



VMware ESXi 5.0 Installation and RWC2 Tips and Tricks

This document introduces the details of how to install VMware ESXi 5.0 Operating System onto an Intel® RAID controller and how to use Intel® RAID Web Console 2 on a client machine to manage the RAID controller remotely.

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Enterprise Platforms and Services Division

Revision History

Date	Revision Number	Modifications
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1. Introduction to VMware ESXi

1.1 What is VMware ESX?

VMware ESX is an enterprise-level computer virtualization product offered by VMware, Inc. ESX is a component of VMware's larger offering, VMware infrastructure, and adds management and reliability services to the core server product. In the ESX original architecture, the virtualization kernel (VMKernel) is augmented with a Linux Operating System known as Service console (also known as COS or service console) to provide management interface such as executing script or installing third party agents into the host. Various VMware management agents are deployed in the Console OS, along with other infrastructure service agents such as name service, time service. In this architecture, many customers deploy other agents from 3rd parties to provide particular functionality, such as hardware monitoring and system management. Furthermore, individual admin users log into the Console OS to run configuration and diagnostic commands and scripts.

1.2 What is VMware ESXi?

In 2007, VMware introduced ESXi to deliver industry-leading performance and scalability while setting a new bar for reliability, security and hypervisor management efficiency. VMware ESXi is a smaller and free footprint version of ESX, it uses the same kernel to deliver virtualization capabilities but doesn't include ESX's Service Console and all of the VMware agents run directly on the VMKernel. Only modules that have been digitally signed by VMware are allowed on the system, creating a tightly locked-down architecture. Preventing arbitrary code from running on the ESXi host greatly improves the security of the system. ESXi is a "bare-metal" hypervisor, meaning it installs directly on top of the physical server and partition it into multiple virtual machines that can run simultaneously, sharing the physical resources of the underlying server.

1.3 Comparison between ESX and ESXi

For ESX:

- VMware agents run in Console OS.
- Nearly all other management functionality provided by agents running in the Console OS.
- Users must log into Console OS in order to run commands for configuration and diagnostics.

For ESXi:

- VMware agents ported to run directly on VMKernel.
- Authorized 3rd party modules can also run in Vmkernel. These provide specific functionality like hardware monitoring and hardware drivers.
- VMware components and third party components can be updated independently.
- The "dual-image" approach lets you revert to prior image if desired.
- Other capabilities necessary for integration into an enterprise datacenter are provided natively.
- No other arbitrary code is allowed on the system.

1.4 Why do we need ESXi?

Thanks to its ultra-thin architecture with less than 100MB of code-base disk footprint, ESXi deliver the industry-leading performance and scalability of ESX with several additional benefits

1. Improved reliability and security- with fewer line of code and independence from general purpose, ESXi drastically reduces the risk of bugs or security vulnerabilities and makes it easier to recure the hypervisor layer.
2. Streamlined Deployment and Configuration-ESXi has far fewer configuration item than ESX, greatly simplifying deployment and configuration and making it easier to maintain consistency.
3. Higher Management Efficiency- the API-based, partner integration model of ESXi eliminates the need to install and manage third party management agents. You can automate routine tasks by leveraging remote command line scripting environments such as vCLI or PowerCLI.
4. Simplified Hypervisor Patching and Updating-Due to its smaller size and fewer components, ESXi requires far fewer patches than ESX, shortening service windows and reducing security vulnerabilities.

For more details about VMware ESX and ESXi, please refer to URL:
<http://www.VMware.com/products/vsphere/esxi-and-esx/overview.html>

2. ESXi 5.0 Related RAID Operations

This document provides a step by step guide to create a RAID virtual drive, install an VMware ESXi 5.0 onto an Intel® Hardware RAID controller, install Windows 2008 R2 on Intel® Server Board, use RAID Web Console 2 (RWC2) on a client to control the RAID controller on server.

To use the RWC2 tools on a client to control the RAID controller on a server, two server boards are used in this document.

On the server you need to insert a RAID Controller and install VMware ESXi 5.0 on Intel® RAID virtual drive, the minimal memory requirement for VMware ESXi 5.0 system is **2GB**.

On the client install a windows OS and the RWC2 software to take control of the RAID controller on the server.

2.1 RAID Configuration on Server Board

1. Insert a RAID controller into the Server Board.
2. Power on the server board and press **<Ctrl+G>** as is displayed on the screen after POST to enter the RAID Adapter Selection page. Then Click **“Start”** in Figure 1.

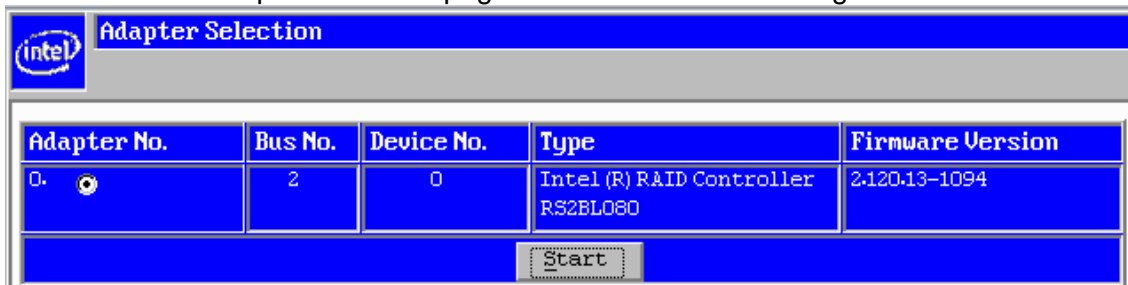


Figure 1. Choose RAID Adapter

3. Enter the RAID BIOS Console page; click **“Configuration Wizard”** to begin the RAID configuration.

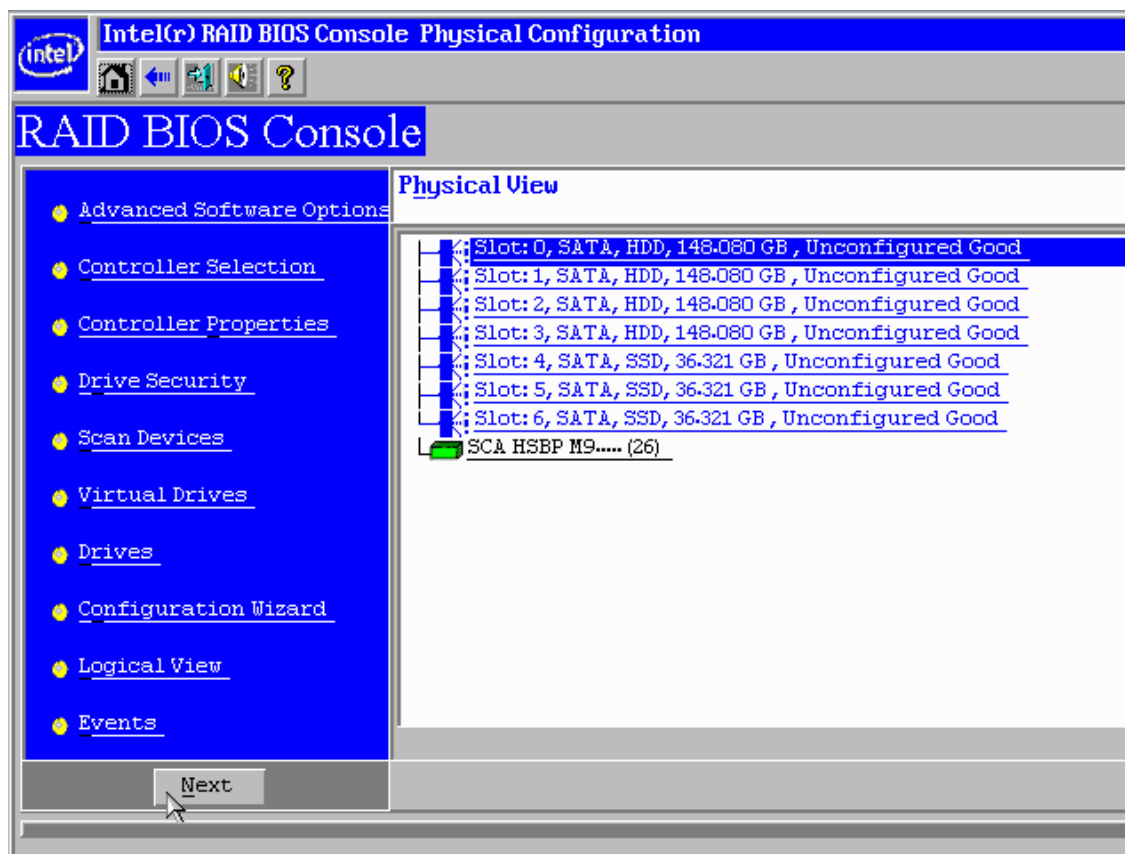


Figure 2. Homepage of the Web BIOS Console

4. Choose “**New Configuration**” to clear existing RAID configurations and add new RAID configuration, then click “**Next**”. Or you can choose “**Add Configuration**” which will add new configuration without clear the existing ones on current physical disks.

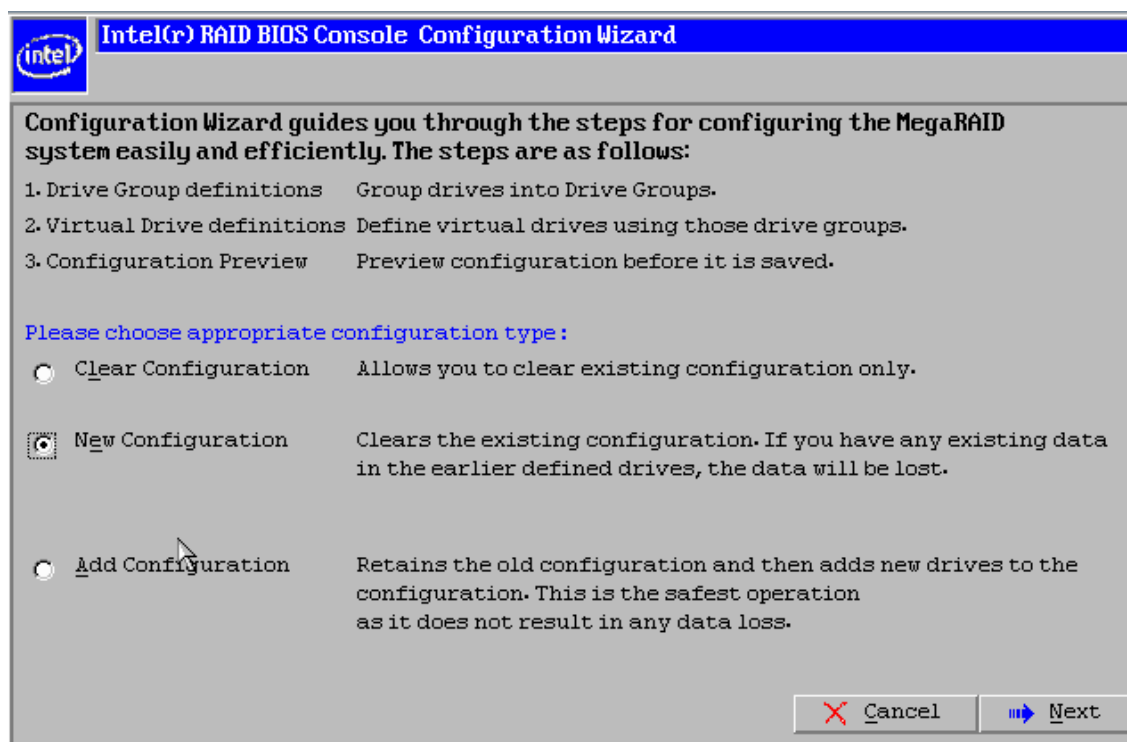


Figure 3. Choose Appropriate Configuration Type

5. When the screen displays “You have chosen to clear the configuration. This will destroy all virtual drives. All data on all virtual drives will be lost. Are you sure you want to clear the configuration”, click “Yes” to continue.

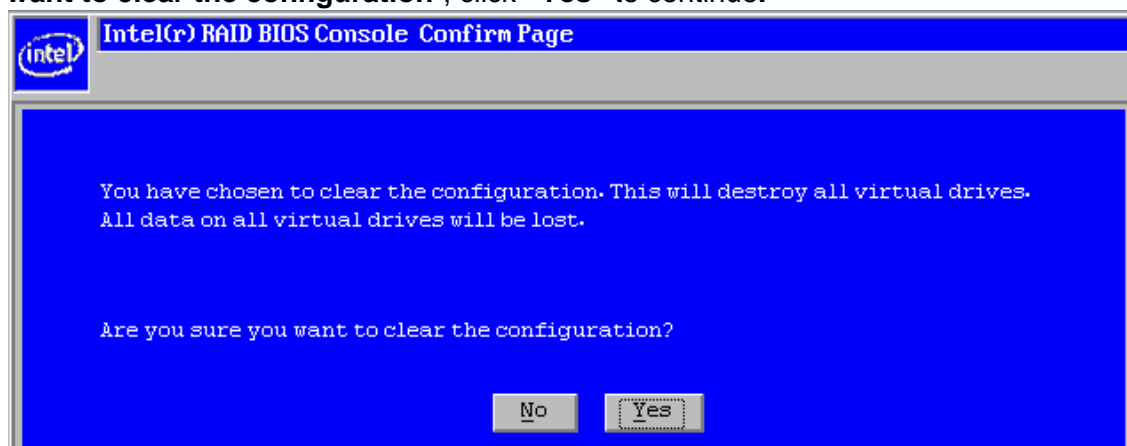


Figure 4. Confirm to Clear Existing Configuration

6. Choose “Virtual Drive Configuration” and then click “Next”.

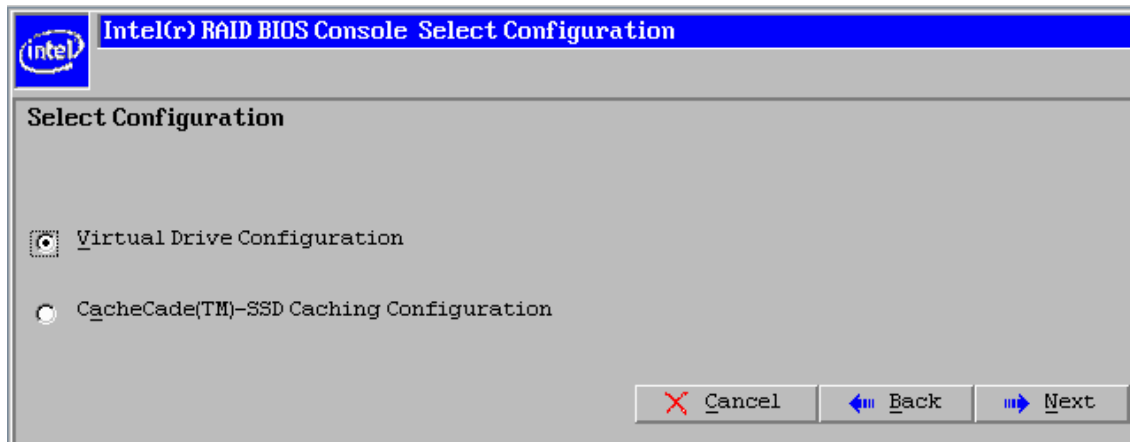


Figure 5. Select Configuration

7. Choose one of the configuration methods displayed on the screen and click “**Next**” to continue, here “**Manual Configuration**” method is chosen which will allow us to choose RAID level and other appropriate parameters. Or you can choose “**Automatic Configuration**”, and the console will automatically decide the RAID level and other parameters according to the status of the physical disks during the configuration.



Figure 6. Select Configuration Method

8. Hold down the <Ctrl> key and click each drive you want to include in the array or the Drive Groups. Click “**Add To Array**”. If you make a mistake and need to remove drives, click “**Reclaim**”. And then click “**Next**”.

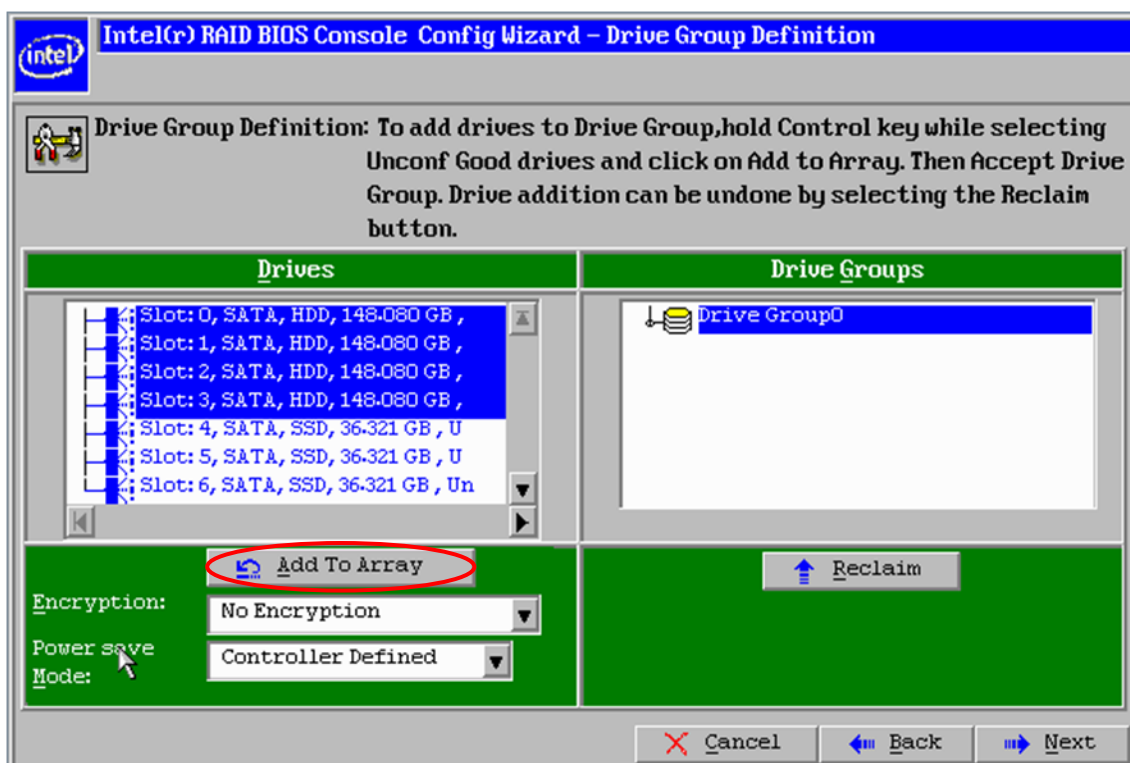


Figure 7. Add Physical Drives to Drive Group

9. Click “Accept DG” to accept the Drive Group, click “Next” to continue.

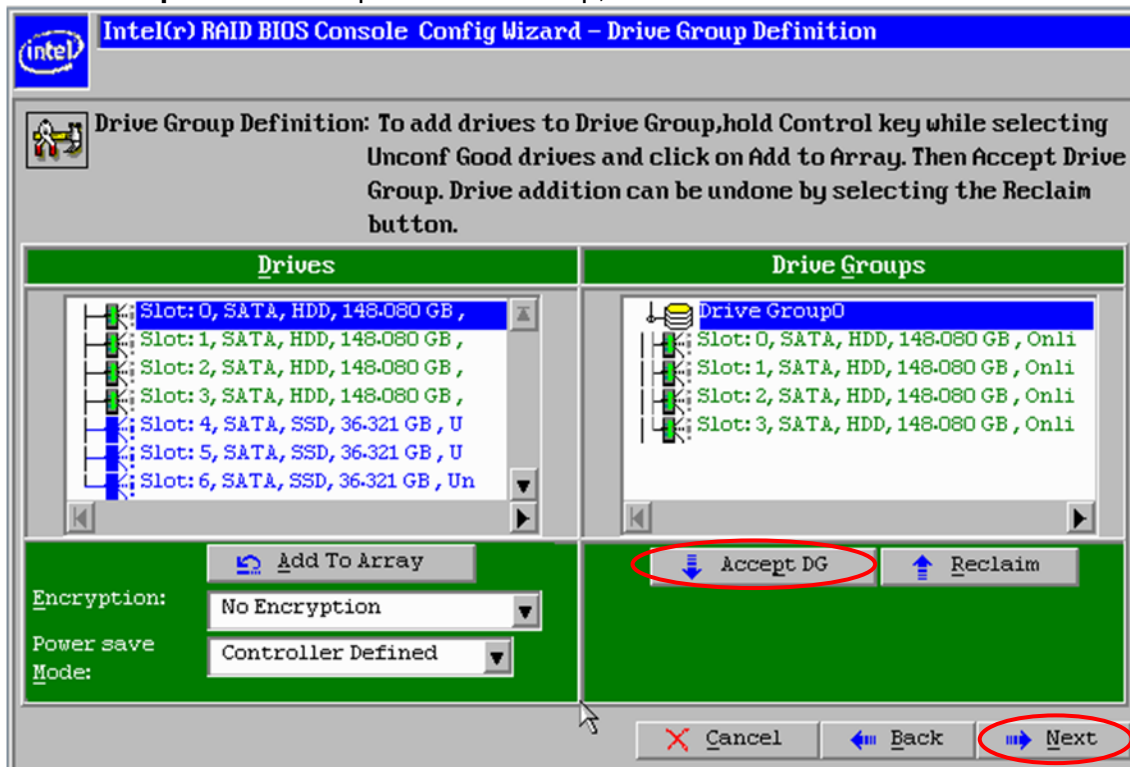


Figure 8. Accept Drive Group

10. Choose the “**Array with Free Space**” from the drop-down list and then Click “**Add to SPAN**” to add the chosen array into Span.

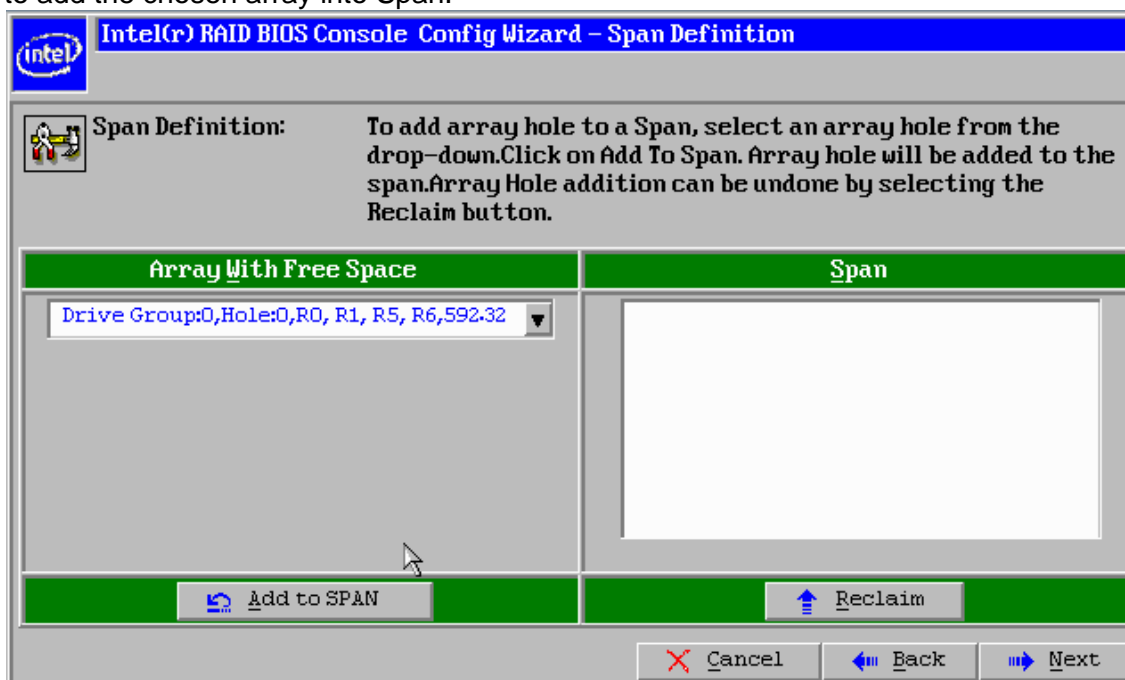


Figure 9. Add Array to Span

11. Click “**Next**” to accept the Span.

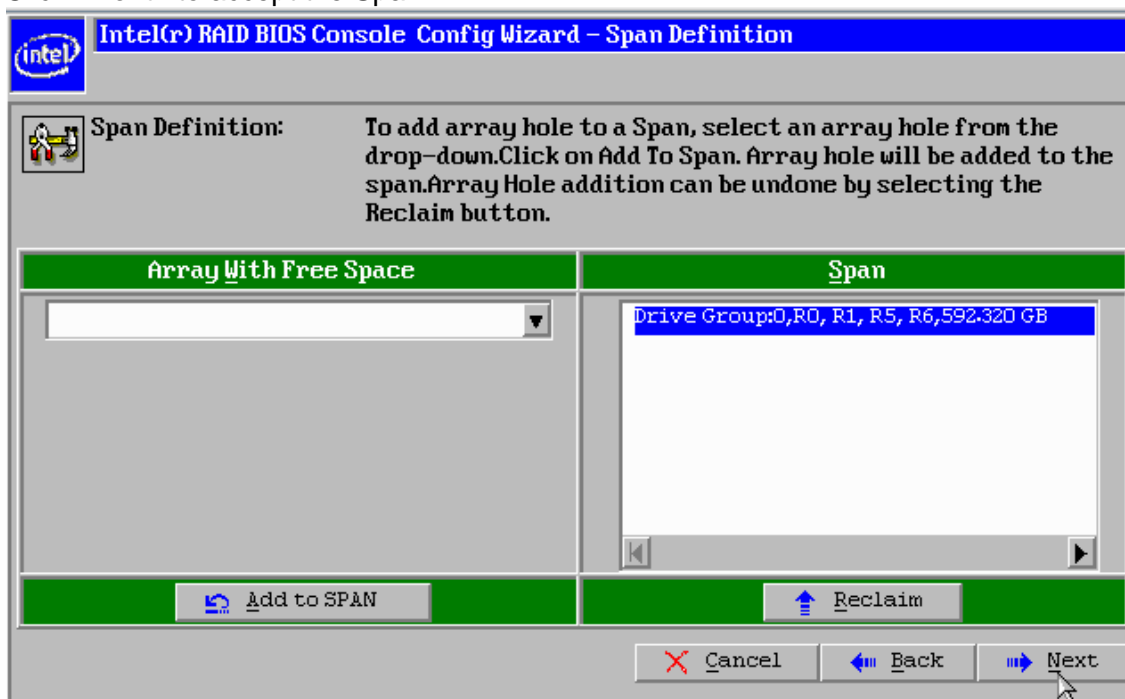


Figure 10. Accept the Span

On the Virtual Drive Definition window, select the **“RAID Level”** from the first drop-down list. Here RAID 5 is chosen. If needed, change the stripe size, the policies for Access, Read, Write, IO, and Disk Cache and decide whether to use background initialization. And then Click **“Accept”** to accept the changes, or click **“Reclaim”** to delete the changes and return to the previous settings.

NOTE: There is a prompt in green that shows the max size of each RAID Level.

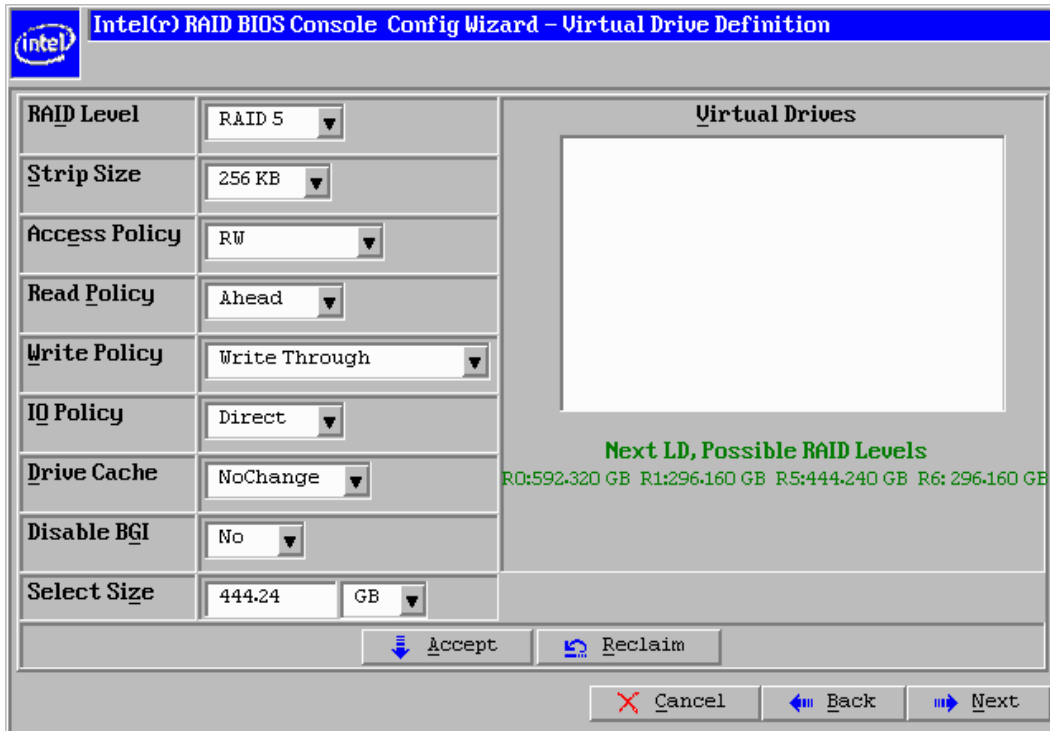


Figure 11. Virtual Drive Definition

12. If you choose the Write Through policy in step 11, the screen displays the warning **“Write Through mode eliminates risk of losing cached data in case of power failure. But it may result in slower performance. Are you sure you want to select Write Through mode?”** then click **“Yes”** to save the configuration, or click **“No”** to return to the previous screens and change the configuration.

