



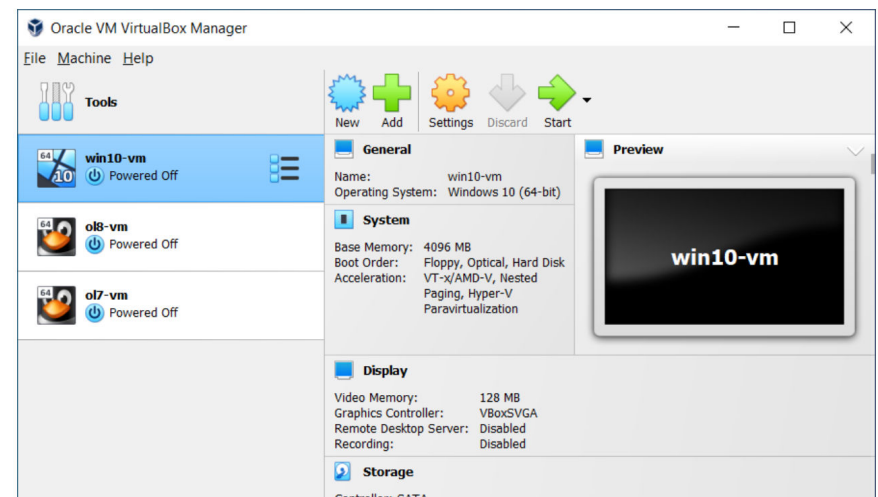
# Virtualbox

Tuul Triyason, Ph.D.

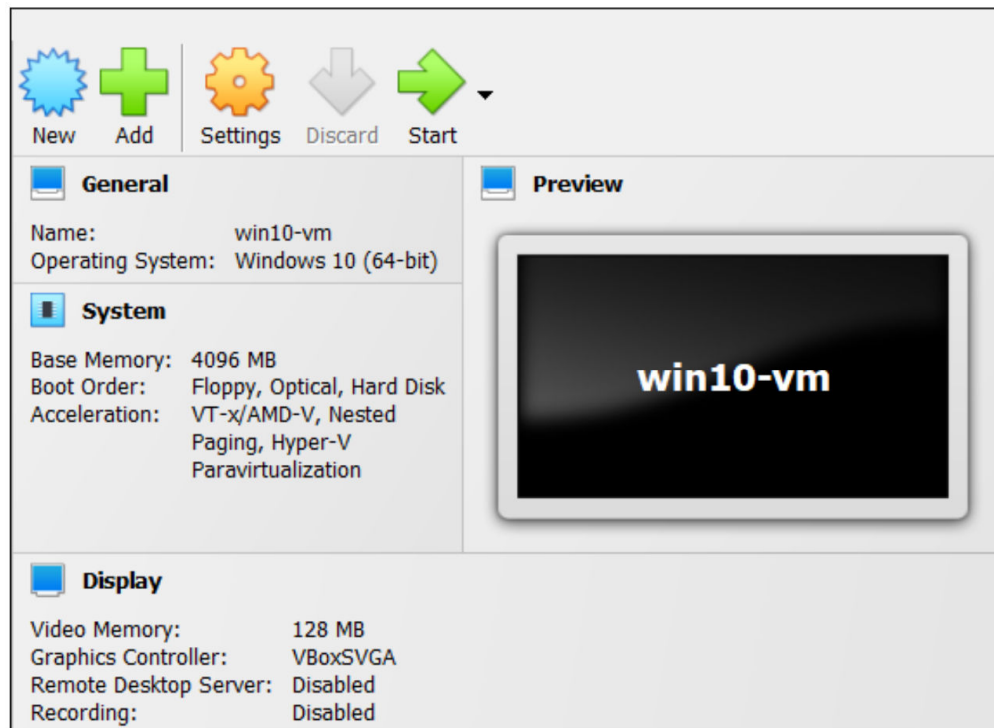
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# Virtualbox Manager

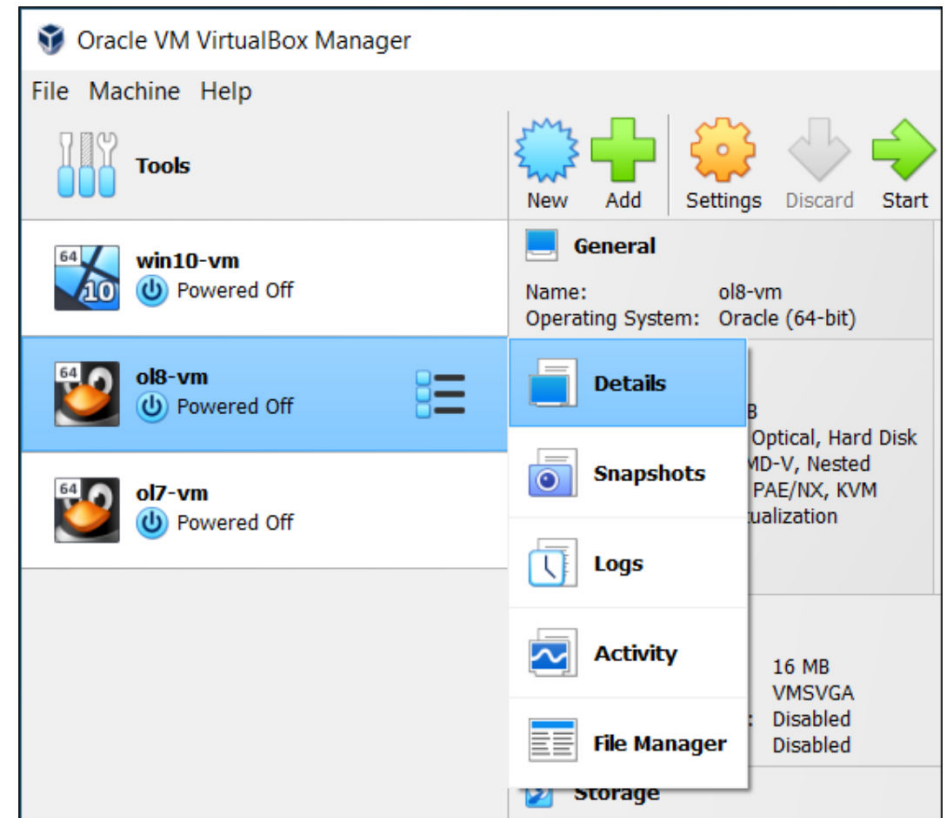
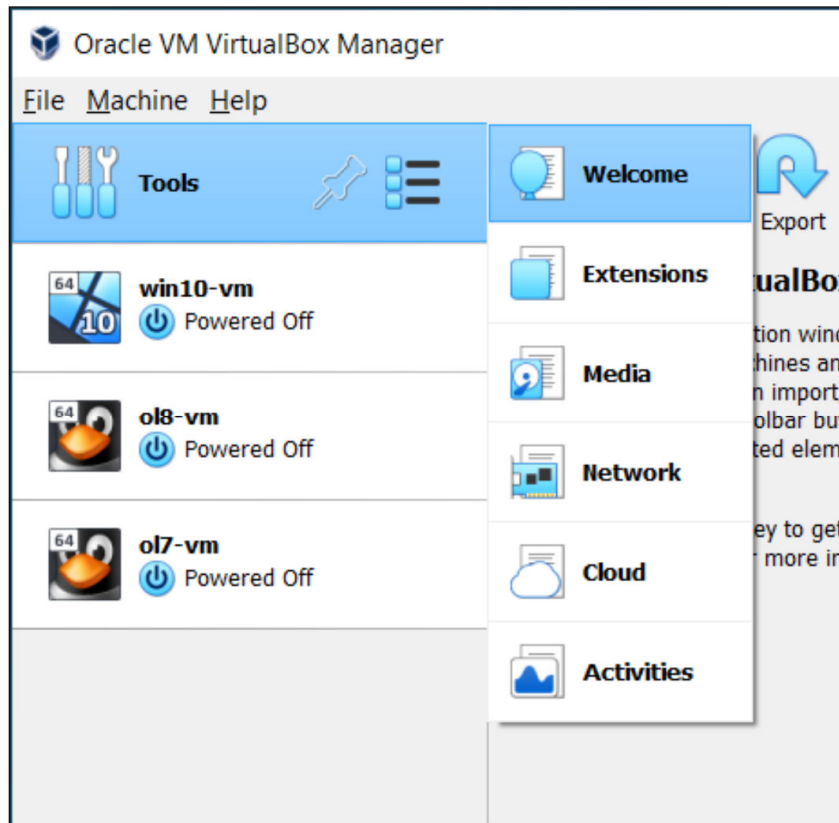


