

# Preparation for Lab 2

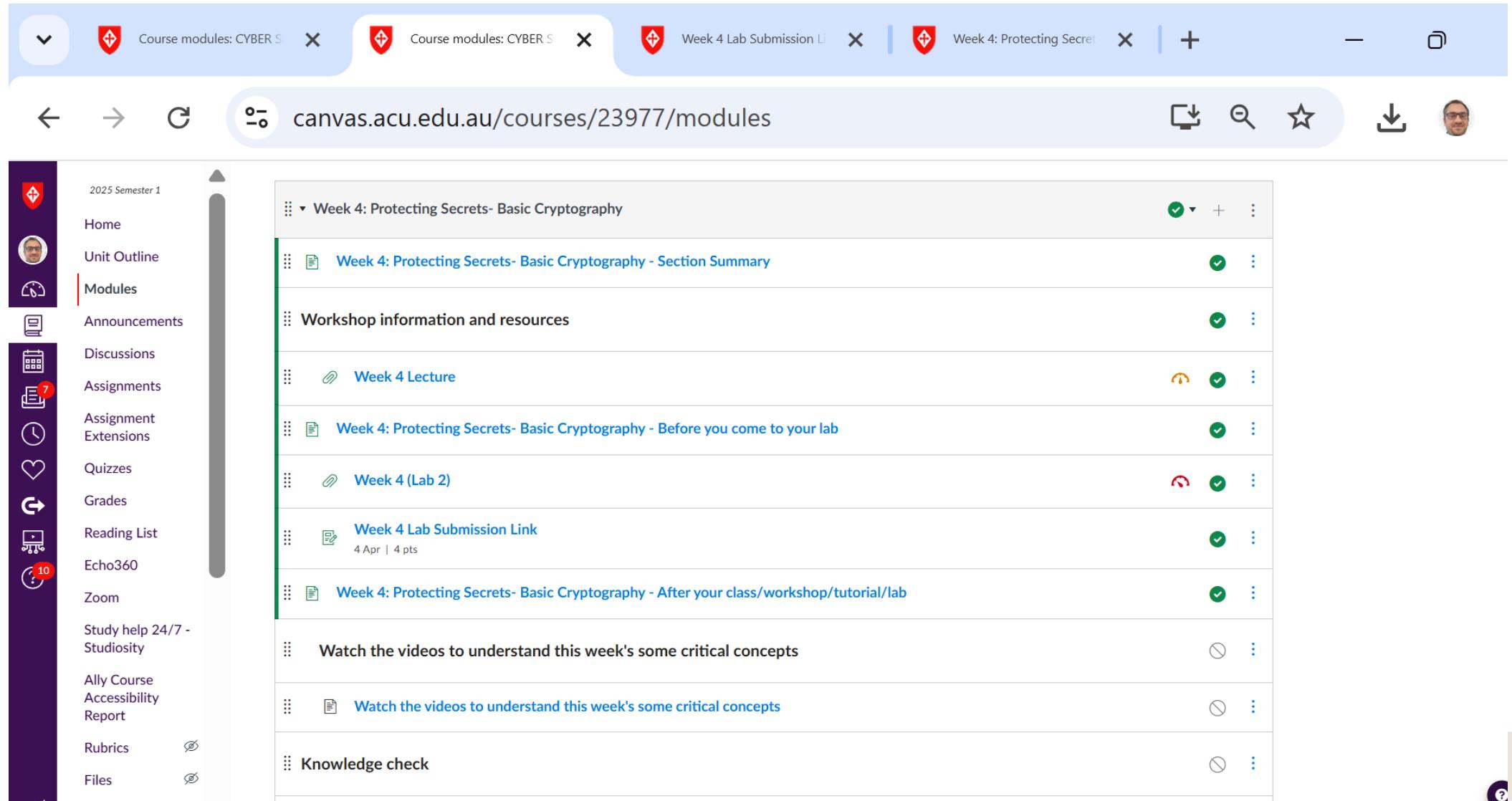
**Week 4**

Semester 1, 2025

Dr. Farshid Keivanian

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Navigate Canvas >> Week 4 >> Lab 2 (submit a word document with screenshot)



The screenshot shows a web browser window with four tabs open:

- Course modules: CYBER S
- Course modules: CYBER S
- Week 4 Lab Submission Link
- Week 4: Protecting Secrets- Basic Cryptography

The address bar shows the URL: canvas.acu.edu.au/courses/23977/modules

The sidebar on the left lists various course sections and tools:

- 2025 Semester 1
- Home
- Unit Outline
- Modules** (selected)
- Announcements
- Discussions
- Assignments
- Assignment Extensions
- Quizzes
- Grades
- Reading List
- Echo360
- Zoom
- Study help 24/7 - Studiosity
- Ally Course Accessibility Report
- Rubrics
- Files

The main content area displays the following list of activities for Week 4:

- Week 4: Protecting Secrets- Basic Cryptography
  - Week 4: Protecting Secrets- Basic Cryptography - Section Summary
  - Workshop information and resources
  - Week 4 Lecture
  - Week 4: Protecting Secrets- Basic Cryptography - Before you come to your lab
  - Week 4 (Lab 2)
  - Week 4 Lab Submission Link (4 Apr | 4 pts)
  - Week 4: Protecting Secrets- Basic Cryptography - After your class/workshop/tutorial/lab
- Watch the videos to understand this week's some critical concepts
  - Watch the videos to understand this week's some critical concepts
- Knowledge check

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## Introduction

Today, we will work with **VirtualBox** and **Kali Linux** to set up a virtual machine (VM) for penetration testing and security analysis. This lab will guide you step-by-step through installing VirtualBox and setting up Kali Linux.

## What is VirtualBox?

VirtualBox is an open-source tool developed by **Oracle** that allows users to create and run multiple operating systems on a single computer. It supports Windows, macOS, and Linux machines.

## Why Use VirtualBox?

- Runs multiple OS environments on one device
- Isolates software for testing and development
- Useful for penetration testing and ethical hacking

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## What Are We Doing in This Lab?

This lab is about **setting up a virtual environment** where we can run **Kali Linux** inside **Oracle VirtualBox** on our Windows computer.

This means:

- We don't need to install Kali Linux directly on our main computer.
  - Instead, we create a **virtual machine (VM)** that runs Kali Linux **inside** Windows, like an app.
  - This allows us to experiment with **cybersecurity tools** in Kali Linux without affecting our main operating system.

## What is Oracle VirtualBox Manager?

- Oracle VirtualBox is a **virtualization software**.
- It allows us to run **multiple operating systems (like Kali Linux) inside our computer**.
- Think of it like a **computer inside our computer**.
- Instead of buying a separate computer for Kali Linux, we use **VirtualBox to create a virtual computer**.

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## Main Purpose of VirtualBox in this Lab:

- To **install and run Kali Linux** in a safe, isolated environment.

## What is Kali Linux?

- **Kali Linux** is a special operating system designed for **penetration testing, cybersecurity, and ethical hacking**.
- It comes with **many security tools** used by cybersecurity professionals.
- Kali Linux is **based on Linux**, meaning it looks and works differently from Windows.

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## Main Purpose of Kali Linux in this Lab:

- To practice **cybersecurity skills** in a controlled environment.
- To explore tools that help in **ethical hacking, network security, and system security**.

## How Do VirtualBox and Kali Linux Work Together?

**VirtualBox is the software that runs Kali Linux as a virtual machine.**

Here's the relationship step-by-step:

### 1. We install VirtualBox on Windows.

- This gives us the ability to create virtual computers.

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## 2. We download and install Kali Linux inside VirtualBox.

- Instead of installing it directly on our computer, we install it inside a **virtual machine**.

## 3. Now, we can use Kali Linux within VirtualBox.

- We can open VirtualBox → Start Kali Linux → Use it without affecting our Windows system.

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## Installing VirtualBox

Follow these steps to install VirtualBox:

1. Download VirtualBox from the official website:

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

We should choose the "**Windows hosts**" option if we are installing VirtualBox on a **Windows machine**. If we are using **macOS**, we choose either "**macOS / Intel hosts**" or "**macOS / Apple Silicon hosts**", depending on our system.

For Linux users, we select "**Linux distributions**".

Kali Linux can absolutely run on macOS —you can use it with **VirtualBox** for macOS or **UTM (for Apple Silicon chips)**.

There are two recommended solutions:

## Option 1: Use VirtualBox (Intel Mac)

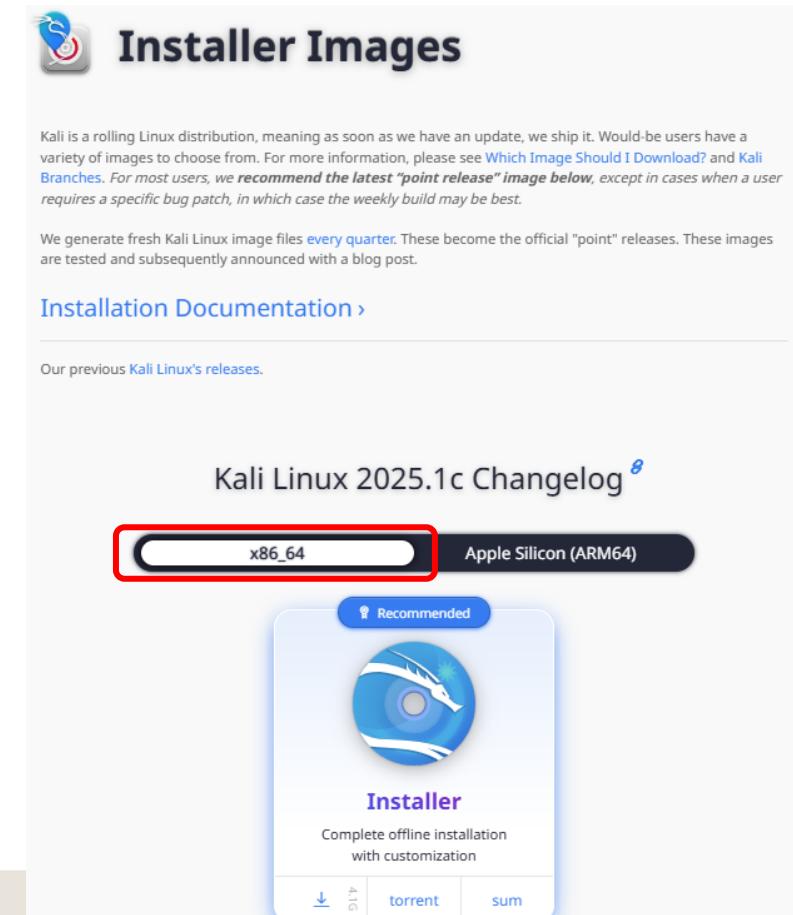
If your Mac has an Intel processor, you can continue using VirtualBox:

1. Download the **Kali Linux ISO (Installer)** version from the official Kali Downloads page. (suitable for Intel-based Macs running VirtualBox)
  2. Set it up as a new VM in VirtualBox.
  3. Follow the same steps provided for Windows users in the Week 8 lab guide.
- ✓ Make sure to choose the "**Installer**" ISO for your architecture (**amd64** for Intel Macs).
- ✗ Do **not** use the Live or NetInstaller versions for lab-based VirtualBox installation.

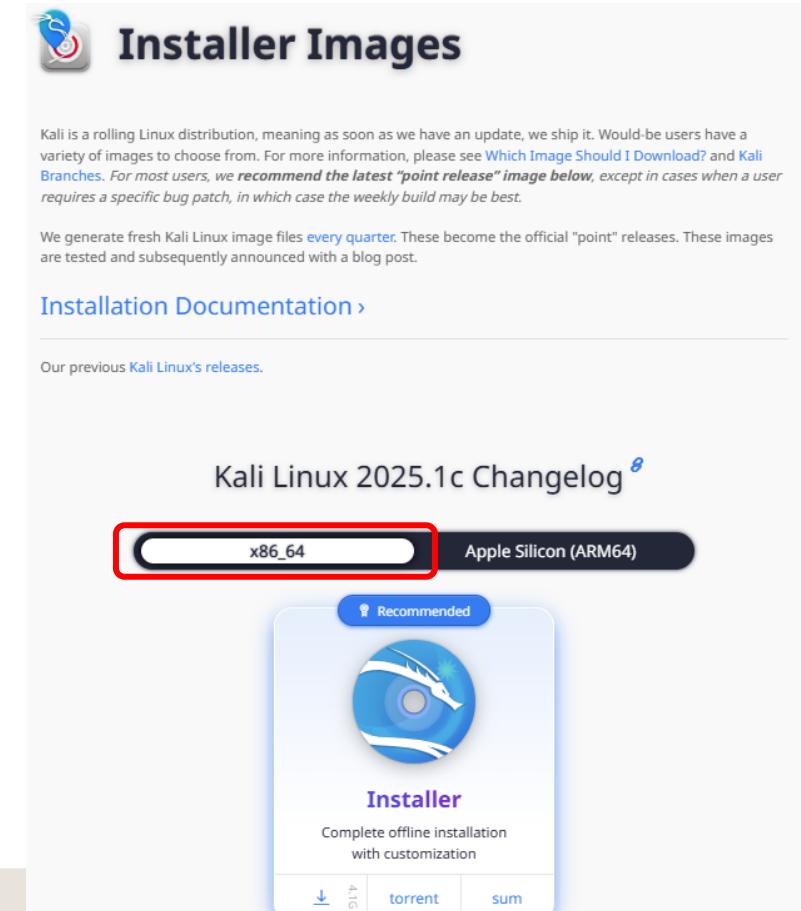
You should download the **Installer Image for x86\_64 architecture**, which is compatible with VirtualBox on Intel Macs.

**Link to download (Installer Image):**

<https://www.kali.org/get-kali/#kali-installer-images>



- Choose **x86\_64** (not Apple Silicon), then download the **Installer ISO** file.
- This version allows full installation with customization via VirtualBox.



The screenshot shows the "Installer Images" section of the Kali Linux website. It features a logo of a blue and red shield with a white dragon. The title "Installer Images" is displayed in bold. Below the title, there is a brief description of Kali Linux as a rolling distribution and links to "Which Image Should I Download?" and "Kali Branches". A note for users recommends the latest "point release" image unless a specific bug patch is required. The main content area shows two options: "x86\_64" (which is highlighted with a red box) and "Apple Silicon (ARM64)". Below these options is a large image of the Kali Linux installer ISO file, which has a blue and white design with a dragon logo. Text below the image states "Installer Complete offline installation with customization". At the bottom, there are download links for "download", "torrent", and "sum".

**If you are using an Apple Silicon (M1, M2, M3) Mac:**

VirtualBox may not work properly. In this case, option 2 is recommend:

- Download UTM from <https://mac.getutm.app/>
- Then use the **ARM64 image** from this page:

<https://www.kali.org/get-kali/#kali-arm>

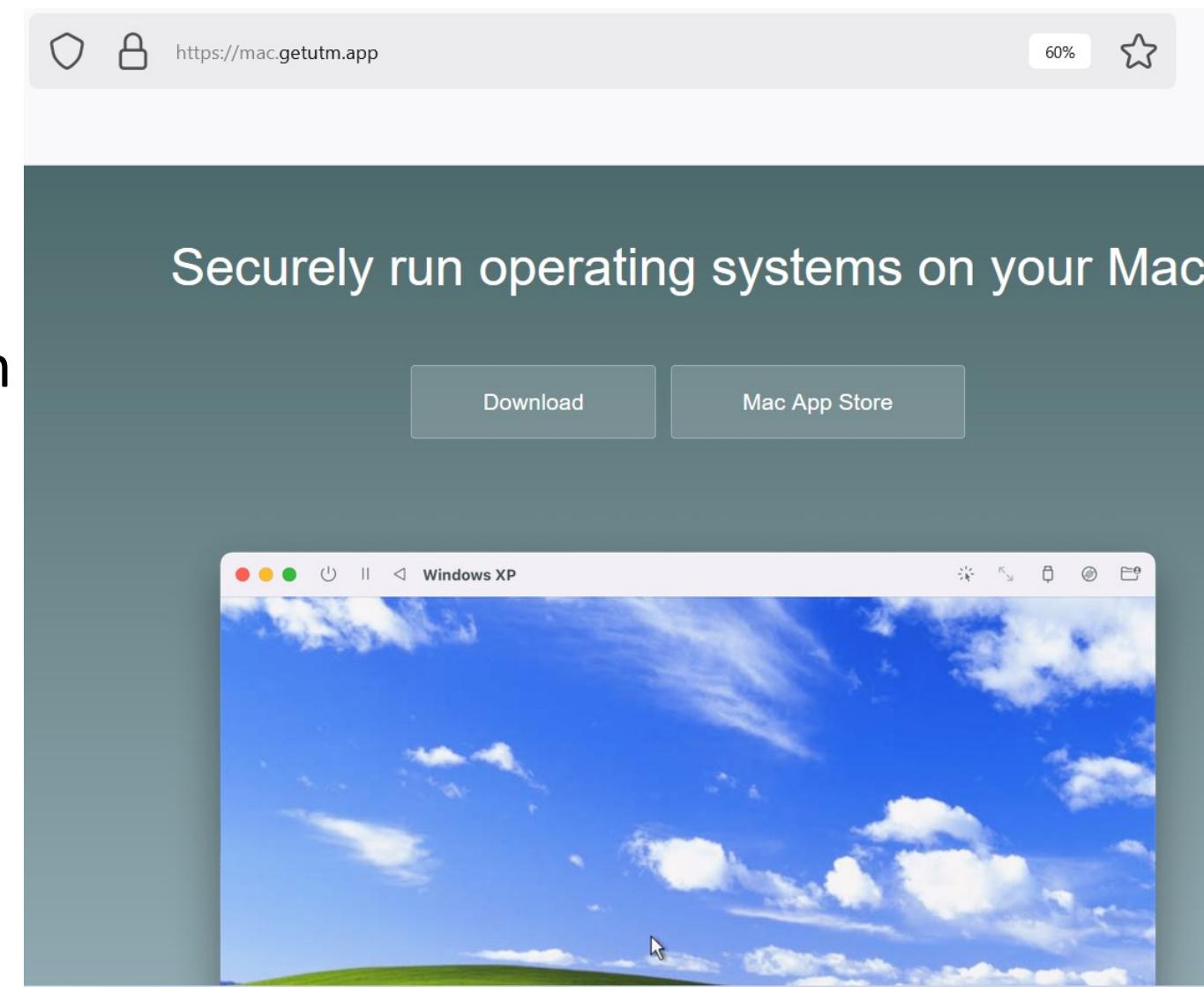
## Option 2: Use UTM (Apple Silicon/M1/M2/M3 chips)

If you are using an **M1/M2/M3 Mac**,

VirtualBox may not work as expected.

In that case:

1. Download and install **UTM** from  
<https://mac.getutm.app/>
2. Use a pre-built **Kali ARM image**  
from Kali ARM images.
3. Import it into UTM and start  
your Kali environment.



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

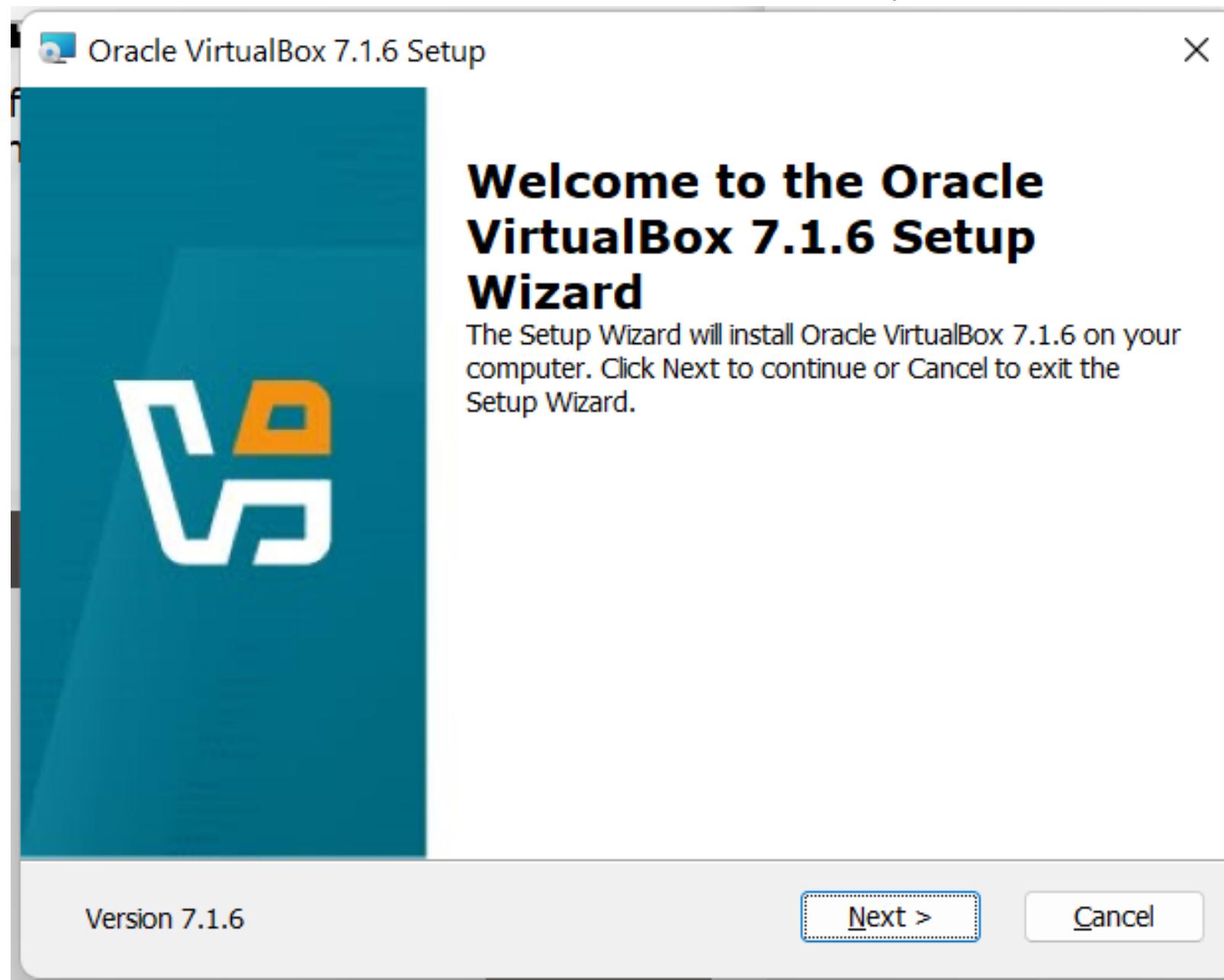
2. Once downloaded, **locate** the installation file on your computer and double-click to start the installation (Run as Administrator)

▼ Today (14)



VirtualBox-7.1.6-167084-Win

3. Click on Next



## 4. Accept & Click on Next

Oracle VirtualBox 7.1.6 License Agreement X

**End-User License Agreement**

Please read the following license agreement carefully.

