BAHIR DAR UNIVERSITY

BAHIR DAR INSTITUTE OF TECHNOLOGY

FACULTY OF COMPUTING

DEPARTMENT OF SOFTWARE ENGINEERING

Individual assignment

COURSE Name: Operating system and system programming

OS Name: mageia os

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Section:- B

SUBMITTED TO: MR. wendimu.B

SubmissionDate:4/09/2017E.C

Contents

Introduction

Mageia is a potent and easily modifiable open source operating system built on Linux Kernel. As with any other collaborative open source platform, its funded by an international pool of developers, contributors and users. Most of their Mageia's powerful features stem from the community working towards a single goal, transparency, cooperation and mutual aid. It received praise for its user experience, design, system stability, and ease of use. Like most systems, it was also forked out of another system, Mandriva Linux, but grew over time to be a self-sustained project with its own community.

From its inception, Mageia has been focused on providing a computing interface that is easy to learn but has depth in sophistication for advanced users. Whether you're a home user, someone needing access to a computer for educational activities, software development or even a professional, Mageia has got your back. It can be installed on stand alone machines and also works well with cloud-based systems like VMware and VirtualBox.

What makes Mussel Mageia unique among other Linux distributions are its distinct characteristics:

1. Graphical User Interface (GUI)

It supports multiple desktops which allows users to select their preferred KDE Plasma, GNOME, XFCE along with other options. In addition to customizability, Mageia comes with an appealing GUI.

2. Spell Package Correctly

With robot Mageia regions and functions and software pieces of modules, they own URPMI package manager, which aids the process of installation, software

updates and even erasure. URPMI employs Mageia's countless software repositories that store more than a thousand free and open source applications. Casual users do not require complex workarounds like downloading outside URLs for essential multimedia, development tools and system utilities.

3. Very Flexible

Customization herbs and plants of stamp Mageia fall under the catgorzyst extreme flexibility. Be it during the installation stage or after, one can make customize changes according to their wish. Users can opt for the systeam put together options, kernel and system service policies, and alter the look and feel of the settings page. This makes mageia a computing environment must have with full control required for developments, tests or even everyday usage.

4. Robust security protocols

Mageia Computing Systems is developed with cyber security measures. Technologies, Functions and processes done to an operating system are sieved regularly with new patches and updtes therefore harding the system against possible new threats. Other measures include having a pre installed firewall, softwar damage control, secure software storage and greatly functional os enabling features. The accompanying system and user data with region protection become especially useful for files open to multi user and network settings.

5. Dynamic and Helping Community

A very valuable feature of Mageia is that its users a very passionate and dedicated community. Users are encouraged to spend from their time participating with the project by resolving issues, writing documents, making videos, or even helping out the software engineers. The wiki pages, foras, and outside email lists greatly assist anybody from the novice to the professional, which guarantees even the most experienced professionals are able to find what they require. The cheerful atmosphere makes certain support is available everywhere and the distro concentrates on what users want.

Objectives

This task is meant to achieve comprehension and skill in performing the installation process of Mageia OS, a Linux distribution maintained by a community, in a virtual environment using VMWare Workstation. The focus of the task is to make learners understand Linux system installation, configuration, and troubleshooting along with understanding virtual machines and open-source operating systems.

1. To Install Mageia OS Through VMware Workstation Successfully

The initial goal is to ensure users excel at installing Mageia OS in a virtual machine using VMware Workstation by methodically guiding them through the steps starting from downloading the ISO file to configuring virtual hardware specifications such as memory, hard disk, processor allocation, and system booting. Virtualization has become an integral aspect of modern computing in developing, testing, and conducting safe experiments with systems, and guiding users through this procedures will increase their confidence in these technologies.

2. To Acquaint With The Process Of Creating And Configuring Virtual Machines For Linux

An objective of significant importance is to instruct students on the creation, configuration, and performance optimization of virtual machines tailored for Linux operating systems. Most important within this objective is defining the right settings for performance to include RAM, CPU cores, and disk space.

3. To Examine the Target Steps of Setting Up Mageia OS

This particular case study of Mageia OS covers the use of the system served the with its primary focus being its installation. Students are required to complete disk partitioning (free space or custom) as well as select a desktop environment KDE, GNOME or XFCE, set the country and language including the keyboard layout, and create users. Some of the remaining functions will include updates, installing required drivers,

customizing the interface, and other maintenance tasks which must be performed before or after installing the operating system in order make it functional and productive will be taught.

4. To Find and Solve Problems and Issues Related to Installation

One of the main goals is develop the ability to construct approach for solving problem and diagnosing them. Users will start defining problems like powered-off state booting requests, non-visible displays for virtual viewer, network non-identification and peer connection, missing some software/ driver installation settings, and unintentional partition layout design. Each of these problems comes with a workaround and a unique solution which steps through each crafted structure of practical troubles in IT networking builds strong de facto troubleshooting competencies which are essential.

5. To Set Virtual Framework Using Linux along with Mageia OS For Other Related Activities

Requirment

These prerequisites should not pose any challenges during the installation of Mageia OS on a virtual machine.

i. Requirements for Hardware

List the Windows 10, Windows 11, Mac, Linux GNU; and other operating systems can run on the Mageia Computer Systems alongside the latest versions of Mageia.

For enhanced experience as a user and for running Mageia on a virtual machine, there are some specific requirements that need to be met.

Processor (CPU):

The best Processor for Mageia OS would be a multi-core CPU and best of all, a 64-bit one. Other offered functionalities by the CPU such as Intel VT-x or AMD-V should also be available since they greatly enhance the performance of virtual machines. This type of processor can include x86 terms like intel core duo which can supprt multiple executions/ forcing. Other examples include the Core i5, i7 and i9 and AMD Ryzen 5, 7 and 9, among others.

Those models certainly have enough resources and power for effective multitasking because of the features designed by their builders for virtualization.

Memory (RAM):

Most modern computers should find it agreeable to have an interface operating system and a copy of Mageia OS installed alongside it, configured within 2GB of memory.

Storage Space:

The installation prerequisites for Mageia OS includes allocating a minimum of 20 GB of available disk space on either the hard drive or solid state drive (SSD). With regard to setting aside space on the disk for the OS, core system files, optional applications, updates, and system maintenance, partitioning has been accounted for. Additionally, if Mageia is intended for use in development work or intensive data activities, it is better to have disk space beyond 30-40 GB. Unlike traditional mechanical Hard Disk Drives (HDD), SSDs enhance system performance because their access time to read locations is faster, enabling quicker booting, faster application loading, and overall improved performance.

Display And Peripherals:

For optimization of productivity and best software usage experience, the display peripherals should be above 1024x768 resolution, though any value above baseline is useful. With cutting-edge desktop environments, this requirement is easier to fulfill. In addition, a computer would be nonoperational without an input device which comprises a keyboard and mouse.

Even though having an internet connection is not a requirement, it can certainly be beneficial in obtaining software that improves system features, receiving help regarding the system and even to capture crucial updates for the system.

ii. Condition of a Software

The application tools Mageia OS require are software capable of being executed on a virtual machine alongside relevant hardware Mageia OS runs on.

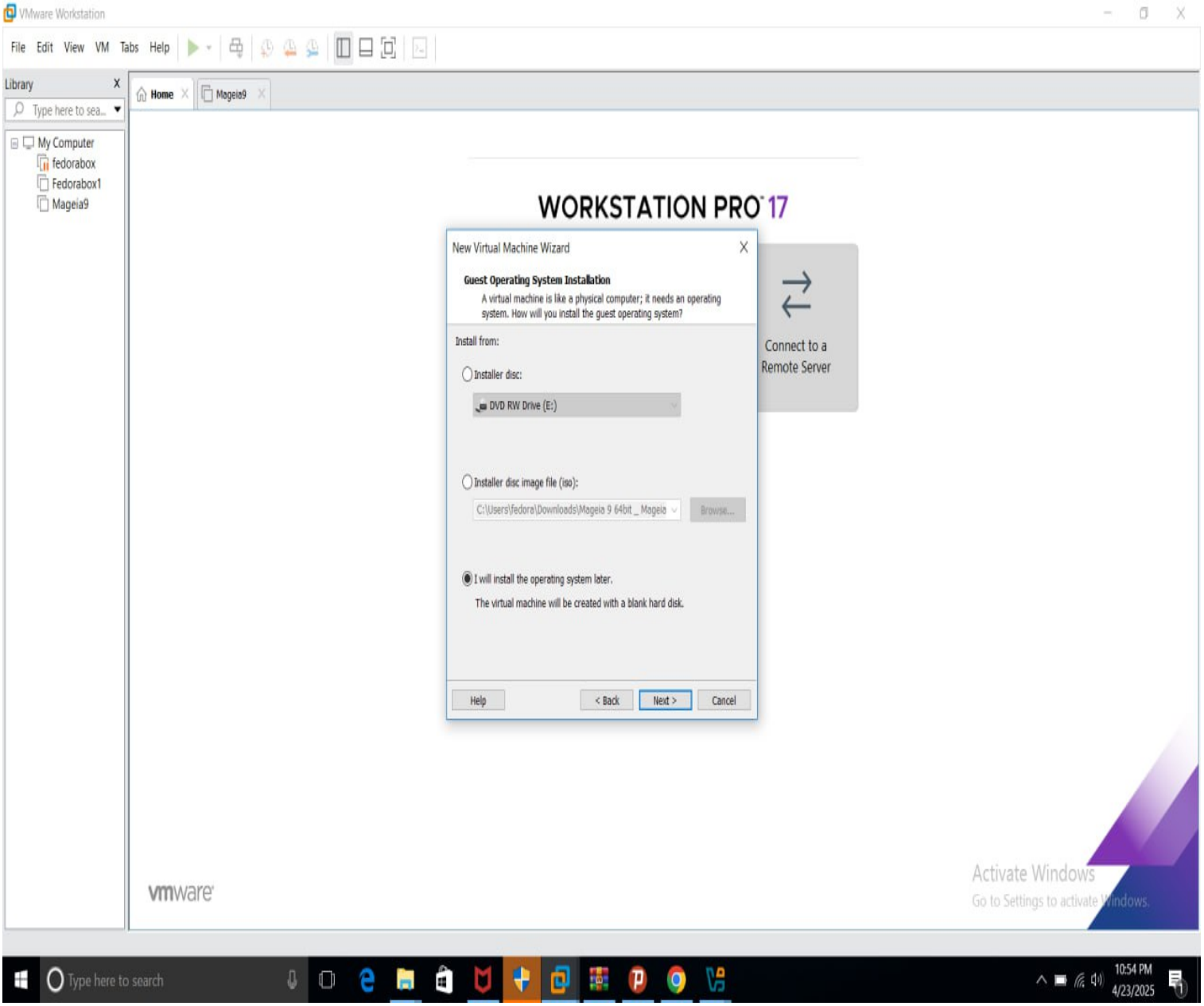
VMware Workstation as the primary software for virtualization provides an option for seamless Mageia OS installation and configuration. Like any other software, it is best to have the student or developer version of the latest VMware Workstation since do alumnos para el ordenador. Snapshots, shared folders, drag and drop between OS' and stability, and numerous other features are avaliable in releasnotes. Also, unparalleled compatibility with guest operating systems have been introduced in newer releases.

For ease, an ISO file downloadable from the website serves as an installation media. Incase a user would want later includes, they should first download the last stable release on Mageia's website. Make sure you select the right edition for your needs, seja o que for "Classic installer" for full installations, or "Live ISO" for testing.