# The details pane

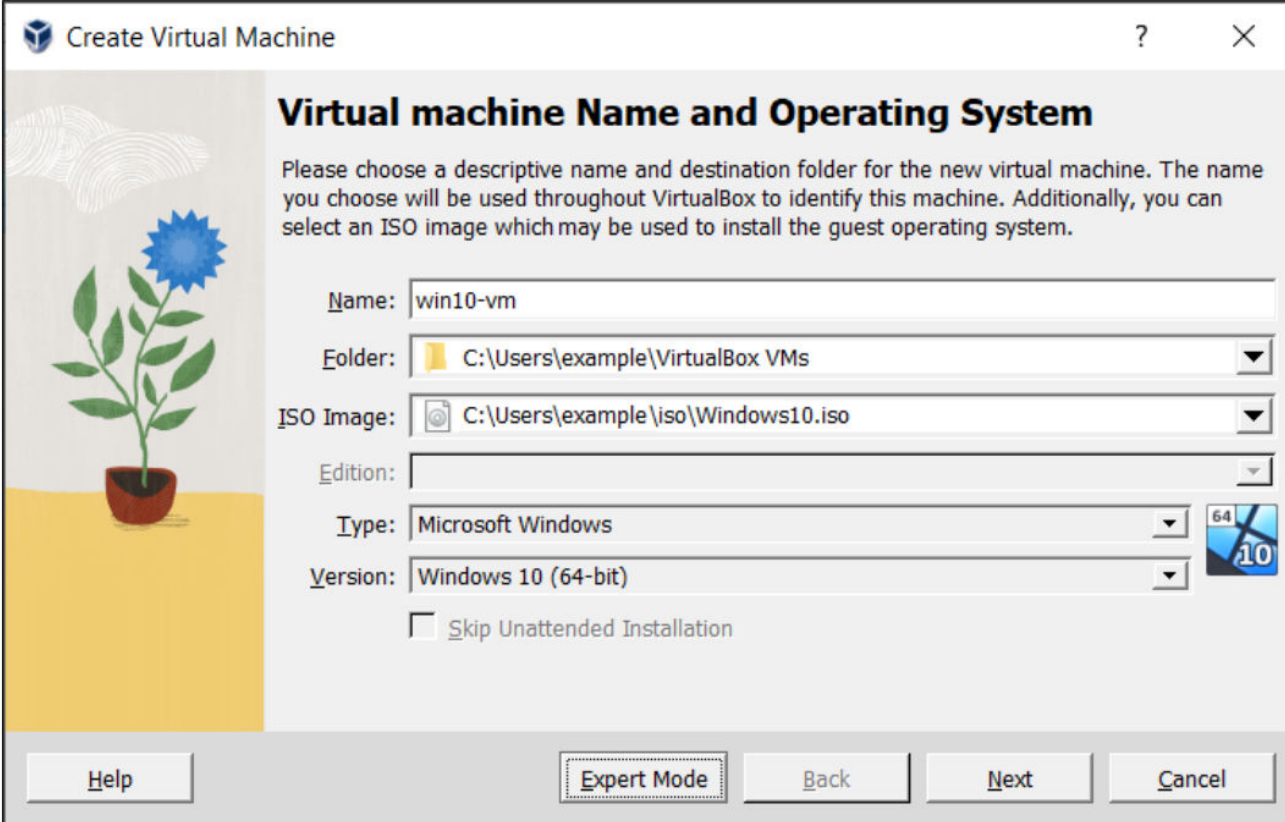


**Note:** If a virtual machine is running, some settings cannot be altered. You must stop the virtual machine first in order to change the setting.

# Virtualbox Global Tools & Machine Tools



# Create your 1<sup>st</sup> VM



The image shows a screenshot of the 'Create Virtual Machine' dialog box in Oracle VM VirtualBox. The window has a title bar with the text 'Create Virtual Machine' and standard window controls. On the left side, there is a decorative illustration of a potted plant with a blue flower. The main area is titled 'Virtual machine Name and Operating System' and contains instructions: 'Please choose a descriptive name and destination folder for the new virtual machine. The name you choose will be used throughout VirtualBox to identify this machine. Additionally, you can select an ISO image which may be used to install the guest operating system.' Below the instructions are several input fields: 'Name' (containing 'win10-vm'), 'Folder' (containing 'C:\Users\example\VirtualBox VMs'), 'ISO Image' (containing 'C:\Users\example\iso\Windows10.iso'), 'Edition' (empty), 'Type' (containing 'Microsoft Windows'), and 'Version' (containing 'Windows 10 (64-bit)'). There is also a checkbox for 'Skip Unattended Installation' which is currently unchecked. At the bottom of the dialog, there are five buttons: 'Help', 'Expert Mode', 'Back', 'Next', and 'Cancel'.

Create Virtual Machine

### Virtual machine Name and Operating System

Please choose a descriptive name and destination folder for the new virtual machine. The name you choose will be used throughout VirtualBox to identify this machine. Additionally, you can select an ISO image which may be used to install the guest operating system.

Name: win10-vm

Folder: C:\Users\example\VirtualBox VMs

ISO Image: C:\Users\example\iso\Windows10.iso

Edition:

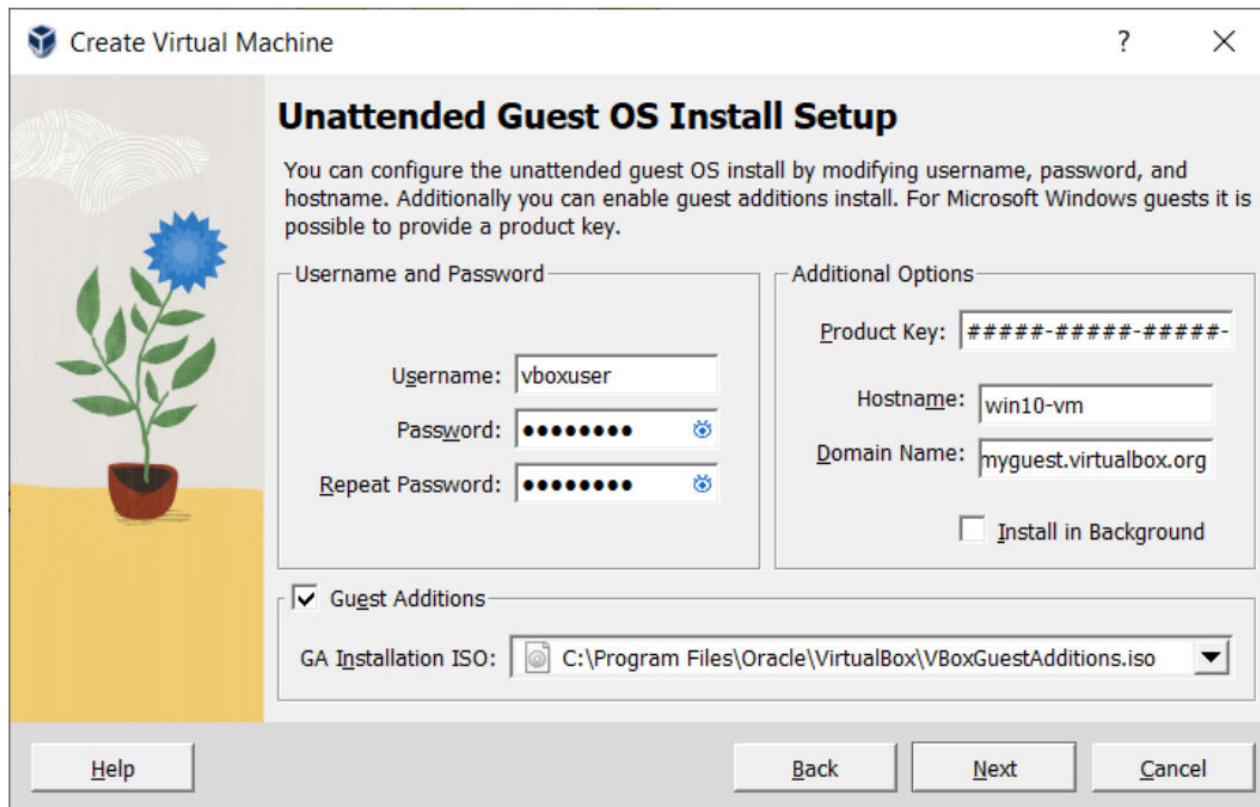
Type: Microsoft Windows

Version: Windows 10 (64-bit)

☐ Skip Unattended Installation

Help Expert Mode Back Next Cancel

# Create your 1<sup>st</sup> VM



The image shows a screenshot of the 'Create Virtual Machine' dialog box in Oracle VM VirtualBox. The window has a title bar with the text 'Create Virtual Machine' and standard window controls. On the left side, there is a decorative graphic of a potted plant with a blue flower. The main area is titled 'Unattended Guest OS Install Setup'. Below the title, there is a paragraph of text explaining that the user can configure the unattended guest OS install by modifying username, password, and hostname, and that it is possible to provide a product key for Microsoft Windows guests. The dialog is divided into two main sections: 'Username and Password' and 'Additional Options'. The 'Username and Password' section contains three text boxes: 'Username' (containing 'vboxuser'), 'Password' (containing eight dots), and 'Repeat Password' (containing eight dots). The 'Additional Options' section contains three text boxes: 'Product Key' (containing '#####-#####-#####'), 'Hostname' (containing 'win10-vm'), and 'Domain Name' (containing 'myguest.virtualbox.org'). There is also a checkbox labeled 'Install in Background' which is currently unchecked. At the bottom of the dialog, there is a section for 'Guest Additions' which is checked. Below this, there is a text box for 'GA Installation ISO' which contains the path 'C:\Program Files\Oracle\VirtualBox\VBBoxGuestAdditions.iso'. At the very bottom of the dialog, there are four buttons: 'Help', 'Back', 'Next', and 'Cancel'.

Create Virtual Machine

## Unattended Guest OS Install Setup

You can configure the unattended guest OS install by modifying username, password, and hostname. Additionally you can enable guest additions install. For Microsoft Windows guests it is possible to provide a product key.

