

GPU Setup Guide with VMware®



DISCLAIMER

The information contained herein is for informational purposes only, and is subject to change without notice. While every precaution has been taken in the preparation of this document, it may contain technical inaccuracies, omissions and typographical errors, and AMD is under no obligation to update or otherwise correct this information. Advanced Micro Devices, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this document, and assumes no liability of any kind, including the implied warranties of non-infringement, merchantability or fitness for particular purposes, with respect to the operation or use of AMD hardware, software or other products described herein. No license, including implied or arising by estoppel, to any intellectual property rights is granted by this document. Terms and limitations applicable to the purchase or use of AMD's products are as set forth in a signed agreement between the parties or in AMD's Standard Terms and Conditions of Sale.

©2016 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD arrow, FirePro, and combinations thereof are trademarks of Advanced Micro Devices, Inc. in the United States and/or other jurisdictions. OpenCL is a trademark of Apple, Inc. and used by permission of Khronos. PCIe and PCI Express are registered trademarks of the PCI-SIG Corporation. VMware is a registered trademark of VMware, Inc. in the United States and/or other jurisdictions. Other names are for informational purposes only and may be trademarks of their respective owners.



Table of Contents

1.	Overview	4
2.	Hardware and Software Requirements	4
2.1	Hardware Requirements	4
2.1.1	Host/Server	4
2.1.2	Client.....	4
2.2	Software Requirements	5
3.	Test Environment Setup for VMware ESXi™	6
3.1	<i>Host Server Setup</i>	6
3.1.1	Install ESXi on Host	6
3.1.2	Configuring the ESX® Host	16
3.2	<i>Host Administrator System Setup</i>	19
3.2.1	Install SSH Secure Shell	19
3.2.2	Install vSphere Client 6.0.0.....	19
3.2.3	Create a Guest Virtual Machine.....	21
3.2.4	Install Guest OS on Guest VM	30
3.2.1	Pass Through Device to Guest VM	42
3.2.2	Guest VM management	48
3.3	<i>Client System Setup</i>	55
3.3.1	Horizon View Client Setup	55
3.3.2	Zero Client Setup	57
3.4	<i>Summary and GFX Driver Installation under Guest VM</i>	59
3.4.1	Graphics Driver Installation.....	60



1. Overview

This setup guide details the basic steps necessary to enable a GPU device for VDI. AMD FirePro™ S7100X, S7150 and S7150x2 family of products are recommended especially if advanced support for Multiuser GPU (MxGPU) is required. However, previous S-series products, such as the S7000 and S9050, can be used if only passthrough is required.

The guide uses VMware® products as an example setup. These products include VMware ESXi™ as a hypervisor, the VMware vSphere® client and VMware Horizon® View™.

2. Hardware and Software Requirements

The sections below detail the hardware and software that are required for setting up the VMware environment.

2.1 Hardware Requirements

2.1.1 Host/Server

Graphics Adapter: AMD FirePro™ **S7100X, S7150, S7150x2** for MxGPU and/or passthrough

***note that the AMD FirePro™ S7000, S9000 and S9050 can be used for passthrough only

Supported Server Platforms:

- Dell PowerEdge R730 Server
- HPE ProLiant DL380 Gen9 Server
- SuperMicro 1028GQ-TR Server

Additional Hardware Requirements:

- CPU: 2x4 and up
- System memory: 32GB & up; more guest VMs require more system memory
- Hard disk: 500G & up; more guest VMs require more HDD space
- Network adapter: 1000M & up

2.1.2 Client

Any of the following client devices can be used to access the virtual machine once these VMs are started on the host server:

- Zero client (up to 4 connectors) with standard mouse/keyboard and monitor
- Thin client with standard mouse/keyboard and monitor running Microsoft® Windows® Embedded OS
- Laptop/Desktop with standard mouse/keyboard and monitor running with Microsoft® Windows® 7 and up



2.2 Software Requirements

Product	Type	Install On	Section	Version/Download Location
VMware ESXi™	Hypervisor	Host (Server)	3.1.1	https://my.vmware.com/en/web/vmware/evalcenter?p=free-esxi6
VMware vSphere®	Client for Host	Host Admin. System	3.2.2	https://my.vmware.com/en/web/vmware/evalcenter?p=vsphere6
VMware Horizon® View™	Client Receiver	Client Terminal	3.3.1	http://www.vmware.com/products/horizon-view/horizon6-hol
Horizon® View™ Agent	Connection Broker	Virtual Machine	3.2.4.4	https://my.vmware.com/web/vmware/info?slug=desktop_end_user_computing/vmware_horizon_6/6_2
Horizon® View™ Agent Direct-Connection Plug-in	Plug-in	Virtual Machine	3.2.4.4	https://my.vmware.com/web/vmware/info?slug=desktop_end_user_computing/vmware_horizon_6/6_2
Windows Client OS	Guest OS	Virtual Machine	3.2.4	Windows 7 64 bit, Windows 10 64 bit
AMD FirePro™ Driver	Guest OS Graphics Driver	Virtual Machine	3.4.1	http://support.amd.com/en-us/download/workstation?os=VMware%20vSphere%20ESXi%206.0#catalyst-pro
SSH Secure Shell	SSH Client and Download Utility	Host Admin. System	3.2.1	

Table 1 : Required Software for Document

(Links to non-AMD software provided as examples)



3. Test Environment Setup for VMware ESXi™

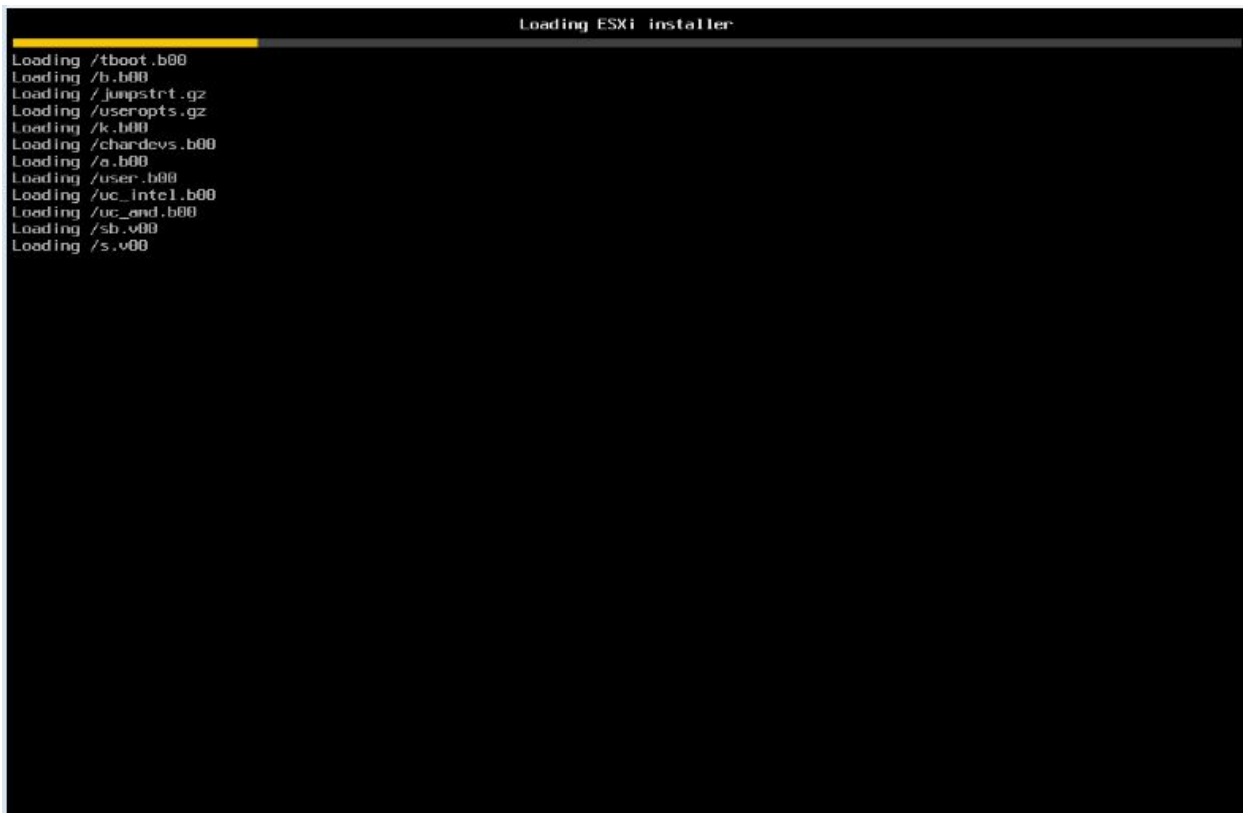
3.1 Host Server Setup

If ESXi is already installed on the host (server) then the steps in this section are not required.

3.1.1 Install ESXi on Host

If the VMware ESXi hypervisor is not yet installed on the host (server), then obtain a purchased copy of the software from the IT organization. Alternatively, trial versions of the hypervisor are available. The valid period of the trial licenses for ESX is 60 days.

1. Create a DVD ROM of the ESXi ISO after downloading the hypervisor from **Table 1**.
2. Connect a monitor to the host display, connect at least one of the network connectors (1000M Ethernet card is preferred) to the LAN, attach a USB DVD ROM to the server (or use the internal DVD ROM drive), set the DVD to be the first boot device. Next, place the DVD in the DVD ROM drive and reboot the server. After reboot, the installation starts with a screen similar to the following :



```
Loading ESXi installer
Loading /tboot.b00
Loading /b.b00
Loading /jumpstrt.gz
Loading /useropts.gz
Loading /k.b00
Loading /chardevs.b00
Loading /a.b00
Loading /user.b00
Loading /uc_intel.b00
Loading /uc_and.b00
Loading /sb.v00
Loading /s.v00
```



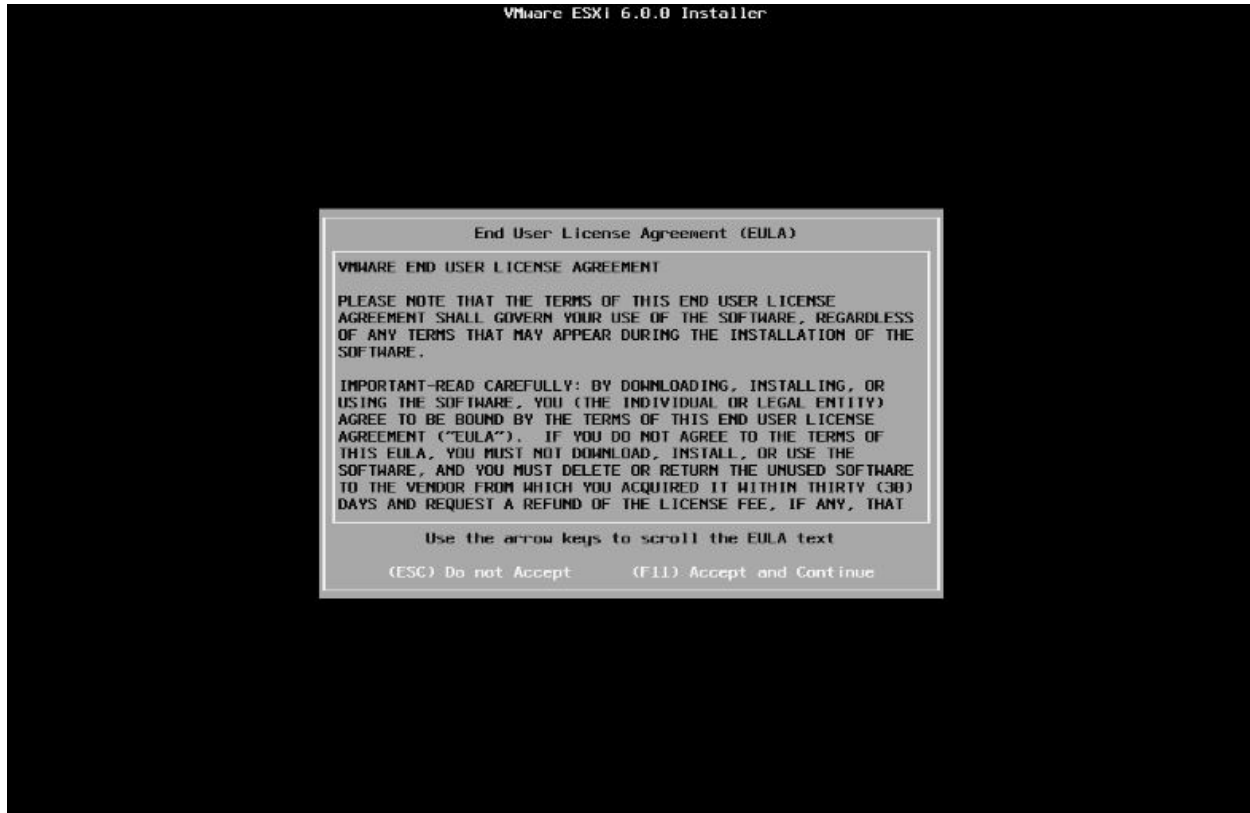
3. Before installing the hypervisor, the installation ISO loads drivers for common hardware devices detected in the host. Installation should proceed unless an unknown device (without drivers) is detected.

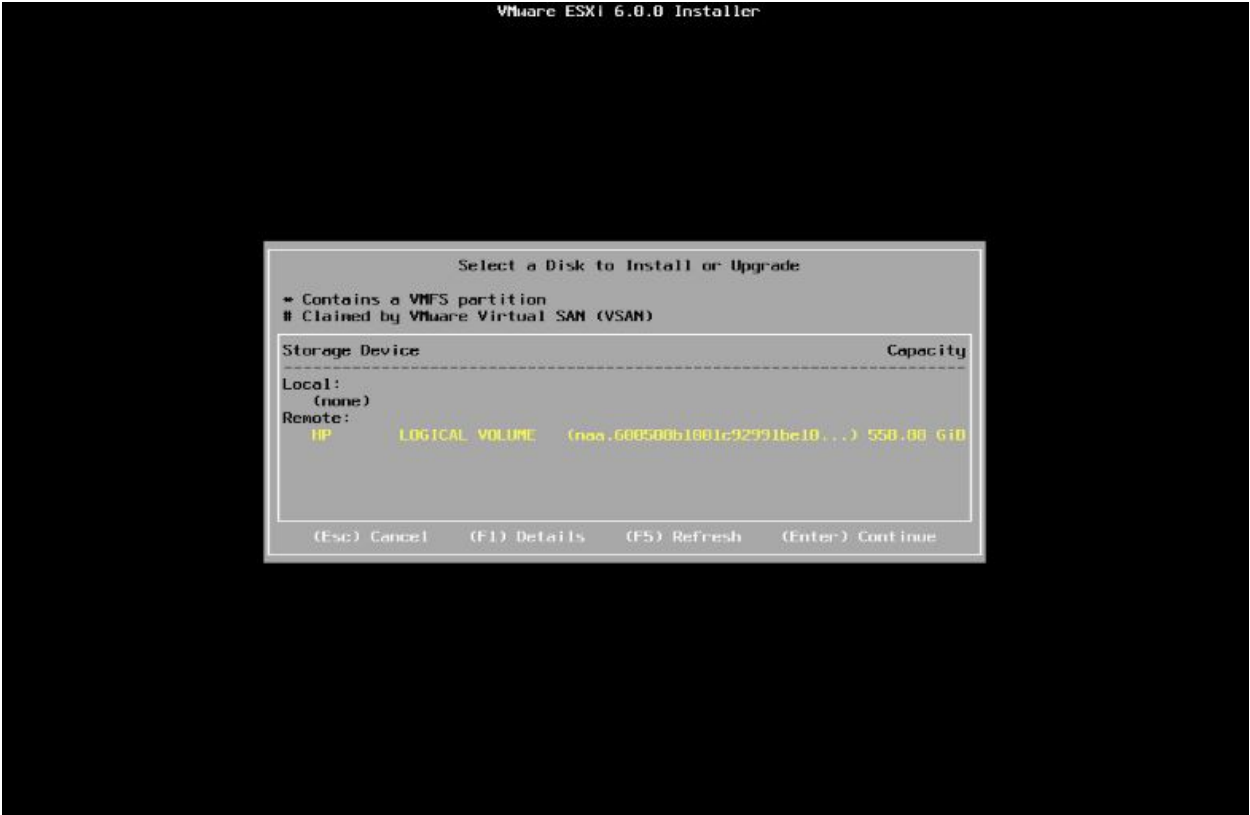


4. Once all required services and drivers are loaded, the welcome screen appears and prompts for confirmation before installing ESXi.



