# TEMASEK POLYTECHNIC
# SCHOOL OF INFORMATICS & IT
# VIRTUAL DESKTOP TECHNOLOGY
## Practical 1

Dear students,

- Please ensure to complete these Labs as they will be part of your final project report and POC.

- Please remember to take all **important screen shots** of each Lab to build up your final project report and POC.

- Please also remember to use virtual box **clone feature** to back up your Ravada VM after each Lab to prevent any corruption.

- Please copy all Linux commands in these Labs to **notepad** first, **ensure all syntax is correct** before copying to Linux Command prompt.

**Hardware requirements**
- Windows 10 or 11 Notebook
- At least 150 GB of free space in internal hard disk or external portable disk
- Preferably 16GB RAM
- Preferably 8 vCores CPU or higher

**VRDT Labs - High Level Design:**

| Windows 10 VDI Client | Ubuntu VDI Client |
|---|---|
| Ravada (Ubuntu) VDI Hypervisor | |
| Virtual Box (nested VM enabled) | |
| Windows 10 | |
| Laptop | |

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## Setting up Ravada VM

Before you start, you need to make sure you have the correct environment being setup. This lab assumption – using a computer that runs on Intel or AMD x86 – 64bit platform that supports Virtualization Technology (VT-x or AMD-v) and Windows 10.
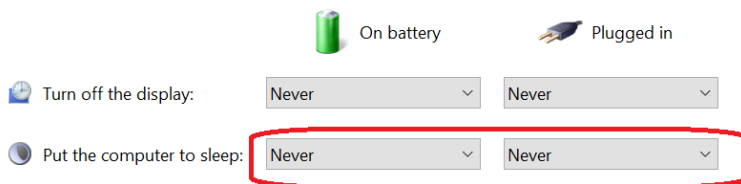
### Step 1

**Enable** Intel VT-x or AMD-v from the Notebook BIOS
**Disable Sleep Mode** on Notebook

Change settings for the plan: Power Saver
Choose the sleep and display settings that you want your computer to use.

|  | On battery | Plugged in |
|---|---|---|
| Turn off the display: | Never | Never |
| Put the computer to sleep: | Never | Never |

Change advanced power settings

### Step 2

**Download the following software from MS Team VRDT Software file folder**
- Ubuntu 22.04.1 LTS iso
- VirtualBox-6.1.40 **(Do not install Version 7)**
- VirtualBox-6.1.40 Oracle VM VirtualBox Extension Pack **(Do not install Version 7)**
- Windows 10 iso
- virt-viewer 11.0
- WinSCP-5.21.6

### Step 3

**Install VirtualBox 6.1.40 and VirtualBox 6.1.40 Oracle VM VirtualBox Extension Pack**
**Create a Ravada VM in VirtualBox**
Configure Ravada VM specs as below:
- CPU: 6 CPUs
- RAM: 10GB
- Hard disk space: 150GB

**Note: For Windows 11**
**Disable Hyper-v:**
Run CMD as administrator
bcdedit /set hypervisorlaunchtype off
DISM /Online /Disable-Feature:Microsoft-Hyper-V

**Disable Windows 11 memory integrity:**
Goto windows security → Device security → Core isolation
Memory integrity → **OFF**

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← Create Virtual Machine
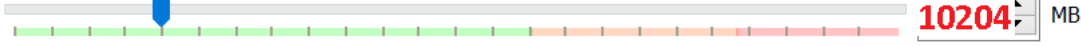
**Name and operating system**

Name: Ravada

Machine Folder: 📁 C:\Users\user\VirtualBox VMs ⌄

Type: Linux ▾

Version: Ubuntu (64-bit) ▾

**Memory size**

10204 MB

4 MB

**Hard disk**

○ Do not add a virtual hard disk

◉ Create a virtual hard disk now

○ Use an existing virtual hard disk file

← Create Virtual Hard Disk

**File location**

C:\Users\user\VirtualBox VMs\Ravada\Ravada.vdi

**File size**

150.00 GB

4.00 MB                                  2.00 TB

**Hard disk file type**

◉ **VDI (VirtualBox Disk Image)**

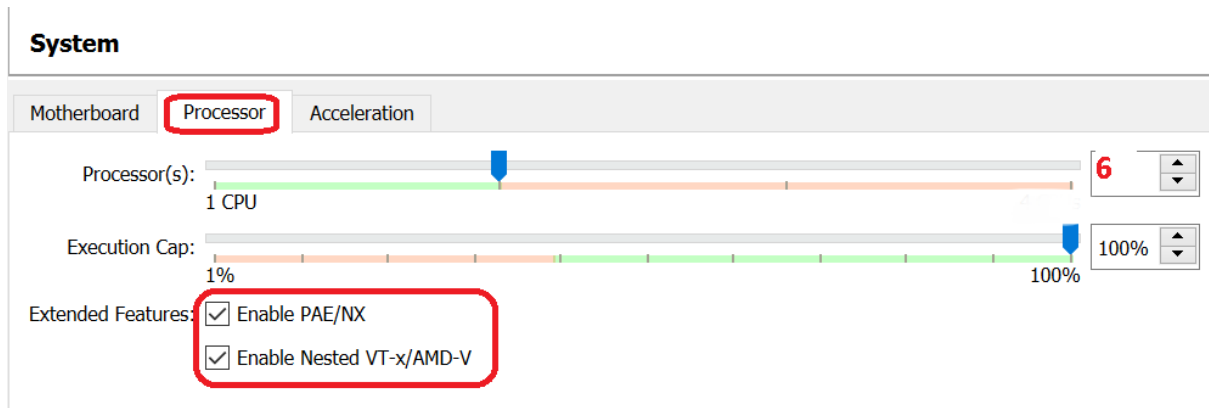○ **VHD (Virtual Hard Disk)**

○ **VMDK (Virtual Machine Disk)**

○ HDD (Parallels Hard Disk)

**Storage on physical hard disk**

◉ Dynamically allocated

○ Fixed size

☐ Split into files of less than 2GB

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## System

| Motherboard | **Processor** | Acceleration |

Processor(s):                                    **6**
1 CPU

Execution Cap:                              100%
1%                                      100%

