HW #1. System Structure

In this homework, you need to set up a VM and install a guest operating system on the VM. If you already know how to do this, you can go directly to the assignment section.

Instruction for Setting up a VM with VirtualBox

A. Installing Oracle VM VirtualBox

1. Download Oracle VM VirtualBox from
   https://www.virtualbox.org/wiki/Downloads

2. Install Oracle VM VirtualBox on your computer. If everything goes right, you should see the following screen (Figure 1) after starting VirtualBox.

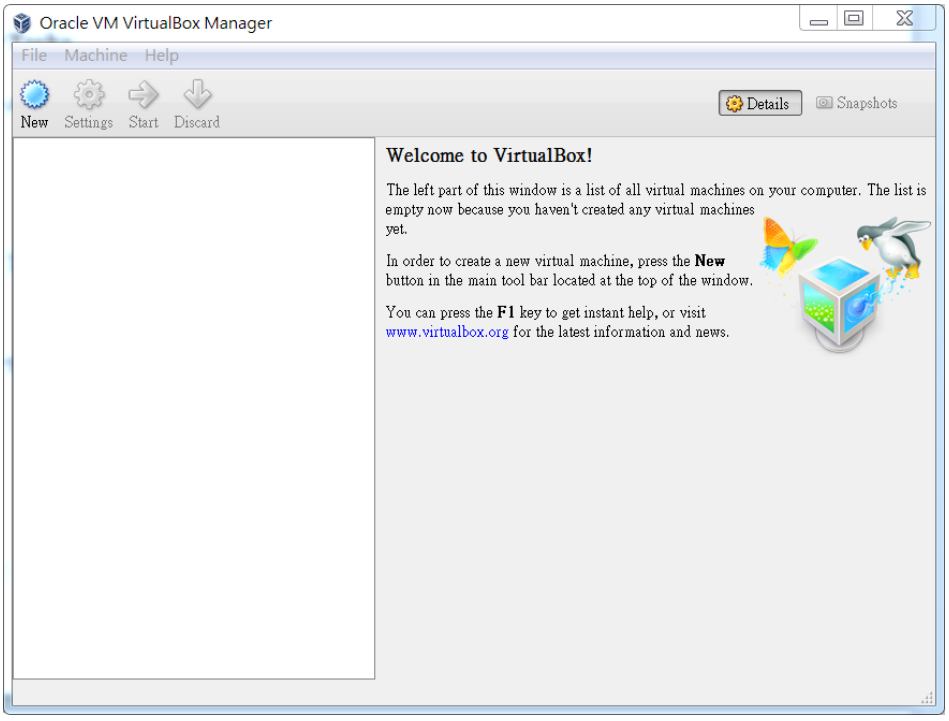
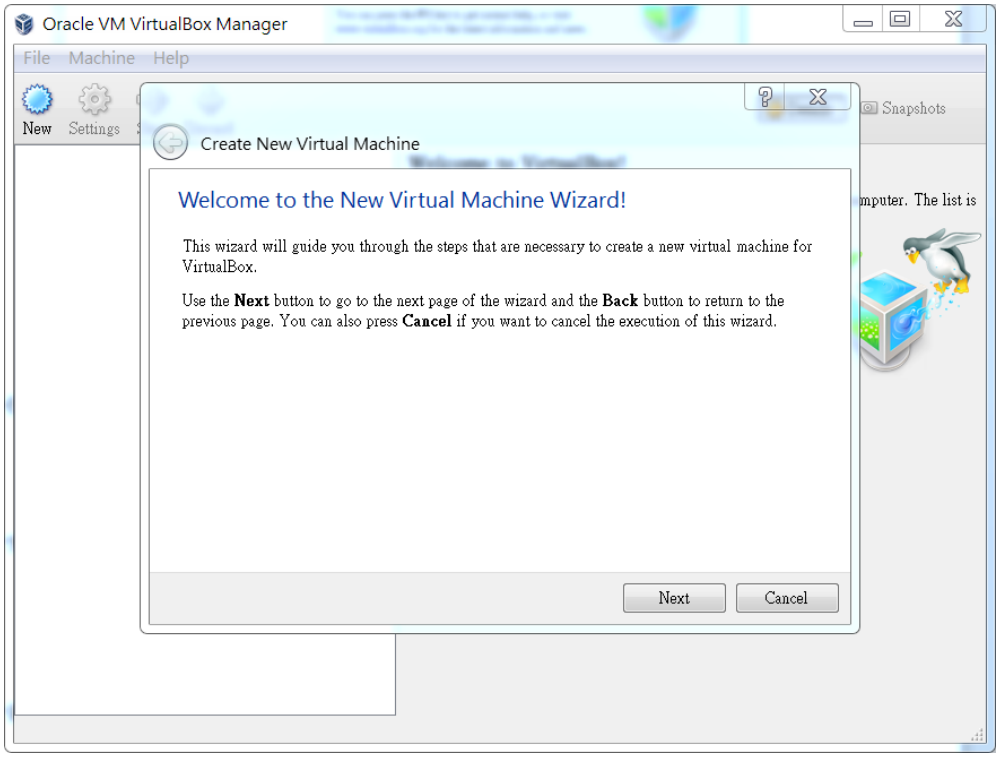


