



## **Grayhill 3Dxx Display Products**

Virtual Machine Installation Using VirtualBox

Revision A

## Revision History

Revision	Date	Description
A	07/29/2019	Original Release

## Table of Contents

Revision History .....	2
Table of Contents .....	3
Introduction.....	4
Recommended Equipment .....	4
Software Required .....	4
Installation Overview.....	5
Prerequisites .....	5
Installation of VirtualBox .....	6
Setup VirtualBox Linux Environment .....	15
Setup VirtualBox Serial Port.....	19
Starting Linux Development Environment from VirtualBox .....	24
Appendix A – Virtual Machine Passwords .....	25
Appendix B – Installing Guest Additions .....	26
Appendix C – Increasing VM disk size.....	31

## Introduction

This document describes how to download, setup and configure a Virtual Machine (VM) using Virtual Box from Oracle. (<https://www.virtualbox.org/wiki/VirtualBox>)

The virtual machine is Ubuntu 16.04 using gnome flashback for the desktop; additionally PuTTY (telnet client software - <http://www.putty.org>) has been installed. 16.04 is a Long Term Support release, currently scheduled for end of life in April 2021.

The VM is provided as an appliance (.ova file); it should be feasible for users of other virtualization software to install this same appliance.

Screen shots were designed to be as accurate as possible and should be used for reference.

## Recommended Equipment

Personal Computer (PC) Running Windows 10 with the following configuration:

- 4 GB RAM (minimum)
- 40 GB available hard drive space (minimum)
- Ethernet port and cable(s)
- RS232 Port (or USB to serial adapter) and cable
- Internet Access

## Software Required

The following files are available for download from Grayhill at: <http://www.grayhill.com/qt43d>

- Qt Virtual Disk Image
  - **Ex: Grayhill 3Dxx Qt 5.9.3 Rev C.ova**
  - **Ex: Ubuntu16.04Qt5.12.2.ova**
- Virtual Machine Installation Using VirtualBox (this document)

## Installation Overview

This section contains a brief overview of the installation steps.

- Download Virtual Box from the internet and install it on the development PC. This application allows a virtual computer to exist within a window on the PC. This means all other Windows applications can be running alongside of this virtual computer. This virtual computer runs the Linux operating system.
- Configure the VirtualBox application. The only thing that the user must configure is the serial port interface; but this procedure will be explained. Grayhill provides a pre-configured image that has the Qt development environment already installed.

## Prerequisites

Before beginning, the following folder must be created on the host PC.

- C:\VMSharedFolder

This folder allow files to be transferred between the VM (Linux) and host (Windows 10 PC). The VM is pre-configured to use that directory, which is accessible from the VM via the /media/sf\_vmshare directory.

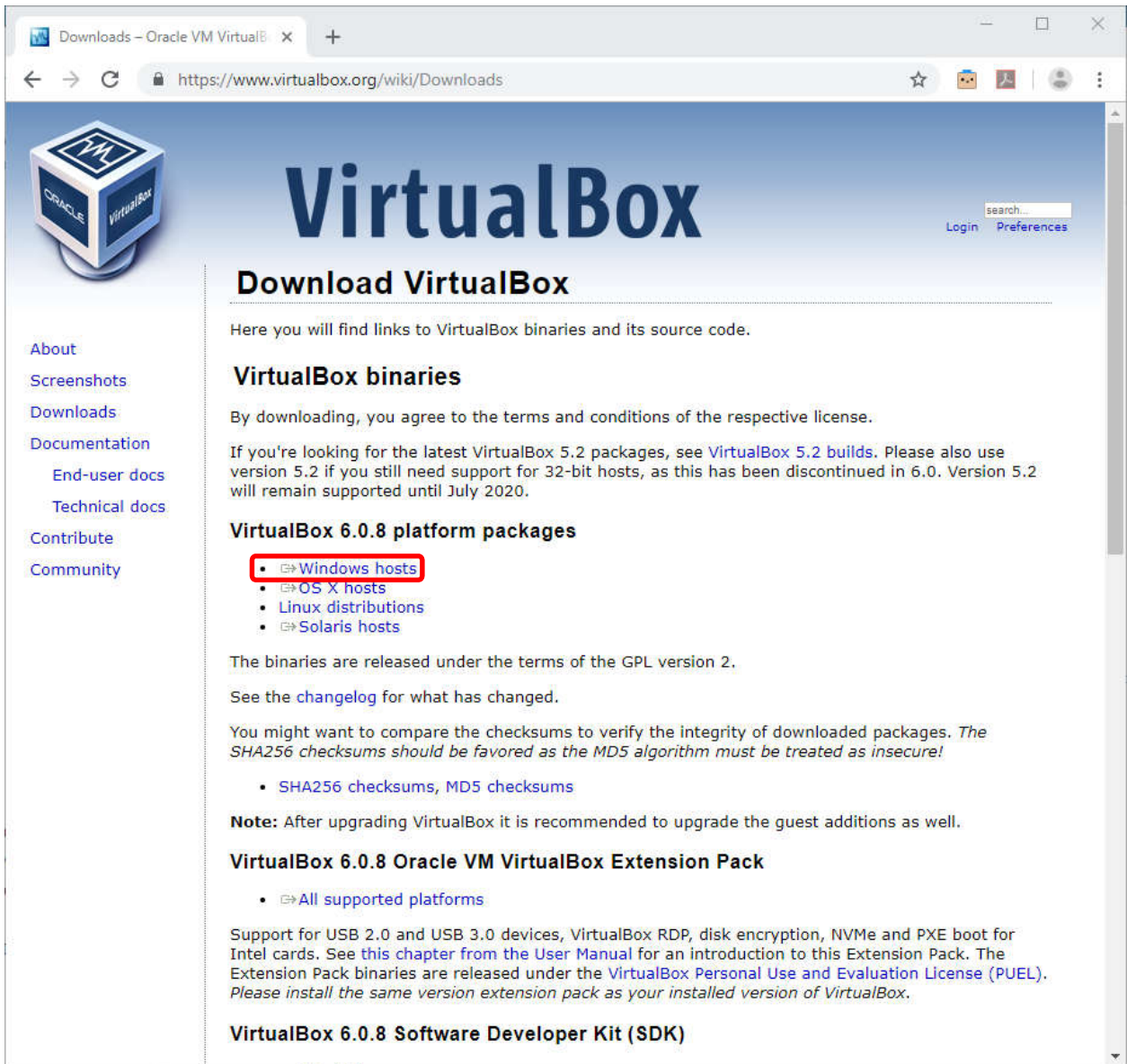
## Installation of VirtualBox

This section illustrates how to download and install VirtualBox. The latest version can be downloaded, but the screen shots shown below may be different. Additionally Guest Additions (these are installed on the VM itself) may need to be updated.

- Navigate to this web page: <https://www.virtualbox.org/>
- Click on “Download VirtualBox ...”

The screenshot shows the Oracle VM VirtualBox website homepage. The browser address bar displays <https://www.virtualbox.org/>. The page features a navigation menu on the left with links for About, Screenshots, Downloads, Documentation, End-user docs, Technical docs, Contribute, and Community. The main content area includes a large 'VirtualBox' heading, a 'Welcome to VirtualBox.org!' message, and a detailed description of the product. A 'News Flash' section on the right lists recent updates, including the release of VirtualBox 6.0.8, 5.2.30, and 6.0. A large green button with a red border at the bottom center prominently displays 'Download VirtualBox 6.0'.

- Click on “Windows hosts” to download the executable installation file

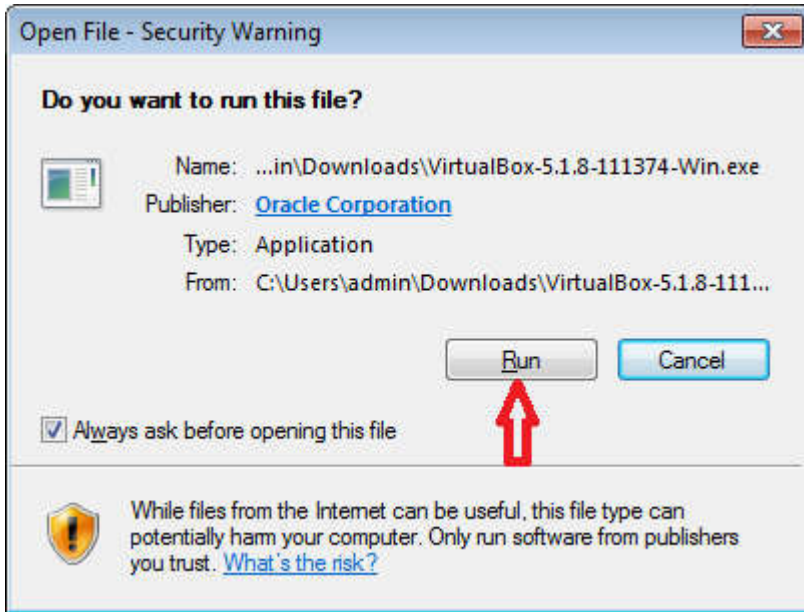


- When the download completes, click on the caret (^) then click on “Open” option. (Note that this download example was performed using the Chrome browser. If a different web browser is used then this open operation may look different.)

