Bahir Dar university
Institute of computing
Software Engineering

Operating System and System Programming

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1.1 Introduction of Fedora-server-41

Fedora Server 41 :-is part of the Fedora Project, which is known for its cutting-edge features and community development.Fedora also referred to as a “bleeding edge” operating system.

1.1.1 Historical development of Fedora server 41

Fedora server 41 was established in october 2003 as a continuation of the Red Hat Linux project.It was created to support open-source software development and serve as a community-driven platform for innovation and collaboration.After Red Hat Linux transitioned to Red Hat Enterprise Linux (RHEL) in 2004 for commercial use, Fedora became the experimental and community-supported counterpart. It acts as a testing ground for cutting-edge technologies before they enter RHEL.

1.1.2 Motivation

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Fedora Server 41 was developed to continue the open-source and community-driven legacy of Red Hat Linux.It aims to provide a platform for testing and refining cutting-edge technologies.The OS supports modern needs like containerization, cloud computing, and development tools.It ensures rapid adoption of the latest features and updates for broader usability.

1.1.3 Objective development of the operating system

* For enhance Performance:-Enhance speed and efficiency
* For issue of Security:- Implement robust security
* To increase usability:-Provide a seamless and intuitive user experience.
* Scalability,Community Engagement, Support for Modern Technologies, Compatibility and Interoperability.

1.2 Requirement to install operating system

1 .2.1 Hardware requirement

- Processor(CPU):- at least 1 GHz ans support 64 architecture.
- Memory(RAM):- as minimum 2GB and 4GB is the best.
- Storage:-as minimum 10GB and 20GB is the best.
- Network Interface:-(NIC) is required.
- UEFI or BIOS Support and Internet access are required.

1.2.2 Software requirement

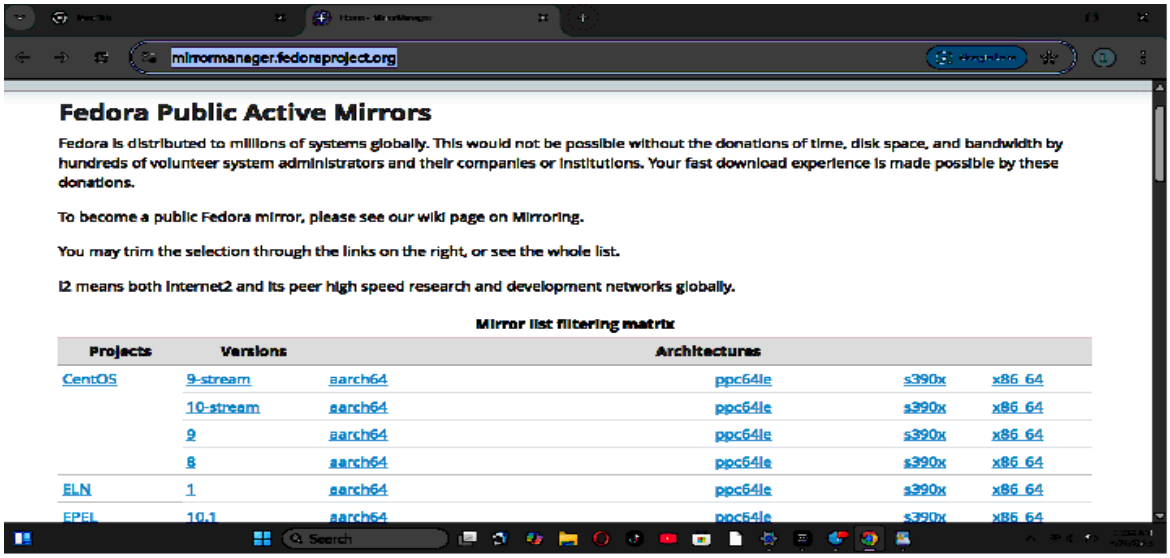
- Network:- Wired Ethernet and Wi-Fi supported.
- File Systems:- Supports Ext4, XFS, and Btrfs.

- Partitioning:- Uses Anaconda for disk setup.
- Packages:- Includes NSM and optional server tools.
- Security & Updates:- Uses DNF, Firewall, and SELinux

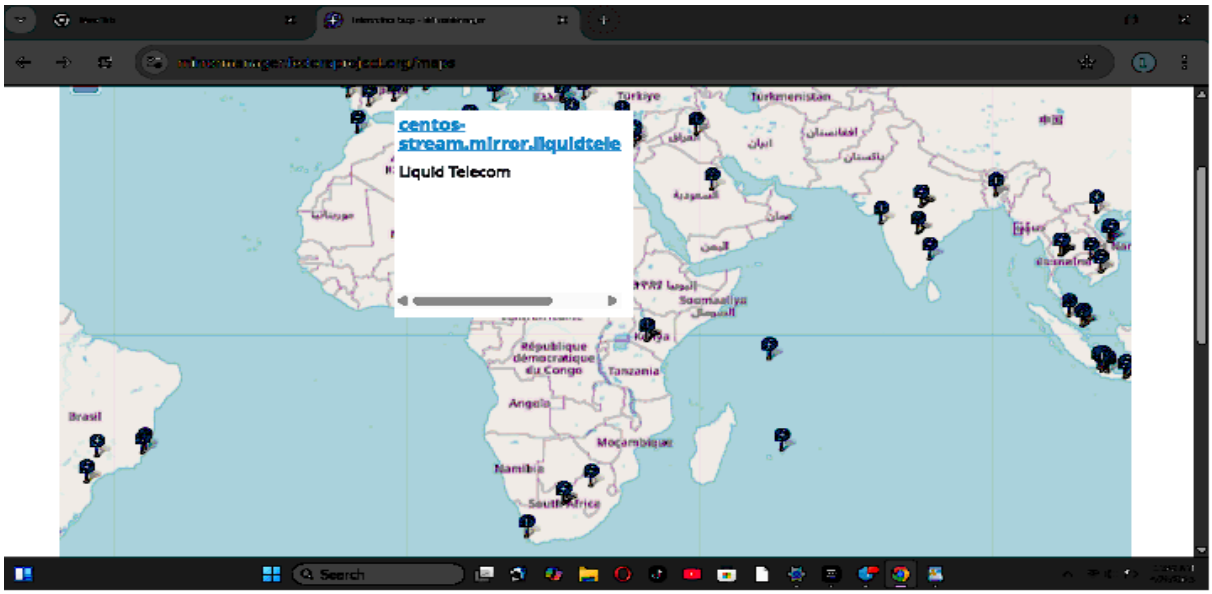
In addition as say in the Hard ware requirement
Backup Solutions AND Documentation.

1.3 Installation step

Detall installation process until say successfully install
Step-1:- The server at fedora-server41.project.org isn't found due to the release of version 42; use the Fedora Mirrors page for installation.when click this link get

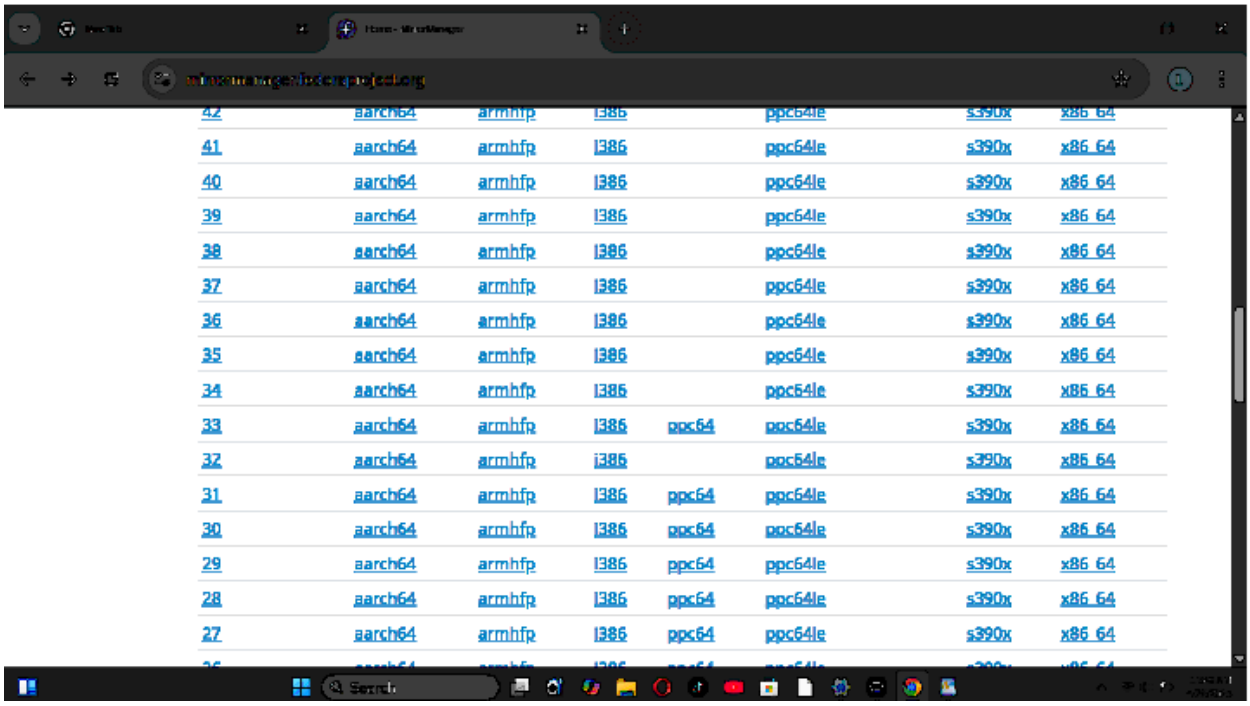


inside head section get map this mean this mirror get or download document of os by geographical location then click the map section get the nearest mirror then get



