



<https://bit.ly/ubuntu-fest>





UBUNTU INSTALLATION FEST

KHARAGPUR OPEN SOURCE SOCIETY



DISTRO INSTALLATION FEST | KOSS



PREREQUISITES!



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An Enthusiastic mind



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Craving to play with a new OS



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An Enthusiastic mind

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Nothing more:) You are good to go!!



LET'S GET STARTED!

Overview

- Intro to GNU/Linux
- Benefits of GNU/Linux
- Families of distros
- Ubuntu Installation
- User mode and Kernel Mode (Sudo)
- File System
- Package manager
- Funny tools
- Terminal commands
- Shell and Basic Shell Scripting





SO... WHAT IS GNU/LINUX?

Fun Fact:

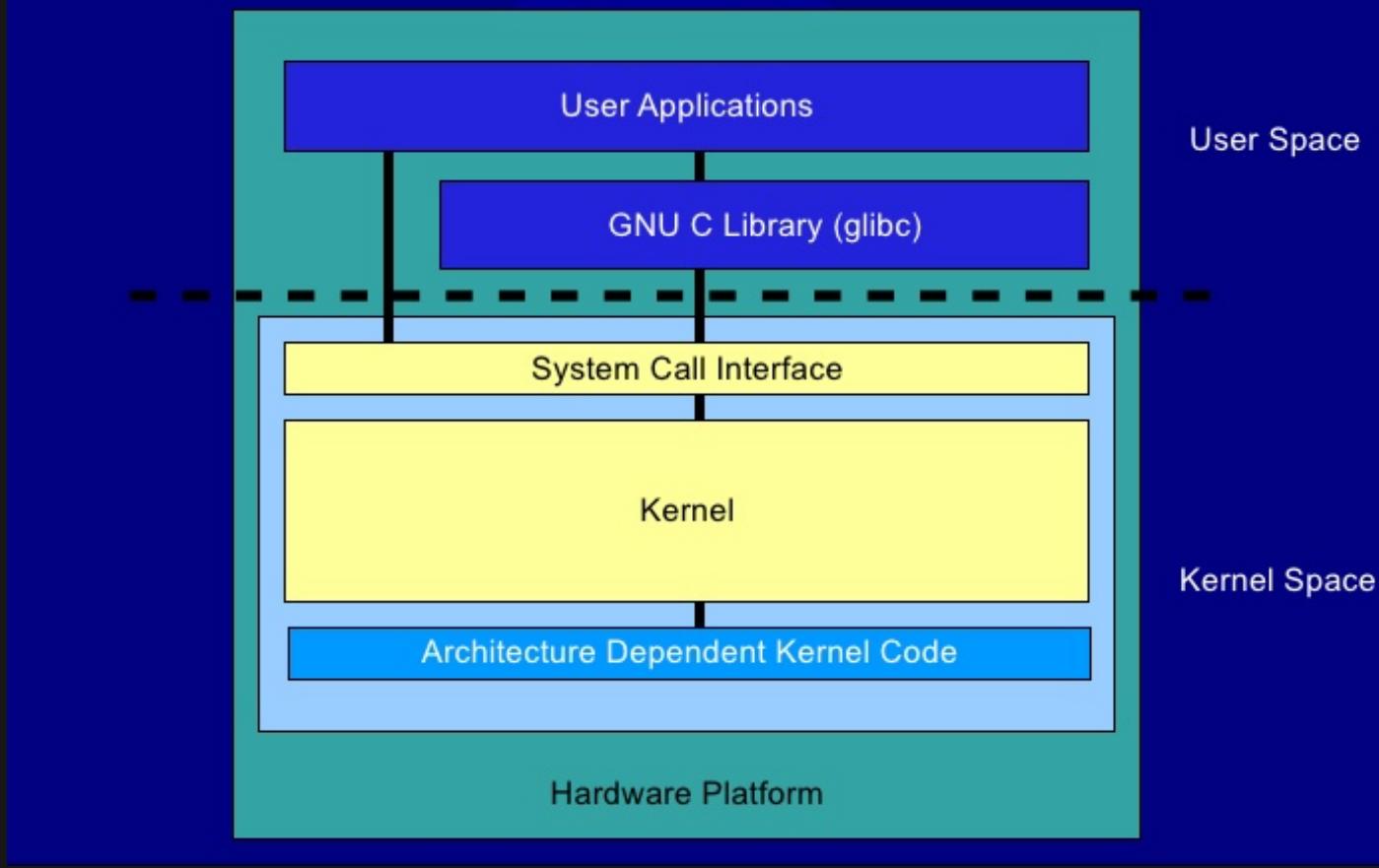
GNU stands for GNU is Not Unix. This is a **Recursive Acronym !!**