5. Follow the instructions shown on the monitor, and choose the default settings when prompted.







6. When prompted, create a **root password** and take note of this password.



7. Depending on the current state of the host, additional screens may appear.



8. A final confirmation prompt appears. Select “F11”.

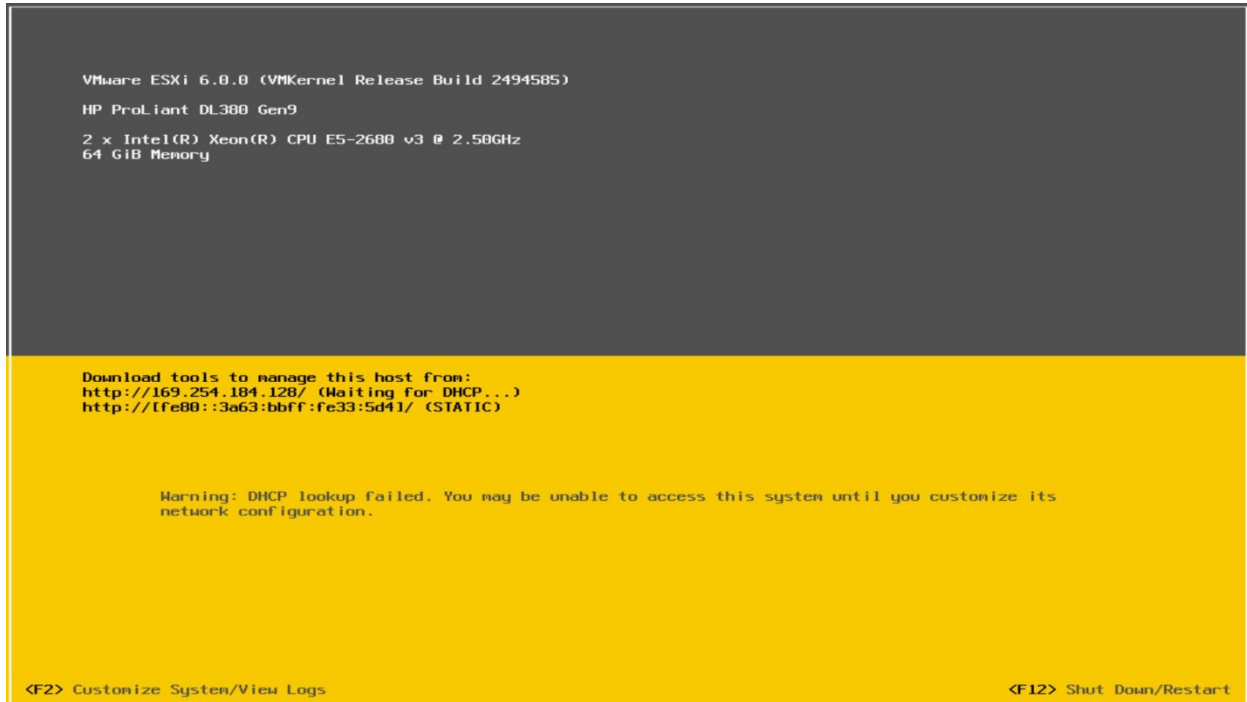


9. Select "Enter" to reboot the host after installation completes.



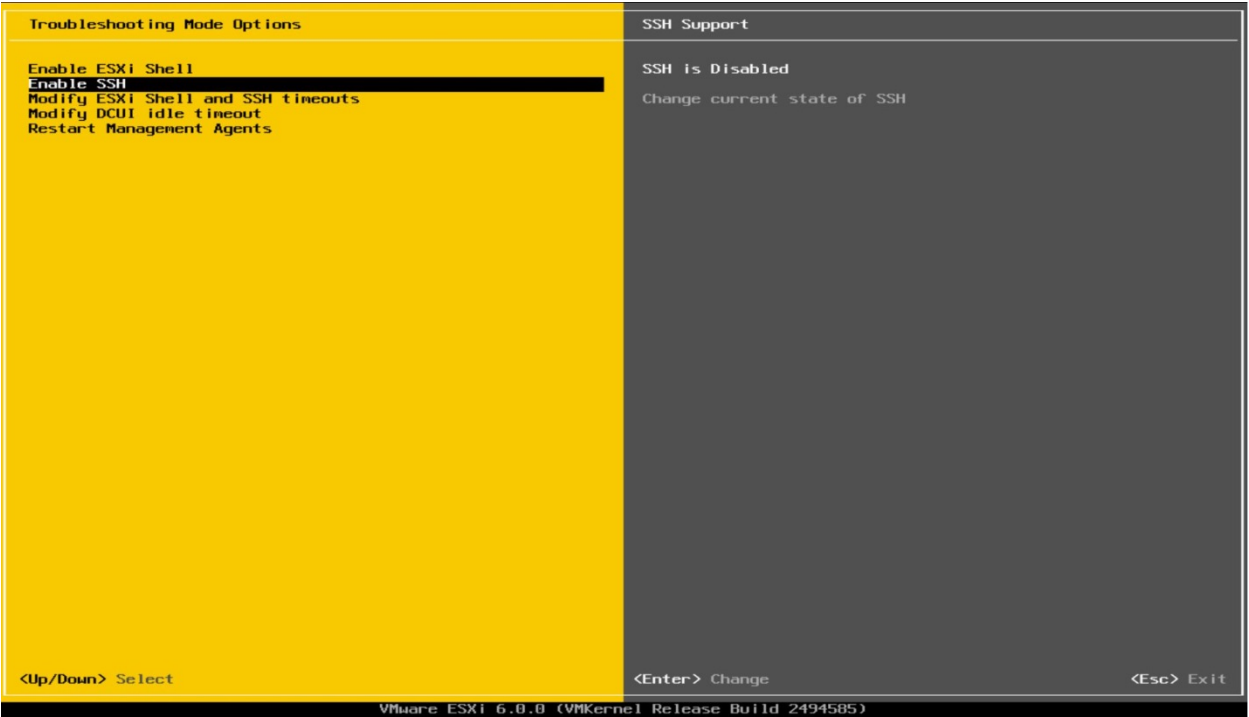
3.1.2 Configuring the ESX® Host

After reboot, the following screen appears:

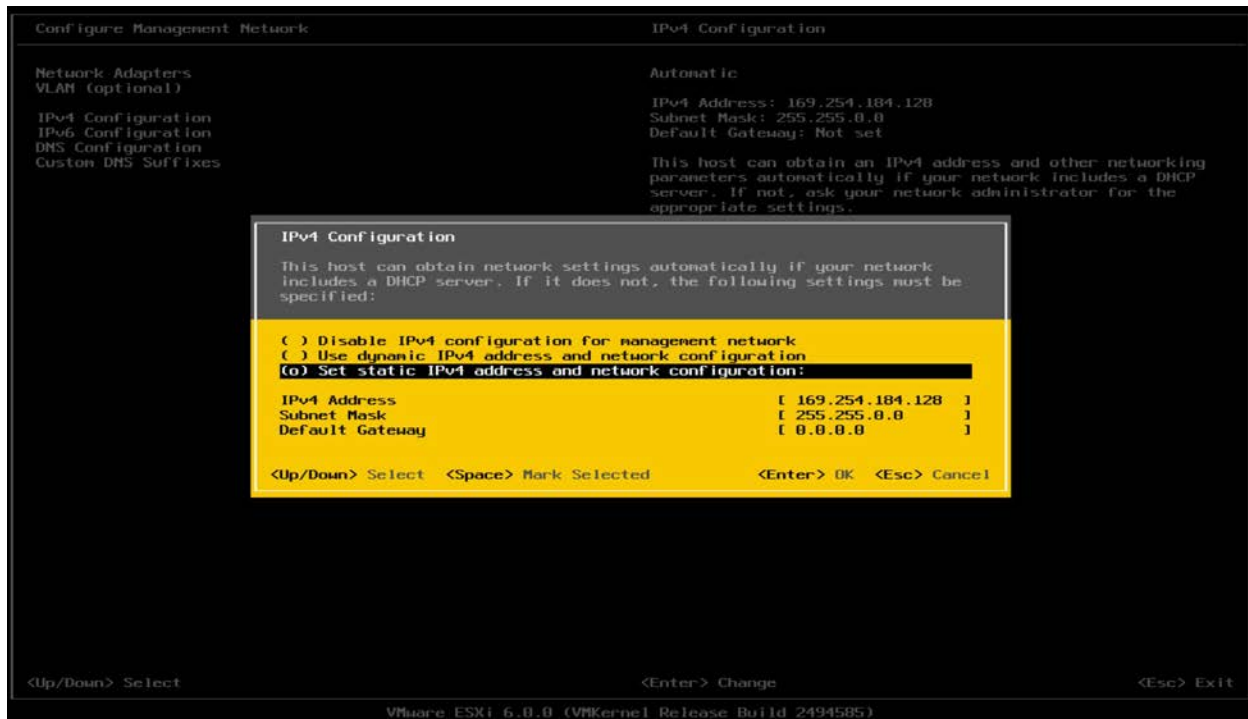


1. Select the “F2” button (“**Customize System/View Logs**”)
2. After entering the **root password** chosen during installation, select “**Troubleshooting Options**”, then select “**Enable ESXi Shell**” and “**Enable SSH**”

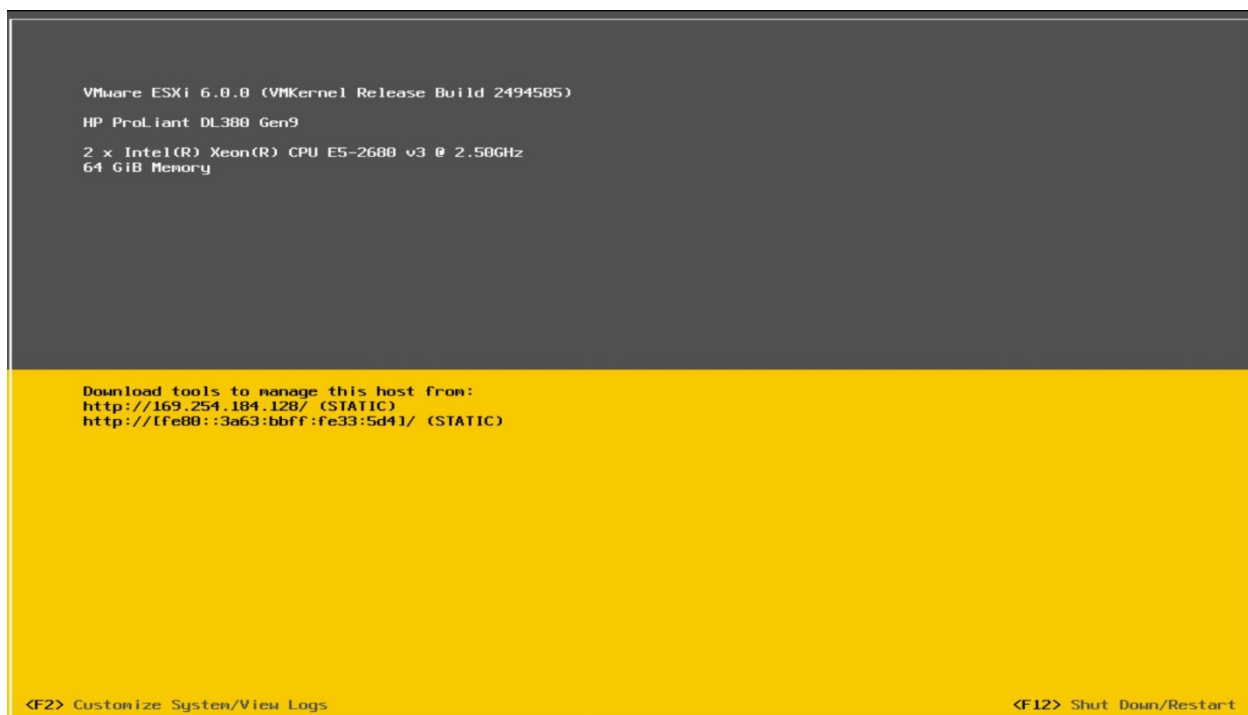




- Choose “Configure Management Network” and select “IPv4 Configuration”. Use the “static” address.



- Save the IP address shown below to access host through either SSH or vSphere client later.



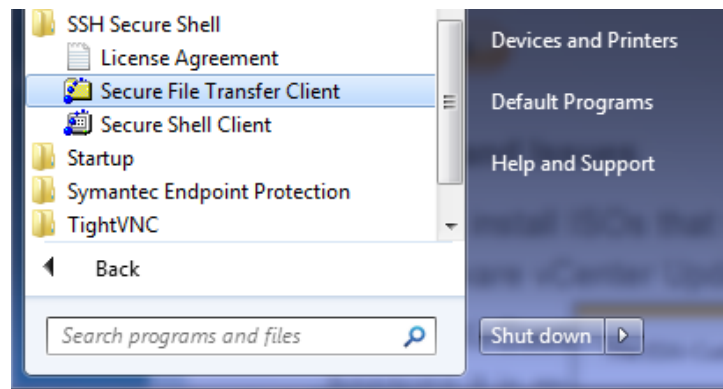
3.2 Host Administrator System Setup

3.2.1 Install SSH Secure Shell

SSH Secure Shell will be needed for future updates and installations. This section assumes that SSH has already been enabled on the host (see previous section).

1. On the administrator system, download SSH Secure Shell from **Table 1**.
2. Run this application.

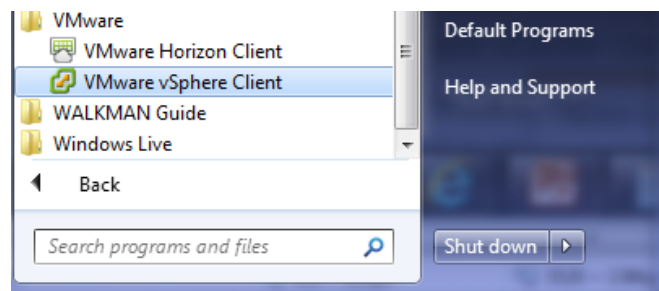
3. After installation, two utilities will be installed as Secure Shell Client & Secure File Transfer Client as the following :



3.2.2 Install vSphere Client 6.0.0

1. On the administrator system, download the vSphere client from **Table 1**.
2. Run this application: VMware-Setup.exe

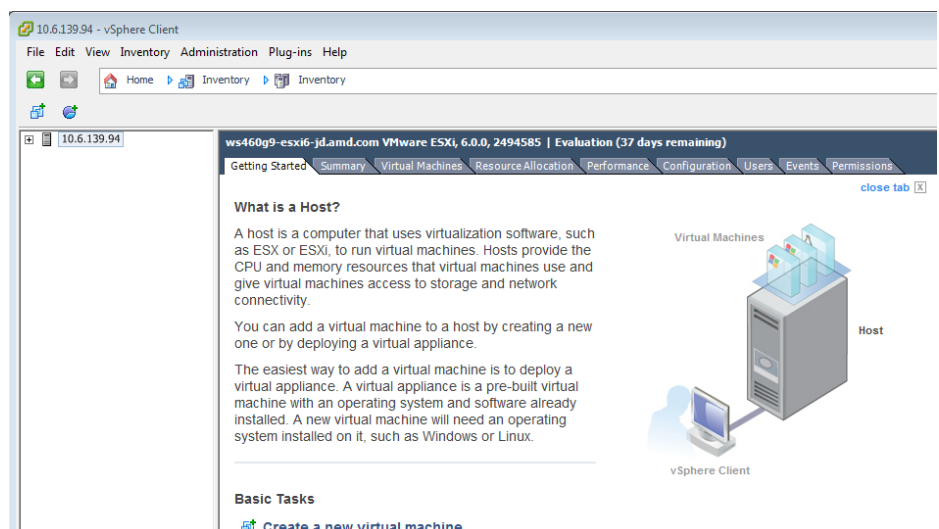
3. After installation, the VMware vSphere client will be installed as



4. Start this application. Ensure that the ESXi host server is up and running. Enter the ESXi host IP address (as noted previously) or computer name in “IP address / Name” entry field. Type “root” in “User Name” entry field. Enter the password created while setting up ESXi in the host server. Click Login button to connect to host.



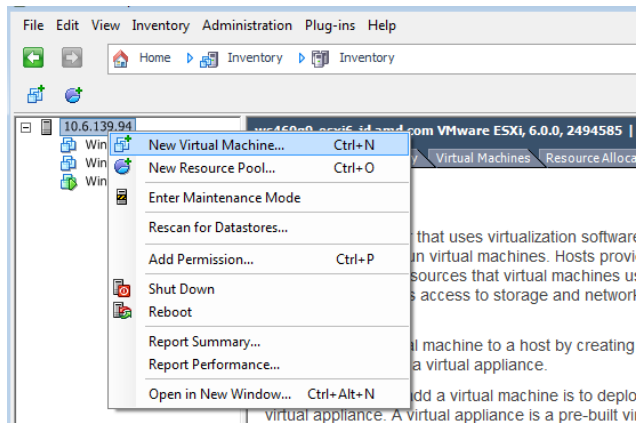
5. Once connected to the host, the vSphere client application displays a similar window to this :



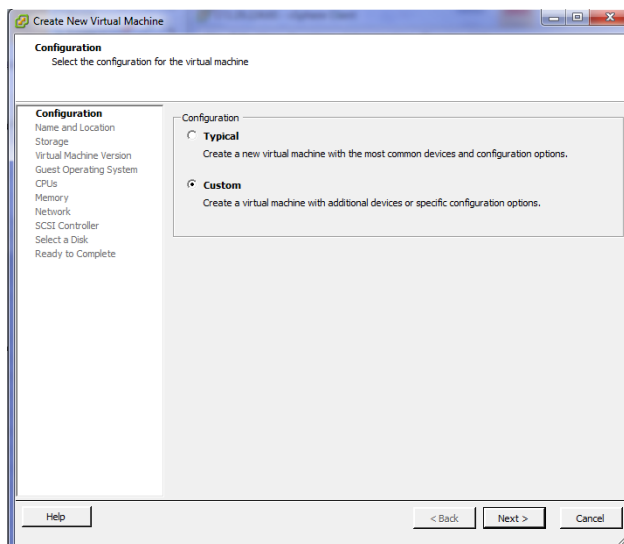
Note: A server name is shown rather than the host IP address

3.2.3 Create a Guest Virtual Machine

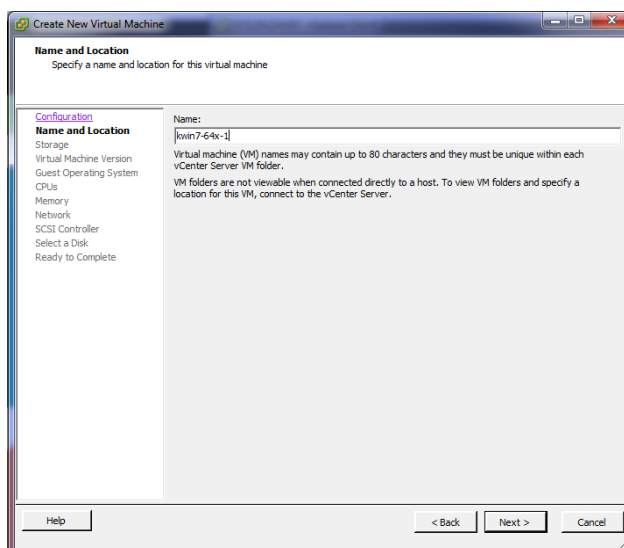
1. On vSphere client window, right click on the host name (in this example, the IP address). Select “New Virtual Machine”.



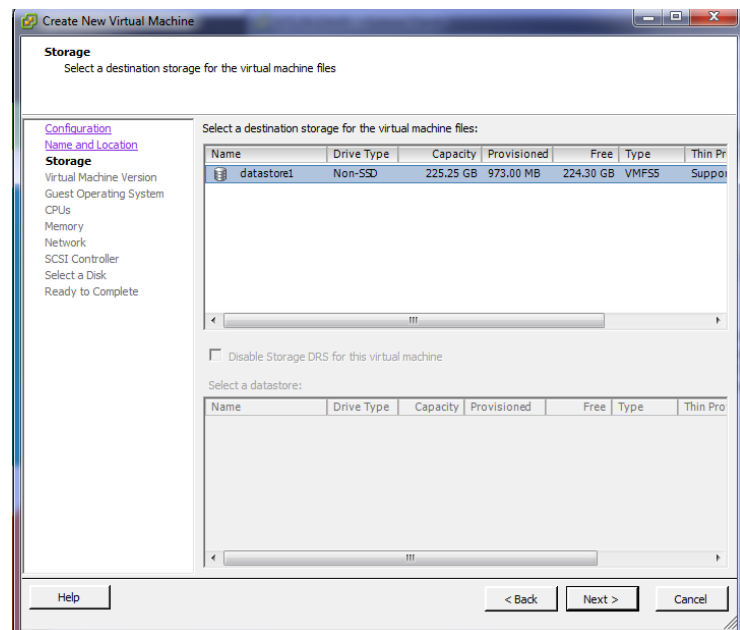
2. In the next window, select Custom and click on Next



3. Click on Next and enter a name for the virtual machine, e.g. kv6-win7-64x-1

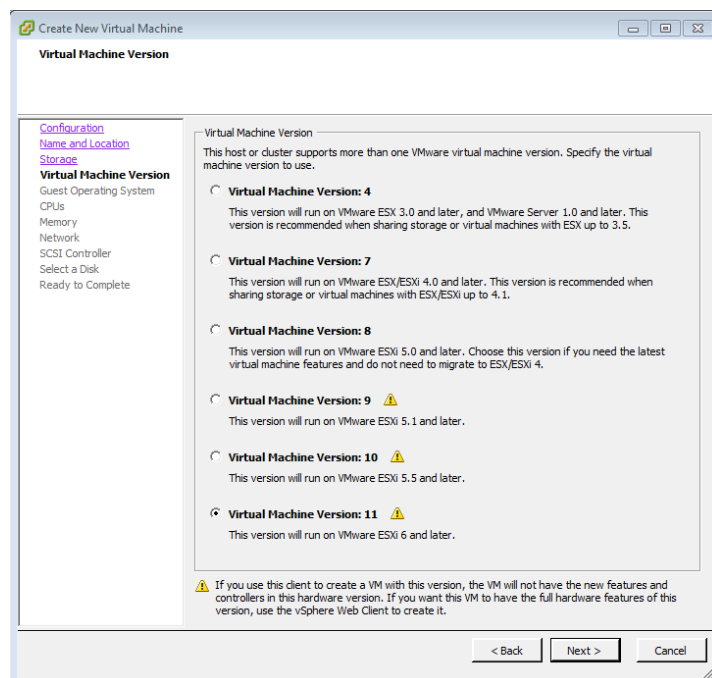


4. Click on Next and select the storage destination for the virtual machine. If there is only one hard disk on the server then, by default, it will be named, **datastore1**. If there are multiple hard disks on the server, there will be multiple destinations named, **datastore<#>**. Select the disk desired for

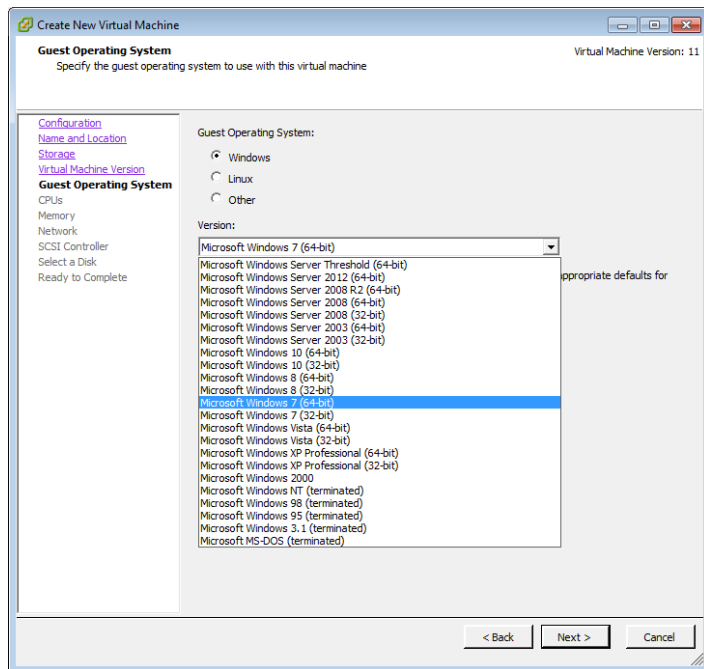


the location of the virtual machine.