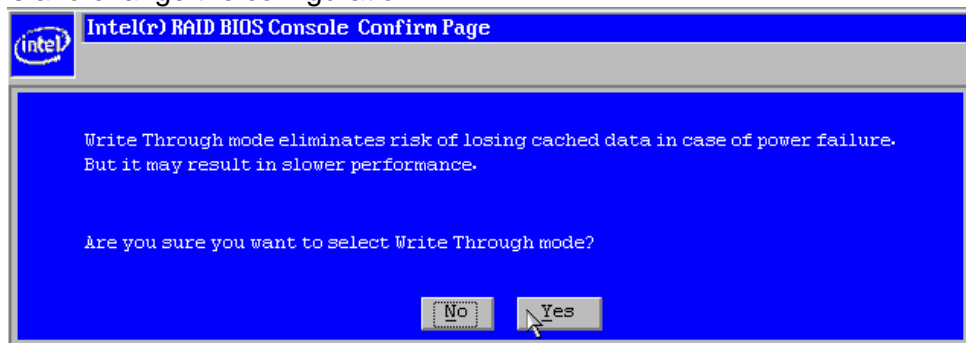


Figure 12. Confirm the Write Policy

13. Click **“Next”** to continue the RAID configuration.

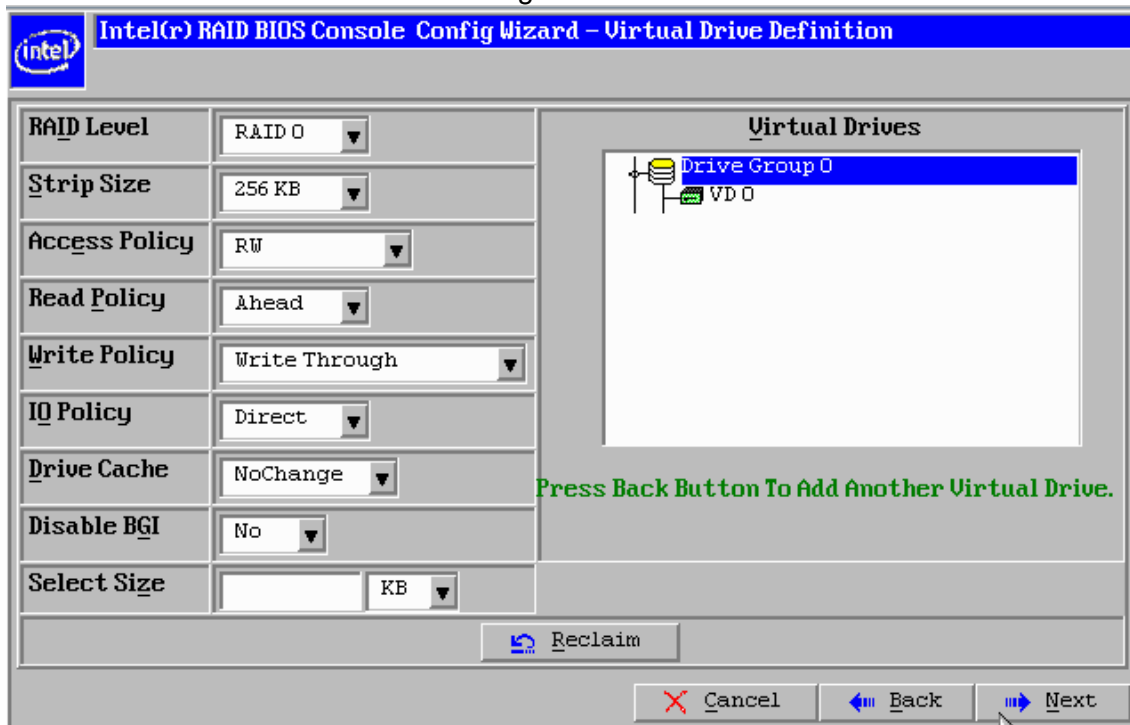


Figure 13. Save the Virtual Drive Definition

14. Click **“Accept”** to save the RAID configuration.

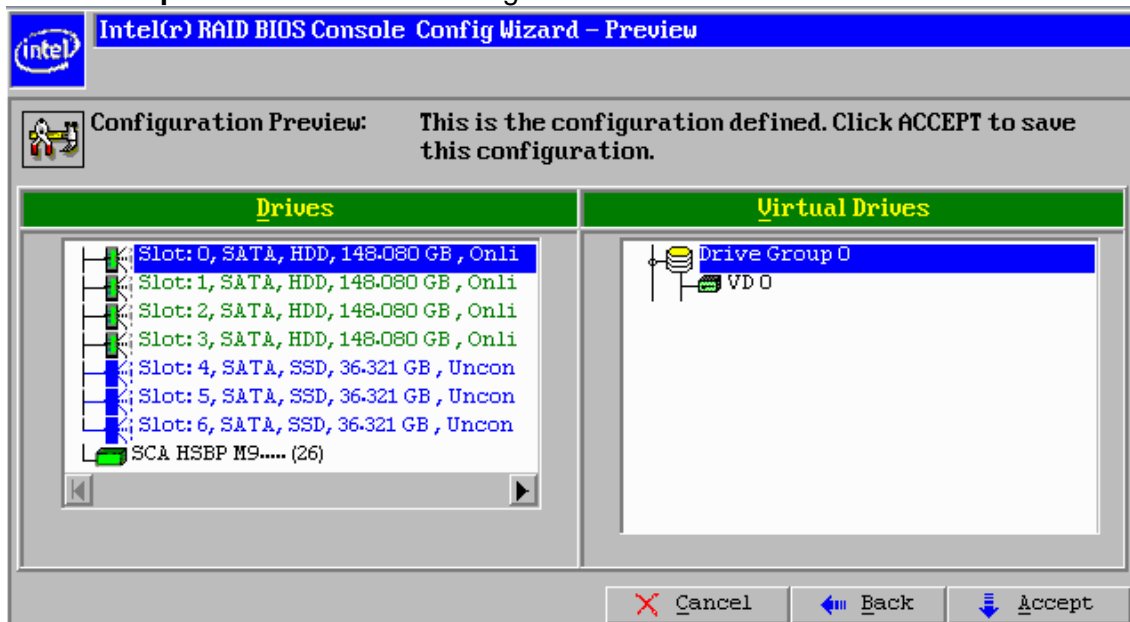


Figure 14. Accept Virtual Drive

15. When the screen displays **“Save this Configuration?”**, click **“Yes”** to save the RAID configuration. Or you can choose **“No”** to change the configuration.

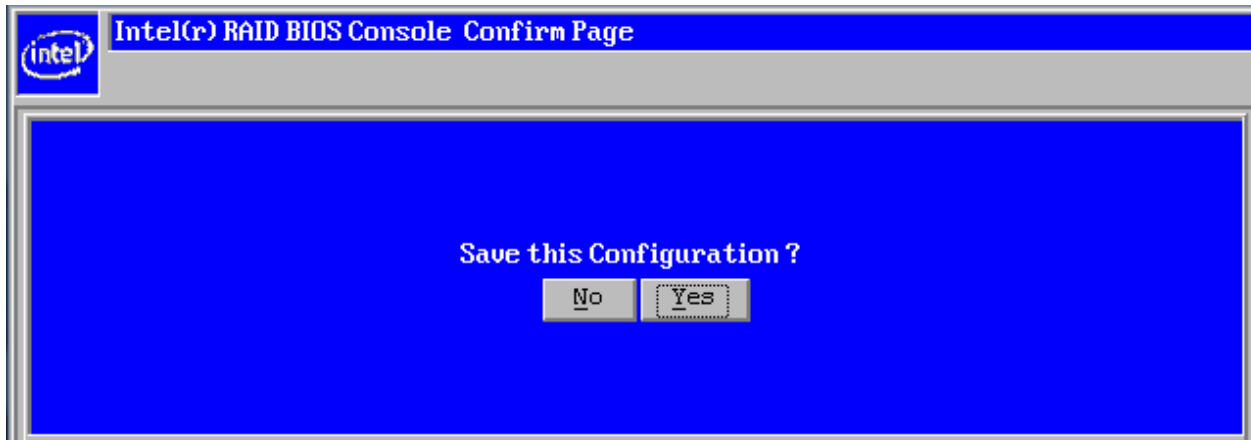


Figure 15. Accept and Save the RAID Configuration

16. When the screen displays “**All data on the new Virtual Drives will be lost. Want to Initialize?**”, click “**Yes**” to initialize the RAID configuration. Or you can choose “**No**” to give up the initialization.

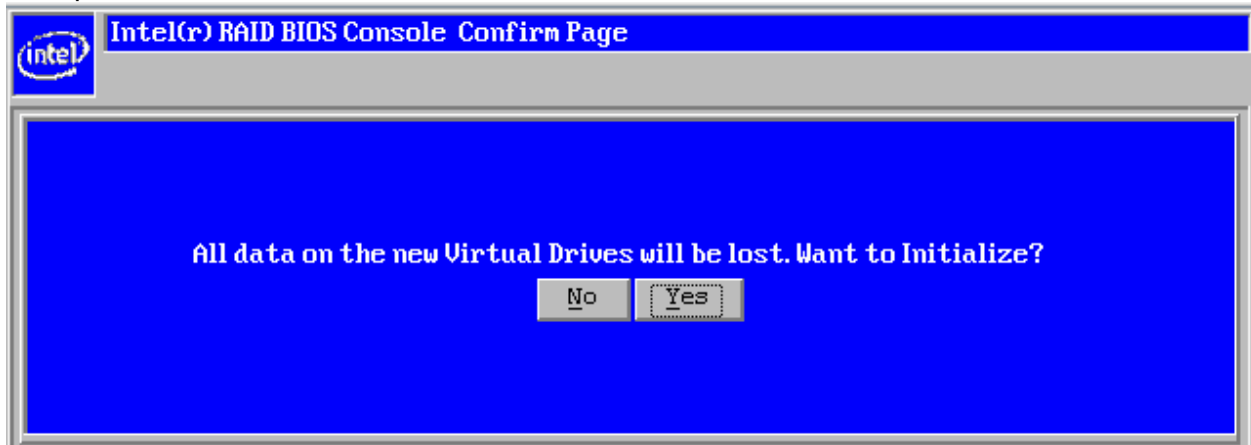


Figure 16. Accept to Initialize the RAID Configuration

17. If you choose “**Yes**” , it will begin the initialization of virtual drive.

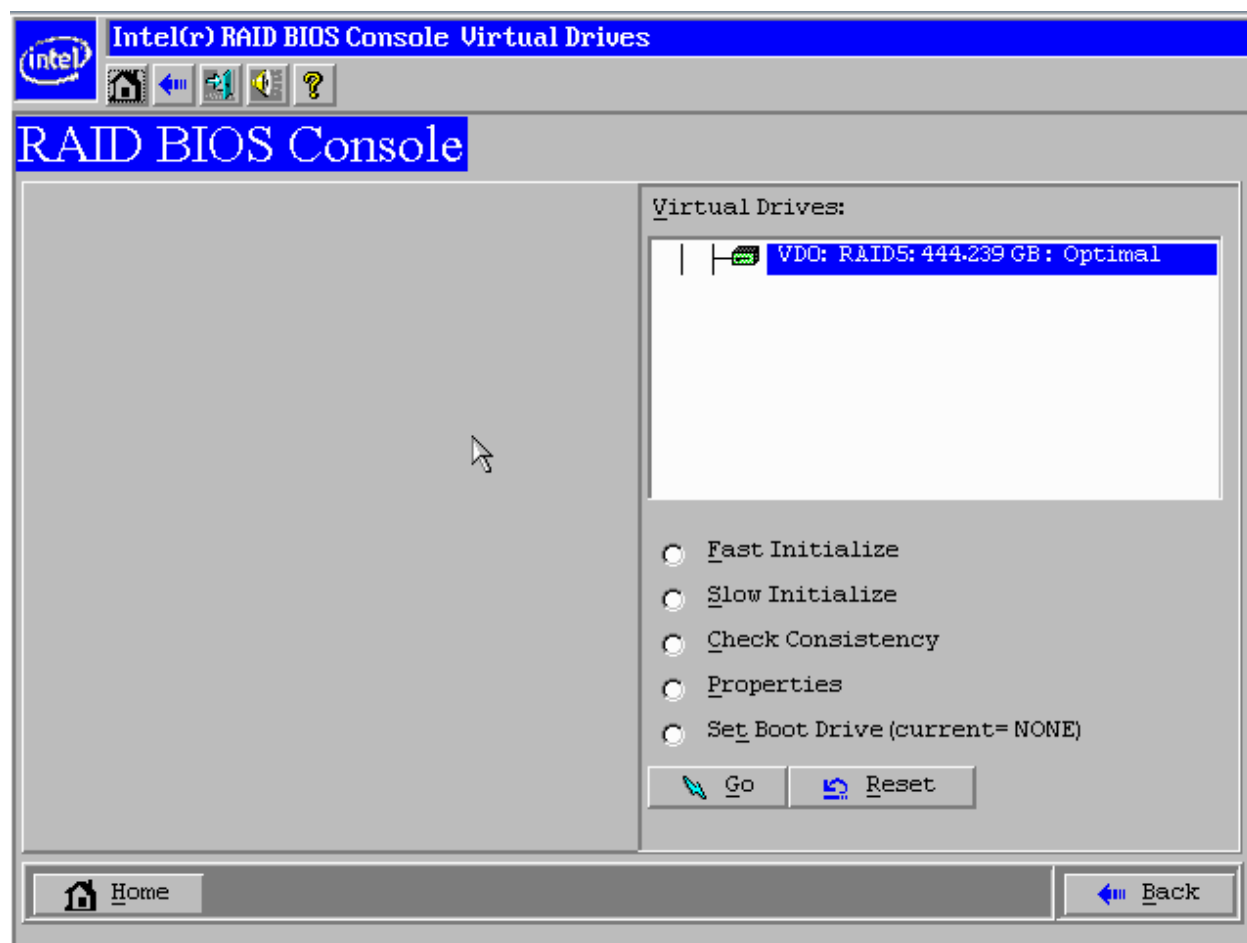


Figure 17. Initialize the RAID Configuration

18. Now go back to the homepage of RAID BIOS console, it displays the detailed information of the virtual drive.

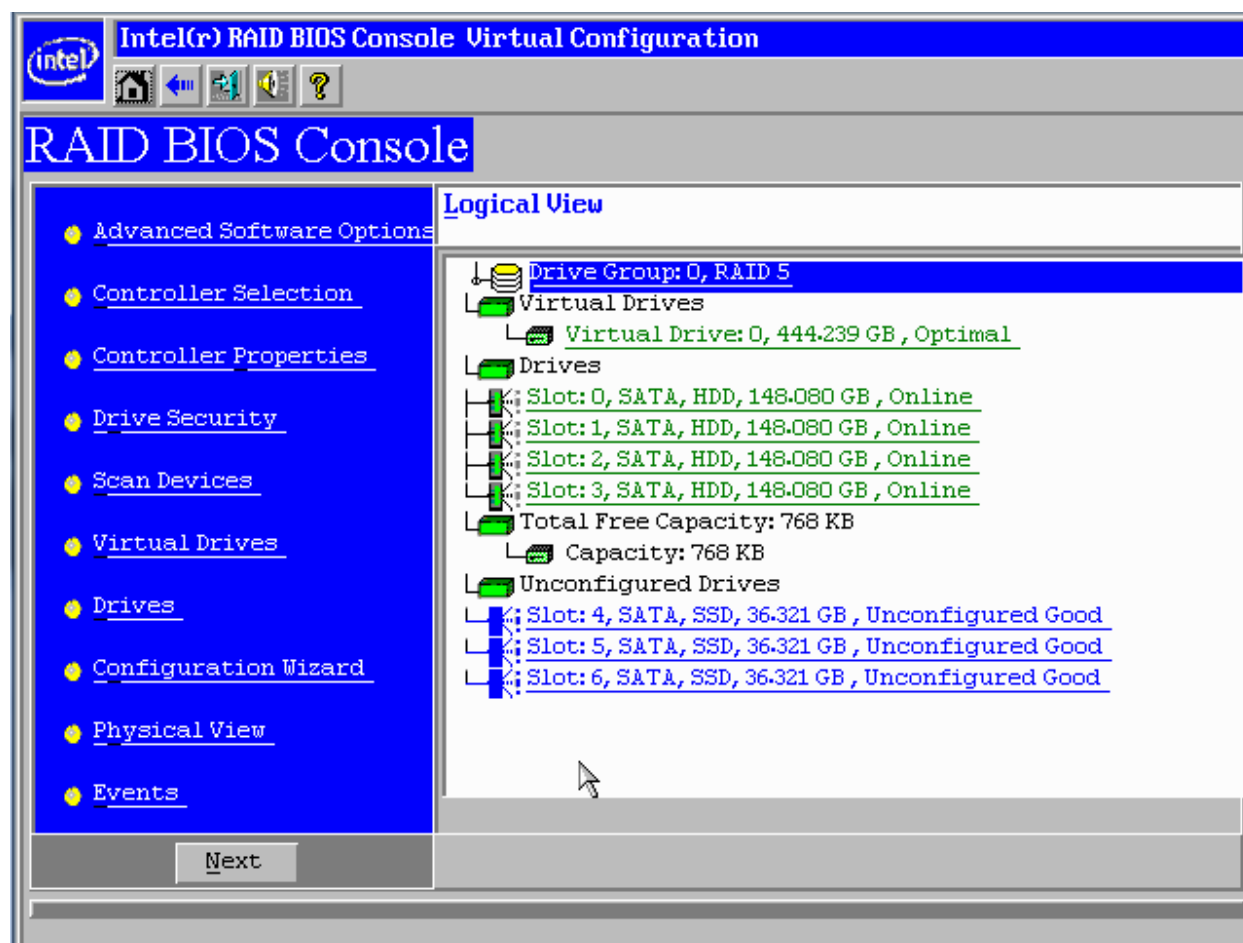


Figure 18. RAID Configuration Results

2.2 Make ESXi 5.0 Installation Disk for 2208 Chip based RAID Controller Driver

2.2.1 Preparations

1. Get VMware ESXi 5.0 Installation depot. User has to contact VMware to get a proper level of access right to download the ESXi 5.0 installation depot. In this document, the downloaded ESXi 5.0 installation depot is named "**VMware-ESXi-5.0.0-469512-depot.zip**".
2. Get the VMware ESXi 5.0 Driver for 2208 Chip based RAID Controller. It can be downloaded from http://downloads.vmware.com/d/details/dt_esxi50_lsi_2108_v534/dHRAYnRqZWRiZHAiJQ . Extract the downloaded zip file to get the "**LSI_5_34-offline_bundle-455140.zip**" which contains the 2208 chip based RAID controller driver.

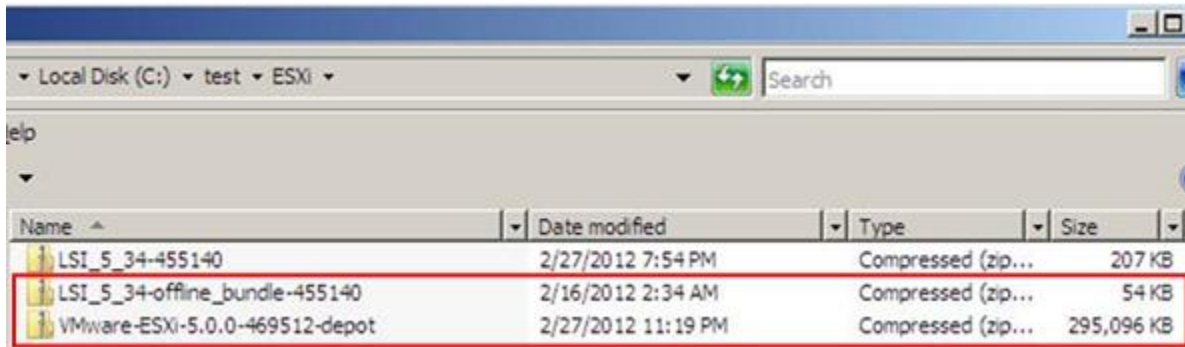


Figure 19. Files Needed for the ESXi 5.0 Installation on 2208 Chip based RAID Controller

3. A system with Windows Server 2008 x64 Standard Edition already installed.
4. In above system, install Microsoft.NET 2.0, you can download the Microsoft .Net 2.0 for Windows Server 2008 x64 system from <http://www.microsoft.com/download/en/confirmation.aspx?id=6523> and complete the installation.
5. In above system, install Microsoft PowerShell 2.0, you can download the Microsoft PowerShell 2.0 for Windows Server 2008 x64 Standard Edition from <http://www.microsoft.com/download/en/details.aspx?id=20430>.

2.2.2 Install vSphere PowerCLI

1. Download the VMware vSphere PowerCLI from <http://www.vmware.com/support/developer/PowerCLI/index.html>
2. Copy above downloaded file to the Windows system that has Microsoft.NET 2.0 and PowerShell 2.0 installed as mentioned in previous section. Double click the VMware vSphere PowerCLI installation icon.



Figure 20. Starting the VMware vSphere PowerCLI Installation

3. Click **“Next”** to begin the Installation Shield Wizard.



Figure 21. Enter the InstallShield Wizard

4. Click **“Next”** to continue the installation.

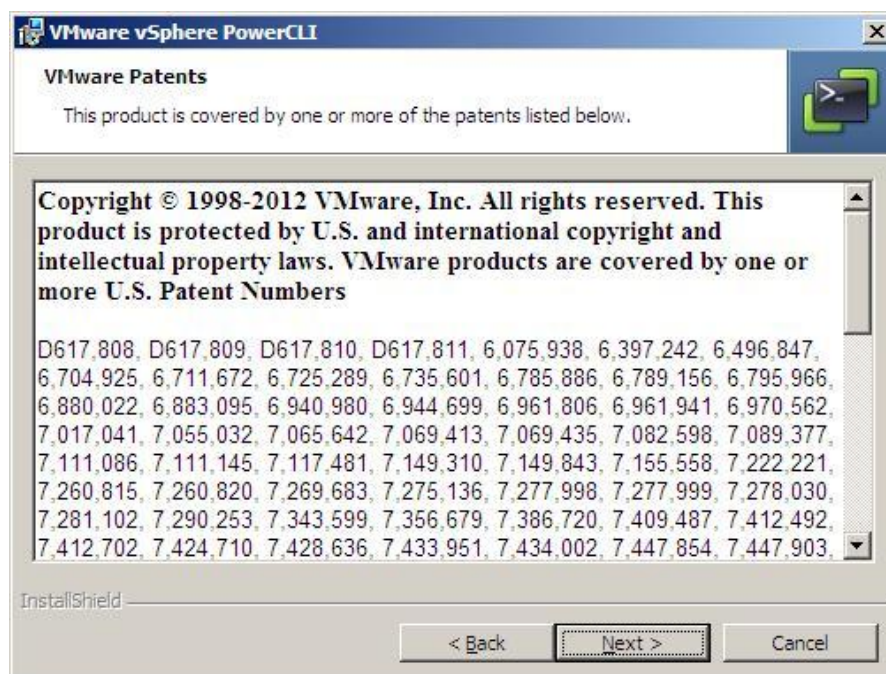


Figure 22. Copyright Information

- Click the checkbox of **"I accept the terms in the license agreement"** and then click **"Next"** to continue the installation.

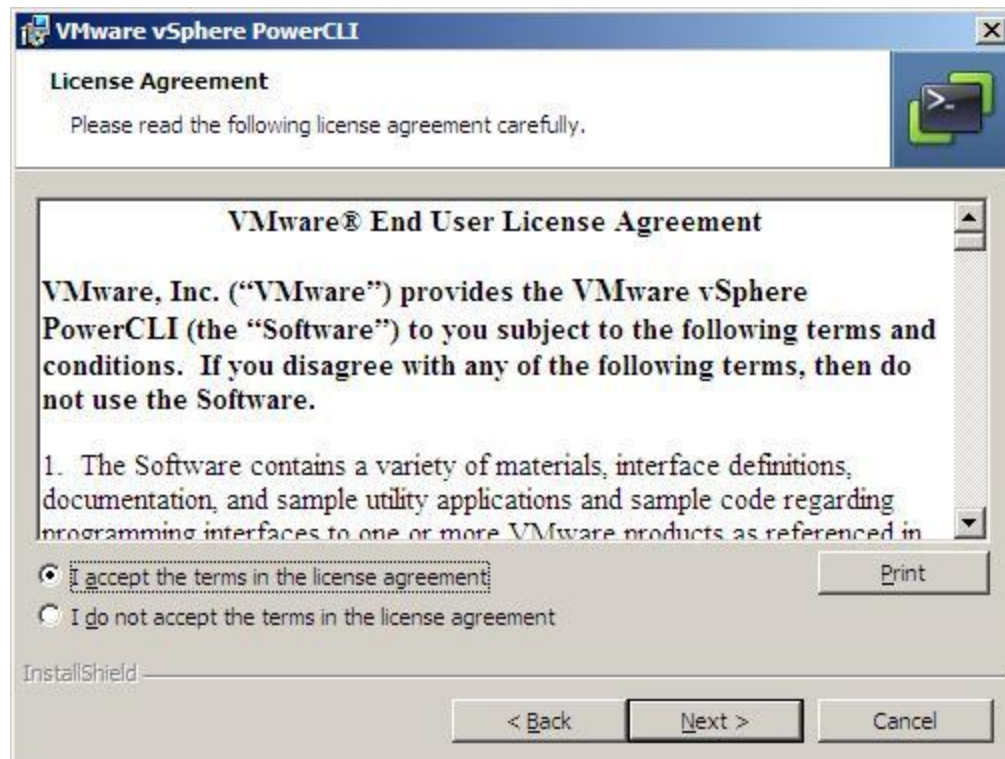


Figure 23. Accept Installation License Agreement

- Choose the Installation features, and you can change the installation directory if needed by click the **"Change"** button and choose the proper directory.

