Lab 1 – Setting Up Kali Linux in VirtualBox

Objective:

To set up a secure and functional Kali Linux virtual machine in Oracle VirtualBox, preparing the environment for cybersecurity practice and experimentation.

Tools and Resources

- **Oracle VirtualBox** – Virtualization platform.
- **Microsoft Visual C++ Redistributable** – Required by VirtualBox for certain runtime libraries.
- **Kali Linux ISO** – Official penetration testing distribution.
- **Windows 10/11 Host System** – Running the virtual environment.

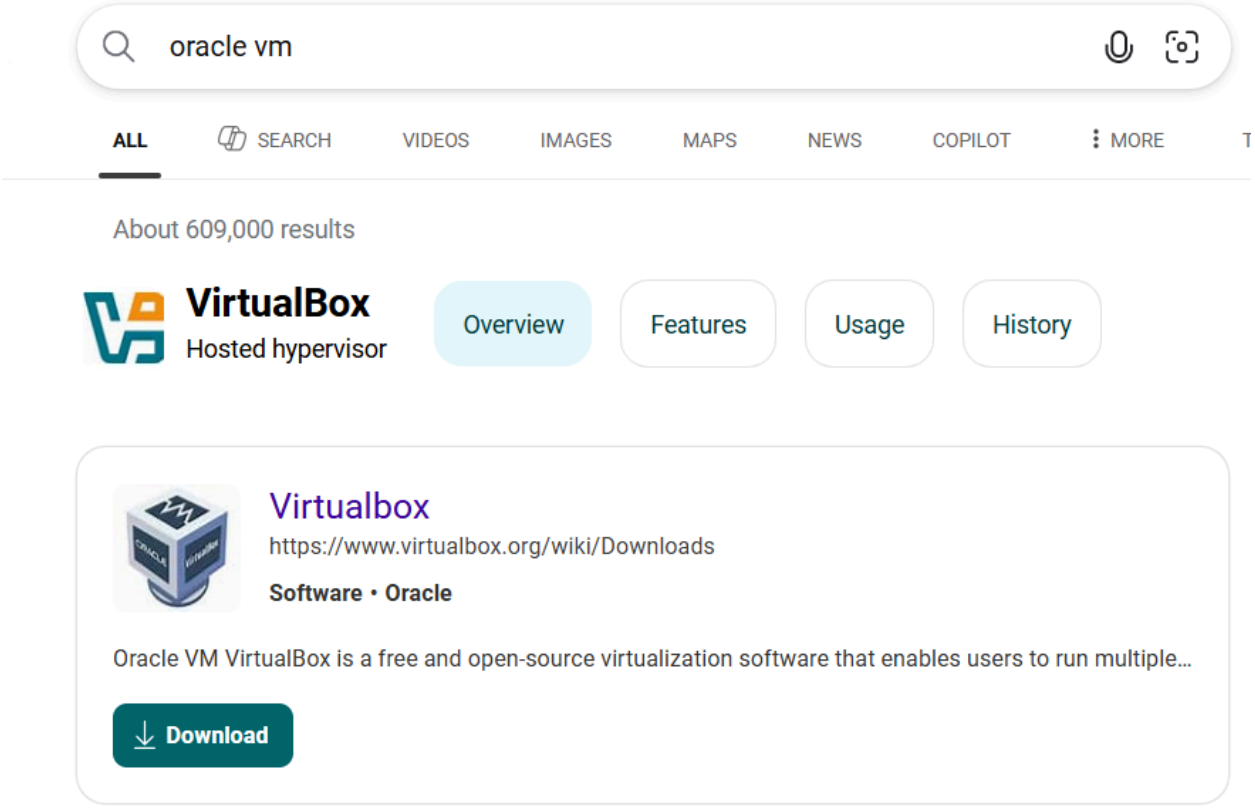
VM Configuration

- CPU Cores: 2
- Memory (RAM): 4096 MB (4 GB)
- Virtual Hard Disk: 80 GB (VDI, dynamically allocated)
- Display: 128 MB Video Memory
- Clipboard & Drag/Drop: Enabled (Bidirectional)
- Network Adapter: NAT (with Bidirectional mode enabled for Host ↔ VM communication)

Steps Performed

1. Download & Preparation

- Downloaded **Oracle VirtualBox** and **Extension Pack** from the official website.
- Installed **Microsoft Visual C++ Redistributable** to ensure VirtualBox could run correctly.
- Downloaded **Kali Linux ISO** from kali.org.



