



Bahir Dar University

Bahir Dar institute of technology

Faculty of computing department of software engineering

Course name: operating system and system programming

Title: Ubuntu server and virtualization

Section: B

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Submission date: 16/08/2017 ec.

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1 Ubuntu server

1.1 Introduction

Ubuntu Server is a specialized version of the popular Ubuntu Linux distribution, optimized for running server applications and services. It's designed for environments like web hosting, file servers, database management, and enterprise applications, prioritizing performance, efficiency, and security. Unlike the desktop version, Ubuntu Server typically uses a command-line interface (CLI) instead of a graphical user interface (GUI), which reduces resource consumption and enhances efficiency on servers.

Background

Ubuntu Server is a free and open-source operating system developed by Canonical Ltd., based on the popular Debian Linux distribution. First released in 2004 as a desktop OS, Ubuntu quickly expanded into server environments due to its stability, ease of use, and strong community support. Ubuntu Server provides a robust platform for hosting applications, services, and virtual machines, making it widely adopted by businesses, cloud service providers, and developers.

Ubuntu Server supports various architectures and is available in both Long-Term Support (LTS) and regular release versions. LTS releases receive updates and security patches for five years, making them ideal for production environments.

Motivation

The motivation behind Ubuntu Server stems from the need for a secure, scalable, and cost-effective alternative to traditional server operating systems like Windows Server or Red Hat Enterprise Linux. Its key benefits include:

- Open-source and free: Reduces operational costs without sacrificing performance or security.
- Ease of use: Simplified deployment and package management with tools like apt and cloud-init.
- Strong community and enterprise support: Backed by Canonical and a global community, offering documentation, forums, and commercial support options.
- Cloud and container readiness: Optimized for cloud platforms like AWS, Azure, and Google Cloud, and supports container technologies like Docker and Kubernetes.
- Security and updates: Regular security patches and updates, with optional Extended Security Maintenance (ESM).

Overall, Ubuntu Server is an attractive choice for both startups and enterprises seeking a flexible, reliable server OS for modern IT infrastructure.

1.2 Objectives of Ubuntu Server

- Provide a stable, secure, and reliable server environment
- Simplify deployment and system configuration

- Support cloud platforms and virtualization technologies
- Enable automation and scalable infrastructure
- Offer long-term support (LTS) with regular security updates
- Promote the use of open-source tools and software
- Optimize performance on modern server hardware
- Let me know if you want a visual slide layout or design tips too.

1.3 Requirements of Ubuntu server

Requirements are what you need in order to install, run, or use a system or application effectively. There are two types of requirement in operating system, hardware and software requirements.

- Hardware Requirements: are the minimum physical components (like CPU, storage, RAM) computer or server must have to run the system (in my case Ubuntu server).
 - CPU: Minimum 1 GHz (x86 or ARM); recommended 2+ GHz multi-core
 - RAM: Minimum 512 MB; recommended 2 GB or more
 - Storage: At least 2.5 GB for base install; 20 GB+ for typical use
 - Network: Ethernet or internet connection; high-speed recommended
 - Architecture: Supports x86_64, ARM64, PowerPC (x86_64 preferred)
- Software Requirements: are the necessary programs or configurations (like file systems, boot method, or virtualization support) needed to install or use Ubuntu Server properly.
 - Bootable installation media (USB/DVD) with Ubuntu Server ISO
 - UEFI or BIOS firmware (UEFI recommended)
 - Supported file systems: ext4 (default), Btrfs, XFS, ZFS (optional)
 - Compatible hypervisor (for VMs): KVM, VMware, VirtualBox, etc.
 - Let me know if you want it styled for a specific slide theme or visual design.

1.4 Installation steps for Ubuntu server

Ubuntu Server is a variant of the standard Ubuntu, tailored for networks and services. It's just as capable of running a simple file server as it is operating within a 50,000 node cloud.

Unlike the installation of Ubuntu Desktop, Ubuntu Server does not include a graphical installation program. Instead, it uses a text menu-based process.

Steps for installation of Ubuntu server using VMware workstation player 17

Step 1: download VMware workstation player 17

Step 2: Install VMware work station player 17

Step 3 Download Ubuntu server iso

<https://ubuntu.com/downloads/server>

https://ubuntu.com/download/server

Canonical

ubuntu® Enterprise ▾ Developer ▾ Community ▾ Download ▾

Downloads Desktop **Server** IoT Cloud

Get Ubuntu Server

Option 1: Manual server installation

USB or DVD image based physical install

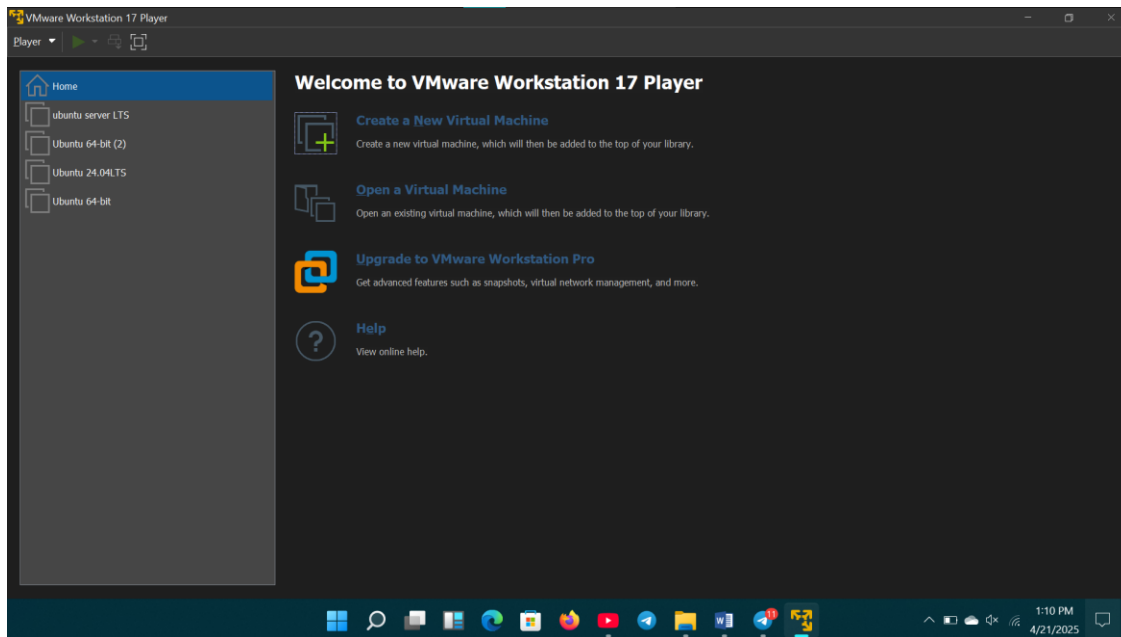
- ✓ OS security guaranteed until April 2027
- ✓ Expanded security maintenance until April 2032
- ✓ Commercial support for enterprise customers

➡ [Download Ubuntu Server 22.04.3 LTS](#) [Alternative downloads >](#) [Alternative architectures >](#)

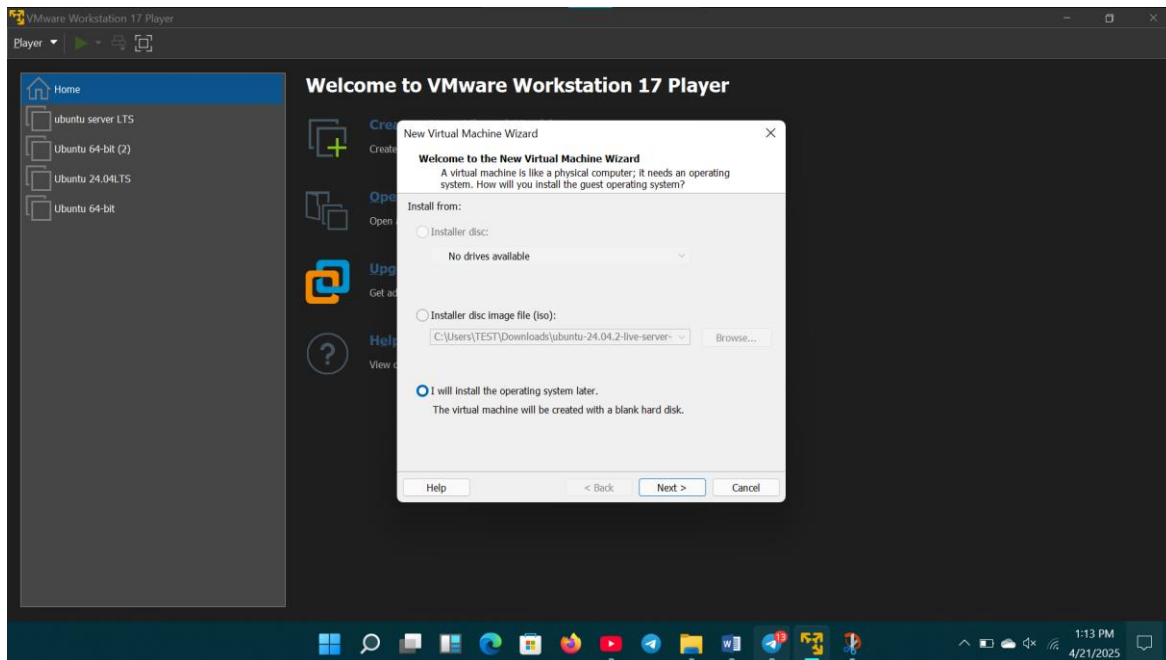
[Read the Ubuntu Server 22.04 LTS release notes >](#)

Option 1 - Manual server installation Option 2 - Instant Ubuntu VMs Option 3 - Automated server provisioning

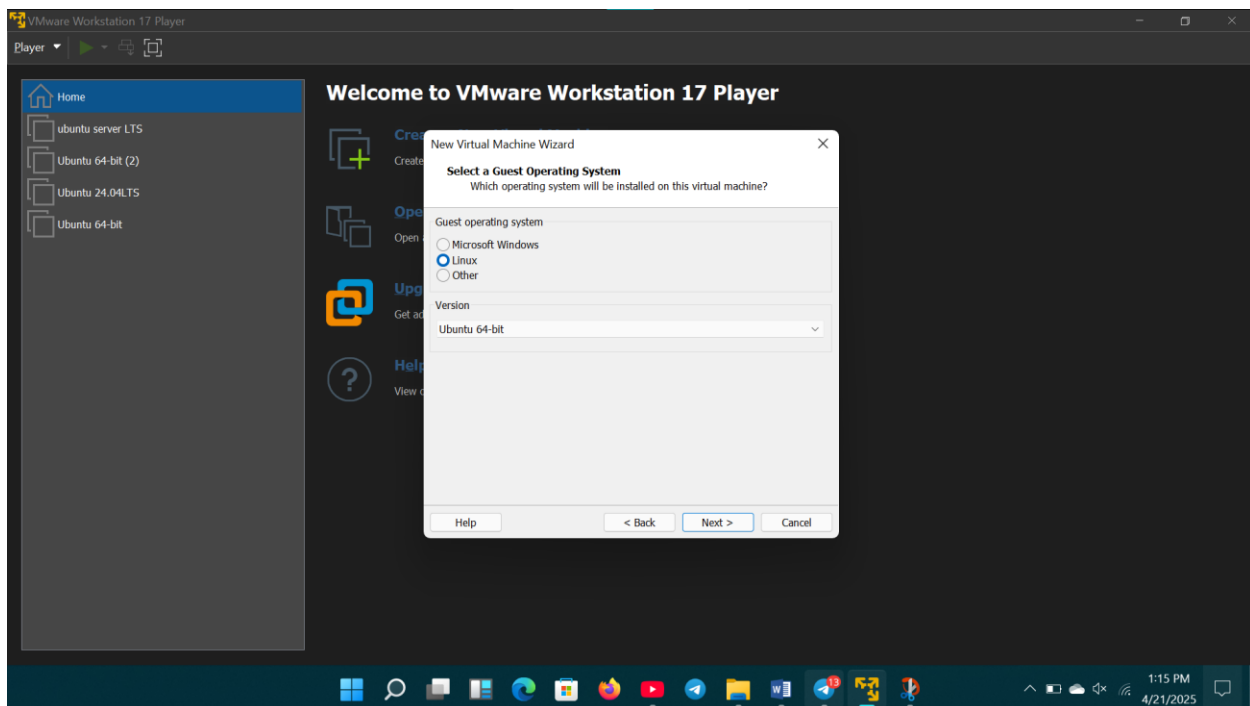
Step :4 – Open VMware workstation player and click create new virtual machine