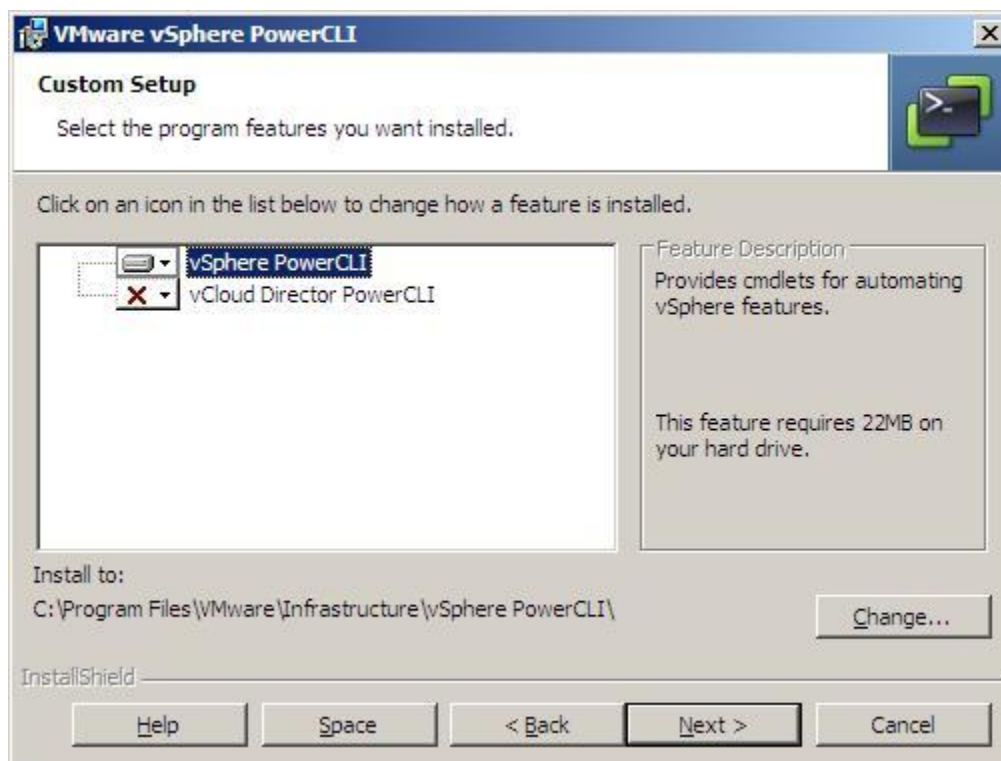


Figure 24. Installation Configuration

7. Click the “**Install**” to begin the VMware vSphere PowerCLI installation.

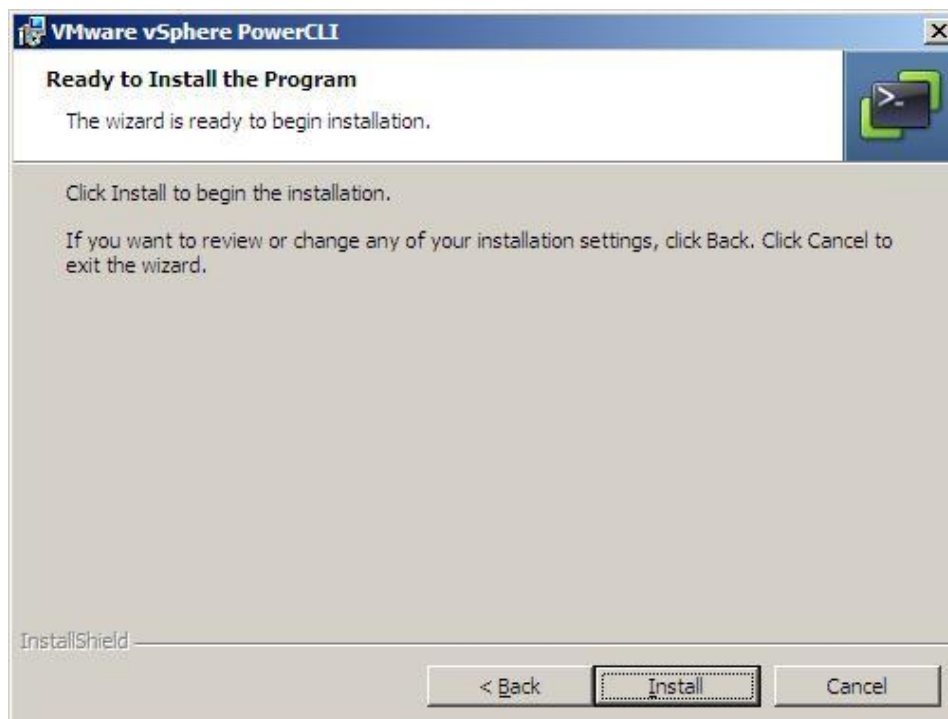


Figure 25. Continue to Install the VMware vSphere PowerCLI

8. The VMware vSphere PowerCLI installation is in process.

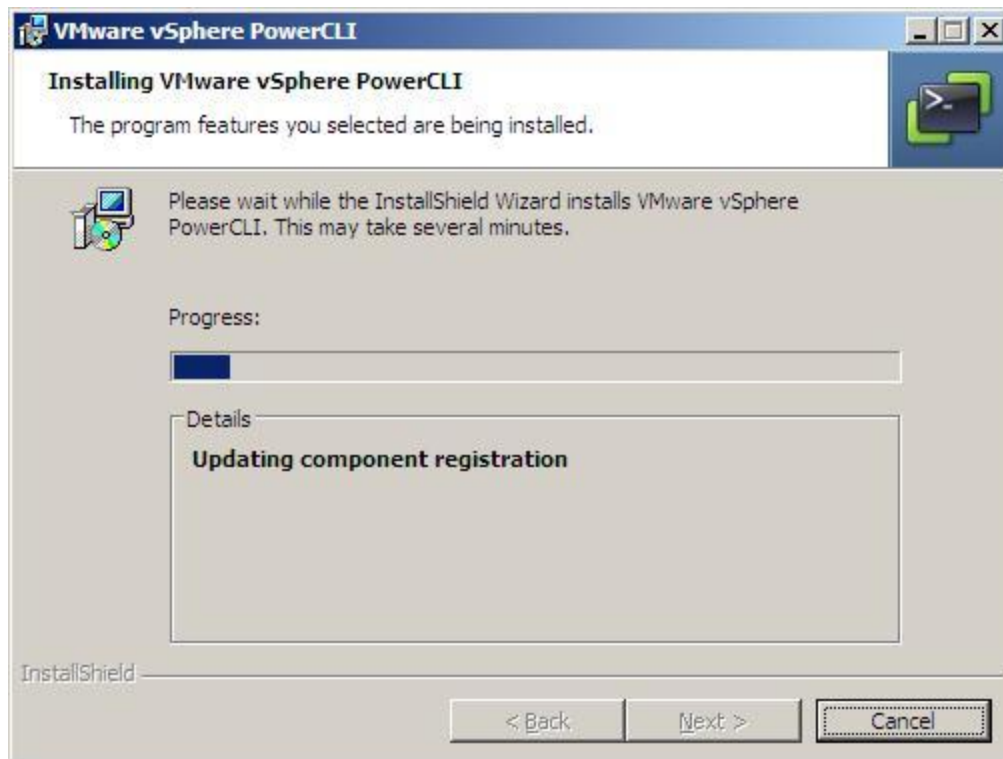


Figure 26. VMware vSphere PowerCLI Installing

9. When the installation is completed, click "**Finish**" to end the installation.

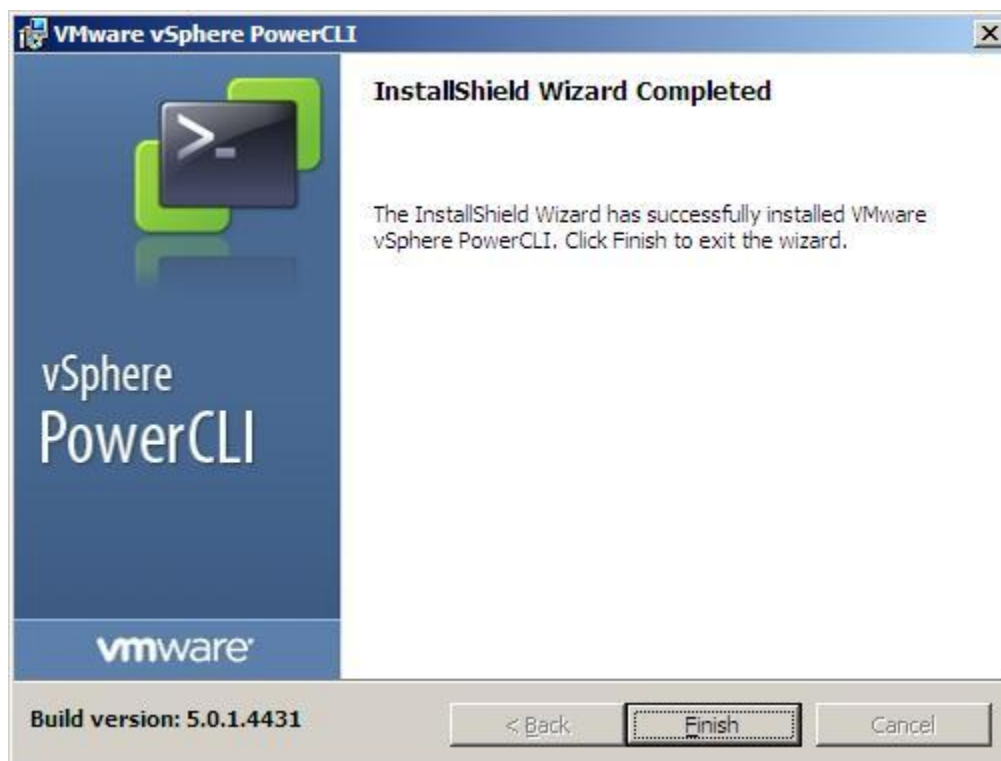


Figure 27. VMware vSphere PowerCLI Installation Completes

10. After the installation, there will be a VMware vSphere PowerCLI icon on the desktop, you just need to double click for use.



Figure 28. VMware vSphere PowerCLI Icon on Desktop

2.2.3 Add RAID Driver to the ESXi 5.0 Depot and Export Installation ISO file

1. Open the **VMware vSphere PowerCLI** by double clicking the icon on desktop.

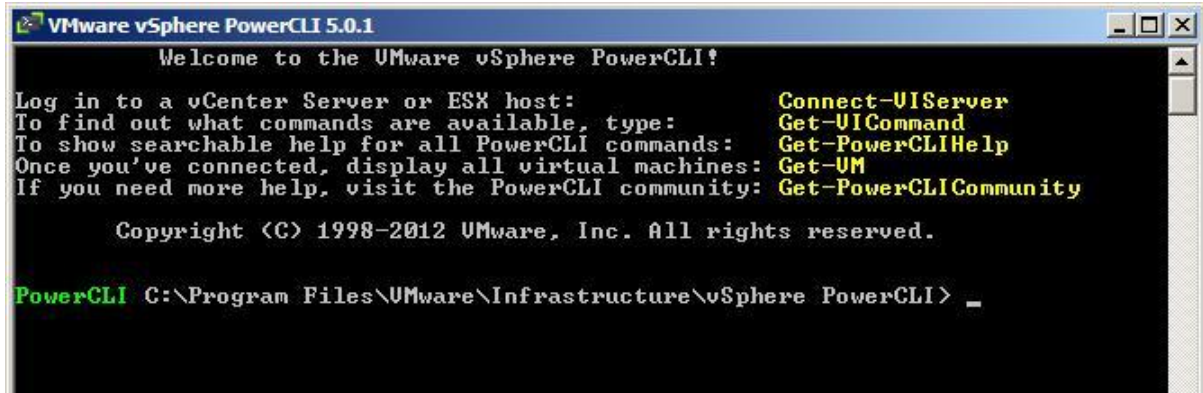


Figure 29. VMware vSphere PowerCLI

2. Type the command **\$DefaultSoftwareDepots**

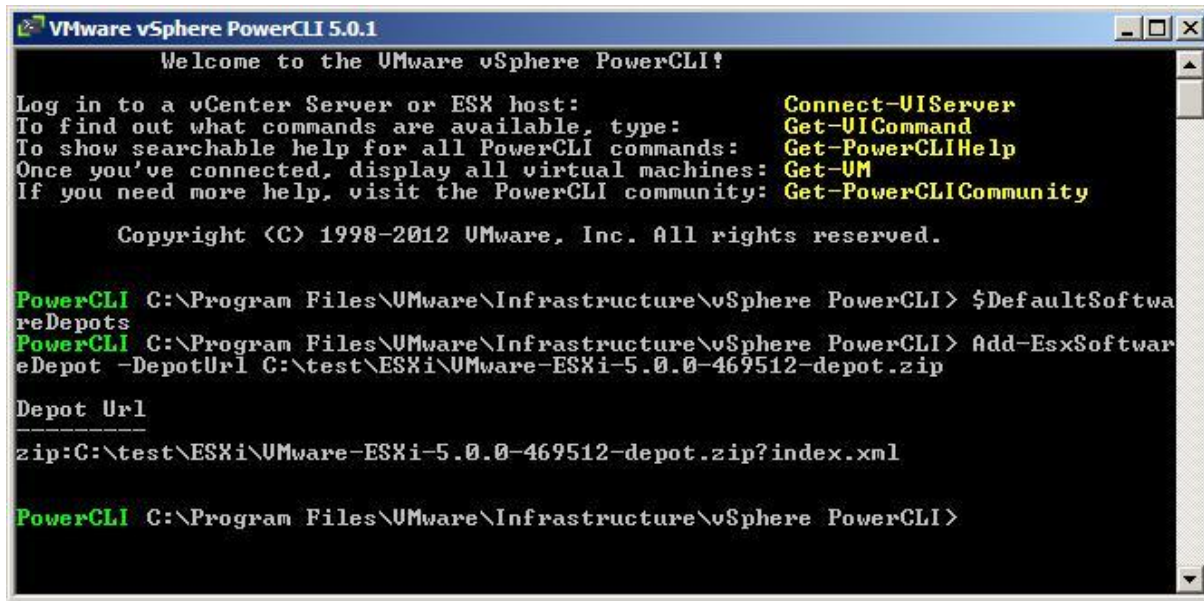
This command is used to show the current default software depots, if the VMware vSphere PowerCLI is newly opened, it will return nothing.



Figure 30. DefaultSoftwareDepots

3. Type the command **Add-EsxSoftwareDepots -DepotUri C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip** (the directory of "C:\test\ESXi\..." needs to be modified to the actual directory that user copies the zip file to)

This command is used to add the ESXi 5.0 installation depot to the current image builder Image Profile, and it will return the information of the image profile.



```

VMware vSphere PowerCLI 5.0.1
Welcome to the VMware vSphere PowerCLI!

Log in to a vCenter Server or ESX host:      Connect-UIServer
To find out what commands are available, type:  Get-UICommand
To show searchable help for all PowerCLI commands:  Get-PowerCLIHelp
Once you've connected, display all virtual machines:  Get-UM
If you need more help, visit the PowerCLI community:  Get-PowerCLICommunity

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PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $DefaultSoftwareDepots
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> Add-EsxSoftwareDepot -DepotUrl C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip

Depot Url
-----
zip:C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip?index.xml

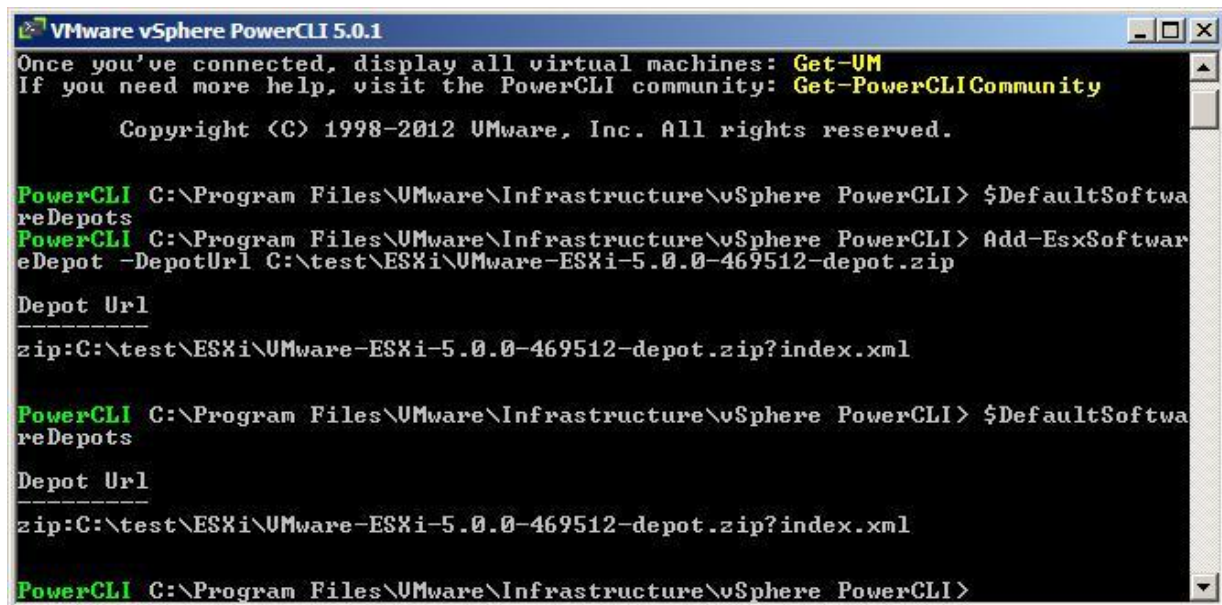
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI>

```

Figure 31. Add ESXi 5.0 Installation Depot to Image Profile

4. Type the command **\$DefaultSoftwareDepots**

After adding the ESXi 5.0 installation depot, the default software depot is the ESXi 5.0 installation index.xml now.



```

VMware vSphere PowerCLI 5.0.1
Once you've connected, display all virtual machines:  Get-UM
If you need more help, visit the PowerCLI community:  Get-PowerCLICommunity

Copyright (C) 1998-2012 VMware, Inc. All rights reserved.

PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $DefaultSoftwareDepots
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> Add-EsxSoftwareDepot -DepotUrl C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip

Depot Url
-----
zip:C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip?index.xml

PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $DefaultSoftwareDepots
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI>

Depot Url
-----
zip:C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip?index.xml

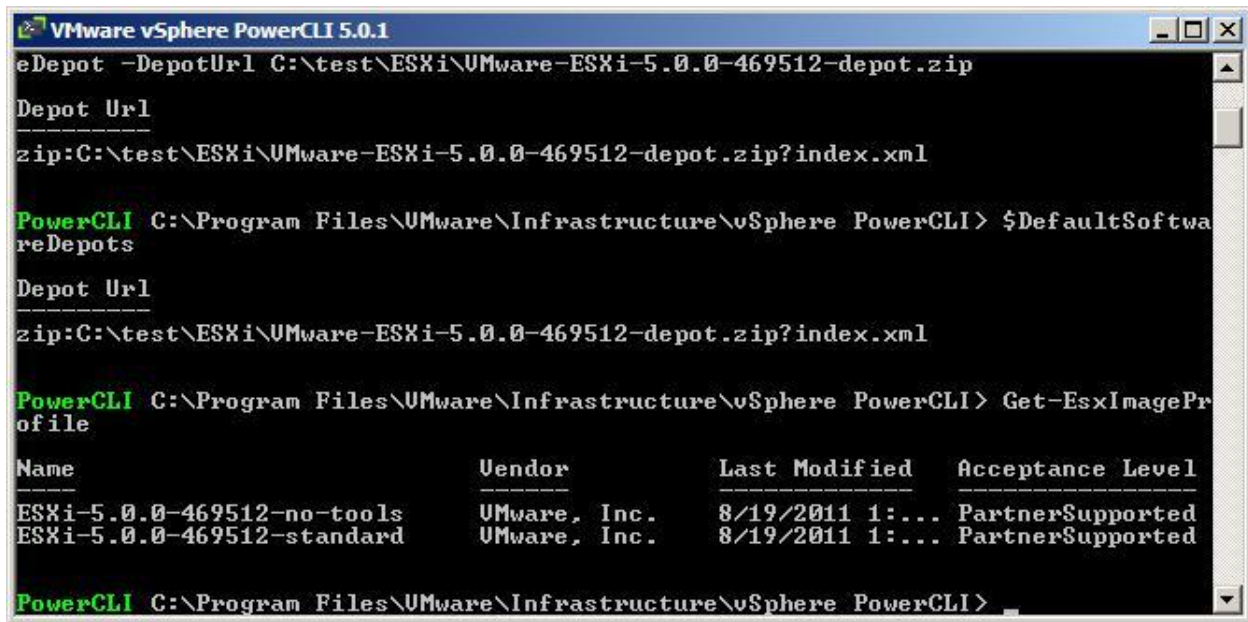
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI>

```

Figure 32. New Default Software Depots

5. Type the command **Get-EsxImageProfile**

This command is used to return the current image profiles. Here it returns two image profiles of the ESXi 5.0 installation depot.



```

VMware vSphere PowerCLI 5.0.1
eDepot -DepotUrl C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip
Depot Url
zip:C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip?index.xml

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> $DefaultSoftwareDepots
Depot Url
zip:C:\test\ESXi\VMware-ESXi-5.0.0-469512-depot.zip?index.xml

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> Get-EsxImageProfile
Name                               Vendor                Last Modified          Acceptance Level
----                               -
ESXi-5.0.0-469512-no-tools         VMware, Inc.          8/19/2011 1:30:00 PM   PartnerSupported
ESXi-5.0.0-469512-standard         VMware, Inc.          8/19/2011 1:30:00 PM   PartnerSupported

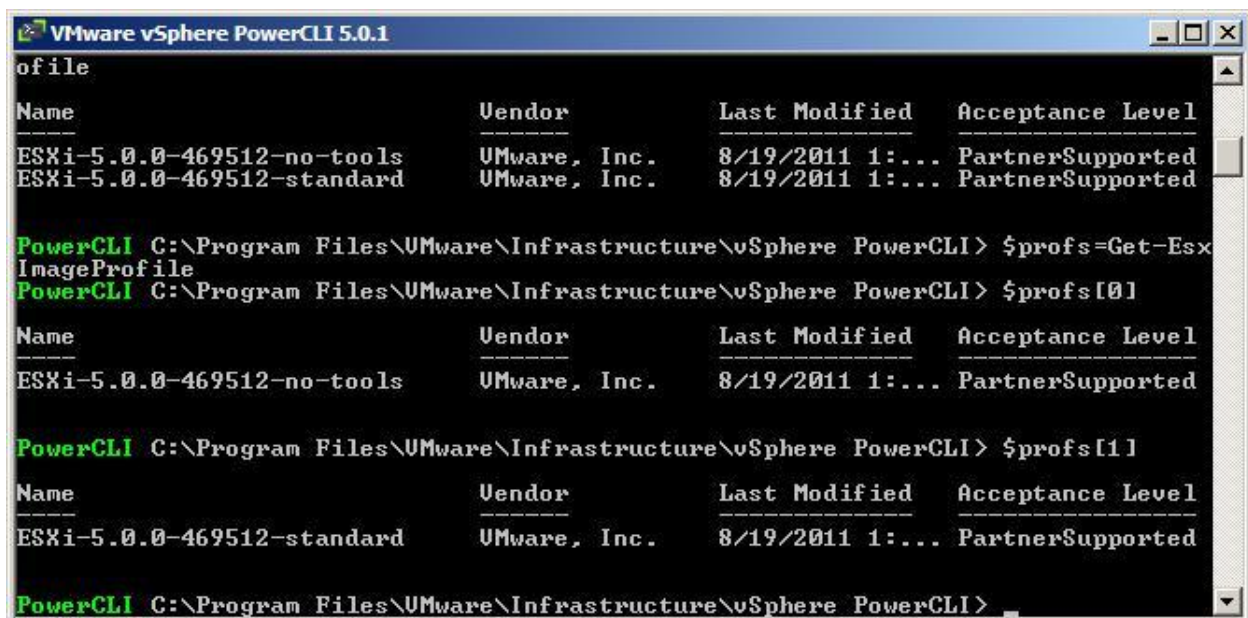
PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI>

```

Figure 33. Show Image Profiles

6. Type the command **\$profs=Get-EsxImageProfile**

In above step, you can use the “**Get-EsxImageProfile**” command to return the image profiles directory, here you can also get the image profiles and save them in “**profs**”, you will get an array with two elements, **profs[0]** is the **ESXi-5.0.0-469512-no-tools** image profile and **profs[1]** is the **ESXi-5.0.0-469512-standard** image profile. By save the image profiles into the array, you can call them by the “**profs[0]**” or “**profs[1]**” instead of the long string of the image profile.



```

VMware vSphere PowerCLI 5.0.1
ofile
Name                               Vendor                Last Modified          Acceptance Level
----                               -
ESXi-5.0.0-469512-no-tools         VMware, Inc.          8/19/2011 1:30:00 PM   PartnerSupported
ESXi-5.0.0-469512-standard         VMware, Inc.          8/19/2011 1:30:00 PM   PartnerSupported

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> $profs=Get-EsxImageProfile
PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> $profs[0]
Name                               Vendor                Last Modified          Acceptance Level
----                               -
ESXi-5.0.0-469512-no-tools         VMware, Inc.          8/19/2011 1:30:00 PM   PartnerSupported

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> $profs[1]
Name                               Vendor                Last Modified          Acceptance Level
----                               -
ESXi-5.0.0-469512-standard         VMware, Inc.          8/19/2011 1:30:00 PM   PartnerSupported

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI>

```

Figure 34. Get and Save Image Profile

7. Type the command **\$ip=New-EsxImageProfile -CloneProfile \$profs[1] -Name "MyProfile"**

This command is used to clone the current image profile **ESXi-5.0.0-469512-standard** (**profs[1]** is the shortname of it) to a new image profile called "MyProfile" and assign a short name **IP** for the new profile. In following steps, the RAIDController Driver software package will be inserted to this new image profile and the new profile can be exported to an ISO file for ESXi 5.0 installation.

*NOTE: Here you can use **New-ImageProfile -CloneProfile \$profs[1] -Name "MyProfile"**, this command has the same efficiency except it doesn't assign a new short name **IP** for the new profile.*

```

VMware vSphere PowerCLI 5.0.1
Name                               Vendor             Last Modified      Acceptance Level
-----
ESXi-5.0.0-469512-no-tools         VMware, Inc.       8/19/2011 1:...    PartnerSupported
ESXi-5.0.0-469512-standard         VMware, Inc.       8/19/2011 1:...    PartnerSupported

PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $profs=Get-EsxImageProfile
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $profs[0]

Name                               Vendor             Last Modified      Acceptance Level
-----
ESXi-5.0.0-469512-no-tools         VMware, Inc.       8/19/2011 1:...    PartnerSupported

PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $profs[1]

Name                               Vendor             Last Modified      Acceptance Level
-----
ESXi-5.0.0-469512-standard         VMware, Inc.       8/19/2011 1:...    PartnerSupported

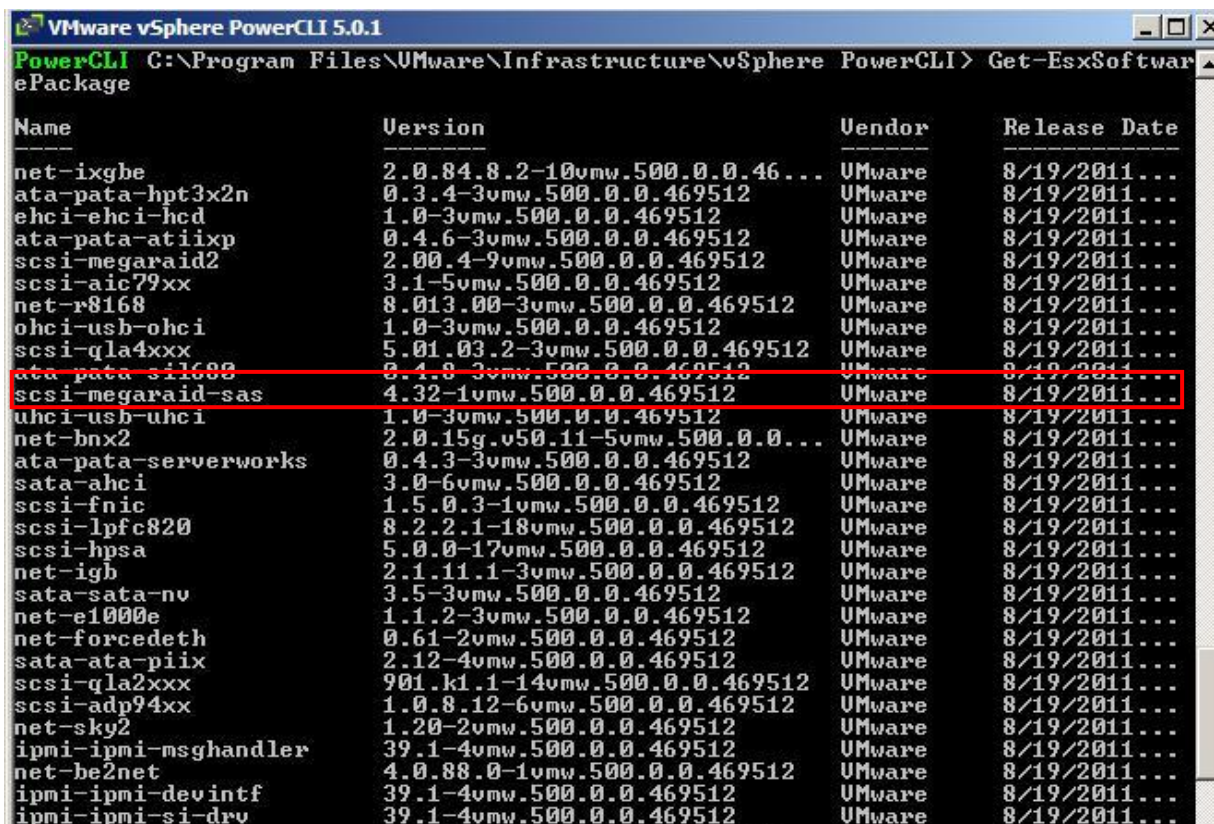
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> $ip=New-EsxImageProfile -CloneProfile $profs[1] -Name "MyProfile"
PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI>

```

Figure 35. Clone Image Profile

8. Type the command **Get-EsxSoftwarePackages**

This command is used to show the current software packages in the new cloned image profile, you will find a VIB file called "**scsi-megaraid-sas**", the version is "**4.32-1vmw.500.0.0.469512**".

