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Introduction to Ubuntu Linux

Vimal Kumar V.

Title: Introduction to Ubuntu Linux (English)

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Publisher: Vimal Kumar V.

ISBN: 978-93-5406-177-6

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How we learn and grow

आचार्यात् पादमादत्ते पादं शिष्यः स्वमेधया ।
सब्रह्मचारिभ्यः पादं पादं कालक्रमेण च ॥

AchAryAt pAdamAdatte, pAdam shiShyaH swamedhayA |
sa-brahmachAribhyaH pAdam, pAdam kAlakrameNa cha ||

"***One fourth from the teacher, one fourth from own intelligence,***
One fourth from classmates, and one fourth only with time."

Mahābhārata Udyoga Parva 44:16

About the author

Vimal Kumar is a library professional who works with Mahatma Gandhi University, Kottayam district, Kerala state, India. He shows interest in observing changes in the scholarly communication, Open Access and Free Software movement. Maintain a number of blogs to convey useful information to academic and library professionals. He is an advocate of Free Software. Active in the promotion of Koha Free Software for library computerization. He has served as Live DVD Manager for the Koha (version 3.12) project. He has earned a Bachelor's Degree in Communicative English from Mahatma Gandhi University, Master's Degree in Library & Information Science from the University of Kerala, PG Diploma in Computer Applications and UGC NET. He has finished PhD in Library and Information Science from Mahatma Gandhi University. He has written about Free Software for several publications. Papers on Free Software and Open Access have been presented at many International and National conferences. He is a native of Vazhappally village of Changanassery Taluk in Kottayam district. You can find out more about Vimal Kumar at http://vimalkumar.info or drop him a line with errata or suggestions at vimalibre@gmail.com.

Preface

The Free Software movement has opened up a door of opportunities to society. Professionals, volunteers, and the public can participate in software development activities along with using them. The high cost of proprietary software and strict licensing practices were not suitable for developing countries like India. People continue to use pirated copies of Microsoft Windows despite copyright laws. Linux-based operating systems have been available since the first half of the 1990s but were not ready to use by the public. The number of home and office computers using the Linux-based operating systems has increased with the release of Ubuntu Linux in 2004. Today, Ubuntu Linux has become one step ahead of any other operating system.

Linux-based operating systems are difficult to use; it's a general perception among people. Such hollow arguments are made by people who have never used Linux-based operating systems. Most of the Linux-based operating systems are user friendly and suitable for beginners. Awareness and proper training can help to dispel the false prejudices of the ordinary people about Linux-based operating systems. Plenty of Ubuntu Linux learning materials are available on the web, but nobody recognised its importance. Ubuntu Linux learning resources prepared using simple language and easy to digest available on the Ubuntu Linux website. I have had the opportunity to introduce Ubuntu Linux to a lot of people, including those who have essential computer expertise and those who don't have. In my experience, classroom learning with practical training is the best way to learn Ubuntu Linux. Those who have received a basic level of awareness or training can start to try Ubuntu Linux themselves. The main intention to write this book is that it gives understanding and introduction among persons who wish to use Ubuntu Linux. This book was written during the Lockdown period (March 24-April 14, 2020) in India due to the COVID 19 virus epidemic. This book was released in the Open Access model and licensed under the *Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International*. I humbly request you to inform me of your valuable comments and suggestions for improving the book.

5 June 2020

Vimal Kumar V.
Changanassery

Acknowledgements

I started my computer studies in 1998. Mr Thaha Hussain (IT City Technologies, Changanassery) taught me the basics of computer in an exciting way. I have been using a Linux based operating system since 2004. I had to learn Linux to finish the MLIS dissertation on benchmarking of Free/Open Source ILS. The topic for the dissertation was suggested by my supervisor Dr K.P. Vijayakumar, Faculty Member of Library and Information Science at the University of Kerala. Without his involvement, my attention would not have reached the Free software domain too early.

N. Parameswaran (Retired Deputy Librarian, University of Kerala) my senior colleague at Asian School of Business encouraged my activities and experiments in Free software at the initial days of my career.

My friendship with Sanjo Jose (Librarian, St. Thomas College, Thrissur) and Thomas Abraham had helped a lot to improve my knowledge of Free software applications in libraries.

I express my sincere thanks to my colleagues at Mahatma Gandhi University Library. They always encourage my experiments on Free and Open Source software.

My sincere thanks to Dr Smitha C. Elayadom (Librarian, MCA Department, UC College, Aluva), Nikhil V.R. (Assistant Manager, Eurofins Advinus), Subeesh Gopinathan (Librarian, St. Mary's Women's College for Teacher Education, Thiruvalla), Sonaj Kailas (Research Scholar, Department of Library and Information Science, University of Delhi), Dr Dhanya Deepak (Librarian, Upasana College of Nursing, Kollam), and Sumit A.T. for reviewing the book many times.

A very special thanks to V. Sriram (Librarian, Centre for Development Studies, Thiruvananthapuram) who inspired me to publish this book in Open Access method.

Thanks to everyone working for Free software development.

Finally, I would like to thank my wife, Manju, for sharing her life with me and encouraging me to write this book.

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The origins of Ubuntu Linux

Introduction

The advent of Linux has changed the history of computer technology. Linux development ensures community participation in operating system development. The Free software movement grew as a social movement beyond software development. The Linux-based operating systems used only by the academic and computer community at the initial stages of development. The development of Ubuntu Linux under the direction of Mark Shuttleworth could popularise Linux-based operating among all segments of society. Ubuntu quickly gained popularity in the areas of education, governance, business and technology. The Ubuntu Linux project is an excellent example of how to develop a powerful Linux-based operating system with a user-friendly graphical interface.

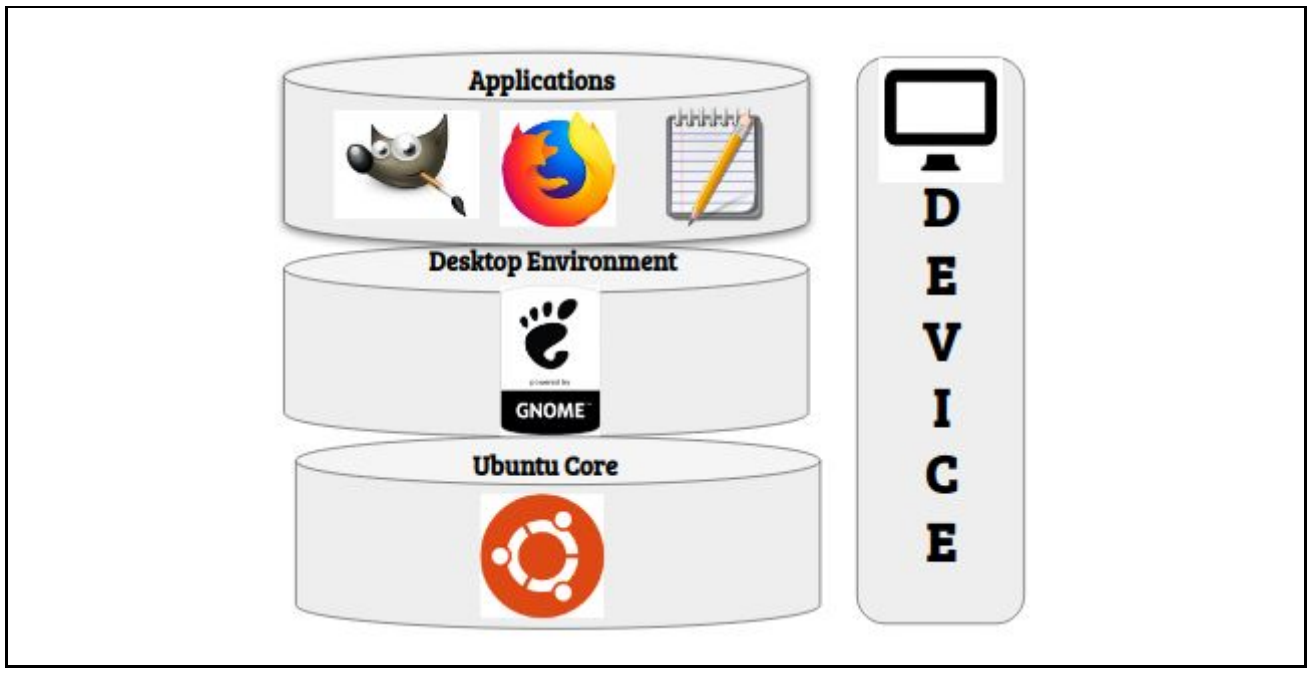
The birth of Linux

In 1983, under the leadership of Richard Stallman, the GNU Project was set up to coordinate activities to develop a free operating system. They could develop all of the components required for an operating system except a kernel. The kernel is considered as the heart of a computer operating system. The kernel controls the resources on a computer and makes it available to various functions. The kernel acts as an intermediary between computer hardware and application software. For example, when you watch a movie on a computer when we press the volume button to increase the level of sound, the media player application passes the instruction to the operating system kernel. As per the instruction, the kernel increases the volume by interfering with the parts controlled by the sound system. The attempts of the GNU project to develop an operating system did not manifest due to various reasons. The kernel used in Linux-based operating systems developed in 1991 by Linus Torvalds, a computer science student from Helsinki, Finland. The new kernel was named Linux. The Linux kernel began to be used with other parts of the operating system developed for the GNU project. Such systems are known as the GNU Linux. With the development of the X-Window module in 1992, the Linux operating system became more and more accessible. Initially, the popularity of Linux was limited to the academic community and computer experts. Two Linux-based operating systems, Slackware and Debian, started in 1993. The Linux kernel-based operating systems became known as the Linux operating system. The development of the Linux kernel is still led by Linus Torvalds.

The mascot of Linux kernel is a penguin, and its name is Tux. GNU General Public License developed by Free Software Foundation for the use and distribution of Free software. The GNU General Public license promotes the idea of copyleft, opposite of copyright. This license gives users the freedom to run, distribute, copy, modify, study, and develop software. So, free software proposes more freedom free of cost. Linux kernel is a Free software in nature with the adoption of GNU General Public License. As a result, there are no restrictions on building the operating systems using the Linux kernel. A large number of operating systems have been built on Linux kernels.

Development of the Linux operating system

A computer operating system consists of a lot of components like kernel, compiler, file manager, graphical interface, and so on. Companies like Microsoft Windows and Apple build the entire operating system with the help of staff software developers. Building a Linux-based operating system is quite different. They use components from various Free software projects along with the Linux kernel.



The structure of Ubuntu Linux

We can compare the development of Linux based operating systems with modern car manufacturing. Various components for car manufacturing are outsourced to companies in different countries. The tyre is made from Brazil, the engine is from France, the paint is from Japan. The components are integrated at the assembling unit of the company. The Linux-based operating systems developed by integrating the Linux kernel along with desktop (e.g. GNOME). They also pick default application software from various projects to the Linux distribution. Majority of Linux-based operating systems use LibreOffice, VLC media player, Mozilla Firefox browser as default applications.

Ubuntu Linux

Although there were plenty of Linux-based operating systems, there was no one that could be used easily by the public. Mark Shuttleworth, a South African entrepreneur, came with the idea of Ubuntu Linux. Microsoft Windows was famous as an easy to use operating system and became popular among computer users. Mark Shuttleworth's goal was to develop a simple, Linux-based operating system for all sections of the community. He established a company named Canonical. Initially, the Ubuntu operating system was started as a project by the Canonical company. The Ubuntu Operating System is an almost Free software project. Ubuntu has gained immense popularity

because of its simplicity of use compared to other Linux-based operating systems. Community involvement is there in all stages of Ubuntu development. The term Ubuntu borrowed from an African philosophical thought. The basic idea of Ubuntu is 'Humanity towards others'. Ubuntu Linux is first released on 20 October 2004. Ubuntu Linux copies are made available on the Internet for download. Ubuntu CDs were sent by post because of the slow speed of the Internet at that time.

Installing Linux-based operating systems on the computer was complicated. Only those with the right expertise could successfully install the Linux-based operating systems. Complex installation procedures were a significant hindrance to the popularity of the Linux operating systems. Ubuntu introduced a simple installation method, and it attracted users. Customised GNOME-based desktop added the attractiveness of Ubuntu. Both of these factors boosted the popularity of Ubuntu Linux. Ubuntu became synonymous with the Linux operating system.

Ubuntu is based on Debian Linux. Debian is a large Linux project with active community participation. Ian Murdock, a young computer expert, started the Debian Linux project in 1993. Debian is a popular Linux-based operating system among programmers and system administrators. Using Debian Linux was not simple for everyday use by ordinary people. Ubuntu has made several changes to the Debian Linux for public utility. Statistics show that Ubuntu is the most popular Linux-based operating system.

Ubuntu mainly uses the GNU General Public License. Several operating systems were again developed based on Ubuntu. Linux Mint, Zorin OS, Elementary OS, Peppermint OS and many more operating systems built on the Ubuntu platform.

Ubuntu editions

Ubuntu releases two times in a year; in April and October months. Year and month are used for version numbering. For example, a new release in October 2019, will be Ubuntu 19.04. Besides, each version has a code name. Version name carries an animal name and an adjective with it. The International Union for Conservation of Nature, an organization dedicated to the preservation of nature and natural resources, maintains a list of endangered species. Ubuntu releases are named after a creature from this list. Ubuntu version 20.04 is called Focal Fossa. The Fossa is a cat-like, carnivorous mammal, an endangered species living on the island of Madagascar. An adjective 'Focal' added to the animal name Fossa.

Ubuntu maintains two types of releases; a short term and long term. The short-term version has nine months of life. Long term version gets five years of life. Ubuntu users will receive updates during the life period of short and long term versions. Linux-based operating systems frequently release software updates and enhancements. Updates and improvements to applications software installed on Ubuntu are available in the form of updates. Software and security updates make the Ubuntu operating system new and secure.

Ubuntu releases editions for various hardware requirements. Hardware requirements such as Server, Desktop, Cloud and Raspberry Pi available. The desktop version is for use on a desktop or laptop computer. The Ubuntu server edition is to be installed on the server computers. The Ubuntu

Server version does not have a graphical interface, so it's not suitable for home or office purposes. Ubuntu also releases an exclusive edition for the cloud computing environment.

All Linux distros release security updates and patches to alleviate the potential vulnerability. Ubuntu users are notified daily for security updates and weekly for non-security updates. Ubuntu update manager alert about the availability of new updates. Keeping your computer's software up to date is the most possible solution for protecting your system. Configure the Ubuntu update manager to install the updates automatically.

Other Linux-based operating systems

We have learned that Linux is a kernel for the operating systems. Many Linux-based operating systems have been developed using the Linux kernel. Linux-based operating systems differ in terms of installation, graphical interface, package management, hardware support, development, release, and support. Let's get familiar with the prominent Linux-based operating systems that differ mainly in software package management.

Redhat

Red Hat Enterprise Linux (RHEL) developed by Red Hat, a US-based company. RHEL is a commercial Linux operating system; users need to make payments for the services. Red Hat Enterprise Linux is primarily used for the server computers.

RHEL uses a package format called RPM (Redhat Package Management). The software packages use .rpm with the file name. DNF (command-line front-ends) is used as the package manager. Fedora Linux (Fedora Linux) is a free and community edition of Red Hat Enterprise Linux. Fedora Linux is suitable for use on desktop and laptop computers. CentOS (CentOS) is an operating system based on Red Hat Enterprise Linux. It is a community-owned project suitable for server computers. Another RHEL based commercial Linux is SUSE Linux. OpenSUSE is the name of the free edition of Suse Linux. Oracle Linux is another prominent RHEL based operating system developed by Oracle company.

Arch Linux

Arch Linux uses a package management system called Pacman. The software package extension is .pkg. For example, the name of the VLC player package is vlc-3.0.8-13-x86_64.pkg.tar.zst. There is no time limit for the release of new versions. As soon as updates are available, a new release is ready (Rolling release). Arch Linux home page, https://www.archlinux.org.

Manjaro Linux is an easy to use and popular operating system based on Arch Linux. The web address, https://manjaro.org.

Android

Android is the operating system used by the majority of mobile phones in the world. Android is a mobile operating system designed for touchscreen mobile devices such as smartphones and tablets. Android is based on a modified version of the Linux kernel. The development of Android is being led by Google's Open Handset Alliance. This mobile operating system development project name is Android Open Source Project (AOSP). Mobile phone manufacturers are making changes to the base Android operating system to suit mobile phone hardware. They customise the features and enhance the graphical interface for good user experience. Oxygen OS is the name of the modified version of the Android operating system used by the OnePlus mobile company on their phones.

Android application software uses the APK (Android application package) file format. Google Play is a popular Android app store maintained by Google. Users can find and install apps from the Google Play Store. F-Droid is a repository of Android apps with Free software in nature and licensed under GPL. Users can find apps with Free Software license. The web address: https://f-droid.org/en/.

Replacing the Android operating system on a mobile phone is not like installing the Linux operating system on a computer. There was no universal Android OS suitable for all mobile phone hardware. Once a new Android version is released, it is a time-consuming process to modify and make it fit into a specific model phone. Users have to wait until the company makes new updates. Mobile phone manufacturers stop sending Android updates within one or two years after the release. Then mobile phone users will not get the latest version of the Android operating system. As a solution, Google has introduced an Android edition that can be installed directly on any phone. The initiative is named Project Treble. Project Treble images can be installed directly on the phones since the Android Oreo version. Customers do not have to wait until the phone manufacturers launch the new Android version.

Conclusion

Sharing Culture is a novel concept encouraged by the Free Software movement. Software development with community participation can attract more experts. When more people are involved in software development, they can build software faster and better. No software is perfect in every aspect. An error in the software source code is called a bug. Such errors can affect software performance on the user side. Both developers and users can participate in Free Software development. Mistakes can be detected and corrected quickly when more people are involved in software development. Active free software projects can bring out the best software.

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Ubuntu flavours

Introduction

Ubuntu has been using GNOME Desktop since Ubuntu version 17.10. Before that, Unity was the default desktop of Ubuntu. Unity was a graphical layer for the GNOME desktop developed by Canonical Ltd. for Ubuntu. Linux-based operating systems come with different desktops. Desktops used by Linux based operating systems are diverse in appearance and function. KDE (K Desktop Environment), XFCE. (XForms Common Environment), Cinnamon, LXQt desktops are popular among Linux users. Users can choose desktops based on computer hardware specifications, and it's performance. XFCE and LXQt desktops consume minimal hardware resources and work better on older computers. GNOME, KDE, and Cinnamon desktops are attractive and suitable for Linux beginners.

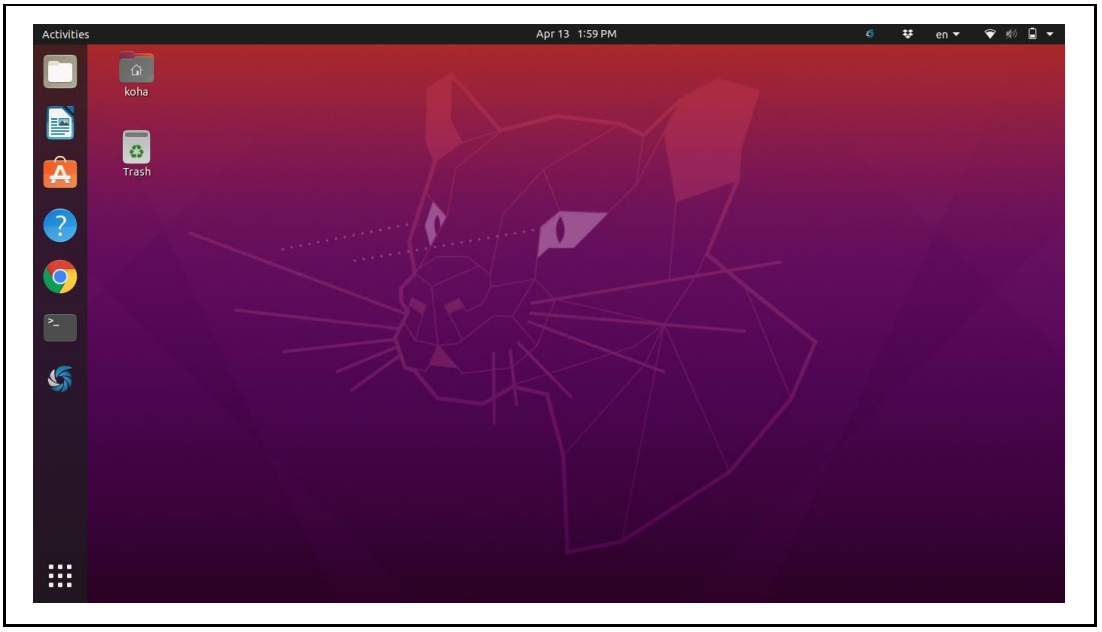
Ubuntu flavours

Ubuntu flavours are available with various desktops. Despite the diversity of desktops and default applications, Ubuntu flavours depend on the same Ubuntu software repository, packages, and updates. All official Ubuntu flavours follow the same release pattern. All of the Ubuntu flavours maintain separate websites. Here we are going to be familiar with Ubuntu flavours and its features.

Diversity in Linux-based operating systems is known as Linux distributions/distro. We can compare the Linux distros with different flavours of ice cream. Ice cream base made from milk cream and different flavours created by adding various ingredients vanilla, pistachio, strawberry etc. Almost all Linux-based operating systems are based on the Linux kernel. But they differ in the installer, desktop environment, package manager, utilities, themes, browser and other software. Developers packaged together selected software and tools with Linux kernel to meet the taste of users. More than five hundred Linux distributions available as per the leading Linux distro watching websites.

Ubuntu

Ubuntu is available with the GNOME desktop. The purple colour (Canonical aubergine) interface of Ubuntu GNOME desktop is familiar among Linux lovers. When searching the web for Ubuntu, the website of the Ubuntu GNOME version will come first. Ubuntu GNOME edition is the most commonly used Ubuntu version.

