

# LINUX SERVER

Fundamentals | Administration | Web Server

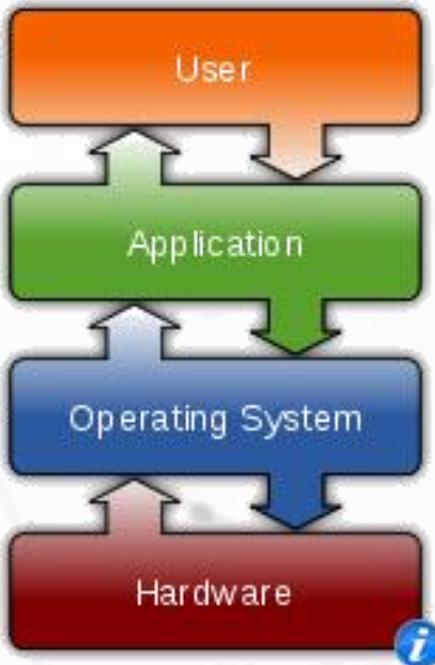
By Dr Nizam

# About Linux

## What is Linux?

It's an Operating System

### Operating systems



### Common features

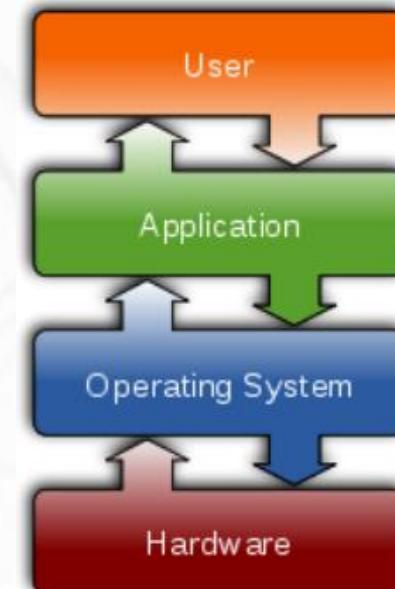
- Process management
- Interrupts
- Memory management
- File system
- Device drivers
- Networking (TCP/IP, UDP)
- Security (Process/Memory protection)
- I/O



The Most Common O/S Used By BU Researchers When Working on a Server or Computer Cluster

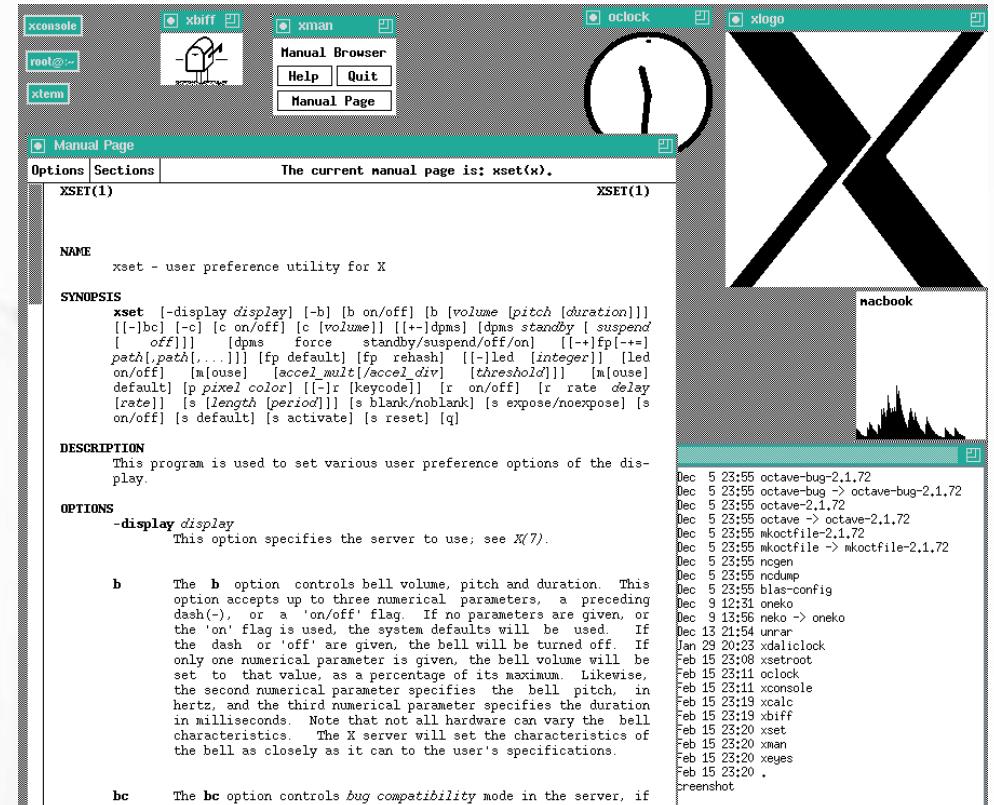
# Operating System (OS)

- **Operating System:** Manages activities and resources of a computer.
  - software that acts as an interface between hardware and user
  - provides a layer of abstraction for application developers
- features provided by an operating system:
  - ability to execute programs (and multi-tasking)
  - memory management (and virtual memory)
  - file systems, disk and network access
  - an interface to communicate with hardware
  - a user interface (often graphical)
- **kernel:** The lowest-level core of an operating system.



# Story About Linux

- **Linux is a Unix clone** written from scratch by Linus Torvalds with assistance from a loosely-knit team of hackers across the Net.
- Unix is a multitasking, multi-user computer operating system originally developed in 1969 by a group of AT&T employees at Bell Labs.
  - written in a high-level language (C)
  - virtual memory
  - hierarchical file system; "everything" is a file
  - lots of small programs that work together to solve larger problems
  - security, users, access, and groups
- Linux and Unix strive to be POSIX compliant.
- **Over 70% of the world's servers run some variant of Unix or Linux.** The Android phone and the Kindle run Linux.



# The Founding Father

Linux + GNU Utilities = Free Unix

"GNU's Not Unix!"



- Linux is an O/S core written by Linus Torvalds and others



- a set of small programs written by Richard Stallman and others. They are the GNU utilities.

# What is Linux?

- **Linux**: A kernel for a Unix-like operating system.
  - commonly seen/used today in servers, mobile/embedded devices, ...
- **GNU**: A "free software" implementation of many Unix-like tools
  - many GNU tools are distributed with the Linux kernel
  - E.g; date, gcc,
- **distribution**: A pre-packaged set of Linux software.
  - examples: Ubuntu, Fedora
- **key features of Linux**:
  - **open source software**: source can be downloaded
  - free to use
  - constantly being improved/updated by the community

# Linux Has Many Distributions → Distros



# Linux Desktop

- X-windows
- window managers
- desktop environments
  - Gnome
  - KDE

Why should I learn to use a shell when GUIs exist?

# Linux Shell

- **shell**: An interactive program/interpreter that uses user input to manage the execution of other programs.
  - A command processor, typically runs in a text window.
  - User types commands, the shell runs the commands
  - Several different shell programs exist:
    - bash : the default shell program on most Linux/Unix systems



```
baljit@baljit:~/shell_scripting$ ./first_script
-          2          4_read          D1          Q3          Q7
1          2_quoting      5_command_input  K20KK      Q4          Q8
1.1_variables  3_envir_var      6_ifelse          Q1          Q5  Questions
1_variables      4          7_for          Q2          Q6  array
Wed Oct  7 22:40:13 IST 2020
          October 2020
Su Mo Tu We Th Fr Sa
          1  2  3
          4  5  6  7  8  9 10
          11 12 13 14 15 16 17
          18 19 20 21 22 23 24
          25 26 27 28 29 30 31
```

# QUIZ!

Session 1

206.189.80.102

# Why use a shell?

- Why should I learn to use a shell when GUIs exist?

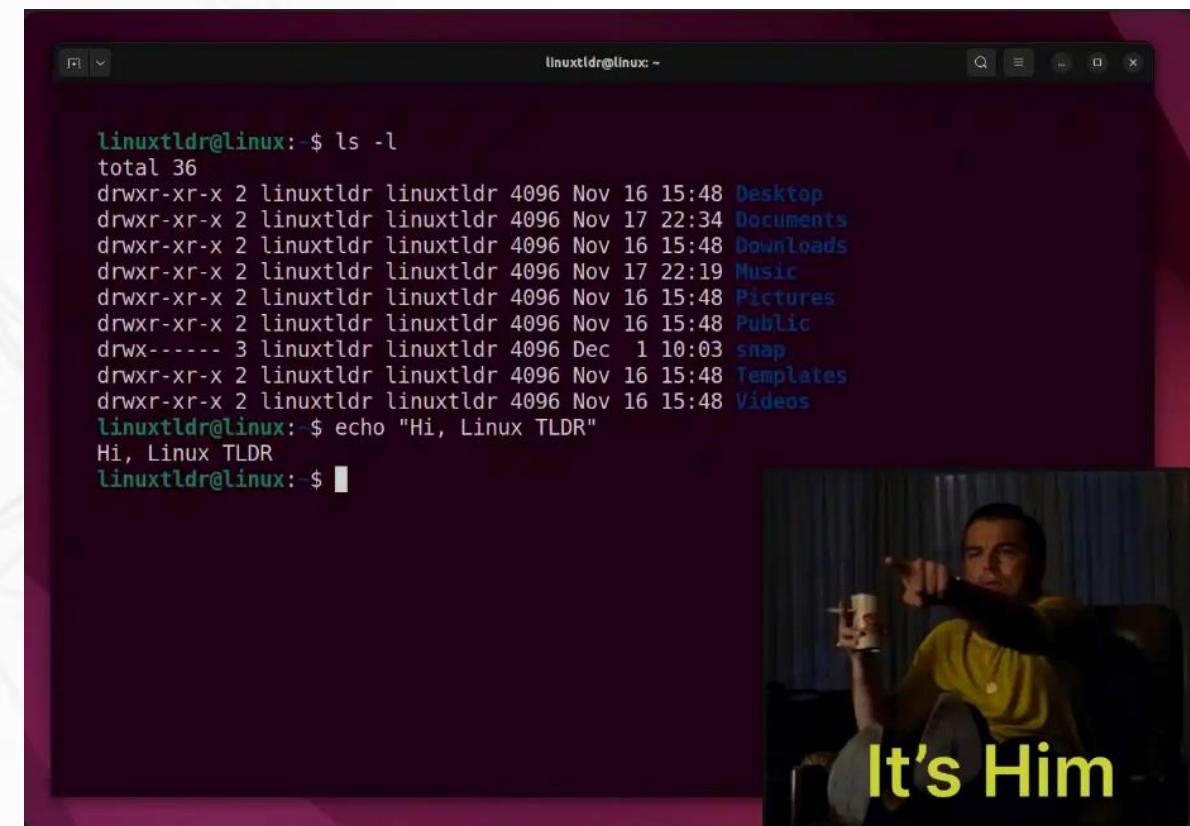
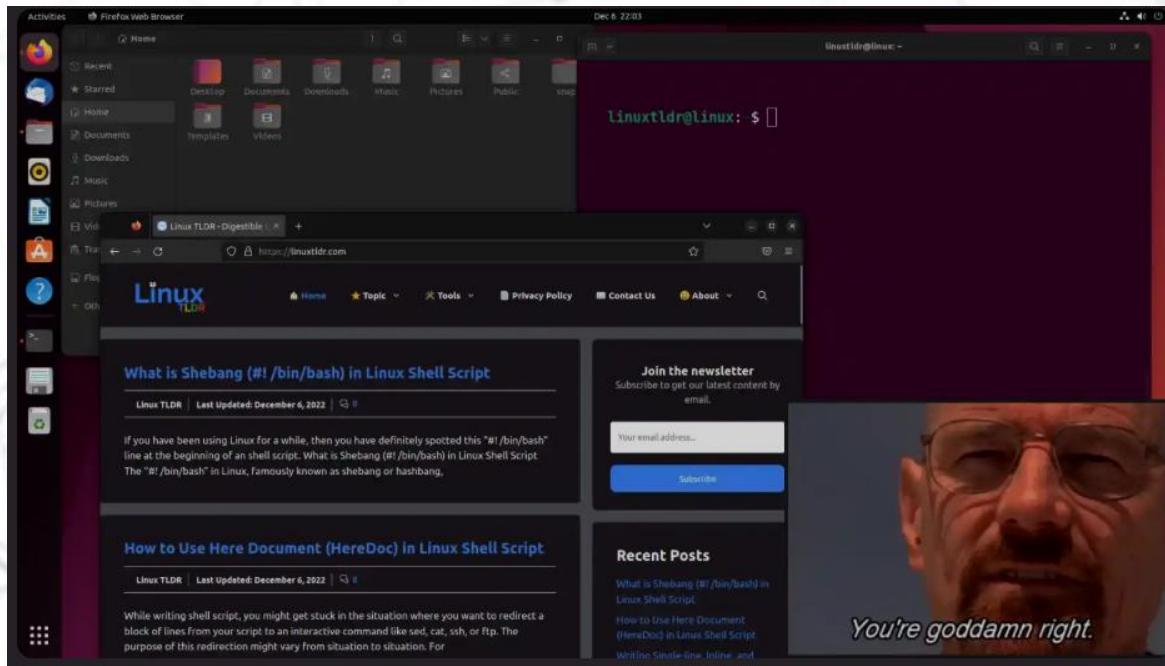
- faster
- work remotely
- programmable
- customizable
- repeatable