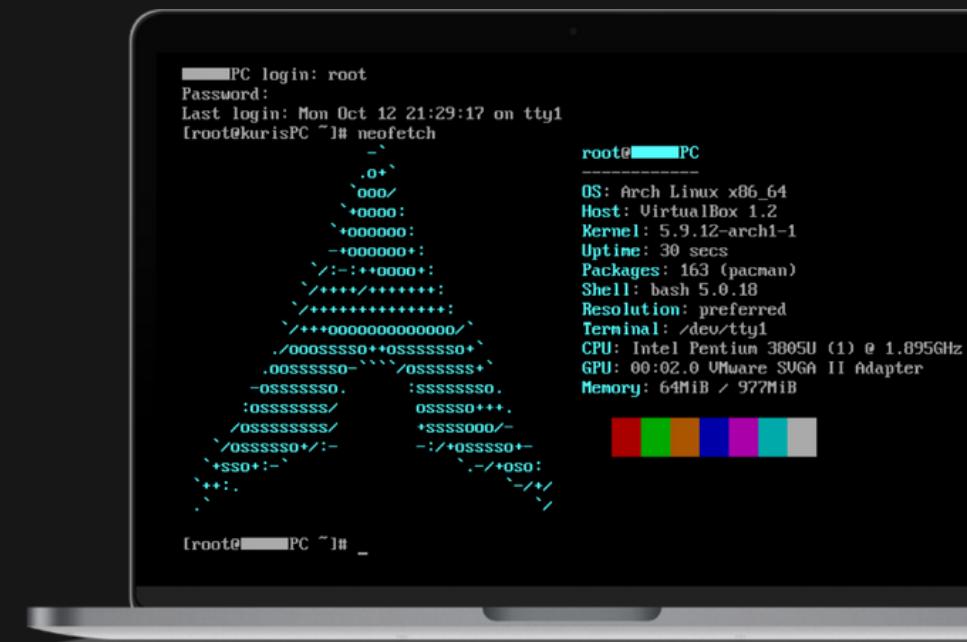


Fundamental Architecture



GNU/Linux is an open-source operating system based on the **Linux** kernel, which was originally created by Linus Torvalds in 1991.

The operating system is a combination of the GNU Project's tools and libraries and the Linux kernel, which is responsible for managing system resources such as memory, CPU, and input/output devices.



BUT... WHY CHOOSE LINUX WHEN WE ALREADY HAVE OTHER OS??

ARE LINUX BASED OPERATING SYSTEMS BETTER THAN OTHER OPERATING
SYSTEMS ?



WHY LINUX ?

Advantages of having a linux based OS

Cost-effective

One of the biggest advantages of GNU/Linux is that it is free and open-source software

Flexibility

GNU/Linux is highly customizable and can be tailored to suit the specific needs of users

Security

GNU/Linux is known for its robust security features, which make it less susceptible to viruses, malware, and other cyber threats

Compatibility

GNU/Linux is compatible with various hardware platforms, including desktops, laptops, servers, and even mobile devices

Stability

It can run for long periods of time without needing to be restarted, making it a popular choice for servers and other mission-critical applications

Support

The GNU/Linux community is large and active, providing users with access to a wealth of resources, including online forums, documentation, and support from other users