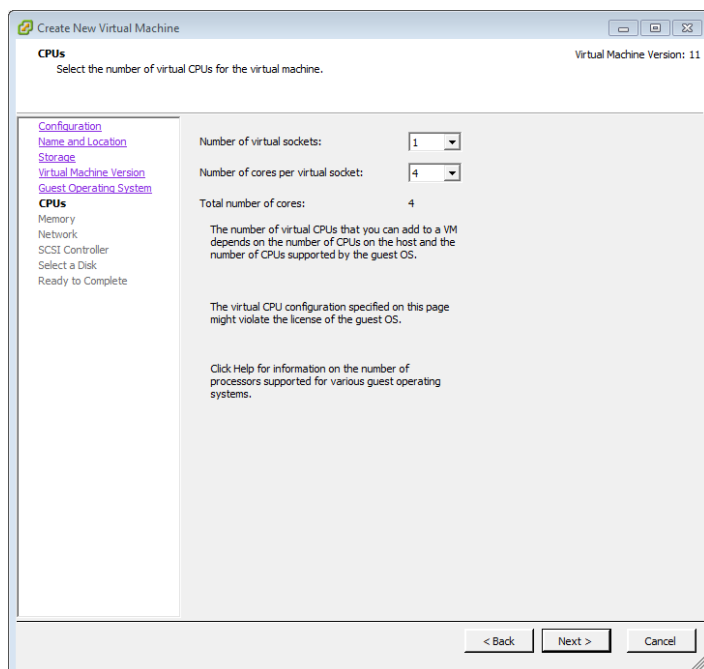
5. Click on Next and select "ESXi 6.0 and later". With this option, the virtual machine will be set to VM version 11.



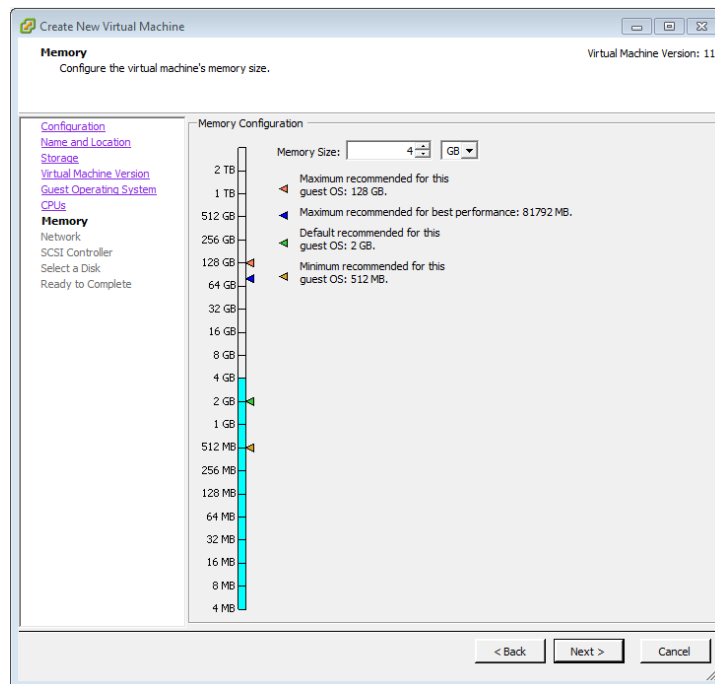
- Click on Next and select the guest OS version which will be installed on this virtual machine. In this example, Microsoft Windows 7 (64-bit) is selected.



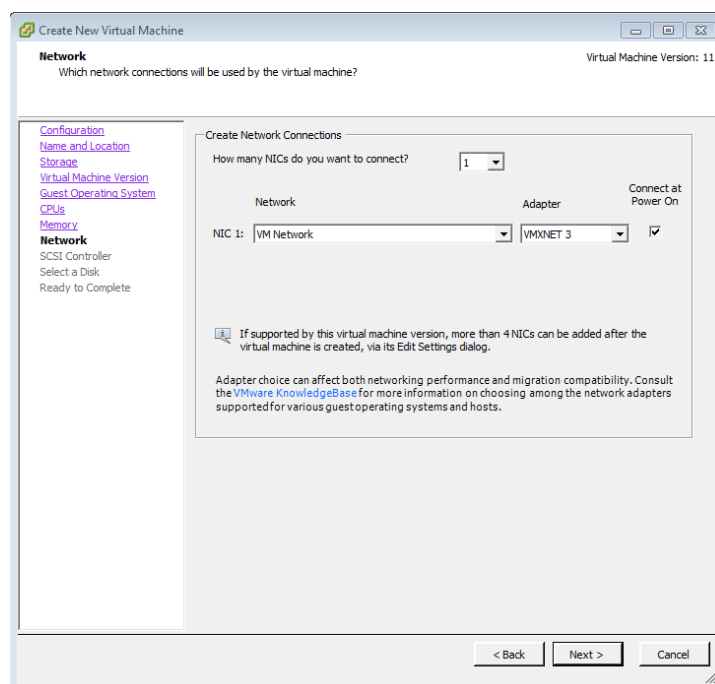
- Click on Next and enter the number of virtual CPU cores, system memory size, and hard disk size for this virtual machine; leave all the other options at default.



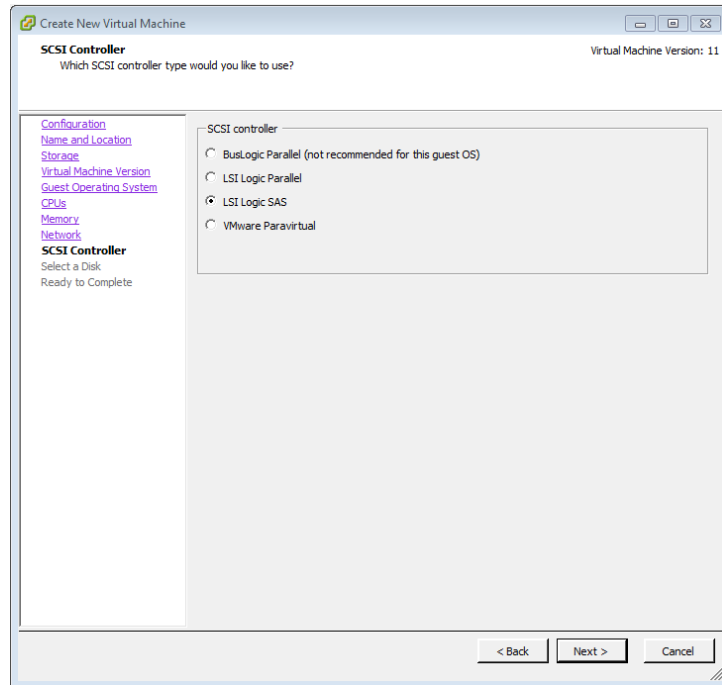
8. Click on Next and select the system memory size for this virtual machine.



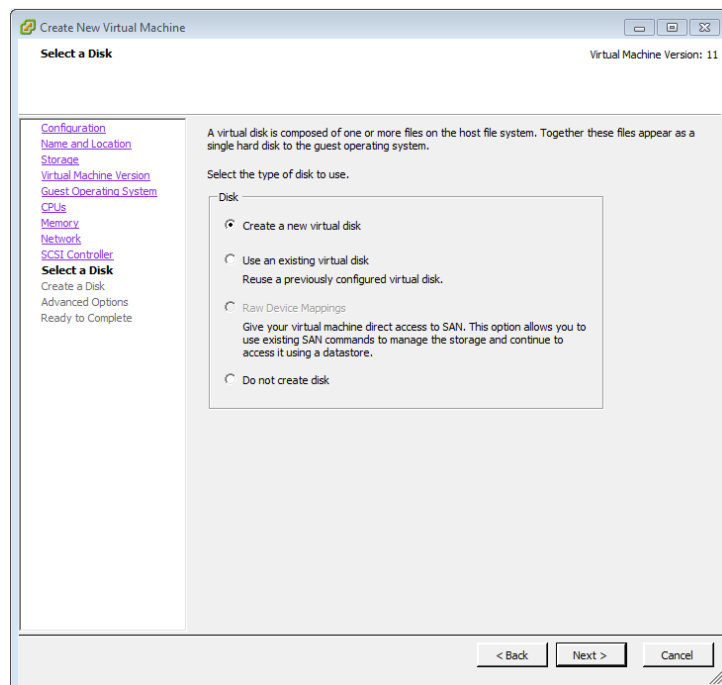
9. Click on Next and select the network connection for this virtual machine. Choose "VMXNET 3".



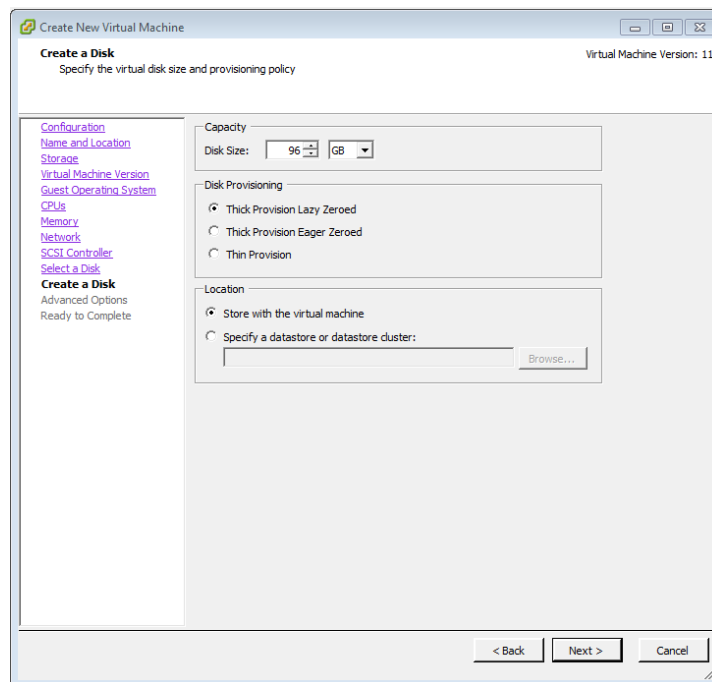
10. Click on Next and select the SCSI controller for this virtual machine. Choose the default setting.



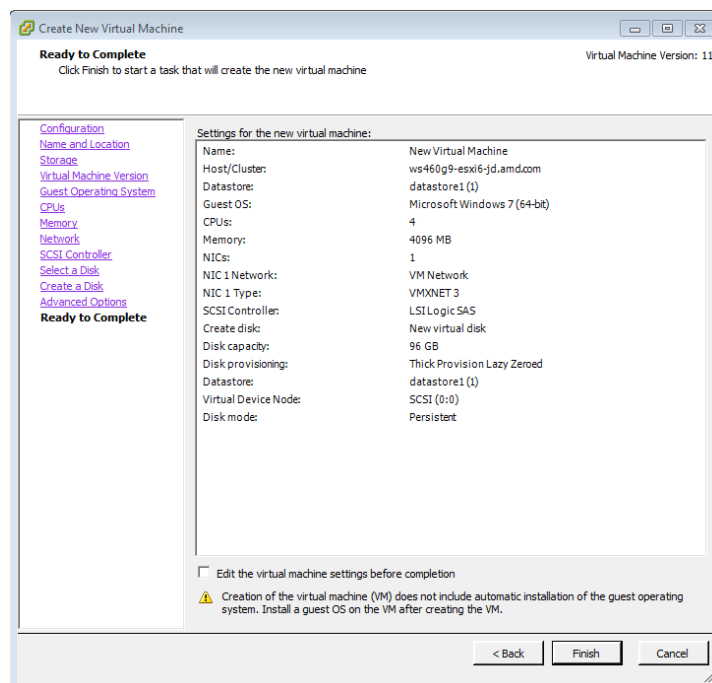
11. Click on Next, select a virtual disk to use. Select create a new virtual disk.



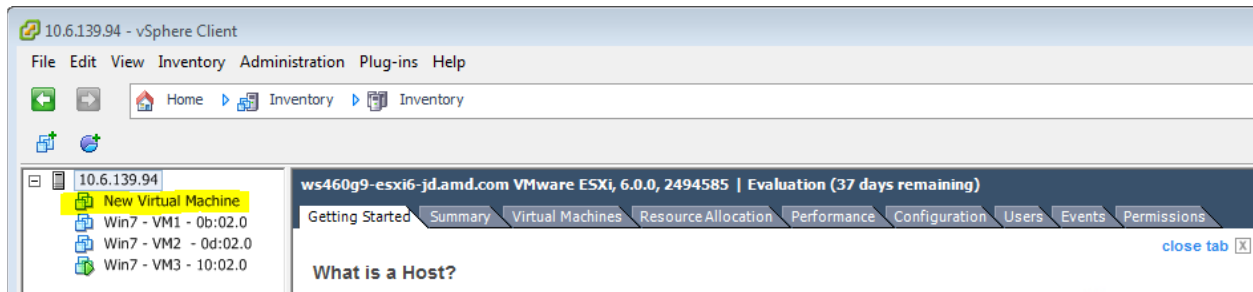
12. Click on Next and select disk size, provision, and location. The recommend minimum disk size is 96GB. For “Disk Provisioning”, select “Thick Provision Lazy Zeroed”. For “Location”, select “Store with the virtual machine”



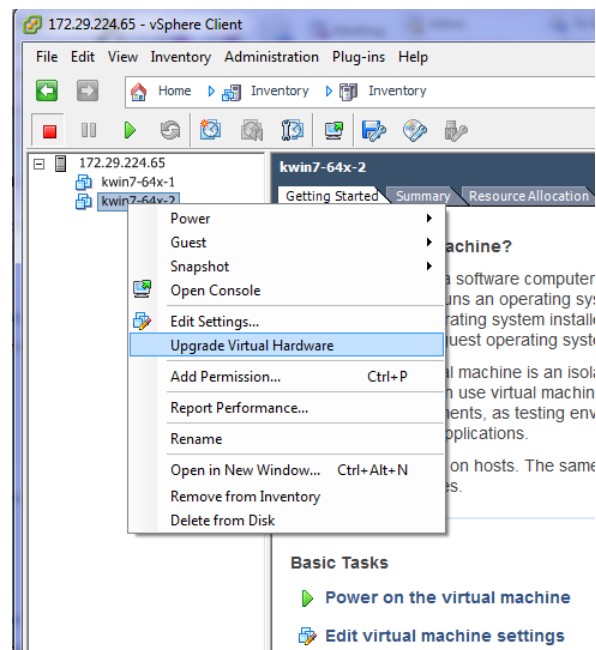
13. Click on Next. An “Advanced Options” page will appear. Don’t change anything, just click on Next. A Ready to complete windows will shows the summary of the virtual machine will be created.



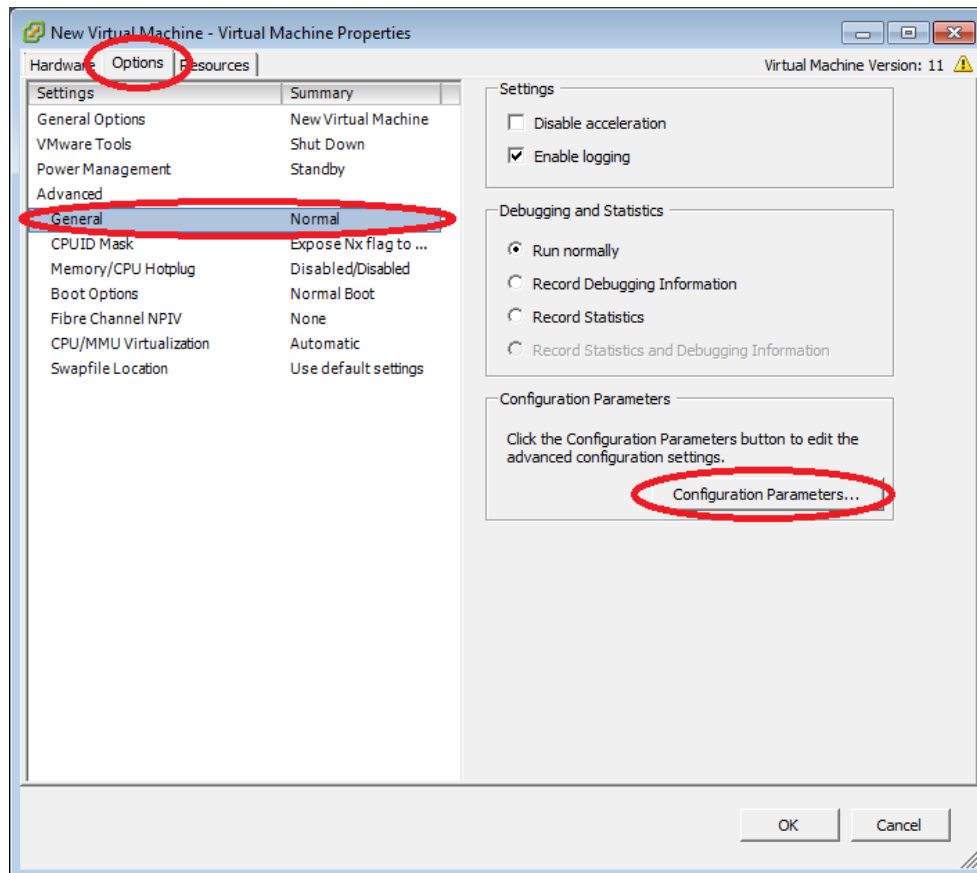
14. After clicking on “Finish”, a new virtual machine will appear under the host IP address as the following :



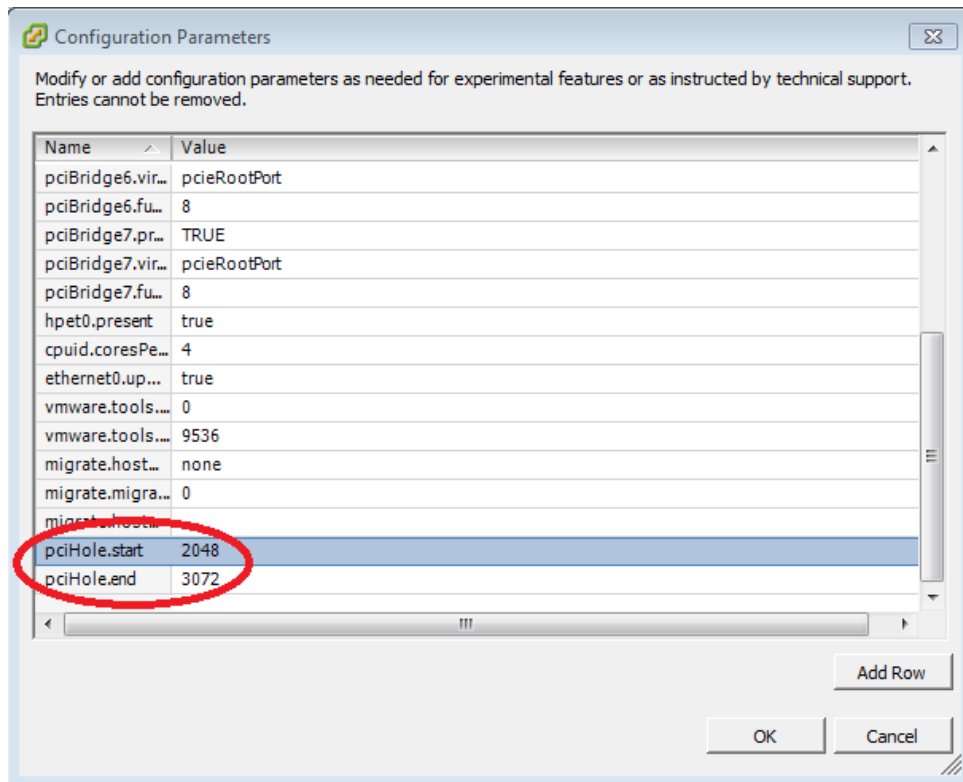
15. If VMs have not been updated to the latest VM type, right click on the virtual machine and select “Upgrade Virtual Hardware”. If a warning window pops up indicating that the virtual machine will upgrade to version 11, click “Yes” and continue.