# The shell is not all about commands!

Shell is divided into two categories:

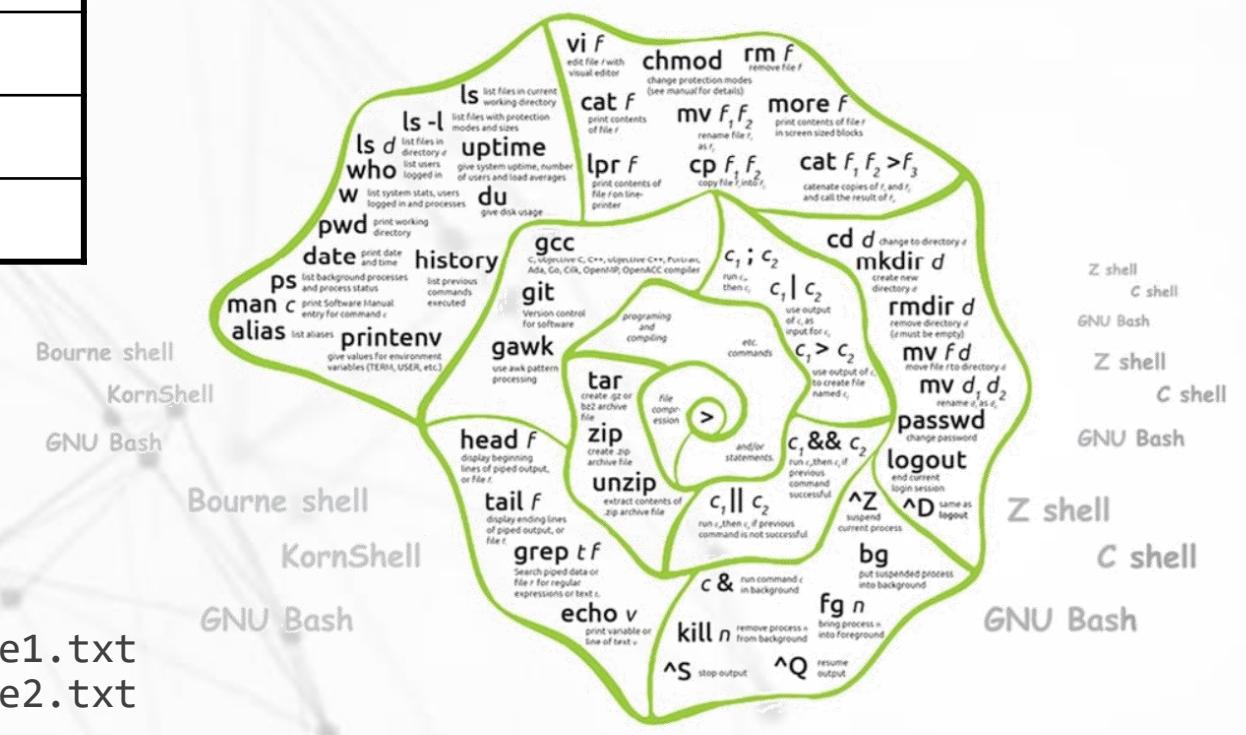
- Command-Line Shell
- Graphical Shell



# Shell commands

command	description
exit	logs out of the shell
ls	lists files in a directory
pwd	print the current <u>working directory</u>
cd	<u>changes the working directory</u>
man	brings up the manual for a command

```
$ pwd
/homes/iws/rea
$ cd CSE391
$ ls
file1.txt file2.txt
$ ls -l
-rw-r--r-- 1 rea      fac_cs 0 2016-03-29 17:45 file1.txt
-rw-r--r-- 1 rea      fac_cs 0 2016-03-29 17:45 file2.txt
$ cd ..
$ man ls
$ exit
```



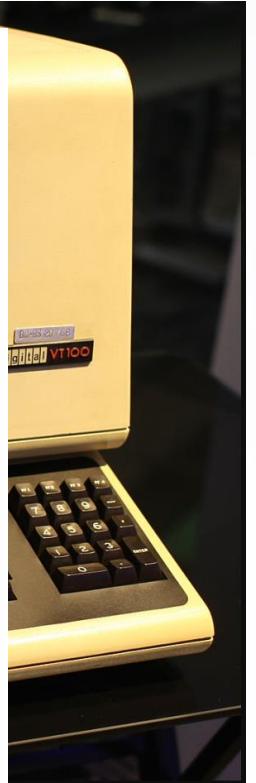
# Tools to Execute Shell Via CLI



Command Prompt

Microsoft Windows [Version 10.0.19045.6466]  
(c) Microsoft Corporation. All rights reserved.

C:\Users\User>



... JENT!

# What is SSH?

- SSH, or **Secure Shell**, is a network protocol that allows users to log in to and interact with a computer over the internet.
- SSH service was developed as a replacement for the unencrypted **Telnet** protocol, providing a more secure way to access and administer remote servers.
- It provides a secure channel for transferring inputs and outputs between a remote user and a host, and relaying the data through a relay host.
- The default port for SSH is 22.



**Administration protocol** that allows users to log in to and interact with a computer over the internet.

placement for the unencrypted **Telnet** protocol, providing a more secure way to access and administer remote servers.

g a remote user, host, and relaying the data through a relay host.



# What SSH Do?

- **Secure Communication:** A client and a server can communicate securely thanks to SSH. To prevent unwanted access to the data, it encrypts all information sent over the network, including passwords, usernames, and other private data.
- **Authentication:** SSH offers methods for confirming the legitimacy of the client and server. To confirm the parties' identities, it makes use of cryptographic keys. Only authorized users and servers can access the system thanks to this authentication procedure.
- **Data Transfer via Encryption:** SSH encrypts all data transferred between the client and server to prevent bad actors from listening in on it or altering it. The confidentiality and integrity of the data being transferred are guaranteed by this encryption.
- **Remote Access:** SSH is primarily used to enable safe remote access to computers, servers, and other resources. With SSH, users can safely run remote commands or access a server's command-line interface from a distance.
- **File Transfer:** SSH facilitates safe file transfers between computers by using programs such as Secure Copy Program (SCP) and SSH File Transfer Protocol (SFTP). With the help of these tools, users can safely move data between two remote servers or between a local computer and a distant server.
- **Tunneling:** The ability to build secure channels for the transmission of other network protocols over SSH is made possible by the functionality for tunneling provided by SSH. Services that might not be immediately accessible via the network, such as web servers, databases, and email servers, can now be accessed securely thanks to this capability.