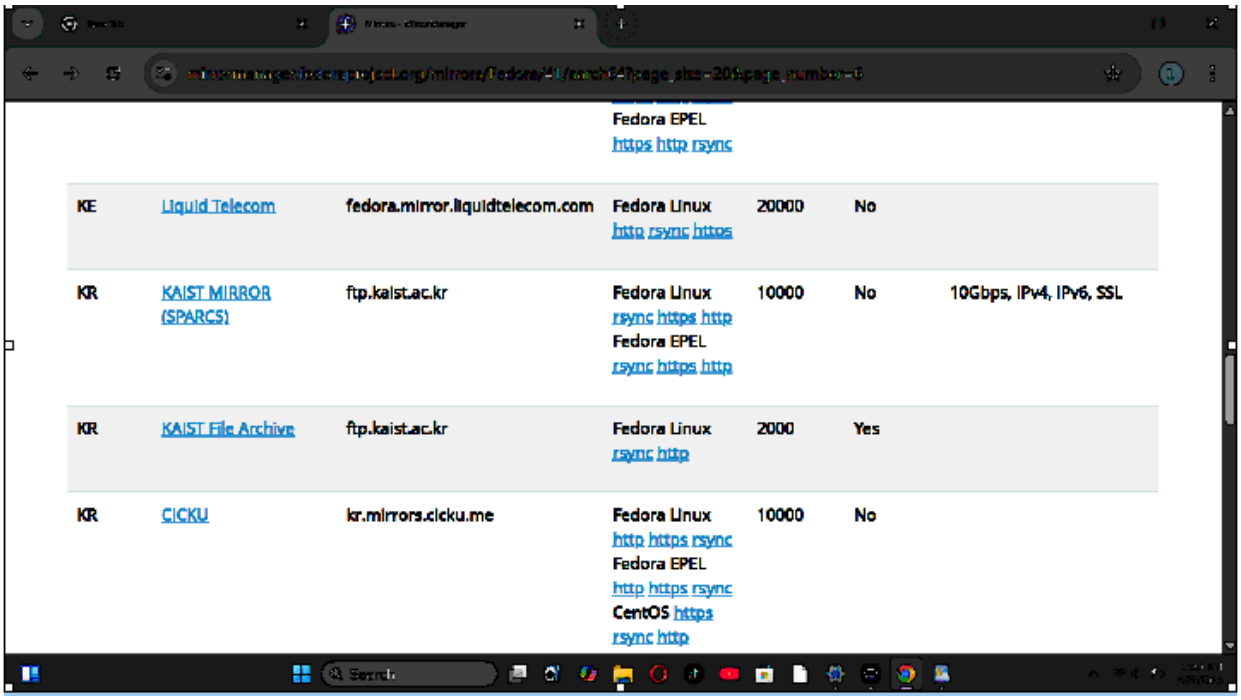
using this name choose the mirror inside the mirror tag in the head section so get country name so

i get country name KE then inside main section get version list like this



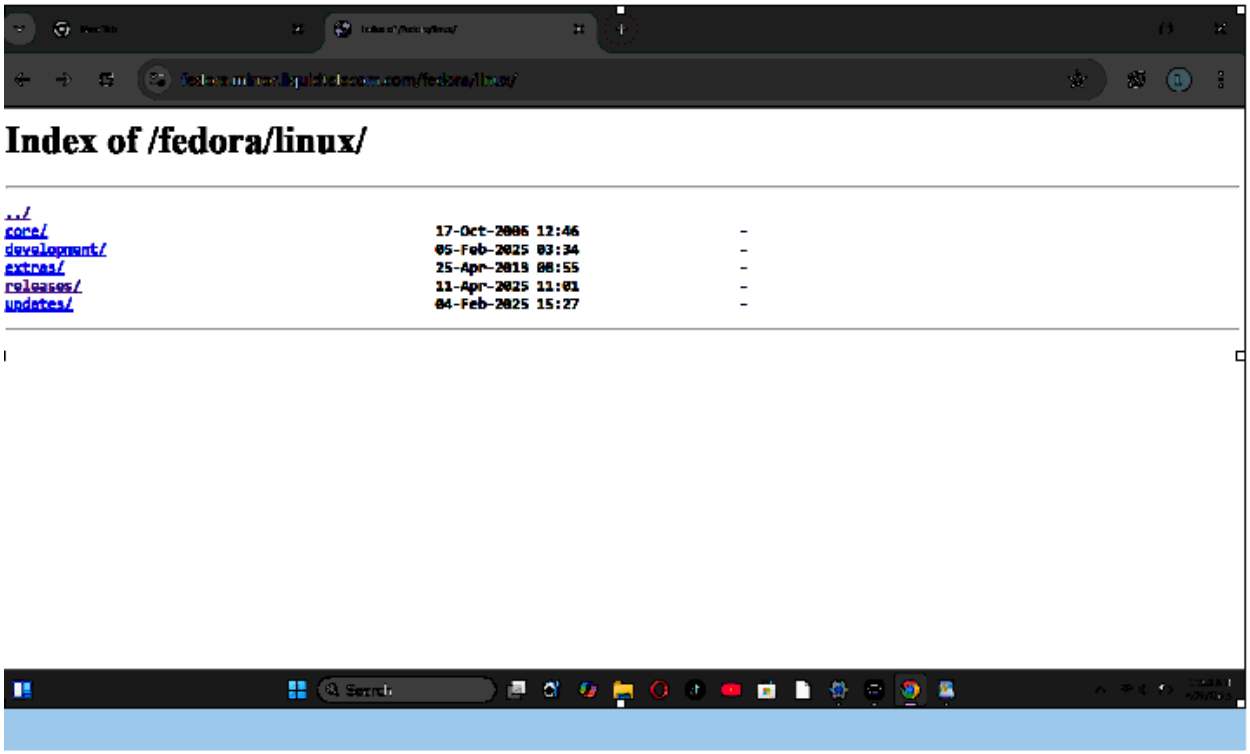
41	aarch64	armhfp	i386		ppc64le	s390x	x86_64
40	aarch64	armhfp	i386		ppc64le	s390x	x86_64
39	aarch64	armhfp	i386		ppc64le	s390x	x86_64
38	aarch64	armhfp	i386		ppc64le	s390x	x86_64
37	aarch64	armhfp	i386		ppc64le	s390x	x86_64
36	aarch64	armhfp	i386		ppc64le	s390x	x86_64
35	aarch64	armhfp	i386		ppc64le	s390x	x86_64
34	aarch64	armhfp	i386		ppc64le	s390x	x86_64
33	aarch64	armhfp	i386	ppc64	ppc64le	s390x	x86_64
32	aarch64	armhfp	i386		ppc64le	s390x	x86_64
31	aarch64	armhfp	i386	ppc64	ppc64le	s390x	x86_64
30	aarch64	armhfp	i386	ppc64	ppc64le	s390x	x86_64
29	aarch64	armhfp	i386	ppc64	ppc64le	s390x	x86_64
28	aarch64	armhfp	i386	ppc64	ppc64le	s390x	x86_64
27	aarch64	armhfp	i386	ppc64	ppc64le	s390x	x86_64

then select 41 aarch64 then get the option of os then by using country name select the os document category then get

