



BAHIRDAR UNIVERSITY

Department of Software Engineering

“Operating System and System Programming”

Individual Assignment “Bodhi OS Documentation”

Name: Eyuel Yeshambel Gebeyehu

ID No: BDU1601474

Section: B

Submitted To: Wendimu B.

Submission Date: 16/08/2017 E.C

Table of Contents:

1. Introduction	1
2. Key features.....	2
3. Objectives.....	2
4. System Requirements.....	3
✓ Software Needs and Hardware Needs	
5. Installation Procedure.....	4
6. Challenges Encountered.....	7
7. Solutions.....	9
8. File System Support.....	10
9. Advantage and dis advantage.....	11
✓ Pros and Cons	
10. conclusion.....	11
11. Future Outlook / Recommendations.....	12
12. Understanding virtualization in Operating System	12

1. Introduction

Bodhi OS is a lightweight Linux distribution which is designed for minimal resource usage and high customization. First released in 2011 by the Bodhi Linux team, it uses the Moksha desktop environment, a fork of Enlightenment, offering a fast and visually appealing interface. Bodhi OS targets users with older hardware or those seeking a streamlined Linux experience, making it an excellent choice for students and enthusiasts exploring Linux.

Unlike mainstream operating systems like Windows, Bodhi OS prioritizes performance and user control, avoiding bloatware and unnecessary services. It is secure, with minimal data collection, and less prone to viruses due to its Linux foundation. Its modular design allows users to install only the software they need, fostering a tailored computing experience. Bodhi OS serves as an accessible entry point to Linux for users transitioning from other systems.

Bodhi Linux is particularly appealing to users who want a **fast, efficient, and customizable** operating system without unnecessary bloat. Whether you are a beginner or an experienced Linux user, Bodhi Linux offers a unique experience tailored to individual preferences.

Key Features of Bodhi Linux:

- ✓ **Minimalist Approach:** Unlike many Linux distributions that come preloaded with numerous applications, Bodhi Linux provides only essential software, allowing users to install what they need.
- ✓ **Low System Requirements:** Ideal for reviving older hardware, Bodhi Linux runs smoothly even on computers with limited processing power.
- ✓ **Software Management:** Users can install applications through the **AppCenter**, which provides a simple way to find and install software.
- ✓ **Security & Stability:** Since it is based on Ubuntu, Bodhi Linux benefits from Ubuntu's security updates and stability.

Objectives

The primary objective of Bodhi Linux is to provide a **lightweight and efficient** operating system that maximizes performance while maintaining a minimalist approach. Unlike traditional Linux distributions that come preloaded with numerous applications, Bodhi Linux offers a streamlined base system, allowing users to install only the software they need. This ensures that the OS remains fast and responsive, making it an excellent choice for older computers or users who prefer a clutter-free computing experience.

The goal of this project is to acquire knowledge and practical skills in installing and understanding Bodhi OS, a Linux-based operating system. This documentation outlines the installation process, challenges encountered, and solutions applied. It also explores supported file systems (e.g., ext4, NTFS) to enhance file management across platforms. Additionally, the document evaluates Bodhi OS's strengths, weaknesses, and potential improvements, providing a comprehensive overview for Linux.

- ✓ Understanding Bodhi's minimalists.
- ✓ Mastering the installation of Bodhi Linux in a virtual environment.
- ✓ Identifying and resolving installation challenges to build troubleshooting skills.
- ✓ Exploring supported file systems (e.g., ext4, NTFS) to facilitate data management across platforms, crucial for students and professionals working with mixed OS environments.
- ✓ Evaluating Bodhi's strengths and limitations compared to other Linux distributions.

Requirements

Before installing Bodhi OS, it's essential to verify hardware and software compatibility. Despite its lightweight nature, Bodhi OS requires specific resources to function effectively.

a. Software

- ✓ Bodhi OS ISO file (downloadable from the official website).
- ✓ Image flasher (e.g., Rufus, Balena Etcher) for physical installations.
- ✓ VMware Workstation for virtual environment setup.
- ✓ Image flasher (e.g., Balena Etcher, Rufus) for physical installs