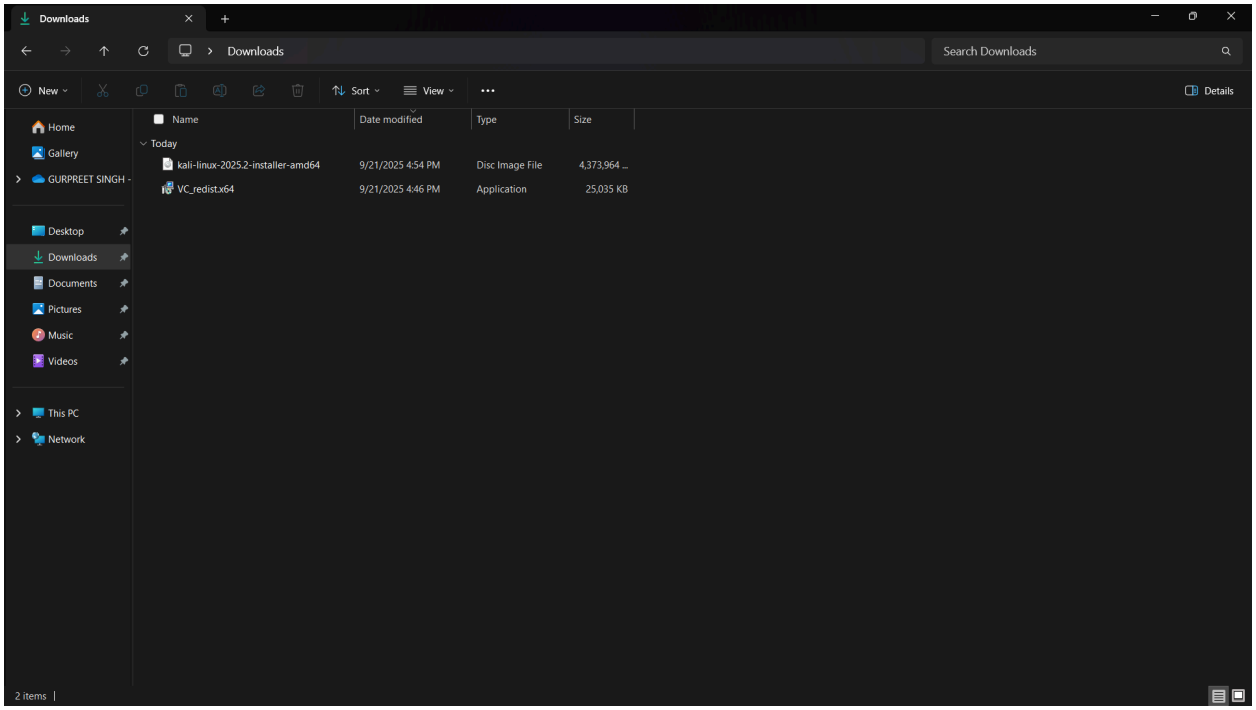
Latest Microsoft Visual C++ Redistributable version

The latest version is `v14.44.35211.0`

Use the following links to download this version for each supported architecture:

Expand table

Architecture	Link	s
ARM64	https://aka.ms/vs/17/release/vc_redist.arm64.exe	alink for latest supported ARM64 on
X86	https://aka.ms/vs/17/release/vc_redist.x86.exe	alink for latest supported x86 version
X64	https://aka.ms/vs/17/release/vc_redist.x64.exe	Permalink for latest supported x64 version. The X64 Redistributable package contains both ARM64 and X64 binaries. This package makes it easy to install required Visual C++ ARM64 binaries when the X64 Redistributable is installed on an ARM64 device.