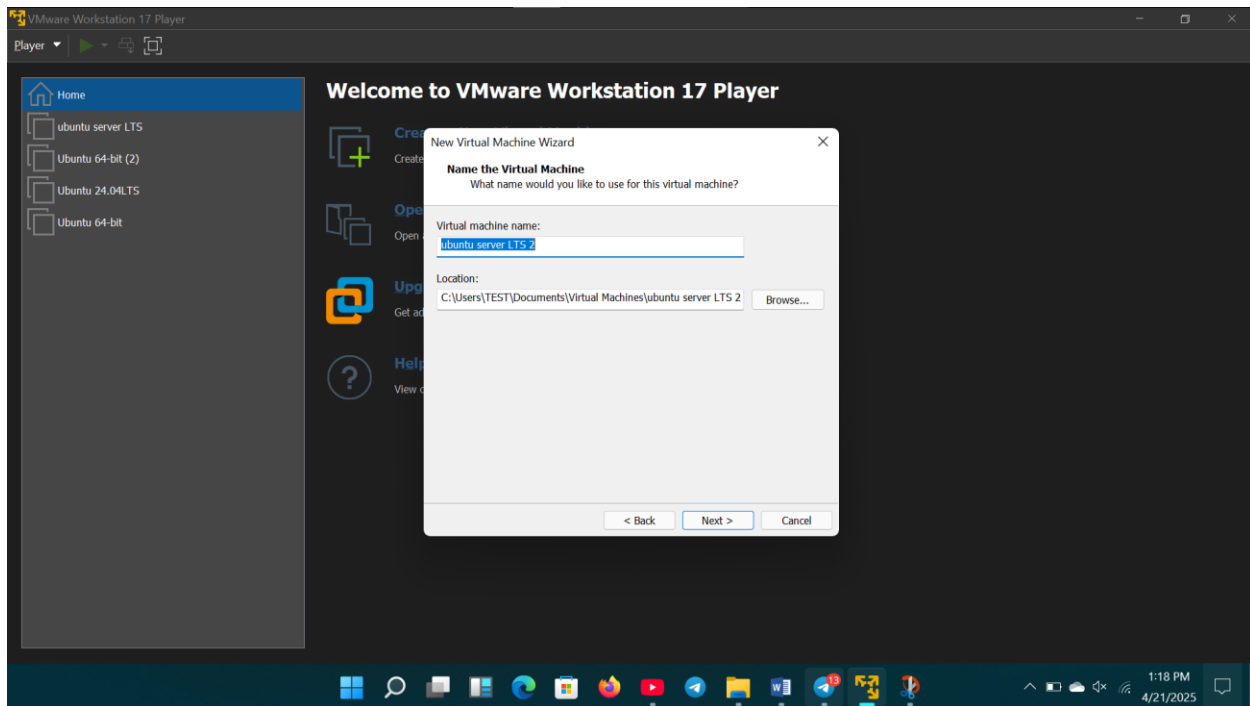
Step:5- select the third option to install os later.



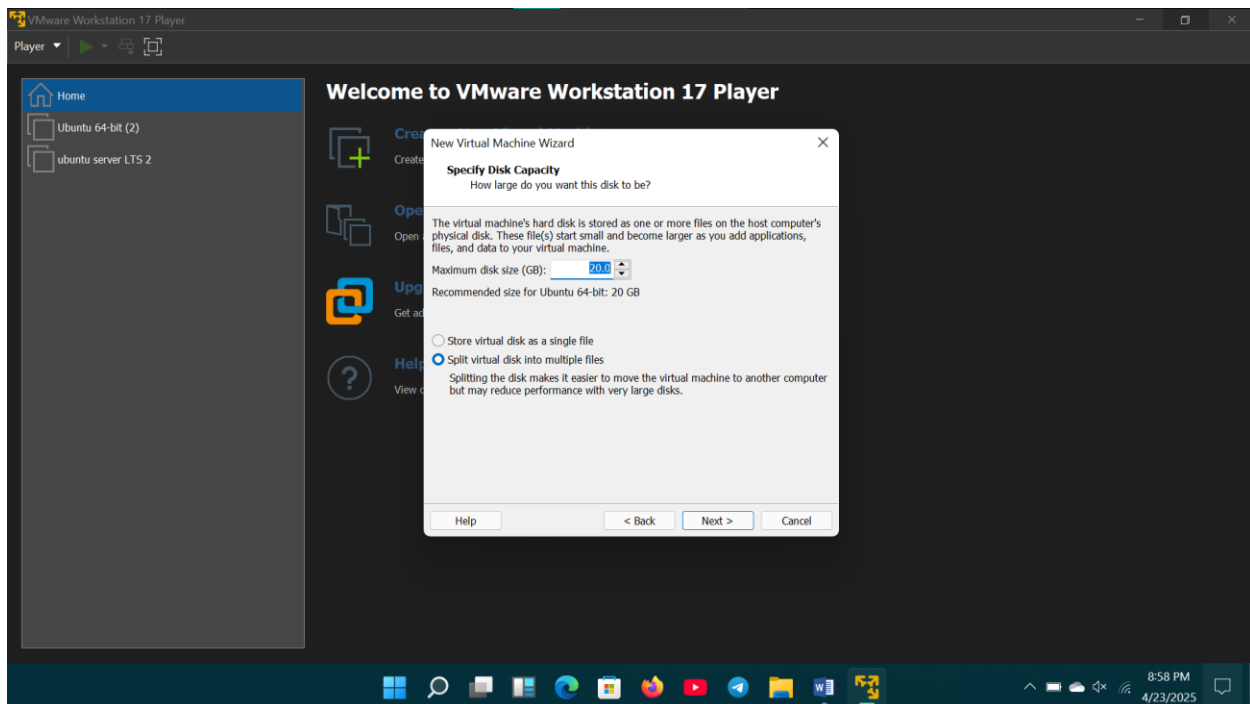
Step:6-select guest operating system and its version then click next.



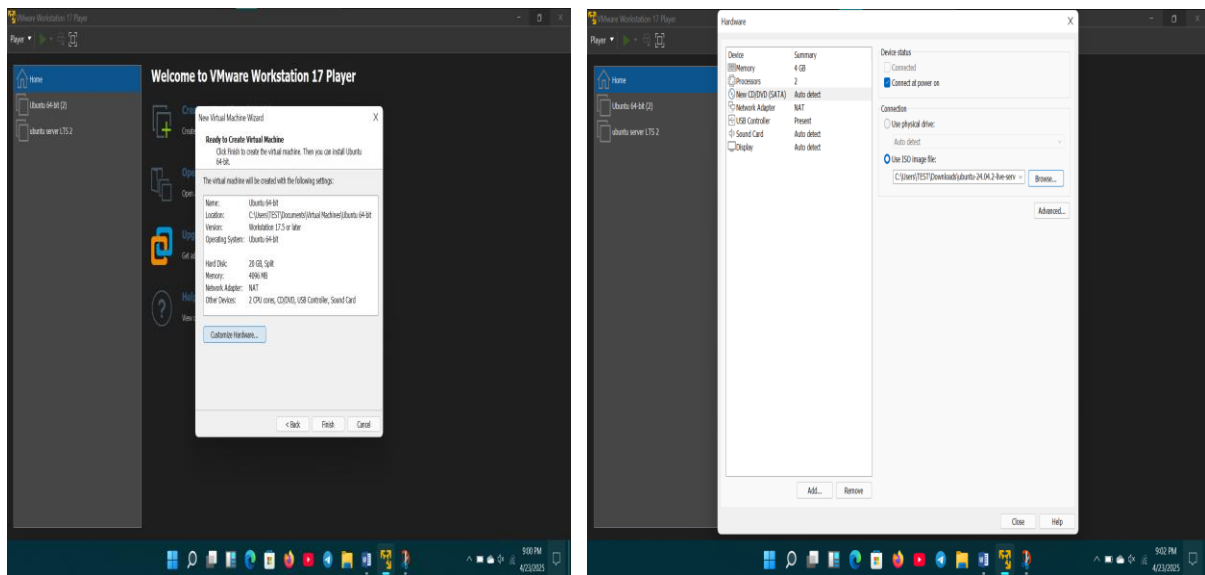
Step:7-name the virtual machine and place its location.then click next.



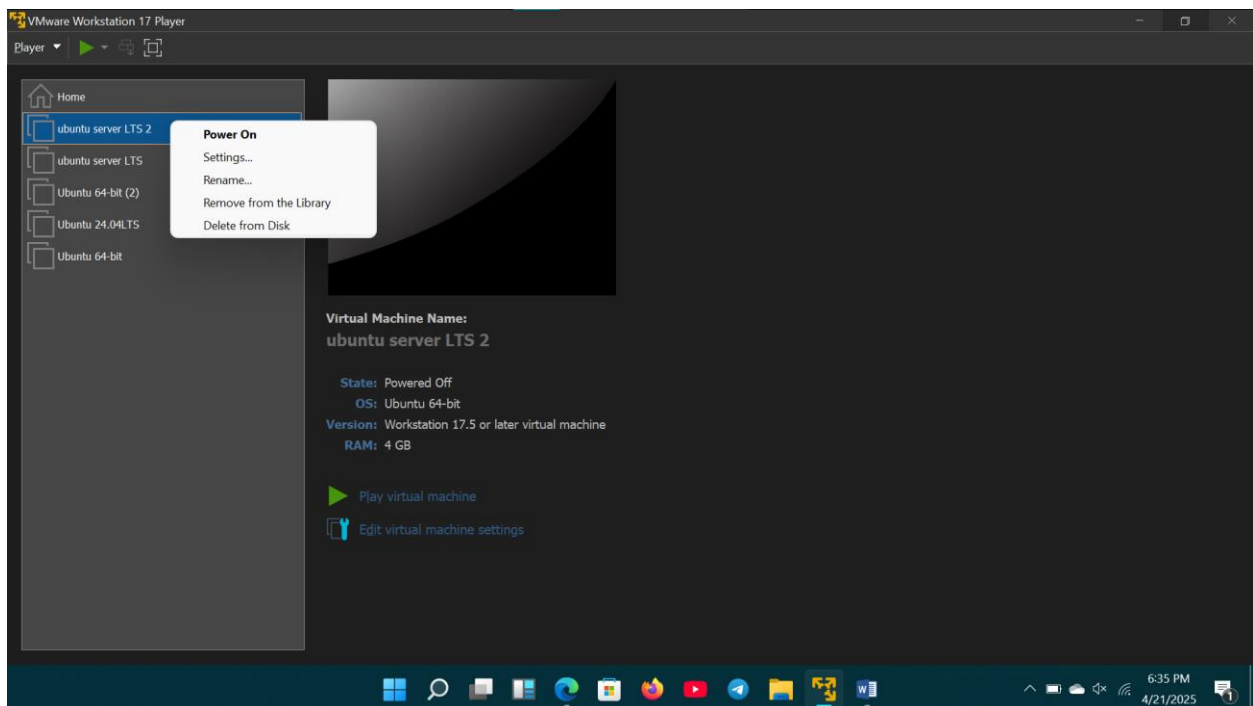
Step:8- specify disk capacity (maximum disk capacity).then click next.



