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Installation of Linux Mint OS using Oracle VM VirtualBox

Introduction

Linux Mint is a user-friendly Linux distribution based on Ubuntu, designed to provide a smooth and familiar experience for those transitioning from other operating systems, particularly Windows. It offers three main desktop environments: Cinnamon, MATE, and Xfce, each catering to different preferences and hardware requirements. Linux Mint comes pre-installed with a variety of essential software, such as the Firefox browser, LibreOffice suite, and VLC media player, ensuring a functional out-of-the-box experience. The distribution is known for its simplicity, with tools like the Software Manager and Update Manager making system maintenance easy for users of all skill levels. Additionally, Linux Mint benefits from Ubuntu's stability and security, offering long-term support (LTS) and a secure, stable environment for everyday computing. With its focus on ease of use, customization, and reliability, Linux Mint is an excellent choice for both new and experienced Linux users looking for a straightforward yet flexible operating system.

2.Objective

- ☒ To successfully install Linux Mint OS in VirtualBox.
- ☒ To understand the requirements and steps involved in setting up virtualmachine.
- ☒ ToexplorethefeaturesandcapabilitiesofLinuxMint.
- ☒ To identify potential installation issues and provide solutions.

3 Requirments

Hardware Requirments

1.Processor(CPU):

Minimum:1GHzorfasterprocessorwithsupportforx86_64(64-bit).Thismeansyoushouldhave a64-bitcapableprocessorfortheinstallation.LinuxMintdoesnotofficiallysupport32-bitsystems anymore,soa64-bitprocessorisnecessary.

Recommended:Amodernmulti-coreprocessor(Inteli3orbetter,AMDRyzenseries)forsmoother

performance.

2.Memory(RAM):

Minimum:2GBofRAM.LinuxMintcanrunwith2GB,butperformancemaybelimited,especially withheavyapplicationsrunningatthesametime.

Recommended:4GBormore.Thisallowsforbettermultitaskingandsmootherperformancewhile runningapplications,especiallyifyouintendtousethesystemformorethanbasictasks(suchas browsing,watchingvideos,coding,etc.).

3.HardDriveSpace:

Minimum:15GBoffreediskspaceforabasicinstallation.Thisissufficientforthesystemand basicapplicationstorun.

Recommended:20GBormore.Thisgivesyouextraspaceforpersonalfiles,additionalsoftware, andsystemupdates,whichwillallowtheoperatingsystemtorunsmoothlyforalongerperiod.

Optional(forfullinstallwithapps):50GBormoreifyouplantoinstalladditionalapplicationsor storealargeamountofpersonaldata.

4.GraphicsCard:

Minimum:Abasicgraphicscardwith1024x768resolutionorbetter.

Recommended:Agraphicscardthatsupportshardwareacceleration(e.g.,IntelHDGraphics, NVIDIA,orAMDcards).

ForAdvancedUsers:Forspecializedtasks(e.g.,gaming,graphicsdesign),adedicatedgraphics cardwithmoreVRAMwillimproveperformance.LinuxMintgenerallysupportsmostmodern graphicshardwareoutofthebox,butforsomeNVIDIACards,youmayneedtoinstallproprietary driversforoptimalperformance.

5.Display:

Minimum:1024x768resolution.Thisstandardformostmodernmonitorsandlaptops.

Recommended:Higherresolutions,suchas1920x1080orhigher,foramorecomfortableviewing experience,especiallyformultitaskingorworkingwithdetailedcontent.

6. USB Drive (If installing via USB):

A 4GB USB drive is the minimum required to create a bootable USB for the installation.

A 8GB or higher USB drive is recommended for creating a more reliable bootable drive and for installation of the OS and additional tools.

Software requirements

1. Linux Mint ISO file:

You need to download the official Linux Mint ISO file from the Linux Mint website. There are several versions of Linux Mint available, depending on the desktop environment you prefer:

Cinnamon: This is the default and most popular desktop environment, with a modern, user-friendly interface.

MATE: A lightweight, classic desktop environment, perfect for systems with lower resources.

Xfce: The lightest version of Linux Mint, ideal for older hardware or low-resource environments.

2. USB Bootable Tool:

If you plan to install Linux Mint via USB, you will need a tool to create a bootable USB drive:

Windows Users: You can use tools like Rufus or Balena Etcher to create a bootable USB drive.