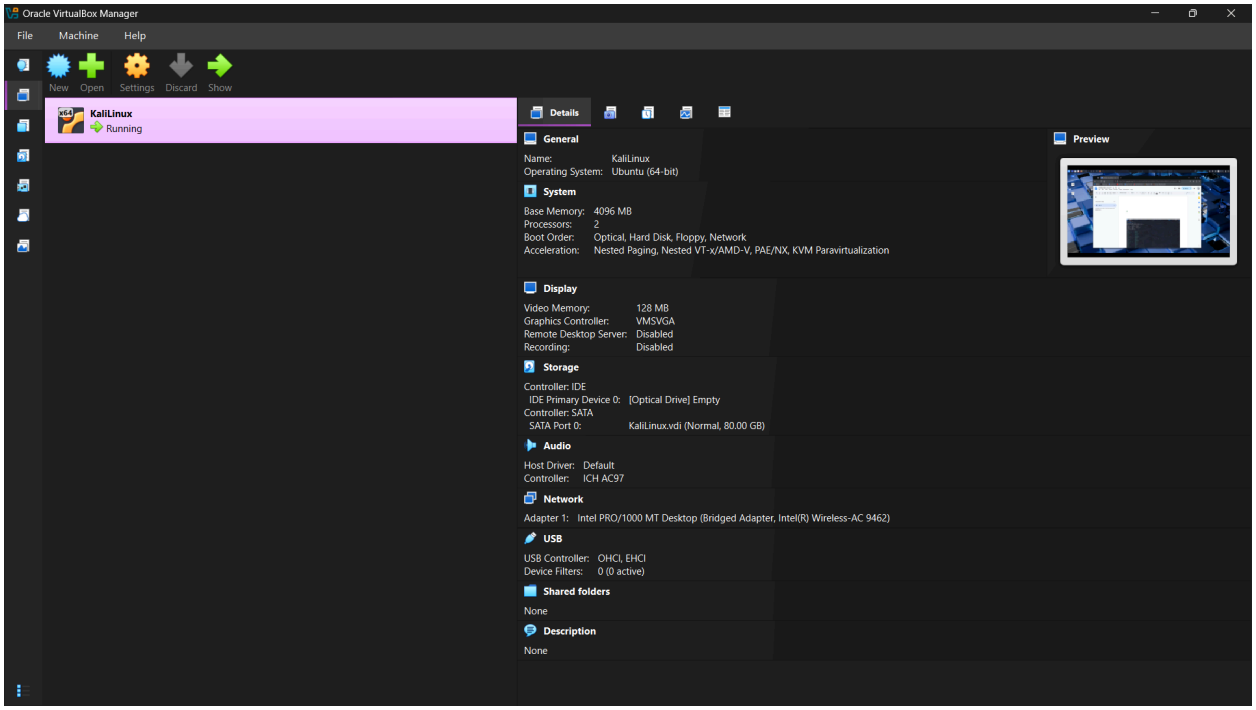
2. Virtual Machine Creation

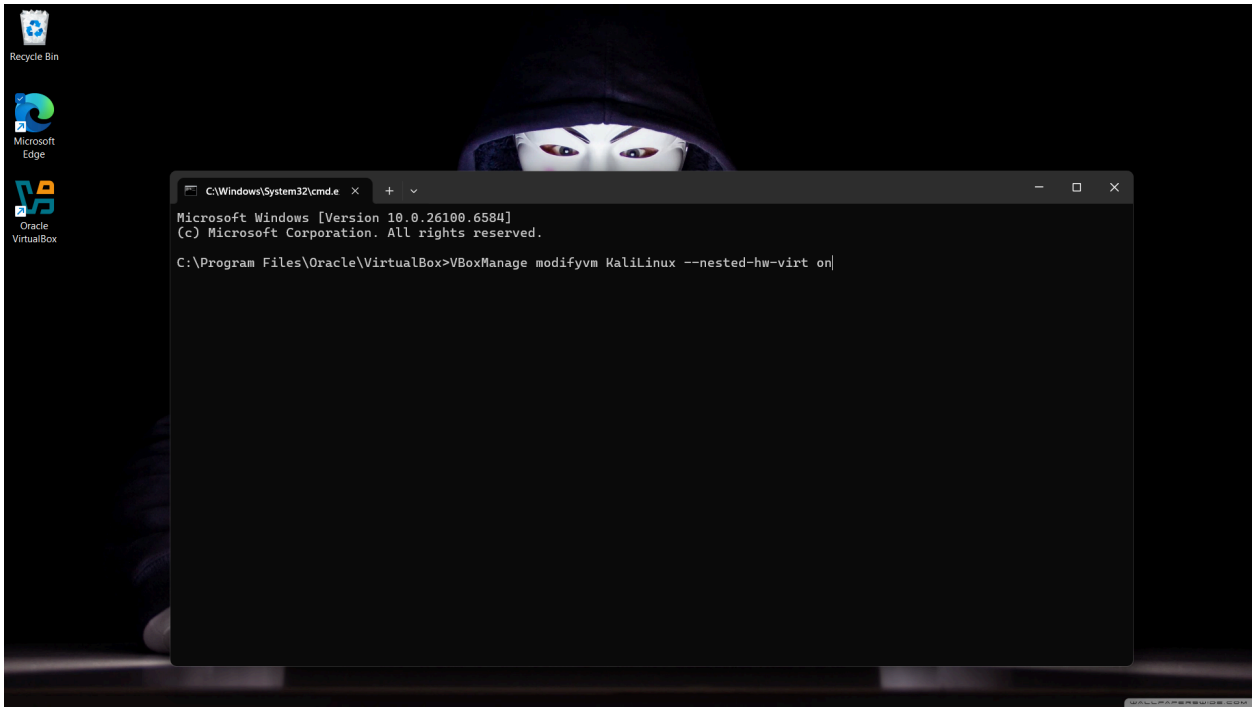
1. Opened VirtualBox → **New VM** → Named it *KaliLinux*.
2. Selected **Linux / Debian (64-bit)** as the system type.
3. Assigned **2 CPU cores** and **4096 MB RAM**.
4. Created an **80 GB virtual hard drive**.
5. Set **Video Memory** to **128 MB** for smoother graphics.
6. Enabled **Bidirectional Clipboard & Drag/Drop** for convenience.
7. Attached the Kali ISO under **Storage → Optical Drive**.

