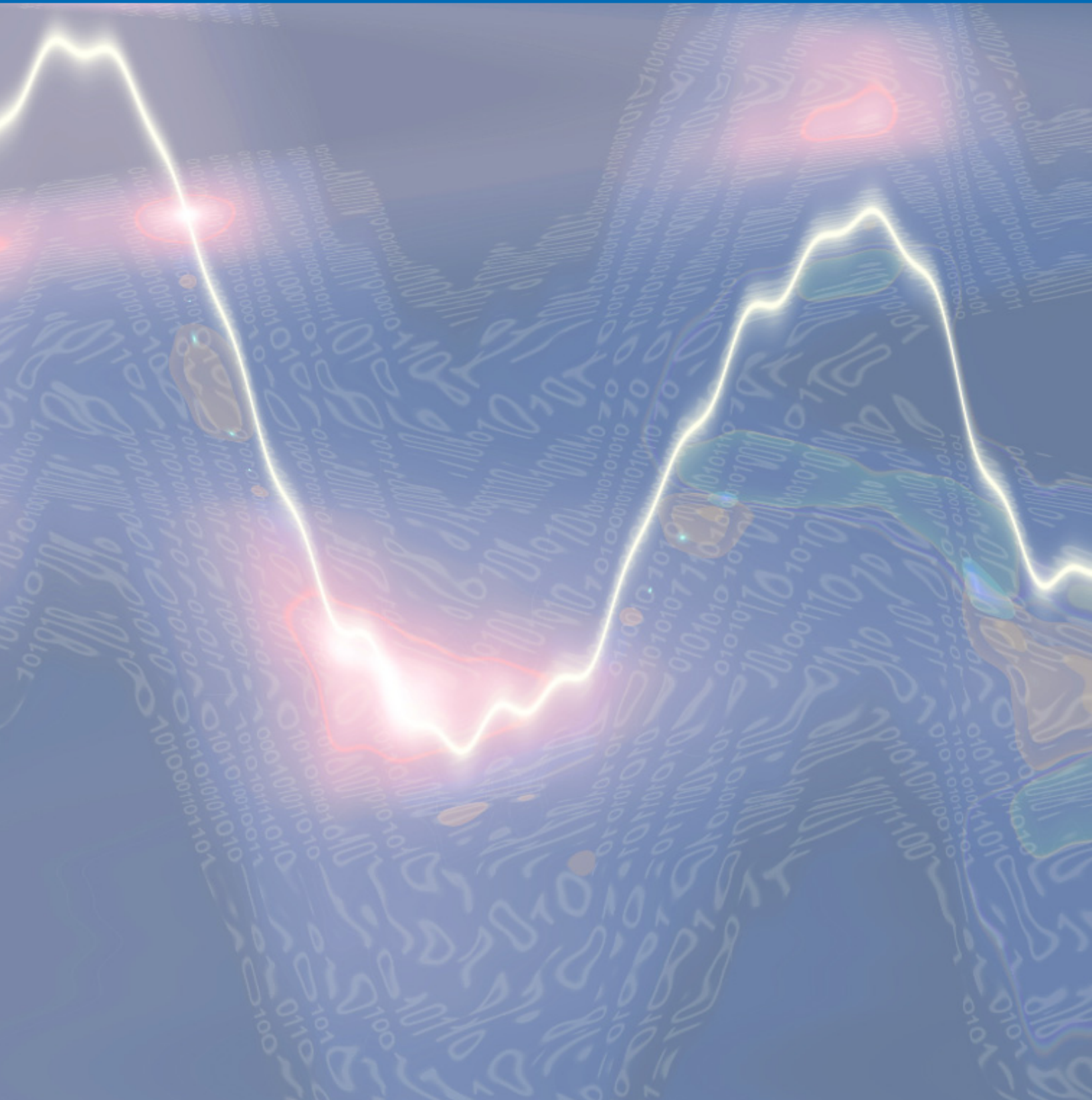


# PORTLOCK™

## Physical to Virtual Migration with Portlock Storage Manager

### What this document covers:

This document covers physical to virtual migration using Portlock Storage Manager to image the physical server and restore it on a virtual machine created with VMware.



## Table of Contents

<b>Introduction .....</b>	<b>1</b>
<b>Section One .....</b>	<b>5</b>
Getting Started .....	5
The Portlock Boot CD & Portlock Storage Manager .....	7
<b>Section Two .....</b>	<b>19</b>
Installing Portlock Storage Manager .....	19
Setting Up Portlock Install on Windows .....	20
Installer for NetWare .....	25
Quick Installation on Novell Open Enterprise Server .....	31
<b>Section Three .....</b>	<b>33</b>
Creating an Image .....	33
<b>Section Four .....</b>	<b>37</b>
Migrating the Image: Source to Target .....	37
Restoring the Image to the Target Machine: Linux .....	41
Load and Configure Drivers: Linux .....	54
Restoring the Image to the Target Machine: NetWare .....	62
Load and Configure Drivers: NetWare 5.1 .....	70
Load and Configure Drivers: NetWare 6.5 .....	77
Load and Configure Drivers: Windows XP Pro .....	85

## Introduction

IT managers around the globe share a common challenge: Keeping up with the unpredictable need for more servers and storage while addressing growing business continuity demands. Yet strategies to manage computing resources more effectively across sprawling enterprises and amid constant new application developments have not always kept pace. The result is that many IT organizations are severely under utilizing their existing hardware resources while others are constantly reacting to business conditions instead of proactively planning for growth.

