



DFI CS620 ISA Device User Guide

V 1.1



DFI

DFI

Revision Control.
Long Product Life Cycle.

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Revision History

Date	Revision	Description	Author
2020/11	0.9	Initial document. For DVT sample.	Jack Lan, Kuowei Pai, Fernando Lin, Fred Chou
2021/1	0.10	Update Ch. 2 contents, add step 13 ~ 22.	Jack Lan, Kuowei Pai, Fernando Lin, Fred Chou
2021/2	1.0	Formal release version.	Jack Lan, Kuowei Pai, Fernando Lin, Fred Chou
2021/4	1.1	Add DIO function page	Jack Lan, Fernando Lin

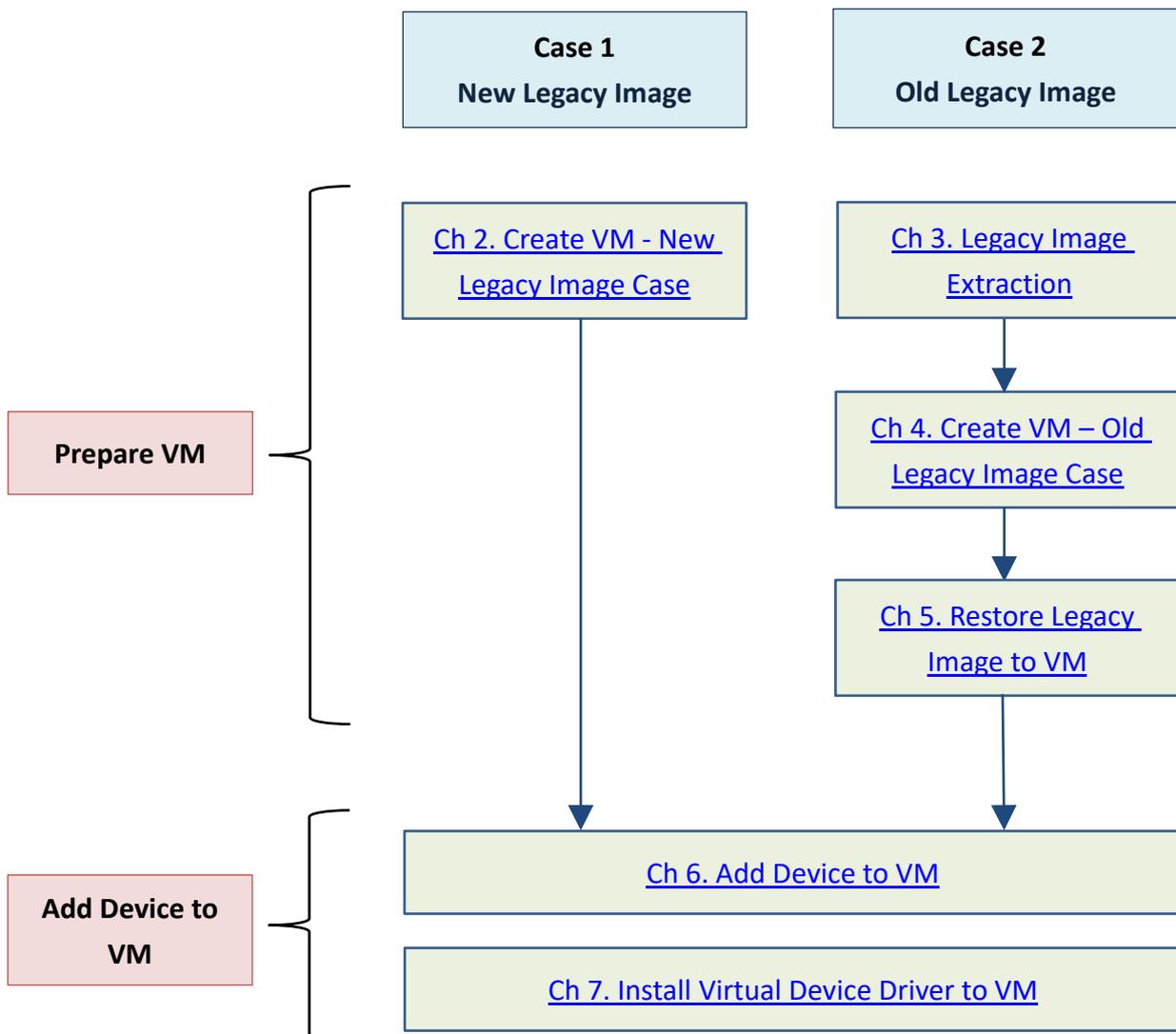
1 Introduction

DFI provides a virtualization solution that new X86 platform can also use ISA device. CS620 provides a host image (Ubuntu), which includes hypervisor KVM and let user install their legacy image. This document will guide user how to install legacy image and configure ISA device setting.

1.1 System Setup

There are two parts: **Prepare VM** and **Add Device to VM**.

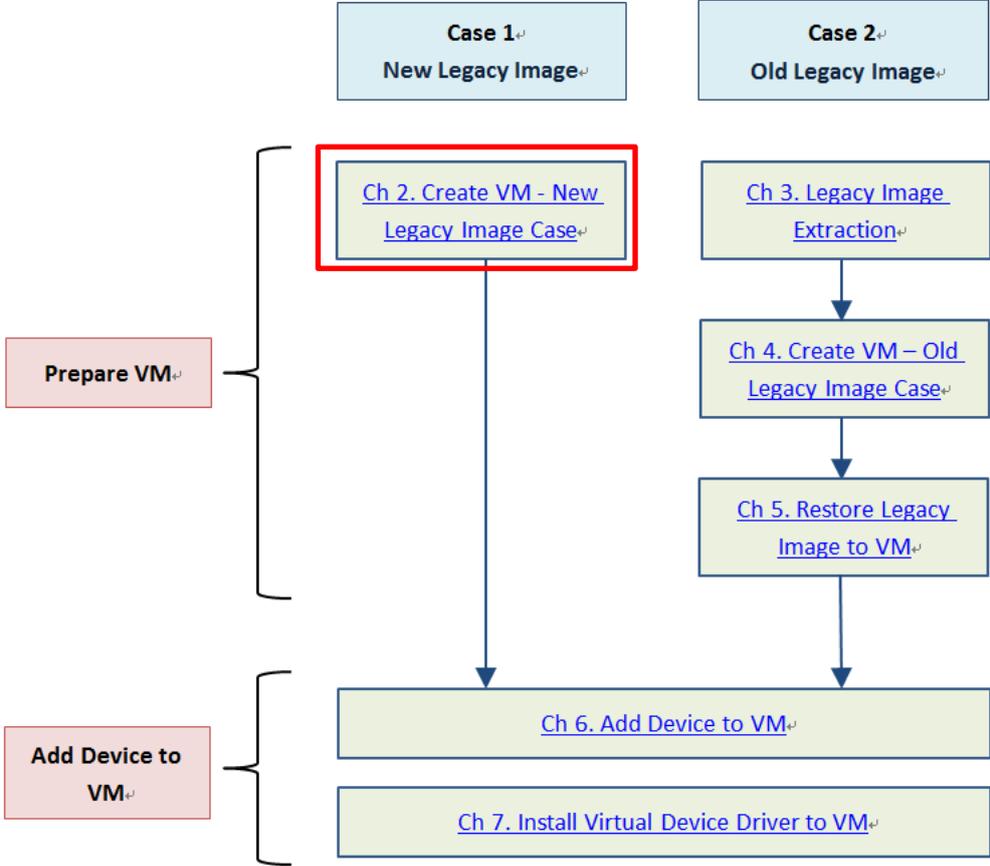
Prepare VM has two cases: **New Legacy Image** and **Old Legacy Image** (image from old machine).



1.2 Terminology

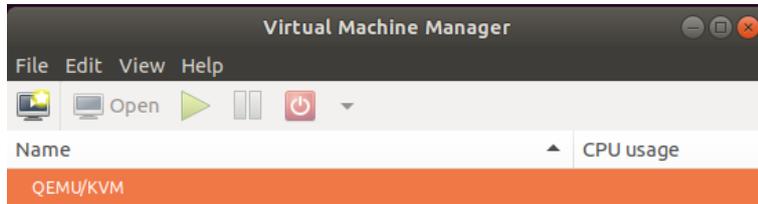
Acronym/Term	Definition
OS	Operating System
VM	Virtual Machine
KVM	Kernel-based Virtual Machine. https://www.linux-kvm.org/

2 Create VM - New Legacy Image Case

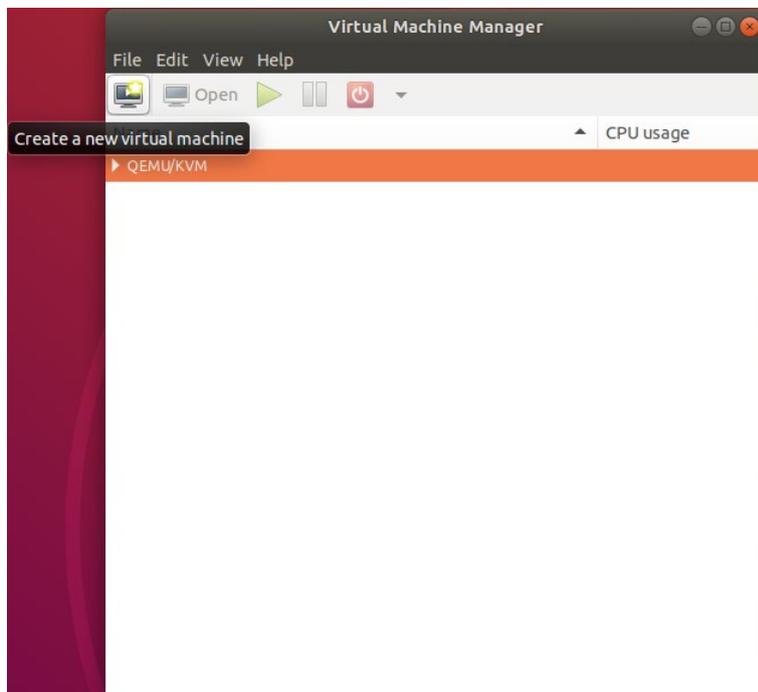


1. Run `virt-manager`

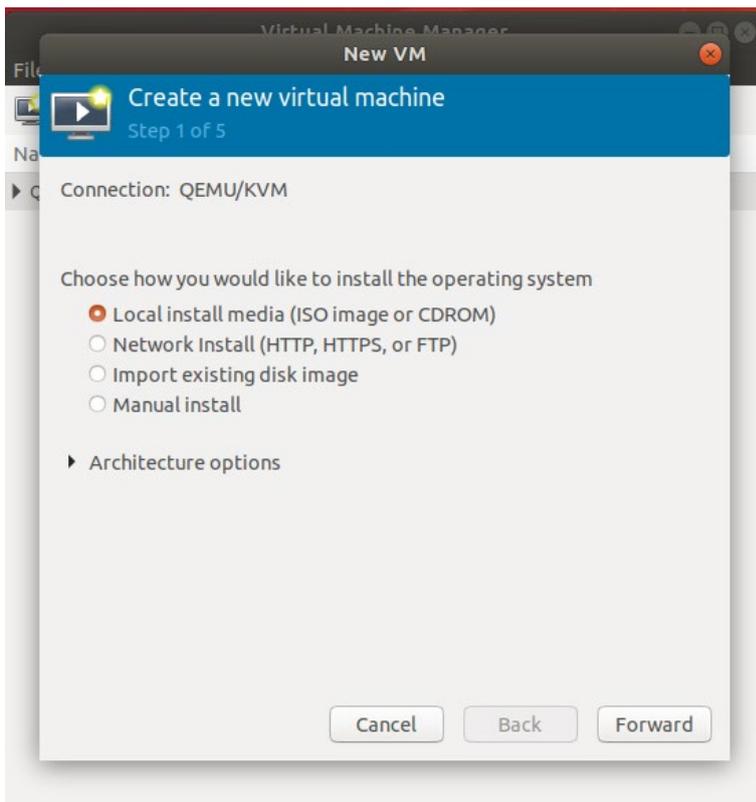
```
dfi@dfi-Not-Specified:~/virt-manager_2.2.1_package$ sudo virt-manager
dfi@dfi-Not-Specified:~/virt-manager_2.2.1_package$
```



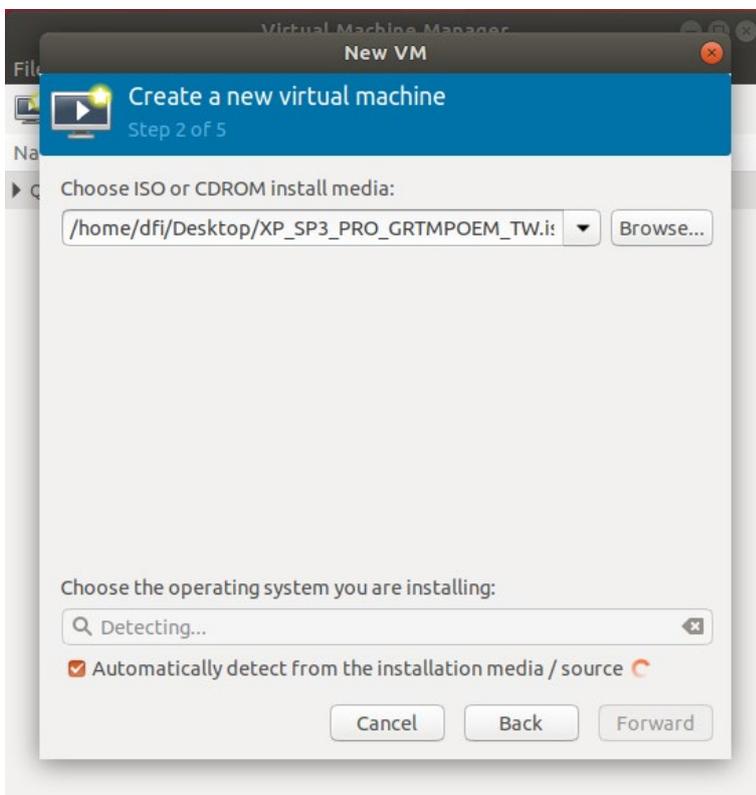
2. Create a new virtual machine by clicking the button in the top left-hand corner



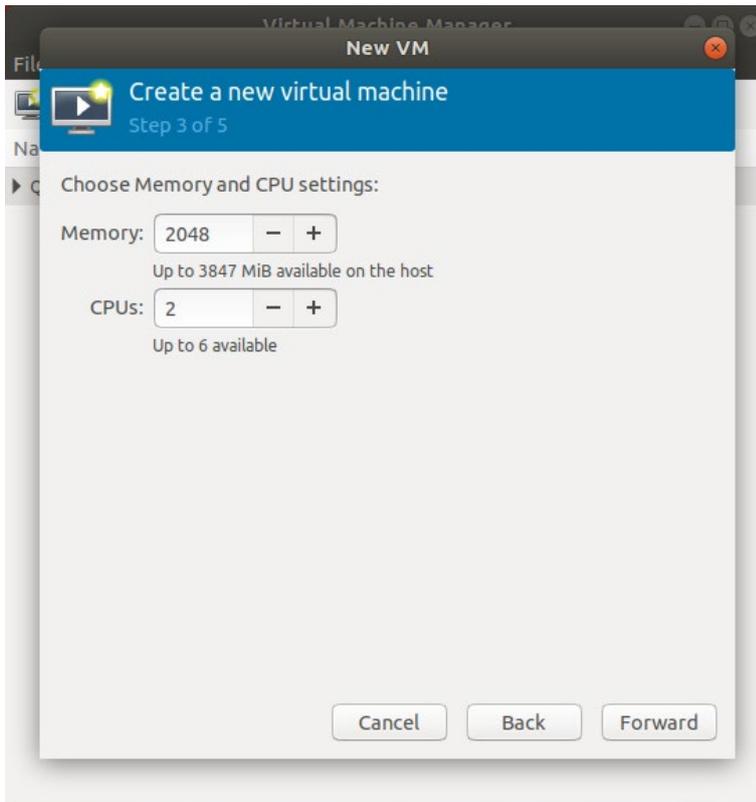
3. Select **Local install media (ISO image or CDROM)**. Then click **Forward**



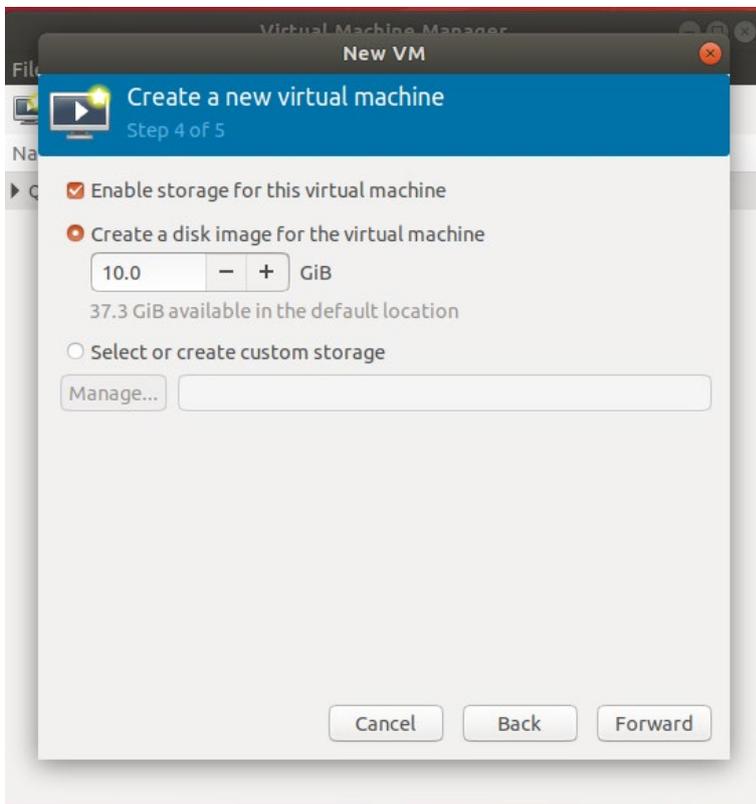
4. Upload ISO image file. Then click **Forward**



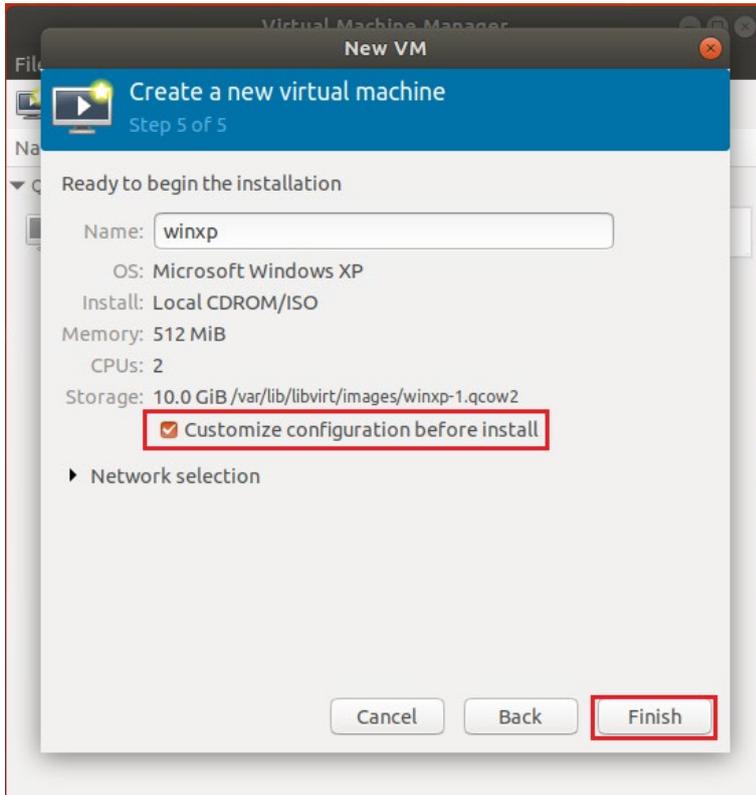
5. Enter the appropriate **RAM** and **CPU** settings as required.
EX. Windows XP case, suggest Memory: 2048MiB, CPUs:2



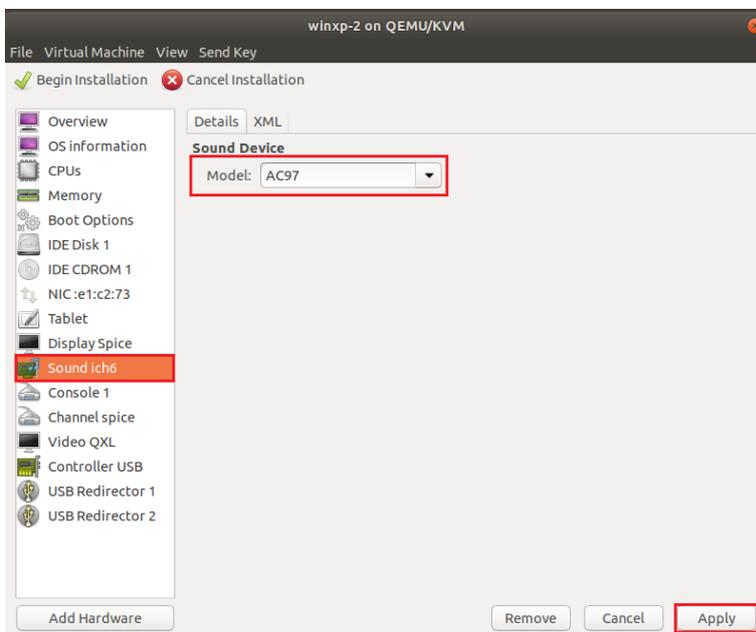
6. Assign the amount of storage for legacy image.



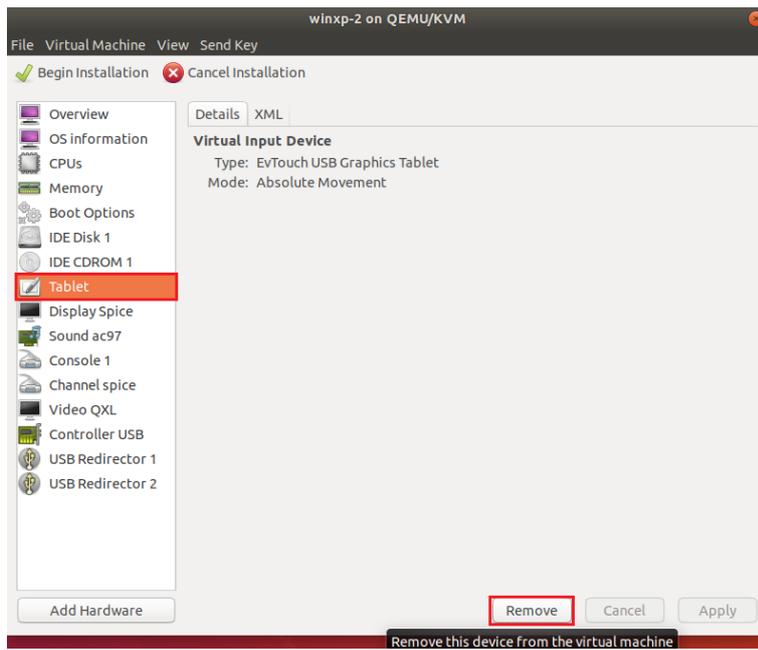
7. Enter a name for your virtual machine, and check **Customize configuration before install**, then click **Finish**



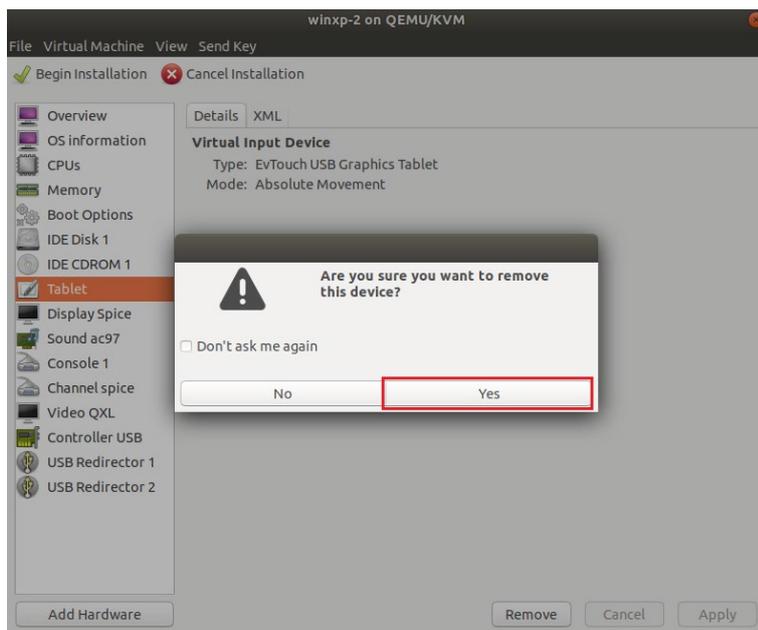
8. Click **Sound ich6**. In Sound Device, select **AC97**. Then click **Apply**



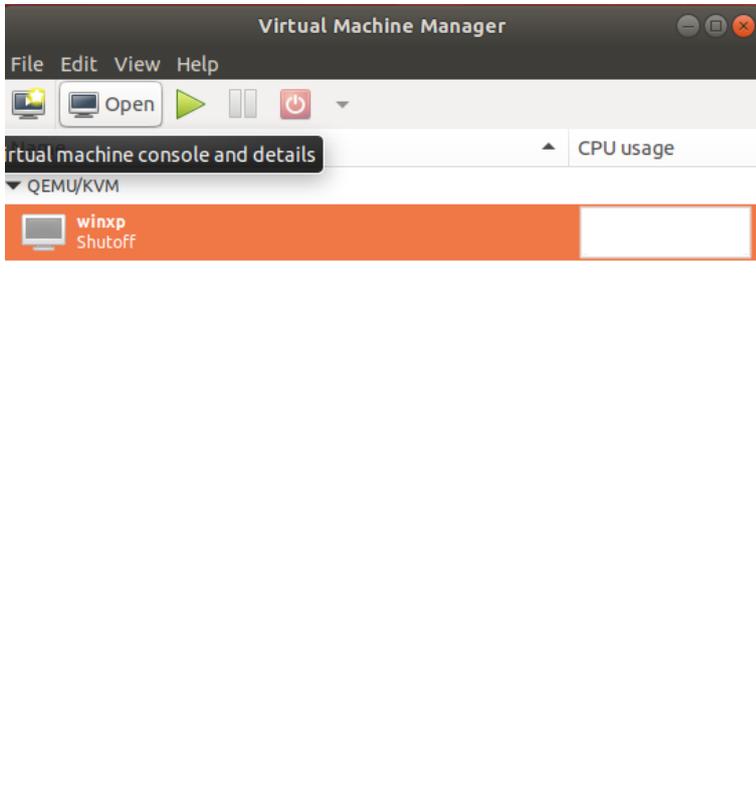
9. Click **Tablet**. Then click **Remove**