**COPYING file for VirtualBox versions 7.0 and later versions that include this file**

Preliminary notes:

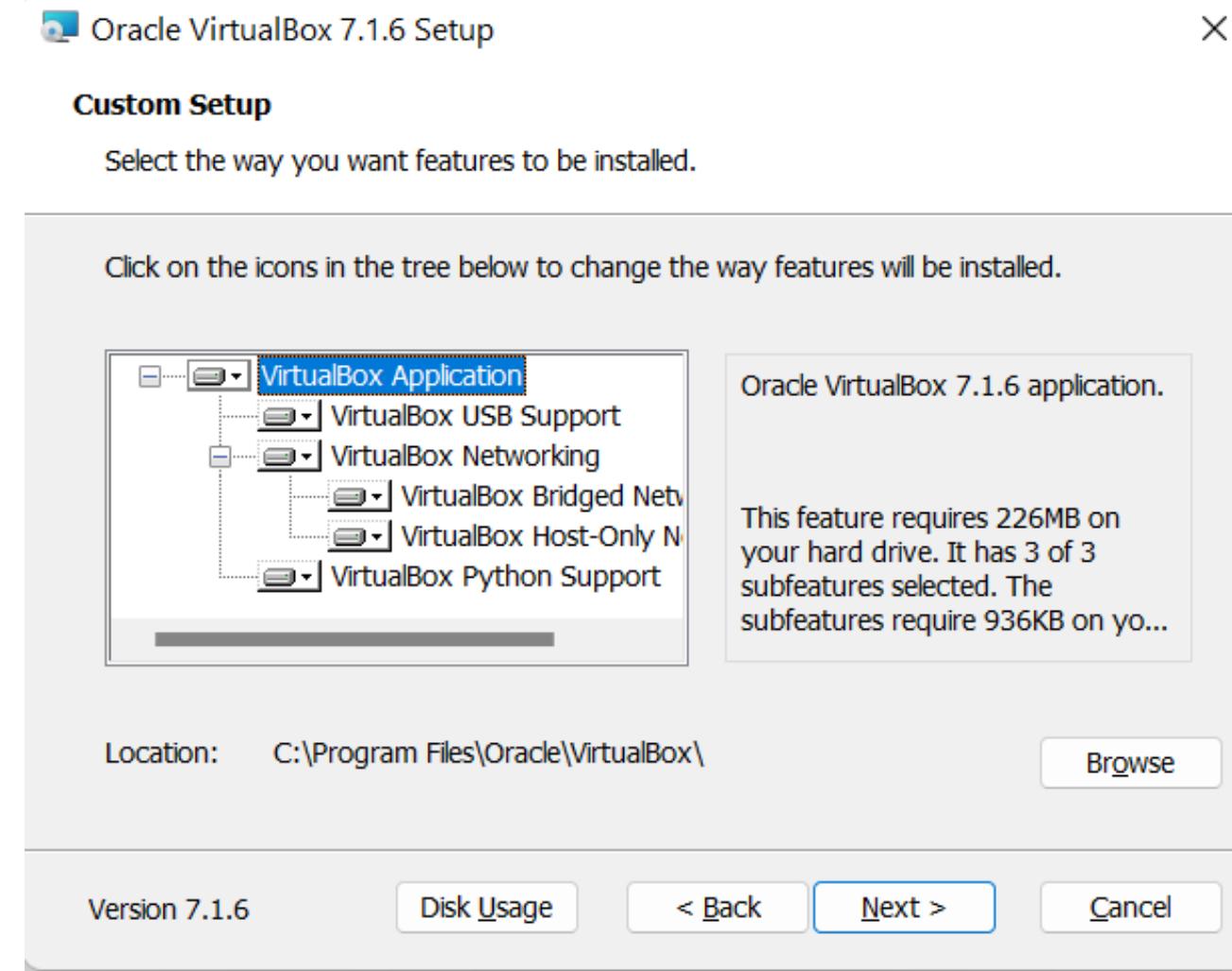
1) The majority of the code in the VirtualBox base package is licensed under the GNU General Public License, version 3 (GPL). VirtualBox contains many components developed by Oracle and various third parties. The license for each component is located in

I accept the terms in the License Agreement  
 I do not accept the terms in the License Agreement

Version 7.1.6 < Back Next > Cancel

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

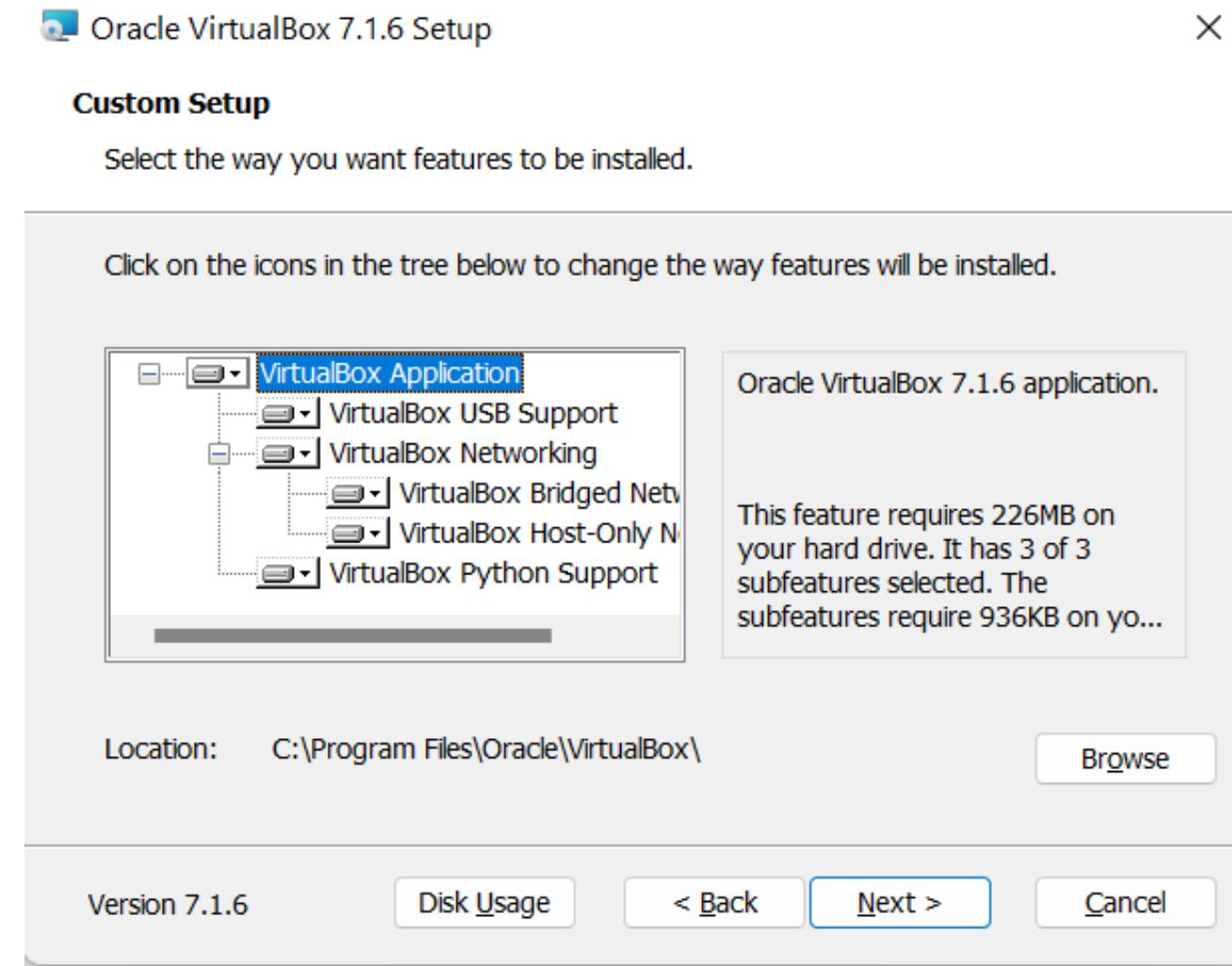
- **VirtualBox Application** (Mandatory for installation)
- **VirtualBox USB Support** (Recommended for USB device compatibility)
- **VirtualBox Networking** (Includes Bridged Networking, Host-Only Networking, and other network features—recommended to keep)



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **VirtualBox Python Support** (Optional, but useful if you plan to run automation scripts)

5. Keep the default options selected & proceed with the installation



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



Oracle VirtualBox 7.1.6



- Click on Next & Yes



## Warning: Network Interfaces

Installing the Oracle VirtualBox 7.1.6 Networking feature will reset your network connection and temporarily disconnect you from the network.

Proceed with installation now?

Version 7.1.6

Yes

No

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



Oracle VirtualBox 7.1.6 Setup

- Next

## Custom Setup

Select the way you want features to be installed.

Please choose from the options below:

- Create start menu entries
- Create a shortcut on the desktop
- Create a shortcut in the Quick Launch Bar
- Register file associations

Version 7.1.6

< Back

Next >

Cancel

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



Oracle VirtualBox 7.1.6 Setup



- **Install**

## Ready to Install

The Setup Wizard is ready to begin the Custom installation.

Click [Install](#) to begin the installation. If you want to review or change any of your installation settings, click [Back](#). Click [Cancel](#) to exit the wizard.

Version 7.1.6

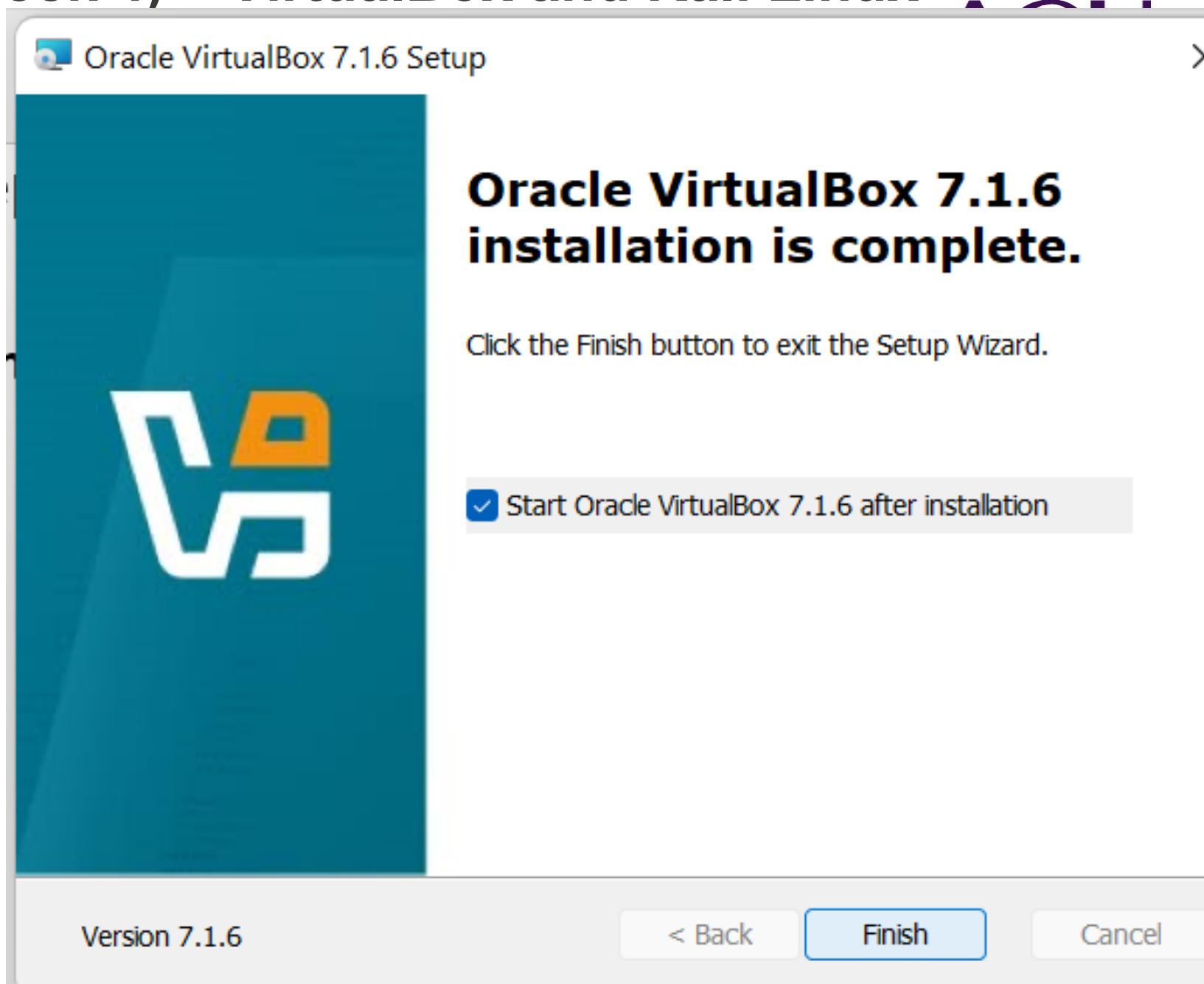
< Back

Install

Cancel

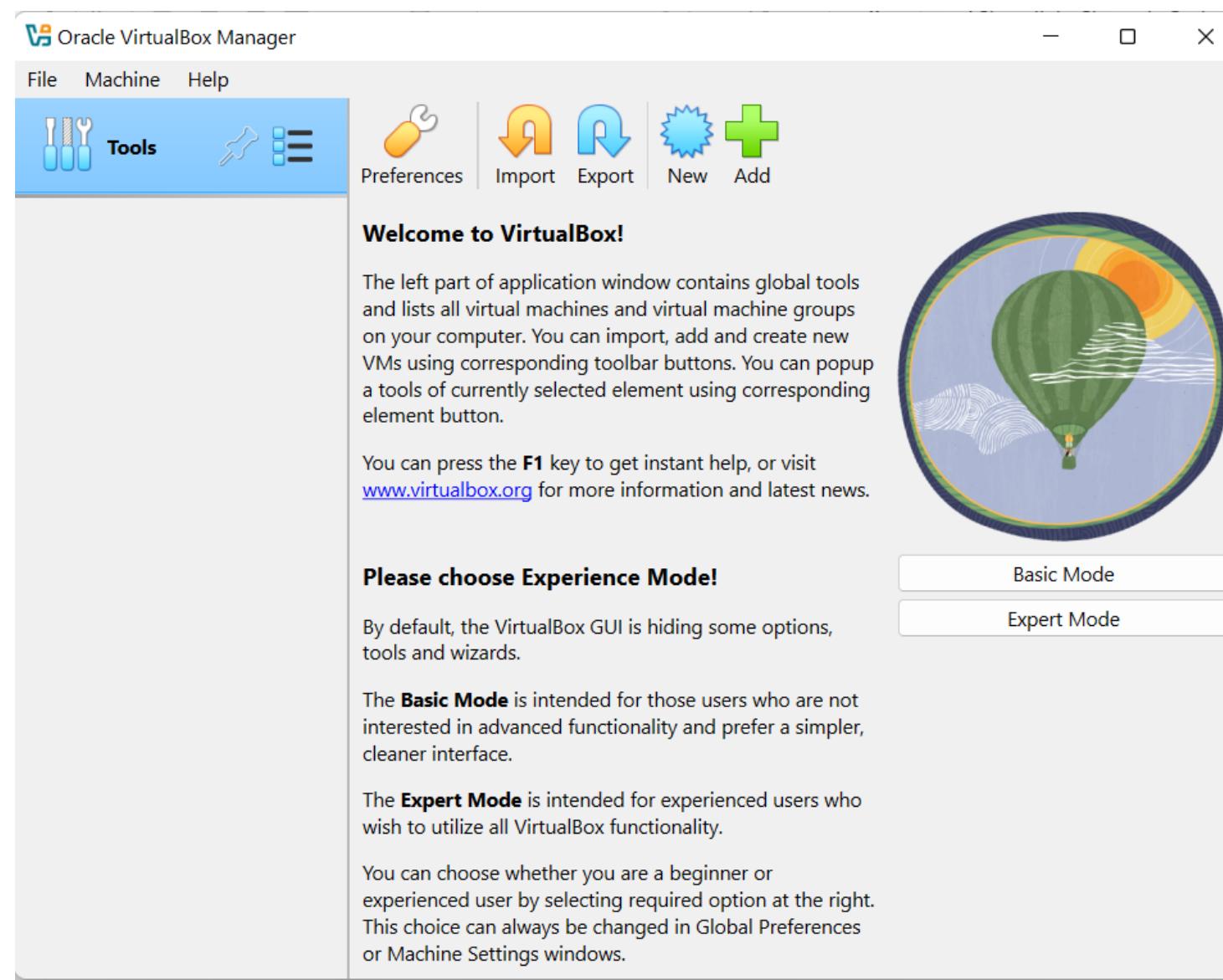
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Click Finish to exit the setup wizard



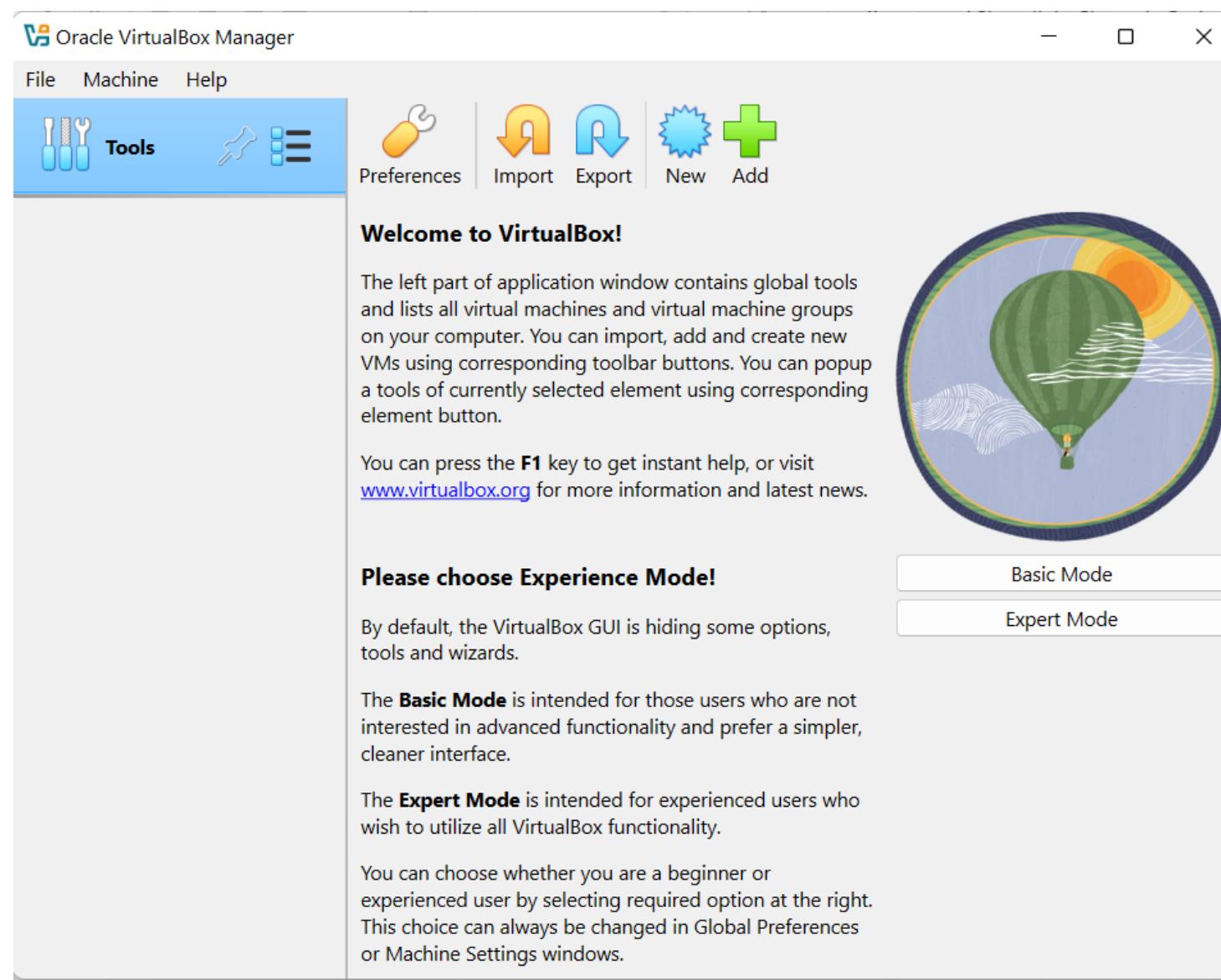
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Now Virtual Box is ready to use
- If you are a **beginner**, select "Basic Mode" (Recommended).
- It provides a simpler interface with essential options for creating and managing virtual machines.



