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Linux As A Personal Desktop Operating System

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1.Abstract-

Linux operating system has a special position the field of computer science. It is a Unix-like operating system which was developed by Linus Torvalds at the University of Helsinki in Finland to provide a low-cost, secure and flexible operating system to users. Whether we talk about Unix, Windows, MacOS all these operating systems are expensive as well as less secure as compared to Linux. Where all other operating systems are sold at a profit, there lies Linux OS which is open-source and can be modified according to the need.

Linux conveys many properties of Unix OS as it was developed before. Later on, when issues were detected in Unix by Linus, he reported these to the team. But as these issues were not addressed then he developed Linux using major source code of Unix as launched it as open source.

Today, there are more than 600 active Linux distros among which the latest variant is developed by Kali 2022.2 which is GNOME 42.

2.Introduction-

Linux is free and open-source Operating System, which is bundled with features of Windows and Mac OS, since its Open source, we have various Linux distributions, which cater to different needs of different users. Open-source software is a software whose source code can be modified and enhanced according to user's need. Linux is famed both for its stability and for its efficiency, often running for months, or occasionally years at a time without having to be rebooted, while also achieving excellent performance.

Linux is developed as open-source OS under the GNU project by the Originator, Linus Torvalds and many others. It was written in the year 1991, and also enhanced for current usage.

Linux is nowhere a complete OS but a kernel. The fact that it is a kernel, it requires additional ad-ins in form of software. Many of these kinds of distributions or distros exist.

Other important fact about Linux OS is that it is less vulnerable to virus attacks as compared to other operating systems. It consists of both command-line interface as well as graphical user interface.

3.Linux Environment-

Linux has come a long way. From a terminal (CLI) and an old UI to an amazing GUI in last 10 years.

When the discussion is about Linux on Desktop then we are actually discussing about a Linux distribution, like Ubuntu/Fedora (although there are more than 600 distros), and hence we need to understand what makes a distribution/distro/variant.

A Linux distribution is an Operating System made up of mainly-

- **The Linux Kernel-** It is a core of the operating system which is being used by all Linux OS, including Android and Chrome OS also.

- **Windowing System-** This system is mainly responsible for the management input peripherals and driving output displays.This is either by **Legacy X11** or the newer **Wayland** by default now instead of the legacy X11 server.However all distros support both.

- **Desktop Environment-** It creates the GUI shell of OS and there are multiple options like **Gnome**, **KDE**, **Xfce** and so on. Most of the distros provide their multiple versions with each having a different DE.

- **Package Manager-** Each Linux Distribution has a unique package manager for finding and installing software.
  For e.g.: - **APT**, **DNF**, **paceman** and so on.

- **Software and tools-** Each distribution also comes with a batch of default Software's like a terminal emulator, a shell, a browser, file manager and so on.
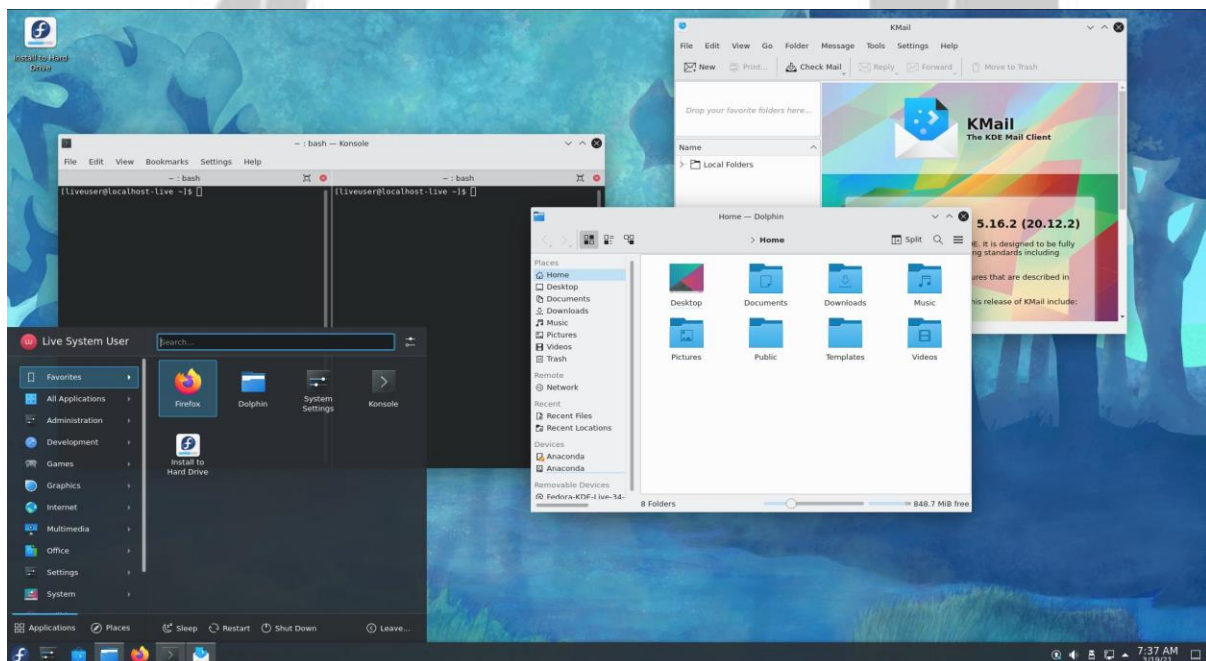
Now, it's time to view different aspects of Linux and analyze that whether it is appropriate for use as a personal desktop.