Server virtualization is a proven way to overcome this challenge by better utilizing computing resources, improving scalability, reliability and availability while lowering total cost of ownership (TCO). Virtualization software divides a single physical server into several independent virtual machines, each of which can host a separate operating system and applications in complete isolation from other virtual machines on the same server.

Portlock Storage Manager is the perfect tool to migrate physical computers to a virtual environment.

## About this Document

The purpose of this document is to guide the user interested in performing a physical to virtual migration in VMware, using Portlock Storage Manager and the Portlock Boot CD. Portlock Storage Manager will be used in this exercise to image the source computer and migrate it to the target computer.

## About the Reader

Chances are if you are reading this document, you already have some level of experience working with VMware and Virtual Machines. But even this is your first attempt at creating a virtual machine, more than likely you want to move a physical machine to a virtual machine.

There are numerous reasons for wanting to perform a physical to virtual conversion. You may want to test a new application. Perhaps you want to install a recent update

to your operating system and want to test it before actually installing it on a production machine, or you plan on consolidating several servers onto one machine. Whatever your reasons, you are undoubtedly looking for a quick and easy solution for physical to virtual migration.

## **About Portlock Storage Manager & Portlock Boot CD**

Originally designed as an Enterprise-class storage management product, Portlock Storage Manager has evolved into a multi-functional, multi-platform management product for Linux, NetWare and Windows, and now VMware. Tested extensively on a large number of machines, it supports almost every type of storage device. IDE, EIDE, SATA, SCSI, RAID, Fibre Channel, iSCSI, FireWire, USB and SANs are all supported. Our "bare-metal" image and restore technology supports thousands of server configurations from Compaq, Dell, HP, IBM and more.

Portlock Storage Manager can optimize server storage, perform bare metal recoveries, facilitate server to server migration, and more. In addition, users can copy, create, clone, image, and restore. Portlock Storage Manager's image and restore features make it possible to image/restore from disk, tape, CD/DVD, FTP and across the wire using TCP/IP.

Since Portlock Storage Manager does not require operating system installation, the operating system can be restored automatically as part of the recovery/migration process, helping make a physical to virtual migration as painless as possible.

The Portlock Boot CD is a bootable CD-ROM that contains Portlock Storage Manager in various configurations for installation / execution for Linux, NetWare and Windows. The CD auto configures Ethernet and Storage device drivers, making it a valuable tool when your system will not boot, or will not boot correctly. It can be a lifesaver by allowing you to examine your system's configuration settings.

The Portlock Boot CD is available as a downloaded ISO image on our website, [www.portlock.com](http://www.portlock.com).

## Terminology

It is a good idea to familiarize yourself with the terminology associated with virtual machines. The following are some common terms you will use when working with virtual machines:

**Host:** The computer that holds or hosts the virtual computer. The host can be a Windows or Linux based computer. Not all versions of the operating systems are supported in VMware. You should consult VMware documentation for the supported versions.

**Guest:** The virtual computer created on the host. The guest can run on a NetWare, a Linux or a Windows operating system. Not all versions of the operating systems are supported in VMware. You should consult VMware documentation for the supported versions.

**P2V:** This is an abbreviation for Physical to Virtual. This term is used a lot when discussing the physical to virtual migration of computers.

**Source or Master:** The computer from which you will create an image in order to perform a P2V migration.

**Target or Slave:** The virtual (guest) computer to which you will migrate the source computer.

## Considerations before Migrating

Regardless of what operating system you will be migrating, before you perform a physical to virtual migration there are some issues one needs to consider.

### Source or Master Machine

#### **Inventory of applications**

Take an inventory of the applications you currently have on the source computer. Decide which applications you will be using on the target computer.

#### **Inventory of Hardware**

Take an inventory of the hardware you are currently using on the source computer. Take note of your hardware interfaces.

#### **Analyze Disk Space and Disk Type**

Analyze your disk space and type. Ask yourself how much space will I need? What disk type am I currently using? Is it compatible with VMware?

### **Prepartory procedures for migration**

As in all instances, when you are performing a major operation such as installing new software, changing hardware, updating, etc., you should do the following:

- System Backup

- Clean up of machine - purge files such as temp files, outdated/old files, etc.

### **Memory Requirements**

Analyze your memory requirements. What programs will you be running? What are their memory requirements?

### **Network Configurations**

Make note of network configurations such as DHCP, Subnet. What specific configurations are required for your computer?

## **Target or Guest Machine**

### **Limitations**

#### **Hard Disk Size and Type**

The size of your hard disk will be limited by your selection of Hard Disk Type. VMware allows you to select IDE or SCSI as your Hard Disk Type. The maximum hard disk space for a Virtual IDE drive is 128 gigabytes and 256 gigabytes for a Virtual SCSI drive.

#### **Memory**

Choose the amount of memory you will need for your virtual machine's best performance. However, you will not be able to select more memory than what your host machine has. VMware's virtual machine wizard will guide you in selecting the correct amount of memory for your machine.