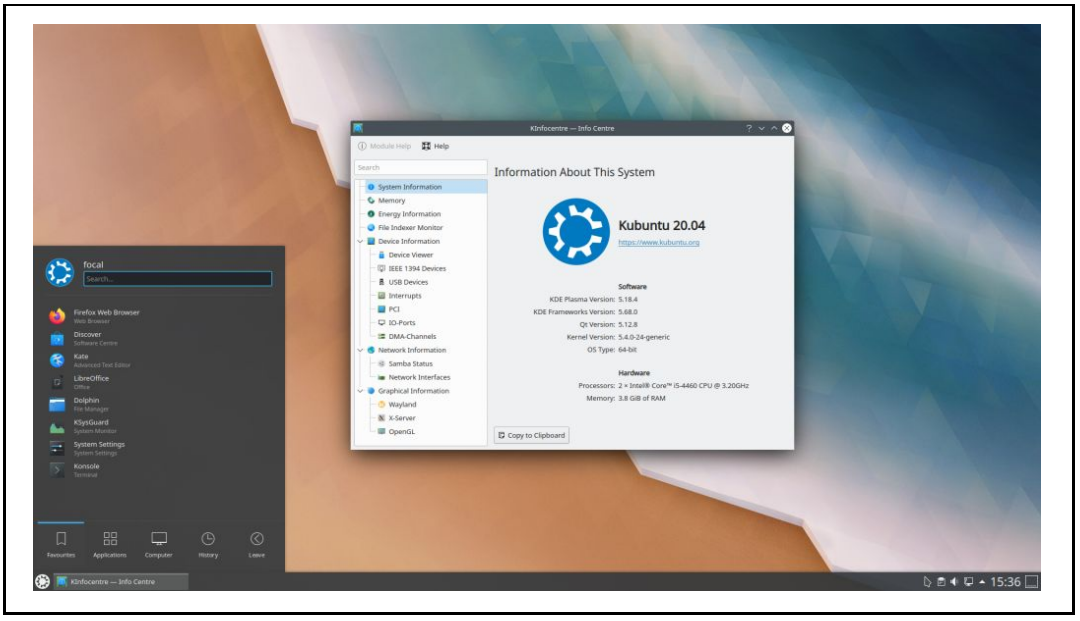


Ubuntu GNOME desktop

These are the minimum computer hardware requirements for Ubuntu: 2 GHz dual-core processor, 4 GB RAM, 25 GB storage space. Homepage of Ubuntu, https://ubuntu.com.

Kubuntu

Kubuntu is using KDE Plasma Desktop. Kubuntu offers a beautiful desktop. Kubuntu is similar in appearance to the Windows operating system and Apple's Mac operating system. Kubuntu is recommended for those who like to migrate from the Windows operating system and prefer to use Linux.



Kubuntu desktop

Kubuntu needs a high performance computer. The minimum hardware requirements to run Kubuntu: 2 GHz dual-core (x86) processor, 4 GB RAM, 25 GB storage space. Kubuntu home page, https://kubuntu.org.

Ubuntu MATE

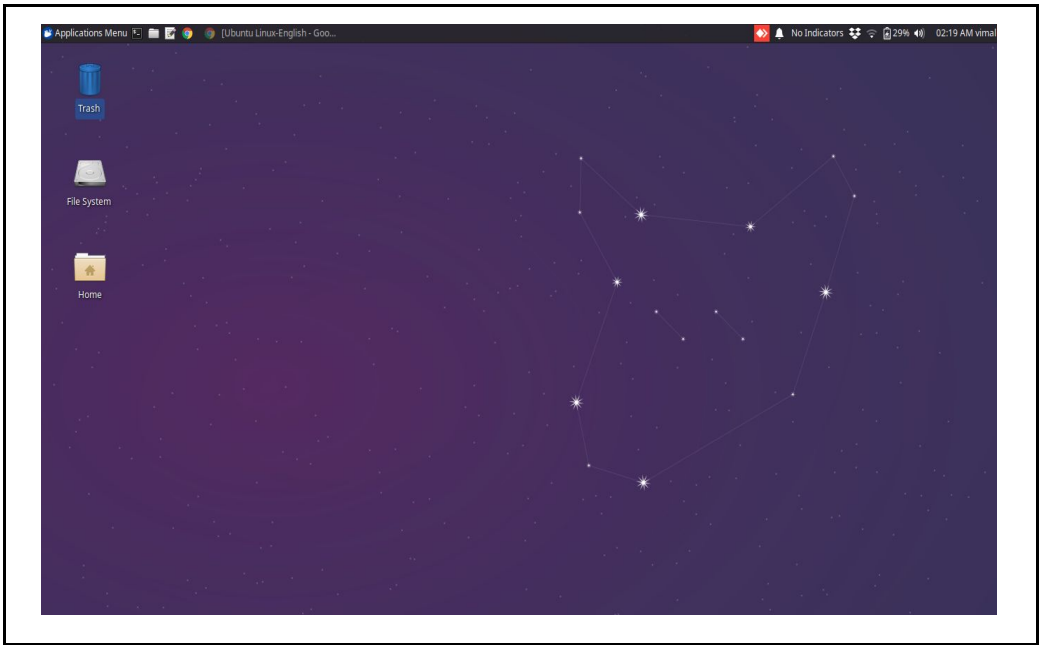
MATE is a desktop inspired from GNOME 2 version known for its simplicity. The GNOME 3 released with drastic changes on architecture and interface. A group of people who love GNOME 2 started the MATE project. MATE desktop is built using GNOME 2 source code. The name MATE is derived from Yerba Mate, a plant used to make tea in South America.

Ubuntu MATE desktop interface

Ubuntu MATE is suitable to run on computers with average and high hardware specifications. Ubuntu Mate uses a file manager called Caja. The recommended hardware specifications for a computer to Ubuntu MATE are Core 2 Duo 1.6 gigahertz processor, 2 GB RAM, 16 storage space. Home page of Ubuntu MATE, https://ubuntu-mate.org.

Xubuntu

Xubuntu is an official edition of Ubuntu based on the XFCE desktop. Xubuntu owns a simple and elegant desktop. Xubuntu is well-suited to low-performance computers to get fast performance. Computers with excellent hardware capabilities can give excellent performance. Xubuntu consumes fewer hardware resources. Thunar is the default file manager with Xubuntu. Simple application software like AbiWord and Gnumeric are used as default word processors and spreadsheets.

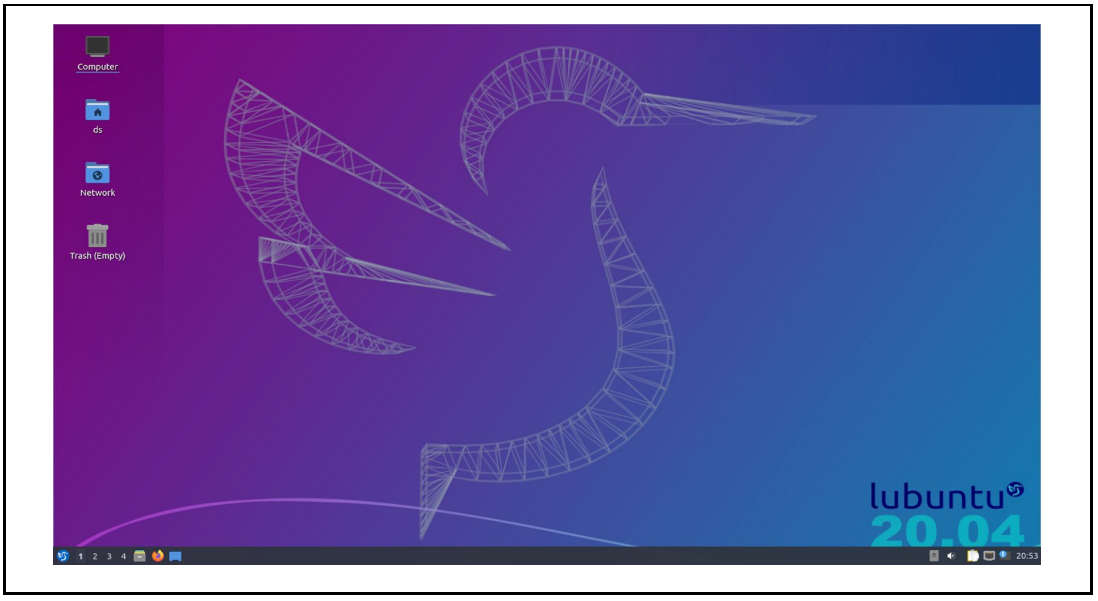


Xubuntu desktop interface

The minimum capacity of RAM required for Xubuntu is 1 GB. Xubuntu home page, https://xubuntu.org.

Lubuntu

Lubuntu is the lightest operating system among official editions and uses LXQt desktop. Formerly LXDE was used as the default desktop of Lubuntu. LXQt has been used as the desktop since version 18.10. Openbox is the default file manager. Very minimum application software is loaded with Lubuntu. Users need to install and use the necessary software for the day to day activities. LXQt offers a very attractive desktop interface with high performance. Lubuntu uses the Calamares installer. Other Ubuntu flavours use Ubiquity installer.

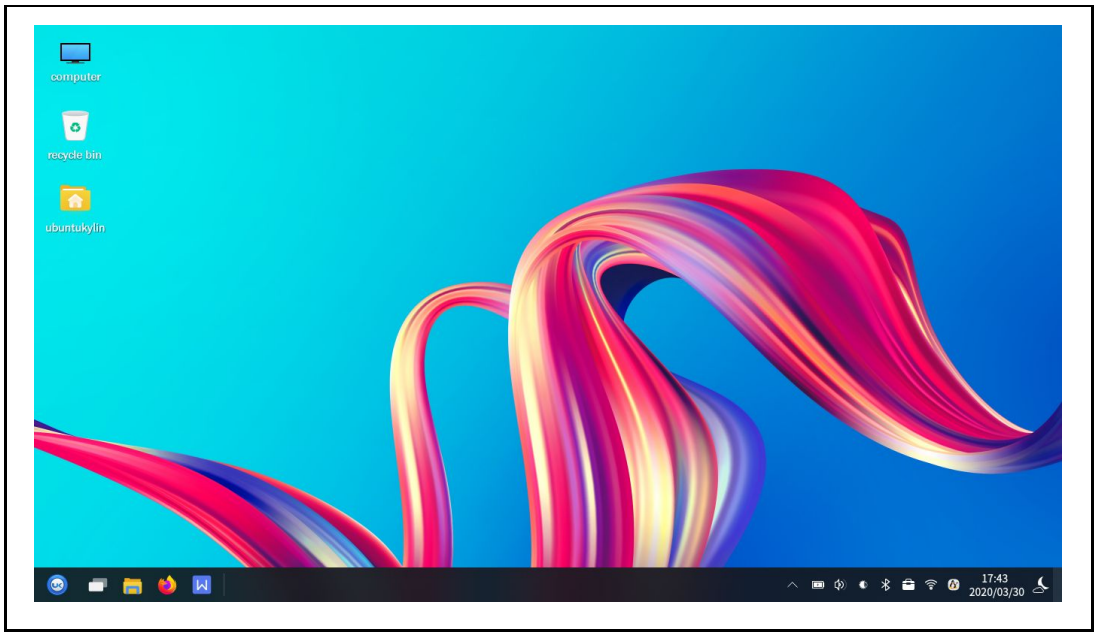


Lubuntu desktop interface

Lubuntu can run on a computer with minimum RAM. Lubuntu home page, https://lubuntu.net.

Ubuntu Kylin

Kylin is the Chinese edition of Ubuntu Linux and developed in collaboration with the Chinese government.



Ubuntu Kylin desktop

Kylin uses an LXQT Based UKUI desktop and it is a simple and lightweight desktop. Ubuntu Kaylin Website Address, http://www.ubuntukylin.com.

Ubuntu Studio

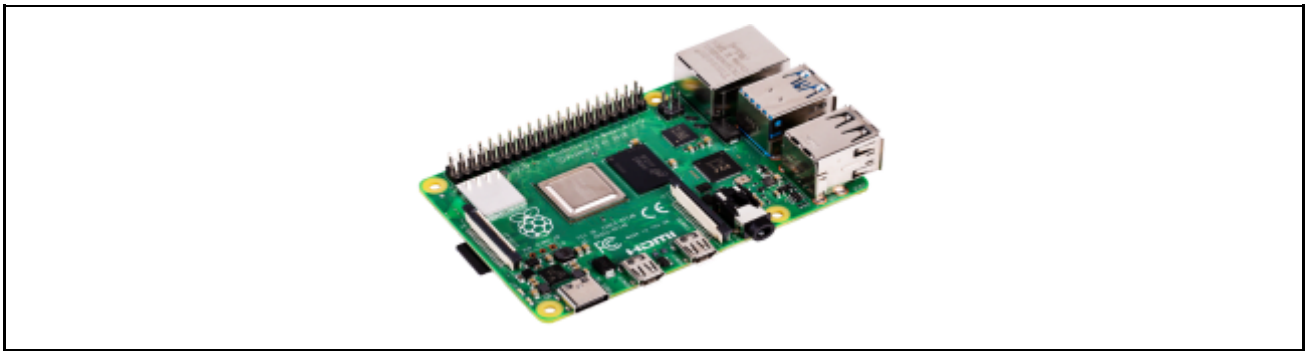
Ubuntu Studio is mainly for the use of multimedia professionals. KDE Plasma desktop provides the graphical interface for the Ubuntu Studio.

Ubuntu Studio desktop

Minimum RAM size required for Ubuntu Studio is 2 GB. Ubuntu Studio architecture is suitable to run multimedia applications. Home page of Ubuntu Studio, https://ubuntustudio.org.

Ubuntu Pie

Ubuntu Pie is an Ubuntu operating system suitable for the Raspberry Pi. The Raspberry Pi is an ATM card-sized, inexpensive computer. The processor, RAM, network, USB ports and Wi-Fi embedded in a small card-sized computer. Raspberry Pie is a versatile hardware piece and can make use for innovative uses. It can be used to build a home automation system, low-cost desktop pc, media centre, web server, VPN (Virtual Private Network), robots etc. Visit the home page of the project to get more insight into the usage of Raspberry Pie, https://projects.raspberrypi.org.



Raspberry Pie 4

Raspberry Pi is available for purchase through Amazon online shopping website. The Raspberry Pi 4 series hardware component costs around Rs. 5,000. Visit the following website to download Ubuntu Pi, https://ubuntu.com/download/raspberry-pi.

Conclusion

The desktop offers a graphical interface and simplifies the use of Linux-based operating systems. An attractive and user-friendly desktop is necessary for ordinary users to work with Linux. The Linux-based operating system became more and more popular after desktops began to be used. The variety of desktops with the various Ubuntu editions satisfy the taste of users. The availability of suitable desktops for use in computers with high and low performance is a blessing.

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Ubuntu installation

Introduction

Installation of Linux was a complicated process in the past for ordinary people. The main problem was the lack of a simple and user-friendly graphical interface for the installation process. Ubuntu introduced a simple installer and the installation process became simple. Ubuntu facilitated an easy way to install along with the existing Windows operating system. Ubiquity is the name of the installer program used by Ubuntu. This chapter describes how to install the Ubuntu 20.04 LTS desktop version.

Selection of hardware

If you decide to use a Linux-based operating system, it is essential to know about computer hardware. Today the Linux-based operating system is ideal for use on all types of computers and all related devices. All of the computer hardware manufacturers make products that are compatible with Linux-based operating systems.

It is not necessary to install Ubuntu on your computer to try and know the experience. Write Ubuntu ISO image on a DVD / pen drive and run it live. In live mode, Ubuntu is not installed static on the computer storage. But the computer can run like Ubuntu installed. Check whether the Wi-Fi, printer, sound, video works with Ubuntu. If any of the components are not working on your computer, you can search the Internet for the solution. There are many active Ubuntu discussion forums, social media groups on the web to seek help. First, do a general search on the Internet for the problem and solution. There is a high chance to get an answer from the archive of solved questions in various Linux forums. The latest versions of Ubuntu work well on all types of computers and have the least chance to fail.

If you're looking to buy a desktop/laptop, you can contact any local computer shops or online shops to see the models based on your requirements and budget. First, make sure they work on Ubuntu Linux. You can also search the Internet to see if that model is compatible with Ubuntu. Ubuntu works well with most of the laptops. Rarely, certain hardware components may feel difficulty working. For example, Wi-Fi may not work because the Linux driver may not be compatible. You can search the online community of Linux users for a list of the best laptops suitable with Ubuntu. Most likely to get a clear answer from there. User experience can be obtained from online shopping sites. Go through the customer comments about the model. Try to interact with the customers to know the user experience. You can ask questions about the product to its sellers.

Leading computer manufacturers have launched desktop, laptop and server computers preloaded with Ubuntu operating systems. Preloaded Ubuntu is convenient for users to get fully functional Linux-based operating systems with computers. Many laptops and desktops are preloaded with Ubuntu Linux.

The list of computers and other devices compatible with the Ubuntu operating system is available on the Ubuntu website. The hardware and the devices in the list is certified by Canonical Limited. Here you can quickly find computers and related accessories that work well with Ubuntu, https://certification.ubuntu.com.

One needs to be more careful when buying printers to work with Ubuntu. In the early days, it was difficult to find printers that would work with Ubuntu. All major printer manufacturers now support the Linux operating system. A software component called the driver enables the printer to work with Linux. When a printer is attached to a computer running Ubuntu Linux, the printer software unit, including the driver, helps to identify the printer and handle the printing tasks. Make sure that the printer you plan to buy supports the Ubuntu operating system. The printer manufacturer's website contains information about Linux support. If you are currently using an older printer, don't worry about non-availability of Linux drivers. The Linux driver suitable with old printers can be found at Open Printing project website, https://www.openprinting.org.

Download Ubuntu Linux

First, decide which version of Ubuntu Linux you are going to use. Choose the type of Ubuntu that suits the computer hardware specifications and your taste. Ubuntu with the GNOME desktop is an excellent option if you have a computer with good hardware capacity. Xubuntu or Lubuntu can be selected if you have a low-power processor. Go to the concerned Ubuntu edition website and download the Linux ISO. Select the LTS (Long Term Support) version for the stable and long term use. Try to download the latest update of the Ubuntu LTS release. For example, the Ubuntu 18.04 LTS version released in April 2018 and the fourth update came out in February 2020. The name of the release with the update is Ubuntu 18.04.4, and it comes with a lot of improvements. Security updates for Ubuntu and newer versions of application software packages will be available through the latest updates. In the download page, you will see ISO images suitable for various hardware architecture. Latest computers supported by the 64-bit architecture. Desktop and laptop computers can choose Ubuntu-18.04.4-desktop-amd64.iso. Try and find the newest version of Ubuntu.

There are two types of computer processors, i.e., 32-bit and 64-bit. A significant difference between 32-bit processors and 64-bit processors is the number of calculations per second they can perform. It results in the speed of completing the tasks. 64-bit processors available in dual-core, quad-core, six-core, and eight-core variants for desktop computers. The use of multiple cores results in an increased number of calculations per second. It can increase the processing power and help to make a computer run faster.

After downloading the ISO image of Ubuntu, write into an installation medium. DVD or pen drive can be used to prepare the installation medium. Use any image burning software available with the existing software. Free software like Infrarecorder can be used to burn DVD on Microsoft Windows. Select the Burn Image option in the software to write the Ubuntu Linux ISO to a DVD. If pen drive is

available, transfer the Linux ISO file to the pen drive and make it suitable for installation. If you are a Windows user, find an appropriate software to write Ubuntu ISO to Pendrive. A software called Startup Disk Creator available with most of the Linux-based operating systems.

Keep a backup

Take necessary action to secure the data in your computer before the installation of Ubuntu Linux. Store all the required files on the computer to a pen drive or in cloud storage (e.g. Dropbox and Google Drive) before the installation of Ubuntu Linux. Your precious data will remain secure if something wrong happens to your computer storage during installation.

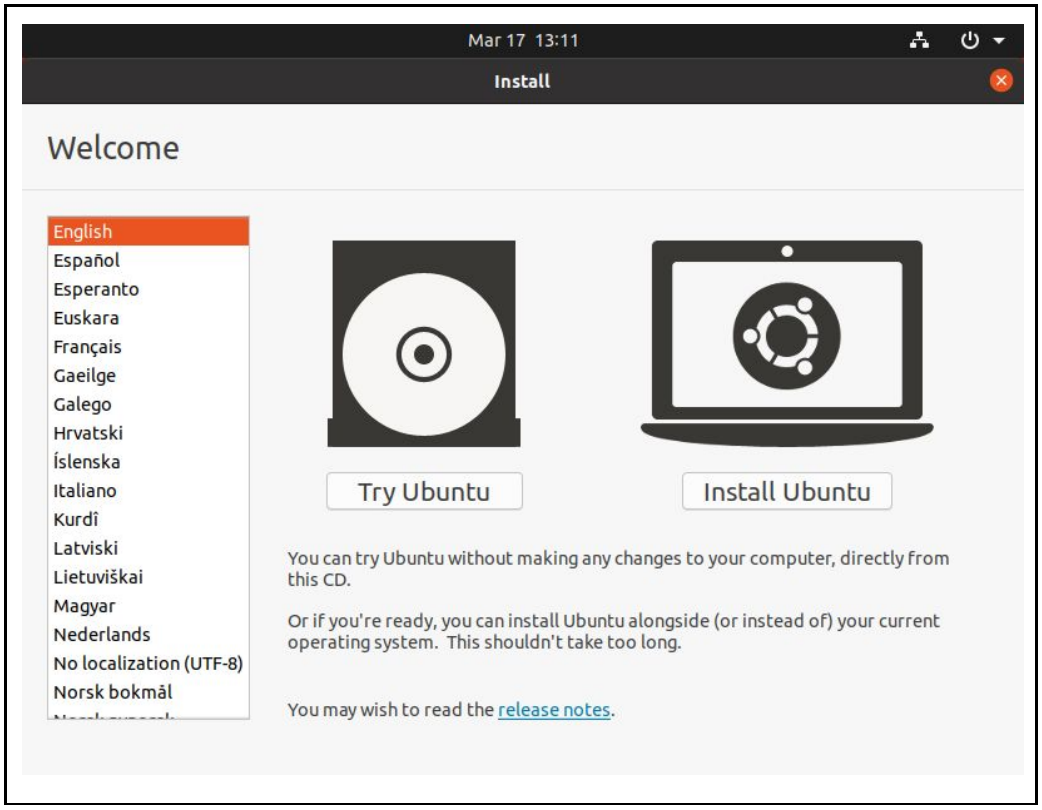
Boot the installation medium

Insert the DVD / Pendrive which contains the installation medium on the computer that you wish to install Ubuntu Linux. Restart your computer. There is a possibility that an operating system available on the computer intends to install Ubuntu. Once the computer is turned on, the existing operating system will load and start working. Installing Ubuntu is only possible if your computer initially starts from the Ubuntu installation medium. Restart your computer and press the boot option. Touching on a dedicated single button (e.g. F12, Delete) is required to change the boot option. The boot option button is indicated on the screen of the computer when it is turned on. If you do not see a boot button indication, search on Google with the computer model name and find the Boot Option button. Select the installation medium (DVD/Pen drive) from the boot option. Ubuntu Linux will load, and the installation process will begin.