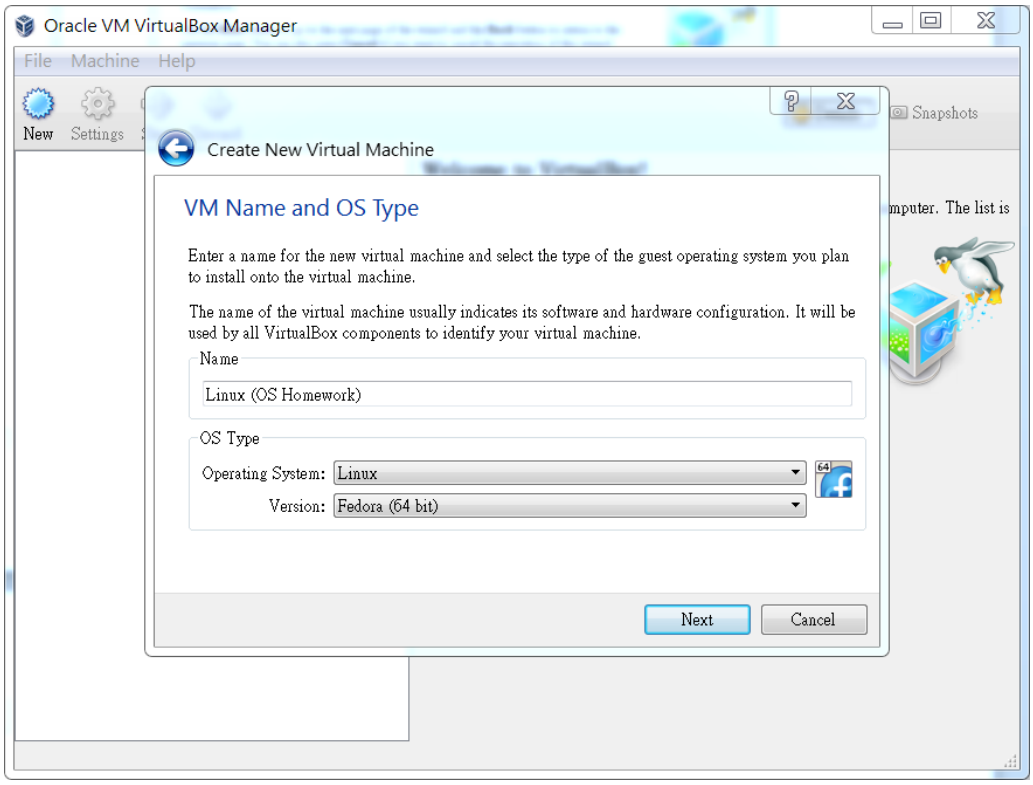
Figure 1. VirtualBox

B. Creating a new VM

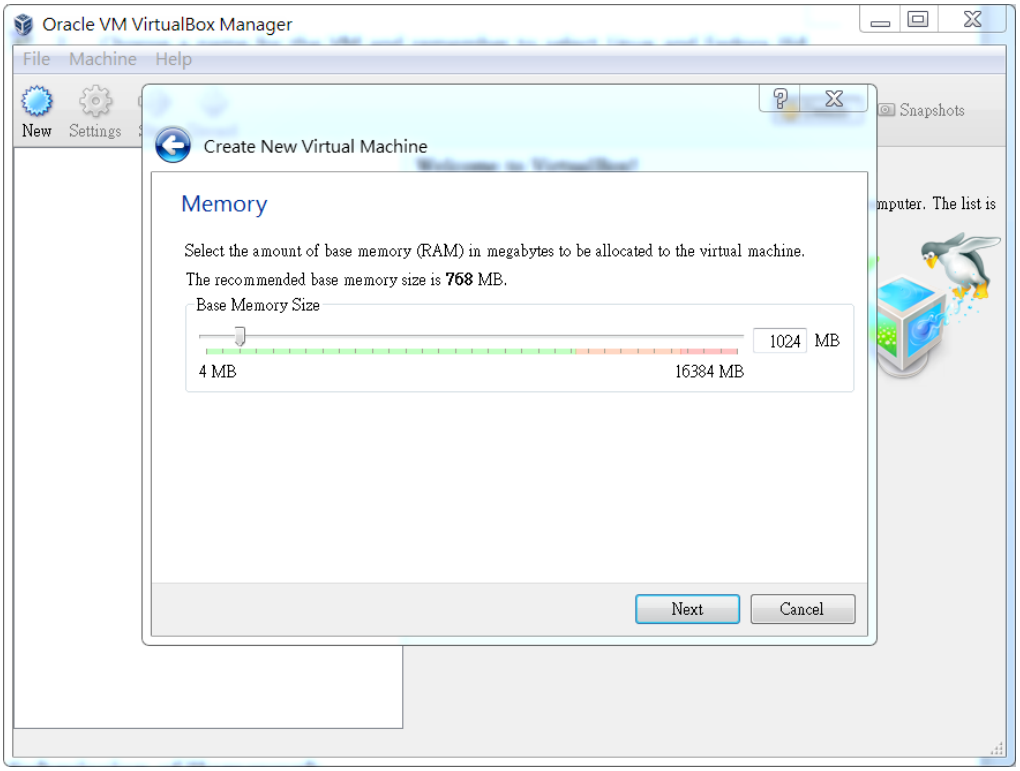
1. Click the “New” icon to create a New Virtual Machine