#### **Virtual Disk Types**

There are two types of Virtual Disks. Fixed and Dynamic. Fixed sets aside a specific amount of space on the physical hard drive for that virtual drive. Dynamic grows to the size specified as more space is needed. For example, a fixed 100 gigabyte virtual disk will set aside a 100 gigabyte space on the physical drive for use by the virtual machine. A dynamic 100 gigabyte virtual disk may only be 2 gigabytes in size at first, but will grow to it's allocated size as more space is needed.

A rectangular graphic with a blue border. The background is a dark blue gradient with glowing, wavy lines in shades of yellow, orange, and red. The text "Section One" is centered in a large, white, sans-serif font.

# Section One

## **Getting Started** **The Target Machine**

---



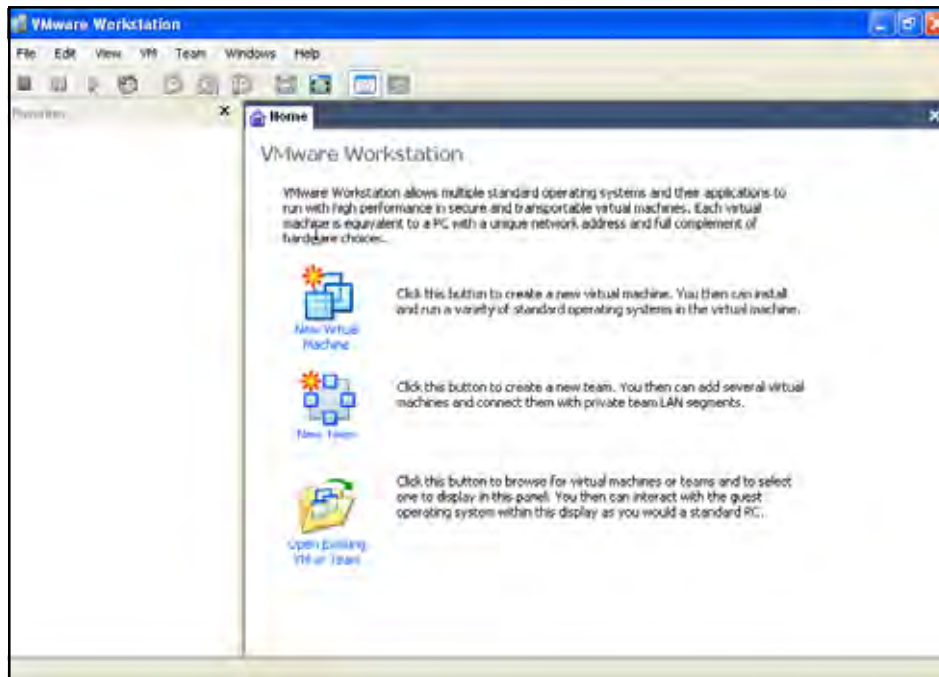
## Getting Started

### The Target (Virtual) Machine

The Portlock Boot CD will be used to boot your Target (virtual) machine. Portlock Storage Manager, which is included on the Portlock Boot CD will be used to restore the image of the Source (Physical) machine. The Portlock Boot CD is available for download at [www.portlock.com](http://www.portlock.com) in the form of an ISO image.

After downloading the ISO image, you may choose to burn the image to a CD-ROM using a CD burning software such as Roxio or Nero. You can also use the ISO directly from a location on your Host machine, such as the Desktop.

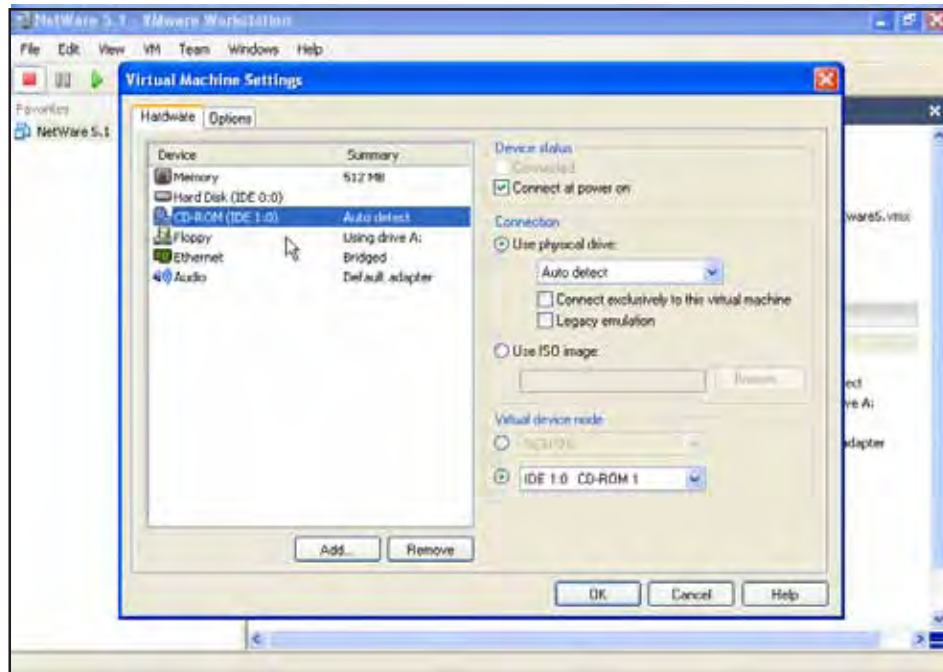
You may find it more convenient to use the ISO image directly. This way you don't have to remove the CD from the drive if you need the CD-ROM for another application.