Installation

Step 1 open VMware Workstation and Create a New Virtual Machine

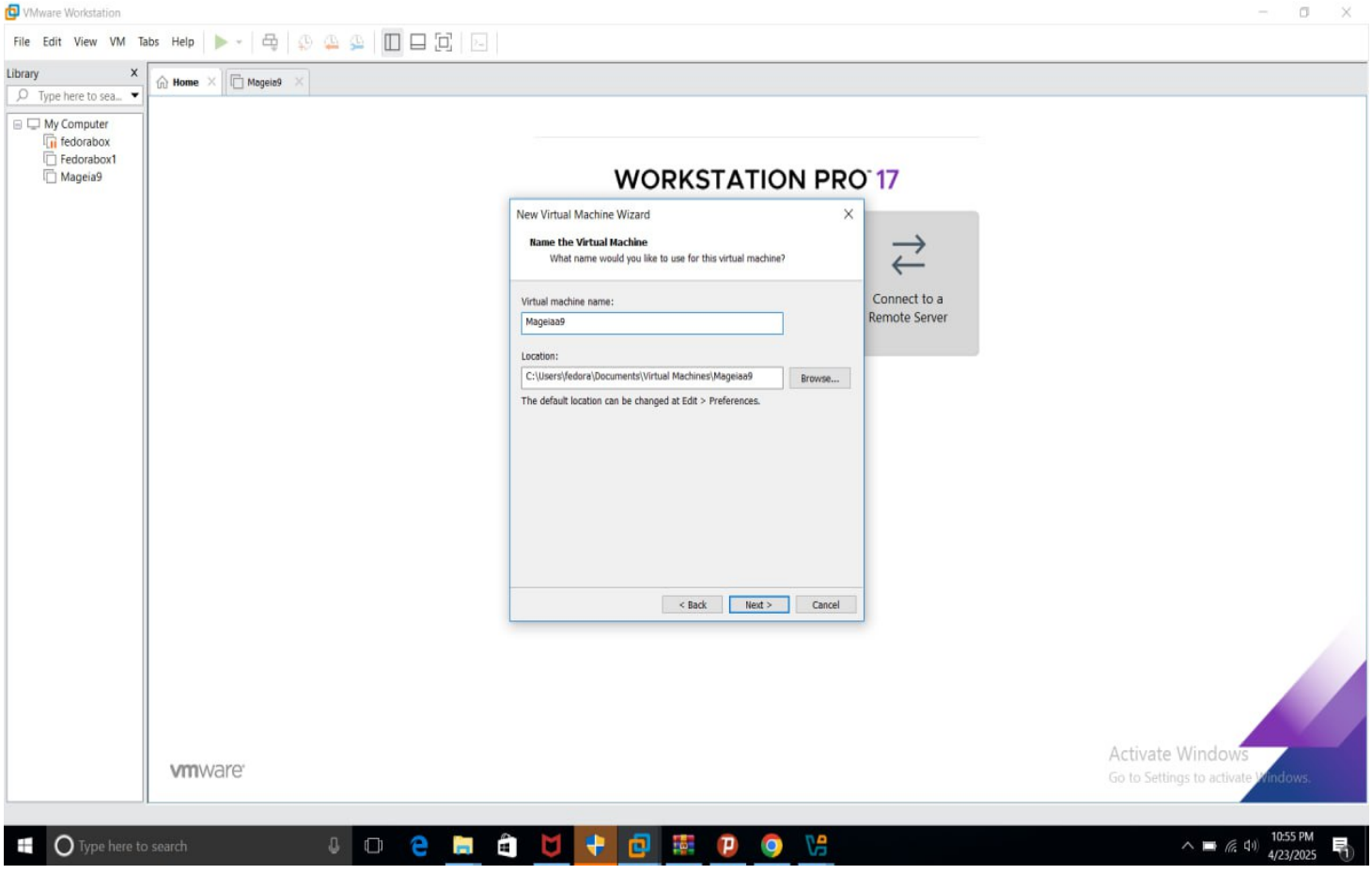
- First, open VMware Workstation



Step 2: Select the Magic Iso file

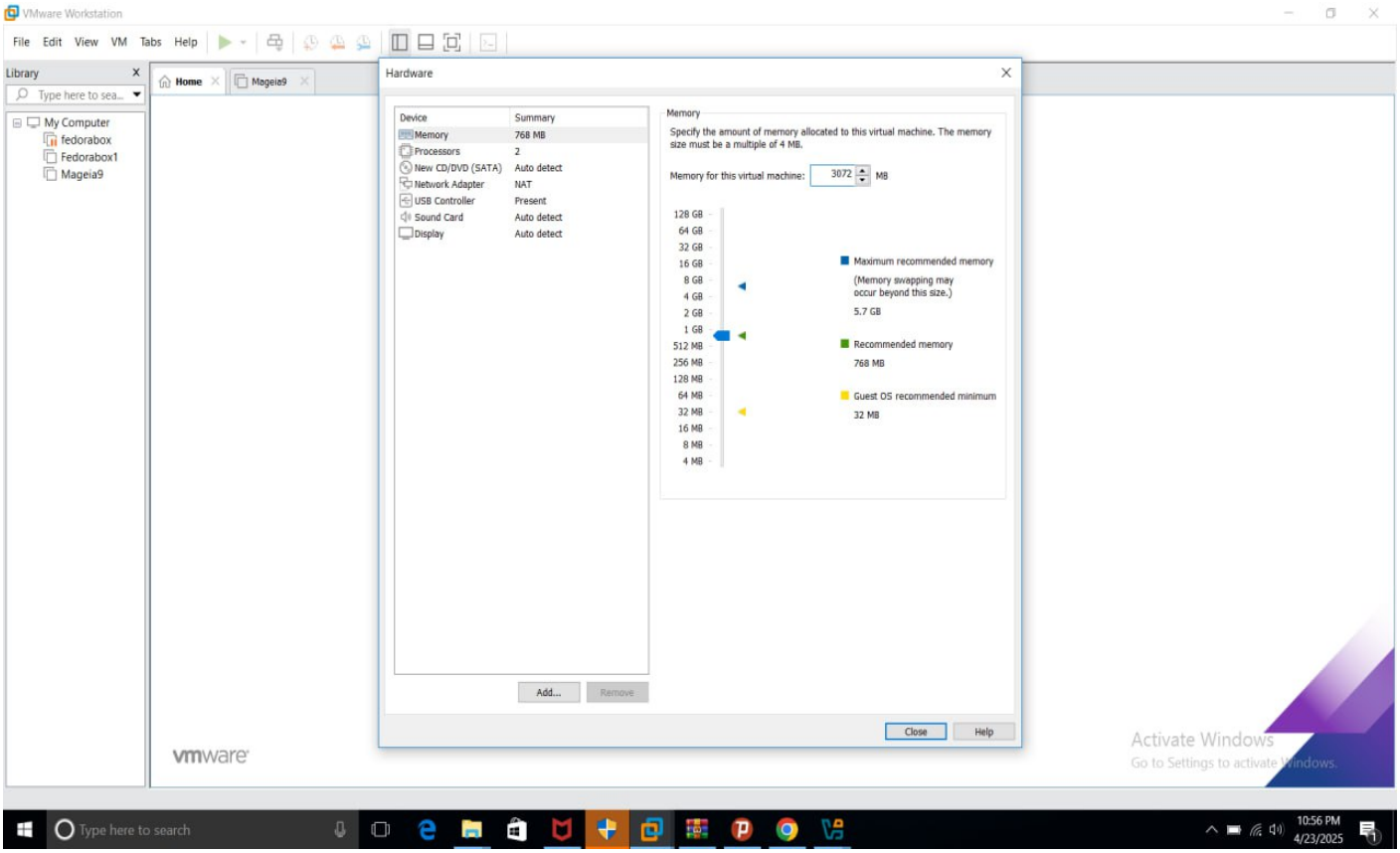
Step 3. Name the virtual machine and choose the location

- Enter name of the virtual machine here
- Choose the location to store the VM files
- Now, click “Next



Step 4. Specify disk capacity

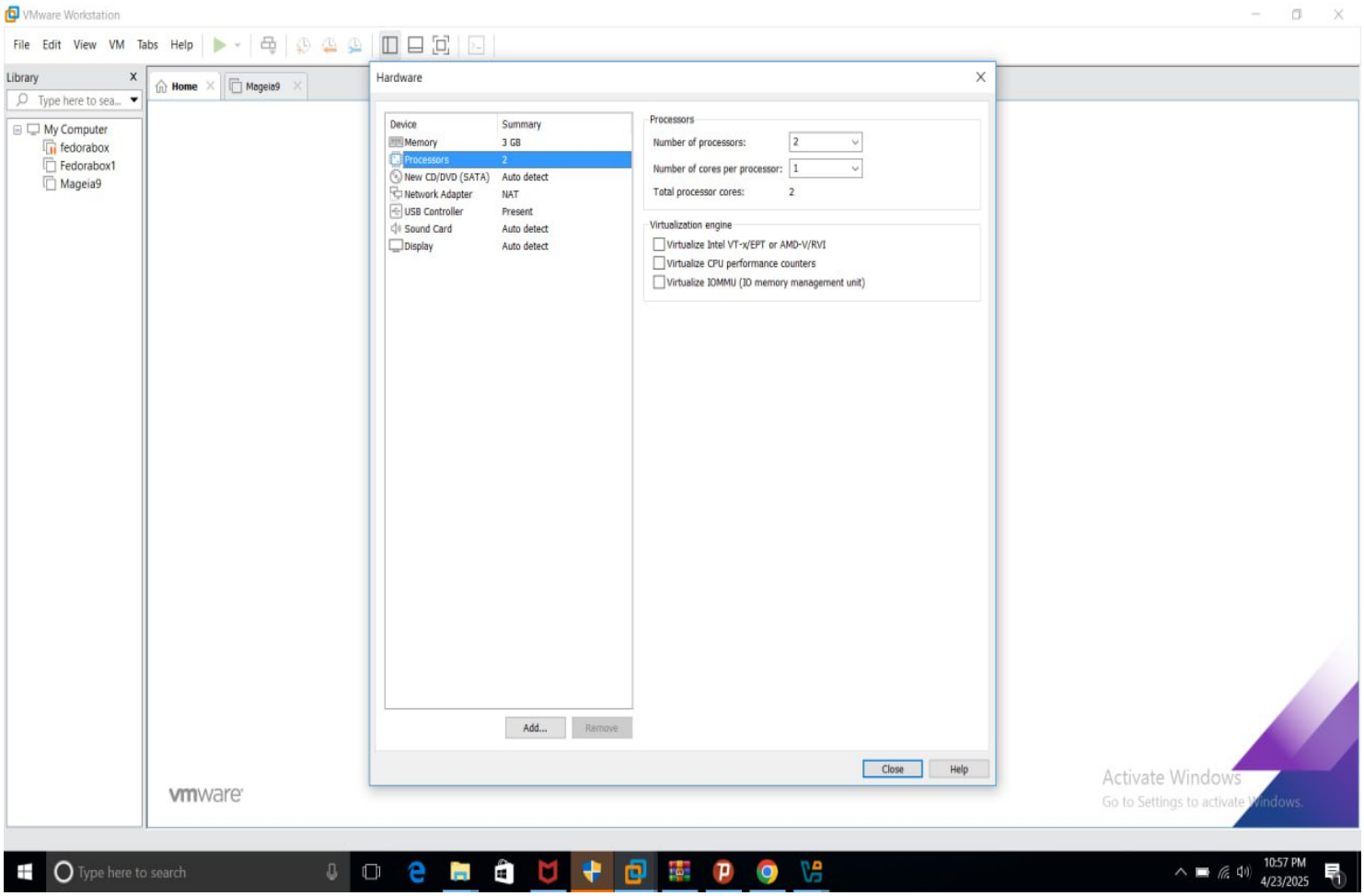
- Set the maximum disk size

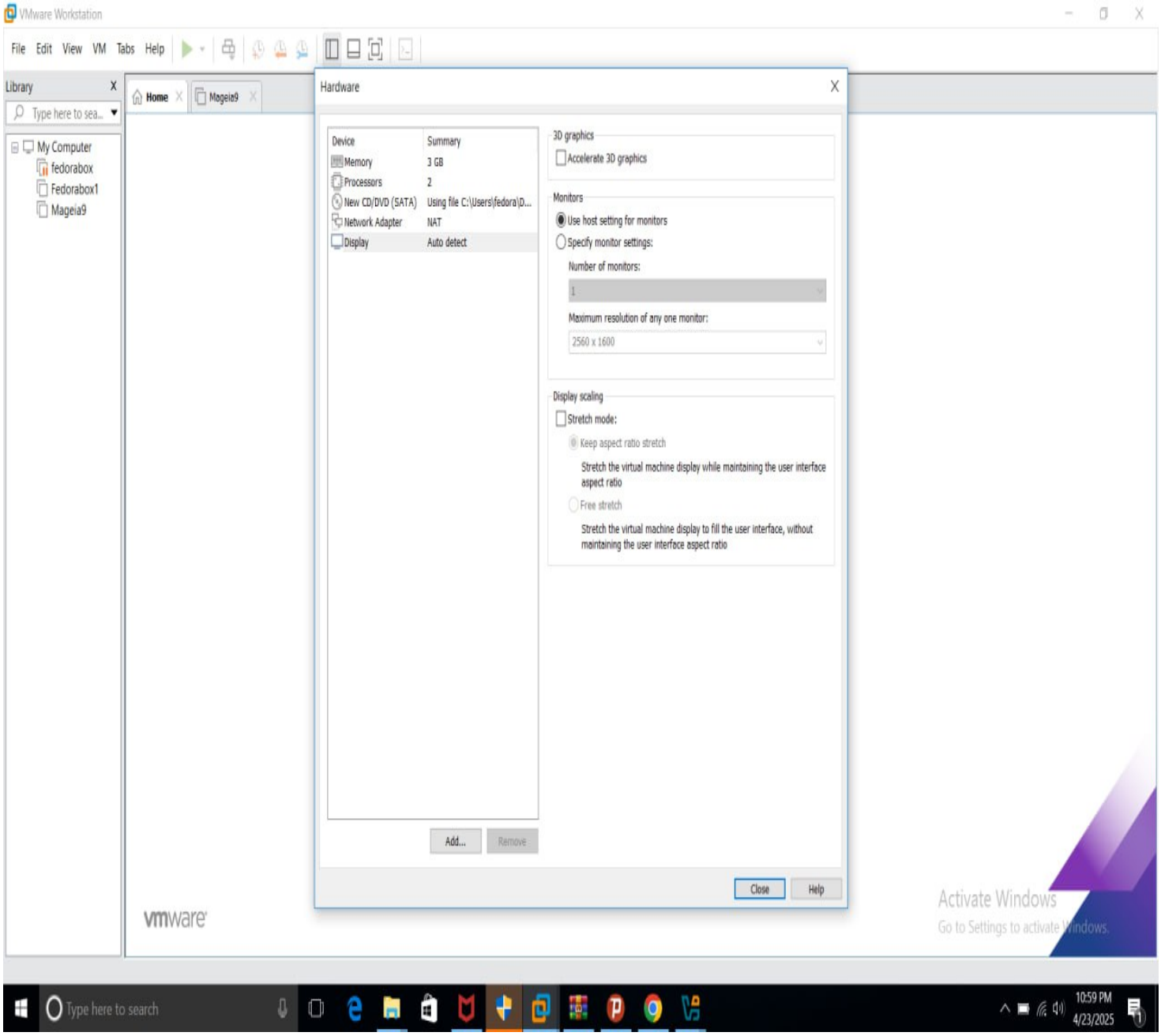


Step 5. Customize Hardware

• Right click the Mageia file then click Setting to adjust memory, processors, motherboard options, and display options etc.

• In the display settings, under ‘Display,’ select Use Host Settings for Monitors.





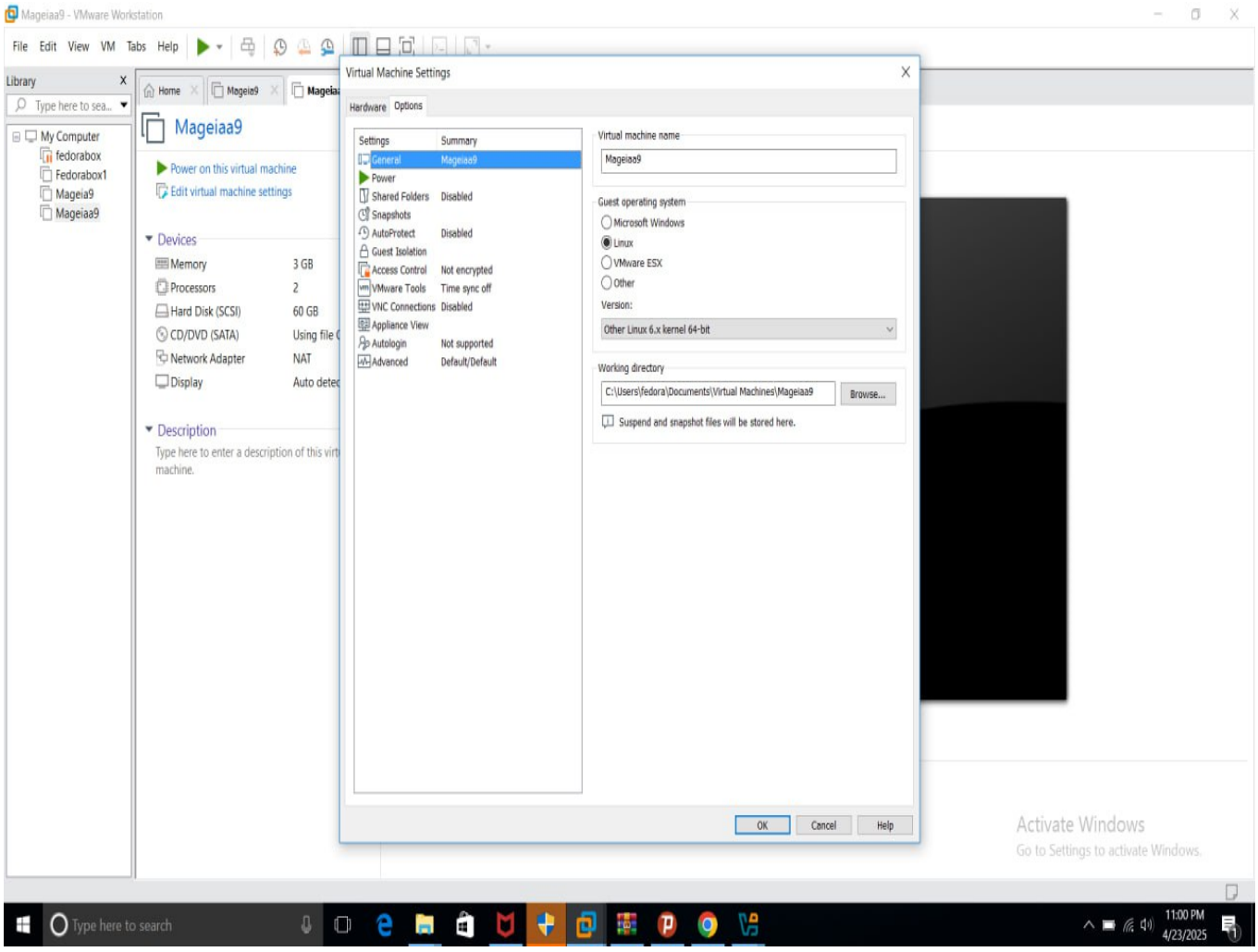
●on the display setting select use host setting for monitors

Step 6. Click Options which is next to Hardware Lists.