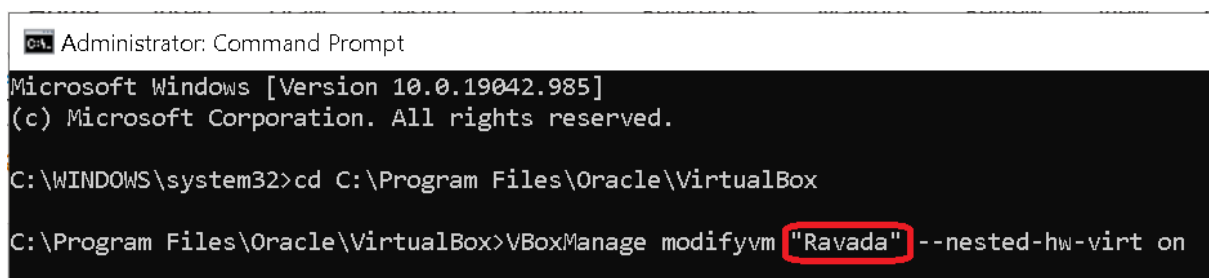Extended Features: ☑ Enable PAE/NX
☑ Enable Nested VT-x/AMD-V
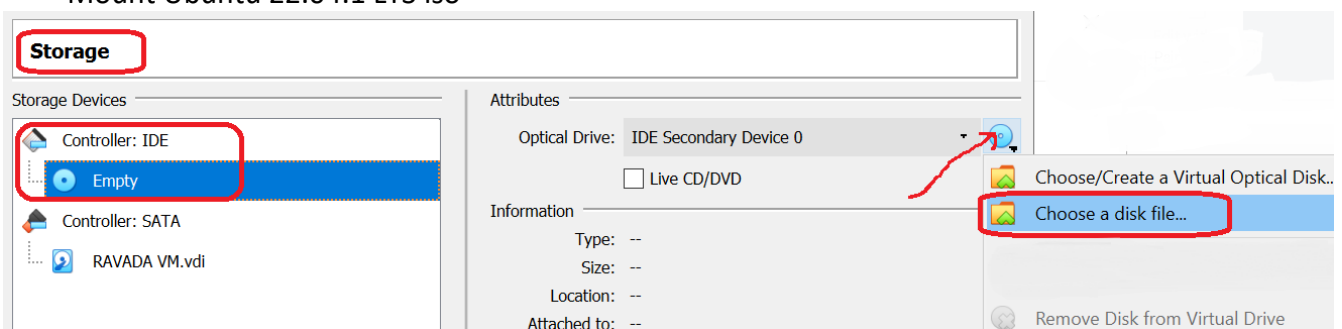
**Step 4**
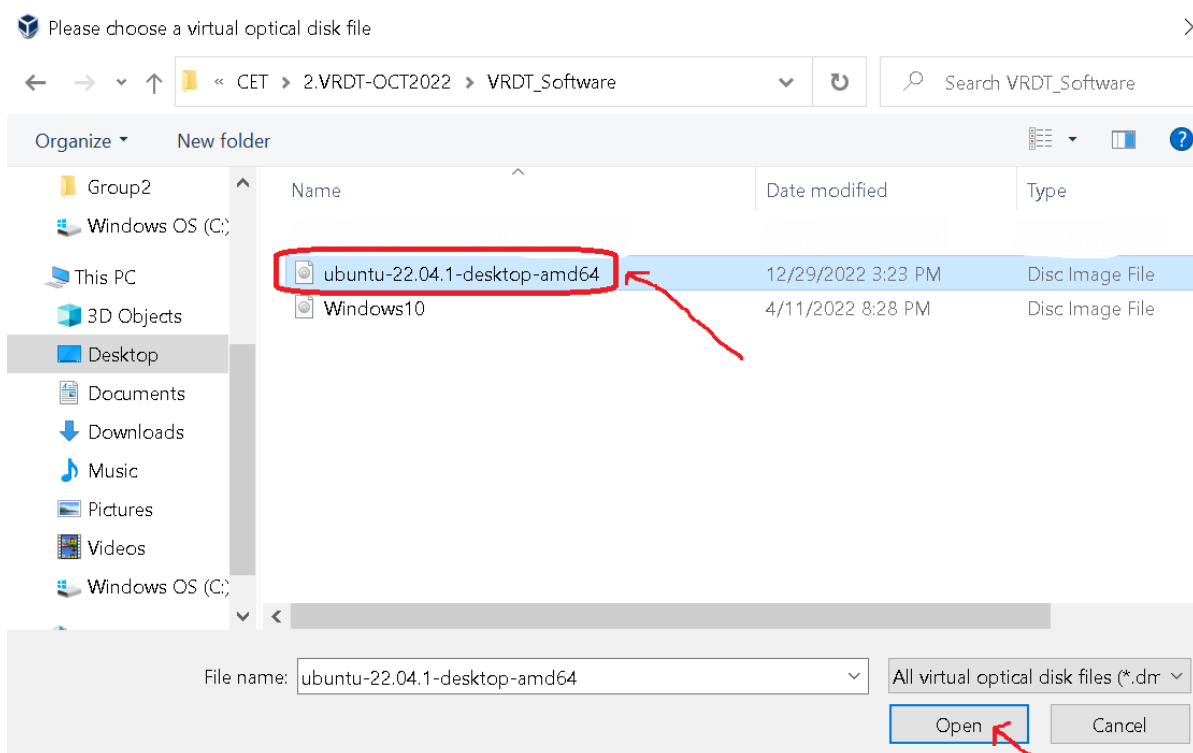**Enable Nested Virtualization for Ravada**
On your Windows 10 Notebook:

- Goto **command prompt** as administrator
- Type in the commands as below
- cd C:\Program Files\Oracle\VirtualBox
- **VBoxManage modifyvm "Ravada" --nested-hw-virt on**
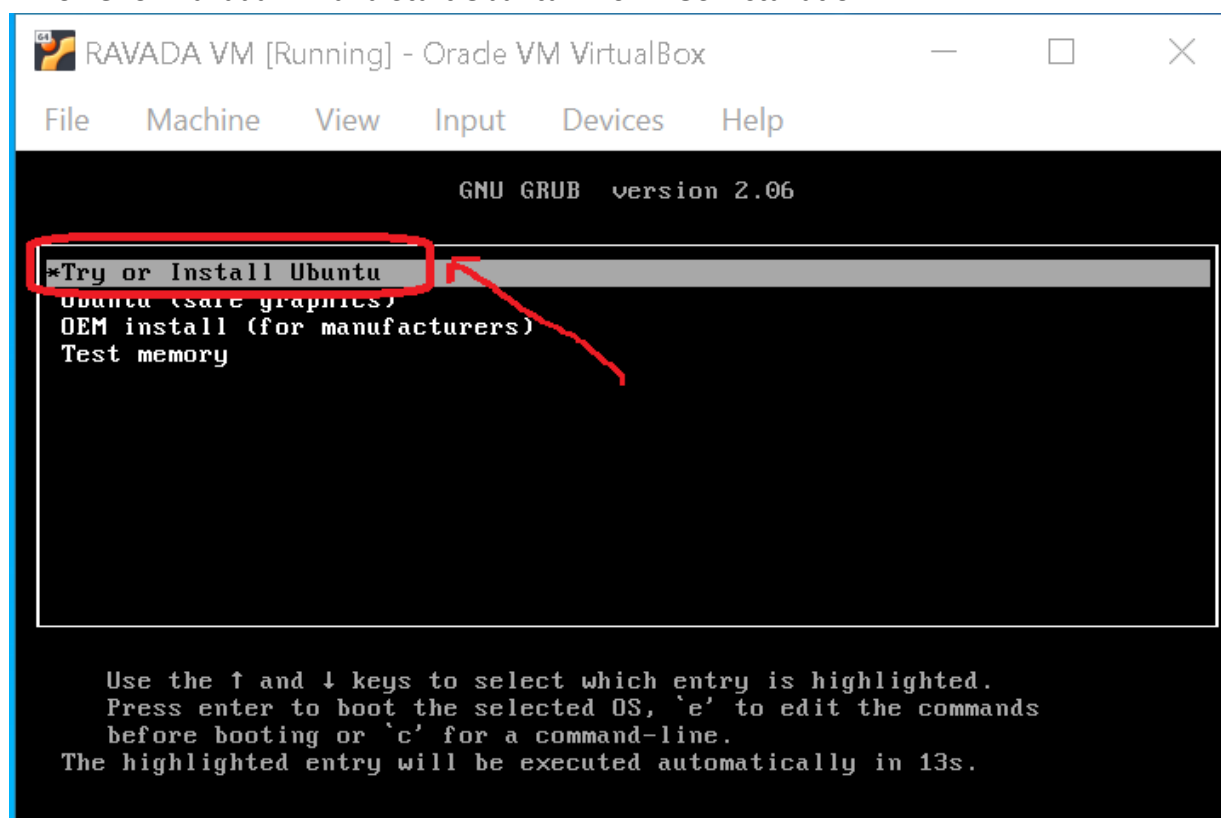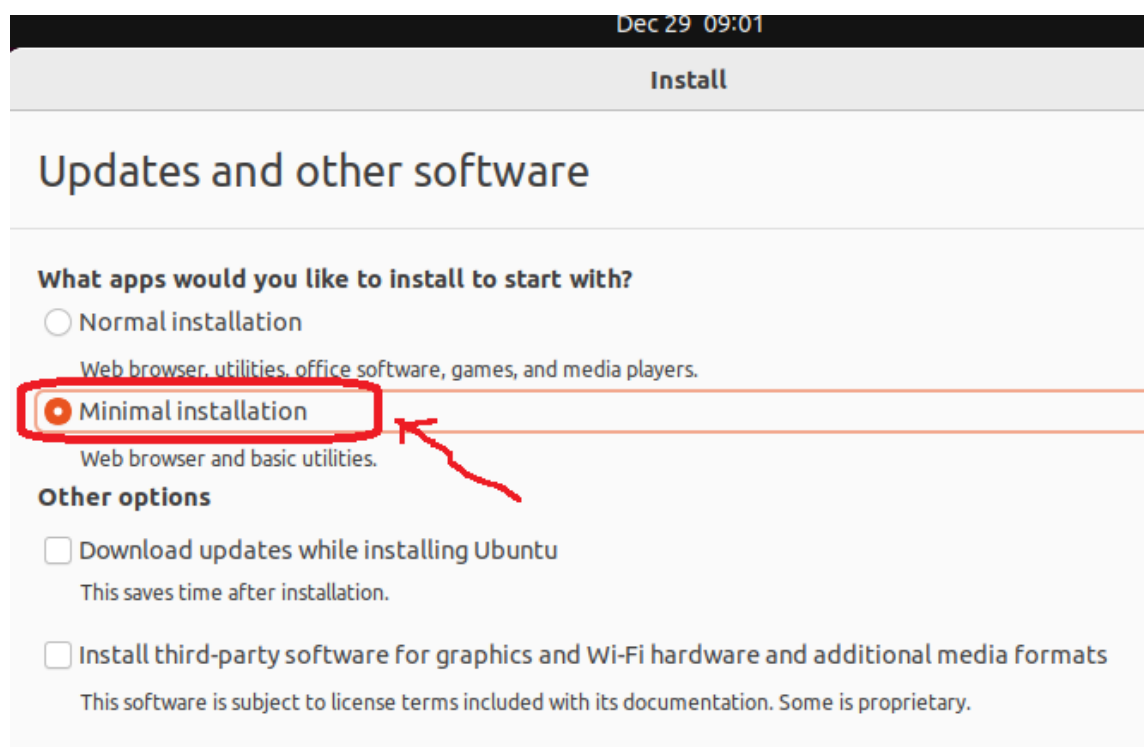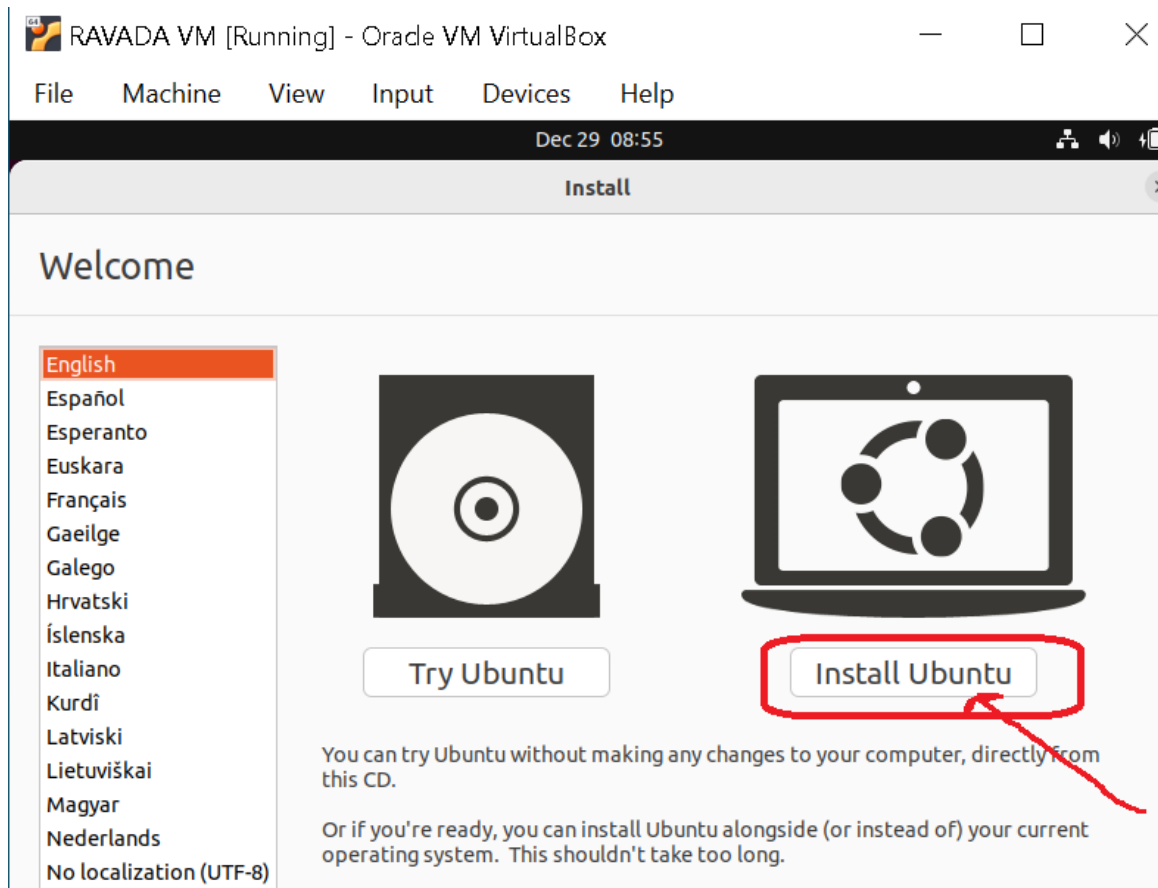- Make sure Nested VT-x+AMD-V is checked



```
Administrator: Command Prompt

Microsoft Windows [Version 10.0.19042.985]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Program Files\Oracle\VirtualBox

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

**Step 5**
Mount Ubuntu 22.04.1 LTS iso



**Storage**

Storage Devices

- Controller: IDE
  - Empty
- Controller: SATA
  - RAVADA VM.vdi

Attributes

Optical Drive:  IDE Secondary Device 0

☐ Live CD/DVD

Information
Type:  --
Size:  --
Location:  --
Attached to:  --

Choose/Create a Virtual Optical Disk..
Choose a disk file...