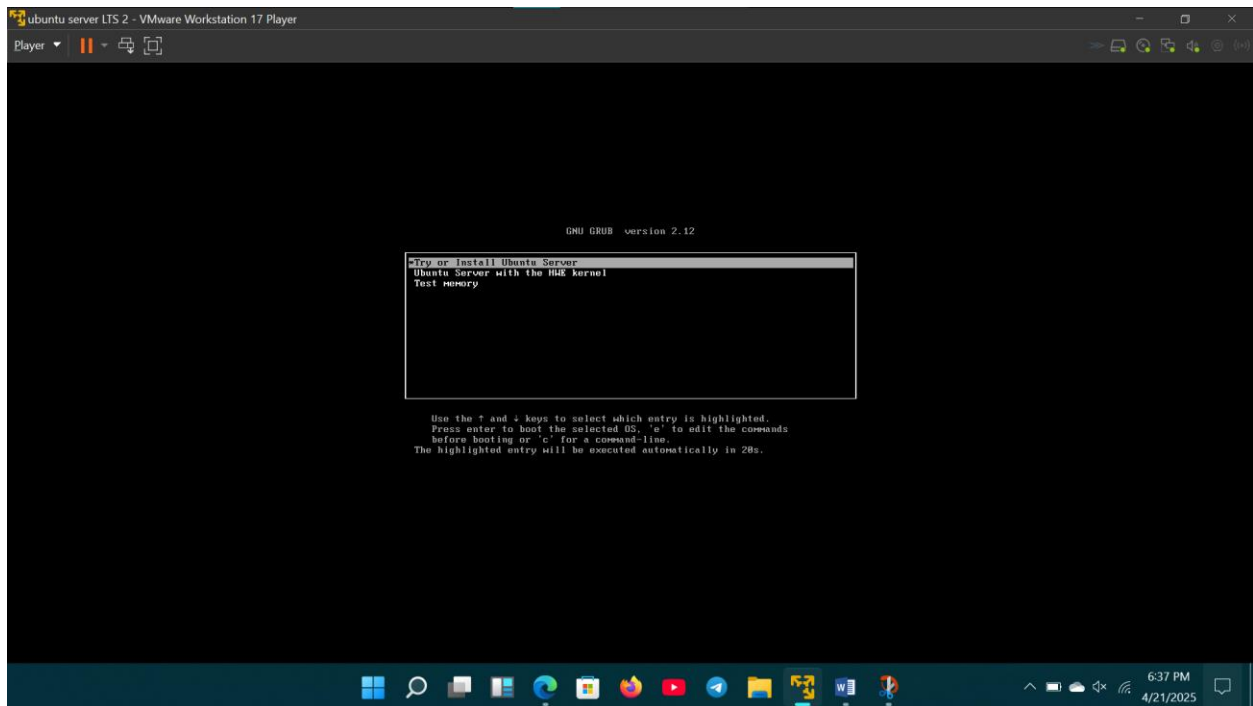
Step:9- before finishing creating virtual machine click customized hardware and set up the rest requirements ,click close and then click finish.



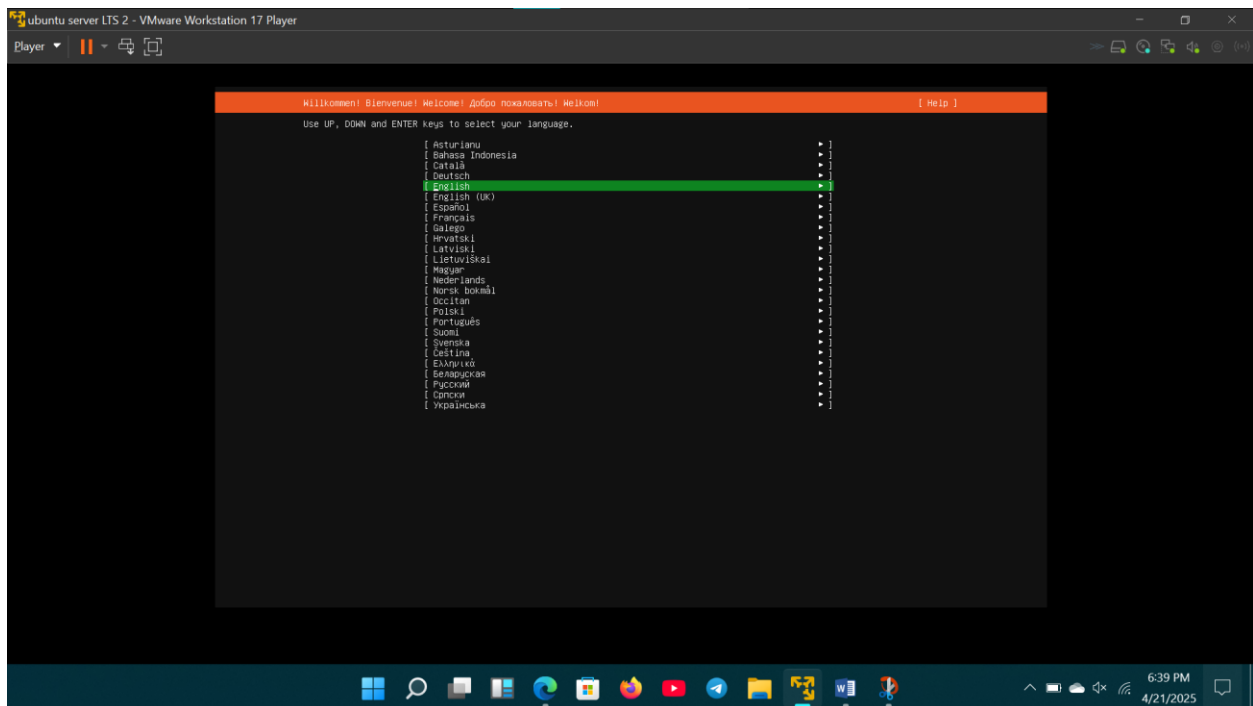
Step: 10- click on virtual machine, click power on.



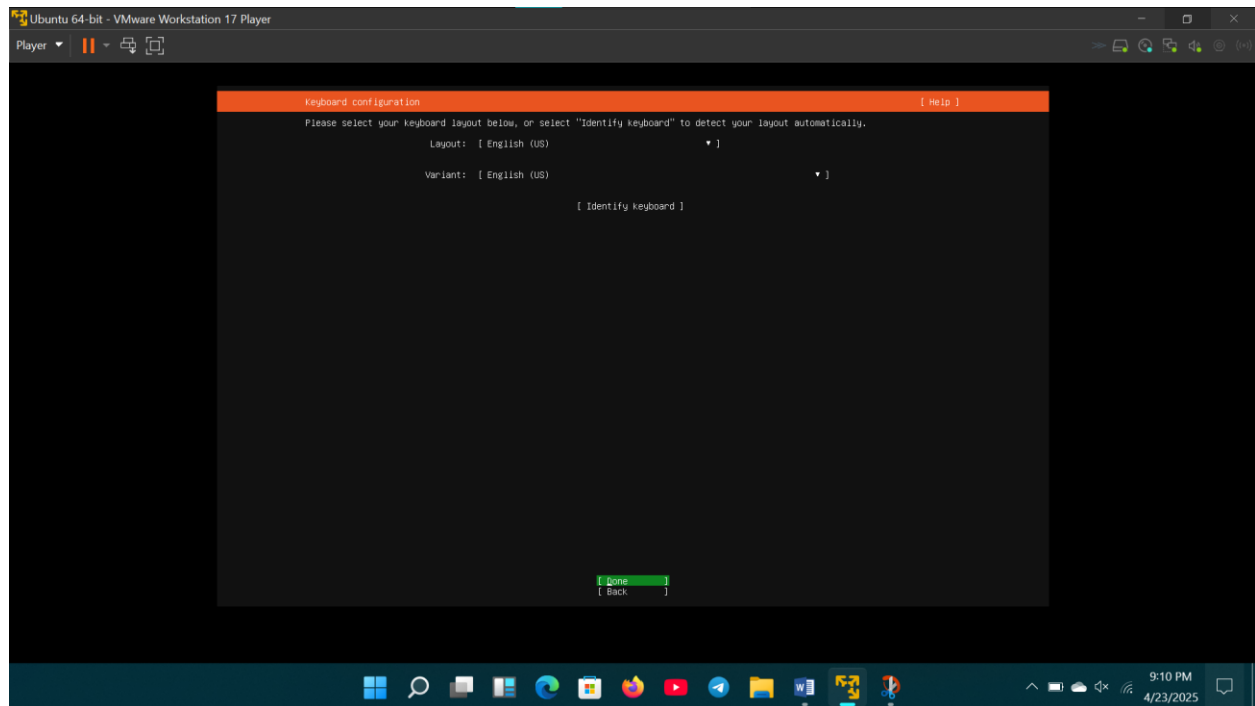
Step:11-select the first command and click enter.