Next, if you have not already done so, you will need to create a New Virtual Machine in VMware. To do this, open VMware and at the home screen click new virtual machine. Follow the install wizard instructions to create your virtual machine with the guest operating system you wish to migrate.

After creating your new virtual machine, return to the VMware home screen again and select Edit Virtual Machine settings.

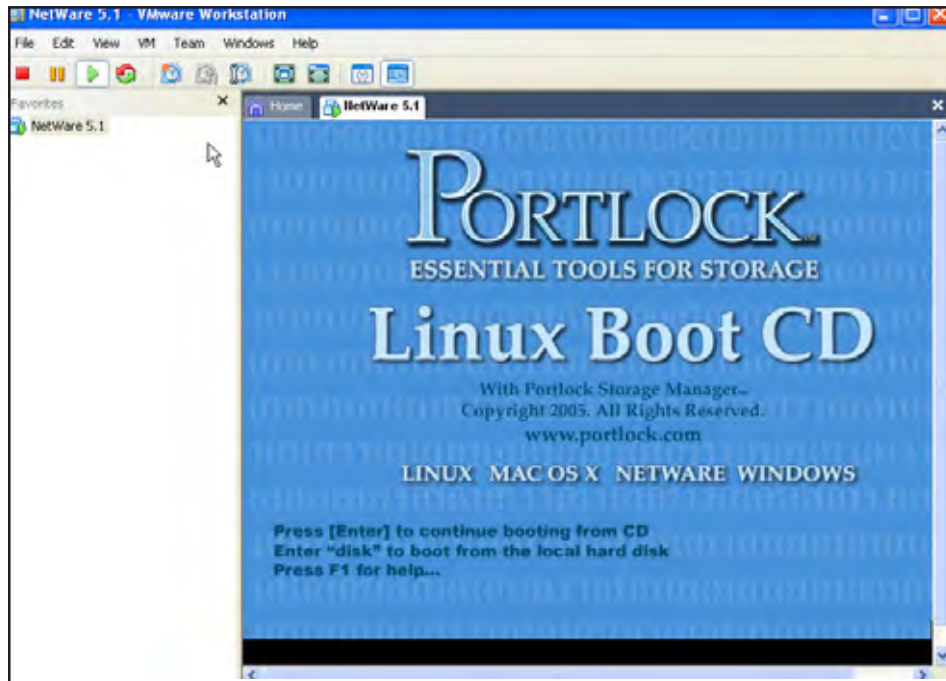




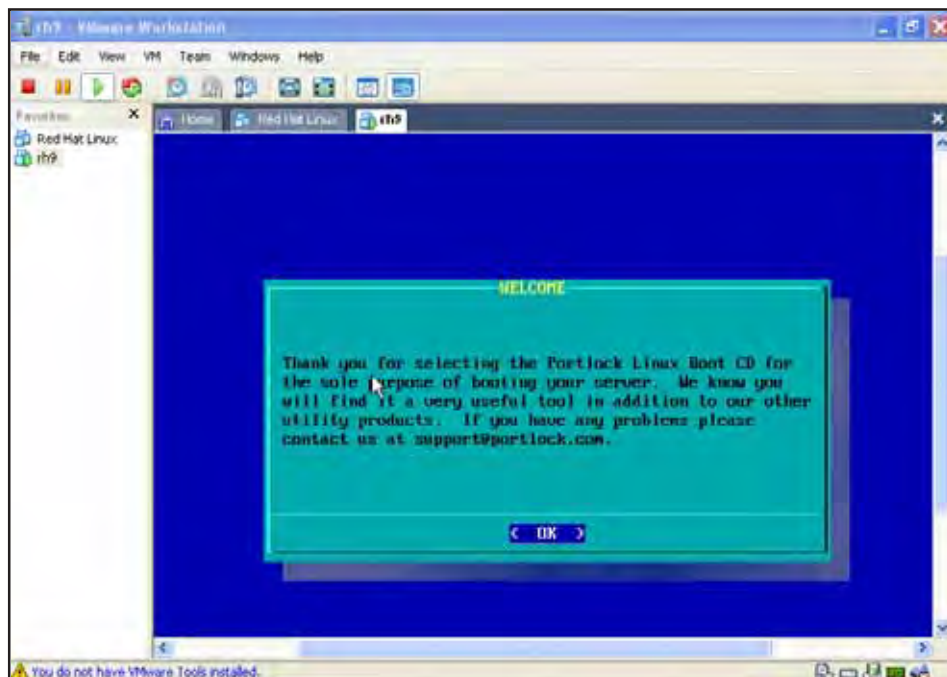
In the Connection menu of the Virtual Machine Settings window select the Portlock Boot CD. As discussed earlier, this may be on a physical CD-ROM or as an ISO image. Select physical drive and the CD-ROM if the Boot CD has burned to a CD or select Use ISO image if you are using the ISO image of the Portlock Boot CD. In the Use ISO image you will see an option to browse to the location of the ISO. Browse to the Portlock Boot CD ISO and click open to select the file.