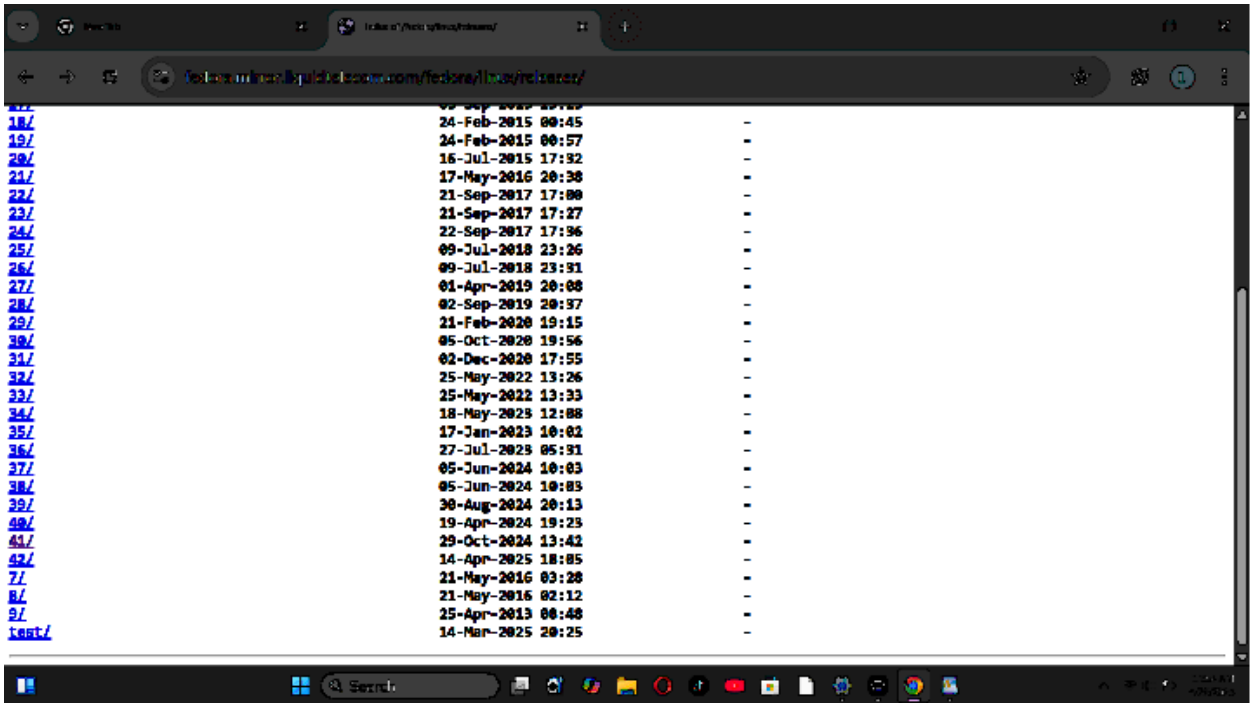


			Fedora EPEL https http rsync			
KE	Liquid Telecom	fedora.mirror.liquidtelecom.com	Fedora Linux http rsync https	20000	No	
KR	KAIST MIRROR (SPARCS)	ftp.kaist.ac.kr	Fedora Linux rsync https http Fedora EPEL rsync https http	10000	No	10Gbps, IPv4, IPv6, SSL
KR	KAIST File Archive	ftp.kaist.ac.kr	Fedora Linux rsync http	2000	Yes	
KR	CICKU	kr.mirrors.cicku.me	Fedora Linux http https rsync Fedora EPEL http https rsync CentOS https rsync http	10000	No	