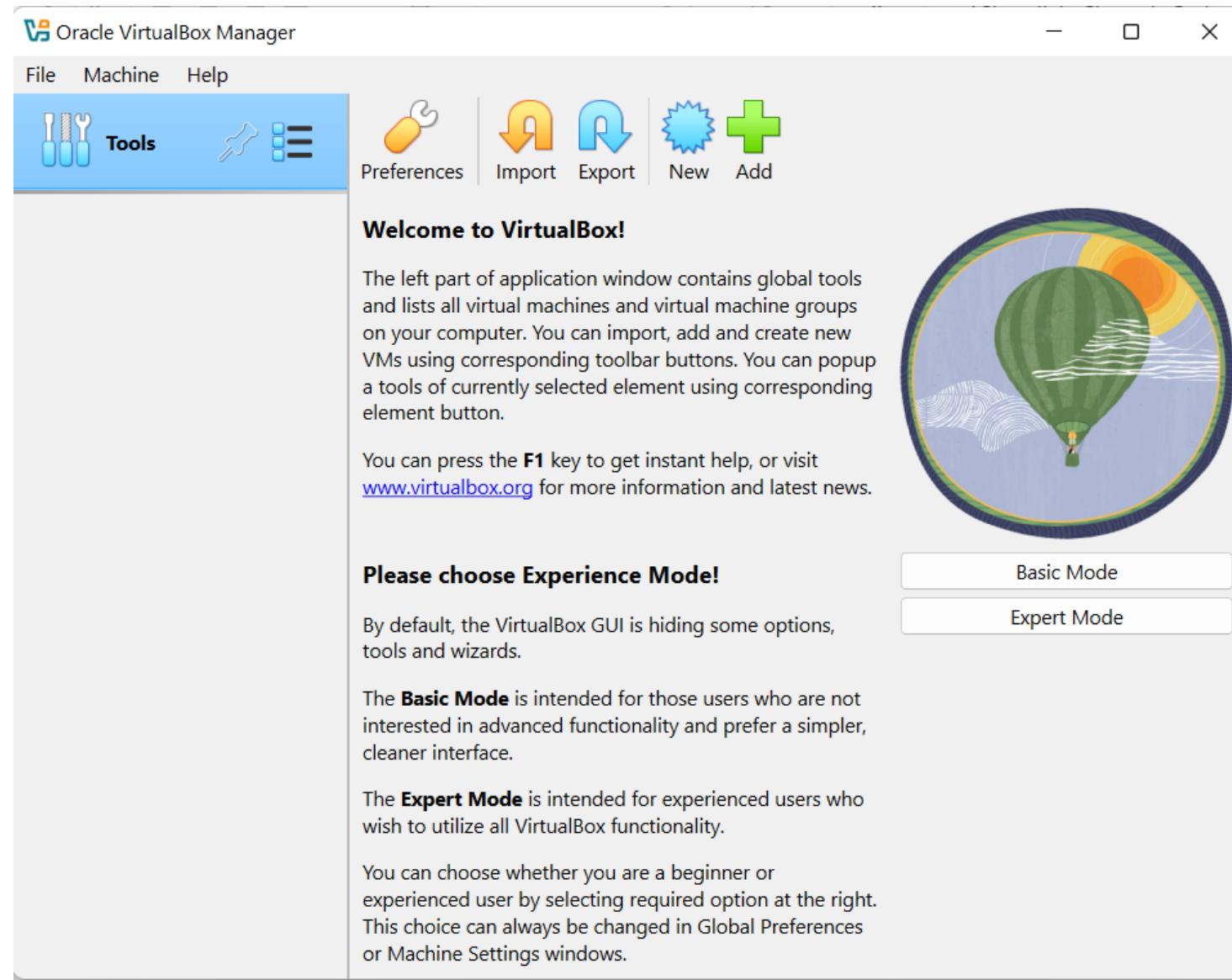
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- If you are **comfortable with advanced settings**, select "**Expert Mode**".
- This mode gives you more flexibility when setting up virtual machines, such as manually configuring storage, memory, and network settings.



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Currently, we select **Basic Mode**. We can always switch to **Expert Mode** later from the preferences if needed.



## What is Kali Linux?

Kali Linux is a **Linux distribution** designed for penetration testing, security auditing, and ethical hacking. It comes pre-installed with a wide range of cybersecurity tools.

## Why Use Kali Linux?

- Includes essential security and penetration testing tools
- Helps in cybersecurity training and research
- Open-source and regularly updated

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



## Installing Kali Linux on VirtualBox

Follow these steps to install **Kali Linux** on your VirtualBox:

1. Download Kali Linux from the official website:

<https://www.kali.org/get-kali/#kali-platforms>

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

We plan to download the 64-bit ISO file

kali.org/get-kali/#kali-platforms

GET KALI BLOG DOCUMENTATION ▾ COMMUNITY ▾ CO

Choose your Platform |

LIGHT  DARK

 **Installer Images**

- ✓ Direct access to hardware
- ✓ Customized Kali kernel
- ✓ No overhead

Single or multiple boot Kali, giving you complete control over the hardware access (perfect for in-built Wi-Fi and GPU), enabling the best performance.

 Recommended

 **Virtual Machines**

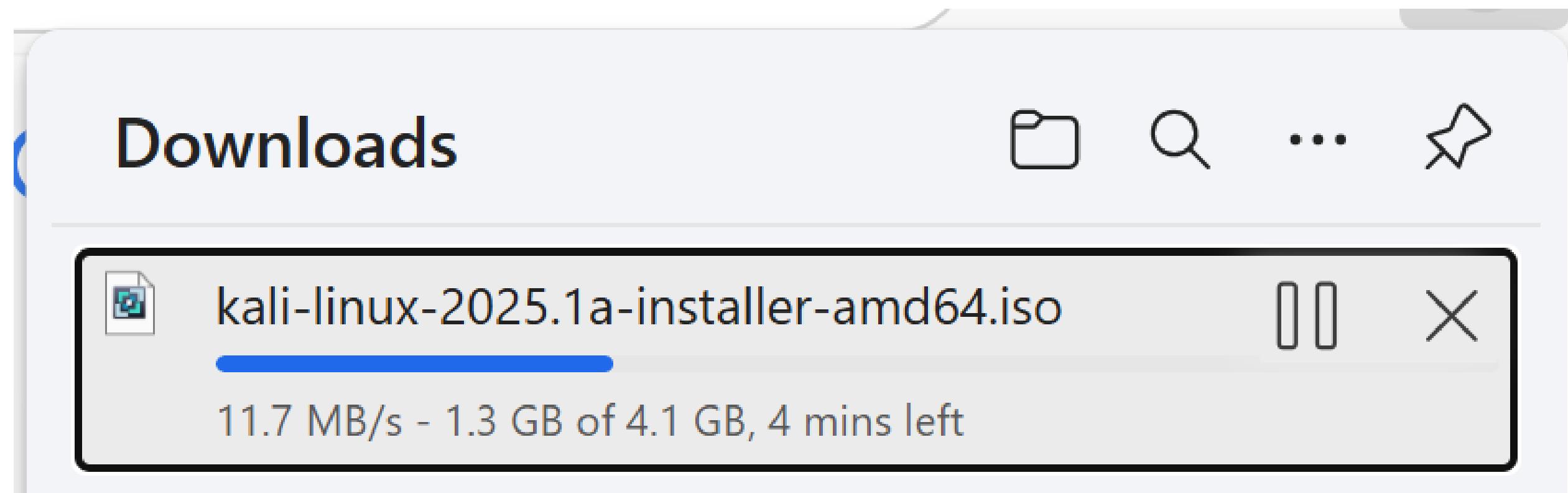
- ✓ Snapshots functionality
- ✓ Isolated environment
- ✓ Customized Kali kernel
- ✗ Limited direct access to hardware
- ✗ Higher system requirements

VMware & VirtualBox pre-built images. Allowing for a Kali install without altering the host OS with additional features such as snapshots. Vagrant images for quick spin-up also available.

 Recommended

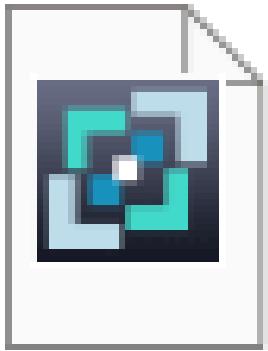
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

Wait 5-6 minutes until the file is completed



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

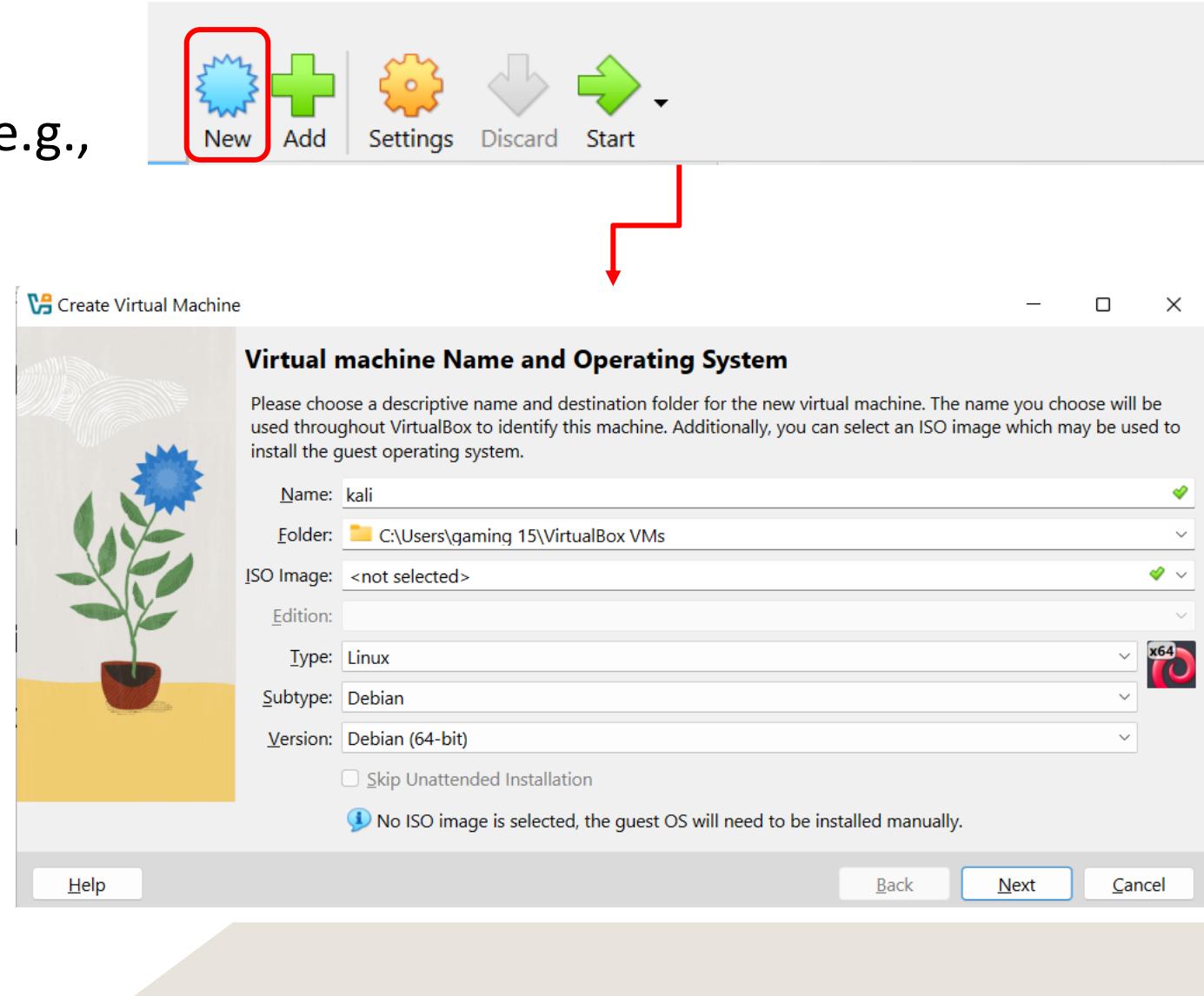
- Once downloaded, we can install Kali Linux on our VirtualBox



**kali-linux-2025.1a-installer-amd64**  
**ISO File**  
**4.13 GB**

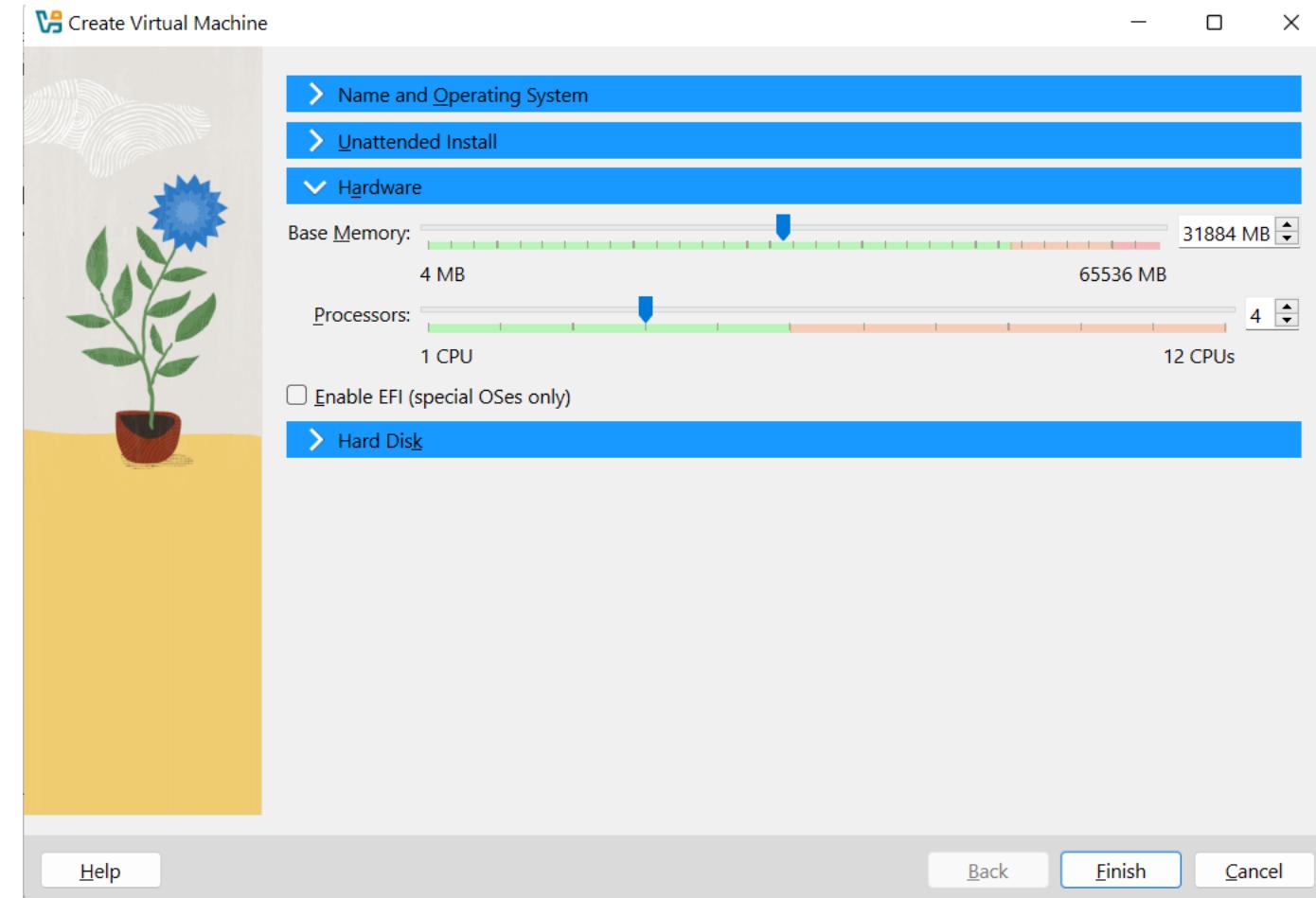
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Click on New
- Write a name for the virtual machine e.g.,  
kali
- Type: Linux
- Version: Oracle Linux



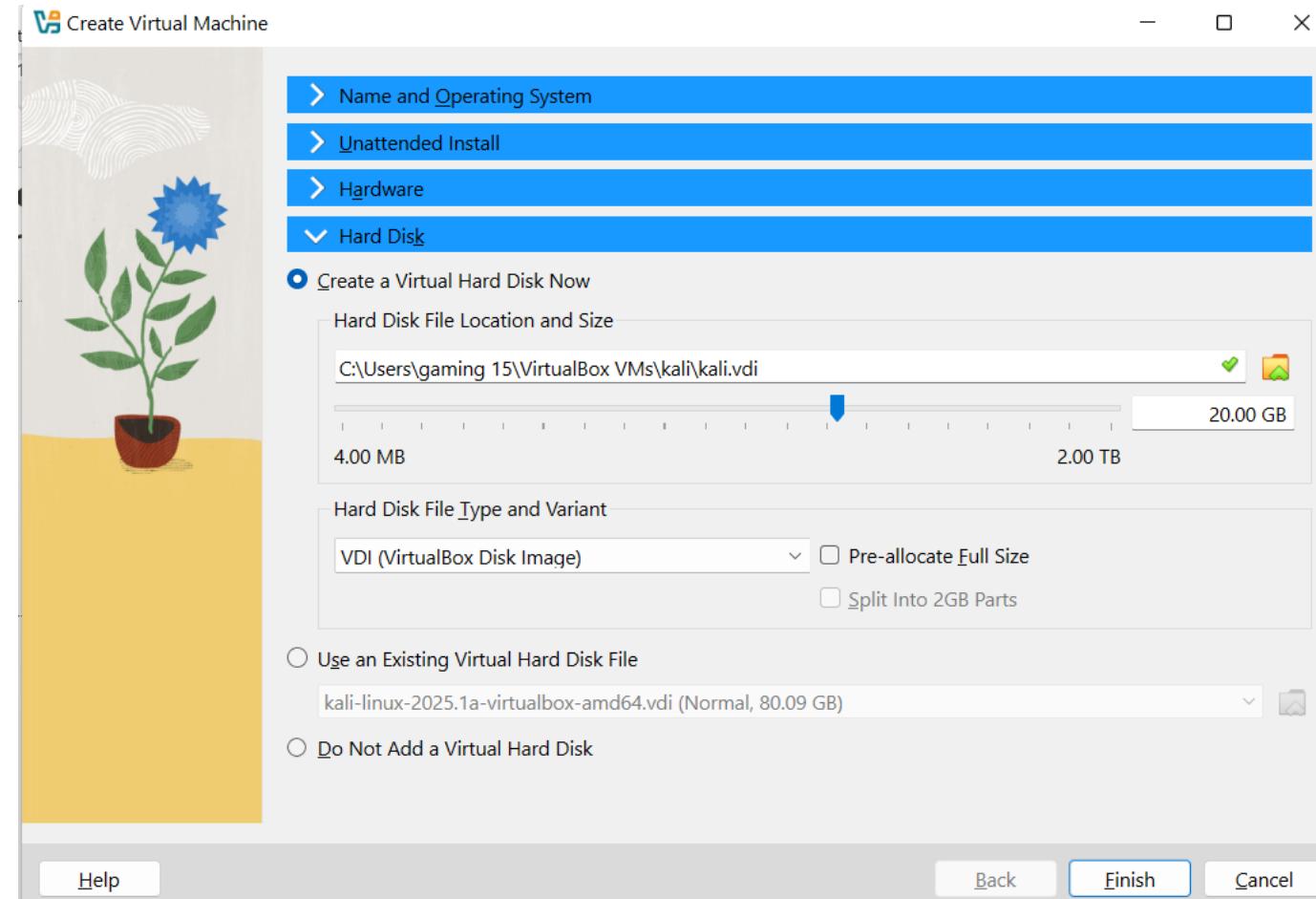
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Base Memory Size: Up to red (end of green level) ~ 3G
- Processor CPU 4