•First choose General

•On guest operating systems, select Linux.

•press OK.

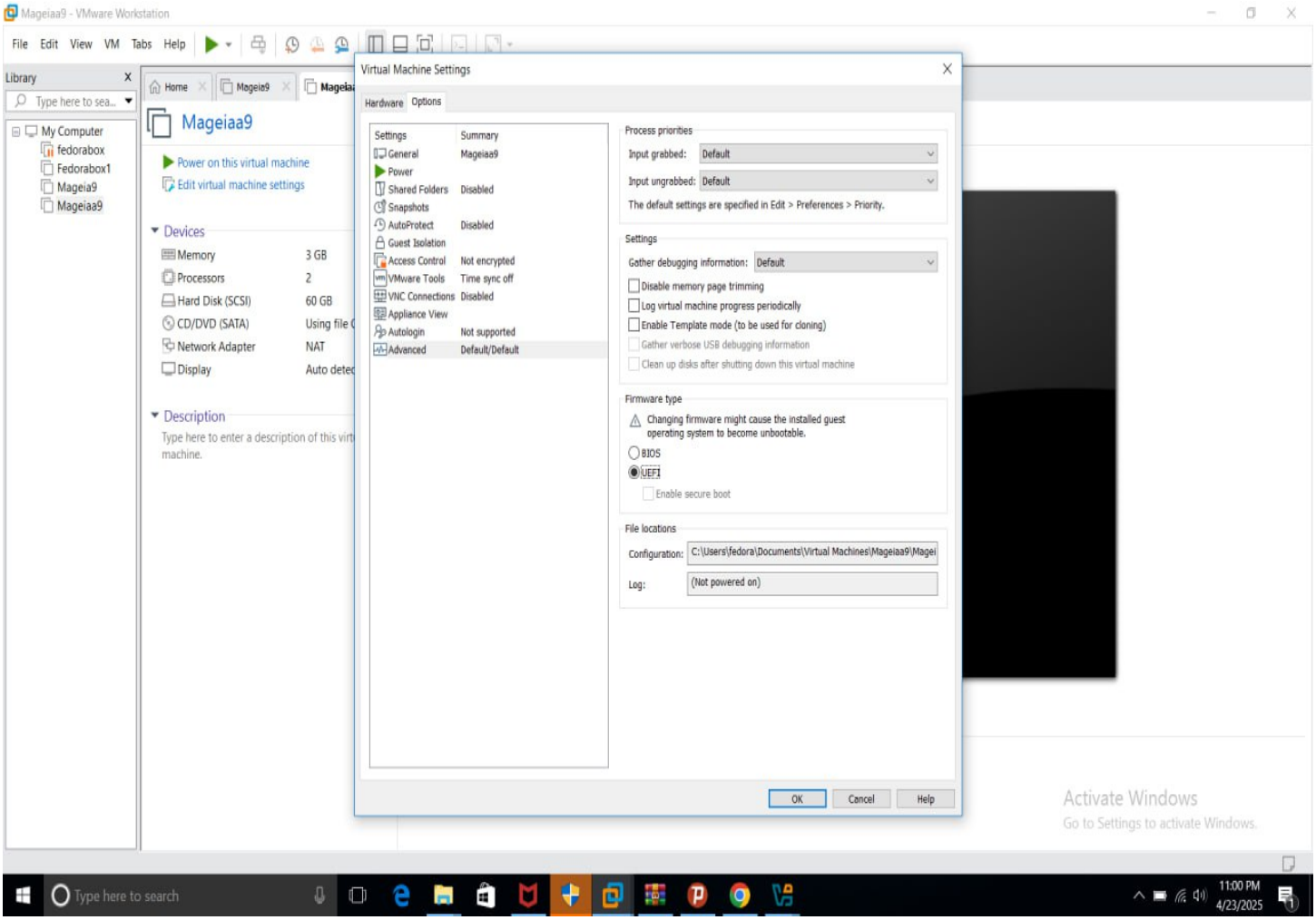


Step 7. Go to Advanced Setting

•Click select default for the process priority and debugging information.

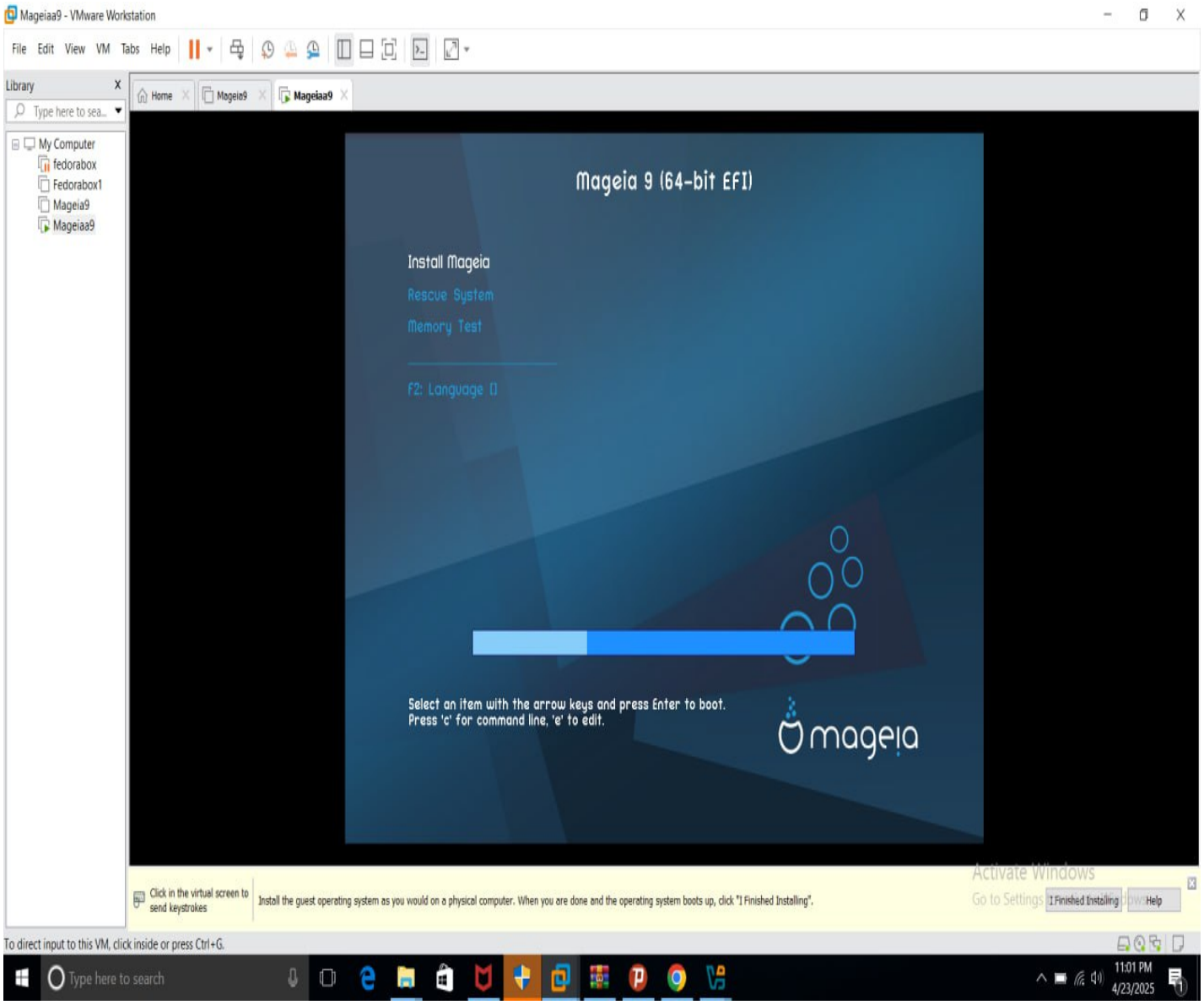
•Click UEFi for the Firmware type.

• Then, Click OK



Step 8. Mageia Boot Menu Will Appear

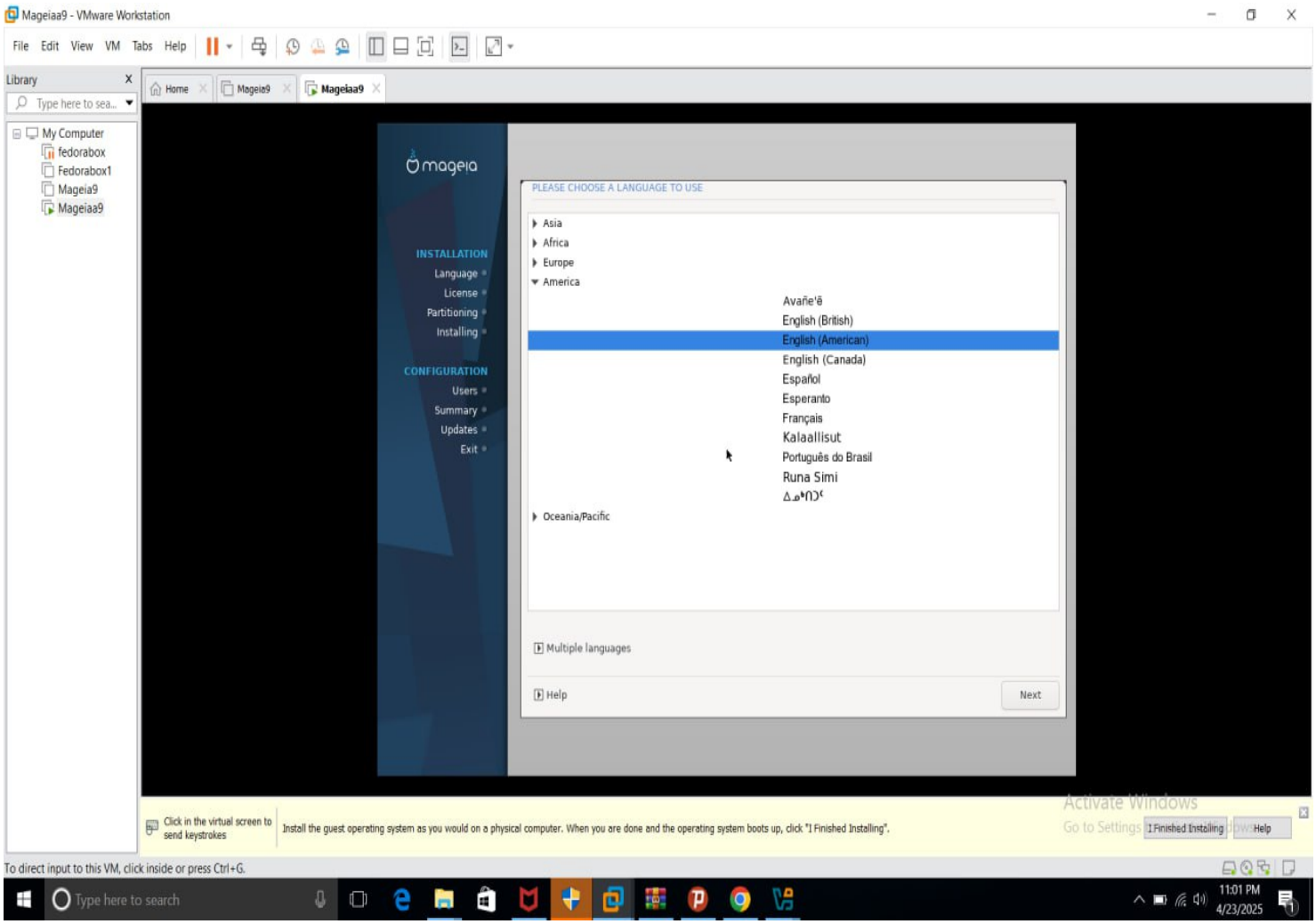
- To start Mageia OS Installation, Click Enter key.

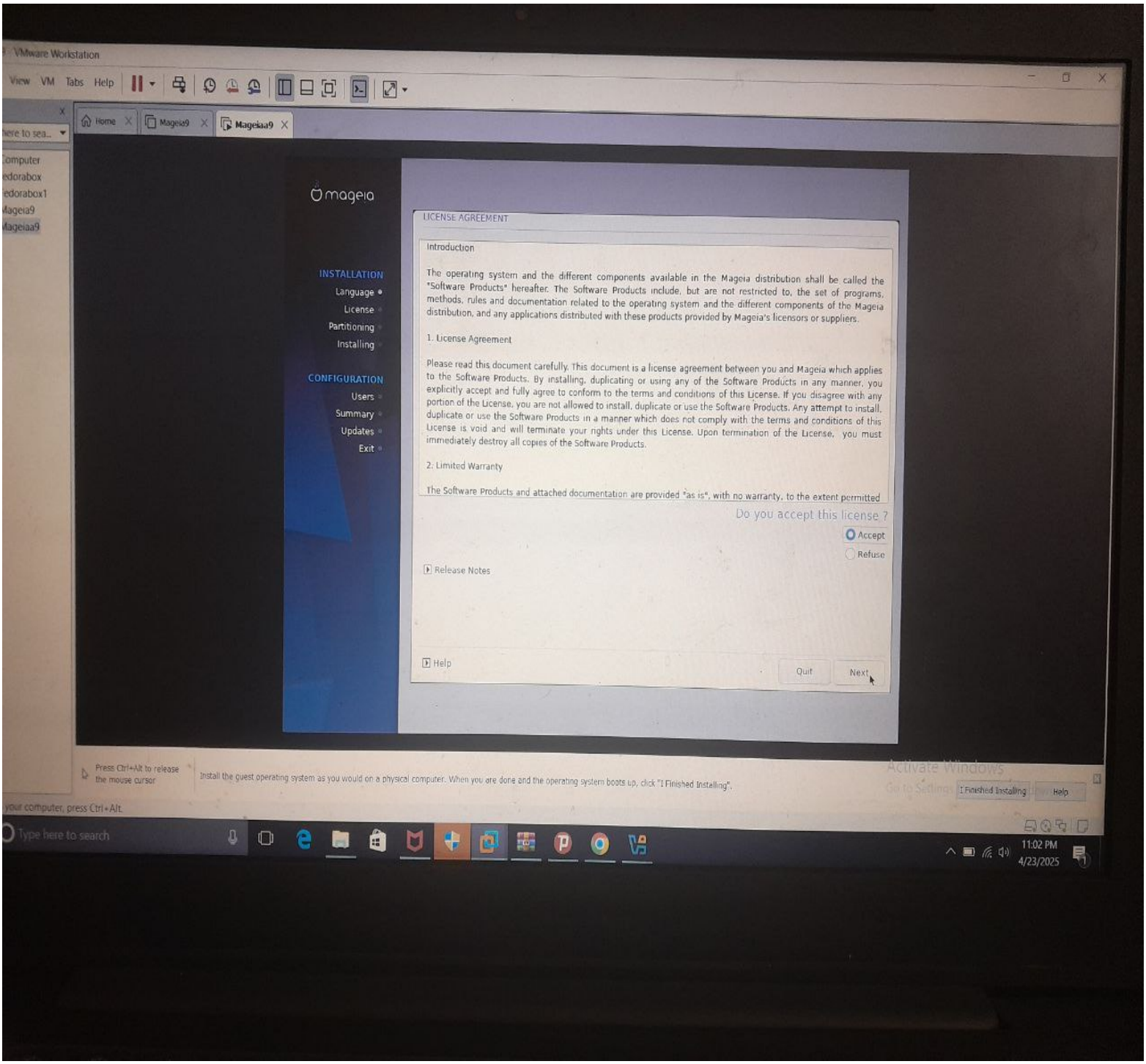


Step 9. Start Mageia Installation

•Installation instructions to install Mageia will appear on the screen.