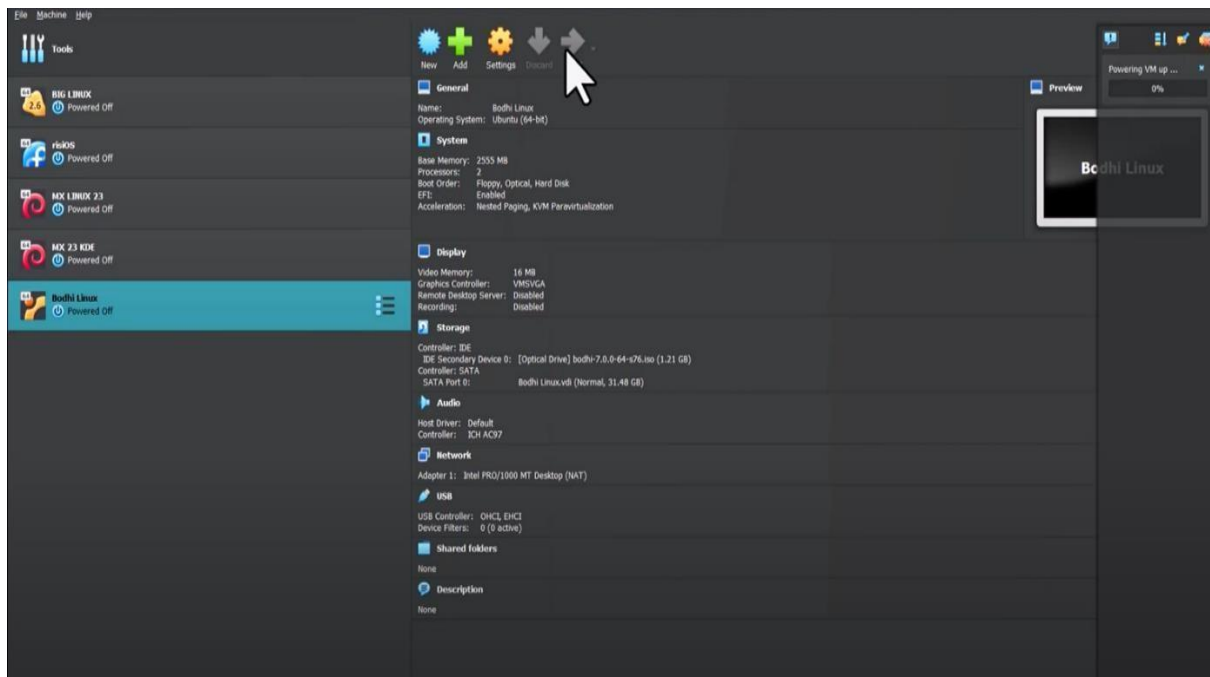
b. Hardware

- ✓ **Processor:** ≥ 1 GHz Single Core (Dual Core recommended).
- ✓ **RAM:** ≥ 512 MB (1 GB or more recommended).
- ✓ **Internet Connection:** For updates and software installation.
- ✓ **Disk Space:** ≥ 4 GB (10 GB recommended).
- ✓ **Optional:** USB drive (4 GB or more) for physical installations.

Installation Steps

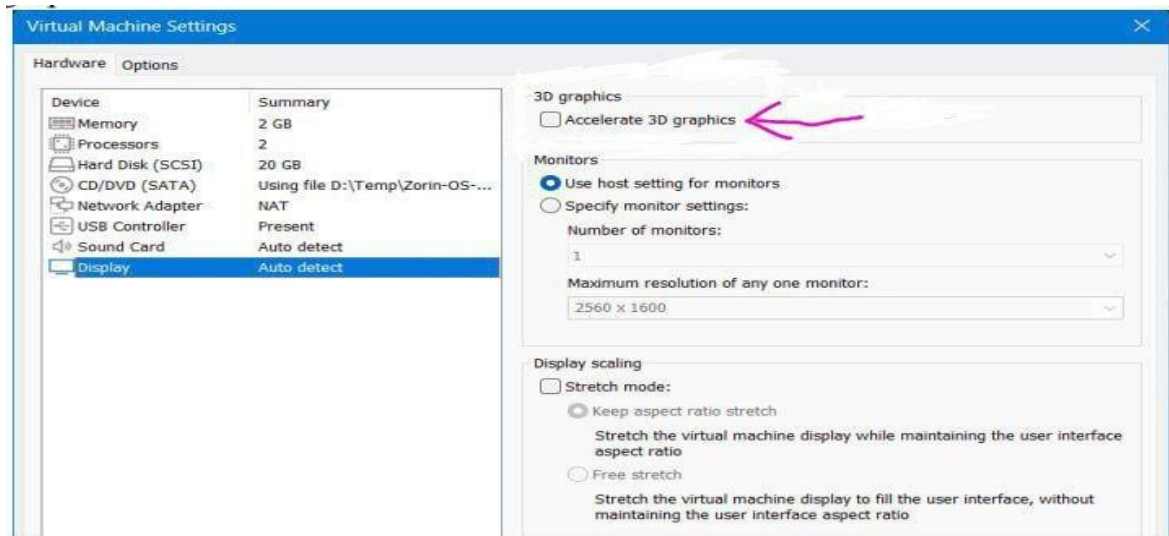
The following steps outline the installation of Bodhi Linux 7.0 (64-bit) on VMware Workstation. Ensure all requirements are met before proceeding.

