

Introduction to Linux

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Who am I?

- Linux professional with nearly 25 years of experience.
- Have run Linux as my desktop OS for about 30 years.
- Silver fox. Yip.



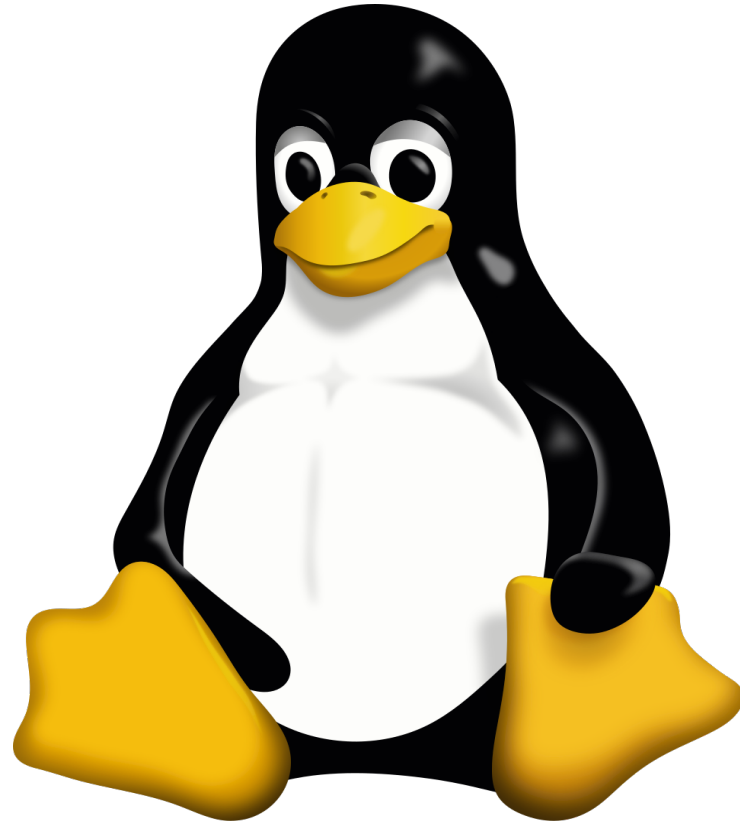
So what is Linux, anyway?

- A miserable little pile of secrets?
- The leading server, cloud, smartphone, and supercomputer operating system.
- Technically, an operating system kernel.
- A kernel has complete control over a computing system.
- Scheduling processes, handling hardware (through programs called device drivers), managing memory.

Mascots

- Tux is the official mascot, since 1996.
- Xenia was also created in 1996, by Alan Mackey but she was just “Linux Fox” then.
- The character languished in obscurity until 2019, when she was rediscovered by an artist named cathodegaytube and named Xenia.
- Xenia was originally meant to be male but was reimagined as a transgender girl.

Tux



Xenia

by Alan Mackey on July 14, 1996
Al@IAM.com · <http://www.early.com/~emackey/atm/>



What else is there?

- A kernel needs a userland: utilities and libraries required to run applications.
- Linux is developed exclusively as a kernel.
- The GNU project had a userland developed but lacked a kernel.
- These were combined to form the first Linux operating system. (Sometimes referred to as GNU/Linux)

What is a distribution?

- A distribution is a combination of the Linux kernel, a userland (usually GNU), applications, and at least one method of packaging and updating system components and software, usually a package manager.
- This combination is intended to be run standalone as an operating system on a device.
- A device can boot multiple operating systems; dualbooting with Windows is a common setup.

Linux distributions in general

- There are...a lot of them.
- Most of them are derived from a handful of “root” distributions:
- Arch
- Debian
- Fedora
- Ubuntu (derived from Debian)

Atomic and immutable distros

- An immutable distro is one where the core of the OS is essentially read-only. Any changes have to be layered on top of a static image, then re-applied when that image gets updated.
- An atomic distro performs OS updates all at once, in a transactional manner, which is also similar to how a smartphone does an OS update. Unlike a smartphone, OS updates can be easily rolled back if something breaks.
- These distros usually use separate, agnostic package managers vs. having one specifically for the distro that handles everything, though this can vary.
- Examples: Fedora Silverblue, Fedora Kinoite, Bazzite.