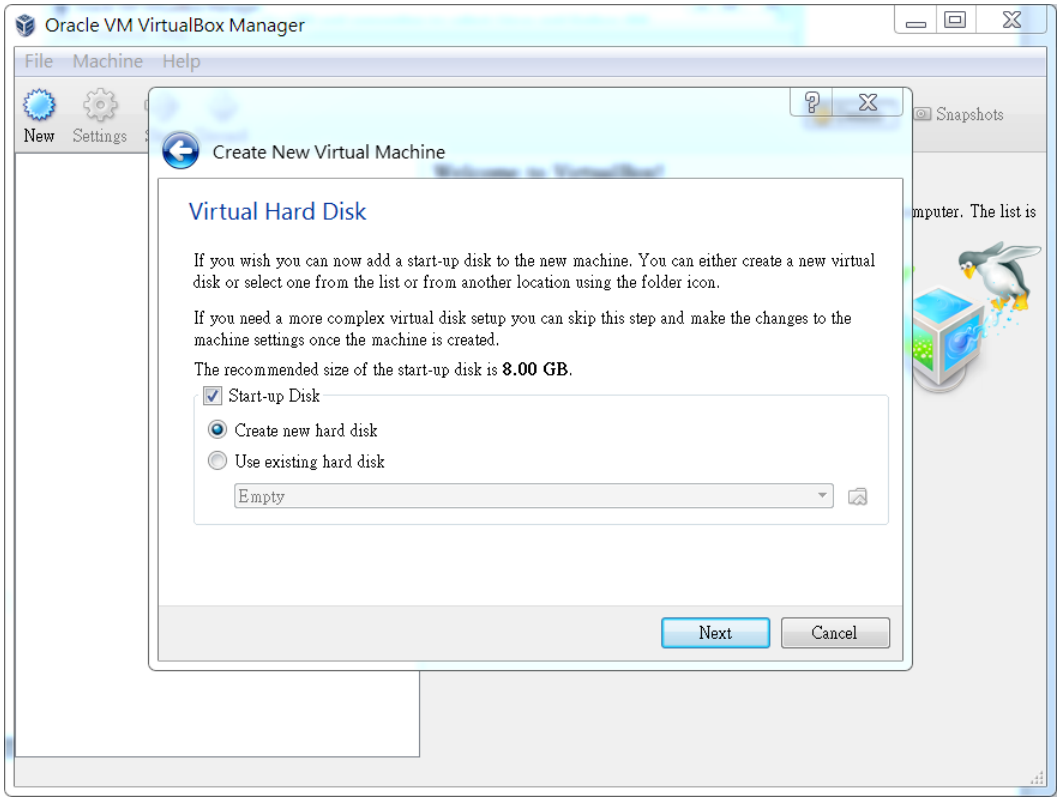
2. Choose a name for the VM and remember to select Linux and Fedora (64 bit) as the OS type and version.