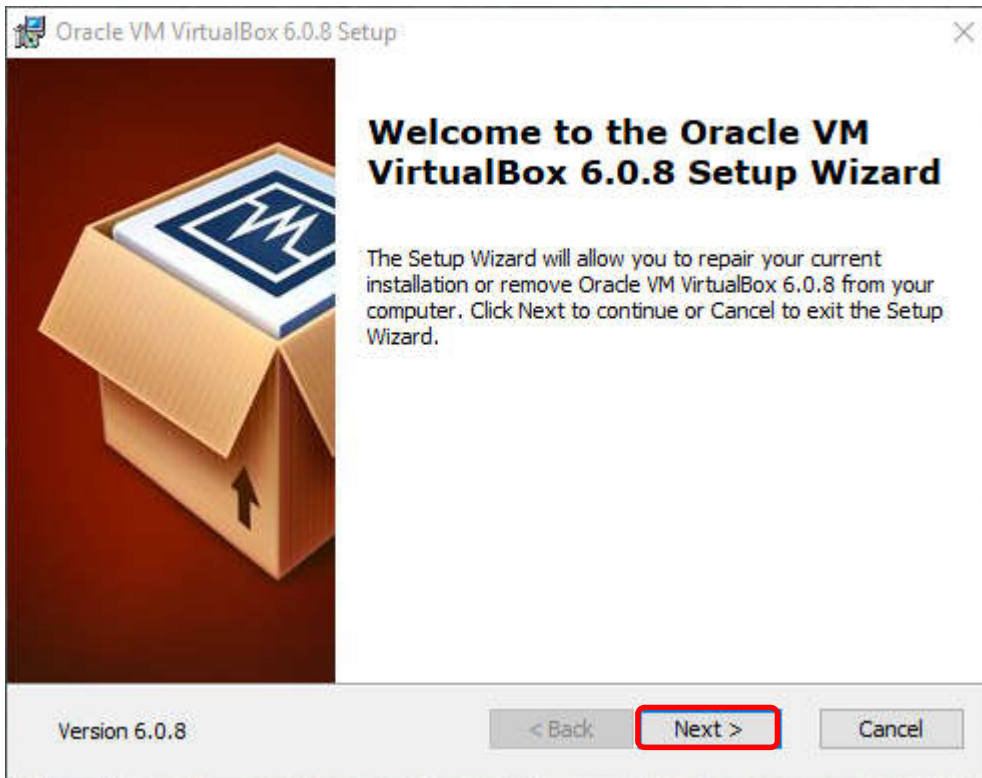




- If an “Open File – Security Warning” box appears, click on “Run”



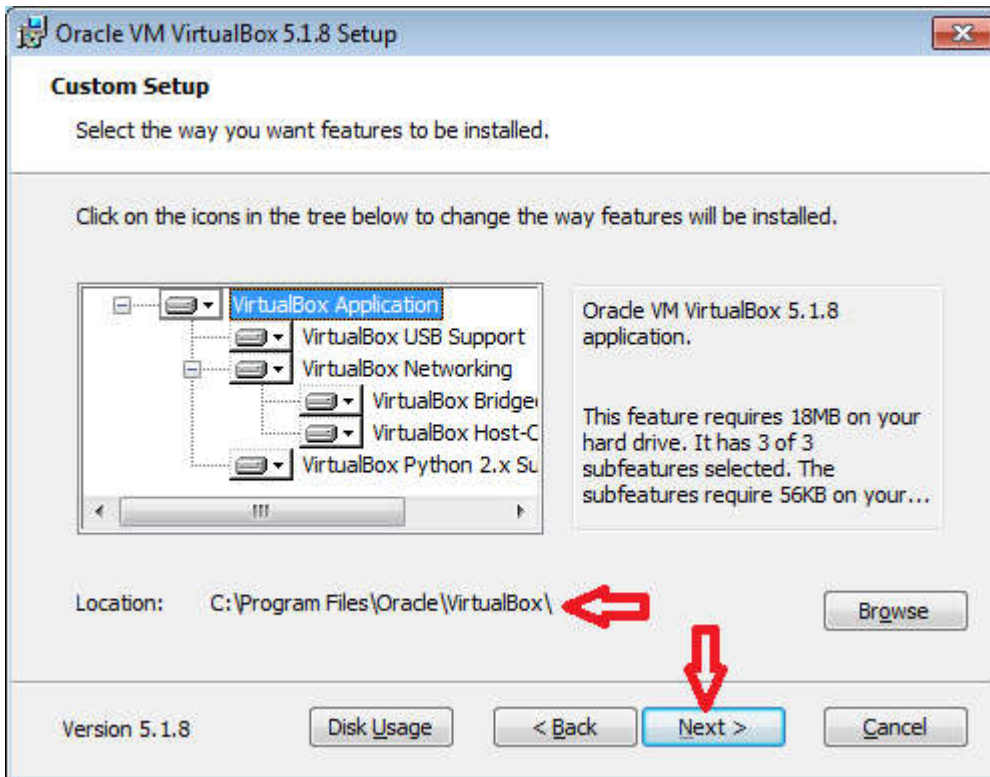
- The following “Welcome...” dialog should appear. Click on “Next”



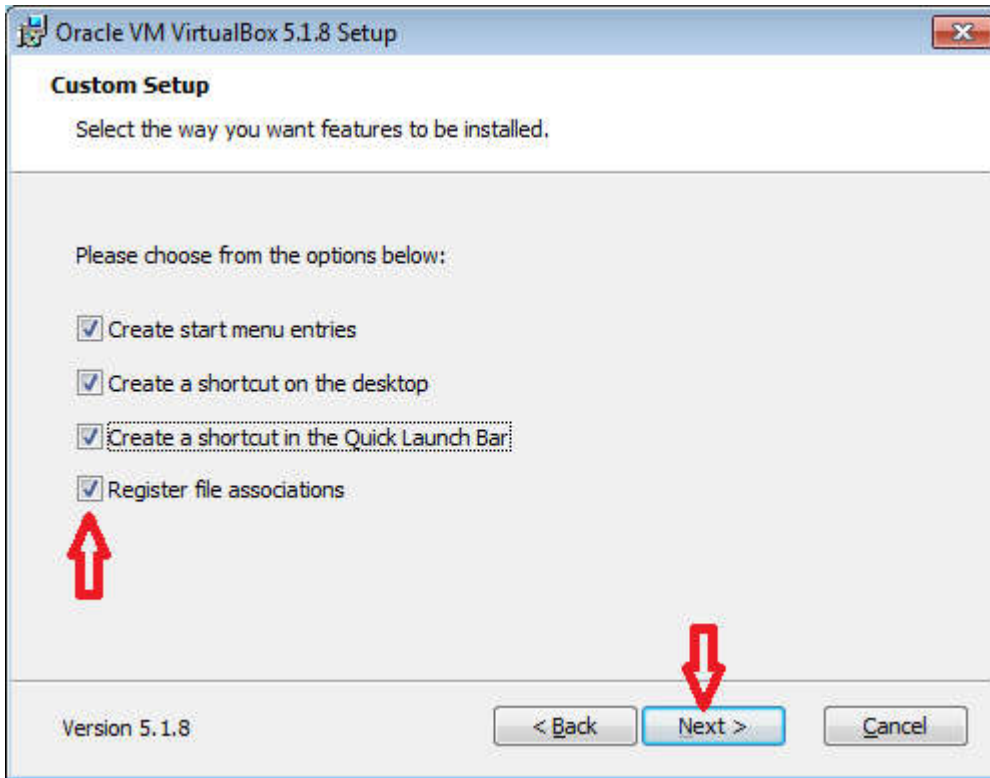
- Next will appear this “Custom Setup” dialog. Do not make any changes, just click “Next” button

**NOTE!**

Make sure that the installation location is on a local disk drive, not a network storage unit! This is because during installation the network connections will be disconnected so that the VirtualBox can install network adapter software and this will make network storage units inaccessible.



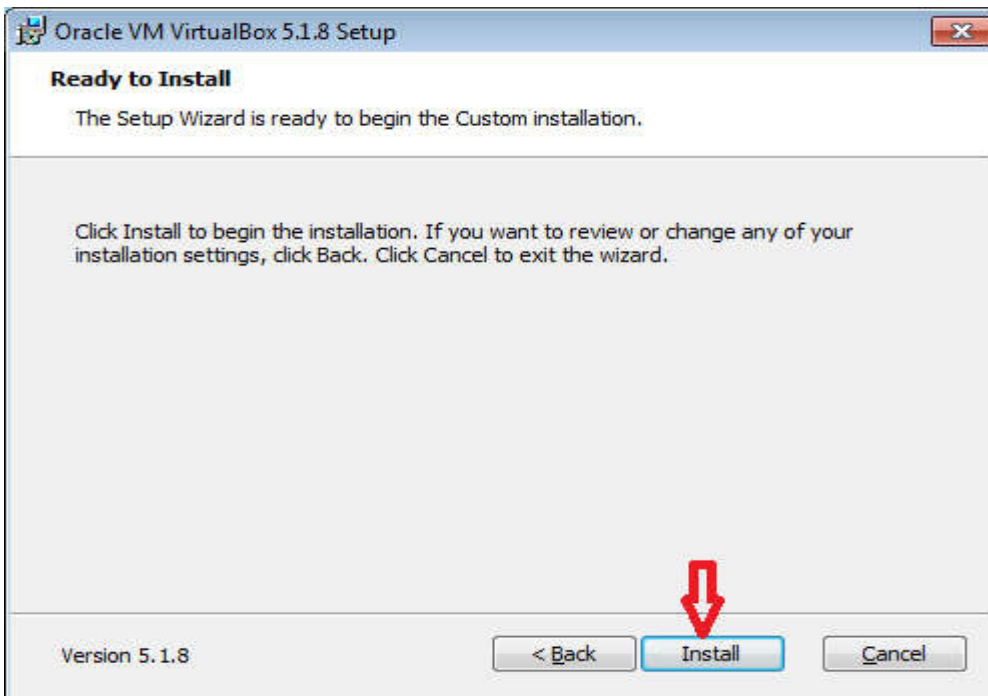
- On the second “Custom Setup” screen the first three options may be adjusted as desired, but leave the “Register file associations” option checked. When done, click “Next” button



- The following “Warning: Network Interface” dialog should appear next. Make sure that there are no network accessing programs running (i.e. email) on the computer. Exit any such programs and then click “Yes” button.