4.Parameters Of Linux As A Personal Desktop-

- **Flexibility-** For Linux OS, it can be considered as a boon and a curse at the same time. But it is the foremost reason why many people get into Linux and many people get scared of Linux.

In my point of view, Flexibility can be considered as a core of Linux OS. There are plenty of choices of distribution to choosing a DE and even after that, there are many things which one can customize to his/her exact preference, be it look and feel, UX or performance, everything is configurable.

- **UI/UX-** UI and UX are not same thing. A good UI doesn't mean good UX and vice versa. About a decade ago, there was nothing anything special in Linux's UI/UX. But after 2020 there are some of the most beautiful UIs and one of the best UX on Linux DEs.

Default Breeze twilight theme on Fedora 34

- **Performance-** When it comes to performance there is no much to worry in case of Linux. Performance has never been an issue in the Linux world and that is why it is the default choice for servers and infrastructure.

Mainstream distributions such as **Debian**, **Fedora**, **Arch** Linux gives very high performance and DEs such as **Gnome** and **KDE** are now becoming smoother and faster. Lightweight Distributions such as **Xubuntu** or **Labantu** use lightweight DEs like **Xfce** and **LXQt** and that's why they can be used on very outdated hardware also.

This does not end here. Graphics performance which was an issue for Linux OS in the past is not a problem now. Latest drivers for both **Nvidia** and **AMD** now gives good GPU performance.

- **Stability & Software Support-** This is a weak point of Linux. Actually Linux Kernel is very stable in itself but this Is not in the case of its distros.

However, this issue is also being resolved and now it depends on which distro you are using. For eg. Distributions like Ubuntu and Fedora are fairly stable, with better support for third-party software and hardware drivers, which improves stability.

If stability is really important, then Ubuntu might be a better choice with its long release cycle and stable ecosystem with more software to choose from.

- **Security & Privacy-** Security and privacy is not an issue in Linux OS as it is open-source software. There are also Linux distributions such as **QubesOS** and **PureOS that** focus entire- eely on privacy and security.

Mostly Linux software's are open source and are trustworthy and also has a community around which will fix bugs and vulnerabilities whenever any issue arises.

- **Installation & Availability-** Installation is quite difficult in some of the Linux distros such as **Arch,** but there are many

distros also which are very easy to install such as **Ubuntu**, **Fedora**, **Elementary** and so on.

But now the scene is changing and lot of great companies such as Dell, Lenovo and Asus had started building and selling machines with pre-installed Linux OS.

Some good options for Linux are – **System76**, **Tuxedo**, **Slim book**, **Ubuntu Focus**, **Purism**, **Lenovo ThinkPad**

- **Security**- Bugs are fixed more quickly and security patches are made avail ble as soon as they are ready. No other operating system offers the kind of community support that Linux does. If you're expecting professional paid support today, may not be as good as what's available for other operating systems.