1. **Download Bodhi ISO:** Visit (<https://www.bodhilinux.com/download/>) and download the Standard 64-bit ISO. Save it to a local directory.
2. **Download VMware Workstation:** Obtain VMware Workstation Player from (<https://vmware-player.en.uptodown.com/windows>) and install it.
3. Open VMware Workstation and click “Create a New Virtual Machine.”
4. Choose “Installer disc image file (iso)” and browse to the Bodhi ISO. Click “Next.”

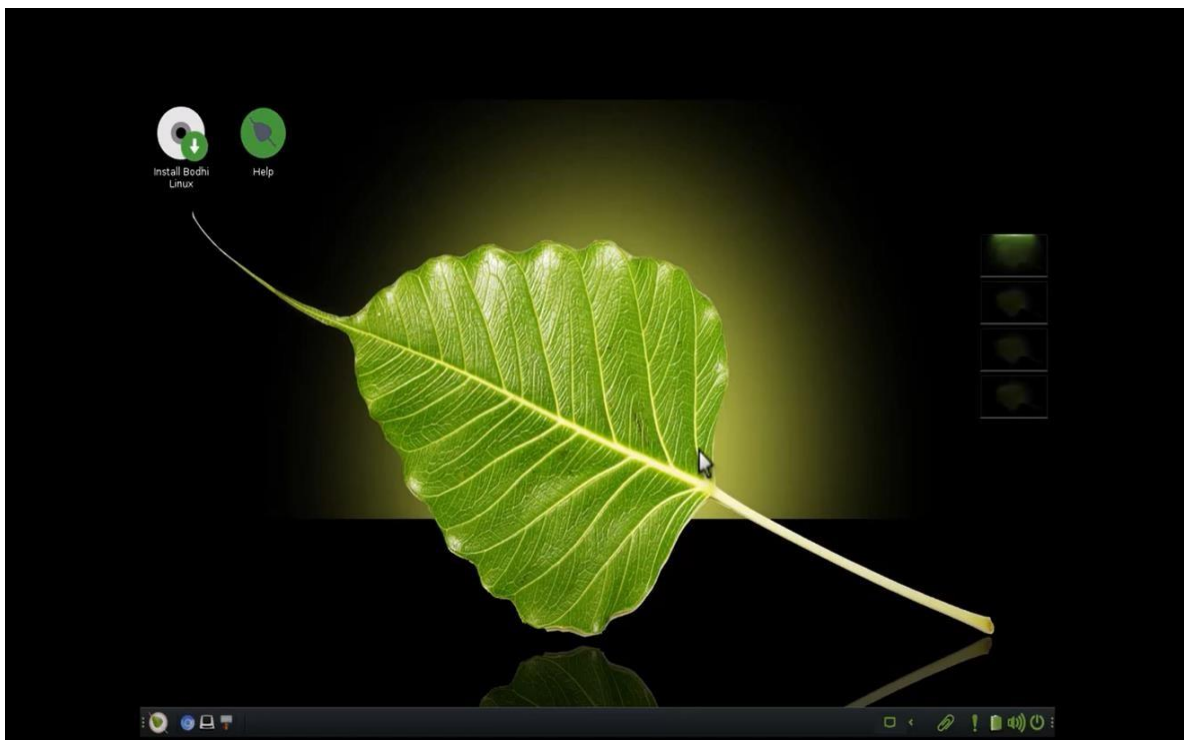


5. Select “Linux” as the guest OS and “Ubuntu 64-bit” as the version, as Bodhi is Ubuntu-based. Click “Next.”
6. Enter a name (e.g., “Bodhi-Linux”) and choose a storage location. Click “Next.”
7. Set disk size to 10 GB (recommended) and select “Store virtual disk as a single file.” Click “Next.”