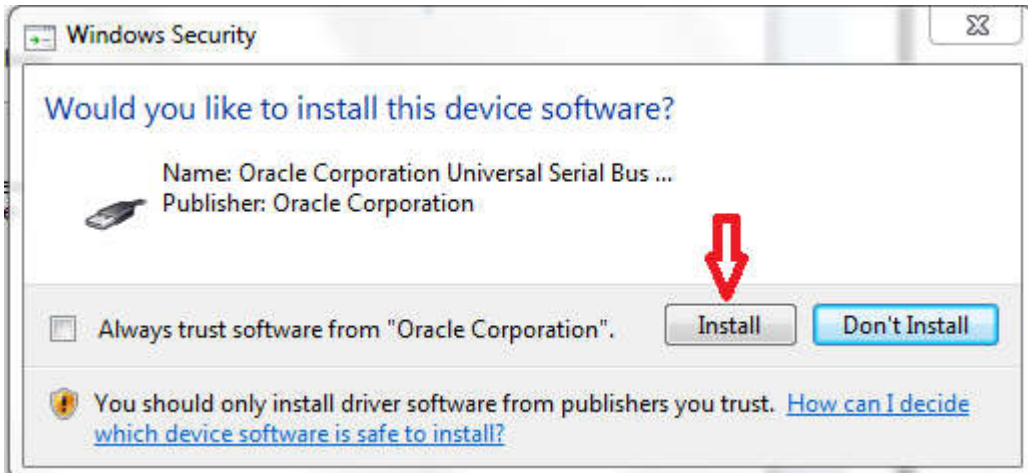


- The next dialog is “Ready to Install” as shown here. Click on the “Install” button



- If a “User Account Control” window appears, click “Yes” button

- If any “Windows Security” windows appear as shown below, click on “Install” button. Several such windows may appear asking permission to install various driver software modules



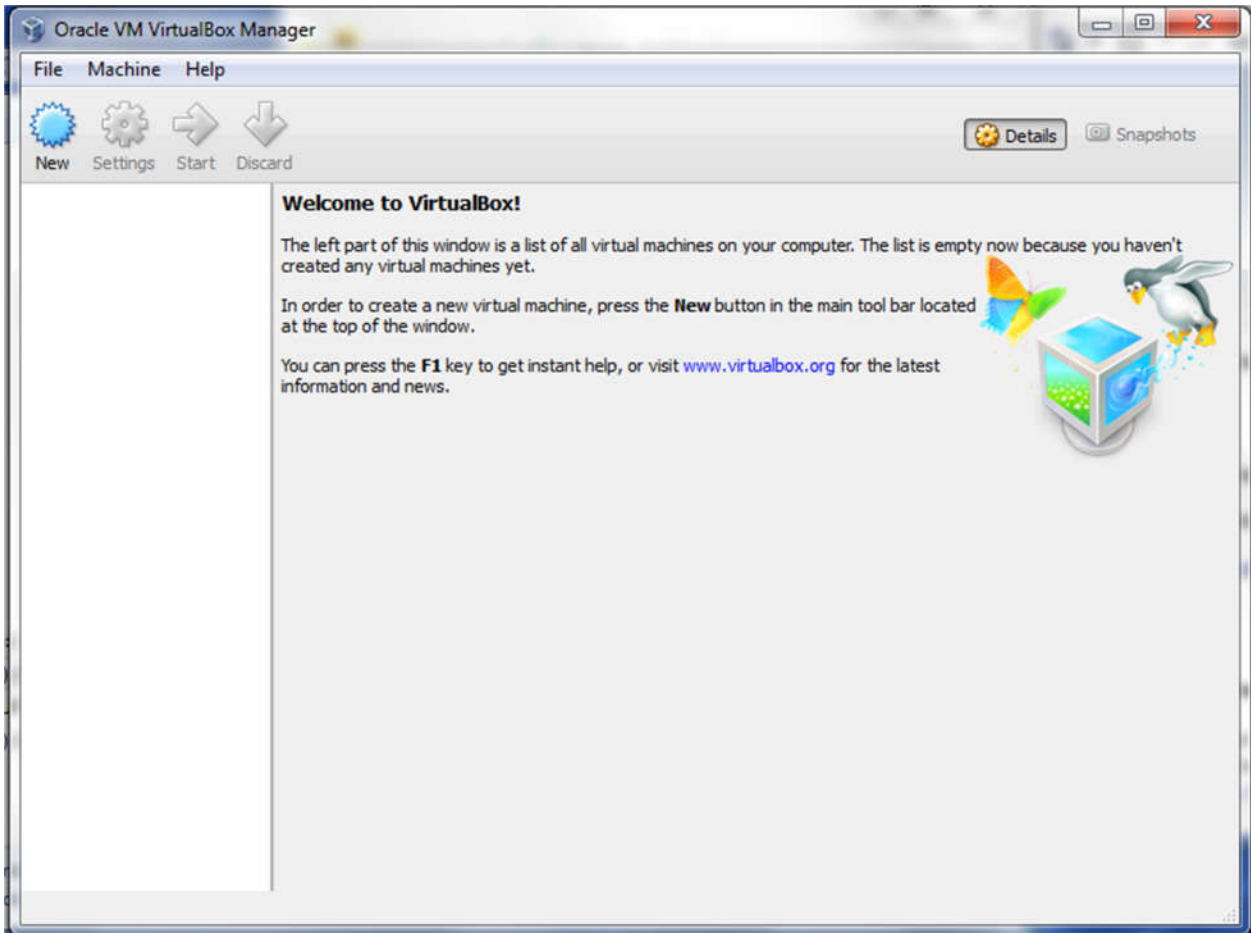
- When installation is finished, this window should appear. Uncheck the “Start Oracle VM VirtualBox...” selection and click the “Finish” button



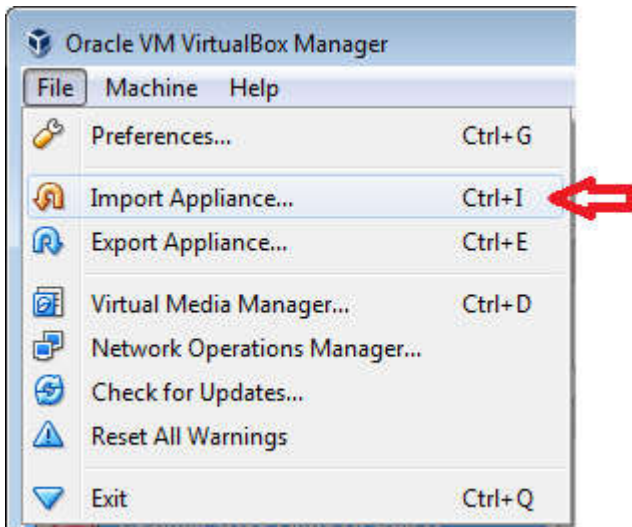
- Reboot the host computer at this time to re-establish network connections.