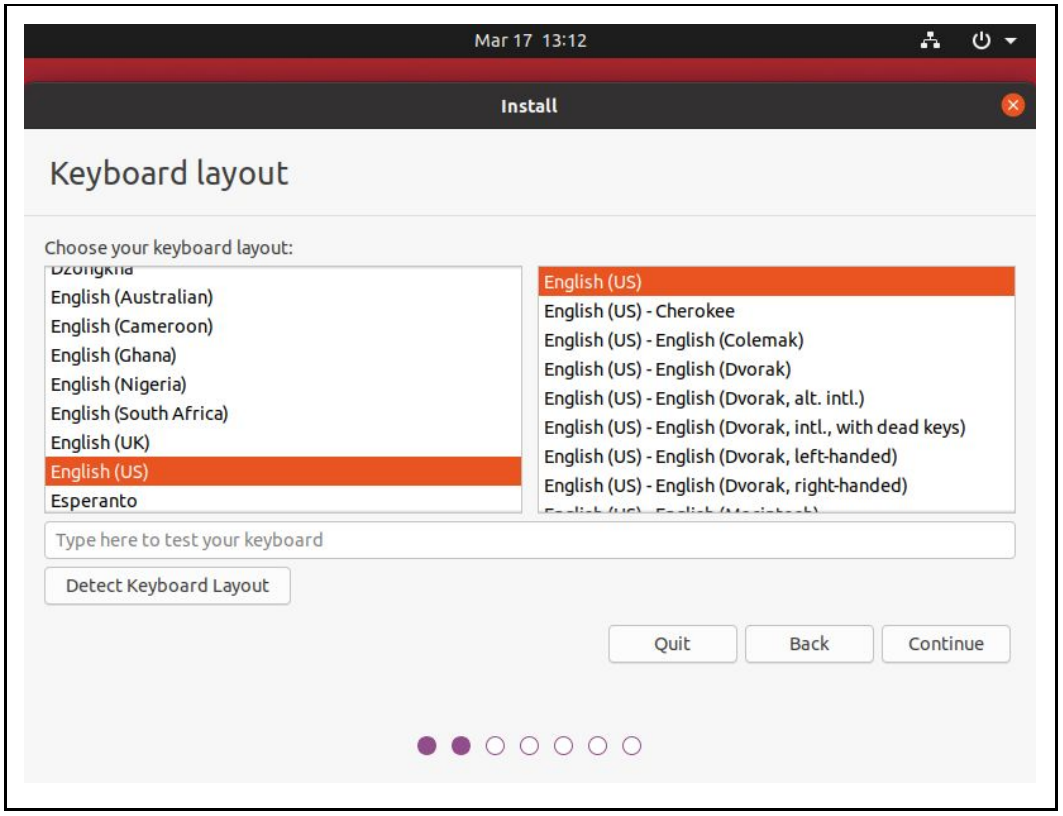
Know about the firmware of the computer when going to boot the Ubuntu installer medium. Configure firmware for Ubuntu installation confuses beginners. BIOS and UEFI are two firmware interfaces for computers and act as an intermediary between the operating system and the computer firmware. Firmware interface becomes active when the computer starts. It kicks the hardware components and starts the operating system, which is installed on the storage. UEFI is a modern firmware and available with the latest computers. Recent versions of Ubuntu support UEFI. Existing operating systems (Windows Vista/7/8, GNU/Linux...) of your computer installed in UEFI mode, then you must install Ubuntu in UEFI mode too. Otherwise, the existing operating system not able to open after the installation of Ubuntu. If you are going to install Ubuntu after erasing all other operating systems in the computer, then no need to care about whether you installed Ubuntu in UEFI mode or not.

The various stages of the Ubuntu installation

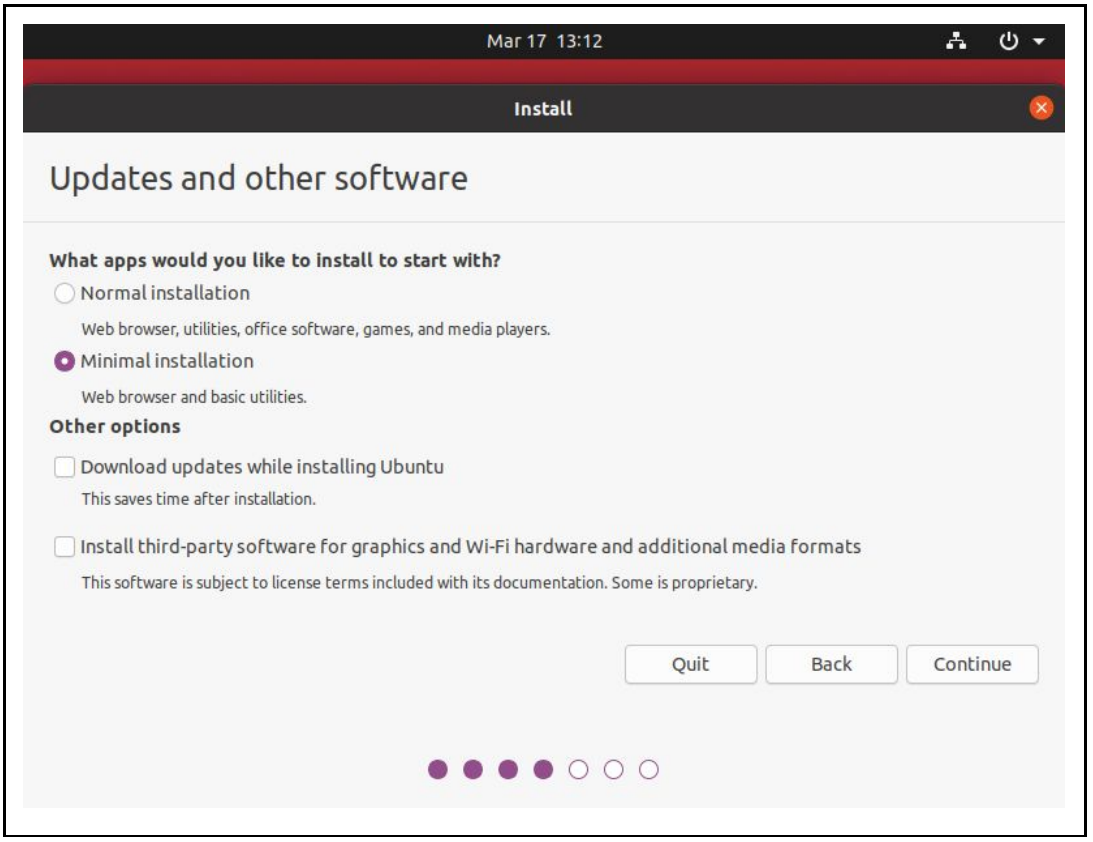
If you could boot properly using Ubuntu Linux DVD / Pendrive, the installer screen will appear soon.



First, select the language. The default language is English.
Start the installation by clicking on the **Install Ubuntu** button. Try the **Ubuntu** button for Live Mode.

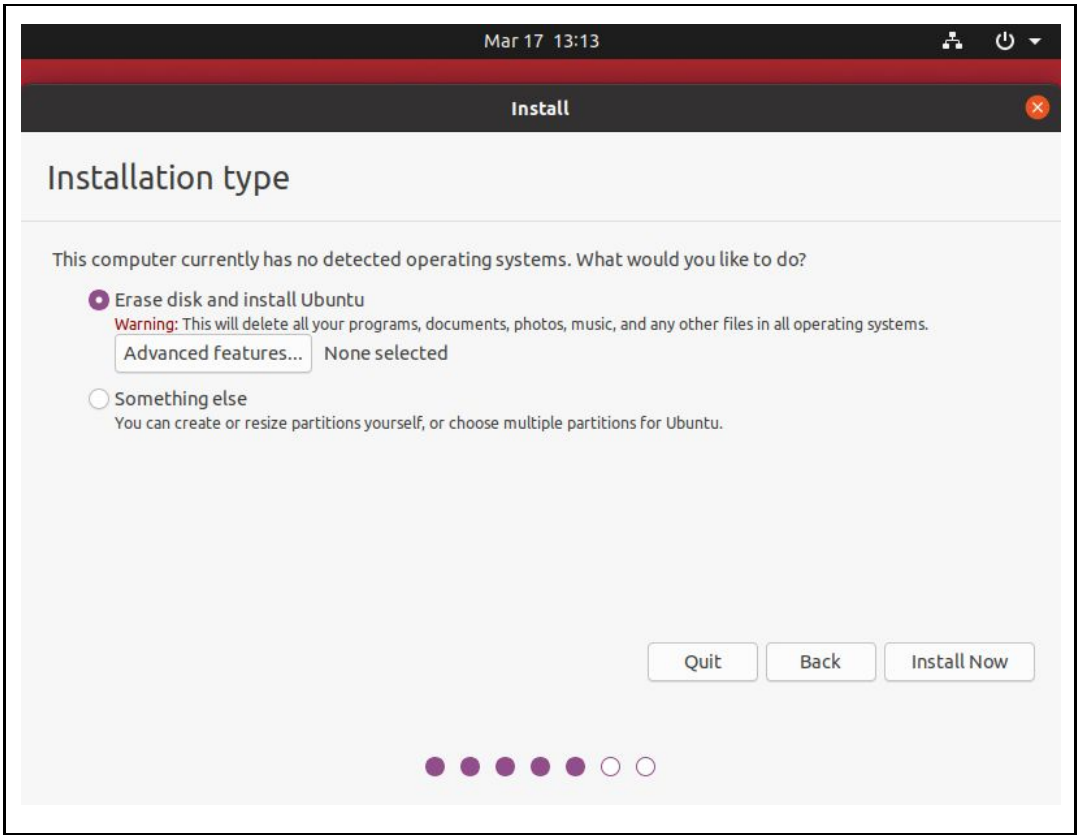


Select the appropriate keyboard layout. The most popular one is the American English keyboard (English US). Ubuntu will detect and show what your keyboard layout is. Press the **Continue** button to enter into the next step.

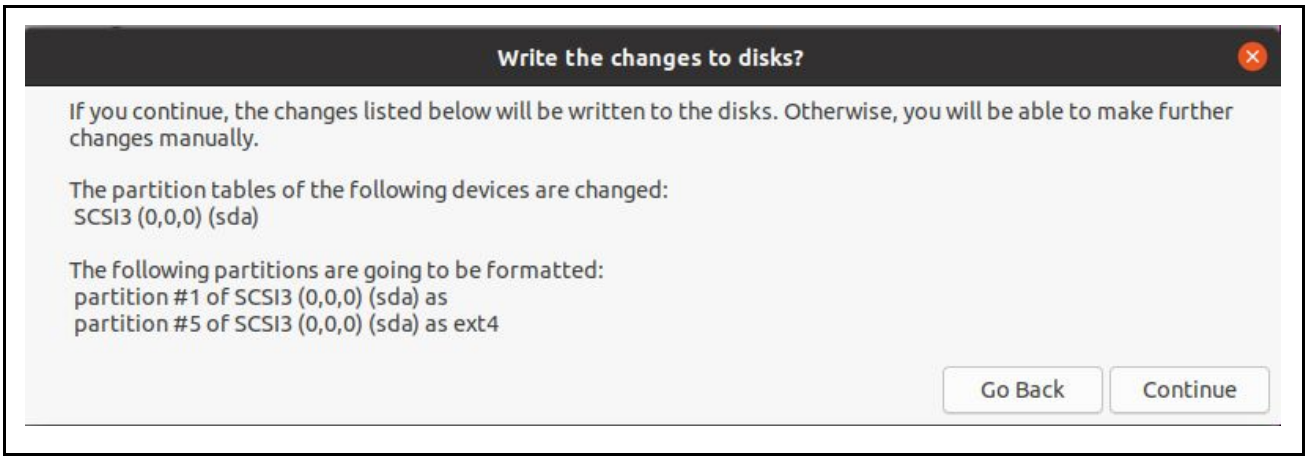


Decide whether or not to install the entire application software on Ubuntu DVD. Selecting **Normal Installation** will install all the application software on the DVD. It includes software such as LibreOffice and VLC media player for everyday needs. If you choose **Minimal Installation**, Ubuntu will install a minimal working environment. The User can install the desired software later.

Other options, the installation process indicates whether to install new updates during the installation. It requires an active Internet connection. No need to select that option because downloading and installing new updates takes time and it will delay the installation process.

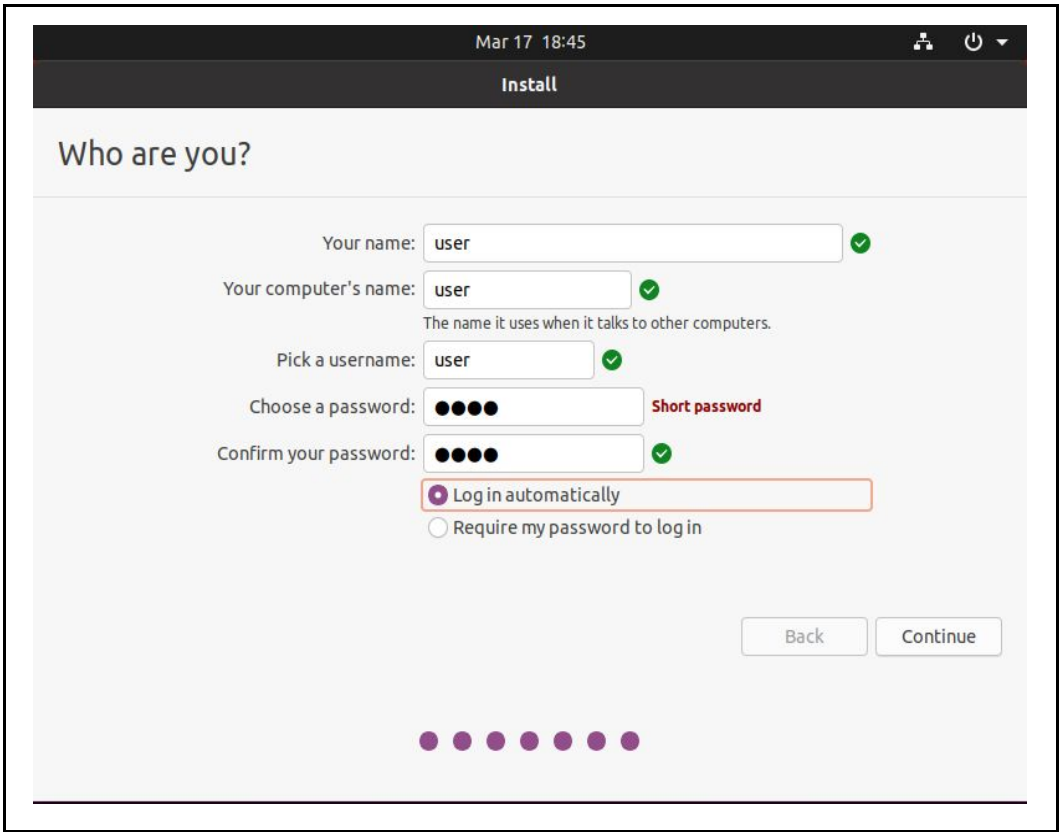


Here are the different ways to determine how to install Ubuntu on computer storage. Select **Erase disk and install Ubuntu** to install Ubuntu after removing all of the information on the computer storage. If the Windows operating system is already on your computer, choose the **Install along with Windows** option. If you want to partition your hard disk and install Ubuntu, select **Something else**. Once you have determined which method to use, click the **Install Now** button.

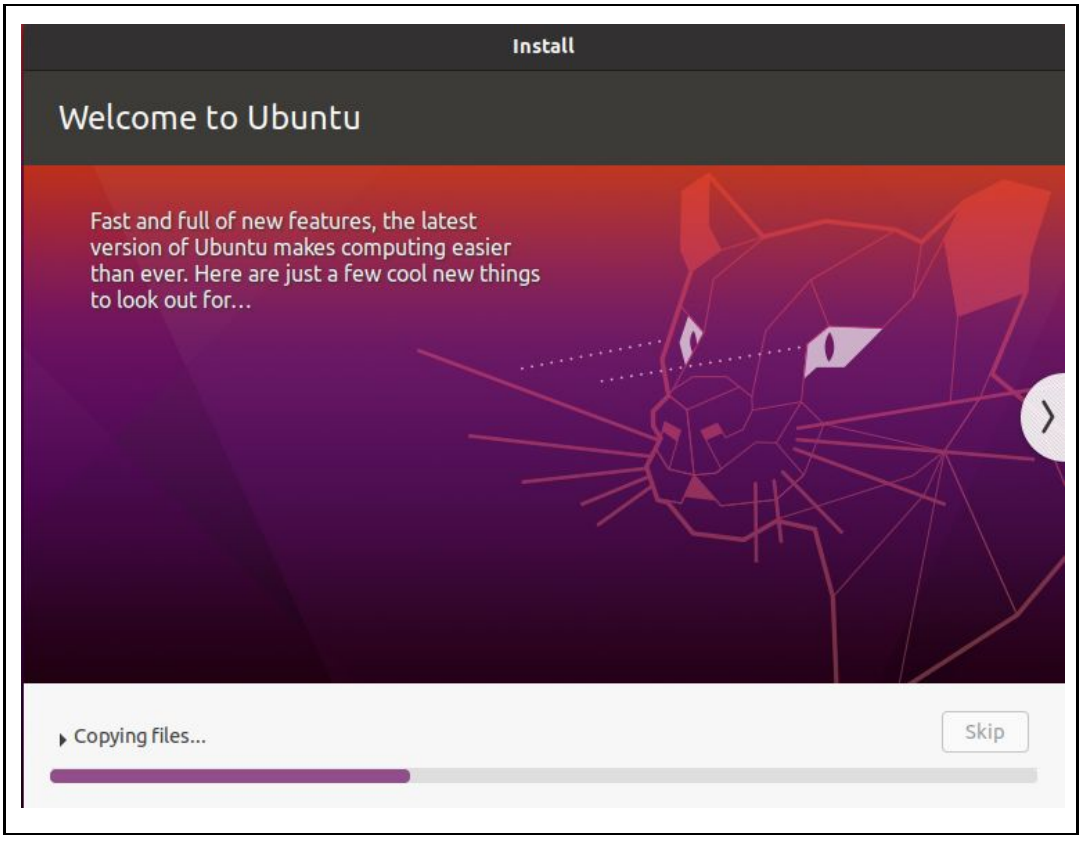


Ubuntu slices the storage space and creates partitions to install Ubuntu. When it's finished, the above window appears. Click on the **Continue** button.

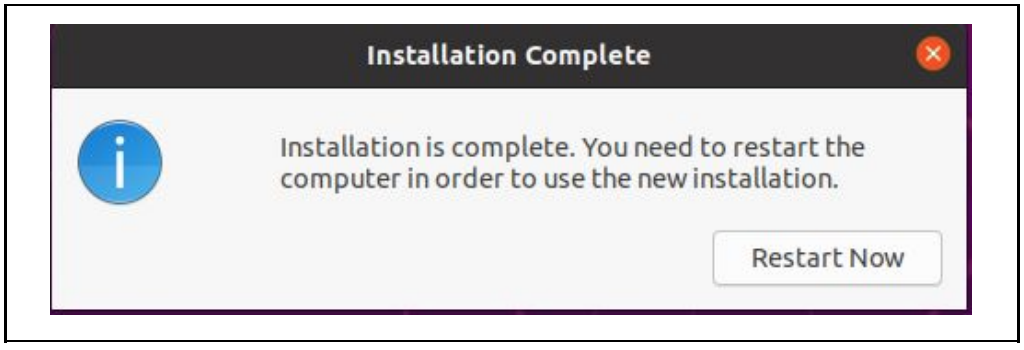
Select your country from here. Having an Internet connection will automatically show your geographic location. Otherwise, choose the country from the map. Computer time and software repositories are defined based on the location. Software repositories from the nearest location make the update/upgrade work process complete fast.



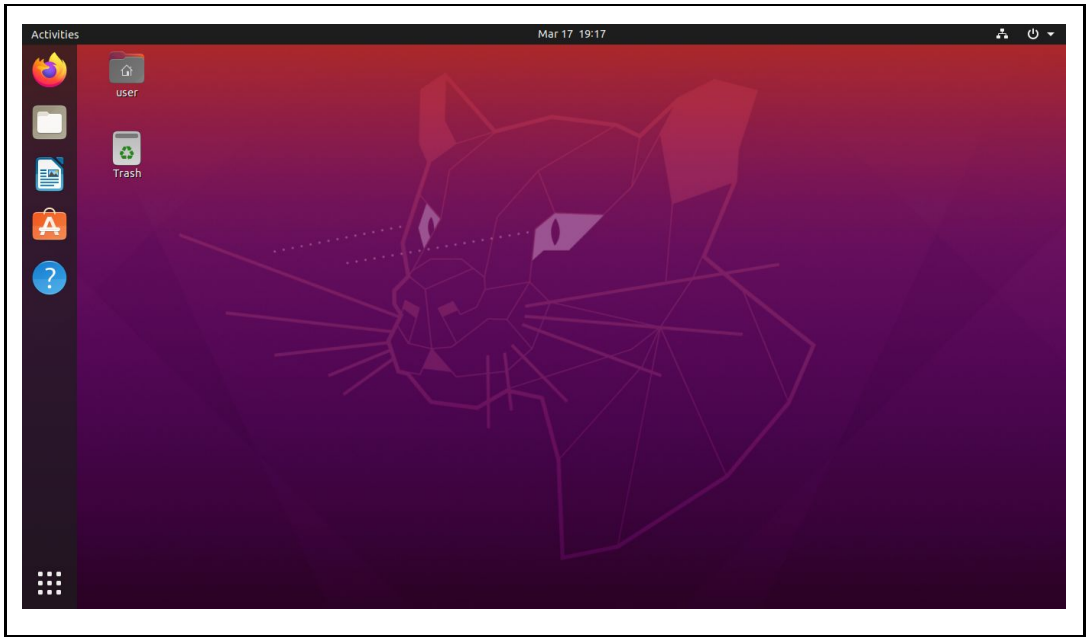
Enter the username and password for Ubuntu user account. Enter the name of the computer. The computer on a network can be easily identified by using the name of the machine. Here you can choose whether to open your computer and enter into it with/without asking the password. Press the **Continue** button. After this step, the Ubuntu installation process begins.