**Username and Password**

Username: vboxuser

Password: ●●●●●●●●

Repeat Password: ●●●●●●●●

**Additional Options**

Product Key: #####-#####-#####

Hostname: win10-vm

Domain Name: myguest.virtualbox.org

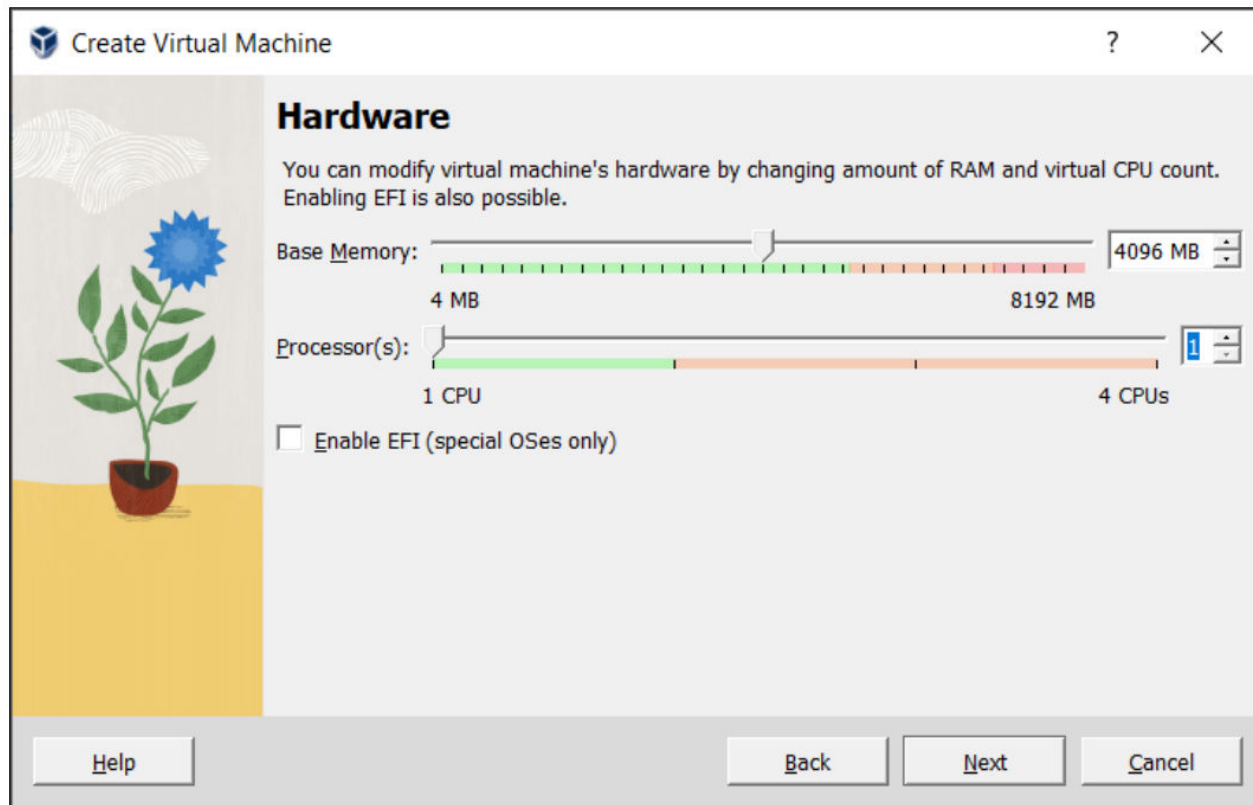
☐ Install in Background

☒ Guest Additions

GA Installation ISO: C:\Program Files\Oracle\VirtualBox\VBBoxGuestAdditions.iso

Help Back Next Cancel

# Create your 1<sup>st</sup> VM

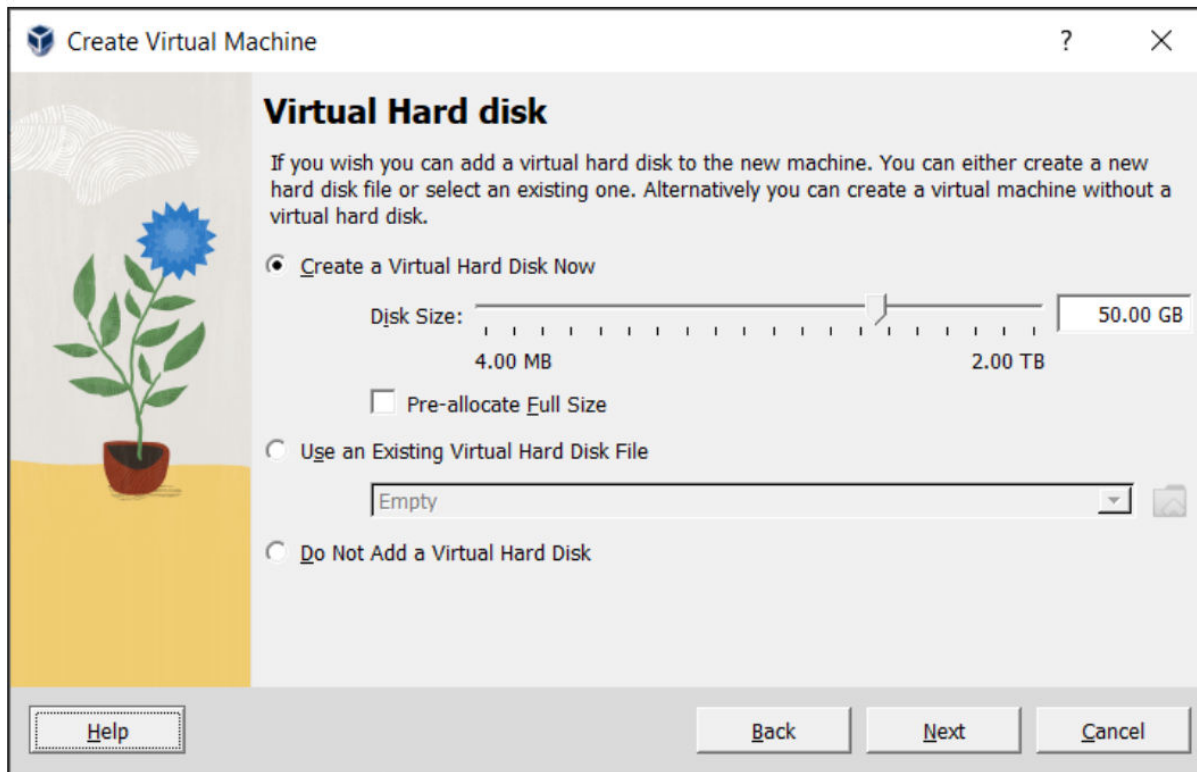


The amount of memory selected here will be taken away from your host machine and presented to the guest OS, which will report this size as the virtual machines installed RAM.

Choose this setting carefully. The memory you give to the VM will not be available to your host OS while the VM is running, so do not specify more than you can spare.



# Create your 1<sup>st</sup> VM



The screenshot shows the 'Create Virtual Machine' wizard window. The title bar reads 'Create Virtual Machine'. The main heading is 'Virtual Hard disk'. Below the heading, there is a descriptive paragraph: 'If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select an existing one. Alternatively you can create a virtual machine without a virtual hard disk.' There are three radio button options: 'Create a Virtual Hard Disk Now' (selected), 'Use an Existing Virtual Hard Disk File', and 'Do Not Add a Virtual Hard Disk'. The 'Create a Virtual Hard Disk Now' option has a slider for 'Disk Size' ranging from 4.00 MB to 2.00 TB, with a text box showing '50.00 GB'. There is also a checkbox for 'Pre-allocate Full Size'. The 'Use an Existing Virtual Hard Disk File' option has a text box showing 'Empty' and a folder icon. The 'Do Not Add a Virtual Hard Disk' option is also present. At the bottom, there are buttons for 'Help', 'Back', 'Next', and 'Cancel'. On the left side of the window, there is a decorative illustration of a potted plant with a blue flower.

**Virtual Hard disk**

If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select an existing one. Alternatively you can create a virtual machine without a virtual hard disk.

☒ Create a Virtual Hard Disk Now

Disk Size:

4.00 MB 2.00 TB

☐ Pre-allocate Full Size

☐ Use an Existing Virtual Hard Disk File

☐ Do Not Add a Virtual Hard Disk

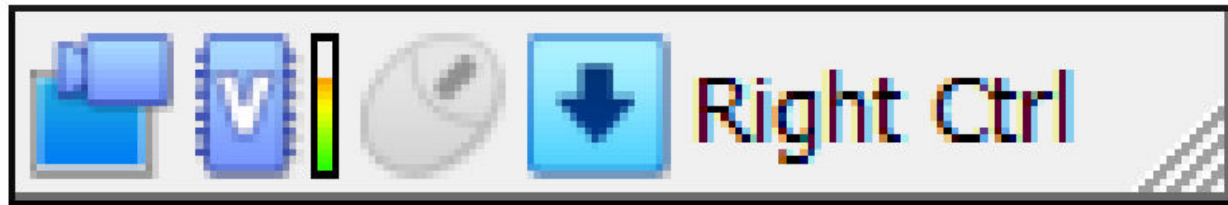
Help Back Next Cancel

**Note:** You can skip attaching a virtual hard disk file to the new virtual machine you are creating. But you will then need to attach an hard disk later on, in order to install a guest operating system.



# Running your VM

- Double-click on the VM's entry in the machine list in VirtualBox Manager.
- Select the VM's entry in the machine list in VirtualBox Manager, and click **Start** in the toolbar the top of the window.
- Go to the VirtualBox VMs folder in your system user's home directory. Find the subdirectory of the machine you want to start and double-click on the machine settings file. This file has a .vbox file extension.
- To return ownership of keyboard and mouse to your host OS, Oracle VM VirtualBox reserves a special key on your keyboard: the *Host key*. By default, this is the *right Ctrl* key on your keyboard. On a Mac host, the default Host key is the left Command key.



# Typing Special Character

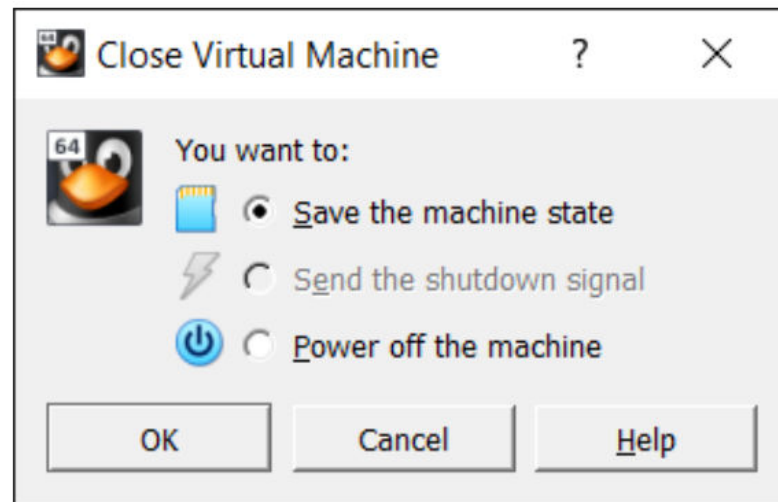
- Host OS reserve certain key combinations for themselves. For example, you cannot use the **Ctrl+Alt+Delete** combination to reboot the guest OS in your VM, because this key combination is reserved by the host OS.
- Use the items in the **Input, Keyboard** menu of the virtual machine window. This menu includes the settings **Insert Ctrl+Alt+Delete** and **Insert Ctrl+Alt+Backspace**. However, the latter setting affects only Linux guests or Oracle Solaris guests. This menu also includes an option for inserting the Host key combination.
- Use special key combinations with the Host key, which is normally the right Ctrl key. Virtualbox then translates the following key combinations for the VM:
  - **Host key + Del** sends **Ctrl + Alt + Del** to reboot the guest OS.
  - **Host key + Backspace** sends **Ctrl + Alt + Backspace** to restart the graphical user interface of a Linux or Oracle Solaris guest.
  - **Host key + Function key**. For example, use this key combination to simulate **Ctrl + Alt + Fx** to switch between virtual terminal in a Linux guest.

