

What This Means for You

For now, it's best to stick with the default X setup if you're using an nVidia graphics card. Wait for official announcements from Ubuntu or other Linux distributions before making the switch to Wayland. By doing so, you'll ensure that your system remains compatible with a wide range of software and applications.

Remember, this transition is an ongoing process, and it's essential to stay informed about the latest developments in the Linux community. As Wayland continues to mature, we can expect a smoother, more secure, and more performant computing experience.

To put things into perspective, MS Windows GUI functionality is similar to X in performance and worse than Xorg in terms of security. The published performance of Wayland running on similar hardware outperforms Xorg and MS Windows in all benchmarks.

Hey Ubuntu Have Jumped The Gun!

If you have a nVidia GPU and in the event that Canonical decide to change the default installation to Wayland and you are not ready to change. You can force your Linux installation to use X again. Here is how:

Create the file `/etc/gdm3/custom.conf`, if it does not exist using your terminal and favourite text editor. (If you are using Fedora, this file is `/etc/gdm/custom.conf`) In this file uncomment the lines so that the file looks like this:

```
[daemon]
WaylandEnable=false
DefaultSession=gnome-xorg.desktop
```

When you reboot the PC and you will no longer be using Wayland.