The entire installation process may take five to ten minutes. It also depends on the computer's hardware specifications.



When the Ubuntu installation process completes, the installation screen indicates to restart the computer. Click on the **Restart Now** button. Remove the installation media, DVD / Pen Drive when it prompts. Don’t forcefully open the DVD drive before it opens itself.



GNOME desktop of Ubuntu 20.04 LTS

After the installation, the computer will reboot and enter into the Ubuntu desktop. Here is the GNOME desktop of Ubuntu 20.04 LTS.

Conclusion

Ubuntu installation process is comparatively easy compared to other Linux-based operating systems. There are plenty of videos on installing Ubuntu on YouTube. A beginner may try to install Ubuntu after watching the tutorial videos and get familiarize with the installation process. If you are unable to do Ubuntu installation, you should ask someone else for help. From the free software community, you can find experts in your area who have experience in installing Ubuntu.

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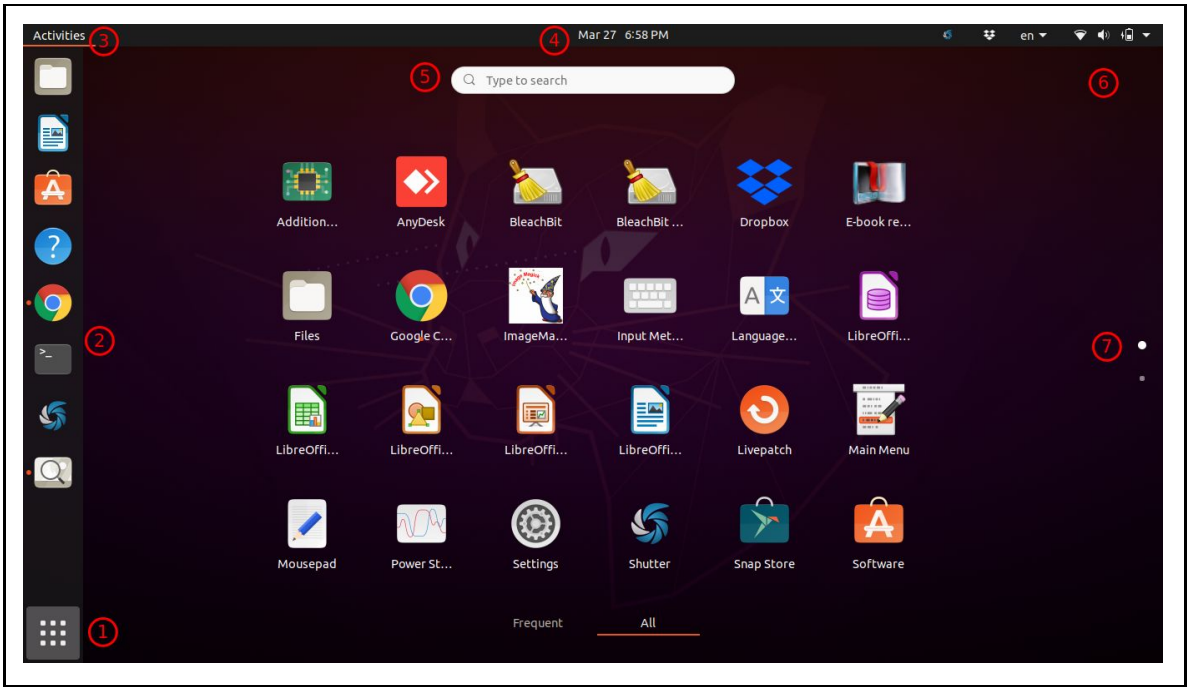
Ubuntu desktop

Introduction

The desktop is a critical component of an operating system that enables the user to communicate efficiently with the system. The desktop also has the functionality of making the operating system more attractive and comfortable to use. Themes, file Manager, wallpaper, panels and app launcher determine the look and feel of the desktop. Proprietary operating systems use the inbuilt desktop developed exclusively for the purpose. The desktop of the Windows operating system is not allowed to replace with another. Linux-based operating systems enable the users to change the default desktop and add another. There are plenty of desktops available for use on Linux-based operating systems. A Linux-based operating system always has a default desktop environment. You can install other desktops and switch to any desktop than your default desktop. Desktops give different looks for operating systems, the same as a person wears a different style of costumes. Ubuntu uses the GNOME desktop by default. Users can easily be familiar with the different graphical interface of Linux-based operating systems. Let's get acquainted with the GNOME desktop with Ubuntu.

GNOME home

Ubuntu desktop consists of different elements. Get familiar with the different parts of the GNOME desktop.



An overview of the GNOME desktop.

1. Application launcher 2. Dashboard 3. Activities button 4. Notification area 5. Search bar 6. System menu 7. Workspace list.

Start applications

Find the favourite application icons on the dashboard located on the left side of the GNOME home. All of the applications can be visible on the centre of the desktop. Press the App Launcher (1) button at the bottom left of the panel. Users can search and find apps using the search box (5). It is possible to move to the next set of applications by pressing the workspace (two small dots) (7) on the right-hand side of the home page.

Favourite applications

Frequently used applications can be placed on the dashboard on the left side. Easy to launch favourite apps from the panel, and there is no need to find and open the application from the group every time.

Adding apps to the dashboard.

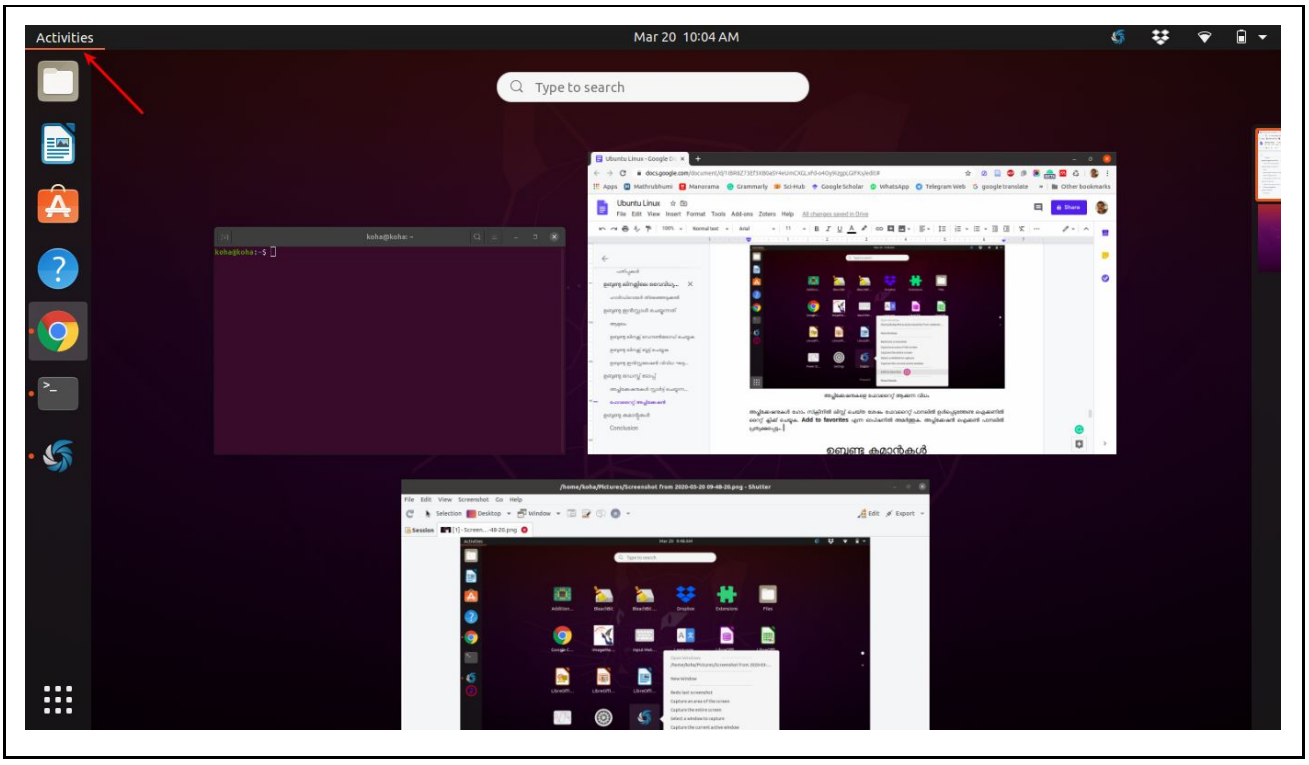
Right-click on the app icon on the dashboard and select **Add to favourites** option to include in the favourite applications. The app icon will appear on the panel.

Remove an app from favourites

Right-click on the app icon and select the option **Remove from Favorites**.

View running applications

Often users work with many applications and need to switch from one app to another. Click on the Activities option in the upper left corner of the GNOME home to view all the running applications.

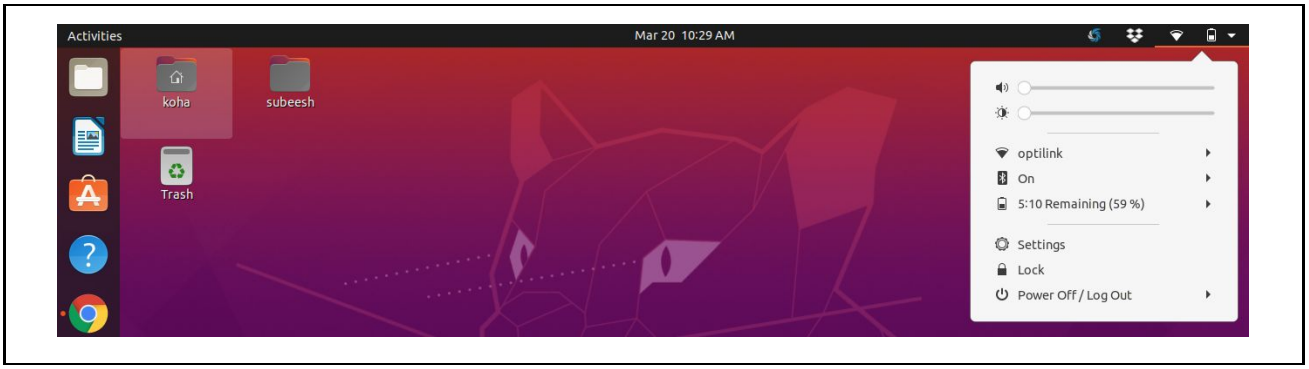


Activities menu

Press on the snapshots to maximize and open the applications. It’s possible to close the unwanted apps from here by pressing on the **Close** button on apps windows right corner.

System menu

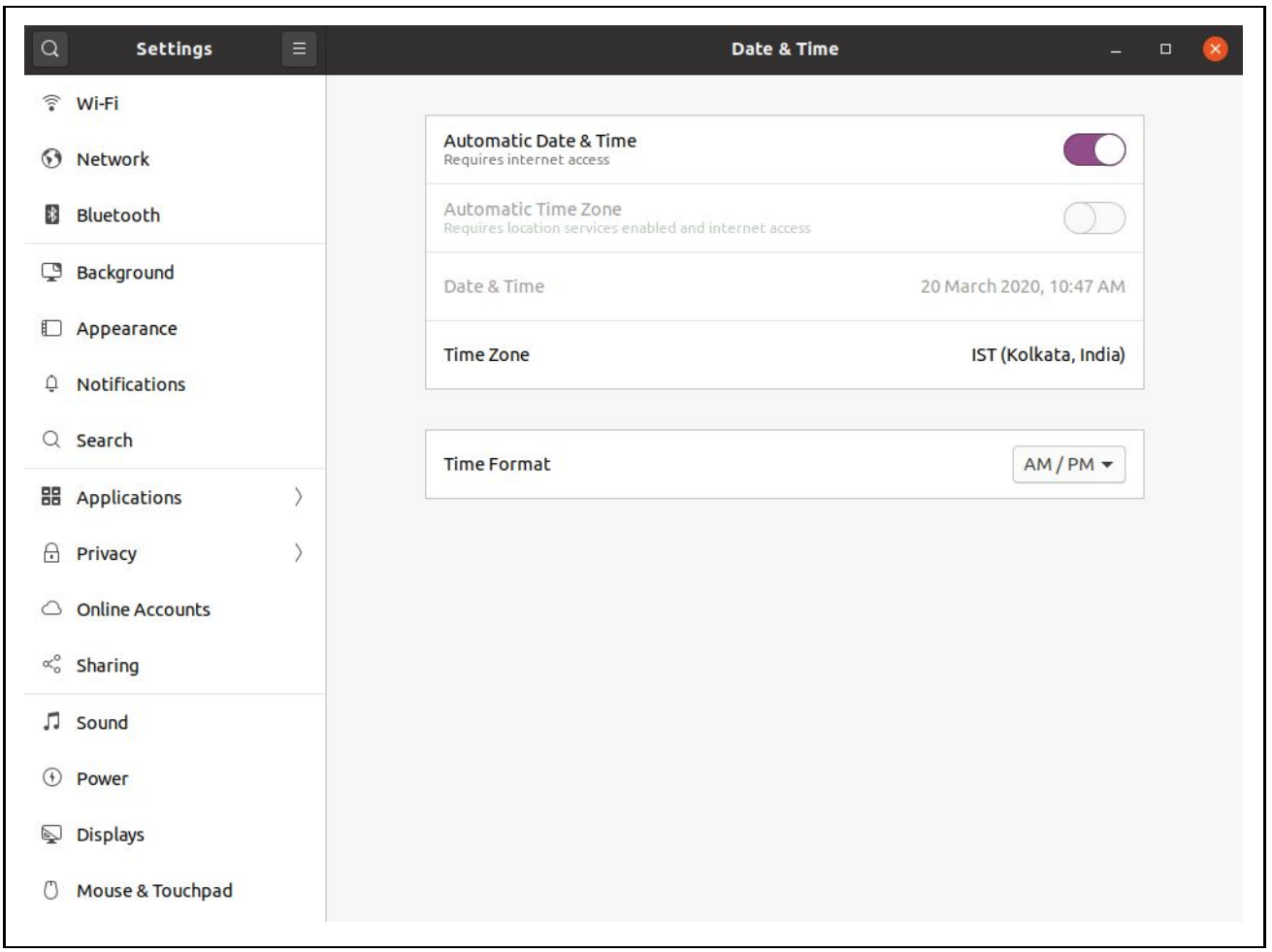
The System Menu is located on the upper right corner of the GNOME home screen. The system menu appears when pressing the mouse. Screen Lock, Restart, Shutdown and System Settings are arranged inside the **System Menu**.



System menu

System settings

To handle all Ubuntu settings, visit **System Menu > Settings**.



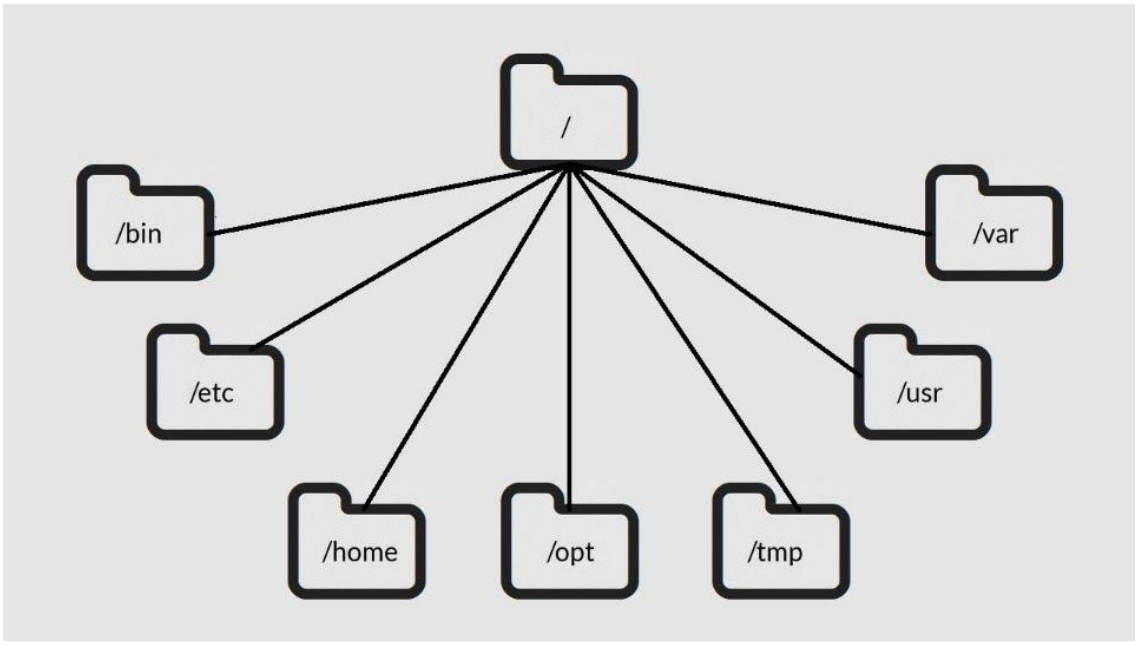
Ubuntu Settings

It can handle all kinds of settings, including network, wallpaper, printer, time and date, online account, voice and more. Online accounts with Ubuntu helps to sync cloud storage to your computer. Users can add Google Drive to access files from the Ubuntu File Manager.

Linux directory structure

Understanding the Ubuntu system is only possible if you are familiar with the Linux directory structure. The hard disk is partitioned to store data at the time of operating system installation. The data relating to the operating system are stored in files and folders. Each operating system has its directory structure. Linux directory structure is not like the Windows operating system. Windows operating system divides the entire storage space into C, D and E. C is the leading directory where system files are stored by default. Files are usually stored in C: \ Program Files when a new application is installed.

The directory structure of Linux can be compared to a tree root. Many branches start from the root. The Linux operating system directory structure starts from the Root directory. The / used to refer to the Root directory. There are other subdirectories within the Root directory.



Linux directory structure
Image courtesy: https://www.linuxtrainingacademy.com

The function of each directory in the Linux directory structure is described here very briefly.

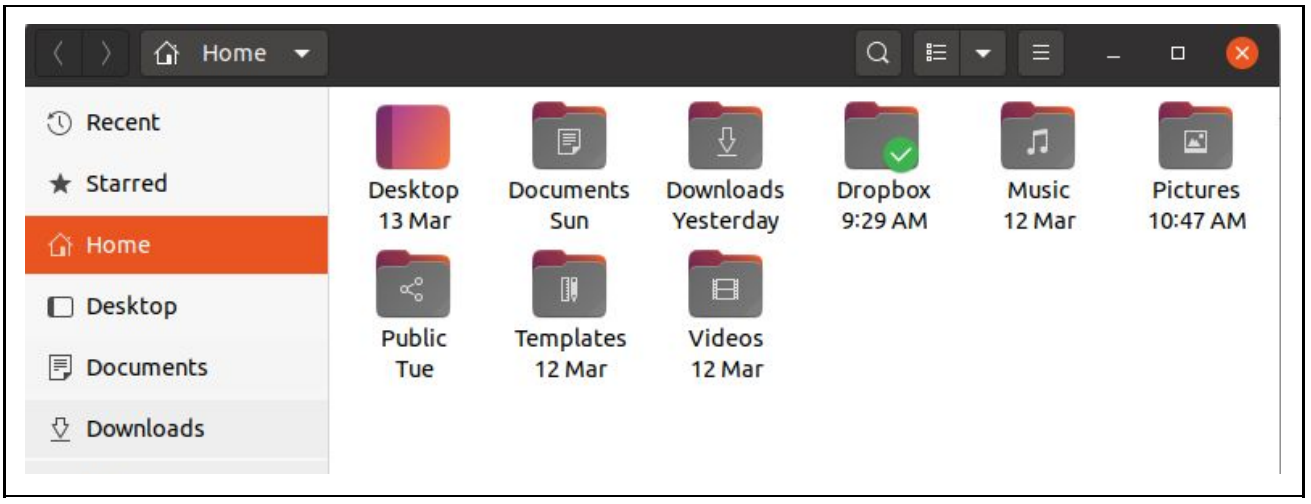
Name of the directory	**Functions**
/	The origin of all the directories is from here.
/bin	Here the binary files are stored. Details of functions described in the binary files associated with the application of various commands.
/etc	This directory contains the configuration files of all application software.
/home	Linux users store their personal files here.
/opt	Here store the directories and files of applications software installed from out of Ubuntu repository.
/tmp	Storage place of the temporary files when the applications software is running. Temporary files get cleared while restarting the computer.
/usr	Storage place of the application software installed and its source code.
/var	A log or history of various currently running programs.

Each subdirectory in the Linux directory structure has its own function. The home directory contains directories for the Linux users. The home directory for each Linux user includes the files and folders they create. When a Linux user account with the name Tom is created, a folder named Tom will be created inside /home directory. The location will be called /home/tom. The symbol / in the middle of folder names to indicate the hierarchy of directories. If Tom writes a love letter using LibreOffice; it is stored in his home folder. If Tina has another account, the /home/teena folder is created inside the home directory. Tina cannot enter Tom's home directory without permission to access his files.