Arch

- Text installer (graphical available separately)
- Aggressive/fast moving distro. (Known as a rolling release).
- Doesn't emphasize any particular graphical environment.
- Requires a certain level of skill and knowledge to install and run effectively. Its derivatives usually lower the learning curve considerably.
- Package manager: pacman.

Debian

- **Graphical installer.**
- **Known for its stable branch, also has testing and unstable branches (unstable is also a rolling release).**
- **Has a distinct philosophy it has followed since its origin.**
- **Defaults to GNOME, though any desktop can be installed.**
- **A new stable release occurs roughly every two years.**
- **Moderate difficulty to learn and use.**
- **Package manager: apt**

Fedora

- Graphical installer.
- Updates aggressively, new releases every 6 months.
- Red Hat Enterprise Linux is its most well-known/used derivative.
- Defaults to GNOME, though other desktop images are available.
- Fairly easy to use and manage.
- Package manager: dnf

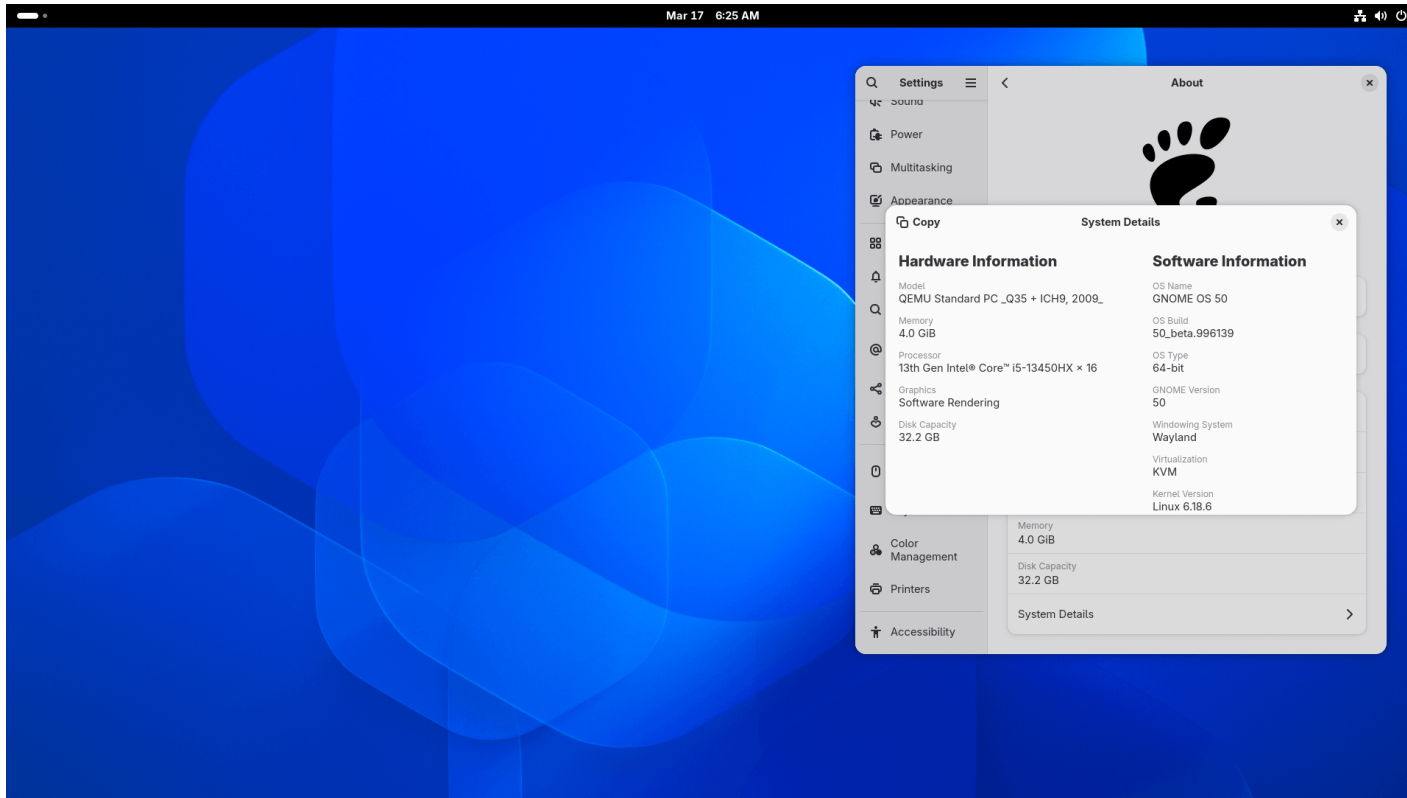
Ubuntu

- Graphical installer.
- Has two branches..a long term support (every two years) and an every six month release.
- Very opinionated about how it does things.
- Defaults to a modified GNOME along with other desktop editions.
- Easy to use and manage.
- Package managers: apt, snap

