



Vulnerability Assessment & System Setup Report

----Arch Linux

--BY: - Vinayak Chauhan

Introduction 😊

Arch Linux is a lightweight and flexible Linux distribution designed for advanced users who want full control over their operating system. It follows a rolling release model, providing the latest software updates continuously. Arch Linux is widely used for learning Linux internals, system customization, and performance optimization.

This report documents the process of downloading, installing, and verifying Arch Linux in a virtual environment using Oracle VirtualBox.

1.1 Objective of the Report:

The objective of this report is to:

- Document the process of downloading Arch Linux
- Explain the installation and configuration steps
- Verify the successful setup of the system
- Provide screenshots and observations for validation
- Ensure the system is installed in a safe and isolated environment

1.2 Scope of the Report

This report covers:

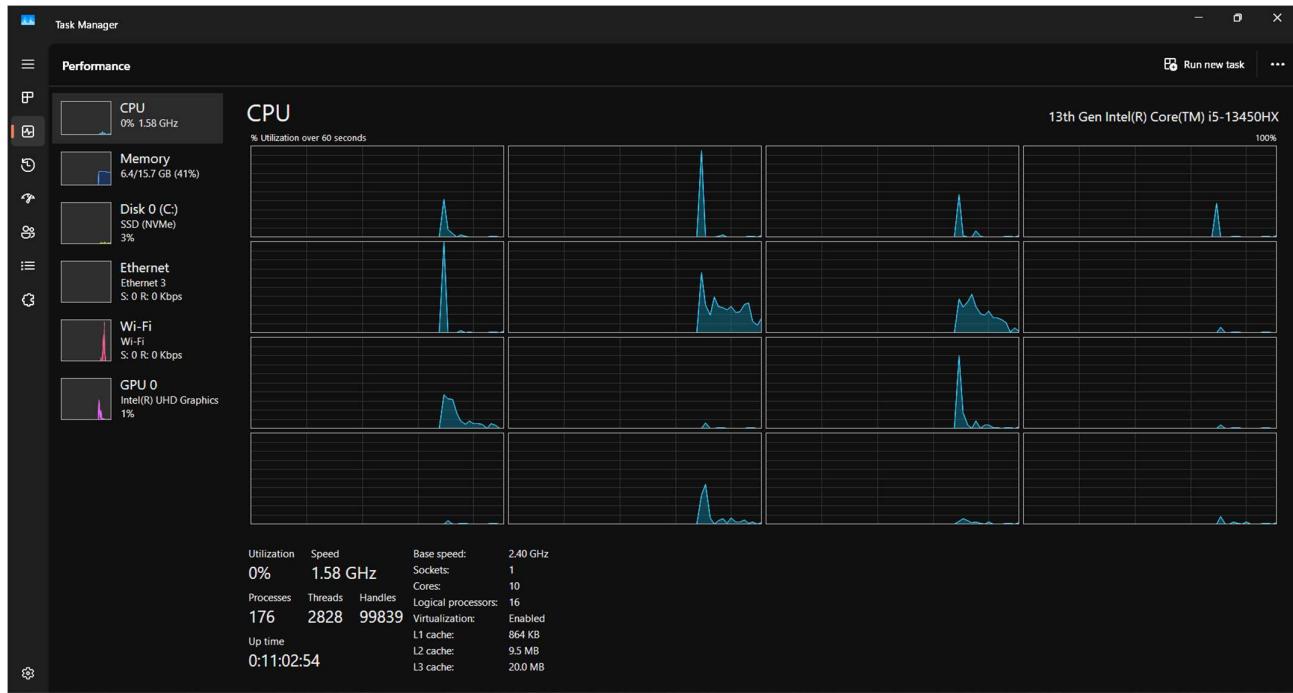
- System requirements for Arch Linux
- Download procedure for required software
- Installation and configuration steps
- Post-installation verification
- Challenges faced and their solutions
- Security considerations