Remove Disk from Virtual Drive

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**Step 6**

**Power on Ravada VM and Start Ubuntu 22.04.1 OS installation**

RAVADA VM [Running] – Oracle VM VirtualBox

File    Machine    View    Input    Devices    Help

Dec 29  08:55

**Install**

## Welcome

| |
|---|
| **English** |
| Español |
| Esperanto |
| Euskara |
| Français |
| Gaeilge |
| Galego |
| Hrvatski |
| Íslenska |
| Italiano |
| Kurdî |
| Latviski |
| Lietuviškai |
| Magyar |
| Nederlands |
| No localization (UTF-8) |

Try Ubuntu        Install Ubuntu

You can try Ubuntu without making any changes to your computer, directly from this CD.

Or if you're ready, you can install Ubuntu alongside (or instead of) your current operating system. This shouldn't take too long.

Dec 29  09:01

**Install**

## Updates and other software

**What apps would you like to install to start with?**

◯ Normal installation

    Web browser, utilities, office software, games, and media players.

◉ Minimal installation

    Web browser and basic utilities.

**Other options**

☐ Download updates while installing Ubuntu

    This saves time after installation.

☐ Install third-party software for graphics and Wi-Fi hardware and additional media formats

    This software is subject to license terms included with its documentation. Some is proprietary.

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**Install**

## Installation type

This computer currently has no detected operating systems. What would you like to do?

- ( ● ) **Erase disk and install Ubuntu**
  Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.

  [ Advanced features... ] None selected

- ( ) **Something else**
  You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

---