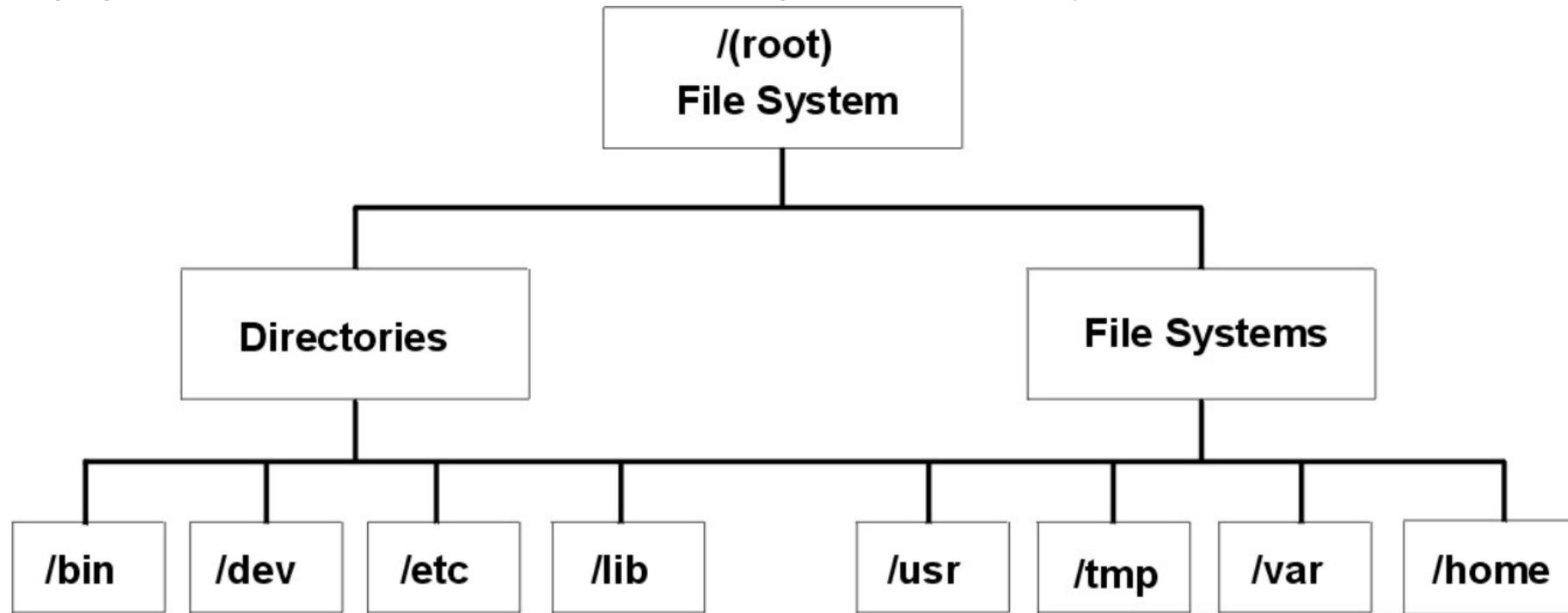
# The Linux File System

- The \*Nix (Unix or Linux) file system is a hierarchical directory structure
- The structure resembles an **upside down tree**
- Directories are collections of files and other directories. The structure is recursive with many levels.
- Every directory has a parent except for the root directory.
- Many directories have children directories.
- Unlike Windows, with multiple drives and multiple file systems, a \*Nix system only has **ONE** file system.
- The Linux Standard Base (LSB) specifies the structure of a Linux file system.



# File System & Directory Structure

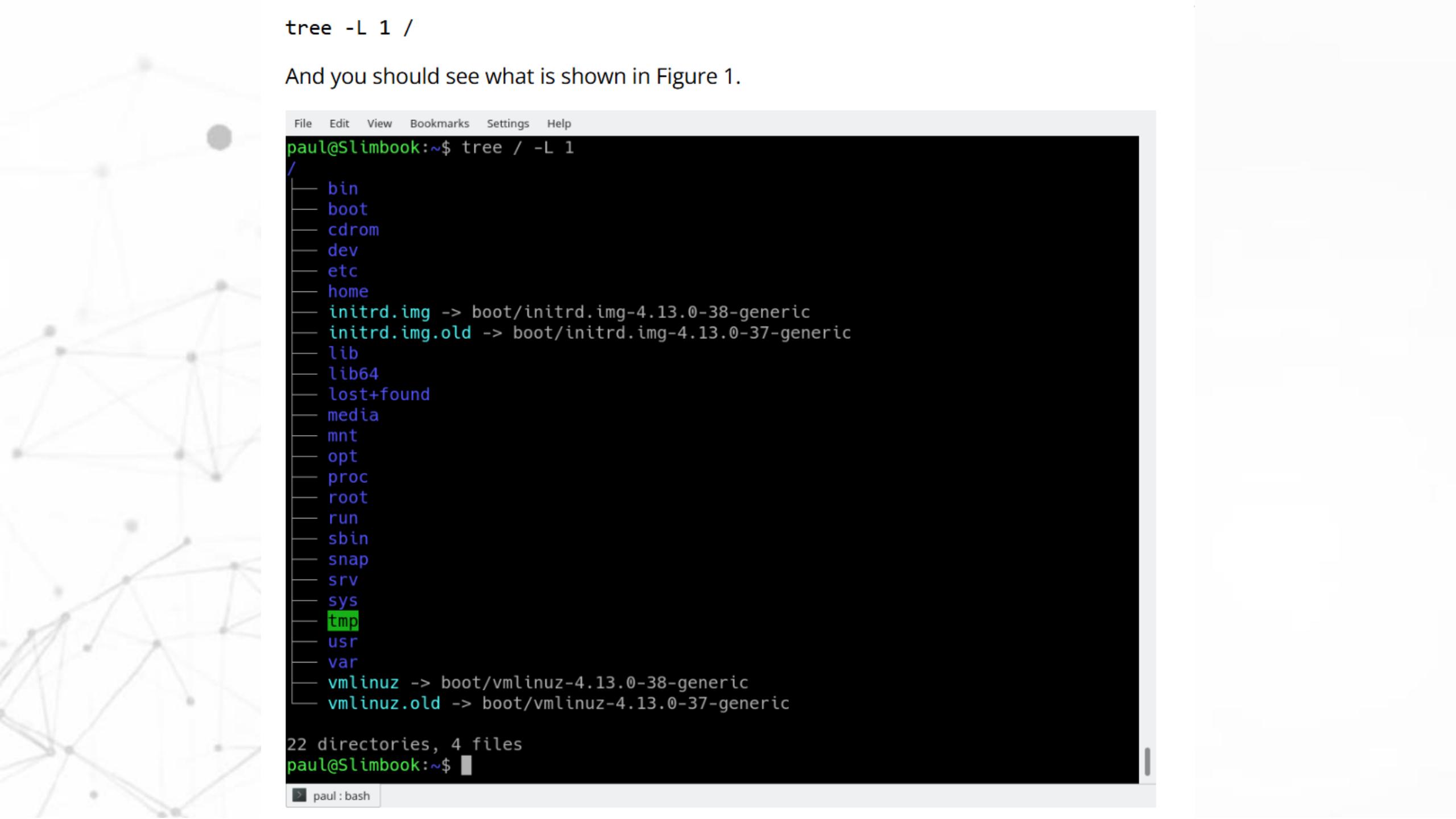
Figure 1. / (root) File System Tree. This tree chart shows a directory structure with the / (root) file system at the top, branching downward to directories and file systems. Directories branch to /bin, /dev, /etc, and /lib. File systems branch to /usr, /tmp, /var, and /home.



The directories on the left (/bin, /dev, /etc, and /lib) are all directories and share a single section of the hard disk. The file systems on the right (/usr, /tmp, /var, and /home) are all file systems so they have separate sections of the hard disk allocated for their use. These file systems are mounted automatically when the system is started, so the end user does not see the difference between these file systems and the directories listed on the left (/bin, /dev, /etc, and /lib).

```
tree -L 1 /
```

And you should see what is shown in Figure 1.



```
File Edit View Bookmarks Settings Help
paul@Slimbook:~$ tree / -L 1
/
+- bin
+- boot
+- cdrom
+- dev
+- etc
+- home
+- initrd.img -> boot/initrd.img-4.13.0-38-generic
+- initrd.img.old -> boot/initrd.img-4.13.0-37-generic
+- lib
+- lib64
+- lost+found
+- media
+- mnt
+- opt
+- proc
+- root
+- run
+- sbin
+- snap
+- srv
+- sys
+- tmp
+- usr
+- var
+- vmlinuz -> boot/vmlinuz-4.13.0-38-generic
+- vmlinuz.old -> boot/vmlinuz-4.13.0-37-generic

22 directories, 4 files
paul@Slimbook:~$
```