When installing application software, associated files and folders stored in different system folders of Linux.

File manager

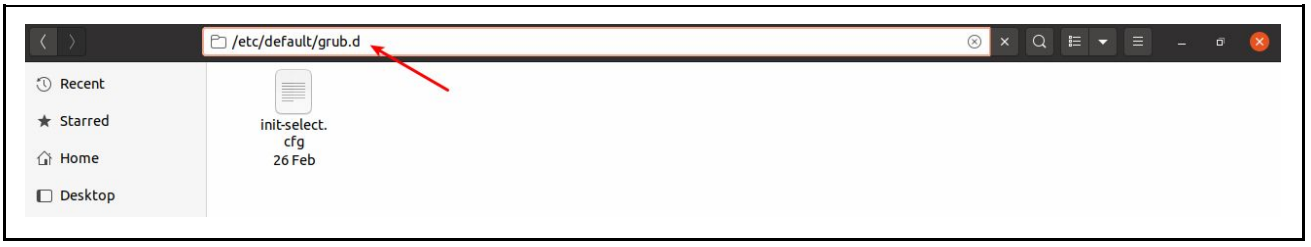
A file manager is a tool in an operating system that helps to organise and find the files and folders stored on the computer. The file manager also helps to manage the contents inside the storage system, such as DVD, pen drive, etc. Copying and deleting of files, folders can be done with the help of a file manager. The File Manager icon is displayed in the left panel of the GNOME desktop by default.



File manager

The top right corner of the menu contains options for searching, sorting, zooming, copy and paste from the file manager. Important folders are bookmarked visible on the left side. Users can bookmark frequently used folders.

From the File Manager, press the Ctrl + L buttons on the keyboard to know the folder location.

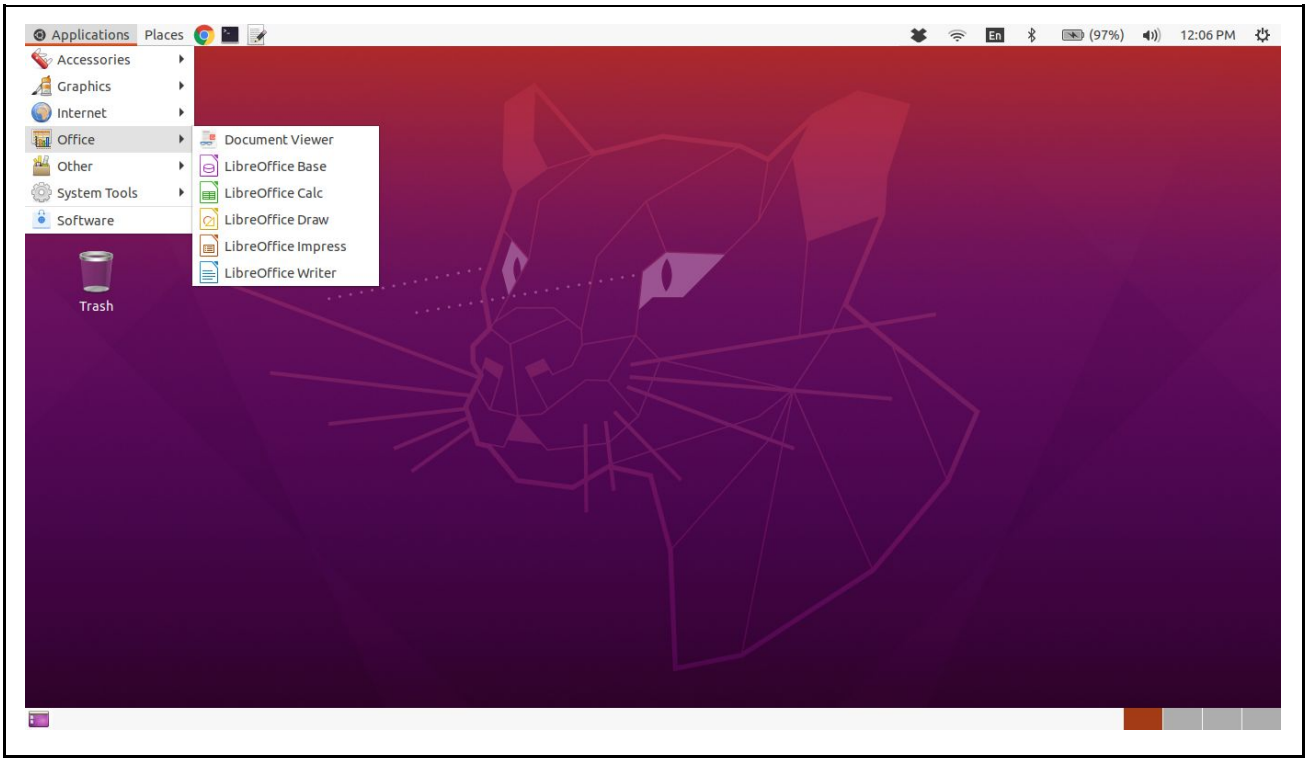


Location of files and folders can be found from the address bar.

Recycle Bin, is where the deleted files and folders are stored. It is called Trash in the Linux operating system. Location of Trash is found on the left panel of the file manager.

GNOME classic desktop

The default desktop of Ubuntu is Gnome 3. Its new interface is entirely different from the previous version. Those who are reluctant to use GNOME 3 can switch to the traditional look desktop of GNOME 2. Install the gnome-session-flashback package to give the classic look for GNOME 3. The installation of the classic desktop will be discussed in the next chapter.

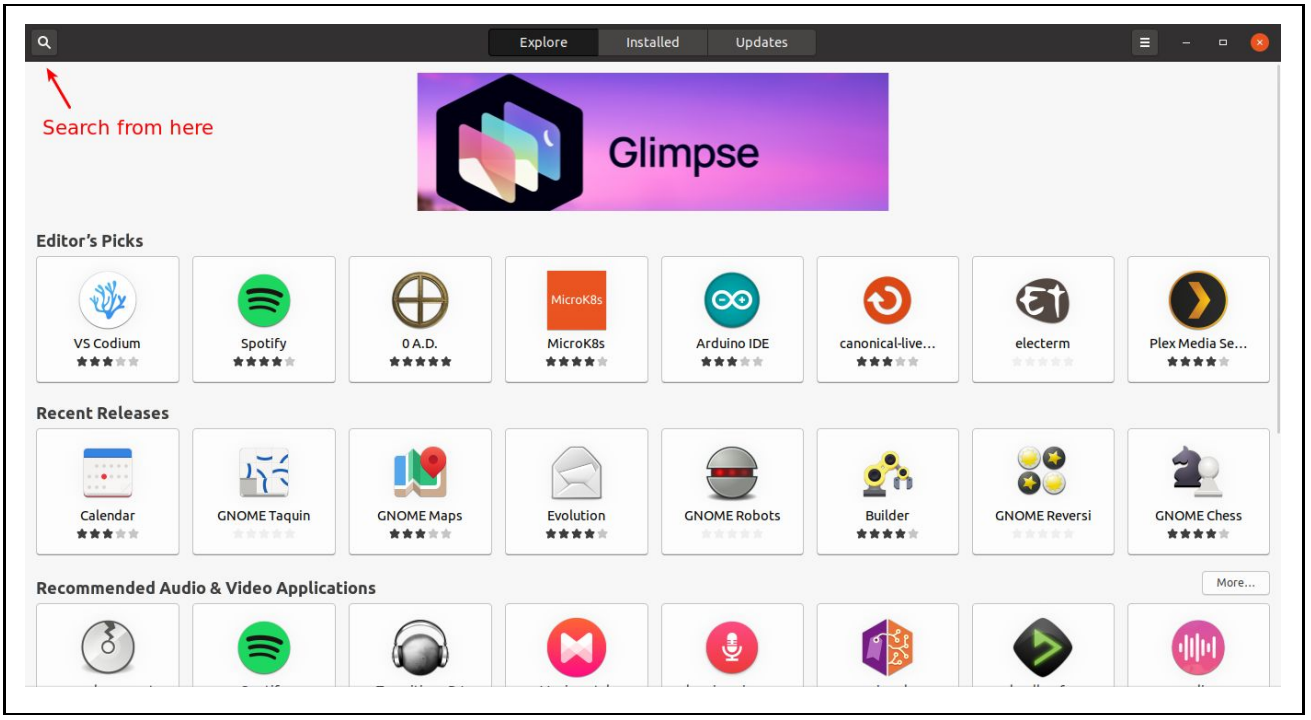


GNOME Classic desktop

GNOME Classic retains the style of the GNOME 2. GNOME Classic Desktop can work faster than GNOME 3 Desktop.

Ubuntu software centre

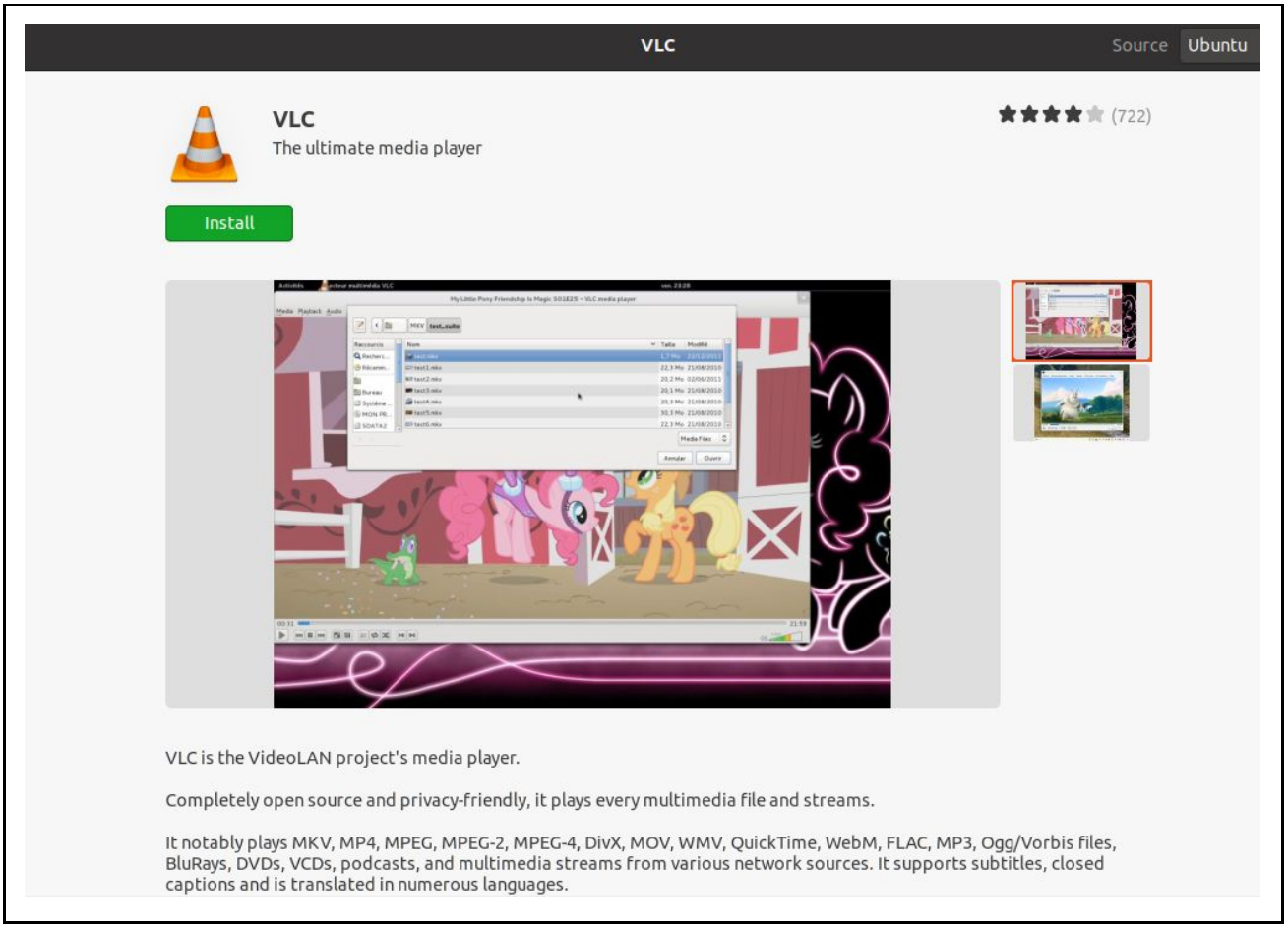
It is essential to install the necessary software for the user. Ubuntu is preloaded with essential software such as LibreOffice. There are many ways to install software on Ubuntu Linux. Users of GNOME Desktop can use Simple Software tools. The panel on the left side of the Gnome desktop contains the software icon. Otherwise, the application can be found from the list.



Ubuntu software centre

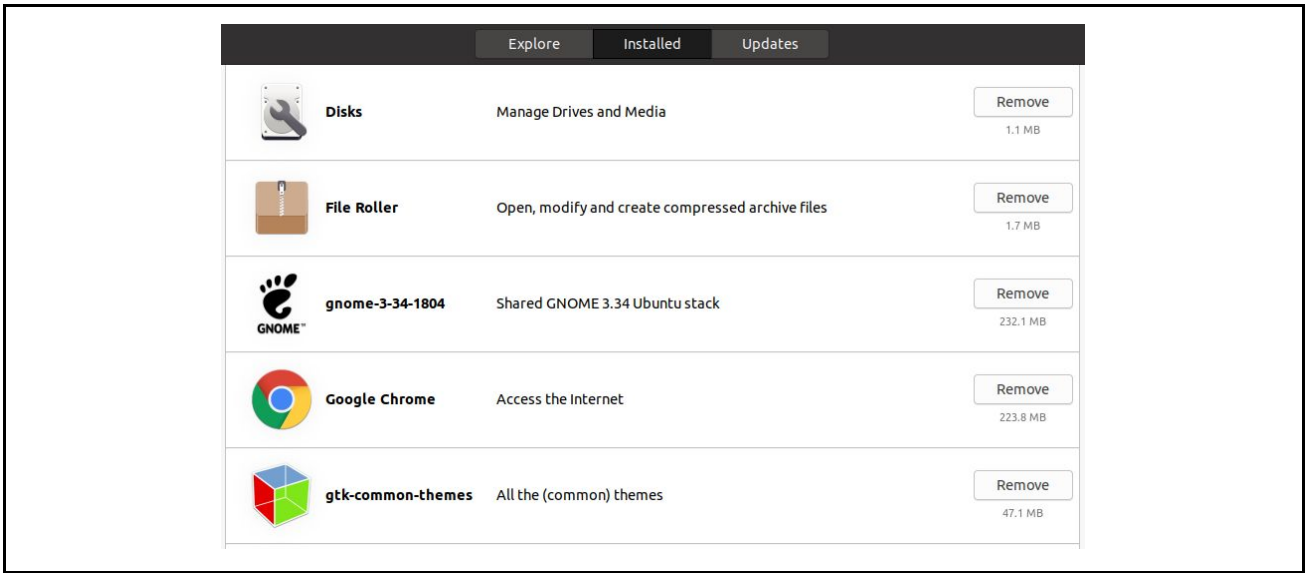
Popular Softwares are displayed on the main page of the software centre. The software is categorized based on use. If you are looking for a music player software, search in the **Audio & Video** section. Characteristics, popularity and the opinions with each software are mentioned.

A search box is available to find the desired software. If you need to install the famous media player VLC, search and find using the software search.



Details of application software in the software centre.

Press the **Install** button to install the vlc player. The **Installed** tab on the software centre gives the list of installed software.



List of installed software.

Press on the Remove button to uninstall application software.

Control the computer

Ubuntu provides a variety of options to control the computer including Screen Lock, Suspend, Log Out, Restart and Shut Down. Buttons are located in the system menu (top right of the home screen).

Screen Lock

Lock your computer if you need to stay away for a while. The screen lock function prevents others from unauthorised access to the computer. Lock the computer by pressing the Screen Lock button from the System menu (top right of the home screen). The User can enable the automatic lock, and it helps to lock the screen when the computer stays idle for a specific period (e.g. 10 minutes). Find more options for securing the computer in Ubuntu Settings.

Suspend

If you need to stay away from your computer for a long time, apply the **Suspend** option to save energy. The machine will go into hibernation, stopping all-important operations (including network and memory). On a laptop computer, the suspension works very effectively and saves battery life. You can return from suspension by pressing any keyboard button.

Logout

If you have multiple user accounts on your computer, you can use the Log Out option to switch from one account to another. Log out option can also be applied to lock the screen.

Restart

Apply Restart option to stop the running processes and start the machine again.

Shut down

Power Off can be used to turn off the computer completely.

Conclusion

Ubuntu Desktop is an essential tool for ordinary computer users. Users can manage the daily computer tasks such as copying files, opening various applications, printing and browsing the web with the help of Ubuntu Desktop. The GNOME version 3 desktop is a state of the art one and comfortable for ordinary users. GNOME includes accessibility tools that make it more suitable for disabled people.

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Linux commands

Introduction

Commands are extensively used to do a specific task in the early days of the Linux operating system. At that time, the majority of the operating systems had no graphical user interface like a desktop. To print a document on modern computers, one needs to press the Print button. Then the software sends the instruction to the printer to start the print process. The Linux operating system provides the convenience of using both commands and graphical interface. System administrators, network administrators, database administrators, programmers, and Linux developers use Linux commands for the day to day activities. There are hundreds of Linux commands to apply in various contexts. In this chapter, we are going to learn the basic Linux commands that the beginners should know while using Ubuntu.

How to apply Linux commands

The tool that helps to apply commands on a Linux operating system is called Terminal. Type 'Terminal' in the search box on the GNOME home page to open the Terminal tool. Add the Terminal to the dashboard as a favourite application for quick launching. If you are using GNOME Classic Desktop, find the Terminal from, **Applications> System Tools**. The Terminal can also be opened using the short key, **Ctrl + Alt + T** buttons together.

Linux command Terminal

There are specific rules to be followed while using Linux commands. Otherwise, the Linux operating system will refuse to apply the commands. Beginners may find it a bit difficult when dealing with Linux commands. The commands for Linux must be case-sensitive. Whether the commands are in lower or upper case, it must be entered as such. Otherwise, the command will misinterpret and stop the action without implementing. Linux commands can have multiple parts. Space should be placed between each part. Otherwise, the Linux operating system will stop the action without applying commands. Linux users should be careful to follow syntax while applying commands. Type the command on the terminal and press the **Enter** button to apply commands. If the command is applied correctly, the result would be displayed on the Terminal screen or jump to the next prompt. If the command is not valid, the error message will be displayed.

Sudo command

The ultimate power on Linux operating systems is focused on the administrator; he is called the Super User / Root User. The sovereign of a nation will be the head of state. All power is concentrated at the head of the country. The same concept is applied to the **Super User** concept in the Linux operating system. A user must have the privilege to perform such tasks as installing, removing software, upgrading, opening files, modifying them, copying and moving file-folders. A user account is created while installing Ubuntu Linux. A user name and a password are assigned to the Linux account. This prime account holder is the **Super User** of Ubuntu Linux.

To work as a superuser, you must add the word sudo to all of the commands. The full form of the word sudo is **Super User Do**. The Password will be asked when the sudo command is applied. Type the password assigned to the account you created at the time of Ubuntu installation. The * special character is symbolically displayed when a password enters on the Windows operating system. While typing a password in a Linux terminal, nothing will be displayed. Type the password in the blank space and press the **Enter** button. The command will start running and show the result. Once you have added the sudo command, you will not be asked a password till 15 minutes.

APT commands

Advanced Packaging Tool (APT) is used by Ubuntu to perform new tasks such as installing new software packages, upgrading the already installed software packages, updating the package list, and upgrading. Let us get acquainted with a set of commands used to control the APT system.

Commands for Ubuntu update

Ubuntu Linux is a community project. Many experts are working on the development of Ubuntu, and the new updates come out frequently. Minimum five years are needed for the release of a new edition of Microsoft Windows. A new version of Ubuntu is released every six months. Ubuntu receives updates for each version regularly. Users need to know the commands to collect and add new updates to Ubuntu installation.

Update the package index

Ubuntu software repositories are available all over the world where they store collection of software packages. Ubuntu software repositories are available in India. Ubuntu users in India receive updates from software repositories dedicated to India. The software repositories in the country help the users to download the updates faster. Addresses of the software repositories are stored on the computer where Ubuntu is installed. For example, the new version/update of LibreOffice Software first appears in the software repository. The Ubuntu user needs to fetch the latest version packages from the software repository. Type the following command to update the package index on your computer. It fetches the latest package information available in the repository. While using update commands, the user should make sure that your computer has Internet access.

```
sudo apt update
```

Enter the password when prompted. This command checks the repositories and gathers information about the latest versions of the packages available.