System Requirements

2.1 Hardware Requirements

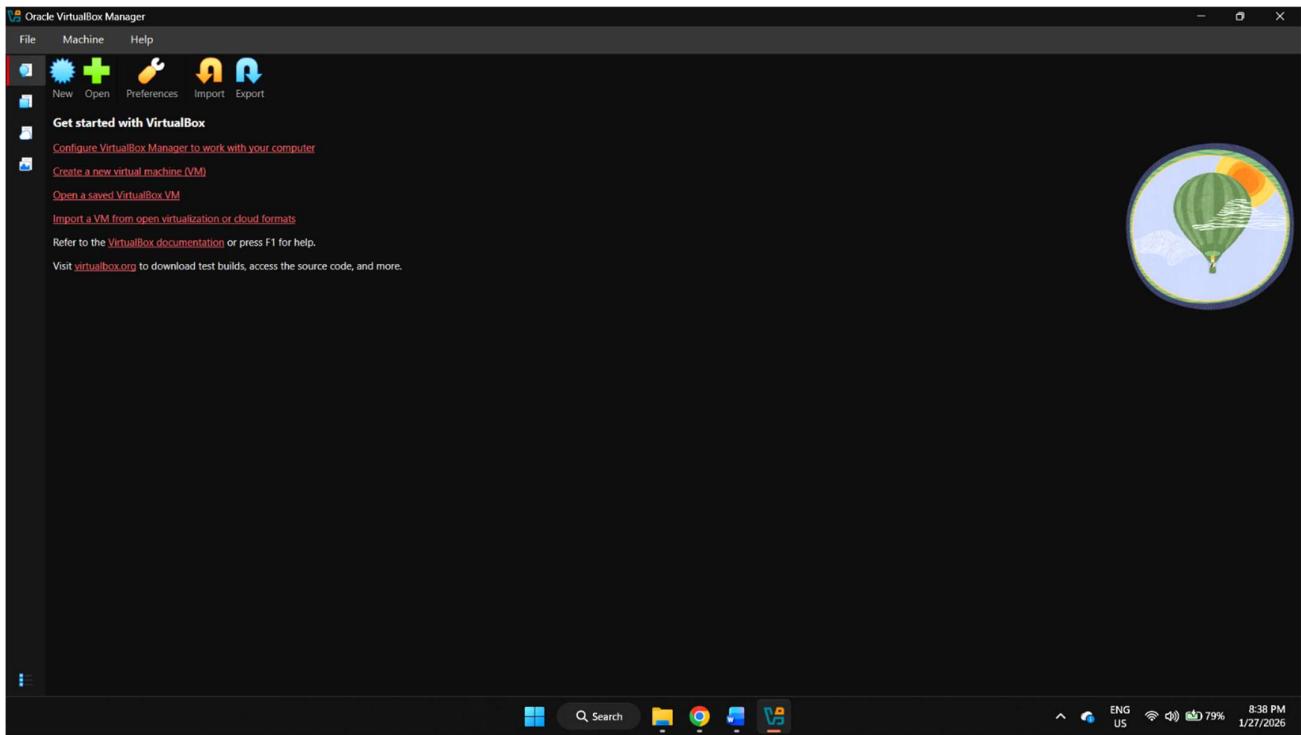
Minimum hardware required:

- **Processor: Intel/AMD 64-bit**
- **RAM: Minimum 2 GB (Recommended: 4 GB)**
- **Storage: Minimum 20 GB free disk space**
- **Virtualization: Enabled in BIOS/UEFI**



2.2 Software Requirements

- Host Operating System: Windows 10 / Windows 11
- Virtualization Software: Oracle VirtualBox
- OS Image: Arch Linux ISO (official source)
- Internet Connection: Required for installation and updates



Download Procedure

3.1 Downloading Oracle VirtualBox

Steps followed:

1. Visited the official Oracle VirtualBox website
2. Selected the Windows host version
3. Downloaded the installer package
4. Installed VirtualBox using default settings

The screenshot shows the official Oracle VirtualBox download page. At the top, there's a navigation bar with links for Home, Download, Documentation, Community, and a search bar. Below the navigation, there's a section titled "Download VirtualBox" with a note about the PUEL license. Two main download options are presented: "VirtualBox Platform Packages" and "VirtualBox Extension Pack". The "Platform Packages" section lists various host operating systems supported by VirtualBox 7.2.4. The "Extension Pack" section contains the license terms and a "Accept and download" button.

VirtualBox Platform Packages

VirtualBox 7.2.4 platform packages

- Windows hosts
- macOS / Intel hosts
- macOS / Apple Silicon hosts
- Linux distributions
- Solaris hosts
- Solaris 11 IPS hosts

Platform packages are released under the terms of the [GPL version 3](#)

VirtualBox Extension Pack

VirtualBox 7.2.4 Extension Pack

This VirtualBox Extension Pack Personal Use and Educational License governs your access to and use of the VirtualBox Extension Pack. It does not apply to the VirtualBox base package and/or its source code, which are licensed under version 3 of the GNU General Public License ("GPL").

See our [FAQ](#) for answers to common questions.

VirtualBox Extension Pack Personal Use and Educational License (PUEL)

[PUEL License FAQ](#) [PUEL License Text](#) [Accept and download](#)

Icon after successfully downloading virtual box

The icon is a black square with a white "V" logo in the center. Below the logo, the text "VirtualBox-7.2.4-1 70995-Win.exe" is displayed.

3.2 Downloading the Operating System Image

Steps followed:

1. Visited the official Arch Linux website
2. Downloaded the latest Arch Linux ISO file
3. Verified that the ISO was downloaded successfully

Source used: <https://archlinux.org>

The screenshot shows the 'Arch Linux Downloads' section of the official Arch Linux website. It includes sections for 'Release Info', 'Existing Arch Users', 'BitTorrent Download (recommended)', 'Netboot', and 'Docker image'. A large image of an ISO file is displayed on the left.

Release Info
The image can be burned to a DVD, mounted as an ISO file, or be [directly written to a USB flash drive](#). It is intended for new installations only, an existing Arch Linux system can always be updated with `pacman -Syu`.
Images for installing Arch can be downloaded via [BitTorrent](#) or right here in your browser from one of the [Arch HTTP\(S\) mirrors down below](#).

- Current Release: 2026.01.01
- Included Kernel: 6.18.2
- ISO Size: 1.4 GB
- Installation Guide
- Resources:
 - Issue tracker
 - Mailing List

Existing Arch Users
If you are an existing Arch user, there is no need to download a new ISO to update your existing system. You may be looking for [an updated mirrorlist](#) instead.

