Evolutionary Computing
COMP 5660-001/6660-001/6660-D01 – Auburn University
Fall 2024 – Python Environment Setup Guide

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1   Overview

In this assignment, you will create the development environment used for assignments throughout the course. You will start by creating a Linux environment using one of several virtualization options. These options will result in a good experience and it is up to the student to pick which method they prefer, though we make recommendations in case this is entirely new to you. In any case, an Ubuntu 22.04 (24.04 is also fine) environment will be created and Anaconda will be set up to provide Python package management. Once environment creation is complete, you will complete a brief introduction to GitHub.

2   Linux Setup

We require development for a Linux environment in this course. For development and grading purposes, we prescribe the use of Ubuntu (22.04 or 24.04) for all assignments. If you already have a machine running Ubuntu, you can skip to the next section. If you're running another distro of Linux, reach out to the TAs to check if your existing OS install will work. For everyone else, you'll be creating a Linux environment using some form of virtualization. We make the following recommendations based on your OS and hardware:

Windows 10 or newer We recommend installing Ubuntu using Windows Subsystem for Linux, but you can also use a virtual machine if you already have one or are more comfortable with this approach.

Older versions of Windows and Intel-based Mac We recommend installing Ubuntu in a virtual machine.

Non-Intel Mac, ChromeOS, tablets, etc. Virtualization is poorly supported on these devices or requires paid software. You are welcome to use any virtualization software at your disposal, but otherwise please contact the TAs.

2.1   Windows Subsystem for Linux (WSL)

For more information on setting up WSL, please read the official installation documentation from Microsoft: https://learn.microsoft.com/en-us/windows/wsl/install.
After installing WSL, install Ubuntu 24.04 LTS with:

```
wsl --install -d Ubuntu-24.04
```

2.2 Virtual Machine

You are welcome to use the virtualization software of your choice, but we recommend VirtualBox as it's free and relatively easy to use. A guide to installing an Ubuntu VM with VirtualBox can be found in the appendix. Note, however, that this guide was created using Windows 10 and you may encounter interface discrepancies. You can also use VMware or another tool, if you're more familiar with another virtualization software capable of supporting Ubuntu.

3 Anaconda Setup

Use the following terminal commands to download and install Anaconda:

```
wget https://repo.anaconda.com/miniconda/Miniconda3-latest-Linux-x86_64.sh
chmod 755 ./Miniconda3-latest-Linux-x86_64.sh
./Miniconda3-latest-Linux-x86_64.sh
```

4 GitHub Setup

Now we're going to walk through the process of setting up your repository and submitting your assignment. First, sign into your GitHub account (or create a new one). Make sure you have verified your email address. Then, follow this link https://classroom.github.com/a/c0Ytptsd and wait a few seconds until the repository is set up (you need to refresh the page). Follow the instructions in README.md to complete your first assignment. This assignment is due Sunday, August 25, 2024 at 10:00 PM.

5 Appendix

5.1 VirtualBox

First, download the Ubuntu 22.04 or 24.04 Desktop installation image: https://ubuntu.com/download/desktop

Visit the following page to download the VirtualBox installer that is appropriate for the target machine: https://www.virtualbox.org/wiki/Downloads