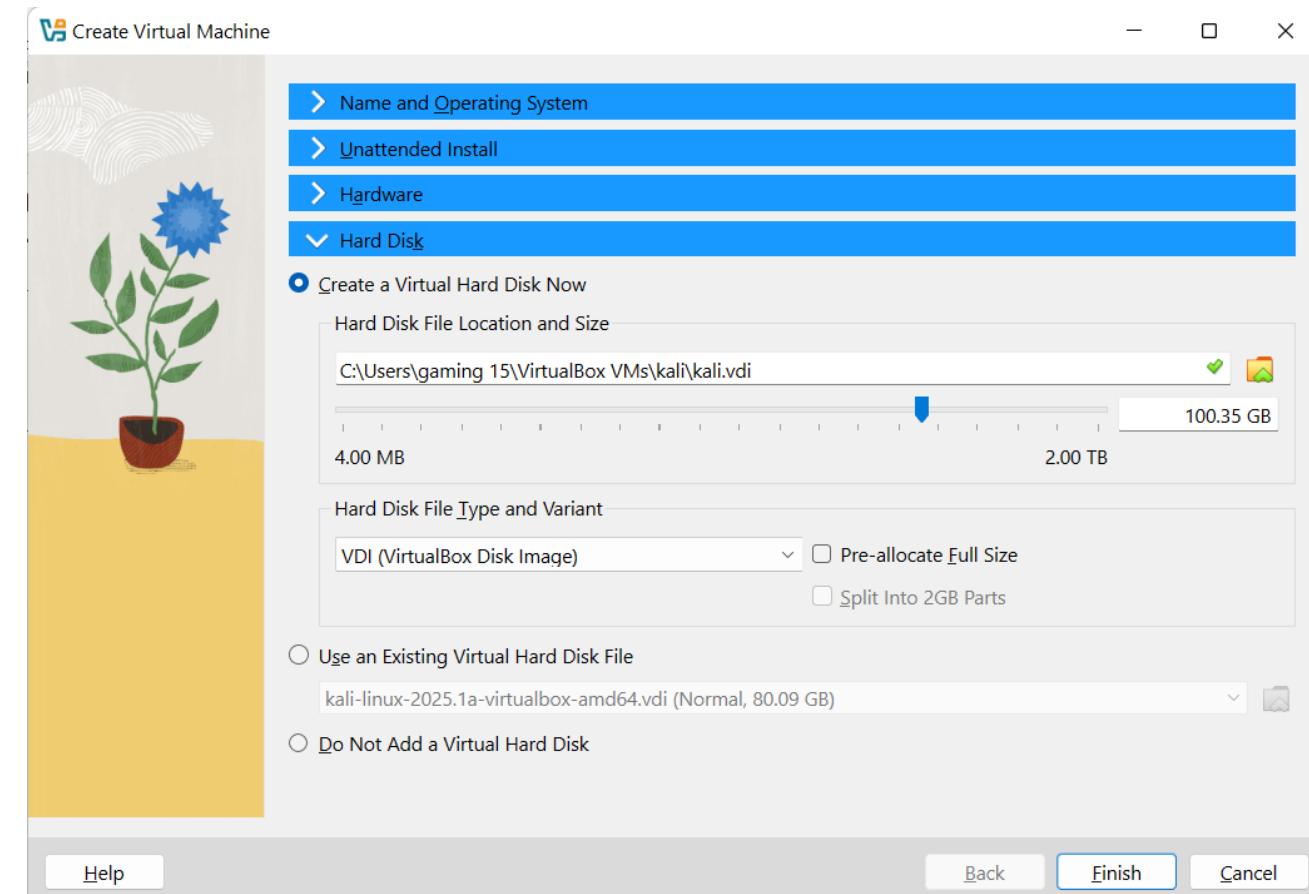
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Hard Disk File Type: VDI (Virtual Disk Image)
- Create
- Hard Disk File Type: VDI (Virtual Disk Image)
- Finish



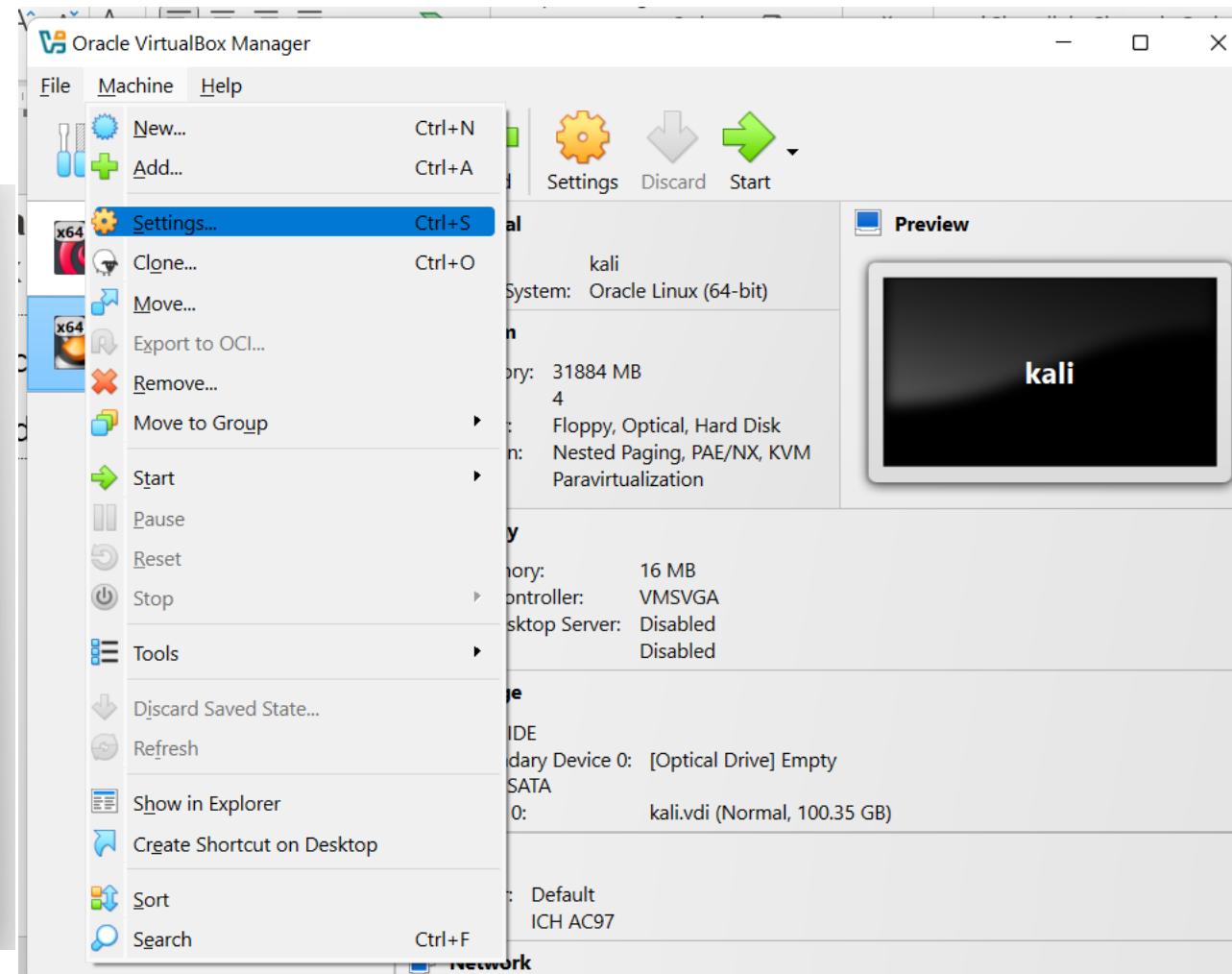
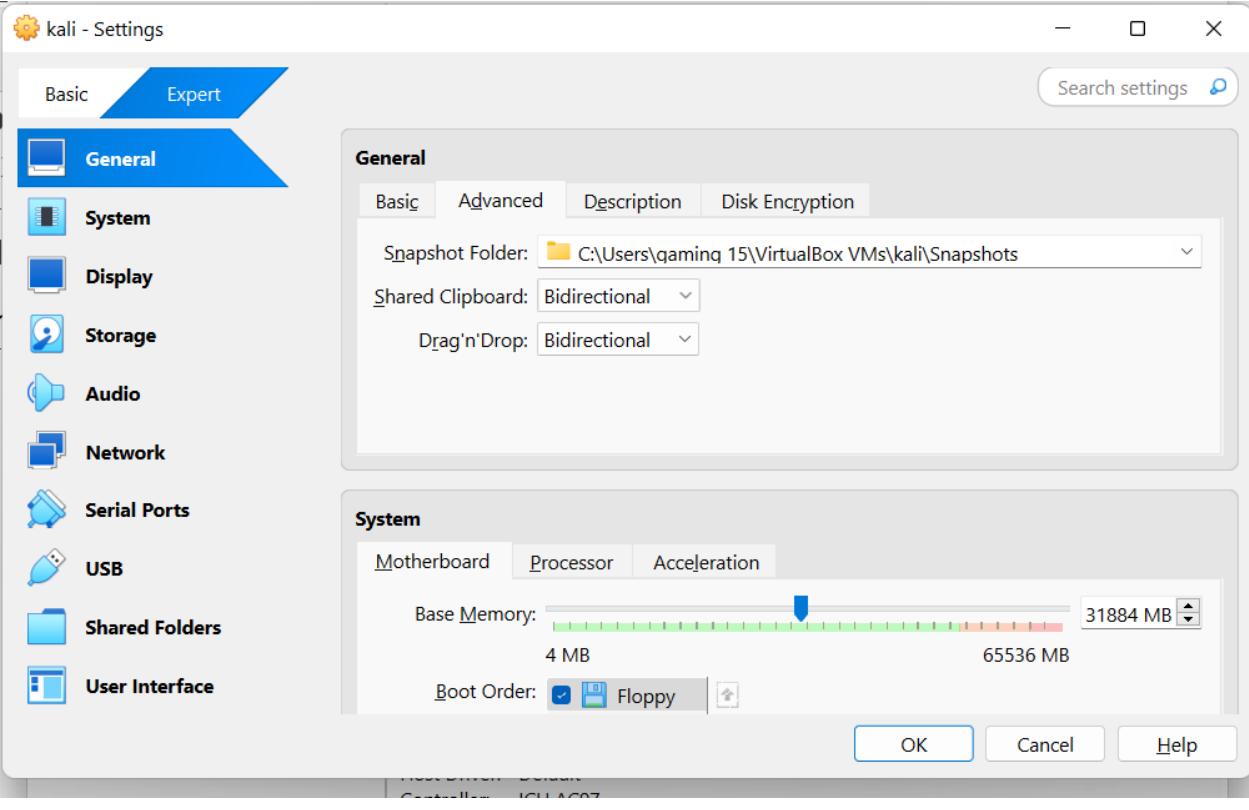
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- File Location and Size: Move Size to around 100 GB
- Finish → It will create a virtual machine on Virtual Box Manager



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

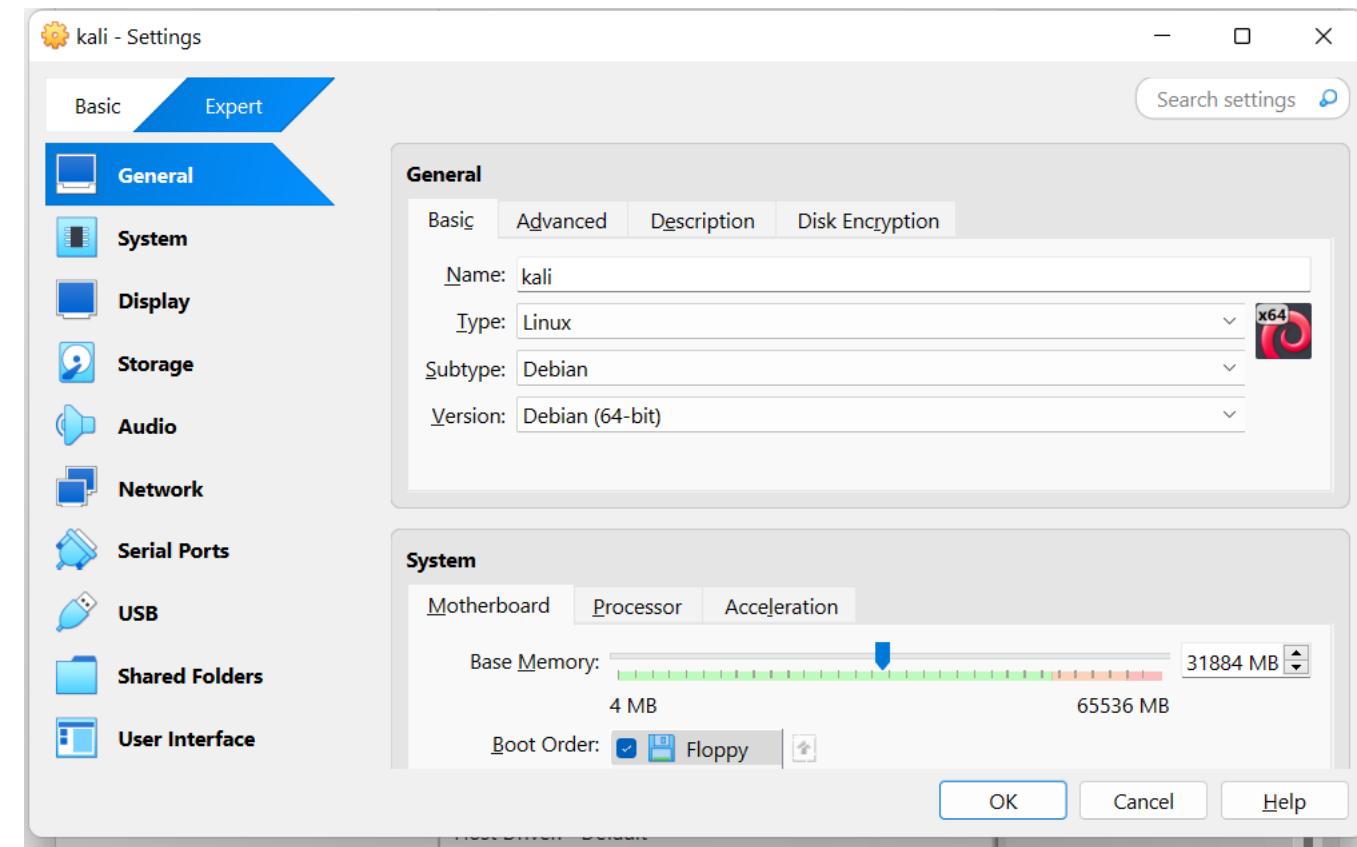
- Click on Settings >> General >> Advanced >> Shared Clipboard (Bidirectional) and Drag & Drop (Bidirectional)



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

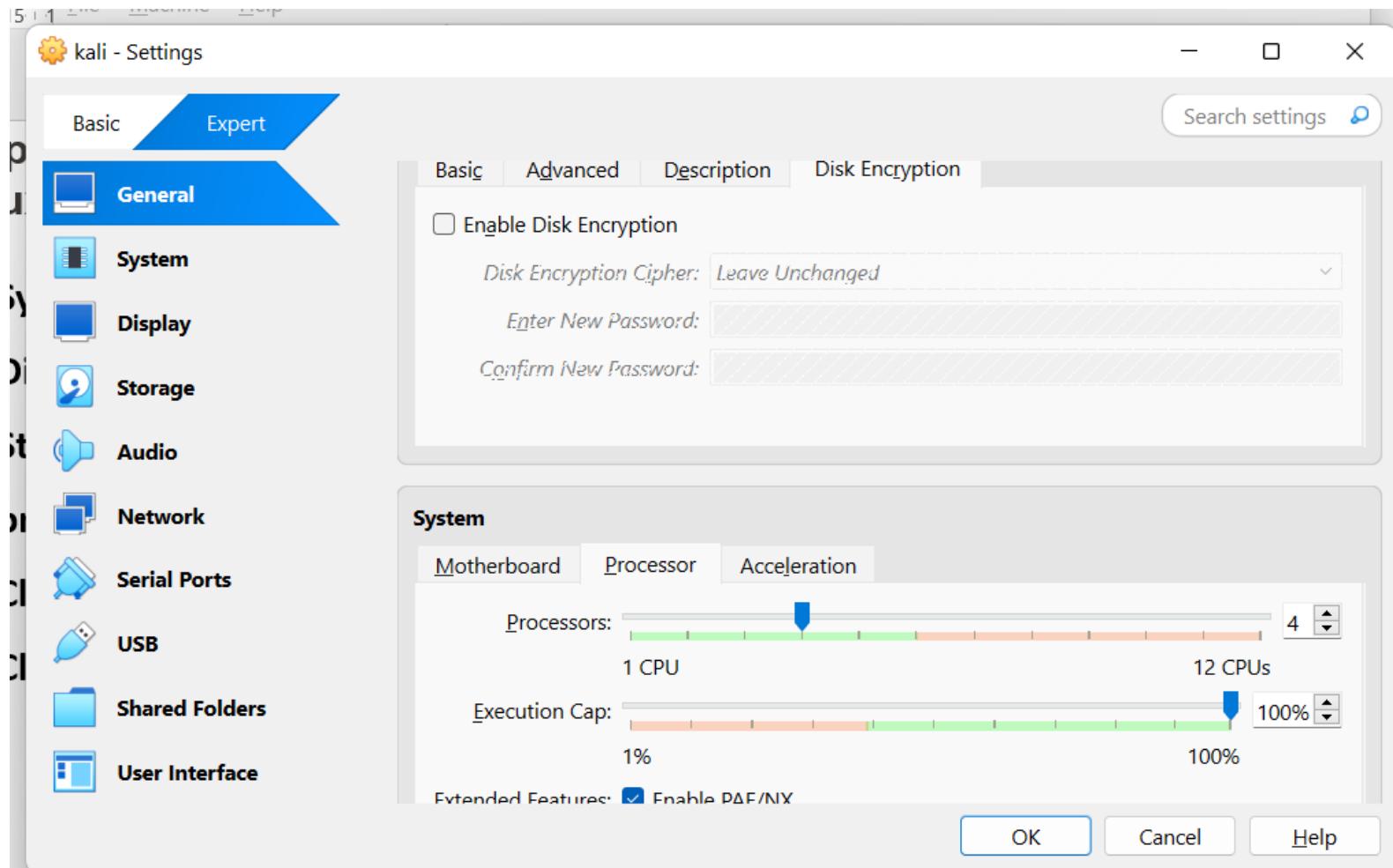
- **Kali General Settings: Type = Linux, Subtype = Debian**

Since **Kali Linux** is based on **Debian**,  
using **Debian (64-bit)** ensures proper  
compatibility with the virtual machine  
settings.



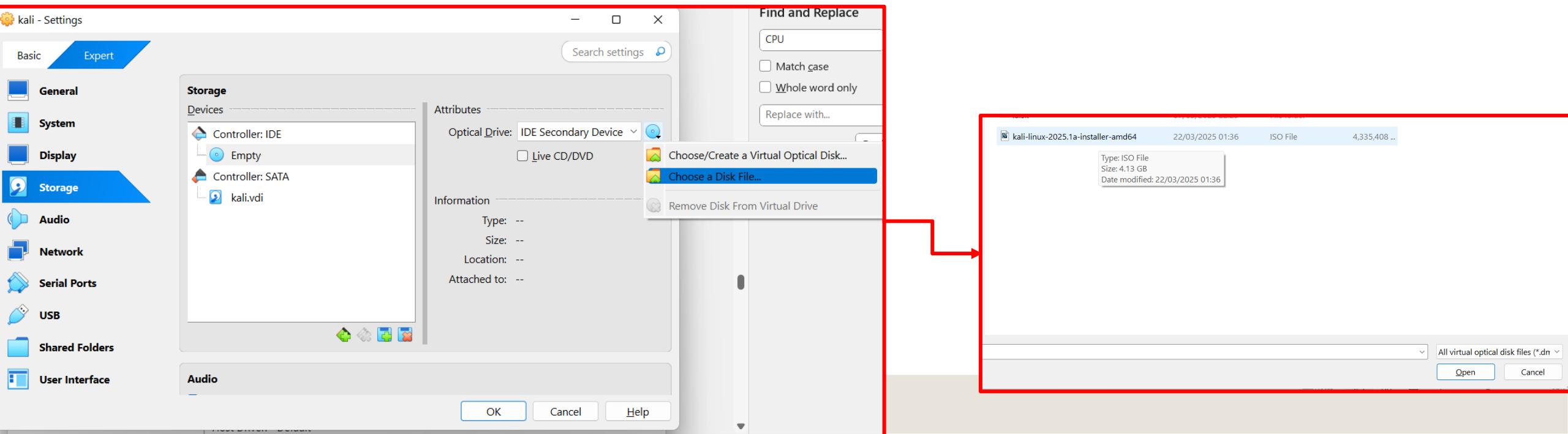
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- System → Processor → Assign 4 CPU to Virtual Machine



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

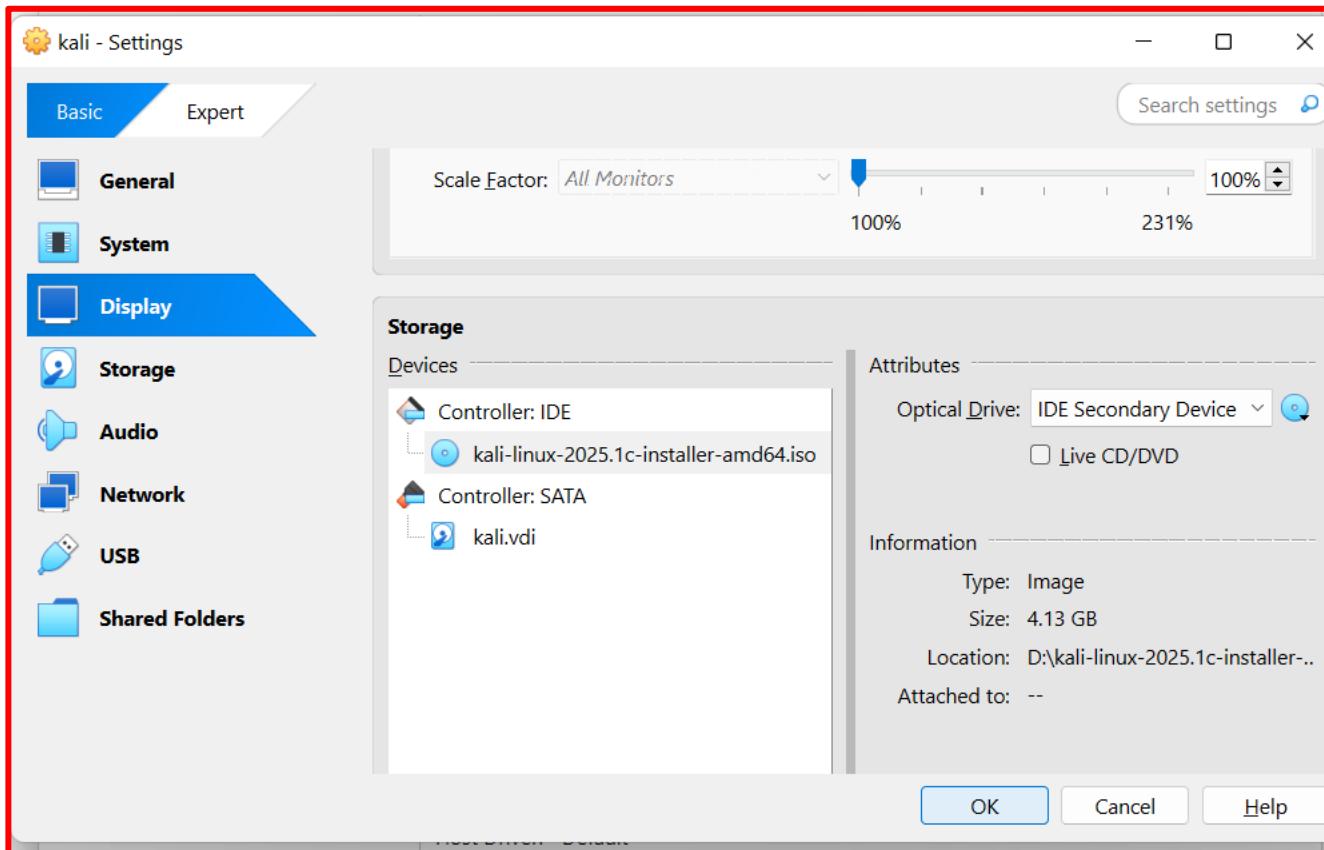
- Display → Default
- Storage → Controller – IDE → Empty → Optical Drive → Choose a Disk file → browse to the path you downloaded iso file (open)
- Click Start