▶ paul : bash

# QUIZ!

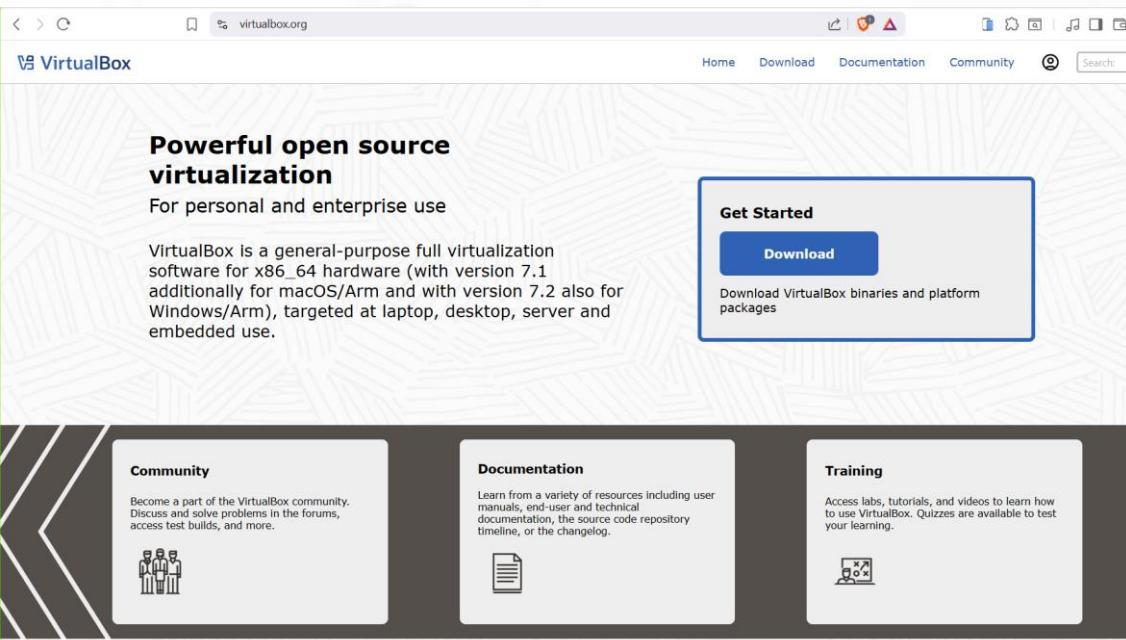
Session 2

206.189.80.102

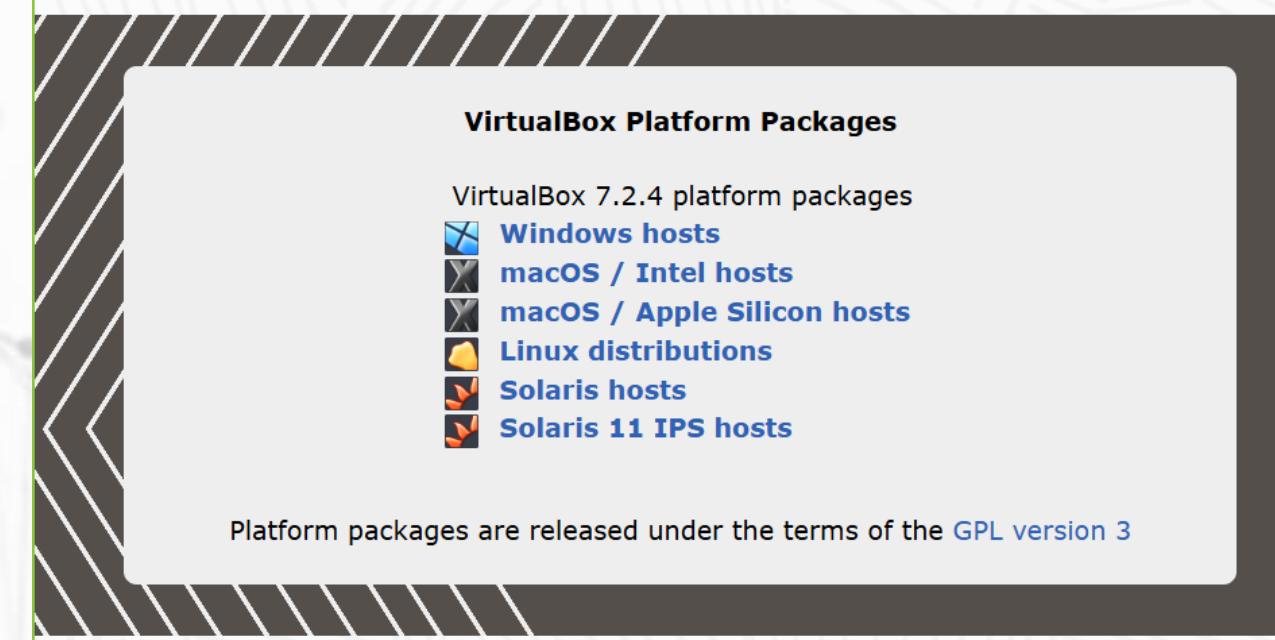
# Linux Installation

Server Editions/Virtual Machine

# Download – Virtualization Tools



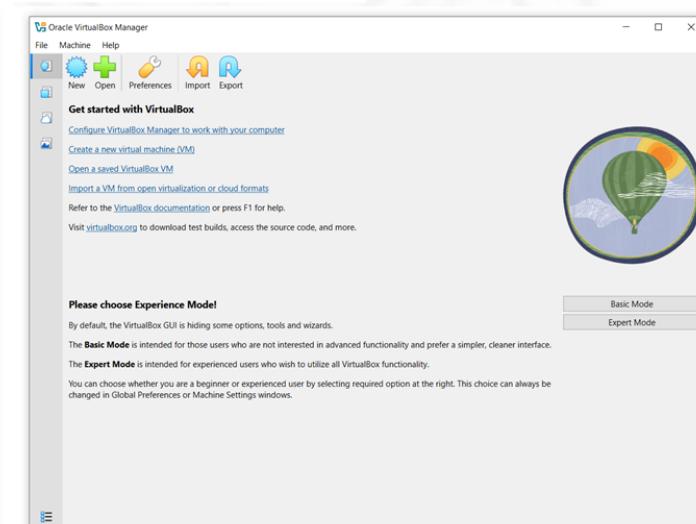
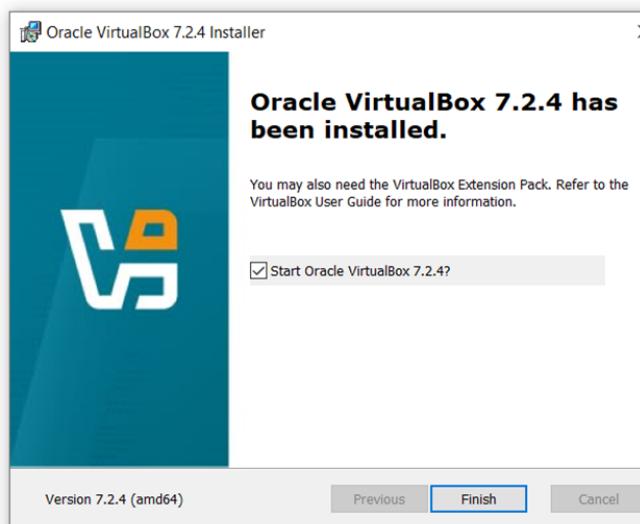
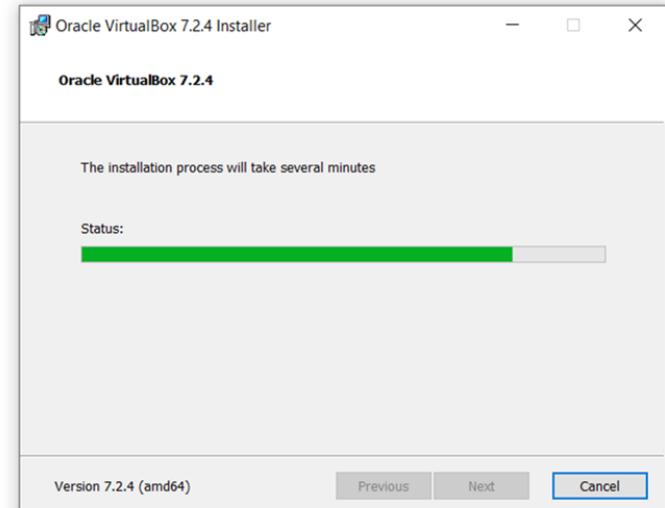
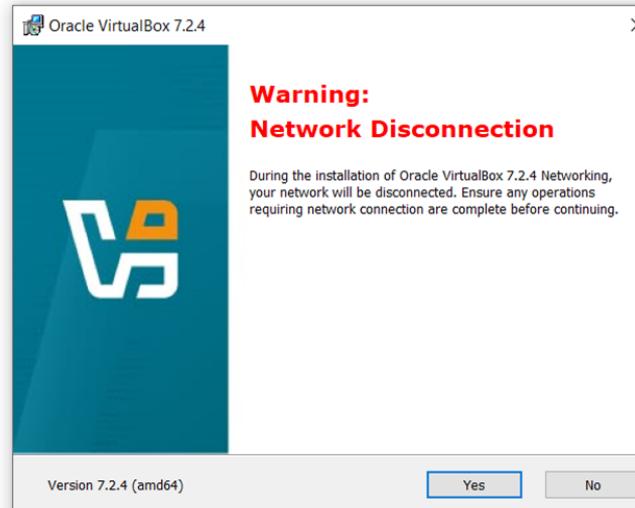
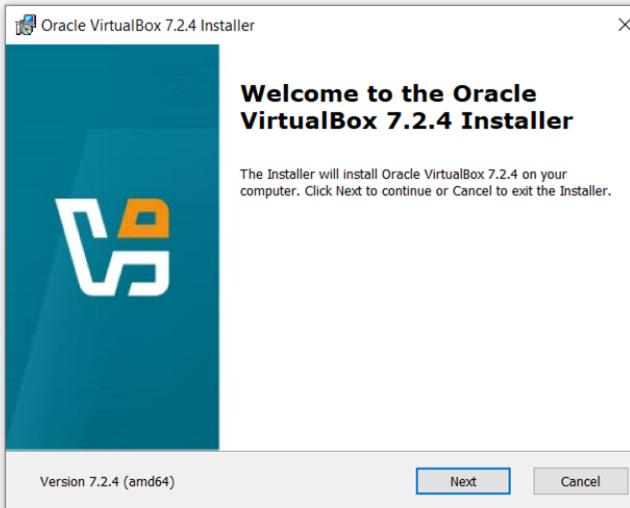
The screenshot shows the official VirtualBox website at [virtualbox.org](https://www.virtualbox.org). The page features a header with navigation links for Home, Download, Documentation, and Community. A search bar is also present. The main content area includes a section titled "Powerful open source virtualization" with a "Get Started" button and a "Download" link. Below this, there is a brief description of the software and its compatibility. At the bottom, there are three cards: "Community", "Documentation", and "Training".



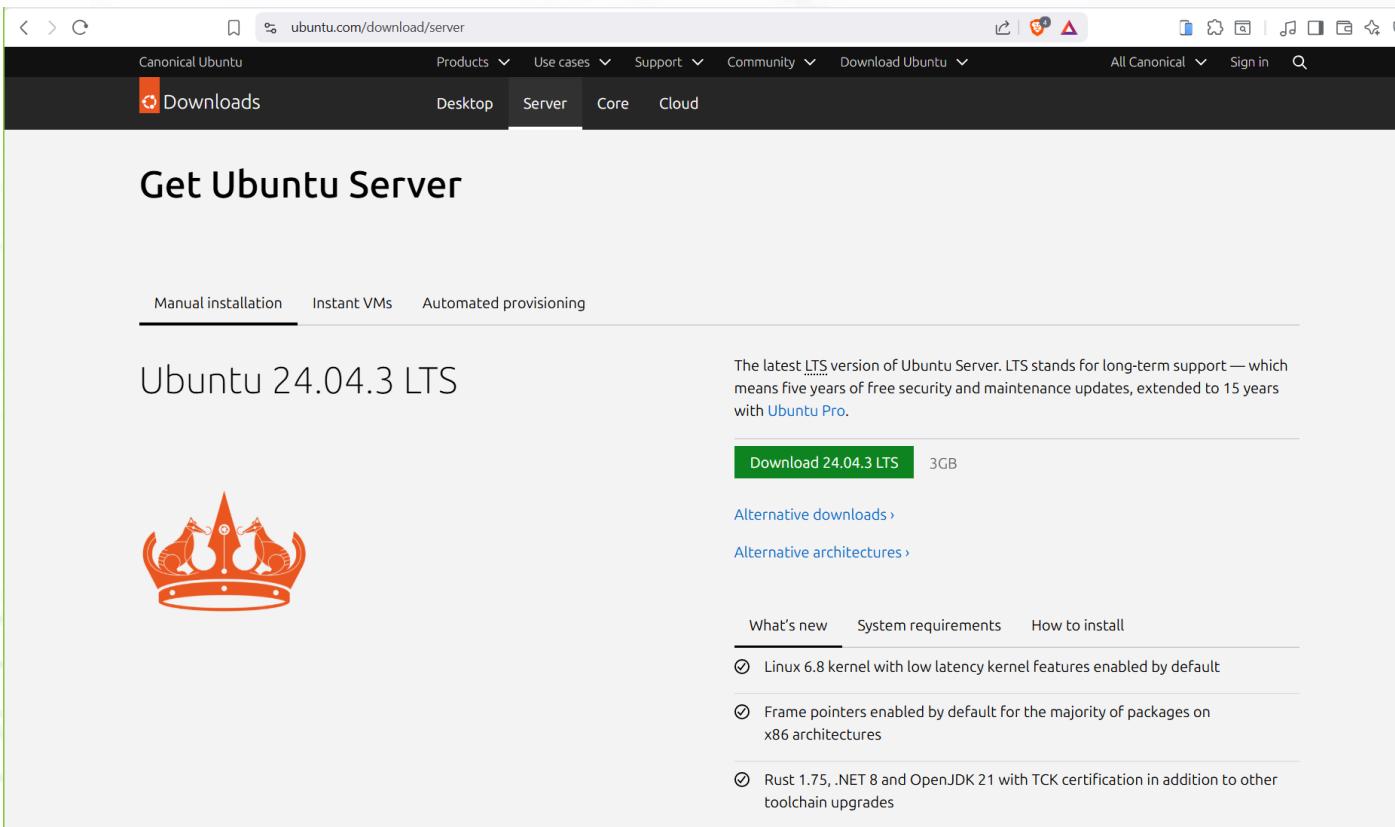
The screenshot shows the "VirtualBox Platform Packages" page. It features a title "VirtualBox Platform Packages" and a sub-section for "VirtualBox 7.2.4 platform packages". It lists several packages with corresponding icons: "Windows hosts" (blue square with white 'X'), "macOS / Intel hosts" (black square with white 'X'), "macOS / Apple Silicon hosts" (black square with white 'X'), "Linux distributions" (orange square with white 'X'), "Solaris hosts" (red square with white 'X'), and "Solaris 11 IPS hosts" (red square with white 'X'). A note at the bottom states: "Platform packages are released under the terms of the [GPL version 3](#)".