## The Portlock Boot CD and Portlock Storage Manager All Operating Systems

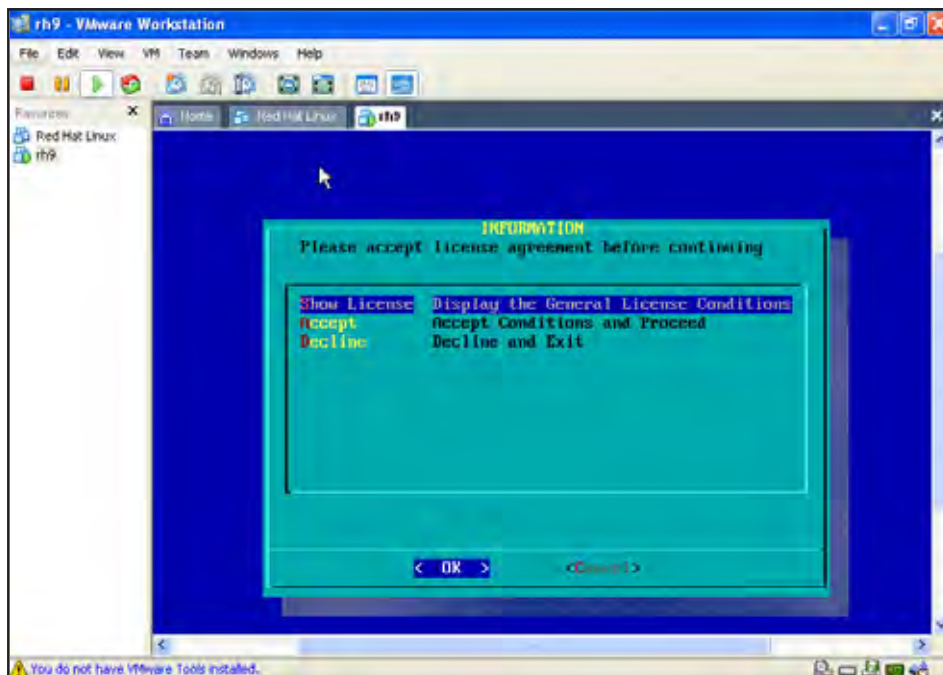
*The following steps for using the Portlock Boot CD and Portlock Storage Manager are very similar. Where there are differences from one operating system to another, this guide will make note of it.*



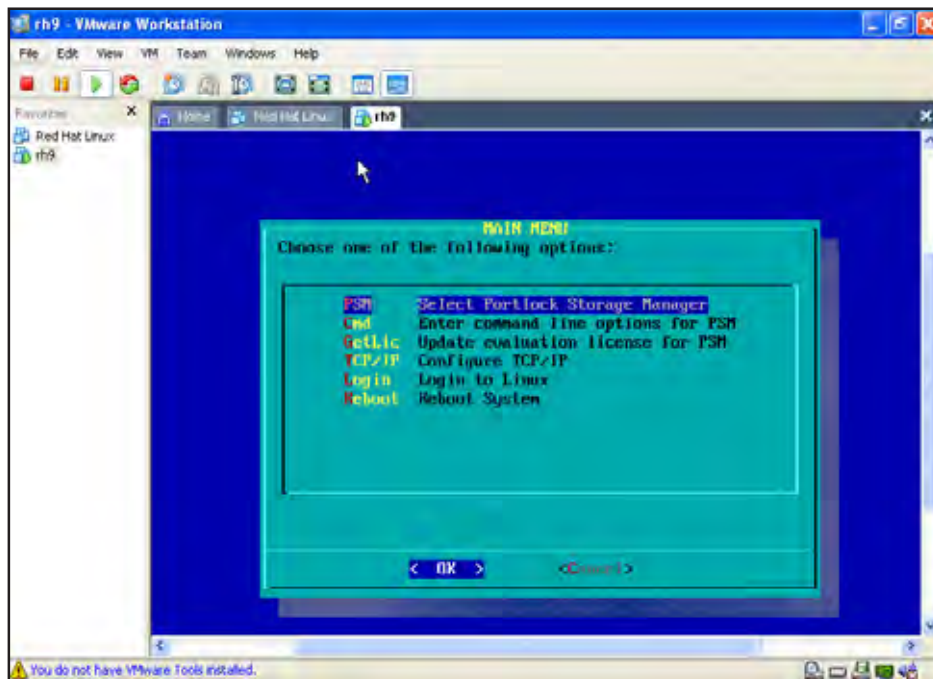
After selecting the Portlock Boot CD, start your virtual machine by clicking the Start Icon in VMware. The Portlock Boot CD will then boot your virtual machine. At Boot Start Up screen you will see a set of options. Press [Enter] to continue booting your virtual machine from the CD.



From the Boot Start Up screen, you will be prompted to the Welcome screen. The Portlock Boot CD contains preconfigured versions for Linux, Netware and Windows. For further information on the Portlock Boot CD, please refer to our website at [www.portlock.com](http://www.portlock.com). Press [Enter] to continue.