# Resizing the Machine's Window

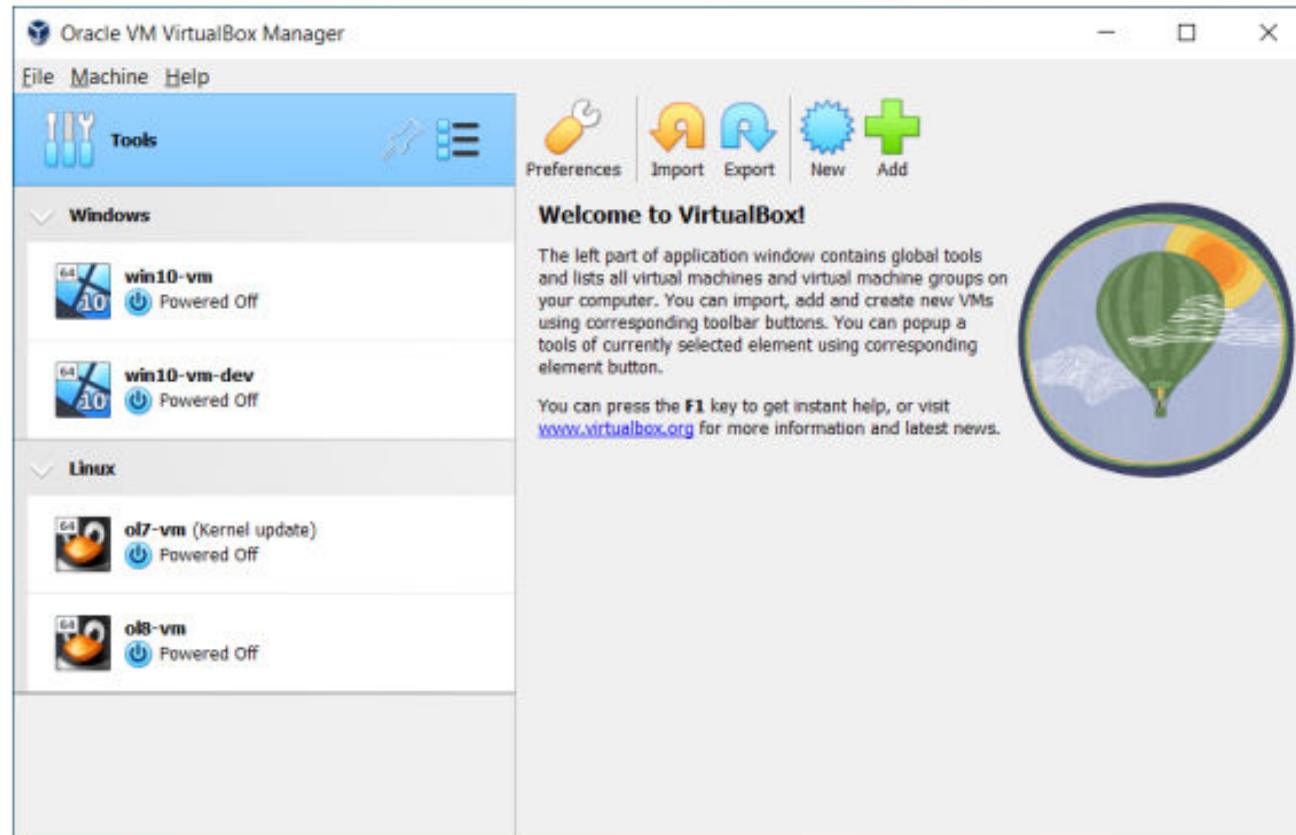
- You can resize the VM's window while that VM is running. When you do the window is scaled as follow:
  - If you have **scaled mode** enabled, then the virtual machine's screen will be scaled to the size of the window. To enable scaled mode, press **Host key + C**, or select **Scaled Mode** from the **View** menu in the VM window. To leave scaled mode, press **Host key + C** again.
  - The aspect ratio of the guest screen is preserved when resizing the window. To ignore the aspect ratio, press **Shift** during the resize operation.
  - If you have the Guest Additions installed and they support automatic **resizing**, the Guest Additions will automatically adjust the screen resolution of the guest OS.

# Saving the State of the Machine

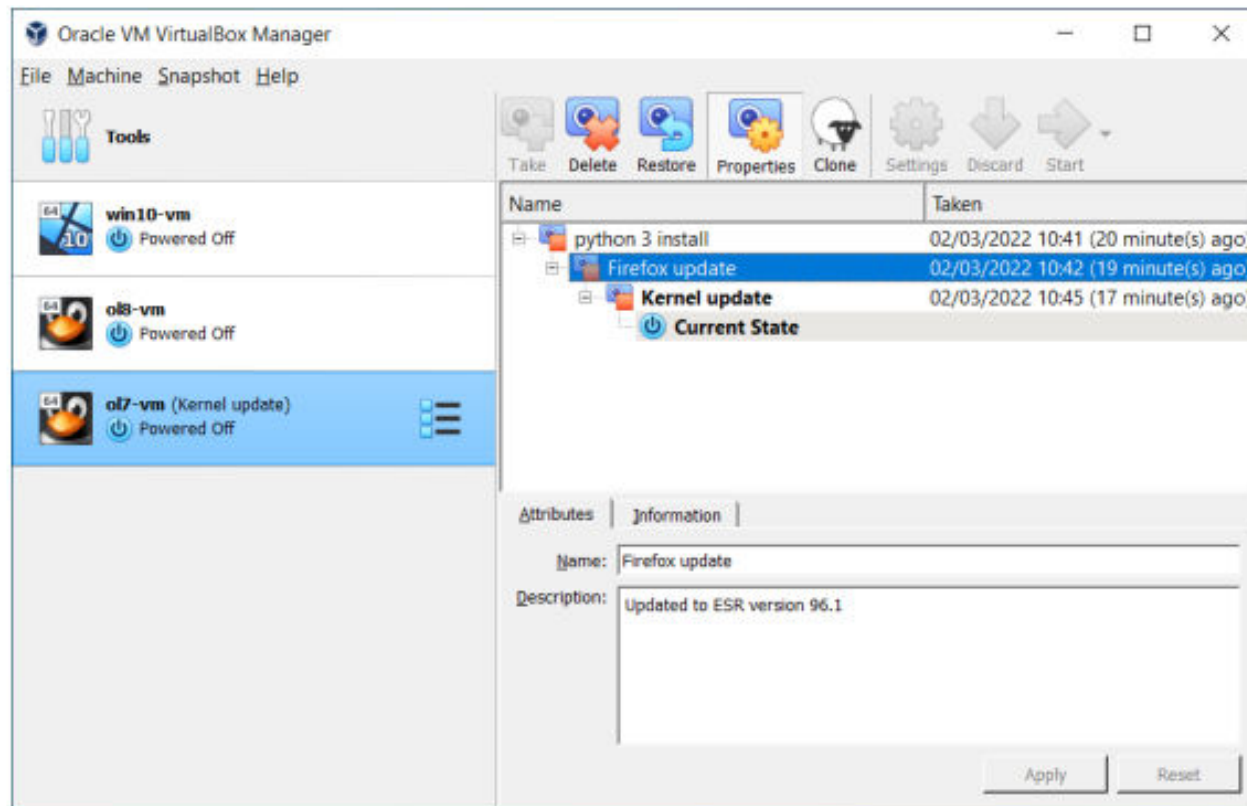
- When you click on the **Close** button of your VM window, at the top right of the window, Virtualbox asks you whether you want to save or power off the VM.