Once VirtualBox is installed, a new virtual machine instance must be created. After launching VirtualBox, click the "New" button.
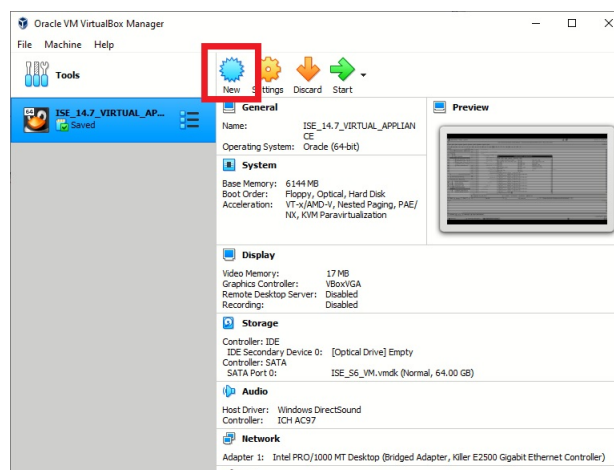
Use the following dialog to select an appropriate name and storage location for the new VM. Use this dialog to select Linux Ubuntu (64-bit) as the Type and Version as shown here.
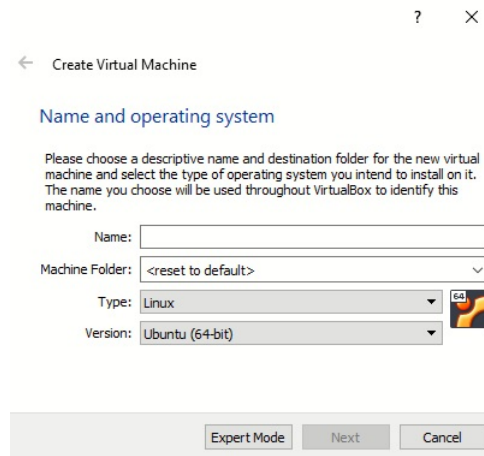