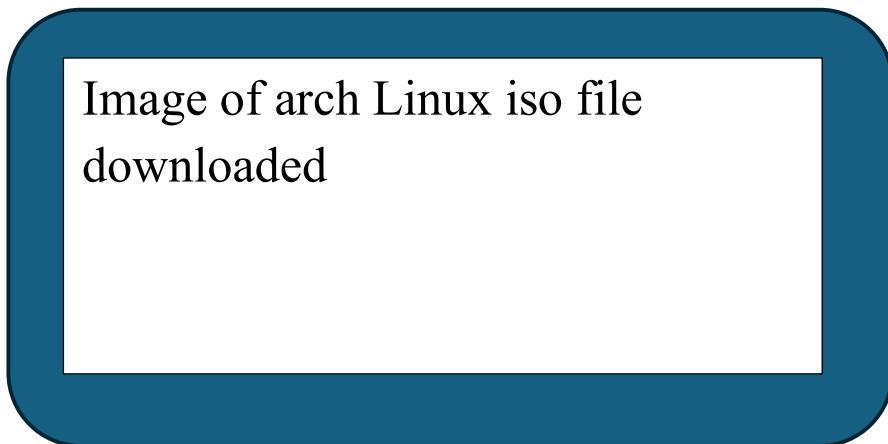
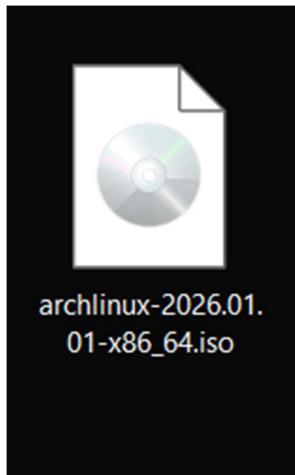
BitTorrent Download (recommended)
If you can spare the bytes, please leave the client open after your download is finished, so you can seed it back to others.
A DHT capable client is required. A WebSeed capable client is recommended for fastest download speeds.

- Magnet link for 2026.01.01
- Torrent for 2026.01.01

Netboot
If you have a wired connection, you can boot the latest release directly over the network.

- [Arch Linux Netboot](#)

Docker image
The official Docker image is available on [Docker Hub](#). You can run the image with the following command:

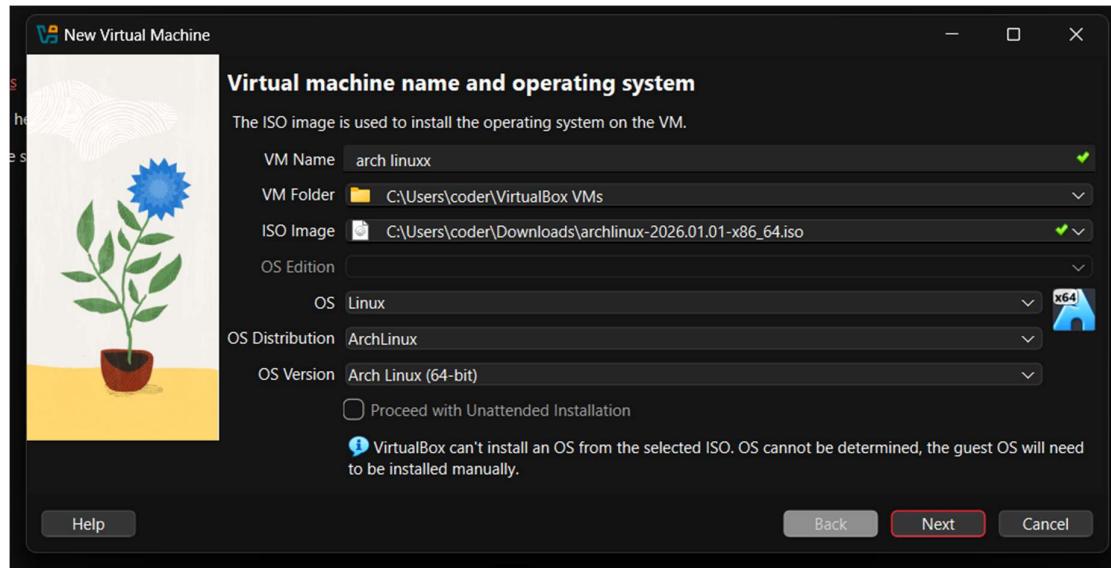


Installation and Configuration

4.1 Virtual Machine Creation

Steps followed:

1. Opened Oracle VirtualBox
2. Clicked on New to create a virtual machine
3. Set name as Arch Linux
4. Selected Type: Linux
5. Selected Version: Arch Linux (64-bit)