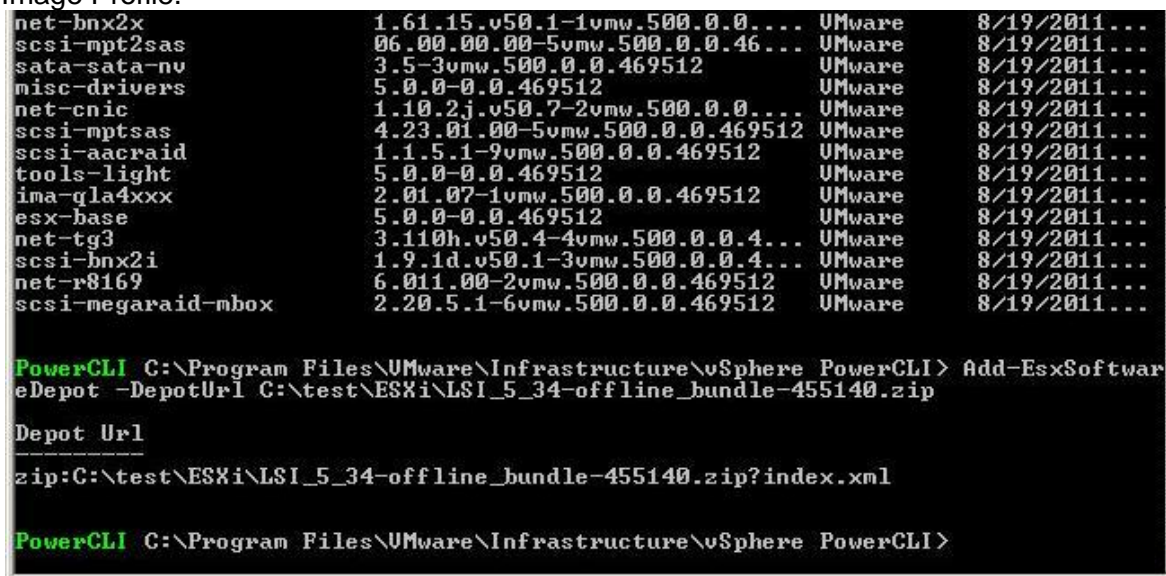


Name	Version	Vendor	Release Date
net-ixgbe	2.0.84.8.2-10vmw.500.0.0.46...	VMware	8/19/2011...
ata-pata-hpt3x2n	0.3.4-3vmw.500.0.0.469512	VMware	8/19/2011...
ehci-ehci-hcd	1.0-3vmw.500.0.0.469512	VMware	8/19/2011...
ata-pata-atiixp	0.4.6-3vmw.500.0.0.469512	VMware	8/19/2011...
scsi-megaraid2	2.00.4-9vmw.500.0.0.469512	VMware	8/19/2011...
scsi-aic79xx	3.1-5vmw.500.0.0.469512	VMware	8/19/2011...
net-r8168	8.013.00-3vmw.500.0.0.469512	VMware	8/19/2011...
ohci-usb-ohci	1.0-3vmw.500.0.0.469512	VMware	8/19/2011...
scsi-qla4xxx	5.01.03.2-3vmw.500.0.0.469512	VMware	8/19/2011...
ata-pata-sil680	0.1.0-3vmw.500.0.0.469512	VMware	8/19/2011...
scsi-megaraid-sas	4.32-1vmw.500.0.0.469512	VMware	8/19/2011...
uhci-usb-uhci	1.0-3vmw.500.0.0.469512	VMware	8/19/2011...
net-bnx2	2.0.15g.v50.11-5vmw.500.0.0...	VMware	8/19/2011...
ata-pata-serverworks	0.4.3-3vmw.500.0.0.469512	VMware	8/19/2011...
sata-ahci	3.0-6vmw.500.0.0.469512	VMware	8/19/2011...
scsi-fnics	1.5.0.3-1vmw.500.0.0.469512	VMware	8/19/2011...
scsi-lpfc820	8.2.2.1-18vmw.500.0.0.469512	VMware	8/19/2011...
scsi-hpsa	5.0.0-17vmw.500.0.0.469512	VMware	8/19/2011...
net-igb	2.1.11.1-3vmw.500.0.0.469512	VMware	8/19/2011...
sata-sata-nv	3.5-3vmw.500.0.0.469512	VMware	8/19/2011...
net-e1000e	1.1.2-3vmw.500.0.0.469512	VMware	8/19/2011...
net-forcedeth	0.61-2vmw.500.0.0.469512	VMware	8/19/2011...
sata-ata-piix	2.12-4vmw.500.0.0.469512	VMware	8/19/2011...
scsi-qla2xxx	901.k1.1-14vmw.500.0.0.469512	VMware	8/19/2011...
scsi-adp94xx	1.0.8.12-6vmw.500.0.0.469512	VMware	8/19/2011...
net-sky2	1.20-2vmw.500.0.0.469512	VMware	8/19/2011...
ipmi-ipmi-msghandler	39.1-4vmw.500.0.0.469512	VMware	8/19/2011...
net-be2net	4.0.88.0-1vmw.500.0.0.469512	VMware	8/19/2011...
ipmi-ipmi-devintf	39.1-4vmw.500.0.0.469512	VMware	8/19/2011...
ipmi-ipmi-si-drv	39.1-4vmw.500.0.0.469512	VMware	8/19/2011...

Figure 36. Show the Software Package in New Image Profile

9. Type the command **Add-EsxSoftwareDepots -DepotUrl C:\test\ESXi\LSI_5_34-offline_bundle-455140.zip**

This command is used to add the RAID Controller Driver depot to current image builder Image Profile.



```

net-bnx2x                1.61.15.v50.1-1vmw.500.0.0.46... VMware 8/19/2011...
scsi-mpt2sas             06.00.00.00-5vmw.500.0.0.46... VMware 8/19/2011...
sata-sata-nv             3.5-3vmw.500.0.0.469512 VMware 8/19/2011...
misc-drivers             5.0.0-0.0.469512 VMware 8/19/2011...
net-cnic                 1.10.2j.v50.7-2vmw.500.0.0.46... VMware 8/19/2011...
scsi-mptsas              4.23.01.00-5vmw.500.0.0.469512 VMware 8/19/2011...
scsi-aacraid             1.1.5.1-9vmw.500.0.0.469512 VMware 8/19/2011...
tools-light              5.0.0-0.0.469512 VMware 8/19/2011...
ima-qla4xxx              2.01.07-1vmw.500.0.0.469512 VMware 8/19/2011...
esx-base                  5.0.0-0.0.469512 VMware 8/19/2011...
net-tg3                  3.110h.v50.4-4vmw.500.0.0.4... VMware 8/19/2011...
scsi-bnx2i                1.9.1d.v50.1-3vmw.500.0.0.4... VMware 8/19/2011...
net-r8169                 6.011.00-2vmw.500.0.0.469512 VMware 8/19/2011...
scsi-megaraid-mbox       2.20.5.1-6vmw.500.0.0.469512 VMware 8/19/2011...

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> Add-EsxSoftwareDepot -DepotUrl C:\test\ESXi\LSI_5_34-offline_bundle-455140.zip

Depot Url
zip:C:\test\ESXi\LSI_5_34-offline_bundle-455140.zip?index.xml

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI>

```

Figure 37. Add the RAID Controller Driver Depot

10. Type the command **Add-EsxSoftwarePackage -ImageProfile MyProfile -SoftwarePackage scsi-megaraid-sas**

This command is used to add the RAID Controller Driver software package (VIB file) into the ESXi installation image profile ("MyProfile"). As is shown on the top of the below Figure, there is a "**scsi-megaraid-sas, version 5.34-1vmw.500.0.0.406165**", this is the RAID Controller Driver software package for 2208 chip based RAID Controller, which is different from the "**scsi-megaraid-sas, version 4.32-1vmw.500.0.0.469512**" in Figure 36, and after this command line, the new scsi-megaraid-sas.vib will cover the previous one, it will run automatically during the ESXi 5.0 installation to load the RAID Controller driver.

*NOTE: If you don't remove the previous one, the **add-EsxSoftwarePackage** command will automatically cover the previous one with the new one. But it is strongly recommended that you remove the previous RAID Controller driver software package*

"scsi-megaraid-sas_4.32-1vmw.500.0.0.469512.vib" before adding the new 2208 chip based RAID Controller driver software package

"scsi-megaraid-sas_5.34-1vmw.500.0.0.406165.vib" to the image profile.

You can use the command "**Remove-EsxSoftwarePackage -ImageProfile MyProfile -SoftwarePackage scsi-megaraid-sas**" to remove the previous **scsi-megaraid-sas** file.

```

VMware vSphere PowerCLI 5.0.1
ipmi-ipmi-msghandler 39.1-4vmw.500.0.0.469512 VMware 8/19/2011...
net-be2net 4.0.88.0-1vmw.500.0.0.469512 VMware 8/19/2011...
ipmi-ipmi-devintf 39.1-4vmw.500.0.0.469512 VMware 8/19/2011...
ipmi-ipmi-si-driv 39.1-4vmw.500.0.0.469512 VMware 8/19/2011...
net-nx-nic 4.0.557-3vmw.500.0.0.469512 VMware 8/19/2011...
sata-sata-promise 2.12-3vmw.500.0.0.469512 VMware 8/19/2011...
net-bnx2x 1.61.15.v50.1-1vmw.500.0.0.469512 VMware 8/19/2011...
scsi-ips 7.12.05-4vmw.500.0.0.469512 VMware 8/19/2011...
ata-pata-cmd64x 0.2.5-3vmw.500.0.0.469512 VMware 8/19/2011...
scsi-megaraid-sas 5.34-1vmw.500.0.0.406165 VMware 6/1/2011...
sata-sata-sil 2.3-3vmw.500.0.0.469512 VMware 8/19/2011...
sata-sata-sow 2.3-3vmw.500.0.0.469512 VMware 8/19/2011...
ata-pata-via 0.3.3-2vmw.500.0.0.469512 VMware 8/19/2011...
esx-thoot 5.0.0-0.0.469512 VMware 8/19/2011...
scsi-mptspi 4.23.01.00-5vmw.500.0.0.469512 VMware 8/19/2011...
ata-pata-pdc2027x 1.0-3vmw.500.0.0.469512 VMware 8/19/2011...
misc-cnric-register 1.1-1vmw.500.0.0.469512 VMware 8/19/2011...
net-s2io 2.1.4.13427-3vmw.500.0.0.469512 VMware 8/19/2011...
net-e1000 8.0.3.1-2vmw.500.0.0.469512 VMware 8/19/2011...
net-enic 1.4.2.15a-1vmw.500.0.0.469512 VMware 8/19/2011...
ata-pata-amd 0.3.10-3vmw.500.0.0.469512 VMware 8/19/2011...
scsi-mpt2sas 06.00.00.00-5vmw.500.0.0.469512 VMware 8/19/2011...
block-cciss 3.6.14-10vmw.500.0.0.469512 VMware 8/19/2011...
misc-drivers 5.0.0-0.0.469512 VMware 8/19/2011...
net-cnric 1.10.2j.v50.7-2vmw.500.0.0.469512 VMware 8/19/2011...
scsi-mptsas 4.23.01.00-5vmw.500.0.0.469512 VMware 8/19/2011...
scsi-aacraid 1.1.5.1-9vmw.500.0.0.469512 VMware 8/19/2011...
tools-light 5.0.0-0.0.469512 VMware 8/19/2011...
ima-gla4xxx 2.01.07-1vmw.500.0.0.469512 VMware 8/19/2011...
esx-base 5.0.0-0.0.469512 VMware 8/19/2011...
net-tg3 3.110h.v50.4-4vmw.500.0.0.469512 VMware 8/19/2011...
scsi-bnx2i 1.9.1d.v50.1-3vmw.500.0.0.469512 VMware 8/19/2011...
net-r8169 6.011.00-2vmw.500.0.0.469512 VMware 8/19/2011...
scsi-megaraid-mbox 2.20.5.1-6vmw.500.0.0.469512 VMware 8/19/2011...

PowerCLI C:\Program Files\VMware\Infrastructure\VMware PowerCLI> Add-EsxSoftwarePackage -ImageProfile MyProfile -SoftwarePackage scsi-megaraid-sas

Name Vendor Last Modified Acceptance Level
----
MyProfile VMware, Inc. 2/28/2012 5:... PartnerSupported

```

Figure 38. Add the RAID Controller Driver Software Package into Image Profile

11. Type the command **Export-EsxImageProfile MyProfile -ImageProfile MyProfile -ExportToISO -FilePath C:\test\ESXi\newesxi5.iso**

This command is used to export the new image profile with the RAID Controller driver software package to an ISO file. After this step, a new ESXi 5.0 installation ISO file will be created, you can burn it into a DVD disk and then install the ESXi 5.0 system.

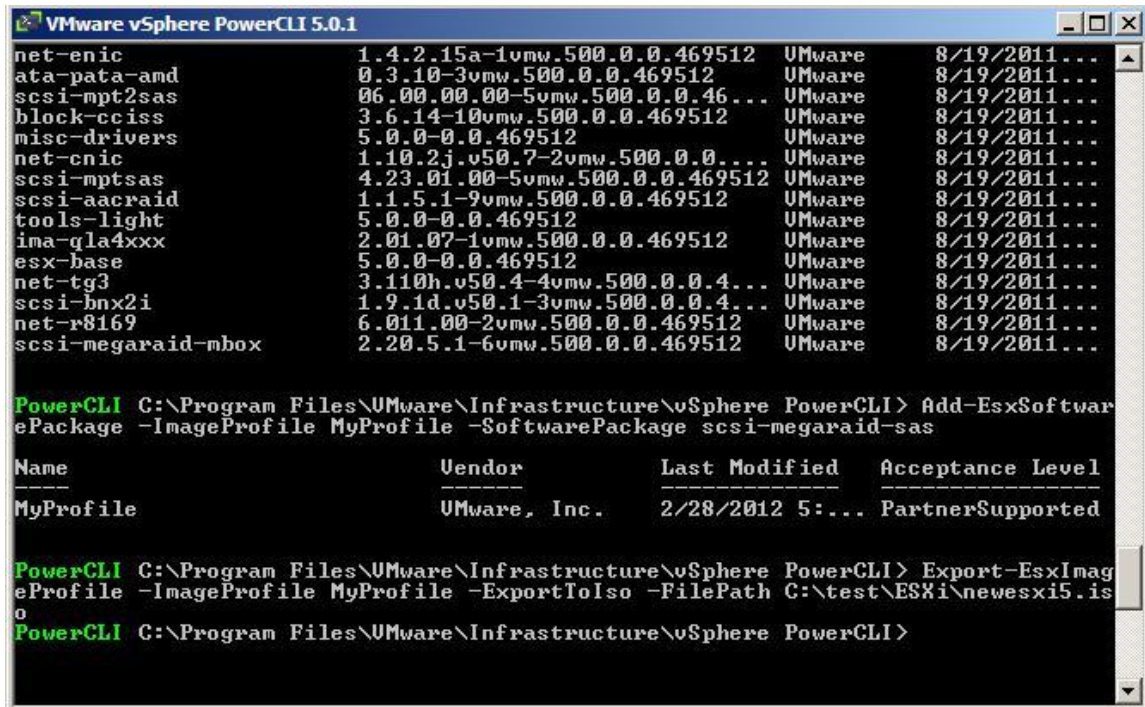


Figure 39. Export Image Profile to an ISO file

12. After this step, a new ESXi 5.0 installation ISO file will be created, you can burn it into a DVD disk and then install the ESXi 5.0 system

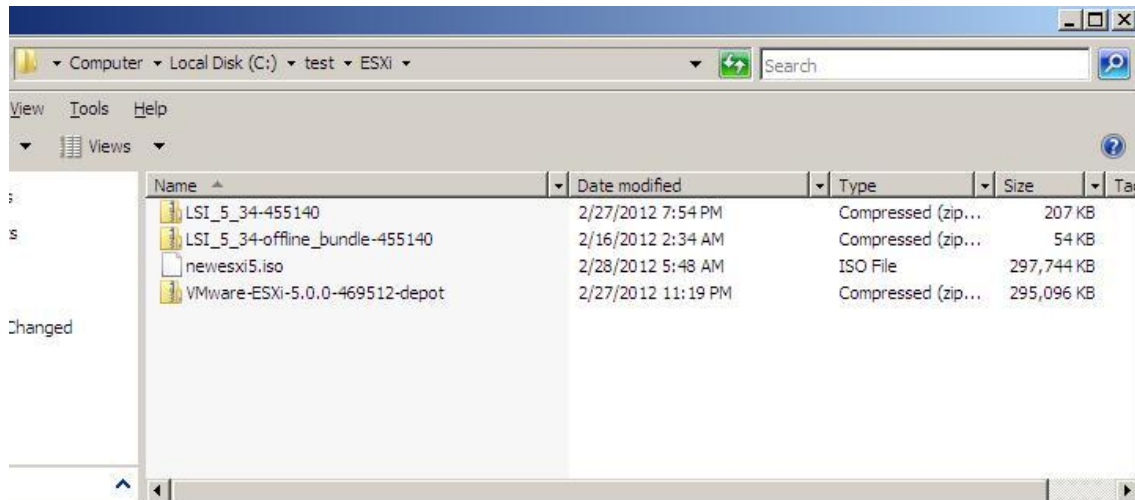


Figure 40. Succeed in Making New ESXi 5.0 Installation ISO with the RAID Driver

For detailed vSphere PowerCLI commands, refer to
<http://www.vmware.com/support/developer/PowerCLI/PowerCLI50/html/index.html>

2.3 VMware ESXi 5.0 Installation and Configuration on Server

2.3.1 VMware ESXi 5.0 installation on Server RAID virtual drive

1. Before installing VMware ESXi 5.0, make sure that the Intel® Virtualization Technology is enabled as is shown in Figure 41.

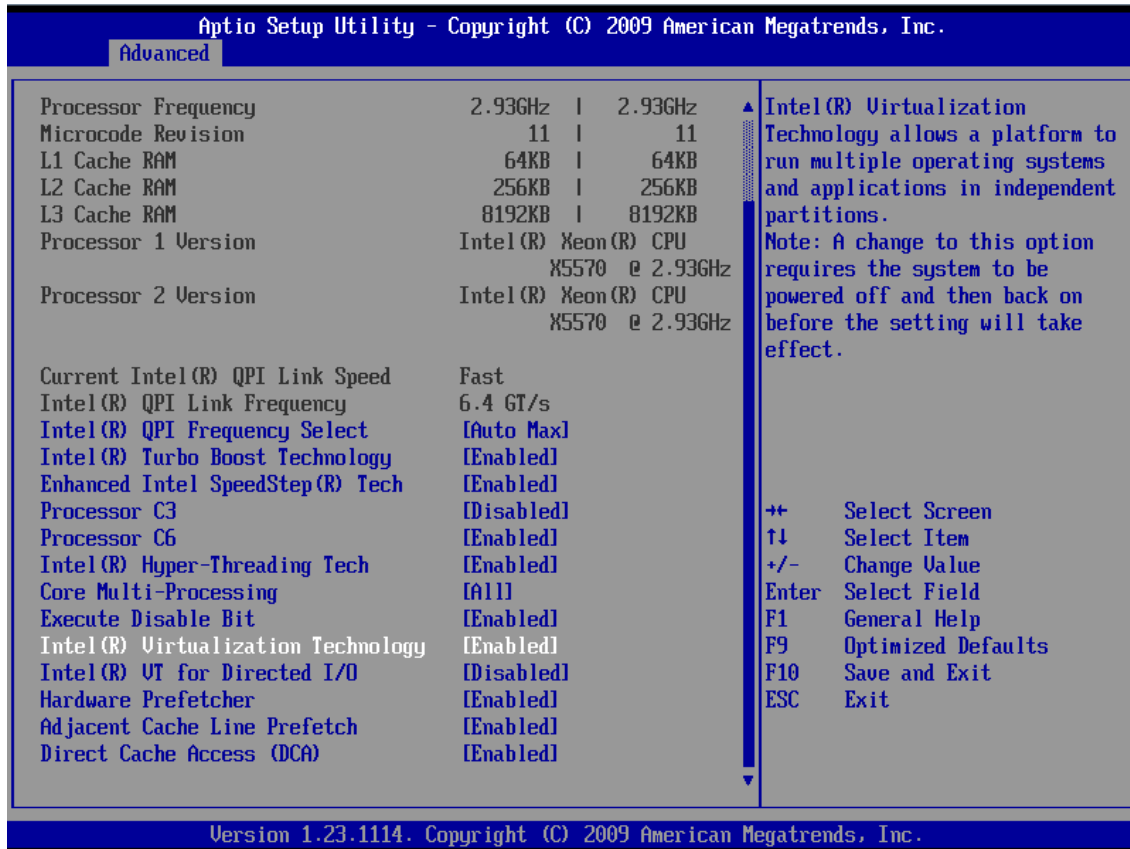


Figure 41. Enable Intel® Virtualization Technology

2. Insert the VMware ESXi 5.0 installation DVD and press <F2> to enter the BIOS boot manager, and choose to boot from the DVD-ROM.

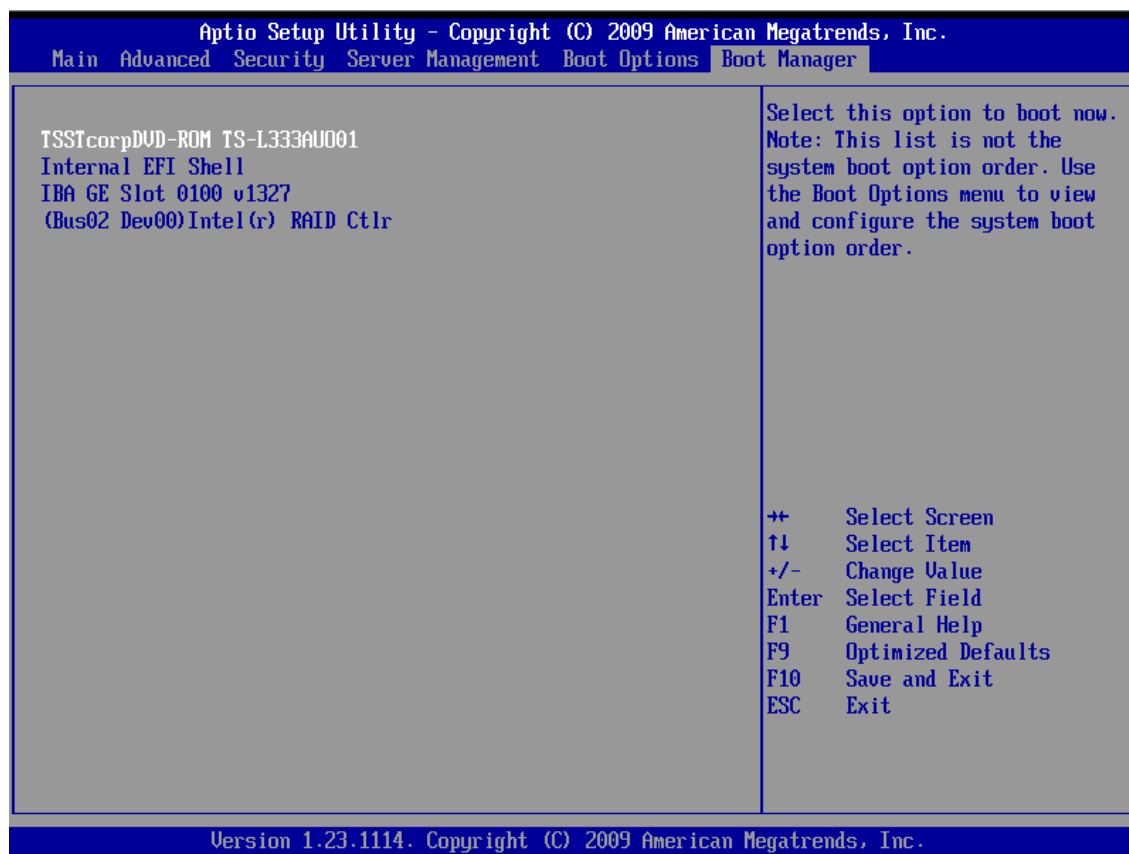


Figure 42. Boot from the VMware ESXi 5.0 installation DVD

3. Boot from the ESXi 5.0 standard installer.

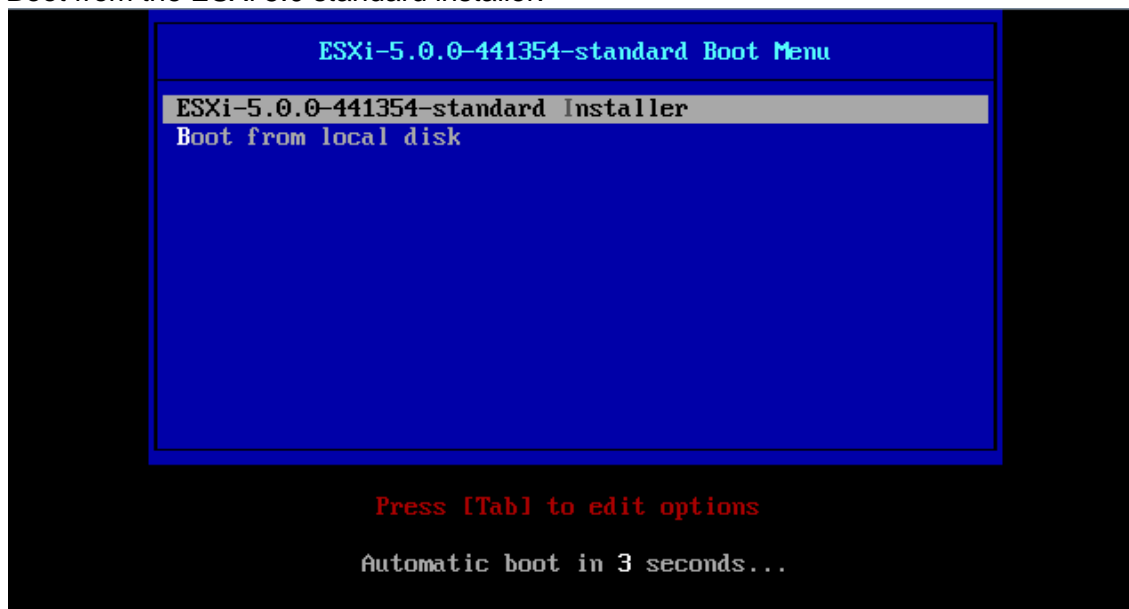


Figure 43. VMware ESXi 5.0 Installer Automatically Boots

NOTE: If you are installing the ESXi 5.0 you make by yourself as is described in section 2.2, then it will display “MyProfile Installer” instead of the “ESXi-5.0.0-441354-standard installer” in above Figure.