3. Nested Virtualization

To improve VM performance, I enabled **nested VT-x/AMD-V** using CMD:

```
cd "C:\Program Files\Oracle\VirtualBox"
VBoxManage modifyvm "KaliLinux" --nested-hw-virt on
```

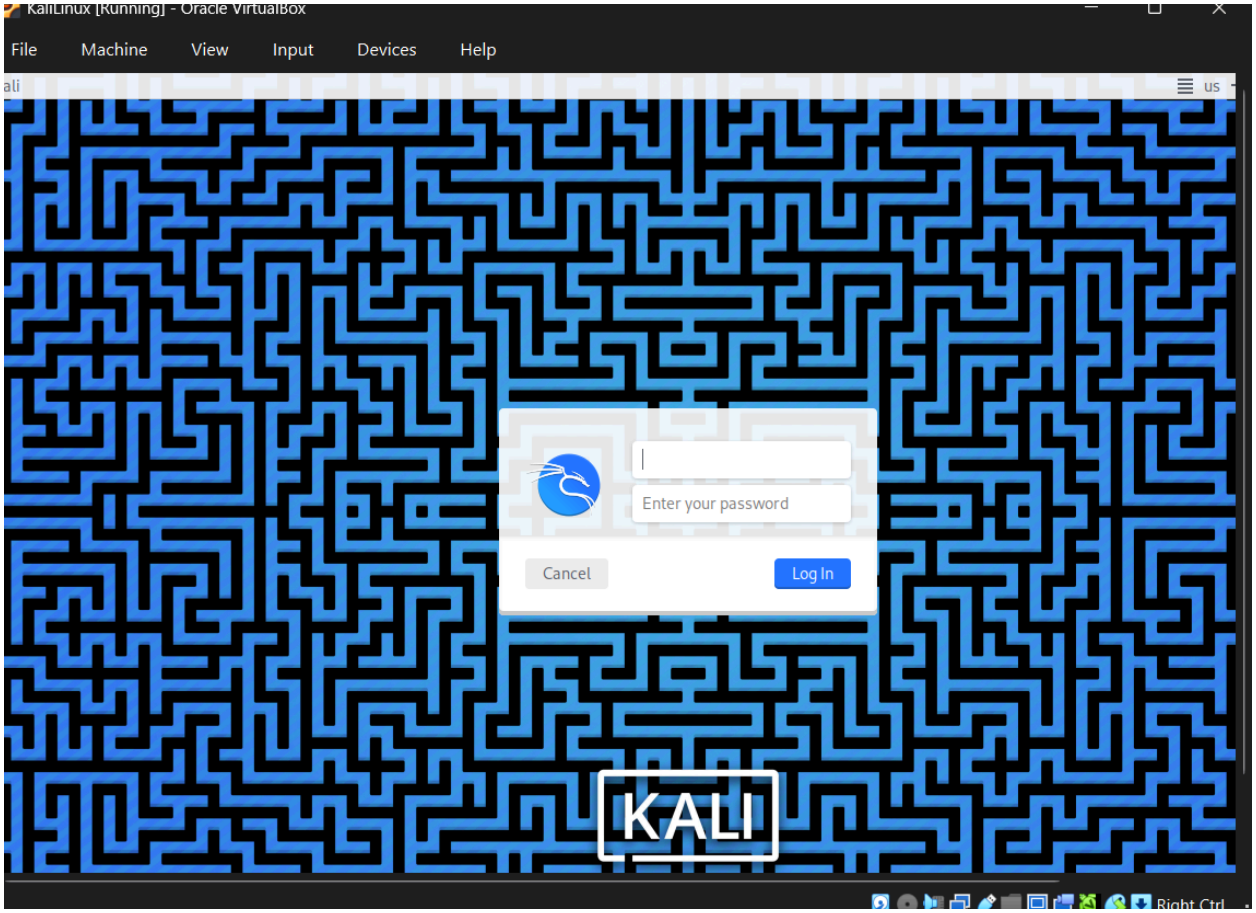

Oracle VirtualBox Manager
File
Machine
Help
New
Open
Settings
Discard
Show
KaliLinux
Running
Details
General
Name: KaliLinux
Operating System: Ubuntu (64-bit)
System
Base Memory: 4096 MB
Processors: 2
Boot Order: Optical, Hard Disk, Floppy, Network
Acceleration: Nested Paging, Nested VT-x/AMD-V, PAE/NX, KVM Paravirtualization
Preview
Display
Video Memory: 128 MB
Graphics Controller: VMSVGA
Remote Desktop Server: Disabled
Recording: Disabled
Storage
Controller: IDE
IDE Primary Device 0: [Optical Drive] Empty
Controller: SATA
SATA Port 0: KaliLinux.vdi (Normal, 80.00 GB)
Audio
Host Driver: Default
Controller: ICH AC97
Network
Adapter 1: Intel PRO/1000 MT Desktop (Bridged Adapter, Intel(R) Wireless-AC 9462)
USB
USB Controller: OHCI, EHCI
Device Filters: 0 (0 active)
Shared folders
None
Description
None