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

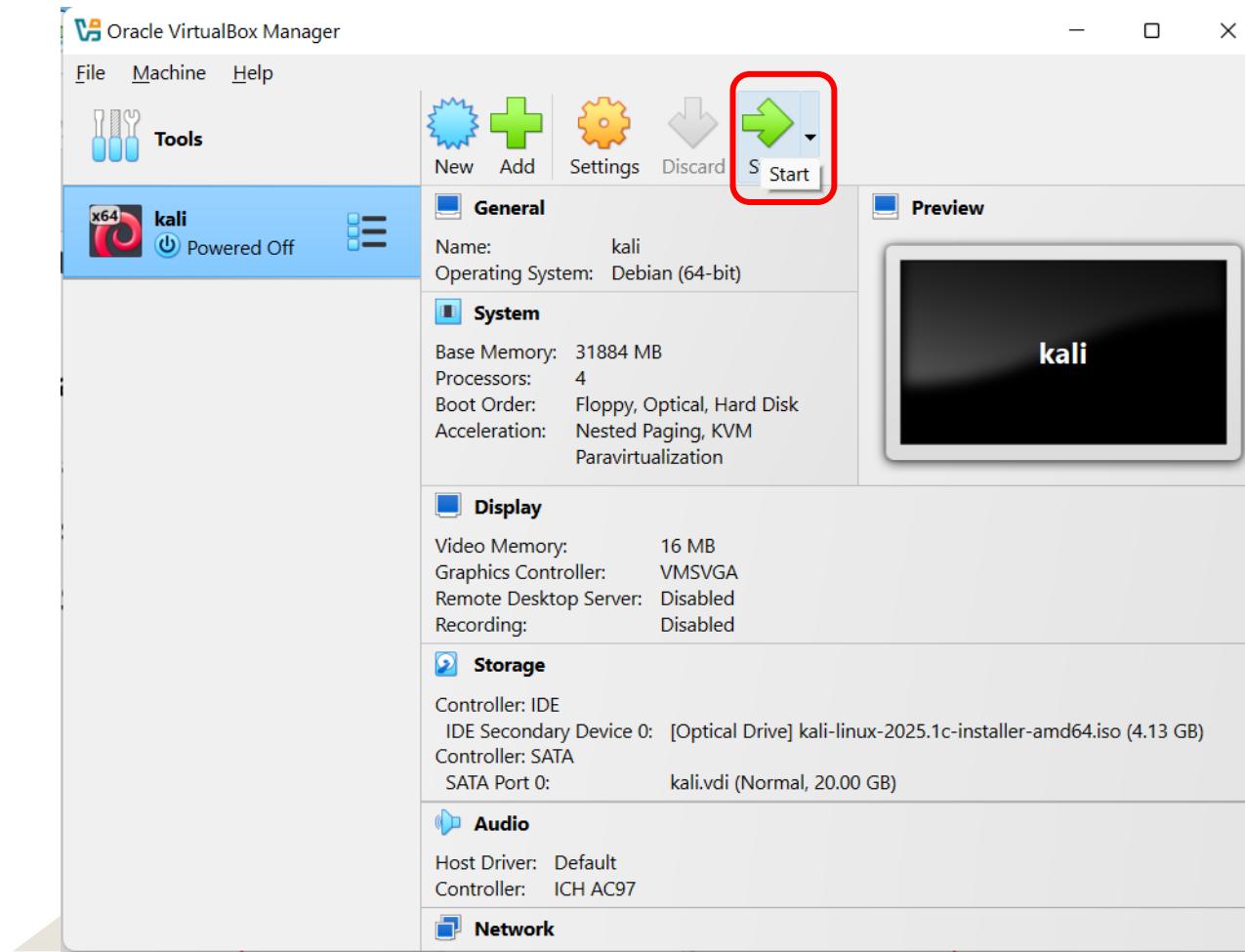
- Display → Default
- Storage → Controller – IDE → Empty → Optical Drive → Choose a Disk file → browse to the path you downloaded iso file (open)

- Click Start



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Display → Default
- Storage → Controller – IDE → Empty → Optical Drive → Choose a Disk file → browse to the path you downloaded iso file (open)
- Click Start



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **Select Language (English)**
- **Select Location**
- **Configure Keyboard Layout**
- **If it asks for host name by default is it kali**
- **Domain name → leave it blank**
- **Full name of new user → e.g., kali or codebind**

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Set a Password when you login to Kali Linus (remember when you log in)
- Choose a clock → Central region
- Partition Disks → Guided use entire disk
- Continue
- Partition Disks → All files in one partition
- Finish Partitioning and write changes to disk
- Write the changes to disk? Yes

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- **Configure the Package Manager → Blank & Continue**
- **Software Selection → Be default & Continue**
- **Installation step failed (Click on Continue)**
- **Install the GRUB boot loader on a hard disk? Yes**
- **Enter device manually → /dev/sda ..**
- **Wait for Kali Linus to restart**

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux



**Login Window (e.g., codebind username):**

**Login Credentials for Kali Linux:**

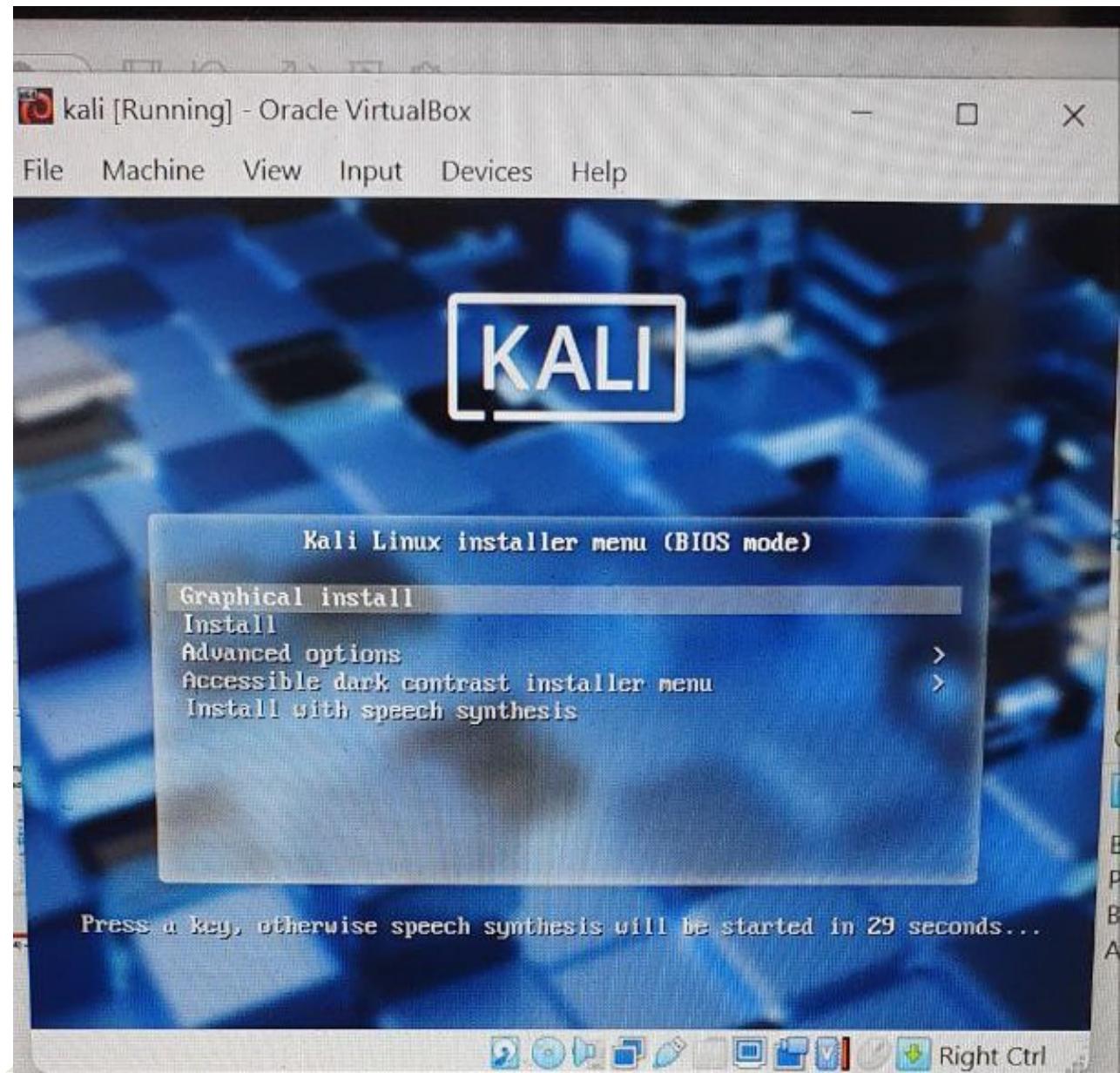
- **Kali Linux 2019:**
  - **Username:** root
  - **Password:** toor
- **Kali Linux 2020 and later:**
  - **Username:** kali
  - **Password:** kali
- **Now, Kali Linux is installed and ready to use!**

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Start **Kali Linux** VM and log in with:
  - **Username:** kali
  - **Password:** kali
- **VirtualBox >> Click New**
- Set the name as **Kali Linux**
- Select **Type: Linux** and **Version: Debian (64-bit)**
- Allocate at least **2GB RAM** (recommended: 4GB or more)
- Create a **virtual hard disk** (20GB minimum)

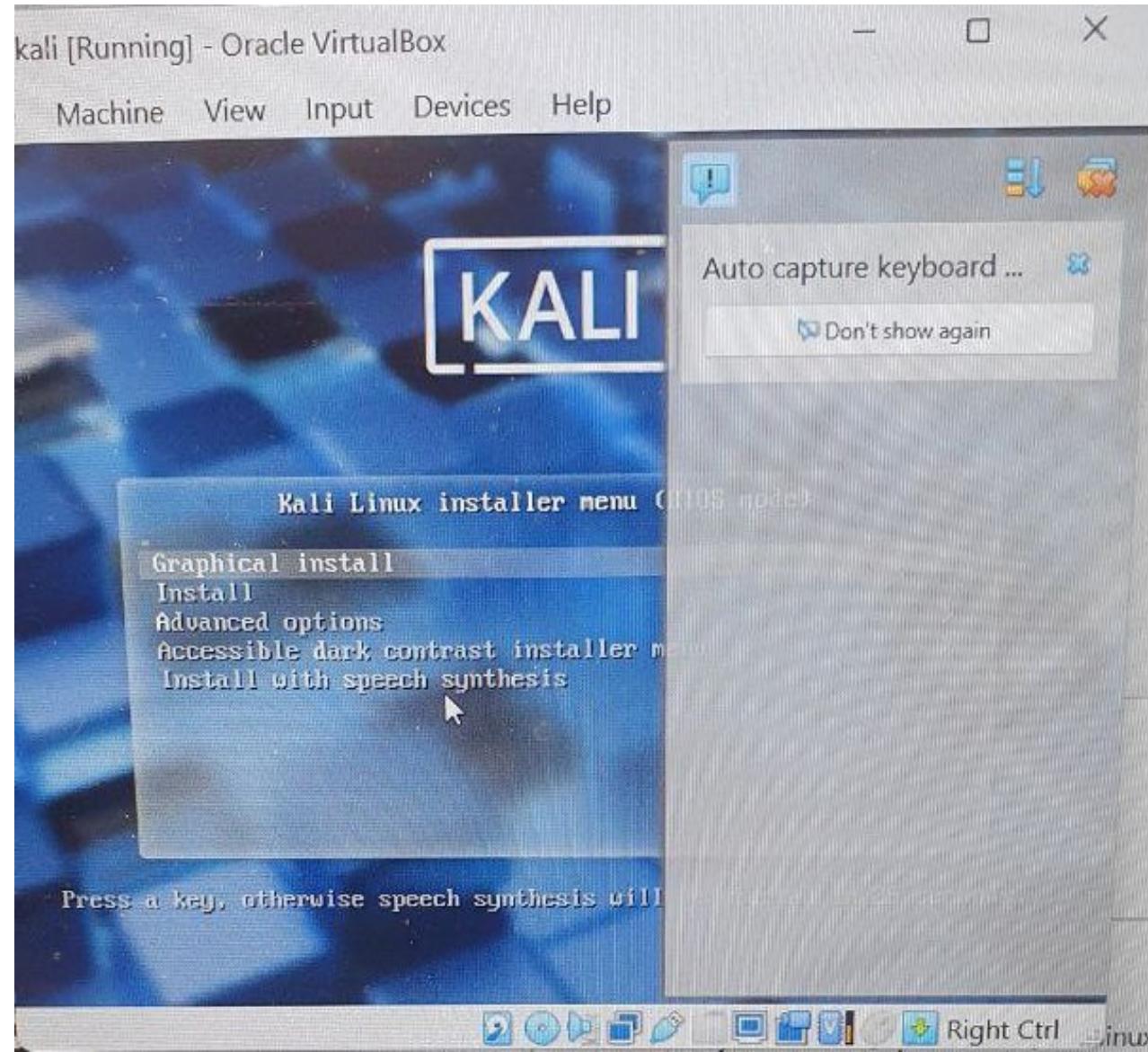
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



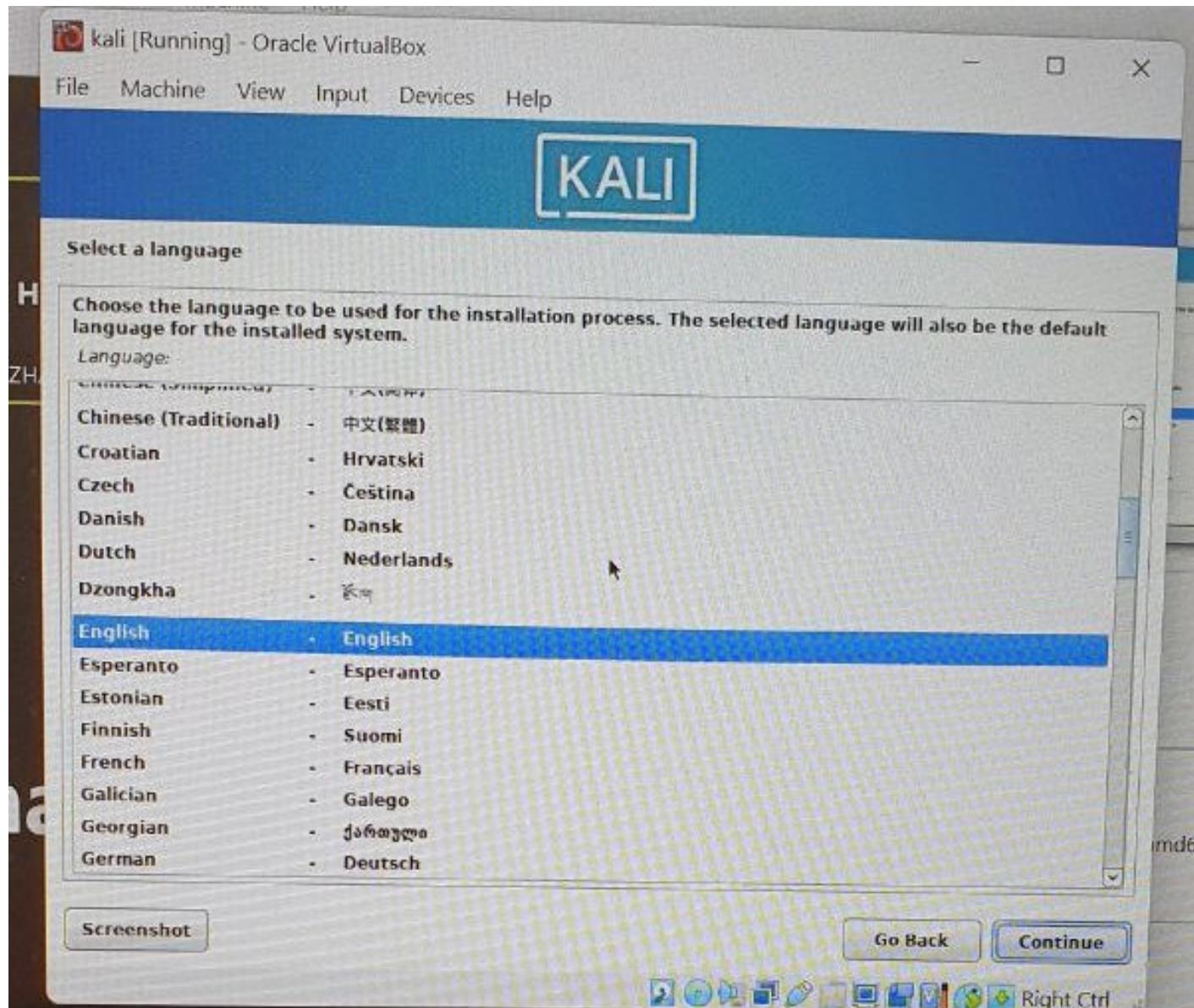
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



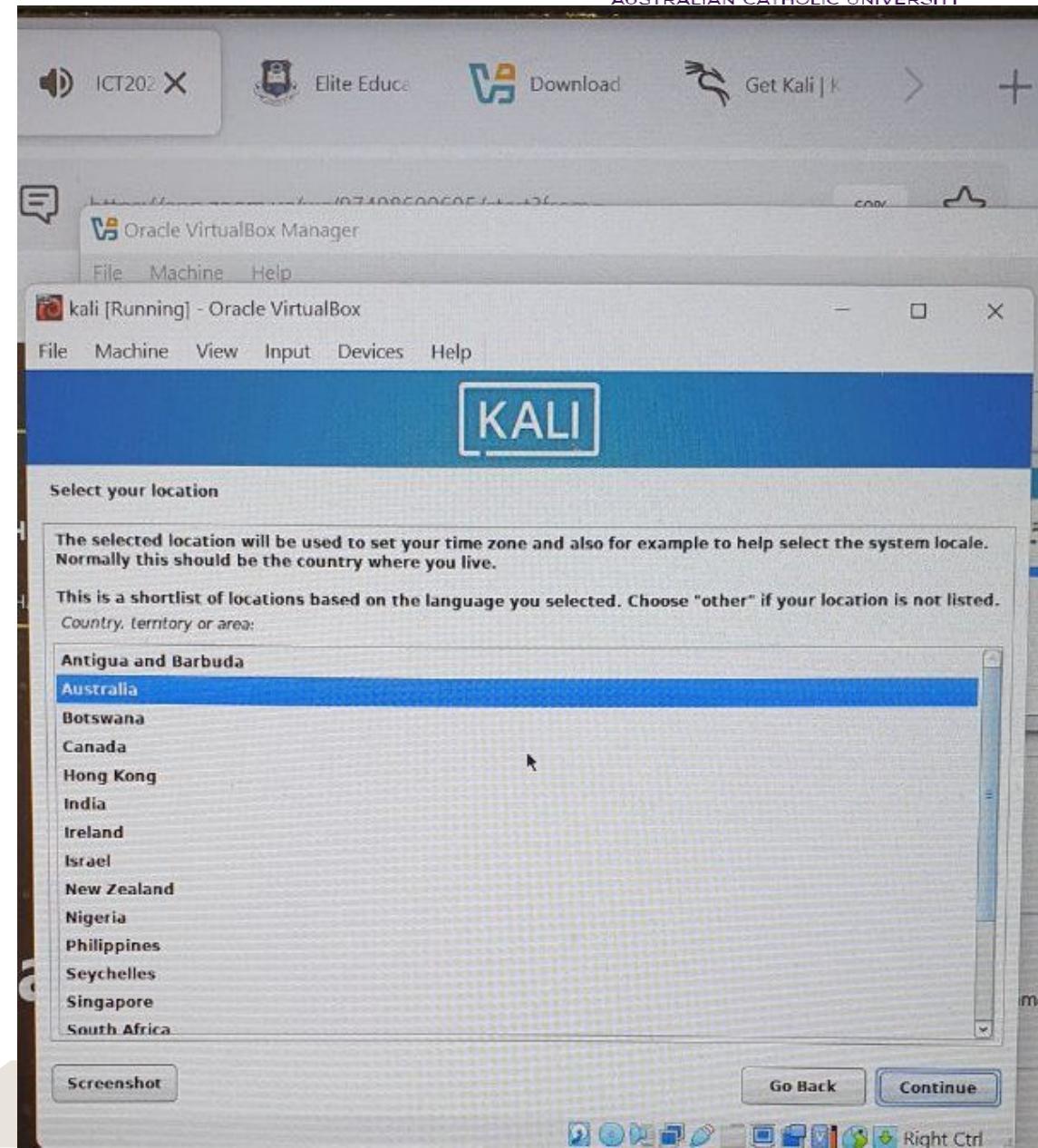
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