<https://www.virtualbox.org/>

# Install – Virtualization Tools



# Download – Linux OS (Ubuntu Server 24.04.3 LTS)



The screenshot shows the Ubuntu Server download page. The URL in the browser is [ubuntu.com/download/server](https://ubuntu.com/download/server). The page has a dark header with the Canonical logo, navigation links for Products, Use cases, Support, Community, and Download Ubuntu, and a search bar. Below the header, there are tabs for Downloads, Desktop, Server (which is selected), Core, and Cloud. The main content area is titled "Get Ubuntu Server" and features a "Manual installation" section. It highlights "Ubuntu 24.04.3 LTS" with a "Download 24.04.3 LTS" button (3GB). Below the download button are links for "Alternative downloads" and "Alternative architectures". At the bottom, there are links for "What's new", "System requirements", and "How to install", followed by a list of three bullet points about kernel features, frame pointers, and toolchain upgrades.

Get Ubuntu Server

Manual installation Instant VMs Automated provisioning

Ubuntu 24.04.3 LTS

The latest LTS version of Ubuntu Server. LTS stands for long-term support — which means five years of free security and maintenance updates, extended to 15 years with [Ubuntu Pro](#).

[Download 24.04.3 LTS](#) 3GB

[Alternative downloads >](#)

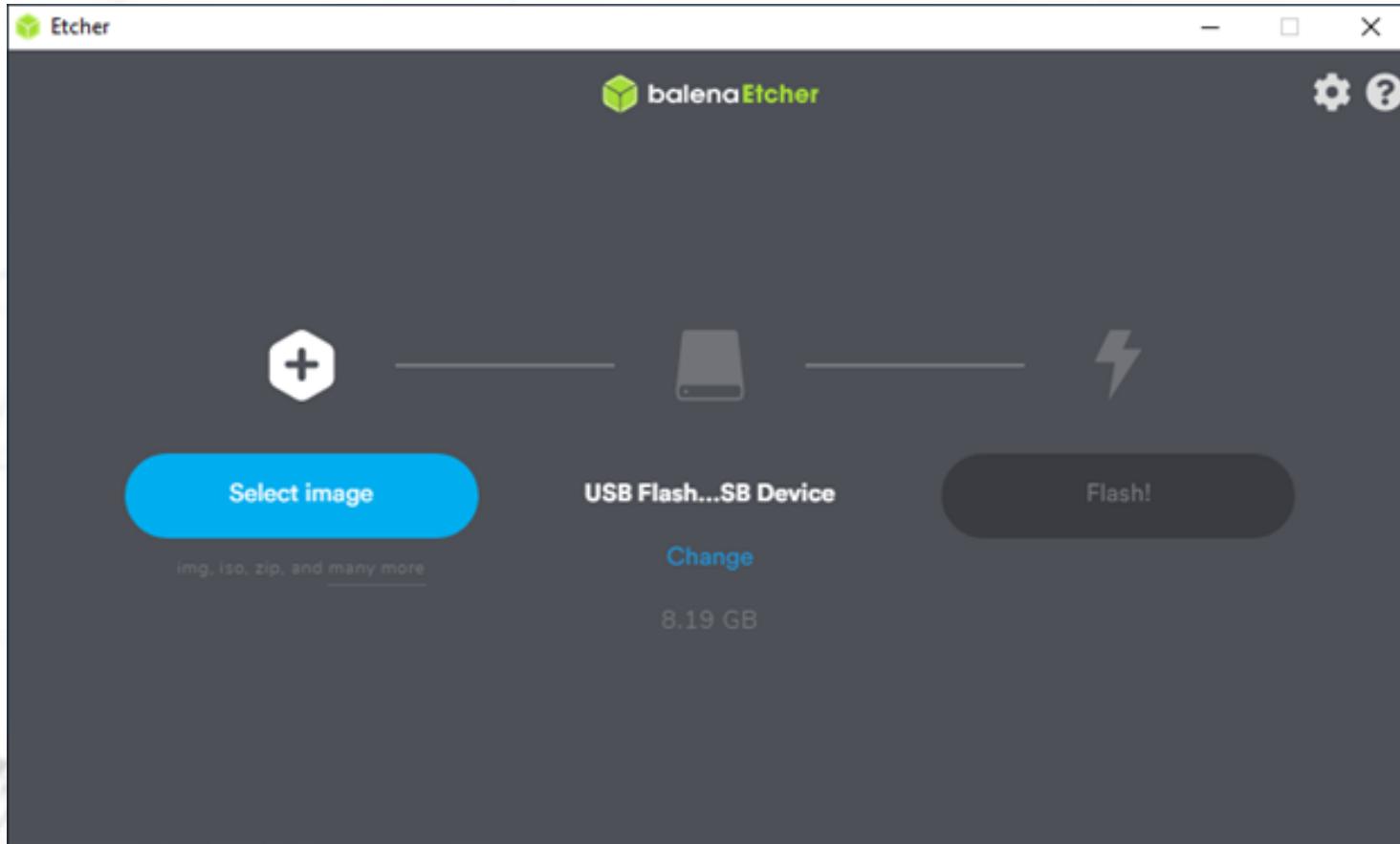
[Alternative architectures >](#)

What's new System requirements How to install

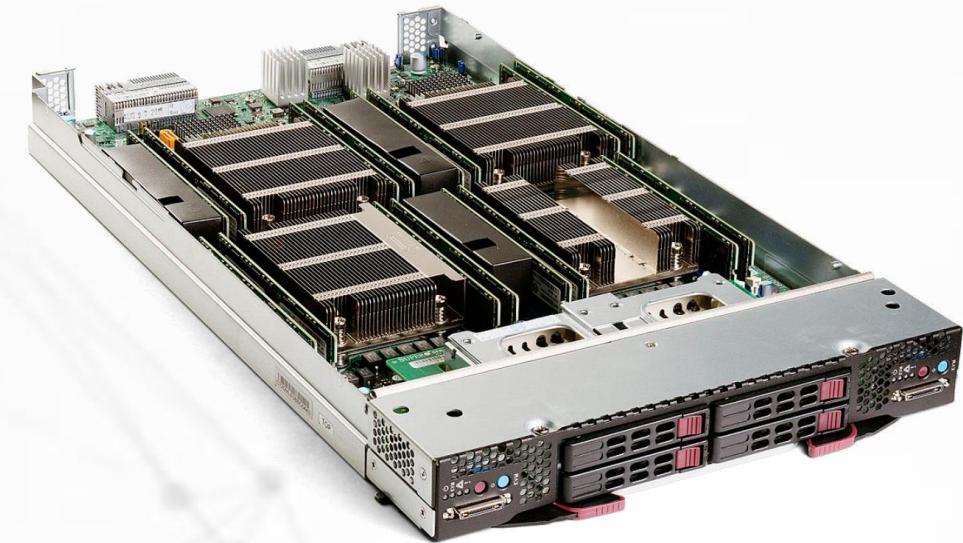
- Linux 6.8 kernel with low latency kernel features enabled by default
- Frame pointers enabled by default for the majority of packages on x86 architectures
- Rust 1.75, .NET 8 and OpenJDK 21 with TCK certification in addition to other toolchain upgrades