Next, set the amount of RAM that will be allocated to the VM. A minimum of 16 GB is recommended (note you can go lower, if necessary, but this may require some slight changes to the assignments). However, if the target machine has enough RAM to allow for a higher setting, that can allow the VM to be more effective. This setting can also be changed after setup at any time as long as the VM is powered down.
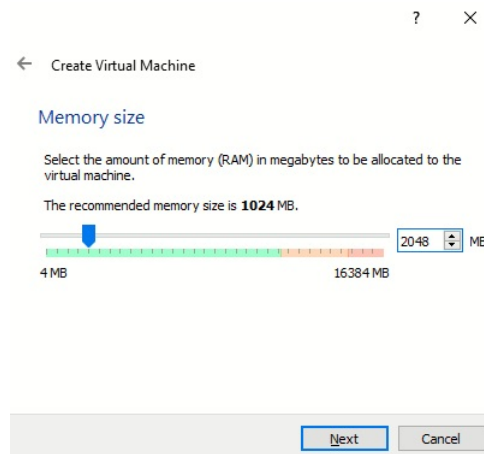
The next step will be to create a new virtual hard disk.
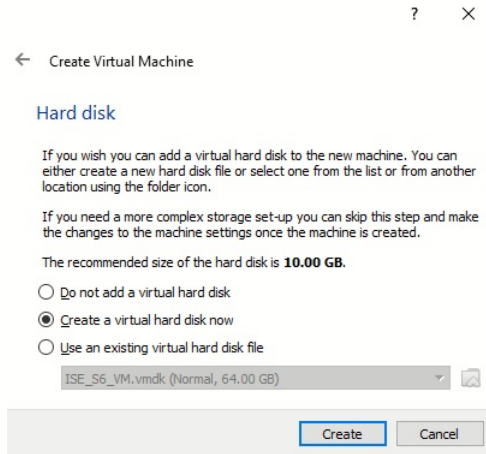
Use the default setting of VDI (VirtualBox Disk Image)
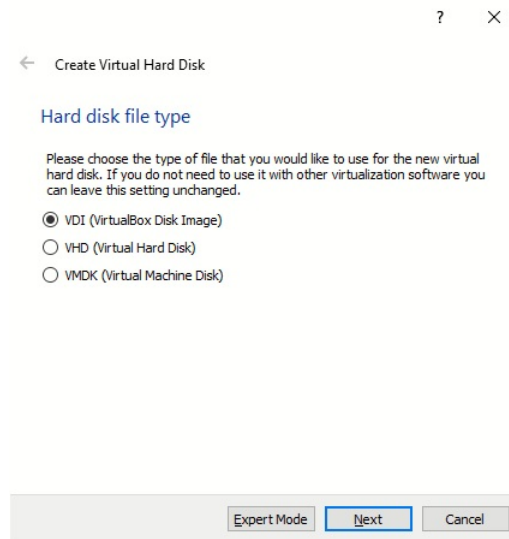
Next, select how storage will be allocated on the physical disk. It is recommended to use the default option of Dynamic allocation, but if a fixed size is desired that option can be selected as well.
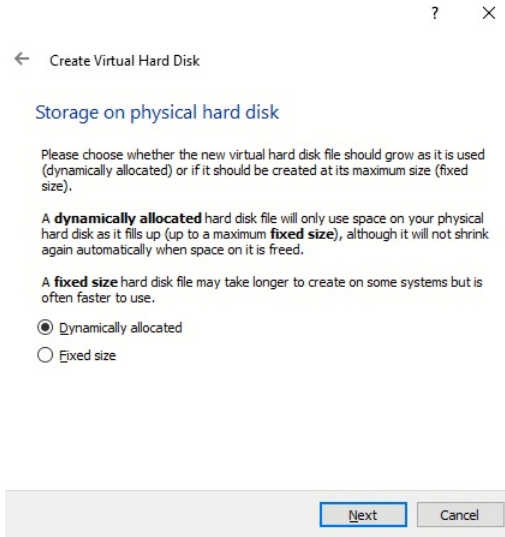
Select the desired location and size for the virtual hard disk. If a dynamic allocation method was selected in the previous step, this setting will be used to limit the maximum size of the virtual drive (allocation will take place as needed up to the selected size). If a fixed size was selected, the size entered here will be immediately reserved on the physical drive. The minimum recommended size is 20 GB.
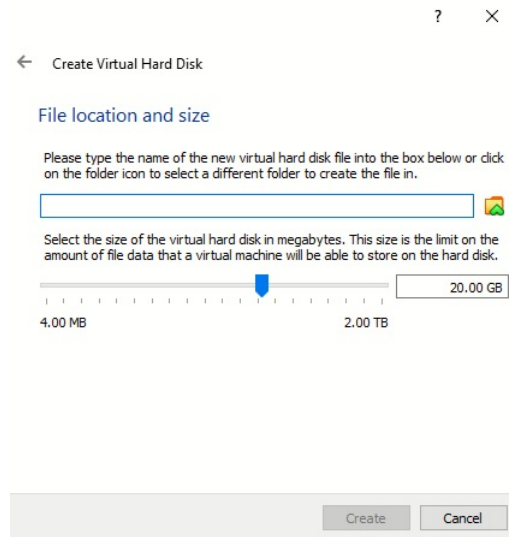