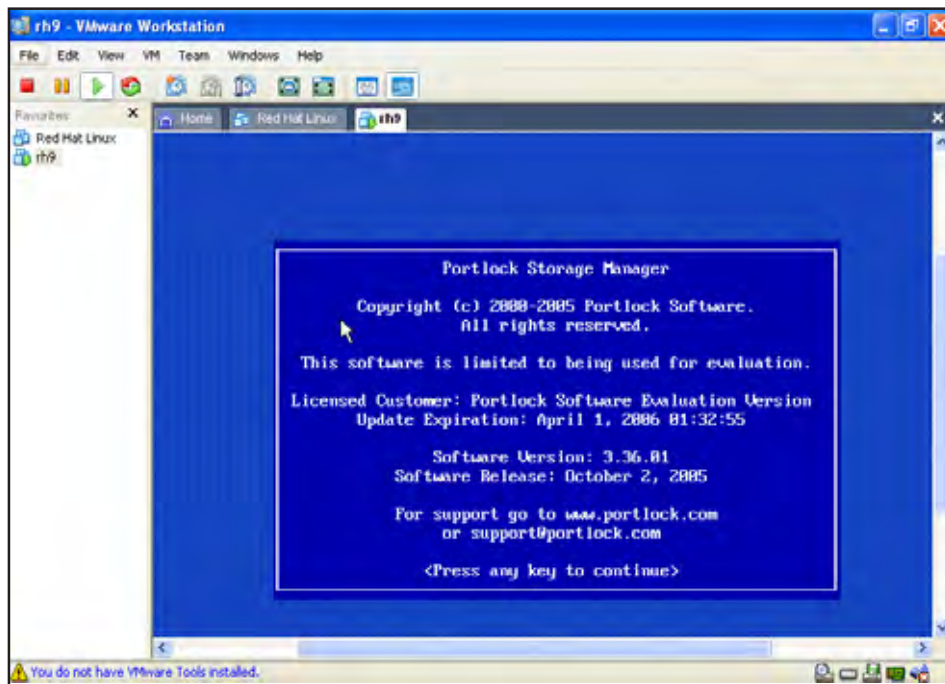
Before you continue, please read the license agreement and choose Accept Conditions if you choose to proceed. Our licenses are sold on a per server basis. If you do not agree to these conditions, please decline and exit.



After you have accepted the license conditions you will be prompted to the main menu of the Portlock Boot CD ISO. From here you may choose Select Portlock Storage Manager to continue through to the license installation.

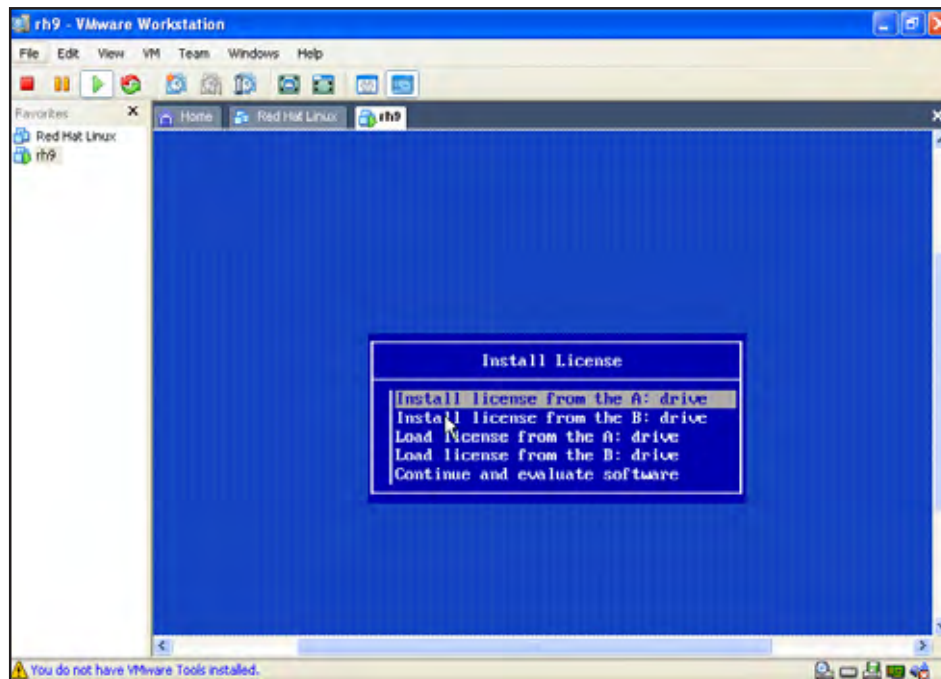
The other options on this menu will provide you with assistance you may need to set up your target machine.

Press [Enter] to continue.



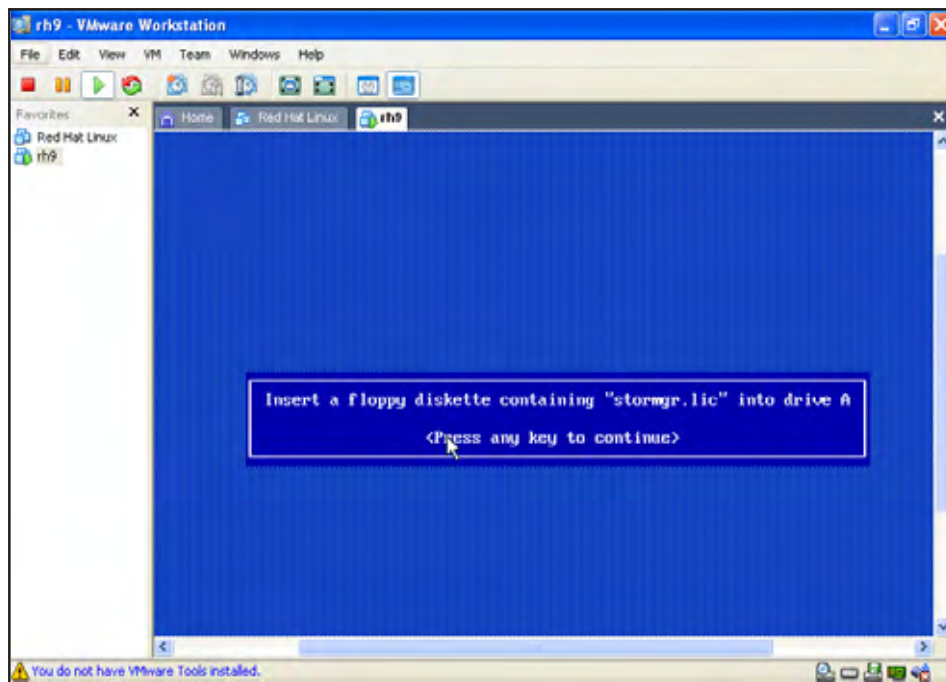
At this point you will be in evaluation mode of Portlock Storage Manager, until you install your server license. This screen will also provide you with the latest version and expiration date of Portlock Storage Manager.