• Select language and accept the agreement; configure partitions as required.




VMware Workstation
View VM Tabs Help
Home
Mageia9
Mageiaa9
mageia
INSTALLATION
Language
License
Partitioning
Installing
CONFIGURATION
Users
Summary
Updates
Exit
LICENSE AGREEMENT
Introduction
The operating system and the different components available in the Mageia distribution shall be called the "Software Products" hereafter. The Software Products include, but are not restricted to, the set of programs, methods, rules and documentation related to the operating system and the different components of the Mageia distribution, and any applications distributed with these products provided by Mageia's licensors or suppliers.
1. License Agreement
Please read this document carefully. This document is a license agreement between you and Mageia which applies to the Software Products. By installing, duplicating or using any of the Software Products in any manner, you explicitly accept and fully agree to conform to the terms and conditions of this License. If you disagree with any portion of the License, you are not allowed to install, duplicate or use the Software Products. Any attempt to install, duplicate or use the Software Products in a manner which does not comply with the terms and conditions of this License is void and will terminate your rights under this License. Upon termination of the License, you must immediately destroy all copies of the Software Products.
2. Limited Warranty
The Software Products and attached documentation are provided "as is", with no warranty, to the extent permitted
Do you accept this license ?
Accept
Refuse
Release Notes
Help
Quit
Next
Press Ctrl+Alt to release the mouse cursor
Install the guest operating system as you would on a physical computer. When you are done and the operating system boots up, click "I Finished Installing".
I Finished Installing
Help
Activate Windows
your computer, press Ctrl+Alt.
Type here to search
11:02 PM
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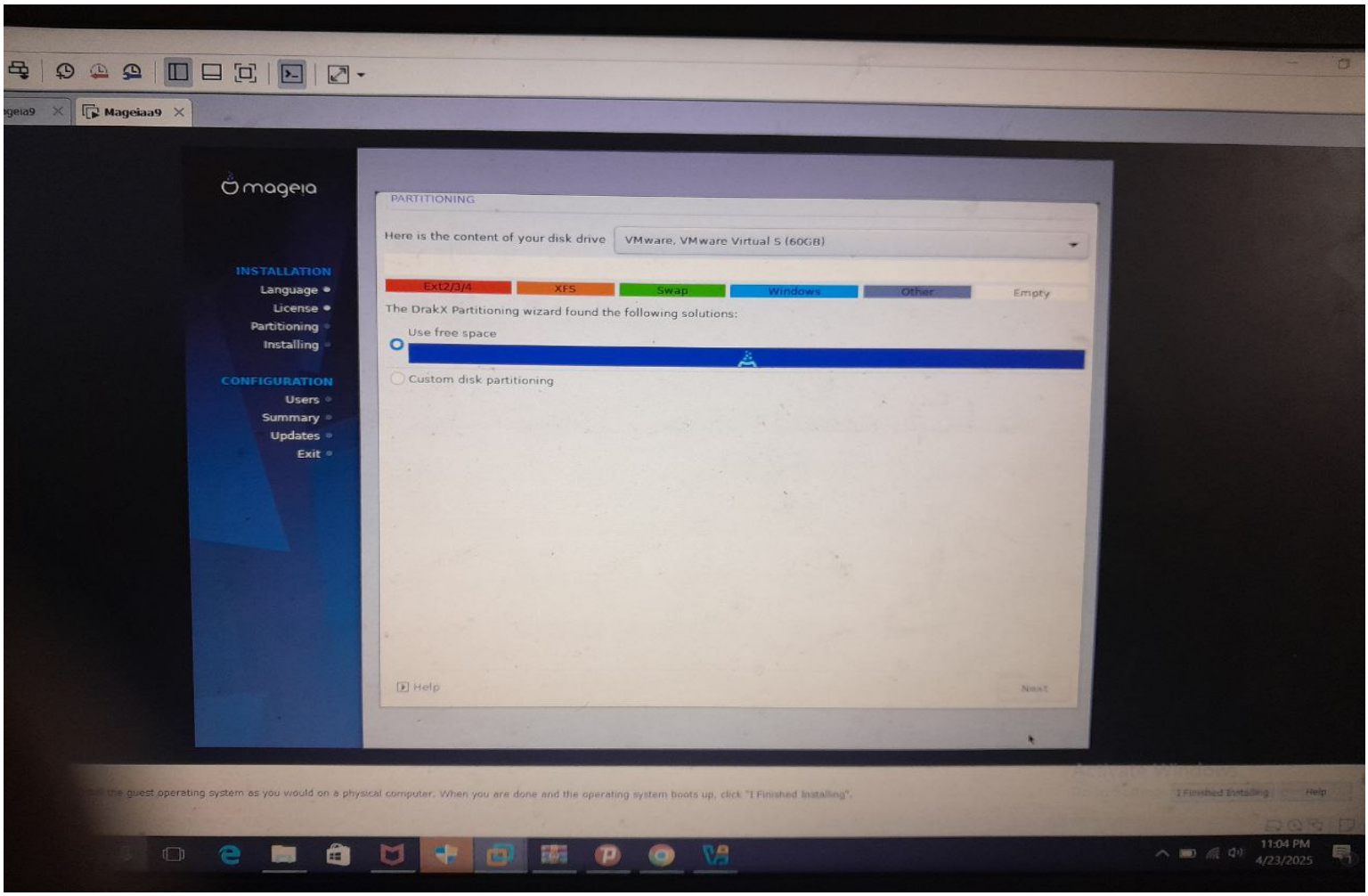
Step 10 Click Partition.

• Select Use Free Space.

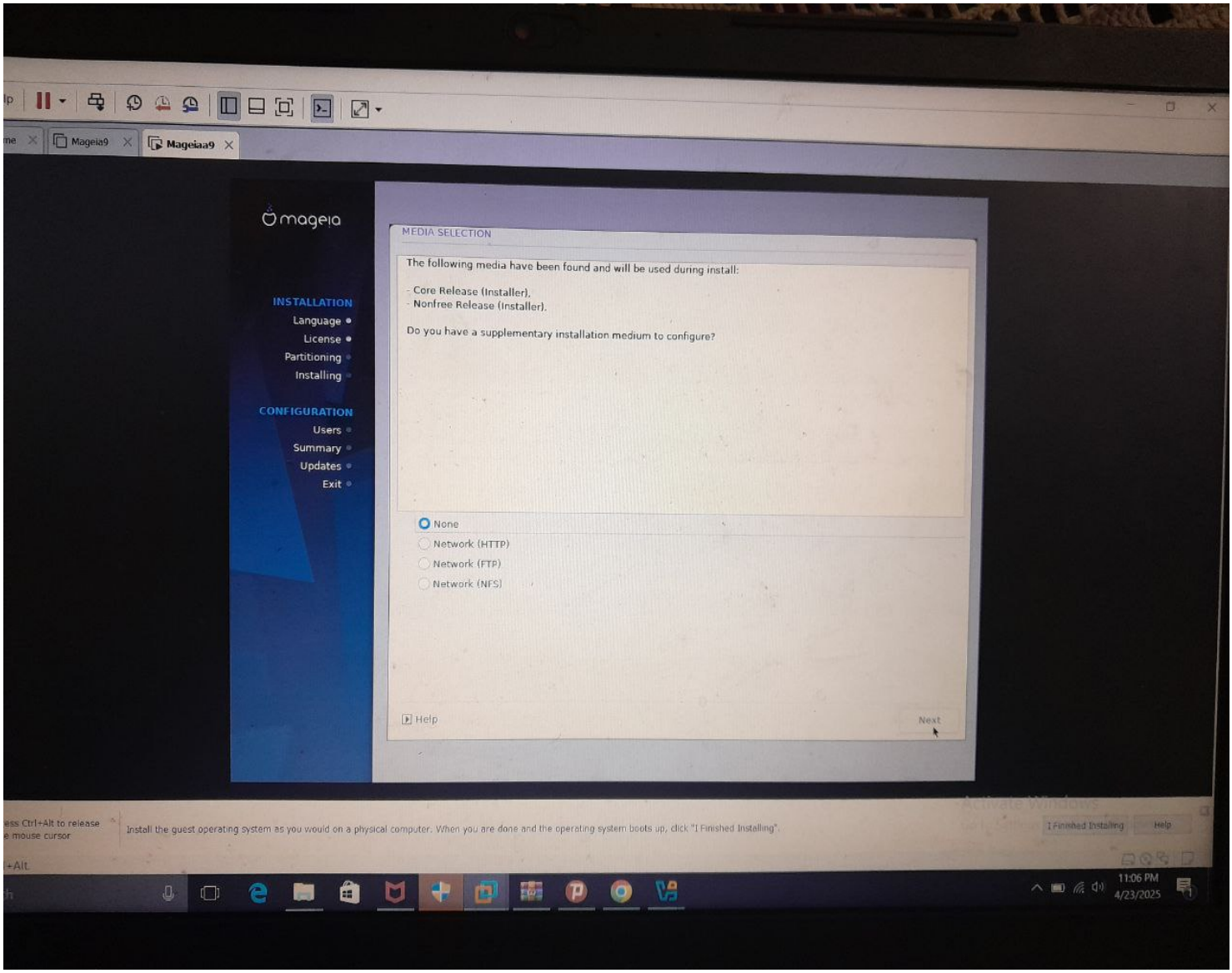
-> It indicates to Mageia that they should automatically partition the unused space created on the virtual hardware.

• Then, Click Next.



Step 11 Media Selection:

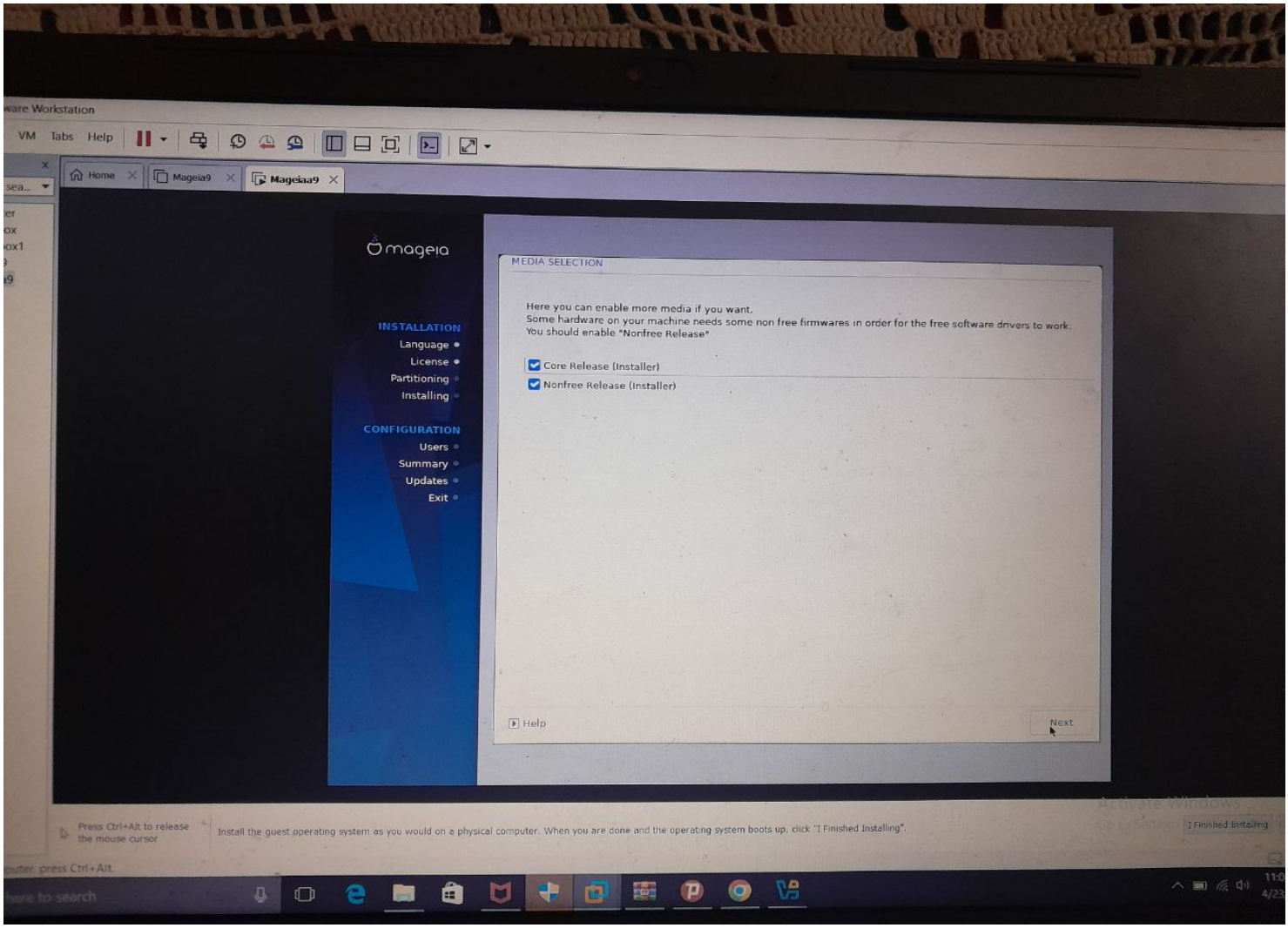
• On the “Media Selection" screen Leave it at None; (default) if you don’t have any other installation media or network source, then click Next to continue with the installer’s built-in packages.