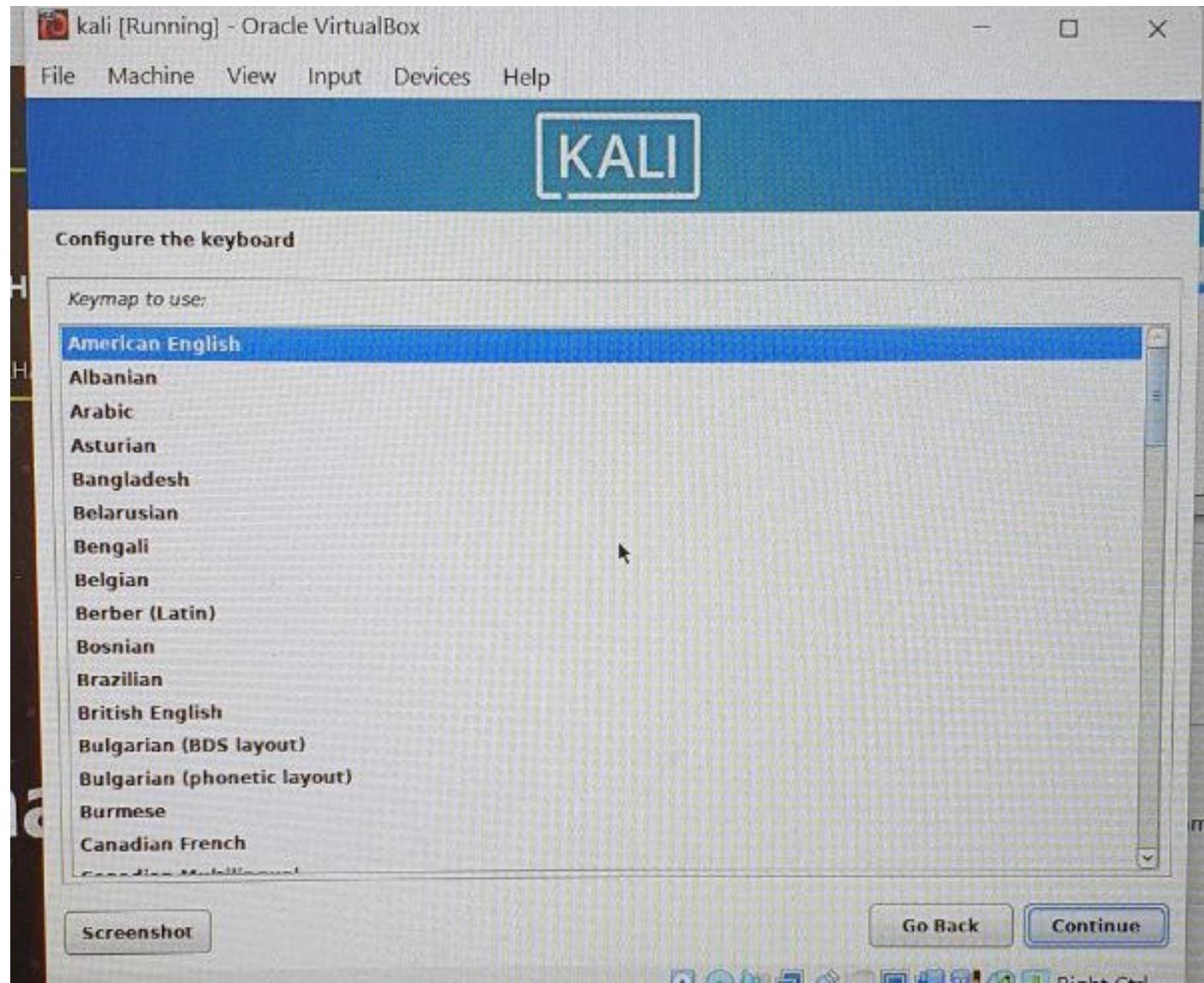
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



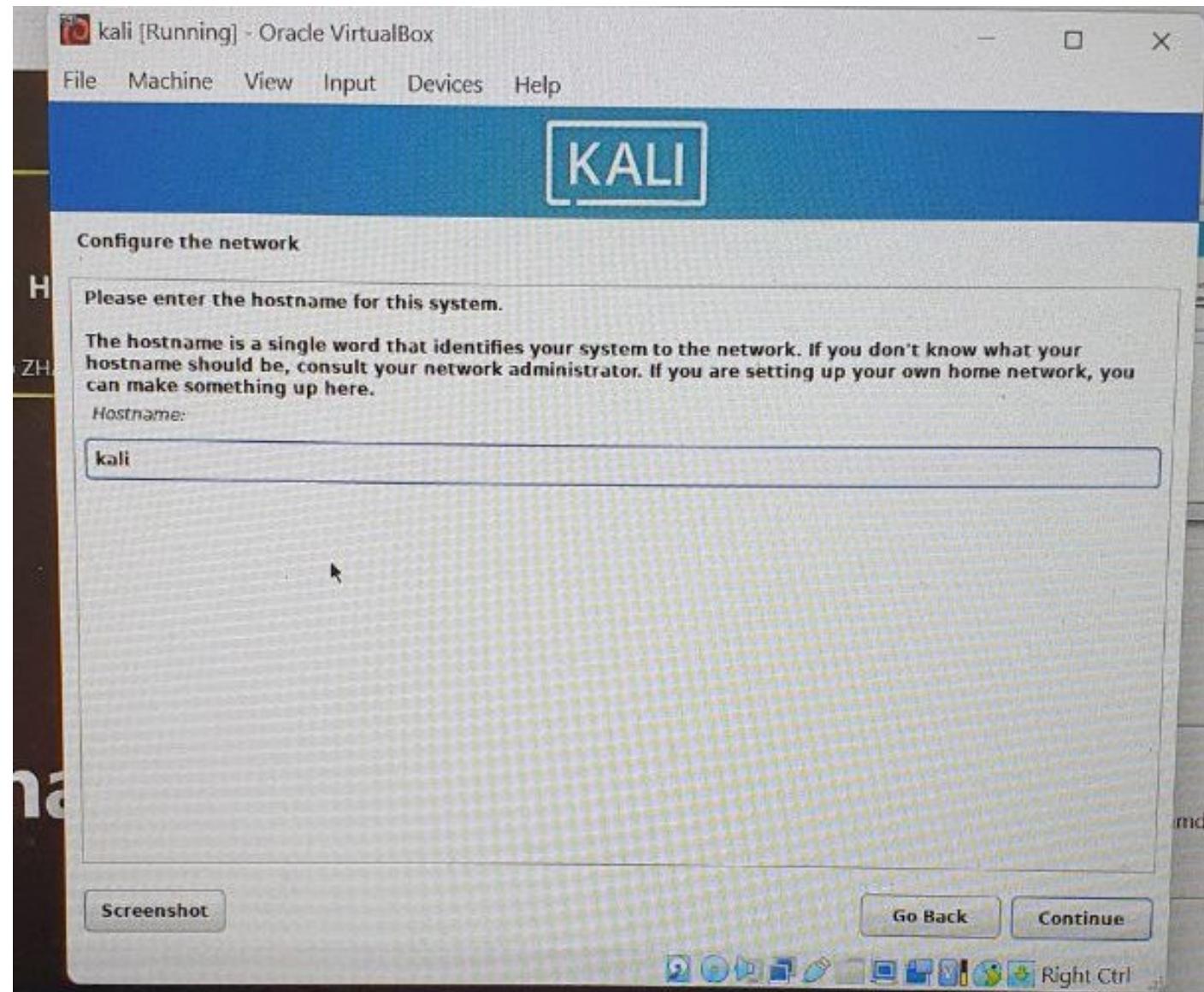
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



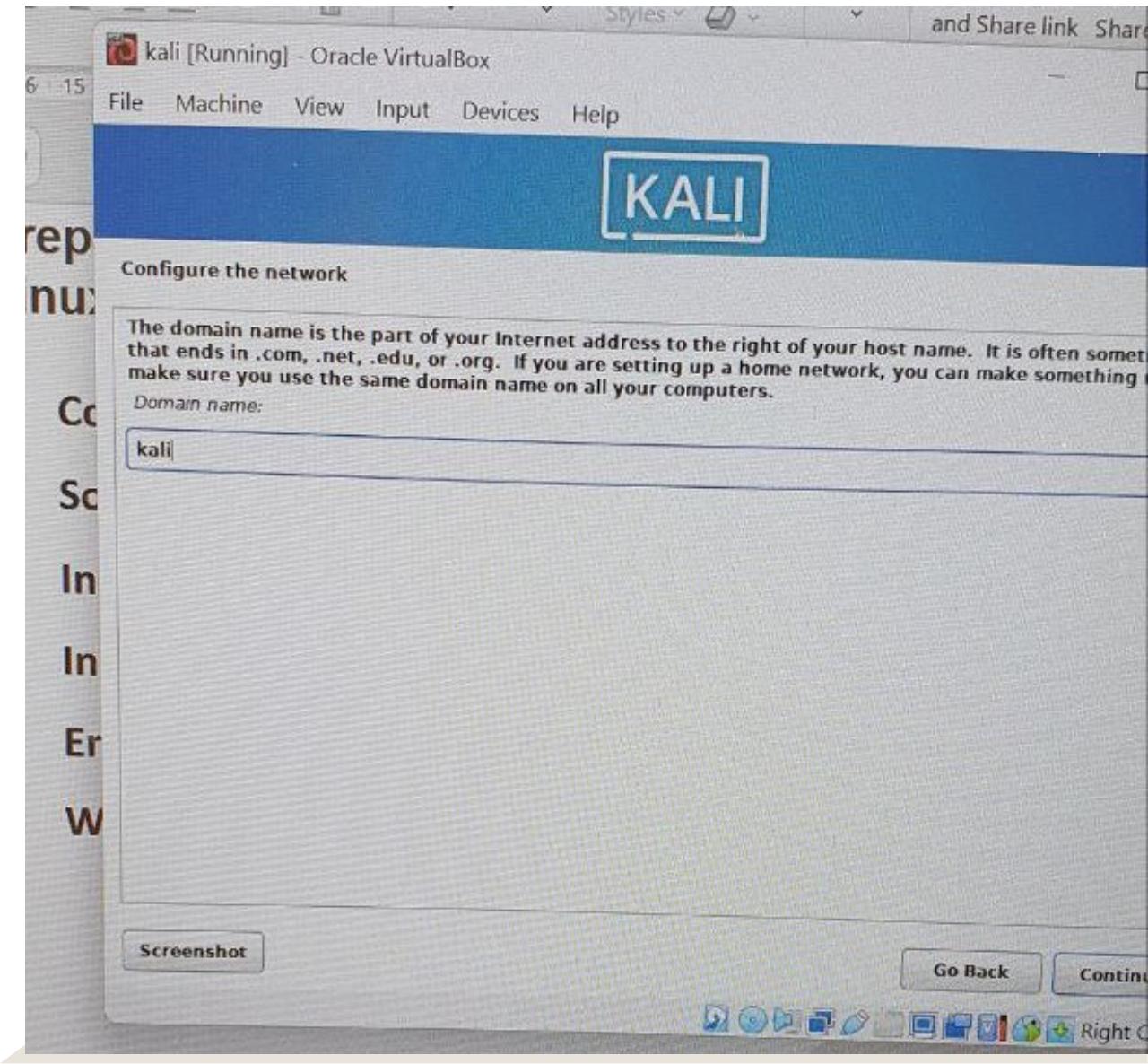
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



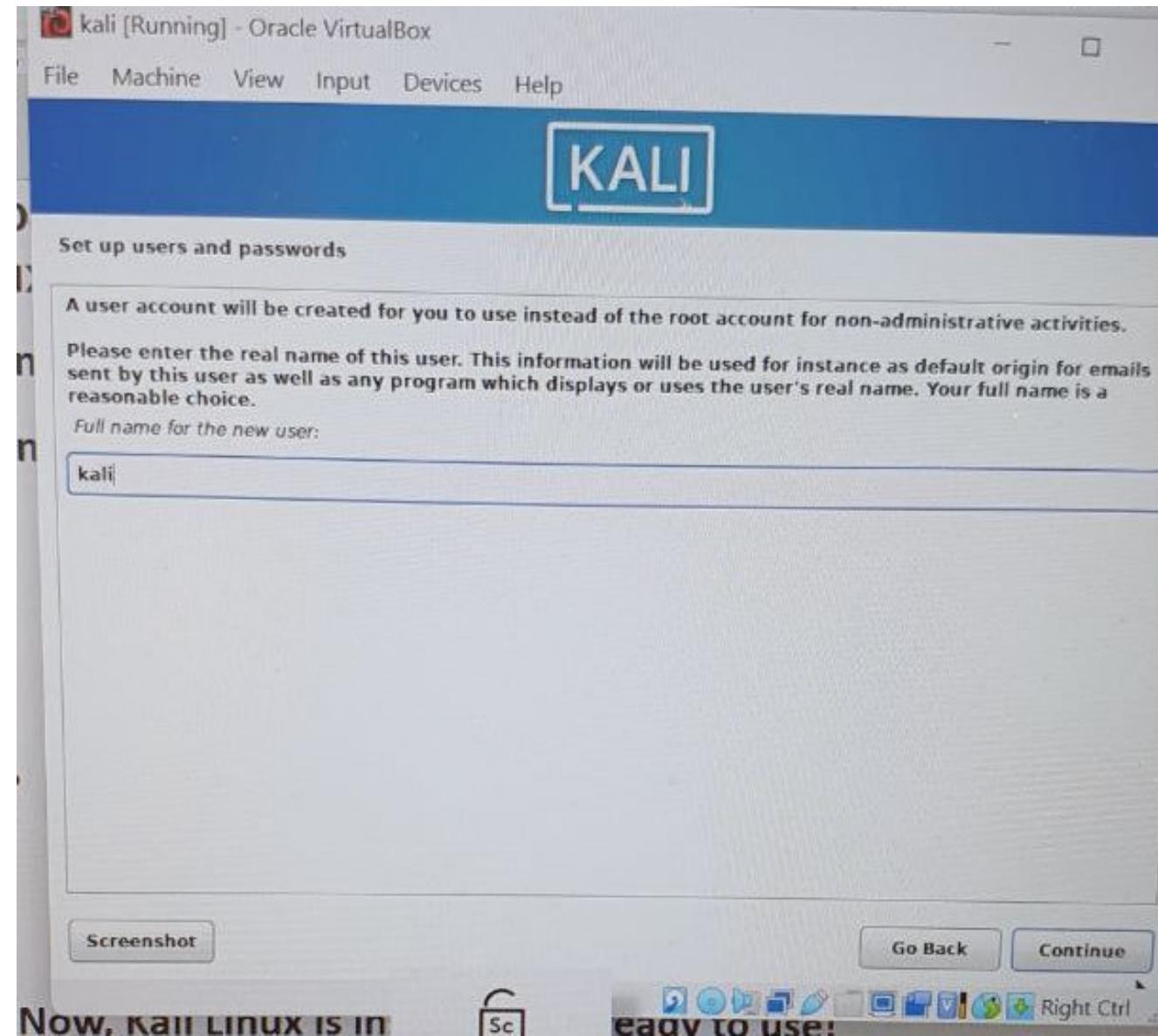
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



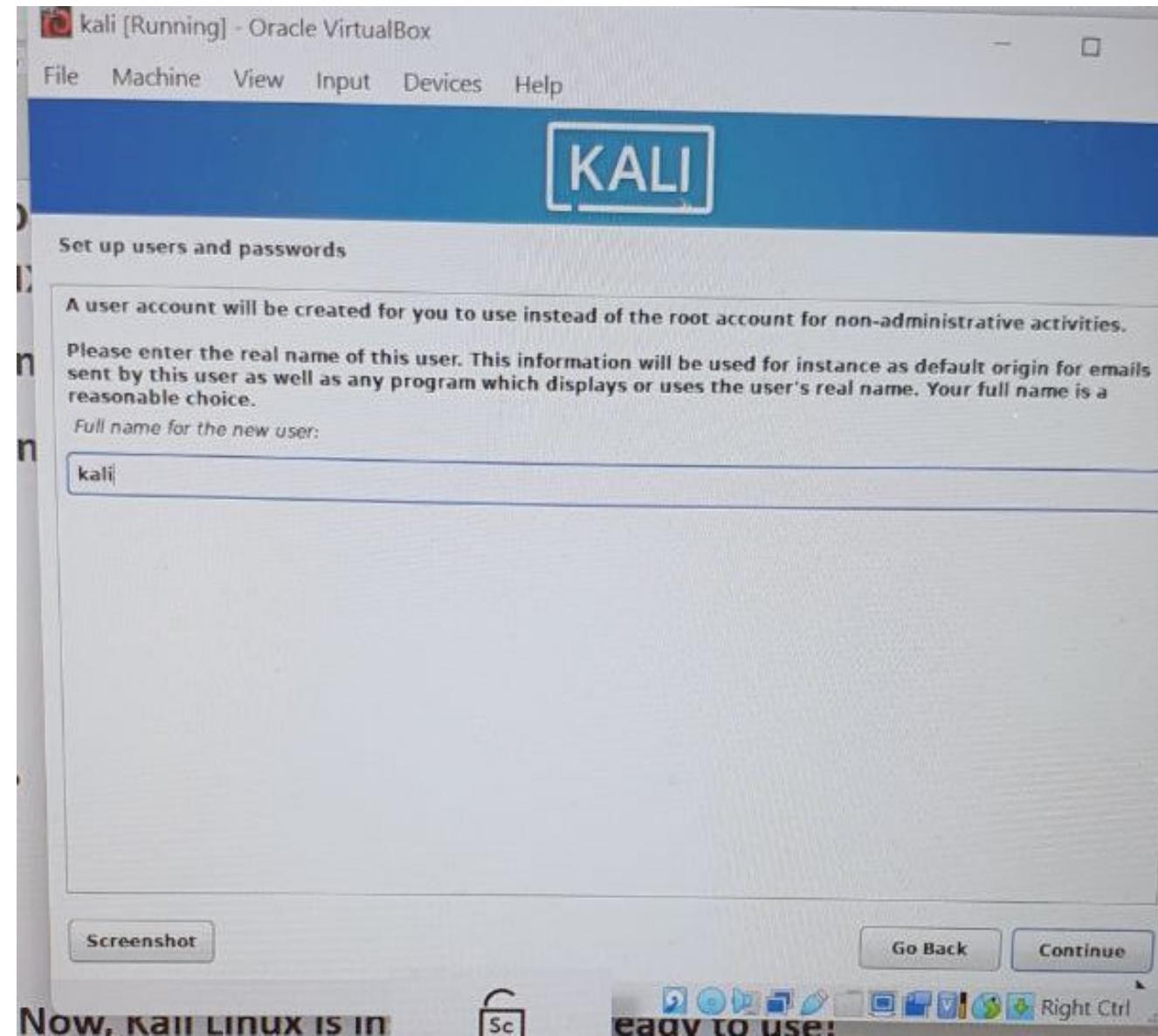
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



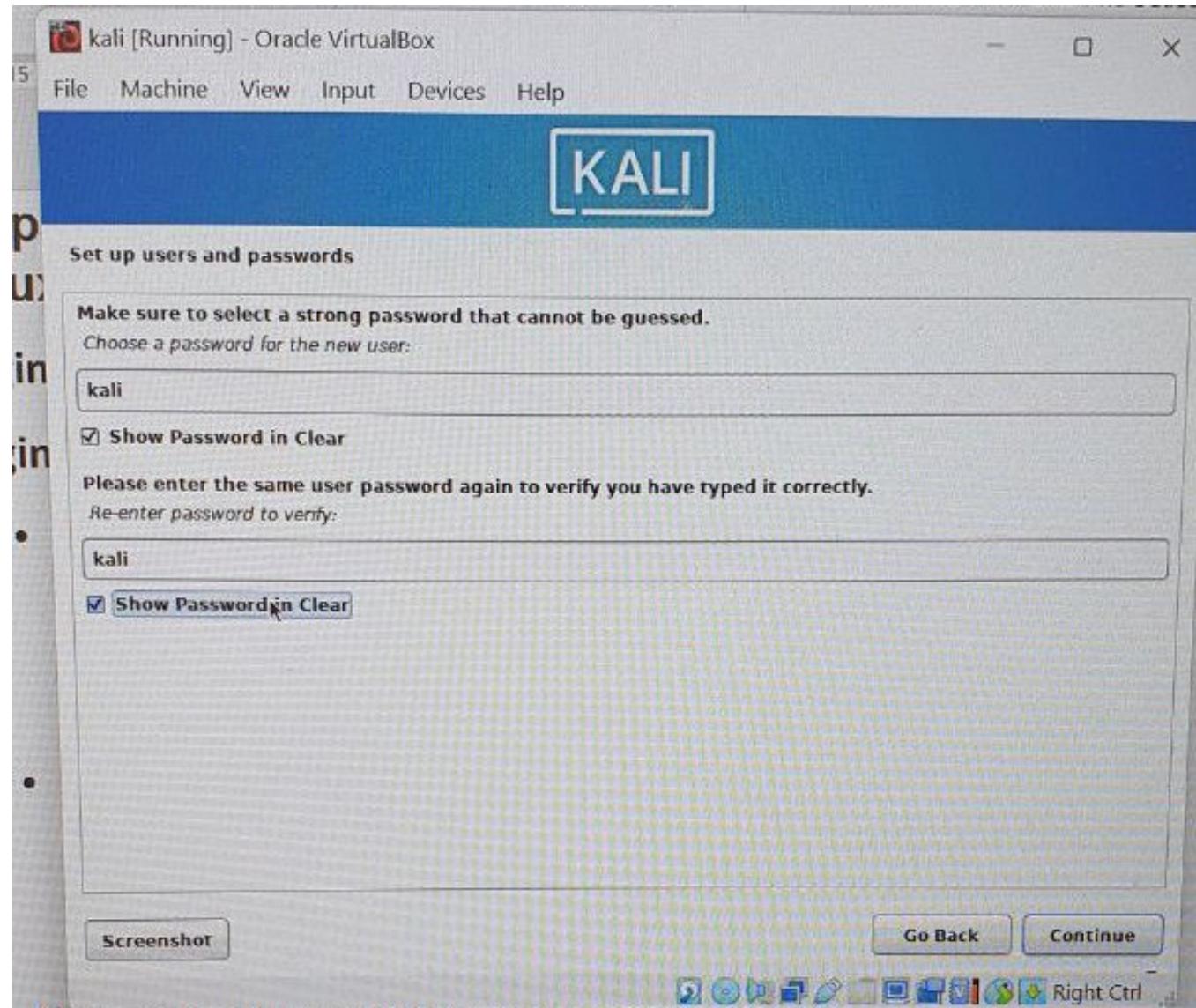
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