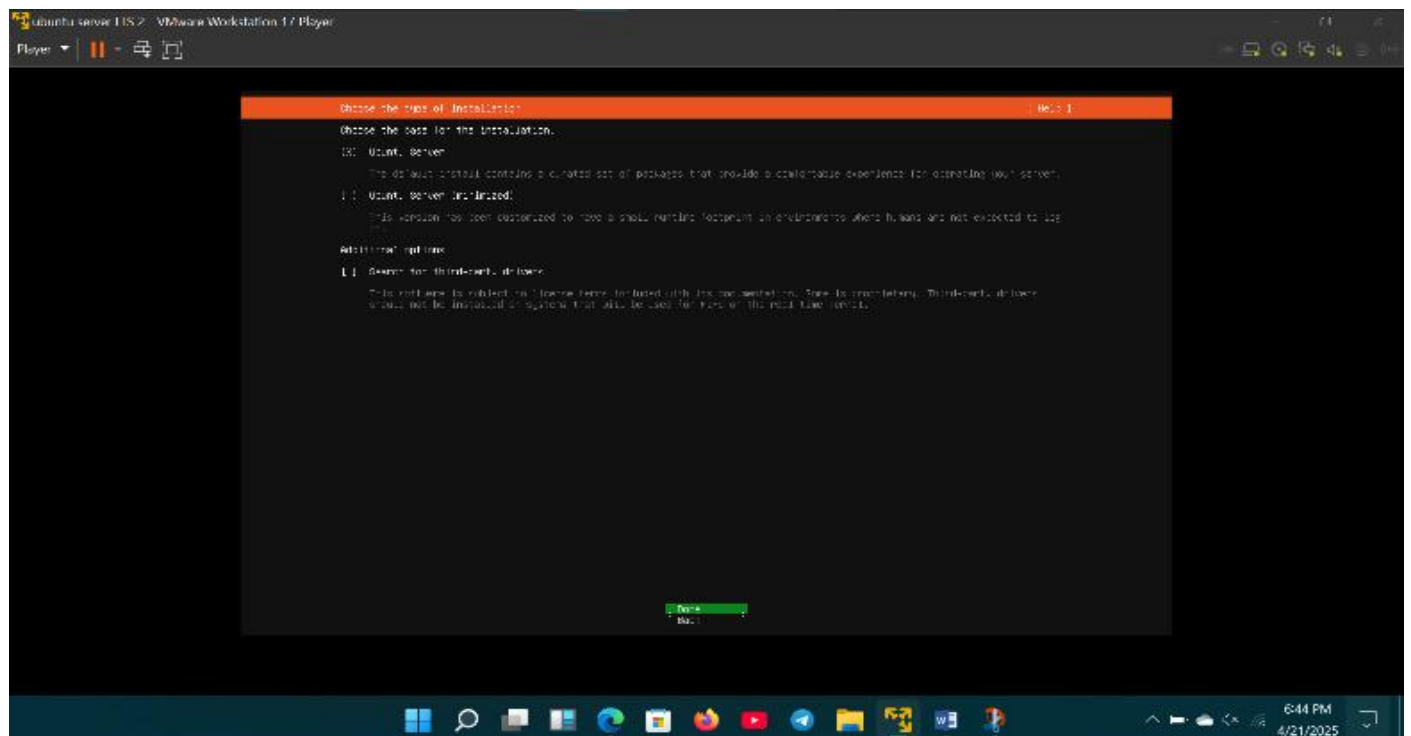
Step:12-select language that is used in os.

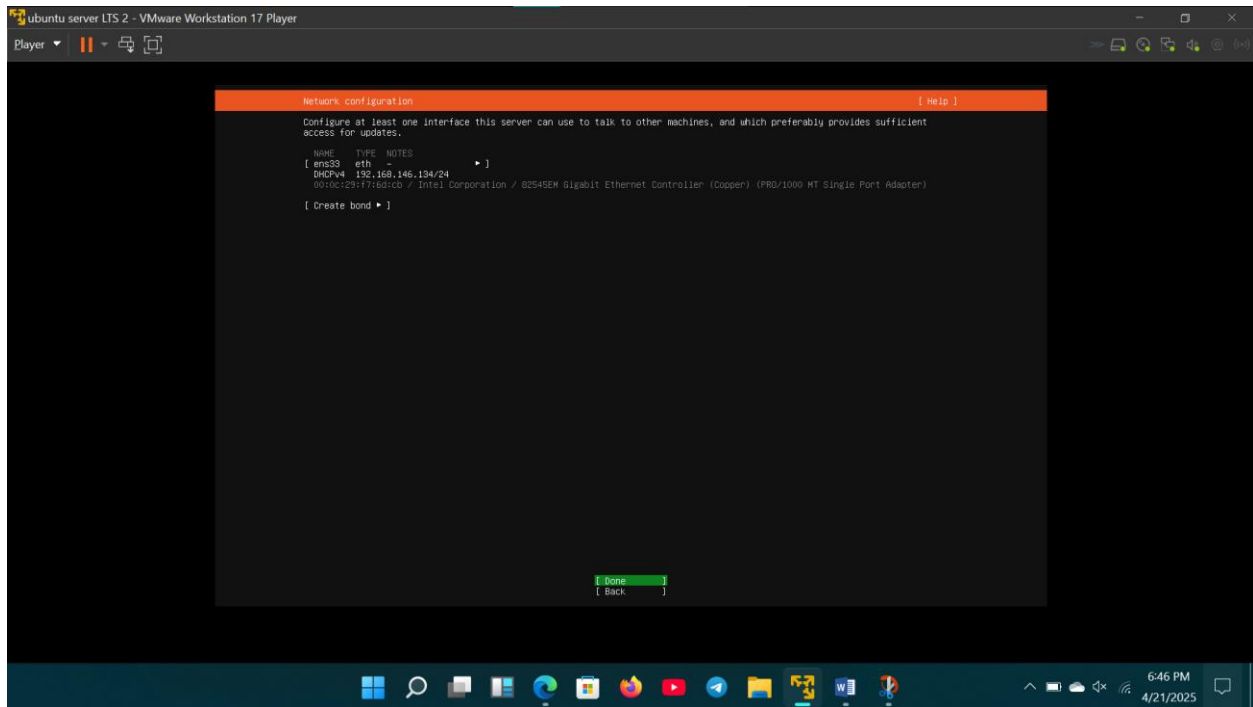


Step:13 set up keyboard configuration.