Linux Users: You can use tools like dd (command-line) or Startup Disk Creator (GUI) to create a bootable USB from the ISO.

macOS Users: You can use Balena Etcher or Terminal to create a bootable USB.

3. Live USB Option (Optional):

You can also run Linux Mint directly from a USB drive without installing it on your computer. This is helpful for testing the OS before deciding to install it.

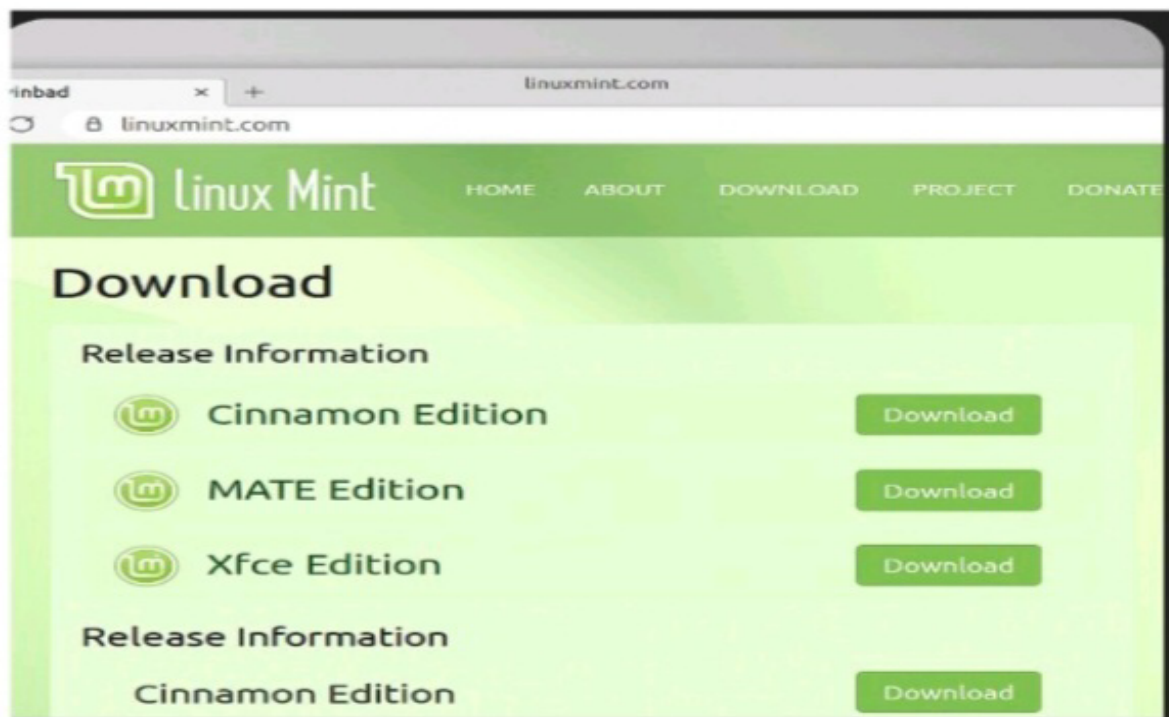
4. Internet Connection (Optional but Recommended):

While not strictly required, an internet connection is helpful for downloading updates and additional software packages during installation. Some drivers may also need to be installed or updated via the internet.

If you are installing Linux Mint in a non-graphical mode or using a minimal installation, you may not need an internet connection, but you will need it to get the most out of your installation (e.g., installing proprietary drivers or software updates).

4. installation step

Step 1: download Linux Mint ISO Visit <https://linuxmint.com> and download the preferred edition.