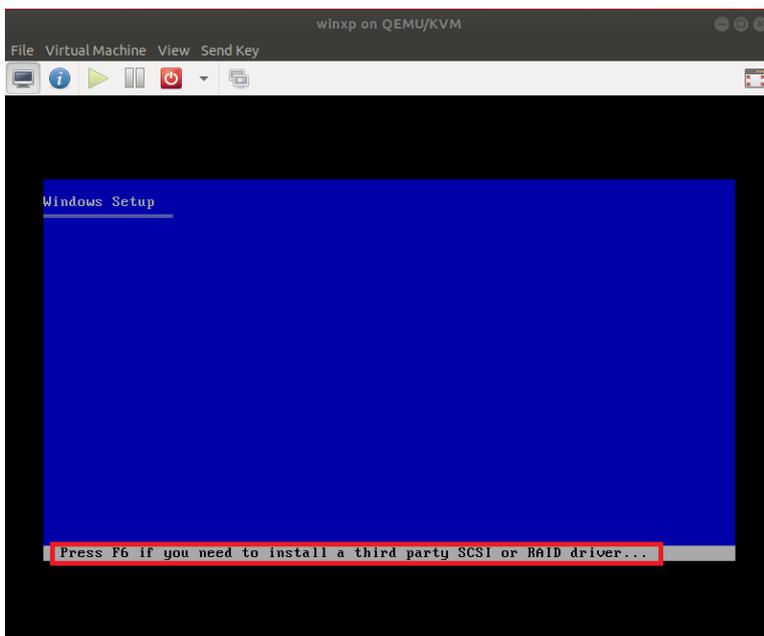
10. Select **Yes**



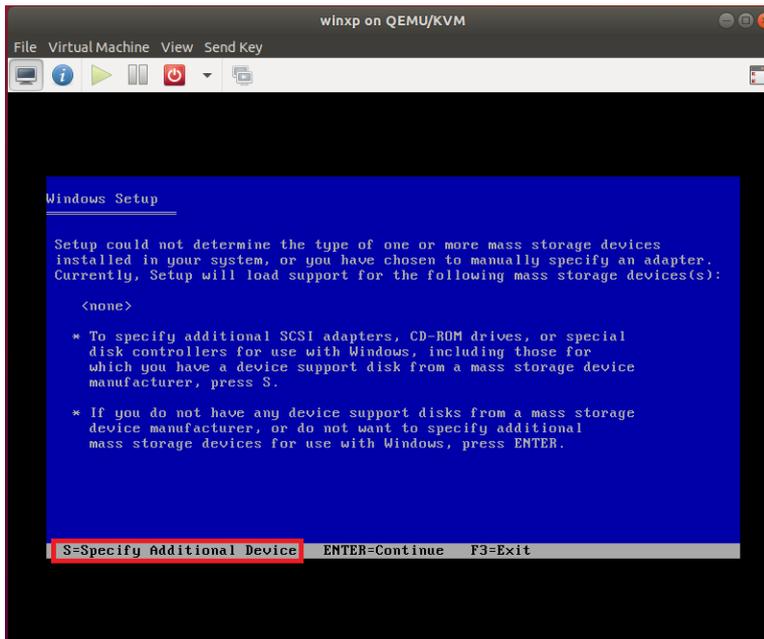
11. Repeat step 9 ~ 10 to remove **NIC: xx:xx:xx** and **Console 1**
12. After remove **Tablet**, **NIC:xx:xx:xx**, and **Console 1** virtual devices, click **Begin Installation**
13. After create VM finished, QEMU/KVM list will be added a new VM (winxp)



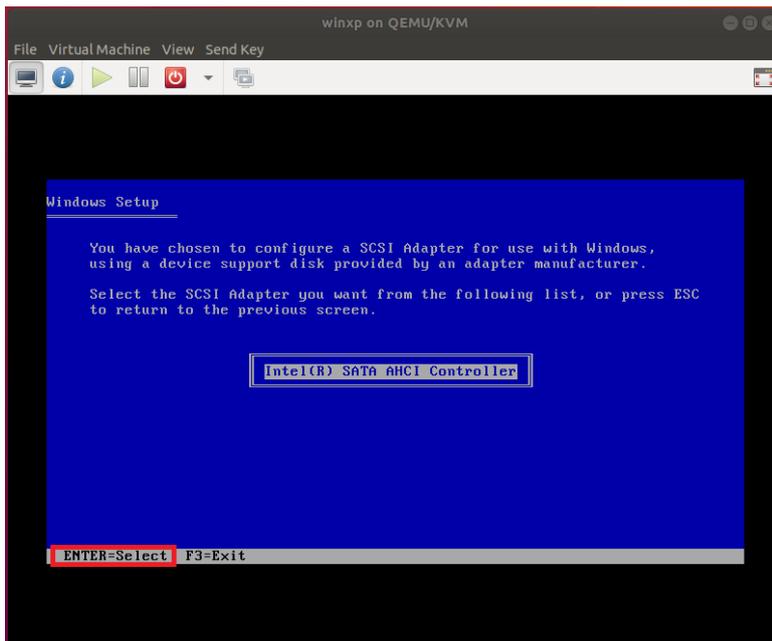
14. When Windows Setup screen is shown as below picture, please **press and hold F6** **immediately** in VM and release after the message shown **Press F2...**



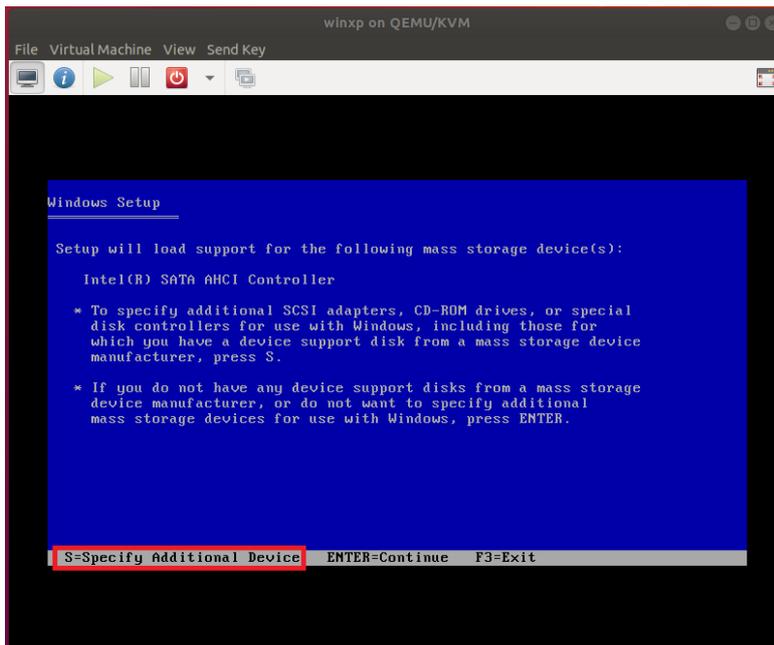
15. Press **S** in this step as below picture.



16. Press **Enter** in this step as below picture.



17. Press **Enter** in this step as below picture.

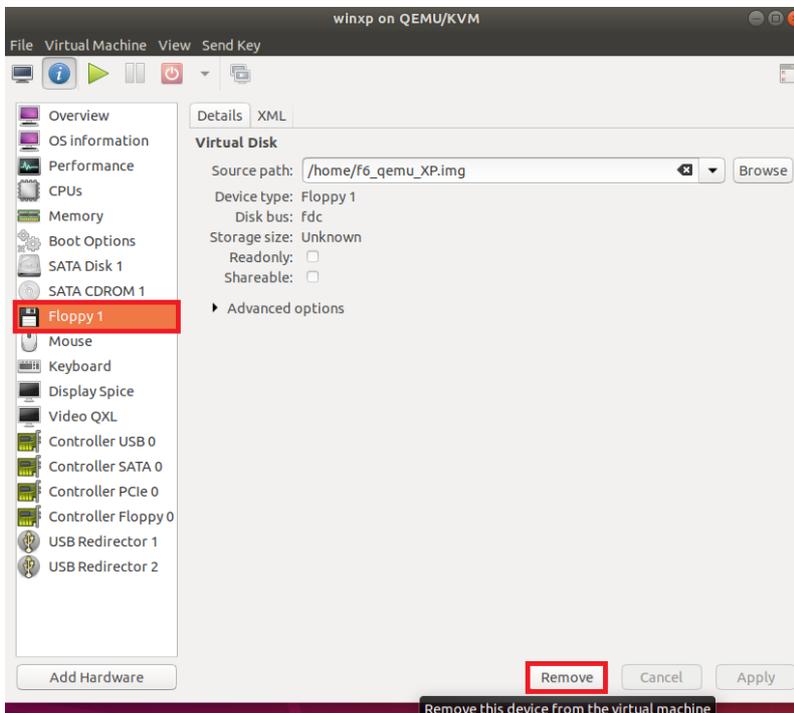


18. Complete installing Windows XP.

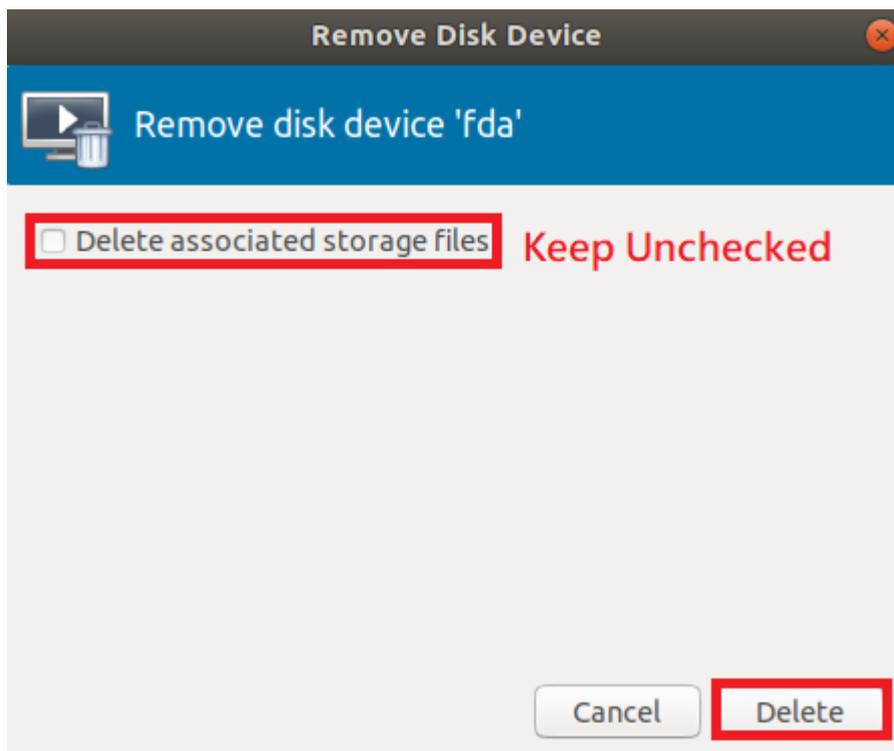
Attention please. If the mouse cannot be used in VM when installing Windows XP, please use keyboard to choose setup items.

19. After Windows XP setup completed, shutdown it first.

20. Go back to hardware details, select **Floppy 1**, and then select **Remove**.



21. Keep **Delete associated storage files** unchecked, and select **Delete**.



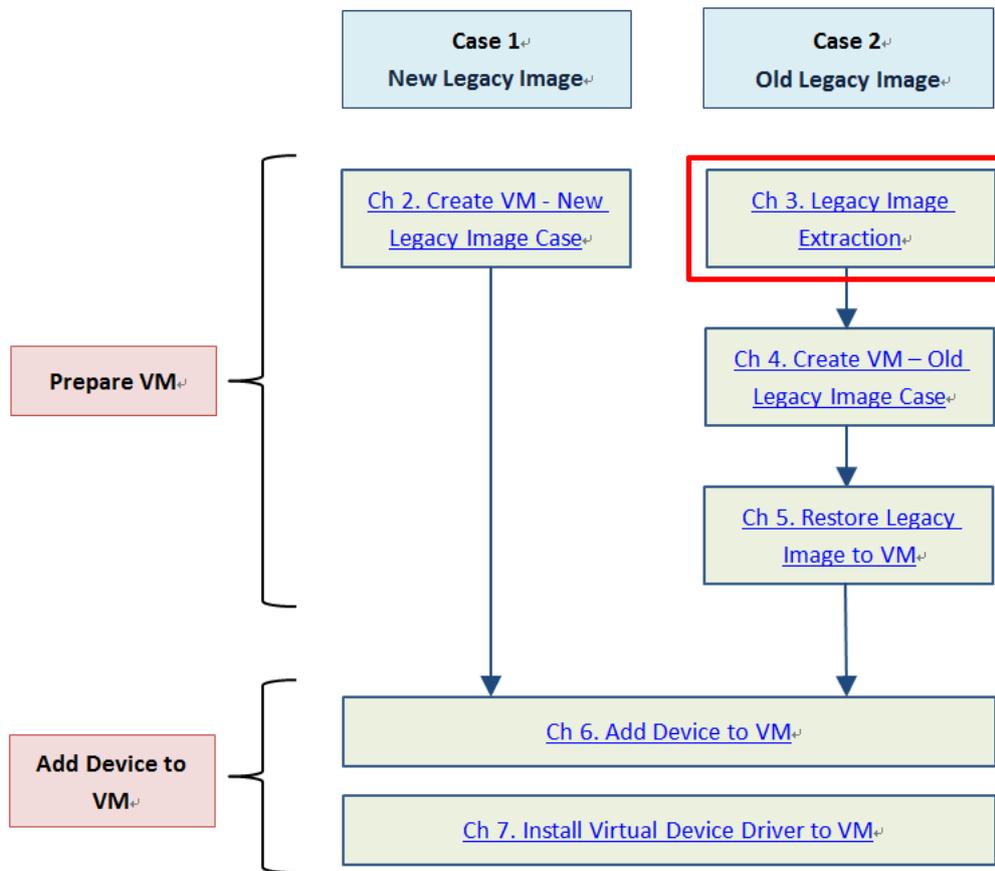
22. Now you can restart guest OS to use.



Note

The online update function of host image (Ubuntu) is default turned off. Please **do not** turns on this function to prevent online update modify the KVM library.

3 Legacy Image Extraction



This section will guide you on how to carry out the legacy system image extraction starting from the system preparation tool **Sysprep** thru to the restoration of the new system. You need two USB drive for this section.

3.1 Sysprep

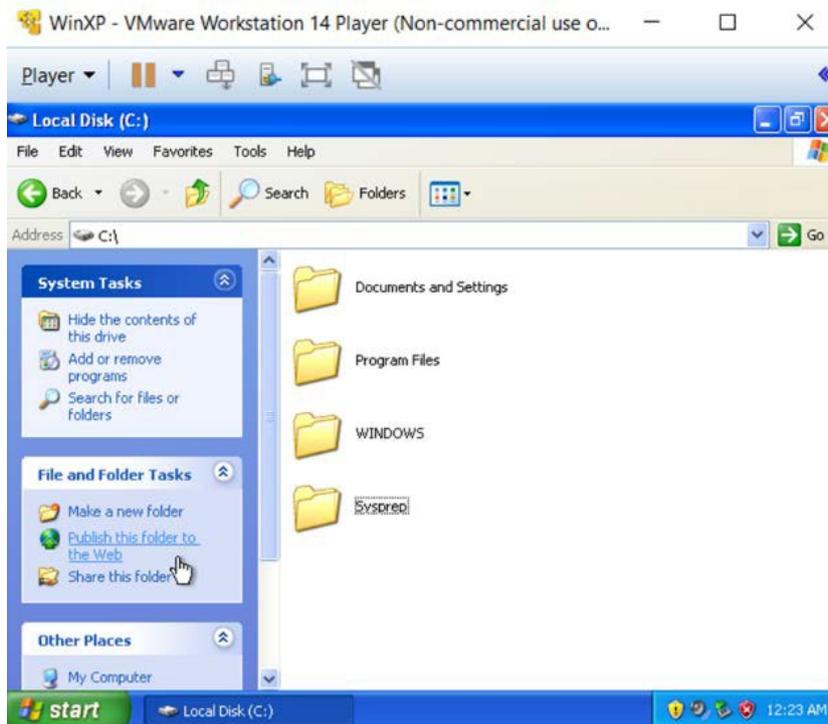
Sysprep is a tool that comes with Windows. This is the initial step prior to cloning. This step is known as generalizing the PC. It removes PC-specific information from the Windows image, including the PC's security identifier (SID). This allows you to capture the image and apply it to other PCs.

NOTE

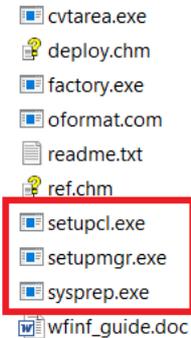
Sysprep files for Windows XP are available in the installation CD or can be downloaded online at <https://www.petenetlive.com/KB/Article/0000599>. For other versions of Windows, the **Sysprep** is already included and can be found at **C:\Windows\System32\sysprep** folder.

Steps for Sysprep:

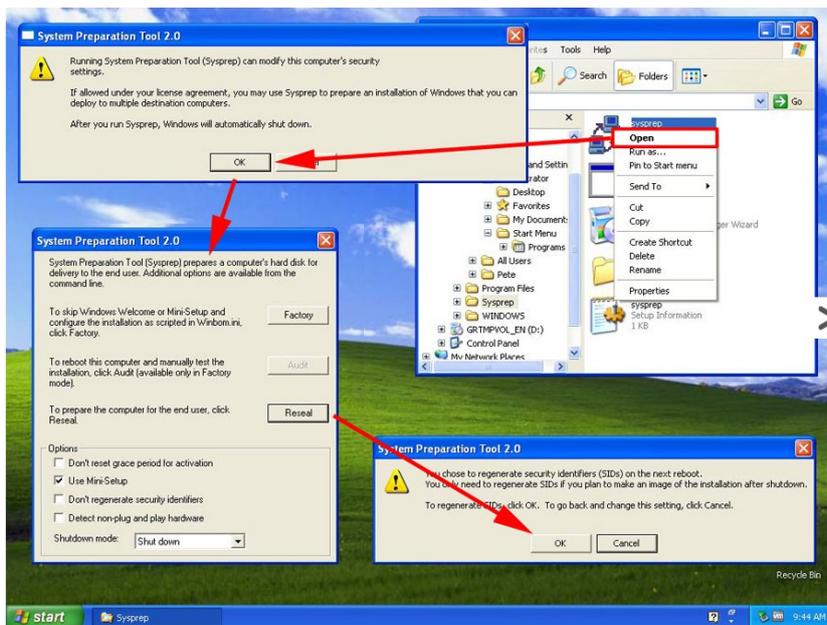
1. In your legacy system, create a new folder in C: drive called **Sysprep**



1. Locate the **DEPLOY.cab .zip** file. This file can be found either in the CD installation or **C:\Windows\System32** or can also be downloaded online
2. Double-click the **DEPLOY.cab** file
3. Copy over the **sysprep.exe** file, the **setupcl.exe** file and the **setupmgr.exe** file to your **C:\Sysprep** folder



4. Run **sysprep.exe** file
5. Click **Reseal** and **OK**



6. The system will **shut down**
7. Before booting the legacy system, plug in the **Clonezilla** USB drive and proceed to extracting the image from the legacy system

NOTE

Please **don't turn on** the system before the image extraction using **Clonezilla** is completed. Else, the system will register the original hardware again. If you have already booted-up the system without completing extracting the image using **Clonezilla**, re-run the **Sysprep** steps again.

3.2 Creating a Bootable Clonezilla USB

Clonezilla is a disk cloning application. It is an open-source application which you can download and install on your system.

After the **Sysprep** process is done, continue with cloning the disk content by creating the bootable USB device using your preferred bootable tool. In this document, the tool used to create the bootable **Clonezilla** is **Rufus**. **Prepare two USB devices**. Use the first device to **prepare the bootable Clonezilla** and the second device to **save the disk content to the image (.iso) file**. These two devices are to be plugged in together at the same time.

NOTE

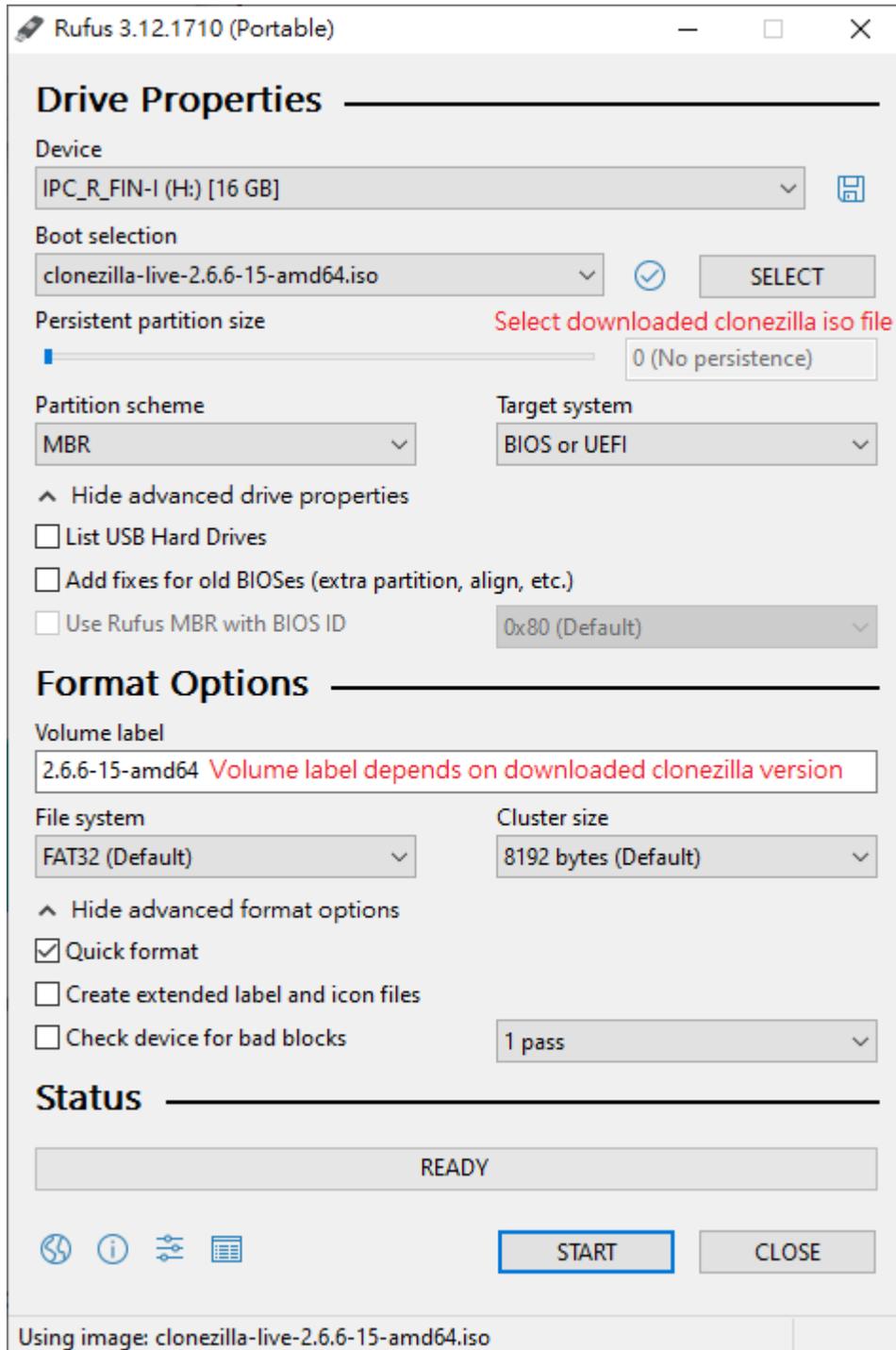
Download Rufus at <https://rufus.akeo.ie>

NOTE

Download the **Clonezilla** iso file at <https://clonezilla.org/downloads.php>
Just download stable version

Steps to create a bootable USB Clonezilla using Rufus:

1. Download [Rufus](#) installer
2. Format a USB drive that has equal or bigger size than the file you will move to (i.e clonezilla.iso)
3. Launch the [Rufus](#) installer application
4. Please refer to below settings to burn a [Clonezilla](#) USB boot disk

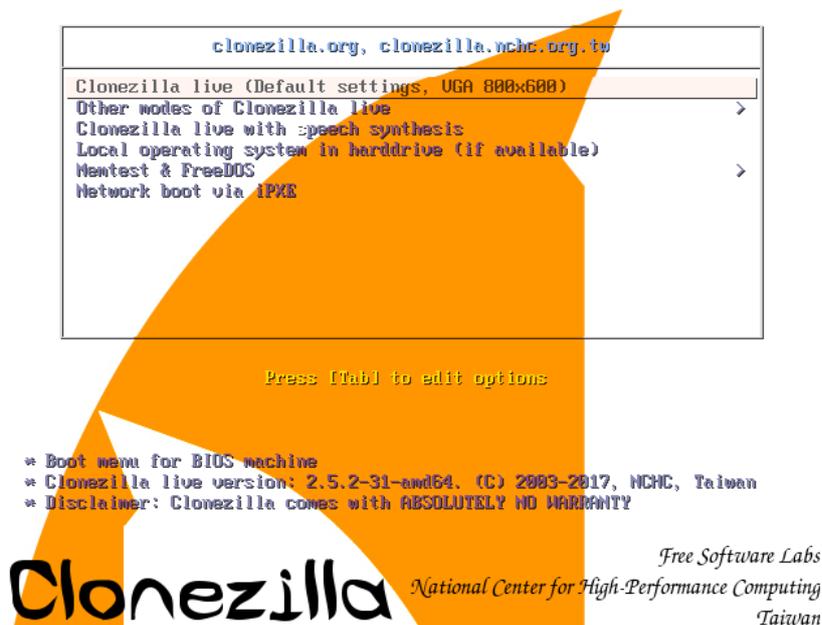


5. A warning message will appear informing you that all current information on your USB storage device will be erased. Click **OK**
6. Click **Start**, the **Rufus** USB Installer begins to create the bootable USB **Clonezilla**

3.3 Extracting the Legacy Image to a USB Device

Steps to save image:

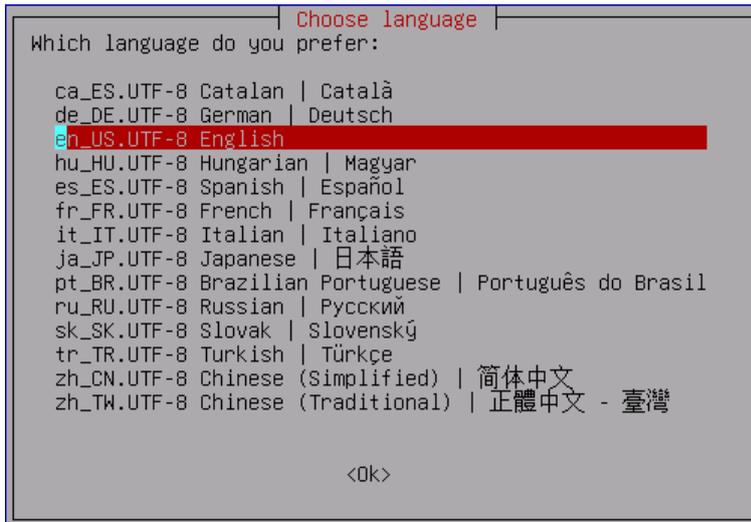
1. Once the bootable **Clonezilla** USB device is ready, **plug it to the system** or machine that you want to clone via **Clonezilla**
2. Go to the **BIOS** page and boot from the USB device that has the bootable **Clonezilla**
3. The boot menu of **Clonezilla** will appear



4. Select the first option which is the **Default settings**
5. The Debian Linux booting process screen will appear

```
[ 3.568433] piix4_smbus 0000:00:07.3: SMBus Host Controller not enabled!
[ 3.585730] sd 2:0:1:0: [sdb] Assuming drive cache: write through
[ 3.586064] sd 2:0:2:0: [sdc] Assuming drive cache: write through
[ 3.588408] sd 2:0:4:0: [sde] Assuming drive cache: write through
[ 3.588422] sd 2:0:0:0: [sda] Assuming drive cache: write through
[ 3.588990] sd 2:0:3:0: [sdd] Assuming drive cache: write through
Starting to prepare Clonezilla live env...
Live media is in /lib/live/mount/medium
Updating /etc/ocs/ocs-live.conf based on kernel parameters if found...
done!
Configuring keyboard...
```