**Write the changes to disks?**                                     ✕

If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.

The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)

The following partitions are going to be formatted:
partition #2 of SCSI3 (0,0,0) (sda) as ESP
partition #3 of SCSI3 (0,0,0) (sda) as ext4

[ Go Back ]   [ Continue ]

Configure your login and **remember your own password**



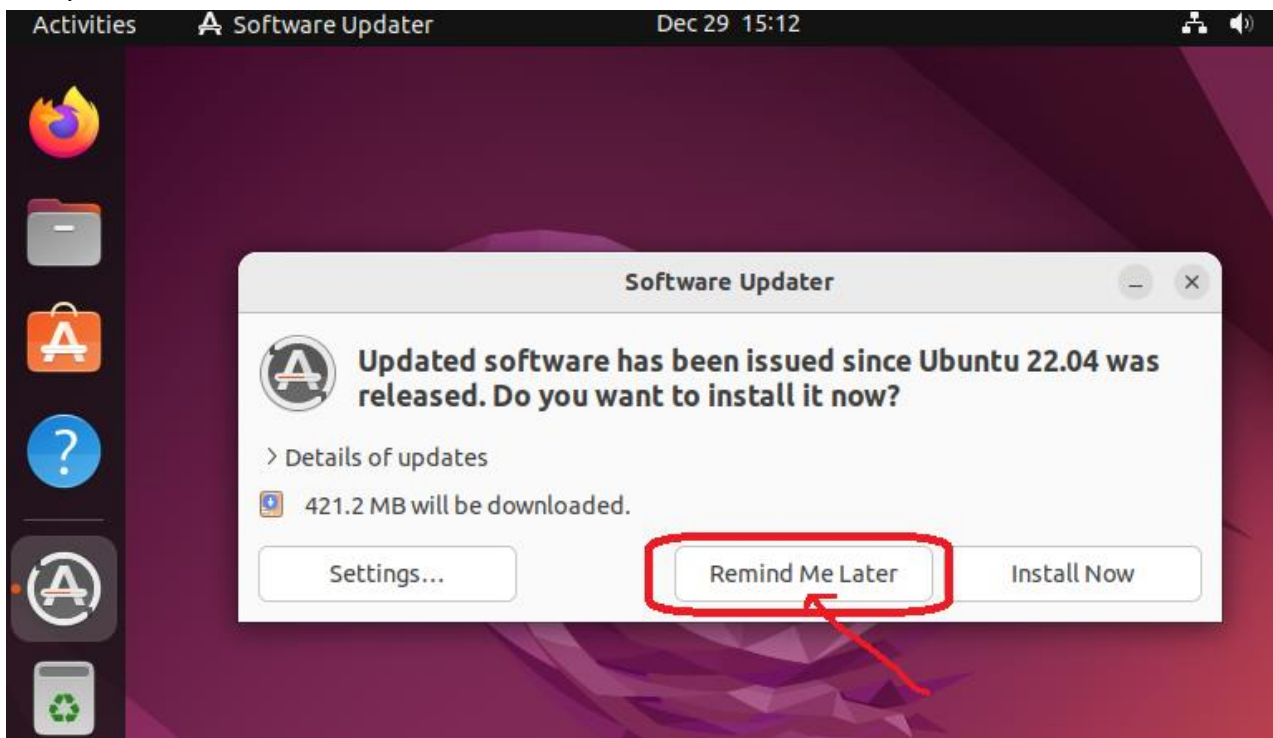Ubuntu 22.04.1 OS installation in progress



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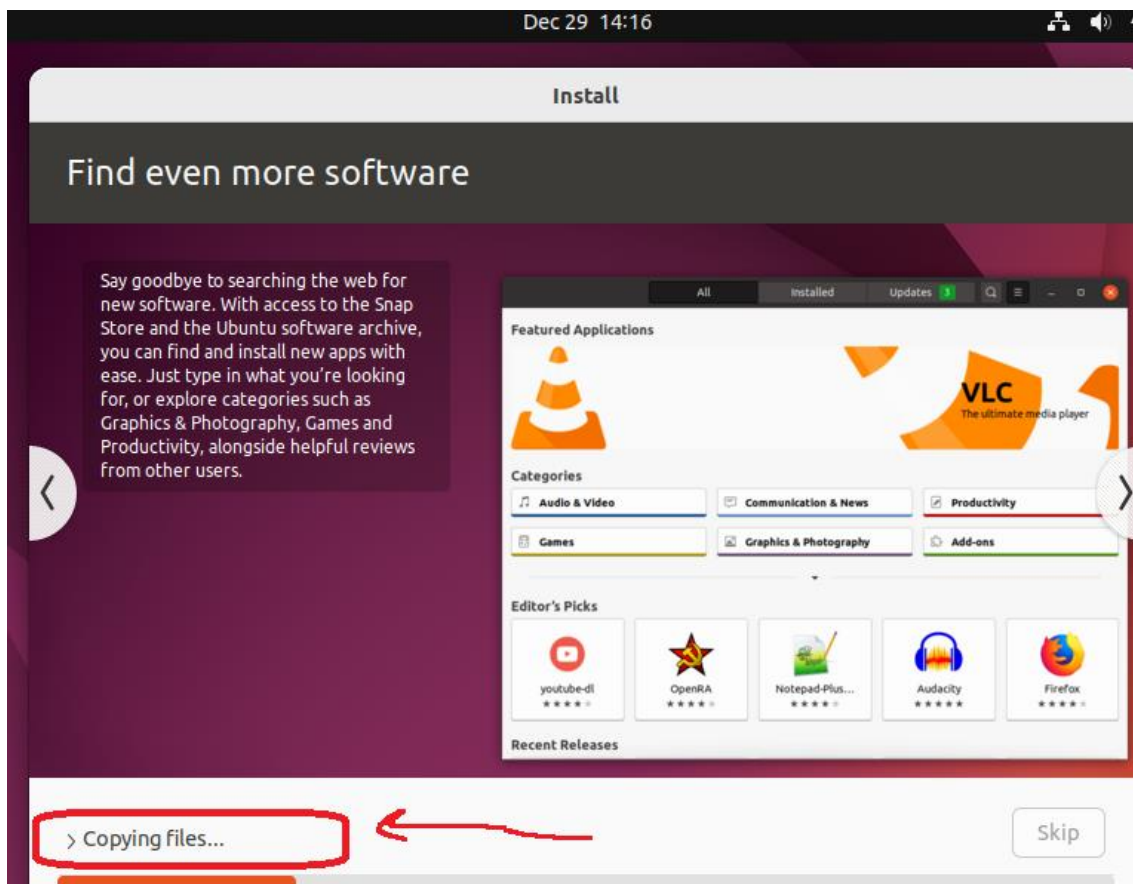
After Ubuntu 22.04.1 OS installation is completed.
**Press Enter and Reboot**
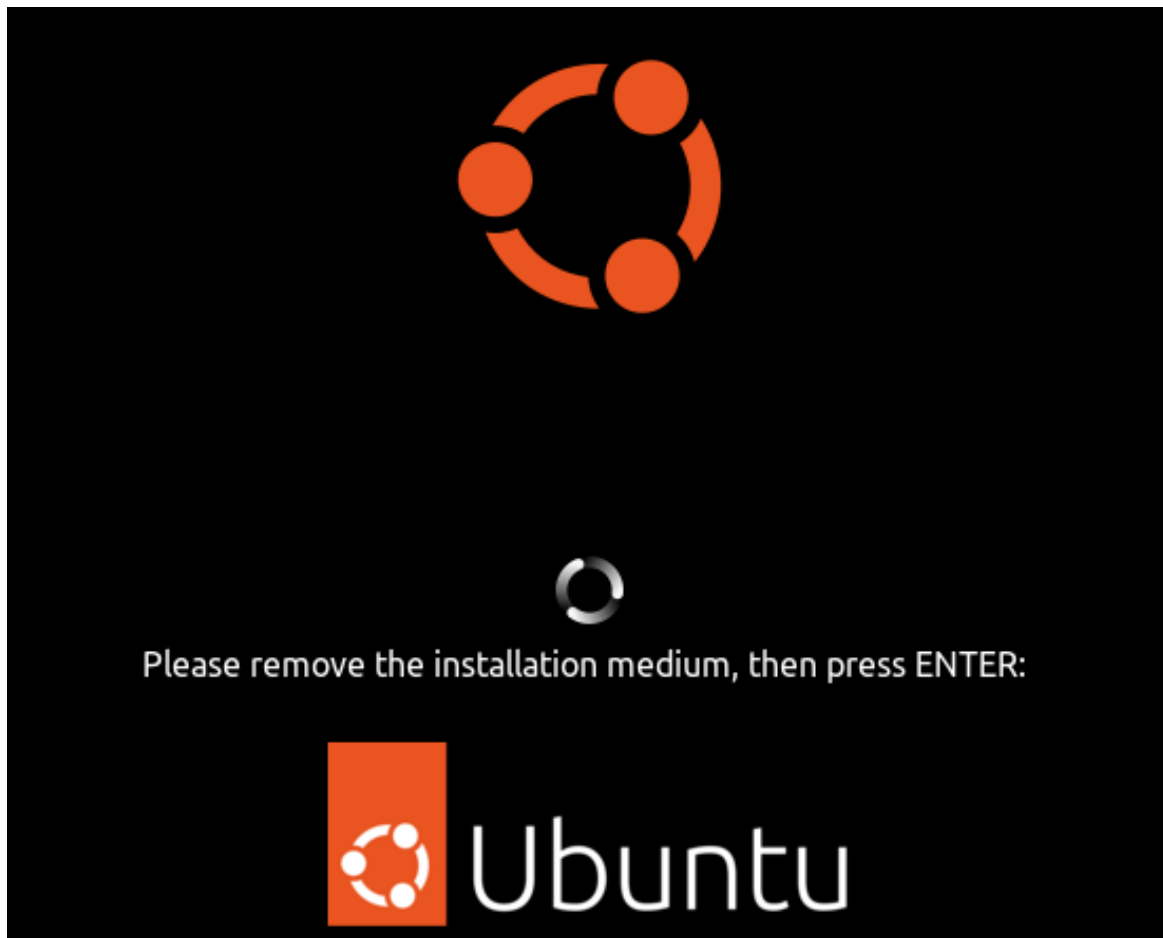


If you see this screen, select **Don't Upgrade**
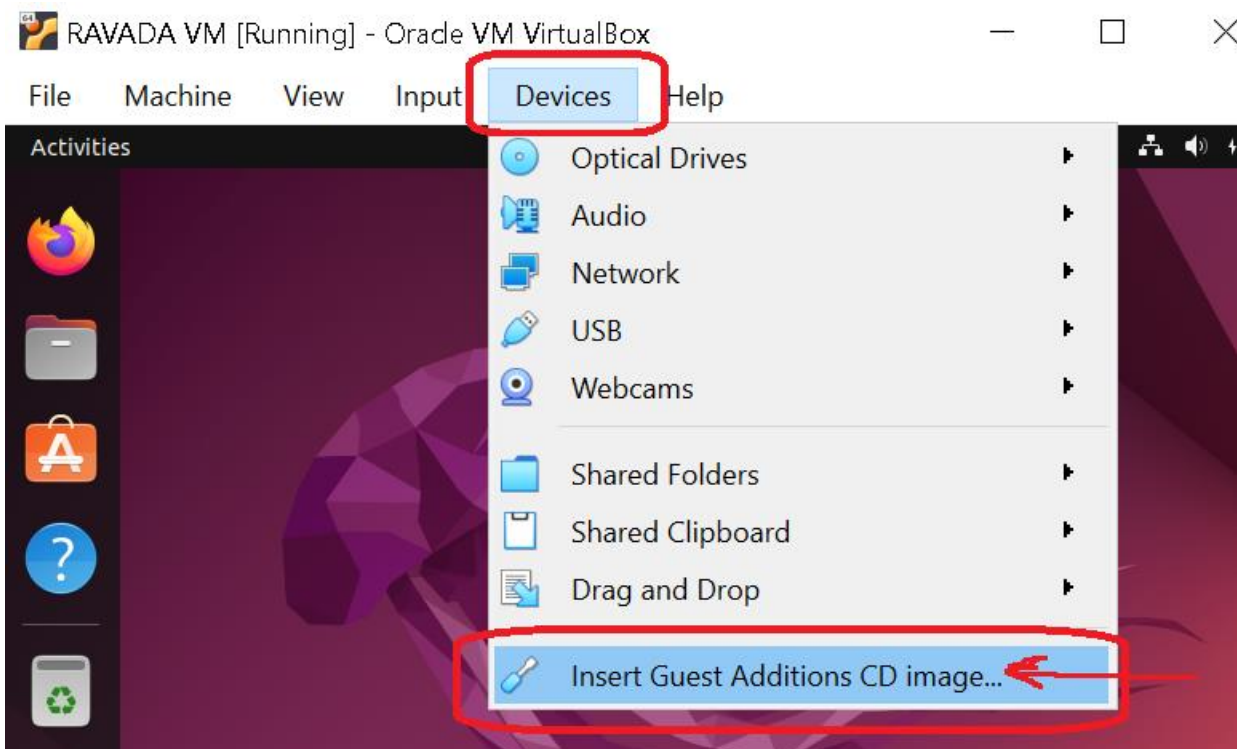


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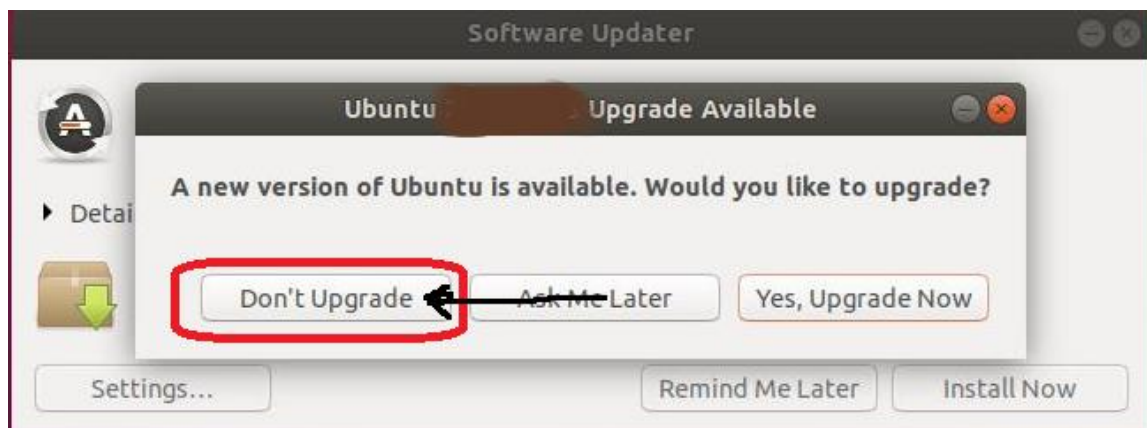