Mac os:



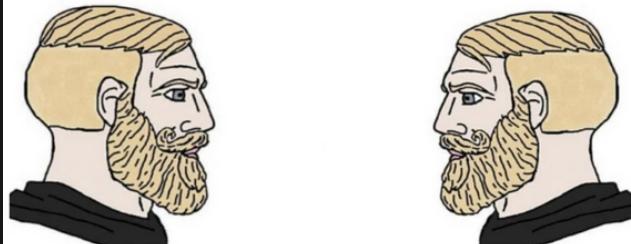
Can you install this
5 year old program? Nooooo, i can't! this
program is too old!

Windows:



Can you install this
25 year old program? Yes, i can!
Installing... done!

Linux



can you install this
25 year old
program

it's already
installed



MAC OS

While macOS is known for its user-friendly interface and high-end hardware, Linux is more flexible, open-source, and secure. Linux also has a wider range of software options and can run on older hardware, making it a more accessible option for many users.

WINDOWS

While Windows is the most popular operating system, Linux is more secure, open-source, and lightweight. Linux is also more customizable and provides greater control over system resources, making it a better option for developers, system administrators, and power users.

UNIX

While UNIX is the precursor to Linux and shares many similarities, Linux is more accessible, customizable, and has a larger community of developers. Linux also has a wider range of software options and is more secure due to its open-source nature, making it a better choice for many users.

NO ONE: NEW LINUX USERS:



DEBIAN



- Debian is one of the oldest and most popular Linux distributions, and many other distributions are based on it.
- Some of the most well-known Debian-based distributions include **Ubuntu**, **Linux Mint**, and **elementary OS**.
- These distributions tend to be known for their stability, strong community support, and large repositories of software packages.

RED HAT

- Red Hat is a popular enterprise Linux distribution, and many other distributions are based on it, including **CentOS**, **Fedora**, and **Oracle Linux**.
- These distributions are often used in business environments and are known for their strong security features and long-term support.



ARCH



- Arch Linux is a lightweight and highly customizable distribution, and several other distributions are based on it, including **Manjaro** and **EndeavourOS**.
- These distributions are popular among power users who want a minimalistic and highly configurable system.
- *I use Arch BTW*

FAMILIES OF DISTROS





Me: Installing 300th distro
on my Computer

My computer:



GENTOO



- Gentoo is a highly customizable distribution that allows users to compile their software from source code.
- **Sabayon Linux** and **Funtoo Linux** are based on Gentoo and are known for their performance and flexibility.

SLACKWARE

- Slackware is one of the oldest Linux distributions and is known for its simplicity and stability.
- **Zenwalk** and **Salix** are based on Slackware and are known for their lightweight and fast performance.



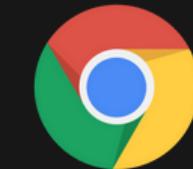
SUSE



- SUSE Linux Enterprise is a popular enterprise distribution, and **openSUSE** is a community-driven distribution based on it.
- These distributions are known for their robustness, security, and ease of use.

CHROME OS

- Chrome OS is a Linux-based operating system developed by Google for use on Chromebooks.
- Several distributions, including **CloudReady** and **Chromixium**, are based on Chrome OS and offer a similar user experience.



Chrome OS



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ENOUGH OF THE THEORY !! LETS GET STARTED WITH THE INSTALLATION!