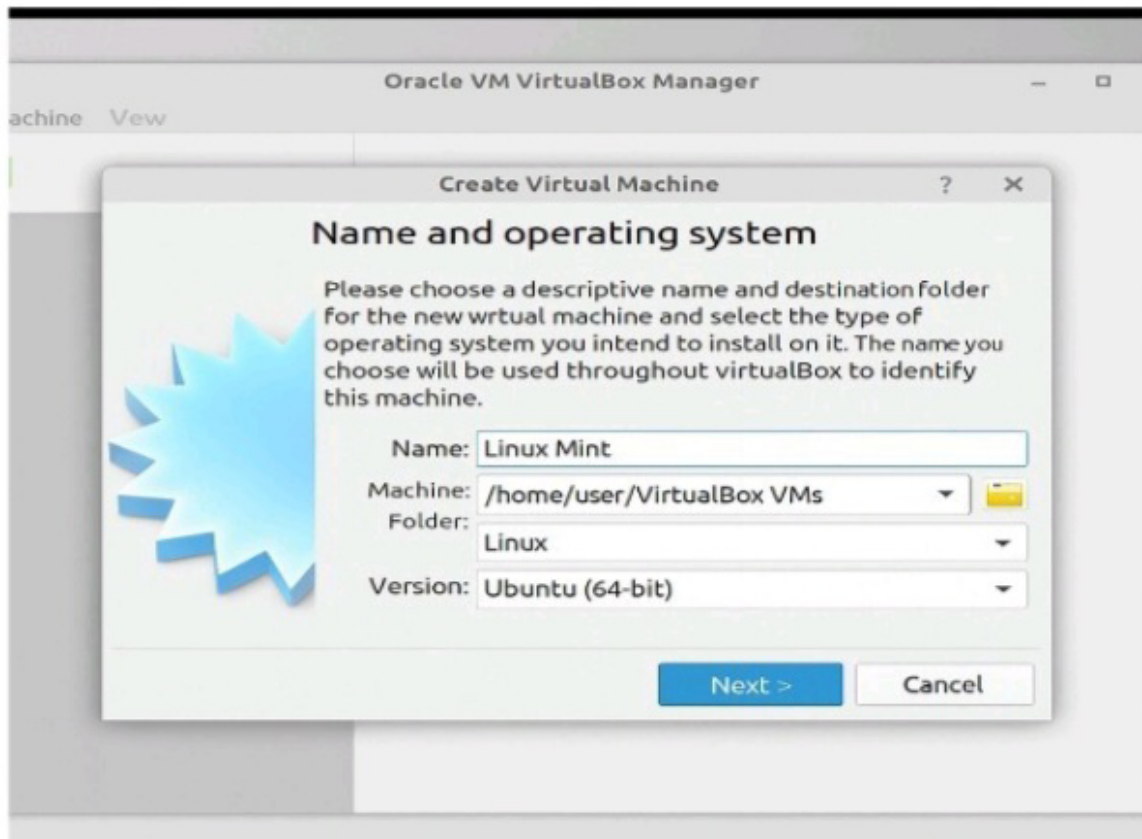


Step 2: Install Oracle VM VirtualBox Download and install the latest version from <https://virtualbox.org>.