4. Load ESXi installer.



Figure 44. Load ESXi Installer

5. Load VMKernel successfully.

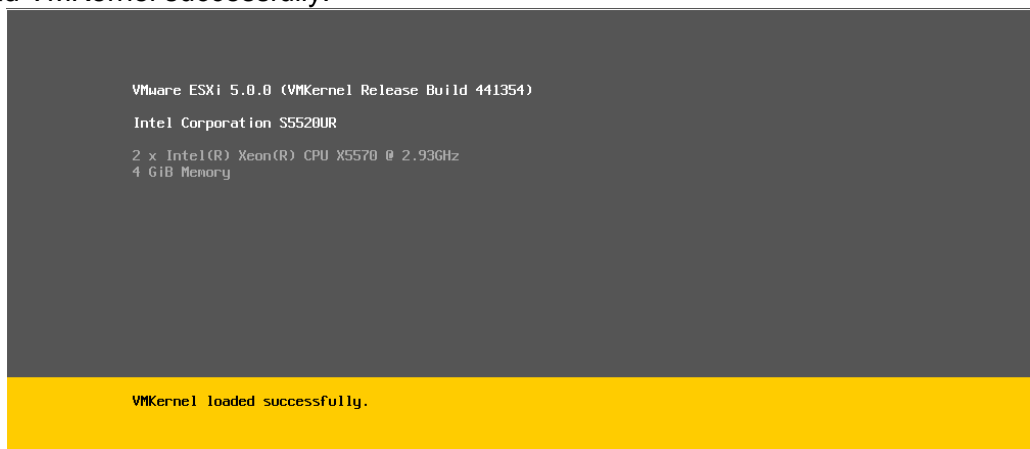


Figure 45. VMKernel Loaded Successfully

6. Press <Enter> key to begin VMware ESXi 5.0 installation.

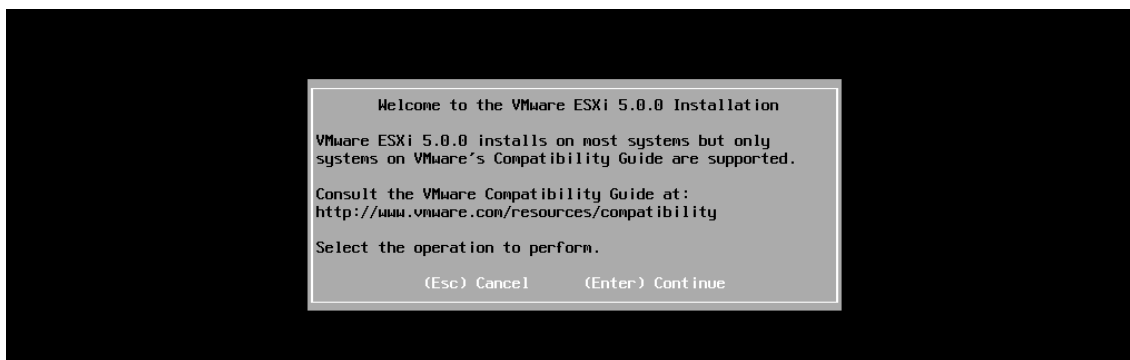


Figure 46. Enter VMware ESXi 5.0 Installation

- Press **<F11>** to accept the user license agreement and continue the installation.

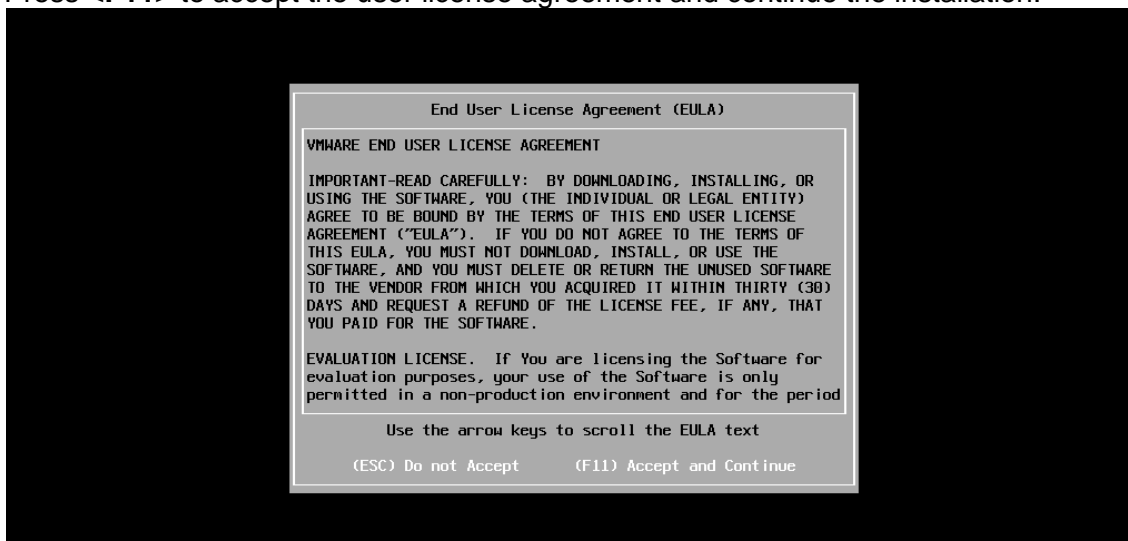


Figure 47. Accept User License Agreement

- Choose the disk to install the VMware ESXi 5.0, the system automatically choose the RAID virtual disk configured in 2.2, press **<Enter>** to choose the virtual drive and continue the installation.

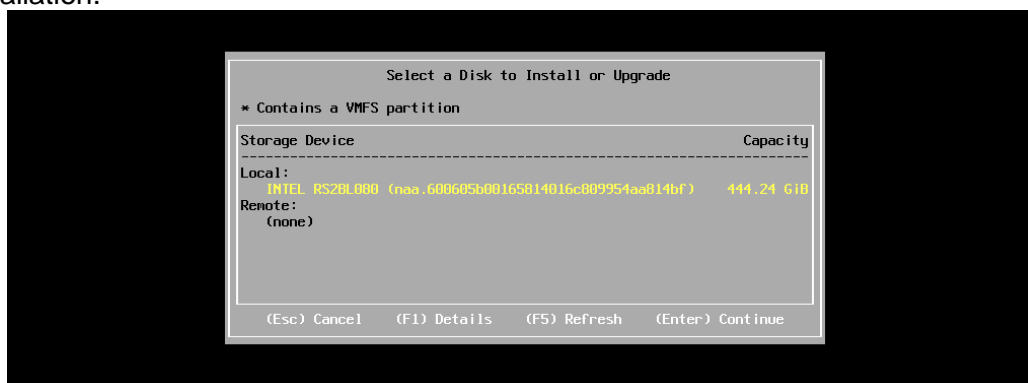


Figure 48. Select the RAID Virtual Drive to Install the VMware ESXi 5.0

- Select the keyboard layout, the default choice is **US keyboard**, and you can make choice by scroll the arrow key and then press **<Enter>** to save the choice.

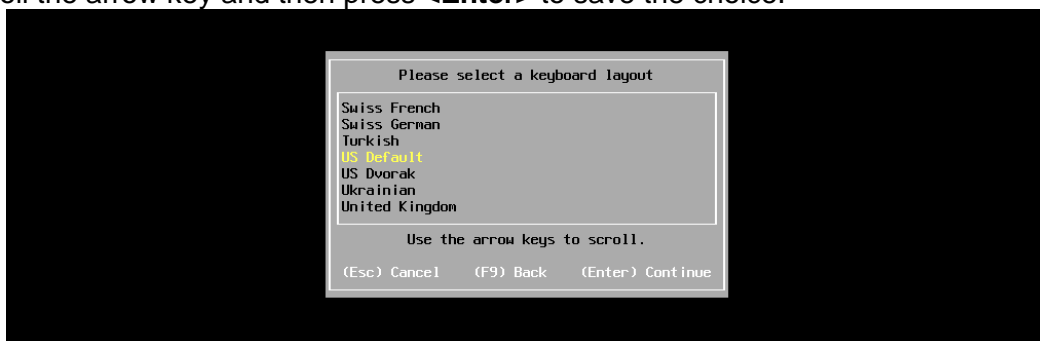


Figure 49. Select Keyboard Layout

10. Enter the root password and confirm it, then press **<Enter>** to continue the installation.

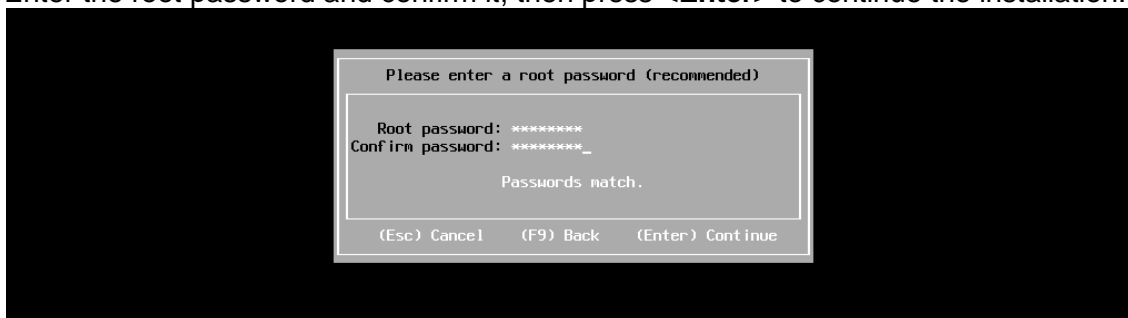


Figure 50. Create a Root Password

11. Press **<F11>** to confirm the VMware ESXi 5.0 installation on RAID virtual drive.

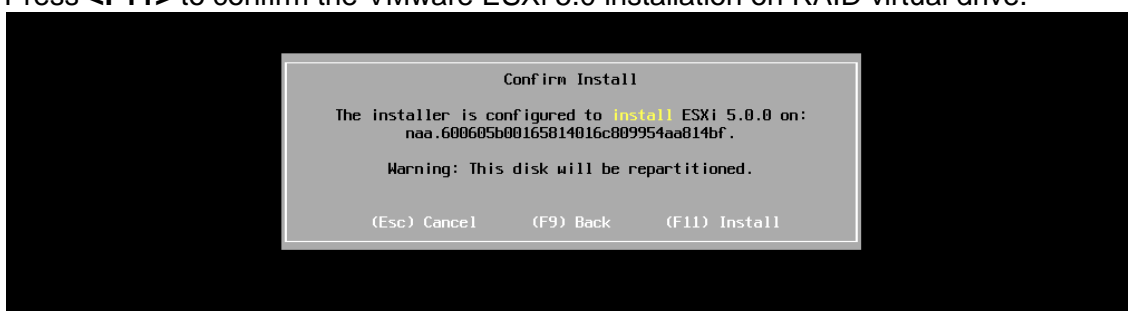


Figure 51. Confirm the VMware ESXi 5.0 installation

12. The VMware ESXi 5.0 installation begins automatically.

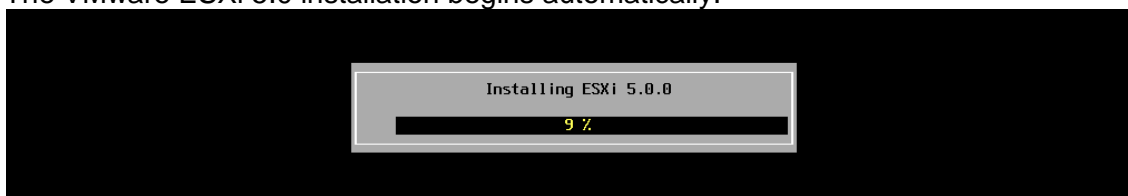


Figure 52. Install the ESXi 5.0

13. After the VMware ESXi 5.0 installation, remove the installation disk and reboot the server.

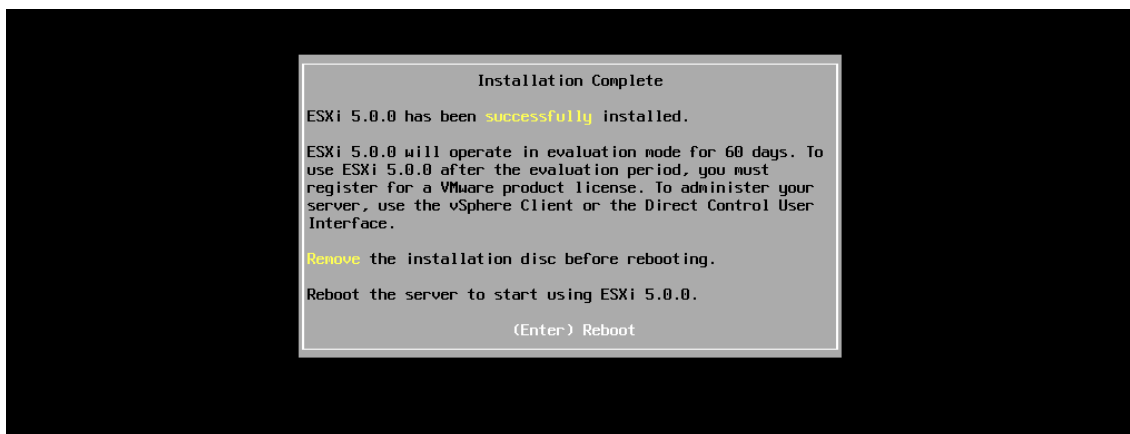


Figure 53. ESXi Installation Completes

14. Reboot the server.

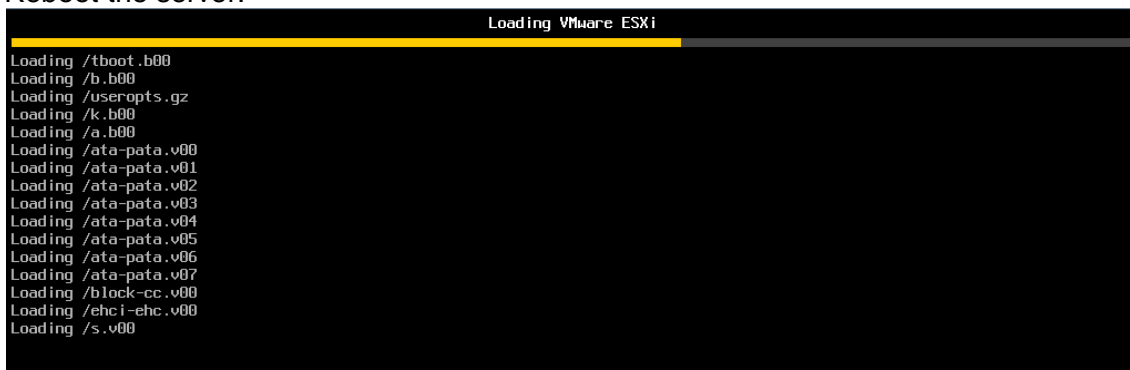


Figure 54. Reboot the Server

15. VMware ESXi 5.0 initialization.



Figure 55. VMware ESXi 5.0 Initialization

16. Reboot successfully.



Figure 56. Reboot Successfully

2.3.2 VMware ESXi 5.0 Network Configuration

1. Press **<F2>** to enter the Customize System/View Logs. Authentication will be required, and enter the root password.

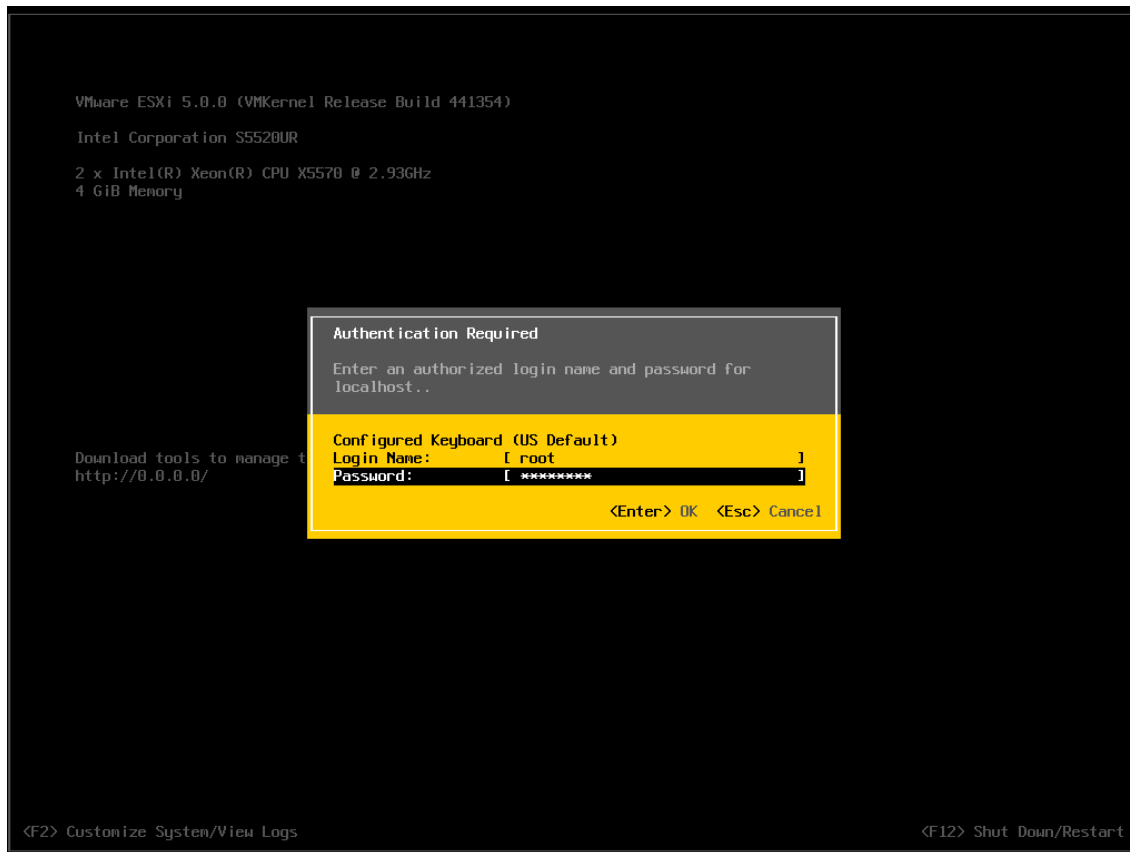


Figure 57. Enter the Customize System/View Logs

2. Scroll the arrows to **“Configure Management Network”**, and the current hostname and IP address will be displayed on the right side of the screen. Press **<Enter>** key to enter the network management configuration.

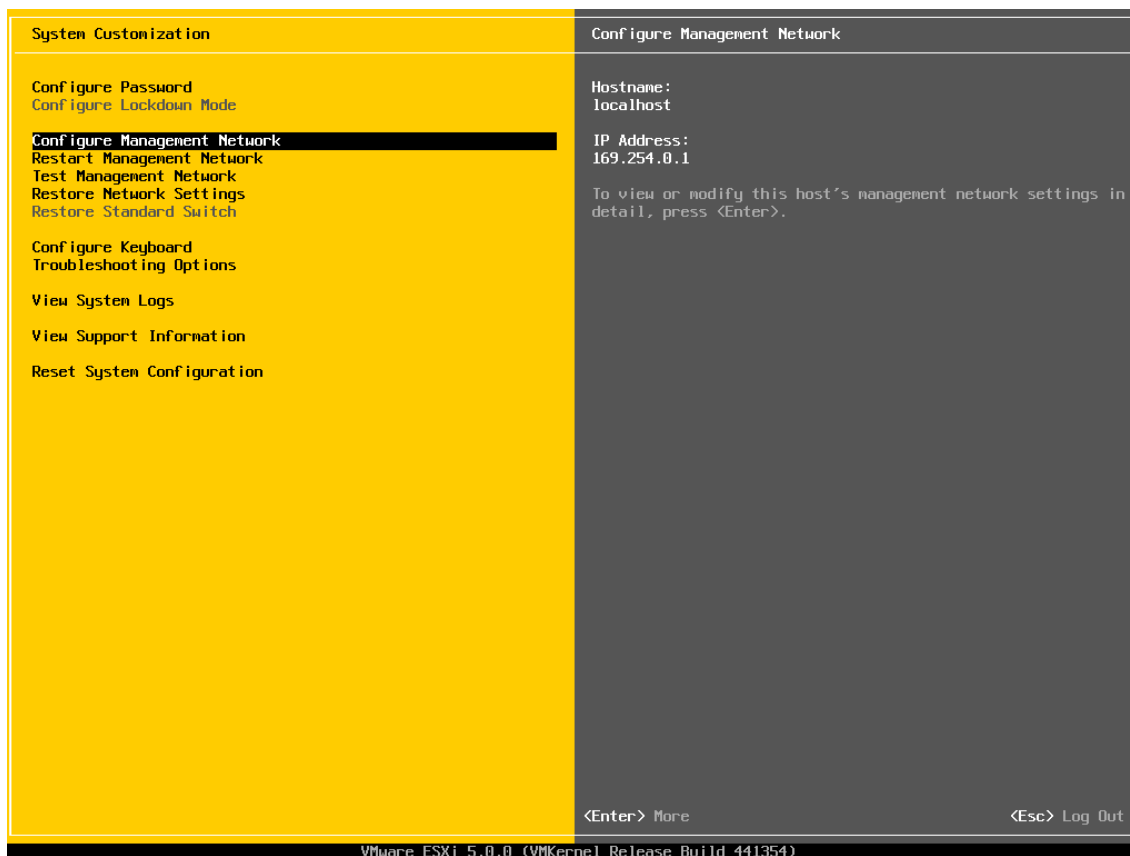


Figure 58. Network Management Information

3. Scroll the arrows to **“IP Configuration”**, current IP configuration information will be displayed on the right side of the screen. Press **<Enter>** key to change the IP address and subnet mask.

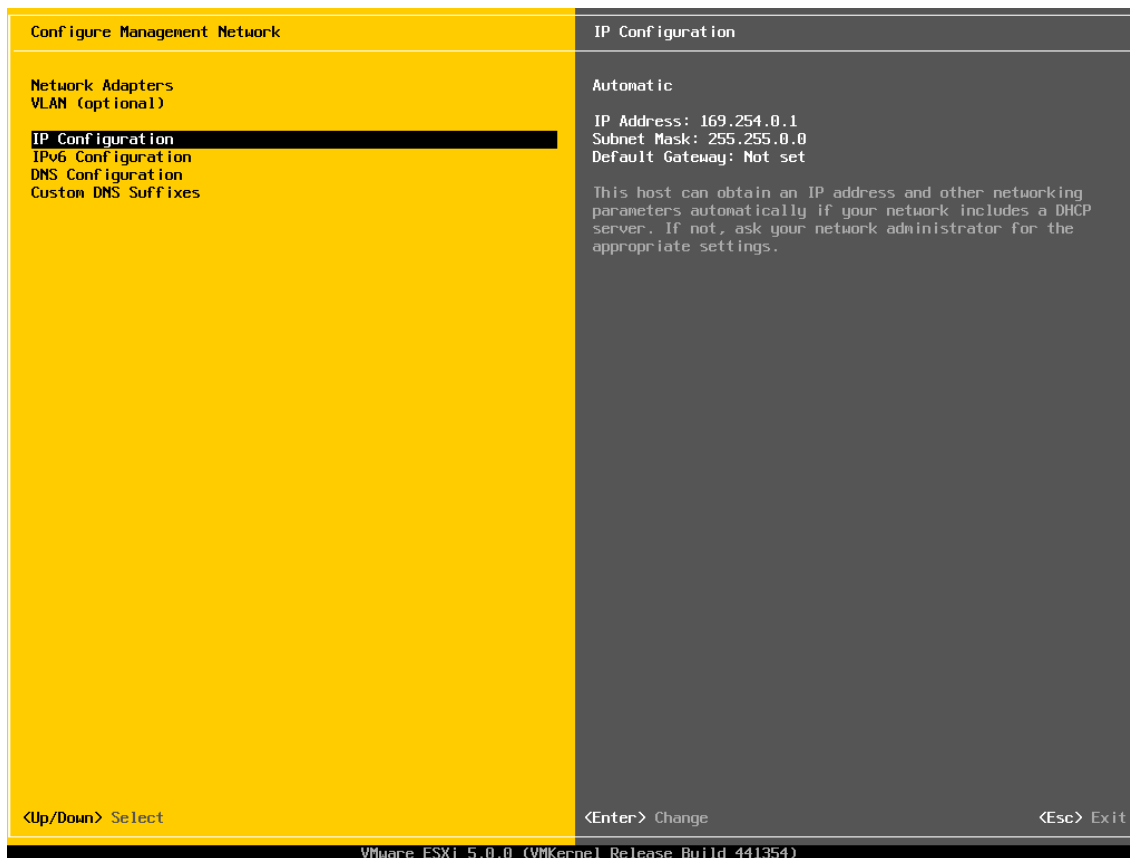


Figure 59. IP Configuration Information

4. Scroll the arrow to “**Set static IP address and network configuration**”, then press the **<space>** key to choose this option, then enter the IP address and Subnet Mask as is shown in following figure, and press **<Enter>** key to save the configurations.

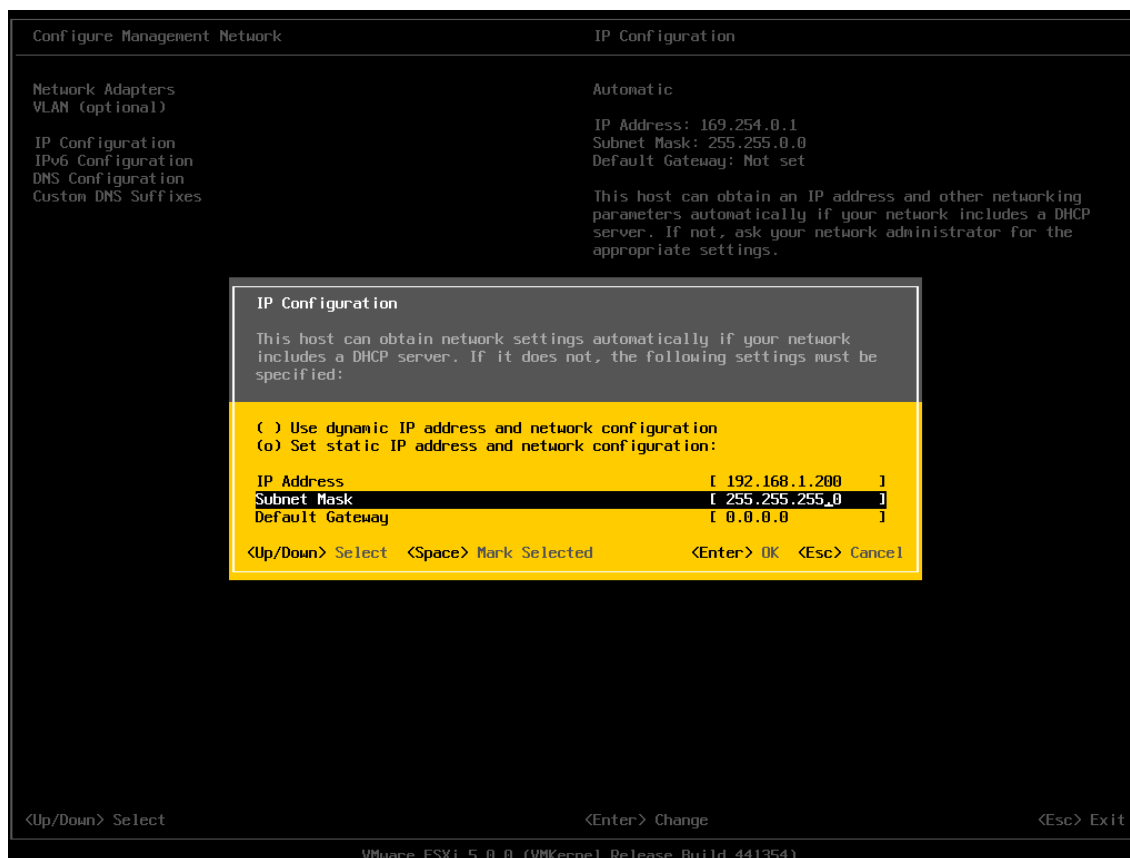


Figure 60. IP Address and Subnet Mask Configuration

5. Scroll the arrow to “**DNS configuration**”, current DNS configuration information will be displayed on the right side of the screen. Press **<Enter>** key to the DNS configuration screen.