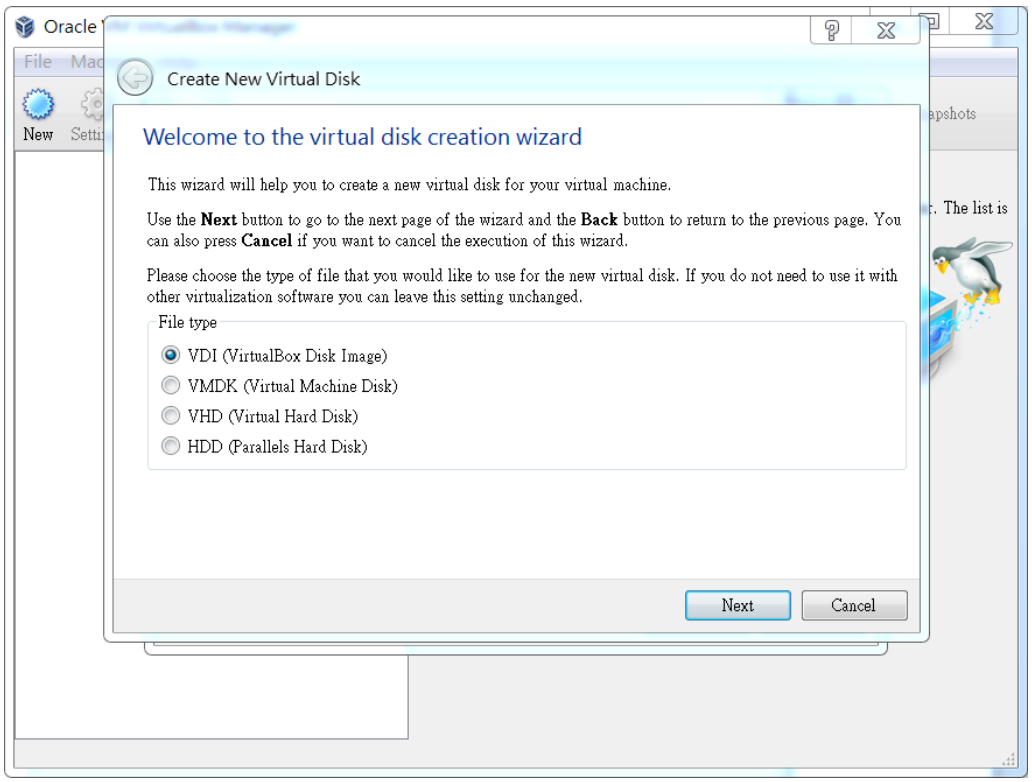


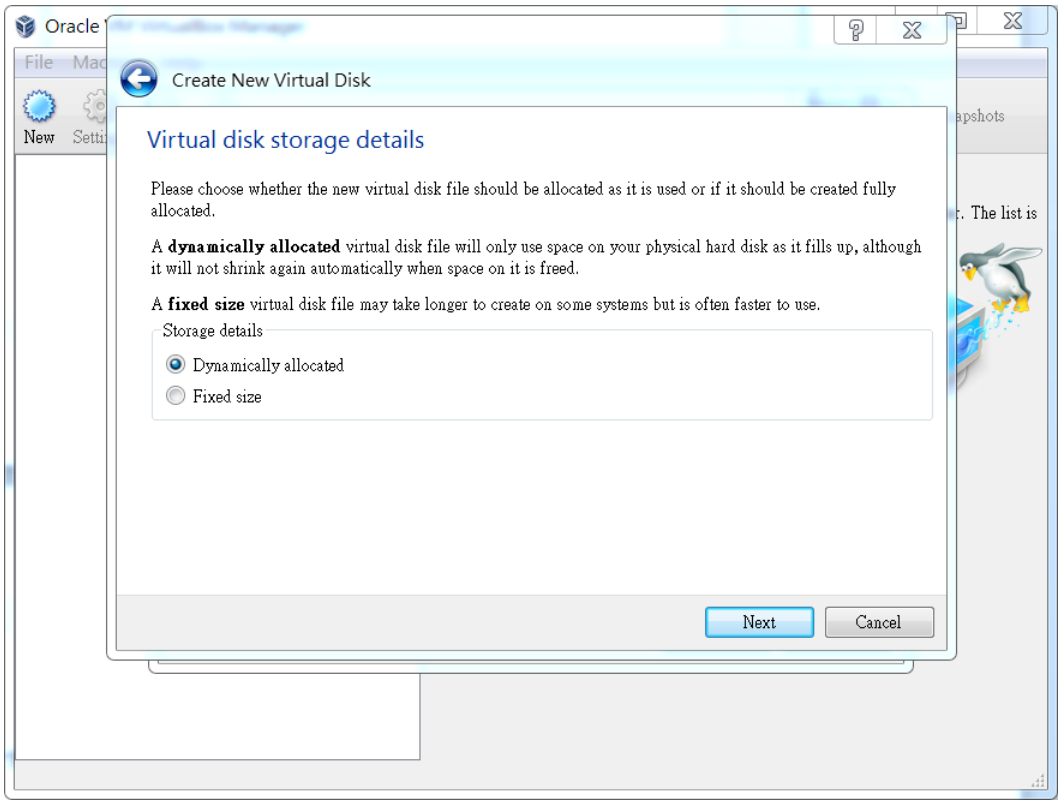
3. Choose an appropriate RAM size

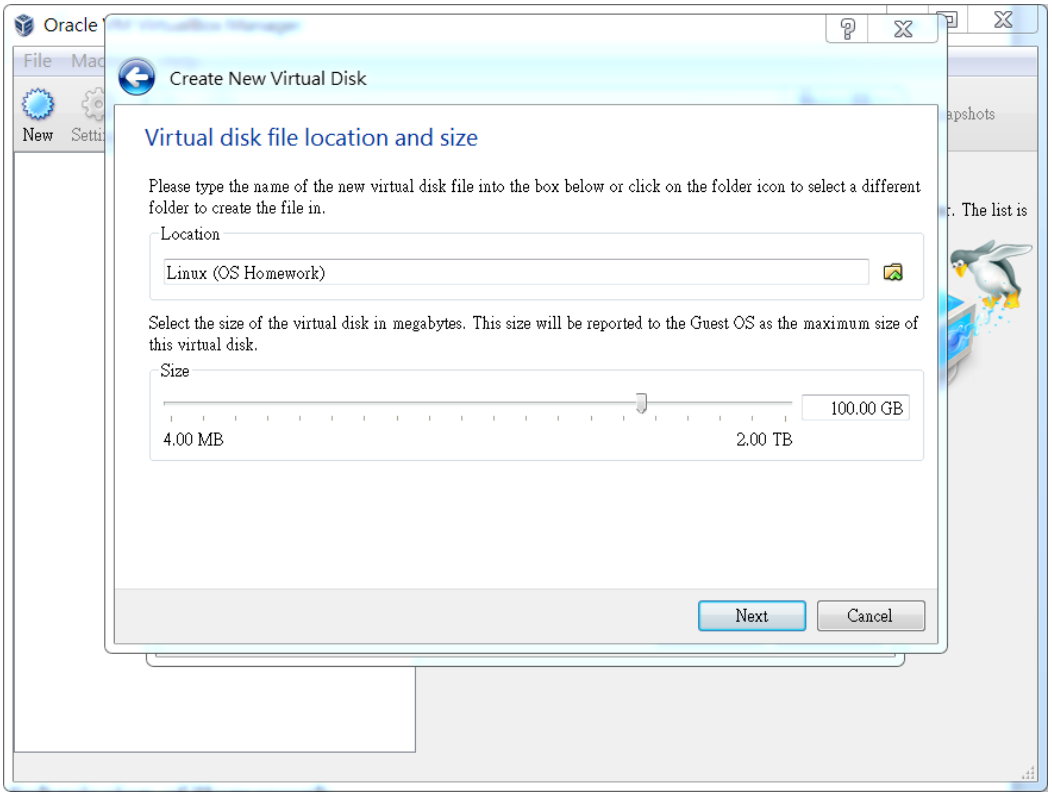


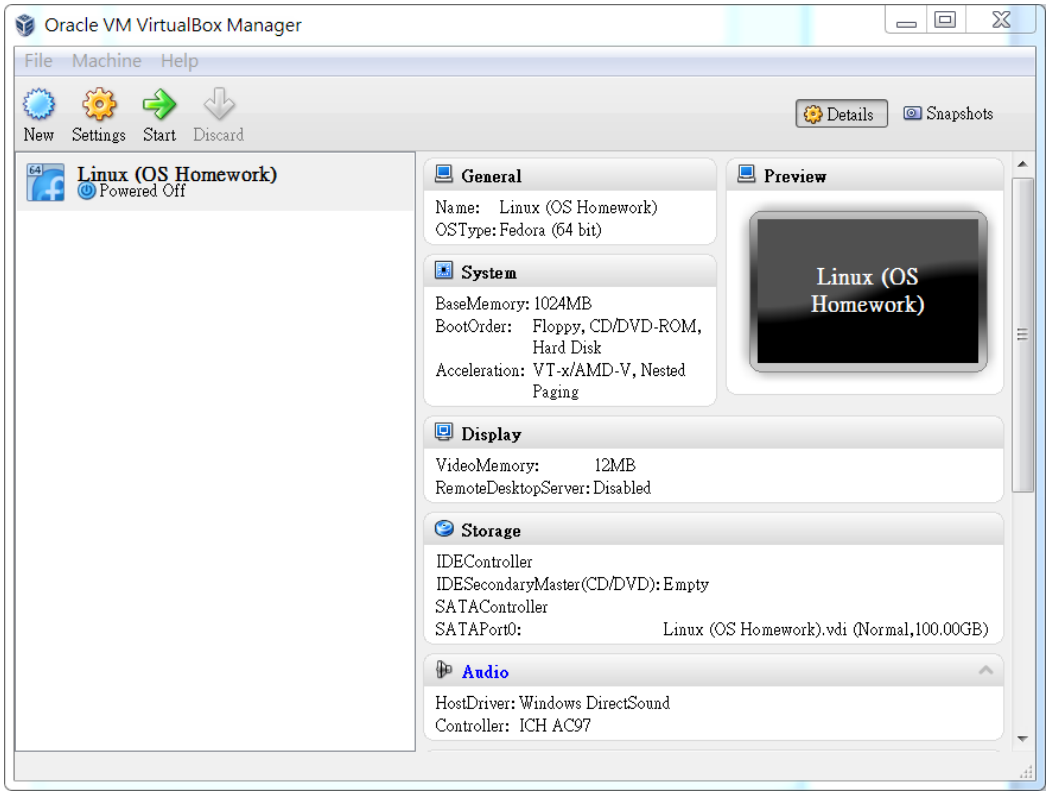
4. Create a new virtual disk




Oracle
File
New
Create New Virtual Disk
Welcome to the virtual disk creation wizard
This wizard will help you to create a new virtual disk for your virtual machine.
Use the Next button to go to the next page of the wizard and the Back button to return to the previous page. You can also press Cancel if you want to cancel the execution of this wizard.
Please choose the type of file that you would like to use for the new virtual disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.
File type
VDI (VirtualBox Disk Image)
VMDK (Virtual Machine Disk)
VHD (Virtual Hard Disk)
HDD (Parallels Hard Disk)
Next
Cancel


Oracle
File
New
Create New Virtual Disk
Virtual disk storage details
Please choose whether the new virtual disk file should be allocated as it is used or if it should be created fully allocated.
A dynamically allocated virtual disk file will only use space on your physical hard disk as it fills up, although it will not shrink again automatically when space on it is freed.
A fixed size virtual disk file may take longer to create on some systems but is often faster to use.
Storage details
Dynamically allocated
Fixed size
Next
Cancel