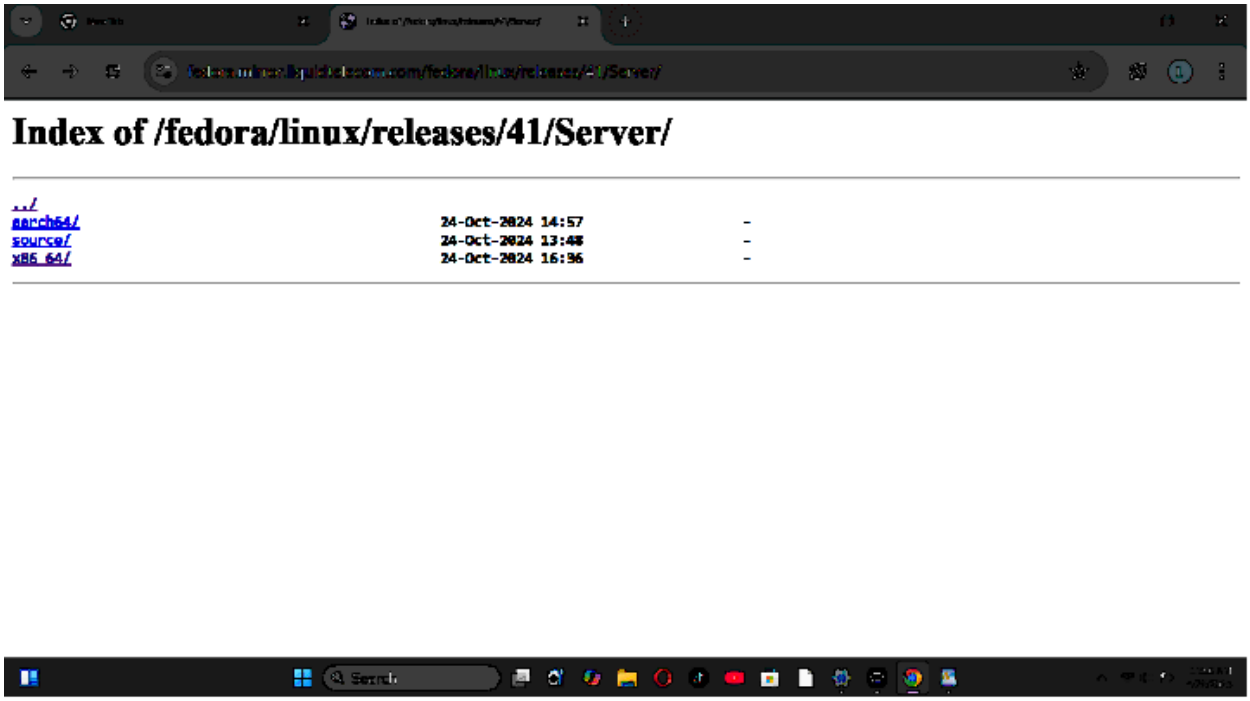
then click the link then



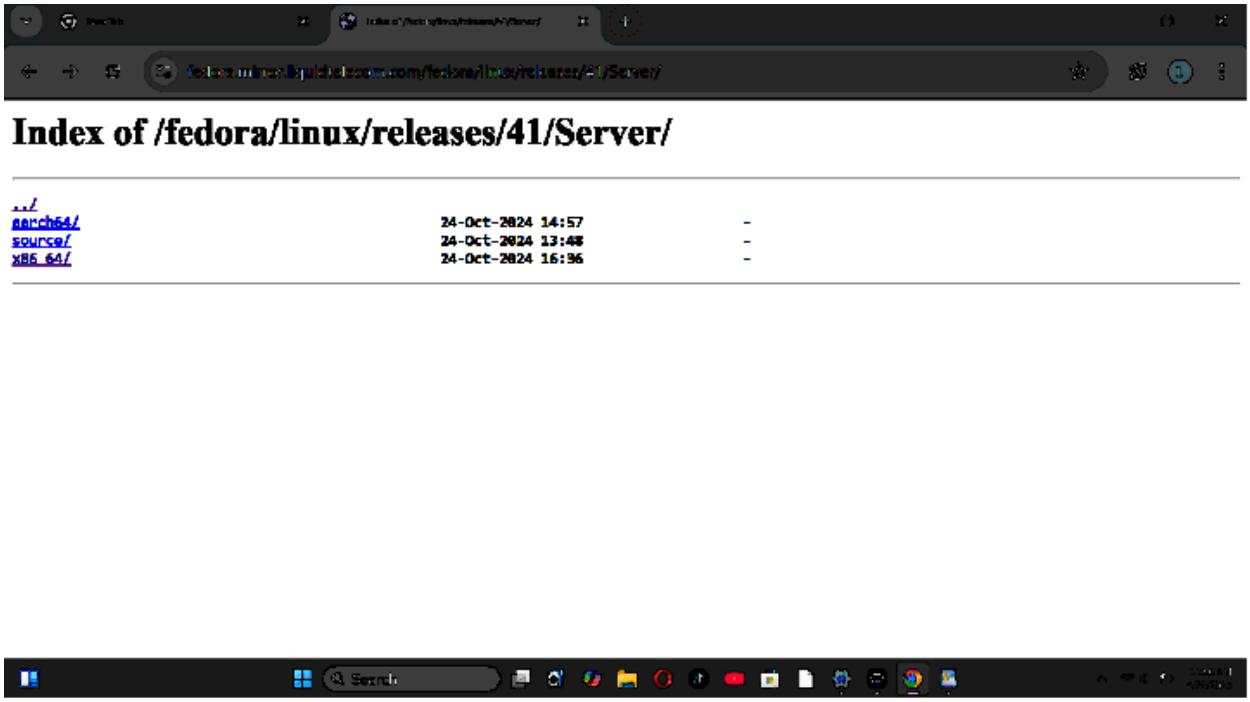
click release folder then get



select 41 then
click server folder get



then select x85_64/ folder then



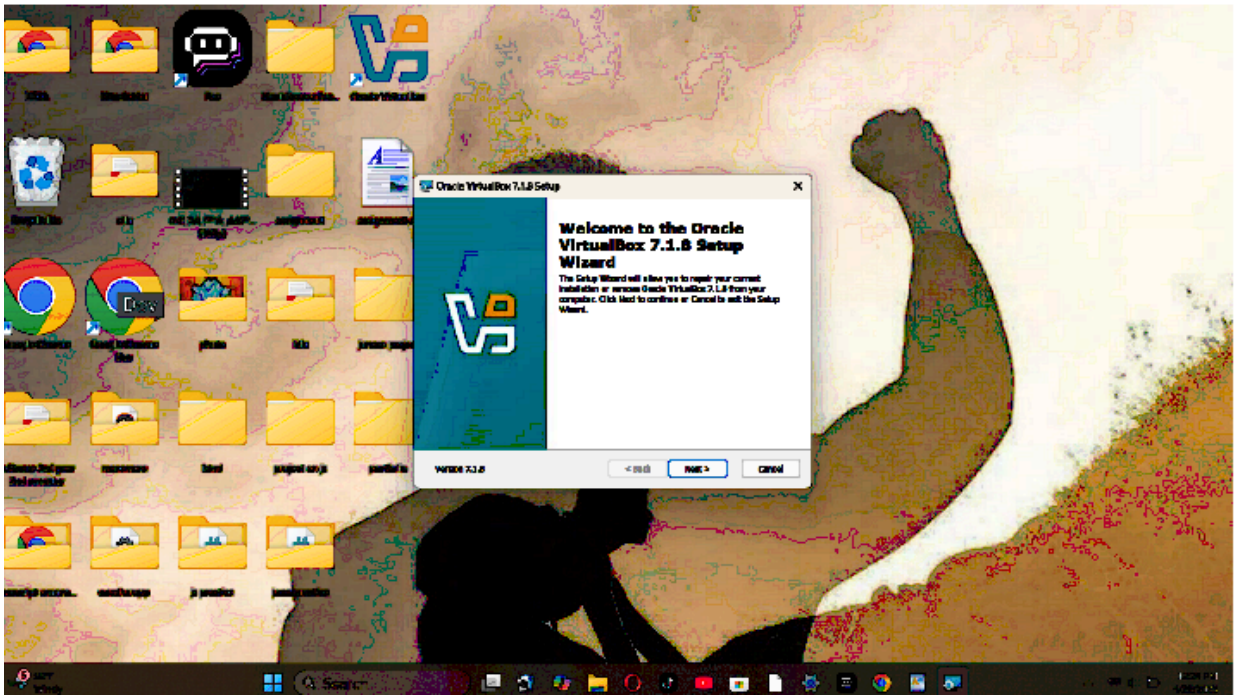
then click ios/ folder then

Index of /fedora/linux/releases/41/Server/x86_64/iso/

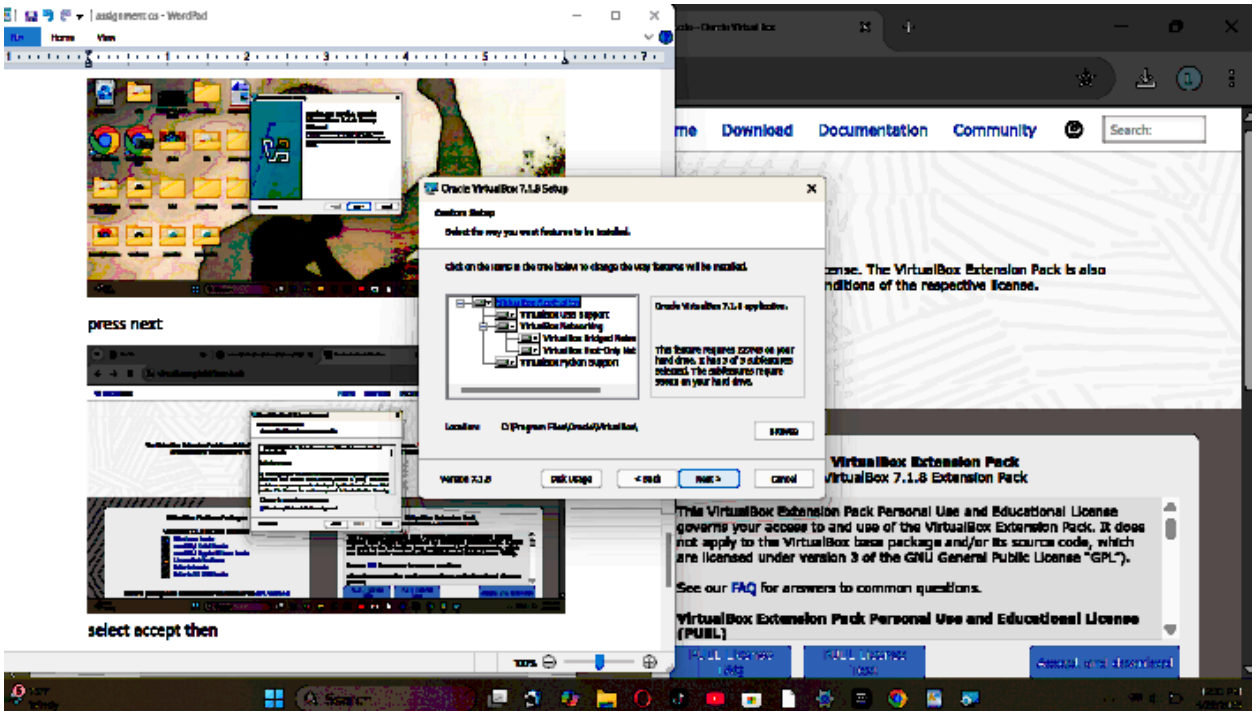
../		
Fedora-Server-41-1.4-x86_64-CHECKSUM	29-Oct-2024 15:25	1225
Fedora-Server-dvd-x86_64-41-1.4.iso	24-Oct-2024 14:48	2818572288
Fedora-Server-dvd-x86_64-41-1.4.iso.manifest	24-Oct-2024 14:47	125943
Fedora-Server-netinst-x86_64-41-1.4.iso	24-Oct-2024 13:36	954900480
Fedora-Server-netinst-x86_64-41-1.4.iso.manifest	24-Oct-2024 13:47	10299

select Fedora-server-dvd-x86-64-41-1.4.ios then start download document then after few minute get downloaded document
then after that
Step-3:- **Download oracle virtualbox**
go to the official website VirtualBox Downloads. click then get

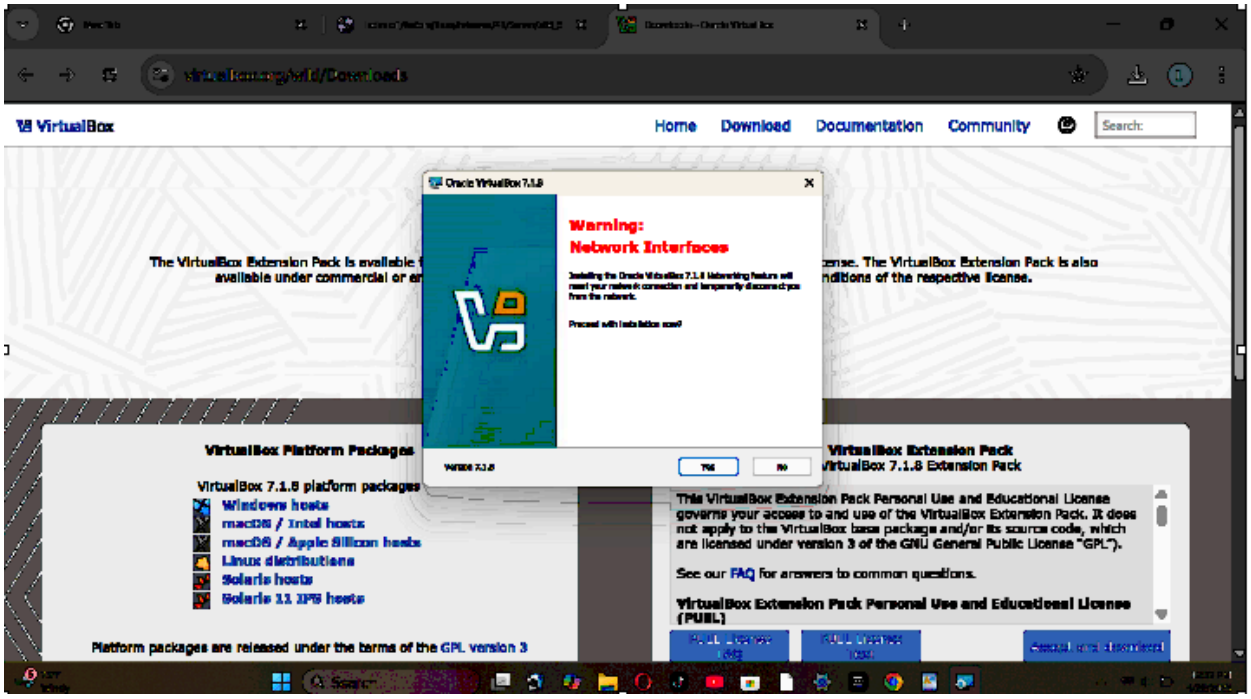
Click the download link in the head section, select Windows shots, and double-click the downloaded file to start the installation .