At this point the VM setup will be complete. However, the Linux Ubuntu operating system must still be installed. Select the new VM and click the settings button.
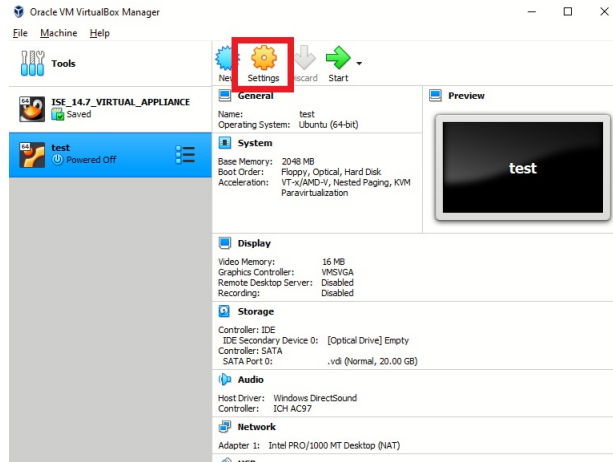
Use the settings menu to select Storage from the left hand menu. Next, select the currently empty device under the IDE controller. Then, click the CD icon and click the option to choose a disk file to select a disk which will be loaded into the virtual drive. Use the file browser dialog to select the Ubuntu 20.04 Desktop image that was downloaded earlier.
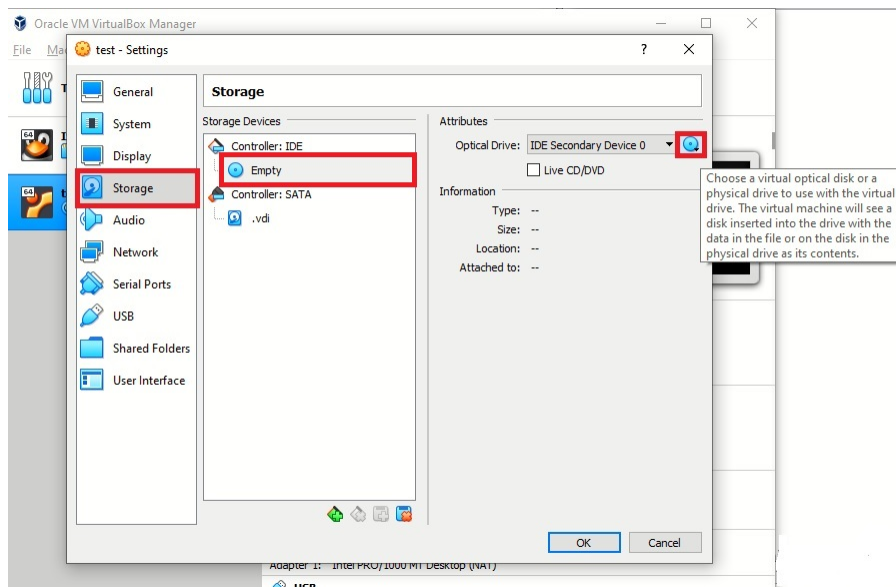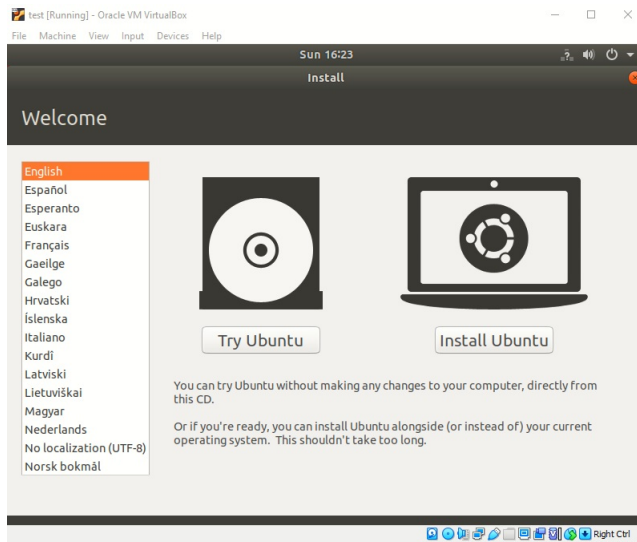