## Setup VirtualBox Linux Environment

- Download the desired Virtual Machine Appliance from [www.grayhill.com/qt43d](http://www.grayhill.com/qt43d). After downloading the .ova file, copy/move the appliance file to the desktop (so that it can be found easier later on during installation).
- Start the Oracle VM VirtualBox Manager. A similar screen should appear:



- Click on “File -> Import Appliance”



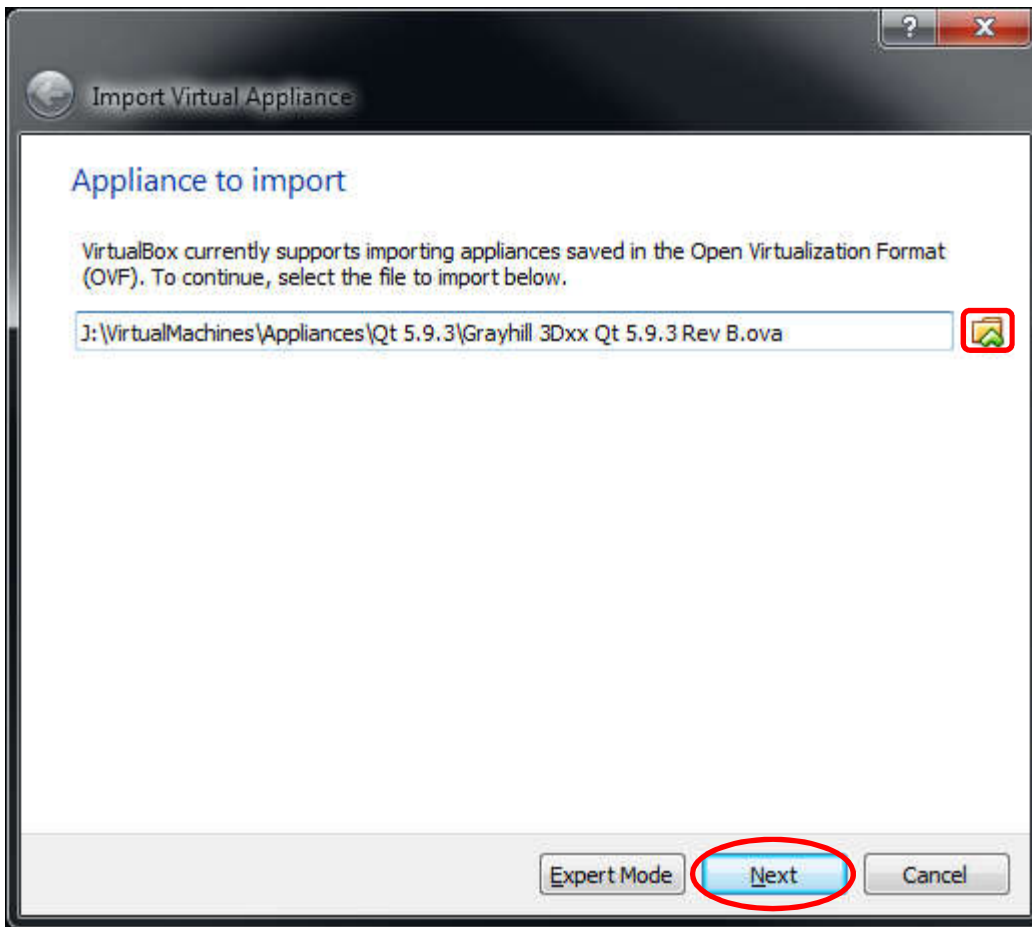


- Click on the open folder icon as shown below then navigate to the previously downloaded appliance file copied to the desktop and open it.

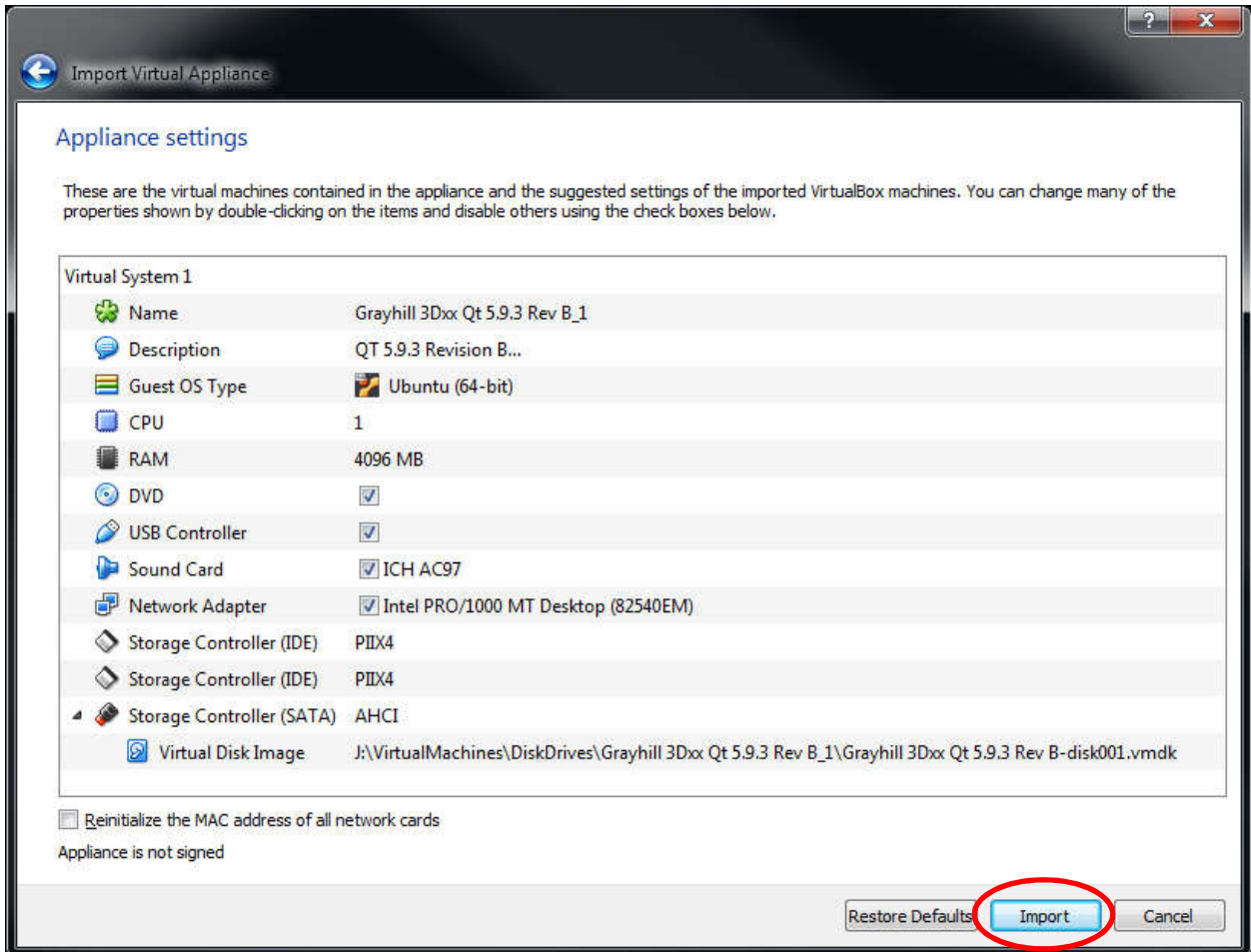
**NOTE**

The above .ova file is quite large and if distributed on a USB memory stick, that memory stick must use exFAT format.

- Click “Next”



- Adjust any settings as appropriate, such as number of processors or RAM size and then click “Import” button.
- Click “Import”