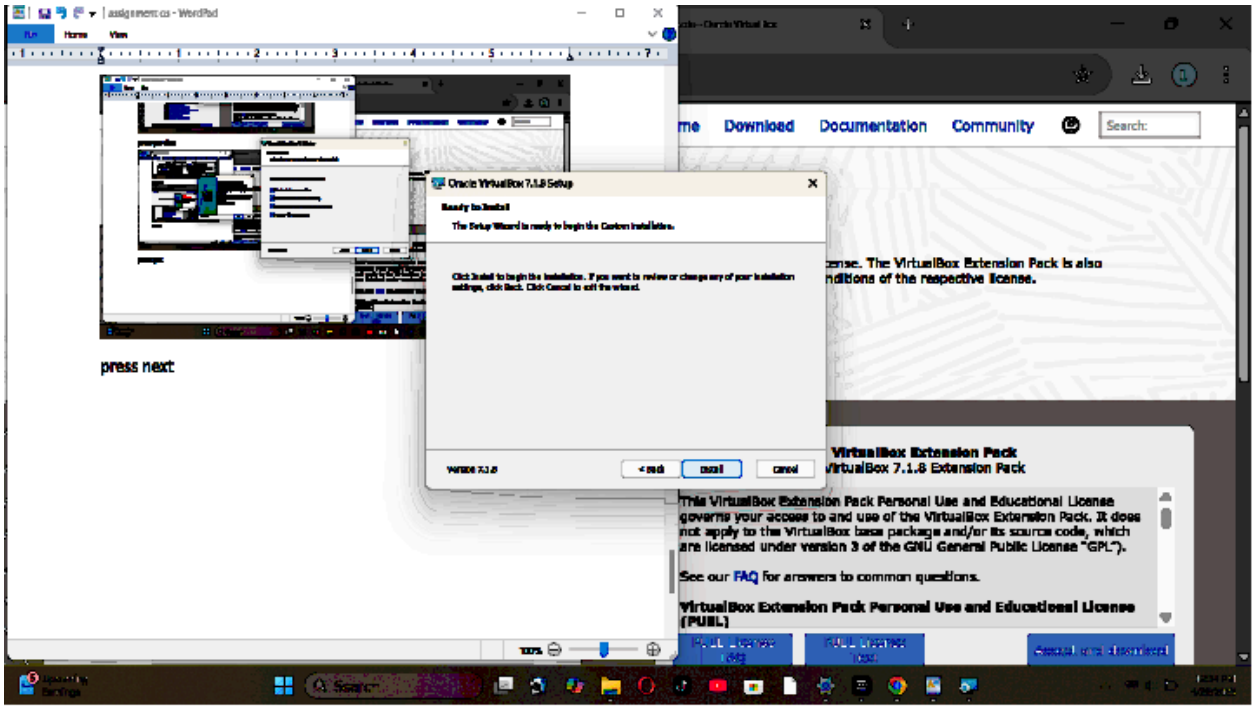
press next and select accept then



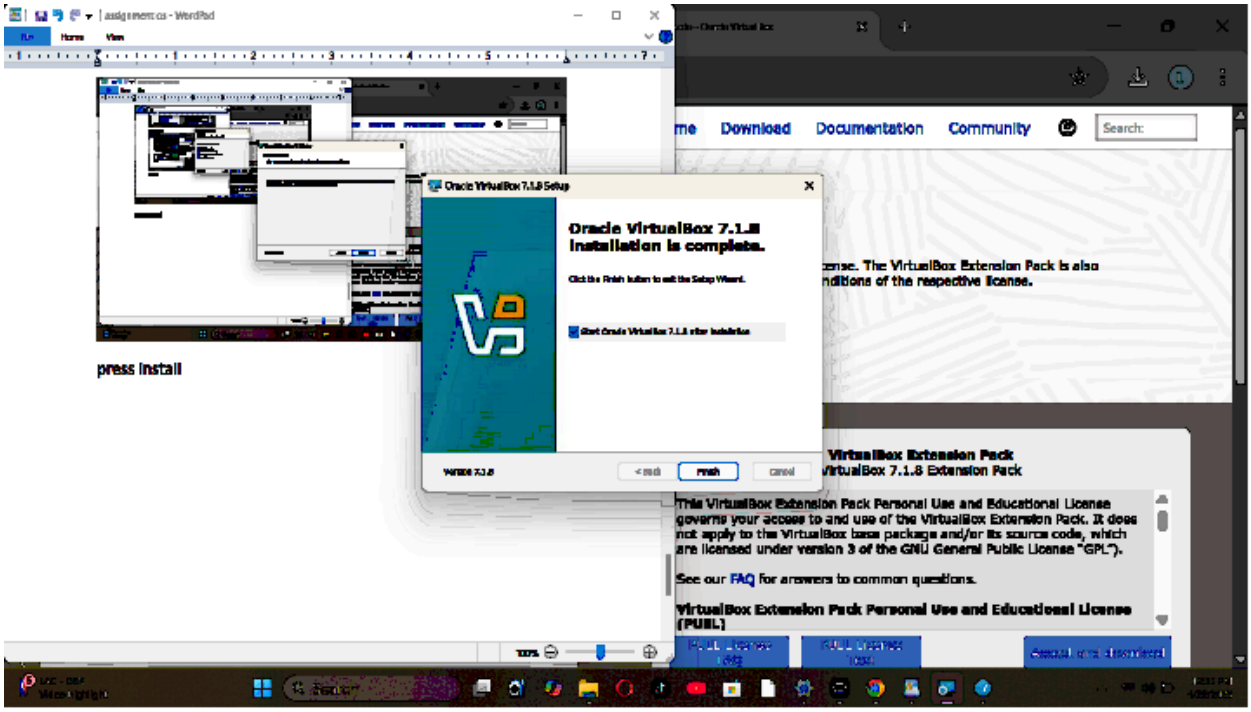
press next



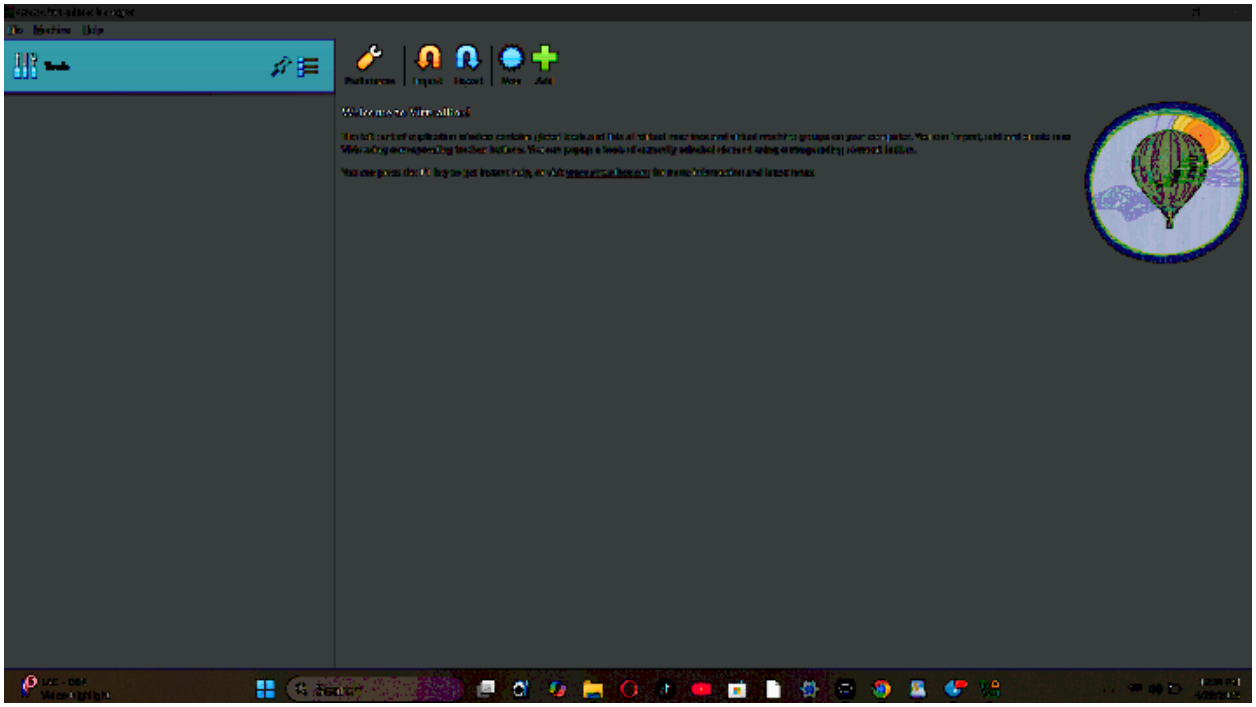
press yes then ans also press yes after press next