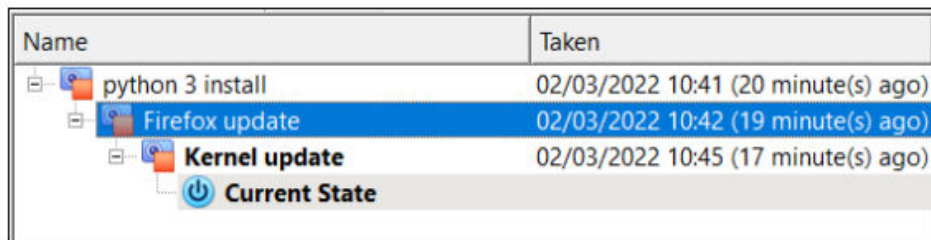
# Using VM Groups







# Snapshots



# Taking, Restoring, and Deleting Snapshots



The screenshot shows a window with a table of snapshots. The table has two columns: 'Name' and 'Taken'. The 'Name' column contains icons and text labels for each snapshot. The 'Taken' column shows the date and time the snapshot was taken, along with the time elapsed since it was taken. The 'Firefox update' snapshot is highlighted in blue.

Name	Taken
 python 3 install	02/03/2022 10:41 (20 minute(s) ago)
 Firefox update	02/03/2022 10:42 (19 minute(s) ago)
 Kernel update	02/03/2022 10:45 (17 minute(s) ago)
 Current State	

- Restoring a snapshot will affect the virtual hard drives that are connected to your VM, as the entire state of the virtual hard drive will be reverted as well.
- This means also that all files that have been created since the snapshot and all other file changes *will be lost*. In order to prevent such data loss while still making use of the snapshot feature, it is possible to add a second hard drive in *write-through* mode using the VBoxManage interface and use it to store your data.

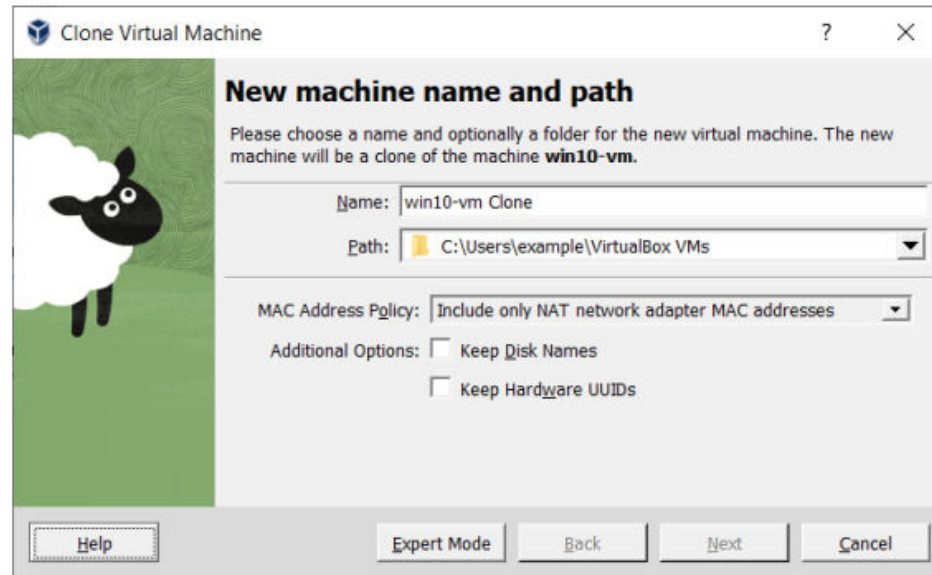


# Removing and Moving Virtual Machines

- **Removing a VM:** To remove a VM, right-click on the VM in the Virtualbox Manager machine list and select **Remove**.
- **Moving a VM:** To move a VM to a new location on the host, right-click on the VM in the Virtualbox manager's machine list and select **Move**.

# Cloning VM

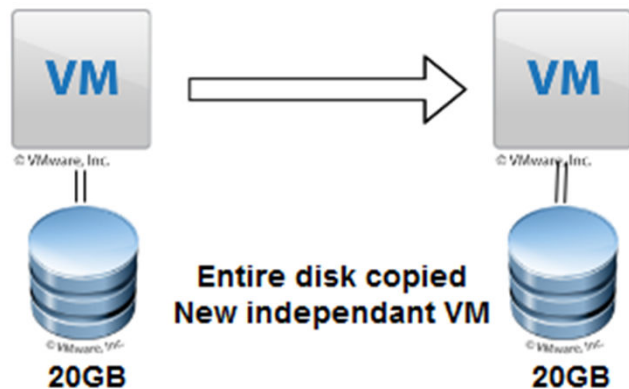
- The Clone menu item is disabled while a VM is running.



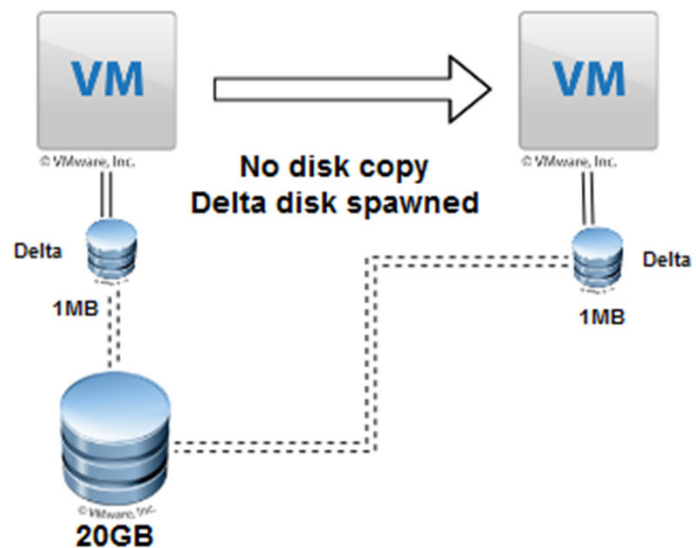
# Clone Type

- **Full Clone:** Copies all dependent disk images to the new VM folder. A full clone can operate fully without the source VM.
- **Linked Clone:** Creates new differencing disk images based on the source VM disk images. If you select the current state of the source VM as the clone point, Virtualbox creates a new snapshot.