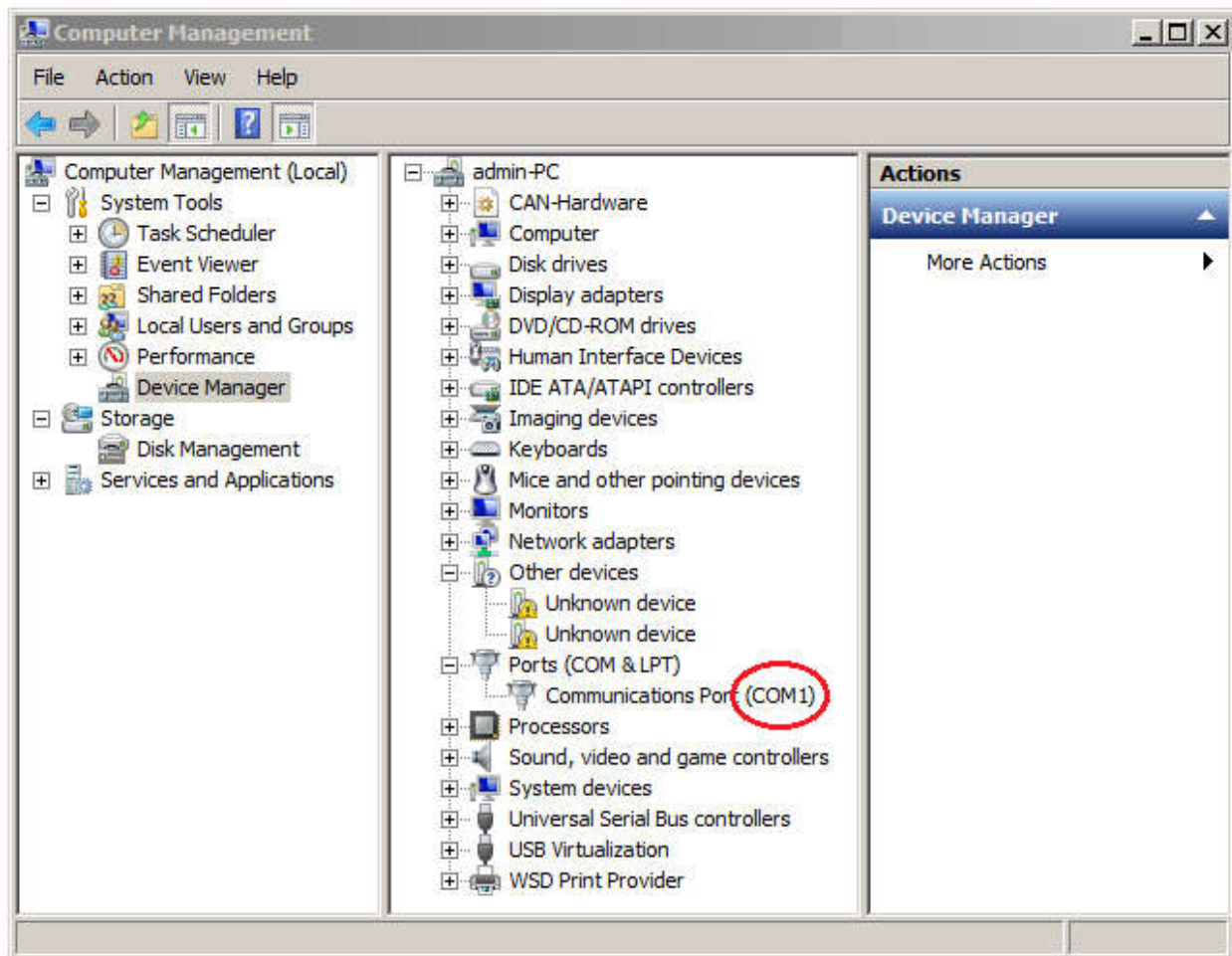
## Setup VirtualBox Serial Port

In order to access the 3Dxx Display Linux console, a serial port that operates at 115200 baud is required. If the development PC has a built-in serial port that is going to be used for this purpose, then proceed with the setup instructions below to configure the VirtualBox Serial Port. If a USB to serial port adapter is going to be used, then skip the VirtualBox Serial Port setup and continue with the step:

## Starting Linux Development Environment from VirtualBox.

Determine what COM port is assigned to the serial port that is going to be used. This is determined by accessing the Device Manager window and looking under the “Ports (COM & LPT)” entry. In the example shown below the serial port is assigned to “COM1”.

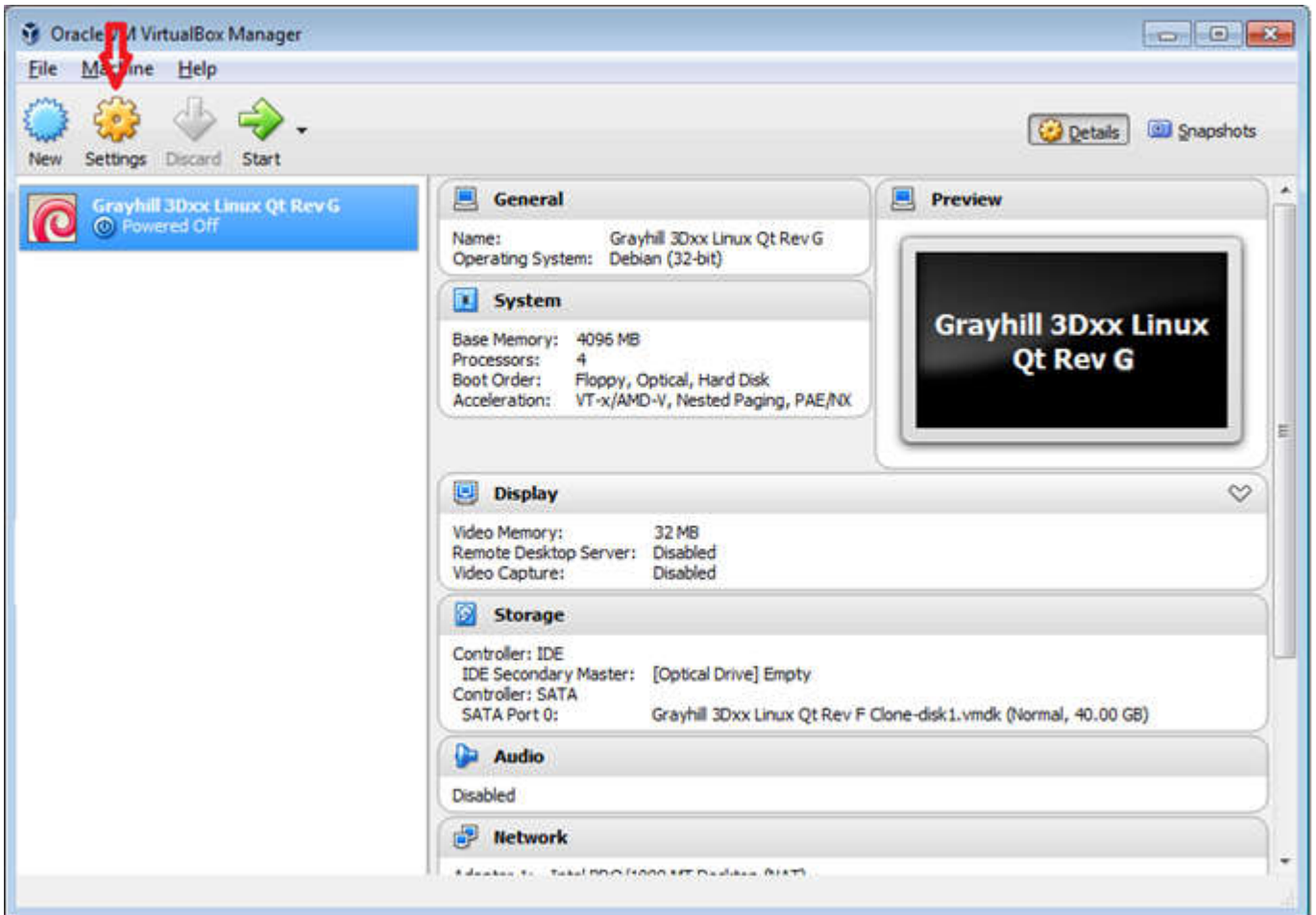
Note: Using a COM port greater than 9 will not work!



Close the “Device Manager” dialog box; but remember the COM port number used.

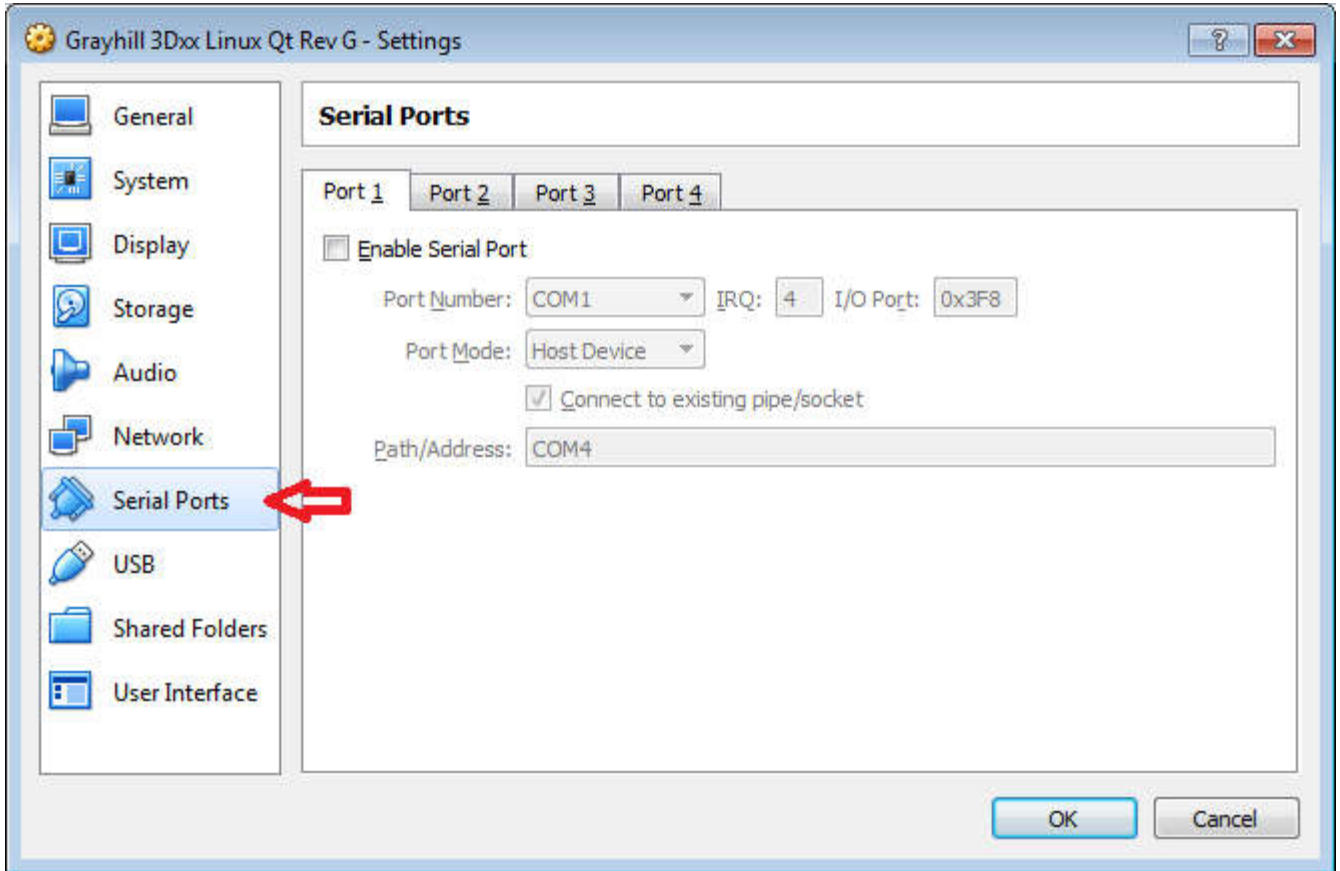
After the previous VirtualBox “Import” operation was performed, a similar screen should appear.