Upgrade

Use the following command to download and install the latest version of the software and associated packages that are currently installed.

```
sudo apt upgrade
```

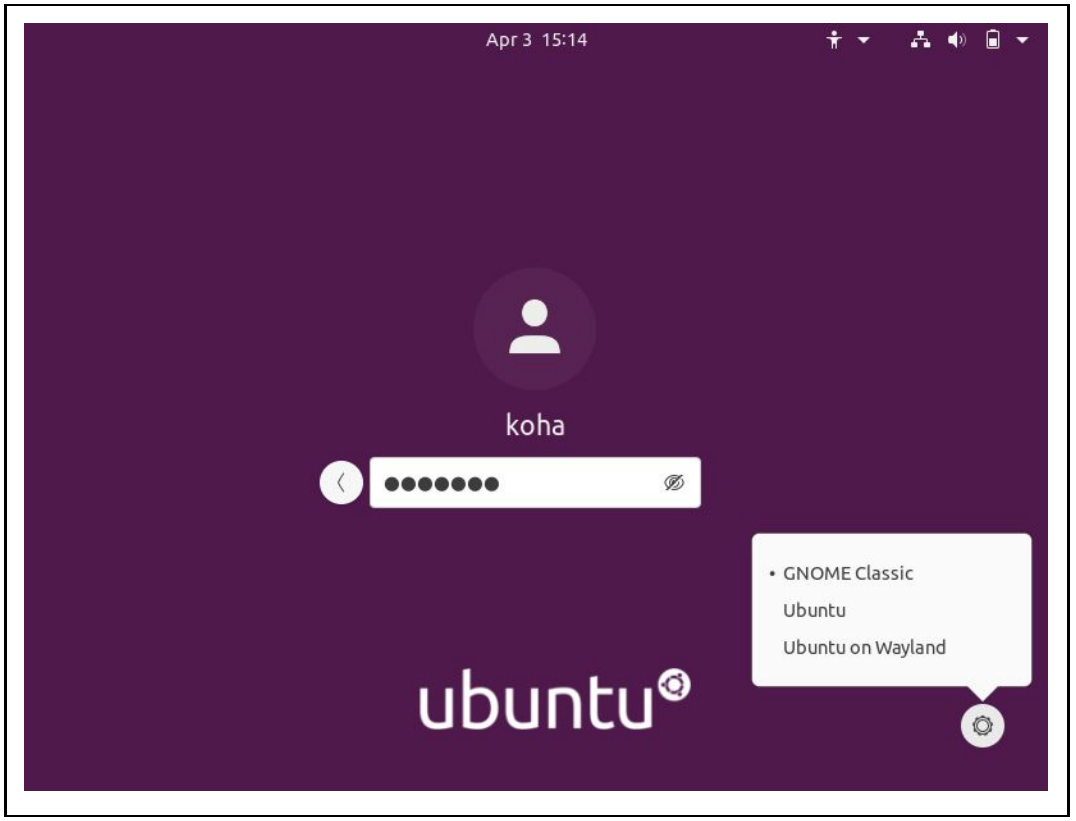
The above-mentioned commands need to apply regularly to keep Ubuntu Linux new.

Install GNOME Classic desktop

Apply the following command to install the GNOME Classic desktop.

```
sudo apt install gnome-shell-extensions
```

Once the installation is complete, log out from the GNOME desktop to enter into the classic desktop. Select the Log Out option from the **System Menu** on the top right of the GNOME desktop.



Ubuntu log out screen

Pressing the button at the bottom of the login screen will pop up the list of desktops. Select the **GNOME Classic** from the list. Enter the password and log in.

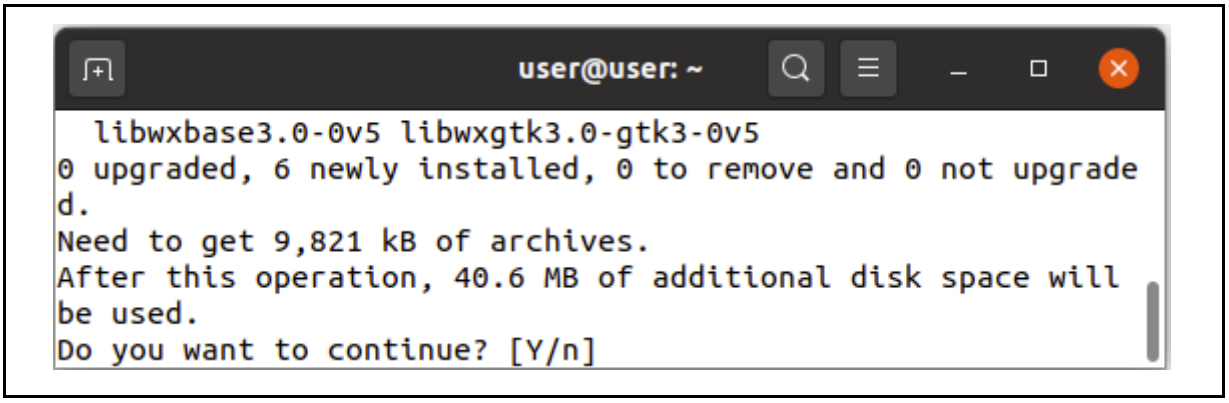
Install application software

New applications software can be downloaded using either software tool or using commands. Installing new software using the Ubuntu Software Tool is a simple process for beginners. Those who are familiar with Linux prefer installing software using commands.

Install a new software

Use the APT command to install new software from the Terminal. When applying the command, packages began to download from the Ubuntu Software repository and get installed on the computer. Apply the following command to install the image editing software GIMP.

```
sudo apt install gimp
```



Ubuntu will ask for confirmation on whether to install the software or not. Type **Y** to start the installation of GIMP. The packages began to download and install the GIMP software. GIMP software icon will appear on the **Applications > Graphics**.

Uninstall software

Use the following command to remove the installed software.

```
sudo apt remove gimp
```

Clean the packages

When updating Ubuntu and installing new software, several packages are downloaded to your computer. These packages are not required after the completion of update and installation processes. Cleaning such packages can save so much storage space. Here is the command to erase the obsoleted packages.

```
sudo apt clean
```

Use this command to remove associated packages that exist after uninstalling the software entirely.

```
sudo apt autoremove
```

Install the software from the Debian package

There is also a way to install software that is not in the Ubuntu software repository. Software such as Google Chrome and Team Viewer is not available in the Ubuntu software repository. The package file for installing such software should be downloaded from the website. Open the File Manager and move the package file from the Download folder to the Home folder. The extension of the Debian package is .deb and is similar to the .exe extension with Windows application installer.

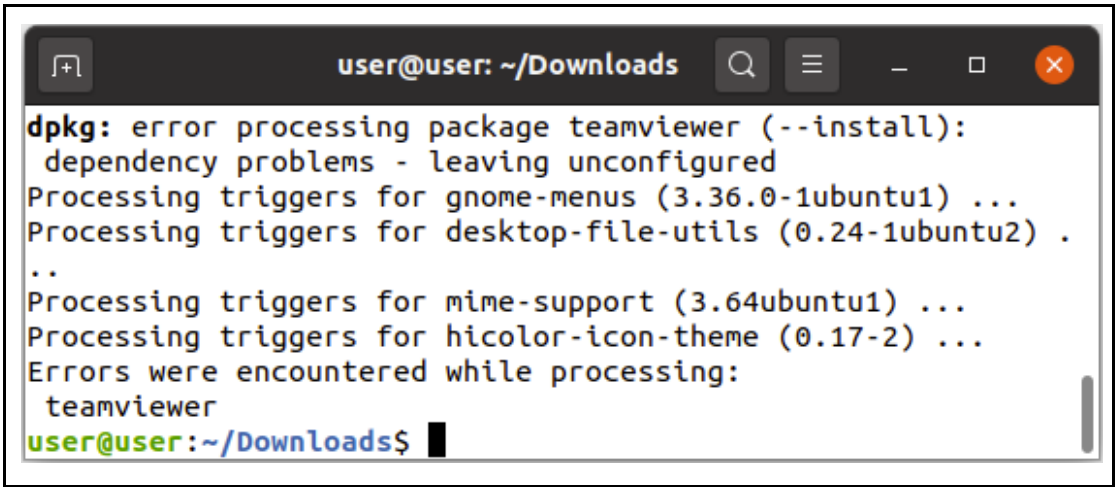
Apply the following command to install the Debian package of Google Chrome browser.

```
sudo dpkg -i google-chrome-stable_current_amd64.deb
```

The package **google-chrome-stable_current_amd64.deb** is lengthy and there is a chance for making mistakes while typing. If the package name is not appropriately given, the attempt of installation will fail. There is an easy way to enter the package name without mistakes. Press the Tab button after typing the first few lines of the package name (e.g. **sudo dpkg -i goo**) and will autofill the rest of the name. Another method to get the full file name put the * symbol after the few letters. It will install all Debian packages starting with google.

```
sudo dpkg -i google*
```

In some cases, the installation of a Debian package may fail due to the lack of additional software packages.



Installation fails due to the lack of associated packages.

In such a situation, apply the following command to download the missing packages to finish the installation of Google Chrome browser.

```
sudo apt install -f
```

The Google Chrome software icon will appear at **Applications > Internet** after the installation. Open the application software by pressing the mouse on the icon.

Basic Linux commands

Here are a few more commands to know for those who want to use Linux.

To know the Ubuntu version
When using a computer with Ubuntu Linux installed, this command will help to know the version.

```
lsb_release -a
```

To know the system information
This command displays details of the system architecture.

```
lscpu
```

To know the date and time
This command will show the current date and time using this command.

```
date
```

To know the user name

This command can be used to determine which account is logged in.

```
whoami
```

To know the working directory

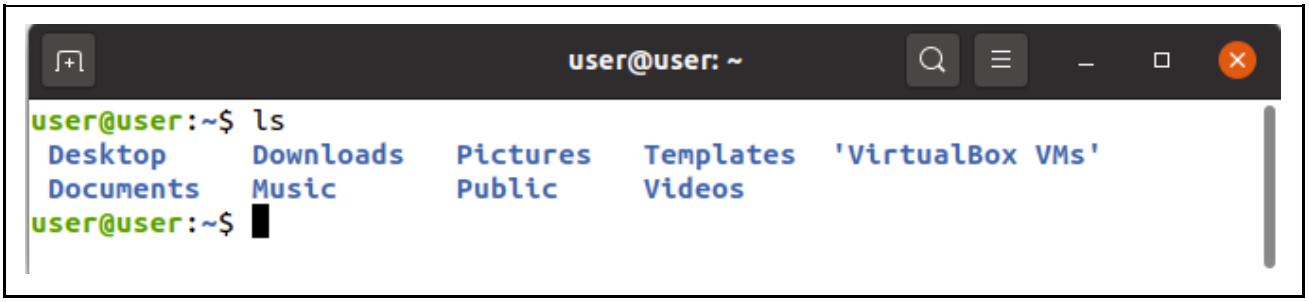
Each Linux account has its own folder. Once everyone is logged in, they will run from within that folder. This is called the Home folder of that account. The files and folders they create are stored in the Home folder. This command helps you to understand the location and name of the home folder.

```
pwd
```

To know the contents inside a folder

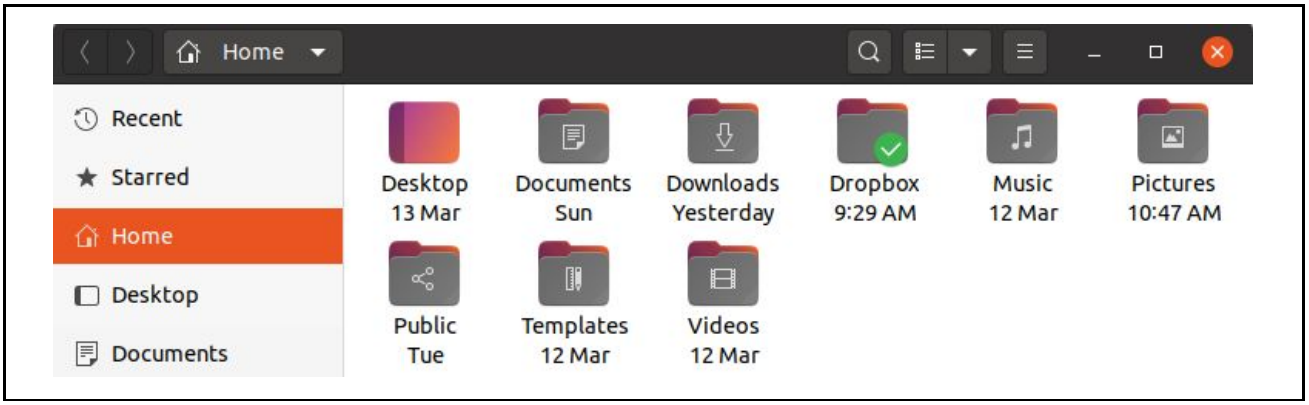
Apply the following command to list the contents inside the current folder you are in.

```
ls
```



Listing of the contents of the home folder.

You can see the list of folders and files. This is similar to what you see when you open the File Manager. Display the contents here in alphabetical order.



View of the home folder from the file manager.

To create a new folder

```
sudo mkdir tom
```

The above-mentioned command will create a folder called tom.

Remove/delete a folder

```
sudo rmdir tom
```

The above command will delete the folder called tom.

To enter inside a folder
There is a folder with the name Public in the home folder. Apply the following command to enter inside the Public folder using a terminal.

```
cd  Public
```

Apply pwd command to check whether you are inside the folder, Public.

To exit from a folder
Apply the following command to exit from the Public folder.

```
cd  ..
```

Apply pwd command to check the current location.

Open a text file using Terminal

Many occasions Linux users need to open files and make changes in it. First, make sure which text editor application is available on your computer. Text editor applications can be found at **Applications > Accessories**. Linux-based operating systems are using different applications for the default text editor. For example, GNOME uses **Gedit**. Install a new text editor, if you are not sure about the name of the default text editor. The **Mousepad** is a lightweight text editor. To install Mousepad, apply the following command,

```
sudo apt install mousepad
```

Open a text file using Mousepad

First, find the location of the file to open. For example, apply the following command to open the **syslog** file located at **/var/log**. We use the **Mousepad** text editor to open the file.

```
sudo mousepad /var/log/syslog
```

Syslog file contains the running history of each movement in Linux.

Conclusion

Hundreds of Linux commands are available for different purposes. Linux commands can be applied to perform all sorts of administrative tasks. People who work with the GNOME desktop are not required to use commands. There is no need to memorize all Linux commands. The more you use, the commands will become familiar. Search and find commands using search engines from the web when need arises.

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https://codeburst.io/a-beginners-guide-to-using-apt-get-commands-in-linux-ubuntu-d5f102a56fc4

Difference Between apt and apt-get Explained
https://itsfoss.com/apt-vs-apt-get-difference/

25 Useful Basic Commands of APT-GET and APT-CACHE for Package Management
https://www.tecmint.com/useful-basic-commands-of-apt-get-and-apt-cache-for-package-management/

dpkg command
https://help.ubuntu.com/lts/serverguide/dpkg.html

40 Basic Linux Commands used Frequently
https://linoxide.com/linux-command/essential-linux-basic-commands/

Basic Linux/Unix Commands with Examples
https://www.guru99.com/must-know-linux-commands.html

Useful Softwares

Introduction

There are lots of Free software to support day to day activities of Ubuntu users. These can be installed either through the Software Center or through APT command. In this chapter introduces the few of the popular softwares in various segments.

Utility Softwares

Mousepad
The mousepad is a simple text editor. The default text editor of Debian Linux. The same can be installed on Ubuntu Linux.

```
sudo apt install mousepad
```

Shutter
The shutter is a handy screenshot tool. Annotation is also possible on screenshot. To install the shutter, apply the following commands to the terminal one by one.

```
sudo add-apt-repository ppa:linuxuprising/shutter
sudo apt-get update
sudo apt install shutter
```

Flameshot
FlameShot is another great piece of software to capture screenshots.

```
sudo apt install flameshot
```

Graphics

GIMP
GIMP (GNU Image Manipulation Program) is a popular image editing software. Gimp possesses many features and functions similar to Photoshop software.

```
sudo apt install gimp
```

Cheese
Cheese is the software for running a web camera. Useful for taking photos and recording videos using a web camera.

```
sudo apt install cheese
```

Multimedia

VLC
VLC is a feature-rich multimedia player. It can be used as a video and audio player.

```
sudo apt install vlc
```

Audacity
Audacity is an audio editing software. User can add the metadata and convert the audio to various formats like mp3 and Ogg.

```
sudo apt install audacity
```

OpenShot
OpenShot is a great video editing software for beginners.

```
sudo apt install openshot
```

Kazam
Kazam is a screencasting software. Activities on the computer screen can be recorded as a video. Sound also can be recorded through the microphone. Kazam is useful for creating videos for learning purposes.

```
sudo apt install kazam
```

Internet

Transmission

Transmission is a torrent client which helps to download big files from the Internet without any interruptions. Movies and Linux-based operating system installer images (ISO files) are big and convenient to download using Transmission.

```
sudo apt install transmission-gtk
```

Anydesk
Anydesk is a proprietary software that allows connecting to a remote computer. Installer package is available at https://anydesk.com.

Filezilla
Filezilla is an FTP (File Transfer Protocol) application extensively used for website management. This tool is helpful for uploading files to remote servers.

```
sudo apt install filezilla
```

System tools

Synaptic
Synaptic is an older generation software package manager. Helpful for installing and removing software packages from Ubuntu.

```
sudo apt install synaptic
```

Bleachbit
Bleachbit is a computer storage cleaner that removes unwanted system files, and cache. Bleach Bit offers a variety of options to speed up the Linux operating system by removing obsoleted files.

```
sudo apt install bleachbit
```

Office

LibreOffice
LibreOffice is the most popular Free software office pack. The features of this software make it a step ahead of Microsoft Office. LibreOffice Package includes tools like a word processor, spreadsheet, presentation and drawing tools. LibreOffice is preloaded with most of the Linux-based operating systems.

```
sudo apt install libreoffice
```

AbiWord
A simple and lightweight word processor.

```
sudo apt install abiword
```

Gnumeric
A simple and lightweight spreadsheet package.

```
sudo apt install gnumeric
```

Evince

Default document viewer of the GNOME desktop. Useful to open and view PDF and Postscript documents.

```
sudo apt install evince
```

Okular
Okular is a software that helps you to open and read files including PDF, XPS and e-Pub (eBook format). Okular is the default document viewer available with KDE Desktop. It can also be installed on the GNOME desktop.

```
sudo apt install okular
```

FB Reader
An e-book reader.

```
sudo apt install fbreader
```

Calibre
Calibre is the best software that can be used to create, store, and read eBooks.

```
sudo apt install calibre
```

GNU Cash
GNU Cash is a financial accounting software.

```
sudo apt install gnucash
```

Conclusion

This chapter introduces some of the most versatile softwares available in the Ubuntu repository. Discussion forums, magazines and blogs are the best sources to get information regarding software for different purposes.

Regional languages in Ubuntu

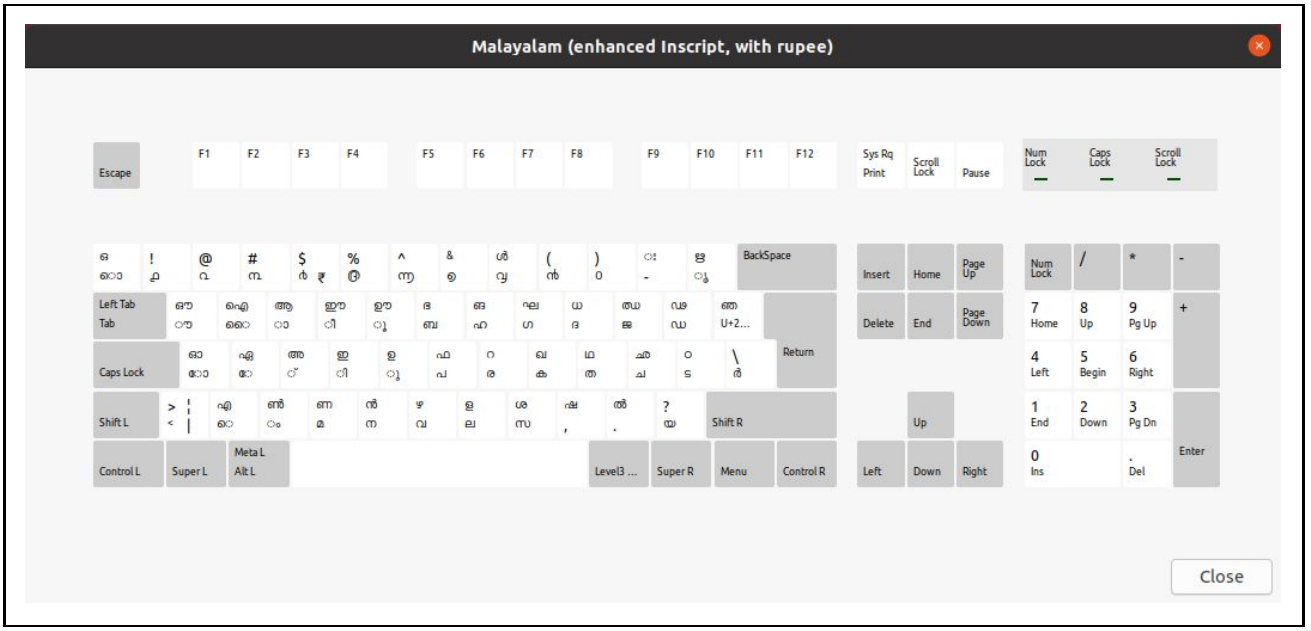
Introduction

The 2011 census confirmed that there are more than 1,000 languages in India. Languages that are used as a mother tongue by more than 1000 people listed in the table of Mother Tongue. Total of 121 languages have been included in the mother tongue list. 96.71% of the total population of India uses one of the languages listed in the mother tongue category. Hindi, Bengali, Marathi, Telugu and Tamil are the five most spoken languages.

In the early days, computers could only handle the English language. Various methods have been used in the past to manage Indian languages, but these have not been effective. With the development of the Unicode standard, non-English languages became easy to use with computers. Input methods and fonts are developed for Indian languages by the Free software communities such as Indic Project and Swathanthra Malayalam Computing. Language tools are available on Linux-based operating systems since the early years of its development. These tools help to manage regional languages well.

Input methods

There are mainly two input methods for the Indian language; InScript and Transliteration Methods. InScript is an input method developed by the Government of India for Indian languages. Similar keyboard Layout is used for all Indian languages in Inscript.