Server distributions like RHEL very few consumer distributions, like **Ubuntu**, provide official support plans. Of course, many independent organizations provide support for most consumer Linux distros.

It is a matter of taste. Community support is good enough for most average users, but if there is a need of enterprise-level support, it can be a bit of hassle to get it.

- **Decision Fatigue-** When it comes to Linux distributions, they can be group- ed into families based on the package formats they supp- ort. Then there are certain distributions and too many derivatives of them. Some popular distros are mentioned below: -

  - **RPM-based**: Fedora and derivatives, CentOS/RHEL and derivatives, openSUSE, and so on.
  - **Debian-based**
    - Ubuntu and derivatives like Pop! _OS, Kubuntu, Labantu, Ubuntu, KDE Neon, Elementary OS, Linux Mint, and so on
    - Kali Linux, Puros, Deepen, and so on
  - **Pacman-based**: Arch Linux, Manjiro, Garuda, Black Arch and so on
  - **Gentoo-based**: Gentoo and its derivatives

All the average user needs are a working operating system, and having so many options just make decision-making tiring.

5.Linux for everyone

The People who are new to Linux operating system or irritate with window's and macOS but are terrified of Linux to it chance.

For an average computer user

For an average computer user who only use desktop and laptop who use internet connectivity for make video call, watch video or listen music and use for all the general purpose without worrying about using the terminal for anything and have descent stability:

- **Ubuntu**-It's the easiest way to get started and come pre-installed in most of Linux laptop option. It is very simple to install and also very simple to use. It's having large section, erm applicable and excellent software and hardware support. This is the friendly Linux for the beginner that come with a good set of default software. If you are windows user, you can choose variant like Kubuntu or Linux mint. If you are old hardware user then use Xubuntu.
- **Elementary OS**: if you are macOS user, you will feel at home with elementary. It's Ubuntu-based and hence is super stable and user-friendly.

  For developers
  For developer who want very fast and quick operating system for anything from web development to kernel development the below listed are a great choice.

- **Fedora**: It provide a stable OS with sorter release cycle thus keeping libraries and tools updated. Has a good community and software support. Comes with tool chain for most languages pre-installed, Linus Torvalds is also use in Fedora. It comes with Gnome DE as default we can choose from different variants if you like KDE or Xfce DE instead.

- *Manjaro*: If we don't mind living on the edge then it is a good option as well, but beware it is an Arch based and hence and does update which could break time to time.

But since it is an Arch-based it is a very powerful and flexible. We can find Manjiro with all popular DE options. If we are computer science student, Then Manjiro is good option, we can learn lot from an Arch-based rolling distribution.

For designers and multimedia professionals

For people who use graphic design, 3D modelling, Video editing, audio production, and other all media related work, Linux could be an excellent choice unless our entire work is based on Abode and some other software suit with bad Linux support.

If we feel a brave we will surprised with free OSS software like GIMP, Blender and etc.

- **Ubuntu Studio:** This is a good choice as Ubuntu is very stable and this variant come with lot of multimedia software.

- **Fedora design suite:** It is a great choice if we want to more bleeding edge. This is also come with lot of OSS multimedia software.

- **AV Linux:** This is designed for audio production and come with all software required for audio/video production.

For Gamers

A long time ago we wouldn't even think about Linux when we think about gaming, thanks to the game maker and valve, maker of steam that has changed now. Steam made it possible to run AAA title on Linux which almost all windows. A big statement to this is SteamOS from valve which power their machine line of gaming PC. There is also Steam play that make it possible to run window game on Linux.

Windows is dominating when it comes to gaming. Due to huge collection of games that are only supported on Window and due to good Graphic Performance. Thing are also looking on the Linux side and Linux might be the best alternative to the windows for the gamers.

There are good options for Gamer on Linux

- **Pop!_OS**: This is an Ubuntu-based distribution from System76 that comes optimized for gaming.

- **SteamOS or GamersOS:** If we want a console-like GUI with great controller support for gaming on Steam.