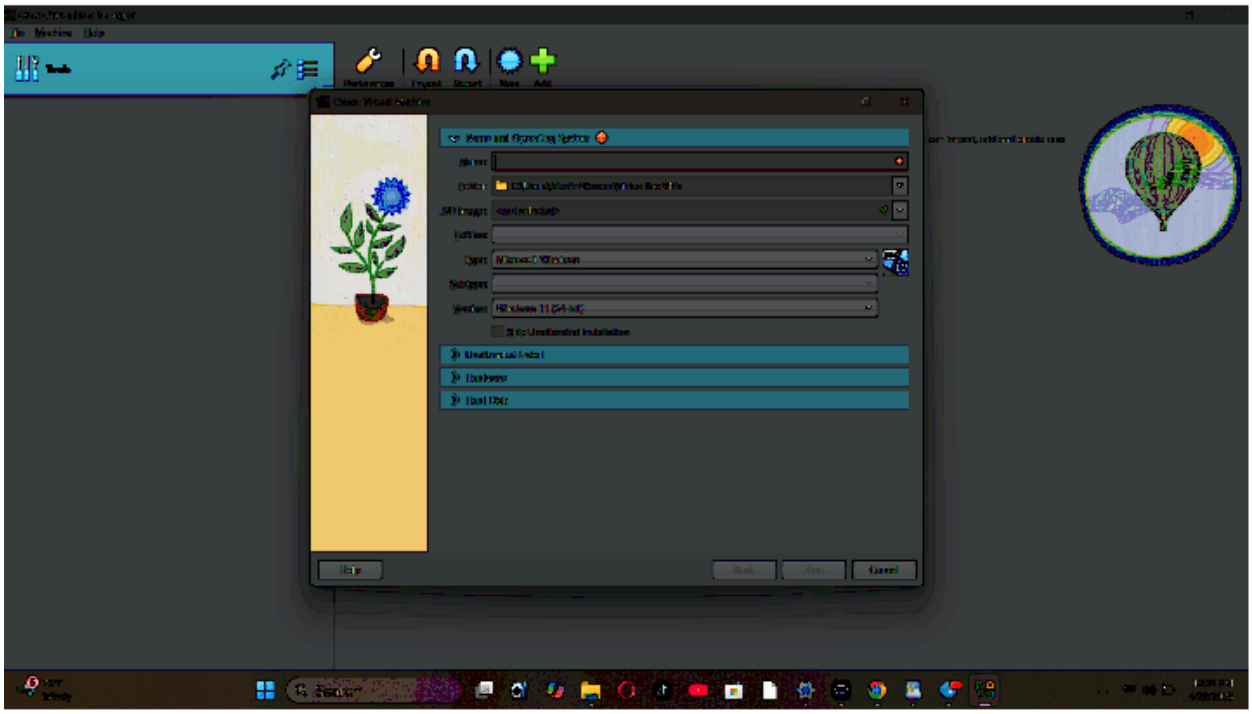
press install



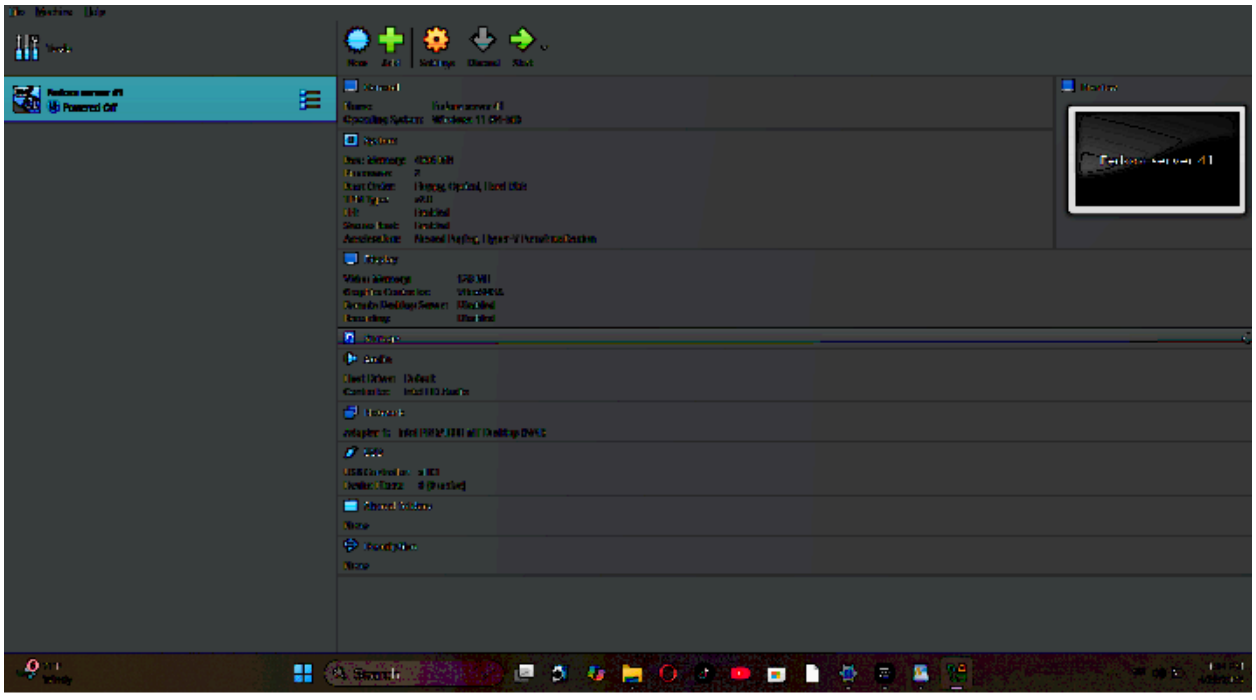
press finish then get this workstation



click new inside head section then get



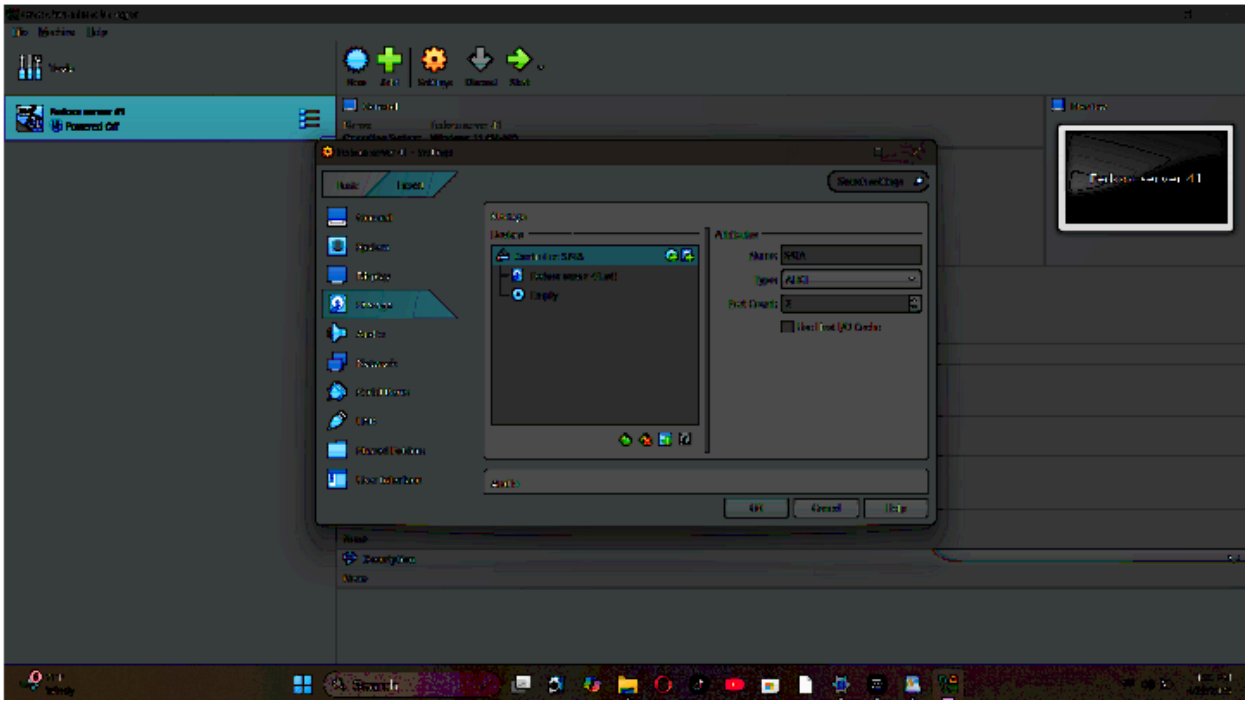
Specify "Fedora Server 41" as the name, select "Windows" as the type, click finish, and adjust settings as needed.



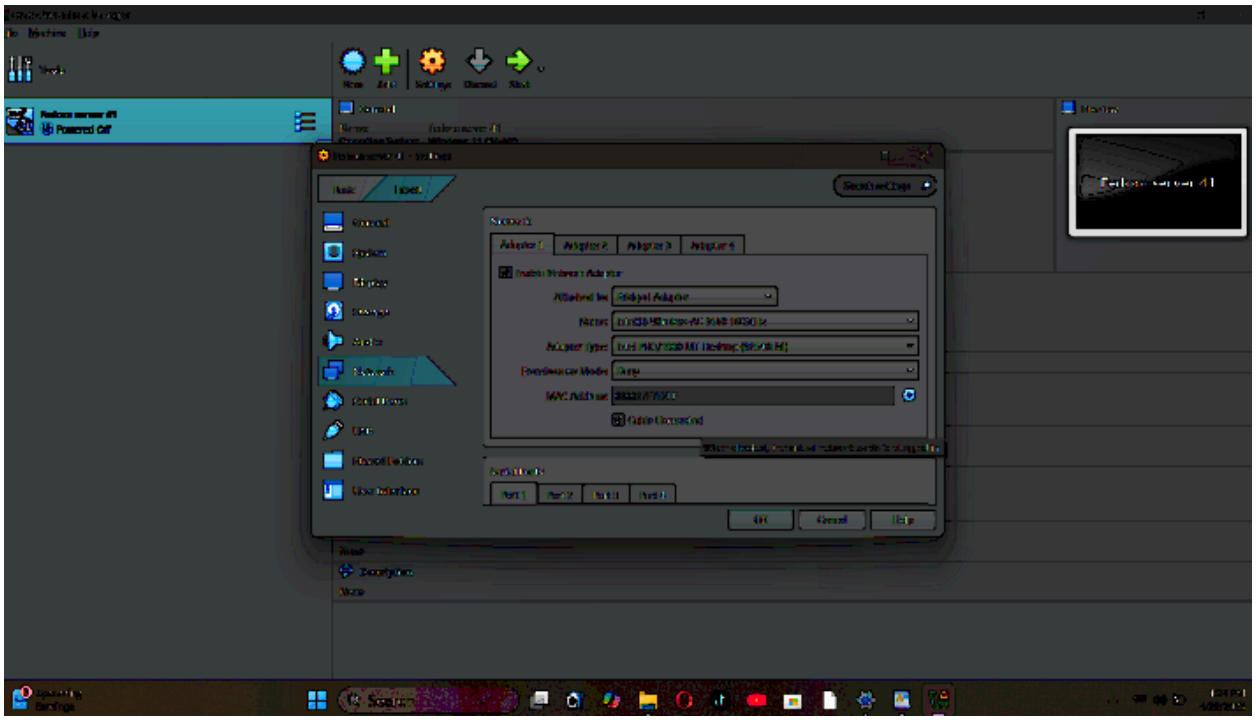
Steps to Rearrange VM Settings

Open Oracle VirtualBox, select your Fedora Server VM, and click the gear icon to access System Settings.

Click on the System tab.