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

# Install Linux on a physical blade server via USB drive



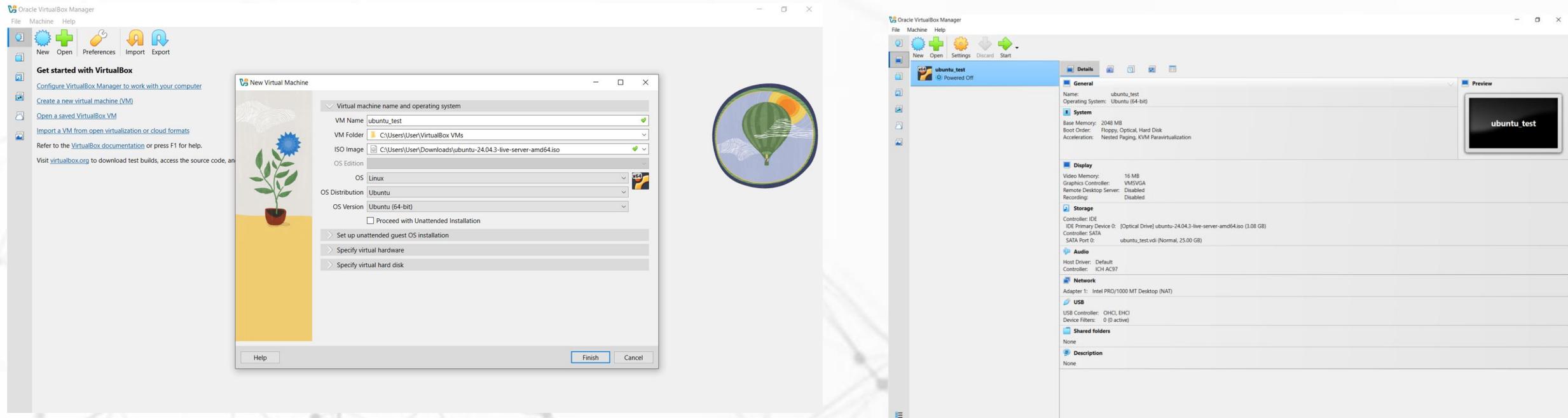
<https://etcher.balena.io/>



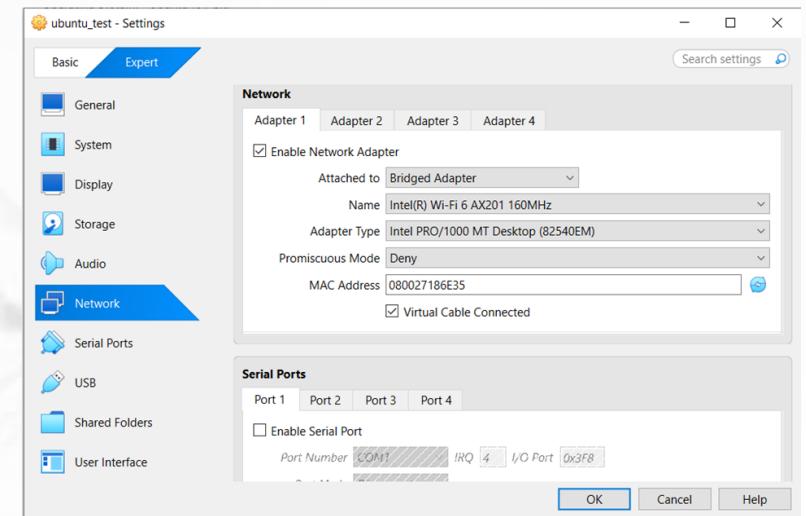
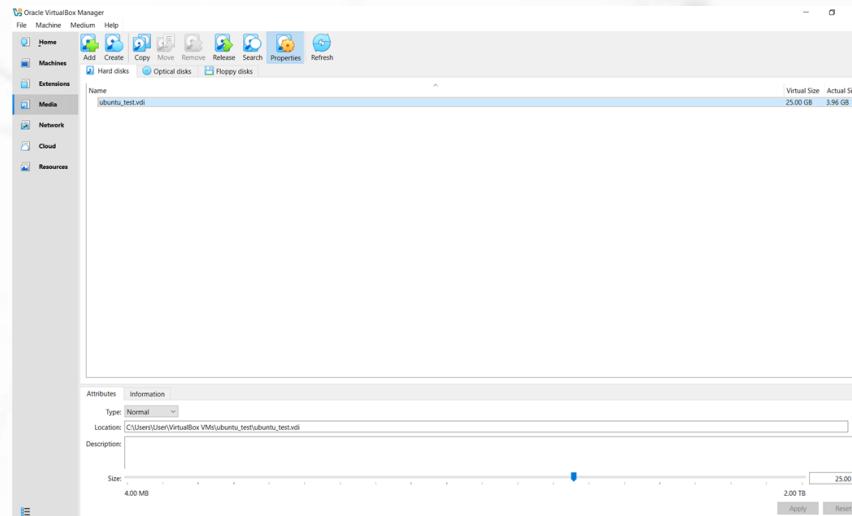
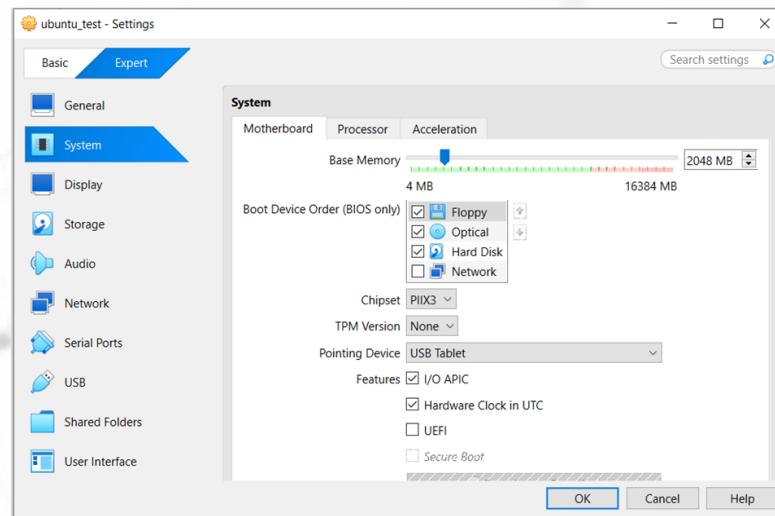
# Build your own VM!

Virtual Machine – Oracle VirtualBox

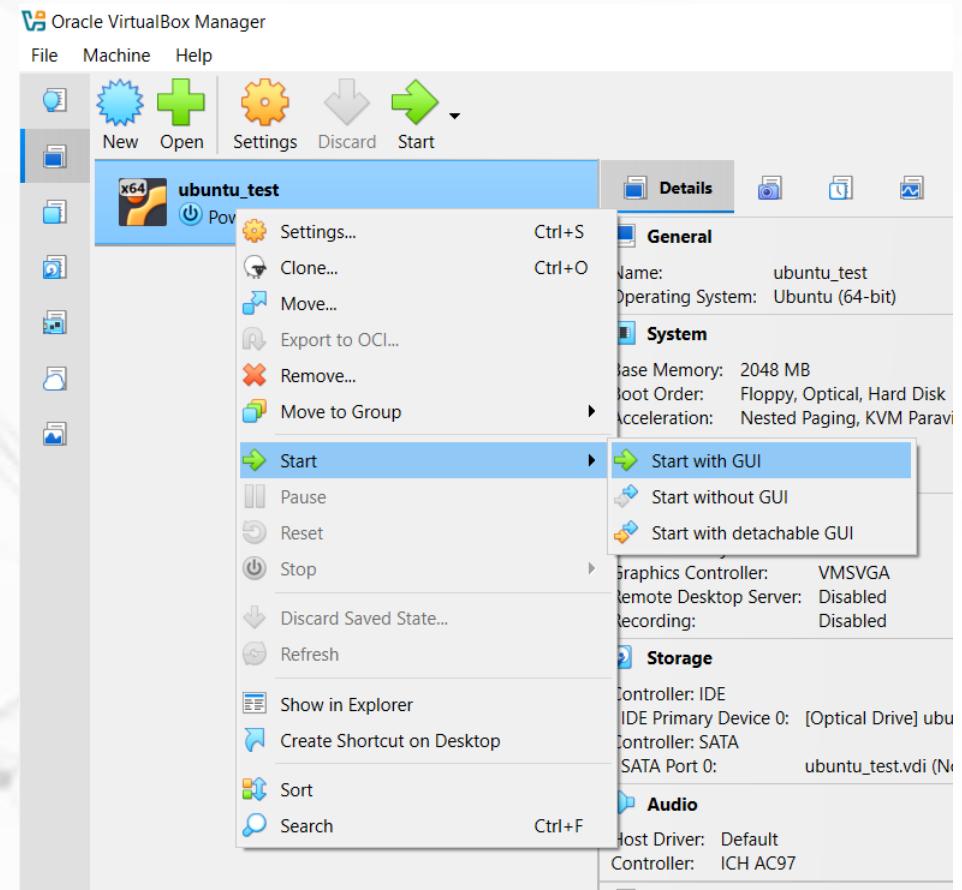
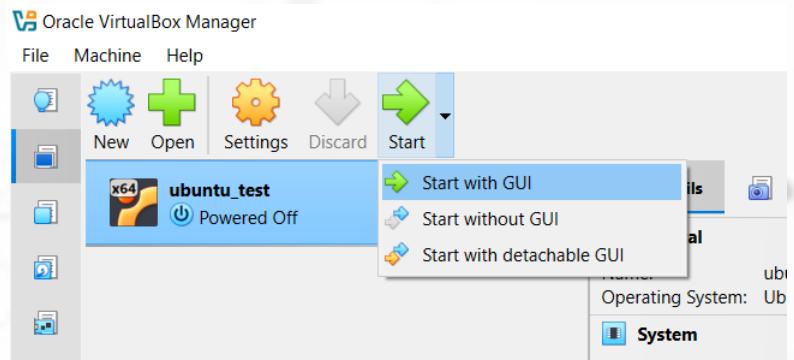
# Install Ubuntu on Virtual Machine



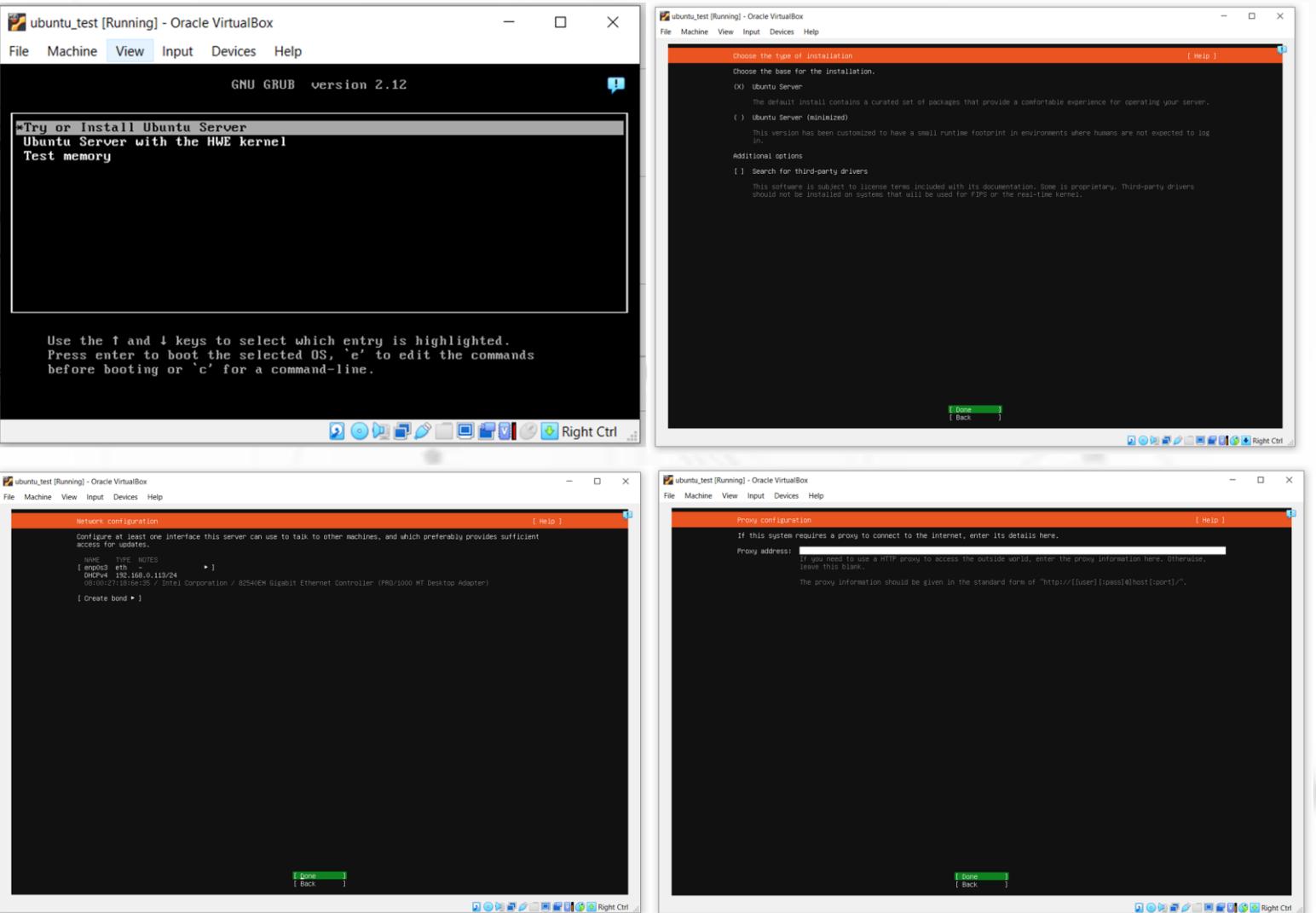
# Configure – Hardware, Storage & Network



# Start!



# Installation step...



# Installation complete!

ubuntu\_test [Running] - Oracle VirtualBox

File Machine View Input Devices Help

Installation complete!