Recycle Bin
Microsoft Edge
Oracle VirtualBox
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.26100.6584]
(c) Microsoft Corporation. All rights reserved.
C:\Program Files\Oracle\VirtualBox>VBoxManage modifyvm KaliLinux --nested-hw-virt on

4. Installation of Kali Linux

1. Booted VM → Selected **Graphical Install**.
2. Choose **language, region, and keyboard layout**.
3. Created a **username and password**.
4. Used **Guided – Entire Disk** for partitioning.
5. Installed system files → Rebooted successfully into Kali Linux.

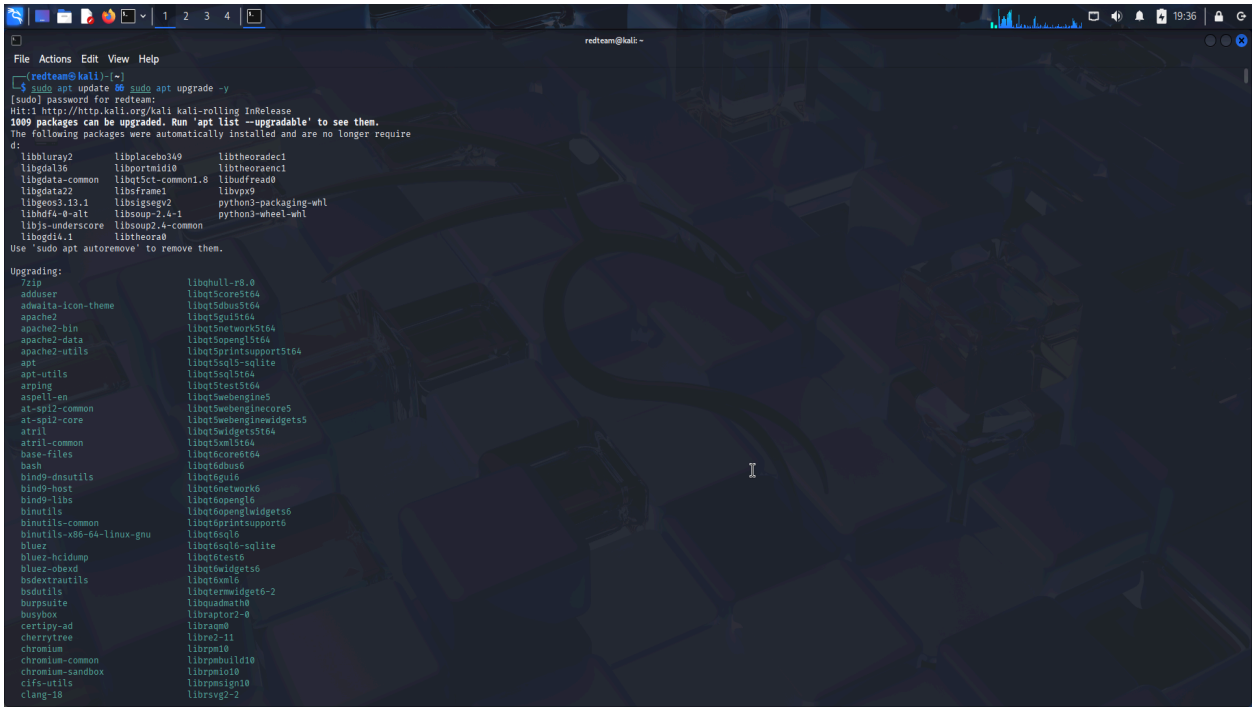
> **Note:** I was focused on completing the installation process and forgot to capture screenshots during these steps. However, I verified the success of the installation by capturing a screenshot of the **login page** after reboot (see below). This confirms that the VM installation was completed correctly.