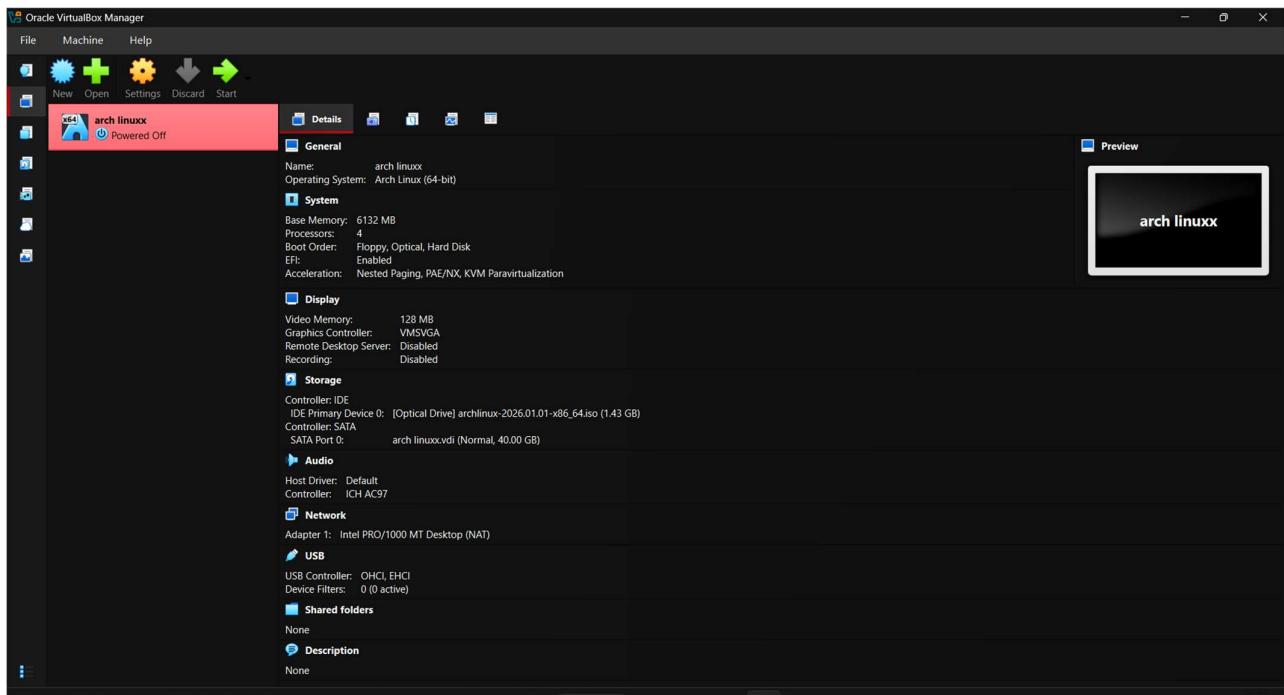
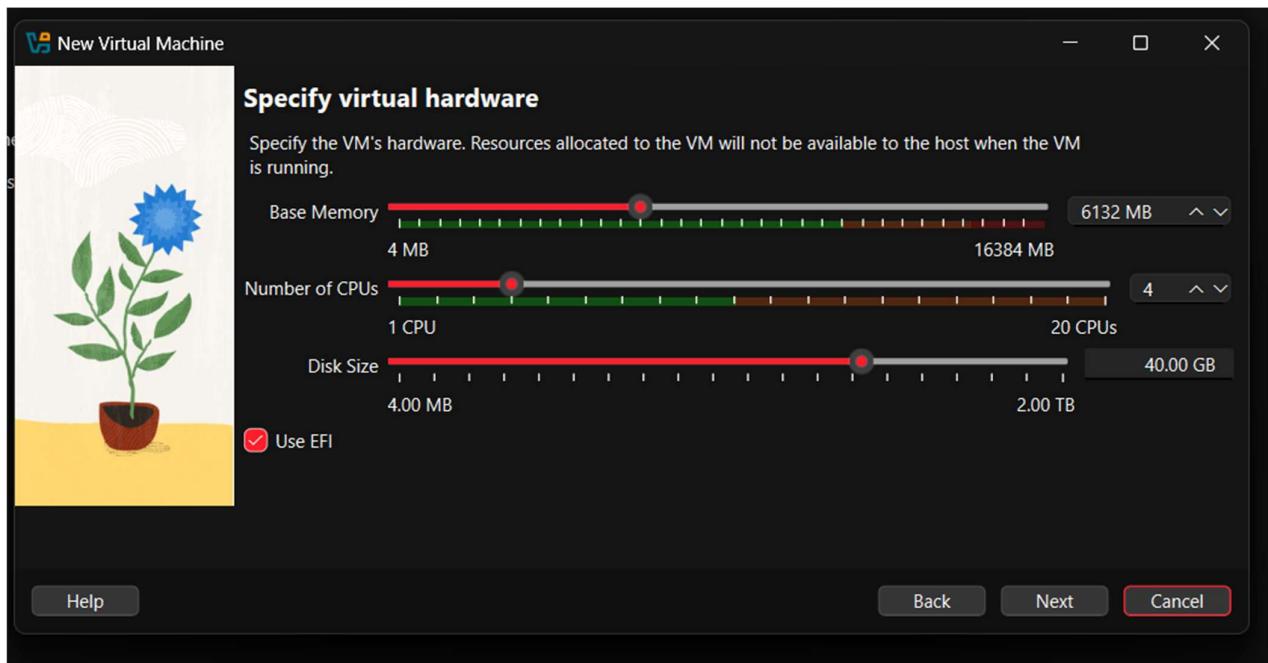