Step3:CreateaNewVirtualMachine

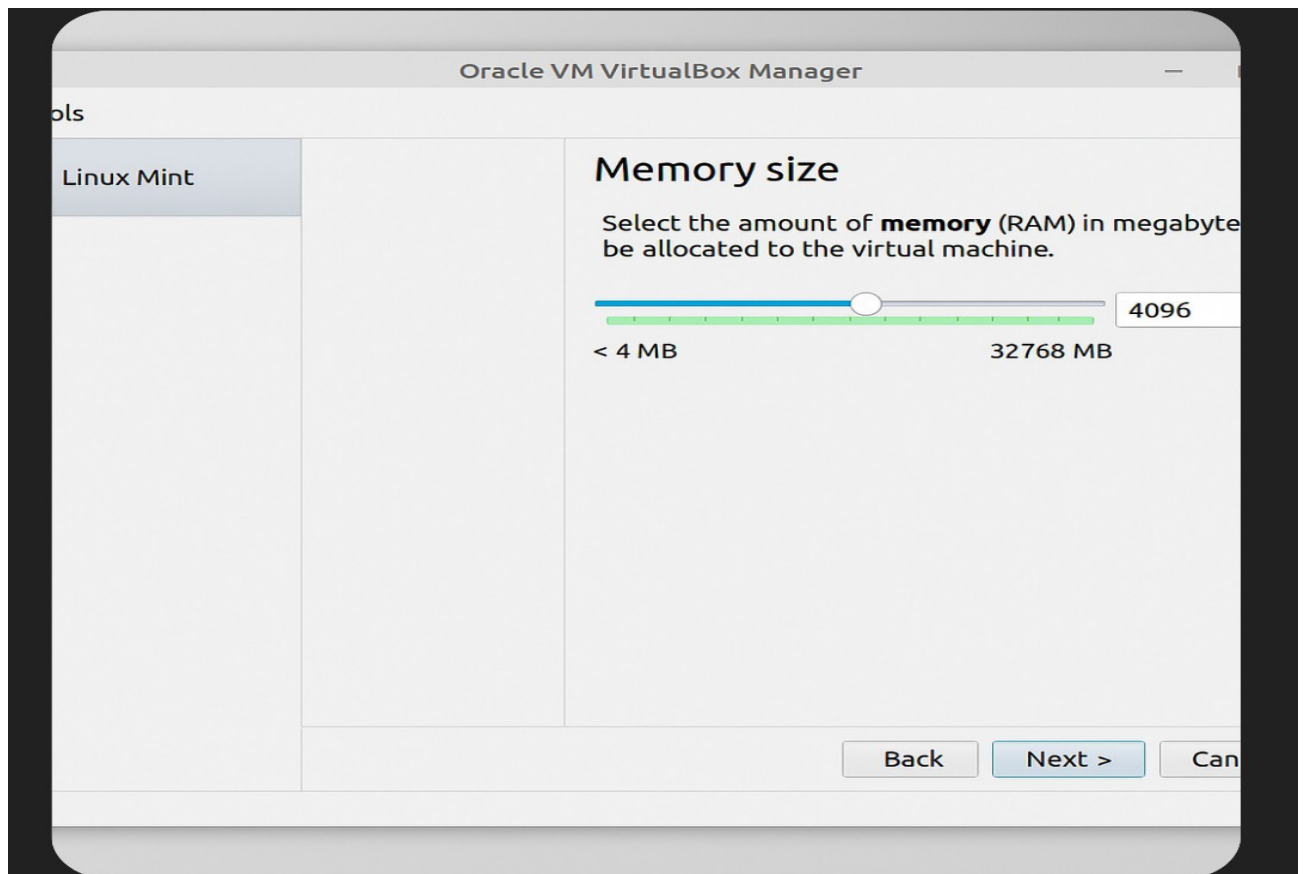
- ☒ OpenVirtualBoxandclickNew.
- ☒ Name:LinuxMint ☒ Type:LinuxVersion:Ubuntu(64-bit) ☒ Allocate memory(e.g.,4096MB).
- ☒ Create a virtual hard disk(20GBminimum).



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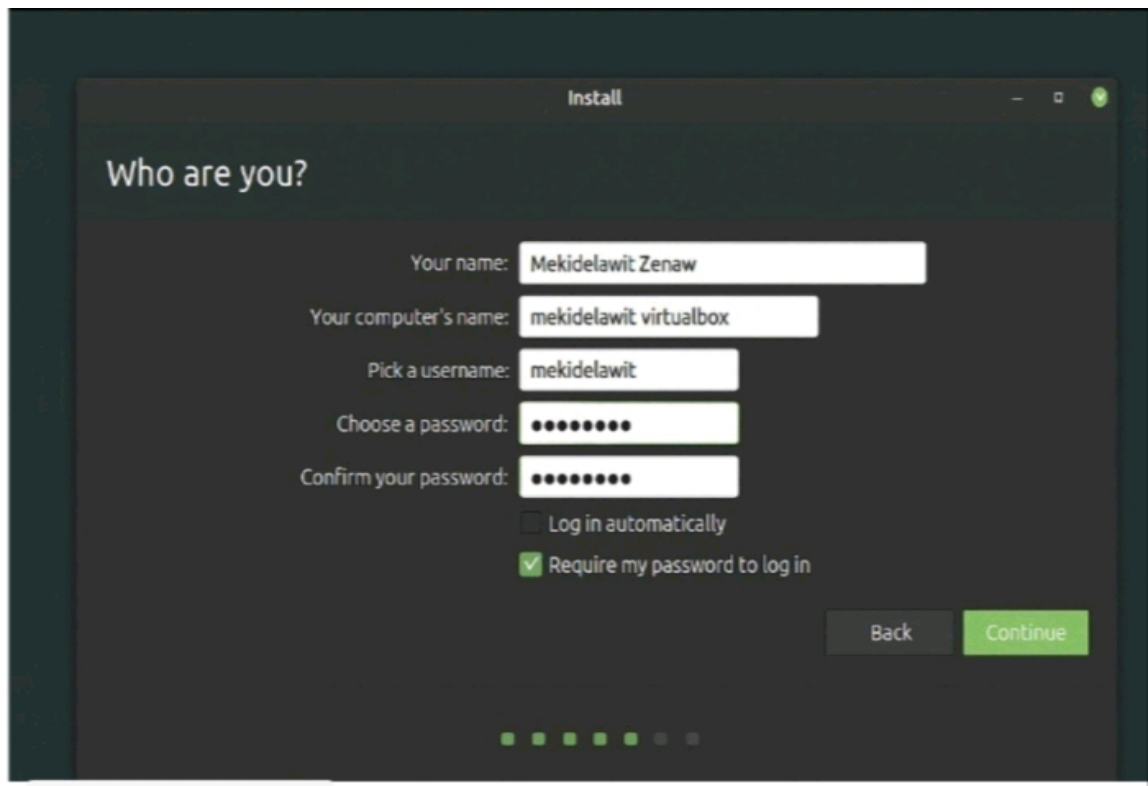
Step4:MountISOandStartVM