USER MODE AND KERNEL MODE



User mode

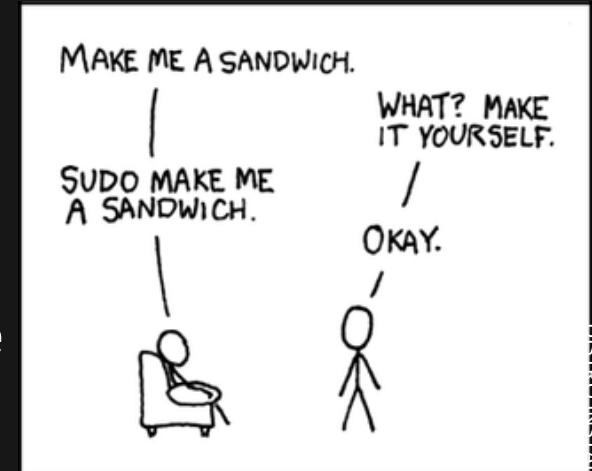
- The system is in **user mode** when the operating system is running a user application such as handling a text editor.
- User mode programs are less privileged than user-mode applications and are not allowed to access the system resources directly. If it needs access, it must switch to the kernel mode.
- In user mode, processes get their own address space and cannot access the address space which belongs to the kernel. So the failure of one process will not affect the operating system. If there is an interrupt, it only affects that particular process.

Kernel mode

- A **kernel** is a software program which is used to access hardware components of a computer system. Kernel works as a middleware software for hardware and application software/user programs.
- As discussed before, in **kernel mode**, you can access system resources directly.
- It is not possible to run all processes in the kernel mode because if a process fails the entire operating system might fail.
- **Eg:** File management system calls read, write, create, delete, open, and close files.

sudo

- By default, most linux distros have the user normally interact as a non privileged user for security reasons.
- This also means that normally a user cannot do things like installing system-wide programs on a system,
- "**sudo**" solves this problem by granting temporary access to run a command as the "**superuser**" or "**root**" user; which has complete control over the system
- Its like "run as administrator" on windows, ***but on steroids***
- One should use this with care and not spam it everywhere



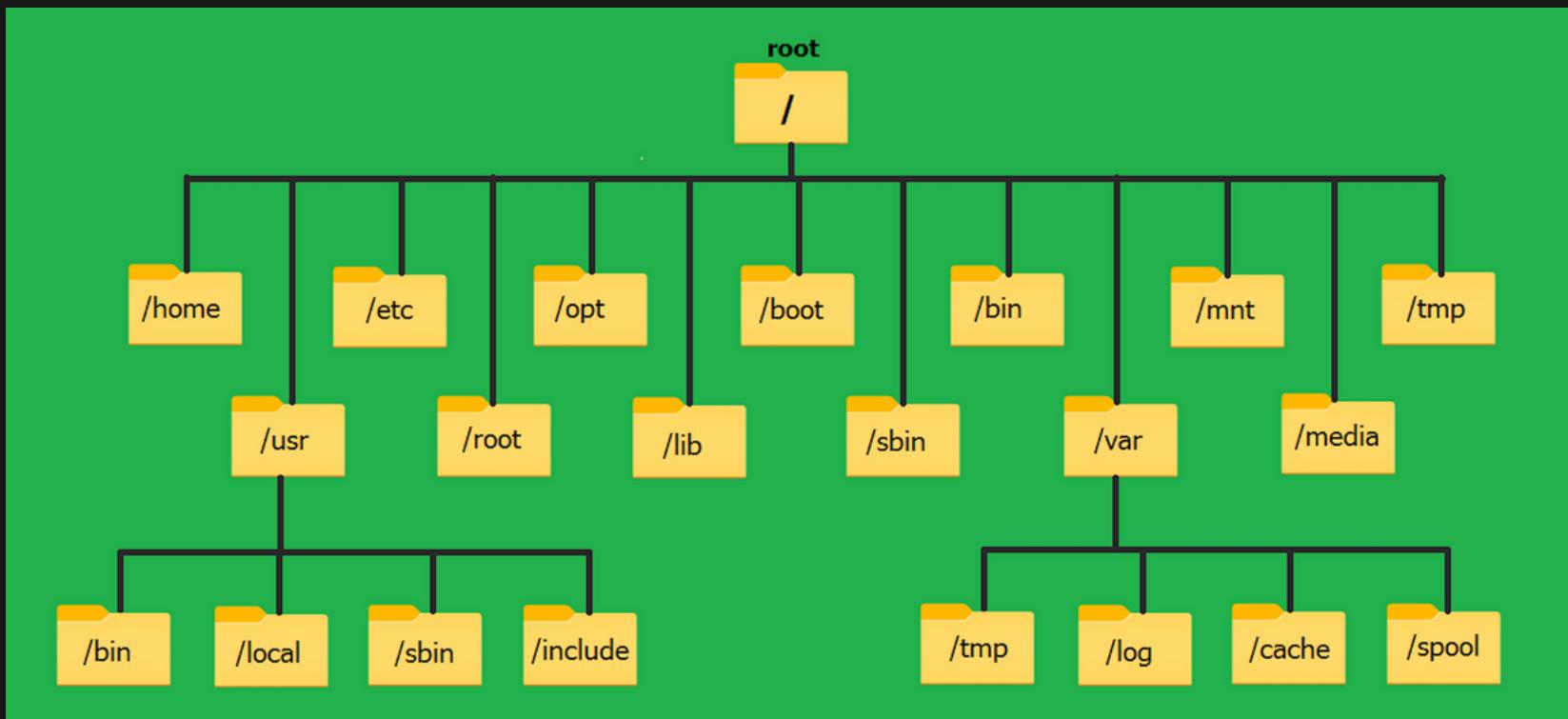
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LINUX FILE SYSTEM