16. Right click on this virtual machine again and select “Edit Settings...”. A warning window will pop up indicating that advanced settings can be changed only within VMware vCenter™. Click OK to continue. The “Virtual Machine Properties” window appears. Within the properties windows, click the “Options” tab and select “General” under the “Advanced” section. On the right side, a “Configuration Parameters...” button will appear. Click on this button.



17. In the “Configuration Parameters” window, scroll through to find the parameters named “pciHole.start” and “pciHole.end”. If these two parameters exist, ensure that the values are set to 2048 and 3072, respectively. If these two parameters do not exist, click the button “Add Row”, and add “pciHole.start” and “pciHole.end” with the above values. Next, click OK to return to main control page of vSphere client.



The virtual machine is now ready for guest OS installation.

3.2.4 Install Guest OS on Guest VM

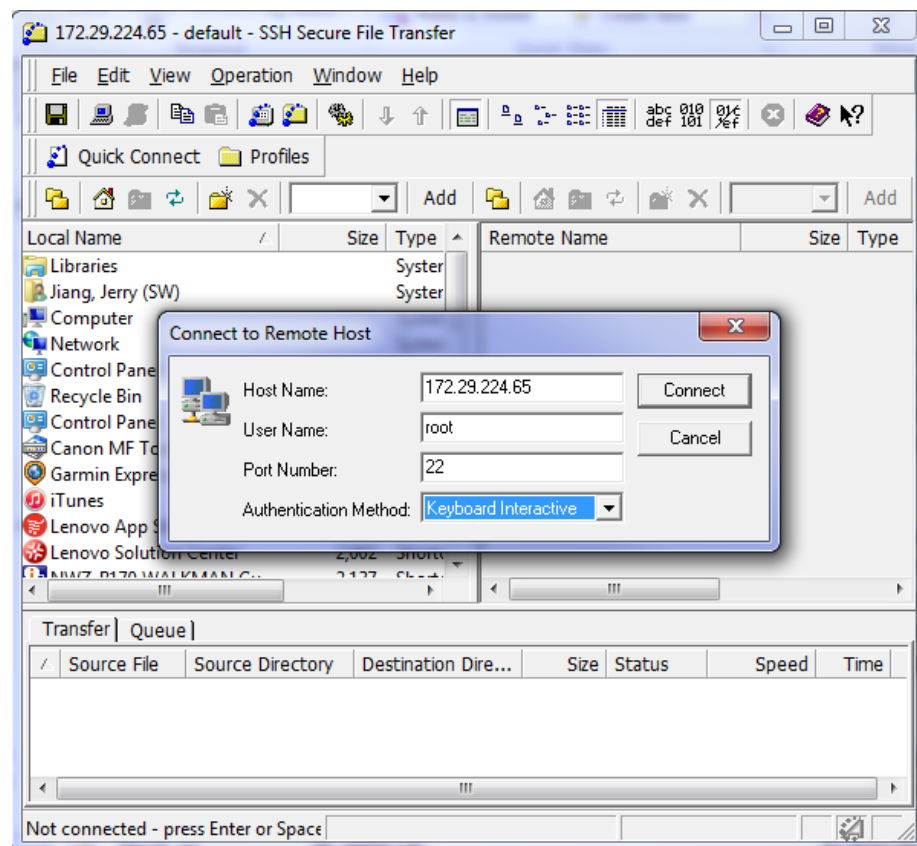
There are several ways to install a guest OS on this newly created virtual machine:

- 1) Install a fresh OS using ISO image on the administrator system
- 2) Install a fresh OS using ISO image on ESXi data storage
- 3) Clone an OS image created and used previously

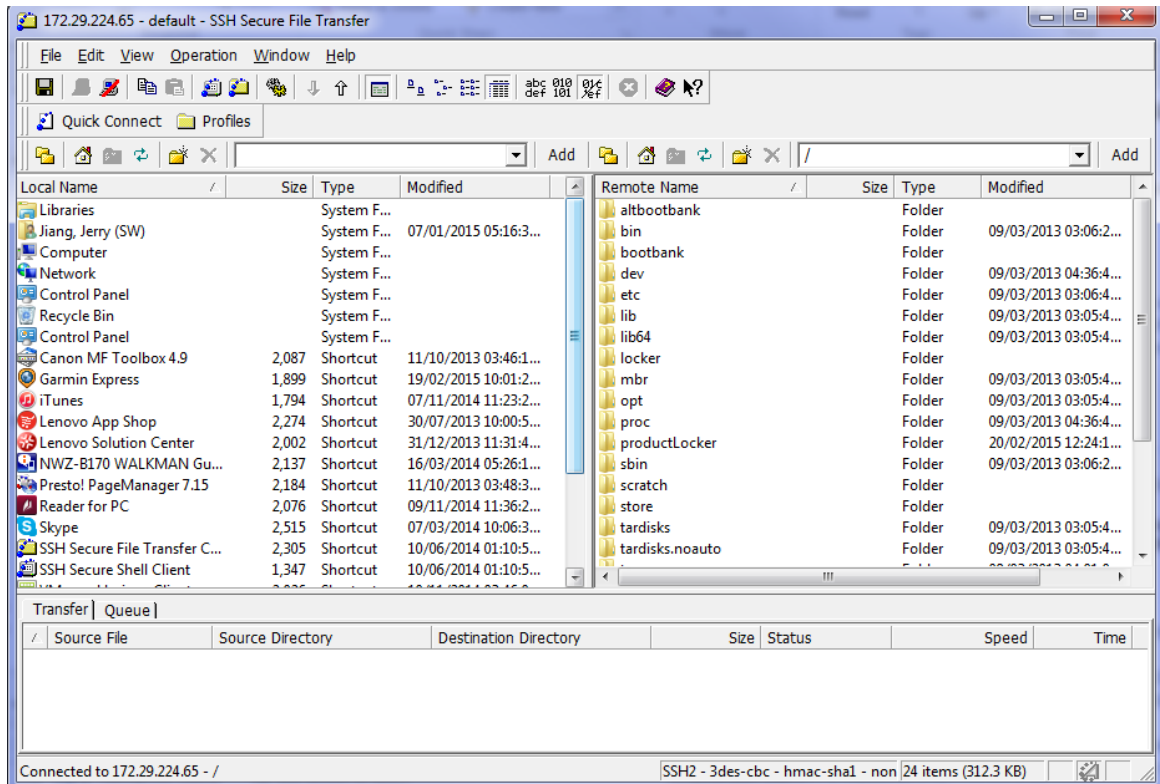
Methods 1 and 2 are similar. Method 2 will be used as an example. Obtain a licensed copy of the supported OSes listed on **Table 1**.

3.2.4.1 Upload file to host ESXi

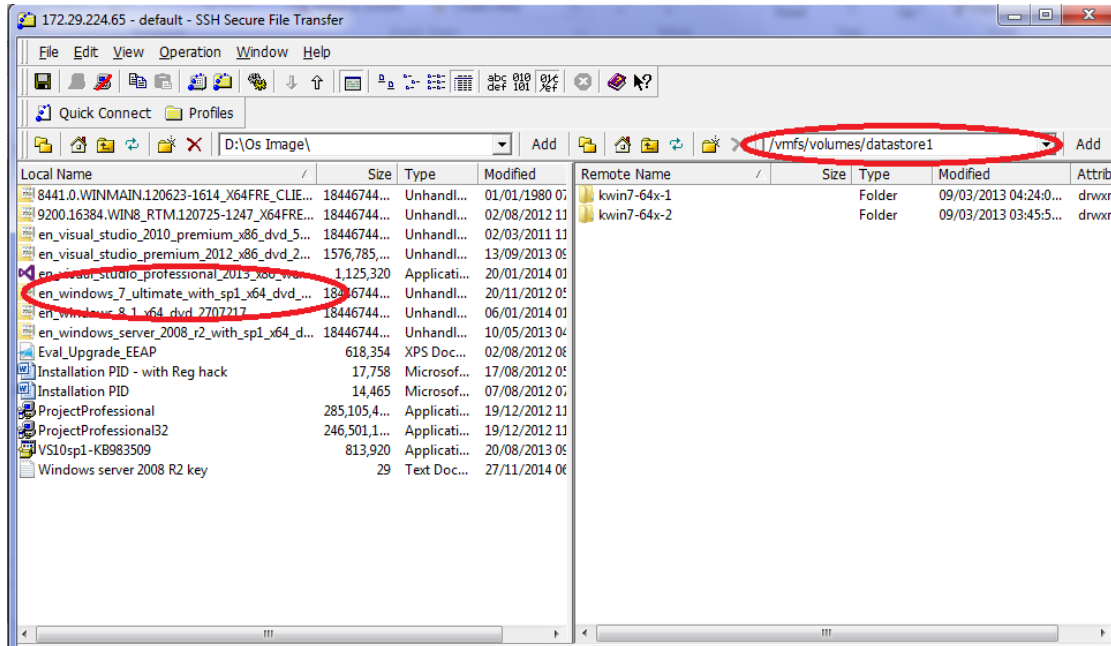
1. Start the SSH Secure File Transfer utility and click on “Quick Connect”. The application will pop up a window like the following :



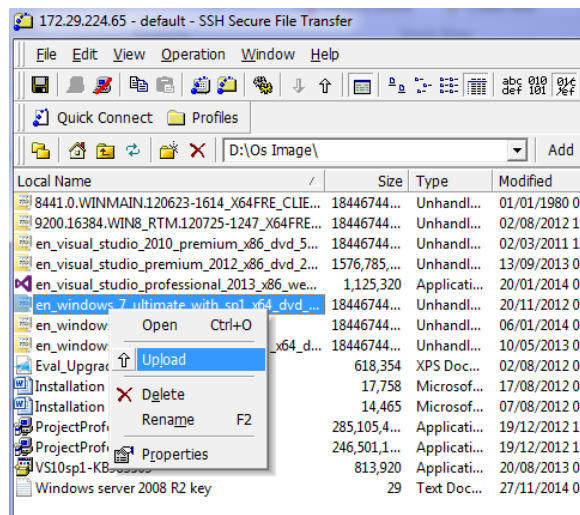
2. Enter the ESXi host IP address or computer name in “Host Name”; type “root” in “User Name”; select “Keyboard interactive” from “Authentication Method”. Click on the Connect button to connect to host.
3. Enter the password created while setting up ESXi in the host server. Once connected to the host, the application should have the following windows :



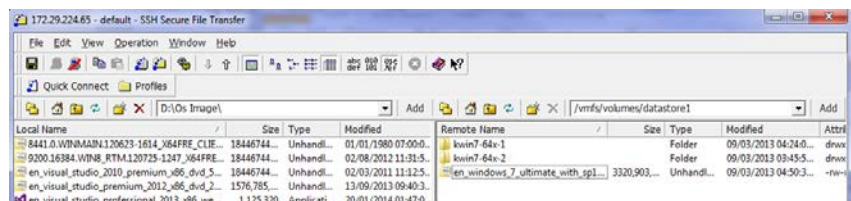
- The left is the administrator system, the right is the host ESXi system. On the left window, navigate to the location where the OS ISO image is stored; on the right window, navigate to **/vmfs/volumes/datastore1**.



- Right click on the desired OS image/file and select the “Upload” after right clicking on the file.



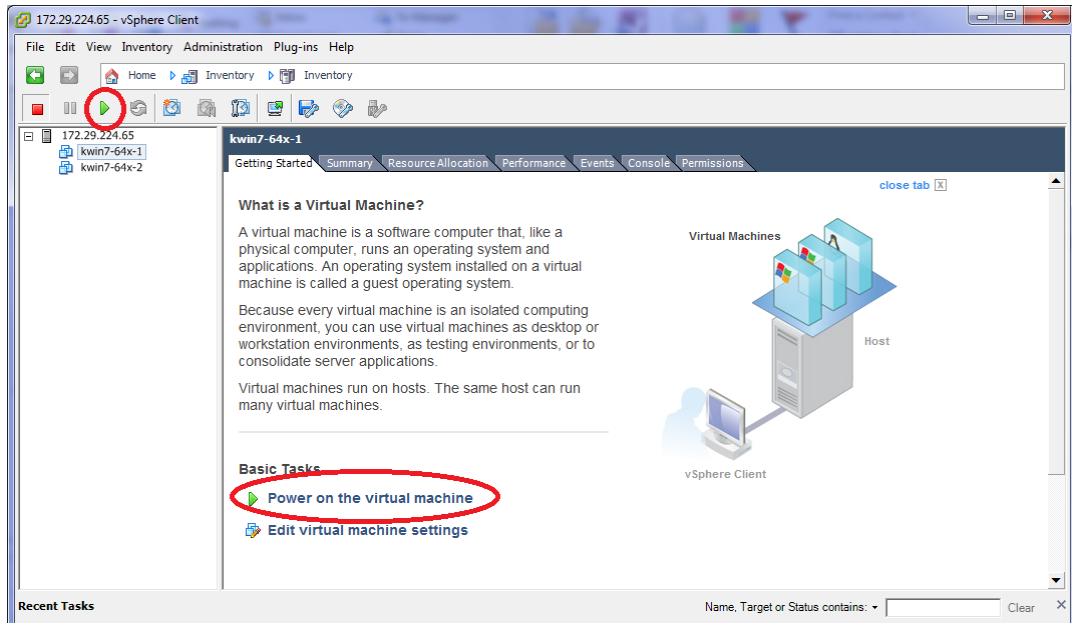
- After a few minutes, the OS image will be uploaded to **/vmfs/volumes/datastore1** as below.



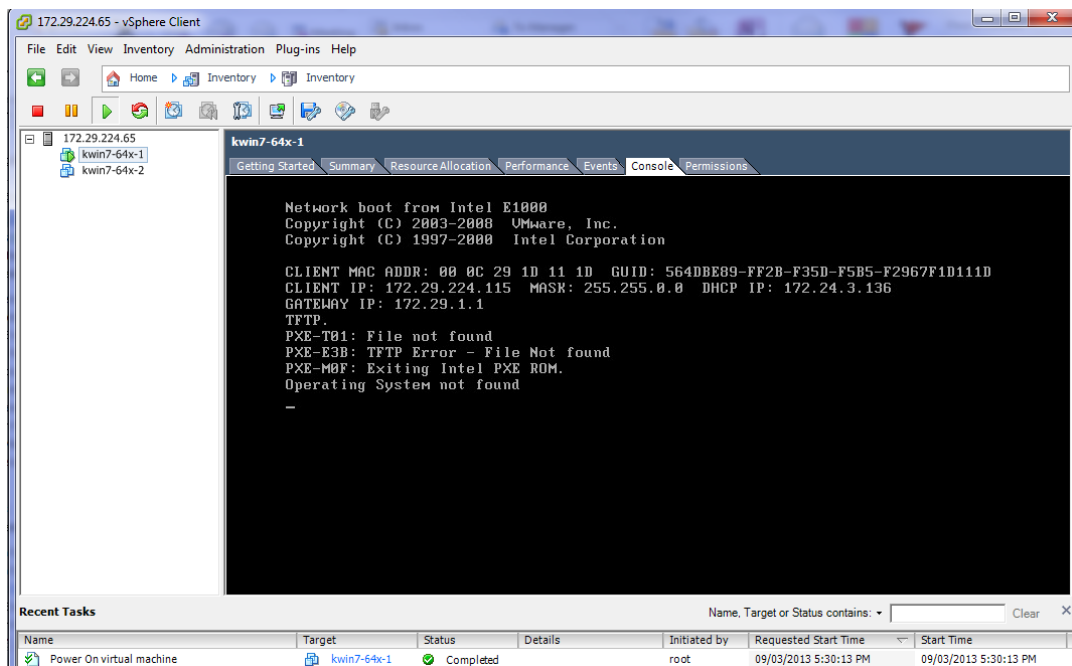
- This ISO image can now be used to install a fresh OS on the virtual machine.

3.2.4.2 Install the OS

1. Start vSphere client application and connect to the host. Expand the host description (host name or IP address) and click on the virtual machine that was just created. Click on the start button or “Power on the virtual machine”. Click on the “Console” tab.