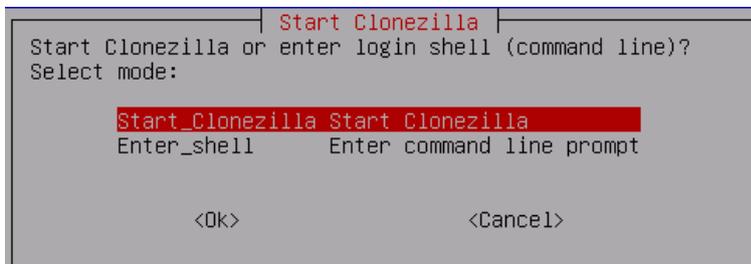
6. Choose your preferred language



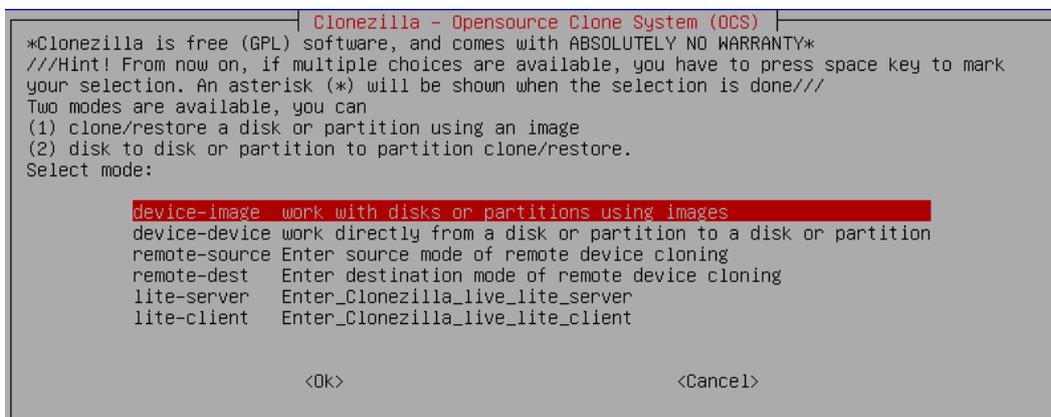
7. In keyboard layout, select **Don't touch my keymap**



8. Select **Start_Clonezilla**



9. Select **device-image** option



10. Choose `local_dev`

```
Mount Clonezilla image directory
Before cloning, you have to assign where the Clonezilla image will be saved to or read from. We
will mount that device or remote resources as /home/partimag. The Clonezilla image will be saved
to or read from /home/partimag.
Select mode:

local_dev Use local device (E.g.: hard drive, USB drive)
ssh_server Use SSH server
samba_server Use SAMBA server (Network Neighborhood server)
nfs_server Use NFS server
webdav_server Use WebDAV_server
s3_server Use_AWS_S3_server
swift_server Use_OpenStack_swift_server
enter_shell Enter command line prompt. Do it manually
skip Use existing /home/partimag (Memory! *NOT RECOMMENDED*)

<Ok> <Cancel>
```

11. Then, you will see a message in yellow instructing you to **plug in the other USB device** as shown in figure below. This is the empty device to save the image file

```
ocsroot device is local_dev
Preparing the mount point /home/partimag...
If you want to use USB device as a Clonezilla image repository, please
* Insert USB device into this machine *now*
* Wait for about 5 secs
* Press Enter key
so that the OS can detect the USB device and later we can mount it as /home/partimag.
Press "Enter" to continue.....
```

12. **Clonezilla** will scan the disks on the machine. Once your USB device appears on the list, press **CTRL-C** to exit from the window

```
Every 3.0s: ocs-scan-disk          debian: Sun Sep 24 03:35:22 2017
2017/09/24 03:35:22
You can insert storage device into this machine now if you want to use that, then wait for it to be
detected.
Scanning devices... Available disk(s) on this machine:
=====
Excluding busy partition or disk...
/dev/sda: VMware_Virtual_S No_disk_serial_no 8590MB
/dev/sdb: VMware_Virtual_S No_disk_serial_no 8804MB
/dev/sdc: VMware_Virtual_S No_disk_serial_no 21.5GB
/dev/sdd: VMware_Virtual_S No_disk_serial_no 64.4GB
/dev/sde: VMware_Virtual_S No_disk_serial_no 2255GB
=====
Update periodically. Press Ctrl-C to exit this window.
```

13. Select `sdb1` as an image repository and then click **OK**

```
Clonezilla - Opensource Clone System (OCS) | Mode:
Now we need to mount a device as /home/partimag (Clonezilla image(s) repository) so that we can
read or save the image in /home/partimag.
///NOTE/// You should NOT mount the partition you want to backup as /home/partimag
The partition name is the device name in GNU/Linux. The first partition in the first disk is
"hda1" or "sda1", the 2nd partition in the first disk is "hda2" or "sda2", the first partition
in the second disk is "hdb1" or "sdb1"... If the system you want to save is MS windows, normally
C: is hda1 (for PATA) or sda1 (for PATA, SATA or SCSI), and D: could be hda2 (or sda2), hda5 (or
sda5)...

sda1 7G_ext4(In_VMware_Virtual_S_No_disk_serial_no
sdb1 20G_ext4(In_VMware_Virtual_S_No_disk_serial_no

<Ok> <Cancel>
```

14. Use **Tab** key to switch light bar on **<Done>**, then press **Enter**

```
Directory Browser for Clonezilla image repository
Which directory is for the Clonezilla image repository? (If there is a space in the directory
name, it will _NOT_ be shown)
When the "Current selected dir name" is what you want, use "Tab" key to choose "Done"
//NOTE// You should not choose the directory tagged with CZ_IMG. They are just for you to know
the images list in the current dir.
Path on the resource: /dev/sdb1[/]
Current selected dir name: "/"

Docs          Sep_24_NO_SUBDIR
lost+found    Sep_24_NO_SUBDIR
Photos        Sep_24_NO_SUBDIR
<ABORT>       Exit_directory_browsing

<Browse>                                <Done>
```

15. Press **Enter** to continue

```
Running: mount --bind -o noatime,nodiratime /tmp/ocsroot_bind_root /home/partimag
The file system disk space usage:
*****
SOURCE      FSTYPE  SIZE USED AVAIL USE% TARGET
/dev/sdb1  ext4    19.6G  44M  18.5G   0% /home/partimag
*****
Press "Enter" to continue....._
```

16. Choose **Beginner mode**

```
Clonezilla - Opensource Clone System (OCS)
Choose the mode to run the following wizard about advanced parameters:

Beginner Beginner mode: Accept the default options
Expert   Expert mode: Choose your own options
Exit     Exit. Enter command line prompt

<Ok>                                <Cancel>
```

17. Select **savedisk**

```
Clonezilla - Opensource Clone System (OCS): Select mode
*Clonezilla is free (GPL) software, and comes with ABSOLUTELY NO WARRANTY*
This software will overwrite the data on your hard drive when restoring! It is recommended to
backup important files before restoring!***
///Hint! From now on, if multiple choices are available, you have to press space key to mark
your selection. An asterisk (*) will be shown when the selection is done///

savedisk Save_local_disk_as_an_image
saveparts Save_local_partitions_as_an_image
exit     Exit. Enter command line prompt

<Ok>                                <Cancel>
```

18. Type in the image name. The length of image name should be **less than 11 chars**.

```
Clonezilla - Opensource Clone System (OCS) | Mode: savedisk
Input a name for the saved image to use

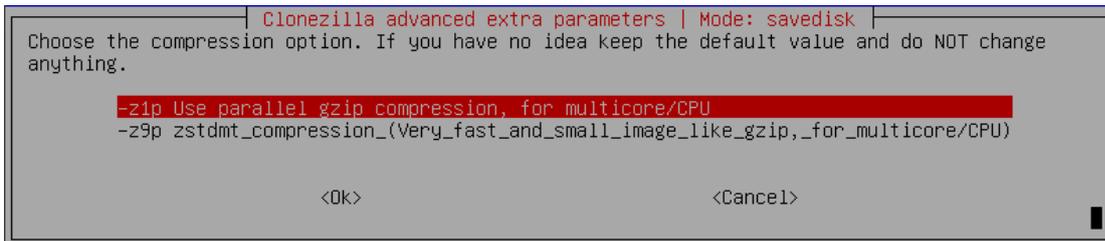
xenial-x64-20170924.....

<Ok>                                <Cancel>
```

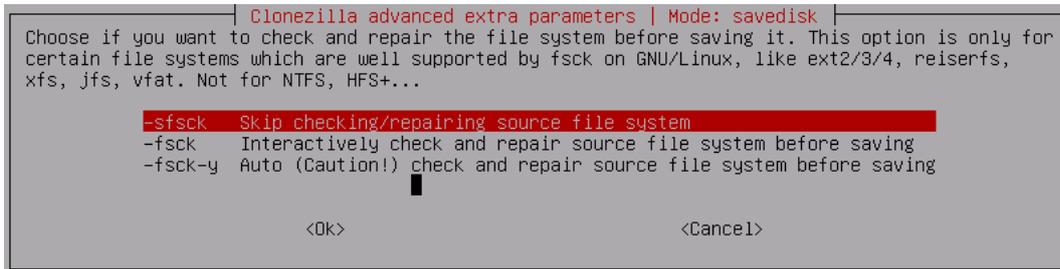
19. Select the source disk **sda** you want to save to



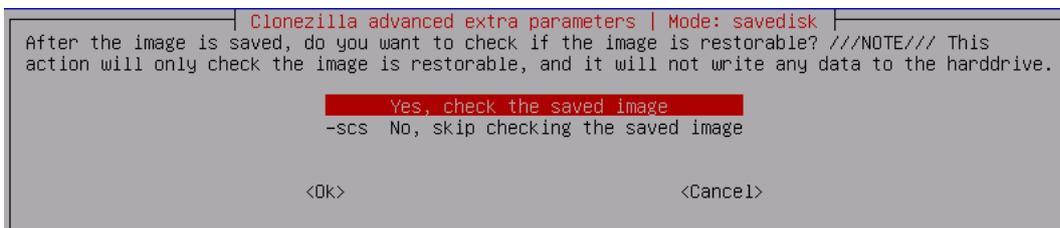
20. Select **zip use parallel gzip compression, for multicore/CPU**



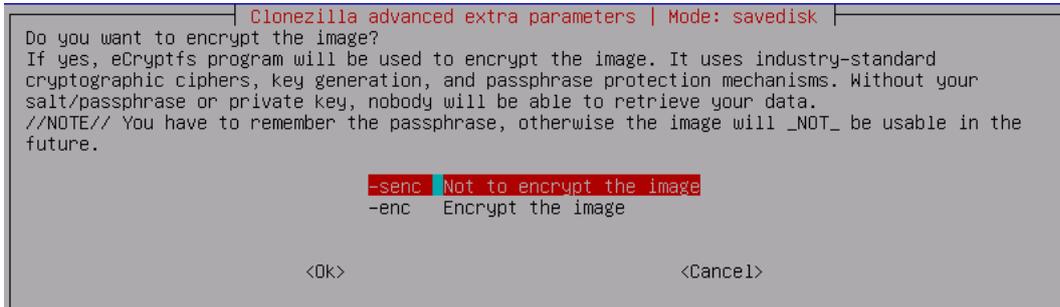
21. Choose whether the source file system needs to be checked or not. Here, we choose to skip **checking**



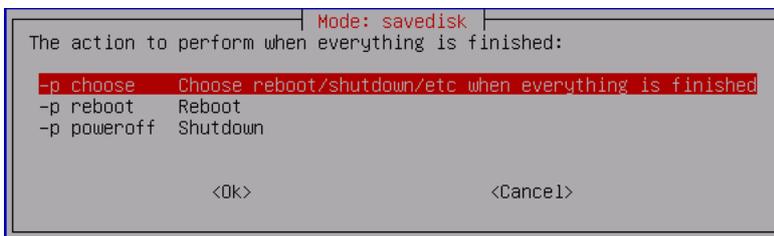
22. Choose whether you would like to check the saved image or not. Here we choose the default option which is **Yes, check the saved image**



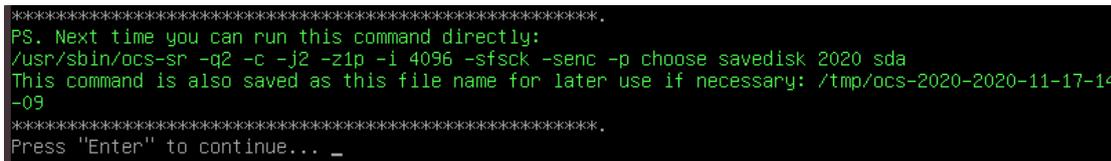
23. Select if you want to encrypt the image or not. Here we choose the default option which is **Not to encrypt the image**



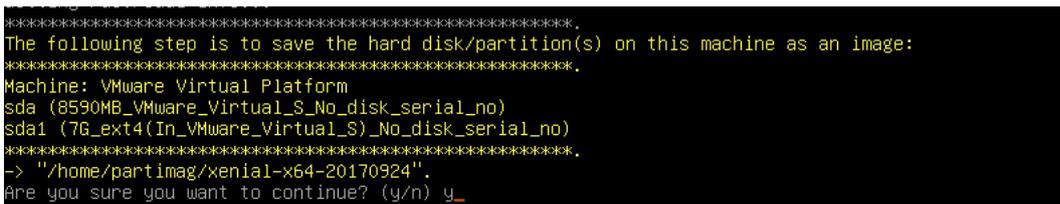
24. Select the next action to perform when everything is finished. Here we choose the default option which is **Choose reboot/shutdown/etc when everything is finished**



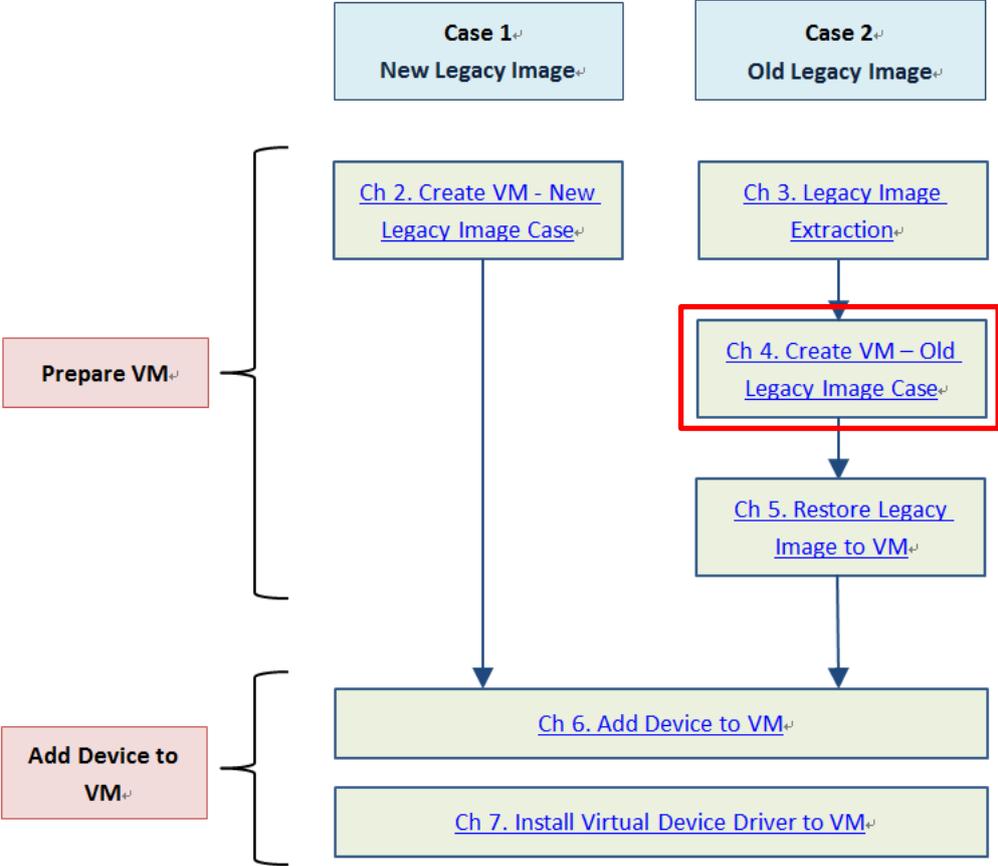
25. Press **Enter** to continue



26. If you are sure about saving the image, enter 'y' for yes



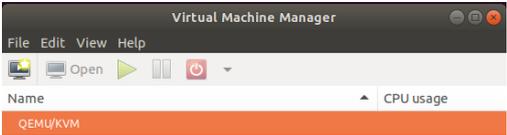
4 Create VM – Old Legacy Image Case



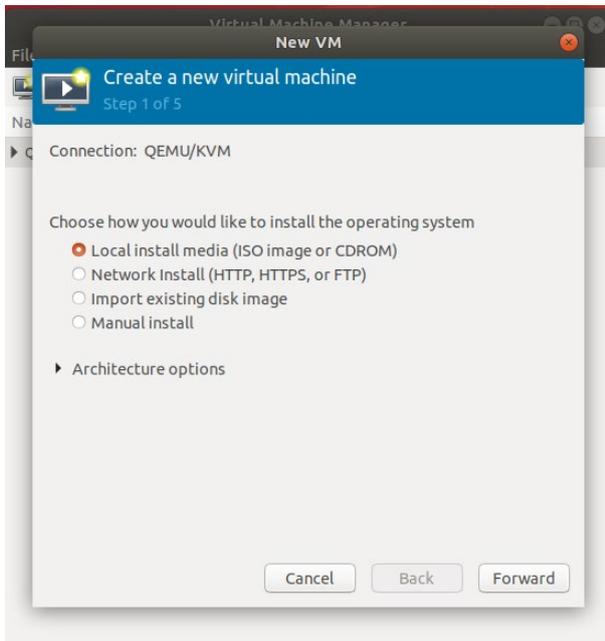
1. Copy **Clonezilla** iso file to the Ubuntu.
2. Run **virt-manager**

```

dfi@dfi-Not-Specified:~/virt-manager_2.2.1_package$ sudo virt-manager
dfi@dfi-Not-Specified:~/virt-manager_2.2.1_package$
  
```



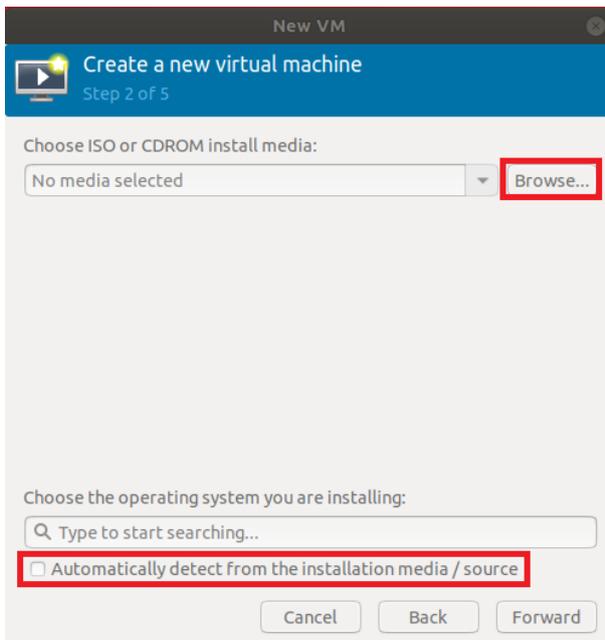
3. Create a new virtual machine by clicking the button in the top left-hand corner and select **Local install media (ISO image or CDROM)**. Then click **Forward**



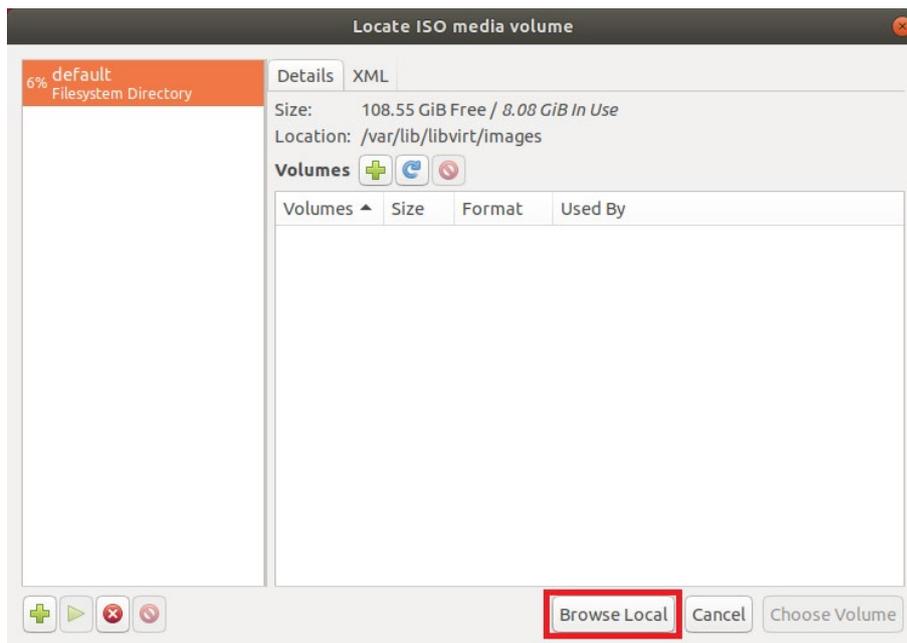
NOTE

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Just download stable version

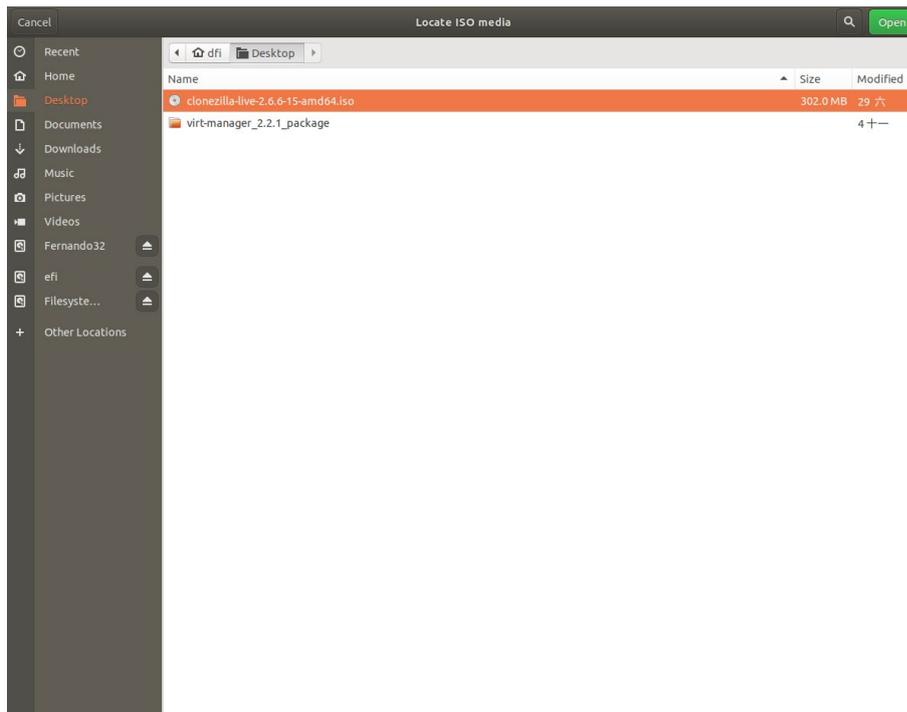
4. Uncheck **Automatically detect from installation media / source**, then click **Browse**



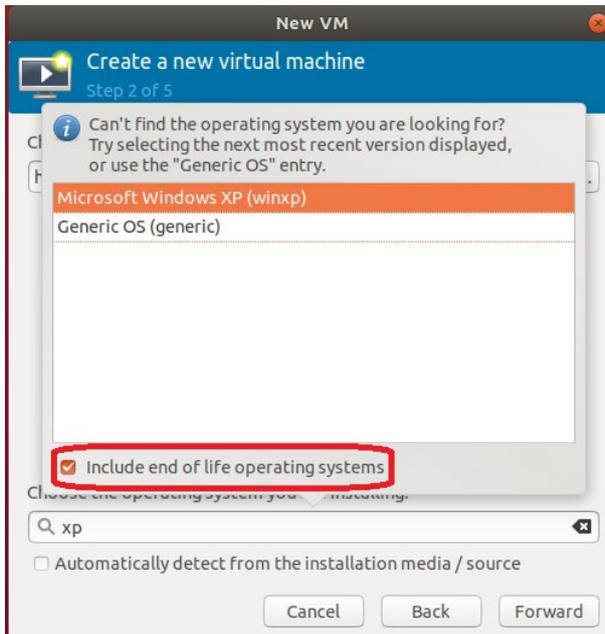
5. Click **Browse Local**



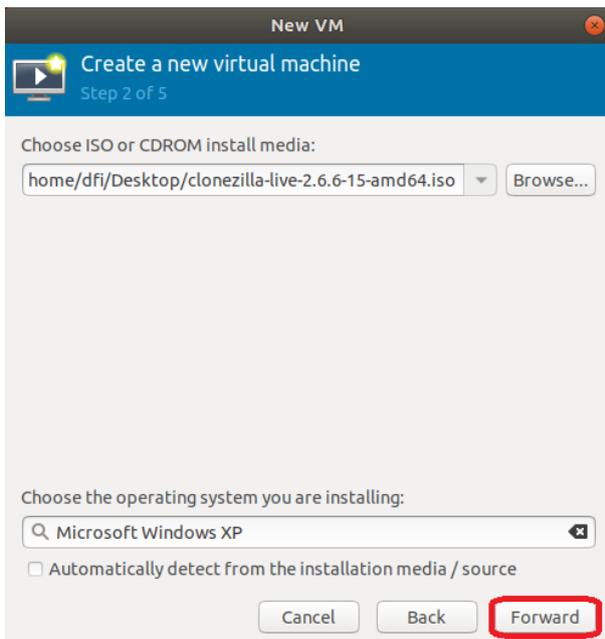
6. Choose **Clonezilla** iso file which you saved, then click **Open**



7. On **Type to start searching...**, input XP, check **Include end of life operating systems**, then select **Microsoft Windows XP (winxp)**



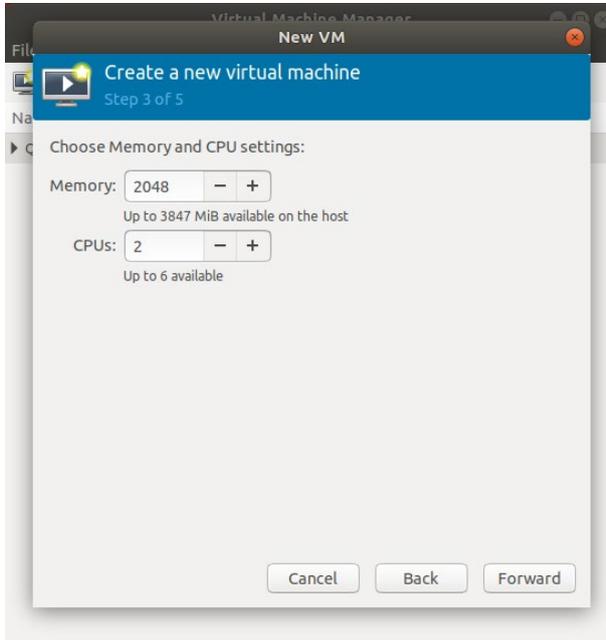
8. Click **Forward** to next step



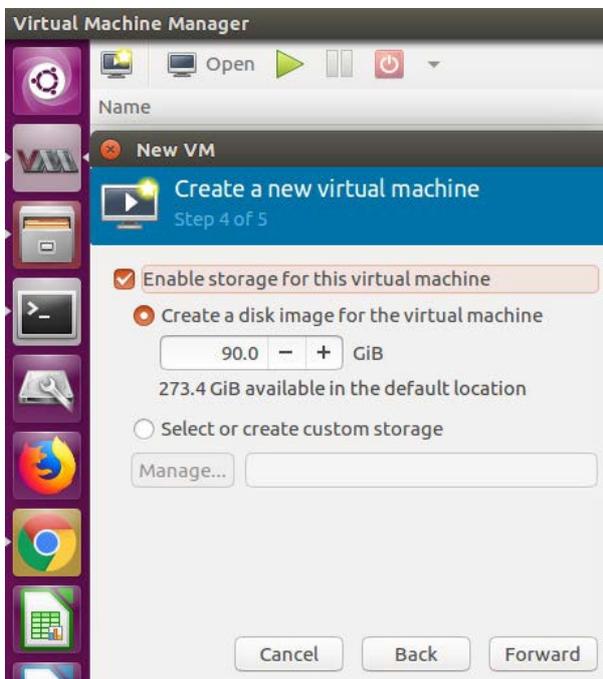
9. Enter the appropriate RAM and CPU settings as required. Here we select 2GB of RAM and for 1 CPU. Then click **Forward**