4.2 Resource Allocation (RAM, CPU, Storage)

Resources assigned:

- **RAM: 6132 MB (6 GB)**
- **CPU Cores: 4**
- **Storage Type: Virtual Hard Disk (VDI)**
- **Disk Size: 40 GB**

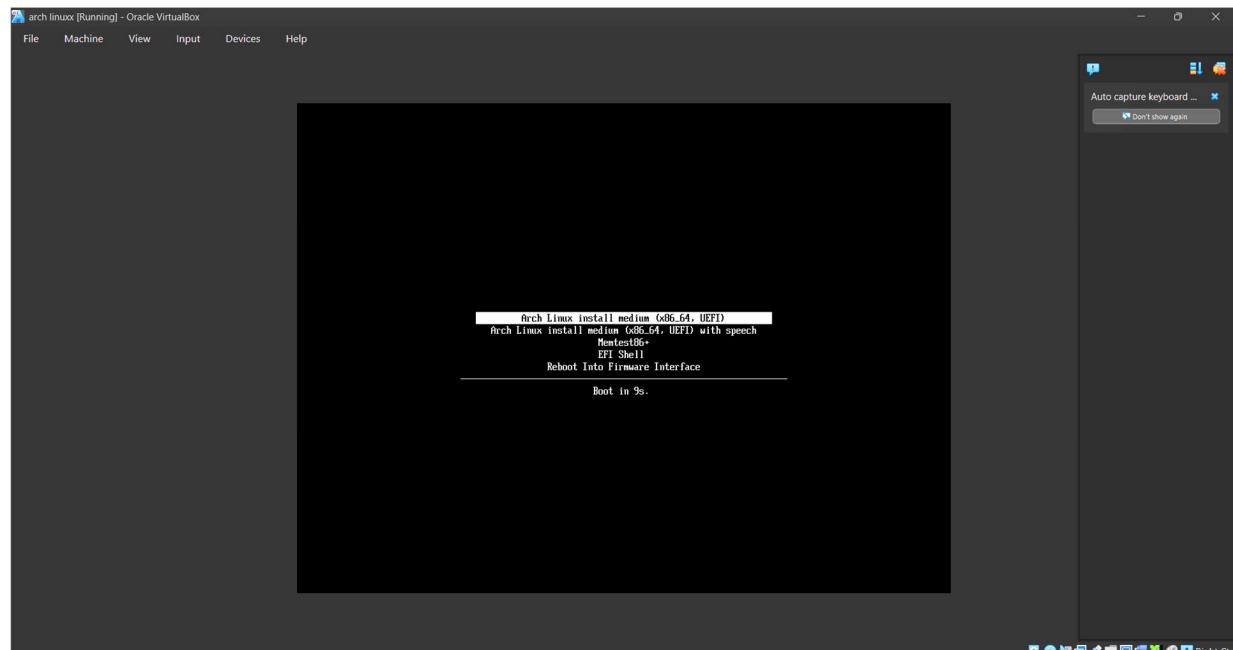
These resources were allocated to ensure smooth installation and performance.