- ☒ Select the created VM and click Start.
- ☒ Browse and attach the Linux Mint ISO.
- ☒ Boot into the Live Environment.



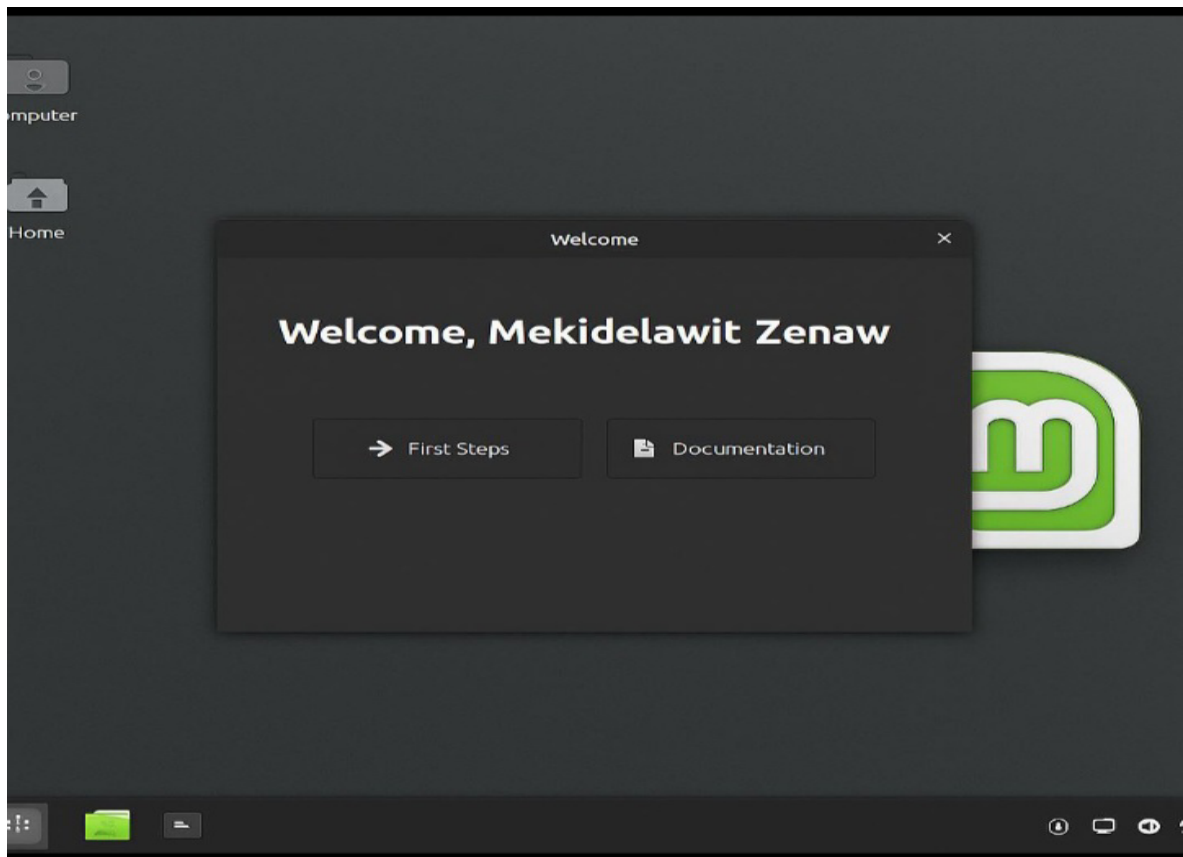
Step5:Install Linux Mint

- ☒ Click "InstallLinuxMint".
- ☒ Selectlanguage,keyboardlayout,andinstalloptions.
- ☒ Chooseinstallationtype(ErasediskandinstallMint). ☒ Setupuseraccountandpassword.