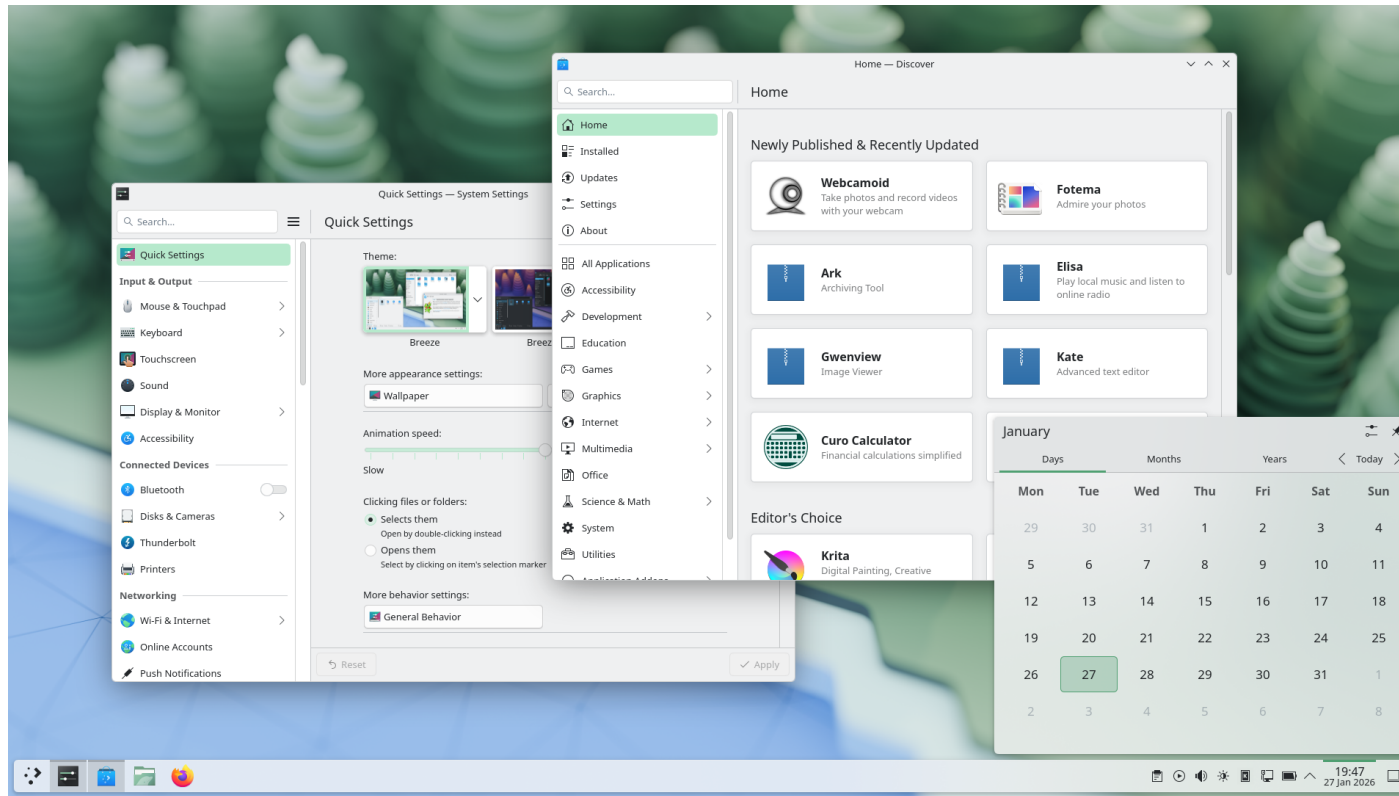
Graphical environments

- **Primary: GNOME Shell and KDE Plasma**
- **Others: Cinnamon, XFCE, MATE, etc.**