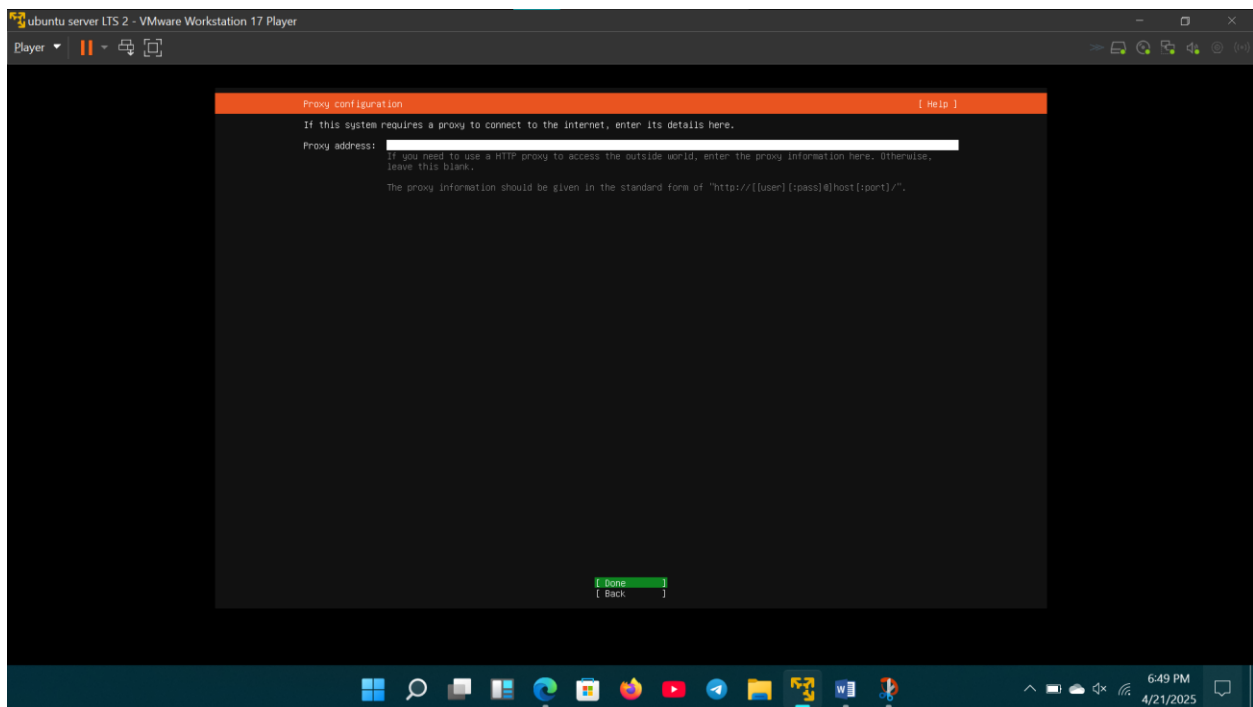


Step:14- configure network settings

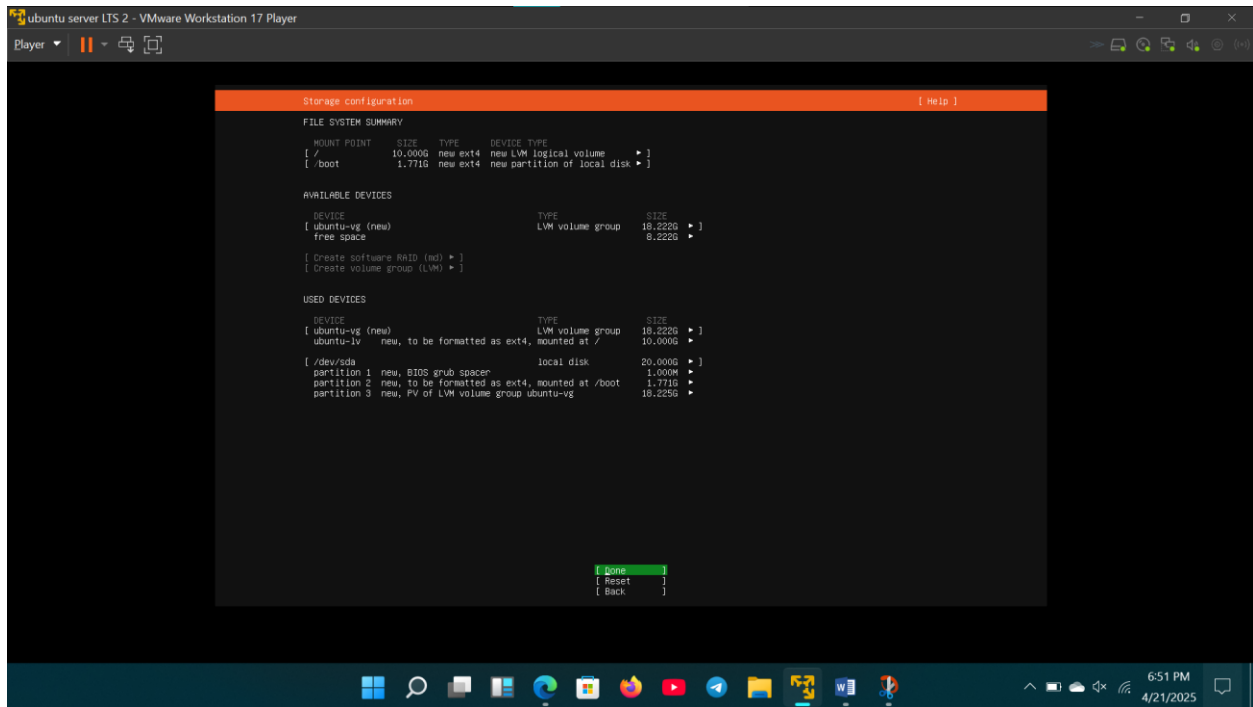




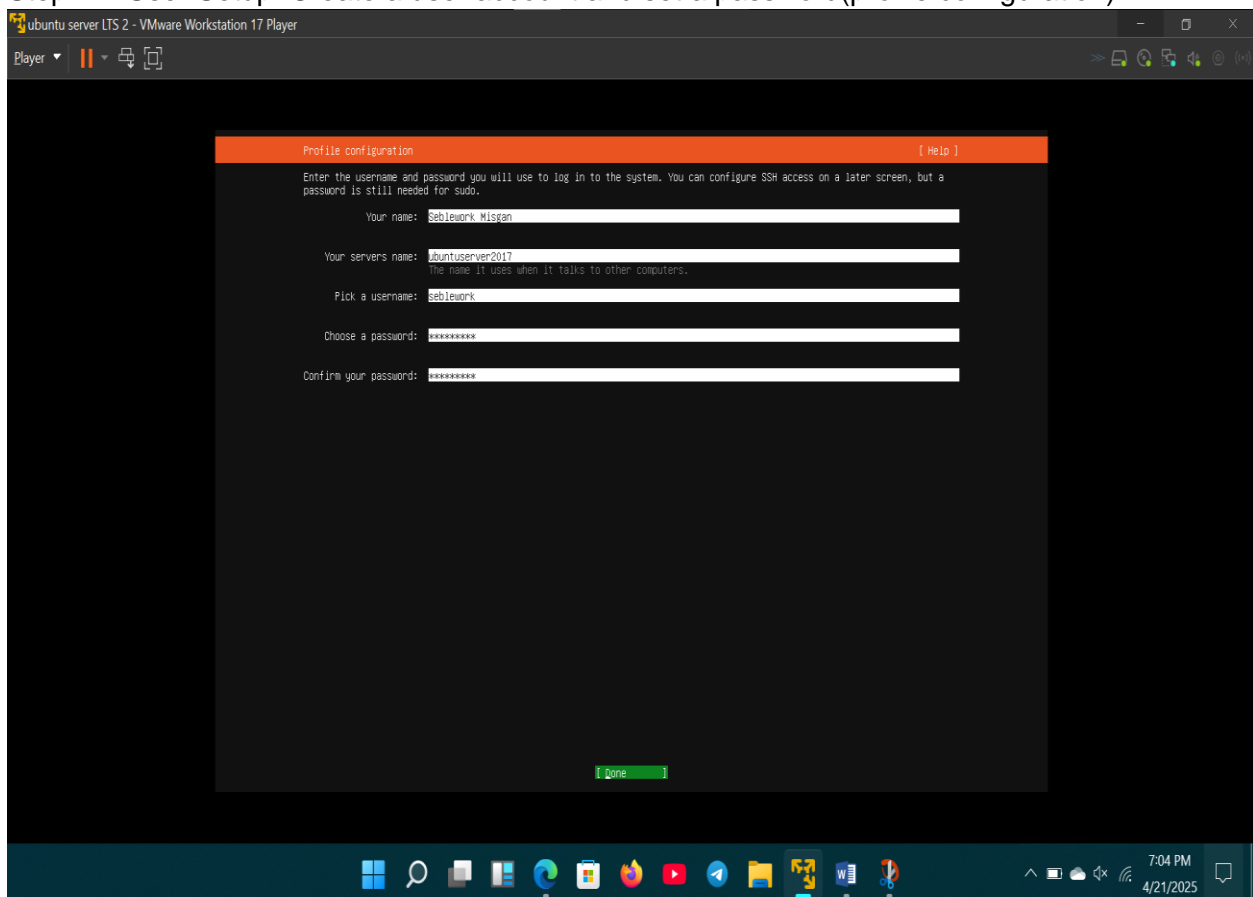
Step: 15-configure proxy settings

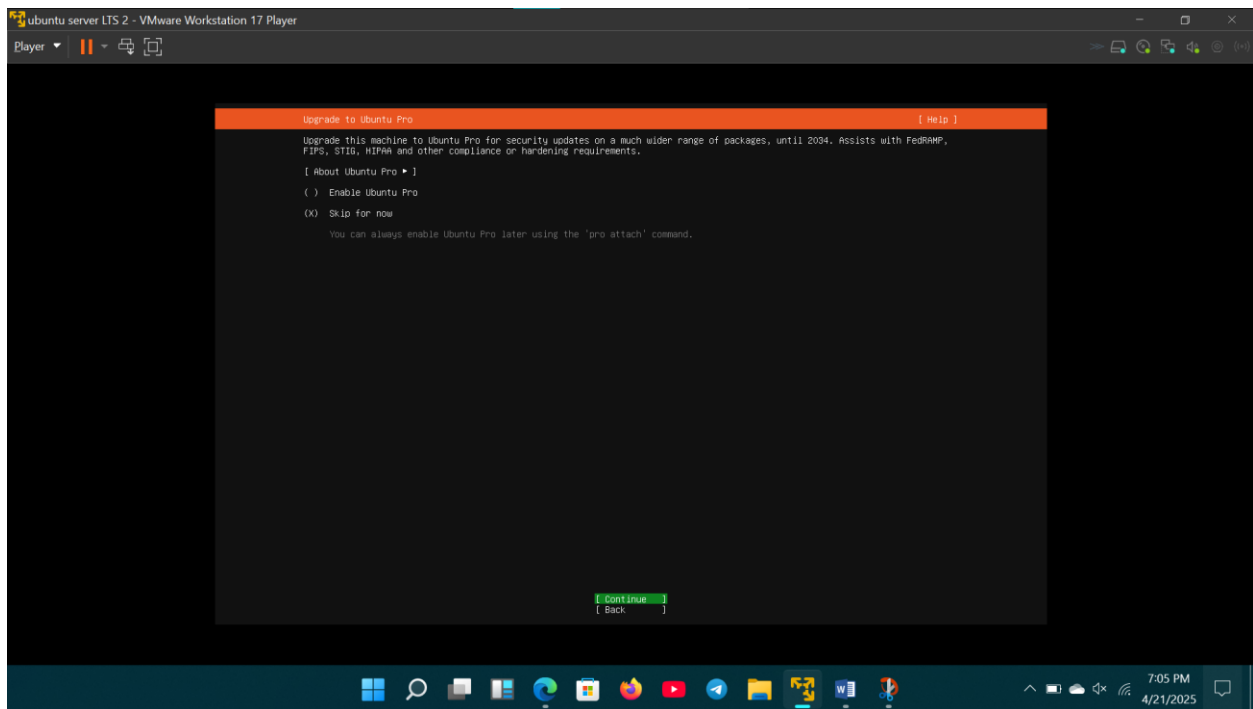


Step: 16-. Configuration storage setting. (Choose how to configure storage In this project use entire disk)

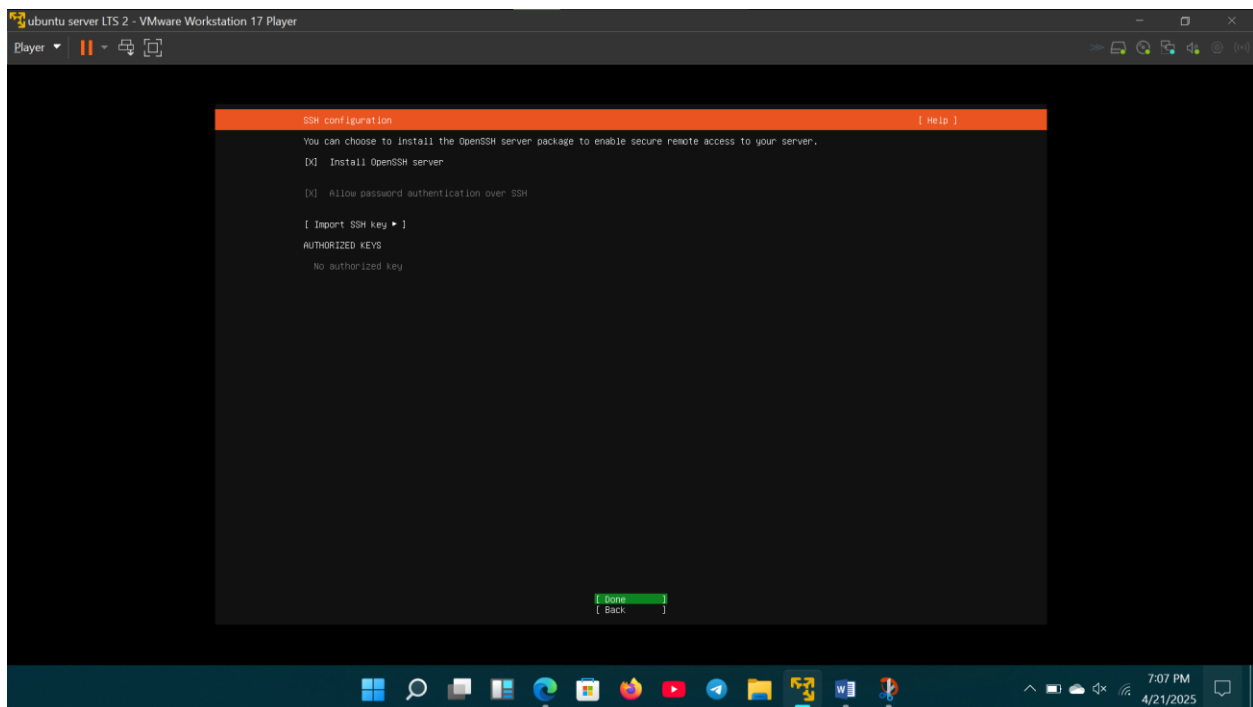


Step:17- User Setup: Create a user account and set a password(profile configuration)