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File System



File System

- home - Home directories for individual users
- usr - Secondary hierarchy
- etc - Host-specific system configuration
- root - Home directory for the root user
- lib - Essential shared libraries and kernel modules
- boot - Static files of the boot loader
- bin - Essential command binaries
- var - Variable data
- media - Mount point for removable media devices
- tmp - Temporary files



PACKAGE MANAGERS



First of all, what is a package?

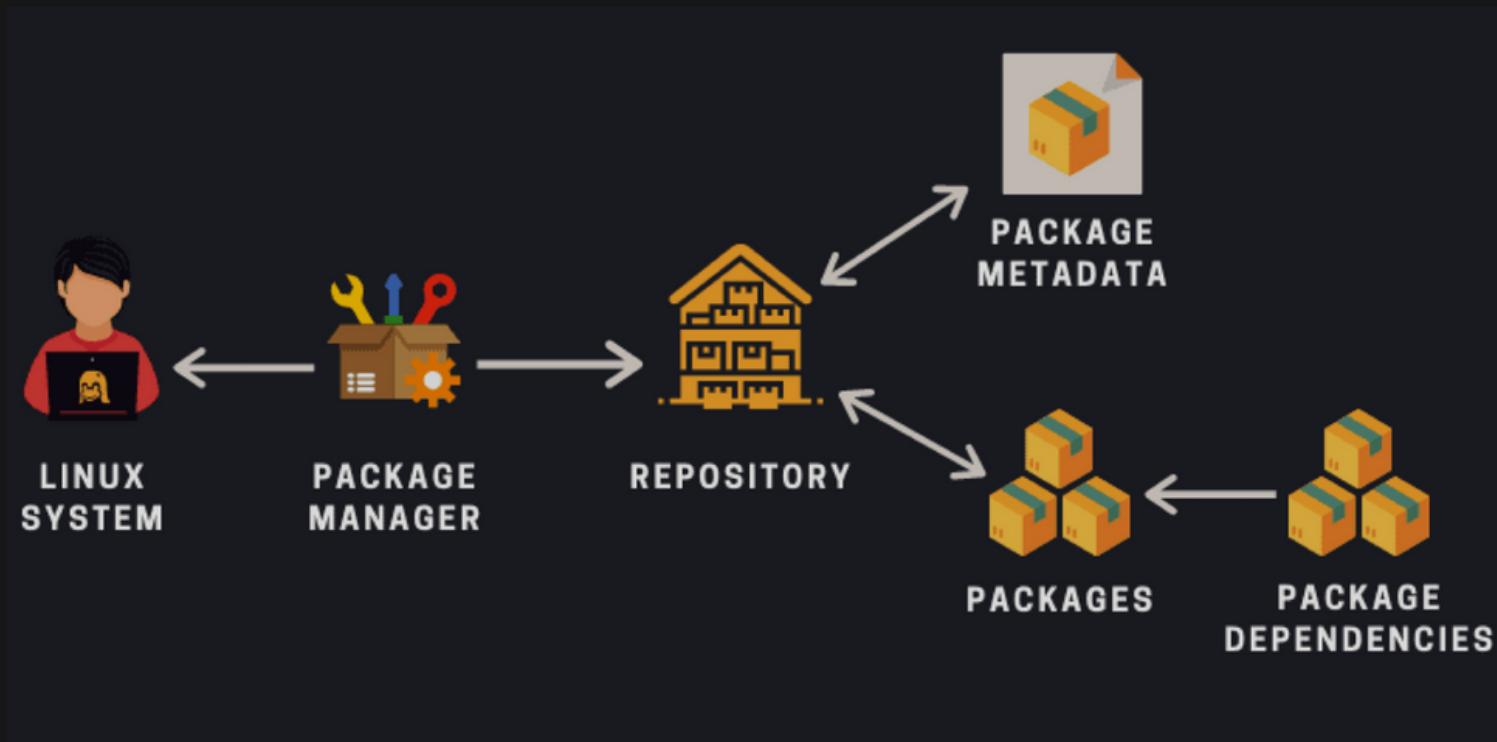
- A package is usually referred to an application but it could be a GUI application, command line tool or even a software library.
- A package is essentially an archive file containing the binary executable, configuration file and sometimes information about the dependencies.
- In older days, software used to installed from its source code. You would refer to a file (readme) and see what software components it needs, location of binaries. You will have to compile the software or on your own along with handling all the dependencies on your own.