Press any key to continue.

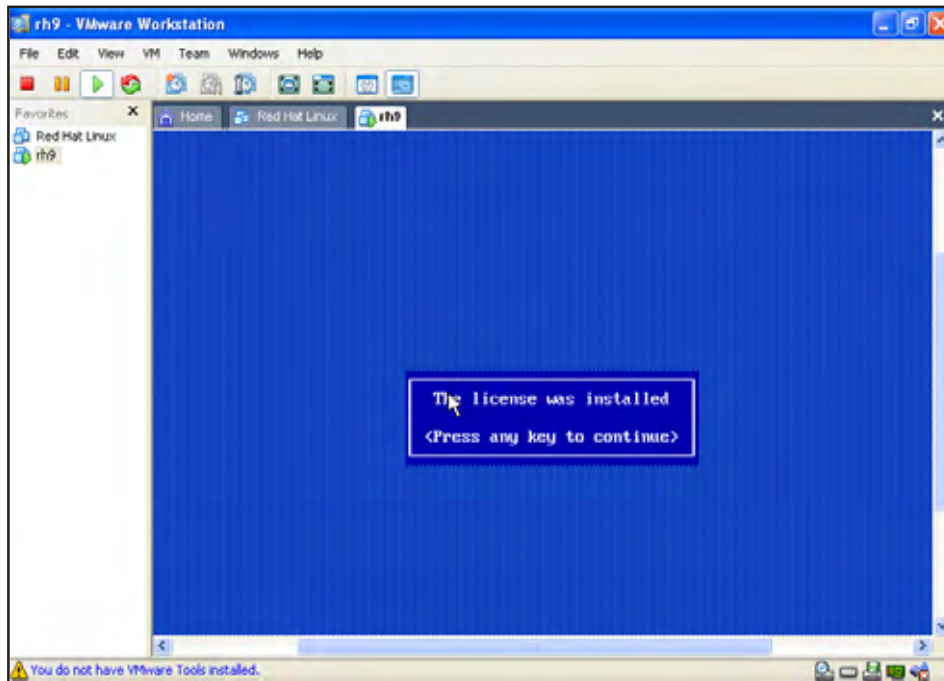


At this point choose the drive on which you will install your license or continue through to evaluation mode. If you choose to continue through evaluating the software, your restore will be limited to 1,000 MB.



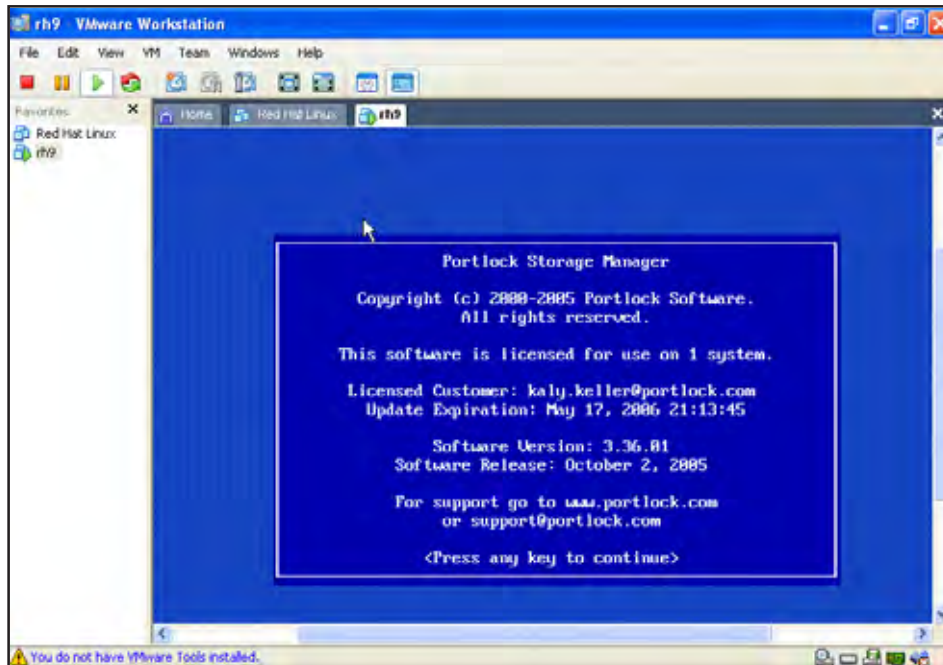


To install your license, copy the stormgr.lic to a floppy disk and insert it into your specified drive.