☒

☒ Complete the installation and restart



☒

5 Issues (problem)

- ❑ Problem 1: No boot able medium found: occurs if ISO is not properly mounted.
- ❑ Problem 2: Screen resolution issues: May default to low resolution after install.
- ❑ Problem 3: Slow performance: due to limited RAM allocation or no guest additions.

6 Solution

- ❑ Solution for problem 1: Re-check ISO mount settings in virtual box.
- ❑ Solution for problem 2: install virtualbox guest Additions for better display and performance.
- ❑ Solution for problem 3: Allocate more RAM or enable 3D acceleration in VM settings.

7 file support

- ❑ ext4: This is the default filesystem for most Linux distributions, including Linux Lite. It's reliable, supports large file sizes, and provides good performance.
- ❑ ext3: An older version of ext4, it's also supported for compatibility reasons. It lacks some of the advanced features of ext4 but is still widely used in older systems.
- ❑ Btrfs: This is a modern filesystem that supports advanced features like snapshots, compression, and checksumming. It's gaining popularity but is not as stable in production environments as ext4.
- ❑ XFS: A high-performance filesystem often used in enterprise environments for large-scale data storage.
- ❑ FAT32 & exFAT: These are commonly used for compatibility with other operating systems (like Windows) on external drives or partitions.
- ❑ NTFS: Linux Lite can read and write to NTFS partitions with the help of tools like ntfs-3g, making it useful for dual-boot setups with Windows.
- ❑ Swap: A dedicated swap partition or swap file is used for virtual memory, and Linux Lite fully supports this.

8 Advantage and disadvantage

Advantage

- ☒ Extremely approachable for newcomers.

The graphical installer is short and sweet, and a friendly “Welcome” app guides you through essentials like codecs, drivers, and system snapshots.

- ☒ Familiar desktop experience.

The flagship Cinnamon desktop mimics the layout of classic Windows (taskbar, start-menu style launcher, system tray), so most Windows users feel at home within minutes. Lighter MATE and Xfce editions are available for very modest hardware.

- ☒ Works “out of the box.”

Mint ships with multimedia codecs, printer drivers, a firewall GUI, Timeshift for snapshots, and a curated software manager. You can usually play videos, connect to Wi-Fi printers, and share files without extra setup.

- ☒ Timeshift-based system snapshots.

Integrated into the update tool, Timeshift takes automatic snapshots before risky upgrades, letting you roll back the entire system with a click—much like macOS Time Machine.

- ☒ Sensibly conservative updates.

Updates are shown and graded rather than forced. Major version upgrades are optional, so sudden breakages are rare.

- ☒ Stable, long-term support foundation.

Each Mint generation rides on an Ubuntu LTS base, which receives five years of security updates and enjoys vast package availability.

- ☒ Low resource footprint.

Cinnamon idles at roughly 750 MB of RAM, and the Xfce spin can run comfortably on decade-old laptops.

- ☒ Flatpak treated as a first-class citizen.

The Software Manager integrates Flathub, giving you up-to-date versions of apps like VS Code or Discord without juggling PPAs.

- ☒ No built-in telemetry.

Mint does not phone home, a plus for privacy-minded users.

- ☒ Helpful, courteous community.

Official forums and subreddits emphasize patience with beginners, so questions get answered quickly.

Disadvantages:

- ☒ Security patches arrive slightly later.

Because Mint re-tests Ubuntu updates before releasing them, critical fixes can trail by a day or two—fine for most people, but not ideal if you demand immediate patching.

- ☒ Older core software stack.

The LTS base means kernels, Mesa drivers, and tool-chains lag behind rolling or fast-moving distros. Gamers on bleeding-edge GPUs may need to install Mint's "Edge" ISO or newer kernels manually.

- ☒ No Wayland session for Cinnamon yet.

That limits fractional scaling on 4K screens and can cause glitches in screen-sharing apps. GNOME or KDE on Fedora/openSUSE offers smoother Wayland support today.

- ☒ Basic software center and no Snap support by default.

Mint's Software Manager is simple but slower to search than GNOME Software, and Snap packages are deliberately disabled. If an application is only distributed as a Snap, you'll have to enable snapd yourself.

- ☒ Two-year release cadence.