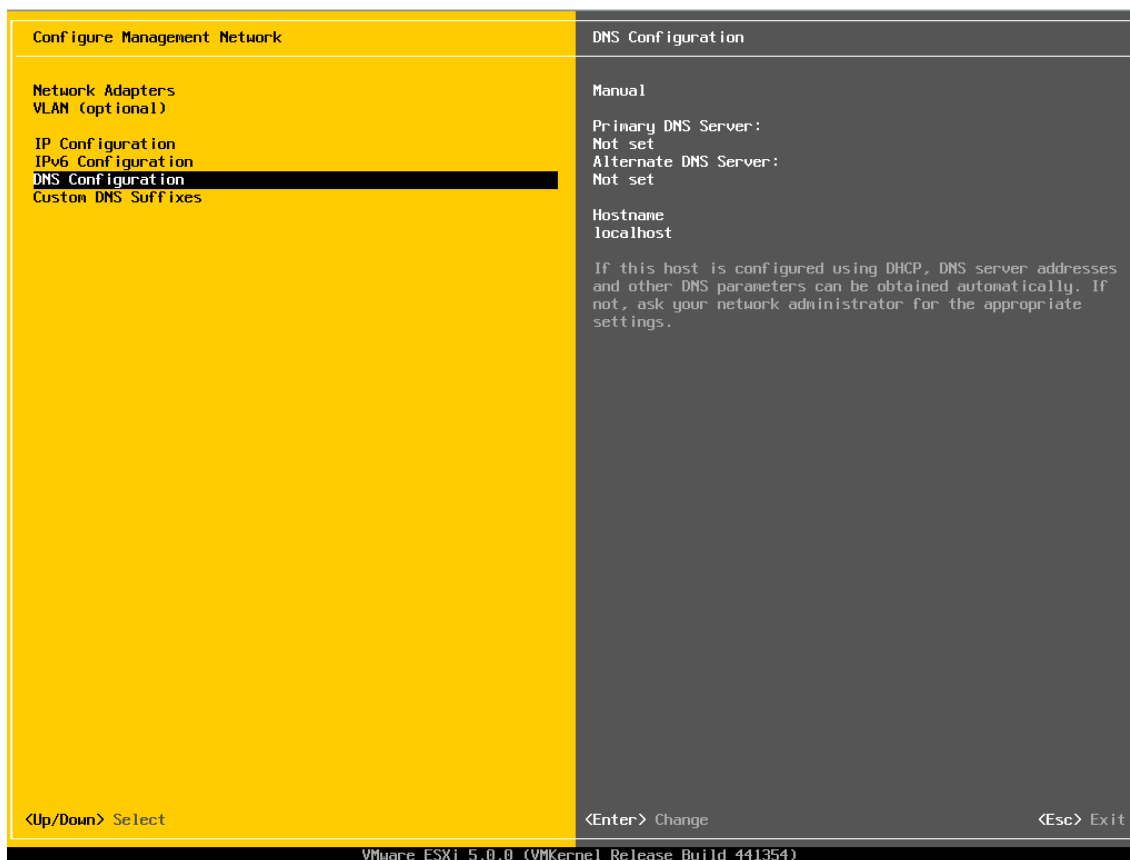


Figure 61. DNS Configuration Information

6. Scroll the arrow to “**Hostname**” and then enter the new hostname as is shown in following figure, and press **<Enter>** key to save the configurations.

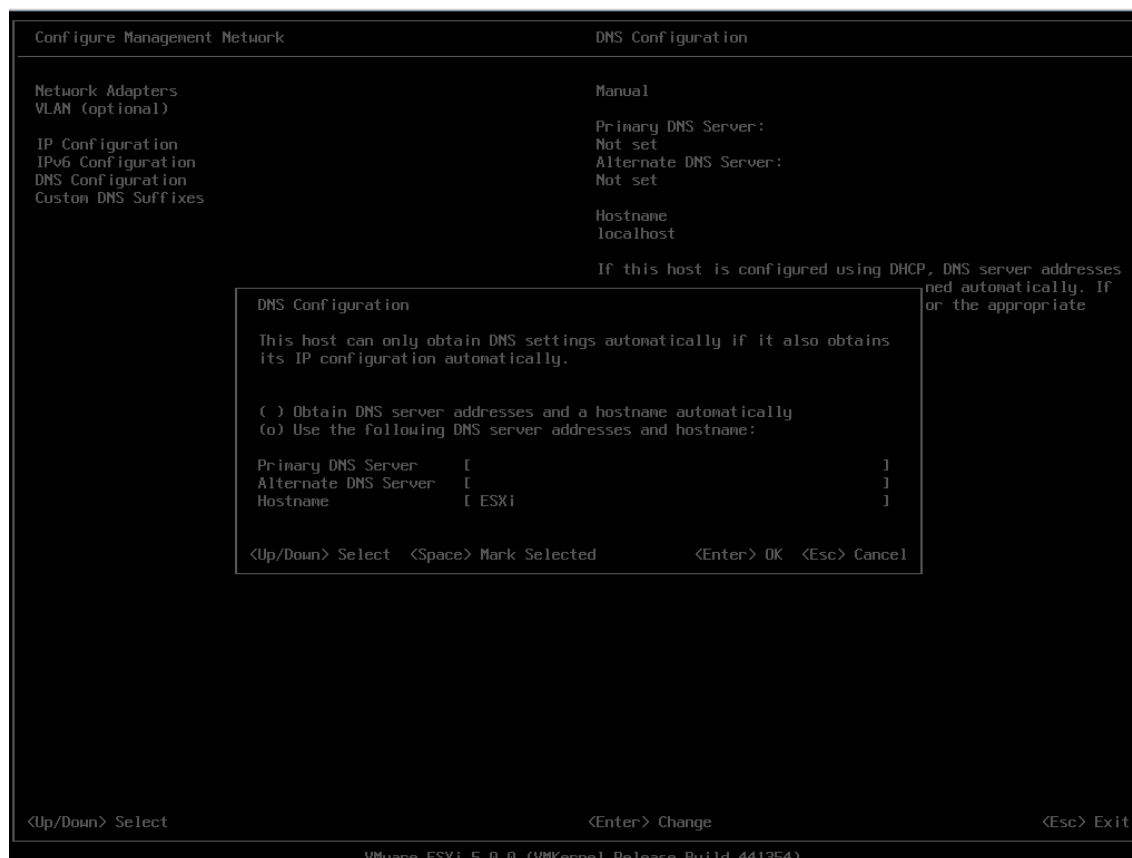


Figure 62. New Hostname Configuration

7. Press **<Esc>** key to exit the DNS configuration and a restart is required. Press **<Y>** key to save the changes.

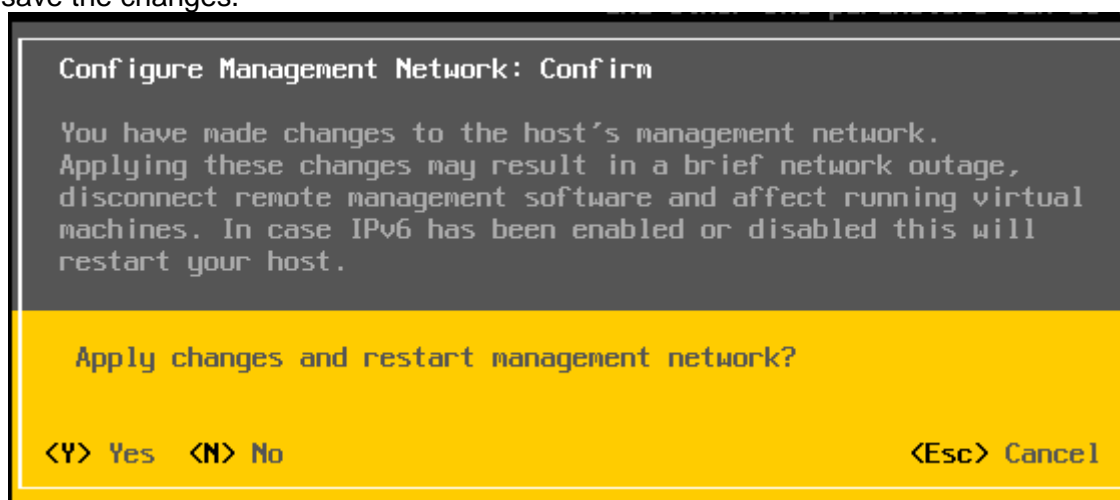


Figure 63. Save Changes of Network Configuration

2.4 Operating System Installation and Configuration on Client

2.4.1 Client operation system installation

Here install Windows 2008 R2 on the client as an example, the detailed installation steps are as follows:

1. Insert the Windows 2008 R2 installation disk, and choose to boot from the DVD-ROM in BIOS boot options.
2. Click **“Next”** to confirm language, time, and so on.

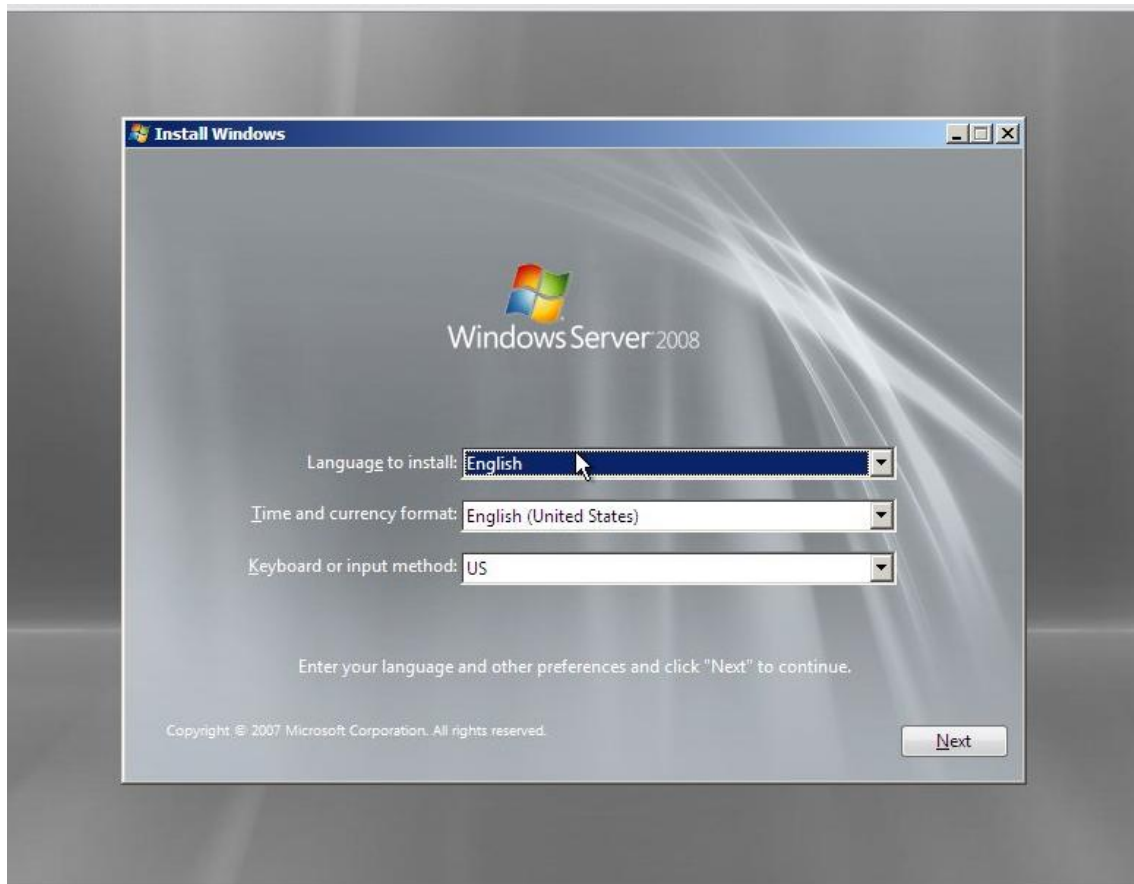


Figure 64. Confirm Language, Time, and Keyboard

3. Click **“Install Now”** to begin the window server 2008 installation process.

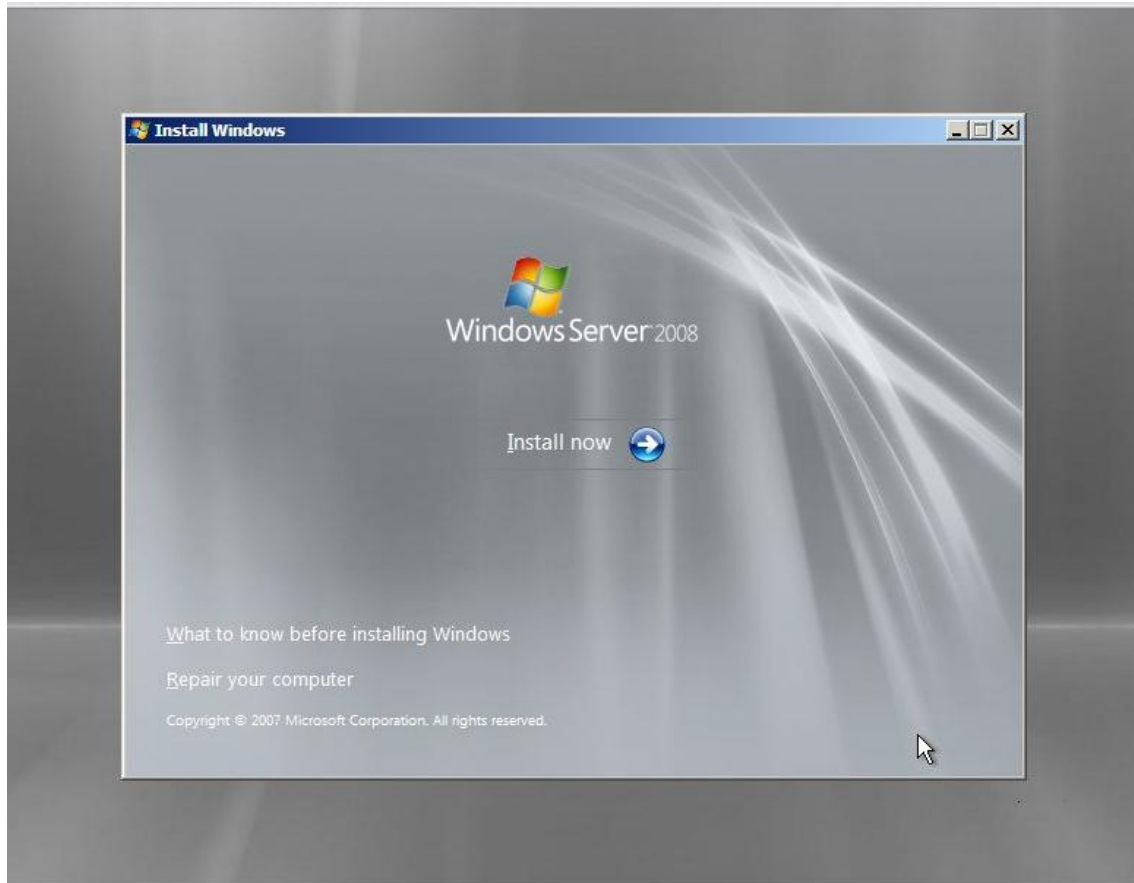


Figure 65. Install Now

4. Select **"Windows Server 2008 standard installation (Full Installation)"** and click **"Next"**.

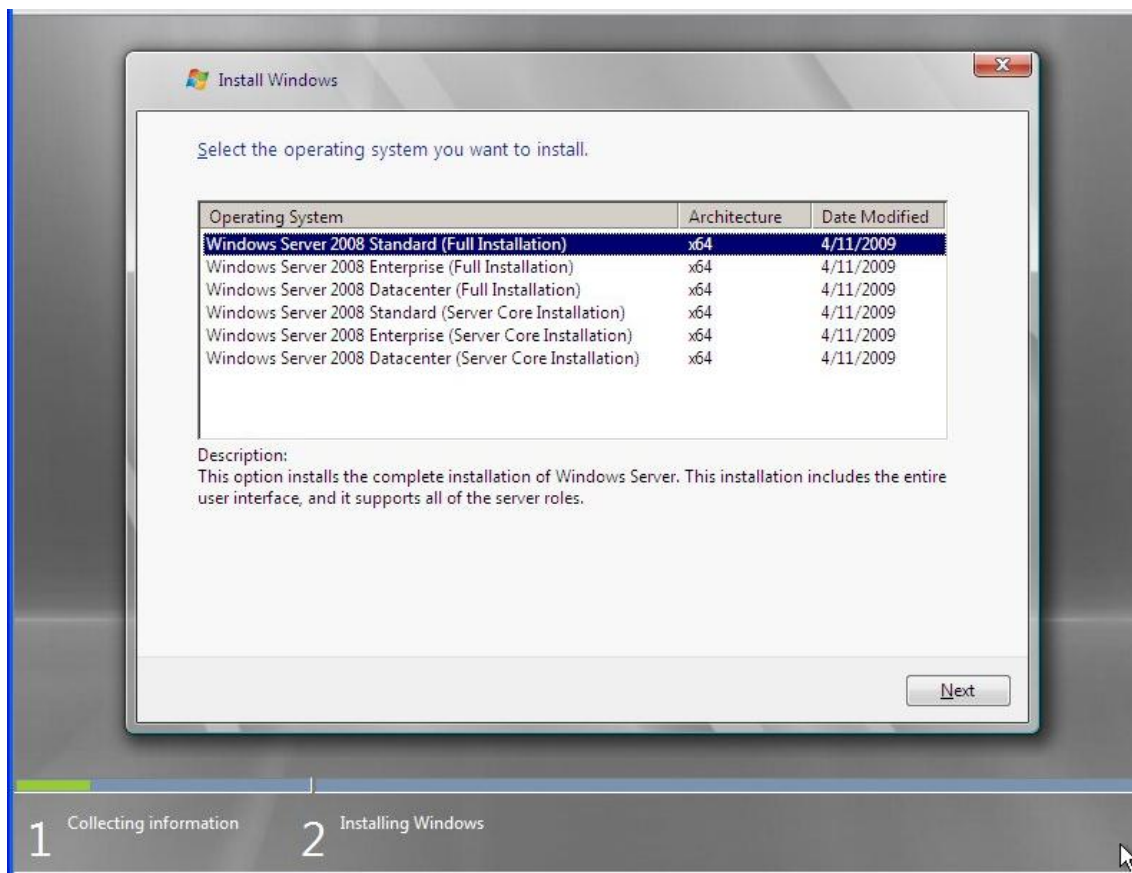


Figure 66. Selecting the Operating System to Install

5. Enable check-box to accept license and click **“Next”**.

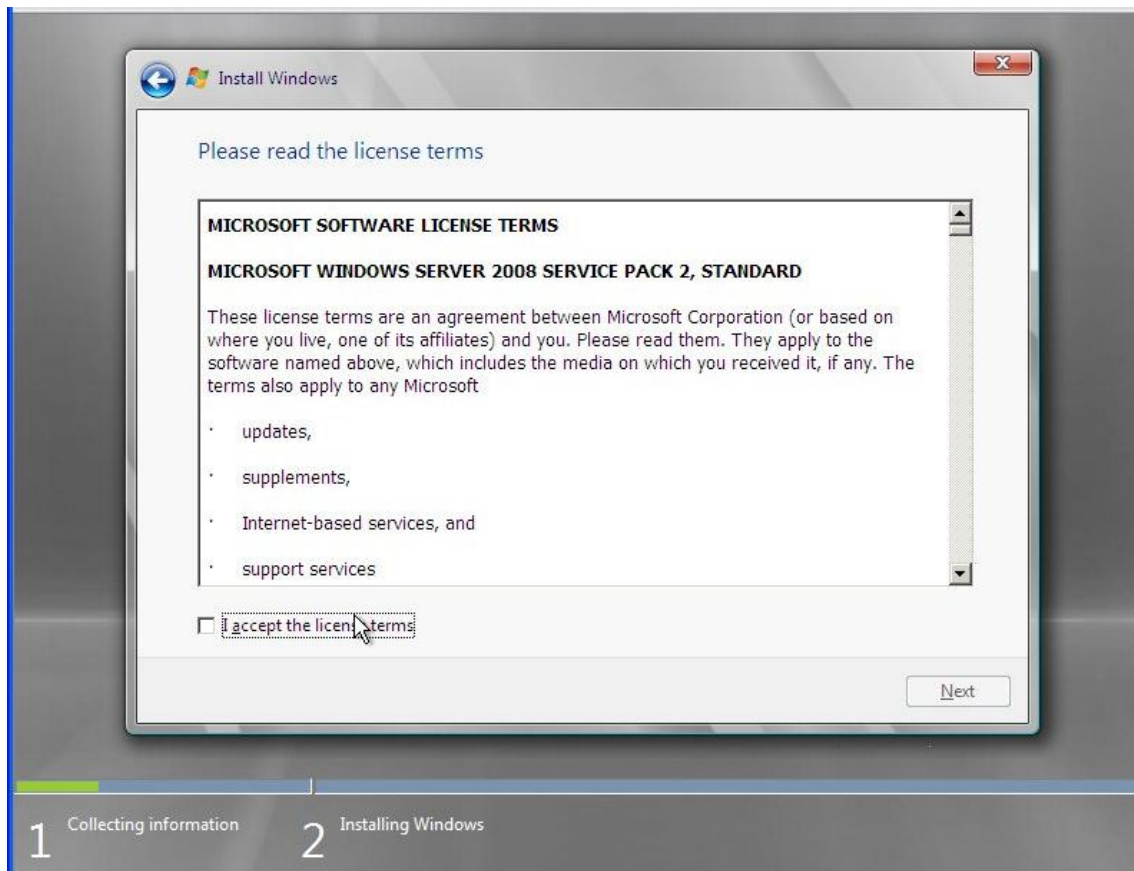


Figure 67. Accept the Installation License

6. Select **“Custom installation”**.

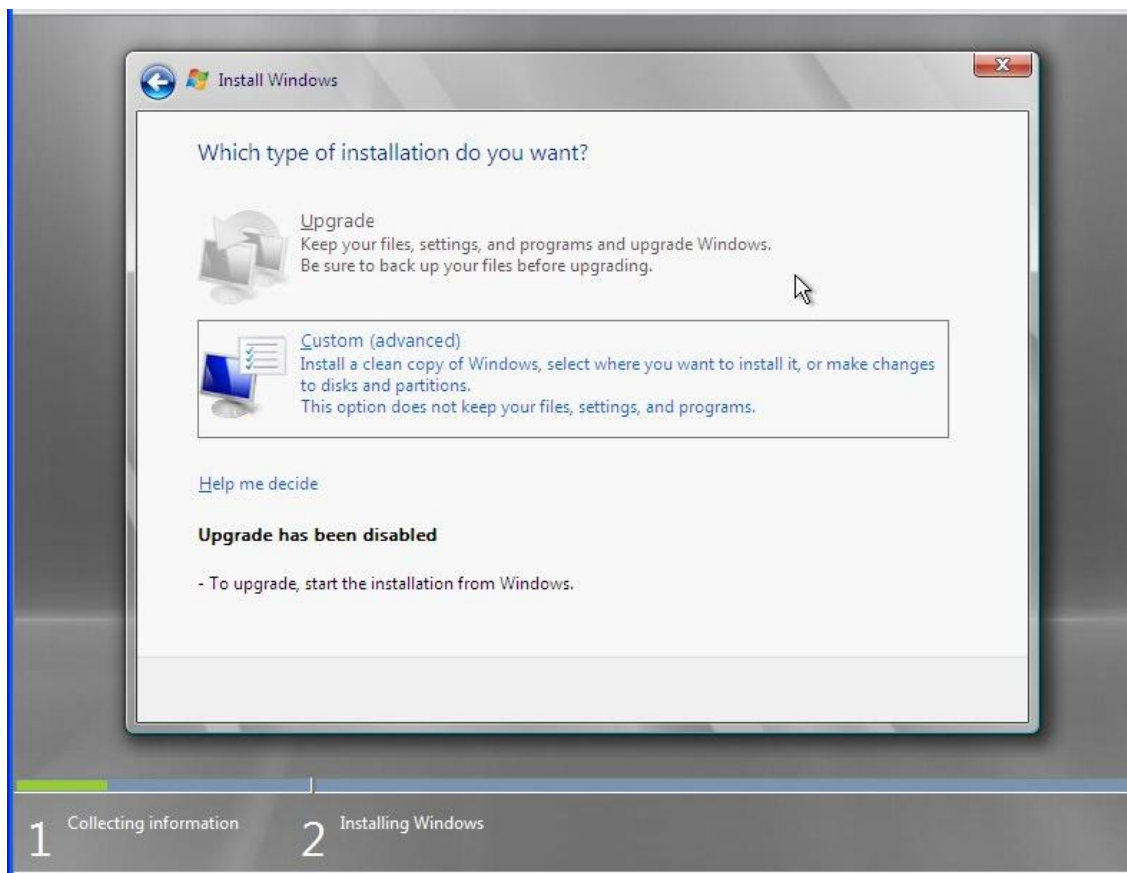


Figure 68. Select Type of Installation

7. Click **"Next"** to start installation.

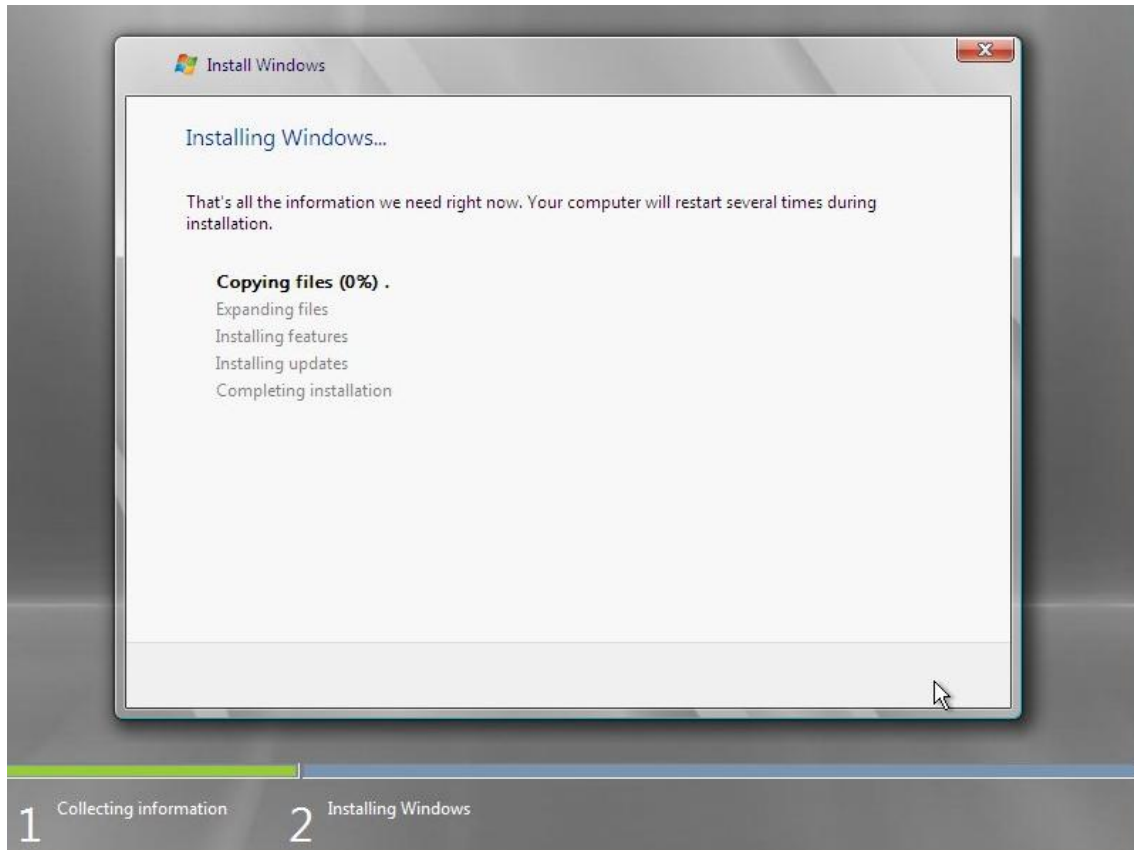


Figure 69. Starting Installation

8. Installation completes.

2.4.2 Client Network Configuration

1. Open the **"Network and Sharing Center"** of the windows and click the **"Local Area Connection 2"** option as is shown in below figure.