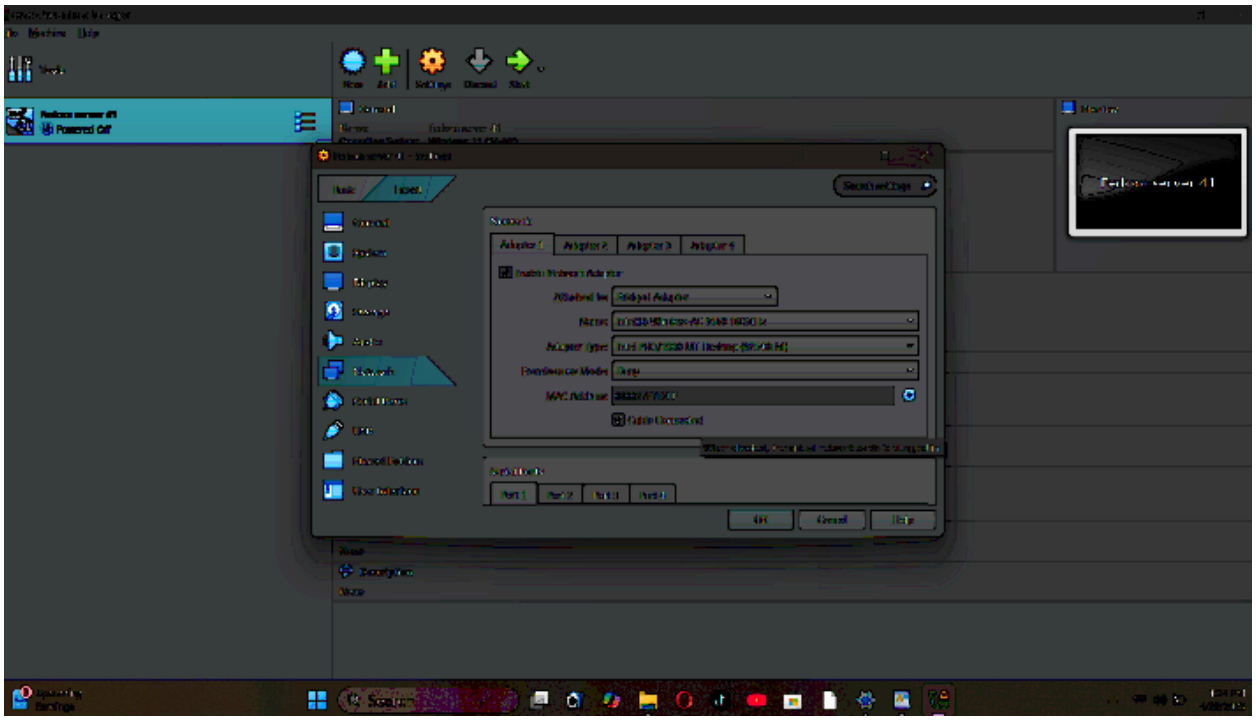


Under the Motherboard tab, ensure that Optical is at the top of the Boot Order list. If it's not, select it and use the arrows to move it to the top.
Check Storage Settings:



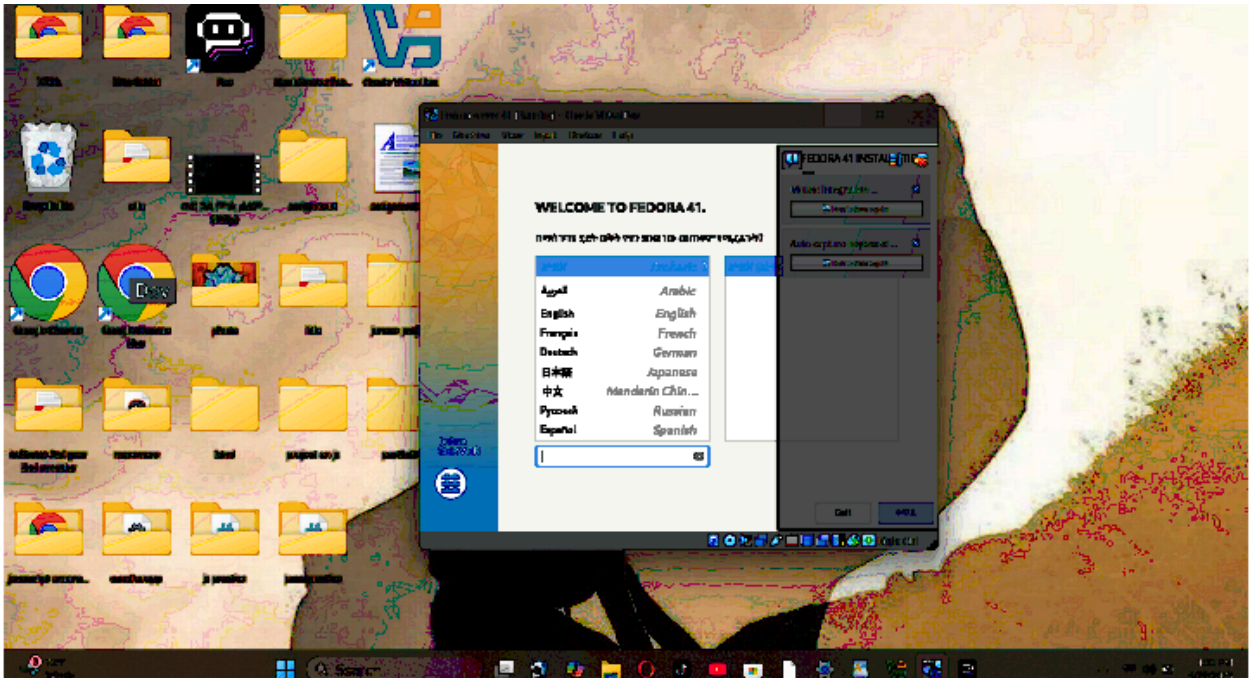
In the Storage section, ensure the ISO file is attached by clicking on the empty disk, then the disk icon to choose the Fedora Server ISO file. andpress ok

Network Settings:
Go to the Network tab and ensure Adapter 1 is enabled. imay select NAT or Bridged Adapter based on preference. so i select nat then