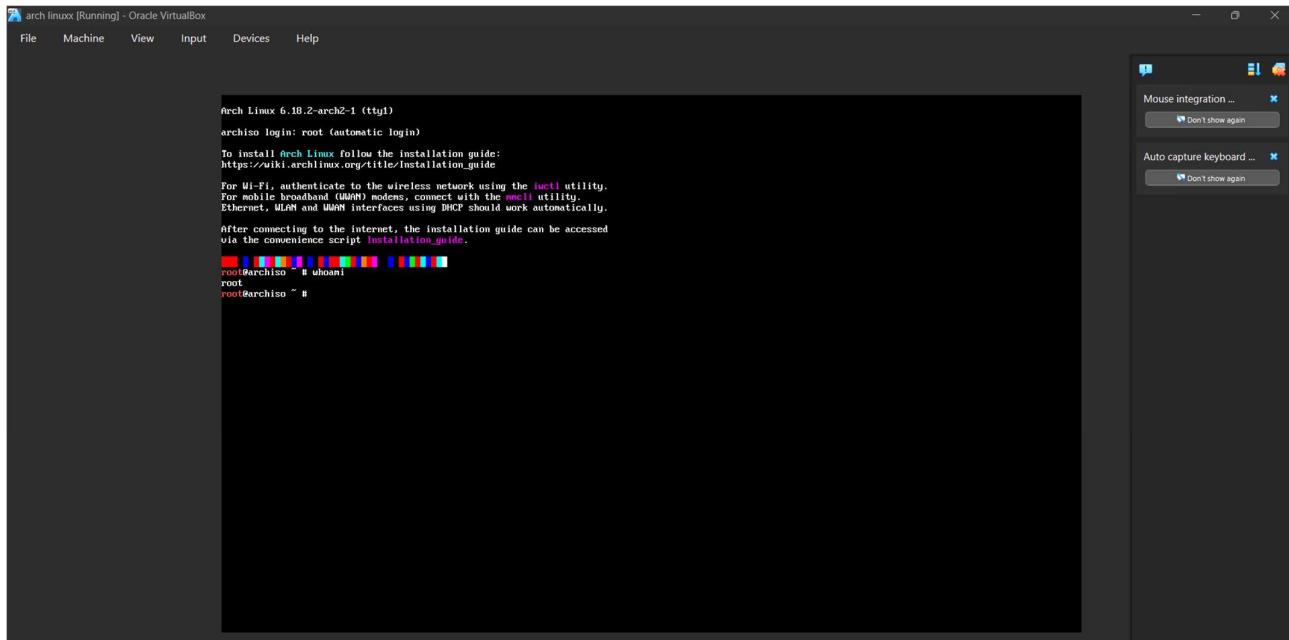
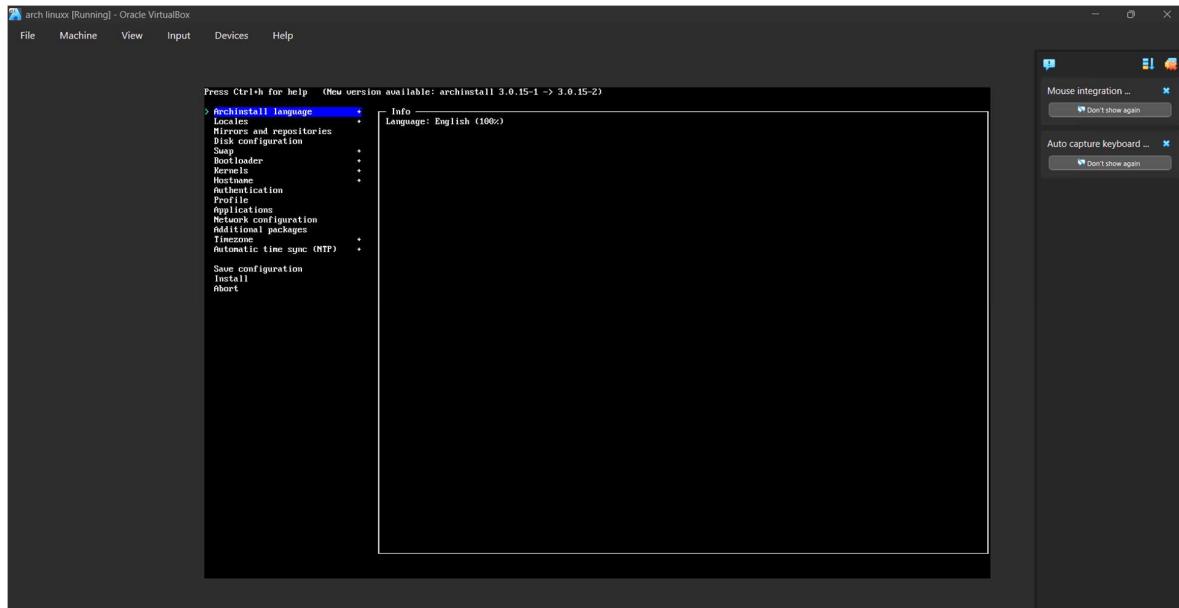


4.3 Operating System Installation Steps

Steps followed:

1. Attached Arch Linux ISO to VM
2. Started the virtual machine
3. Booted into Arch Linux live environment
4. Verified internet connection
5. Partitioned the disk
6. Installed base system
7. Configured time zone, locale, and bootloader
8. Set root password and created a user
9. Rebooted into installed Arch Linux