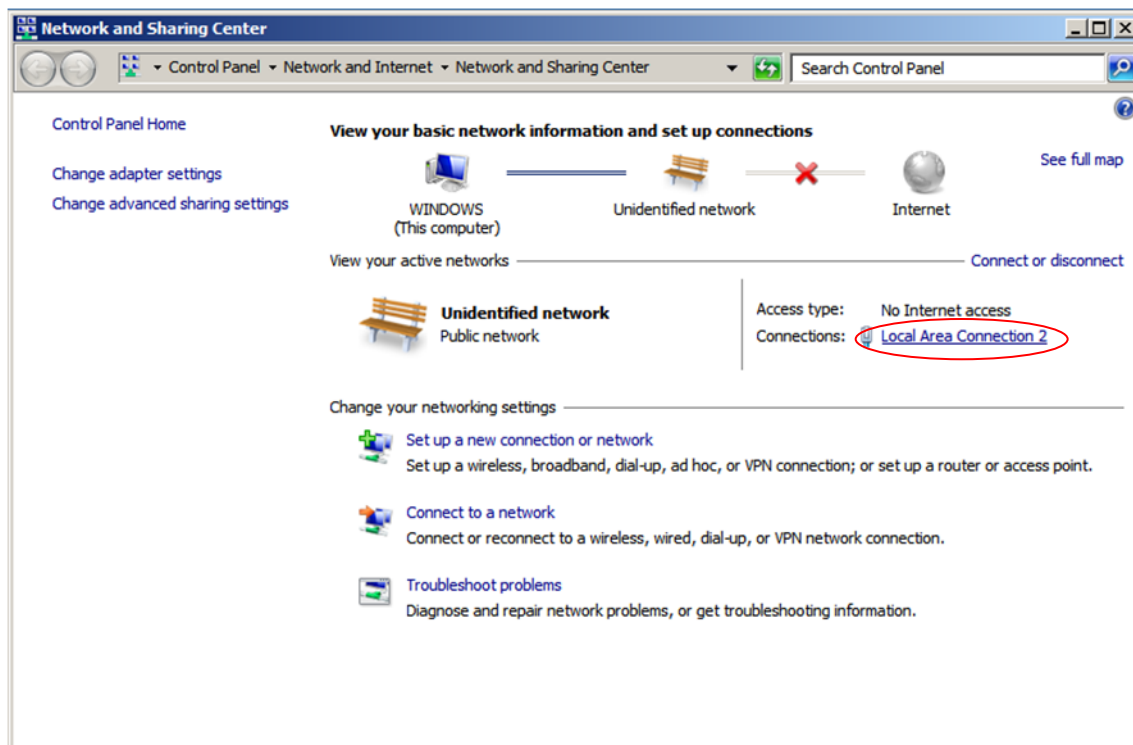


Figure 70. Network and Sharing Center Page

2. Click the “**Properties**” to view the current network connection status.

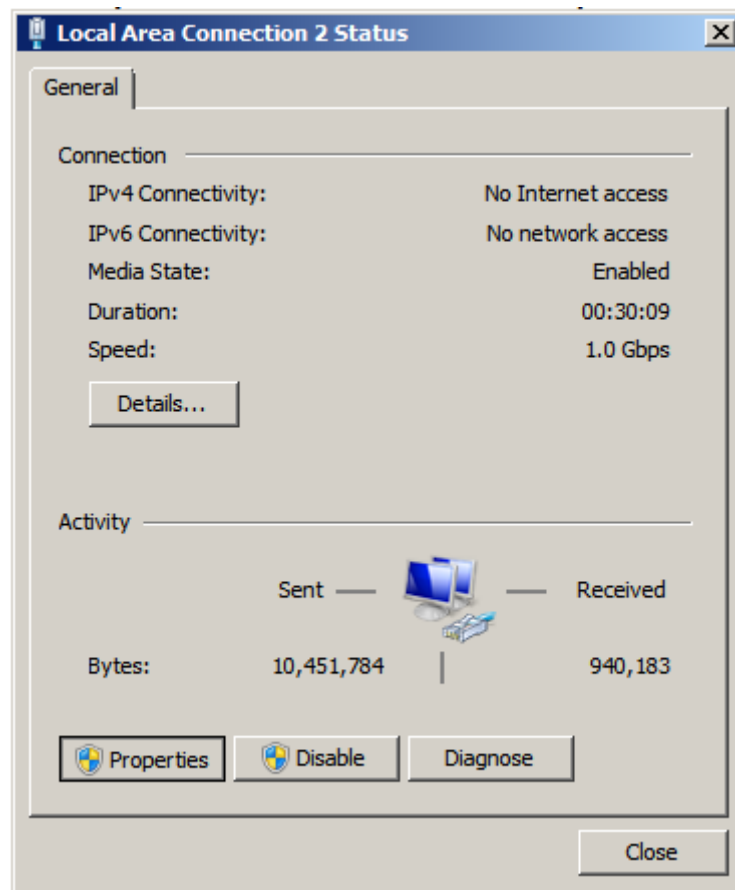


Figure 71. Current Network Connection Status

3. Choose the **"Internet Protocol Version 4 (TCP/IPv4)"** and then click **"Properties"** to view the current network configuration.

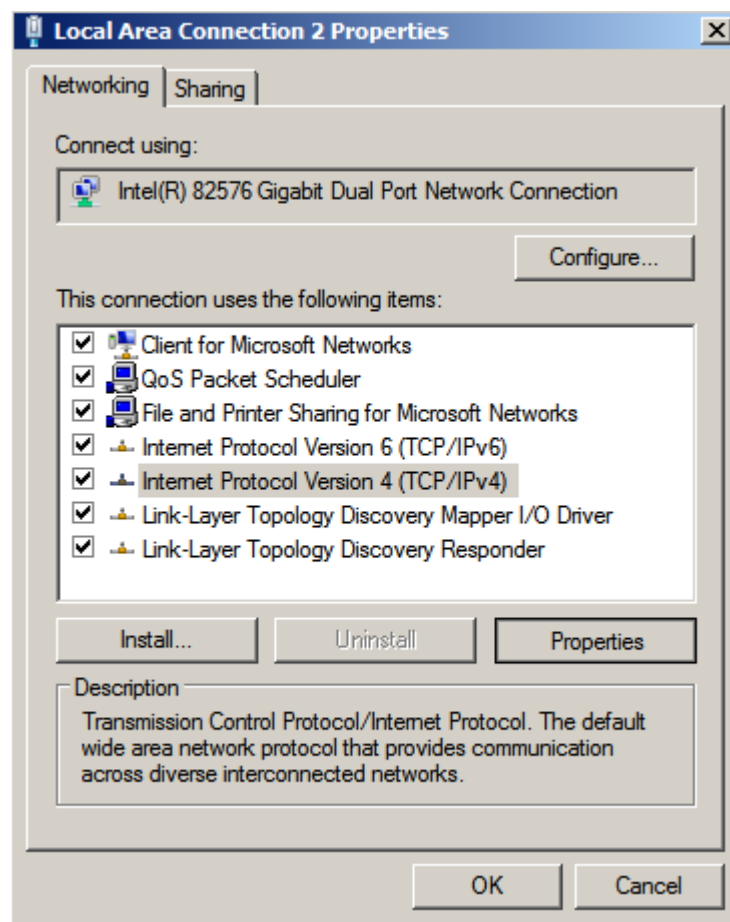


Figure 72. Internet Protocol Version (TCP/IPv4)

4. Choose **“Use the following static IP address”** and then enter the new IP address and subnet mask. Click **“OK”** to save the network configuration.

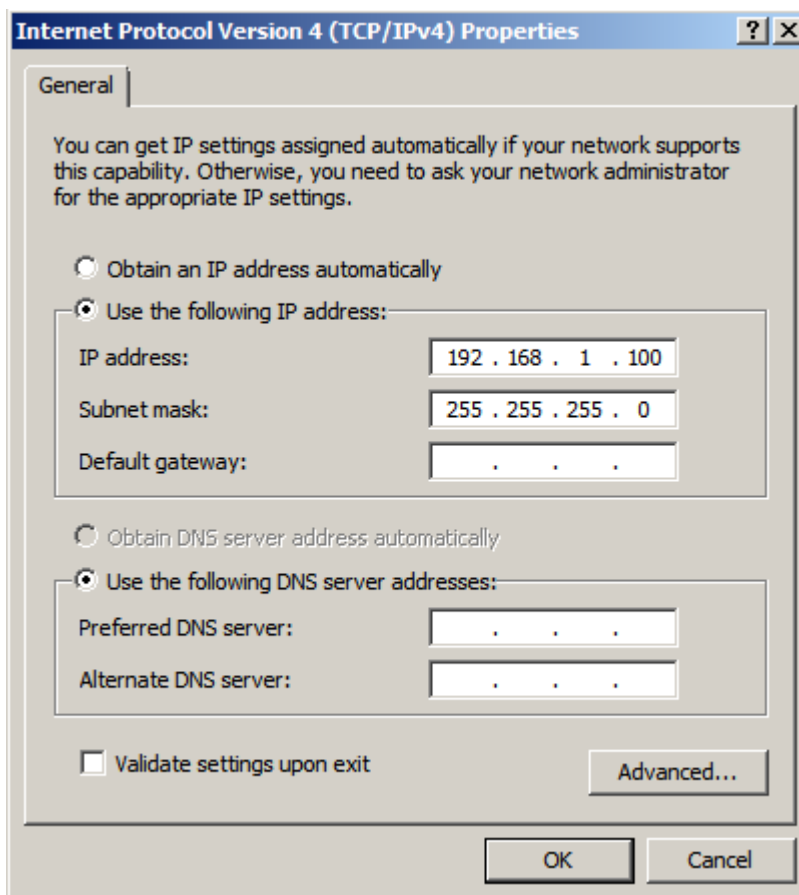


Figure 73. IP Address and Subnet Mask Configuration

5. Click **“OK”** in Figure 72 to save the network configuration. And click **“Close”** in Figure 71 to save the changes.

2.5 Use RWC2 on client to control the RAID controller on Server

2.5.1 RWC2 installation

1. Get the latest RWC2 installation package from <http://www.intel.com>
2. Double click the **“setup.exe”** file and begin the RWC2 installation.

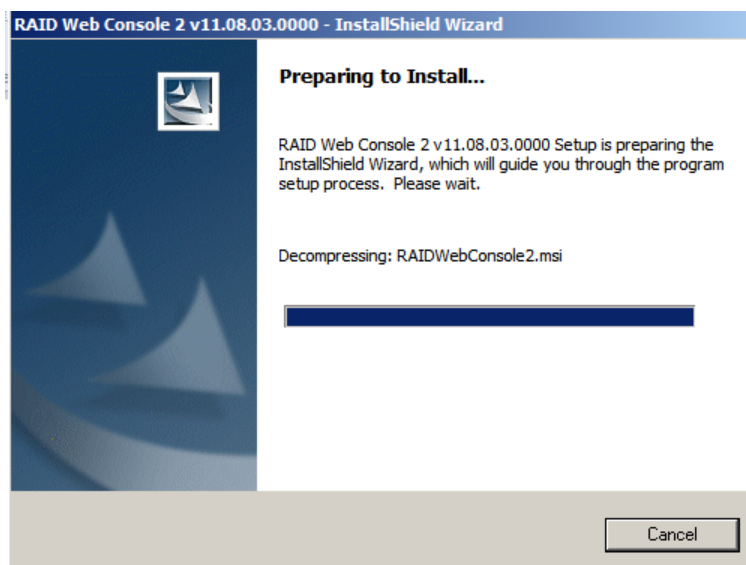


Figure 74. Preparing the RWC2 Installation

3. Click **“Next”** to continue the installation.

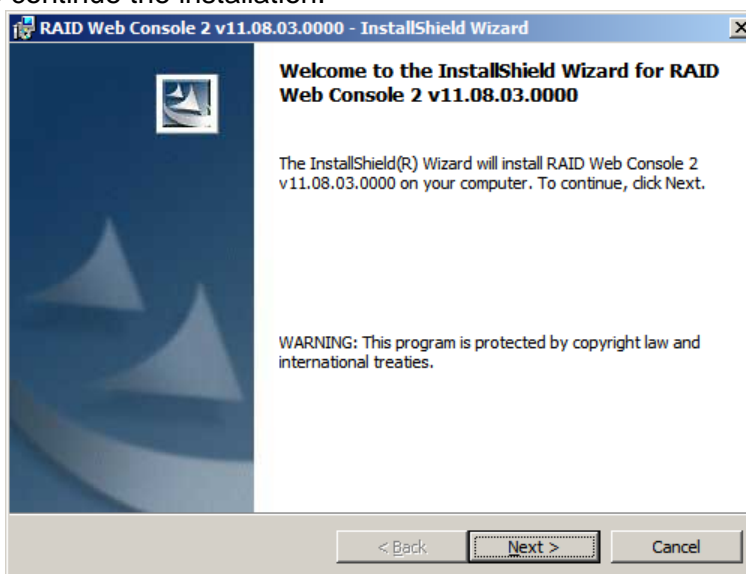


Figure 75. Install RWC2

4. Accept the software license agreement and then click **“Next”** to continue the installation.

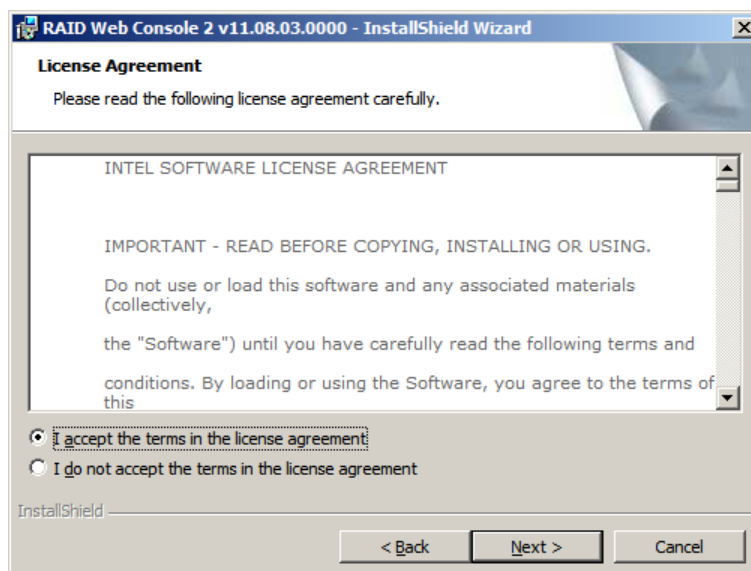


Figure 76. Accept the Software License Agreement

5. Enter the "Customer Information"; this step can be skipped and just click "**Next**" to continue the installation.

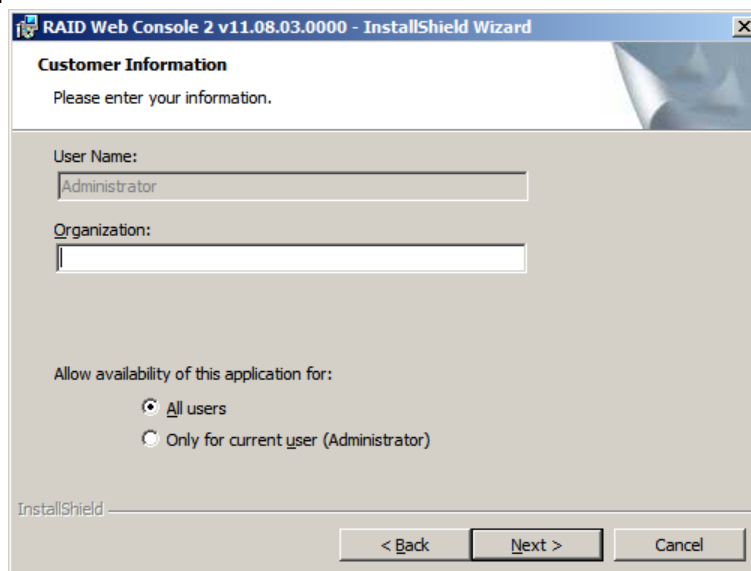


Figure 77. Customer Information

6. Choose the installation directory if needed and then click "**Next**" to save the changes.

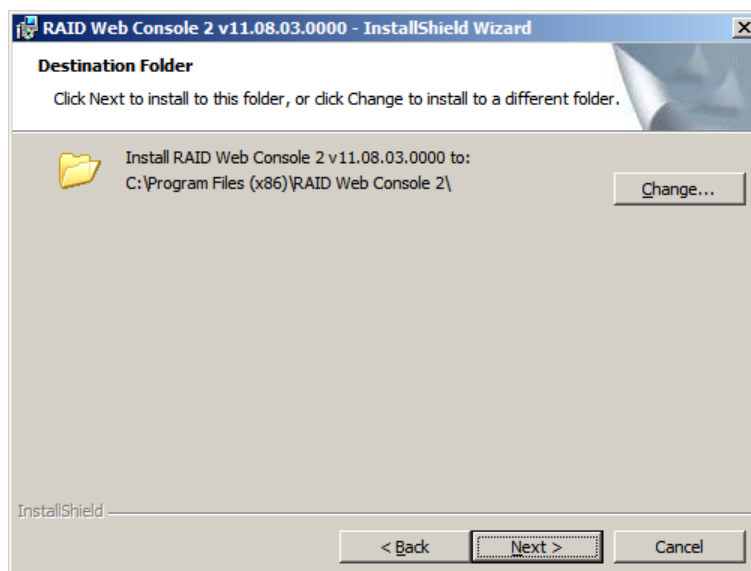


Figure 78. Choose the Installation Directory

7. Select the **“Setup Type”**, the default type is complete. Then click **“Next”** to save the choice and continue the installation.

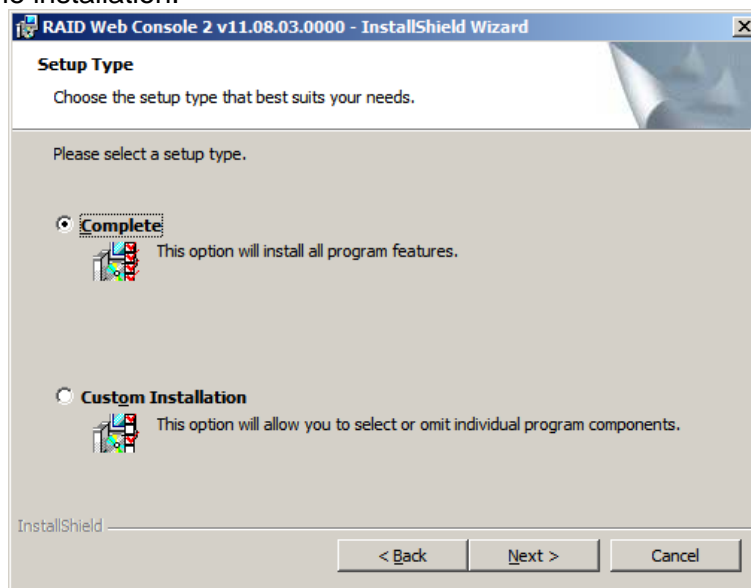


Figure 79. Choose the Installation Type

8. Click **“Install”** to begin the RWC2 installation process.

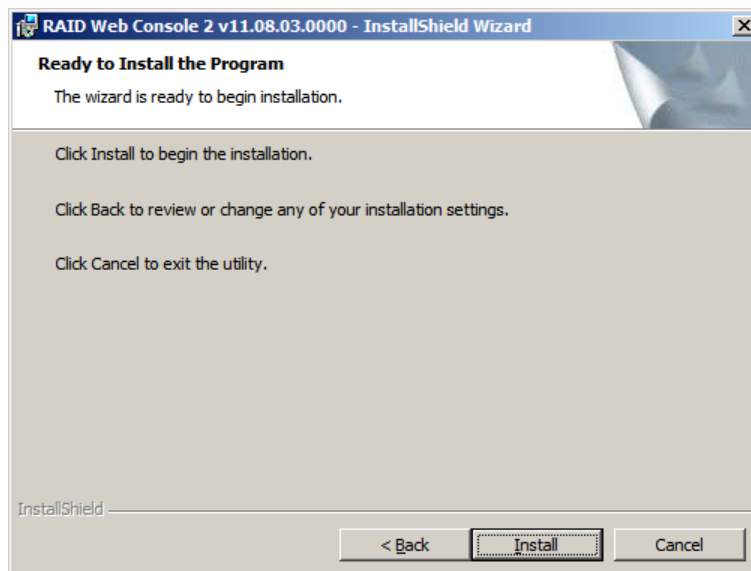


Figure 80. Install the RWC2

9. Starting the installation process automatically.

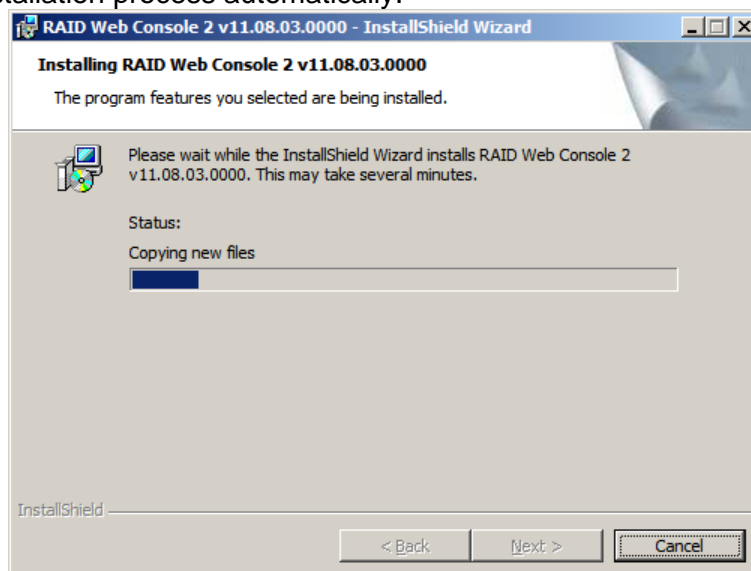


Figure 81. RWC2 is being installed

10. Installation completed.

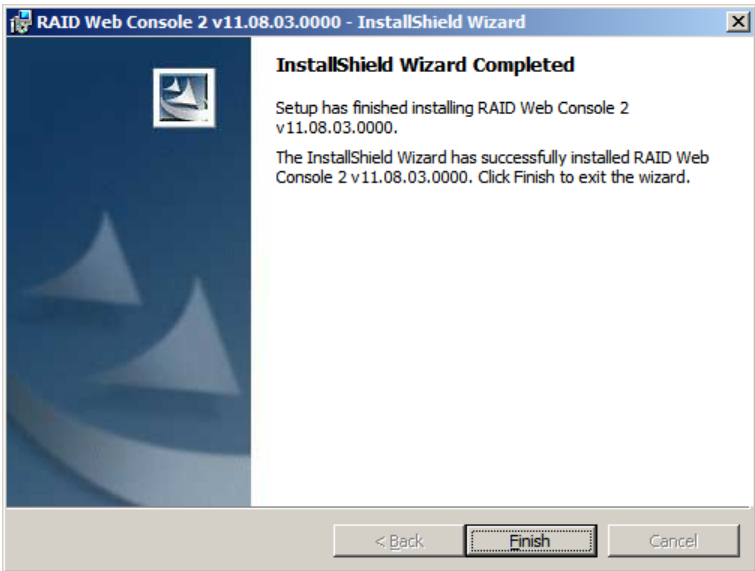


Figure 82. Installation Successfully

2.5.2 Install LSI Provider on VMware ESXi 5.0

1. The default status of the ESXi Shell is **disabled** as is shown in below figure.

Troubleshooting Mode Options	ESXi Shell
Enable ESXi Shell	ESXi Shell is Disabled
Enable SSH	Change current state of the ESXi Shell
Modify ESXi Shell timeout	
Restart Management Agents	

Figure 83. Default ESXi Shell Status---Disabled

2. Press **<Enter>** key to enable the EXSi Shell.

Troubleshooting Mode Options	ESXi Shell
Disable ESXi Shell	ESXi Shell is Enabled
Enable SSH	Change current state of the ESXi Shell
Modify ESXi Shell timeout	
Restart Management Agents	

Figure 84. Set ESXi Shell Status to Enabled

3. The default status of the ESXi SSH is **disabled** as is shown in below figure.

Troubleshooting Mode Options	SSH Support
Disable ESXi Shell	SSH is Disabled
Enable SSH	Change current state of SSH
Modify ESXi Shell timeout	
Restart Management Agents	

Figure 85. Default ESXi SSH Status---Disabled

4. Press <Enter> key to enable the ESXi SSH.

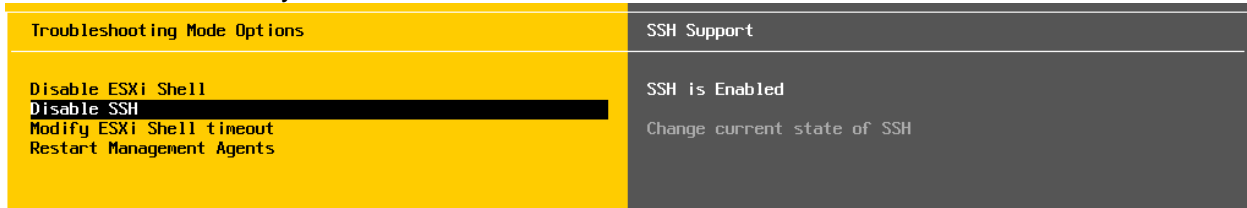


Figure 86. Set ESXi SSH Status to Enabled

5. Download the pscp.exe from <http://www.putty.nl/download.html> and download the SMIS VIB file from <http://www.intel.com>. Extract them to the local disk of client. The below figure shows the information of the pscp.exe and SMIS VIB file.

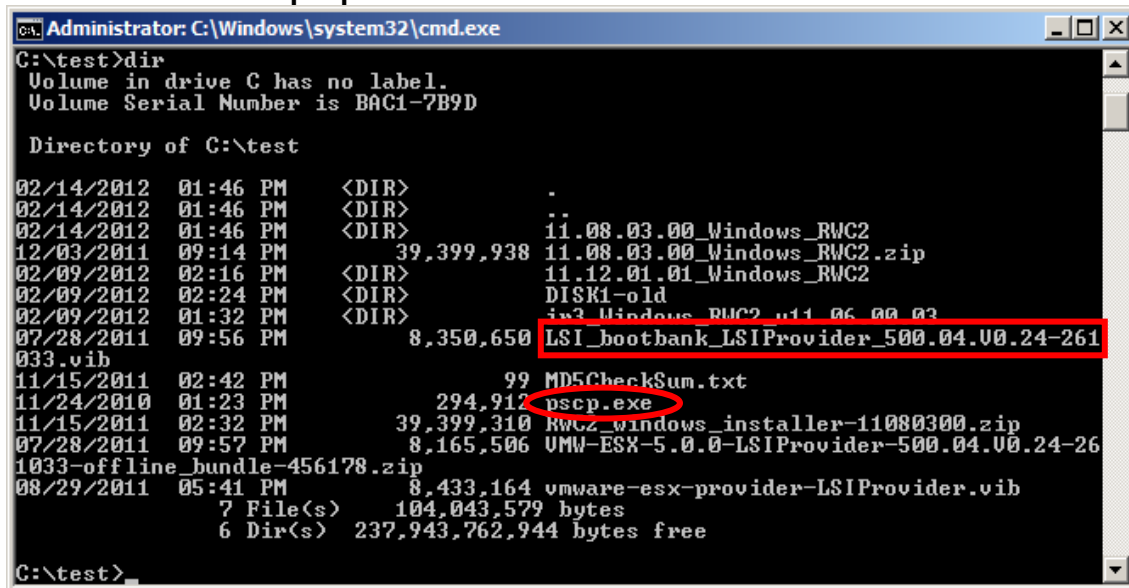


Figure 87. The pscp.exe and LSI Provider Information

6. Transfer the LSI Provider.vib file on client to the server using the command “**pscp.exe LSI_bootbank_LSIProvider_500.04.V0.24-261033.vib root@192.168.1.200:/**”, where root is the login user name of the server and 192.168.1.200 is the ESXi server IP. The password of the server will be required during the transference.