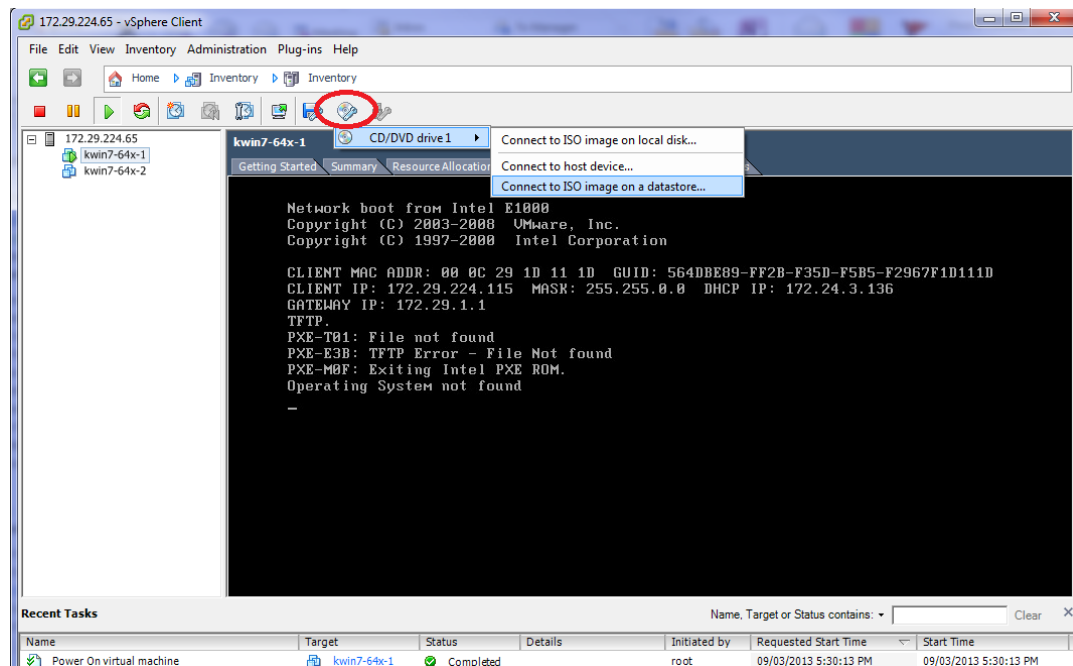


2. The console window should show that an operating system was not found :

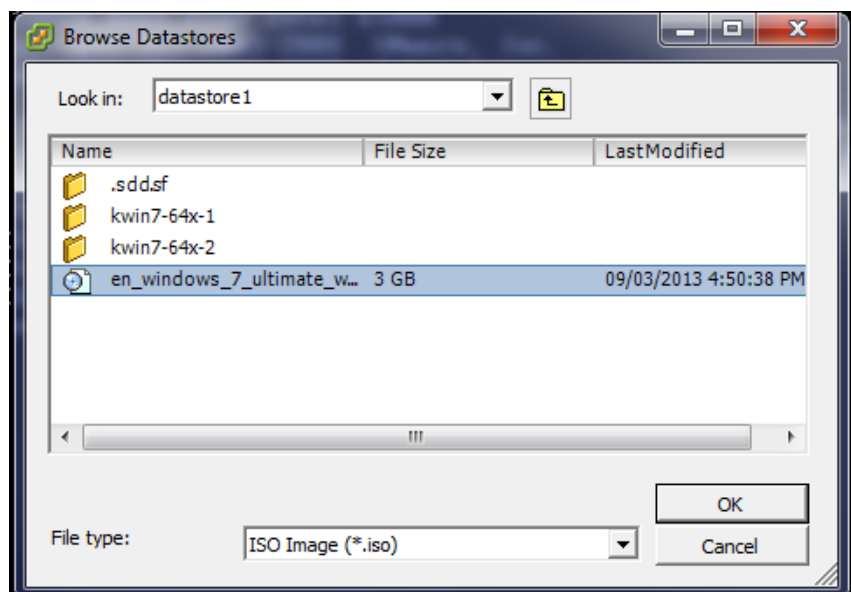


- Click on the CD button, select the drive and select “Connect to ISO image on a datastore...”, as shown below.

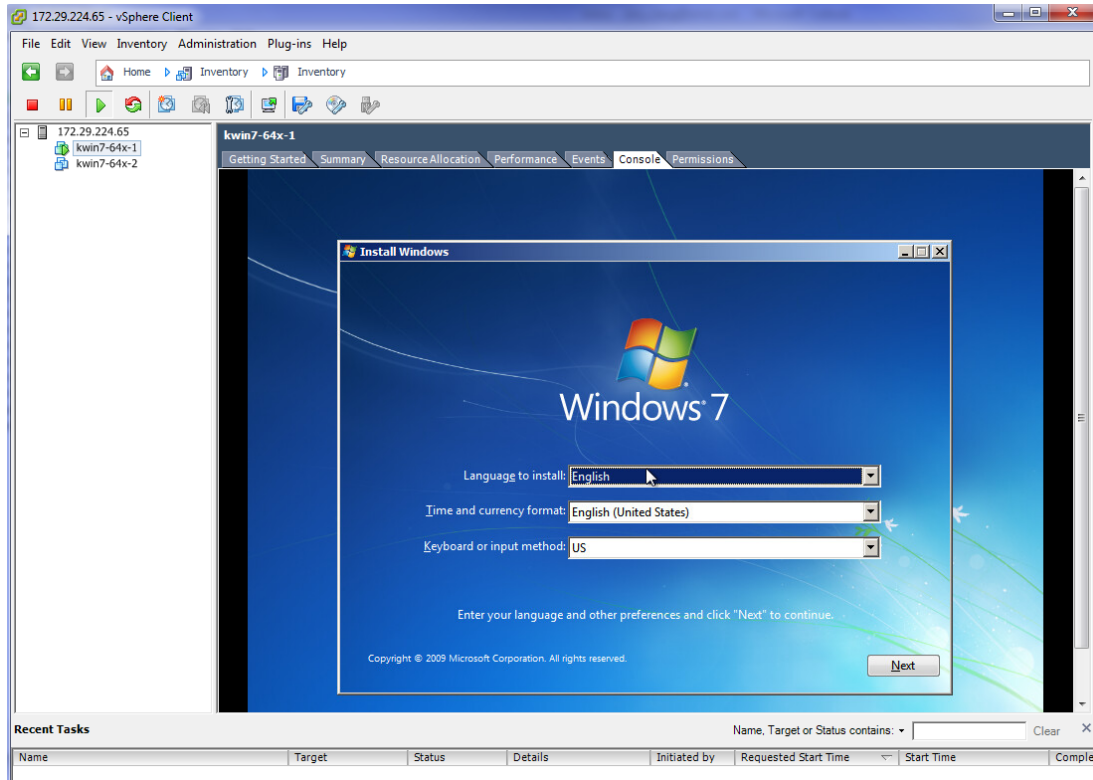
(note: selecting option “Connect to ISO image on a local disk” will result in navigation to the administrator system local disk image. That installation method is the same as this method).



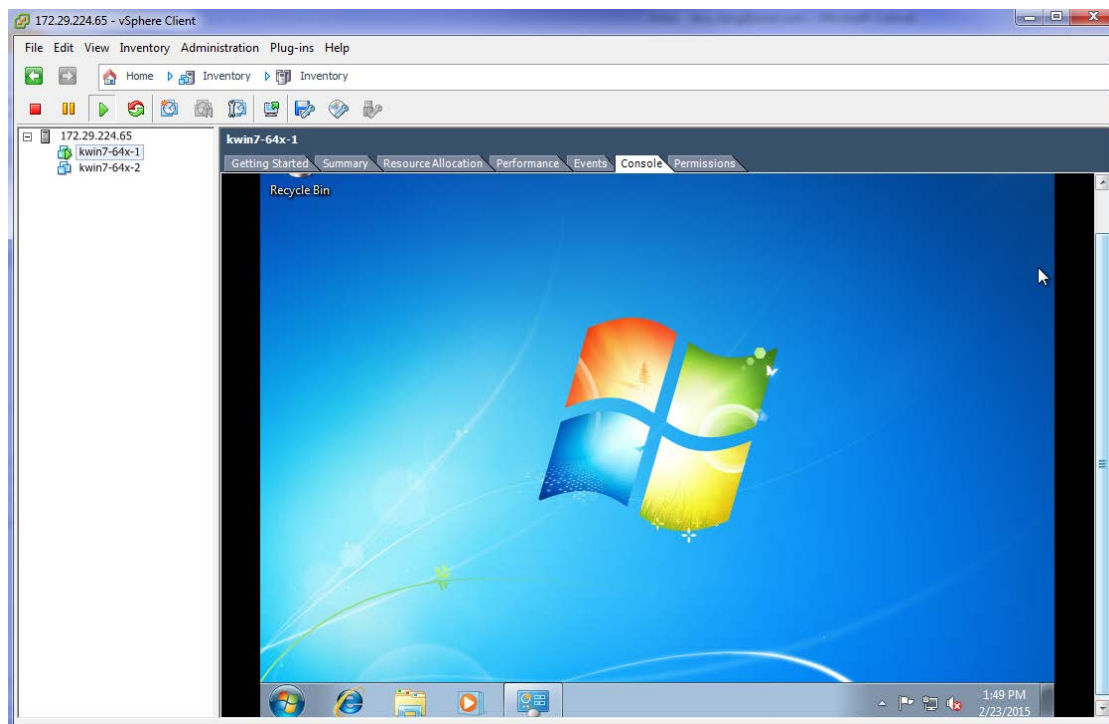
- Once the “Browse Datastores” window appears, navigate to datastore1, select the OS ISO image previously uploaded and click on “OK” :



5. Use a mouse click on the console window followed by an 'enter' or 'space' key. The OS installation screen appears in the console window as it would on a desktop monitor during the regular install process.



6. Follow the normal Microsoft® Windows® installation procedure. Select a user name and password and allow the installation to complete. Once the installation completes, it shows the desktop of the guest OS in console window similar to below.



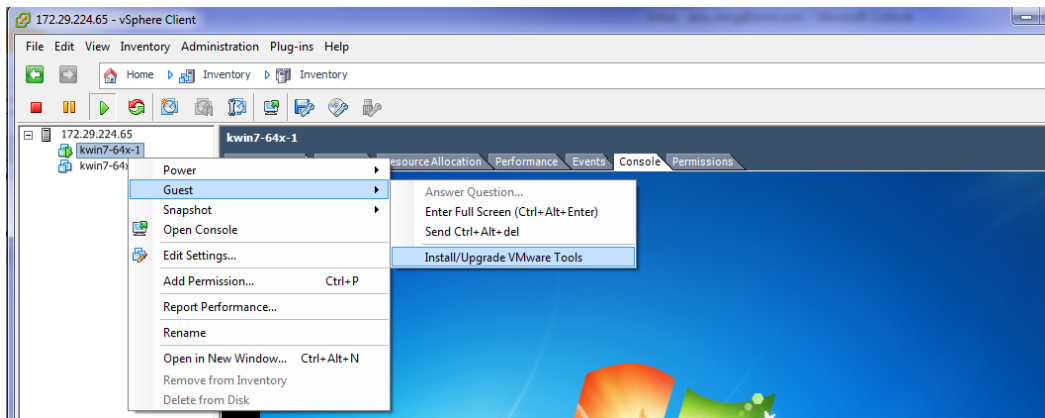
7. There might have some updates that will require rebooting of the OS. After the reboot(s), the guest OS is ready to use.



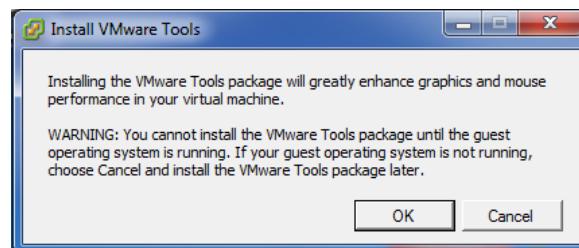
3.2.4.3 Install VMware Tools

It is necessary to install VMware tools to enable connectivity features between the virtual machine running on the host and the administrator system.

1. Once the guest VM boots to desktop, in the vSphere client, select the summary tab of the VM and click on “Install VMware Tools” :



2. A pop-up window will appear as the following :



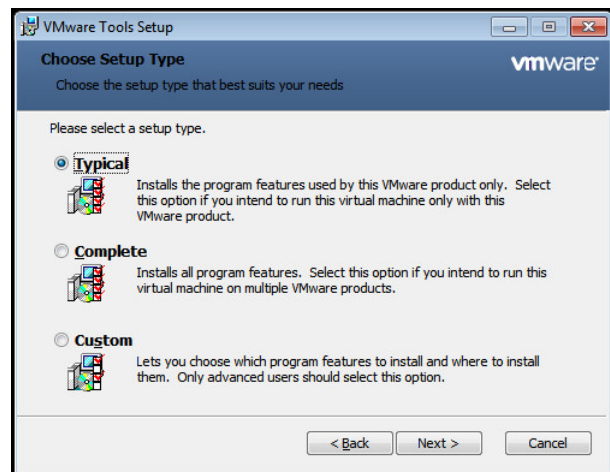
3. Click OK to continue. After a few minutes (depending on network speeds), an AutoPlay window will appear as the following :



4. After clicking on “Run setup64.exe”, an installation window will be shown.



5. Follow the instruction on the screen, select “Typical” when prompt for setup type



6. Once the installation is complete, a reboot of the virtual machine is required.

3.2.4.4 Install Horizon View Agent

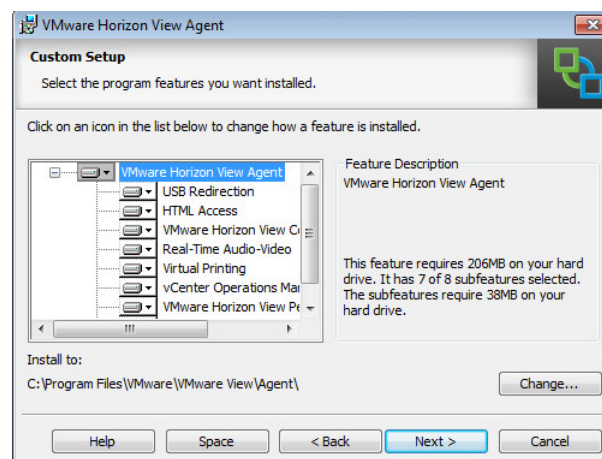
The Horizon View Agent acts as an intermediary software between the virtual machine and Horizon View (that is to be installed on the client terminal later). The Horizon View Agent Direct-Connection Plugin allows a View Client to directly connect to a View desktop without using View Connection Server.

1. Once the guest VM boots to desktop again, download Horizon View Agent indicate on **Table 1**.

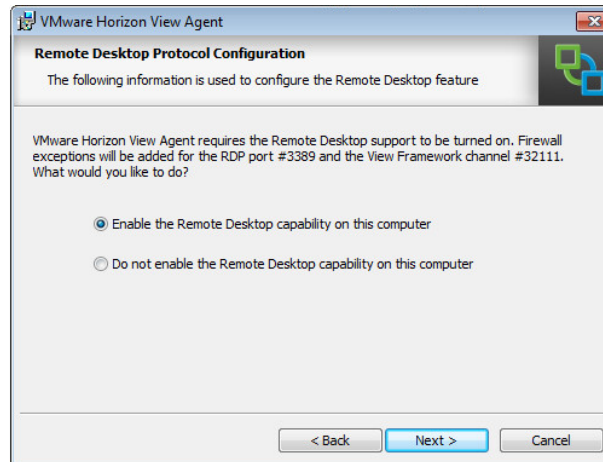
2. Run this application and accept the license agreement



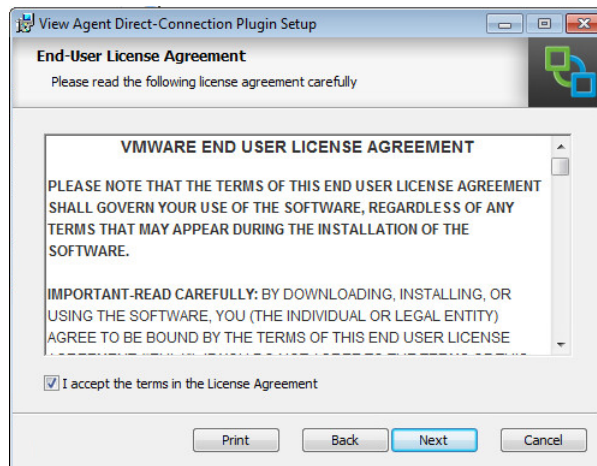
3. On "Custom Setup", click on next without changes :



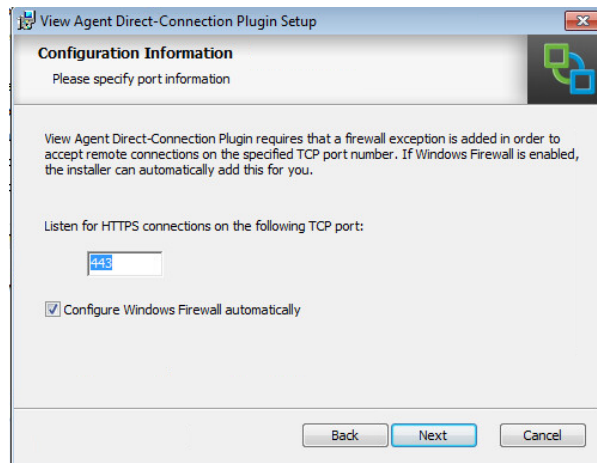
4. Select “Enable the Remote desktop capability on this computer” :



5. Click “Install” in next window. The View Agent will be installed on this guest VM.
6. Once the installation completes, a prompt for reboot will appear.
7. After reboot, continue with downloading the Horizon View Agent Direct-Connection plug-in indicated on **Table 1**.
8. Run this Direct-Connect plug-in and accept the License Agreement



9. Click on Next and make sure Configure Windows Firewall automatically is selected :



10. Click on the Next to install the Direct-Connection Plugin. Once installation is complete, reboot the guest VM.

3.2.1 Pass Through Device to Guest VM

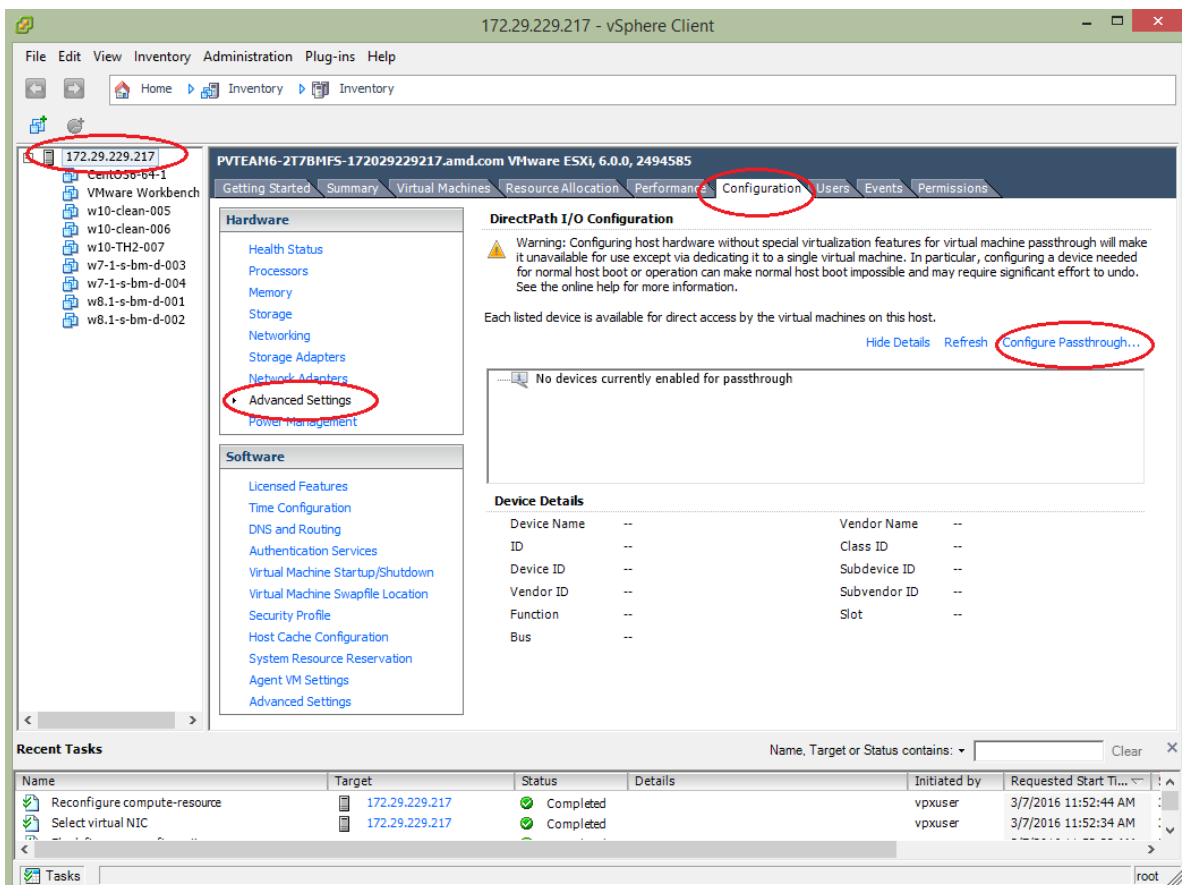
Passing through a device to the guest VM means providing full access of the device residing in the host to that VM. After passing through a GPU, a VM is able to access the full hardware acceleration capabilities of that GPU remotely.