Big new features land only every couple of years. If you live for the "latest and greatest," Fedora, Arch, or Tumbleweed feel fresher.

- ☒ Limited corporate backing.

The project is funded mainly by donations and ads, so it can't match the QA resources of Canonical, Red Hat, or SUSE. Likewise, there's no official enterprise-support contract.

- ☒ Modest presence in business environments.

Mint targets home and office desktops; it offers no built-in Active Directory wizard or certified-hardware program like Ubuntu Pro or RHEL.

- ☒ Potential friction with some Ubuntu PPAs.

Because Mint's libraries can be older, a PPA built for newer Ubuntu releases might complain about unsatisfied dependencies. Flatpaks usually solve this, but it's one more packaging format to juggle.

- ☒ No official OEM or ARM images.

You won't find Mint pre-installed on Dell XPS Developer Edition or an official Raspberry Pi build (community spins exist, but first-party attention is on x86 desktops).

- ☒ Just another Ubuntu spin" perception.

Among veteran Linux users, Mint is sometimes viewed as Ubuntu with a green theme, even though it maintains its own desktop (Cinnamon) and tools. If you want a distro that pushes new technologies first, others innovate faster.

9 Conclusion

Linux Mint 21.x ("Virginia") confirms its standing as the most approachable desktop Linux: tied to Ubuntu 22.04 LTS for updates until April 2027, refined by Cinnamon 6's Wayland option, fractional scaling, and sleeker theming, and strengthened by built-in tools such as Timeshift, Flatpak integration, and a smoother Secure-Boot/dual-boot experience—all communicated through transparent monthly dev-blog posts that keep the community engaged and informed.

10 future recommendation

Before Mint 20.x reaches end-of-life in 2025, migrate those systems to 21.3, begin regular Wayland testing so it matures for Mint 22 (Ubuntu 24.04 base), and use Flatpak or Nix to access newer apps without polluting the core OS; over the next two-plus years, adopt snapshot-centric filesystems (Btrfs/ZFS), encourage ARM64 desktop builds, and prioritise accessibility and localisation to widen Mint's reach and resilience for the coming LTS cycle.

2 Virtualization in modern operating systems

2.1 what is virtualization

Operating System-based Virtualization is also known as Containerization. It is a technology that allows multiple isolated user-space instances called containers to run on a single operating system (OS) kernel. Unlike traditional virtualization, where each virtual machine (VM) requires its own OS, OS-based virtualization allows the sharing of the same OS while providing separate environments for running applications.

2.2 why use virtualization

Resource Efficiency:

- ⊠ Operating system based virtualization allows for greater resource efficiency as containers do not need to emulate a complete hardware environment, which reduces resource overhead.

High Scalability:

- ⊠ Containers can be quickly and easily scaled up or down depending on the demand, which makes it easy to respond to changes in the workload.

Easy Management:

- ⊠ Containers are easy to manage as they can be managed through simple commands, which makes it easy to deploy and maintain large numbers of containers.

Reduced Costs:

- ⊠ Operating system based virtualization can significantly reduce costs, as it requires fewer resources and infrastructure than traditional virtual machines.

Faster Deployment:

- ⊠ Containers can be deployed quickly, reducing the time required to launch new applications or update existing ones.

Portability:

- ⊠ Containers are highly portable, making it easy to move them from one environment to another without requiring changes to the underlying application.

Testing and Development:

- ⊠ Virtualization lets users test other operating systems, software, or configurations in isolated environments without impacting the host system. This is particularly useful for developers and testers

2.3 How virtualization work

- ⊠ The host OS kernel is shared among all containers, unlike full virtualization (e.g., VMs) where each VM has its own kernel.
- ⊠ The kernel enforces isolation between containers using namespaces (for process, network, filesystem isolation) and cgroups (control groups) for resource allocation (CPU, memory, disk I/O, network).
- ⊠ cgroups limit and prioritize resource usage (CPU, memory, disk, network) per container.
- ⊠ The kernel ensures that a container cannot exceed its allocated resources (unless explicitly allowed).
- ⊠ Namespaces prevent processes in one container from seeing or interfering with processes in another.
- ⊠ Programs inside a container cannot access resources outside unless explicitly granted (e.g., mounted volumes, network ports).
- ⊠ The overhead comes from kernel-level isolation mechanisms (namespaces, cgroups), but it's minimal compared to full virtualization

Reference

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