Virtualization

Virtualization :

> **Virtualization** is a technology that allows you to **run multiple operating systems on a single physical computer** — at the same time.

- **Think of it like this**
  - Your real computer (called the **host machine**) creates *virtual computers* (called **virtual machines**) that act like real computers.

Example

Let's say you have **Windows 11** on your laptop.
With virtualization:

- You can **install Kali Linux**, **Ubuntu**, or even **Windows Server** inside your Windows system.

- Each of these runs independently, just like separate computers.

How It Works

Virtualization uses a software called a **hypervisor** (like **VMware**, **VirtualBox**, or **Hyper-V**) that:

1. Divides your real computer's hardware (CPU, RAM, disk).

2. Allocates part of it to each **virtual machine (VM)**.

3. Lets multiple VMs run at the same time — safely and efficiently.

Types of Virtualization

Type	Description	Example
Hardware Virtualization	Runs multiple OSes on one physical machine.	VMware, VirtualBox
Desktop Virtualization	Access your desktop remotely from anywhere.	Citrix, VDI

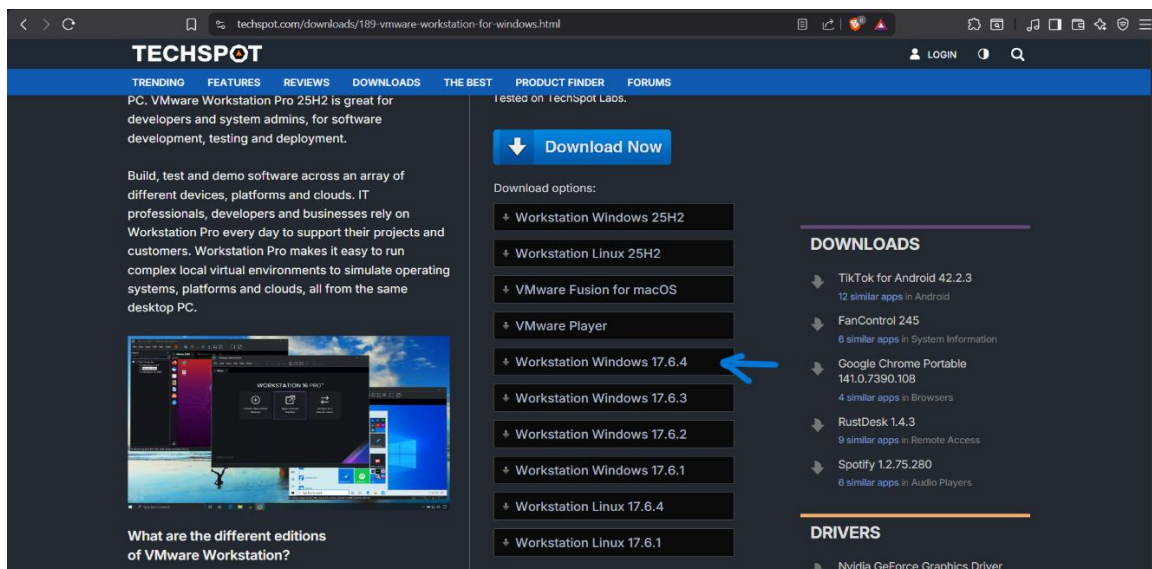| Type	Description	Example
Server Virtualization	One server runs multiple smaller virtual servers.	VMware ESXi
Network Virtualization	Virtual networks built on top of physical ones.	SDN (Software Defined Networking)
Storage Virtualization	Combine multiple storage devices into one.	SAN, NAS

Why It's Useful (Especially in Cybersecurity)

- **Safe testing** – You can test viruses or tools without harming your system.

- **Multiple OS** – Run Windows, Kali Linux, Ubuntu, etc. on one computer.

- **Snapshots** – Save your VM state and restore it anytime.