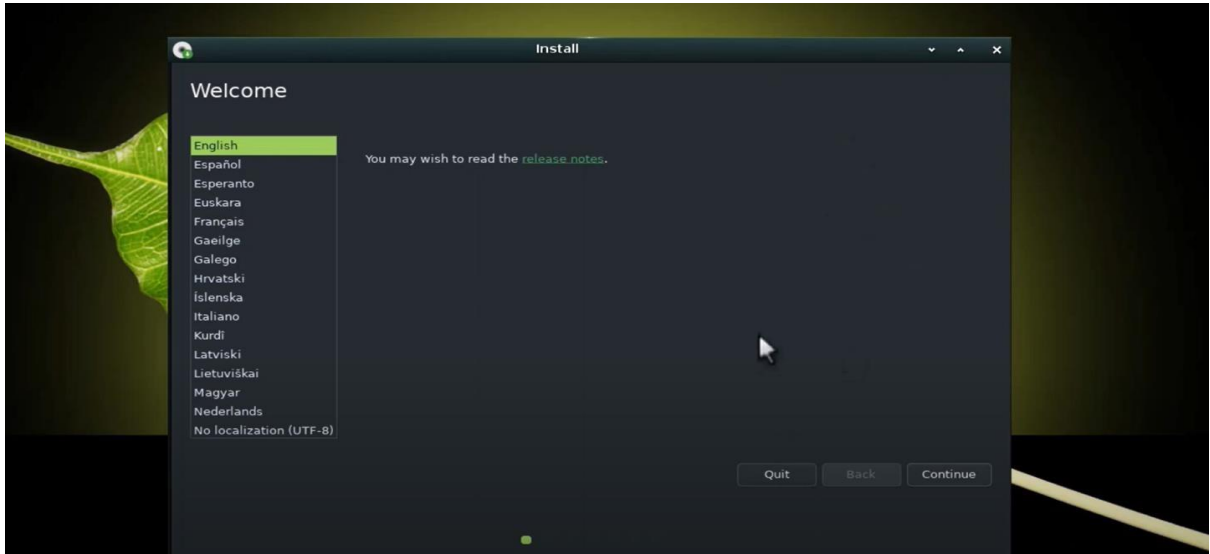
8. Click “Customize Hardware,” allocate 1 GB RAM, 1 CPU core, and **disable** “Accelerate 3D graphics” under Display to avoid graphics issues. Click “Close” and “Finish.”



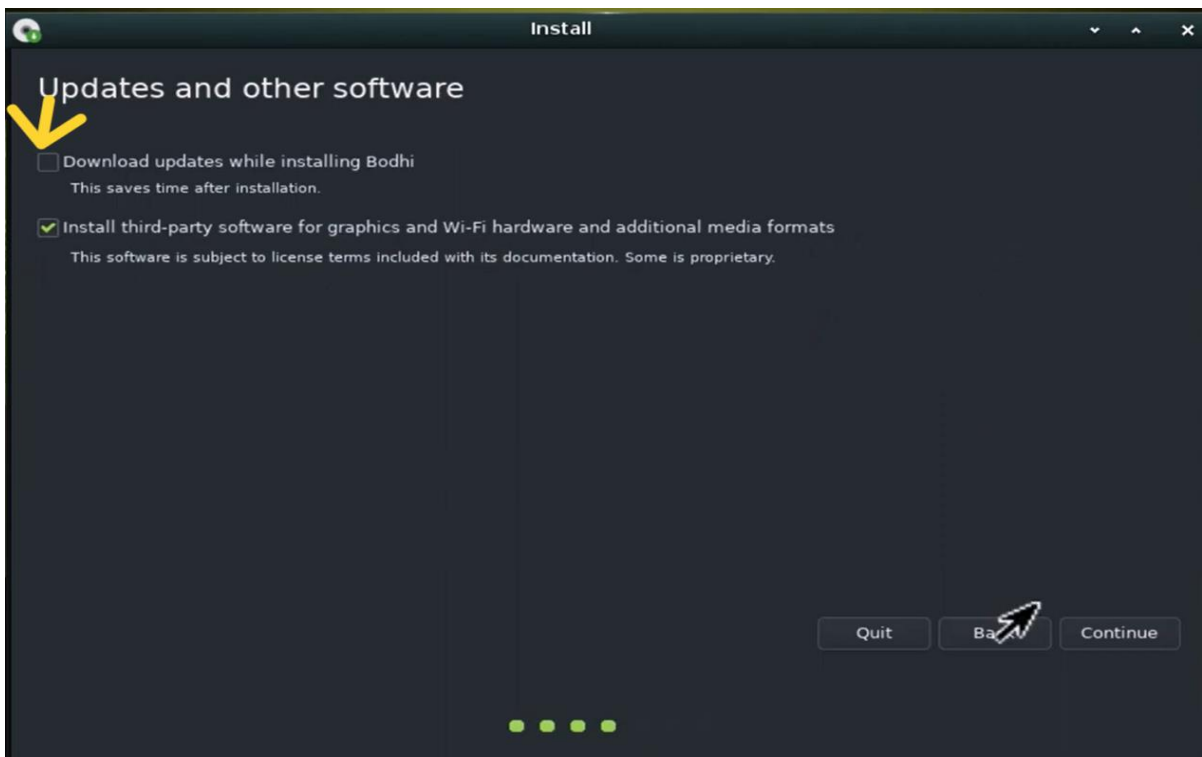
9. At the GRUB boot screen, select “Bodhi Linux” and press Enter.
10. From the desktop, click “Install Bodhi Linux 7.0” under Applications.