MxGPU operates as a number of devices that can be passing through to various VMs. Therefore gaining knowledge about how to pass through a single GPU device to a single VM allows the user to understand the first steps necessary to install MxGPU.

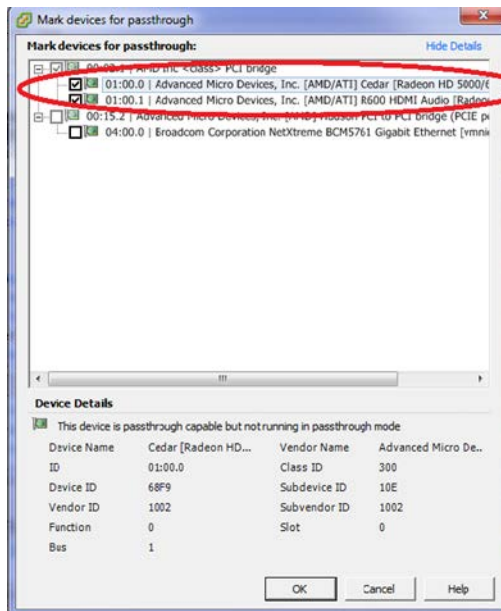
If the user already has a basic understanding of how to pass through a GPU device to the VM, then this section can be bypassed.

3.2.1.1 Select Device for Pass Through

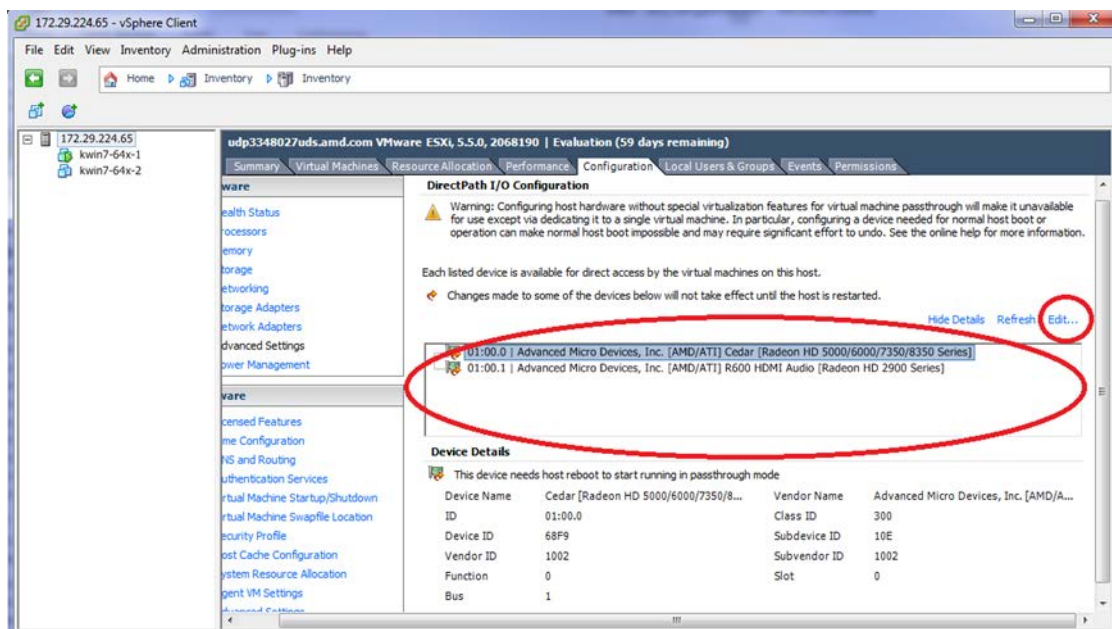
1. In the vSphere host client, click on the host description. Select the “Configuration” tab, click on “Advanced Settings” and select “Configure Passthrough...” as the shown below :



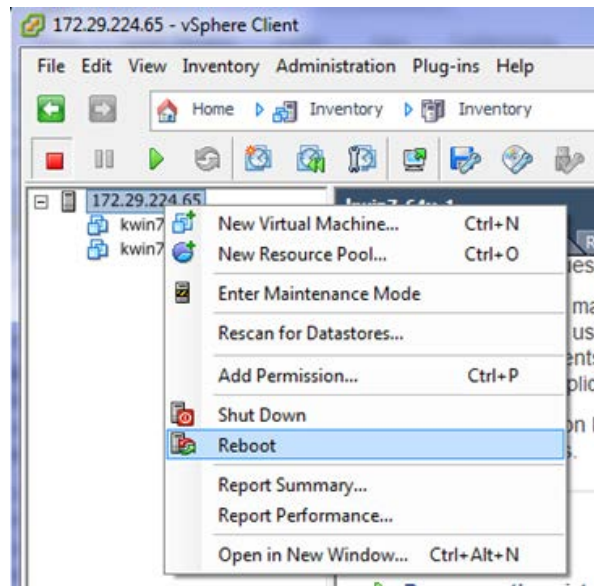
2. A window with devices available for passthrough will appear. Select the desired passthrough device and click on the OK button.



3. The selected device appears in the "Direct Path I/O Configuration" window list. Use the "Edit" link to change/edit the list.

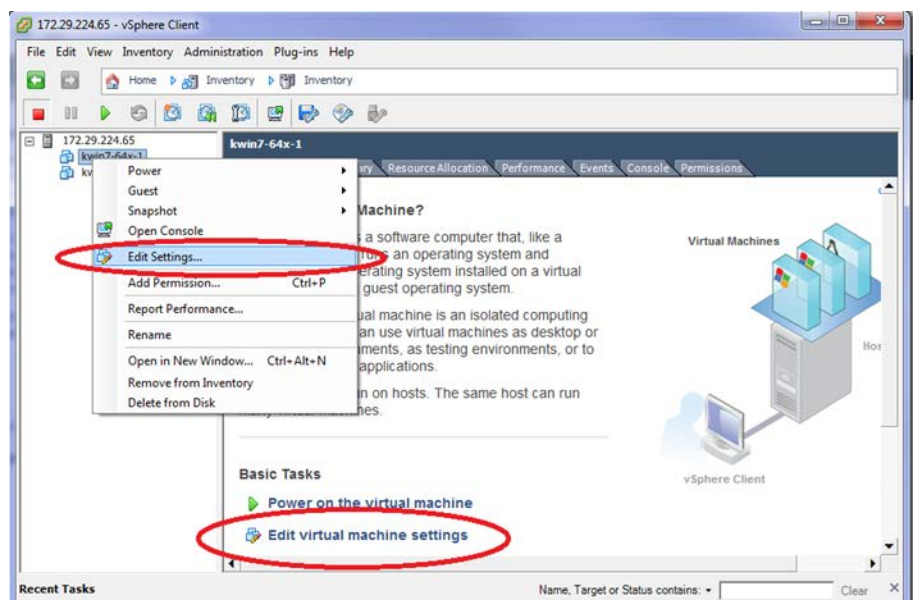


4. The host reboot is required before host “releases” the new devices and makes them available for passthrough to a guest VM. To reboot the host, right click on the host description and navigate to “Reboot”. Note: make sure all guest VMs are already shut down before rebooting the host.

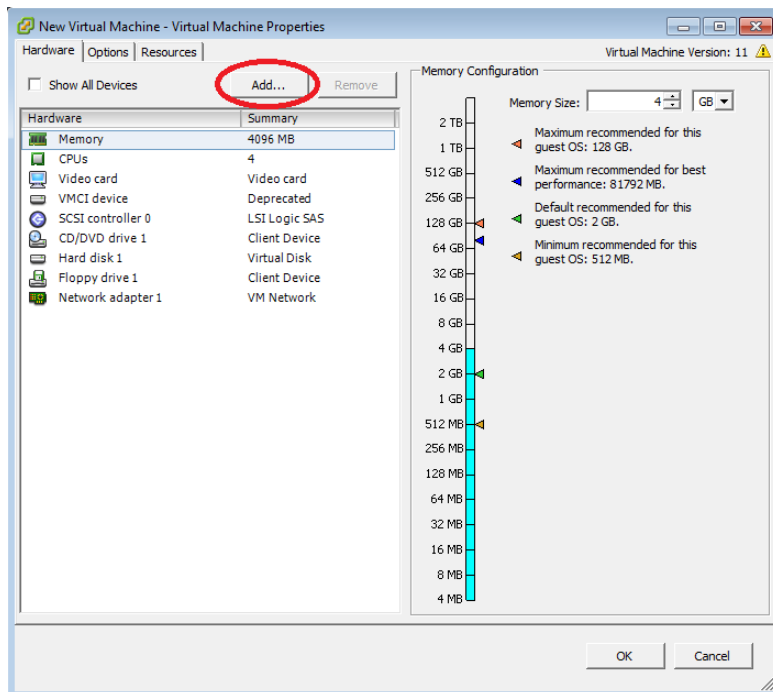


3.2.1.2 Assign Device to Guest VM

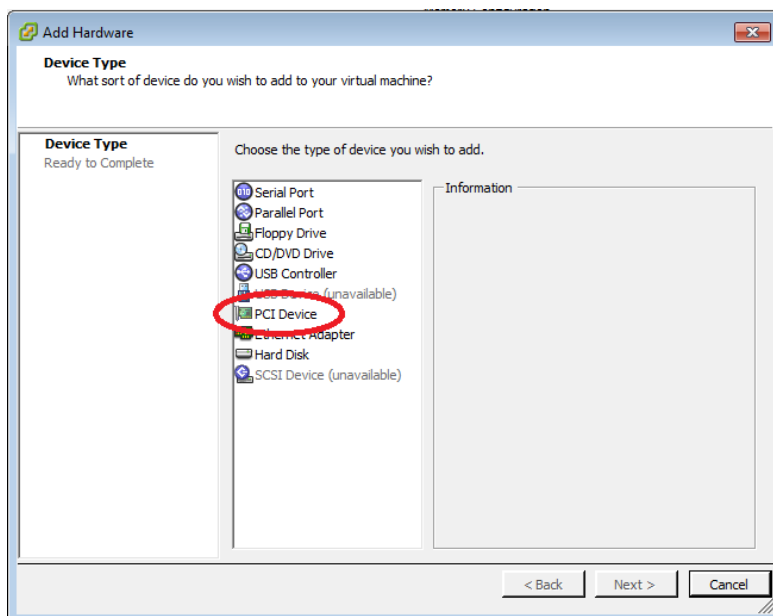
1. After the host reboots, reconnect to host through vSphere client. Ensure that the guest VM targeted for GPU passthrough is shut down.
2. Right click on the guest VM and navigate to “Edit Settings...” or click “Edit virtual machine settings” in the Getting Started tab.



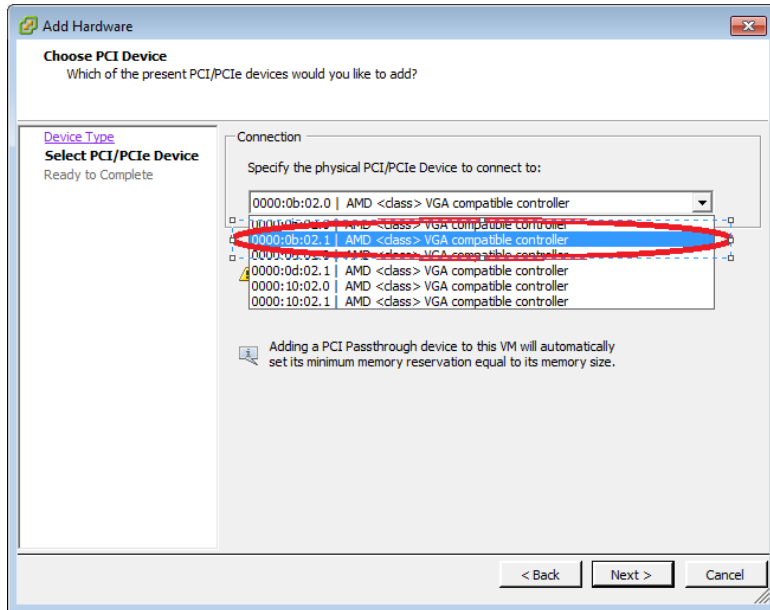
3. A window showing the virtual machine setting will appear as shown. Click on the “Add” button.



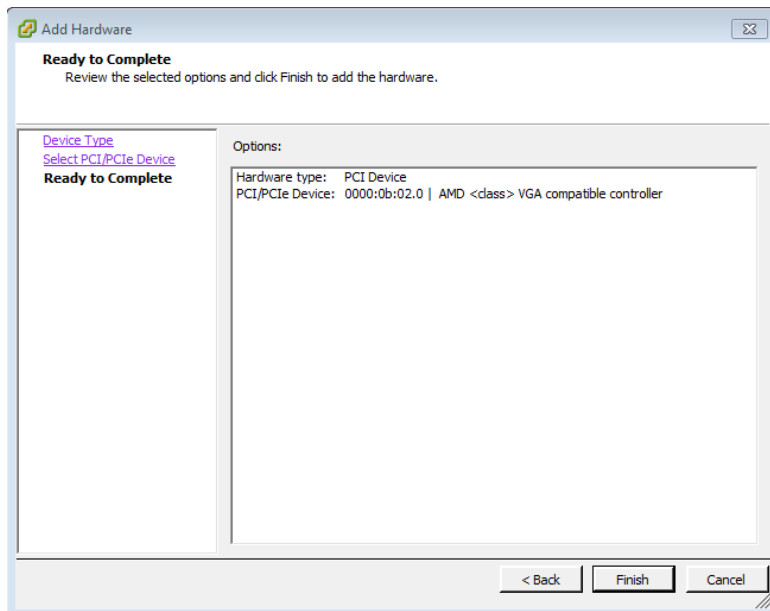
4. An “Add Hardware” window appears. Select “PCI Device” and click on next.



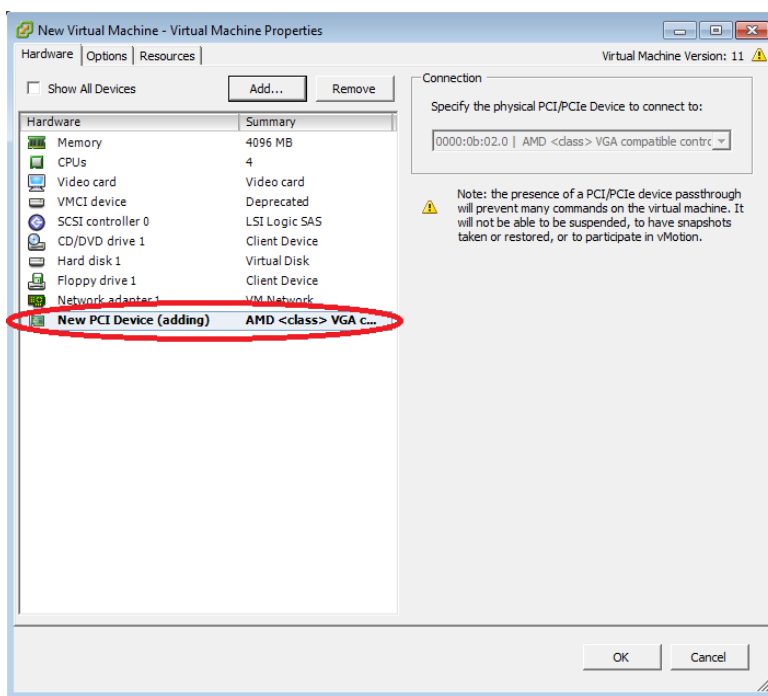
5. A “Choose PCI Device” window will appear. Choose the device from the list box, then click “Next”.



6. The “Ready to Complete” window appears with the device just selected. Click on the “Finish” button.



- The device is now part of the guest VM's hardware list. To pass through additional devices, repeat the steps in this section.

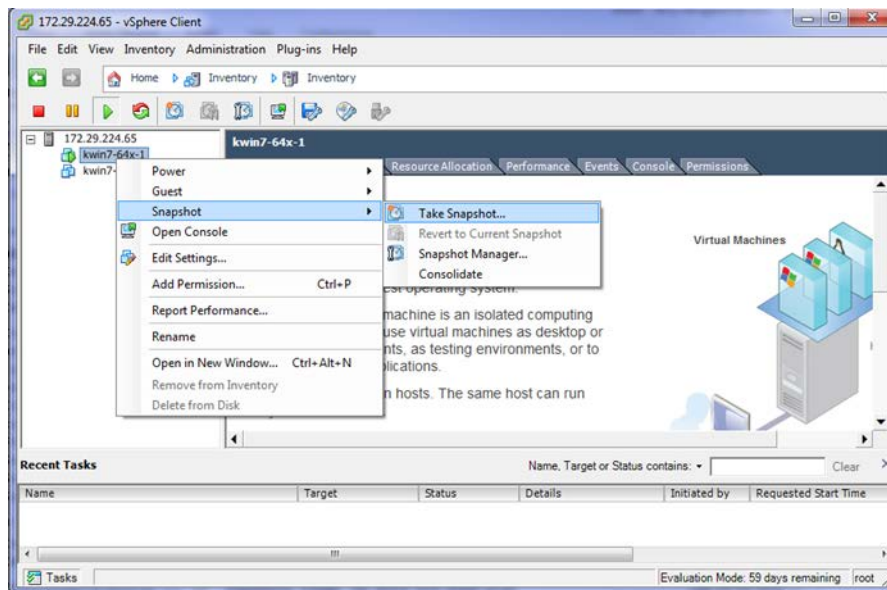


3.2.2 Guest VM management

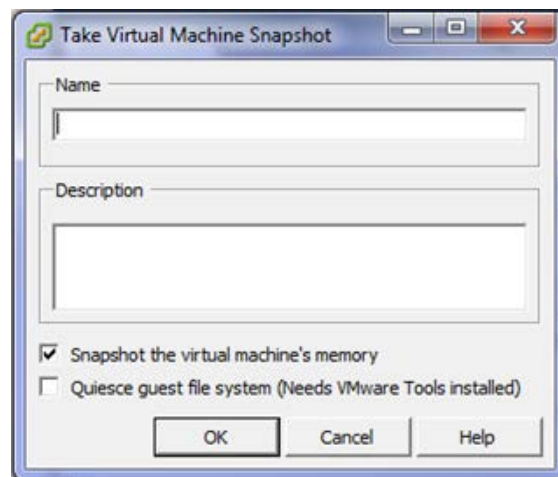
Once a guest VM is up and running, the Snapshot feature can be used to copy an instance of that VM at a particular state. This feature can be used to create stable backup points for the VM. This feature can also be used to create templates to deploy new VMs without going through the OS installation process.