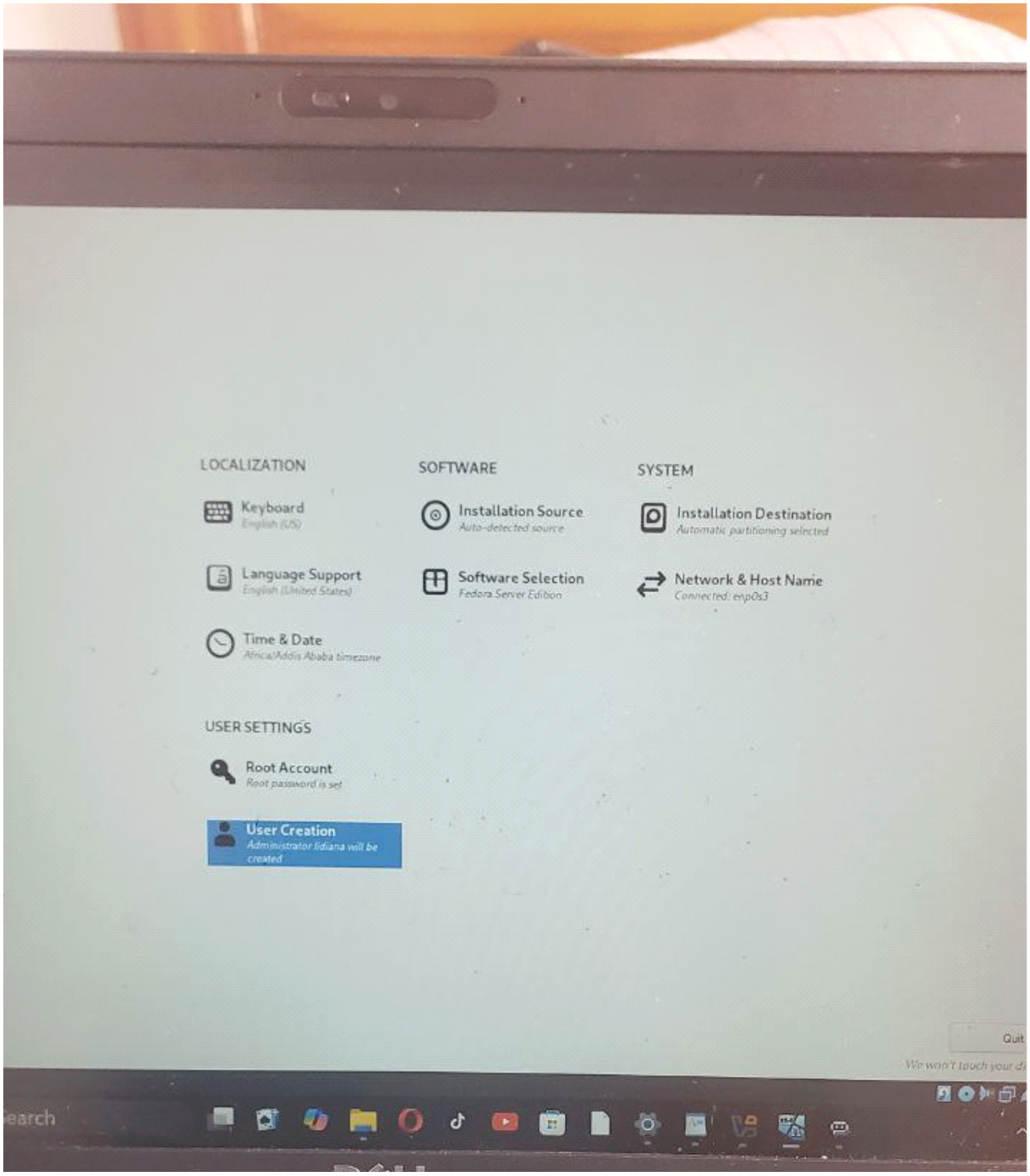


press ok

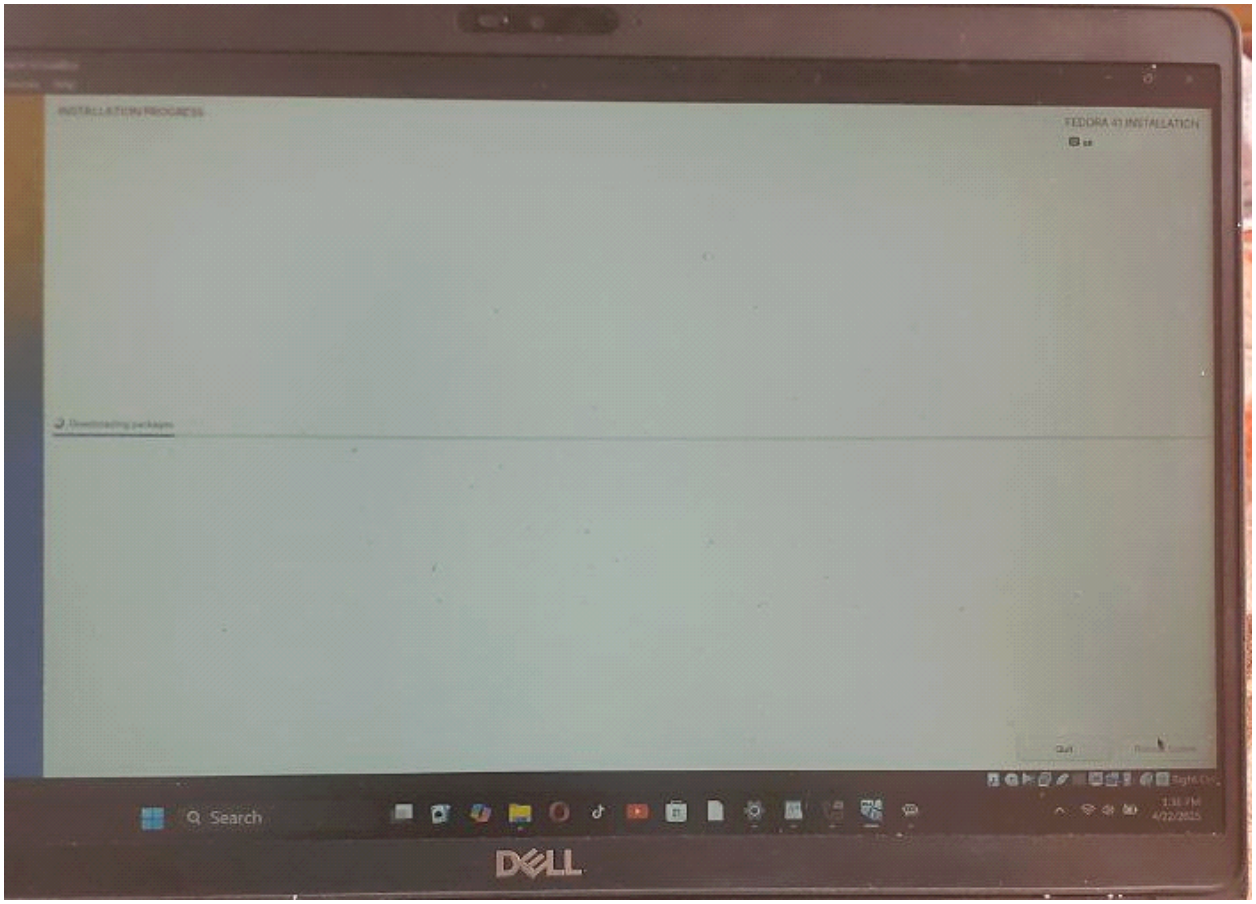
Start the VM:
Once all settings are configured, click OK to save changes, then select the VM and click Start then
then start installation process and get



then select the went language and press continue then get installation summery the



then adjust this software and system setting and click done next user setting select user account and insert password and done next click user creation then click that get
name:- enter full name.
username:- enter my user name.
password:- insert password.
configure:- insert the above password.



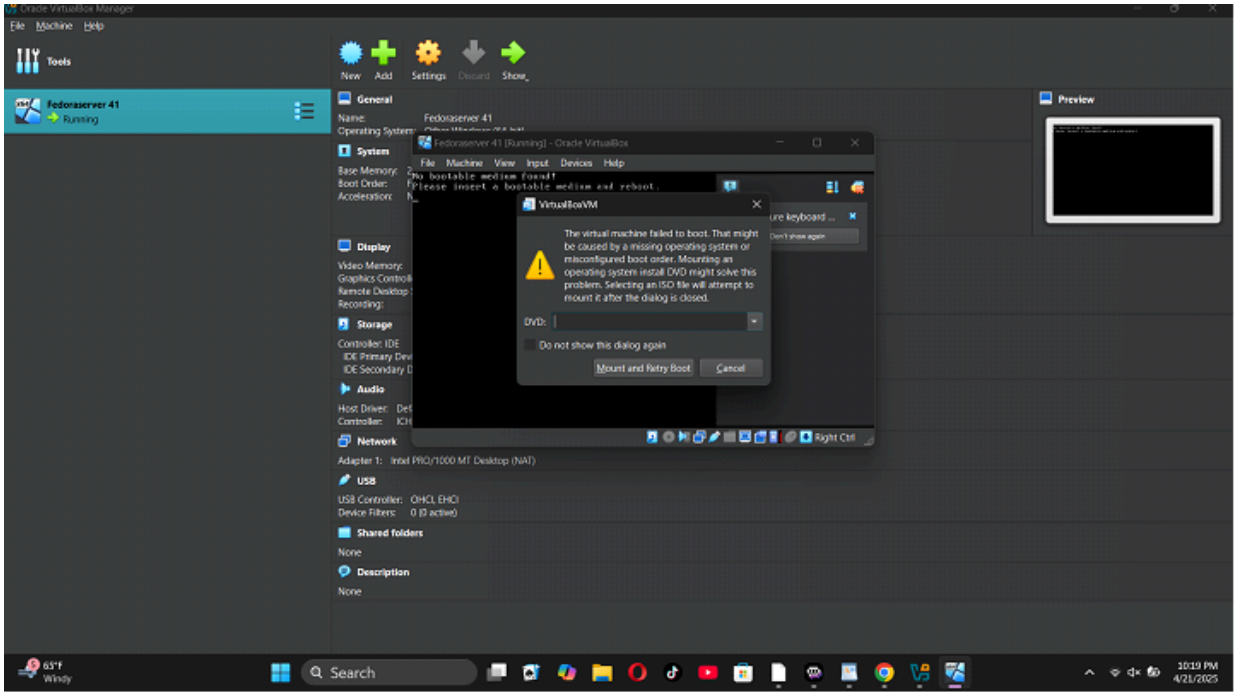
after that start installation process then at the end
then after this click robust system then get terminal and log in then log in by insert user name and password above specify then get after this to implement system call .

1.4 The problem and Solution during installation

1, Problem:-Os document unavailability on Official Website. Solution: -I use alternative website i.e Fedora Mirrors page.

2 Problem:- VMware Workstation Pro Download Failure. Solution:-Switched to Oracle VirtualBox as an Alternative.

3 Problem:-



Solution:-ISO Boot Configuration Fix in VirtualBox

4 Problem : Reboot Failure After Installation

Solution : Manual Reboot and VM ReconfigurationProblem-6

1. 5 File systems support

File system type for Fedora Server installed is XFS .

XFS:- is a high-performance 64-bit journaling file system developed by Silicon Graphics, Inc.It is optimized for handling large files and high-throughput workloads.XFS is commonly used in enterprise systems for its scalability and reliability.It have this future:-Journaling,Scalability,Performance,delayed Allocation and so on.

1.6 Advantage and Disadvantage of OS

Advantage

1 Open to users
2 The modular design .
3 Enhance security,Long-Term Viability
4 Performance Optimization,Containerization Support
5 Role-Based Configuration,Community Support

Disadvantage

1. Short Support Lifecycle
2. Potential Stability Issues
3. Learning Curve for New Users
4. Limited Software Repositories
5. Resource Intensive and Community-Driven Support Limitations.

1.7 Conclusion

Fedora Server 41 is a community-driven OS supported by the Red Hat project.It focuses on cloud, containers, security, and development tools for open-source innovation.The OS has defined hardware/software requirements and a guided installation process.It supports modern file systems with specific advantages and drawbacks.Fedora Server 41 is secure, flexible, and ideal for development and server use.

1.8 Future outlook/recommendation

Fedora Server 41 is expected to remain a testing ground for cutting-edge technologies.The Fedora community is likely to grow, encouraging more contributions.As cloud computing evolves, Fedora Server 41 will enhance support for cloud-native applications.Users should commit to regular updates, implement backup solutions, and participate in the community.Consider long-term needs, explore modular features, and monitor performance continuously.

1.9 Explanation about virtualization in modern OS

Virtualization enables multiple operating systems to run on one physical machine by creating virtual versions of hardware and resources.It includes hardware, OS-level (containers), storage, and network virtualization, all managed by hypervisors.Key benefits are better resource utilization, isolation, scalability, easy backups, and flexible development.It is widely used in data centers, cloud services, software testing, and disaster recovery.Despite some challenges, virtualization is essential in modern operating systems and IT environments.