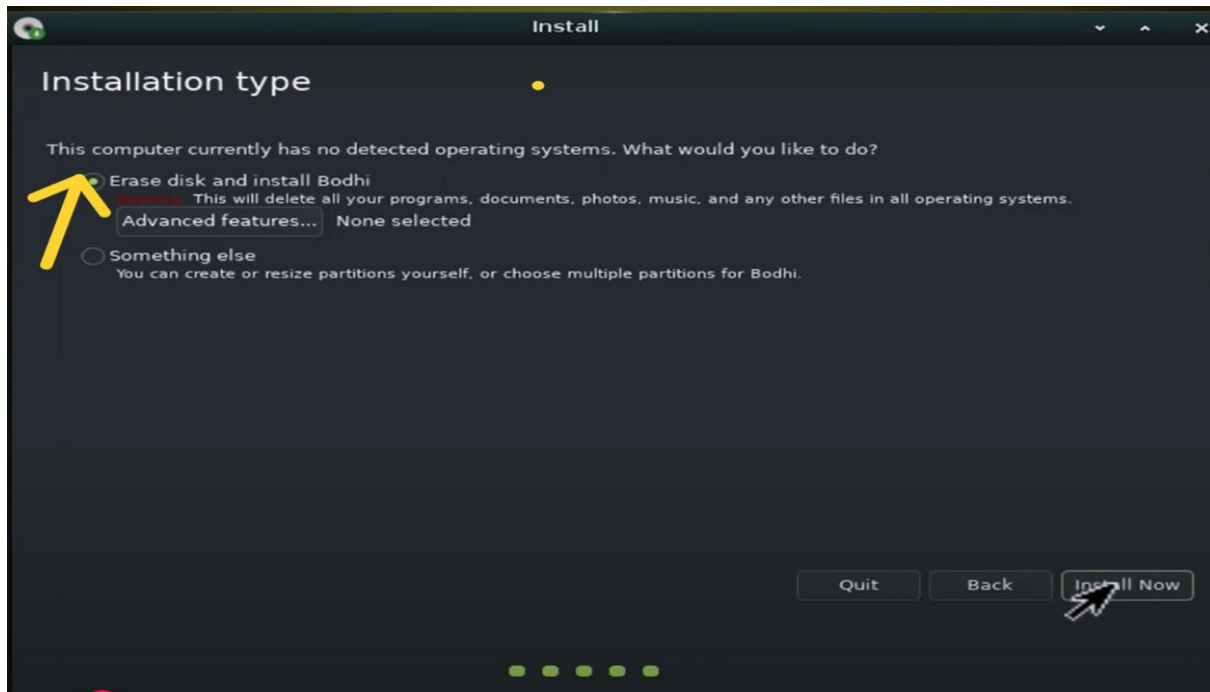
11. **Language:** Select your preferred language (e.g., English) and click “Continue.”