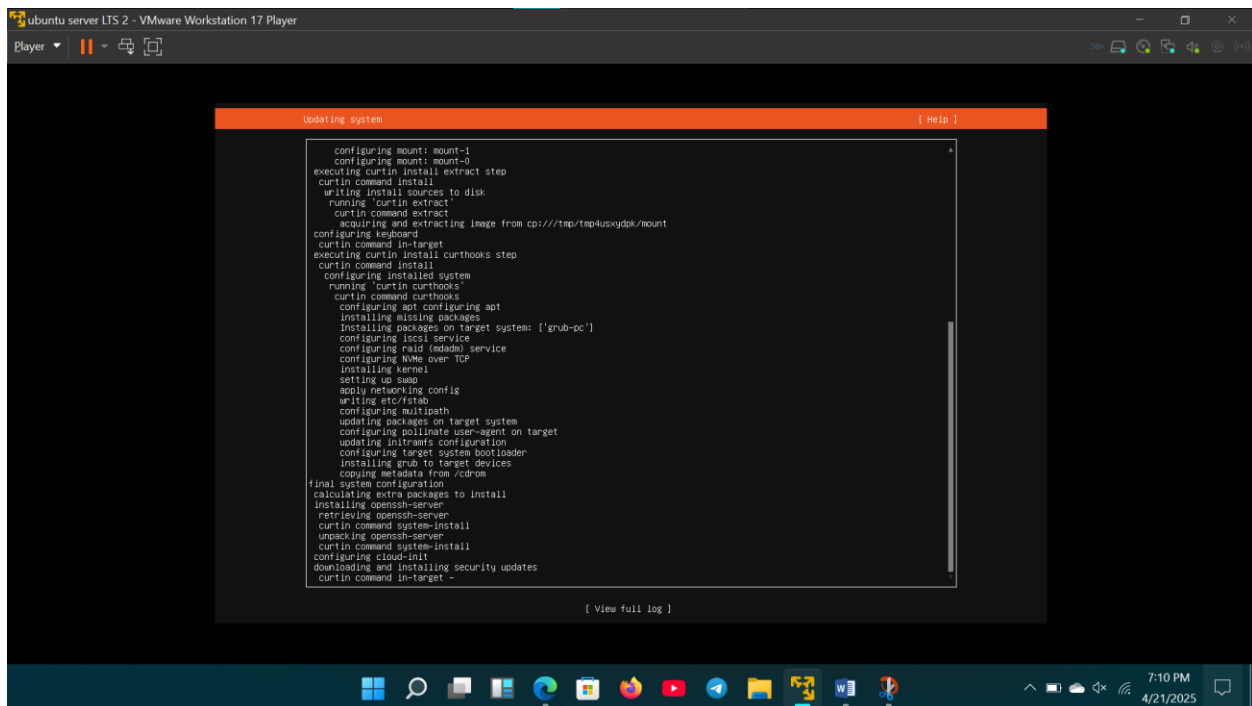




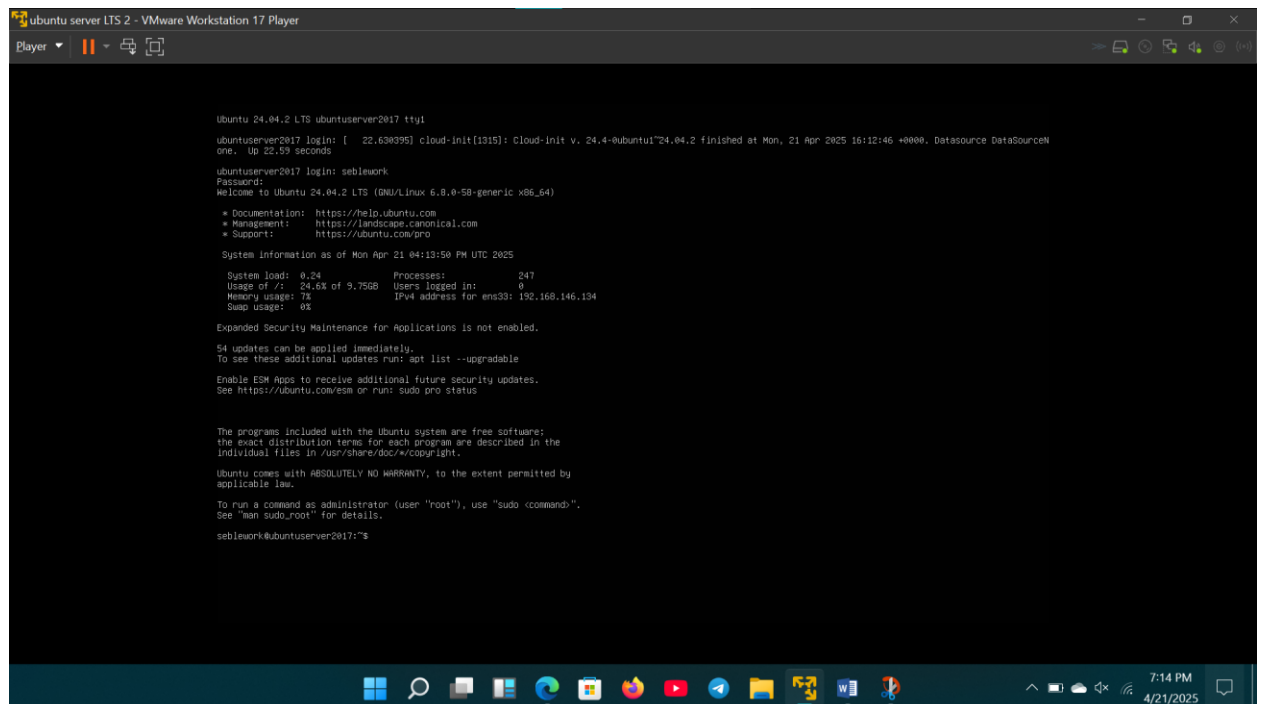
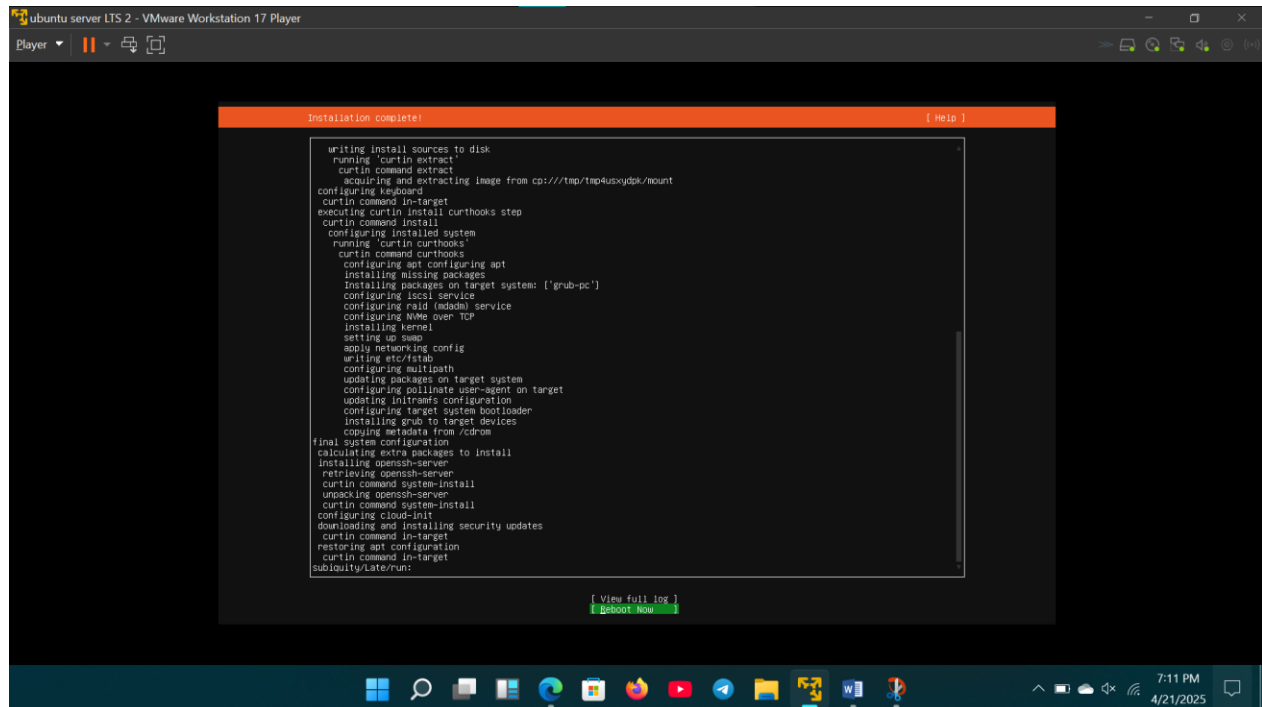
Step: 18- SSH Setup: If remote access is needed, choose to install OpenSSH server.



Reboot: The server will reboot, and you should see the login prompt.



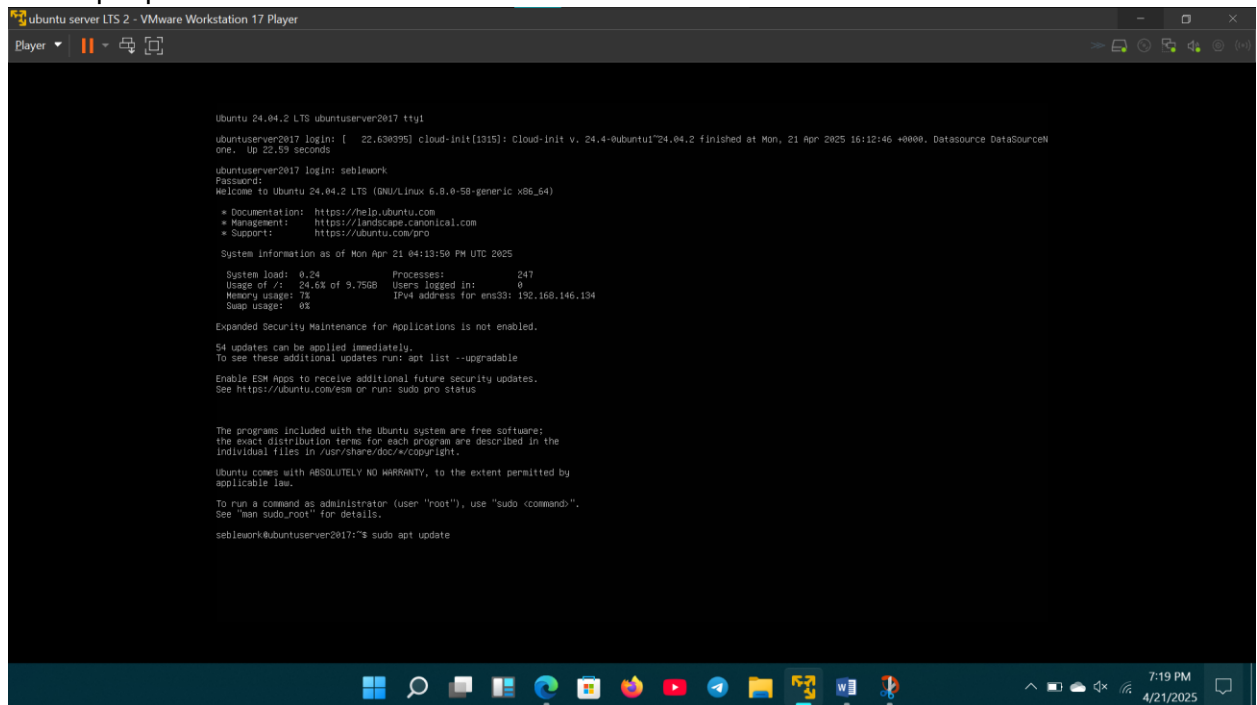
Step: 20-Reboot-The server will reboot, and you should see the login prompt.