- Select “Settings”



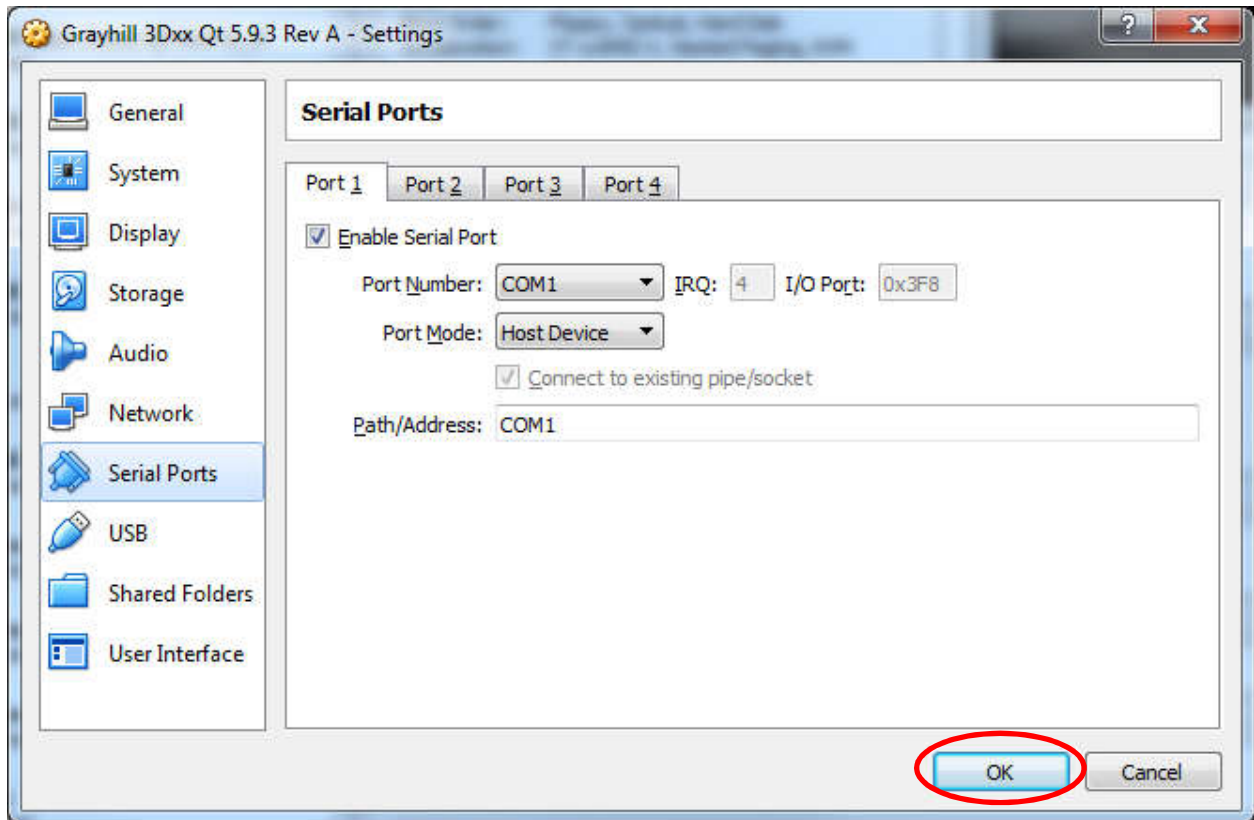
- When the “Grayhill 3Dxx Linux Qt ... -Settings” dialog box appears, click on the “Serial Ports” item on the left column as shown:

N.B. Serial port 1 should already be configured as COM1 as part of the appliance import



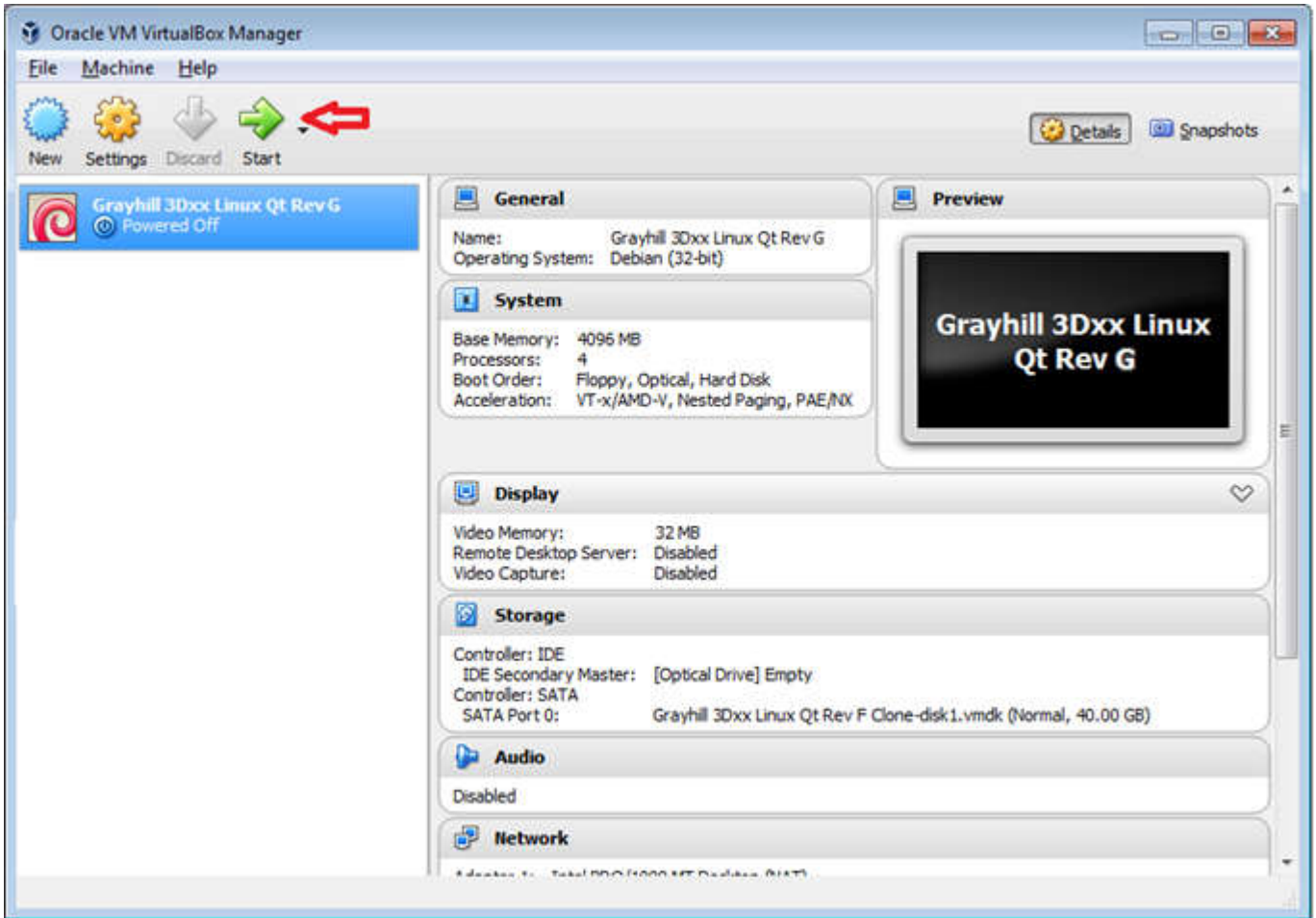
- Select the “Port 1” tab
  - Select “Enable Serial Port”
  - Set “Port Number:” to “COM1” no matter what COM port is being used.
  - Set “Port Mode:” to “Host Device”
  - Set “Path/Address:” to the COM port name and number from the previous “Device Manager” step


An example is shown below. When these settings are correct click “OK”

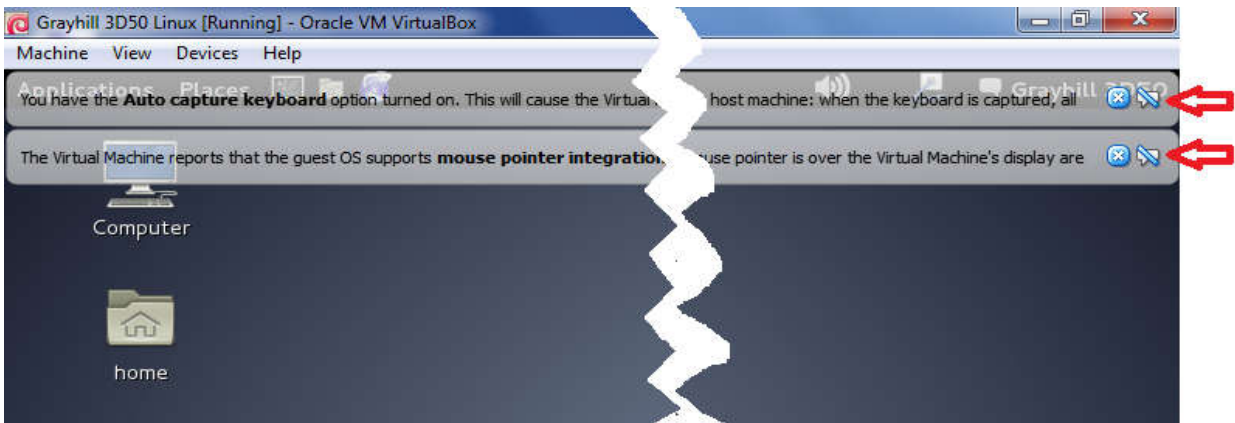


## Starting Linux Development Environment from VirtualBox

- When focus returns to this screen, click on the big, green “Start: arrow



- If any messages such as the ones shown below appear when Linux first starts, click on the  icon to prevent these messages from appearing again





