**Practical No:7**

**Aim:** installation of virtual machine

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**Installition of virtual machine:**

his **step-by-step guide** will show you how to set up a virtualization environment (called a hypervisor) on your computer that will allow you to run **Virtual Machines**. Most of our guides and technical support deals primarily with the **VirtualBox** hypervisor, which is a free, multi-platform, open-source tool. Other hypervisors may be used to run our Virtual Machines, such as **VMware**, which is available freely to SCS Computer Science Students and is supported with some documentation. Other hypervisors include **KVM, Hyper-V, Parallels, etc.**, but we do not provide technical support for those.

**Steps of virtual machine:**

[Step 1: Prepare your computer for Virtualization](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/#prepare-computer)  
[Step 2: Install Hypervisor (Virtualization Tool)](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/#install-hypervisor)  
[Step 3: Import a Virtual Machine](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/#import-virtualmachine)  
[Step 4: Start the Virtual Machine](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/#start-virtualmachine)  
[Step 5: Using the Virtual Machine](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/#using-virtualmachine)  
[Step 6: Shut down the Virtual Machine](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/#shutdown-virtualmachine)

* **Step 1: Prepare your computer for Virtualization**

Before getting started with any **hypervisor**, there are a few things you will want to check on your **host** computer. Checking these before attempting to install and run your virtual machine reduces the chance that something will go wrong.

* **Enable Processor Virtualization:** Ensure Virtualization is enabled on your computer. See the [Virtualization Error (VT-d/VT-x or AMD-V)](https://carleton.ca/scs/2019/virtualbox-virtualization-error-intel-vt-d-vt-x-or-amd-v/) for troubleshooting support
* **Review File Sync Services** for tools like *OneDrive, Nextcloud, DropBox Sync, iCloud, etc*. If you are using a data synchronization service, make sure it **DOES NOT** (or at least not frequently) synchronize the folder in which your **hypervisor** imports and installs the Virtual Machines. File sync services can cause a dramatic fall-off in performance for your entire system as these services try to synchronize these massive files that are getting updated constantly while you are using the Virtual Machines.
* **Sufficient Disk Space:**Virtual Machines require a significant amount of Disk space (10 GB or more each is typical). Ensure you have sufficient space on your computer
* **Admin Privileges:** Installing a **hypervisor** on a host in most cases requires admin privileges.
* **Step 2: Install Hypervisor (Virtualization Tool)**

Installing a **hypervisor** on your **host** is usually quite simple. In most cases, the install program will ask only a couple of questions, such as where to install the **hypervisor** software.

**WARNING:** We only rigorously test our new Virtual Machines on up-to-date versions of ***VirtualBox***. We encourage everyone to use that hypervisor if they can.

* **VirtualBox Installation Instructions:**[text](https://carleton.ca/scs/2021/install-virtualbox/)**|**[video](https://www.youtube.com/watch?v=cWcMQTa1yRo)

**IMPORTANT:** We encourage that you update your **hypervisor** *each term* if you are using new Virtual Machines, as they are often built using the most up-to-date **hypervisor** (typically *VirtualBox* for most SCS course Virtual Machines)

* **Step 3: Import a Virtual Machine**

The first step is to download the Virtual Machine for your course from our [Course Virtual Machines](https://carleton.ca/scs/technical-support/virtual-machines/) page. This will download a **.ova** file.  
The **.ova** file is actually a compressed (zipped) tarball of a Virtual Machine exported from *VirtualBox*

* **VirtualBox VM Import Instructions:**[text](https://carleton.ca/scs/2021/import-virtual-machine-into-virtualbox/)**|**[video](https://youtu.be/cWcMQTa1yRo?t=101)

Once the Virtual Machine has been imported, it will normally show up in the **guest** list within your **hypervisor** tool.

* **Step 4: Start the Virtual Machine**

To start up a Virtual Machine **guest** in most **hypervisors,** you simply click on the desired **guest** and click the **Start** button (*often double-clicking the guest icon will work as well*).

**IMPORTANT:** Some of our larger Virtual Machines can take *up to a minute* to start up the Linux operating system and show you the login screen. If the start-up is a lot slower, or if the performance when logged into the Virtual Machine Desktop or Shell is poor, then consult the [Trouble-Shooting](https://carleton.ca/scs/tech-support/troubleshooting-guides/) section below.

* **Step 5: Using the Virtual Machine**

How you use a Virtual Machine will depend on your course, so consult your TAs. Some useful things to know:

* **Sharing files between the guest and host:**To learn about different ways of sharing files, check out [this guide](https://carleton.ca/scs/technical-support/virtual-machines/transferring-files-to-and-from-virtual-machines/).
* **Run a command with sudo (root) privileges:** Open a terminal and type any command with **sudo** in front to run that command as root.  
  Example: sudo apt-get install vim – will install the vim text editor package on an Ubuntu Linux Virtual Machine
* **Find the IP address of your guest:** Open a terminal and type **ifconfig | more** – The *| more* (pronounced “pipe more”) will “pipe” the output of the ifconfig command to the more command, which will show the results one page at a time, so it doesn’t scroll by before you see it all.  
  If you have a **Host-Only Network IP address,** you will see an IP of **192.168.56.101** (or something similar). Check the [Trouble-Shooting](https://carleton.ca/scs/tech-support/virtual-machines/virtual-machine-technical-support/virtual-machine-step-by-step-guide/troubleshooting) section below for more information about the **Host-Only Network**.
* **Step 6: Shut down the Virtual Machine**

When you are done using a **guest** Virtual Machine, regardless of **hypervisor**, you need to **shut it down properly**. This can be done in **three** ways:

1. Press the shut down button found on the **desktop, taskbar, or task menu** of the **guest operating system**
2. Open a terminal and type the command: **sudo shutdown -h now**
3. In the **guest window,** click *Machine (menu) -> ACPI Shut down* – This will simulate the power button being pressed

**WARNING:** If you shut down a **guest** operating system any other way, such as by just pressing the **“X”** button on the **guest window** or *File (menu) -> Close*, this can have unintended consequences. In some cases, this can be the same as pulling the power cord out of your desktop computer. This can result in hard drive errors depending on what the **guest’s** operating system was doing when you *killed* it.