NOTE

For Windows XP, we recommend up to 2 CPUs and a RAM of between 2GB and 4GB



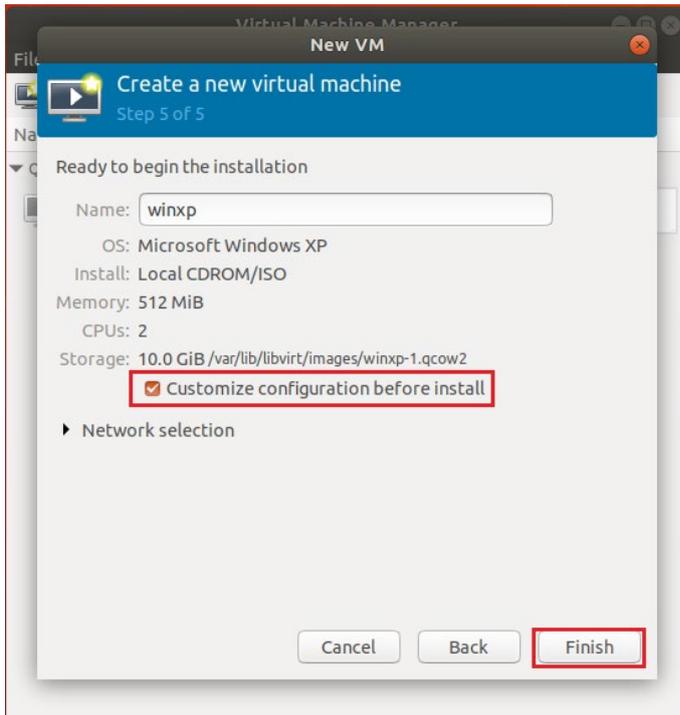
10. Assign the amount of storage for the legacy image



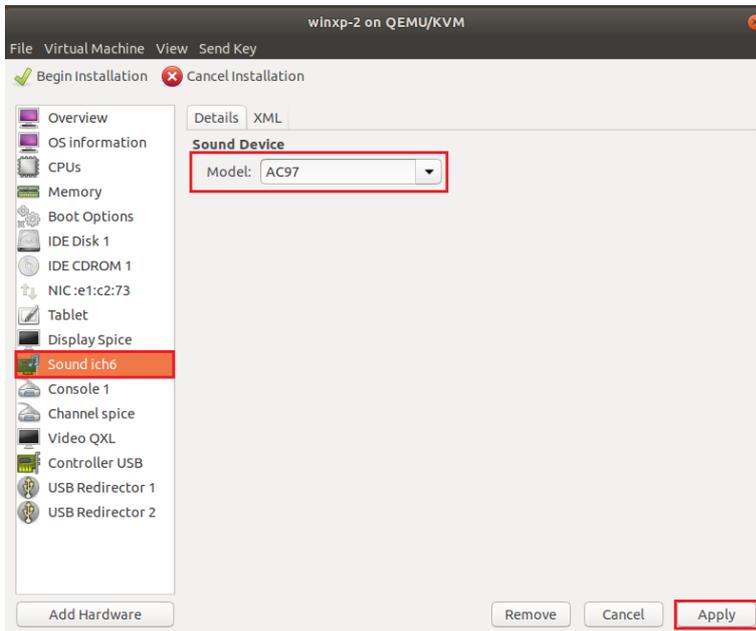
NOTE

The amount of storage selected here should be equal or greater than the legacy image size

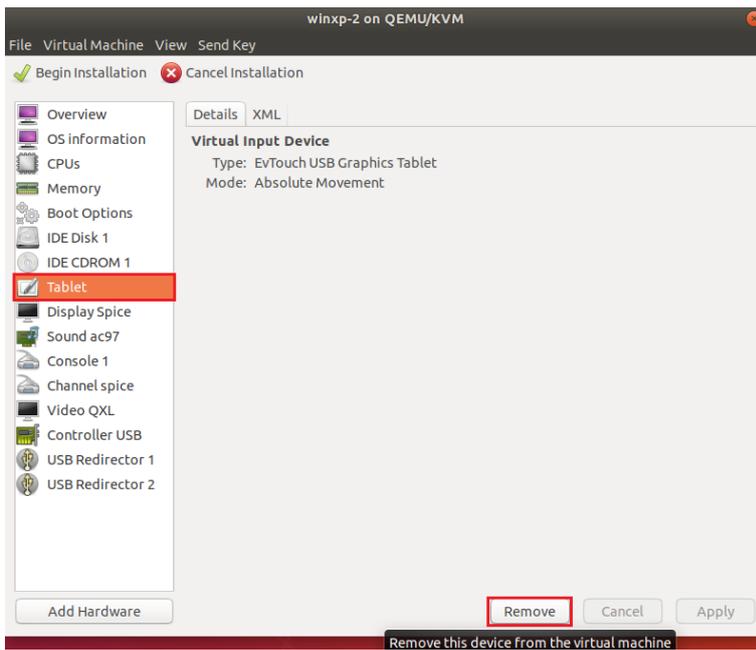
11. Enter a name for your virtual machine, and check **Customize configuration before install**, then click **Finish**



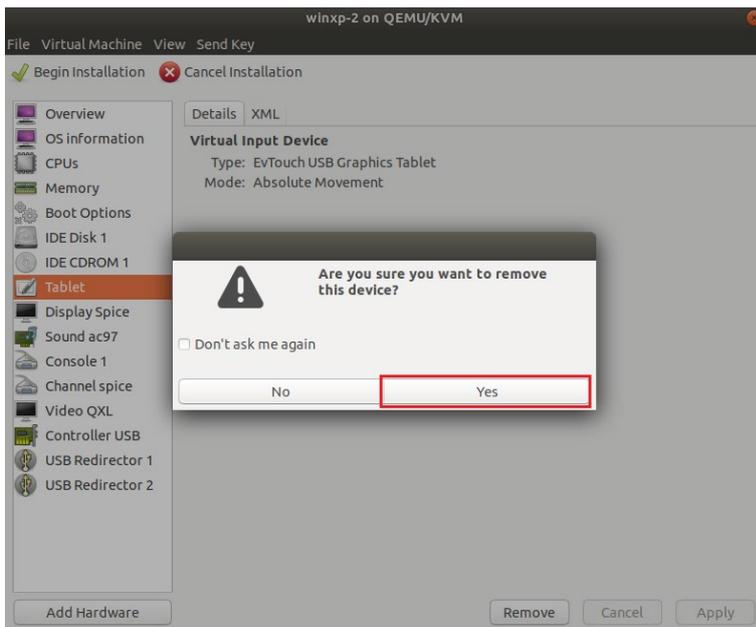
12. Click **Sound ich6**. In Sound Device, select **AC97**. Then click **Apply**



13. Click **Tablet**. Then click **Remove**



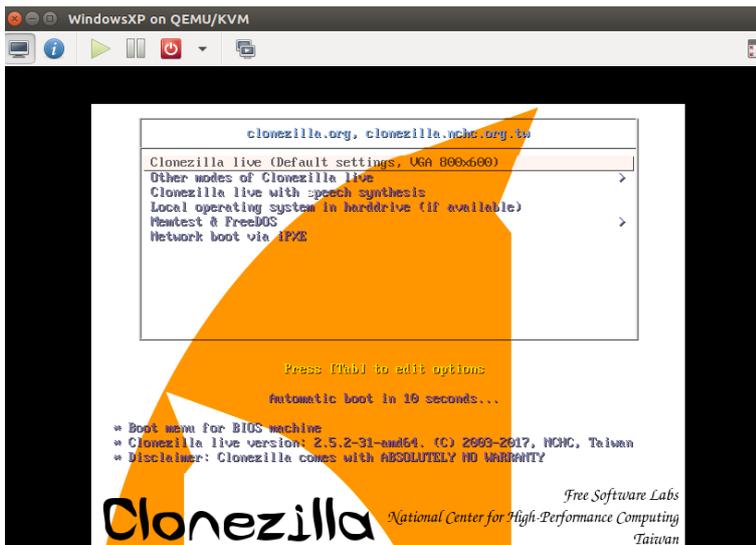
14. Select **Yes**



15. Repeat step 9 ~ 10 to remove **NIC: xx:xx:xx** and **Console 1**

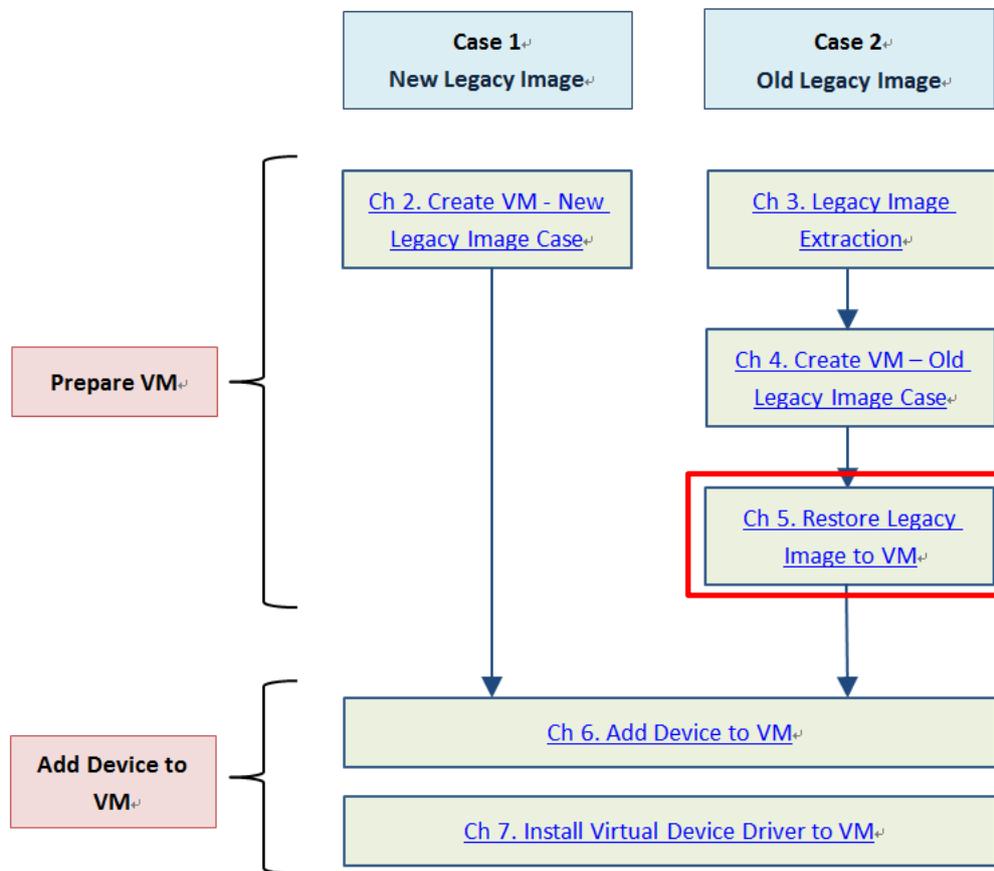
16. After remove **Tablet**, **NIC:xx:xx:xx**, and **Console 1** virtual devices, click **Begin Installation**

17. When you open the VM, the **Clonezilla** page will appear



18. Restore the old content through **Clonezilla** by following the steps at [Ch 5](#)

5 Restore Legacy Image to VM

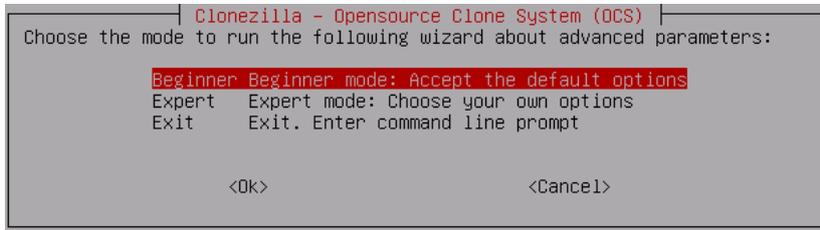


After you have created the Virtual Machine and have uploaded the **Clonezilla** iso file, you need to restore the image that you have extracted earlier in [Ch 3.3](#).

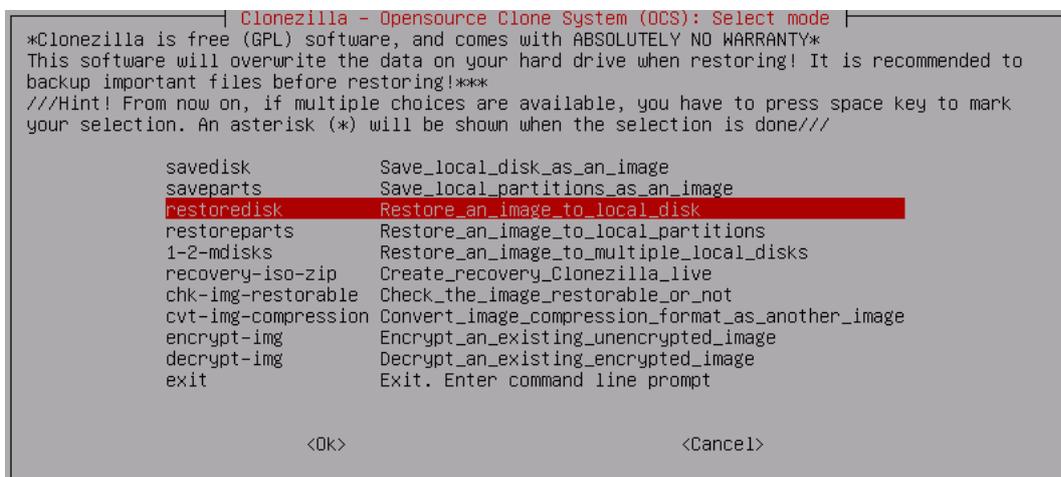
Before proceeding to this section, **plug in the USB device** that contains the legacy image and add the USB device into the VM. Then only do you boot up the system.

1. Select the first option which is the default settings
2. The Debian Linux booting process will appear
3. Choose your preferred language
4. In keyboard layout, select Don't touch my keymap
5. Select **Start_Clonezilla**
6. Select device-image option
7. Choose **local_dev**
8. Then, you will see a message in yellow instructing you to plug in the USB device. This is device to restore the file image
9. **Clonezilla** will scan the disks on the machine. Once you see your USB device on the list, press CTRL-C to exit from the windows

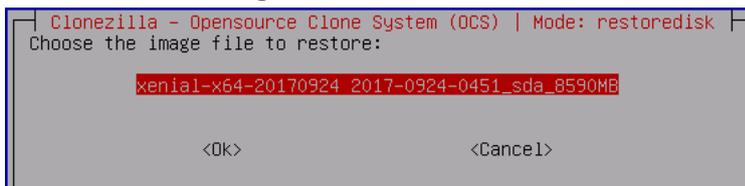
10. Select sdb1 as image repository, then click OK
11. Select Docs (default) as a directory name and /dev/sdb1 as the image repository. Click Done
12. Press **Enter** to continue
13. Choose **Beginner** mode



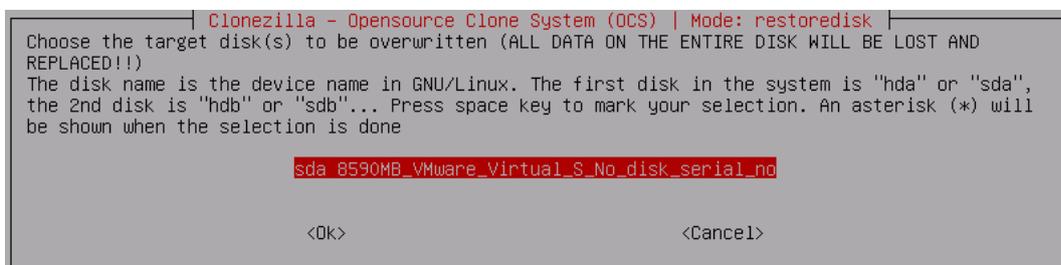
14. Now, select **restore disk**



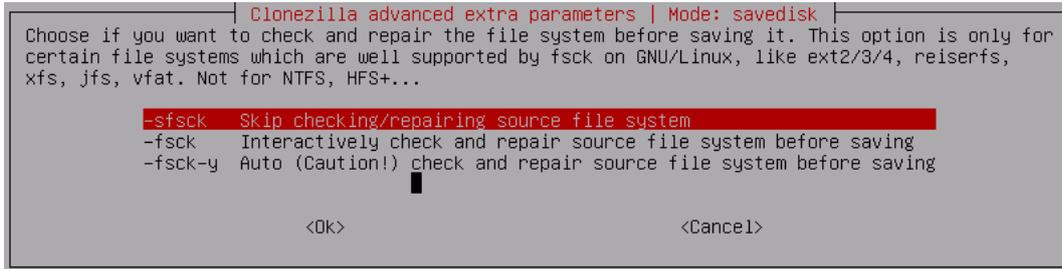
15. Select the image name



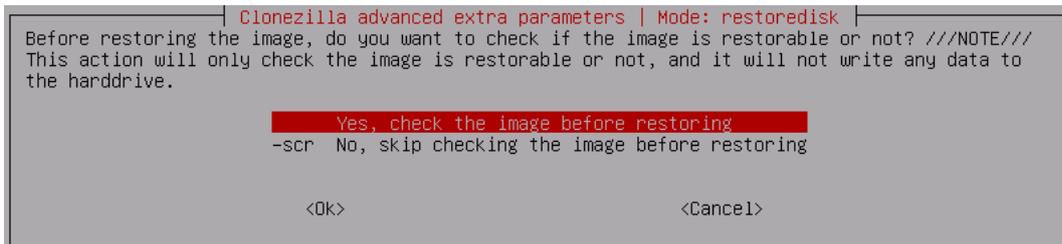
16. Select the source disk **sda** you want to restore



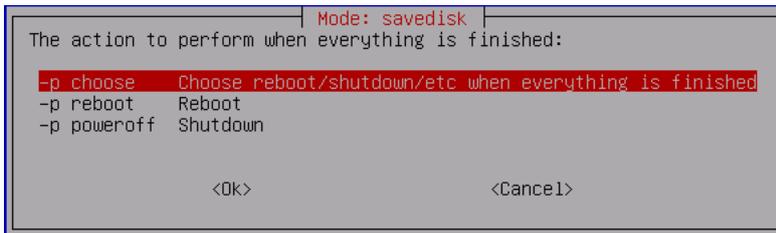
17. Select if the source file system needs to be checked or not. Here, we choose to **skip checking**



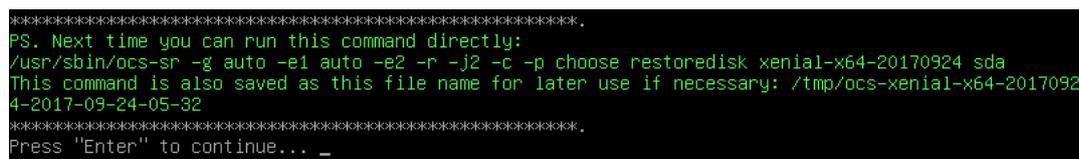
18. Select **Yes, check the image before restoring**



19. Select the next action to perform when everything is finished. Here we choose the default option which is **Choose reboot/shutdown/etc when everything is finished**



20. Press **Enter** to continue the restoration process



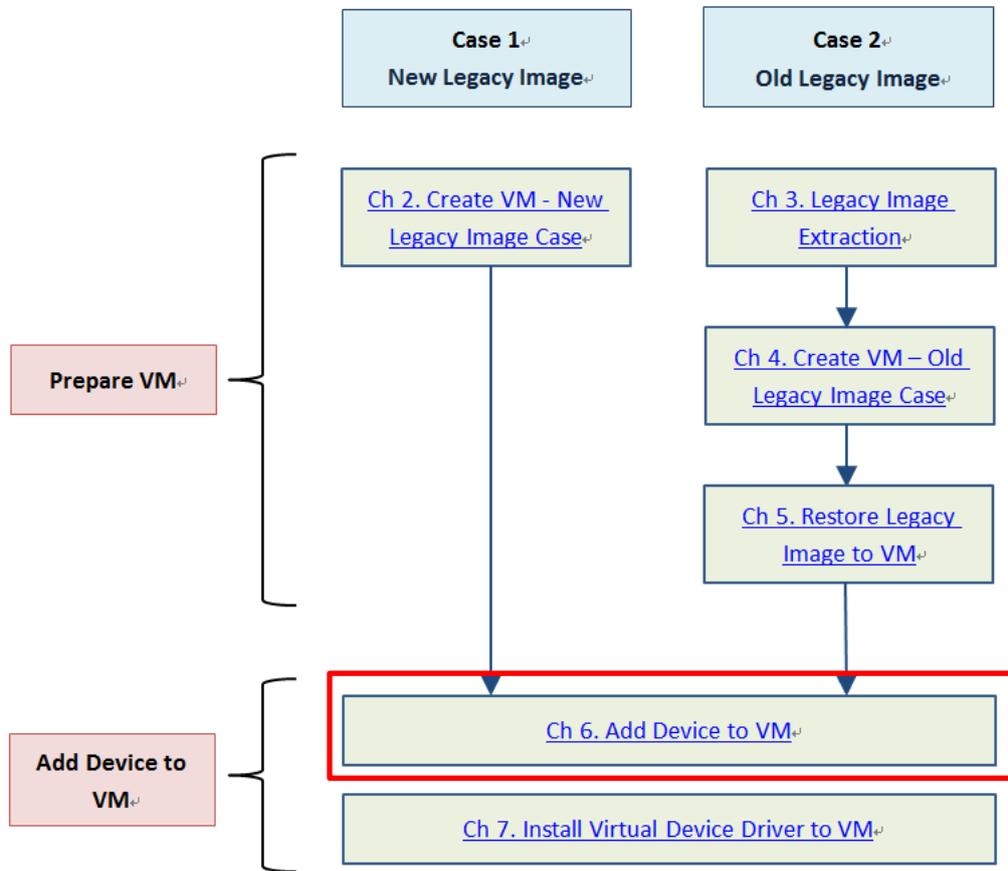
21. Confirm again if you want to restore



27. Power on the new Virtual Machine
28. The Windows XP front page appears
29. Now you can see the old system that you have restored is ready to use



6 Add Device to VM

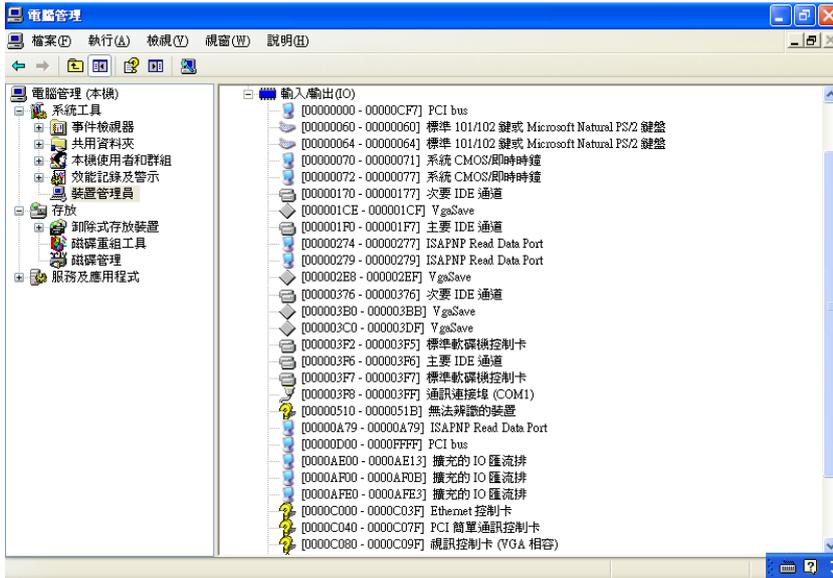


6.1 Add ISA Device

6.1.1 Get IO Base

In VM OS, open Windows **Device Manager** and check used **IO**. Choose an IO address that is not be used.

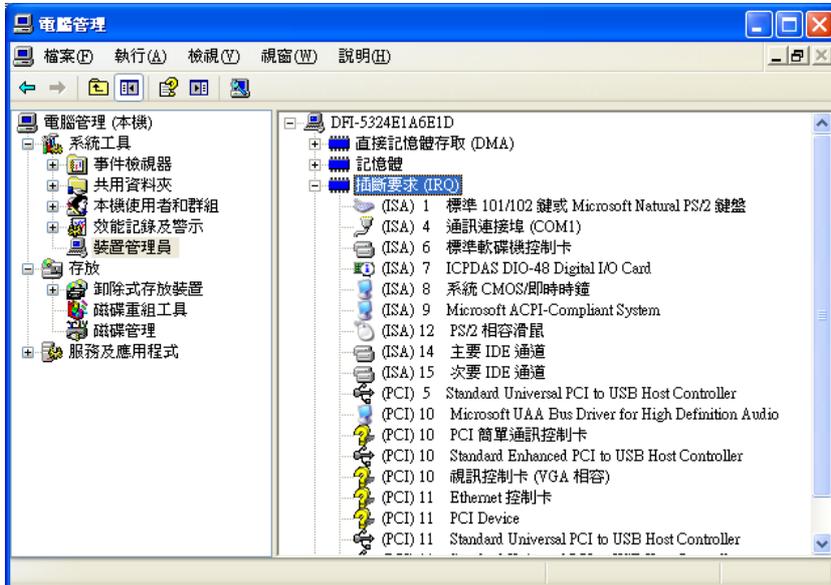
Ex. 2F0



6.1.2 Get IRQ

In VM OS, open Windows **Device Manager** and check used **IRQ**. Choose an IRQ that is not be used.

Ex. IRQ 2



Note

The yellow mark device is automatically generated by VM. Do not need to modify.