[ Help ]

Full installer output

```
start: cmd-in-target: curtin command in-target
Running command ['mount', '--bind', '/dev', '/target/dev'] with allowed return codes [0] (capture=False)
Running command ['mount', '--bind', '/proc', '/target/proc'] with allowed return codes [0] (capture=False)
Running command ['mount', '--bind', '/run', '/target/run'] with allowed return codes [0] (capture=False)
Running command ['mount', '--bind', '/sys', '/target/sys'] with allowed return codes [0] (capture=False)
Running command ['mount', '--bind', '/target/usr/bin/true', '/target/usr/bin/ischroot'] with allowed return codes [0] (capture=False)
Running command ['unshare', '--help'] with allowed return codes [0] (capture=True)
Checking if target_proc (/target/proc) is a mount
It is, so unshare will use --mount-proc=/target/proc
Running command ['unshare', '--fork', '--pid', '--mount-proc=/target/proc', '--', 'chroot', '/target', 'apt-get', 'update'] with allowed return codes [0] (capture=False)
Hit:1 http://my.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://my.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://my.archive.ubuntu.com/ubuntu noble-backports InRelease
Get:4 http://my.archive.ubuntu.com/ubuntu noble/main Translation-en [513 kB]
Hit:5 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:6 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [216 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [490 kB]
Get:8 http://my.archive.ubuntu.com/ubuntu noble/restricted Translation-en [18.7 kB]
Get:9 http://my.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [205 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [5956 kB]
Get:12 http://my.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:13 http://my.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [297 kB]
Get:14 http://my.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [505 kB]
Get:15 http://my.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [303 kB]
Get:16 http://my.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [5564 kB]
Get:17 http://my.archive.ubuntu.com/ubuntu noble-backports/main Translation-en [9208 kB]
Get:18 http://my.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [17.5 kB]
Fetched 8685 kB in 2min 19s (62.6 kB/s)
Reading package lists...
Running command ['udevadm', 'settle'] with allowed return codes [0] (capture=False)
TIMEO sub(['udevadm', 'settle']): 0.007
Running command ['mount', '--make-private', '/target/usr/bin/ischroot'] with allowed return codes [0] (capture=False)
Running command ['umount', '/target/usr/bin/ischroot'] with allowed return codes [0] (capture=False)
Running command ['mount', '--make-private', '/target/sys'] with allowed return codes [0] (capture=False)
Running command ['umount', '/target/sys'] with allowed return codes [0] (capture=False)
Running command ['mount', '--make-private', '/target/run'] with allowed return codes [0] (capture=False)
Running command ['umount', '/target/run'] with allowed return codes [0] (capture=False)
Running command ['mount', '--make-private', '/target/proc'] with allowed return codes [0] (capture=False)
Running command ['umount', '/target/proc'] with allowed return codes [0] (capture=False)
Running command ['mount', '--make-private', '/target/dev'] with allowed return codes [0] (capture=False)
Running command ['umount', '/target/dev'] with allowed return codes [0] (capture=False)
finish: cmd-in-target: SUCCESS curtin command in-target
```

[ Close ]

Right Ctrl

ubuntu\_test [Running] - Oracle VirtualBox

File Machine View Input Devices Help

Installation complete!

[ Help ]

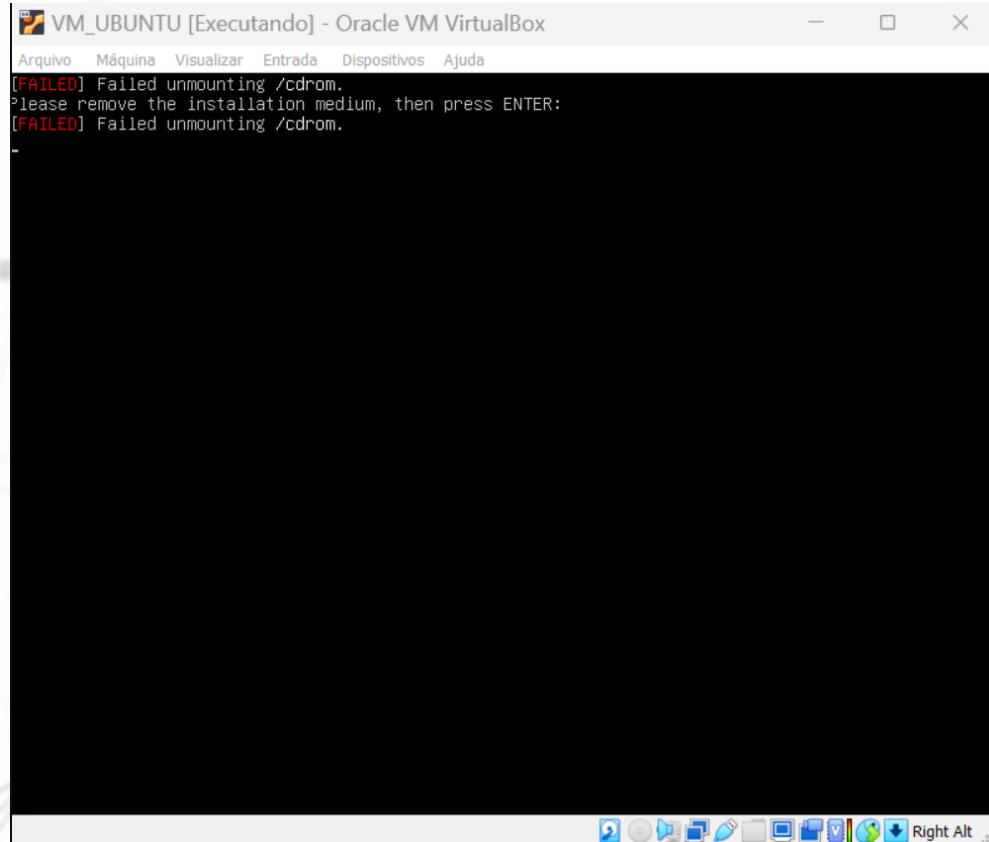
```
writing install sources to disk
running 'curtin extract'
curtin command extract
  acquiring and extracting image from cp:///tmp/tmpu9pnveld/mount
configuring keyboard
curtin command in-target
executing curtin install curthooks step
curtin command install
  configuring installed system
    running 'curtin curthooks'
    curtin command curthooks
  configuring apt
    configuring apt
    installing missing packages
  installing packages on target system: ['grub-pc']
  configuring iscsi service
  configuring raid (mdadm) service
  configuring NvMe over TCP
  installing kernel
  setting up swap
  apply networking config
  writing etc/fstab
  configuring multipath
  updating packages on target system
  configuring pollinate user-agent on target
  updating initramfs configuration
  configuring target system bootloader
  installing grub to target devices
  copying metadata from /cdrom
final system configuration
calculating extra packages to install
installing openssh-server
  retrieving openssh-server
  curtin command system-install
  unpacking openssh-server
  curtin command system-install
  configuring cloud-init
  downloading and installing security updates
  curtin command in-target
  restoring apt configuration
  curtin command in-target
subiquity/Late/run:
```

[ View full log ]

[ Reboot Now ]

Right Ctrl

# Reboot!



Just press 'ENTER'

```
Ubuntu 24.04.3 LTS ubuntu24test tty1
ubuntu24test login: [ 16.466674] cloud-init[1021]: Cloud-init v. 25.1.4-0ubuntu0~24.04.1 running 'modules:final' at Sun, 23 Nov 2025 17:23:00 +0000. Up 16. seconds.
ci-info: no authorized SSH keys fingerprints found for user nizam.
<14>Nov 23 17:23:00 cloud-init: ##### BEGIN SSH HOST KEY FINGERPRINTS #####
<14>Nov 23 17:23:00 cloud-init: -----BEGIN SSH HOST KEY FINGERPRINTS-----
<14>Nov 23 17:23:00 cloud-init: 256 SHA256:meLcf6xCx8k295cyJ+8qiqtypjMeXK1r24dZhyJLFs root@ubuntu24test (EDDSA)
<14>Nov 23 17:23:00 cloud-init: 256 SHA256:KXhfg/vEby1c1c2u1iaGblKg7kD2Vs7u2zFg57J0Cc root@ubuntu24test (ED25519)
<14>Nov 23 17:23:00 cloud-init: 3072 SHA256:jmXoGuwz1xwv/ahNETGkpE2sh210NHxMlZ76tqMCQ root@ubuntu24test (RSA)
<14>Nov 23 17:23:00 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----
<14>Nov 23 17:23:00 cloud-init: #####
-----BEGIN SSH HOST KEY KEYS-----
ecdsa-sha2-nistp256 AAAAE2VJ2HNMLXNoyTitbm1zdHgNTYAAAIBm1zdHgNTYAAAABBH+qE9PBBzDxot4QYs70oj8JK1Drj4+8QhRNH3mRQ1tEMqYvMnQnsFY7IU301/tLBIY2D0AgM9CTTBY251H
root@ubuntu24test
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAInK9bsP2RC/UtsyyBg6Py5Map03a00x26NPZAUlOsy root@ubuntu24test
ssh-rsa AAAAB3NzaC1yc2EAAHQAQBAHABgQDFoE92NgEzmrff8nf2C9bLMH23438afTg62zSv372fHN41K8w1AhGXR/J0I0+mlMGKpHoE2IuvqVbnD6ge7hY5/sR22ur3GlhCVEXMCxGmz2YC/7
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brsaU4WVAJ13R57+f1pWL1eM28g+N+oFc1hcJb3DG2dknCTyJqtwvymU0kHqsS9syzePvNM= root@ubuntu24test
-----END SSH HOST KEY KEYS-----
[ 16.541091] cloud-init[1021]: Cloud-init v. 25.1.4-0ubuntu0~24.04.1 finished at Sun, 23 Nov 2025 17:23:00 +0000. Data source: DataSourceNone. Up 16.53 seconds.
```