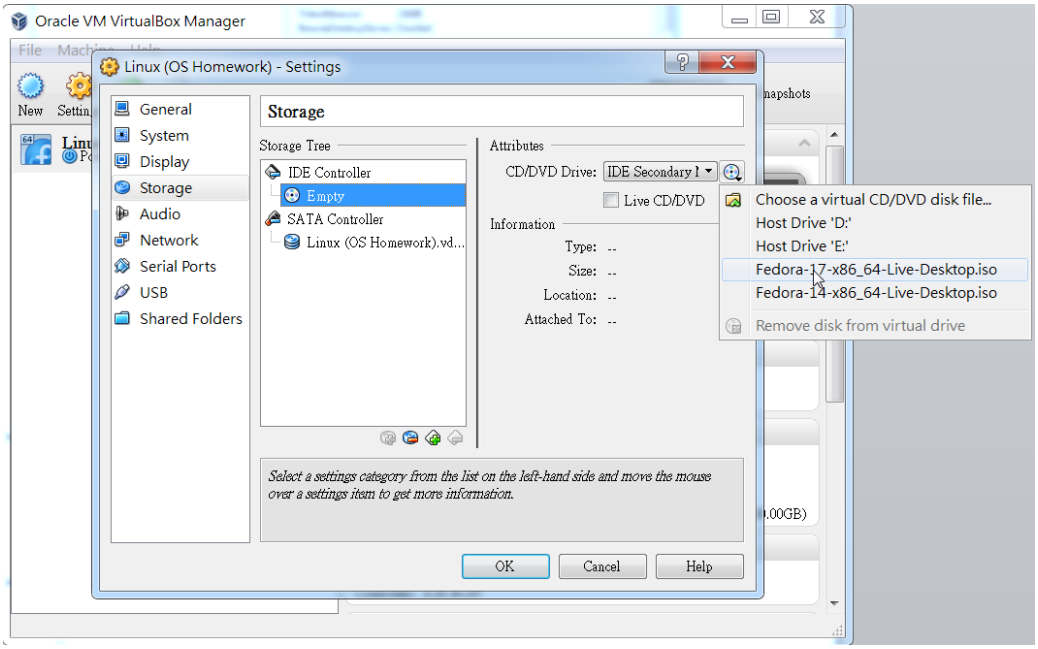

Create New Virtual Disk
Virtual disk file location and size
Please type the name of the new virtual disk file into the box below or click on the folder icon to select a different folder to create the file in.
Location
Linux (OS Homework)
Select the size of the virtual disk in megabytes. This size will be reported to the Guest OS as the maximum size of this virtual disk.
Size
100.00 GB
4.00 MB
2.00 TB
Next
Cancel


Oracle VM VirtualBox Manager
File Machine Help
New Settings Start Discard
Details Snapshots
Linux (OS Homework)
Powered Off
General
Name: Linux (OS Homework)
OSType: Fedora (64 bit)
System
BaseMemory: 1024MB
BootOrder: Floppy, CD/DVD-ROM, Hard Disk
Acceleration: VT-x/AMD-V, Nested Paging
Preview
Linux (OS Homework)
Display
VideoMemory: 12MB
RemoteDesktopServer: Disabled
Storage
IDEController
IDESecondaryMaster(CD/DVD): Empty
SATAController
SATAPort0: Linux (OS Homework).vdi (Normal,100.00GB)
Audio
HostDriver: Windows DirectSound
Controller: ICH AC97

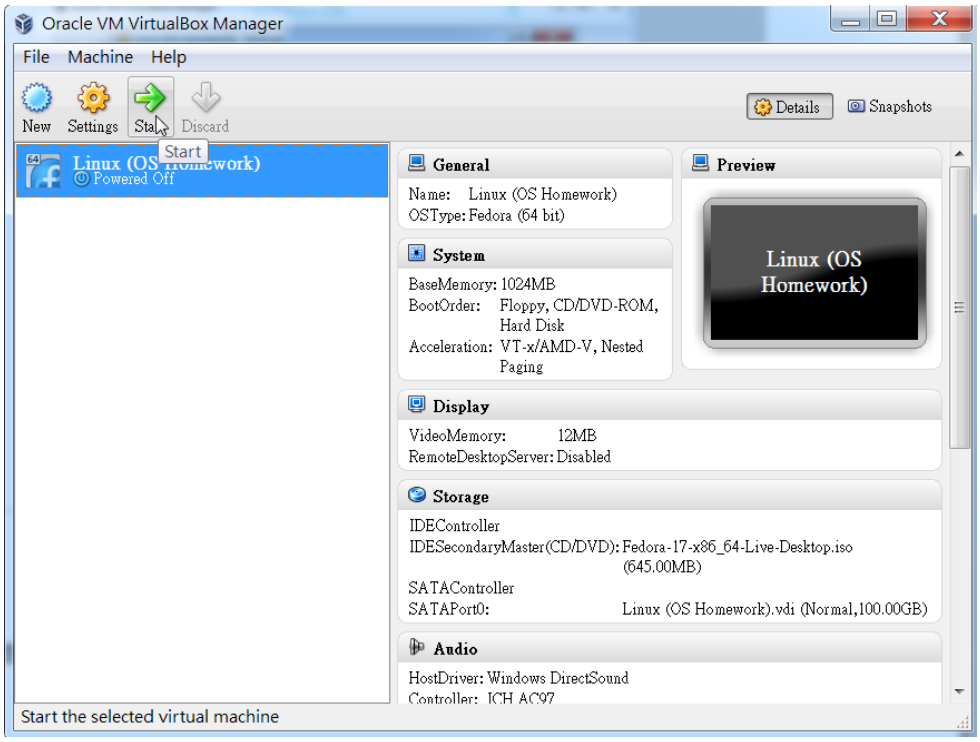
C. Installing Fedora Linux on the newly created VM