### Full Clone



### Linked Clone



## Virtual Machine



## Virtual Appliance



# Importing and Exporting Virtual Machines

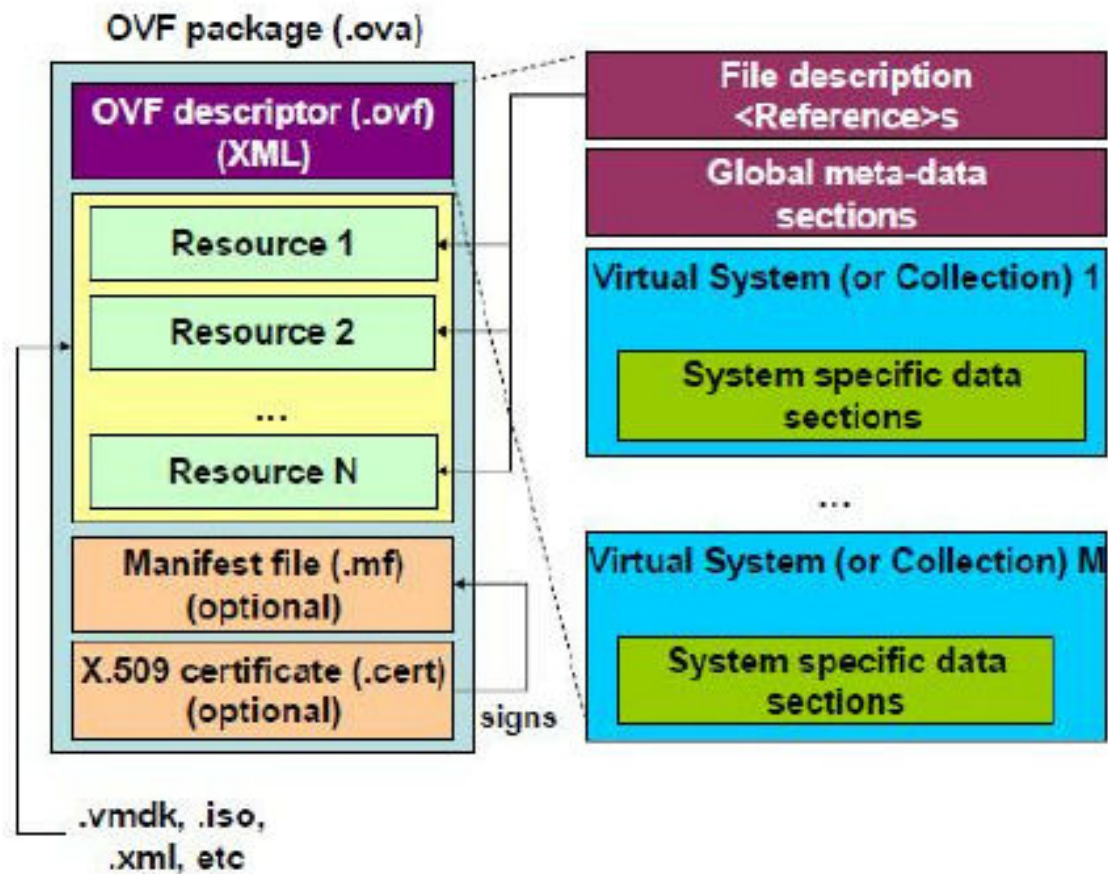
Virtualbox can import and export VMs in the following formats:

- **Open Virtualization Format (OVF, OVA).** This is the industry-standard format.
- **Cloud service formats.** Export to and import from cloud services such as Oracle Cloud Infrastructure is supported.

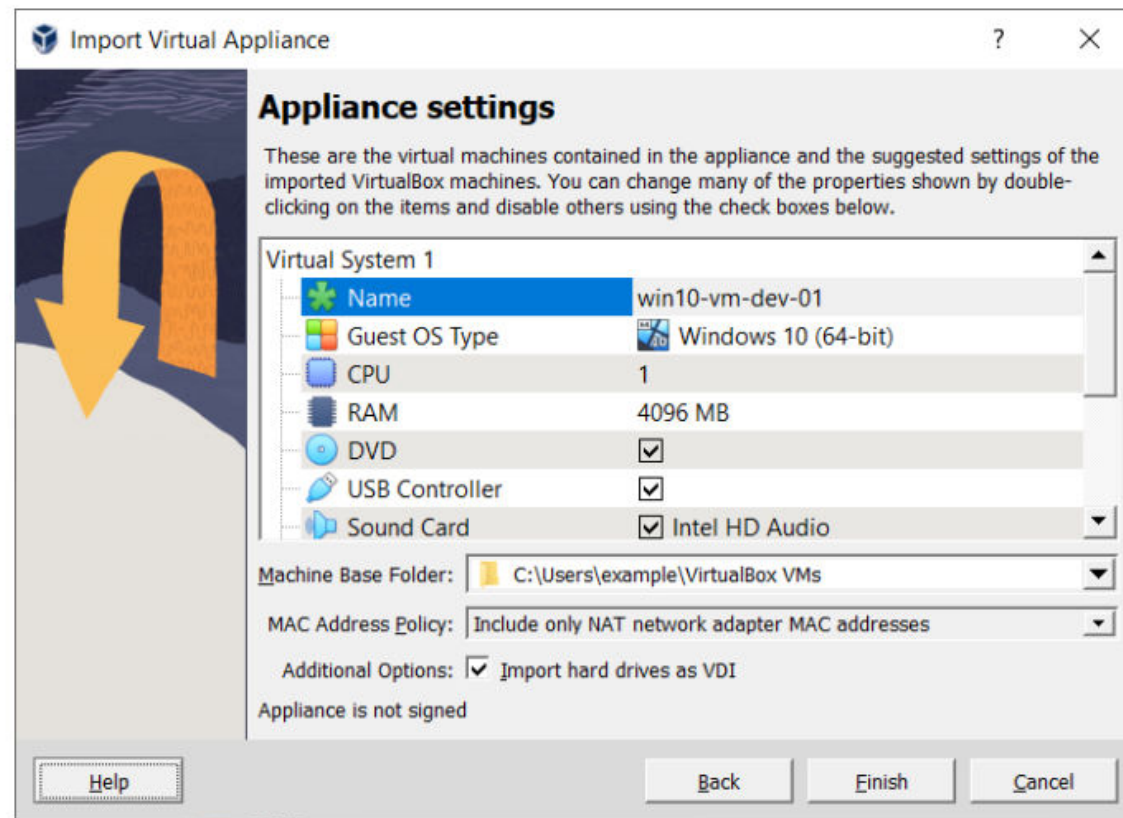
# OVF Format

- They can come in several files, as one or several disk images, typically in the widely-used VMDK format. They also include a textual description file in an XML dialect with an .ovf extension. These files must then reside in the same directory for Virtualbox to be able to import them.
- The above files can be packed together into a single archive file, typically with an .ova extension.
- OVF cannot describe snapshots that were taken for a VM. As a result, when you export a VM that has snapshots, only the current state of the VM will be exported.





# Importing an Appliance in OVF Format



# Preferences

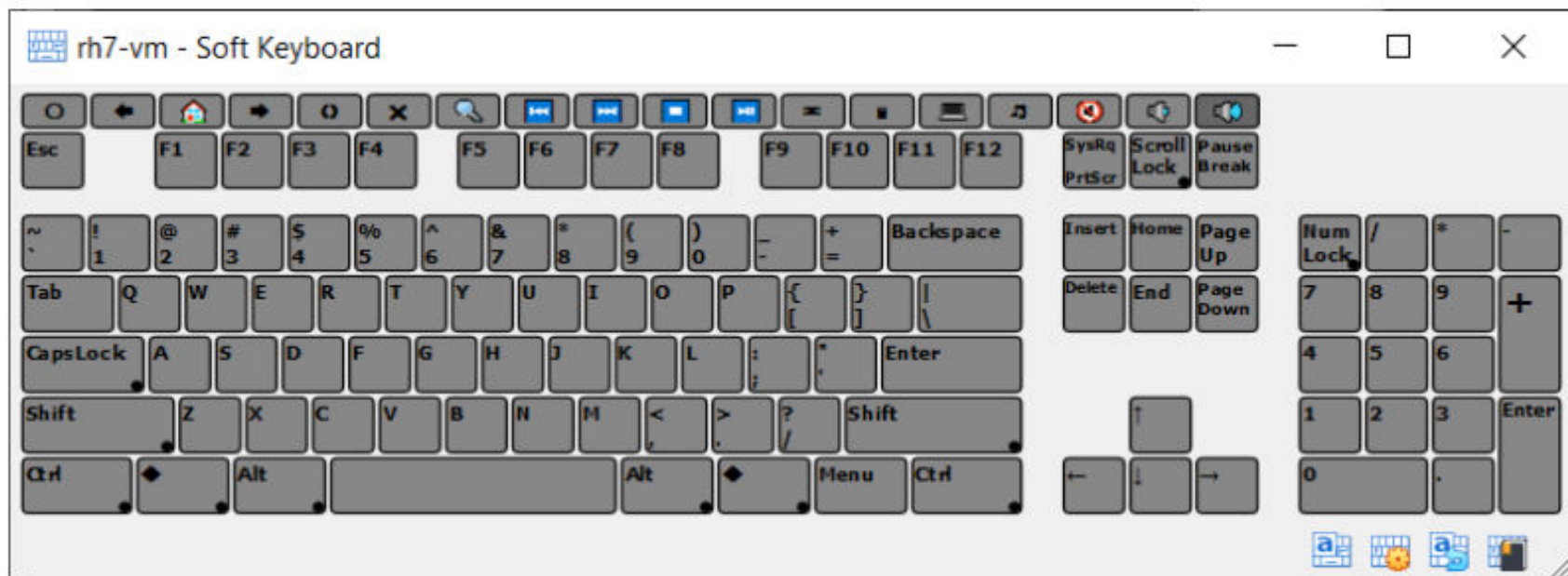
- **General:** Enables you to specify the default directory for VM files, and the VRDP Authentication Library.
- **Input:** Enables you to specify keyboard shortcuts, such as Host key
- **Update:** Enables you to specify various settings for Automatic Updates.
- **Language:** Enables you to specify the language used for menus, labels and text in Vbox Manager.
- **Display:** Enables you to specify the screen resolution, and its width and height.
- **Proxy:** Enables you to configure an HTTP Proxy Server.
- **Interface:** Enables you to select a color theme for the Vbox Manager UI.