The Storage dialog should now show that the Ubuntu image is loaded into the IDE controller's virtual disk drive. Click "ok" to close the settings dialog.
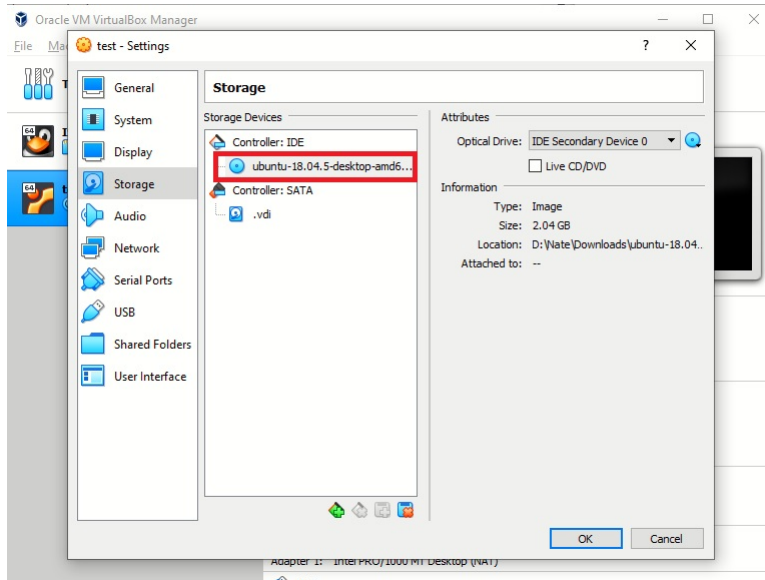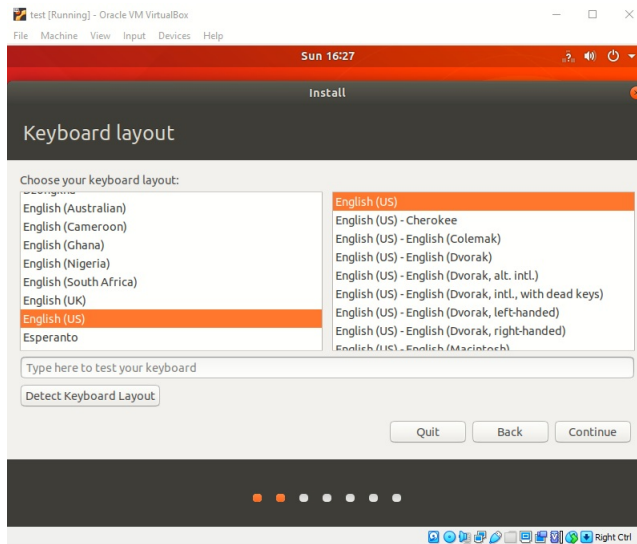
The VM can now be powered on. Click the start button.