1. Get Fedora Core 17 x86_64 Live CD from http://download.fedoraproject.org/pub/fedora/linux/releases/17/Live/x86_64/Fedora-17-x86_64-Live-Desktop.iso

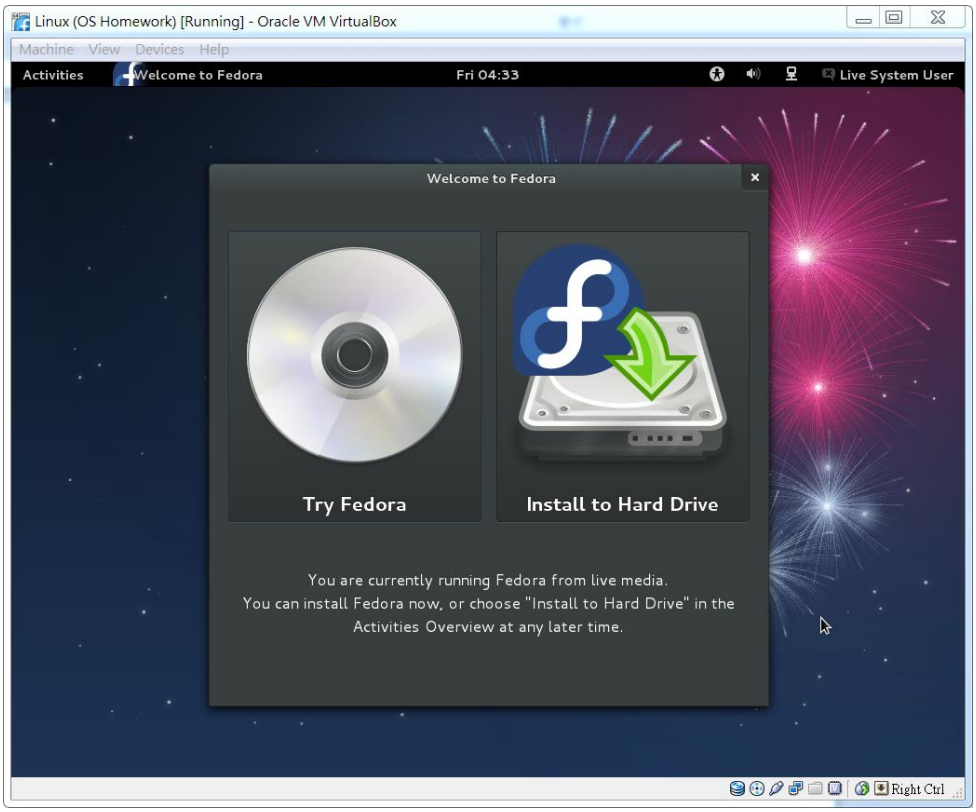
2. Go to setting and mount the Fedora Core 17 live CD iso