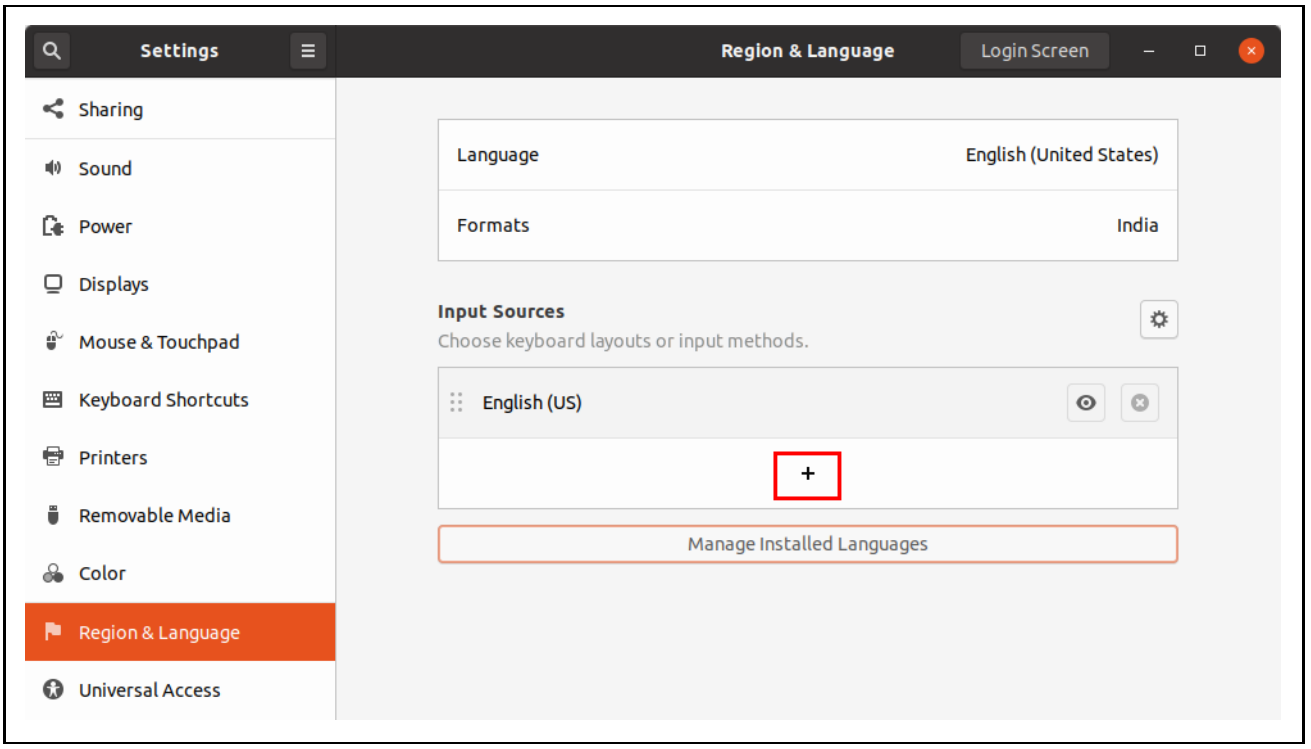


Malayalam Inscript keyboard layout.

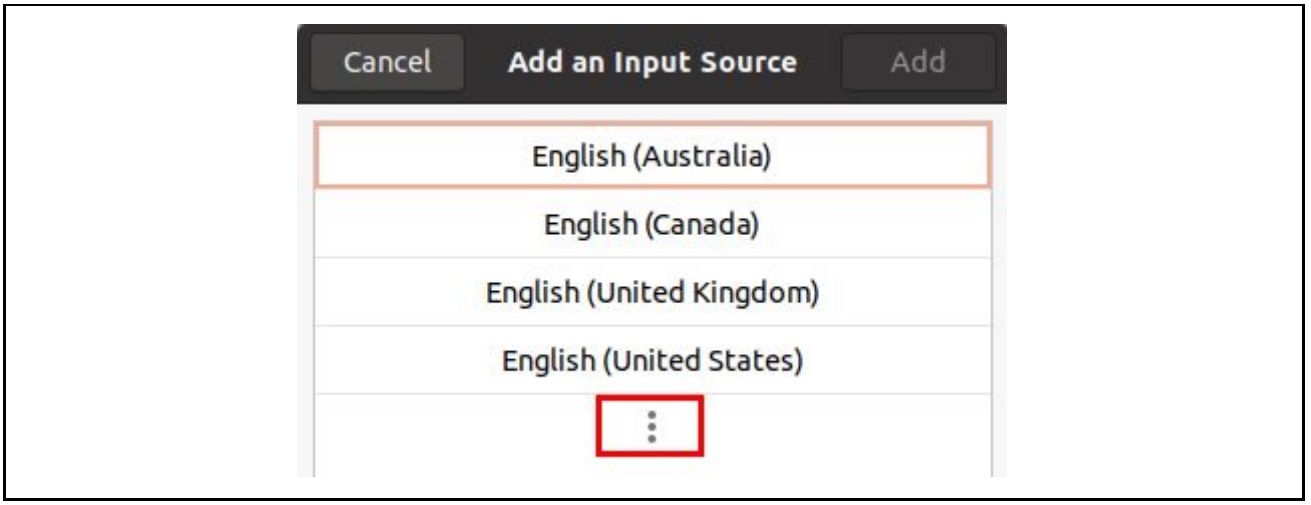
InScript is available on all Linux operating systems. So there is no need to install it separately.

How to enable a regional language

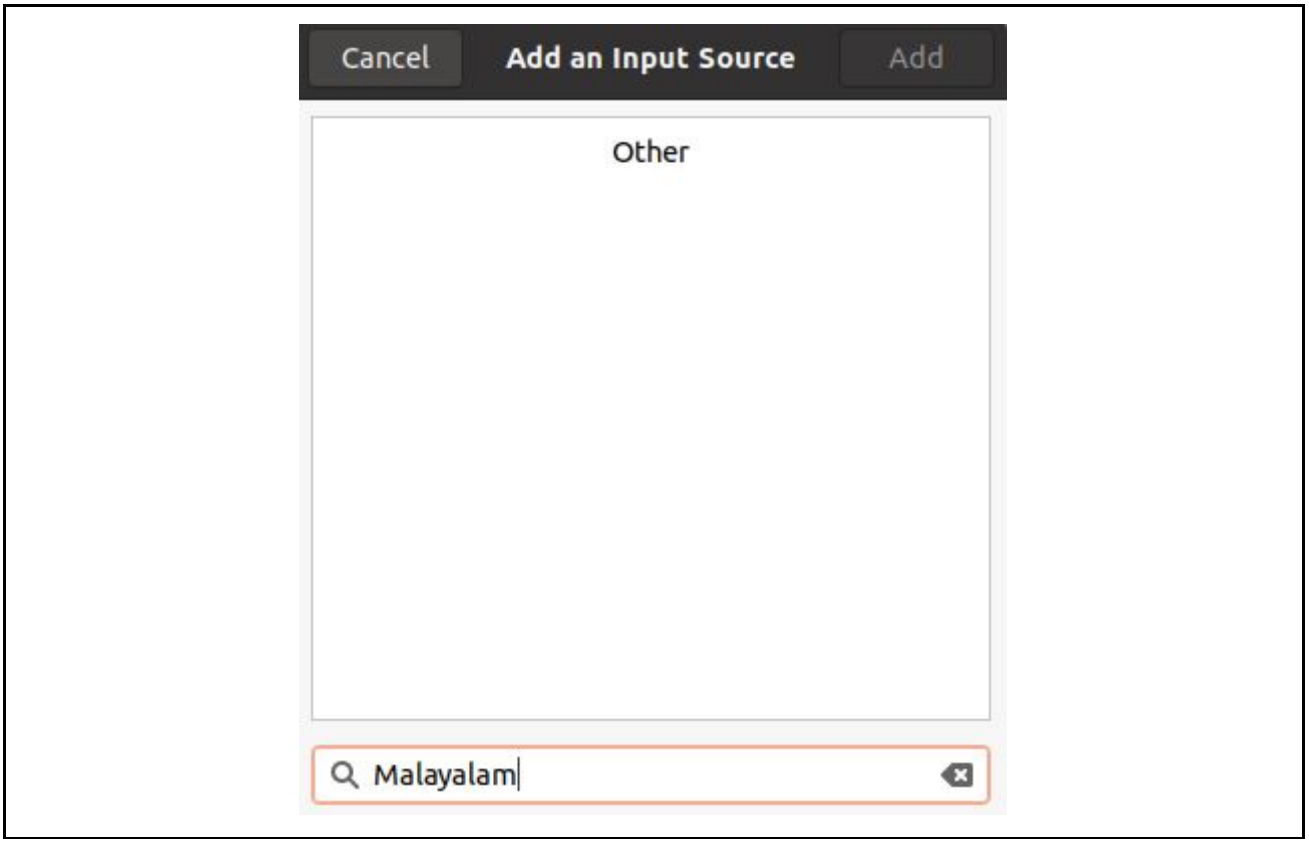
Select the keyboard layout from **Settings > Region & Languages > Input Sources**.



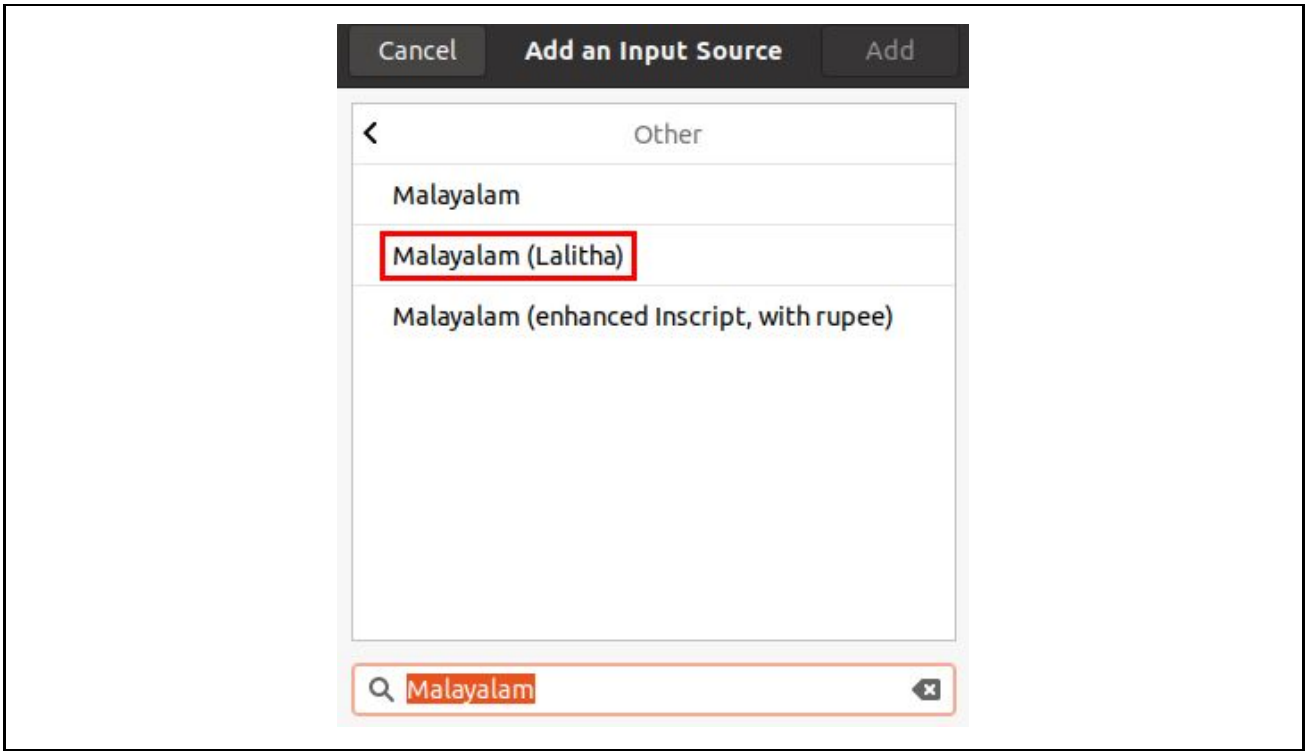
Press **+** button to add a new language.



Press on the **three dots** button.



Search for **Malayalam**.

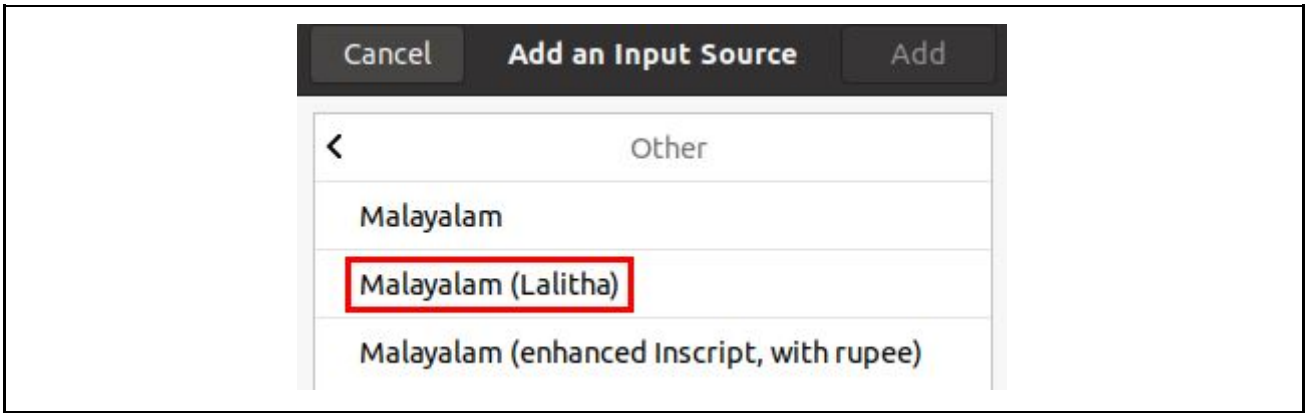


Select the Inscript layout, **Malayalam** or **Malayalam (Enhanced Inscript, with rupee)**.

The selected keyboard layout will appear on the top panel.

Transliteration

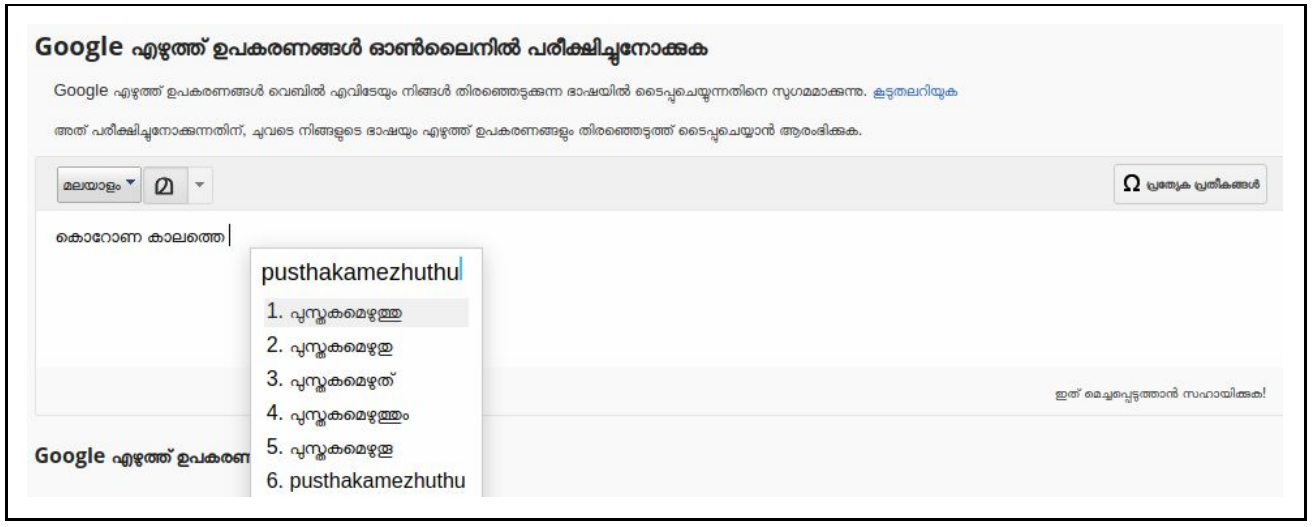
Transliteration is much easier for people who are not familiar with Malayalam InScript keyboard layout. Transliteration refers to the method of conversion of a text from one script to another that involves swapping letters in predictable ways. There are many tools available to input regional languages using transliteration. Lalitha in Linux keyboard layout helps you to type Malayalam in Transliteration mode.



For example, to write 'കാക്ക', (Crow) in Malayalam type 'kaakka' using the English keyboard. Transliteration is based on pronunciation and not on meaning. No need to know the regional language keyboard layout to translate Malayalam into transliteration mode. Transliteration is the most natural input method for local languages.

Google Input Tools

Google Input Tools is an easy to use transliteration tool for prominent languages. Visit the Google Input Tools website and select the language to write. No need to install anything to enable the service. The web URL, https://www.google.com/inputtools/try. We can find prominent languages (Indian and international) in Google Input Tools. The following is the steps to enable and use Google Transliteration for Malayalam. The same steps can be followed to enable other languages.

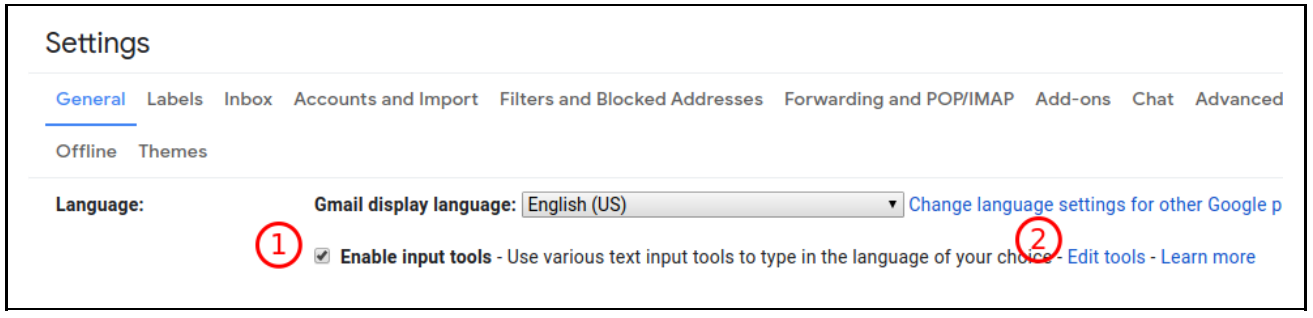


Google Input Tools for Malayalam.

After entering the content, copy it to a word processor. Format using the word processor.

Enable Input Tools on Google services

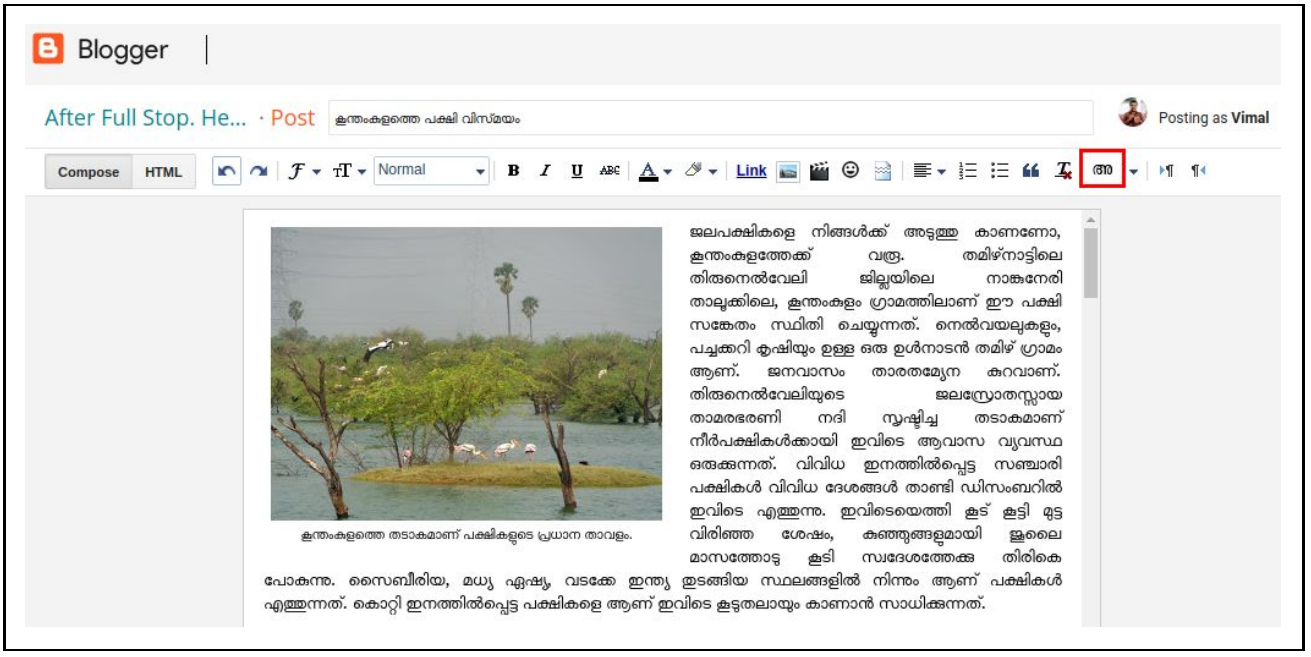
The transliteration system is available on all Google services such as Blogger, Drive and Gmail. For example, a Gmail user can write letters in Malayalam by activating the transliteration. To activate Malayalam in Gmail, select **Enable Input Tools** from **Settings**.



Gmail settings page.

First, select **Enable input tools**. Go to **Edit tools** and select Transliteration.

Once enabled, users can input in regional languages on any Google services. For example, Blogger is the blogging service of Google. Blog posts can be written in Malayalam using transliteration tools.



A blog post was written in Malayalam using Google Transliteration tool.

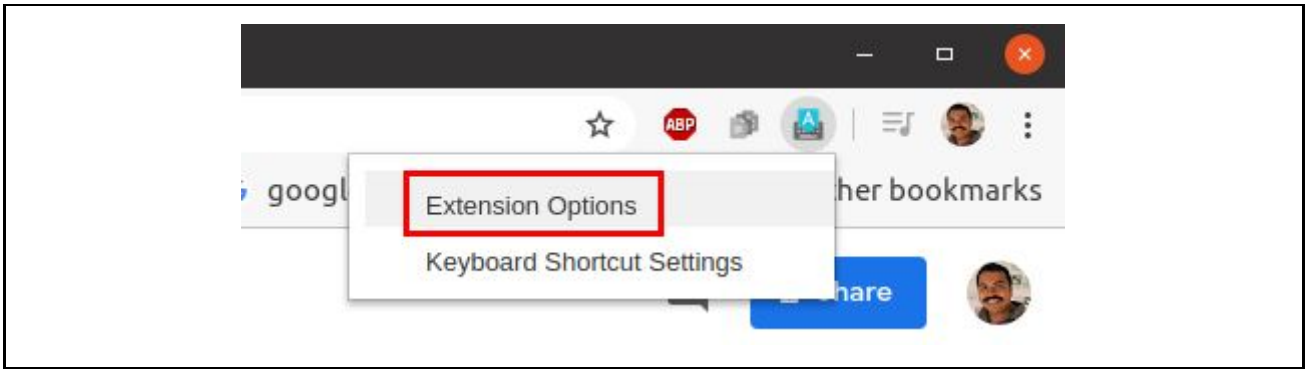
Enable Input Tools on Chrome browser

Google Input tools can be added to Google Chrome browser as an extension. Users can write Malayalam on any websites opening in Chrome browser. For example, users can write comments on Facebook in Malayalam using Google Input Tools.