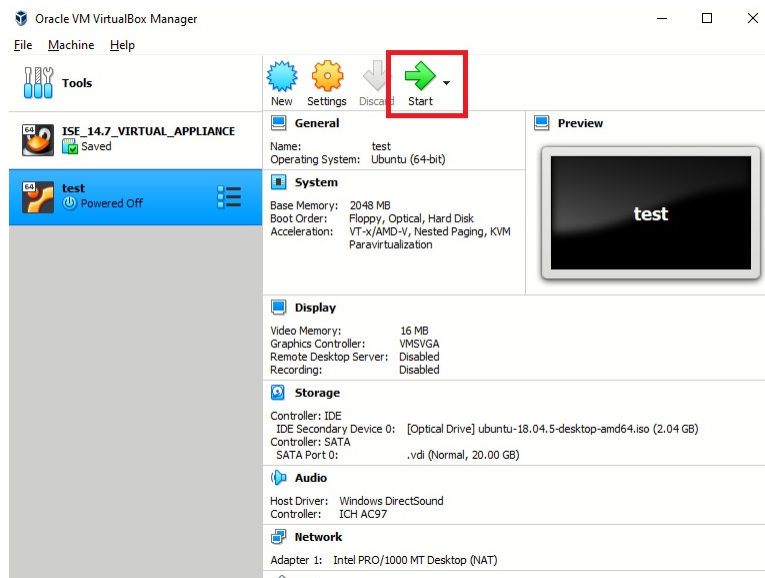
The VM will start up and boot from the selected Ubuntu Desktop image found in the virtual disk drive. Click the Install Ubuntu button.
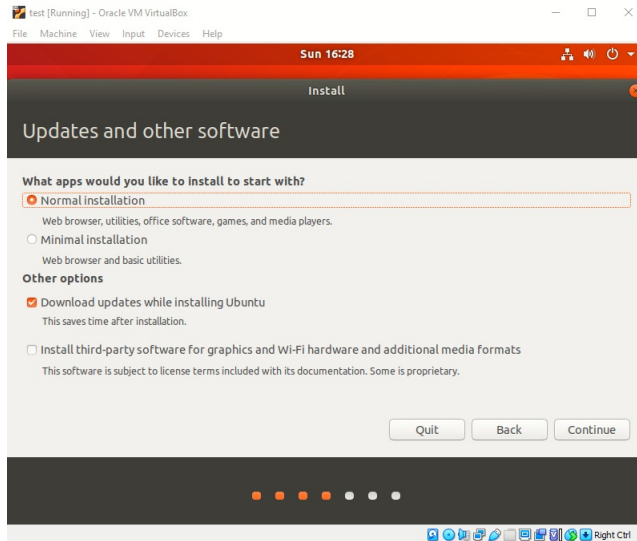
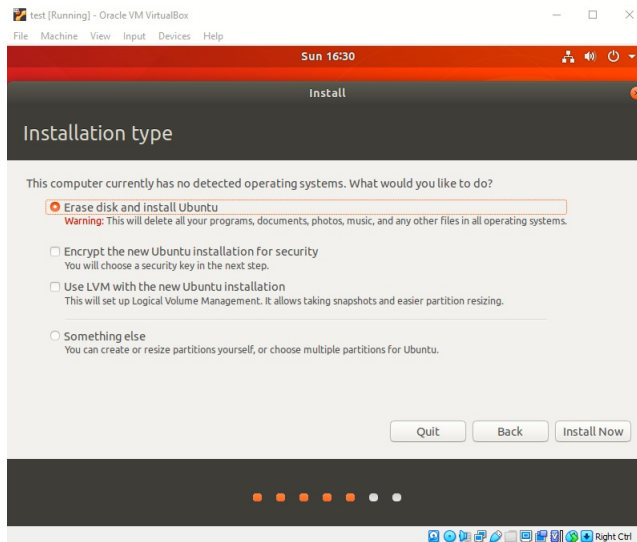Select the desired keyboard layout for the VM.