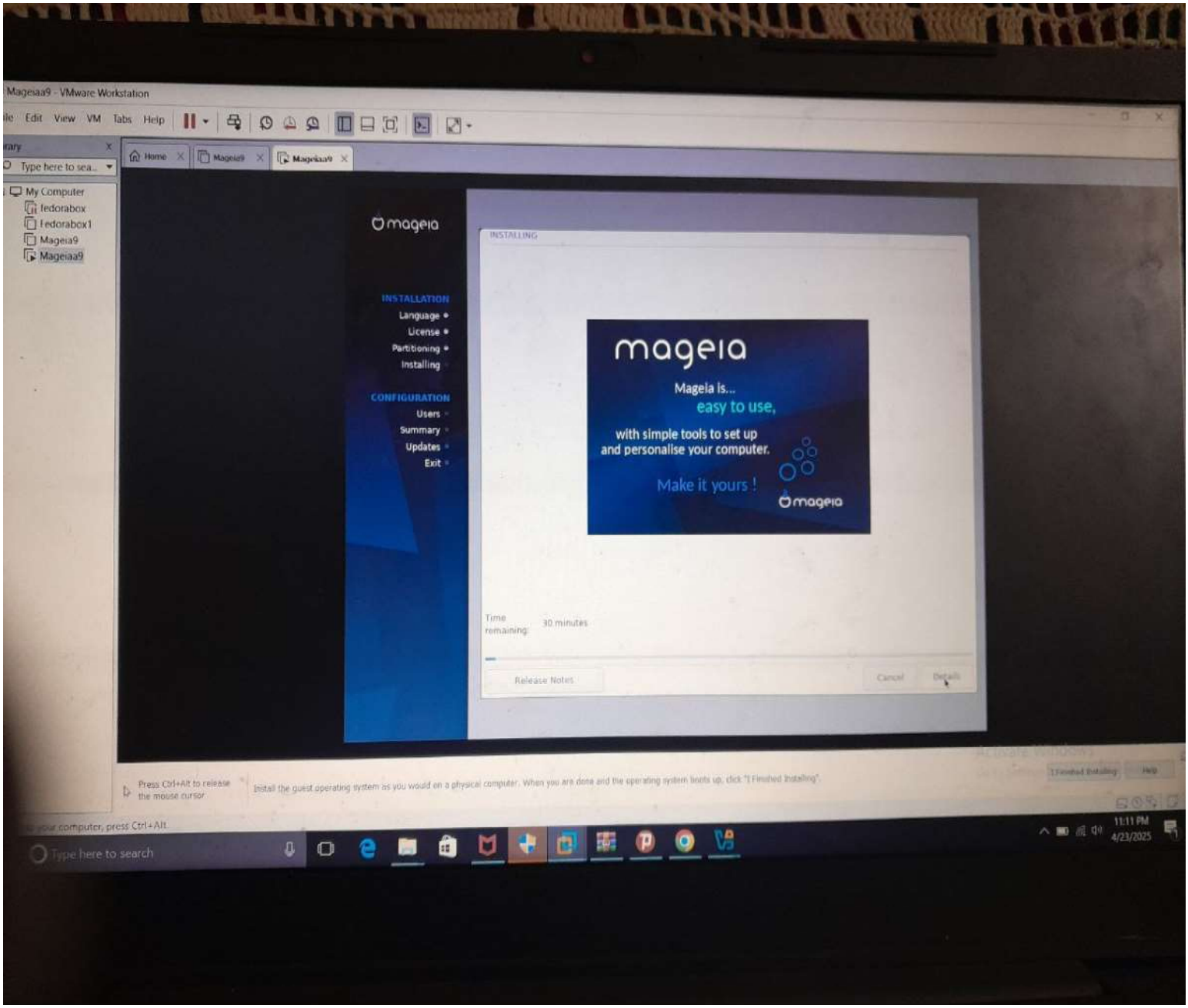


-> Ensure that the Core Release (Installer) option is checked, which is required for installation

-> If your system requires non-free firmware for certain hardware

->Click the Next button at the bottom right corner to continue with the installation.




Mageiaa9 - VMware Workstation
File Edit View VM Tabs Help
Home
Mageia9
Mageiaa9
My Computer
fedorabox
Fedorabox1
Mageia9
Mageiaa9
mageia
INSTALLATION
Language
License
Partitioning
Installing
CONFIGURATION
Users
Summary
Updates
Exit
INSTALLING
mageia
Mageia is...
easy to use,
with simple tools to set up
and personalise your computer.
Make it yours !
mageia
Time remaining: 30 minutes
Release Notes
Cancel
Details
Press Ctrl+Alt to release the mouse cursor
Install the guest operating system as you would on a physical computer. When you are done and the operating system boots up, click "I Finished Installing".
Type here to search
11:11 PM
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Step 12. Set up User Account:

12.1. Set the root password

- Type in a strong Root Password.

- Repeat the same password you entered previously.

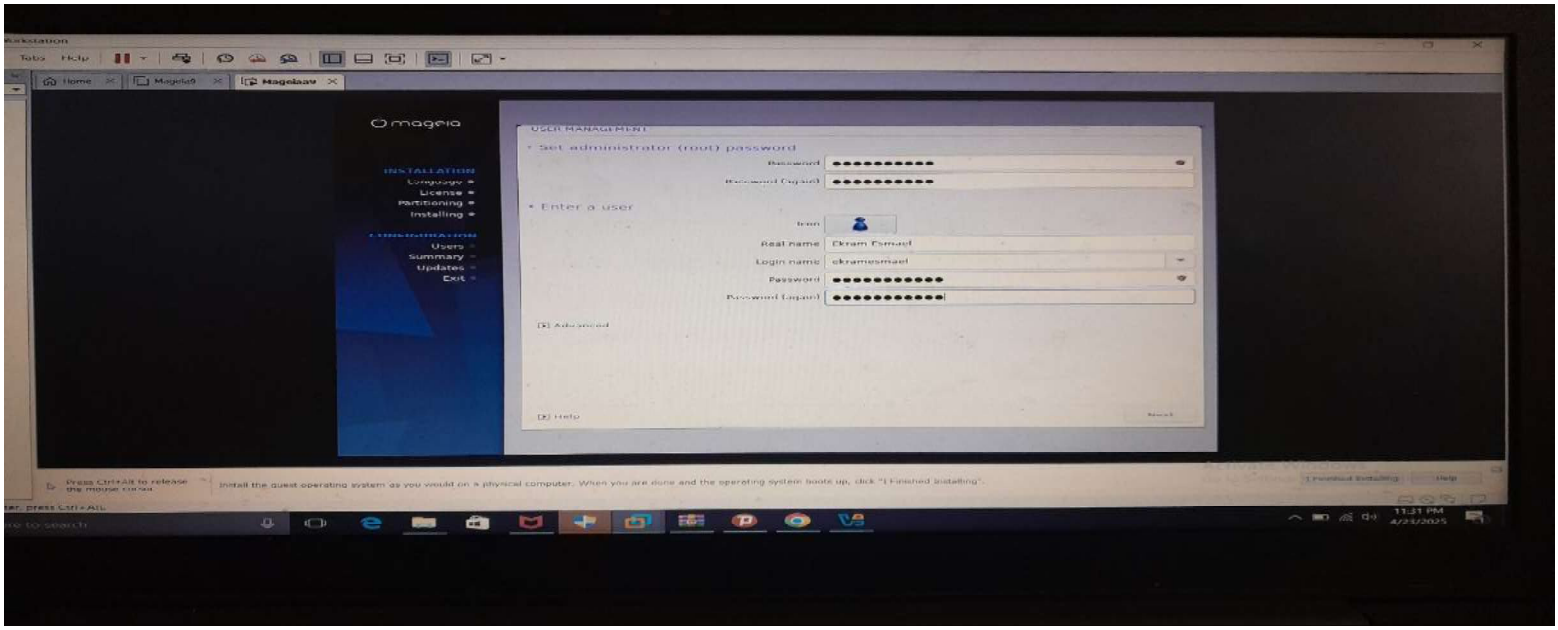
12.2. Set up a user account

- Input your complete name in the appropriate box marked Full Name.

- Selected a particular User Name in the Username box.

- Type a passcode in the Password box for the aforementioned account.

- Repeat the same password you entered previously in Confirm Password.



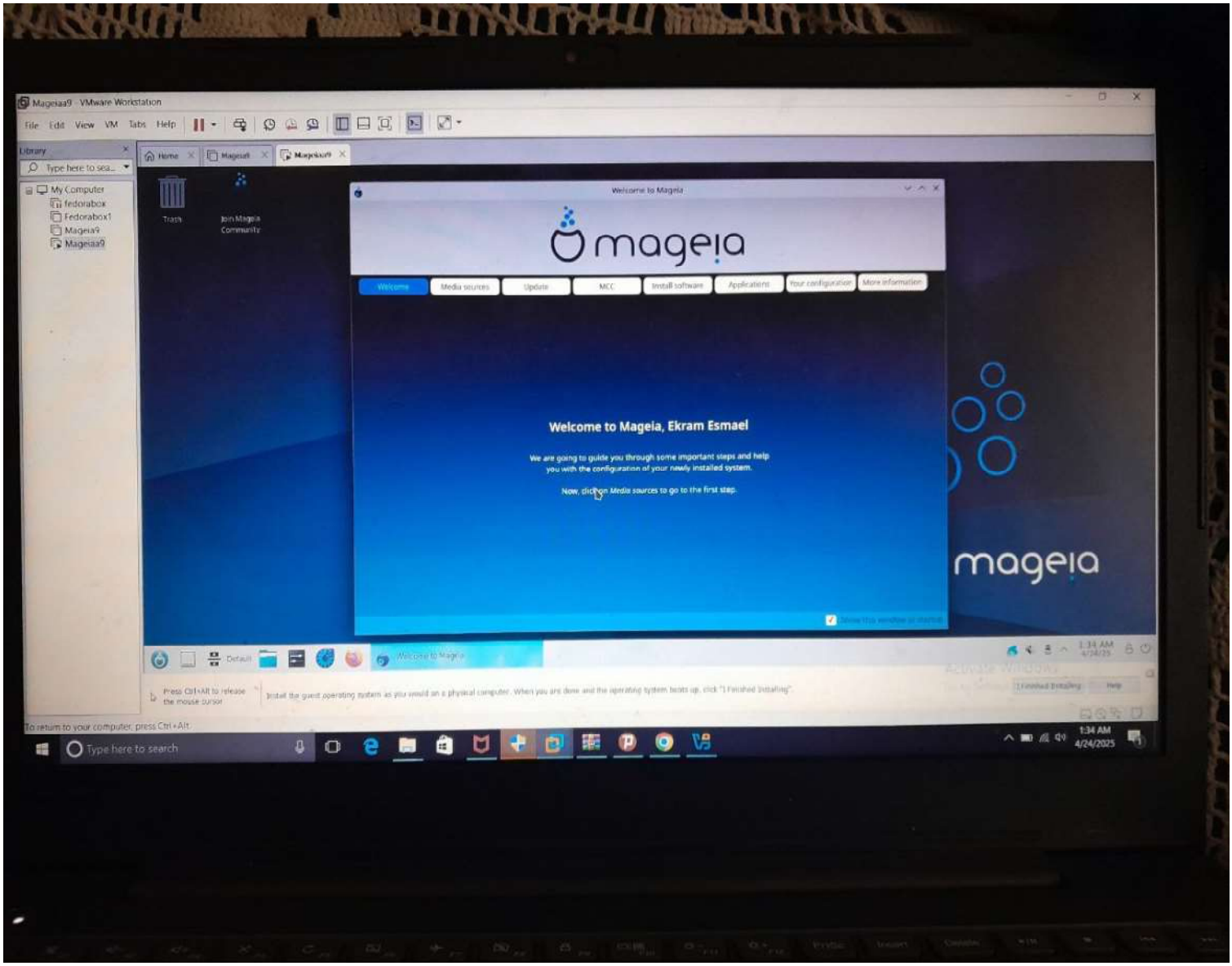
- Click Next to take you to the next step toward completing the installation.

Step 13. When the system starts, the login screen is displayed:

- Select user account.

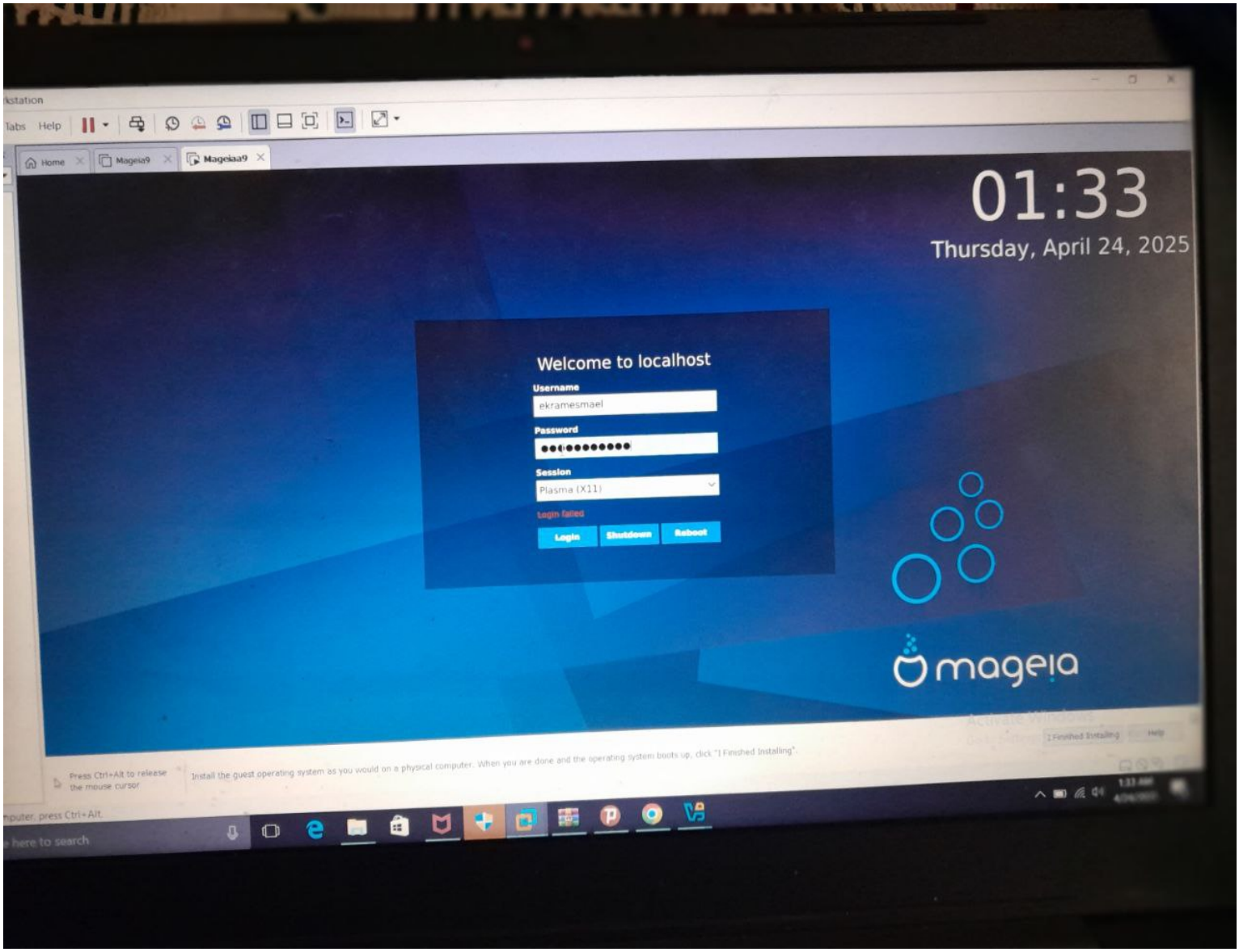
- Type your password in the corresponding box.