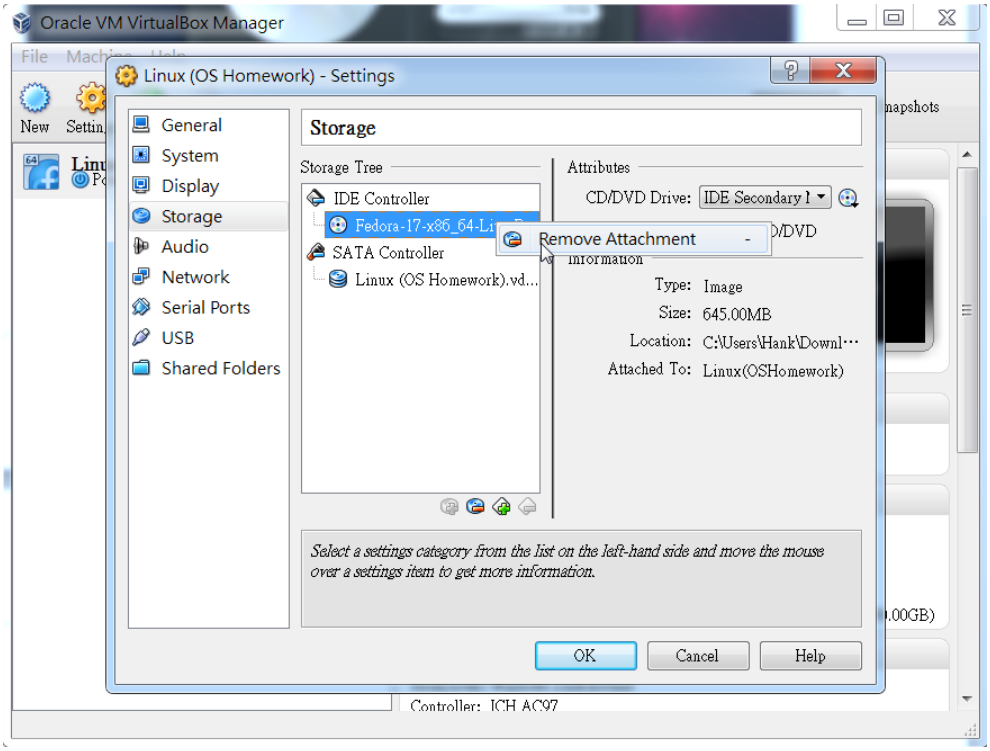
3. Click “Start” to boot the VM



4. Click Install to Hard Drive



5. Once the installation completes, you can shutdown the VM.
6. You can unmount the live CD iso.

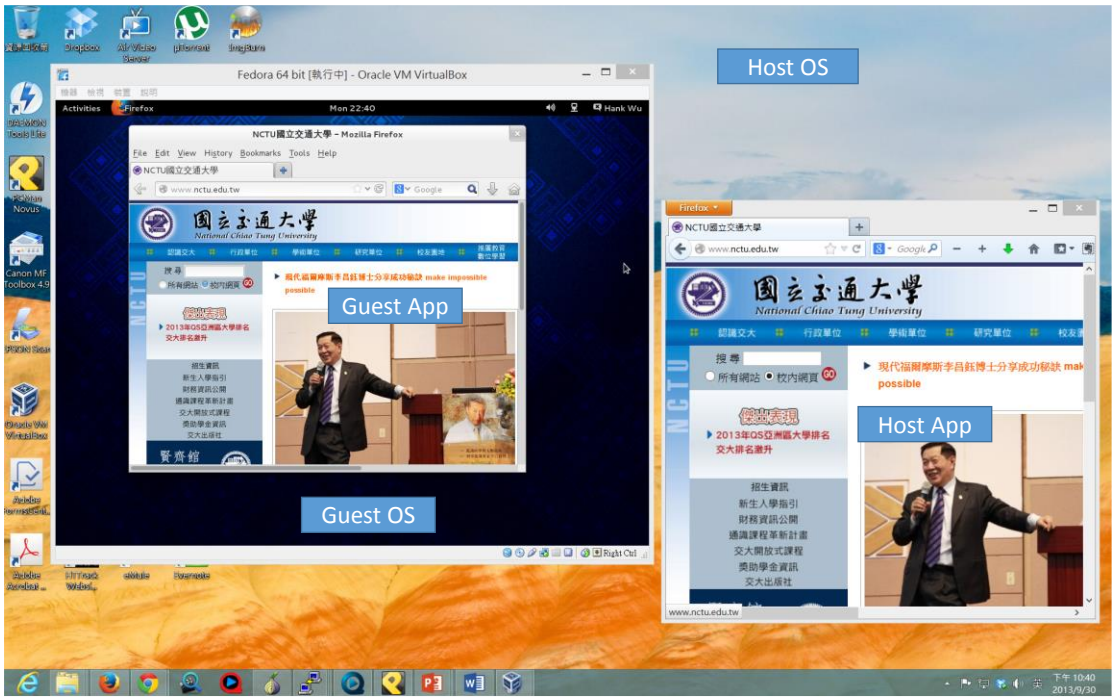


D. Start the VM to boot into Fedora Core 17 on hard disk.

E. Get familiar with the environment. You can use the library to look for books on (Fedora) Linux systems. There are also plenty of free e-Books or resources you can find on the Internet such as

http://www.e-booksdirectory.com/listing.php?category=415
http://linux.vbird.org/
https://fedoraproject.org/wiki/Fedora_Project_Wiki
http://www.youtube.com/watch?v=WkBpSvONXLw

Assignment



Assume that you now have a VM and a guest operating system installed on the VM. The overall look of your environment should look similar to what is presented above. The operating system running inside the VM is commonly referred to as the **guest OS** while the operating system hosting the VM is commonly referred to as the **host OS**. As you can see that, both operating system environments seem to be valid for running applications.

Now for each of the following applications, please try to run them first in the host operating system environment and then run them in the guest operating system environment.

1. A CPU intensive application such as primesieve.
2. A memory I/O intensive application such as MaxxMEM2.
3. A network I/O intensive application such as SPEEDTEST.
4. A file system I/O intensive application.
5. A video playback application.

Make a report of your findings. You need to explain your findings and discuss

about the possible causes for your finding. Be as detailed as possible.

Please submit your report in a PDF file via E3.