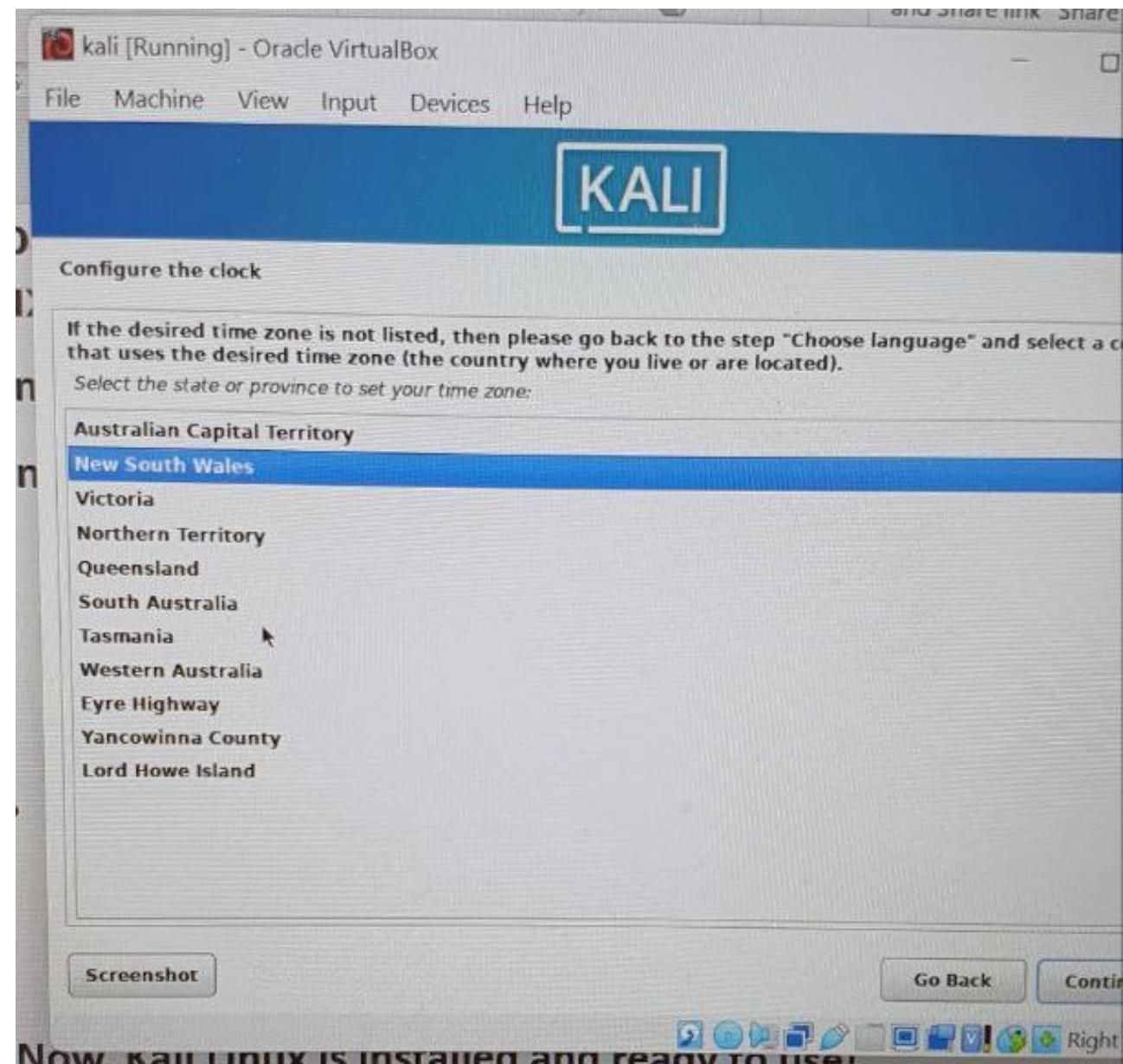
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



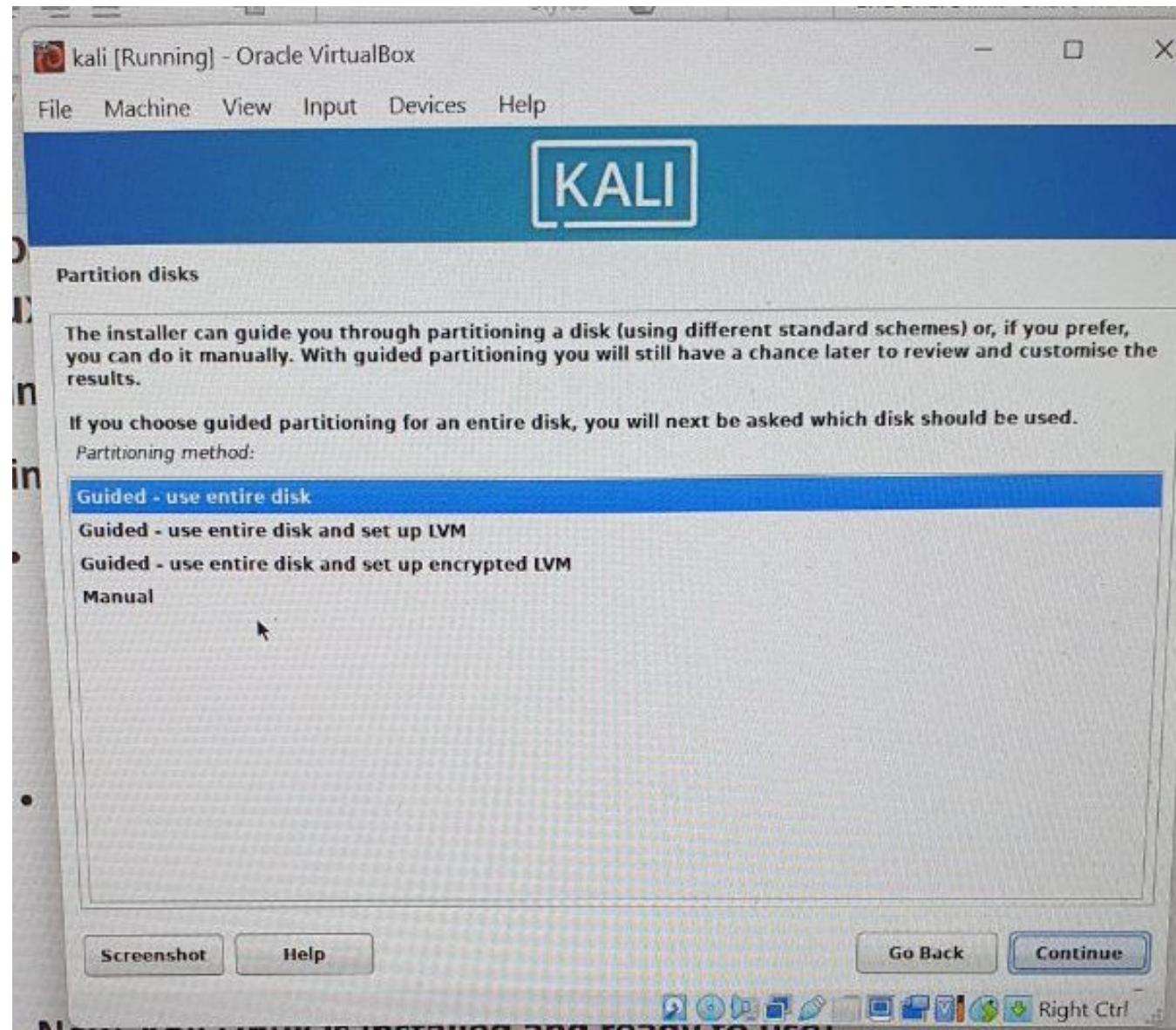
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



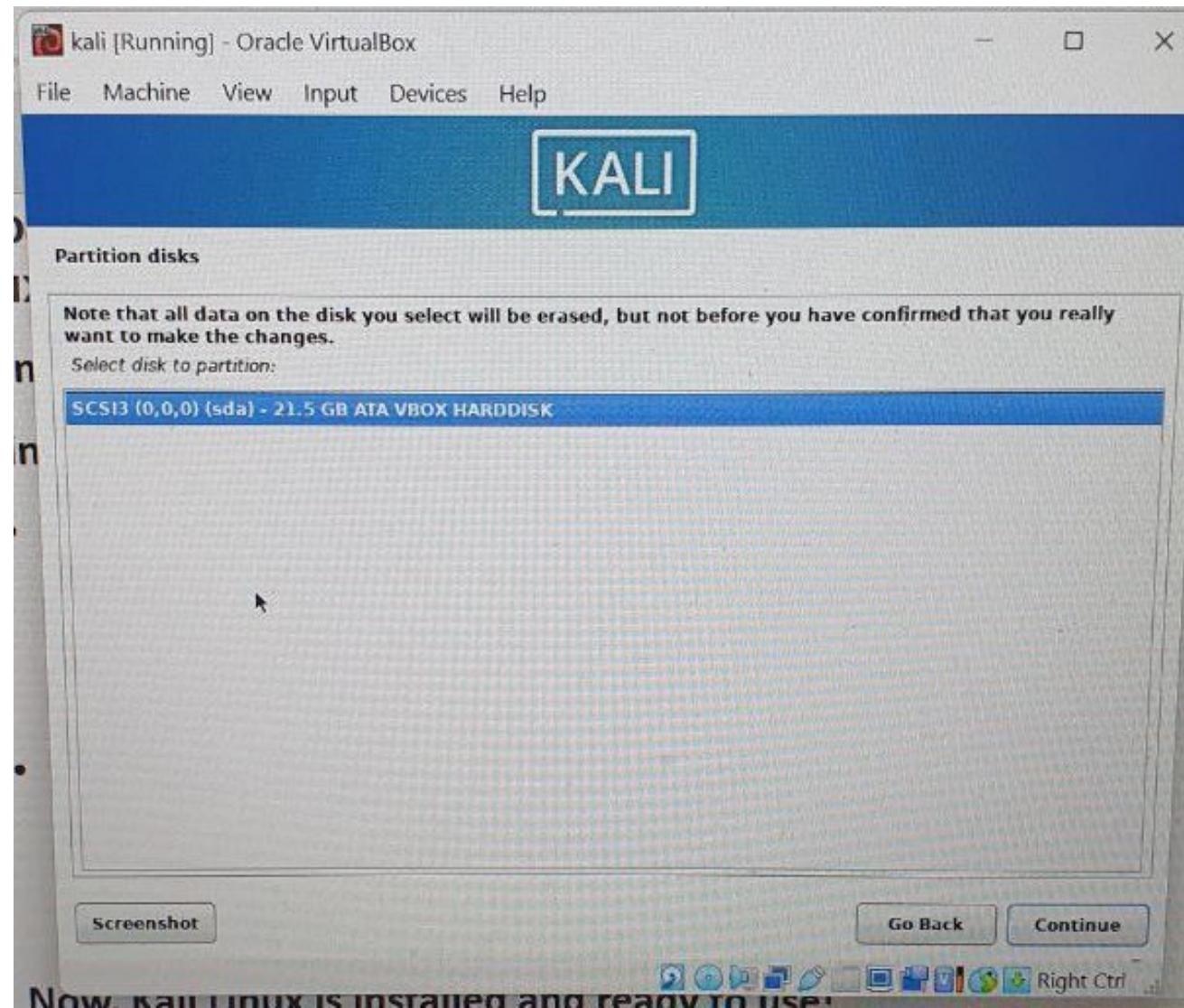
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



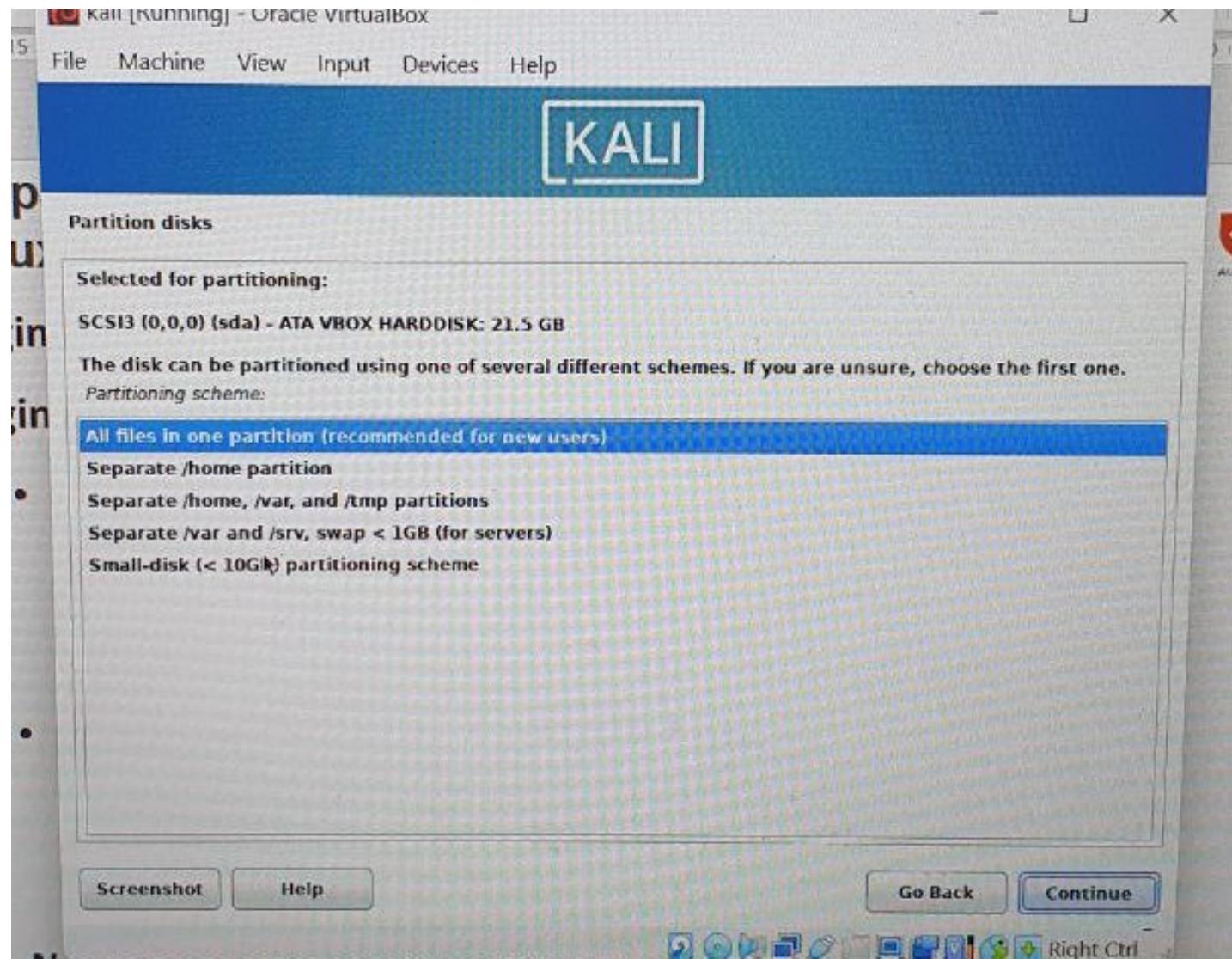
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



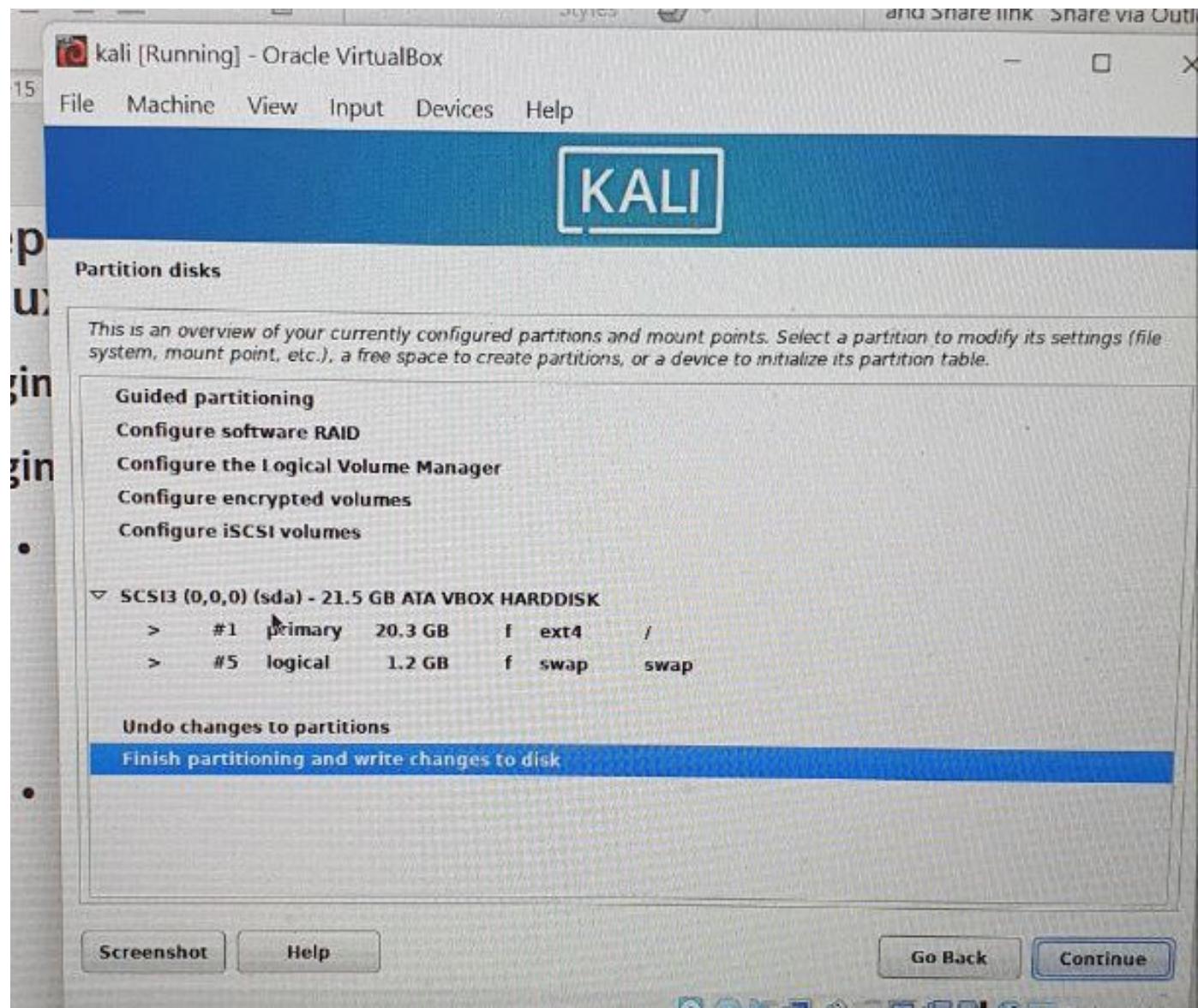
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