- To log in Mageia desktop environment, click log in or press enter.



Step 14. Mageia OS Installation Welcome page:

•To head to the next step of the process press Enter key.



Step 15. You need to select a monitor.

-> The installer has identified your graphic adapter alongside with the monitor, and to the right-side options for selecting the type of monitor will be displayed.

- Plug 'n Play– Automatically detects supported settings.

- Vendor List – Choose your monitor brand and model.

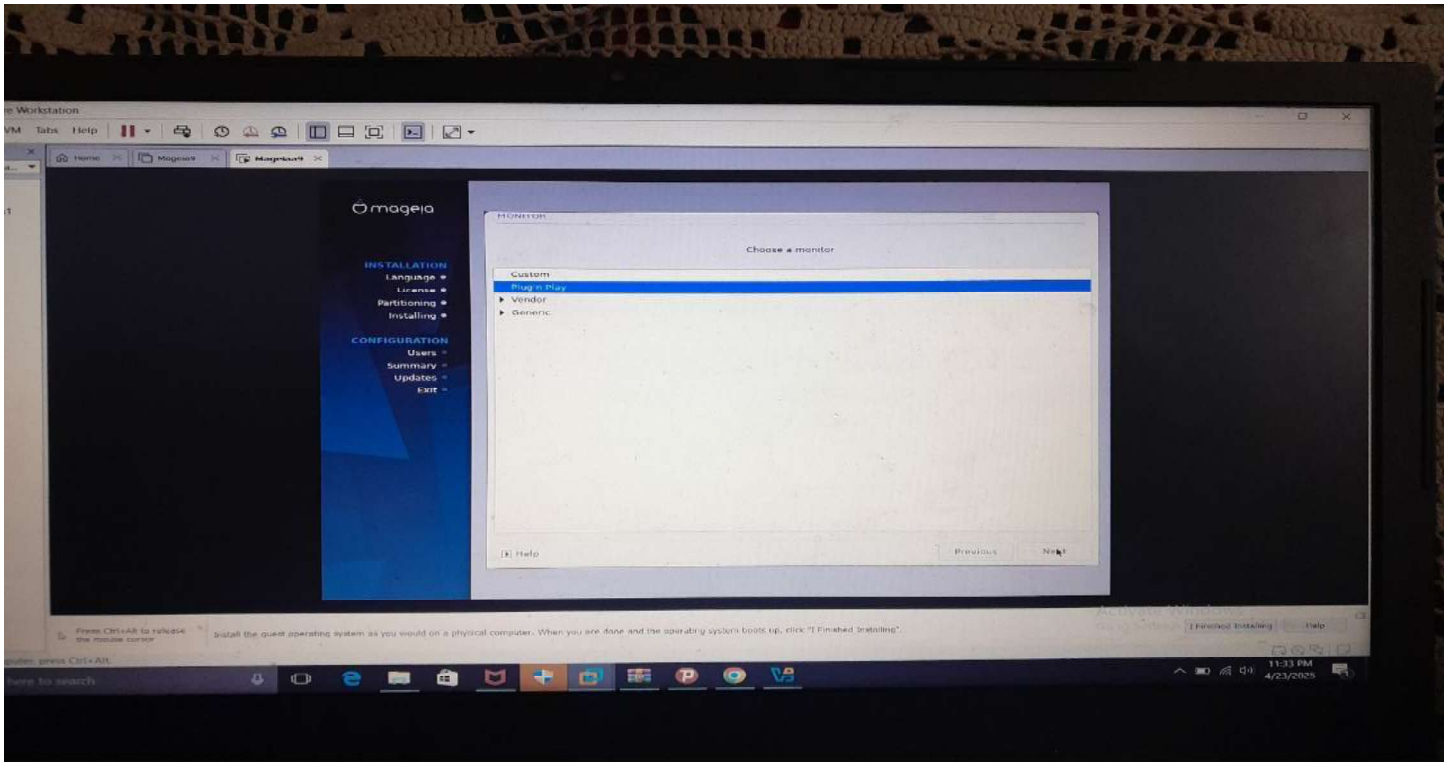
- Generic List – Select a standard monitor type.

- Custom – Manually set horizontal and vertical refresh rates.

->If you are not sure what to choose, follow conventional wisdom and select Plug ‘n Play.

->So go ahead and continue with Plug 'n Play.

->Click Next to proceed with installation

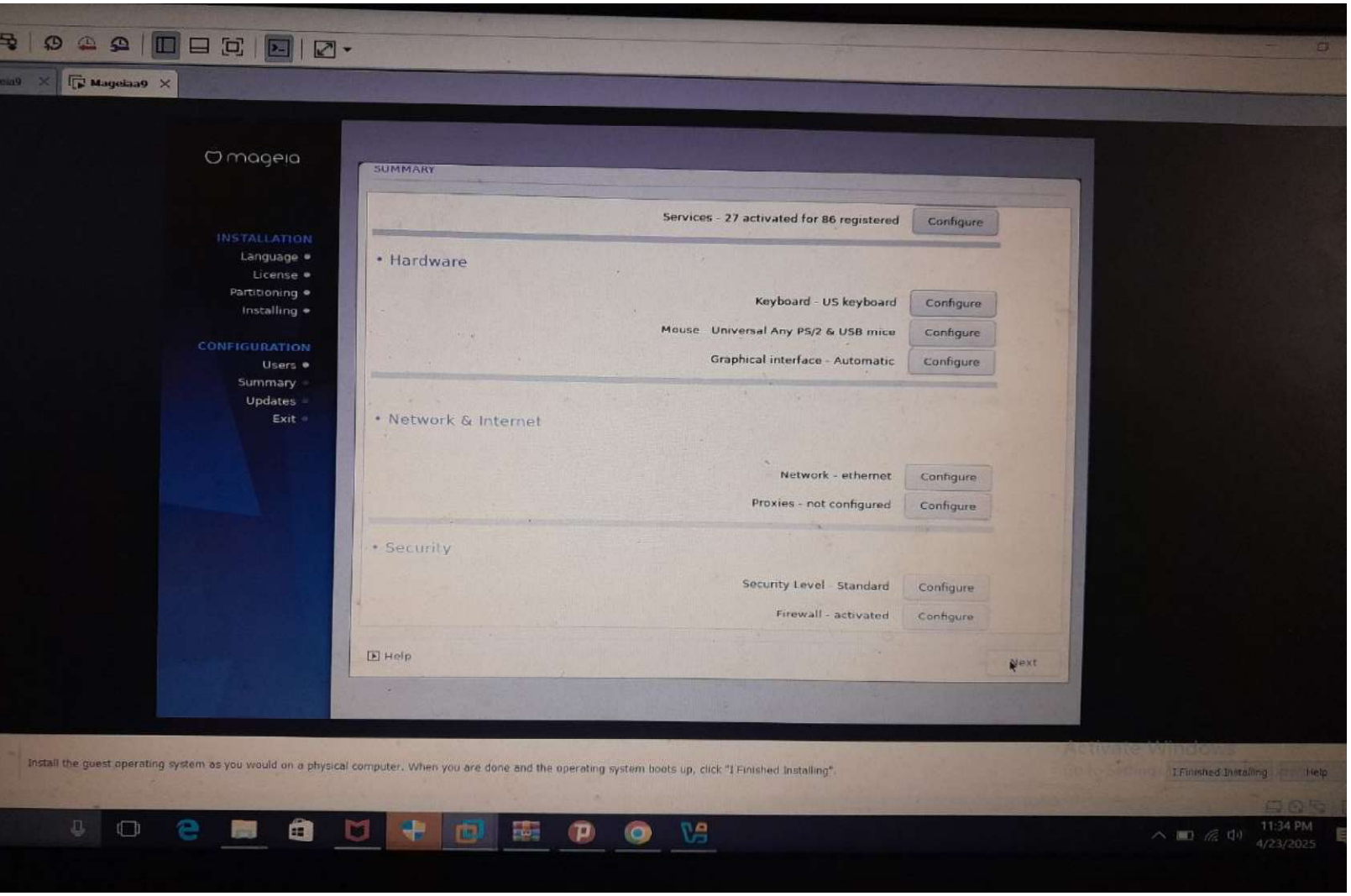


Step16 After completing the steps of the installation, this overview screen comes up.

->It highlights important components such as hardware, network, Ethernet, and other security settings tailored during the installation.

->Decide whether you wish to modify any settings before you complete the installation.

-> Press Next for the last stage of the setup.



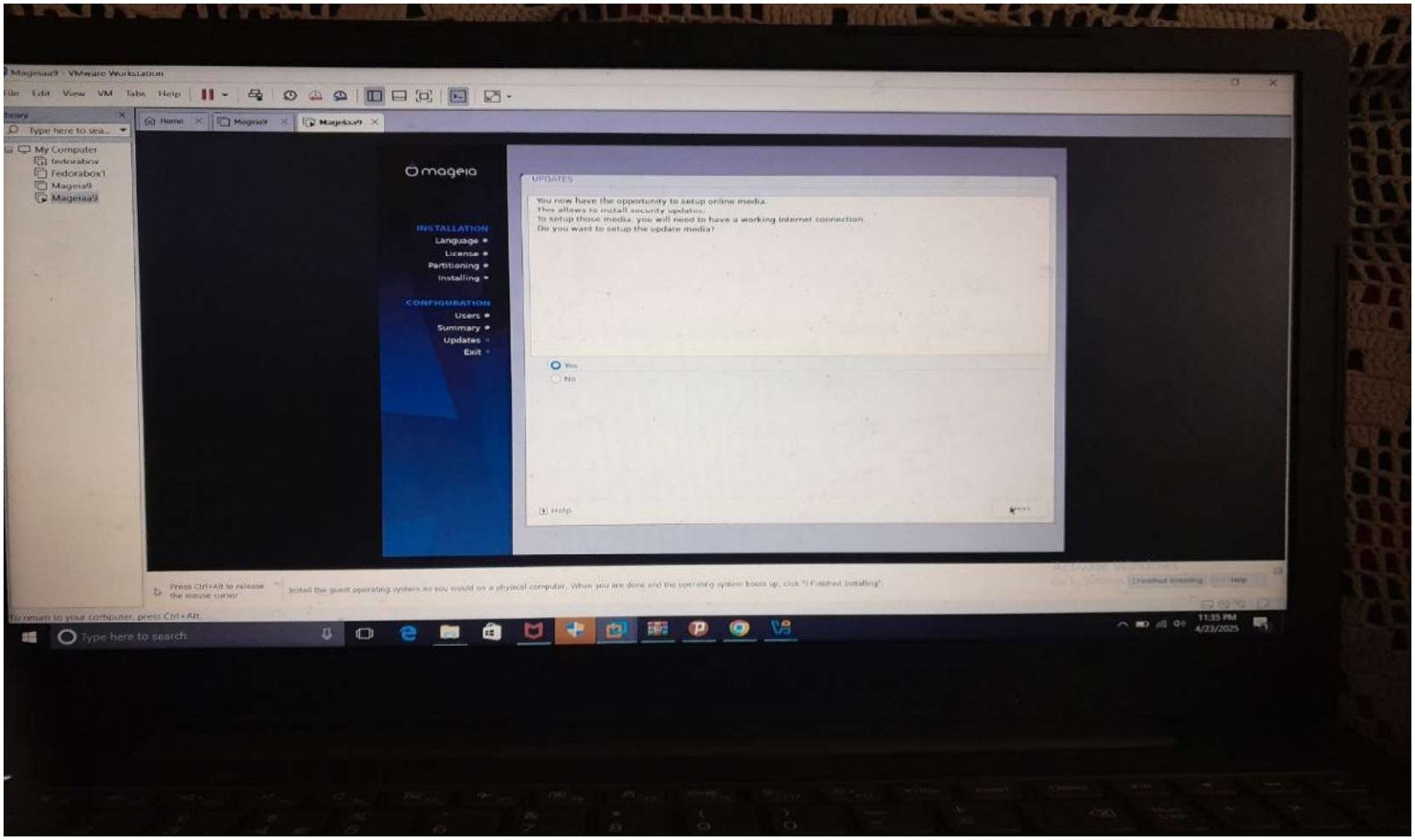
Step 17. During installation, this screen appears where you are prompted to set up updates:

->Select to either **download and install updates during the installation or postpone them for later.

->If you choose Yes, Mageia downloads the most current security and software updates.

->If you select No, updates may be done manually after the setup is complete.