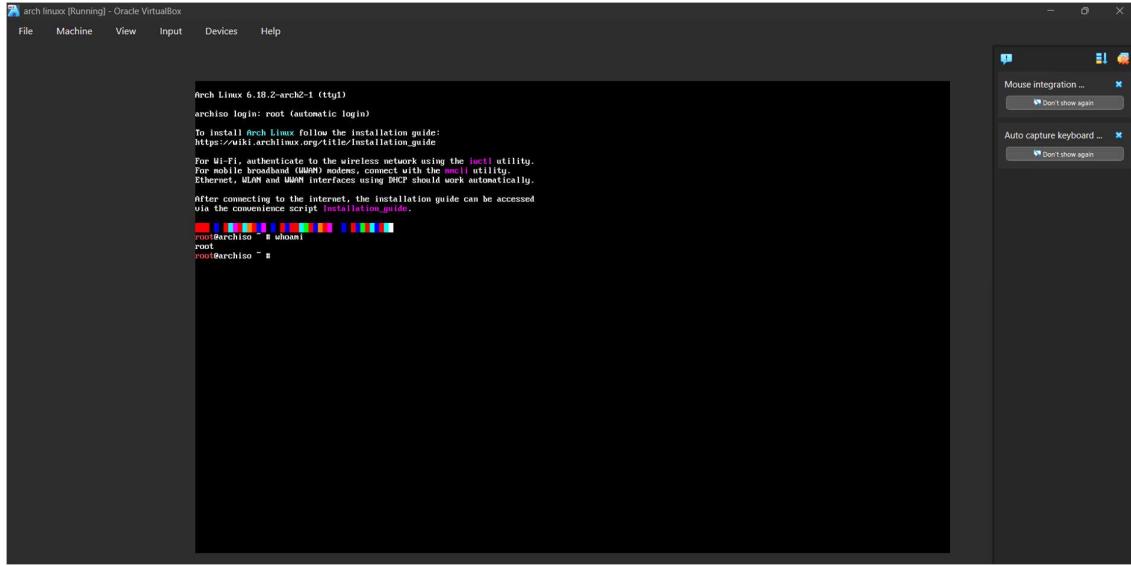




Post-Installation Verification

5.1 Successful Boot Verification

The system booted successfully into Arch Linux after installation without errors.



```
Arch Linux 6.18.2-arch2-1 (tty1)
archiso login: root (automatic login)

To install Arch Linux follow the installation guide:
https://wiki.archlinux.org/title/installation_guide

For Wi-Fi, authenticate to the wireless network using the iwctl utility.
For mobile broadband (WMM) modems, connect with the modem utility.
Ethernet, WLAN and WWAN interfaces using DHCP should work automatically.

After connecting to the internet, the installation guide can be accessed
via the convenience script installation_guide.

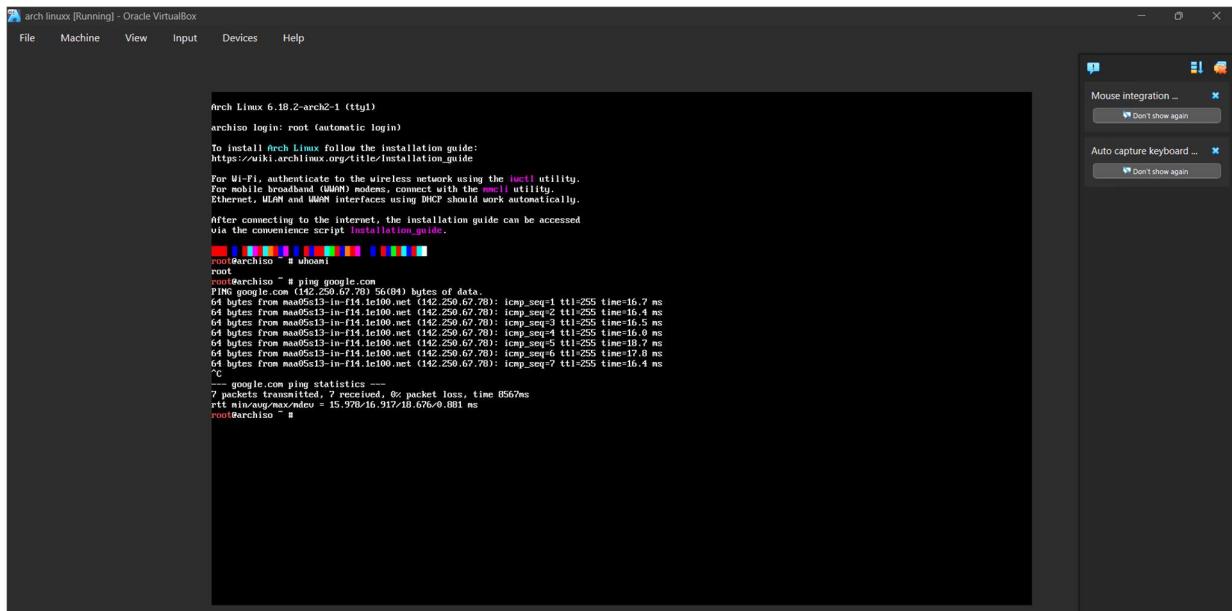
root@archiso ~ # whoami
root
root@archiso ~ #
```

5.2 Network Connectivity Verification

The system was tested for internet connectivity using ping and browser access.

Command used:

“Ping google.com”



```
Arch Linux 6.18.2-arch2-1 (tty1)
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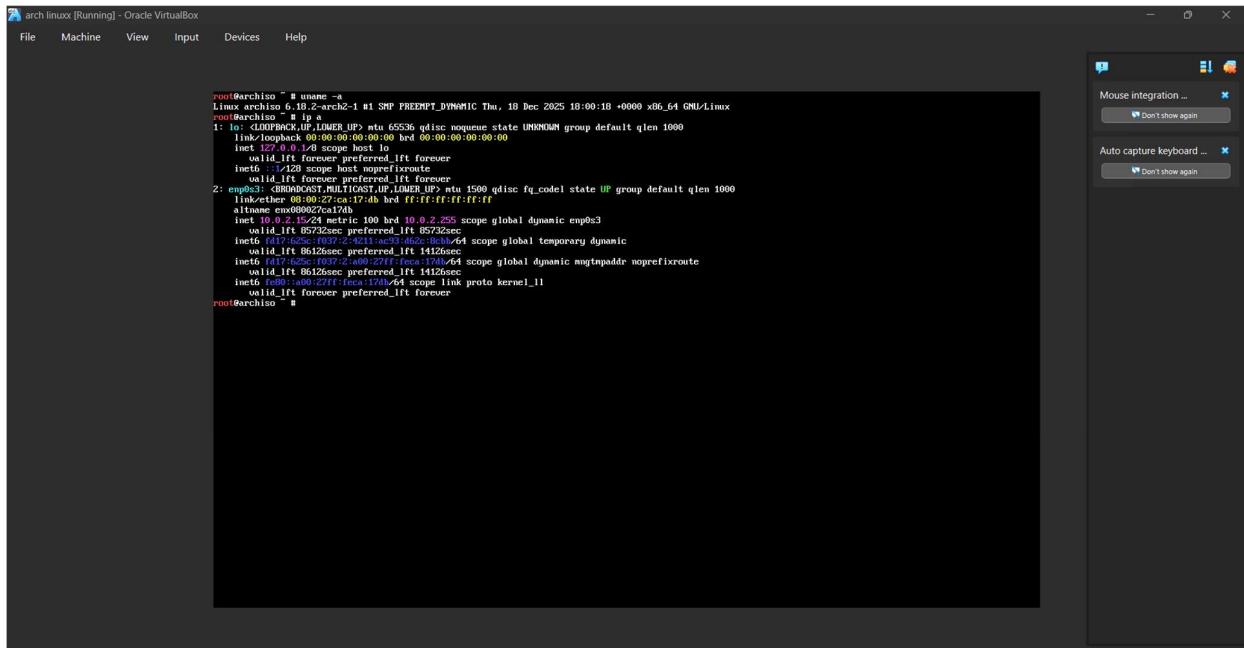
After connecting to the internet, the installation guide can be accessed
via the convenience script installation_guide.

root@archiso ~ # ping google.com
PING google.com (142.250.67.70) 56(94) bytes of data.
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=1 ttl=255 time=16.4 ms
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=2 ttl=255 time=16.4 ms
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=3 ttl=255 time=16.4 ms
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=4 ttl=255 time=16.0 ms
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=5 ttl=255 time=16.7 ms
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=6 ttl=255 time=17.0 ms
64 bytes from mad0:ffff-in-f14.1c100.net (142.250.67.70): icmp_seq=7 ttl=255 time=16.4 ms
...
--- google.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 8567ms
rtt min/avg/max/mdev = 15.978/16.917/18.076/0.881 ms
root@archiso ~ #
```

5.3 System Information Verification

System details verified:

- **OS Name: Arch Linux**
- **Kernel Version: Checked using uname -a**
- **IP Address: Checked using Ip -a**



The screenshot shows a terminal window titled "arch linux [Running] - Oracle VirtualBox". The window contains a command-line session where the user runs "uname -a" and "ip a". The output of "uname -a" shows the kernel version as "Linux archiso 6.18.2-arch2-1 #1 SMP PREEMPT_DYNAMIC Thu, 18 Dec 2025 10:00:18 +0000 x86_64 GNU/Linux". The output of "ip a" lists network interfaces and their configurations, including IPv4 and IPv6 addresses, broadcast addresses, and link layer addresses.

```
root@archiso ~ $ uname -a
Linux archiso 6.18.2-arch2-1 #1 SMP PREEMPT_DYNAMIC Thu, 18 Dec 2025 10:00:18 +0000 x86_64 GNU/Linux
root@archiso ~ $ ip a
1: lo: <loopback,NOFORWARD,NOQUEUE,NODISC> brd 00:00:00:00:00:00 state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host brd 00:00:00:00:00:00
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: empg0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> brd 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:27:ca:17:ab brd ff:ff:ff:ff:ff:ff
    altlink/ether 00:0c:27:ca:17:ab brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 metric 10 brd 10.0.2.255 scope global dynamic empg0s3
        valid_lft 85732sec preferred_lft 85732sec
    inet6 fe80::100c:27ff:fea17ab/64 scope link
        valid_lft forever preferred_lft forever
    inet6 (e17:625c:1037:2:a00:27ff:fea17ab/64 scope global dynamic
            noptmpaddr noprefixroute
        valid_lft 86126sec preferred_lft 14126sec
    inet6 (e17:625c:1037:2:a00:27ff:fea17ab/64 scope link proto kernel_ll
        valid_lft forever preferred_lft forever
root@archiso ~ $
```

Observations

- Arch Linux installation requires manual configuration
 - The system runs efficiently with minimal resources
 - Rolling updates ensure latest packages
 - Provides excellent learning experience for Linux internals
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Challenges Faced and Solutions

7.1 Errors Encountered

Issue	Cause
VM not starting	Virtualization disabled
Internet not working	Network adapter misconfiguration
Boot error	Bootloader configuration issue

7.2 Troubleshooting Steps

Issue	Solution
Enabled virtualization	BIOS settings updated
Fixed internet	Adapter set to NAT
Boot issue fixed	Reinstalled GRUB bootloader

Security Considerations

- Arch Linux was installed from official sources only
 - The system is used in an isolated virtual environment
 - Regular updates reduce vulnerability risks
 - Firewall and user permissions improve system security
 - No real-world systems were harmed during setup
-

Conclusion

This project successfully demonstrated the process of installing and configuring Arch Linux in a virtual machine. The activity helped improve understanding of virtualization, Linux installation, system configuration, and security best practices. Arch Linux proves to be a powerful platform for learning and experimentation.

References

- Arch Linux Official Website – <https://archlinux.org>
- Oracle VirtualBox Documentation – <https://www.virtualbox.org>
- Arch Wiki – <https://wiki.archlinux.org>