6.1.3 Get IO Base Physical

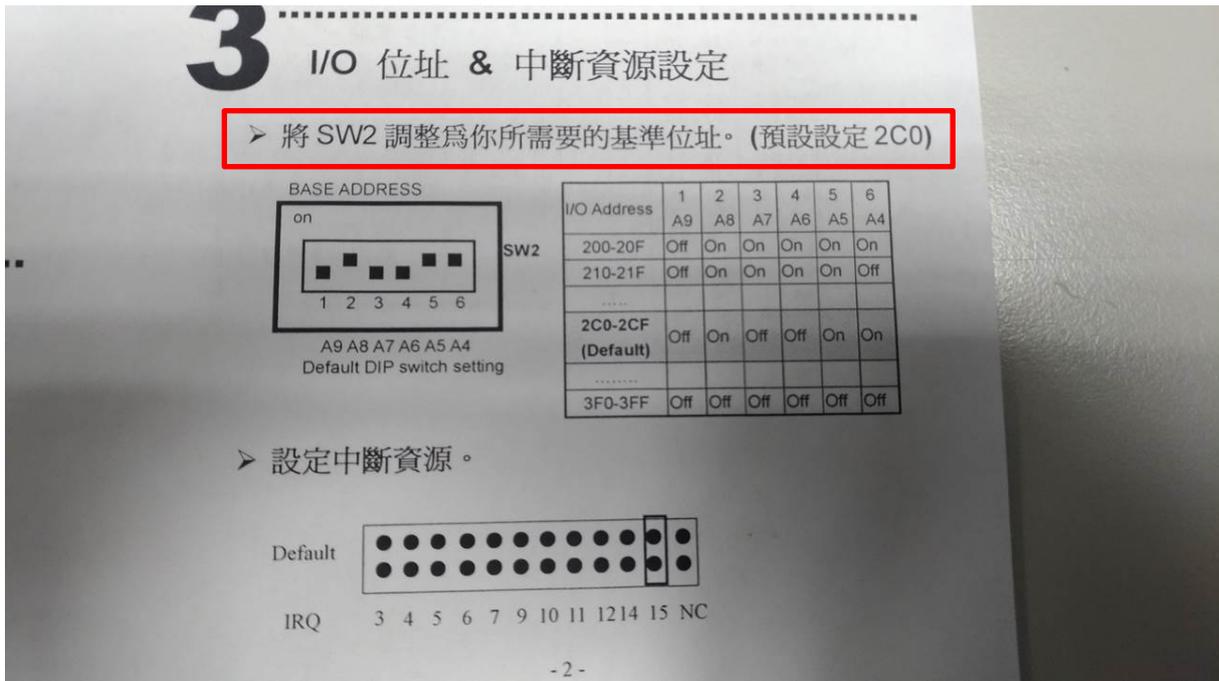
In Physical Ubuntu, open **Terminal** and input `cat /proc/ioports` to check used IO. Choose an IO address that is **over 0x5000** and not be used and set it on ISA Card by ISA Card document. Ex. The value is 0x2F0

```
dfi@dfi-Not-Specified:~$ sudo su
[sudo] password for dfi:
root@dfi-Not-Specified:/home/dfi# cat /proc/ioports
0000-0cf7 : PCI Bus 0000:00
0000-001f : dma1
0020-0021 : pic1
0040-0043 : timer0
0050-0053 : timer1
0060-0060 : keyboard
0064-0064 : keyboard
0070-0071 : rtc_cmos
0070-0071 : rtc0
0080-008f : dma_page reg
00a0-00a1 : pic2
00c0-00df : dma2
00f0-00ff : fpu
00f0-00f0 : PNP0C04:00
0200-020f : pnp 00:02
02e0-02e7 : serial
02e8-02ef : serial
02f8-02ff : serial
0378-037a : parport0
03e8-03ef : serial
03f8-03ff : serial
0680-069f : pnp 00:09
0cf8-0cff : PCI conf1
0d00-ffff : PCI Bus 0000:00
164e-164f : pnp 00:09
1800-1803 : ACPI PM1a_EVT_BLK
1804-1805 : ACPI PM1a_CNT_BLK
1808-180b : ACPI PM1a_TMR
1850-1850 : ACPI PM2_CNT_BLK
1854-1857 : pnp 00:0a
1860-187f : ACPI GPE0_BLK
2000-20fe : pnp 00:0d
3000-3fff : PCI Bus 0000:04
3000-301f : 0000:04:00.0
4000-403f : 0000:00:02.0
4060-407f : 0000:00:17.0
4060-407f : ahci
4080-4083 : 0000:00:17.0
4080-4083 : ahci
4090-4097 : 0000:00:17.0
4090-4097 : ahci
5000-5fff : PCI Bus 0000:02
ef80-efbf : 0000:00:1f.4
root@dfi-Not-Specified:/home/dfi# exit
dfi@dfi-Not-Specified:~$ sudo vi
```

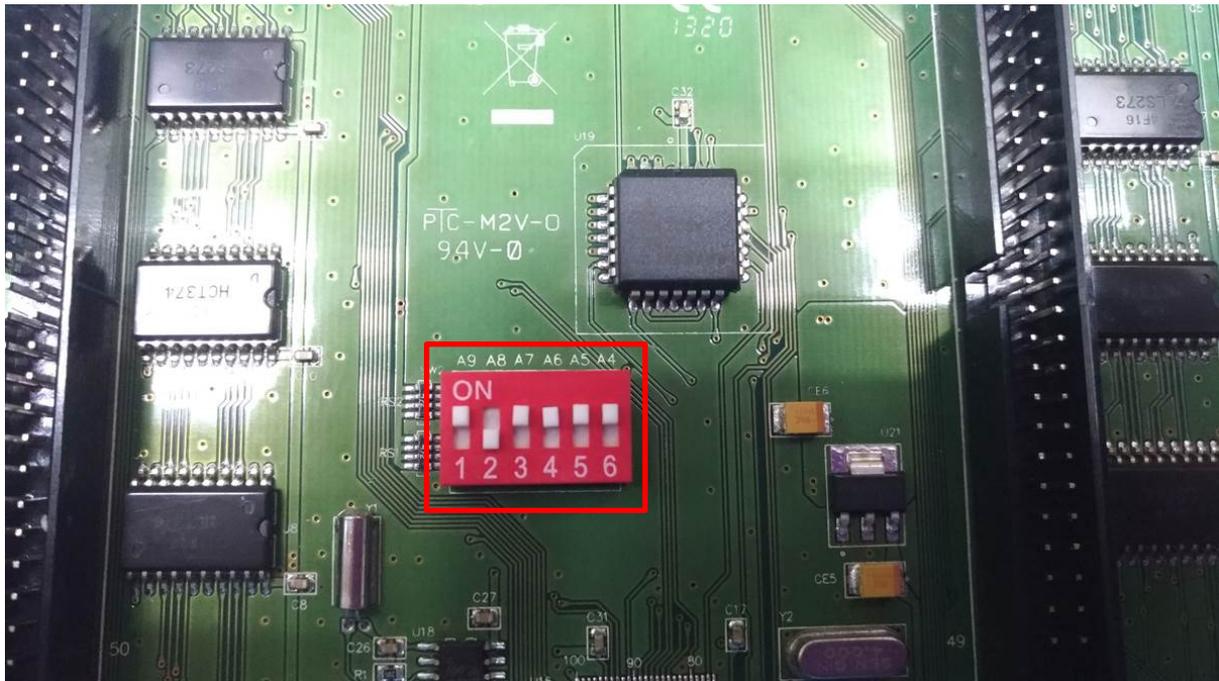
Note

If IO base is fixed by request and it is conflict with other device, please contact to DFI to get further technical support.

Ex. ISA Card document IO setting



Ex. ISA Card IO Setting



6.1.4 Get IRQ Physical

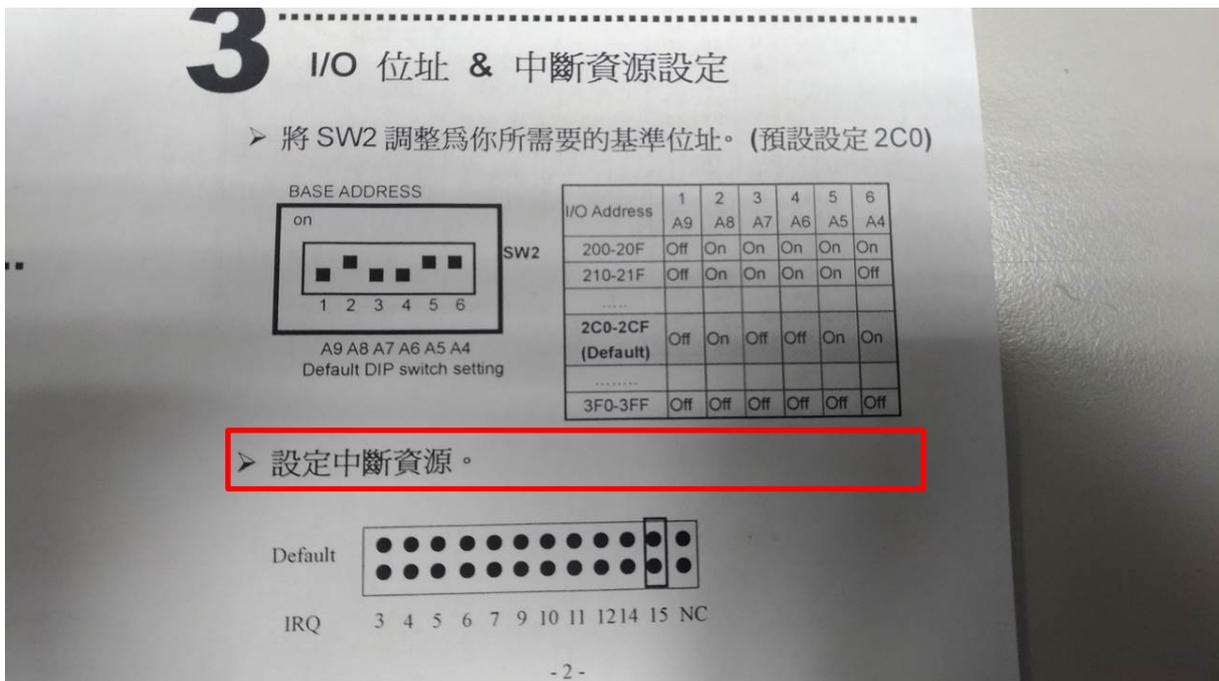
In Physical Ubuntu, open **Terminal** and input `cat /proc/interrupts` to check used IRQ. Choose an IRQ that is not be used and set it on ISA Card by ISA Card document.

Ex. IRQ 7

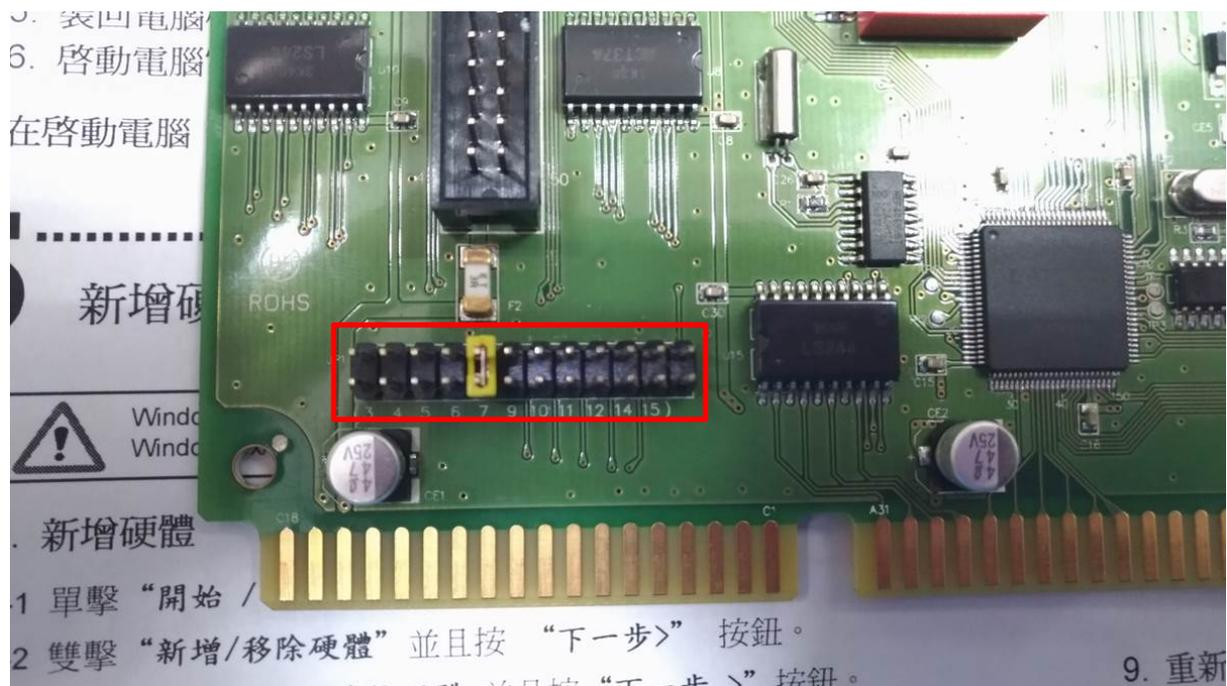
```
dfi@dfi-Not-Specified:~$ cat /proc/interrupts
```

	CPU0	CPU1	CPU2	CPU3	CPU4	CPU5		
0:	7	0	0	0	0	0	IR-IO-APIC	2-edge timer
6:	0	0	0	0	0	0	IR-IO-APIC	6-edge virt-isa-intx
8:	0	0	1	0	0	0	IR-IO-APIC	8-edge rtc0
9:	0	31	0	0	0	0	IR-IO-APIC	9-fastest acpi
10:	0	0	0	0	0	0	IR-IO-APIC	10-edge parport0
14:	0	0	0	0	0	0	IR-IO-APIC	14-fastest INT3450:00
45:	0	1	0	0	0	0	IR-IO-APIC	45-fastest
120:	0	0	0	0	0	0	DMAR-MSI	0-edge dmar0
121:	0	0	0	0	0	0	DMAR-MSI	1-edge dmar1
122:	0	0	0	0	0	0	IR-PCI-MSI	16384-edge PCIe PME
123:	0	0	0	0	0	0	IR-PCI-MSI	458752-edge PCIe PME, aerdrv, pcie-dpc
124:	0	0	0	0	0	0	IR-PCI-MSI	475136-edge PCIe PME, aerdrv, pcie-dpc
125:	0	0	0	0	0	0	IR-PCI-MSI	481280-edge PCIe PME, aerdrv, pcie-dpc
126:	7254	3422	0	0	0	0	IR-PCI-MSI	327680-edge xhci hcd
127:	0	0	0	9545	9141	0	IR-PCI-MSI	376832-edge ahci[0000:00:17.0]
128:	0	0	0	0	0	1	IR-PCI-MSI	2097152-edge enp4s0
129:	36	1535	0	0	0	0	IR-PCI-MSI	2097153-edge enp4s0-rx-0
130:	0	0	0	0	107	25	IR-PCI-MSI	2097154-edge enp4s0-rx-1
131:	0	0	49	13	216	10	IR-PCI-MSI	2097155-edge enp4s0-tx-0
132:	0	0	997	45	0	0	IR-PCI-MSI	2097156-edge enp4s0-tx-1
133:	132	0	0	0	0	6	IR-PCI-MSI	520192-edge eno1
134:	0	4185	0	0	0	52704	IR-PCI-MSI	32768-edge i915

Ex. ISA Card document IRQ setting



Ex. ISA Card IRQ Setting



Note

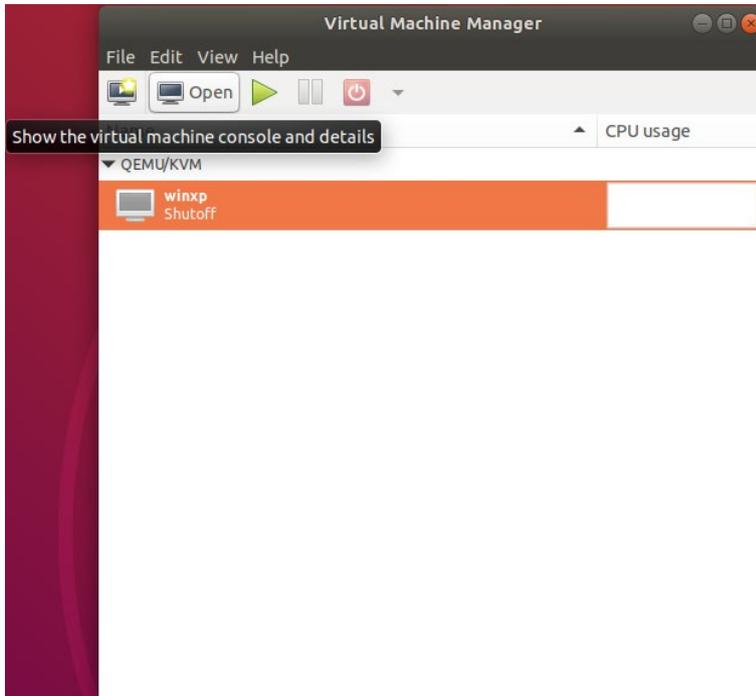
If IO base is fixed by request and it is conflict with other device, please contact to DFI to get further technical support.

6.1.5 Get IO Range and IO Range Physical

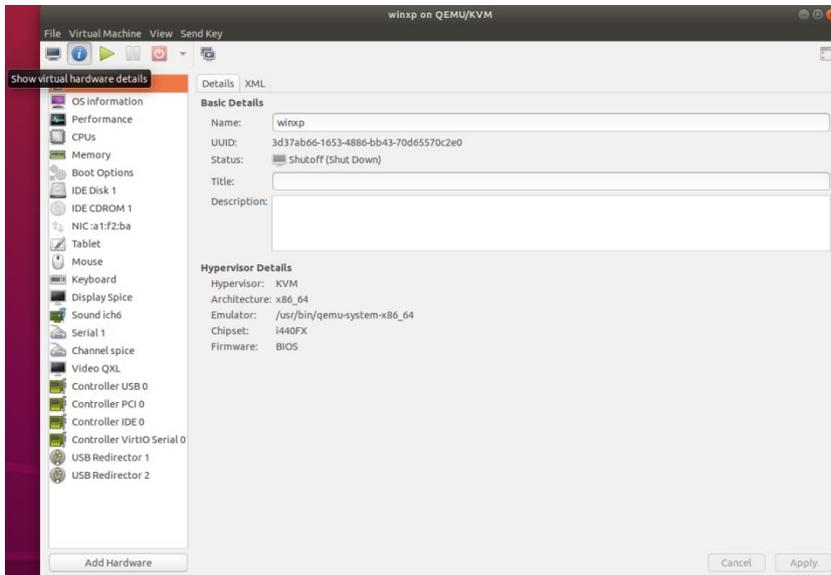
Please reference your ISA card document. If the document did not mention it, you can temporarily set to **16** then test the ISA card function and modify if necessary.

6.1.6 Add ISA Device

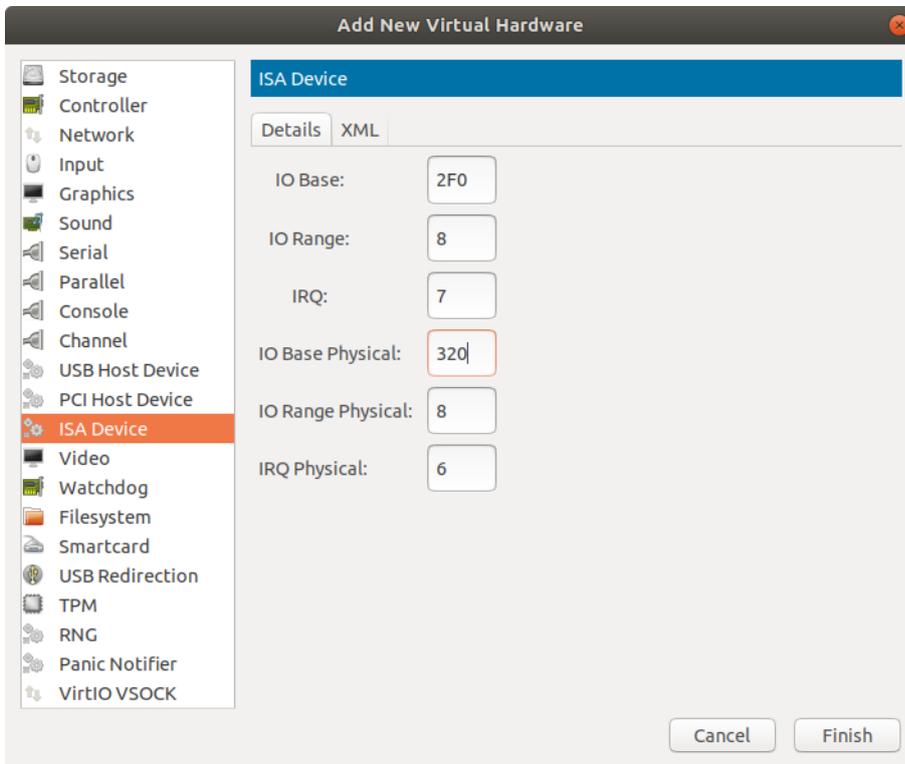
1. Select VM and click **Open**



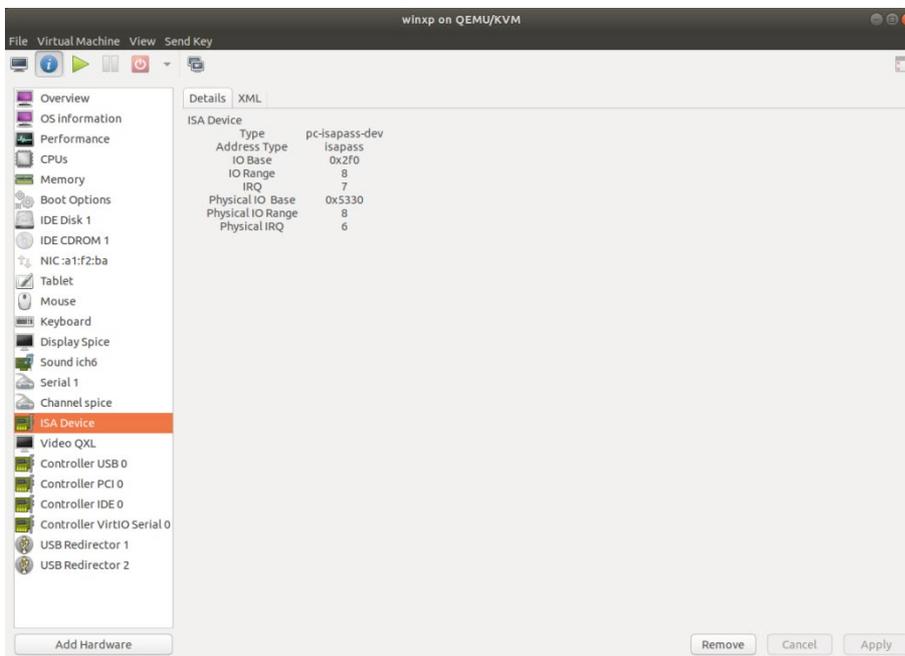
2. Click **Show virtual hardware details**



- Click **Add Hardware** to open **Add New Virtual Hardware** window. Then select ISA Device, fill in values to six items, including **IO Base**, **IO Range**, **IRQ**, **IO Base Physical**, **IO Range Physical** and **IRQ Physical**. Then click **Finish**

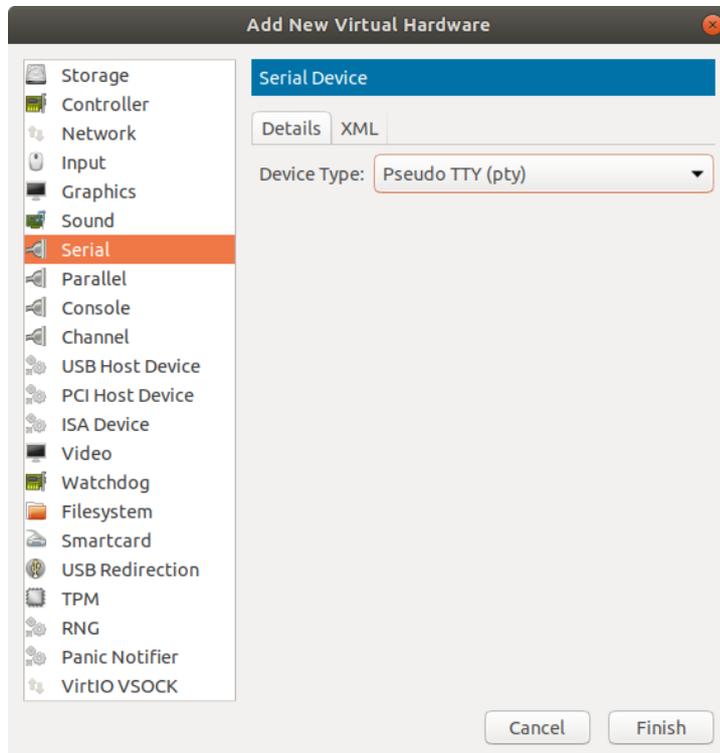


- ISA Device added to hardware details

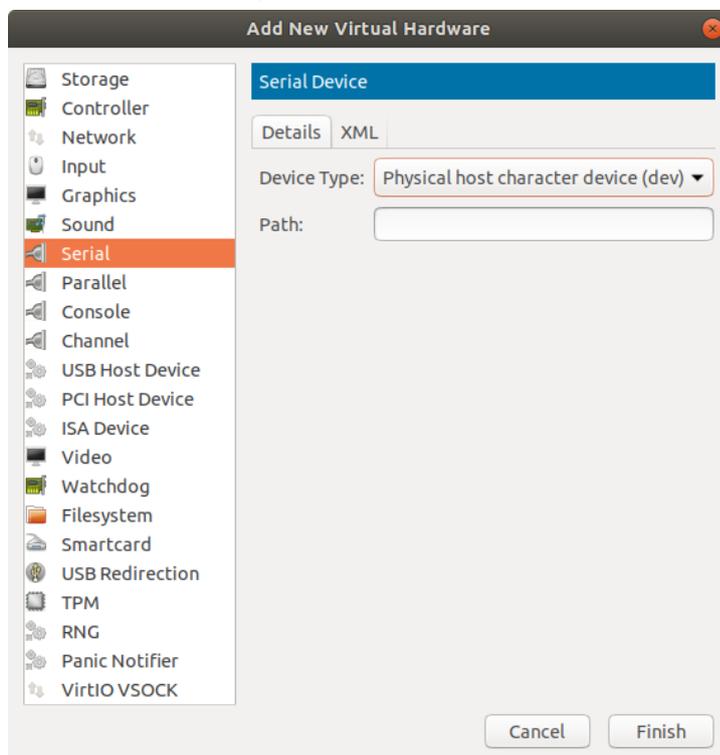


6.2 Add Serial Device

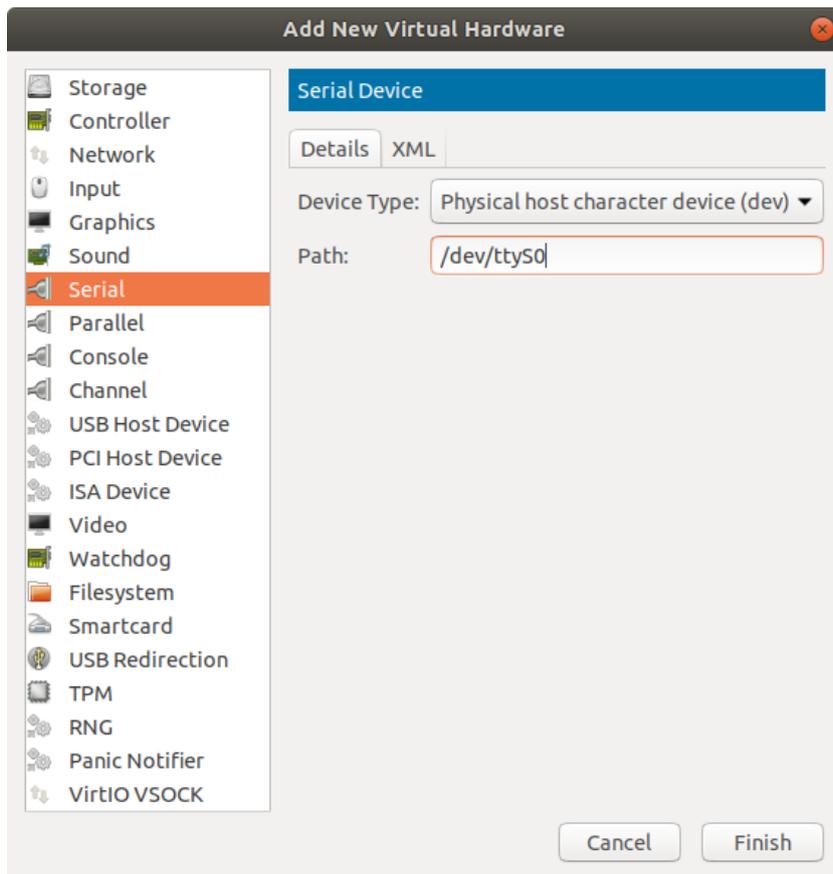
1. Click **Serial**



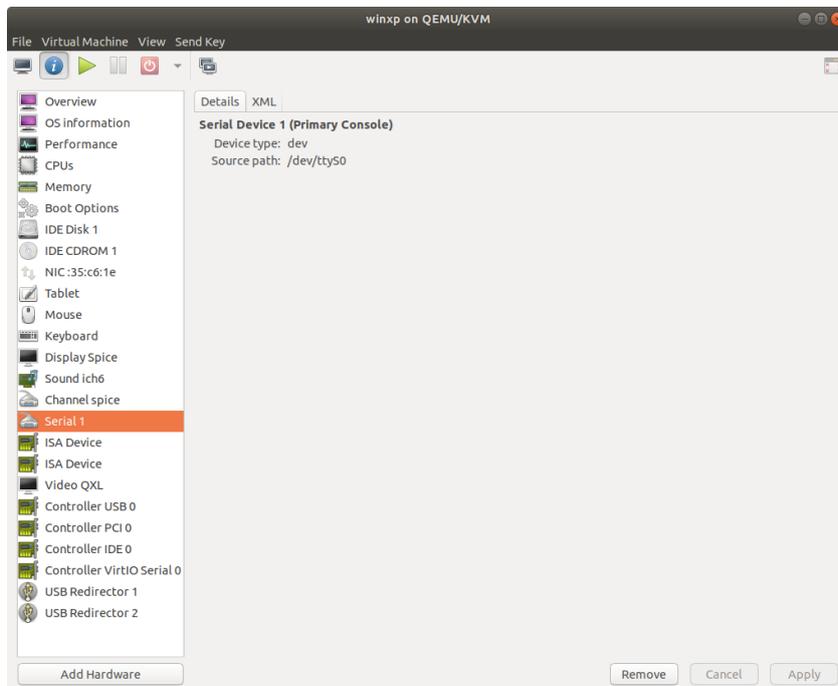
2. In **Device Type**, select **Physical host character device (dev)**