Step: 21- Initial Configuration

1. Log In: Use the username and password you created during installation to log in.
2. Update Package List: Run the following command to update package list:

- `sudo apt update`

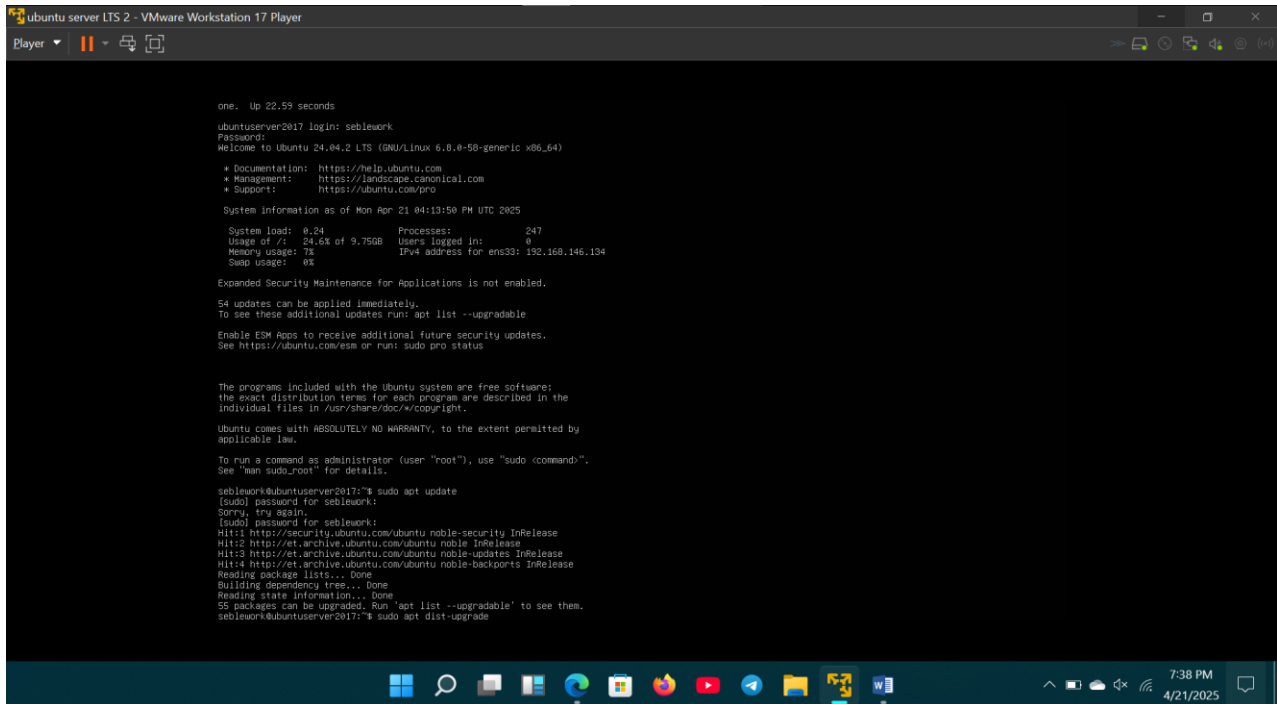
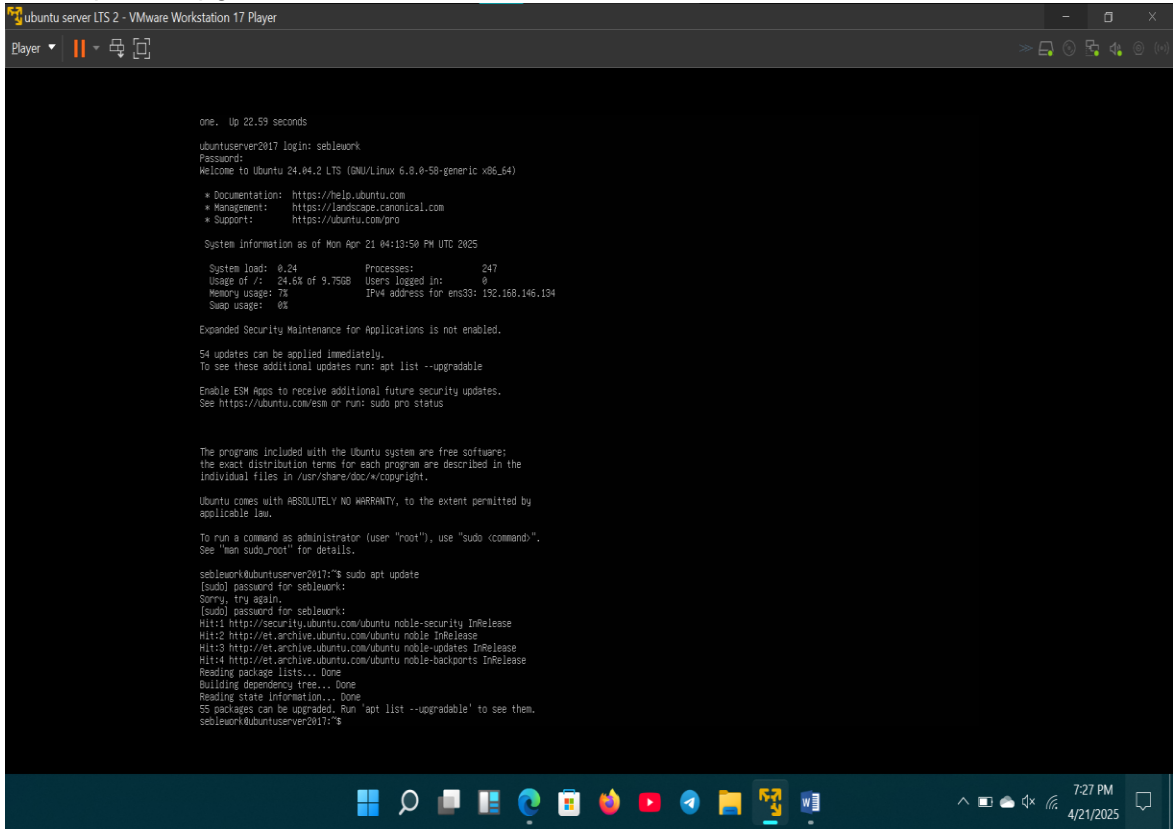


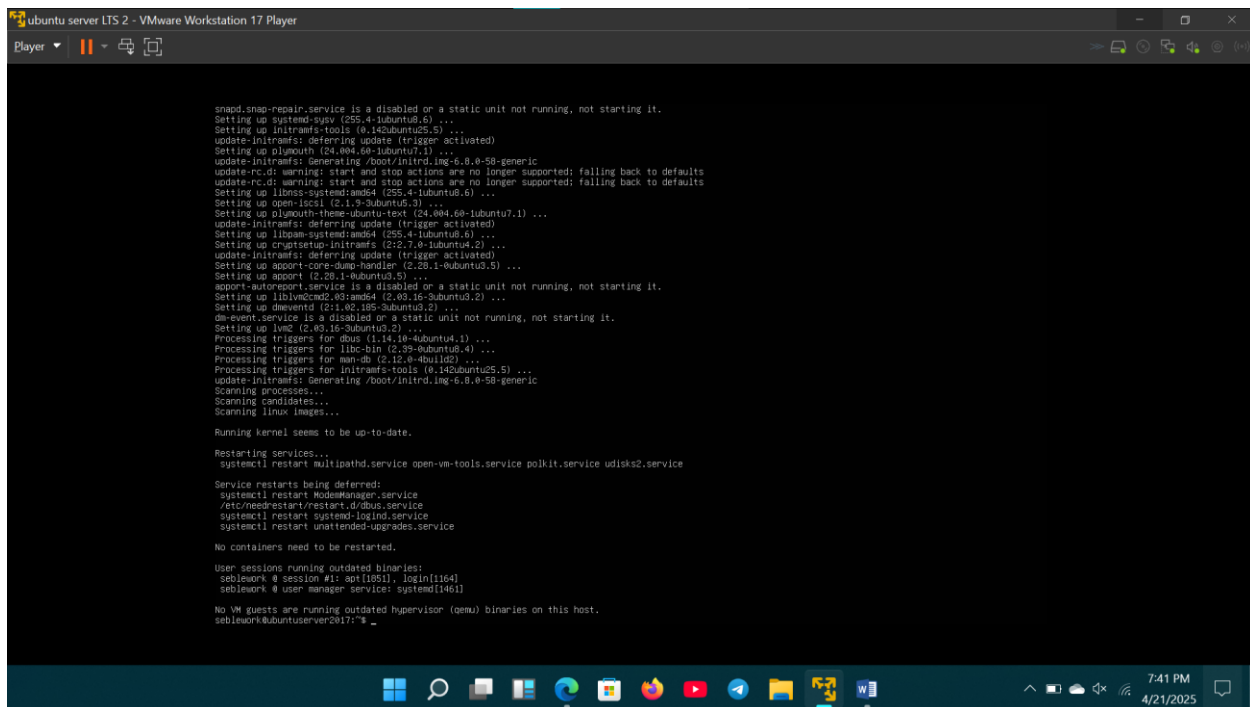
The screenshot shows a terminal window titled "ubuntu server LTS 2 - VMware Workstation 17 Player". The terminal output displays the Ubuntu 24.04.2 LTS login process. It shows the user "seblework" logging in with the password "seblework". The system information section indicates that the system is running on a VM with 24.04.2 LTS (GNU/Linux 6.8.0-58-generic x86_64). It also shows system load, memory usage, and network information. The terminal output includes a warning about Expended Security Maintenance for Applications not being enabled and a message about 54 updates that can be applied immediately. The user is prompted to run "apt list --upgradable" to see these updates. The terminal also displays the Ubuntu logo and the text "Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law." The user is then prompted to run "sudo apt update".

```
ubuntu server LTS 2 - VMware Workstation 17 Player
Player
ubuntu 24.04.2 LTS ubuntu@ubuntu24:~$
ubuntu@ubuntu24:~$ sudo apt update
ubuntu@ubuntu24:~$
```