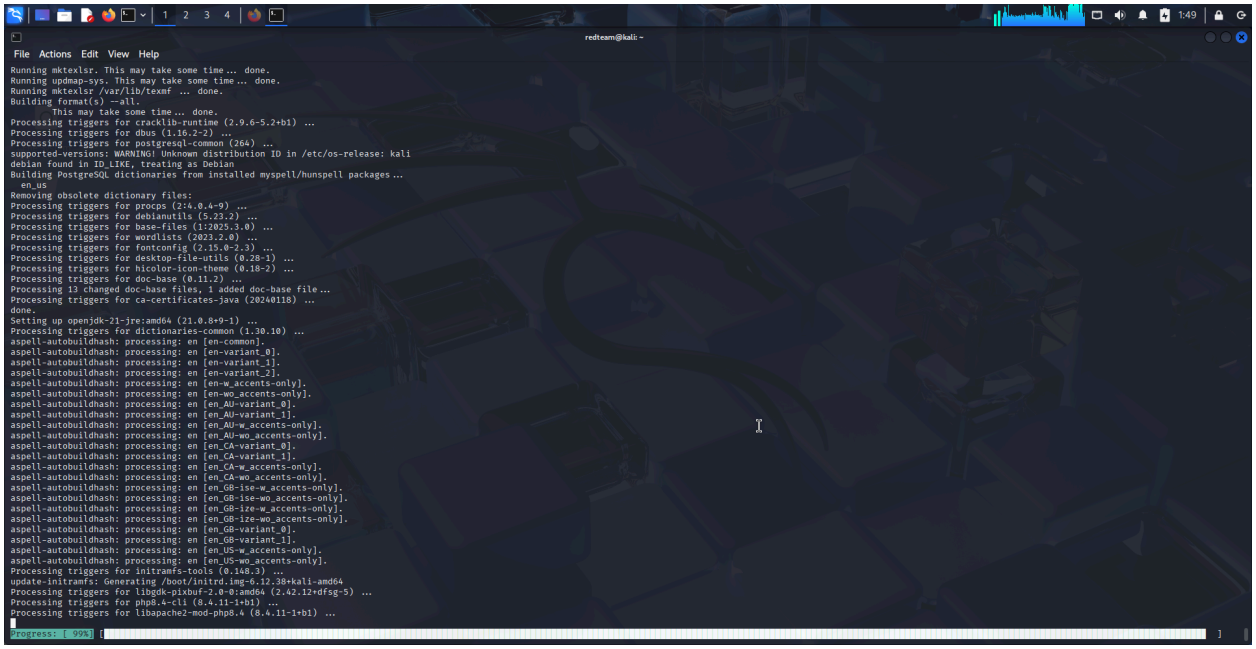


5. Post-Installation Setup

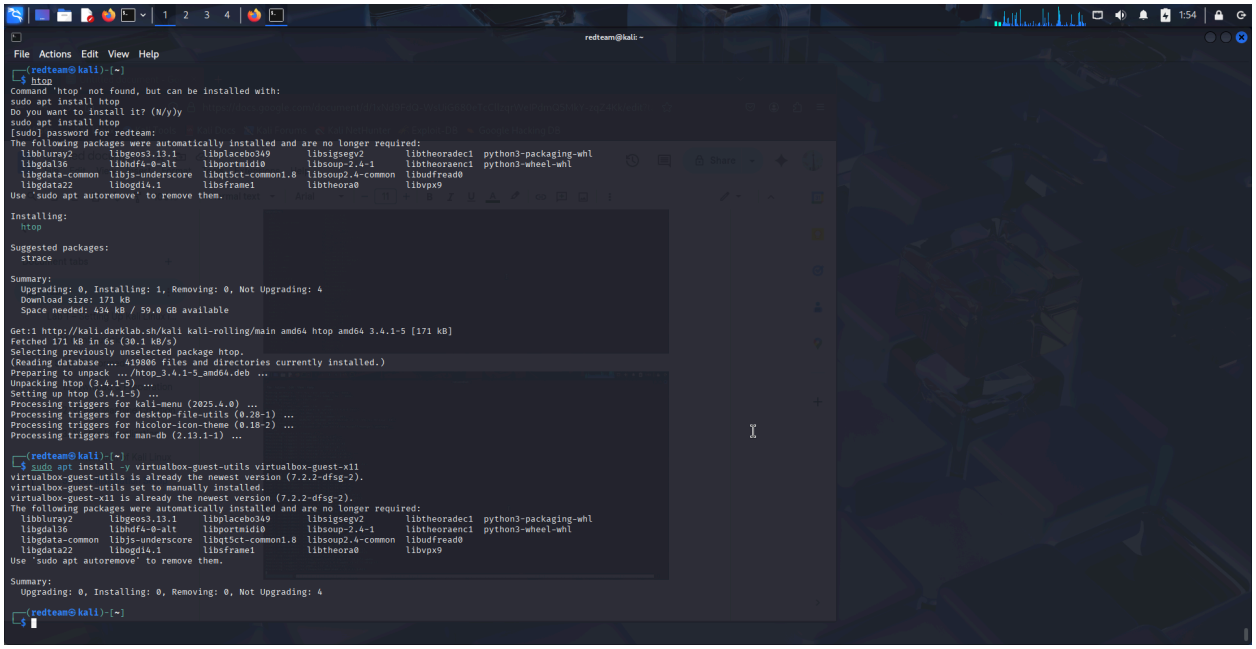
Logged in with the created user and performed system updates:

sudo apt update && sudo apt upgrade -y





6. **VirtualBox Guest Additions : Clipboard Sharing && Darg and Drop Support etc. (Enabled) To check CPU and other Task Manager functionalities like Windows . htop installed.**