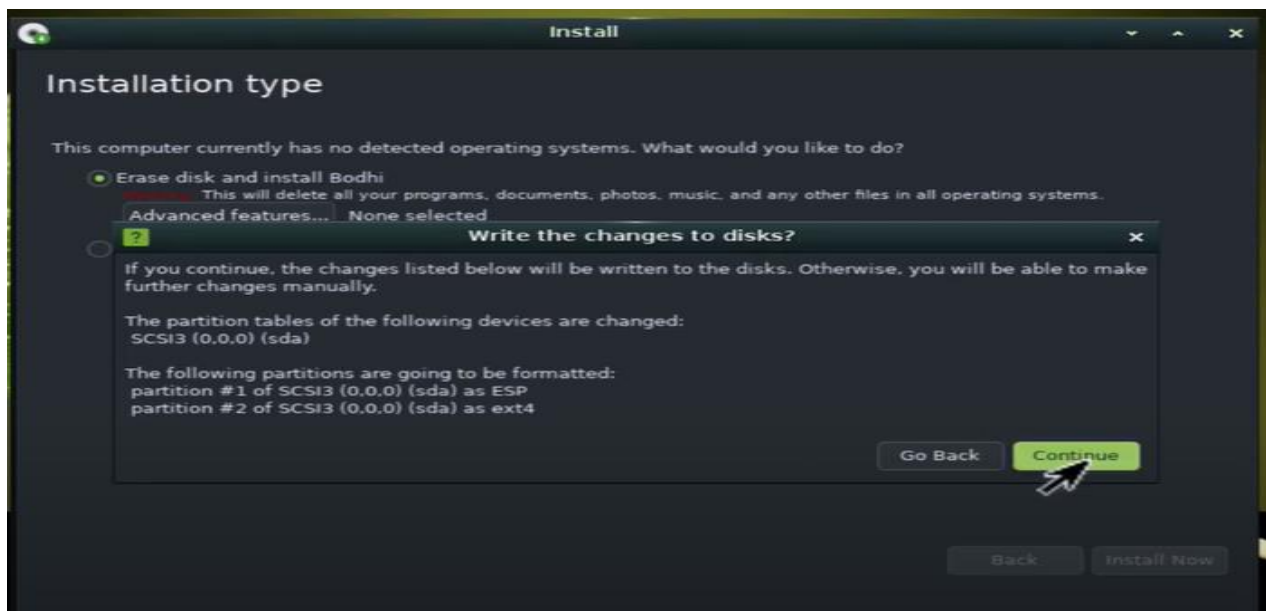
12. Uncheck “Download updates while installing Bodhi” for faster installation on low-spec VMs. Click “Continue.”



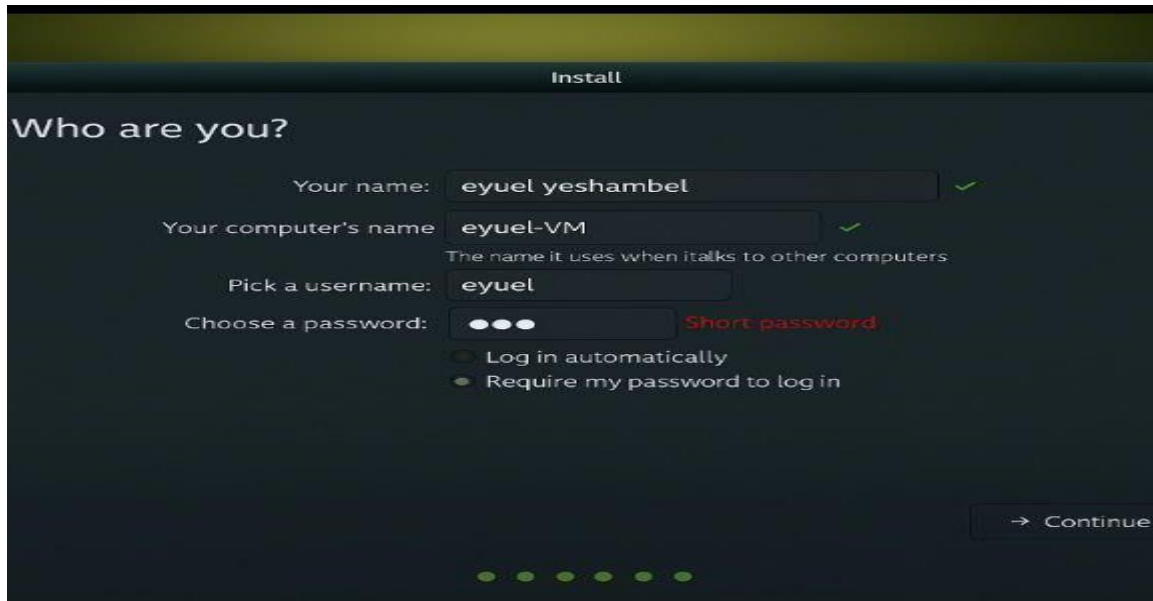
13. Select “Erase disk and install Bodhi” for the virtual disk. Click “Install Now.”