3. In **Path**, input `/dev/ttyS0` (ttyS0 ~ ttyS5 mapping to COM1 ~ COM6). Click **Finish**

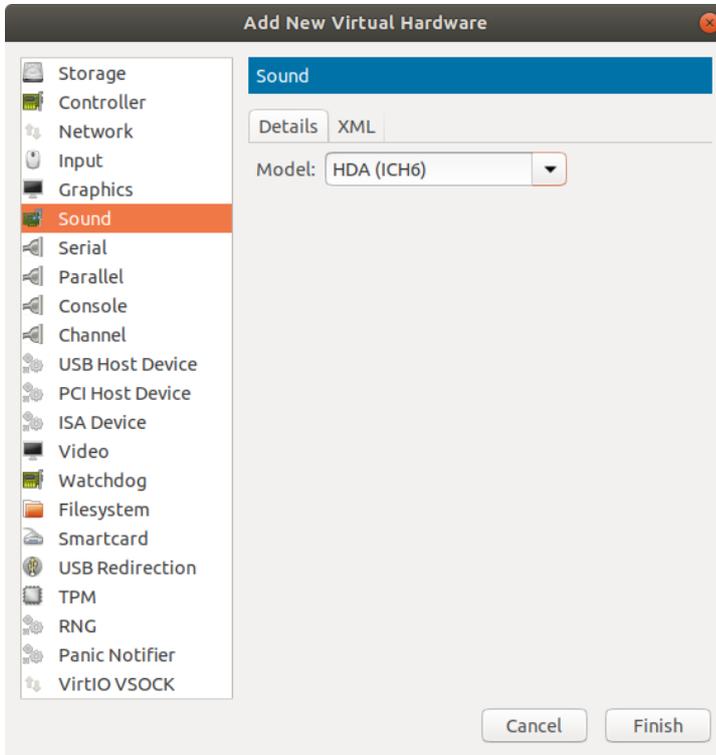


4. Serial Device added to hardware details

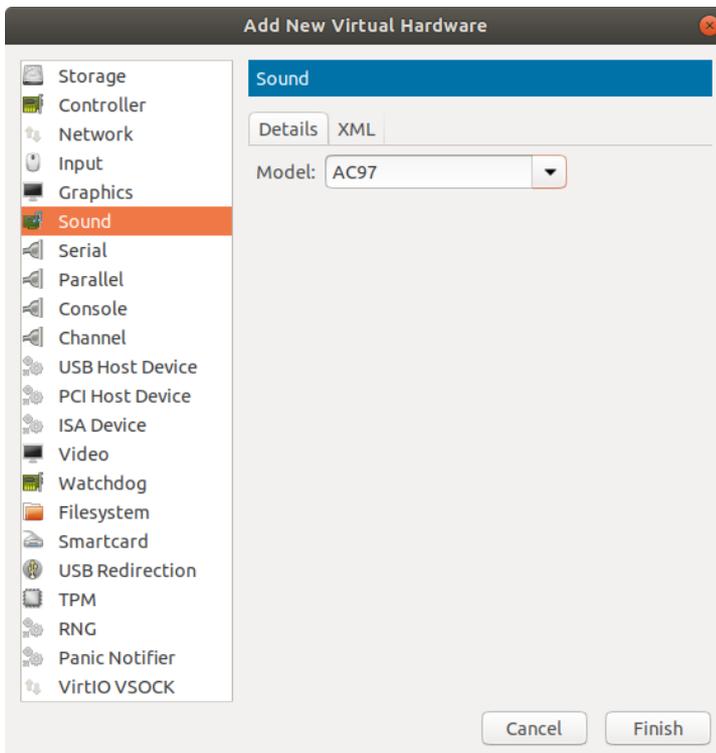


6.3 Add Sound Device

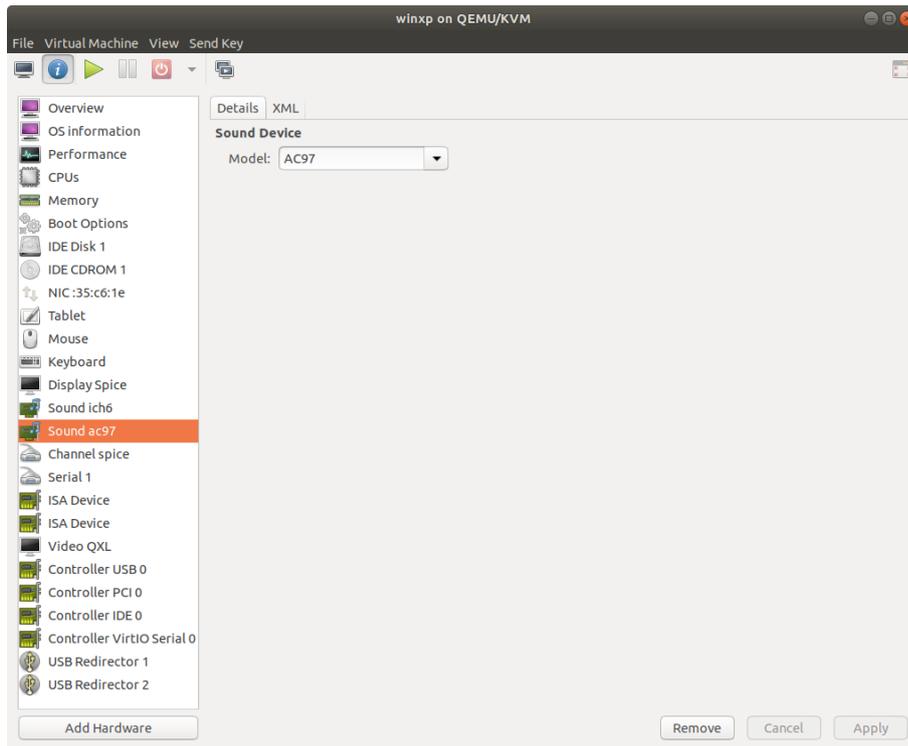
1. Click **Sound**



2. In **Model**, select **AC97**. Click **Finish**

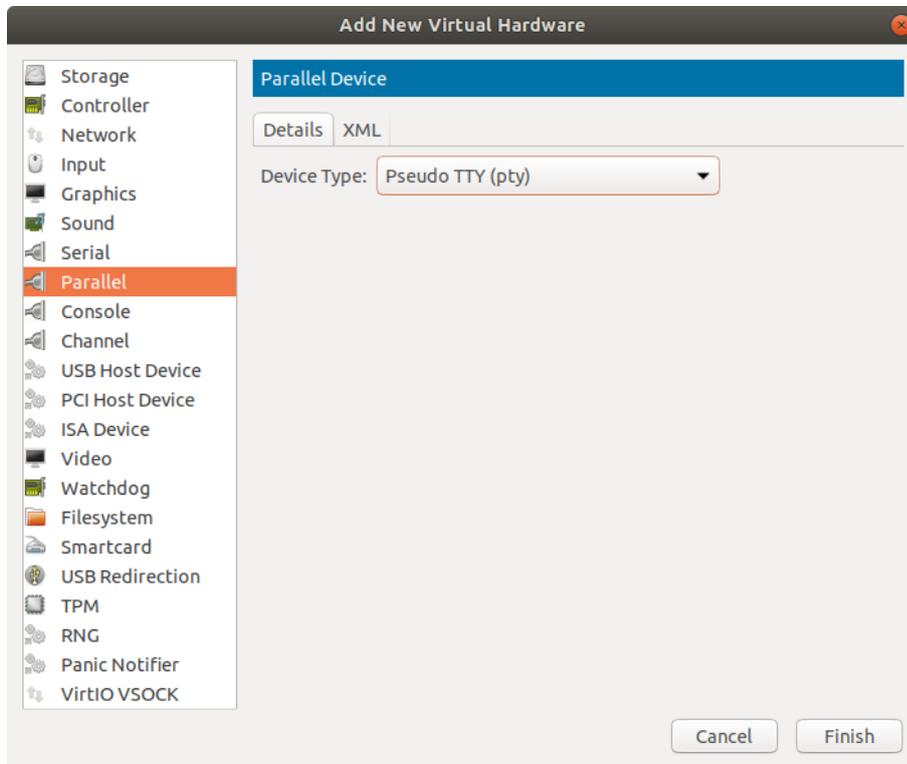


3. Sound Device added to hardware details

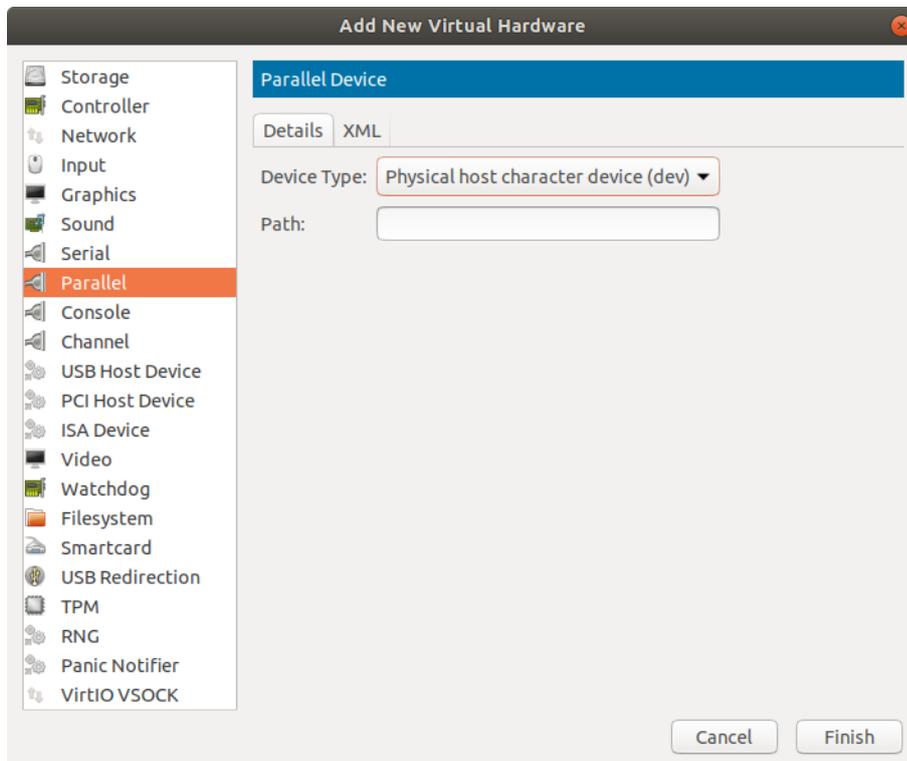


6.4 Add Parallel Device

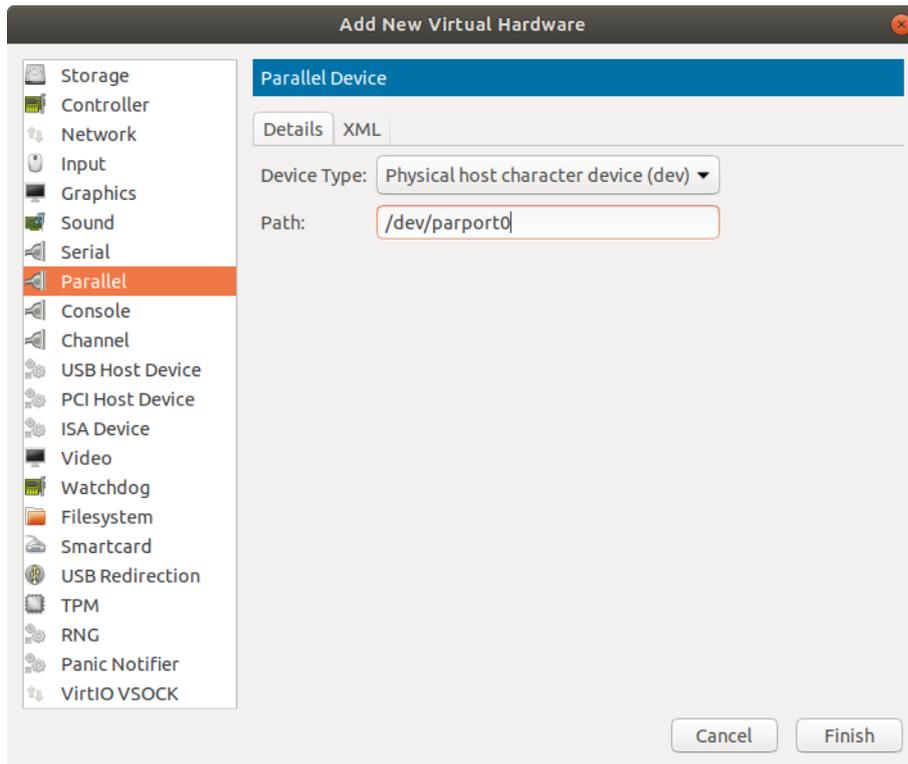
1. Click **Parallel**



2. In **Device Type**, select **Physical host character device (dev)**

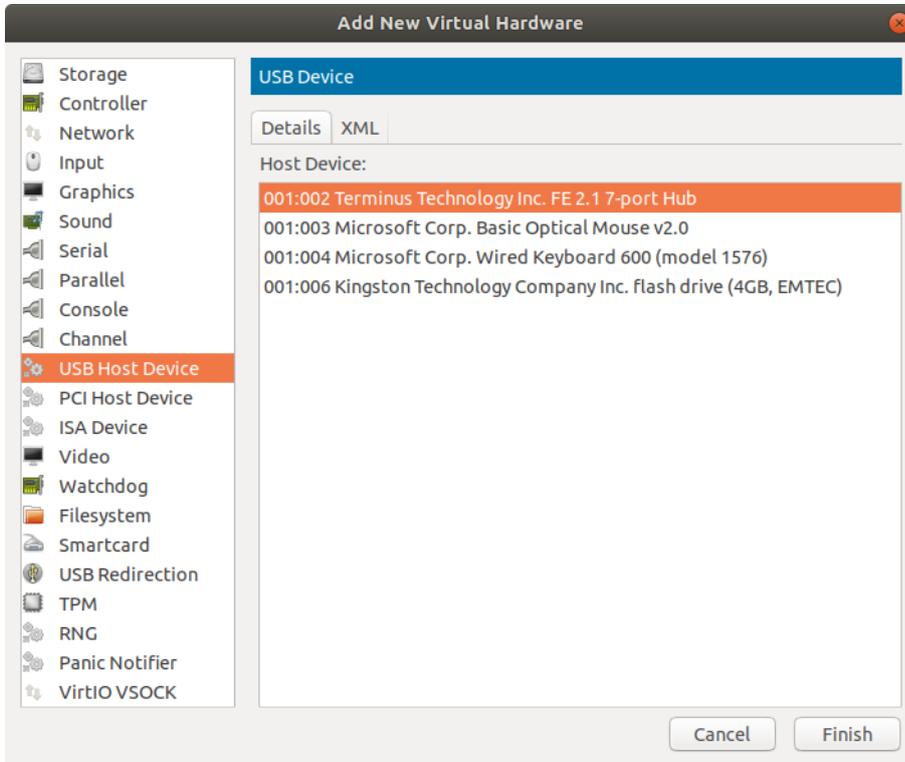


3. In **Path**, input `/dev/parport0` (CS620 has only parport 0). Click **Finish**

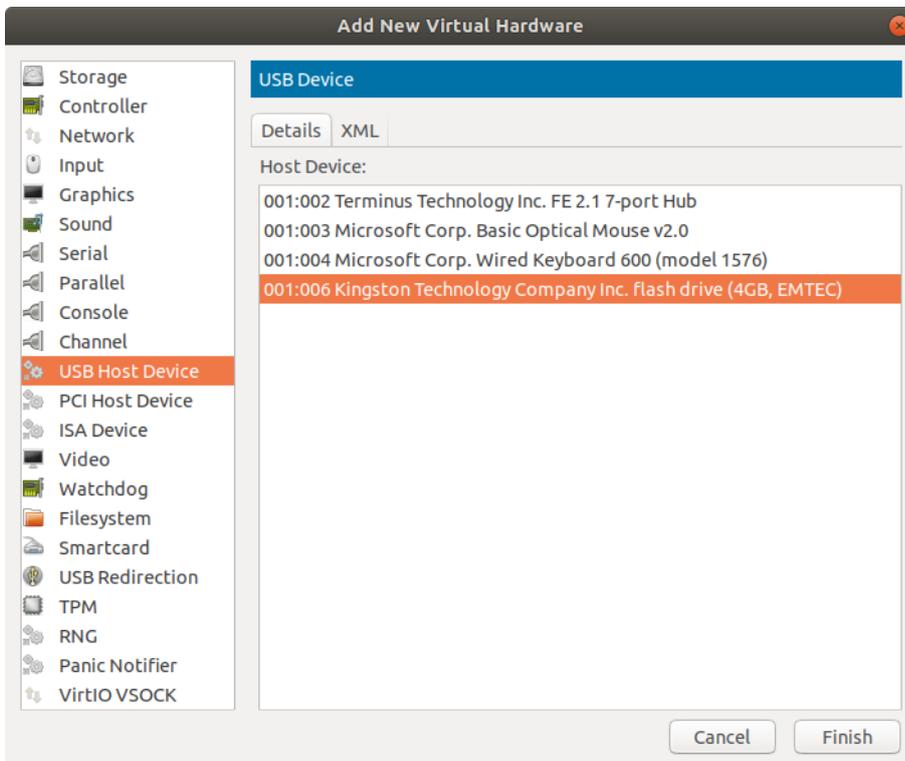


6.5 Add USB Disk Device

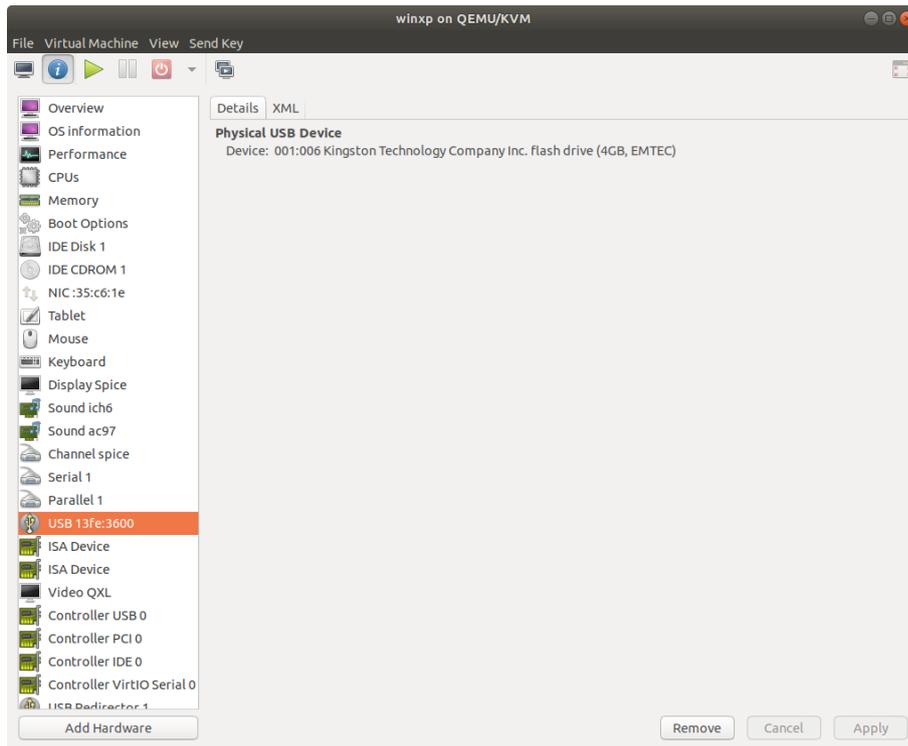
1. Click USB Host Device



2. Select your USB Device. Click **Finish**

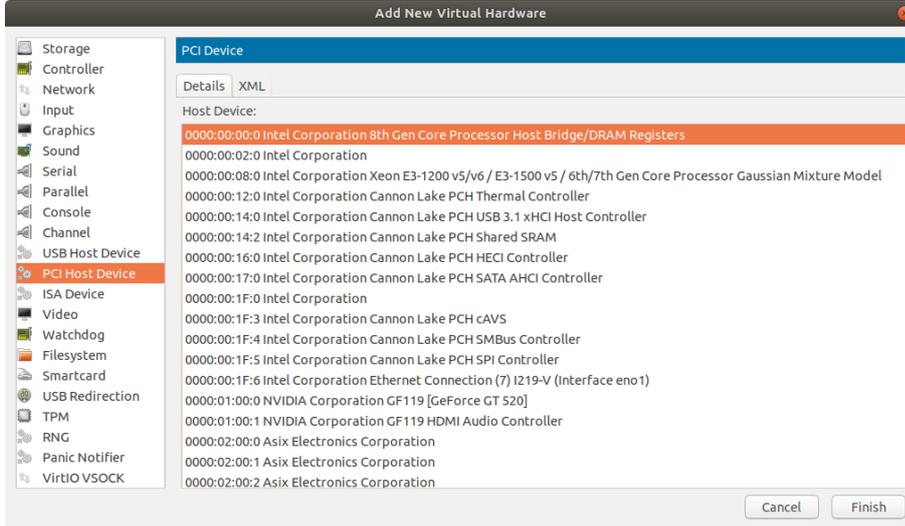


3. USB Device added to hardware details

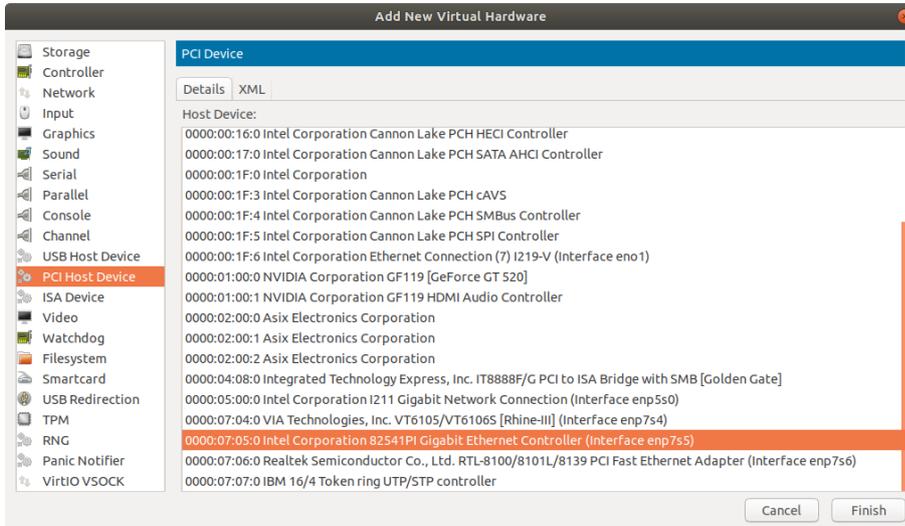


6.6 Add PCI Host Device

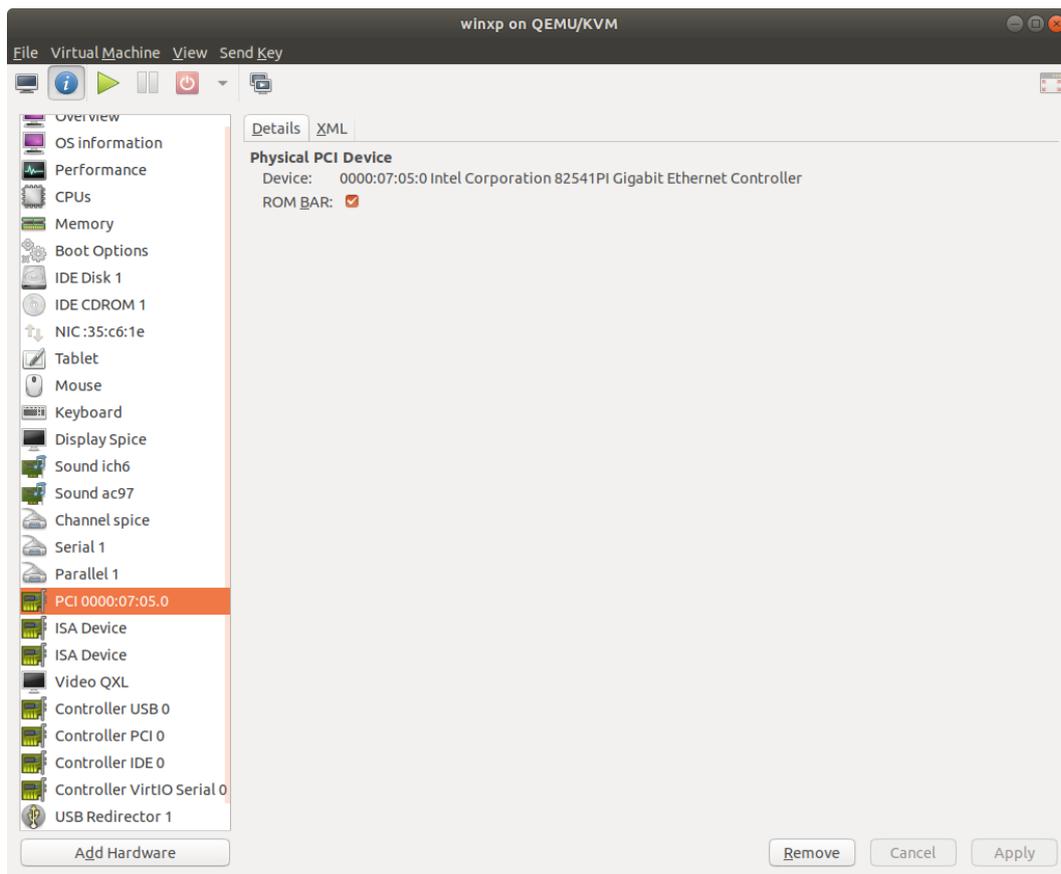
- 1. Click **PCI Host Device**



- 2. Select your PCI Host Device. Click **Finish**



3. PCI Device added to hardware details

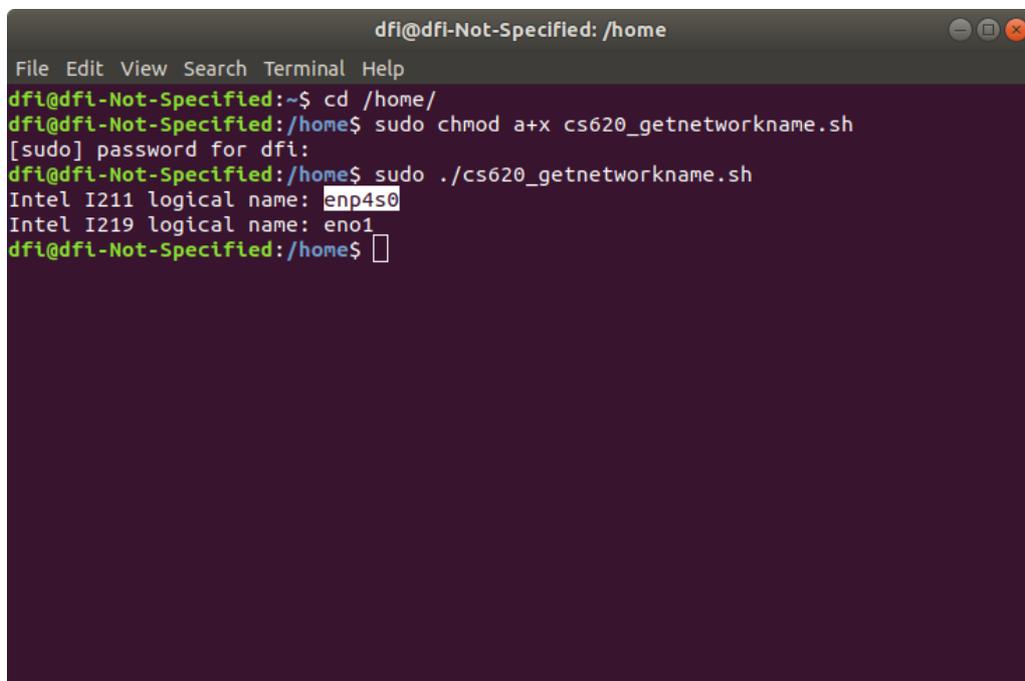


6.7 Add Network Device

There are two ways to add network device: **Network Bridge** and **PCI Passthrough**.