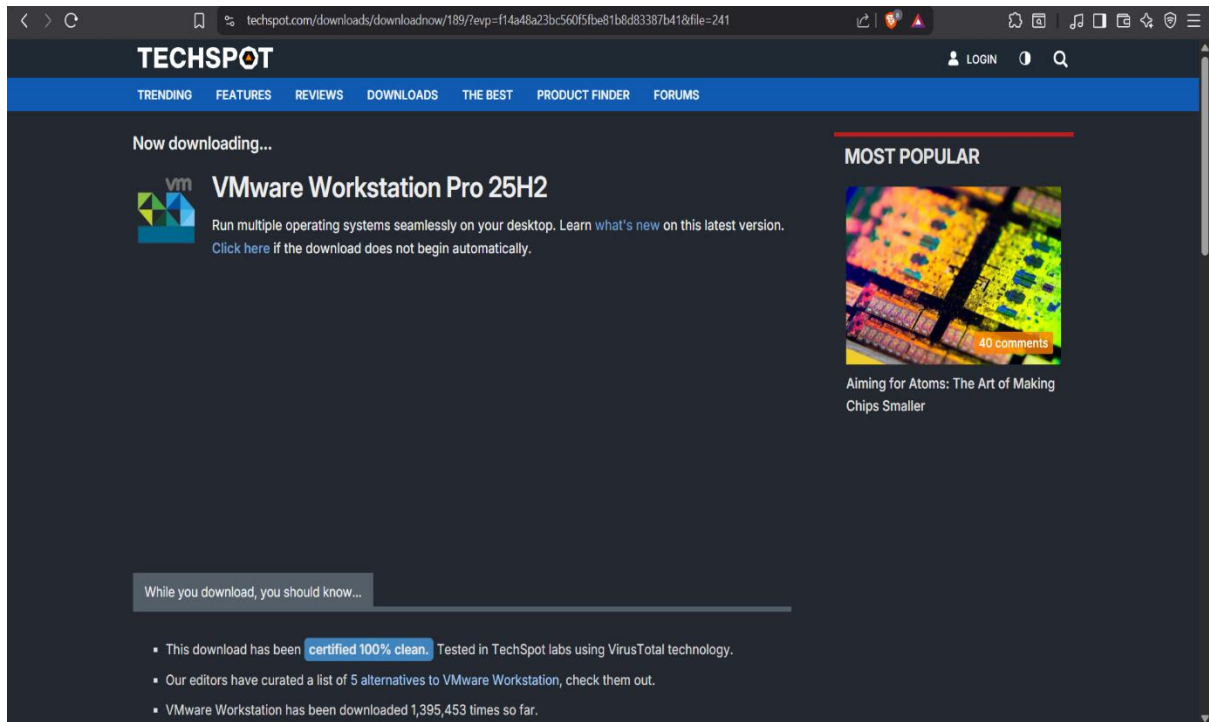- **Isolation** – If malware infects your VM, your main system stays safe.

How to install VMware And Kali Linux :