If you see this screen, select **Remind Me Later**



**Install Virtual Box Guest Additions**
sudo apt install gcc
sudo apt-get install build-essential gcc make perl dkms
Click Insert **Guest Additions CD image**



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Run it from the CD icon as shown below
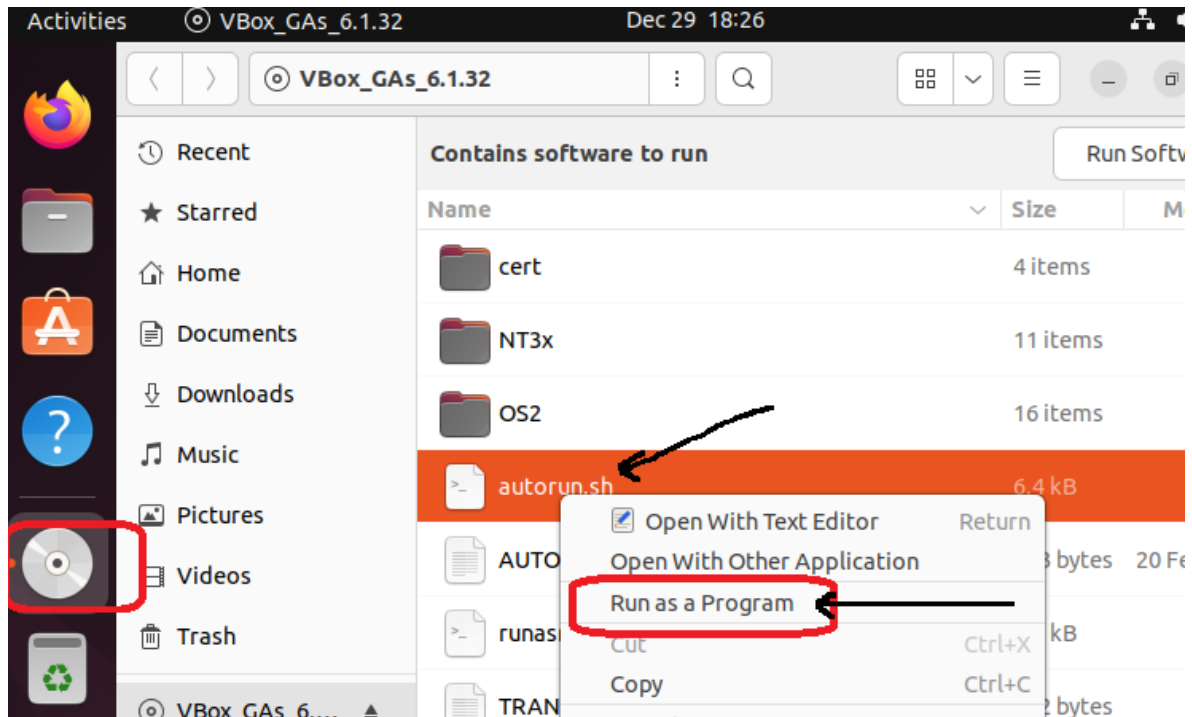


Ensure VBOX additions is installed properly
After VBOX additions installation is completed
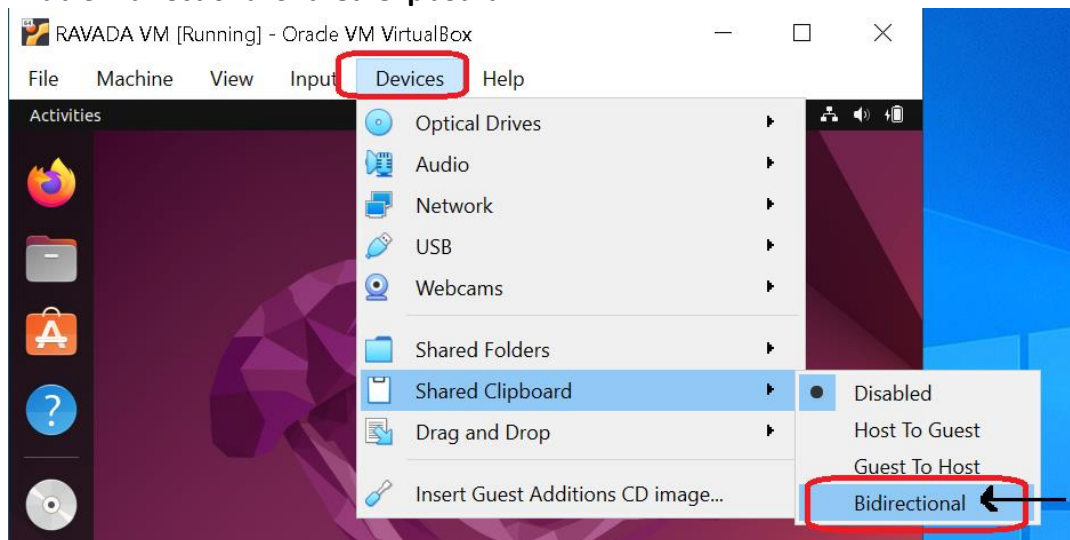Press Enter to exit command prompt



**Reboot Ravada VM**

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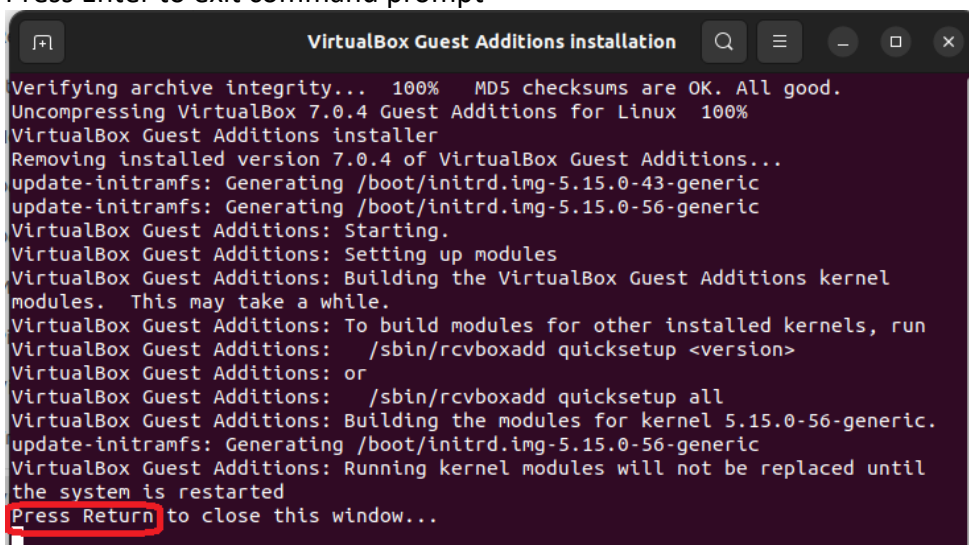
**Resize the Guest Display**
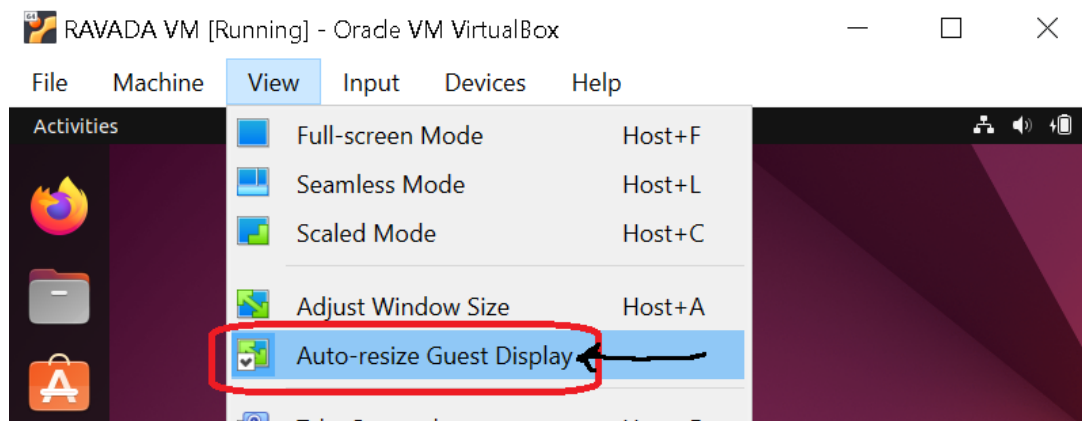


Enable Bidirectional **Shared Clipboard**



**Step 7**
**Perform Ubuntu update and upgrade**
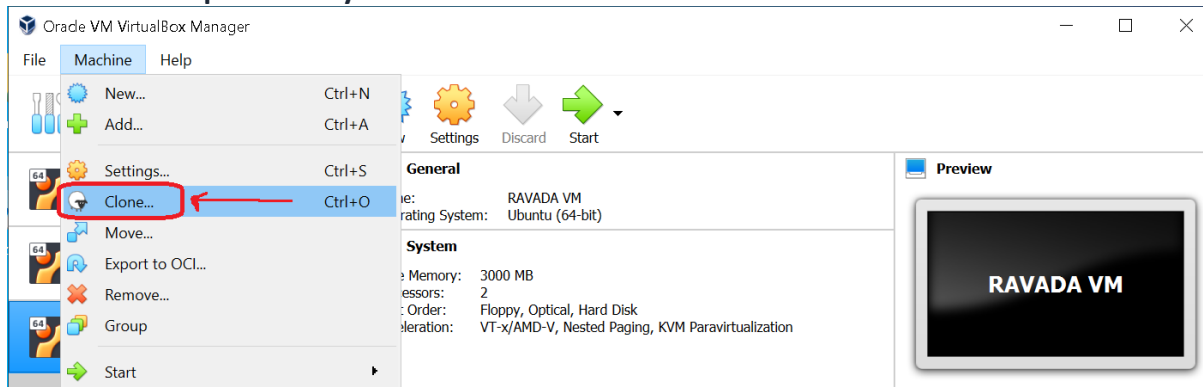$ sudo apt update
$ sudo apt upgrade
**Shutdown Ravada VM after update and upgrade is completed**

**Step 8**
**Perform Backup clone of your successful LABs**





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← Clone Virtual Machine

## Clone type

Please choose the type of clone you wish to create.

If you choose **Full clone**, an exact copy (including all virtual hard disk files) of the original virtual machine will be created.

If you choose **Linked clone**, a new machine will be created, but the virtual hard disk files will be tied to the virtual hard disk files of original machine and you will not be able to move the new virtual machine to a different computer without moving the original as well.

If you create a **Linked clone** then a new snapshot will be created in the original virtual machine as part of the cloning process.

⦿ Full clone
○ Linked clone

Clone          Cancel

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