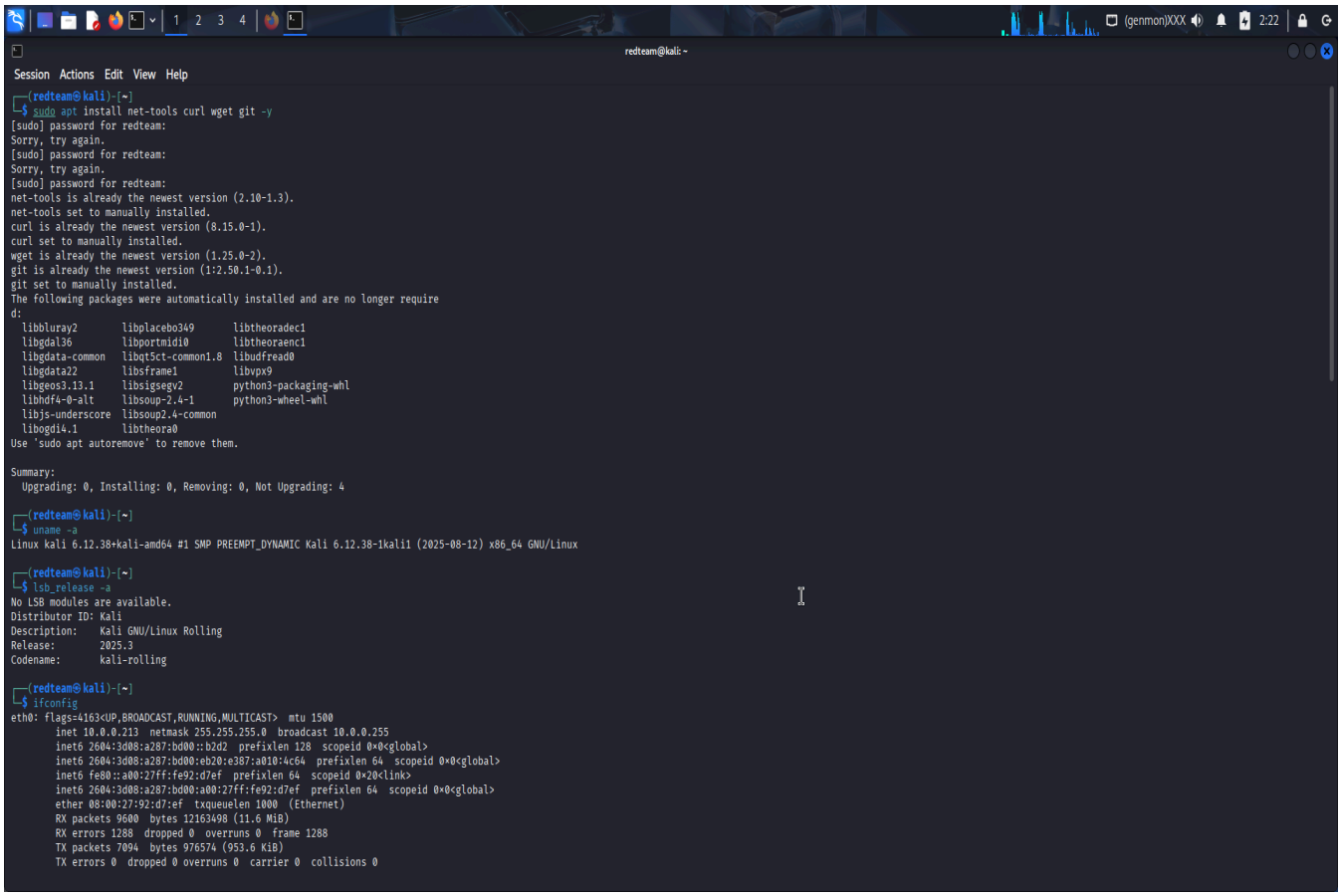


7. System Information & Essential Tools

Theory:

This screenshot shows the system identification and package-install output (uname -a, lsb_release -a, and sudo apt install net-tools curl wget git -y). It confirms the VM is running a recent Kali Rolling kernel and release, and that essential networking and utility tools are present. Verifying kernel and distribution ensures tool compatibility and that the environment is up to date for security work.

What the screenshot evidences: kernel version, distribution (Kali 2025.3), and successful presence of net-tools, curl, wget, and git.



8. Network Configuration

Theory:
Displays the network interfaces with an IPv4 address (10.0.0.213) and global IPv6 addresses. Confirms the VM is connected to the network and ready for network-based tasks.