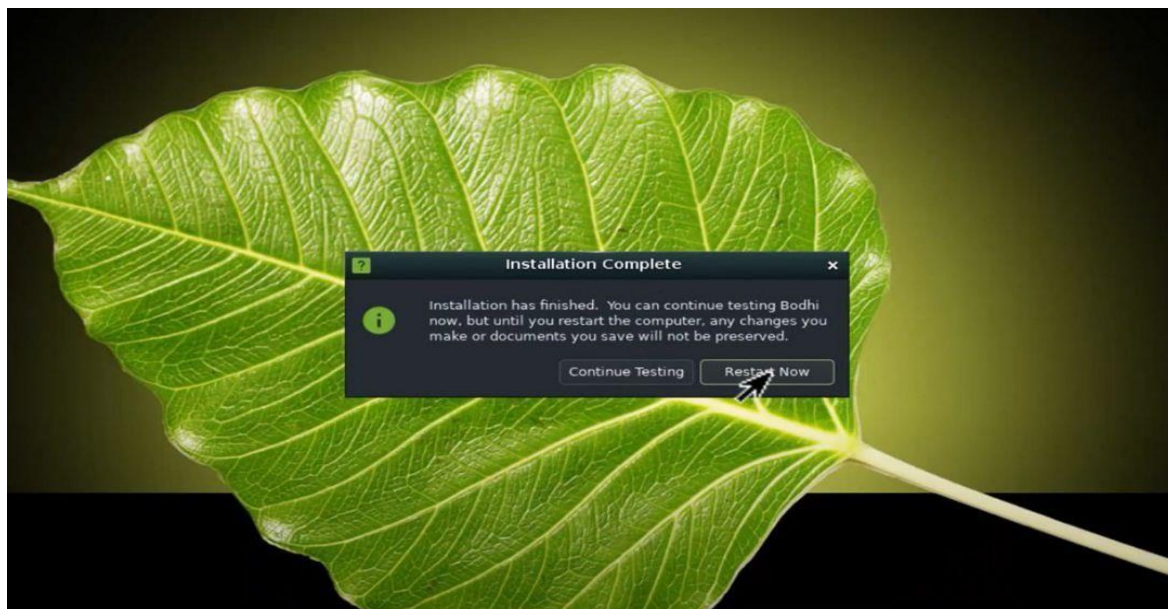
14. Confirm disk changes by clicking “Continue.”



15. Select your time zone (e.g., Ethiopia) and click “Continue.”
16. Enter your full name (e.g., [Eyuel yeshambel]), computer name (e.g., “[bodhi]”), username, and password. Click “Continue.”



17. Wait 15–30 minutes for the installation to complete.
18. Click “Restart Now” when prompted, remove the ISO (in VMware, go to VM > Settings > CD/DVD > Disconnect), and press Enter.



After reboot, log in with your credentials to access Bodhi Linux.

Challenge (Problems Faced)

During installation, two issues were encountered:

- ✓ **Slow Installation:** The installer was sluggish, taking over 30 minutes, likely due to limited RAM (512 MB initially allocated).
- ✓ **Graphics Glitch:** Enabling “Accelerate 3D graphics” caused a display error: “Unsupported graphics driver detected.” [Image: Screenshot of error message, to be included.]
- ✓ **Display Resolution Issue:** The screen resolution was misconfigured, causing a blurry interface.

Solutions

- ✓ **Slow Installation:** Increased VM RAM to 1 GB in VMware settings (VM > Settings > Hardware > Memory). This reduced installation time to ~20 minutes.
- ✓ **Graphics Glitch:** Disabled “Accelerate 3D graphics” in VMware display settings (VM > Settings > Display). The error disappeared, and the desktop rendered correctly. [Image: Screenshot of updated display settings, to be included.]
- ✓ **Resolution Fix:** Adjusted display settings in VMware to match the host’s resolution, fixing the blurry interface.

File System Support

Bodhi Linux, like most Ubuntu-based distributions, uses **ext4** as its default file system due to its stability, journaling (for crash recovery), and performance. It also supports other file systems for compatibility with Windows, macOS, and advanced use cases:

FILESYSTEM	USED FOR	SUPPORTED?	NOTES
EXT4	Default Linux system	Yes (default)	Stable, supports journaling, ideal for Linux partitions.
NTFS	Windows drives	Yes	Read/write support for sharing files with Windows.
FAT32	USB & old drives	Yes	Limited to 4 GB file size, widely compatible.
EXFAT	New USB & SD cards	Yes	Supports large files, ideal for cross-platform media.
BTRFS	Advanced users	Optional	Requires manual setup, offers snapshots and compression.
ZFS	Servers, backups	Optional	Supports advanced features like deduplication; not default.
HFS+	macOS drives	Yes (read-only)	Limited write support; used for macOS compatibility.
APFS	Modern macOS drives	Limited	Read-only; full support requires third-party tools.