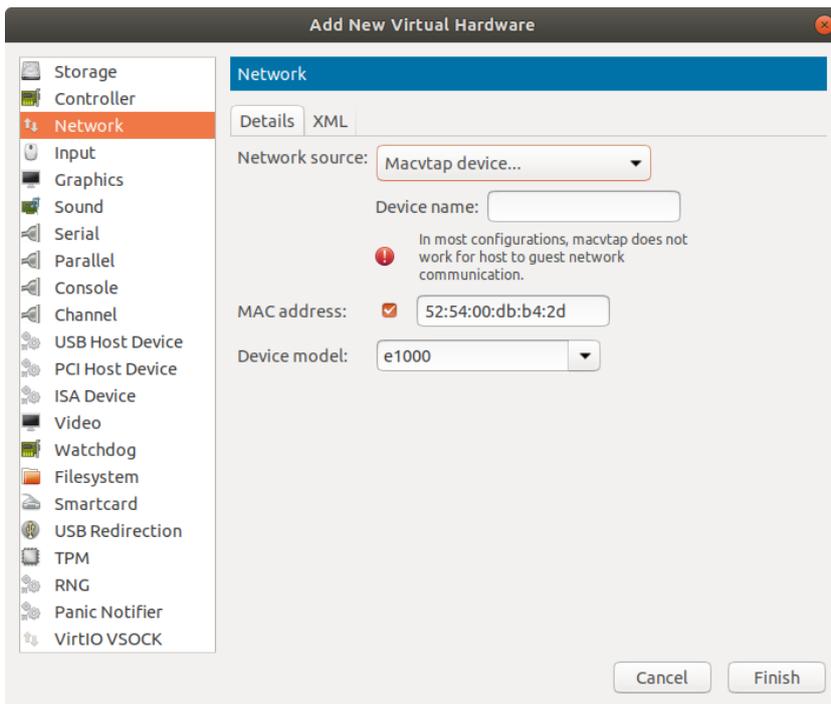
6.7.1 Network Bridge

1. In Physical Ubuntu, open **Terminal** and input `cd /home/`, then **enter**
2. Input `sudo chmod a+x cs620_getnetworkname.sh`, then **enter**
3. Input your **password**
4. Input `sudo ./cs620_getnetworkname.sh`, then **enter**
5. There will show two Intel network devices I211 and I219. Select one you would like to do network bridge. Ex. enp4s0 if I211

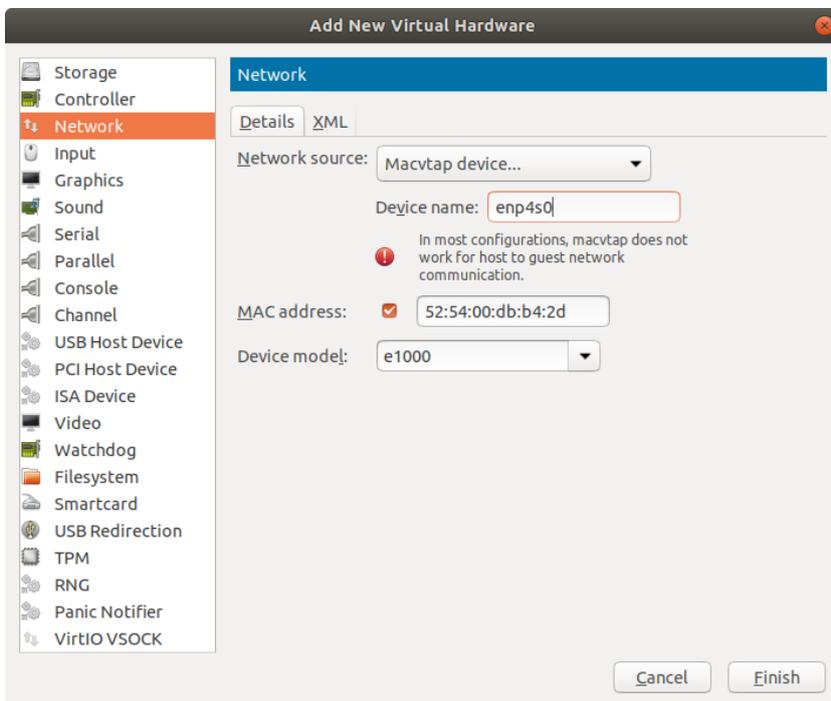


```
dfi@dfi-Not-Specified: /home
File Edit View Search Terminal Help
dfi@dfi-Not-Specified:~$ cd /home/
dfi@dfi-Not-Specified:/home$ sudo chmod a+x cs620_getnetworkname.sh
[sudo] password for dfi:
dfi@dfi-Not-Specified:/home$ sudo ./cs620_getnetworkname.sh
Intel I211 logical name: enp4s0
Intel I219 logical name: eno1
dfi@dfi-Not-Specified:/home$
```

6. Click **Network**. In **Network source**, select **Mactap device...**



7. In **Device Name**, input **enp4s0**, then **MAC address** will be produced automatically. You can modify a specific mac address here. In **Device model**, select **e1000**

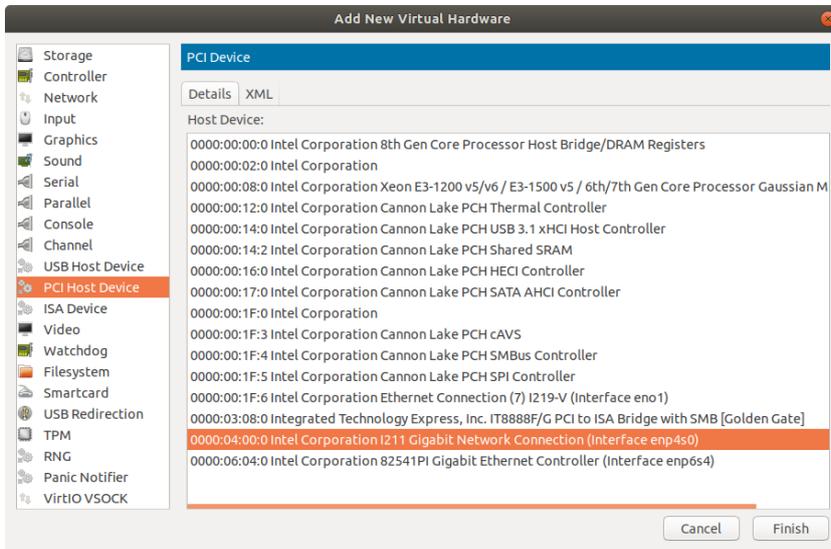


Note

After adding network bridge device, Windows will enumerate a new Ethernet device. Please refer to [Ch 7.1](#) to install Ethernet driver.

6.7.2 PCI Passthrough

1. Click **PCI Host Device**. Select **LAN Device (I211)**. Click **Finish**



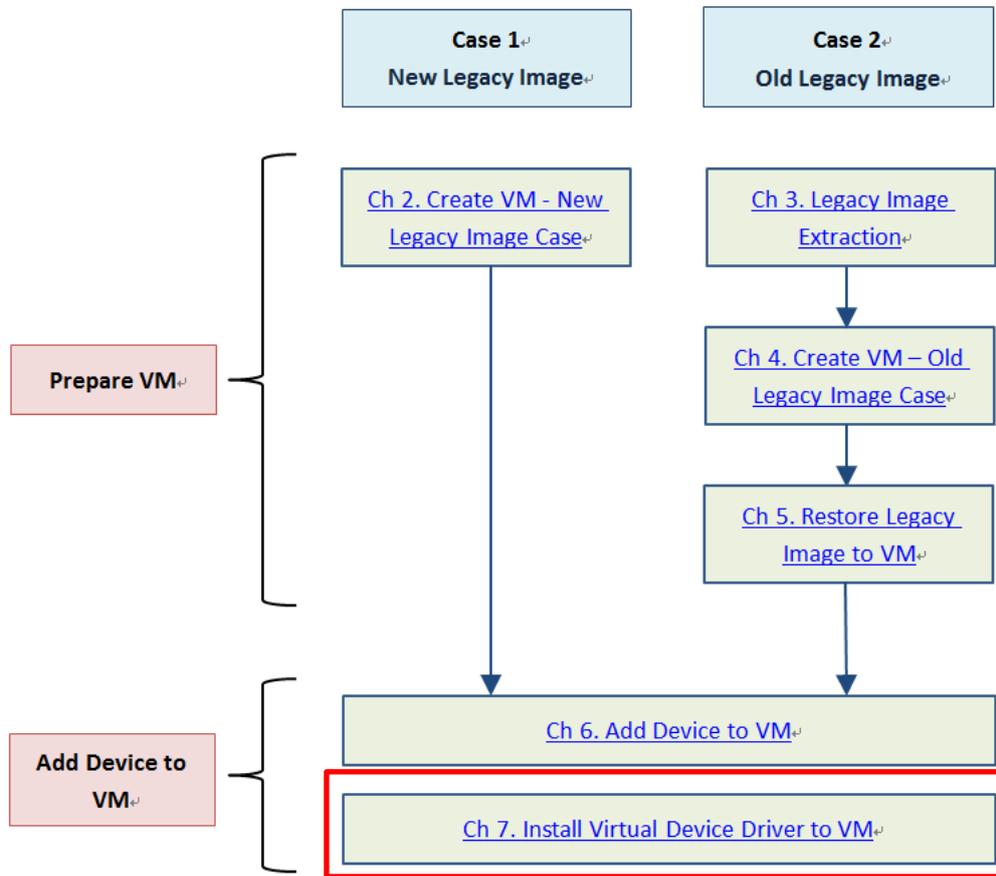
Note

After adding Ethernet PCI host device, Windows will enumerate a new Ethernet device. Please refer to [Ch 7.1](#) to install Ethernet driver.

Note

Due to lacking of Windows XP driver of Intel I219 Ethernet controller, do not passthrough Intel I219 Ethernet device.

7 Install Virtual Device Driver to VM

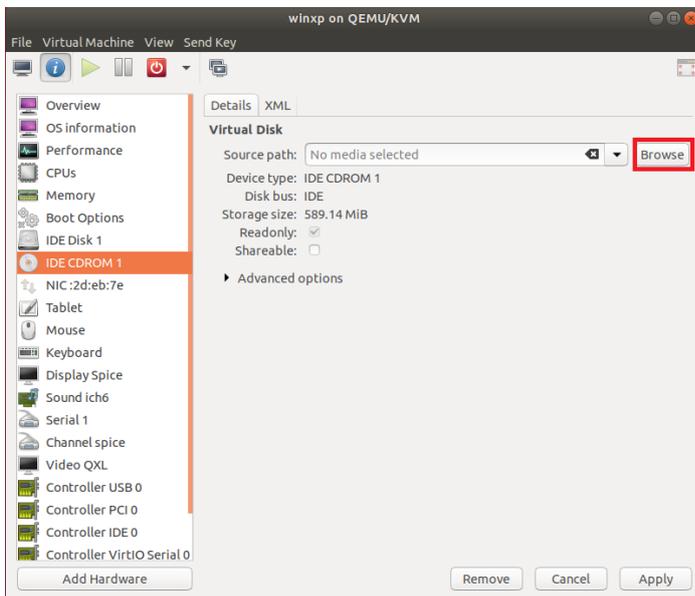


7.1 Install Virtual Device Driver

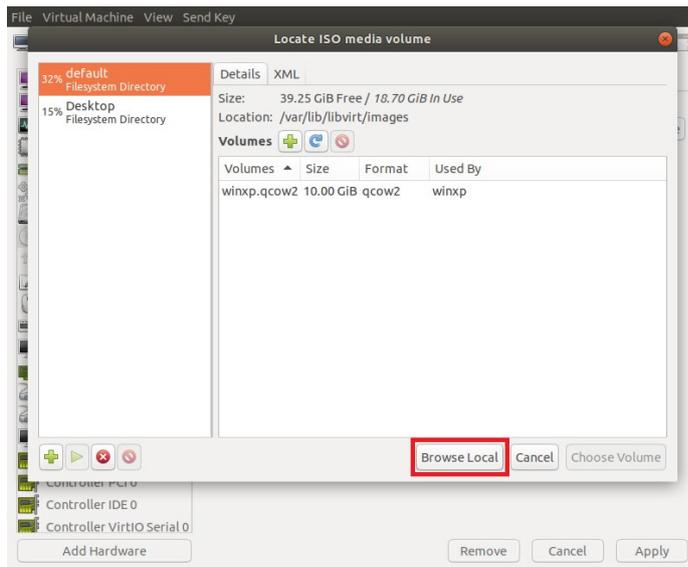
1. Open created VM and get into Windows desktop
2. Click **Show virtual hardware details**



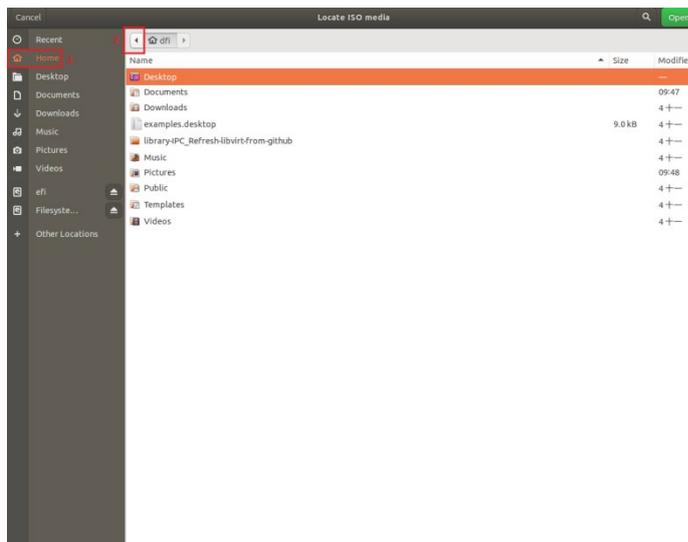
3. Click **IDE CDROM1**. Then click **Browse**



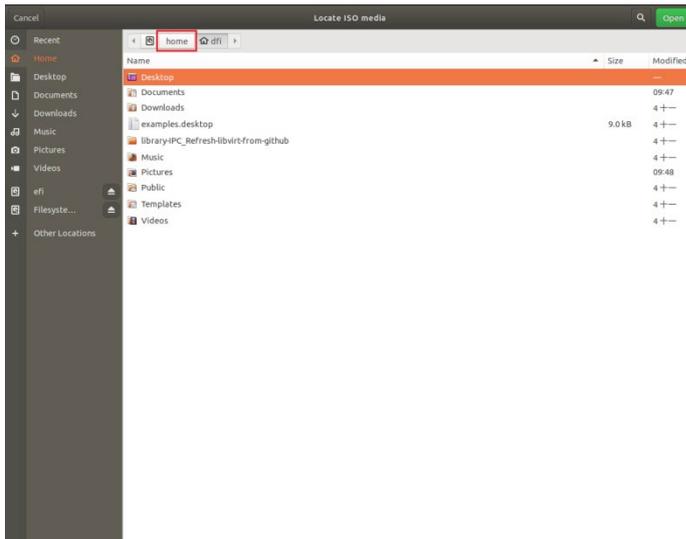
4. In next page, click **Browse Local**



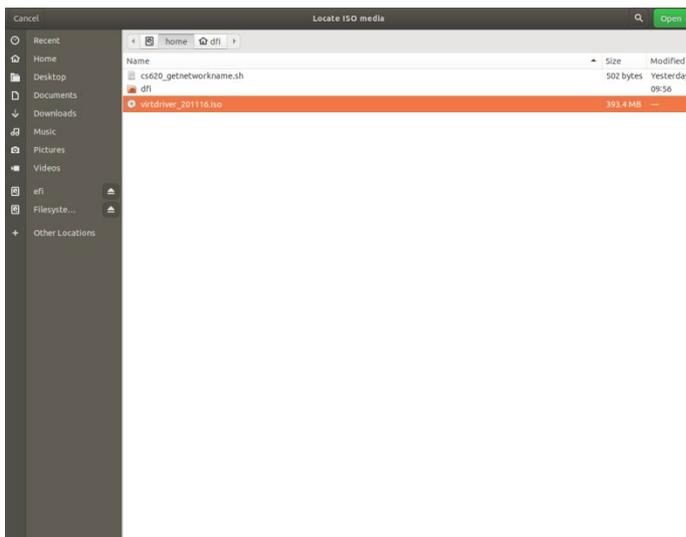
5. Click **Home**. Then click **Left Arrow**



6. Click [home](#)



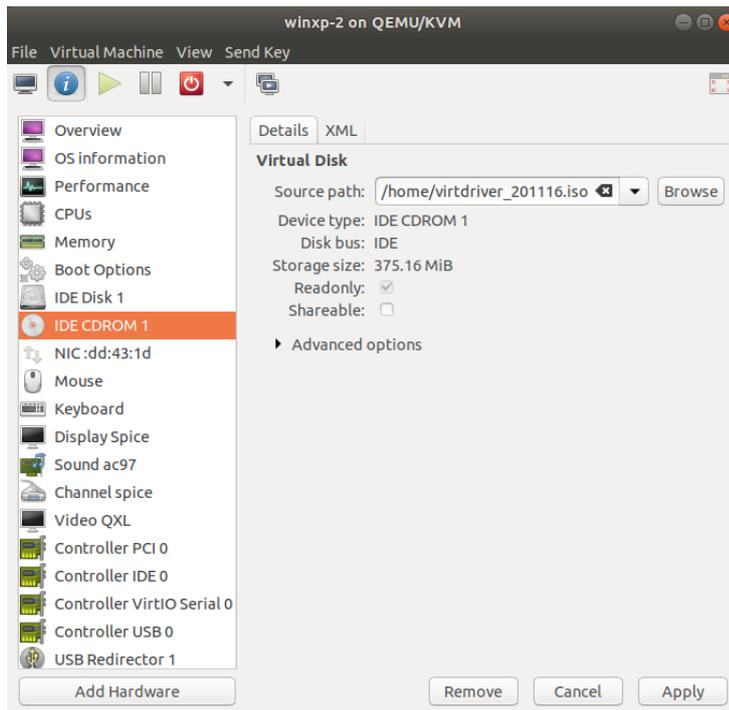
7. You will see a file named [virtdriver_XXXXXX.iso](#). Select it and click [open](#)



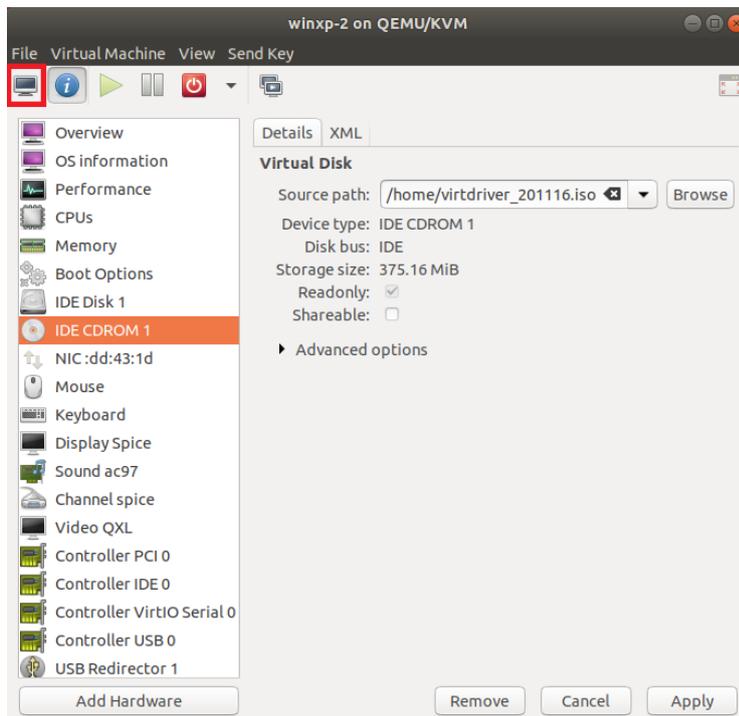
Note

If you don't see this file in the folder, please contact to DFI FAE.

8. In source path, the file path will be shown on it, then click **Apply**



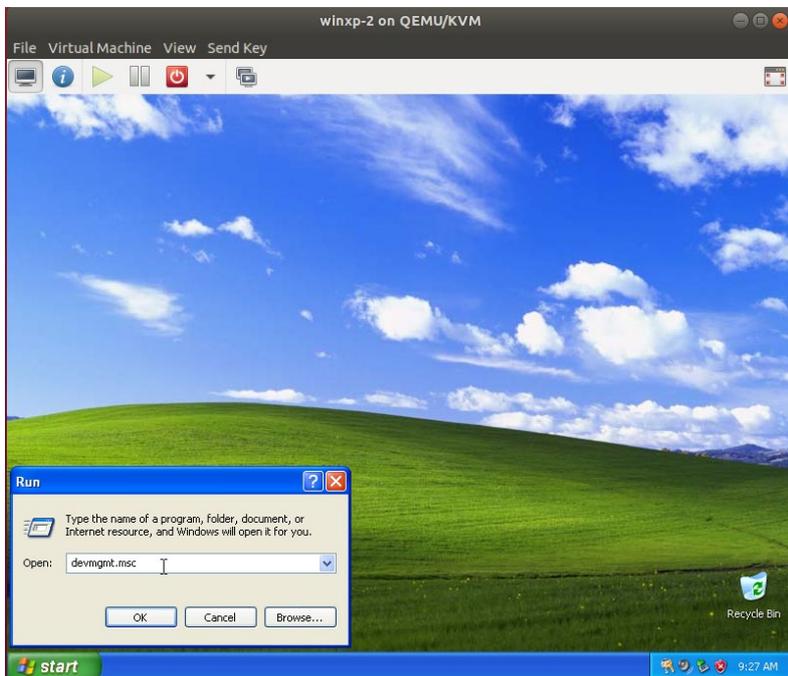
9. Back to graphical console.