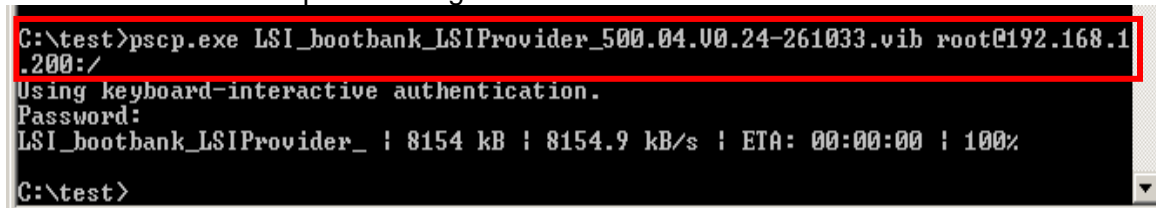


Figure 88. Transfer LSI provider.vib to Server through SSH

7. Press <Ctrl+F1> to enter the shell mode in ESXi 5.0. The user name and password will be required.

```

ESXi 5.0.0 http://www.vmware.com
Copyright (c) 2007-2011 VMware, Inc.

ESXi login: root
Password:

```

Figure 89. Enter the Shell Mode in ESXi 5.0

8. Use the command “ls” to show the contents of root directory in ESXi 5.0, and the LSI Provider.vib file can be found.

```

The ESXi Shell can be disabled by an administrative user. See the
vSphere Security documentation for more information.
~ # ls
LSI_bootbank_LSIProvider_500.04.V0.24-261033.vib  proc
altbootbank                                     productLocker
bin                                              sbin
bootbank                                       scratch
dev                                           store
etc                                           tardisks
lib                                           tmp
lib32                                         usr
lib64                                         var
local.tgz                                    vmfs
locker                                       vmimages
opt                                          vmupgrade
~ # _

```

Figure 90. LSI Provider Received Successfully on ESXi 5.0

9. Enter the command
**“esxcli software vib install -v / LSI_bootbank_LSIProvider_500.04.V0.24-261033.vib
--force --maintenance-mode”** to install the LSI Provider on ESXi 5.0.

```

~ # esxcli software vib install -v /LSI_bootbank_LSIProvider_500.04.V0.24-261033.vib --force --maintenance-mode
Installation Result
Message: The update completed successfully, but the system needs to be rebooted for the changes to be effective.
Reboot Required: true
VIBs Installed: LSI_bootbank_LSIProvider_500.04.V0.24-261033
VIBs Removed: LSI_bootbank_LSIProvider_500.04.V0.24-262041
VIBs Skipped:
~ #

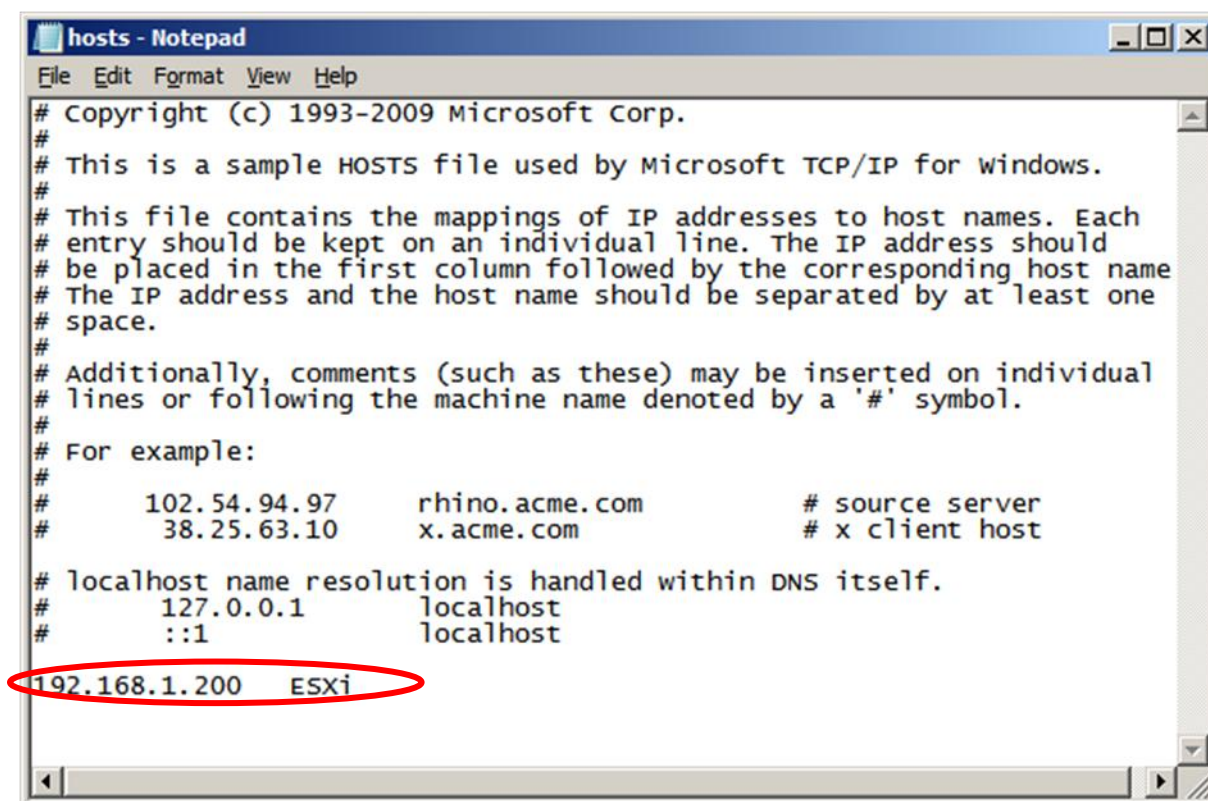
```

Figure 91. Install LSI Provider on ESXi 5.0

10. Reboot the ESXi 5.0 after installing the LSI Provider.

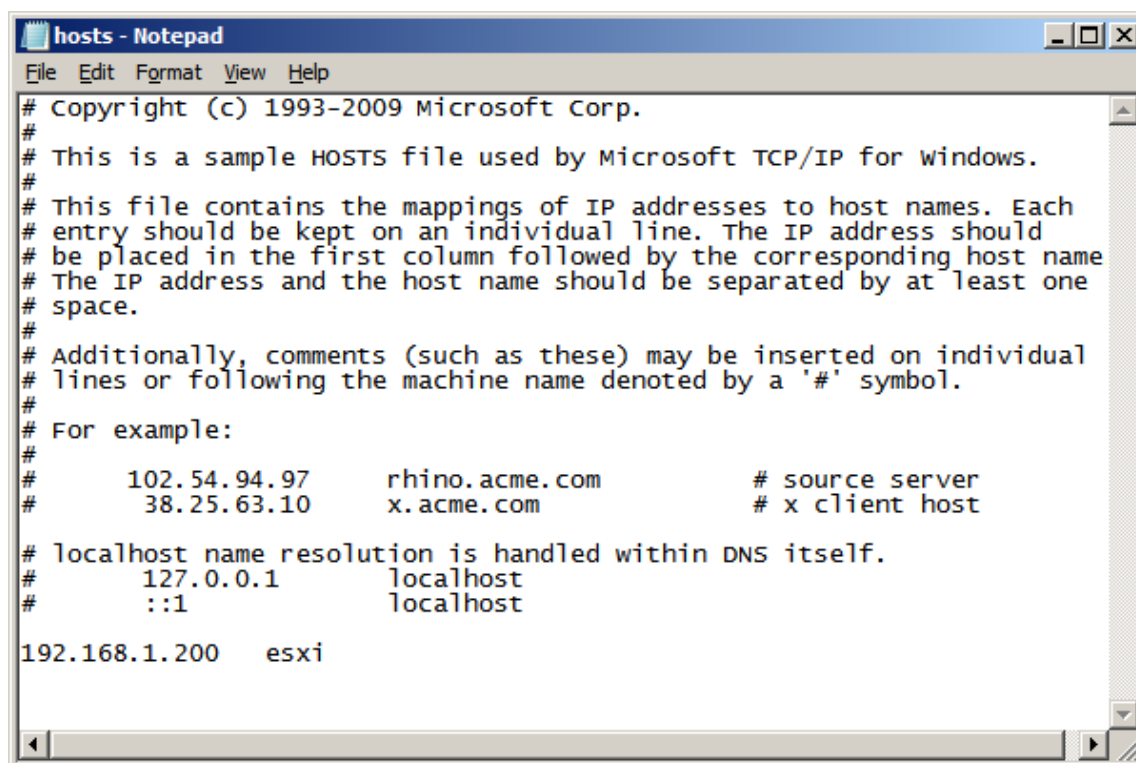
2.5.3 Change the client hosts file

1. Open the hosts file on client: **Disk C-->Windows-->System32-->drivers-->etc-->hosts.**
2. Edit the host file by adding the server information as is shown in below figure.
“192.168.1.200” is the IP Address of the server in local network and **“ESXi”** is the server hostname, the hostname is case insensitive.



```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com       # source server
#       38.25.63.10       x.acme.com           # x client host
#
# localhost name resolution is handled within DNS itself.
#       127.0.0.1         localhost
#       ::1               localhost
192.168.1.200 ESXi
```

Figure 92. Add server IP information in the Hosts File with Uppercase Hostname



```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com       # source server
#       38.25.63.10       x.acme.com           # x client host
#
# localhost name resolution is handled within DNS itself.
#       127.0.0.1         localhost
#       ::1               localhost
192.168.1.200 esxi
```

Figure 93. Add server IP Information in the Hosts File with Lowercase Hostname

3. Save the hosts file, and it is recommended to restart the system.

2.5.4 Use the RWC2 on client to control the RAID controller on server.

1. Double click the RWC2 and open it. Choose the **“Display all the systems in the network of local server”**, uncheck **“Stop discovery process of remote servers”** and then click **“Save Settings”** to save the configuration as is shown in below figure.

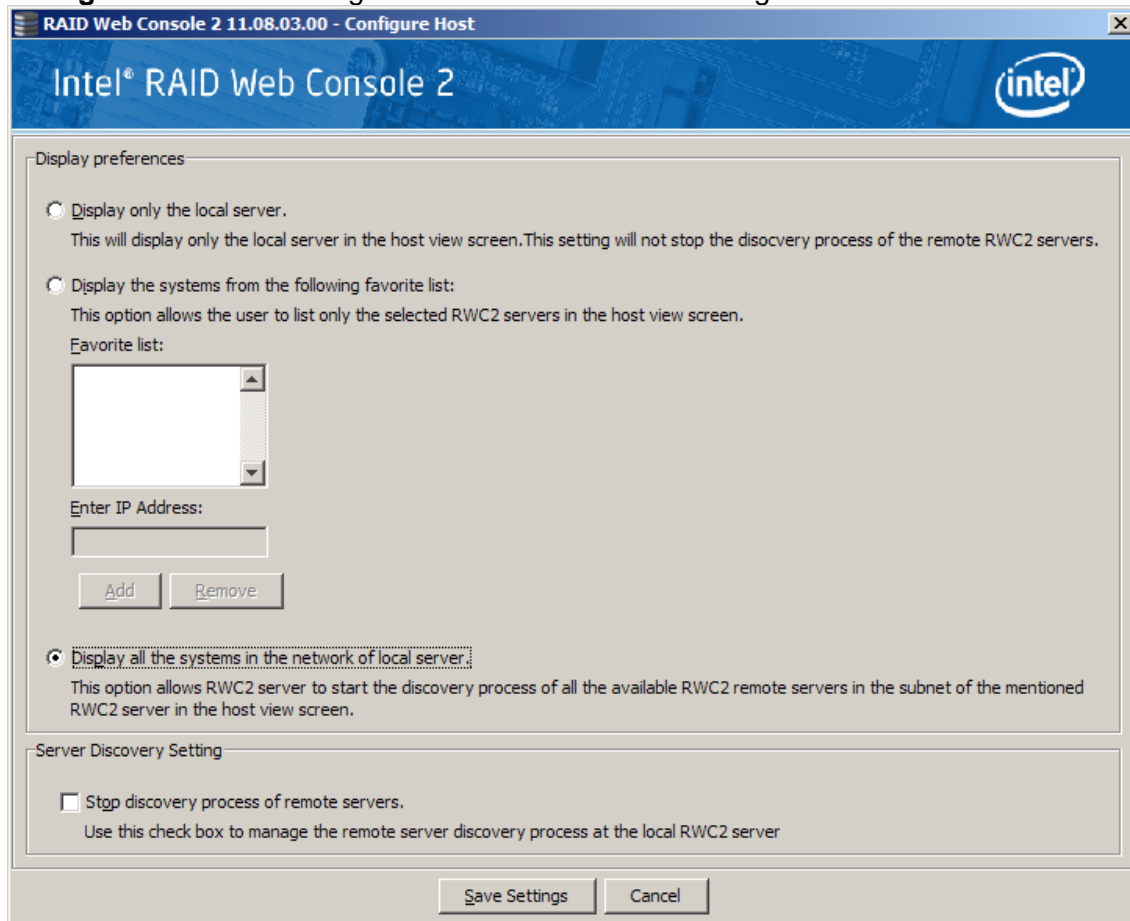


Figure 94. Configure the Display Preference

2. Enter the **“IP Address”** of the server in Intel® RAID Web Console 2 and click **“Discover Host”** to search the host RAID Controller. The IP Address of the server will be returned, double click the IP address of the server to connect the RAID controller.

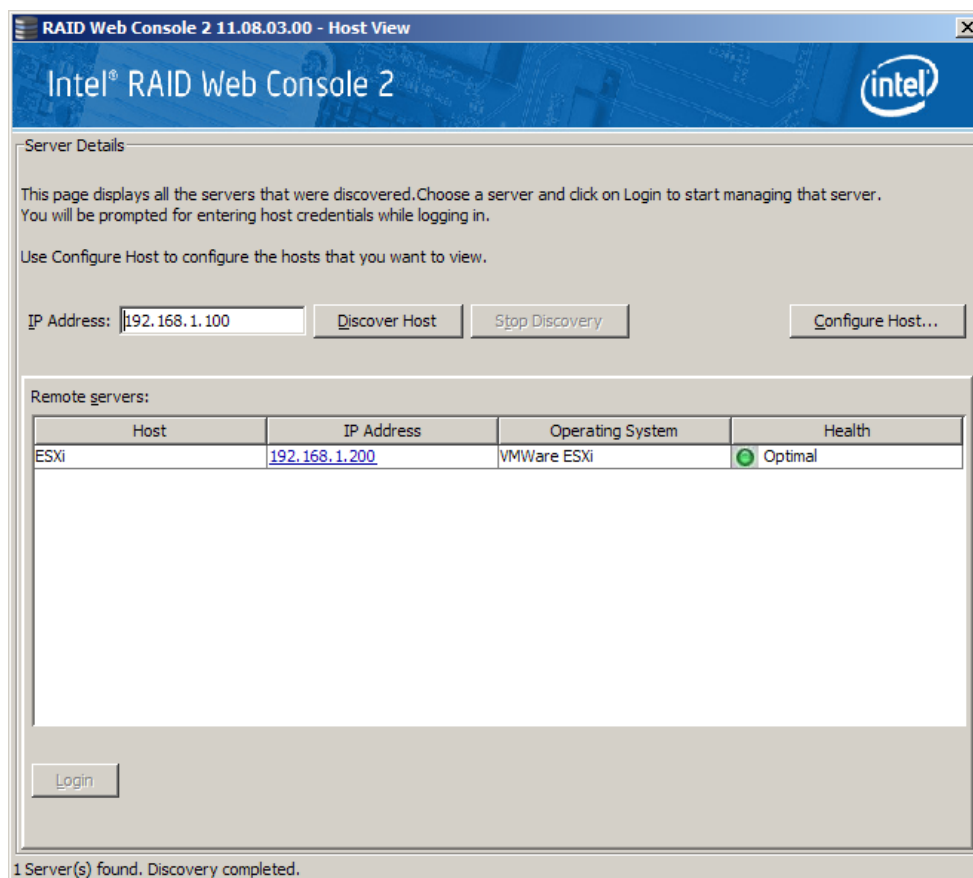


Figure 95. Find the RAID Controller on Server

3. Enter the “**User Name**” and “**Password**” of the Server and click “**Login**” to enter Intel® RAID Web Console 2 on the server.



Figure 96. Login the Intel® RAID Web Console 2 on Server

4. Enter Intel® RAID Web Console 2 on Server successfully.

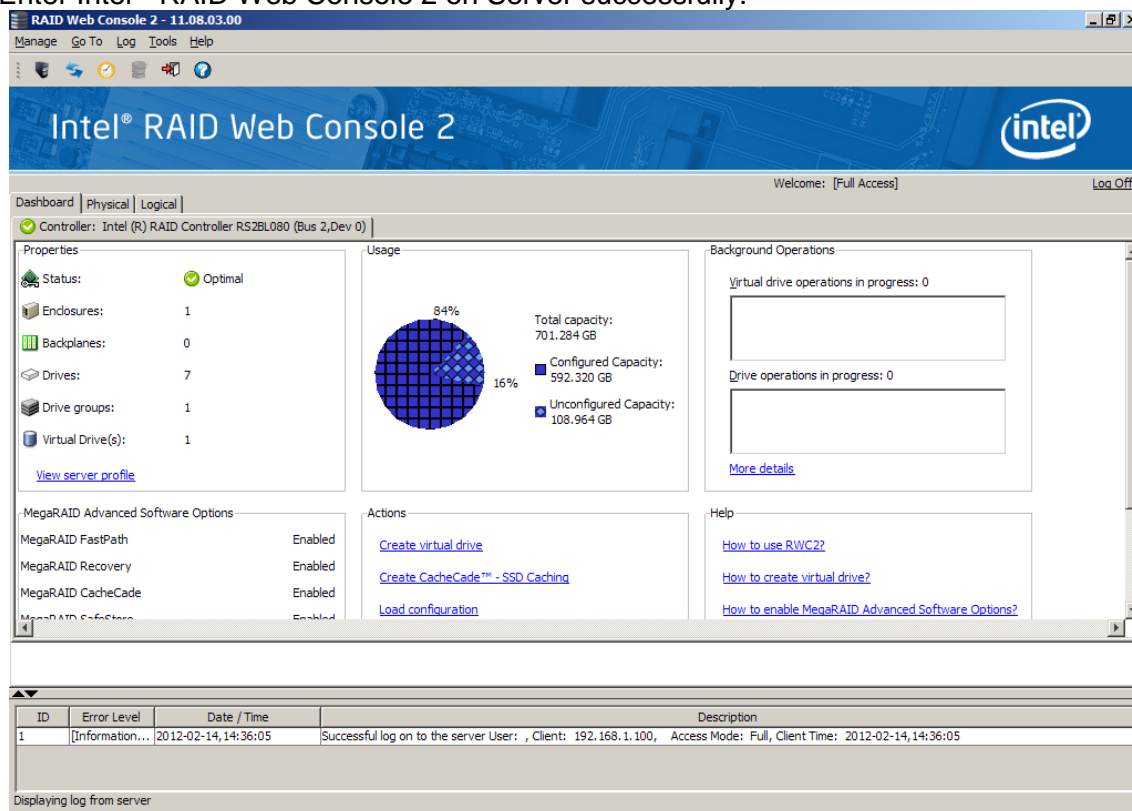


Figure 97. Enter Intel® RAID Web Console 2 on Server

5. The logical view of the Server RAID controller.

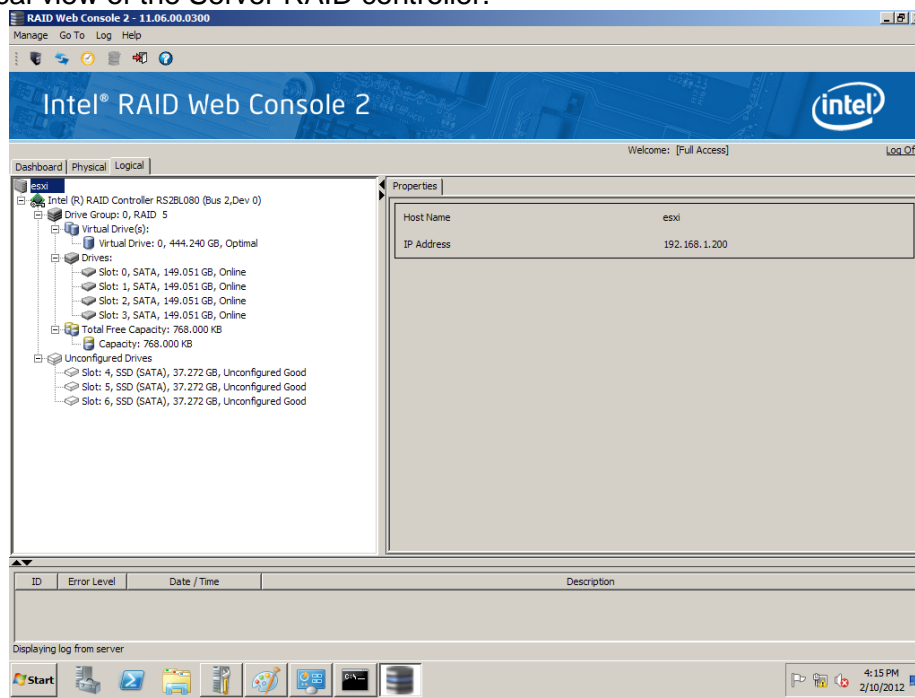


Figure 98. Logical View of the Server RAID controller

3. Backup

3.1 Enable Intel® Virtualization Technology

If the Intel® Virtualization Technology in **BIOS-->Advanced-->Processor** as is shown in Figure 41 is disabled, there will be a warning while installing the VMware ESXi 5.0. This warning can be ignored and it has no effect to the following steps. So It is strongly recommended to enable the Intel® Virtualization Technology

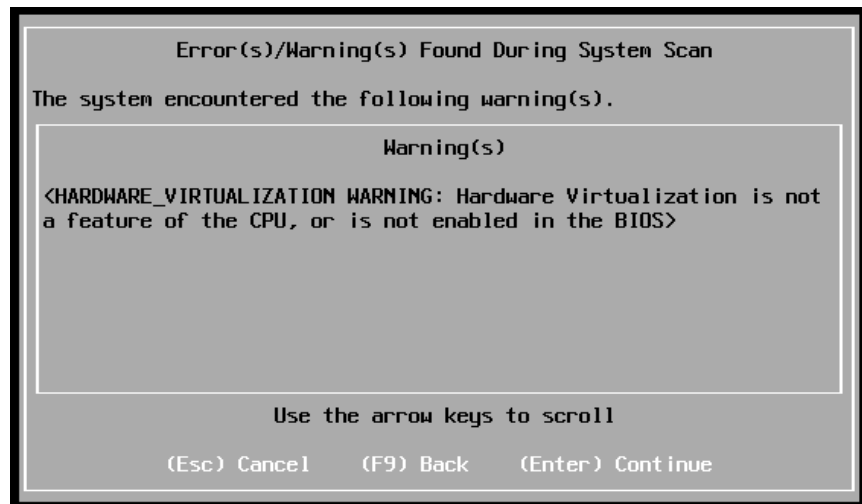


Figure 99. Warning about Disabled Intel® Virtualization Technology

3.2 About the Hosts file

As is given in 2.5.3, the hosts file needs to be edited before the RAID controller can be found on client RWC2. The hostname must be the same with the server, and it is irrelevant to the case. If the hostname is deleted or wrongly spelled, then the RWC2 in client will find an empty IP Address(0.0.0.0) as is shown in following figure.

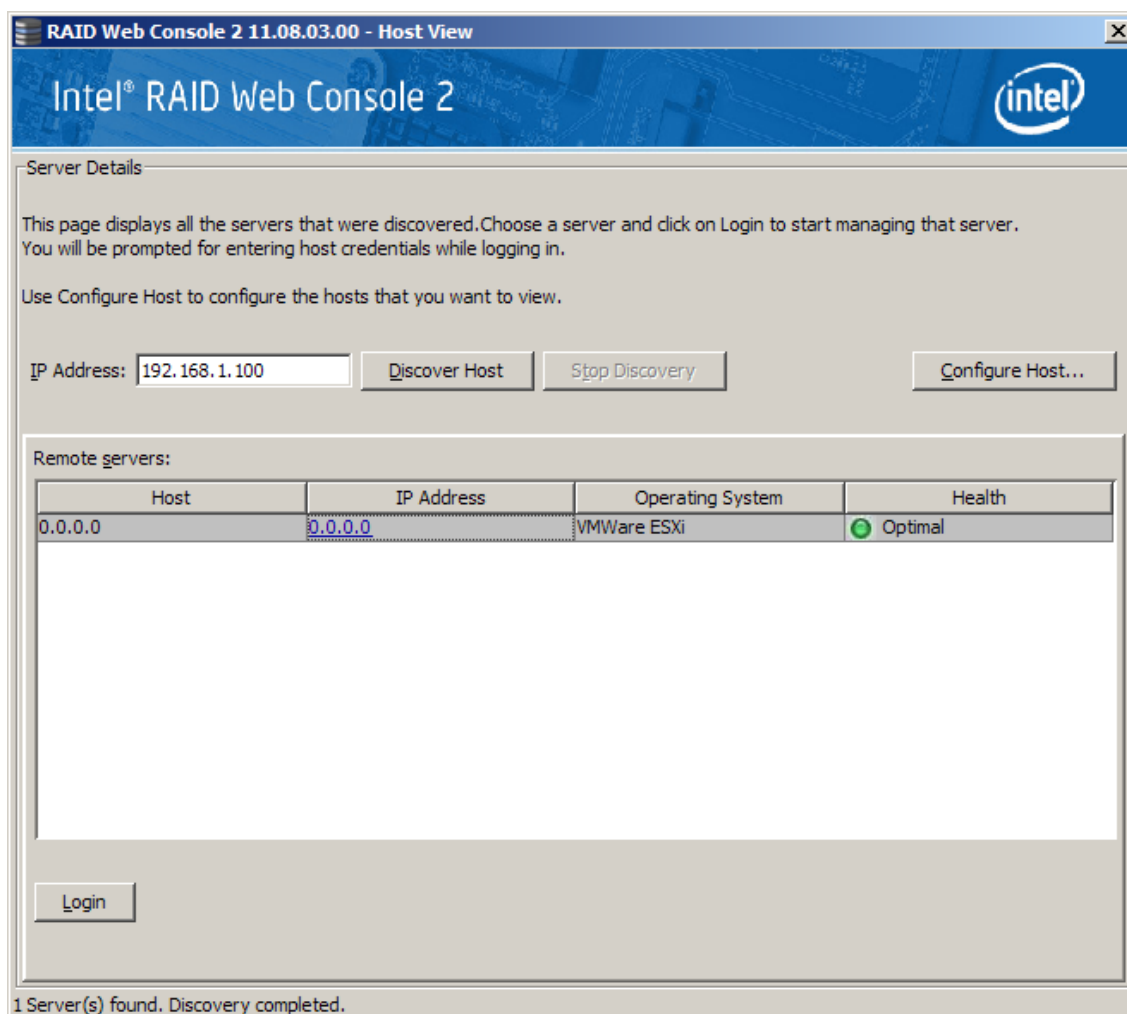


Figure 100. Empty IP address is found with Wrong Hostname or No Hostname

If double click the IP Address 0.0.0.0, the login page will jump out, then enter the root user name and password.



Figure 101. Login the Empty IP Address

But cannot really enter the RWC2 of the Server, and the error information will be displayed as is shown in below figure.

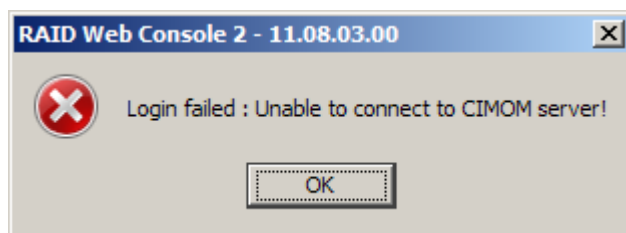


Figure 102. Failed to Connect the RAID Controller on the Server

3.3 About the Server Memory

The VMware ESXi 5.0 needs at least 1.97GB memory. If there is not enough memory, the installation will be forced to stop as is shown in following figures.

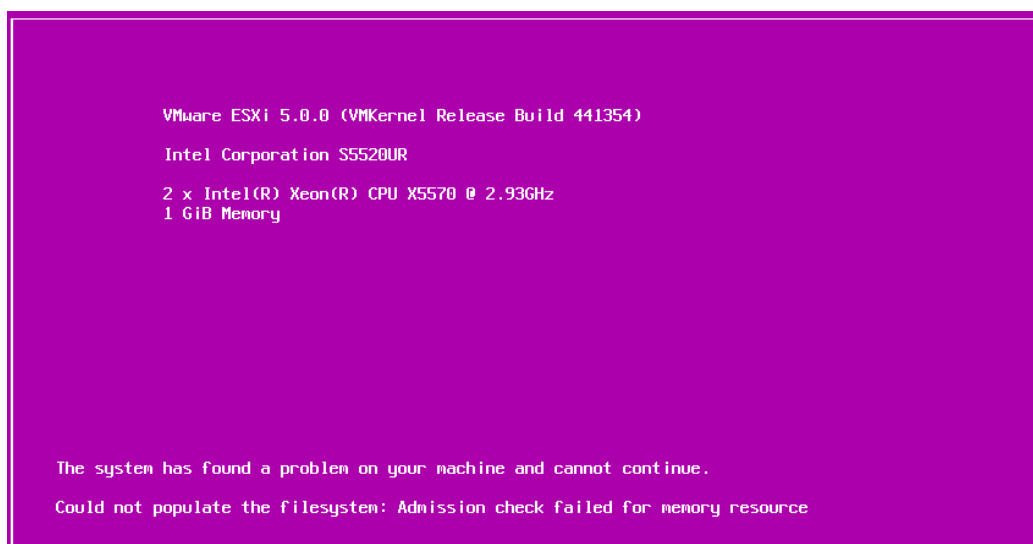


Figure 103. Error Message for Lack of Memory Resource (1GB memory)

Figure 103 above gives the error message while installing the VMware ESXi 5.0.0 with 1GB memory.



Figure 104. Error Message for Memory Resource (2GB memory)

As is shown in Figure 104, 2* 1GB memory chips are installed, but during the VMware ESXi 5.0 installation, it finds only 1.94 GB and at least 1.97GB memory is needed for the ESXi installation, so the installation is forced to stop. To prevent such kind of errors, it is strongly suggested that you insert at least 3GB memory before installing the ESXi 5.0 system.