Why Supported: ext4 is chosen for its maturity and reliability, making it suitable for Bodhi's lightweight focus. NTFS and FAT32 ensure compatibility with Windows, while exFAT supports large media files. Advanced systems like Btrfs and ZFS cater to developers needing snapshots or redundancy, though they require manual configuration. HFS+ and APFS enable macOS interoperability, though APFS write support is limited without additional software. This flexibility makes Bodhi versatile for students and professionals managing multi-OS environments.

Advantages and Disadvantages

a. Pros

- ✓ **Lightweight:** Runs on 512 MB RAM and 500 MHz processors, ideal for reviving old PCs (e.g., 10-second boot time on modern hardware).
- ✓ **Customizable:** Moksha desktop allows extensive theming, widget additions, and layout changes, appealing to both novices and experts.
- ✓ **Stable:** Built on Ubuntu LTS (e.g., 22.04), ensuring five years of security updates.
- ✓ **Minimalist:** Includes only essential apps (Chromium, Thunar, Terminology), reducing bloat and empowering user choice.
- ✓ **Community-Driven:** Active forums and Discord provide support, with opportunities to contribute to development.

b. Cons

- ✓ **Limited Default Apps:** Lacks a standalone software center; the web-based AppCenter requires internet and may confuse beginners.
- ✓ **Learning Curve:** Moksha's unique interface may challenge users accustomed to GNOME or KDE, requiring time to master customization.
- ✓ **Hardware Support:** Some modern Wi-Fi or graphics drivers may need manual installation, unlike mainstream distributions.
- ✓ **Gaming:** Limited support for gaming due to minimal default drivers and lightweight focus, less suitable for gamers compared to Zorin OS.

Conclusion

Bodhi Linux offers a lightweight, stable, and highly customizable platform, making it an excellent choice for users seeking performance on low-spec hardware or a tailored Linux experience. Its Moksha desktop combines elegance with efficiency, while its Ubuntu LTS base ensures long-term reliability. The installation process, though straightforward, benefits from careful configuration in virtual environments like VMware. Challenges like slow performance or graphics issues are easily resolved with proper settings. Bodhi's file system support enhances its versatility, and its community support fosters learning. For students, developers, or anyone exploring Linux, Bodhi provides a refreshing alternative to heavier distributions, balancing simplicity and power.

Future Outlook / Recommendations

Bodhi Linux has a promising future as a niche distribution for lightweight computing. To enhance its appeal:

- ✓ **Improved Software Center:** Develop a standalone app store like Ubuntu's Snap Store for offline use and better usability.
- ✓ **Enhanced Hardware Support:** Include drivers for modern Wi-Fi and GPUs by default to reduce manual setup.
- ✓ **Gaming Support:** Integrate lightweight gaming tools (e.g., Steam with Proton) to attract casual gamers.
- ✓ **Localization:** Expand translations for African languages (e.g., Amharic, Oromo) to reach regions like Ethiopia.
- ✓ **Tutorials:** Create video guides for Moksha customization and installation to lower the learning curve.

Understanding virtualization in Operating System

What?

Virtualization allows multiple operating systems to run simultaneously on a single physical computer by creating virtual machines (VMs). A hypervisor (e.g., VMware, VirtualBox) abstracts hardware resources, enabling each VM to operate independently with its own OS, CPU, RAM, and storage.

Why?

Virtualization saves costs, space, and energy by consolidating multiple systems onto one machine. It's ideal for:

Testing: Safely experiment with OSes like Bodhi without affecting the host (e.g., Windows).

- ✓ **Development:** Run diverse environments for cross-platform coding.
- ✓ **Security:** Isolate risky applications in VMs to protect the host.
- ✓ **Education:** Learn Linux in a controlled setting, as done in this assignment.

How?

The hypervisor allocates hardware resources (CPU, RAM, disk) to VMs, managing communication between the host and guests.

Type-1 hypervisors (e.g., VMware ESXi) run directly on hardware, while Type-2 hypervisors (e.g., VMware Workstation) run atop a host OS. VMs use virtualized drivers to access resources, ensuring isolation. For example, installing Bodhi in VMware allocates 1 GB RAM and 10 GB disk, allowing it to run alongside the host without interference. Challenges like resource contention (e.g., over-allocated RAM) can be mitigated by optimizing VM settings.