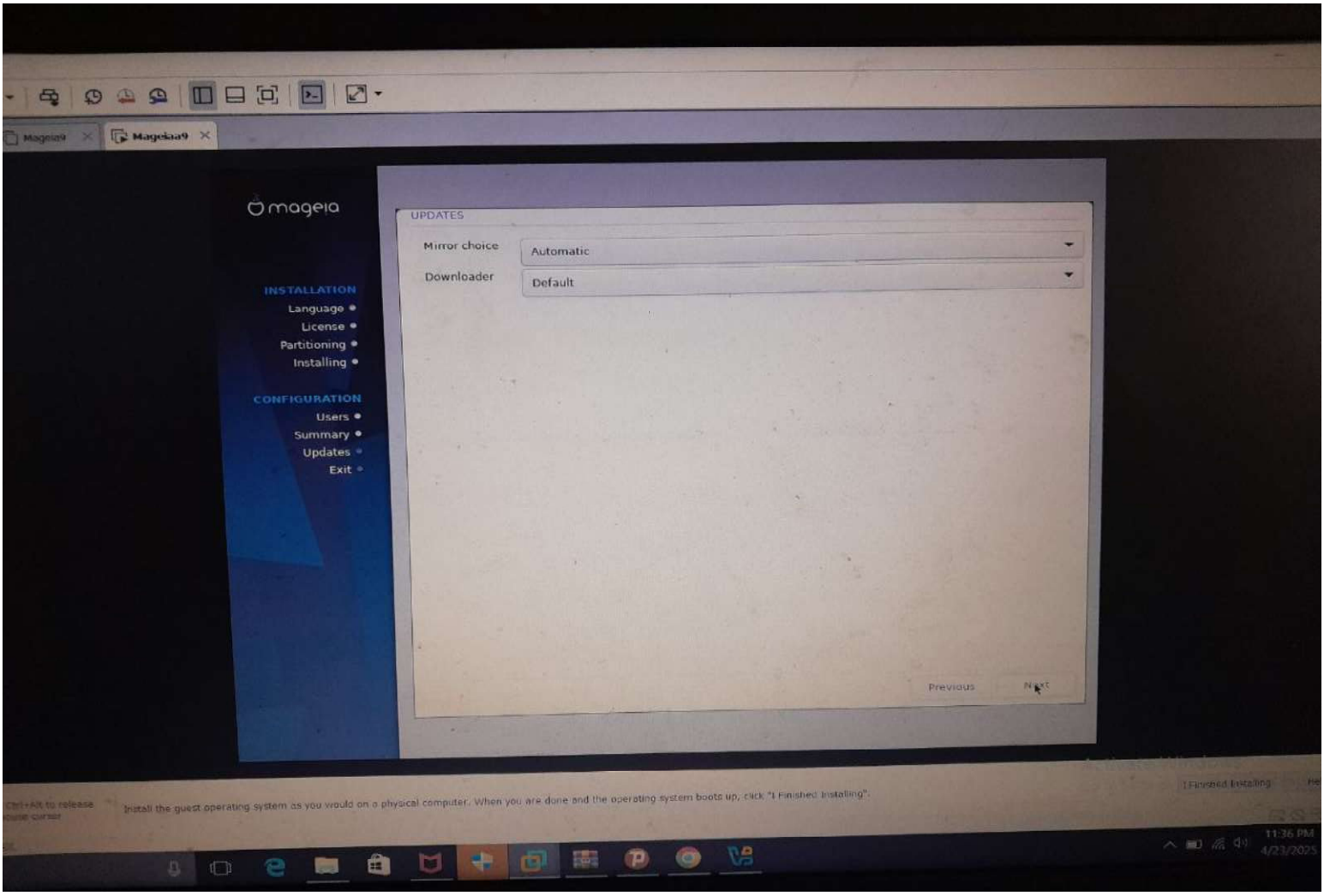
->To continue with the installation, select Next.



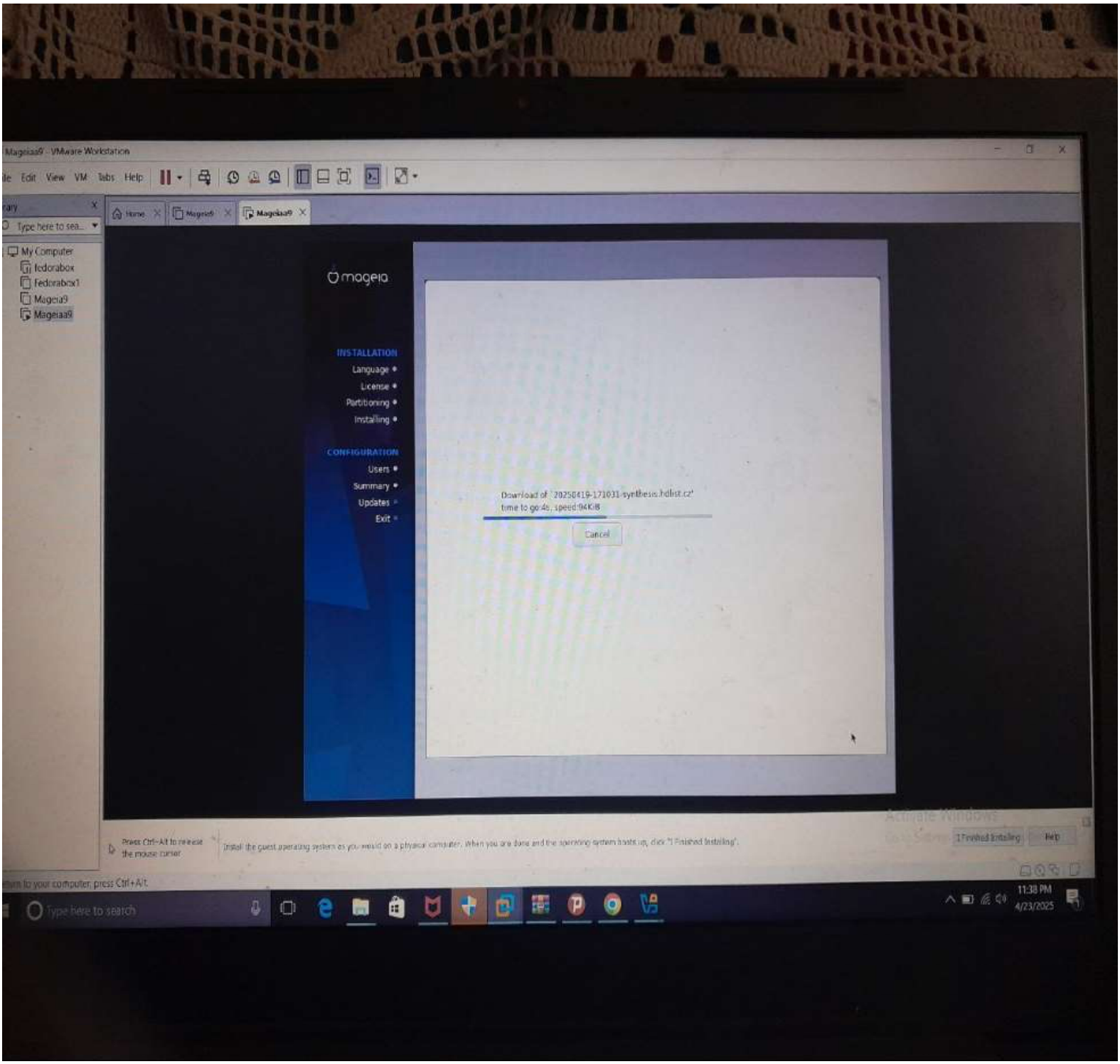
Step 18. This screen prompting the selection of mirrors for downloading extra packages appears while the installation proceeds:

->In Mageia, a mirror is automatically selected given the location and geographical availability of servers.

->Downloader has been set to default, meaning that it uses the standard for fetching the packages.



->To go on with the installation, click Next.


Mageiaa9 - VMware Workstation
Edit View VM Tabs Help
Home
Mageia9
Mageiaa9
My Computer
fedorabox
fedorabox1
Mageia9
Mageiaa9
mageia
INSTALLATION
Language
License
Partitioning
Installing
CONFIGURATION
Users
Summary
Updates
Exit
Download of '20250419-171031-synthesis.hdlist.cz'
time to go:4s, speed:94Ki/s
Cancel
Press Ctrl+Alt to release the mouse cursor
Install the guest operating system as you would on a physical computer. When you are done and the operating system boots up, click "I Finished Installing".
I Finished Installing
Help
Activate Windows
Type here to search
11:38 PM
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Step 19. Network Configuration

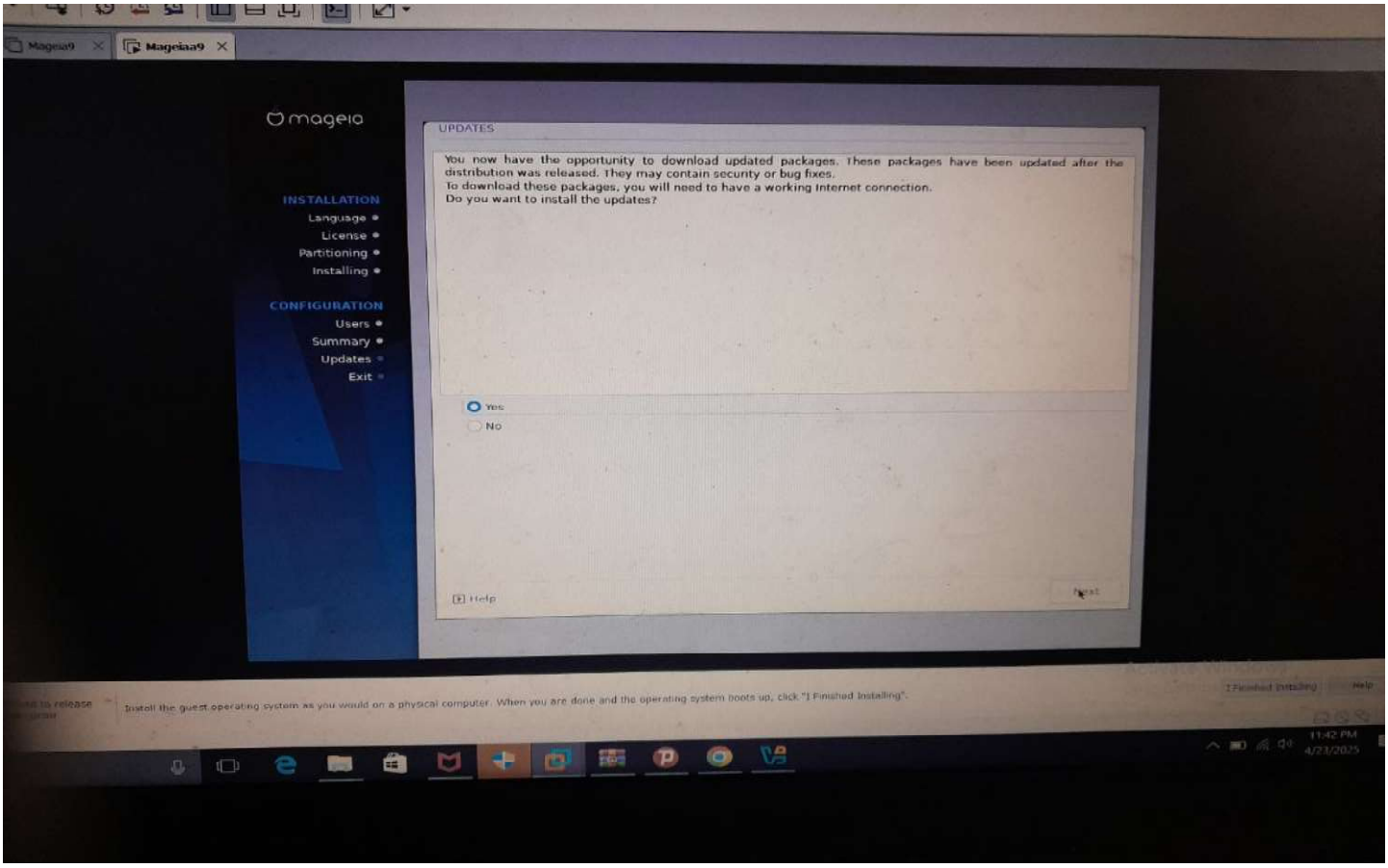
-> Take a look at the message presented on screen: “Would you like to configure the network?”

-> Proceed with your selection:

- If you would like to configure the network and permit the installer to fetch updated packages, select “Yes.”

- Select “No” If you would like to proceed without configuring the network (this is not recommended).

-> 'Next' can be clicked or Enter can be pressed to take you to the next step



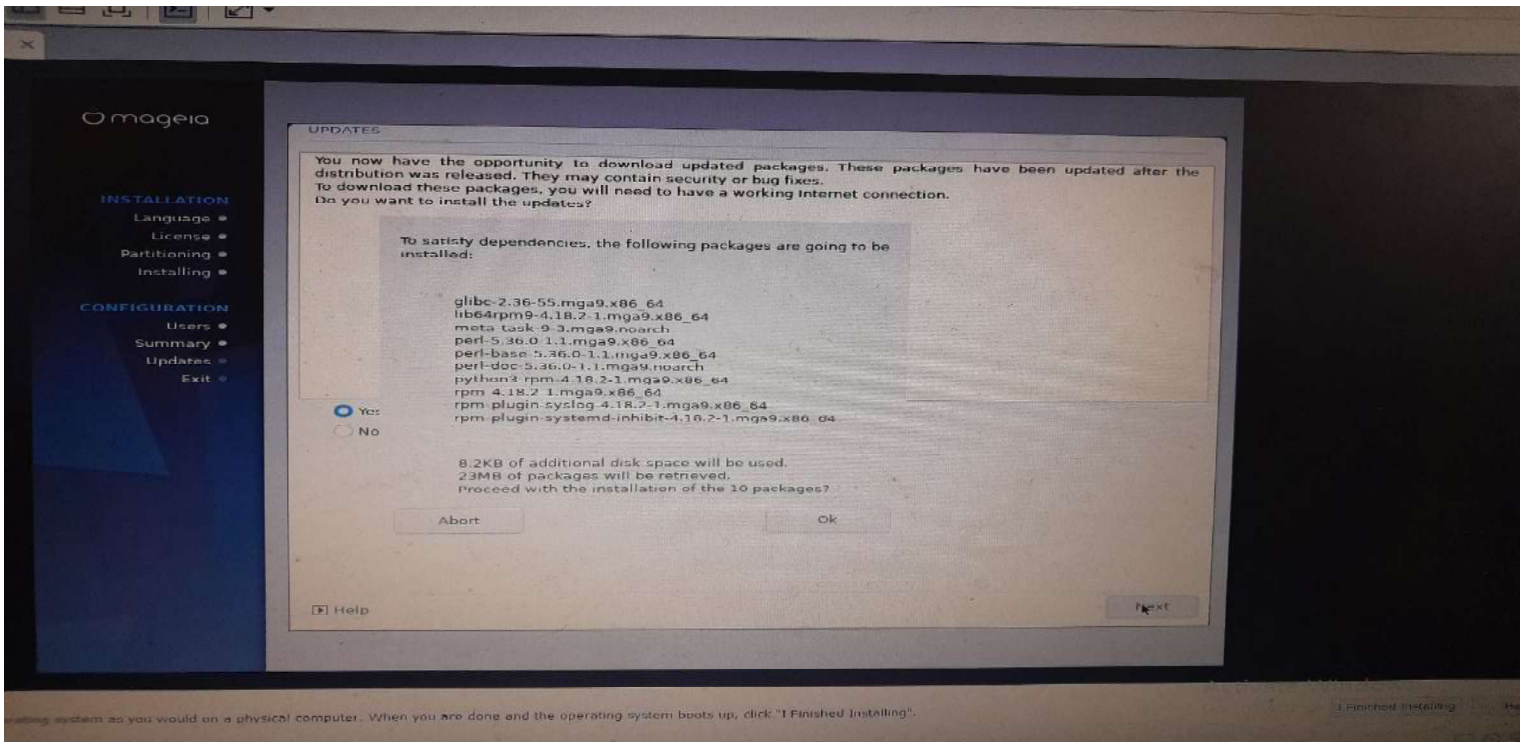
Step 20. You are being notified that some of the packages required to be installed for other dependencies of the software you are configuring have not yet been completed. It is at this point that you can make one of these two choices:

-> Click “OK” – Takes you forward with the required packages ensuring proper execution.