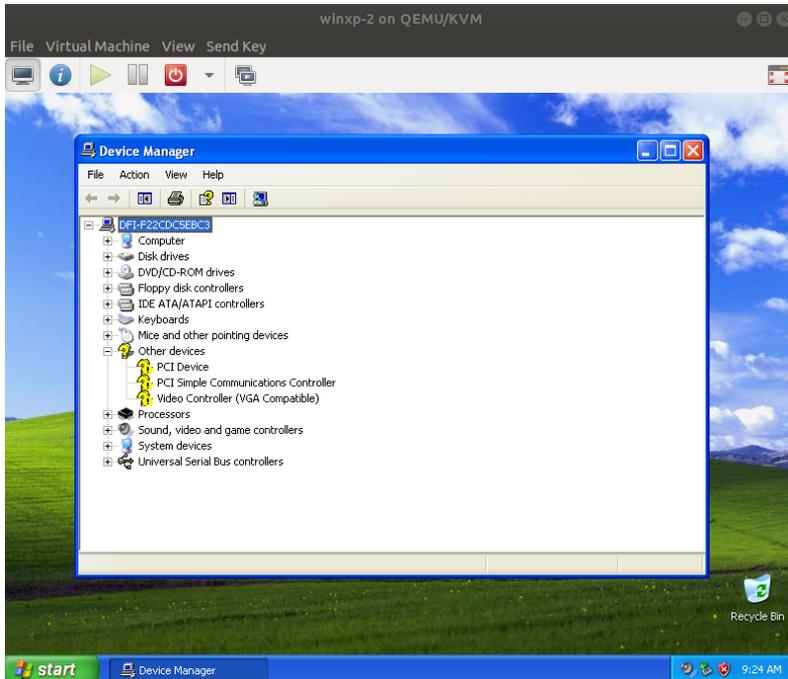
10. Windows will open an explorer window. Just close it
11. On Windows Desktop, click **Start**, then click **Run**



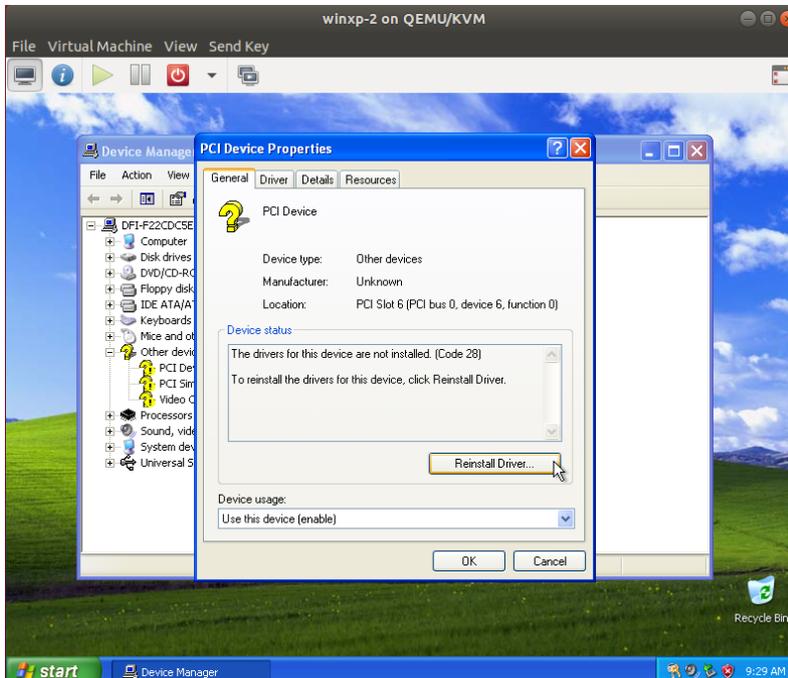
12. Input `devmgmt.msc`, press enter. That will open device manager



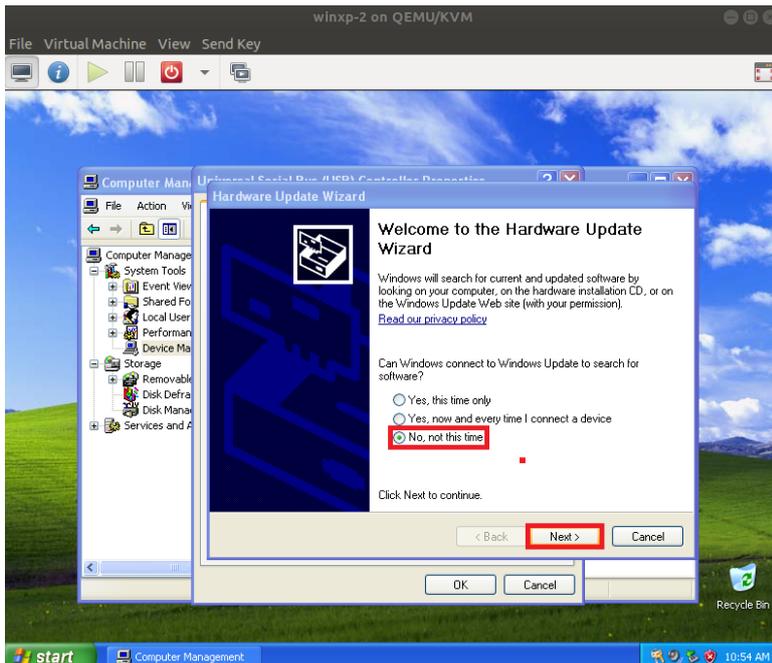
13. On device manager, you will see three devices: **PCI Device**, **PCI Simple Communication Controller** and **Video Controller (VGA compatible)** with yellow mark in other devices class



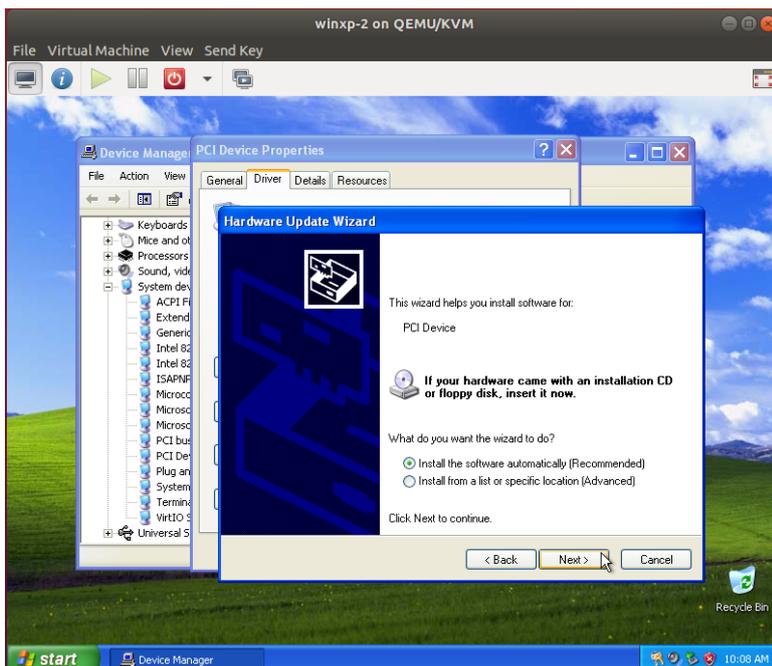
14. Double click **PCI Device**, click **Reinstall Driver**



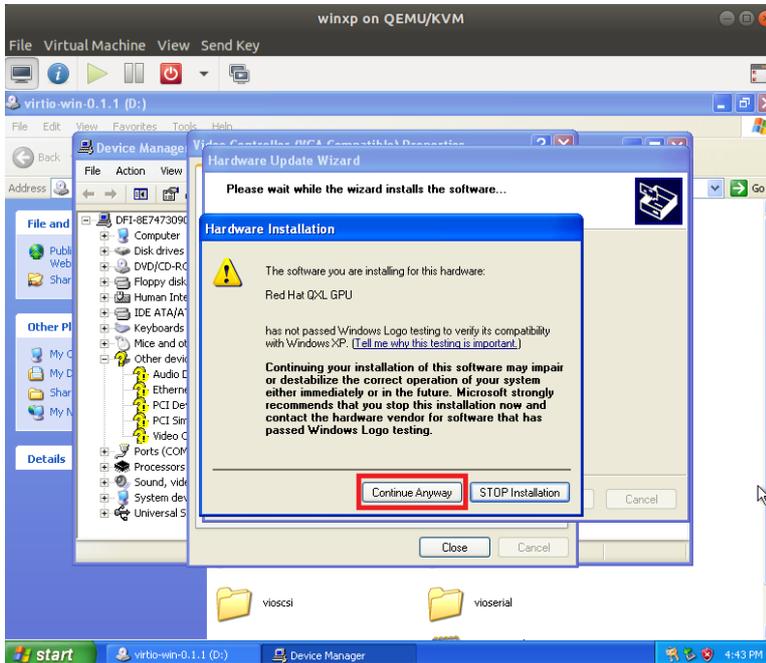
15. Check **No, not this time**, then click **Next**



16. Click **Next**, the wizard will search appropriate driver to install automatically



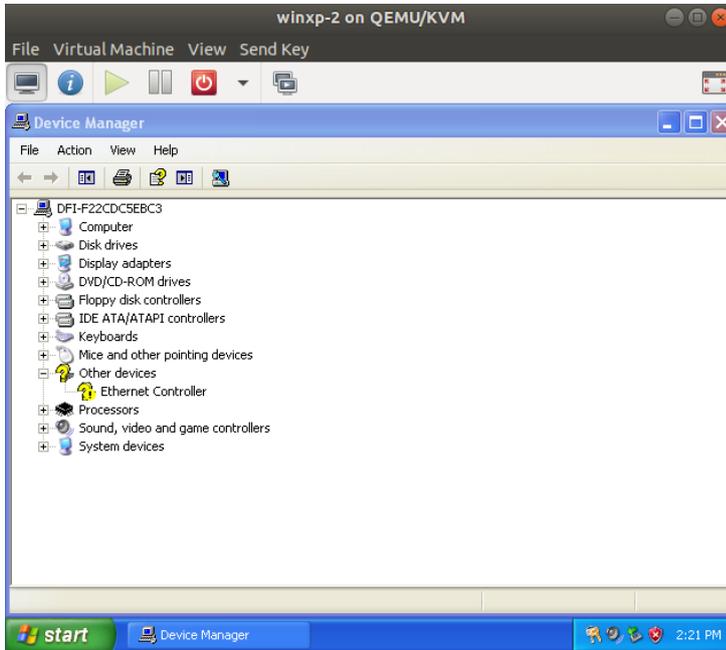
17. After installation completed, click **Finish**
18. Repeat step 12 ~ 15 to complete other two devices driver installation
19. If you see a message like below, just click **Continue Anyway** to install driver



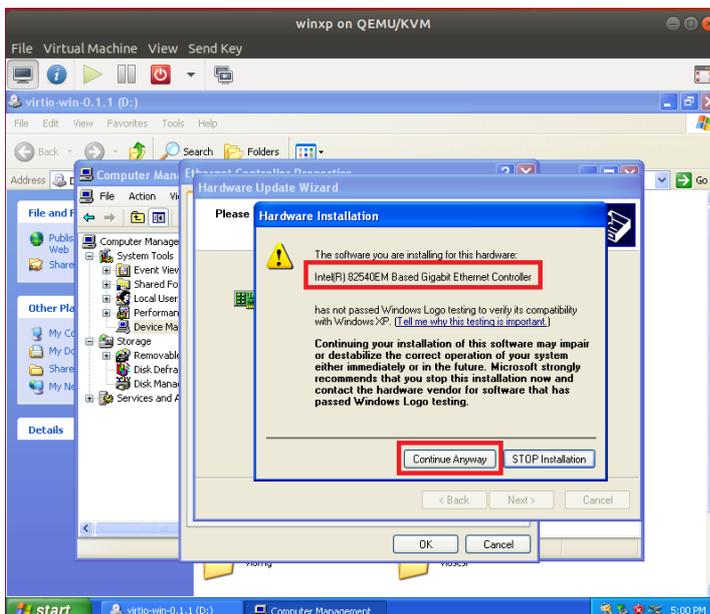
7.2 Install Ethernet Controller Driver

7.2.1 Network Bridge: Simulate Intel e1000 Ethernet controller

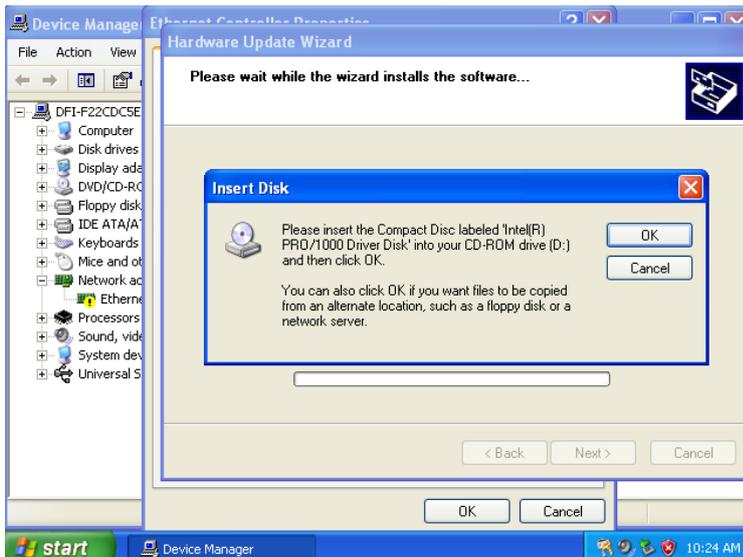
1. Follow step 1 ~ 16 at [Ch 7.1](#) to complete installing Ethernet controller driver



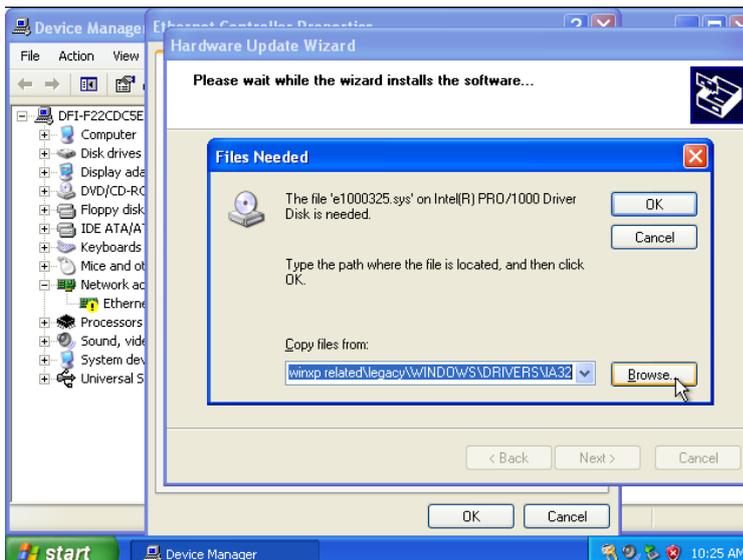
2. Click **Continue Anyway**



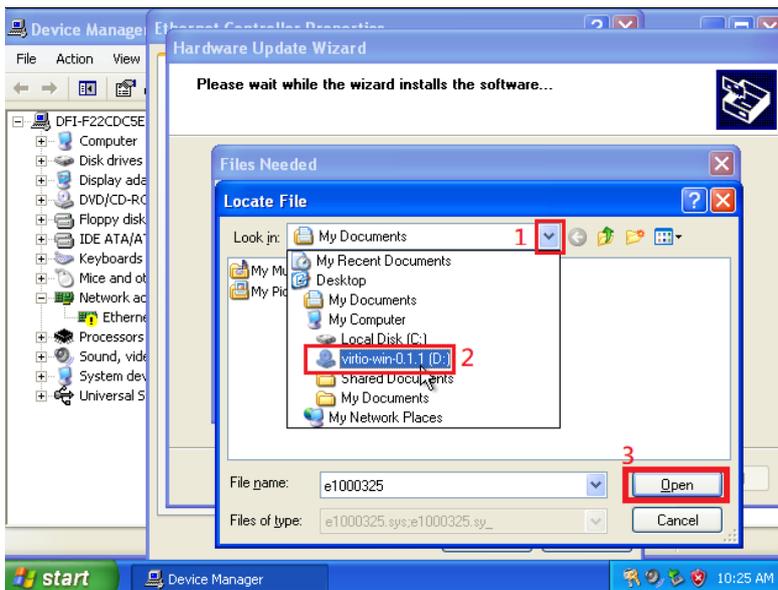
3. Click OK



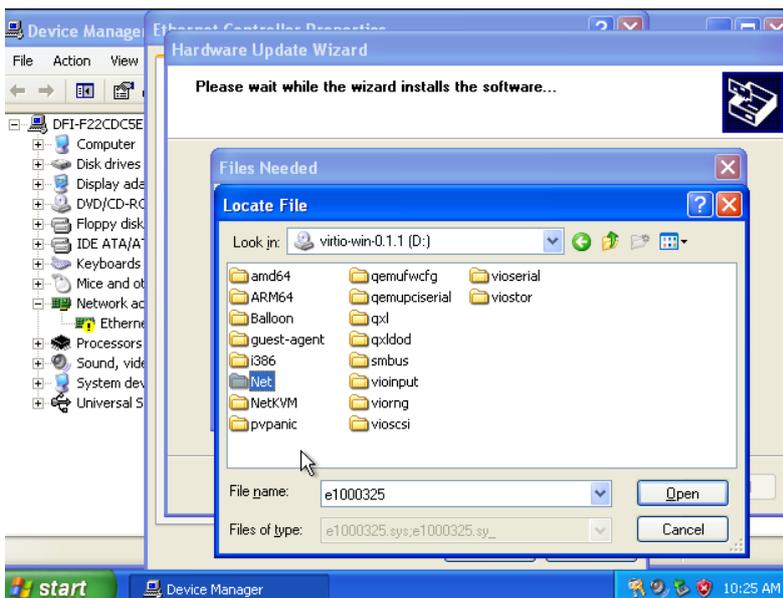
4. Click Browse



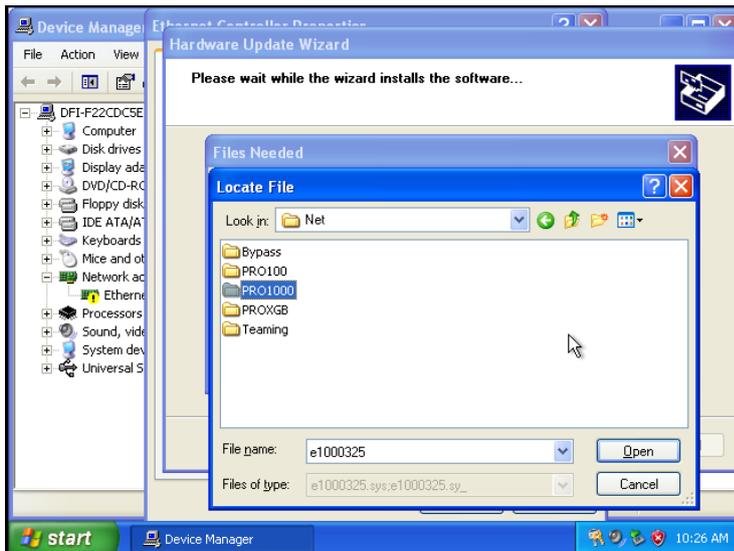
5. Click **down arrow**, then select **virtio-win-0.1.1 (D:)**, then click **Open**



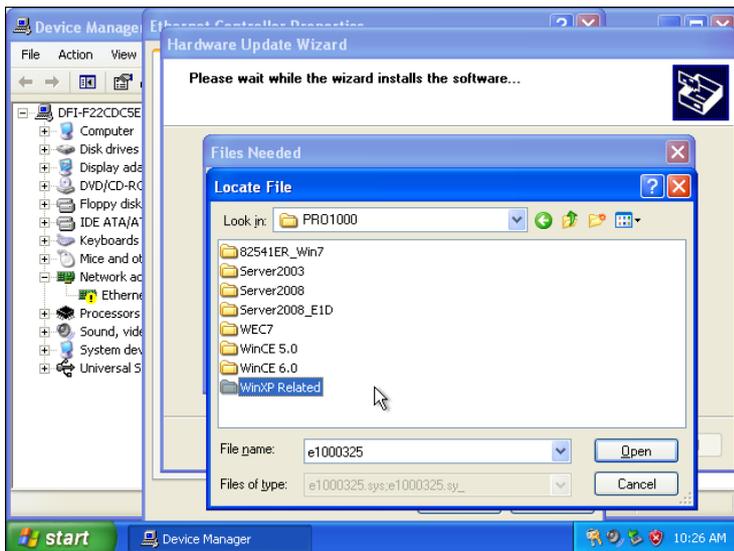
6. Double click **Net**



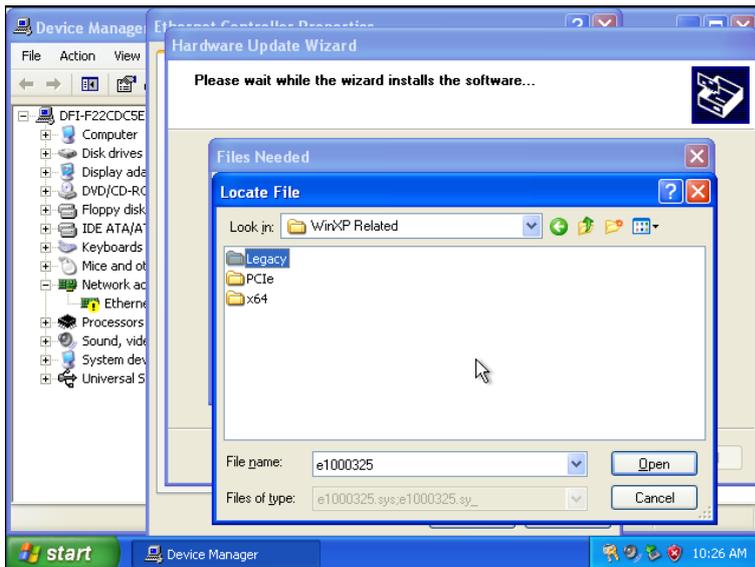
7. Double click **PRO1000**



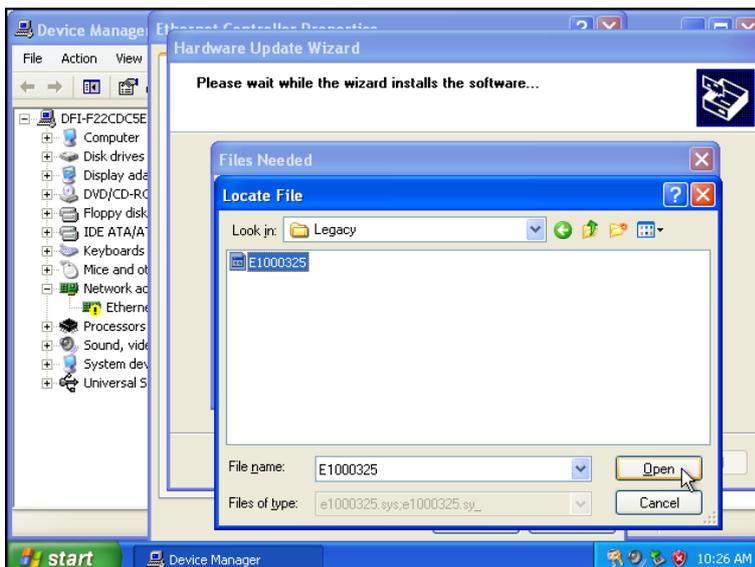
8. Double click **WinXP Related**



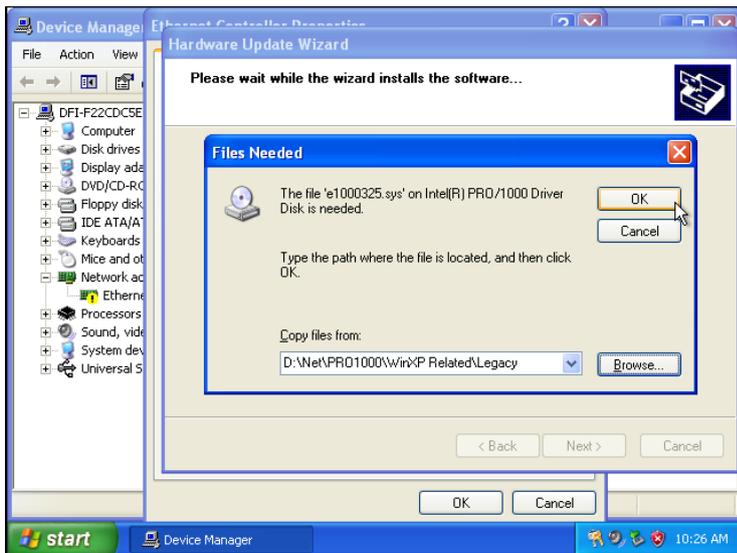
9. Double click **Legacy**



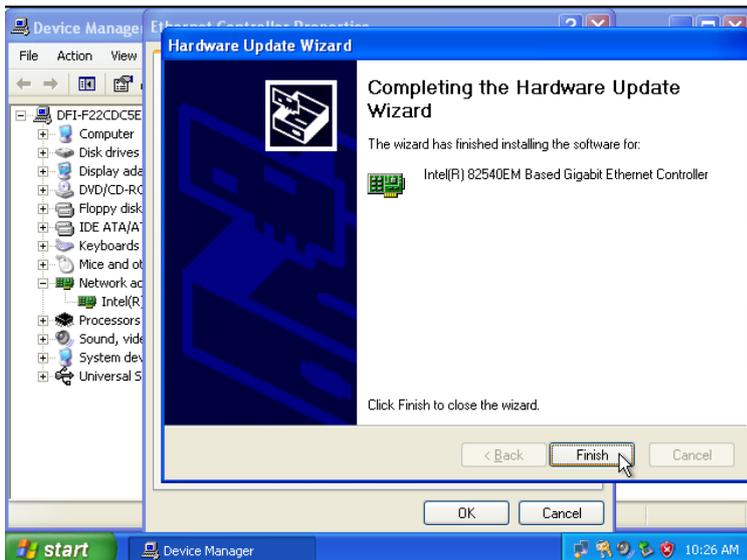
10. Click **E1000325**, then click **Open**



11. Click **OK**

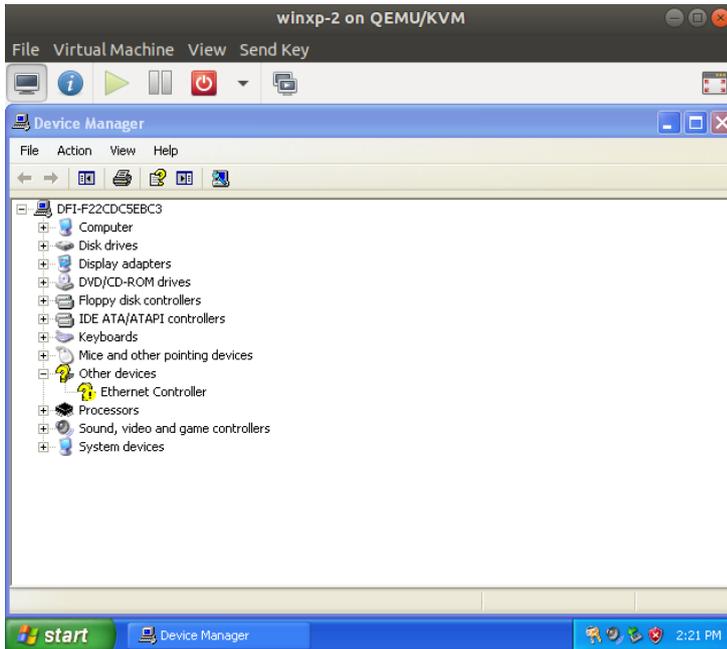


12. Click **Finish**

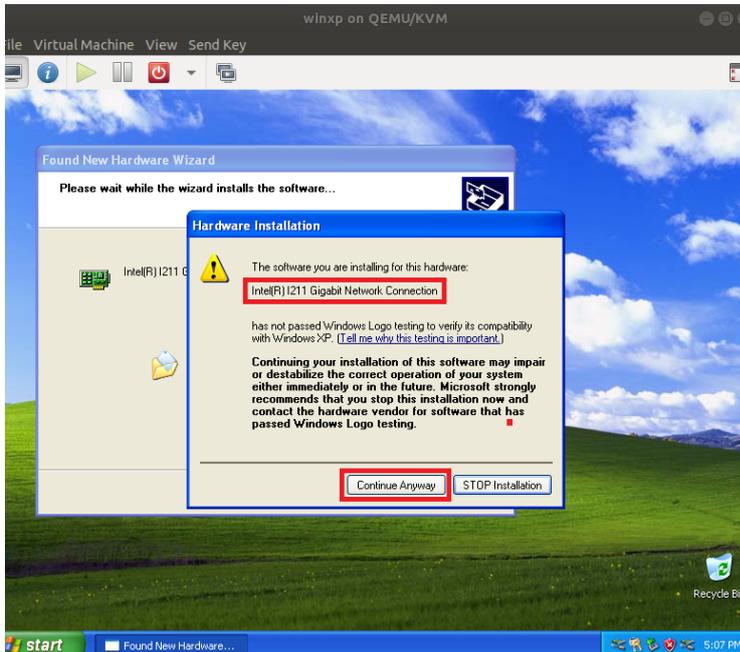


7.2.2 PCI Passthrough: onboard physical Intel I211 Ethernet controller

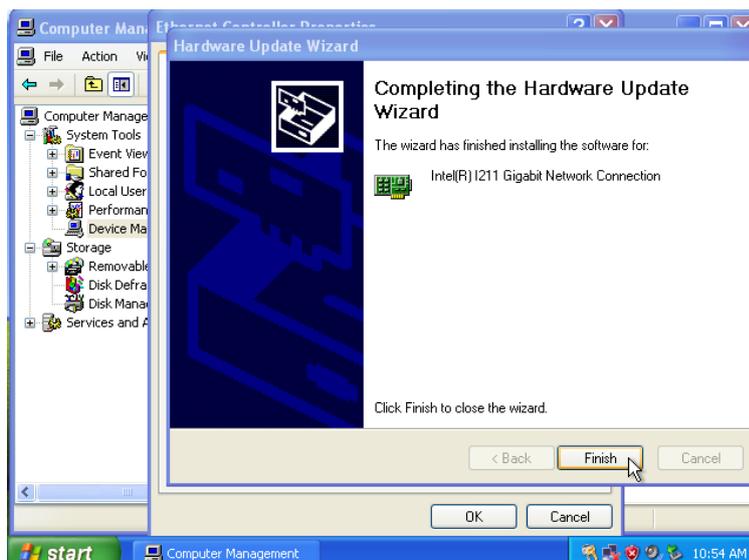
1. Follow step 1 ~ 16 at [Ch 7.1](#) to complete installing Ethernet controller driver



2. Click **Continue Anyway**



3. Click **Finish**



7.3 Install DIO Driver

1. With [virtdriver_XXXXXX.iso](#) mounted, open File Explorer.
2. Go into **DIO** folder in CD-ROM.
3. Executing **setup** to install DIO driver.
4. After installed DIO driver, you can use SMBUS / DIO function with proper library and tool.

Note:

1. This driver is for Windows XP only.
2. Please contact FAE to get SMBUS / DIO library.