3.2.2.1 Create and Use Guest VM Snapshot

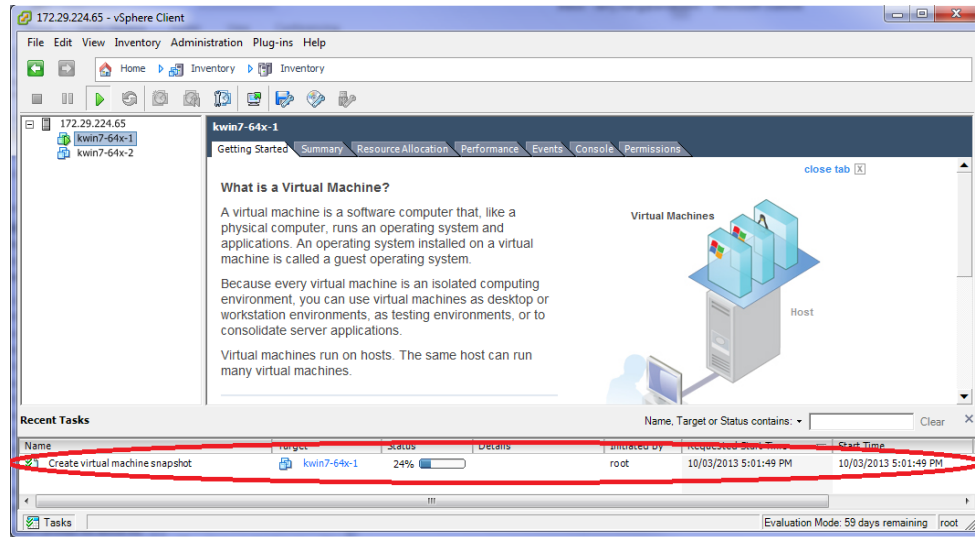
1. In the vSphere client, right click on the VM, navigate to Snapshot, and then “Take Snapshot...” :



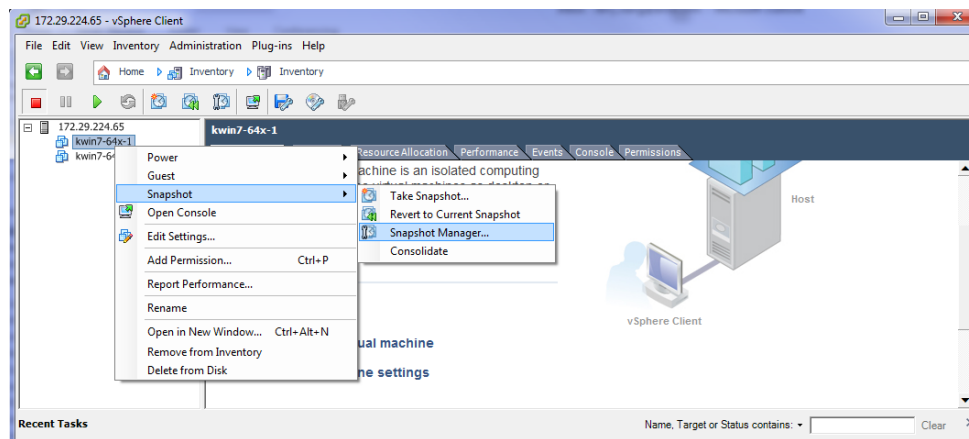
2. Enter a name and description as for the virtual machine snapshot.



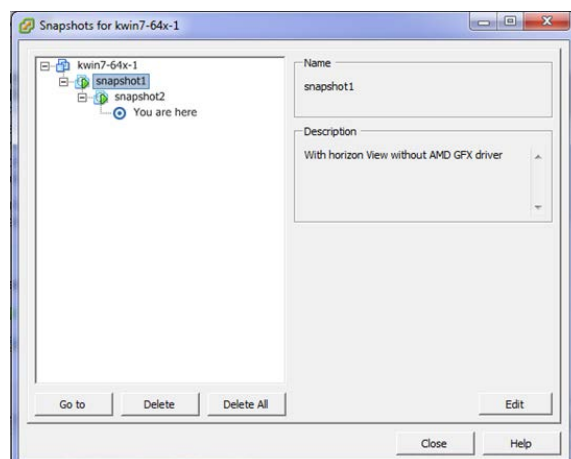
3. The snapshot process requires a few minutes to complete.



4. Once the snapshot is created and a rollback to that snapshot is required, shut down the guest VM, right click on the guest VM, navigate to “Snapshot” and then “Snapshot Manager...” :



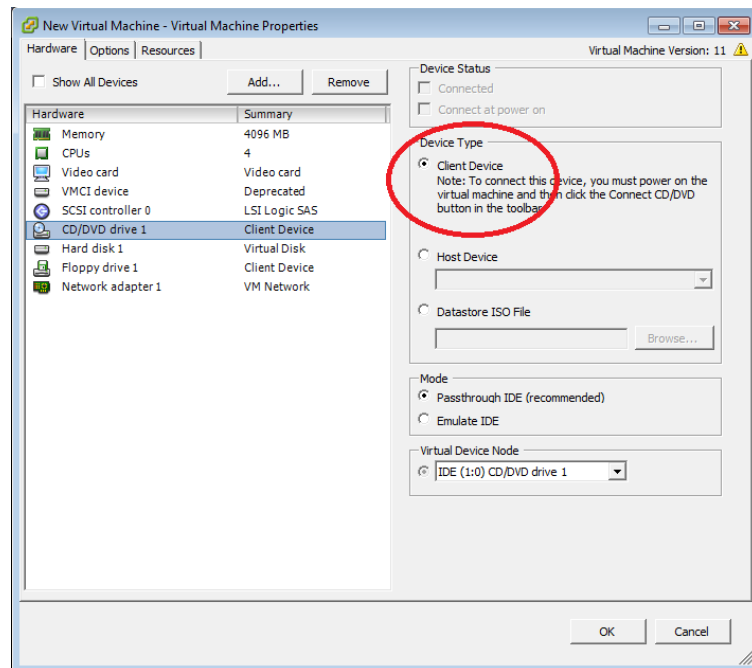
5. Select the snapshot and click on the “Go to” button. Click “Yes” in the warning window to complete the reversion of the VM back to the state when the snapshot was taken.



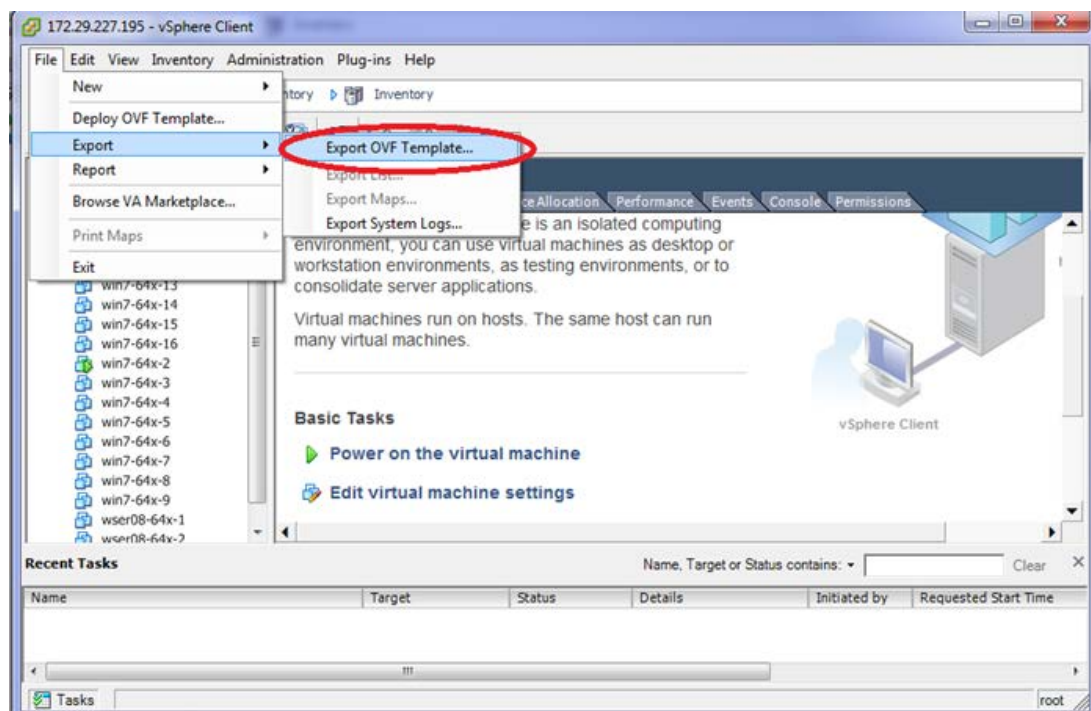
3.2.2.2 Create Guest VM Template

1. To create a template, ensure that the guest VM used for the template

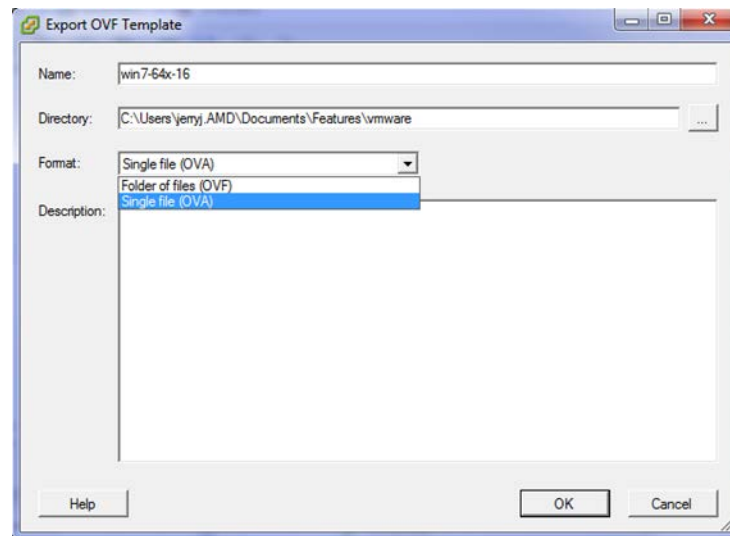
- a. Does not have any pass through devices
- b. CD/DVD drive is set to Client Device



2. Select the guest VM that will be used as a template. Click on "File" and navigate to "Export", then "Export OVF Template...". If the guest VM has any passthrough devices, a warning window will pop up to prevent the export operation.



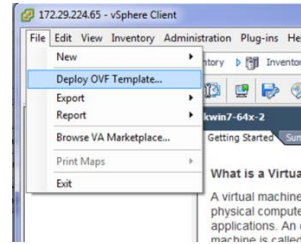
3. In the pop up window, input a descriptive name for this template; select a location to save the template. Select single file (OVA) or folder of files (OVF), and (optionally) add a description for this template.



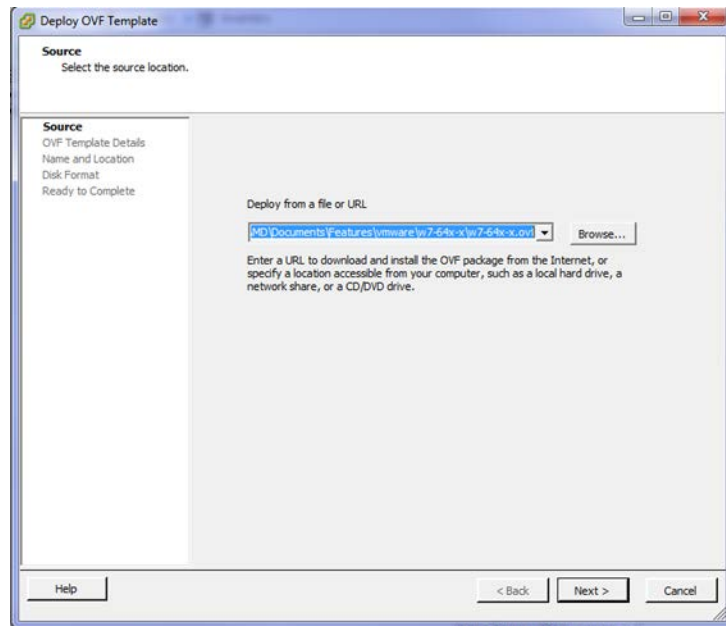
4. It will take some time to create the template. Once the template is created, it can be used to deploy guest VMs with the same content and settings as the original VM.

3.2.2.3 Deploy Guest VM Through Template

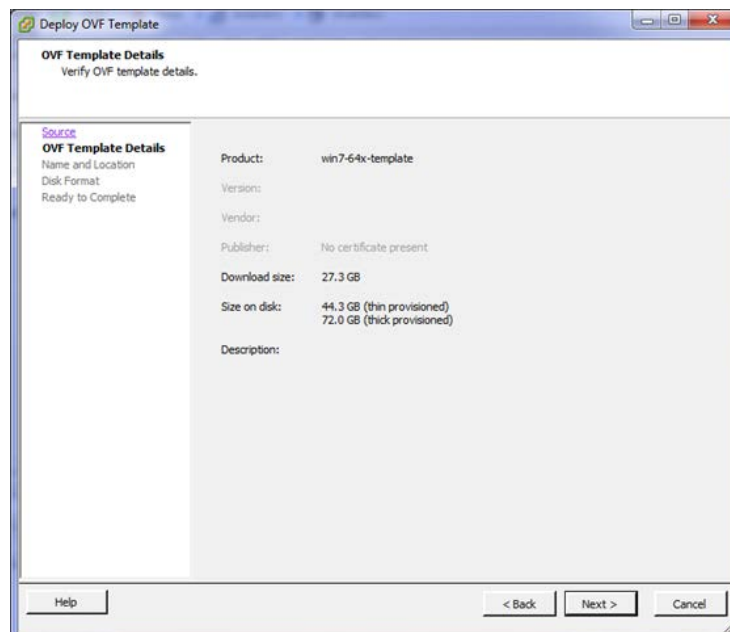
1. Right click on the host name and navigate to “Deploy OVF Template...” :



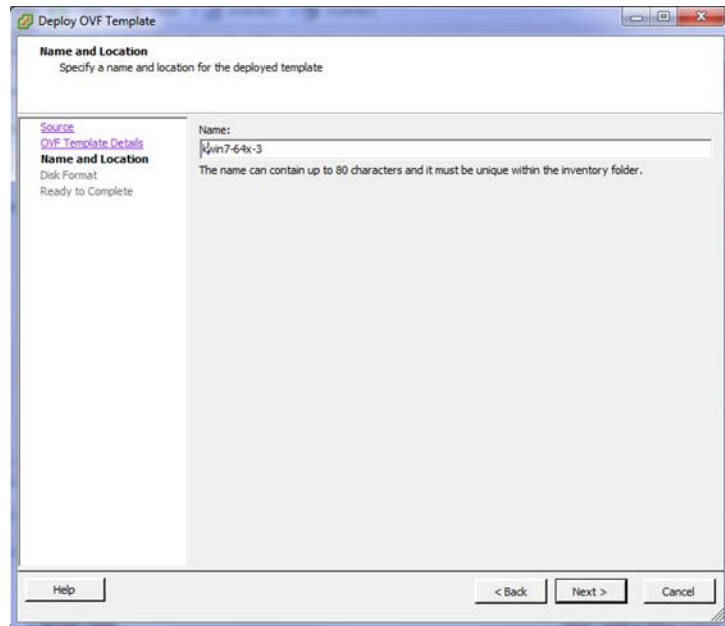
2. A window will pop up. Use the “Browse” button to find the template.



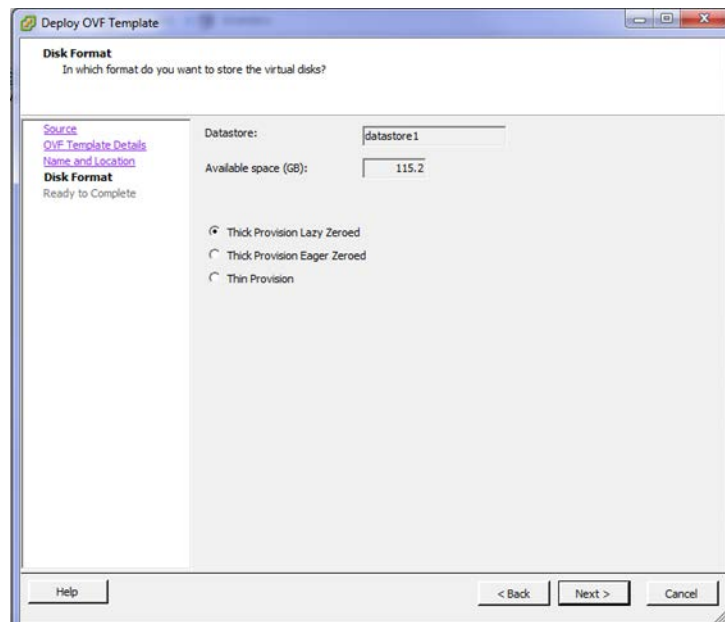
3. After clicking on Next, details of the template will be shown :



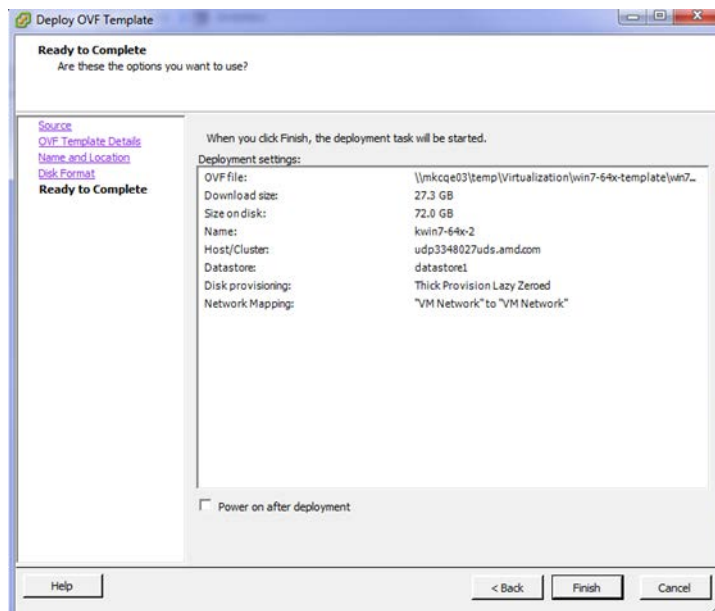
- Click on Next and enter a name for the new guest VM :



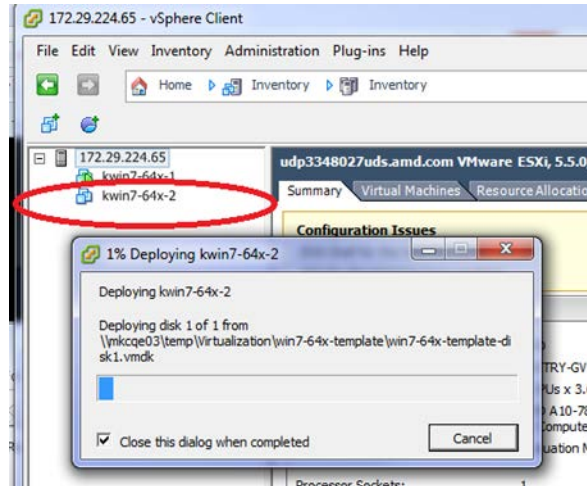
- After clicking on Next, ensure that "Thick Provision Lazy Zeroed" is selected.