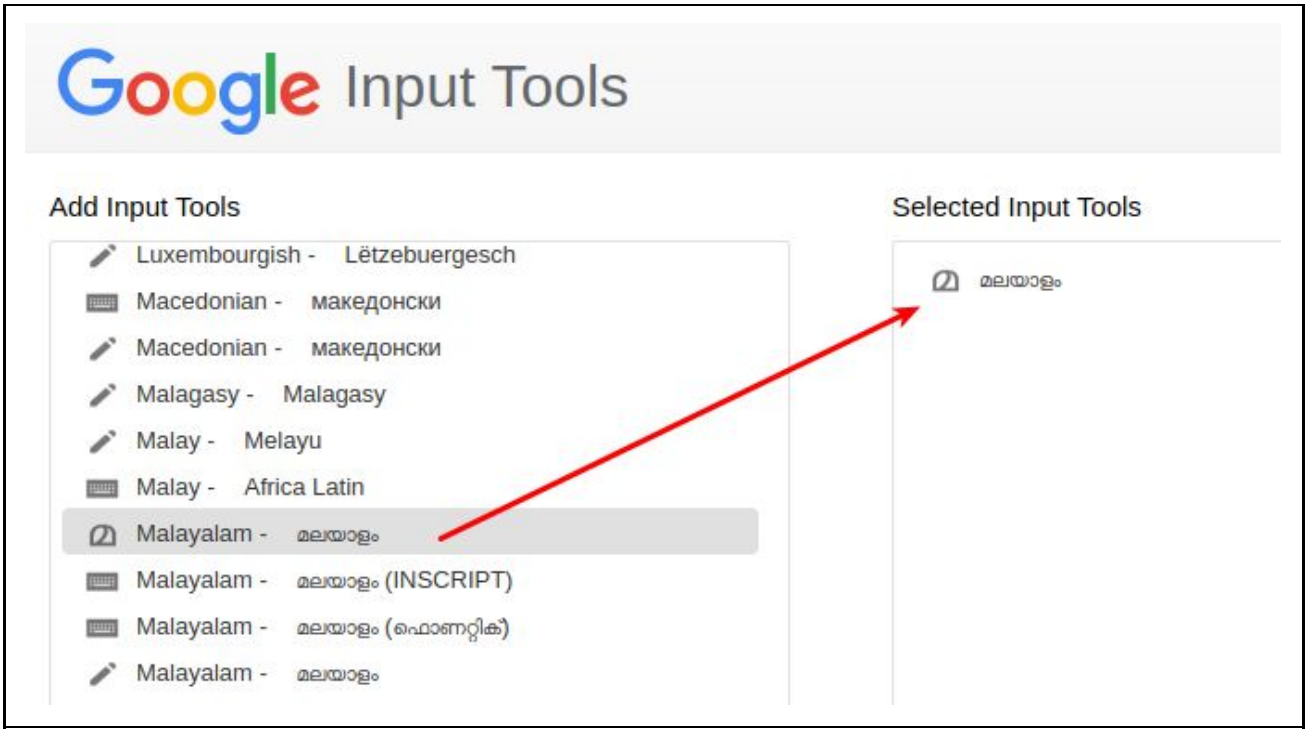
To add Google Input Tools extension, open Google.com via Chrome browser and search for "**google input tools chrome extension**". From the result, find the page of **Input Tools extension**.

Install by pressing the **Add to Chrome** button. Google Input Tools icons will appear on the browser toolbar.

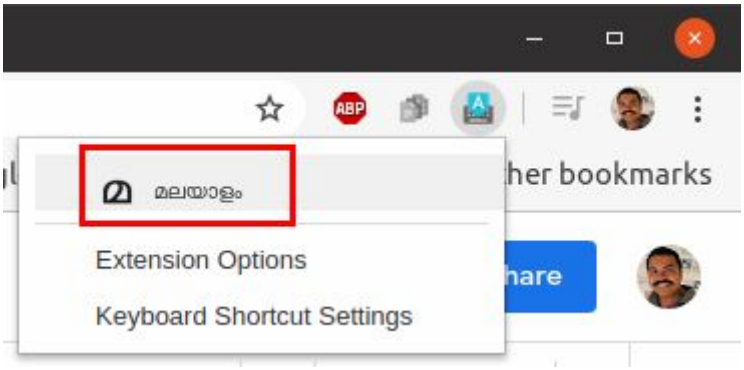
Users can add more than one language to Chrome extension. To add a language, click on **Input Tools** and select **Extension Options**.



Select the desired language from the list. Move the language to the left panel.



Close the tab after selecting the language. Click on the browser extension to see the language.



Select the language and start writing on any website open in Google Chrome browser.

Malayalam fonts

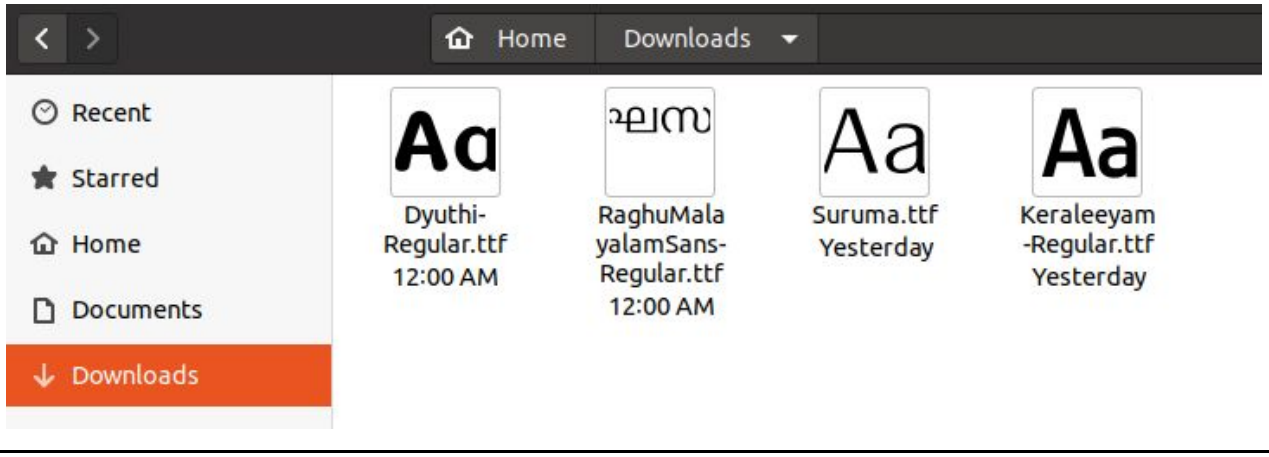
Malayalam Unicode fonts are available to make Malayalam content beautiful. Many Malayalam fonts have been developed by the Swathanthra Malayalam Computing. The same way, Indic Project has developed fonts for Indian languages.

Install fonts

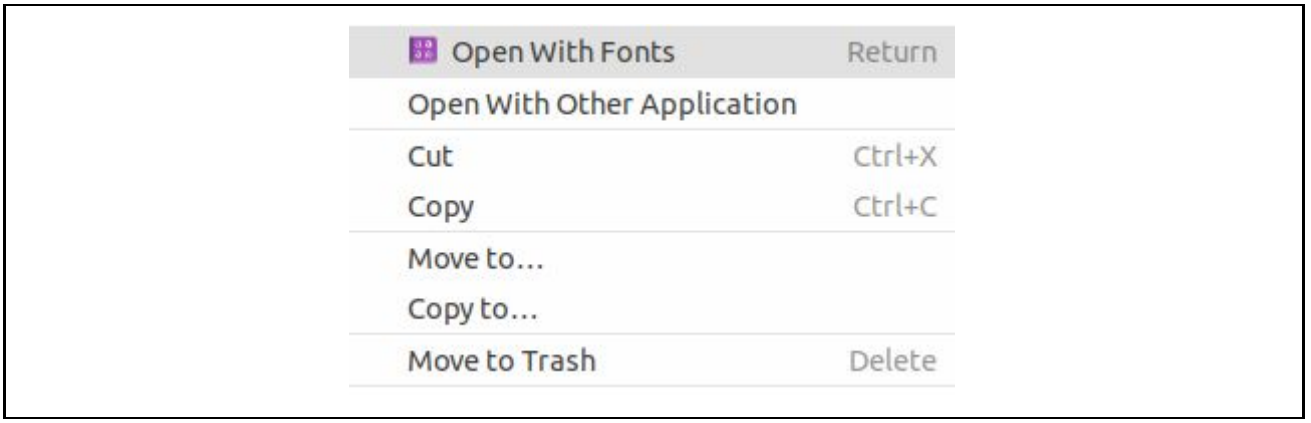
Users can install all the Indian fonts from the Ubuntu repository. Apply the following command to install the fonts.

```
sudo apt install fonts-indic
```

Another method is to visit the concerned website and download the fonts. Malayalam Unicode fonts are available at https://smc.org.in/fonts. Download the fonts to the computer. Open the file manager and find the fonts in the **Download** folder.



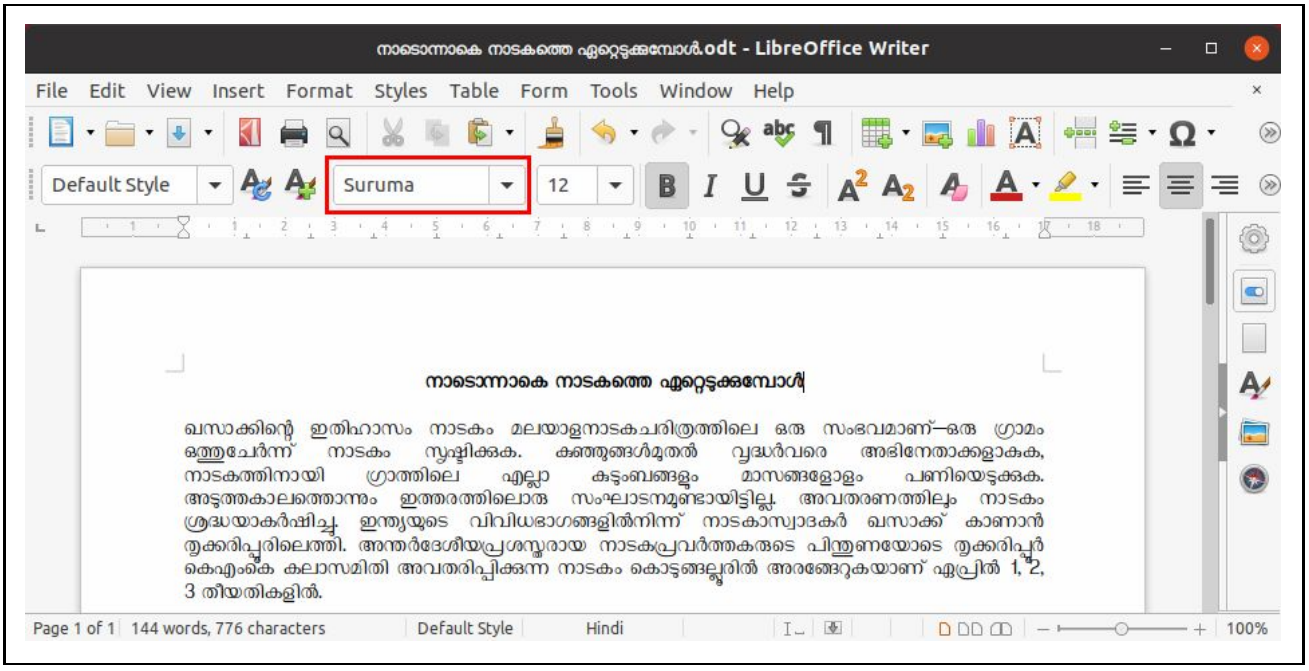
Select the font and press the Right mouse button. Select **Open with Fonts**.



The font installer window will open and press the **Install** button.

Font manager

Open any document with Malayalam content using LibreOffice Write. Check the newly installed font available in the list.



Malayalam content in LibreOffice writer.

Fonts can be installed easily with the help of the Ubuntu Fonts manager.

Conclusion

Linux-based operating systems are friendly towards local languages. The volume of content in local languages increased with the advent of language input tools. Transliteration-based input methods are popular among the public because of its simplicity and easy management.

References

Ethnologue Guides
https://www.ethnologue.com/guides

Data on Language and Mother Tongue
http://censusindia.gov.in/2011Census/Language_MTs.html

Applied Malayalam Computing
https://thottingal.in/page/malayalam-computing-course/

Indic project
https://indicproject.org/

Swathanthra Malayalam Computing
https://smc.org.in/

SMC Malayalam fonts
https://smc.org.in/fonts/

How to acquire knowledge?

Introduction

The growth of free software and related activities is accelerating. New features and improvements are rolling out with the support of the software community. So users can enjoy the software updates and new features immediately. Anyone interested in the Free software movement needs to know changes in the domain and learn new updates. There are plenty of platforms for Free software lovers to meet and exchange ideas. By joining them, one can accurately identify changes in the Free software domain and use them for the well being of society. Here we will discuss the various channels that can be used to share and receive developments in the Free software.

User guides

All free software provides very comprehensive user guides. Software documentation is available on the concerned software web sites. Often, different documentation is available for software users and administrators. Various aspects of software installation and maintenance can be found in the technical documentation. Here we introduce Ubuntu guides.

Ubuntu Help

A comprehensive user guide of Ubuntu Linux is available at Ubuntu Help website. Things are presented in simple language with illustrations and are easy to digest. The user guide, for long term support versions of Ubuntu, is available from the Ubuntu Help website. Home page, https://help.ubuntu.com/.

Ubuntu Wiki

Frequently asked questions, things to care for, tips and tricks are included in the Ubuntu Wiki. Ubuntu Wiki home page, https://help.ubuntu.com/community/CommunityHelpWiki.

Discussion forums

A discussion forum is a public place for everyone in the Free software community to ask questions to resolve their doubts. The forum is categorised into various topics for convenience. Users can find categories like beginner's questions, hardware, desktop and installation etc. Users from various countries participate in the discussion forums. English is the primary language of the forum. Ask questions in simple words and short sentences. The user should mention the version of Ubuntu with the question. If you have a question about software errors, include the Error message to the question. Take the screenshot of the problem screen and add to the question. Detailed information regarding the problem can give a precise solution within a short time. Following are the prominent discussion forums of Ubuntu.

Ubuntu forum

Ubuntu forum is the official platform to ask questions. Users are allowed to discuss any editions of Ubuntu. Home page of Ubuntu forum, https://ubuntuforums.org/.

Ask Ubuntu

Ask Ubuntu is a live platform to ask questions. First, make a search for the problem in the forum. There is a high chance to get an answer among the already solved questions. Home page, https://askubuntu.com.

Ubuntu Loco Team portal

This website is helpful to find a person associated with the Ubuntu project in every country. The User can find the links to the local Ubuntu community. Home page, https://loco.ubuntu.com/teams/.

Ubuntu community hub

Ubuntu community hub is a platform for a person associated with the Ubuntu project. Space for discussions, questions, announcements available here. Home page, https://discourse.ubuntu.com/.

Blogs

Following blogs is a great way to update and learn new developments in the Free software community. Blogs publish news, updates regarding software, training announcements, learning materials and more. Users can subscribe to the updates by adding the email to the blog. Notifications from the blog regarding new posts immediately will arrive at the inbox when new posts come out. Here we introduce popular Free software blogs.

OMG Ubuntu

A great blog for beginners. News, tutorials, tips and trips can be collected from OMG Ubuntu blog. Blog home page, https://www.omgubuntu.co.uk/.

Linux Scoop

Another blog for Linux beginners to find tutorials, and software introduction. Blog home page, https://linuxscoop.com/.

TecAdmin

TechAdmin is an excellent blog for users with basic Linux knowledge. Blog home page, https://tecadmin.net/.

TecMint

TecMint is a suitable blog for students trying for Linux certification. Blog home page, https://www.tecmint.com/.

NixCraft

A useful blog for Linux system administrators. Several tutorials have been included in this blog. Blog home page, https://www.cyberciti.biz.

It’sFOSS

It’sFOSS is a blog that regularly publishes software reviews, news and tutorials. Blog home page, https://itsfoss.com.

Social media

Social media is a great medium to keep in touch with the latest developments in any field. Social media can be accessed through mobile apps, so it is easy to spread information and join groups. Free Software Groups are very active in social media. Here's how to get free information about Free software and Linux-based operating systems using prominent social media services.

Twitter

Twitter is a microblogging service. Twitter currently allows posting messages with 280 words. The advantage of using Twitter is that you can read the messages in a nutshell. Links to websites can also be added to the messages. Free software projects maintain a Twitter account to inform the latest developments to the community. Publishers, individuals, blogs, and organizations make using Twitter to deliver messages to the public. Search using keywords to find the desired Free software channels. Click on the **Follow** button to join the channel and get regular updates. Search the names of the blogs, as mentioned earlier on Twitter and follow their channels. Install the Twitter App on your mobile too. Twitter home page, https://twitter.com.

YouTube

YouTube is a popular video-sharing service, and Free Software lovers can find videos for learning and knowledge updates. Use keywords to search and find YouTube channels. Videos on review, benchmarking, and the installation of Linux-based operating systems are popular on YouTube. Subscribe the channels to get regular updates of new videos. YouTube home page, https://www.youtube.com.

Instant messengers

Instant Messenger services are ideal for live communication with the Free Software community. Although WhatsApp Messenger is very popular, it can accommodate only 256 people in a group. One of the most widely used free software communication groups is Telegram.

Telegram messenger

Telegram groups can accommodate up to 200,000 members. Newly joined users can read old messages. Group admins can add welcome messages, automatic warnings, and conduct surveys

among group members. The admin can implement many controls for the smooth running of the group. Information about telegram groups can be obtained from Free Software community websites. Groups can search and find from the Telegram app. Messages in a group can be read without joining the group. 'IB Computing' is a leading group of Free Software users from Kerala. Publishers like newspapers, magazines, and blogs use Telegram to broadcast news. 'ItsFoss' blog maintains a Telegram channel to inform new blog posts. Telegram App can install from Google Play Store. Telegram has a web interface for using on computers. Telegram web interface URL, https://web.telegram.org.

Periodicals

Free Software lovers can collect information to learn new things from magazines, newspapers, and newsletters.

Magazines

Magazines publishing from India and abroad are useful to get updates on Free Softwares. Let’s acquaint ourselves with such magazines.

Open Source For You

Open Source for You is a high-quality Indian magazine exclusively for Free software. Visit the magazine websites to read the featured articles. Home page of Open Source For You, https://opensourceforu.com.

Digit

Although it is a magazine that covers everything related to the computer, Free Software related news and articles are well placed in each issue. Linux-based operating system ISO images and application software files include in the DVD that comes with each issue of the magazine. Home page of digit magazine, https://www.digit.in.

Full Circle Magazine

Full Circle Magazine is an online magazine with a complete focus on the Ubuntu Linux operating system. It's a monthly magazine and available in English and French languages. The magazine can be downloaded in PDF and EPUB format. Give the mail address on the web site to get the notification on new issues. Magazine home page, https://fullcirclemagazine.org.

Info Kairali

Info Kairali is a computer magazine published in the Malayalam language. It is also the only computer magazine in India publishing in the local language without any delay for 15 years. There are Free Software related articles and guidelines for each issue. Info Kairali is a monthly magazine. Subscription details of the magazine on their website, http://www.infokairali.com.

Training programs

Various groups, organizations and institutions conduct Free Software training. Information about the training programs can be found through social media, Telegram and WhatsApp groups. Often classes are lead by experts in the concerned disciplines. The participants will get training with hands-on experience. Training programs facilitate the opportunity for participants to meet peers and share their knowledge.

Learning programs

Linux lovers start the learning process with the help of aids available on the Internet. Although Linux is taught as part of College and University level courses, students do not get a separate certificate to prove their expertise. Acquiring a certification on Linux is an added advantage for the candidates seeking a job. Get familiar with the various Linux certification programs.

Linux+ CompTIA

This is a primary Linux certification program that helps the participants to acquire the expertise to handle Linux. Such expertise is needed in all types of companies. Home page, https://www.comptia.org/certifications/linux.

Red Hat Certified Engineer

Redhat Certified Engineer-RHCE is considered as one of the best programmes on Linux certification. RHCE course includes a foundation course called Red Hat Certified System Administrator-RHCSA. Students can join an institution that offers training and prepare to attend Red Hat examinations. Home page URL, https://www.redhat.com/en/services/certification/rhce

GIAC Certified Unix Security Administrator

This program concentrates on Linux security. Home page, https://www.giac.org/certification/certified-unix-security-administrator-gcux

Oracle certified programs

Their Linux certification programs combine two levels; OCA & OCP. Home page, https://education.oracle.com.

Linux Professional Institute Certifications

The Linux Professional Institute runs Linux certification programs with various phases. Home page URL, https://www.lpi.org.

Check the website of each of the certificate programs to get a clearer understanding of the programs. Prepare for the examinations with the help of training institutes.

View publication stats

Conclusion

All learning resources on Linux-based operating systems and Free Software are available free. Therefore, it is convenient to study and become proficient with the help of free learning resources. Social media and messenger services will help to join Free software groups, share ideas, and gain knowledge. Along with gaining knowledge, share your experience with others to benefit society.