\*This setting is only available on Windows host platforms.

# Alternative Front-Ends

- **VirtualBox Manager** UI
- **VBoxManage** (A command-line interface)
- **VBoxHeadless** (A front-end that produces no visible output on the host at all, but can act as RDP server if the Vbox Remote Desktop Extension (VRDE) is installed and enabled for the VM.

# Soft Keyboard

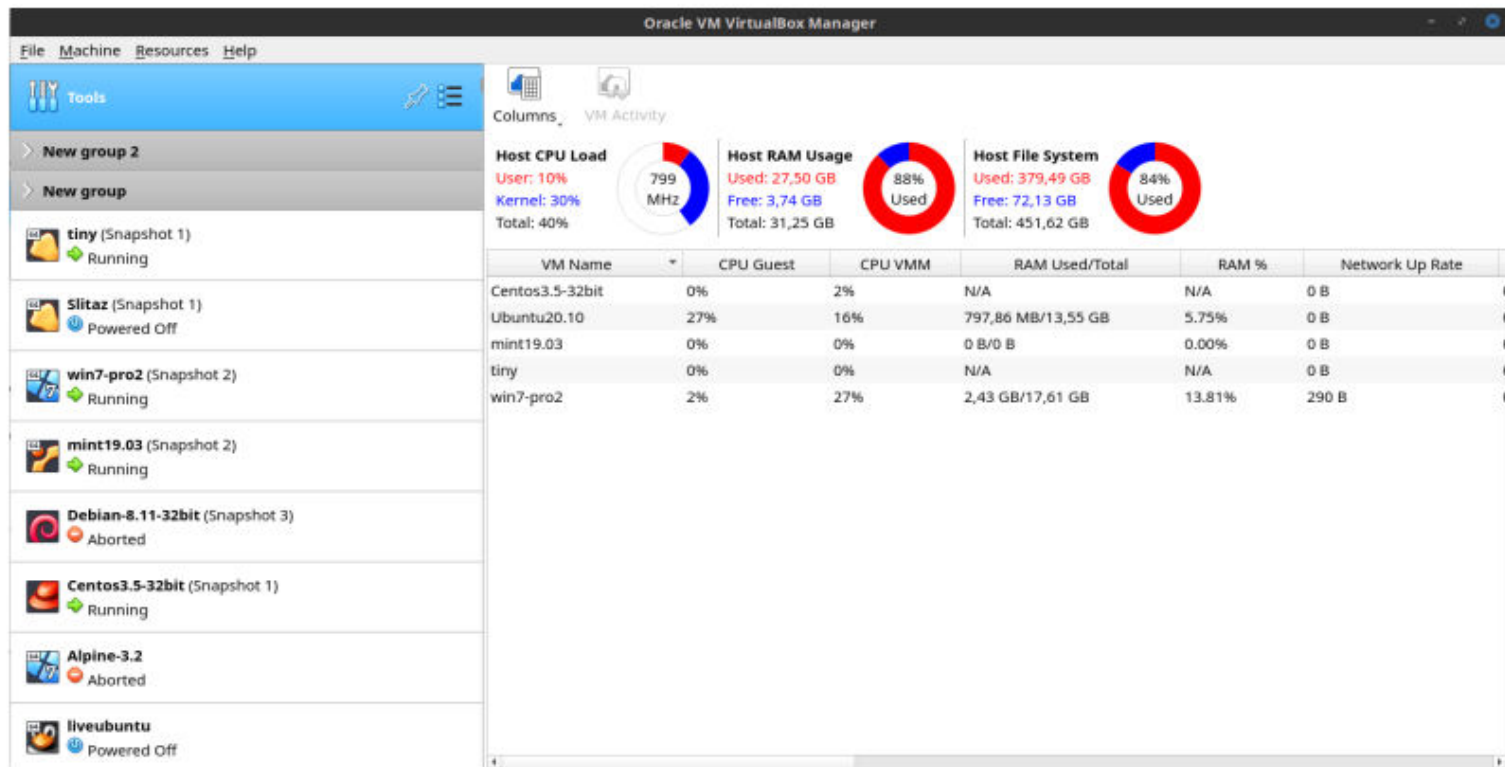


In the guest VM window, select **Input, Keyboard, Soft Keyboard**

# Monitoring of VMs

- **VM Activity Overview:** Displays an overview of performance metrics for all running VMs.
- **Session Information Dialog:** Displays configuration and runtime information for the selected guest system.

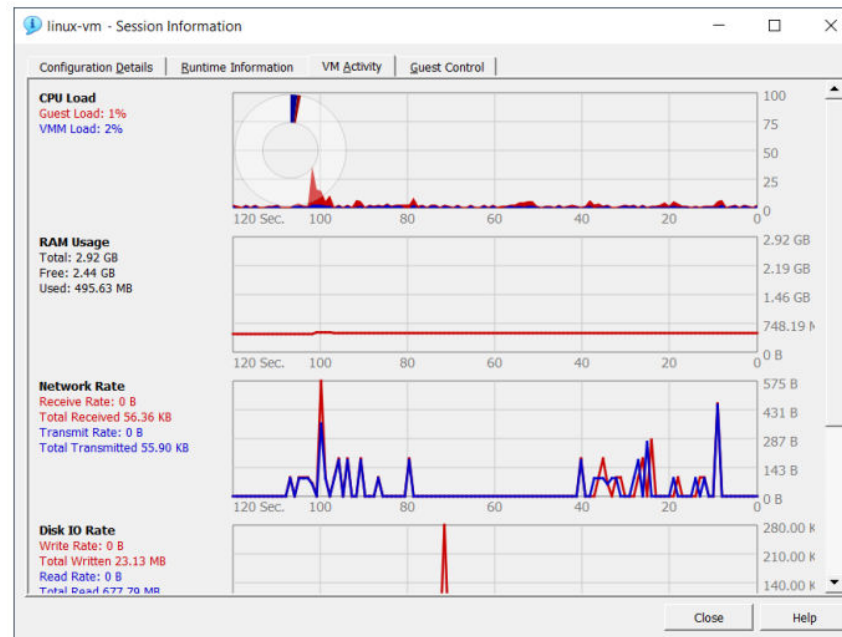
# VM Activity Overview





# Session Information Dialog

- To display the Session Information Dialog, select **Machine, Session Information** in the guest VM.



# The Log Viewer