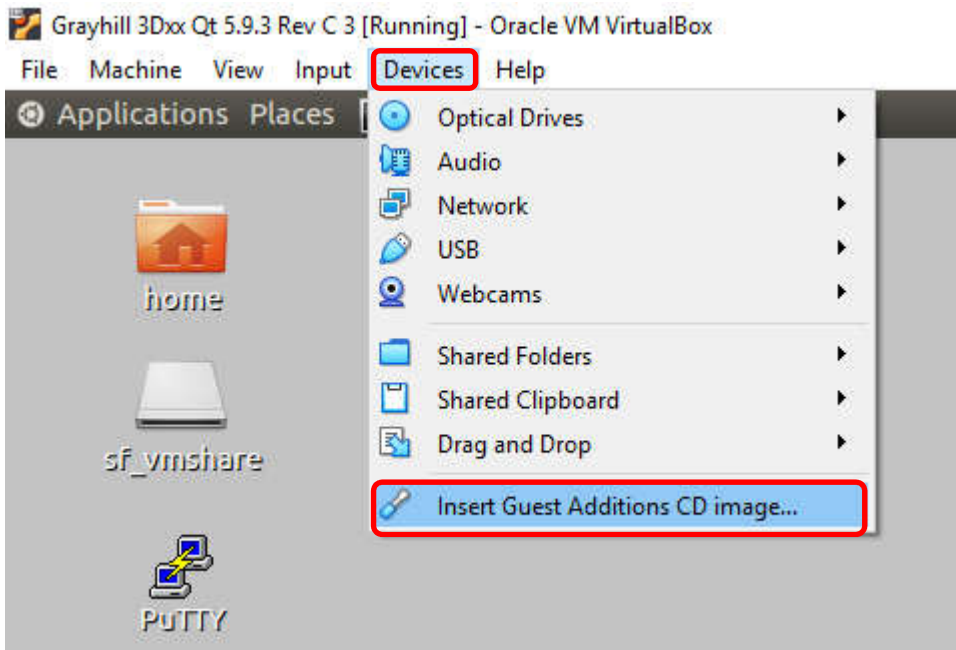
## Appendix A – Virtual Machine Passwords

- ghguest      !admin!
- root         !rty32999!

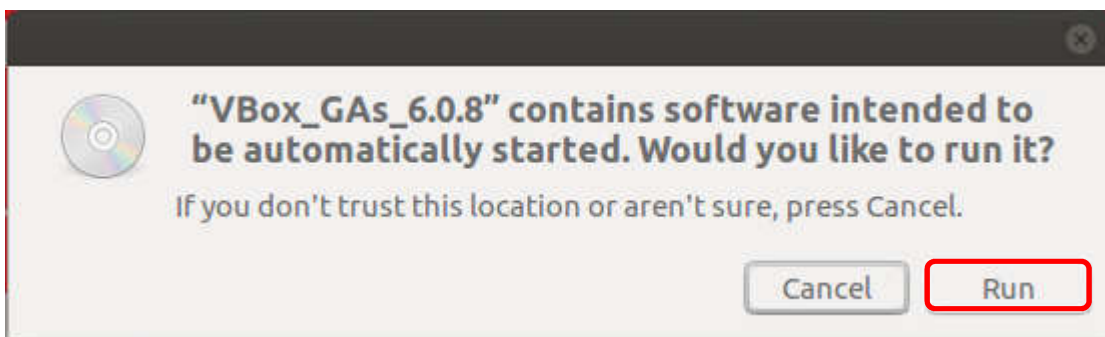
## Appendix B – Installing Guest Additions

For best VM performance, it is recommended to make sure the Guest Additions align with the installed version of VirtualBox. (<https://www.virtualbox.org/manual/ch04.html>)

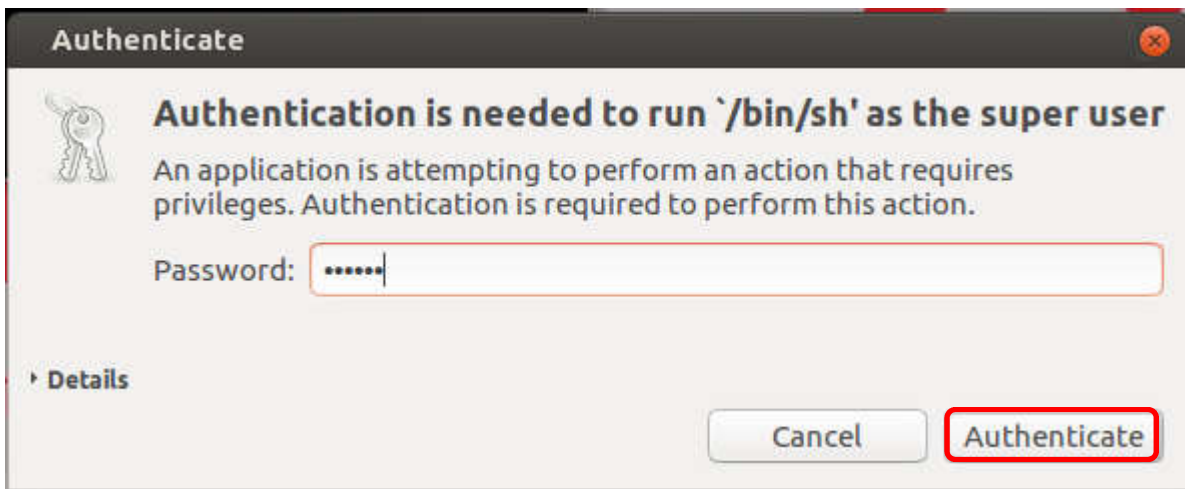
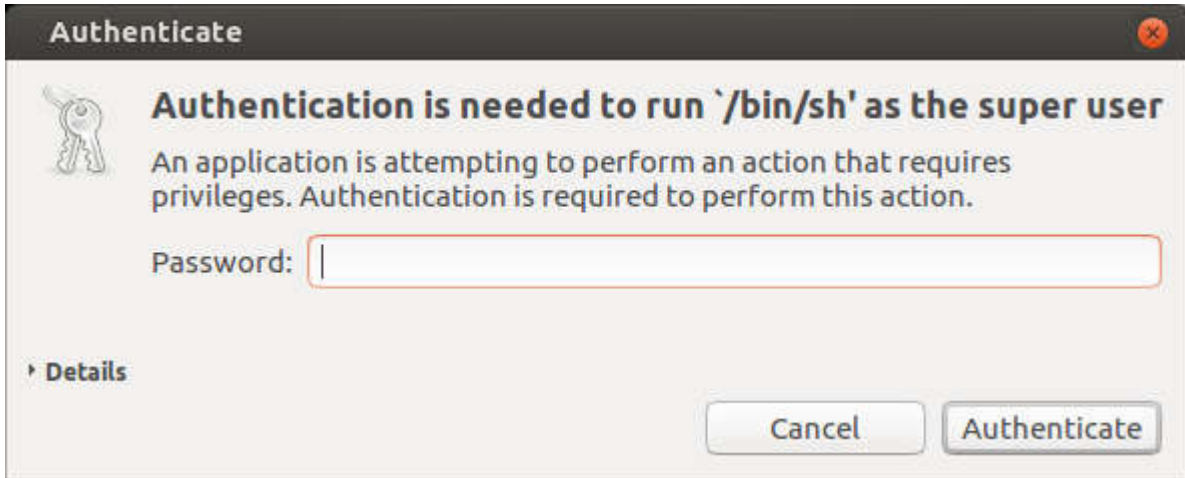
- Insert the CD by clicking on “Insert Guest Additions CD image...” under “Devices”