Use the default values for the updates and other software options

Next, instruct the installer to erase the entire disk. This will only erase the virtual disk (none of the host system files will be erased). Click the Install Now button and then select Continue from the following dialog to begin the installation process.


Follow the prompts to select an appropriate time zone and configure a user and password for the VM's guest operating system. When the installation is complete, click the Restart Now button.
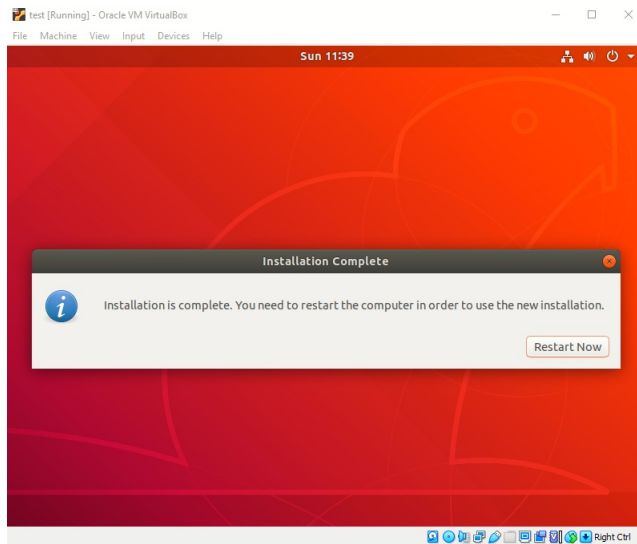
At this point, the installer will pause to give the user time to remove the installation disk. VirtualBox usually handles this automatically, but to verify the Ubuntu disk has been removed, click Devices then Optical Devices and ensure there is no check mark next to the Ubuntu disk image. If there is a check mark, click the disk image menu option and select force unmount. Hit the enter key to reboot the machine.
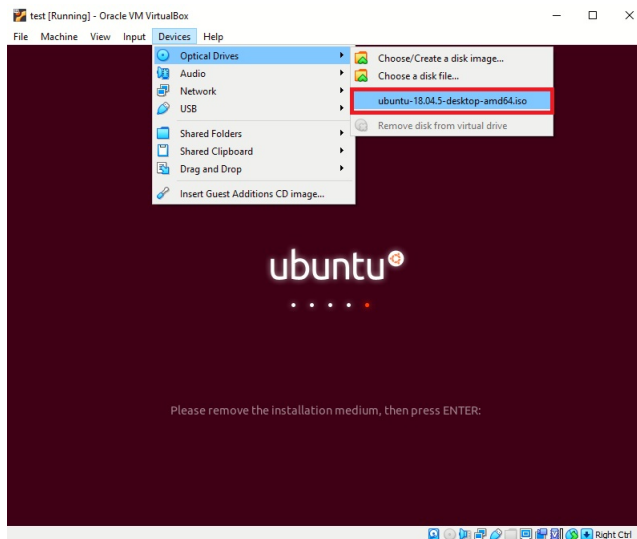
Upon rebooting, the login screen with the configured user name should appear. If the Ubuntu installation menu appears again, it will need to be removed manually through the settings dialog. Shutdown the machine. Using the menu, select Machine, then ACPI Shutdown.
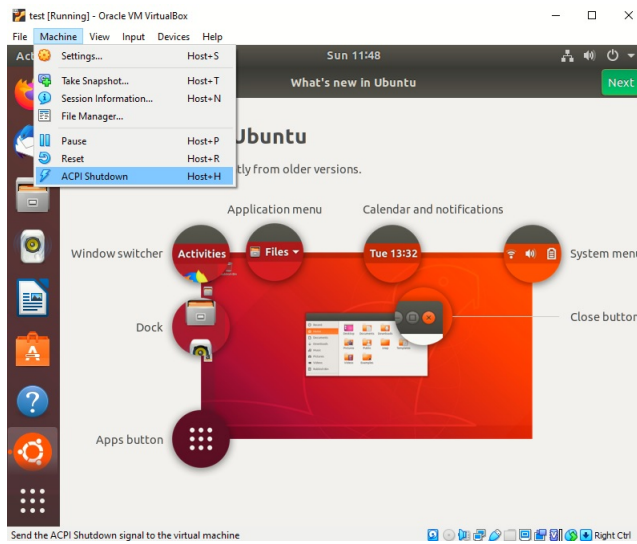
Now that the machine is powered off, use the VirtualBox settings menu to remove the Ubuntu installation disk image.
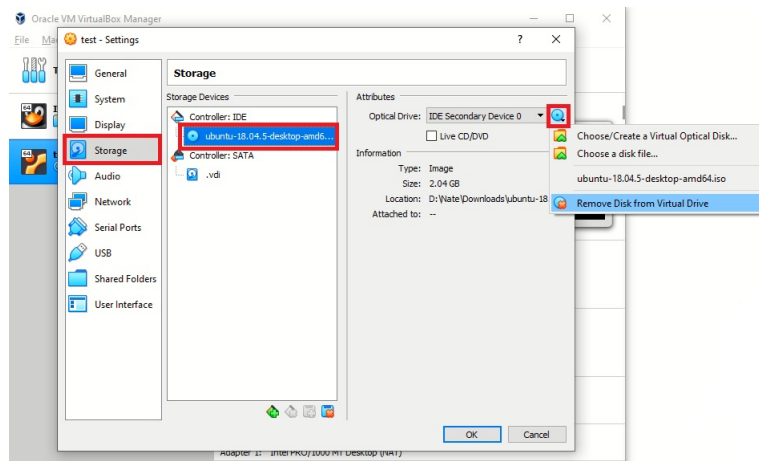
Now that the disk has been removed, close the settings dialog and start the VM again.