First of all, what is a package?

- To get rid of this complexity, Linux distributions created their own packaging format to provide users ready-to-use binary files (precompiled software) for installing software.
- It is like baking a cake versus buying a cake.
- To use the packaging systems, you need a package manager.



Back to Package Managers



Examples of Package Managers

APT

- APT (Advanced Package Tool) is the most popular package manager for Debian-based Linux distributions such as Ubuntu and Mint.
- It is a powerful command-line package management tool which can install, remove, and build packages. It also provides tools for searching, managing, and querying information about packages.
- Packages are taken from online repositories, or they can be installed from local media.

code

Examples of Package Managers

APT

Operation	Command
installing a package	<code>sudo apt install <package name></code>
removing a package	<code>sudo apt autoremove <package name></code>
upgrading all packages	<code>sudo apt update && sudo apt upgrade</code>
upgrading distro	<code>sudo apt update && sudo apt distro-sync</code>
search for a package	<code>sudo apt search <query></code>
clean package caches	<code>sudo apt autoclean</code>

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A GOOD LINUX USER



WHERE TO GO NEXT?

LEARN LINUX BY PLAYING GAMES :

OVERTHEWIRE overthewire.org

LINUX-SURVIVAL linuxsurvival.com

VIM-ADVENTURES vim-adventures.com

HACKERRANK [Hackerrank](https://www.hackerrank.com)

TERMINUS [Terminus](http://terminus.terminalacademy.com)

BASHCRAWL [Bashcrawl](http://bashcrawl.com)

**COMMAND LINE
MYSTERY** [command line mystery](http://commandline.mystery)

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Fresher Selection Form



Sources dump

1. <https://opensource.com/life/16/10/introduction-linux-filesystems>
2. <https://www.differencebetween.com/difference-between-user-mode-and-vs-kernel-mode/>
3. <https://www.linuxfoundation.org/blog/blog/classic-sysadmin-the-linux-filesystem-explained>
4. <https://itsfoss.com/package-manager/>
5. <https://twitter.com/linuxopsys/status/1638572669980274688?>
t=yBxOHNwOY9BcxFMnV_mJEA&s=08
6. <https://wiki.archlinux.org/title/Pacman/Rosetta>