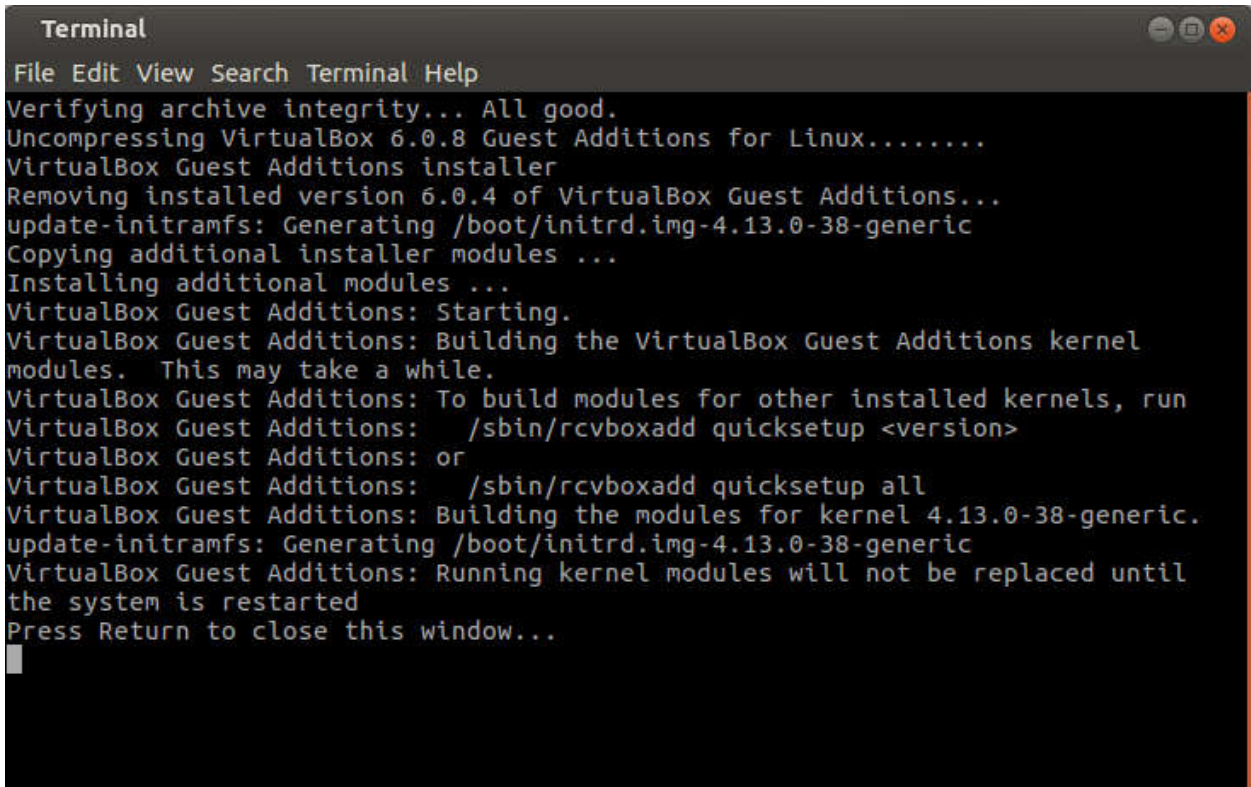
- The following selection box will appear, select “Run”



- Provide the root password (!admin!), then click “Authenticate”

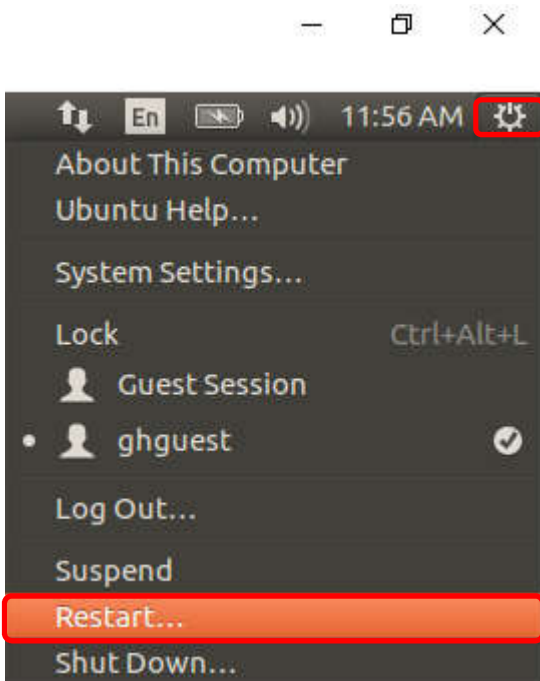


- The following window (which initially appeared as empty with the Authenticate pop-up) will populate as illustrated below

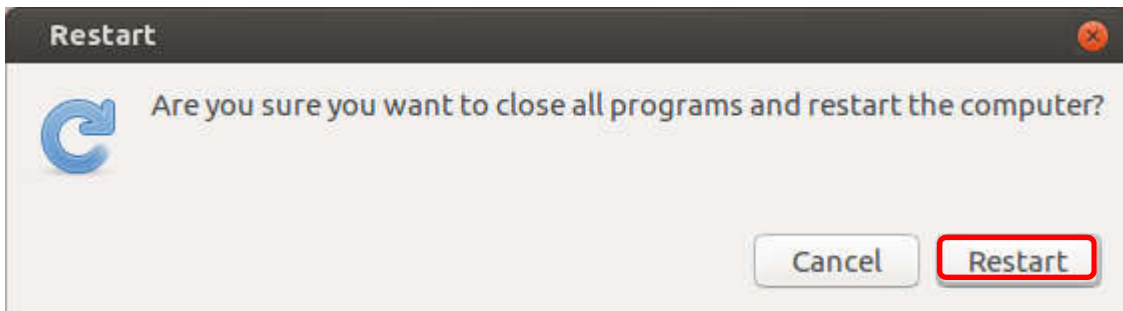


```
Terminal
File Edit View Search Terminal Help
Verifying archive integrity... All good.
Uncompressing VirtualBox 6.0.8 Guest Additions for Linux.....
VirtualBox Guest Additions installer
Removing installed version 6.0.4 of VirtualBox Guest Additions...
update-initramfs: Generating /boot/initrd.img-4.13.0-38-generic
Copying additional installer modules ...
Installing additional modules ...
VirtualBox Guest Additions: Starting.
VirtualBox Guest Additions: Building the VirtualBox Guest Additions kernel
modules. This may take a while.
VirtualBox Guest Additions: To build modules for other installed kernels, run
VirtualBox Guest Additions: /sbin/rcvboxadd quicksetup <version>
VirtualBox Guest Additions: or
VirtualBox Guest Additions: /sbin/rcvboxadd quicksetup all
VirtualBox Guest Additions: Building the modules for kernel 4.13.0-38-generic.
update-initramfs: Generating /boot/initrd.img-4.13.0-38-generic
VirtualBox Guest Additions: Running kernel modules will not be replaced until
the system is restarted
Press Return to close this window...
█
```

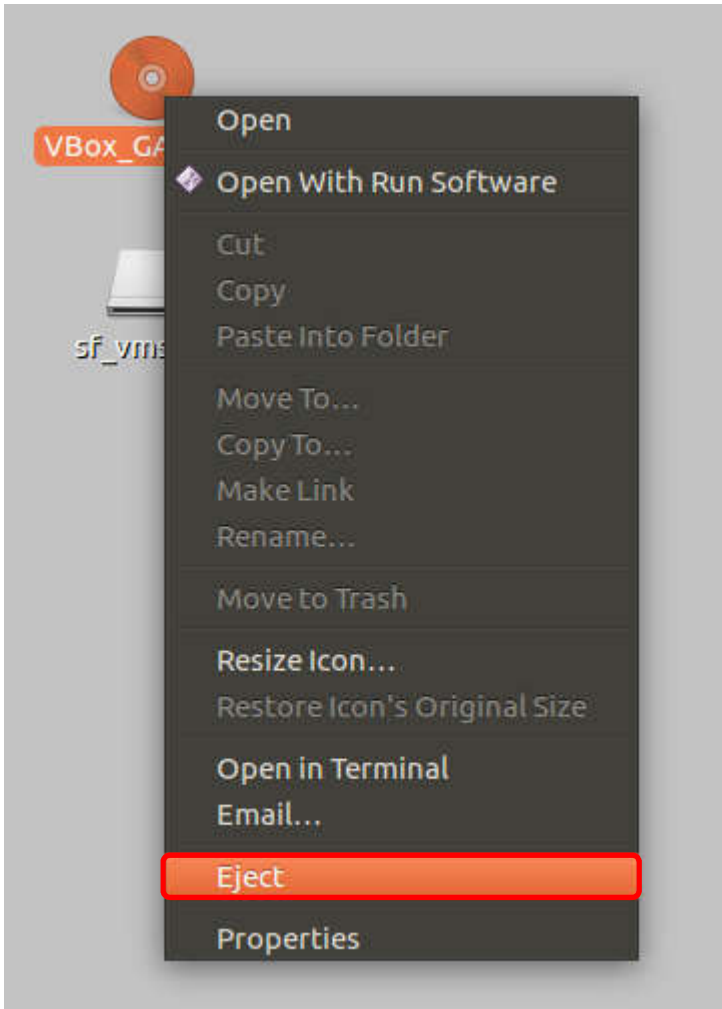
- Restart the VM to apply to enhancements; select “Restart” from the settings icon



- Confirm the restart by clicking “Restart”



- [optional] Clean up by ejecting the CD, right click on the CD icon, then select “Eject”



## Appendix C – Increasing VM disk size

The initial appliance has a 40GB “hard drive”. If the size of the drive needs to be increased, the following link provides an excellent procedure on how to increase the drive’s size.

- <http://derekmolloy.ie/resize-a-virtualbox-disk/>