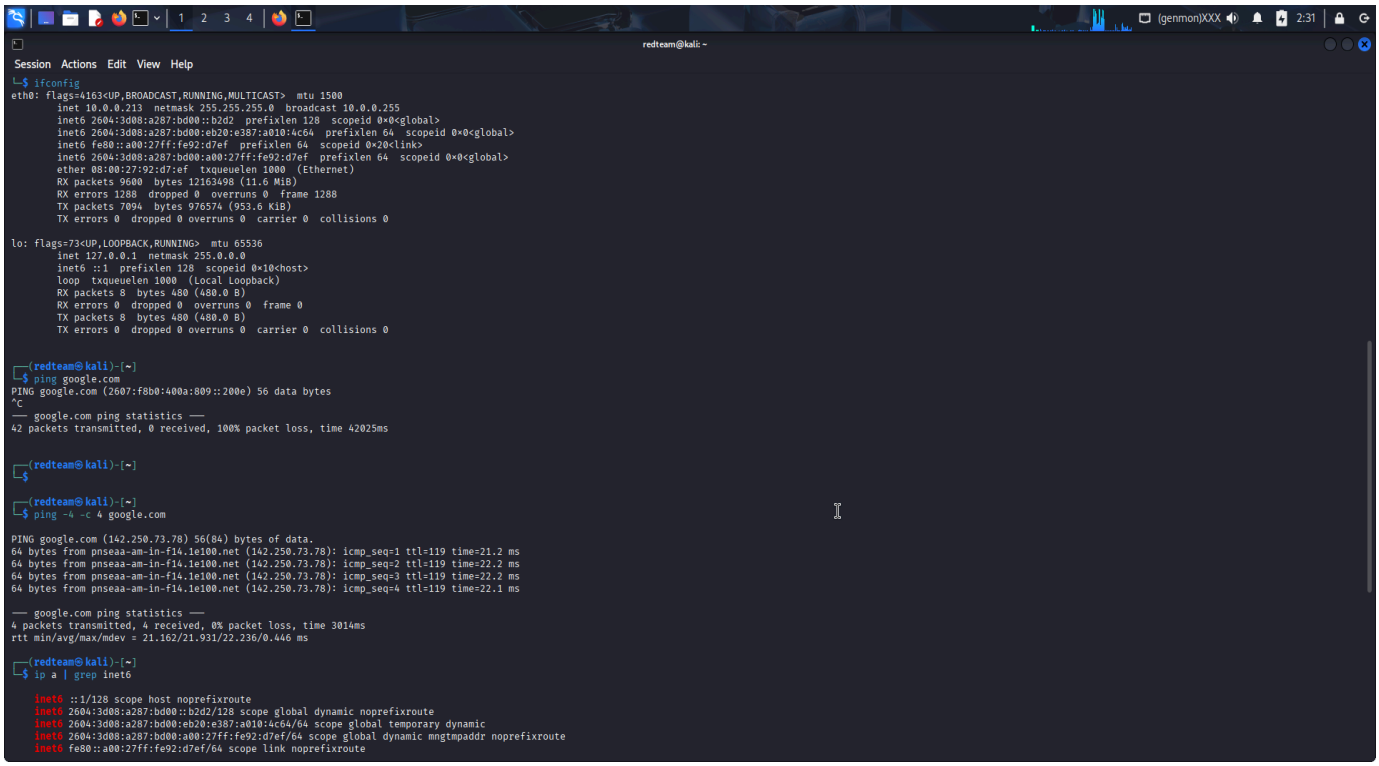
Caption: *Figure 8 — IPv4 and IPv6 network configuration.*

9. Connectivity Test

Theory:
Initial ping to Google failed via IPv6 (100% packet loss), but forcing IPv4 succeeded (`ping -4 -c 4 google.com`). Demonstrates troubleshooting and verifies the VM has working Internet access.

Caption: Figure 8 — Connectivity test showing IPv6 failure and successful IPv4 ping.

Figure8 :



Key takeaways :

Successfully installed Kali Linux in VirtualBox with 2 CPU cores, 4 GB RAM, and 80 GB storage.

- Demonstrated ability to configure VM settings (nested virtualization, bidirectional clipboard) and perform OS installation.
- Performed network troubleshooting: identified IPv6 failure, validated IPv4 connectivity, and documented findings and commands.
- Environment is updated, network-ready, and suitable for subsequent cybersecurity lab

Lab 1 complete. Kali Linux has been successfully installed and configured in VirtualBox. I verified system information, ensured essential utilities are installed, and validated Internet connectivity. While IPv6 name resolution initially failed, IPv4 connectivity is fully functional (0% packet loss), so the VM is ready for updates and penetration-testing labs.