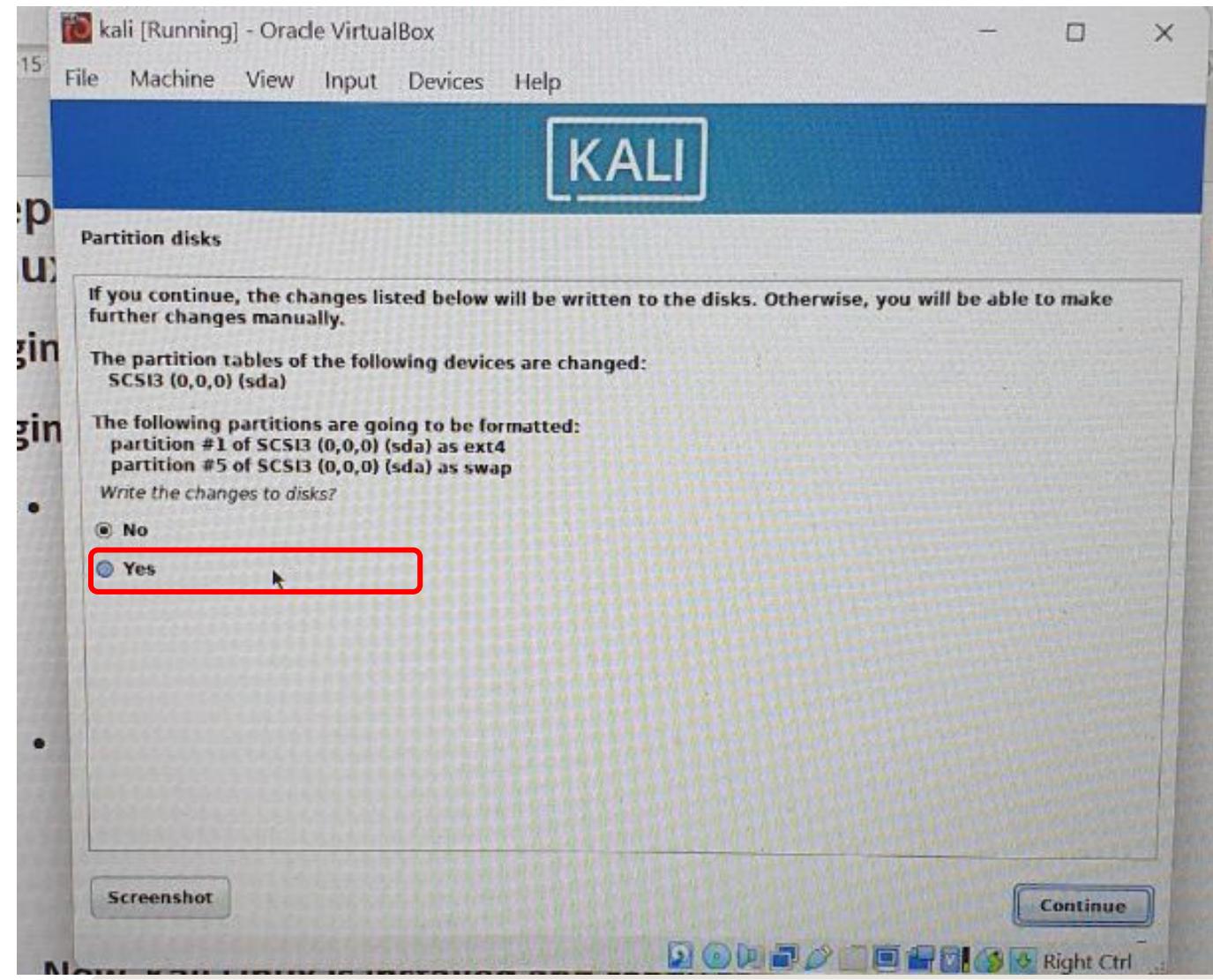
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



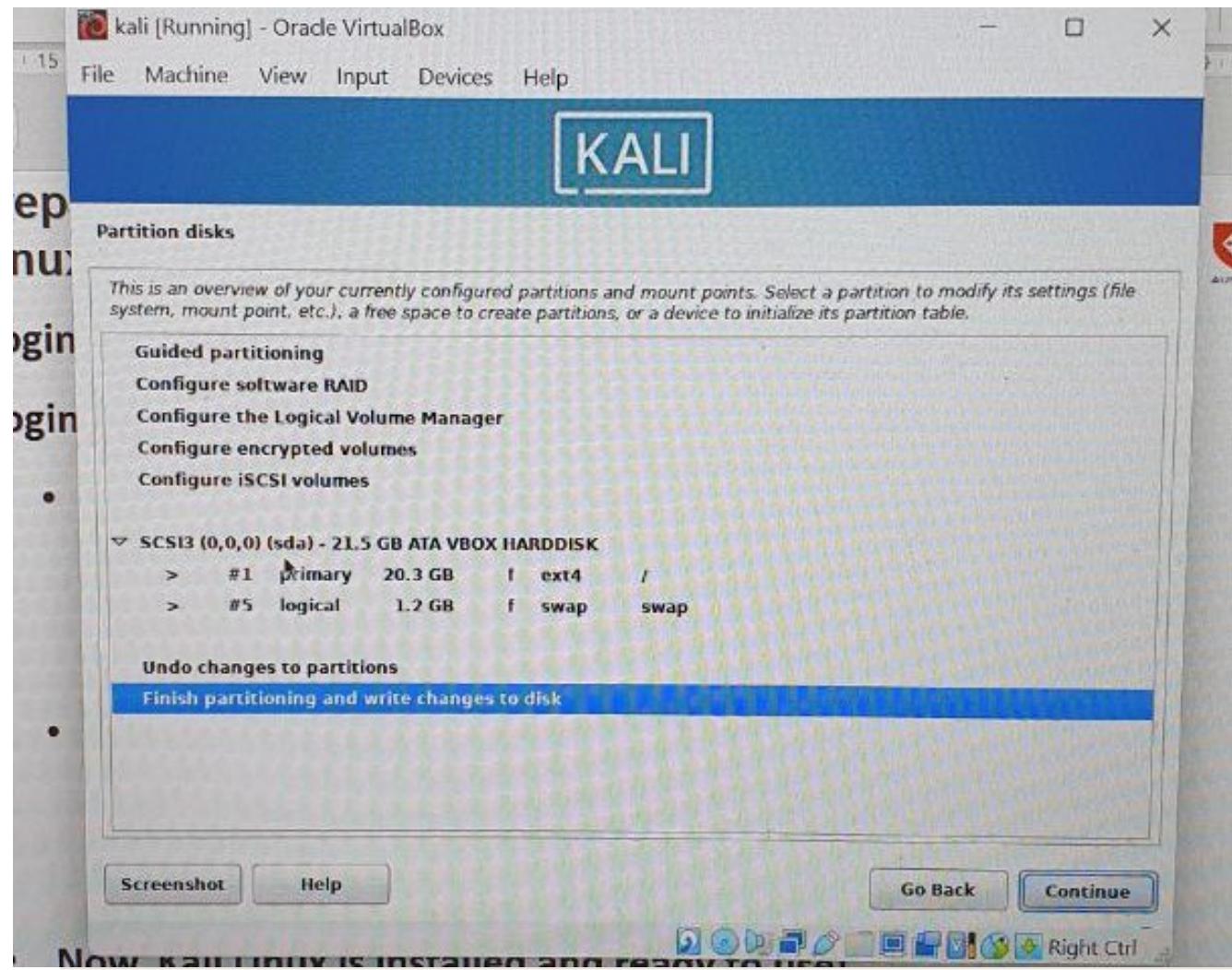
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



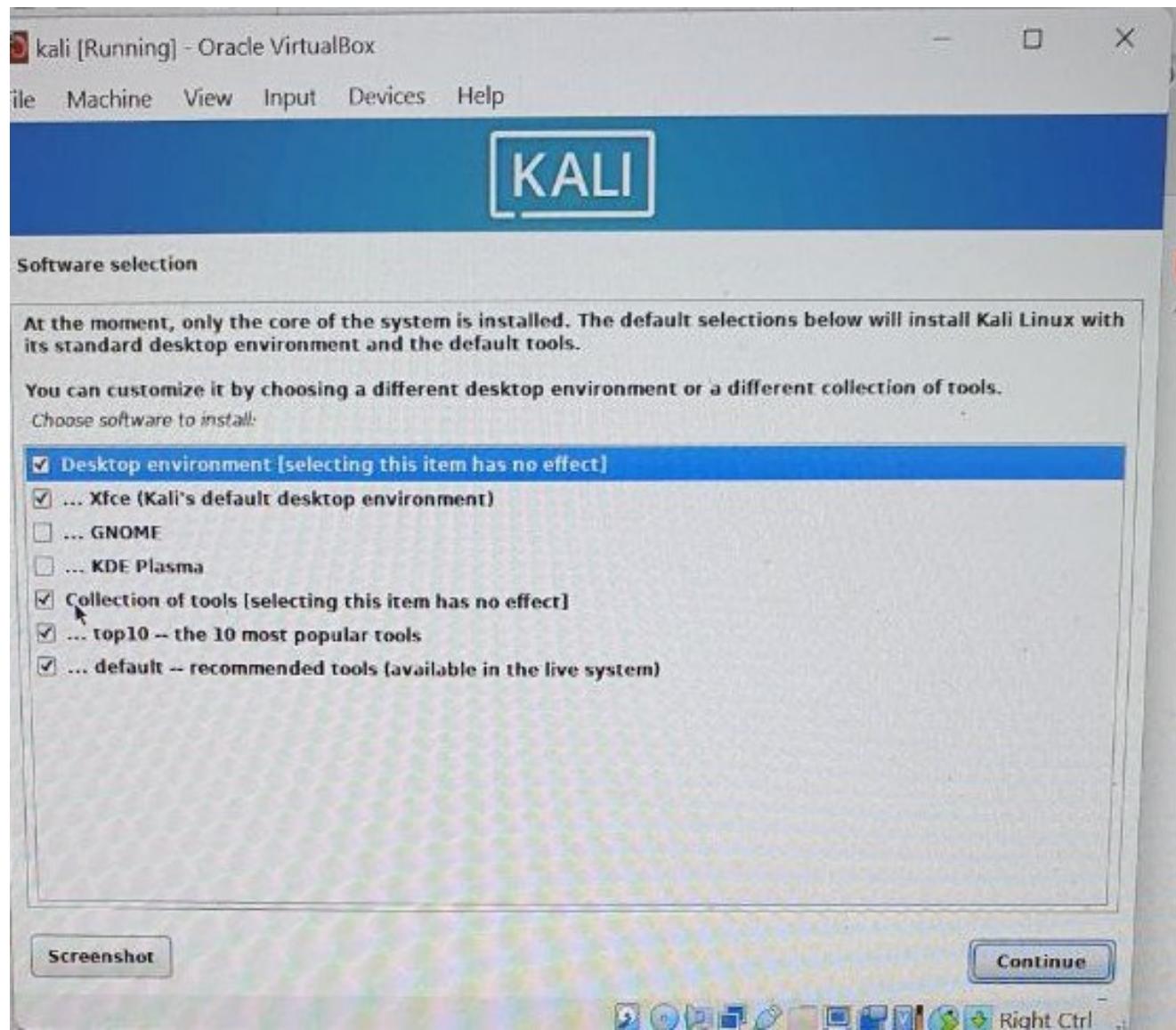
# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

- Proceed the steps, as explain or shown in the following



## Complete Lab Tasks

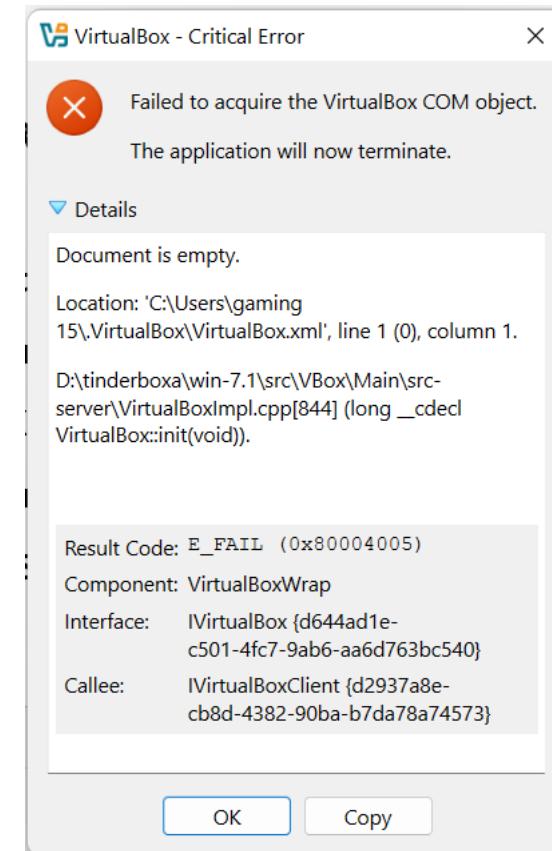
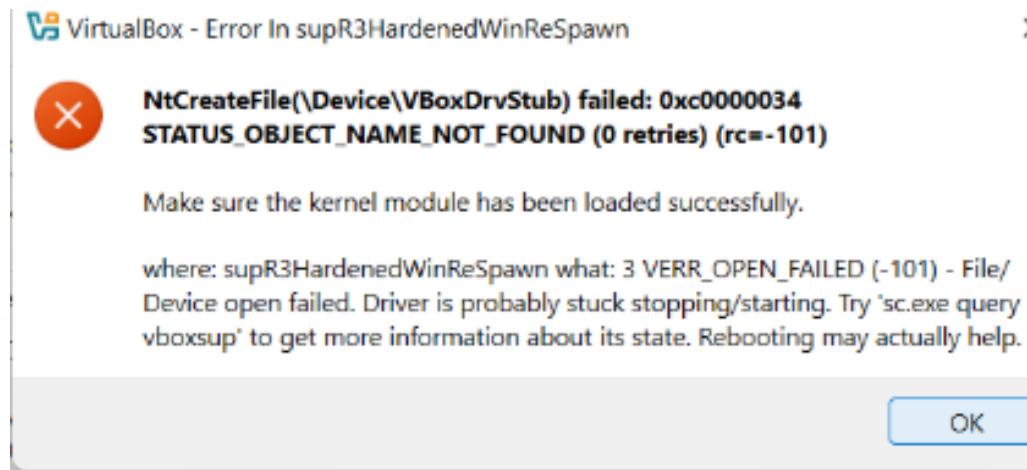
- 1. Take a screenshot** of your Kali Linux desktop after a successful installation.
- 2. List all problems** you encountered during this lab and provide **recommendations** to fix them.

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

In case, if you saw an error like these:

## Solution 1: Restart Your Computer

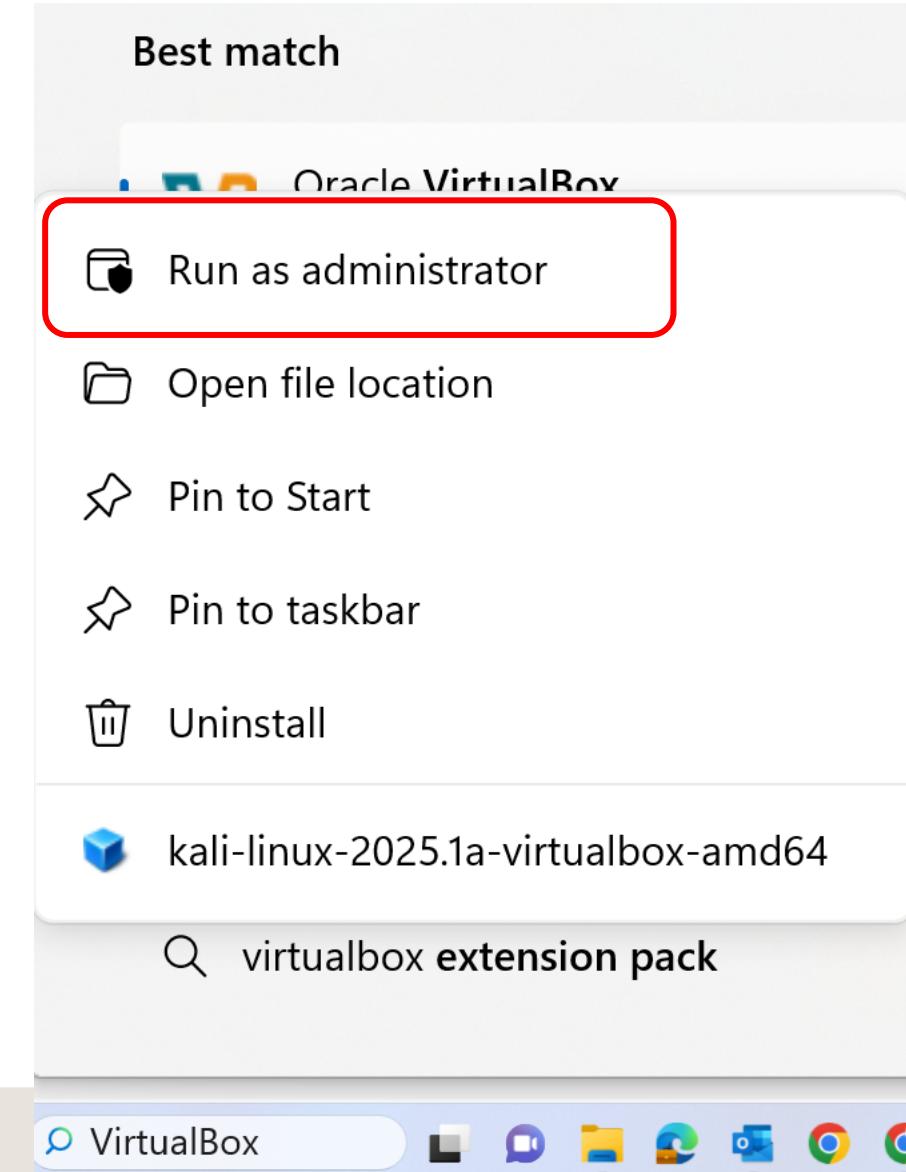
- **First, restart your computer** and try starting Kali Linux again.
- If the issue continues, move to **Solution 2**.



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

## Solution 2: Run VirtualBox as Administrator

- 1. Close VirtualBox completely.**
- 2. Right-click on the VirtualBox icon and select "Run as administrator".**
- 3. Try starting Kali Linux again.**



# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

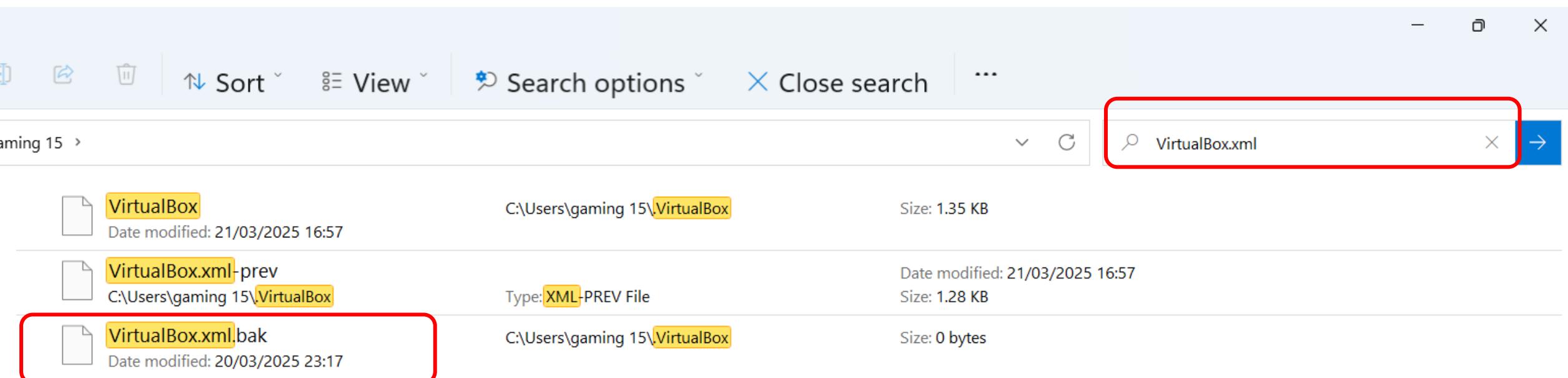


## Solution 3: Reinstall VirtualBox Drivers and VirtualBox Program

# Preparation for Lab 2 (Week 4) – VirtualBox and Kali Linux

## Solution 4:

- Find the **VirtualBox.xml** file in your File Explorer: C:\Users\...
- If the file is empty or corrupt, rename it to **VirtualBox.xml.bak**.
- Restart VirtualBox to let it generate a new configuration file.



## ✓ Things to Remember:

- Follow the steps carefully.
- If you face errors, double-check your settings and ensure you downloaded the correct files.
- Take notes on issues and how you fixed them – this will help in troubleshooting future problems.
- **Final Tip:** Always back up important data before making significant changes to your system!

## Summary of Lab 2 (Week 4)

- **Step 1: Install VirtualBox**
  - Download **Oracle VirtualBox**.
  - Install it on your **Windows** computer.
- **Step 2: Download Kali Linux**
  - We need the **right version** for VirtualBox.
  - There are **two ways** to do this:
    1. **Easier Method (Recommended):** Download the **Kali Linux VirtualBox Image (.iso file)**.
    2. **Harder Method:** Download the **Kali Linux ISO file** and install it manually.

## Summary of Lab 2 (Week 4)

- **Step 3: Import Kali Linux into VirtualBox**
  - If you downloaded the .ova file, just **import** it into VirtualBox.
  - If you downloaded the .iso file, you will **install Kali Linux manually** in VirtualBox.
- **Step 4: Start and Use Kali Linux**
  - Once installed, **start Kali Linux inside VirtualBox**.
  - Use Kali Linux to complete the lab tasks.

## Summary of Lab 2 (Week 4)

- **Step 5: Complete Lab Questions**

- Take a **screenshot** of Kali Linux running inside VirtualBox.
- **List any problems** you faced and how you solved them.

## Summary of Lab 2 (Week 4)

This lab helps us:

- ✓ Understand **virtualization** and how to run different operating systems.
- ✓ Learn how to install and configure **VirtualBox** and **Kali Linux**.
- ✓ Prepare for **cybersecurity tasks** in a safe virtual environment.
- ✓ Use **Kali Linux tools** without affecting our main Windows system.

## Summary of Lab 2 (Week 4)

### Final Thought

Think of **Oracle VirtualBox** as a **TV** and **Kali Linux** as a **video game console**.

- **VirtualBox (TV)** is the platform that runs different operating systems.
- **Kali Linux (Game Console)** is the system we use inside VirtualBox to practice cybersecurity

# Submission of Labs & Assessments



- These guidelines are designed to **support your learning** and help you apply necessary techniques effectively. For **lab or assessment submissions**, please follow instructions and complete tasks based on **Canvas**. If you have any questions, feel free to ask—I'm happy to help!

# Thank You

- *Have a Great Learning Day!*
- Feel free to reach out with any questions!
- Dr. Farshid Keivanian