Step 1 : Open your browser and go to the **VMware Workstation** website click on **Techspot** website show in below diagram.
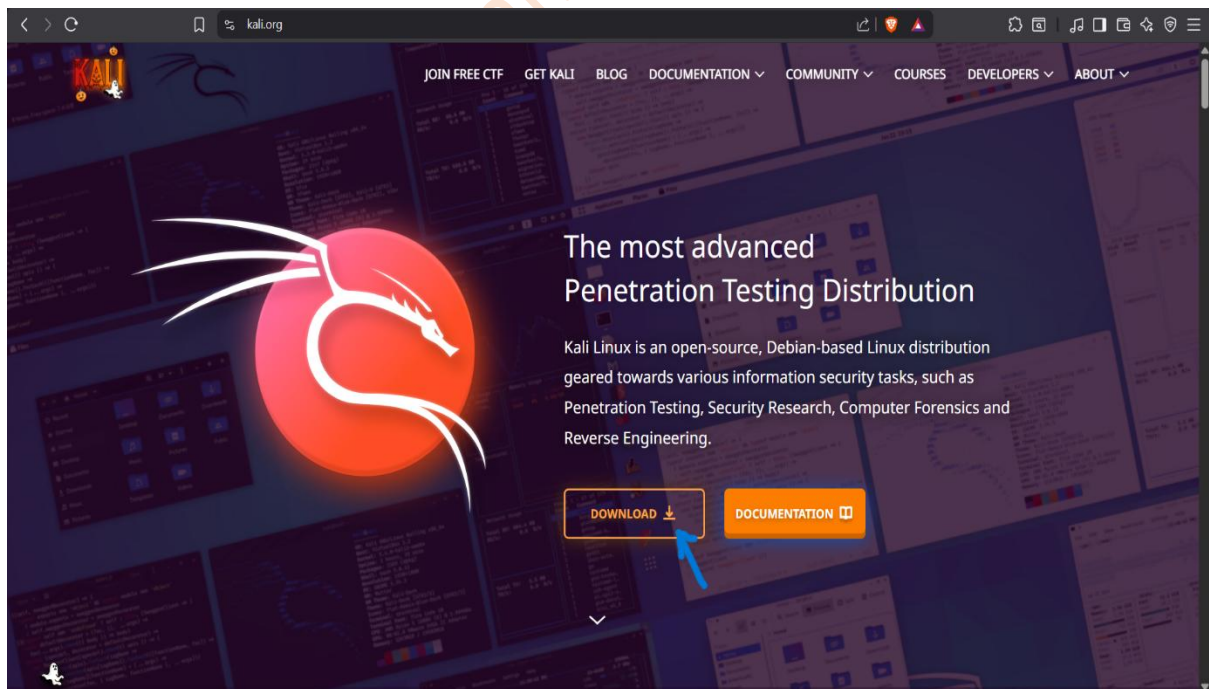
Step 2 : Click on latest version of VMware Workstation after click on this show in diagram.
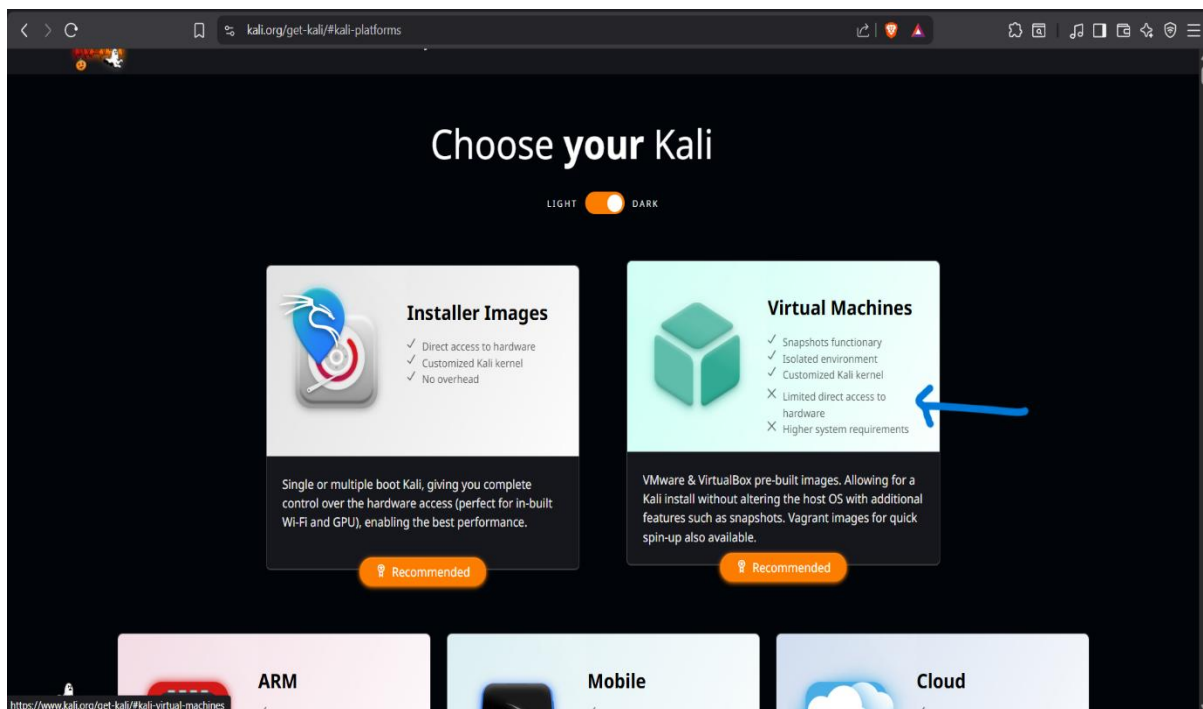
Step 3 : After click on this you see the new web page in this page you see the Downloading is start (show like this page).
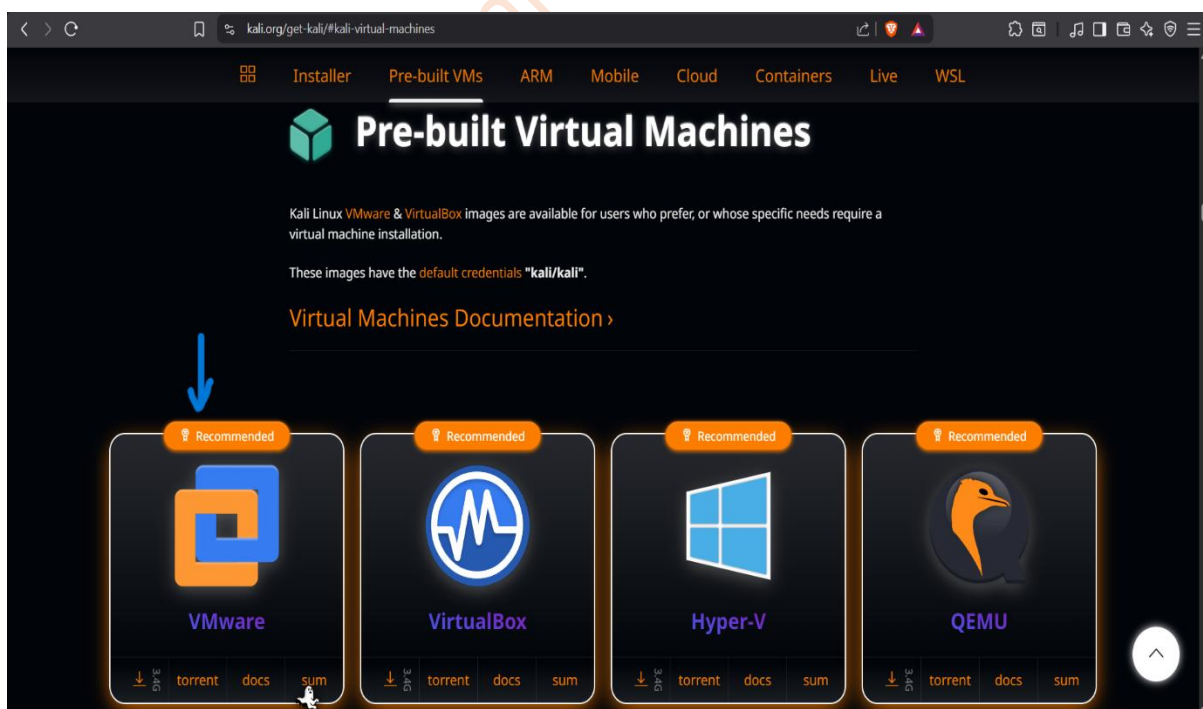