Step:22-Upgrade Installed Packages: Upgrade your installed packages with

- `sudo apt dist-upgrade`





```
snapsnap-repair.service is a disabled or a static unit not running, not starting it.
Setting up systemd-sysv (255.4-ubuntu0.6) ...
Setting up initramfs-tools (0.142ubuntu25.5) ...
update-initramfs: deferring update (trigger activated)
Setting up plymouth (24.094-6ubuntu7.1) ...
update-initramfs: Generating /boot/initrd.img-6.8.0-58-generic
update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults
update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults
Setting up libnss-systemd:amd64 (255.4-ubuntu0.6) ...
Setting up open-iscsi (2.1.7-3ubuntu0.3) ...
Setting up plymouth-theme-ubuntu-text (24.094-6ubuntu7.1) ...
update-initramfs: deferring update (trigger activated)
Setting up libosm-systemd:amd64 (255.4-ubuntu0.6) ...
Setting up cryptsetup-initramfs (2:2.7.0-ubuntu0.2) ...
update-initramfs: deferring update (trigger activated)
Setting up apport-core-dump-handler (2.20.1-0ubuntu0.5) ...
Setting up apport (2.20.1-0ubuntu0.5) ...
apport-autoreport.service is a disabled or a static unit not running, not starting it.
Setting up liblvm2cmd0:amd64 (2.03.16-3ubuntu0.2) ...
Setting up dmidevd (2:1.02.105-3ubuntu0.2) ...
dmeventd.service is a disabled or a static unit not running, not starting it.
Setting up lvm2 (2.03.16-3ubuntu0.2) ...
Processing triggers for dbus (1.14.10-4ubuntu0.1) ...
Processing triggers for libc-bin (2.39-0ubuntu0.4) ...
Processing triggers for man-db (2.12.0-4ubuntu0.1) ...
Processing triggers for initramfs-tools (0.142ubuntu25.5) ...
update-initramfs: Generating /boot/initrd.img-6.8.0-58-generic
Scanning processes...
Scanning candidates...
Scanning linux images...

Running kernel seems to be up-to-date.

Restarting services...
systemctl restart multipathd.service open-vm-tools.service polkit.service udisks2.service

Service restarts being deferred:
systemctl restart ModemManager.service
/etc/needrestart/needrestart.d/dbus.service
systemctl restart systemd-logind.service
systemctl restart unattended-upgrades.service

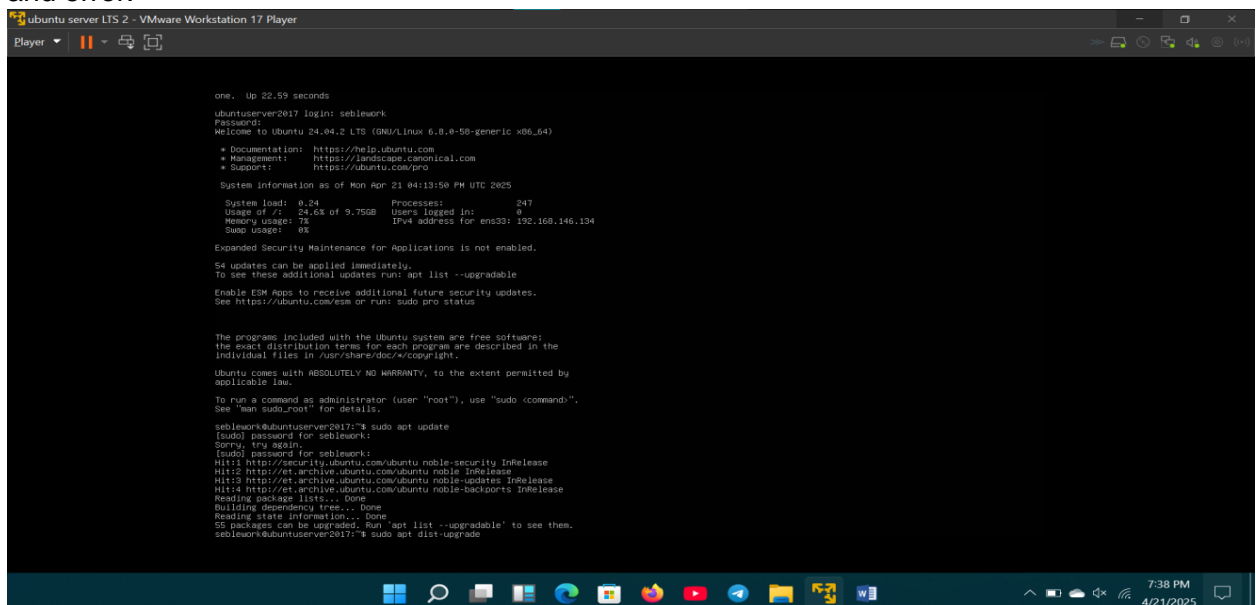
No containers need to be restarted.

User sessions running outdated binaries:
seblework @ session #1: apt[1051], login[1164]
seblework @ user manager service: systemd[1461]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
seblework@ubuntu-server2017:~$ _
```

1.5 Challenges and solutions

- One of the main challenges I faced during the installation process was the unexpected lack of a graphical user interface (GUI), which made it difficult to navigate and manage the server effectively. I solve this issue by practicing commands since it only have CLI.
- Because of its strong security and authorization issue passwords do not displayed this leads to many failers in system authentication, this problem can only be solved by try and error.



```
one. Up 22.59 seconds
ubuntu-server2017 login: seblework
Password:
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.8.0-58-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

System information as of Mon Apr 21 04:13:50 PM UTC 2025

System load: 0.24          Processes: 247
Usage of /: 24.6% of 9.75GB   Users logged in: 0
Memory usage: 7%           IP4 address for ens33: 192.168.146.134
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

54 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software:
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
seblework@ubuntu-server2017:~$ sudo apt update
[sudo] password for seblework:
Sorry, try again.
[sudo] password for seblework:
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:2 http://et.archive.ubuntu.com/ubuntu noble InRelease
Hit:3 http://et.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:4 http://et.archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
55 packages can be upgraded. Run 'apt list --upgradable' to see them.
seblework@ubuntu-server2017:~$ sudo apt dist-upgrade
```

Here when the password is not correctly typed I try it again and again.

1.6 File system support

Ubuntu Server supports a wide range of file systems, offering flexibility, performance, and advanced features tailored for different environments and workloads. The default and most widely used file system on Ubuntu Server is ext4 (Fourth Extended File System) due to its stability, reliability, and performance.

Key File Systems Supported:

ext4 (default)

- Journaling file system
 - Supports large volumes and file sizes
 - Fast and reliable, ideal for most use cases
- My operating system uses the default one i.e. ext4

Btrfs (B-tree File System)

- Advanced features like snapshots, compression, and pooling
- Suitable for advanced storage configurations and data integrity
- Still considered experimental in some production cases

XFS

- High-performance journaling file system
- Optimized for scalability, especially with large files
- Preferred in enterprise environments

ZFS (requires manual installation)

- Advanced file system with built-in volume management
- Supports data integrity, snapshots, compression, and deduplication
- Often used in storage-heavy and cloud deployments

FAT32/exFAT/NTFS

- Used primarily for compatibility with Windows systems or external drives
- Not ideal for Linux system partitions but supported via additional packages

NFS and CIFS/SMB

- Network file systems for sharing files across systems
- Common in enterprise and hybrid environments
- Ubuntu Server's support for diverse file systems makes it adaptable to a variety of workloads, from basic web hosting to complex cloud infrastructure.

1.7 Advantage and disadvantages of Ubuntu server

Advantages of Ubuntu Server

- Open Source and Free

Ubuntu Server is completely free to download, use, and distribute.

You get full access to the source code, allowing customization and transparency.

- Long-Term Support (LTS)

LTS versions come with 5 years of security and maintenance updates.

Ideal for production environments where stability is critical.

- Strong Community and Documentation

Massive global community means it's easy to find help, tutorials, and troubleshooting guides.

Rich official documentation and forums are available for support.

- Security and Regular Updates

Built-in firewall (UFW), AppArmor security framework, and encrypted file system options.

Frequent security patches keep systems protected.

- Cloud- and Container-Friendly

Works seamlessly with AWS, Azure, Google Cloud, and OpenStack.

Supports Docker, Kubernetes, LXD, and cloud-init for automation and containerization.

- Lightweight and Efficient

No GUI by default—uses fewer system resources, making it perfect for headless server environments.

Suitable for both small and large-scale deployments.

- Easy Package Management

Uses apt for simple installation and updates of software packages.

Huge library of packages in Ubuntu repositories.

- Customizable

You can install only what you need—no unnecessary bloat.

Easily tailored for web servers, database servers, file servers, etc.

Disadvantages of Ubuntu Server

- No Graphical User Interface (GUI) by Default

May be challenging for beginners who are not comfortable with the command line.

GUI can be installed, but it consumes extra resources.

- Steeper Learning Curve

Users coming from Windows environments may find the Linux terminal and file system structure unfamiliar at first.

- Compatibility Issues with Certain Proprietary Software

Some commercial or enterprise applications are not available or fully supported on Ubuntu Server.

You may need to find open-source alternatives or workarounds.

- Limited Vendor Support

While Canonical offers paid support, out-of-the-box vendor support from companies like Oracle or SAP may be limited compared to RHEL or Windows Server.

- Hardware Driver Issues

On rare occasions, newer or very specific hardware may require manual installation of drivers or tweaking.

- Requires Regular Maintenance

System admins must stay on top of security patches and package updates to keep systems secure and stable.

1.8 Conclusion

Ubuntu Server provides a robust, secure, and scalable platform that caters to a wide range of use cases, from small business services to large-scale cloud infrastructures. Its compatibility with multiple hardware architectures and major cloud platforms like AWS, Azure, and Google Cloud makes it highly versatile. The Long-Term Support (LTS) versions ensure stability, with up to five years of security updates, making it ideal for production environments where uptime and reliability are critical.

One of Ubuntu Server's greatest strengths lies in its lightweight and modular architecture. With no GUI by default, it minimizes system resource consumption, allowing for efficient performance even on low-spec machines. The powerful apt package manager and extensive repository of software packages streamline the deployment and maintenance of server roles, whether it be a web server (Apache, NGINX), database server (MySQL, PostgreSQL), or container host (Docker, Kubernetes).

Security is also a key focus of Ubuntu Server, with built-in tools such as UFW (Uncomplicated Firewall), AppArmor for access control, and regular upstream security patches. The OS is also automation-ready, supporting modern DevOps practices through cloud-init, Ansible, and kintegration with CI/CD pipelines. These features enable rapid provisioning and configuration management, crucial for dynamic and scalable infrastructure deployments.

Despite its advantages, Ubuntu Server can present challenges to less experienced users due to its command-line-focused interface and the need for manual configuration in some cases. Additionally, while it is compatible with a wide range of software, some enterprise-level proprietary applications may require extra steps or alternatives. Nevertheless, for system

administrators and developers familiar with Linux environments, Ubuntu Server remains a powerful and flexible OS that continues to evolve with the demands of modern IT ecosystems.

1.9 Recommendations

Future Outlook and Recommendations for Ubuntu Server

As we look towards the future, Ubuntu Server is well-positioned to remain a dominant force in the server and cloud computing spaces. With the continuous rise of cloud-native applications, DevOps practices, and containerization, Ubuntu's integration with technologies like Docker, Kubernetes, and LXD positions it as a leading choice for developers and enterprises building scalable, efficient, and automated environments. The ongoing support for cloud providers such as AWS, Azure, and Google Cloud further solidifies Ubuntu Server's relevance as a key player in the cloud market.

In terms of evolution, Ubuntu is expected to further strengthen its support for edge computing, IoT devices, and AI/ML workloads. With an increasing number of distributed systems and edge devices requiring efficient server environments, Ubuntu's lightweight architecture and strong networking tools make it an ideal candidate for these emerging technologies. Moreover, Ubuntu's alignment with containerization and micro services aligns it perfectly with the needs of modern software architecture, especially in container orchestration and multi-cloud setups.

Recommendations:

Adopt Ubuntu Server for Cloud and Containerized Environments

Organizations should consider adopting Ubuntu Server for their cloud-based applications and containerized workloads due to its strong integration with tools like Docker, Kubernetes, and OpenStack. Ubuntu's native compatibility with major cloud platforms makes it a seamless choice for hybrid and multi-cloud deployments.

Embrace Automation Tools

System administrators and developers should leverage Ubuntu Server's support for automation tools such as cloud-init, Ansible, and Terraform to improve the speed, consistency, and scalability of deployments. Automating server provisioning and configuration will enhance operational efficiency and reduce human errors in production environments.

Maintain Awareness of Security Best Practices

Given Ubuntu's commitment to security, it's essential for organizations to stay proactive about patch management and utilize the security tools provided by Ubuntu, such as AppArmor, UFW, and Auditd. Staying updated with the latest LTS releases and security patches is crucial for maintaining a secure and compliant infrastructure.

Plan for Long-Term Support (LTS) Versions

For organizations looking to deploy critical services, utilizing the LTS versions of Ubuntu Server is recommended due to their extended support period. Planning deployments around these stable releases ensures minimal disruption and provides a reliable foundation for mission-critical applications.

In summary, Ubuntu Server is expected to continue thriving in the server and cloud spaces due to its openness, flexibility, and robust ecosystem. Organizations looking to future-proof their infrastructure should embrace Ubuntu's strengths, particularly in the areas of containerization, automation, and cloud-native applications, while ensuring they maintain best practices in security and updates.