6.Discussion: -

- The economic environment will fastly get good in the upcoming days. A continued flop would further quicken the development of Linux on the desktop. The longer than expected finance downfall is already driving enterprises and public agencies to seen harder at their company income and expense alternatives.

- There will be no cutoff in the ability of Linux productivity software to read or write Microsoft Office documents. If Microsoft were to totally split with its current default file formats, that could set back file format compatibility.

- There will be no changes in desktop computing over the year

7.Result: -

Linux is uncontested on the cell phone and server. It has widely installed for common purpose of operating system because of Android.
85% of smartphone are powered by Linux.

TBH, Linux has been declared for the future since the 90s and for some time there will a year of Linux.   On the desktop space it has been never materialized.
The reality is that more and more laptop shipping Linux OOB is also a testament to the fact that Linux on the desktop is finally happening.

It wouldn't surprise if one day Microsoft just get rid of windows and ships their own Linux distro. In today's world Windows hold 75% market business share in desktop OS and macOS stand around 16% with Linux
And another taking remaining 9%.

8.Keyword: -

LEGACY 11, WAYALAND, GNOME, KDE, XFCE, APT, DNF, PACEMAN, DEBIAN, FEDORA, ARCH GNOME KDF , LABANTU , LXQT, NVIDIA AMD,   UBUNTU, FEDORA, ELEMENTARY SYSTEM76, TUEXDO, SLIM Book, UBUNTU FOCUS, PURISM.
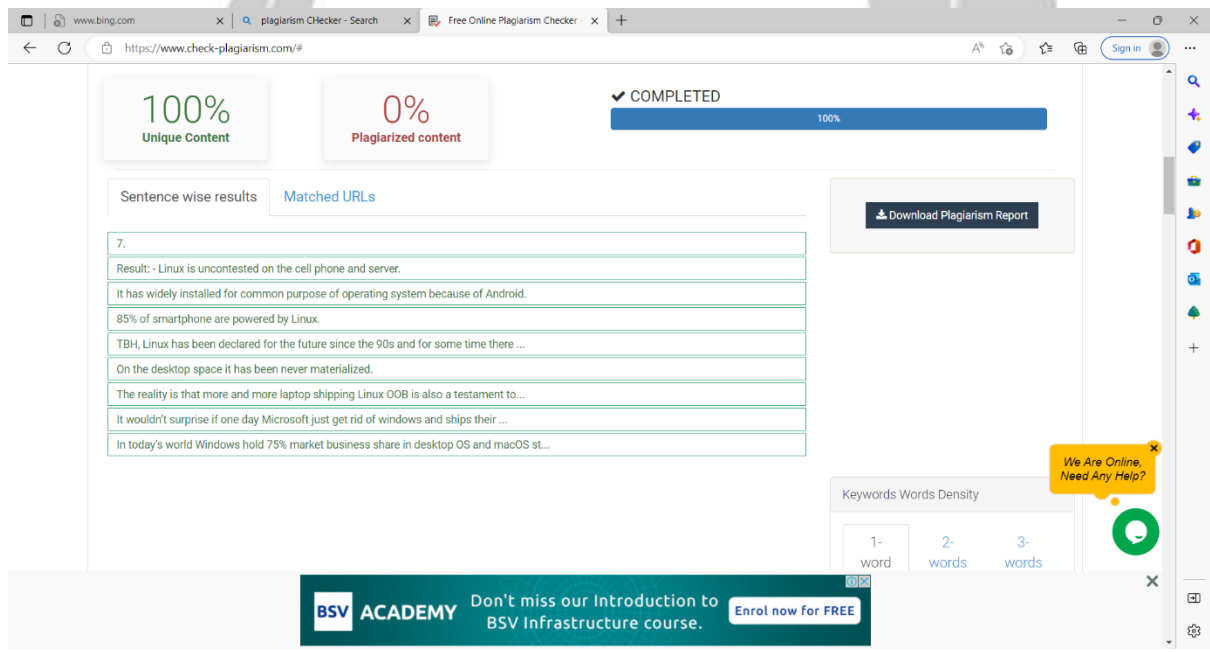
9. Acknowledgments: -

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