Step 4 : After this we download the **Kali Linux** on **Kali.org** site. This is original site of Kali Linux.
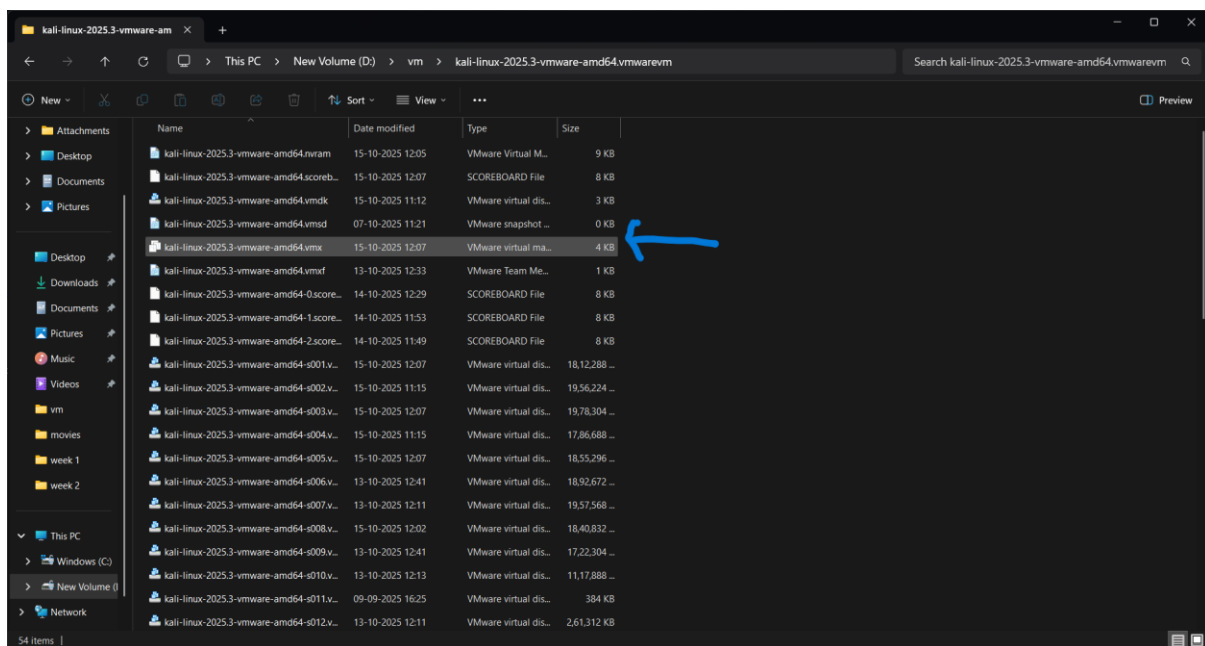
Step 5 : After open the Kali Linux site click on the **download button.** After that you see the this page click on **Virtual Machines.**

Step 6 : After this click on VMware to download this.

Step 7 : After complete both downloads file double click on **VMware file** to open this and setup this .After that extract the **Kali Linux zip** file and open file and click on **.vmx** extension show in below diagram.

Step 8 : After this you see like show in below diagram in this you setup Memory , Processors, You also change Network Adapter NAT into Bridges. Click on Power on this virtual to start the Kali Linux .