-> Click “Abort” – This cancels the process so no dependencies are installed which may lead to any number of missing functions.

•It’s usually best to allow the installation to proceed if the packages affected are important for the system’s stability or the application’s functions.

•If these packages are critical for system stability or application functionality, it's generally recommended to select "OK" and allow the installation to proceed.



Problems

Common Problems in Mageia OS

1.Boot Failure:

Boot failure is one of the most dreadful challenges, which occurs while installing or after the installation of Mageia OS. This issue is often caused by an incorrect BIOS or UEFI configuration, or if GRUB is not installed or configured correctly. 10 9#grub is the bootloader; mageia won't boot if it is not properly set up. Or may be a conflict between legacy BIOS mode vs UEFI--if the operating system is in one mode and if it boot in the other it will not work correctly. Instead of arriving at the Mageia login screen, some users will experience either a black screen or a “GRUB rescue” prompt. Sometimes, one needs to access BIOS and change boot settings, sometimes one can use Mageia’s rescue mode to reinstall or fix GRUB bootloader.

2. No Network Connection:

-The other common issue that happens in Mageia OS is failing to connect to networks, especially to wireless internet. This usually happens because certain wireless cards have proprietary or third-party drivers, which are not installed automatically as part of Mageia. If the installer cannot determine the correct driver for the wireless hardware, the system will not be able to connect to any Wi-Fi network. This may be frustrating to users who don't use the internet except by wireless, since they can't possibly download updates or other software along the way during installation

- Access through an Ethernet (wired) link is often more reliable on installation as most wired network cards are supported by default. If only a Wi-Fi option is available, the user may need to install the appropriate drivers manually after installation from another machine to download them or through enabling the "Nonfree" repository in Mageia Control Center. The repository includes proprietary drivers and firmware required for most Wi-Fi

chipsets. After the appropriate drivers are loaded, wireless capability typically functions perfectly.

3. Resolution Problems in VMware Display Settings:

-One of the common problems noted while installing Mageia OS in a Virtual Environment like VMware Workstation or VMware Player is its low display resolution. While installing users usually notice that the Mageia desktop is either too small, too stretched, or too blurry. In addition, the system seems restricted to low screen resolutions (e.g., 800x600 or 1024x768) that are neither enjoyable nor conducive to productive use. This makes navigation, system modifications, setting changes, and overall virtual machine activity cumbersome.

-Usually the problem stems from lack of installation of VMware Tools, which is a suite of drivers and utilities meant to optimize virtual machines for better performance or usability. Their open-source version in Mageia is open- vm-tools. In their absence, Mageia is unable to communicate with the host system through VMware, causing poor graphics capabilities along with no drive shifting of tasks, desktop auto-resizing, mouse synchronization, or seamless integration mouse.

-(Explain how it can be done) Users may resolve this problem by installing the open-vm-tools and open-vm-tools-desktop packages before or after installation. This can be performed from using terminal commands as shown below, or through the Mageia Control Center.

After the installation of tools and rebooting of Mageia, its OS now scales seamlessly with the windows of the virtual machine, which optimizes the display. Furthermore, partial control of the guest system from the host is

enabled, making Mageia easier to operate within a virtualized system.

4. Software Not Found:

-Another common problem users face while using Mageia OS is the lack of straightforward access to certain software packages including application programs and even drivers. A number of users try to look for popular application software or drivers after their installation, and are crestfallen when they realize that these do not exist in the system's default repositories. This is worst for those users who need all the applications, for work, study or leisure, pre-loaded on their computer immediately.

-Mageia provides by default only 'core' and 'free' repositories wherein only open source and free software applications are available. However, most of the standard packages are found in Nonfree and Tainted repositories like media players (…media codecs), proprietary drivers (…some Wi-Fi or graphic cards). These repositories contain software that is closed or licensed, or even commercially controversial in some jurisdictions.

In order to download this additional software, users will need to manually activate the Nonfree and Tainted repositories. As with enabling any other repositories, this can be easily accomplished through the Mageia Control Center in the "Software Management" > "Configure media sources for install and update" section. When the various repositories are enabled, the system can access many more programs including multimedia codecs, proprietary drivers, and very commonly used third-party applications that are not included in the default installation.

These repositories allow Mageia OS to access a greater range of software. The system's flexibility is drastically improved with Nonfree and Tainted repositories in combination with other community repositories, and this allows for easier customization to fit the users' personal and professional needs. These repositories also unlock a lot of tools that other users will find essential to computing.

5. Keyboard/Language Mistakes:

Every operating system poses the challenge of setting up language and keyboard preferences, and Mageia OS is no different.

- An issue that could occur within or after the installation of Mageia relates to the system language and keyboard preferences. There may be a situation where a user assumes that their computer is using English (US) but finds out that it is using some French, German or some other keyboard layout.

- Such a mismatch can lead to severe problems, particularly when passwords, commands or special characters need to be typed, as the verbosely described actions do not correspond to the current keyboard setup.

- This problem arises when there is no selection made concerning the language or keyboard layout during the installation phase of the process.

- In the course of installation Mageia gives the user the choice of language and the keyboard layout he/she intends to use interface language. In case the user does not want to go through this process and chooses wrong option by mistake or a default option, whichever the case is the system will execute incorrect configurations. Furthermore, it doesn’t limit only to keyboard configuration but may also change interface language, system language, date and time formats.

Users are able to type however they desire and even display the user interface in a different language which results in a wild and uncontrollable system. Users after installation have to log into the Mageia Control Center, System > Manage Localisation and Keyboard Layout, and modify the language and keyboard layout as per their specific preferences. In some instances, options Physique d'affichage and Options annexes d’outils need to be checked first in the configuration settings; otherwise, the whole computer may need to be restarted so they can work properly.

- In the installation phases of Mageia OS, users are strongly advised to select the language and keyboard layout prior to proceeding to the next step. Users will find this decision will afterward eliminate the need for adjustment, making their operation with the operating system more clear-cut and hassle-free in the future.

Solutions to Mageia Os's Most Common Issues

1. How to fix Boot Errors

In case of failure of Mageia OS booting, users are recommended to ensure their machine is either BIOS or UEFI and check that the installation mode matched their system firmware's. In the instance where the system does not start and only displays a black screen or GRUB rescue screen, it is safe to assume that the bootloader is the primary option. This can be fixed by once again booting from the Mageia installation media and this time selecting the "Rescue System" option from the boot menu. Users can also regain access to their devices by fixing the boot order in their BIOS settings and enabling or disabling secure boot as necessary. Additionally, users need to reproduce the same actions to recover the device's GRUB bootloader removing it from the disk.

2.Repairing a Lost Network Connection

Due to the absence of proprietary drivers for some Wi-Fi chipsets, Mageia OS may not detect wireless networks. The easiest workaround is to use a wired Ethernet connection during installation since most PEG Ethernet connections do not require additional drivers. After installation, users are encouraged to enable the "Nonfree" repository from the Mageia Control Center. This non-free repository allows users to install proprietary firmware packages. After enabling it, users can either manually install the to-install wireless driver or use Mageia's package manager to do so. Normally, a system reboot following driver installation will turn on the wireless card.

3.Fixing Low Display Resolution in VMware

To resolve display resolution issues and graphics integration when running Mageia OS on VMware, users must install open-vm-tools and open-vm-tools-desktop. Communication issues between the Mageia OS and the host computer can be solved with these open-source versions of VMware Tools. The packages offer dynamic screen resizing, enhanced mouse mobility, copy-paste, and overall better performance.

4. How to Resolve a Problem with Missing Software

If users are unable to locate a particular application in Mageia's package manager, they should check if all pertinent software repositories are activated. By default, Mageia is set to only have the "Core" and "Free" repositories active, which consist of only open source software. To obtain additional repositories, users must go to the Mageia Control Center, then select Software Management > Configure media sources, and activate the "Nonfree" and "Tainted" repositories. These contain proprietary drivers, media codecs, and various other applications. With these options activated, the package manager has access to a vastly increased number of applications, simplifying the installation of required drivers and tools.

5. Fixing Language and Keyboard Errors

To adjust incorrect keyboard or language settings in Mageia OS, users have to go to the Mageia Control Center and click on System > Manage Localization and Keyboard Layout. From there, users can choose an appropriate keyboard model and layout based on preferences and geographical location. Moreover, users can select a desired system language which changes the user interface and other

regional settings. It is advisable to reboot the system after making the changes to confirm that the changes have indeed been implemented. Users can prevent such

issues from occurring in the future by being more careful when selecting language and keyboard layout options during the initial installation configuration.

Filesystem Support

Mageia supports the following modern and legacy filesystems: ext4, Btrfs, and XFS. These are designed to meet the needs of each user and the performance requirements of the system. Ext4: The fourth extended filesystem, ext4 is by far the most popular and default filesystem in Linux distributions (such as Mageia), providing an acceptable mix of performance, stability and dependability. Ext4's resource use is much higher than ext4. XFS: The sixth-generation journaling filesystem from FreeBSD, it is often used to manage large files and concurrent I/O operations, such as media servers. It provides excellent performance in loud environment. There are some modern features that are not present in XFS, such as native snapshotting. Which filesystem should I choose based on my use? If you are using it for routine desktop and/or virtual machine use, the following filesystem is the best. - Btrfs for systems that require versioning, backup and sophisticated disc functionality. - XFS for systems with large files and high performance

Advantage and Disadvantage

* Benefits

-Safe Testing Environment A virtual machine (VM) is the best environment for testing and teaching because it will not affect your host operating system when any changes are made. Backup and Snapshot ManagementUsing VMware Workstation users can take snapshots of their virtual machines (VMs) at any time to protect from manual backup processes or to roll back to a previous state in case of an emergency.

- Flexible Hardware Allocation System resources can be more efficiently used and isolated by giving users the capability to allocate specific resources (CPU, RAM, and disk space) to the virtual machine based on requirements.

-Portability and Cloning Because virtual machines can be copied or moved between computers they are easy to set up and work on together.

-Portable and cloning because Virtual Machines can be moved or cloned between computers without much modification to how they are configured (the more configuration changes, the easier it is to set up / work on Virtual Machines).

- Multiple OS Environments Because you can run multiple operating systems at once, this can be advantageous for software development, cross platform testing / training environments. - Less Gear Costs because you don't have to buy separate physical equipment to test different OS configurations.

* downsides

- performance can be worse than if done using real hardware. - requires adequate system resources on the host computer.

Conclusion

In conclusion, having Mageia OS installed in a VMware Workstation is an efficient and easy way of learning and testing Linux in a safe and isolated environment. It would be especially useful to developers, system administrators, and students who have to test software, study system settings, or model network topologies without compromising their core system. By providing the ability to control hardware resources, make snapshots, and restore back to previous points, VMware Workstation simplifies the process. Its ease of use, security features, and flexibility make it an excellent option for anyone willing to learn more about Linux and virtualization, although there are decidedly serious performance disadvantages compared to bare-metal installs.

Future outlook

Mageia OS Projected Future

1. Community Stability

- It is evident that Mageia is one of the more user friendly distros out there and possesses a strong community. User engagement and active community work largely defines the future of mageia and clearly measures show that it is consistent albeit at a slow scale.

2. Steps in Release External Schedule

- The releases are done when they feel ready to be implemented ‘when ready’ which means they emphasize stability over new features. This is meant for users who prefer more reliable software systems, however, may not appeal to those who are eager to use new systems.

3. Different Options for Desktop

- Chunk of Mageia users are kf5, GNOME, XFCE users thus providing multiple choices under one umbrella. As long as downstream exits, Mageia will most probably keep up to date.

4. Business and Personal Use

•Not many enterprises have adopted mageia but it does fit well for private usage (teaching and lite office work). Mageia will have slow prospects for growth in the business world UNLESS it gets funded by a corporation.

5. Controveries

•Too little advertising and users in comparison more mainstream names like Ubuntu, Fedora or Arch.

•Visibility and branding are poor for long-term prospects.

•Sustaining development and maintenance on a volunteer basis is vulnerable.

Suggestion- Go for Mageia if; You are looking for a desktop oriented die with reliable RPM support.You are looking for ease in installation.

What is virtualization?

Virtualisation: What is it? Virtualization is a technology that enables the creation of computer, server, operating system, storage device, and network simulated (virtual) versions. This is done by using a special program called a hypervisor, which allows you to run multiple distinct computing areas referred to as virtual machines (VMs) in a single physical system known as the host.

Just like a standalone computer, each virtual machine has its own virtual CPU, memory, disc, and network interface; even though the hypervisor only relies on the host's real hardware to simulate these components. For example, virtualisation allows a user to do: Run Windows simultaneously with Linux on the same computer. Test model different hardware environments. Provide distinct testing and development environments that are not in the main system.

Examples of Type 1 (bare metal) software installed on hardware: VMware ESXi, Microsoft Hyper V; Type 2 (hosted): runs on an existing operating system (e.g. VMware Workstation, Oracle VirtualBox). Many modern IT environments require this abstraction layer for flexibility, to better utilise the hardware and to separate the system.

What is the need of virtualization?

Why Is Virtualisation Beneficial? Hardware Improvement: Increase the effectiveness of the hardware by running multiple operating systems on a single device. Tangible equipment requirements: Saves money on hardware and maintenance. 1. Test and Development: Good for testing new operating systems, applications, or updates in a remote location. Security and Isolation: Each virtual machine runs independently and therefore lowers risks. Simple: Moving, backing up, and replicating virtual computers is simple.

How virtualization within new operating system

Through a layer of software known as a hypervisor, virtualization—a feature of modern operating systems—allows a single physical machine to host numerous virtual machines (VMs). All virtual machines (VMs) use the same CPU, memory, storage, and network resources but each has its own operating system and applications. Rather than communicating with the hardware, the OS communicates with the hypervisor. This makes it possible to separate many operating systems (such as Windows and Linux) from one another when run in parallel. Most contemporary operating systems (OSes), such as Linux using KVM and Windows using Hyper-V, incorporate native virtualisation as part of their base setup. This enables resources to be utilized more efficiently, systems to be controlled more easily, and more secure test environments to be created.

System call Implementation

vfork() is used when the child process will call exec() or _exit() immediately.

It's more efficient than fork() in such cases because it avoids copying the parent's memory space.

Always use _exit() in the child to prevent issues from shared memory space with the parent.

```
#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

#include <sys/types.h>

int main() {

   pid_t pid;

   printf("Before vfork\n");

   pid = vfork();  // vfork is used to create a new process without copying the address space

   if (pid < 0) {

      perror("vfork failed");

      exit(1);

   } else if (pid == 0) {

      // Child process

      printf("Child process (PID: %d)\n", getpid());
```

```
        execlp("/bin/ls", "ls", "-l", NULL);  // Replace child with 'ls -l' command
        perror("execlp failed");
        _exit(1);  // Use _exit instead of exit in child process after vfork
    } else {
        // Parent process
        printf("Parent process (PID: %d), child PID: %d\n", getpid(), pid);
    }

    return 0;
}
```

Thank you