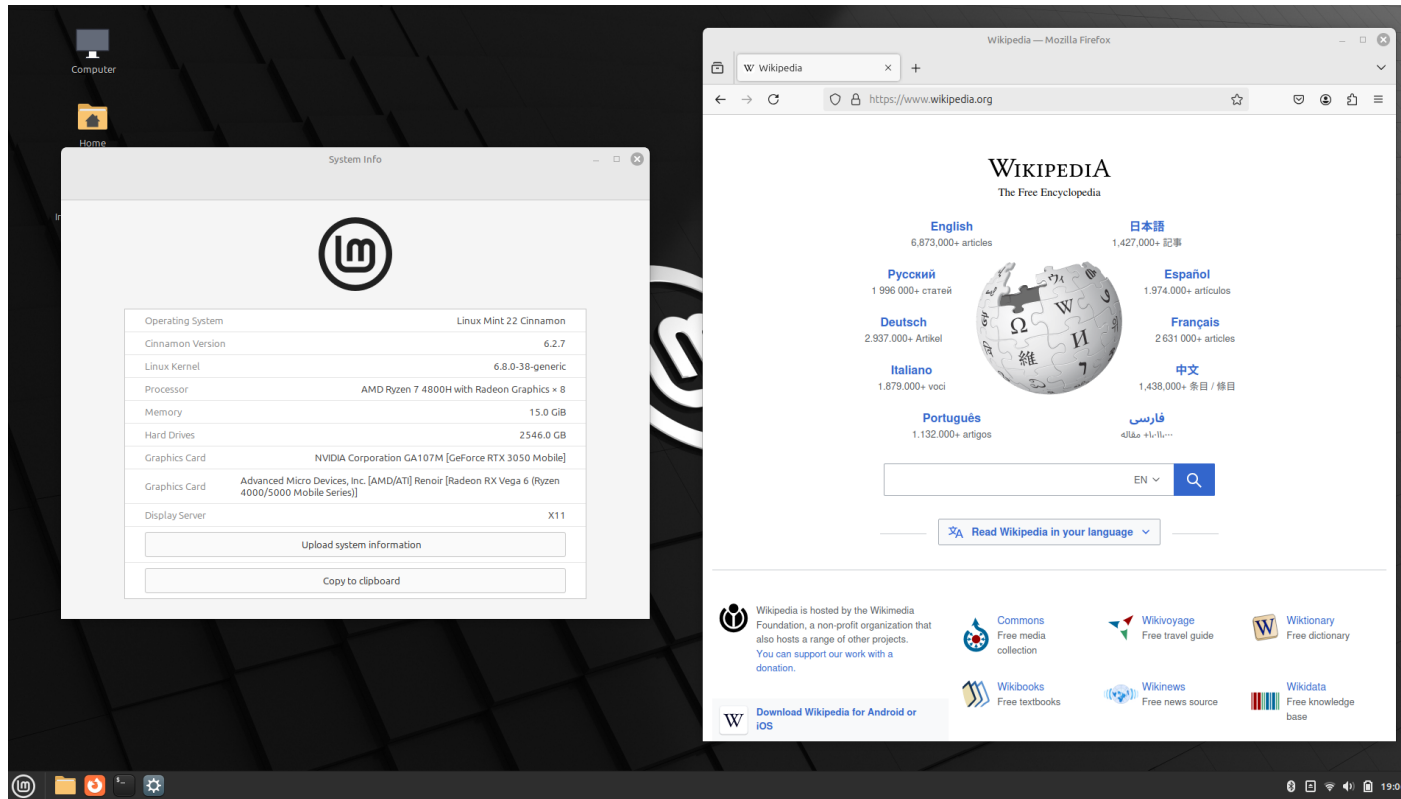
GNOME Shell



KDE Plasma



Cinnamon



Other package managers

- Flatpak
- Snap (an Ubuntu-ism)

What makes a good distribution?