Just press 'ENTER'

# Login

```
ubuntu_test [Running] - Oracle VirtualBox
File Machine View Input Devices Help

Ubuntu 24.04.3 LTS ubuntu24test tty1

ubuntu24test login: [ 16.466674] cloud-init[1021]: Cloud-init v. 25.1.4-0ubuntu0~24.04.1 running 'modules:final' at Sun, 23 Nov 2025 17:23:00 +0000. Up 16. seconds.
ci-info: no authorized SSH keys fingerprints found for user nizam.
<14>Nov 23 17:23:00 cloud-init: -----BEGIN SSH HOST KEY FINGERPRINTS-----
<14>Nov 23 17:23:00 cloud-init: 256 SHA256:meCf6xCxBk295cyU+8giqtyqJMeXK1r24dV2hyJLFs root@ubuntu24test (ECDSA)
<14>Nov 23 17:23:00 cloud-init: 256 SHA256:KXhfpg/vEby1cJzUiaGLbLWg7Kd2VSw7uzCFg67/J0Cc root@ubuntu24test (ED25519)
<14>Nov 23 17:23:00 cloud-init: 3072 SHA256:Jnx0Gwz5i+xw/ahNETGKqqE2shZ10NHXMLZ76tqWCGQ root@ubuntu24test (RSA)
<14>Nov 23 17:23:00 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----
<14>Nov 23 17:23:00 cloud-init: -----BEGIN SSH HOST KEY KEYS-----
-----BEGIN SSH HOST KEY KEYS-----
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAgNTYAAAIBmlzdHAgNTYAAAABBBH+qE9PBBzDxot4QYs70oj8JK1Drj4++8QhRNH3mRQitEMqYyVmQnsFY71U301/tLBIY2DZDAGm9cTTBY251H
root@ubuntu24test
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAINK9bsPZRC/UtsysB6Py5Map03a00x26NP2AQIUosy root@ubuntu24test
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQBgQDF0e92gNEZEzmrff8f2C9BLMI23438aFTg622sV37fHNg41k8aH1AhGXKR/j0I0+m1MGWpHoE2IuvqVbnD6ge7HvY9/sR22ur3GLhCVEXMxCxGmz2YC/7
Z9pyHoub52UFqyFLFBcNT1IEkSS7dyRCM6sc0tj3u0Hpx4HNHv1r1lpfdKV3Im7Gefp3te9c7+HqWdftD3Je+gMsk4nglcoGcPGHasf1CR3R10rhJMnMVAYK7UJg4xF51eZ2iES/+EpSyffJA8bSGA+dMDIH
no0+tzH6ek1xL0phWeFKU9t4MVNV7JBXYjI7E1aqUoYtcfP2D8eQU5gg0stKwlHPTg340e/hlnN+p+S2RaP6ALX+TaeIxholNL8Ly28zz180tB9jnFE1yKawJ6W6pJSxIoY7yuXuFSX+xbVKSkt2u85VWFPy1e
brsa14kVAJ13R57+f1pkL1em28g+N+oC1hcJb3DGZdknCtyjqtuvymU0kHqsS9syzePvWm= root@ubuntu24test
-----END SSH HOST KEY KEYS-----
[ 16.541091] cloud-init[1021]: Cloud-init v. 25.1.4-0ubuntu0~24.04.1 finished at Sun, 23 Nov 2025 17:23:00 +0000. Datasource DataSourceNone. Up 16.53 seconds.

ubuntu24test login: _
```

# Success!

```
ubuntu_test [Running] - Oracle VirtualBox
File Machine View Input Devices Help

ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAAAEBCnBhQsF0oJ8JK1Drj4++8QhRNH3mRQitEmqYyVmQnsFY71U301/tLBIY2DZDAgM9cTTBY251hg4=
root@ubuntu24test
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAInK9bsPZRC/UtsuysBg6Py5Map03a00x26NP2AQU0sy root@ubuntu24test
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQgQDF0e92gNEzEzmrfrBnf2C9BLMTA23438aFTgsZ2sV37FHNg41WBaWIAhGXRx/j0I0+m1MGpHoE2IuvgVbnD6ge7HvY9/sR22ur3GLhCVEXMXCxGmz2YC/7ukb
29pyHoub5UfqyFLFcBc6sc0tj3u0hpX4hNHvirIipfdKV3Im7Gefp3te9c7+HqWDftD3Je+gMsk4nglcoGc2GHasf1CR3R1OrhJMmMVAYK7UJg4xF5nle221ES/+EpSYftJA8bS6A+dMDIHCHF
no0+zh6ekjXLdphkEfKU9t4MNV27JBXYJITElAqUoYtcJPZD0eQU5gq0stKw1HPtg340e/hLN+p+S2RaP6ALX+TaeIhoNL8Ly28zzi80tB9jhFElykAwJ6W6pjSxIoY7yuXwfSX+xbVKSkt2u85VWFpYleI3G
brsaU4KVAJ13R57+f1pWl1eM28g+N+ofC1hcJb3DG2dknCtYjqtwvymU0KhsS9syzePwWM= root@ubuntu24test
----END SSH HOST KEY KEYS-----
[ 16.541091] cloud-init[1021]: Cloud-init v. 25.1.4-0ubuntu0~24.04.1 finished at Sun, 23 Nov 2025 17:23:00 +0000. Datasource DataSourceNone. Up 16.53 seconds
ubuntu24test login: nizam
Password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-87-generic x86_64)

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

System information as of Sun Nov 23 05:27:21 PM UTC 2025

System load:          0.01
Usage of /:           18.7% of 24.44GB
Memory usage:         9%
Swap usage:          0%
Processes:           98
Users logged in:     0
IPv4 address for enp0s3: 192.168.0.113
IPv6 address for enp0s3: 2001:e68:542c:2b28:a00:27ff:fe18:6e95

Expanded Security Maintenance for Applications is not enabled.

25 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.

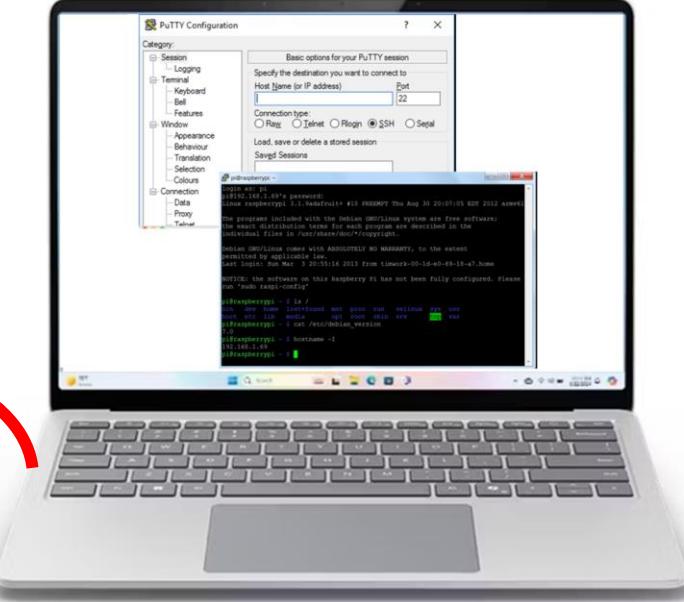
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

nizam@ubuntu24test:~$
```

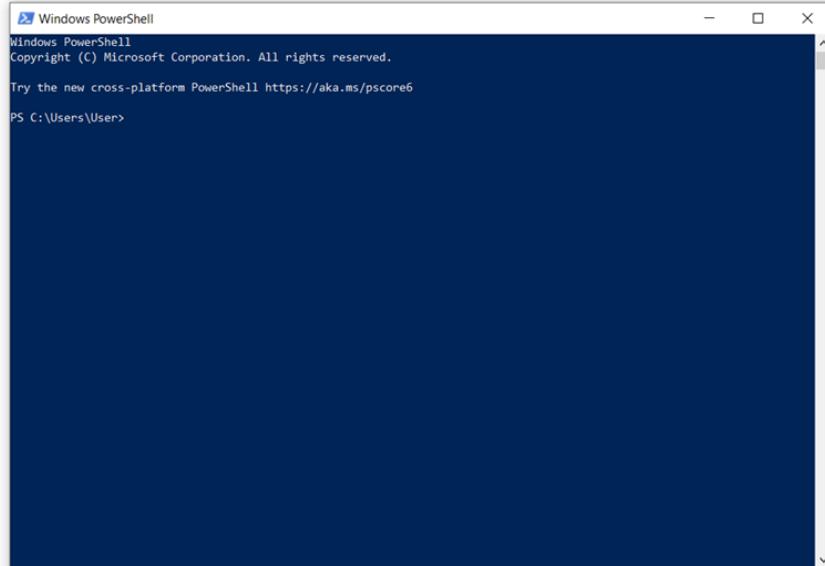
# SSH to your....

Virtual Machine | Server

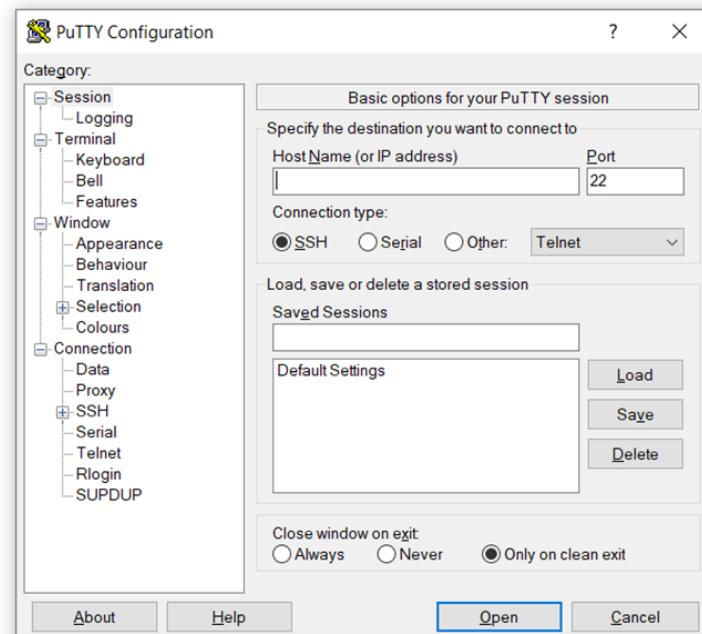


# 3 Famous tools

## PowerShell



## Putty



## MobaXterm