6. After clicking on Next, a summary page will show the details of the VM to be created :



7. Click on Finish. A status window will show the progress of the deployment. A new VM appears under the host description.



8. It will take some time for vSphere to finish the deployment. Once complete, the VM can be started. At this point, passthrough devices can be assigned to the device, as required.

3.3 Client System Setup

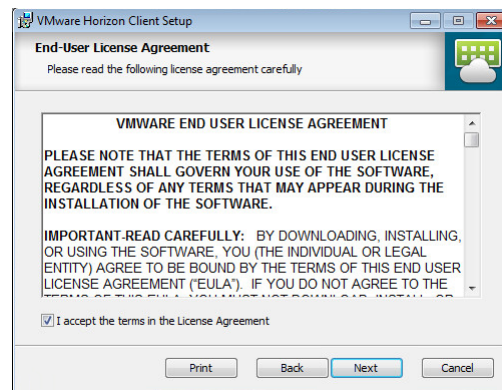
Once the virtual machines are created in the host server, there are two methods for accessing these VMs :

- Connect through a Horizon View client on a laptop, desktop or thin client system
- Connect through a zero client

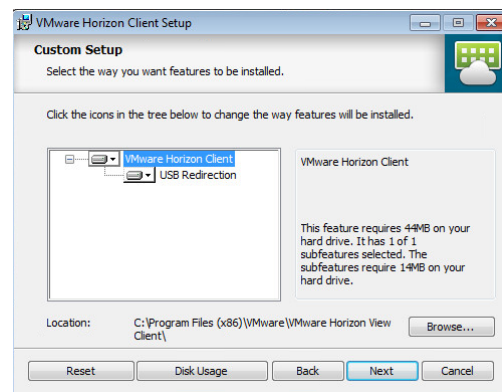
3.3.1 Horizon View Client Setup

1. On the client system or administrator system, download Horizon View indicated on **Table 1**.

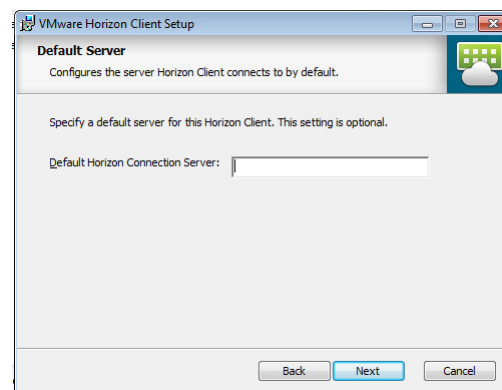
2. Run this application and accept the License Agreement



3. Click on Next and accept all the default features selected :

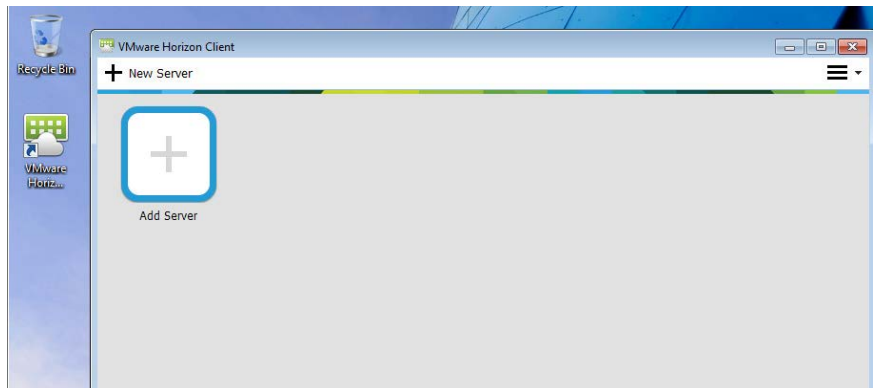


4. Ignore the Default Server, leave the Default Horizon Connection server empty and click on Next :

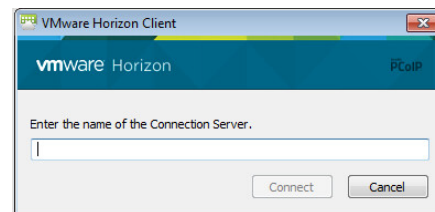


5. Create the desktop shortcut and start menu shortcut. On next page, click on Install to complete the installation.

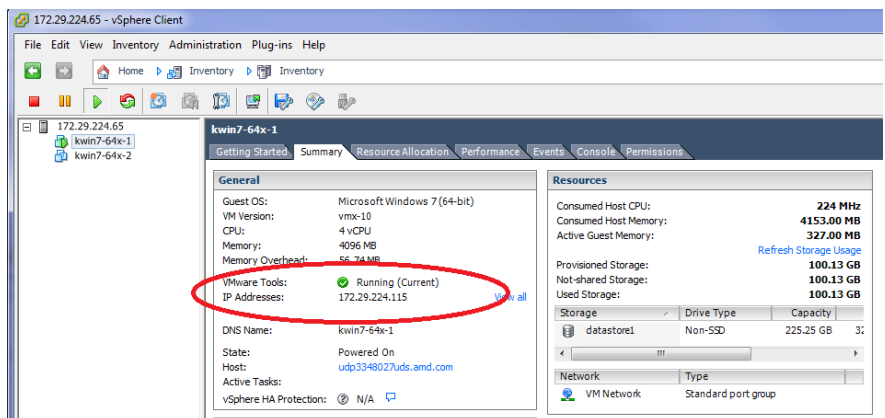
6. Once the installation completes, launch Horizon View. The following window appears :



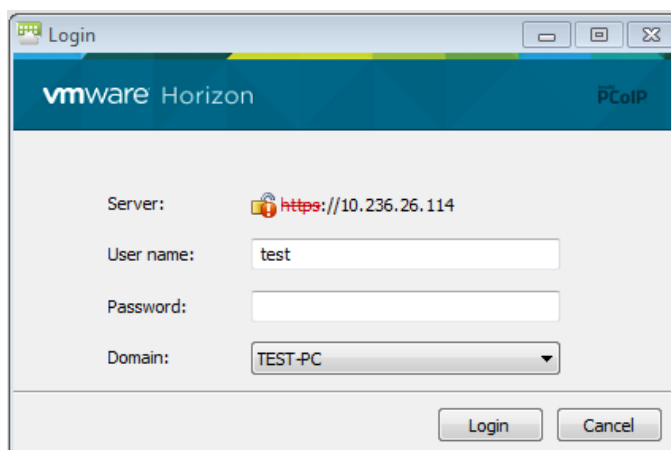
7. Clicking on “Add Server” will pop up a window that prompts for the connection target :



8. Type in the IP address of the guest VM to connect with. The IP address of the guest can be found at guest VM summary page in the vSphere client application.



9. Click on the connection button after entering the IP address. A window will pop up asking for user name and password. Enter the guest VM's user name and password, then click Login button.



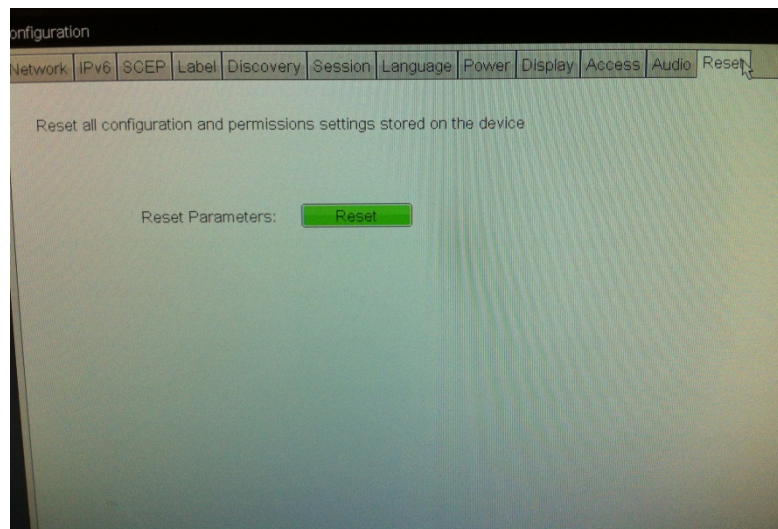
10. After logging in, the virtual machine desktop will automatically snap to full screen size of the connected monitor.

3.3.2 Zero Client Setup

1. Connect monitor, keyboard, mouse, network to the zero client



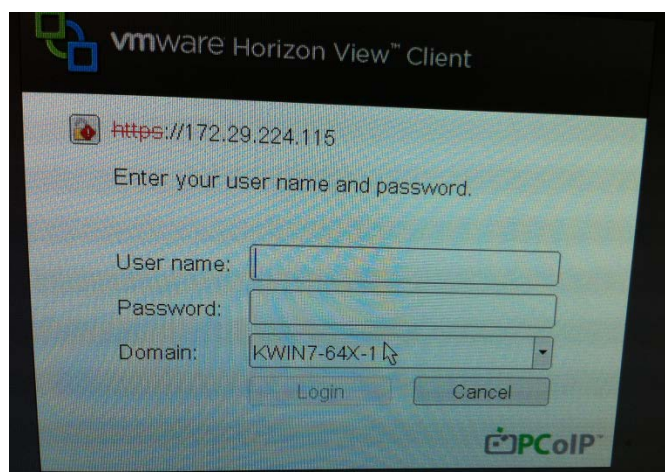
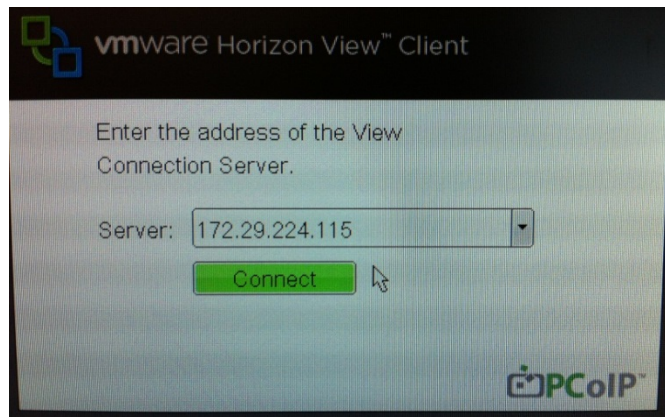
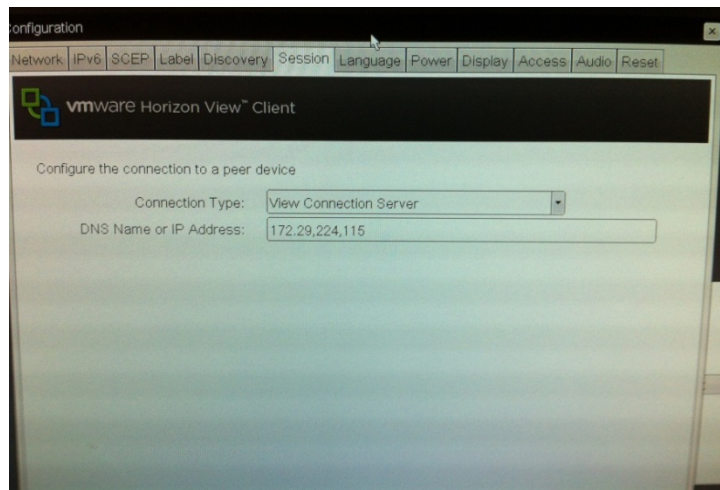
2. If this is the first time using this zero client or the zero client has been used within other network, click on the top-left corner select options-> Configuration. Navigate to Reset tab as the following – this step is only needed for the first time that a zero client is connected on the test network.



3. Click on reset, and click on Yes button. After a few minute, the system will reboot.



4. After reboot, click on the top-left corner select options-> Configuration. Navigate to Session, and select view connection server from the connection Type, type in the IP address of the guest VM
5. Click on apply, and close the windows. The screen will have a connection window as:
6. Click on the connect button a connect window will show up as the following
7. Enter the user name and password, then click on login button. The desktop should show up on the monitor



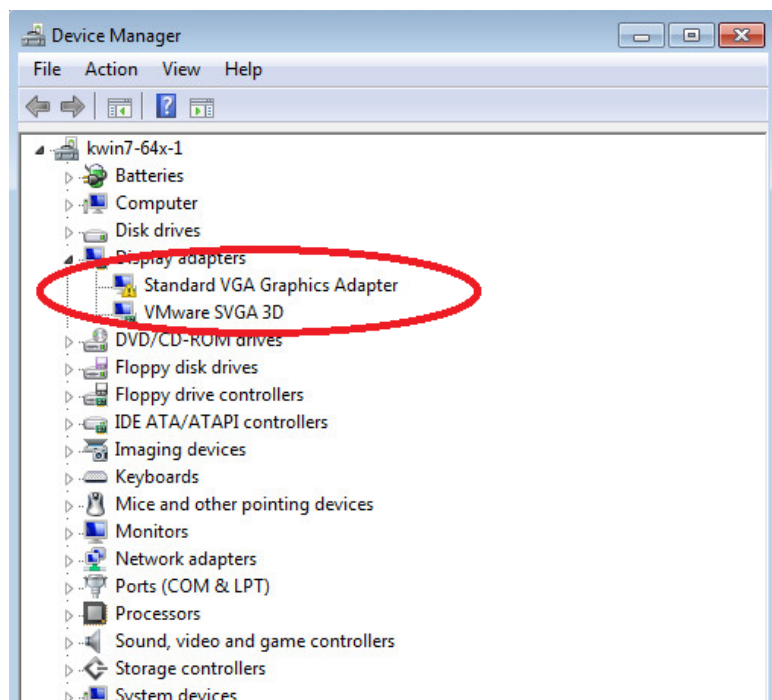
Note: If the monitor's resolution is too big (ex. 1920x1080), you might encounter black screen at this stage. Using a smaller native resolution monitor (ex. 1366x768) will work around the problem at this step. The larger monitor will be supported once the AMD driver is installed.

3.4 Summary and GFX Driver Installation under Guest VM

The sequence described in this section applies to the AMD GFX driver installation in a guest VM. MxGPU uses SR-IOV to replicate one device into several virtual devices that can then be configured for pass through. The procedure for installing the driver on a VM using an MxGPU device is the same procedure as installing the driver on a VM using a regular passthrough device under vDGA. The following installation sequence is based on the Horizon View Agent 6.1.0 and higher. The steps for setting up a virtual machine are summarized:

1. Create a guest VM and fresh install guest VM without GPU pass through. Refer to section **3.2.3** and section **3.2.4** – reboot the guest VM.
2. From vSphere client and VM console, install VMtools. Refer to section **3.2.4.3** - reboot the guest VM.
3. From vSphere client and VM console, install unified Horizon View Agent and Horizon View Agent Direct Connection. Refer to section **3.2.4.4** – shutdown the guest VM.
4. From vSphere client, assign an AMD GPU device to this guest VM. Refer to section **3.2.1** - start the guest VM.
5. Wait until an IP address appears for the guest VM in Summary tab. Start the Horizon View client application from client system, configure as “PCoIP and full screen” and connect to guest VM. Refer to section **3.3** for details.

6. Once the guest VM is powered on, a connected passthru device becomes part of the guest VM’s devices. To check that this is the case, open Device Manager and review the list of devices under “Display adapters”. Before installation of the graphics adapter driver, the devices will appear as, “Standard VGA Graphics Adapter”.



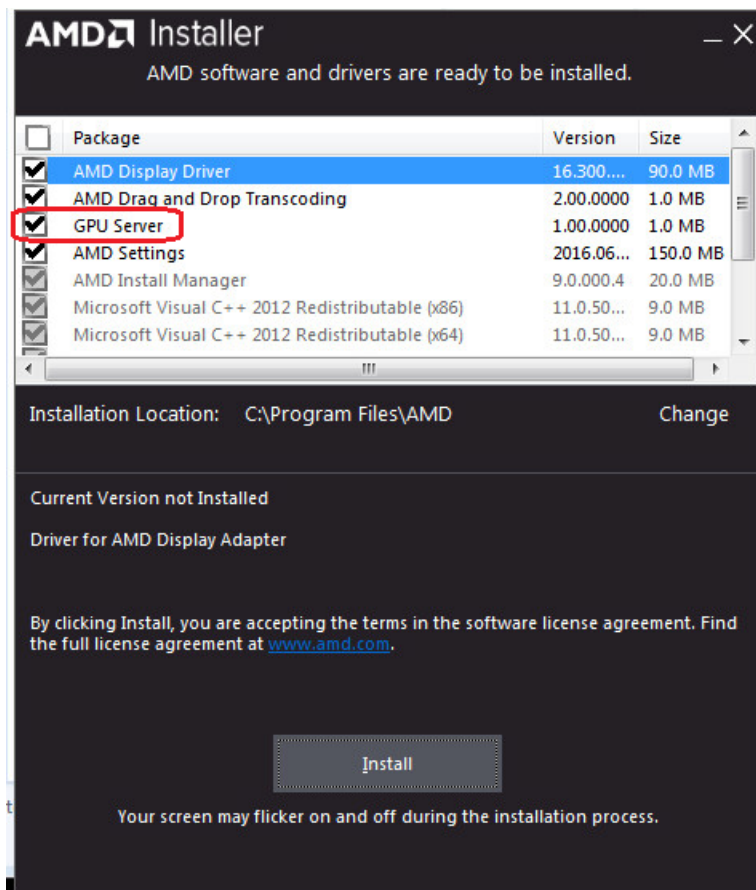
3.4.1 Graphics Driver Installation

The next steps describe the graphics driver installation process inside the VM once a passthrough or MxGPU device is connected.

1. Log into the guest VM and obtain graphics driver install package from the location indicated in **Table 1**.

2. Run **setup.exe** from the graphics driver install package. The first screen should be as shown on the right.

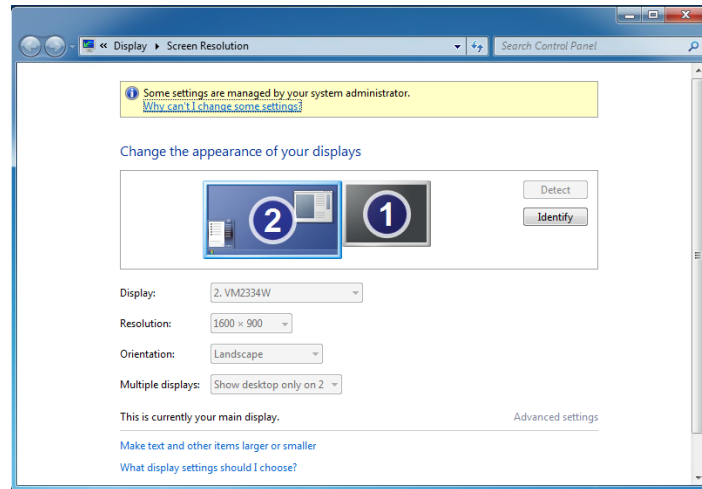
Note : “GPU Server” must be present and selected. Otherwise, the install package will not recognize the GPU as a virtualization capable device.



Other important notes :

- During the installation process, the progress bar may spend a lot of time at “2%” but should eventually advance.
- If, during installation within a VM, the screen freezes or the primary desktop disappears, close the horizon view connection, and reconnect to the guest VM.
- Most of the installation can be done within the console. However, as soon as the driver loads, nothing more can be done from the console as it will appear frozen. The graphics driver has taken control of the desktop. From this point on, use Horizon View to view the virtual desktop.

3. After reboot and IP address of the virtual machine appears in the Summary tab, from client system (desktop/laptop), connect to guest VM again. Right click on the desktop, select screen resolution. The screen resolution window appears and reports the resolution similar to the following :



If a window similar to the above appears then the AMD GFX driver is properly installed and the vSGA desktop is disabled.