- Satisfies your needs and wants, including packaged software.
- Good documentation.
- Friendly community.
- Strong hardware support.
- Timely security updates.
- Consistent development news and updates.
- Predictable, reliable release schedule.

Directory layout

- Unlike drive letters in Windows, everything in Linux is attached to a root filesystem.
- **/dev:** Device driver files
- **/etc:** System configuration
- **/home:** User files and configuration
- **/tmp:** Temporary files and directories
- **/usr:** Binaries and libraries
- **/var:** Log files, caches

Running Windows applications

- WINE has been around a long time and is a compatibility layer (not an emulator) that allows running many (but not all) Windows applications on Linux.
- See *winehq.org* for more information.

Gaming: Steam

- Linux has had a native Steam client since 2013.
- Valve's Proton software (powered by WINE) allows many Windows-only games to run on Linux (but not all)
- SteamOS (Arch based) powers the Steam Deck and can also be installed on your own hardware.
- Check *protondb.com* for game compatibility.
areweanticheatyet.com specifically tracks games that use anticheat software.

Gaming: AMD and Nvidia

- Most modern distributions have support for AMD graphics cards out of the box, as it is built into the kernel.
- Nvidia's GPU driver for Linux needs to be manually added in some cases. Some distros have out of the box support for it, beginning with the install.

Installation tips

- If possible, try Linux apps on Windows/macOS first.
- Try distros out in a virtual machine, though performance/compatibility is usually better on hardware.
- If the distro has a live USB image, use it to test system compatibility.
- If installing on an existing system, make a full backup.
- Make sure you have enough drive space available.
- Remember the passwords you set for the root user and the unprivileged user.

General tips

- Avoid installing programs via a text command that takes a URL and sends it to *bash*. Be especially wary of any command like this that has *sudo*, which would then run the code from the URL with administrative privileges.
- `curl -L https://install.pi-hole.net | sudo bash`
- Be generally aware of what's going on with your distro..security alerts, new releases, major changes. Be aware of when your distro version hits EoL.

Recommendation (Mint)

- It depends on your hardware and what you want to use it for, but for a general purpose desktop computer, Linux Mint is a good place to start.
- Uses Cinnamon by default. GNOME and KDE can be installed but they're not supported/can involve a lot of troubleshooting to set up and maintain .
- Has Ubuntu as its base, but strips out a lot of Ubuntu-isms.

Recommendation (Fedora)

- If you want native GNOME/KDE support in a general purpose distro, Fedora Linux is a good place to start.
- Moves faster than Mint and releases more often. Mint releases are supported for longer; 5 years vs. 1.
- Fedora doesn't package proprietary software, such as the Nvidia driver, Steam, and video codecs, so external repositories need to be configured for those.

Recommendation..? (Ubuntu)

- A very popular distro, with many online guides, documentation, and forums and other resources.
- Defaults to their modified GNOME desktop, along with separate editions for other desktops.
- Filled with Ubuntu-isms (such as snap) that don't apply to other distros, even distros based on it.

Laptops

- Laptops can be more difficult to find hardware support for, especially new models/unusual hardware. Some laptops are built for Linux and have excellent software and hardware integration, like System76 and their distro Pop!_OS.
- Most distros have an option for drive encryption during the install..use it for laptops and do everything possible to remember the passphrase.
- Lenovo Thinkpads traditionally have excellent hardware support.

Resources

- *distrowatch.com*
- *linuxmint.com*
- *fedoraproject.org*
- *ubuntu.com/desktop*
- *ubuntu.com/desktop/flavors*
- *xenia.efi.pages.gay*

Q&A

- Slides will be available at *jsilverfox.blog*
- I can also be contacted at *jsilverfox.blog*