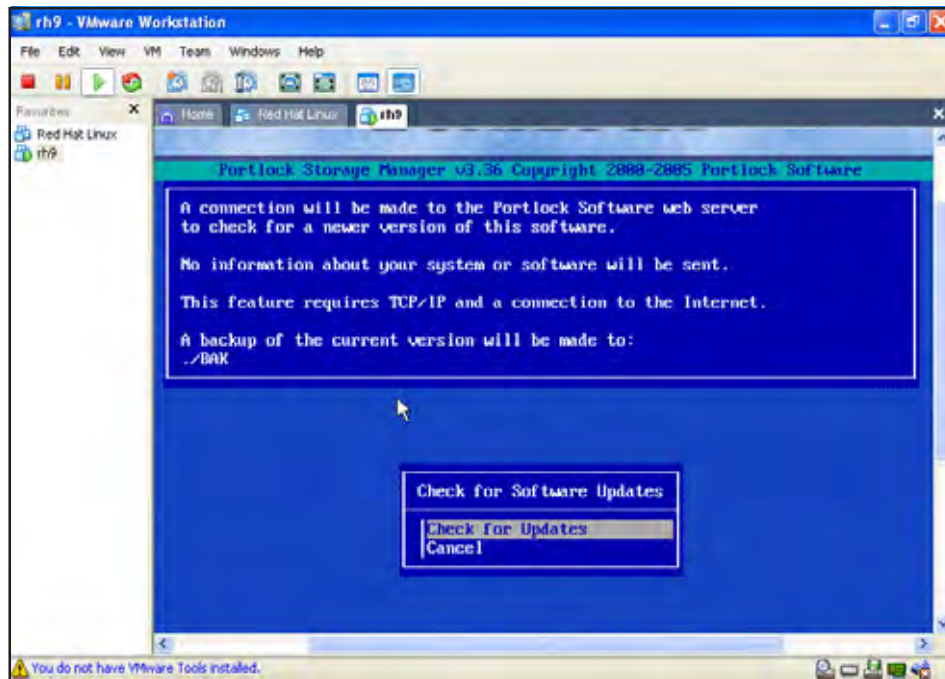


Once Portlock Storage Manager recognizes your issued license you will be prompted that your license was installed. If you receive any other message you may have an expired license and will need to update to a current version.

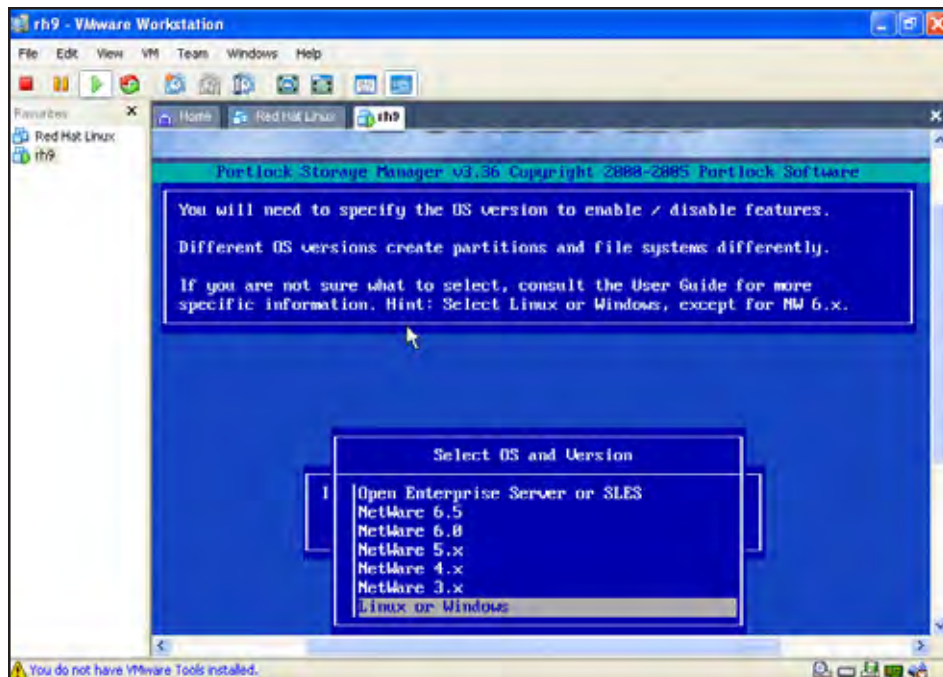
Press any key to continue.



Now that your license for Portlock Storage Manager is installed, you will no longer be operating in evaluation mode. You will no longer be limited 1,000 MB for any restore operations. Press any key to continue.



As different features are added and limitations fixed, there will be added versions to Portlock Storage Manager. An easy way to upgrade to the latest version, as long as your license has not expired, is to check for updates. This feature will upgrade you to the latest version without having to reinstall. If you already have the current version, choose cancel and press [Enter] to continue.



Before you begin, you will need to specify which operating system to enable. Different operating systems provide different file systems and different options. Select the OS you plan to migrate and press [Enter] to continue



A rectangular graphic with a blue border. The background is a dark blue gradient with glowing, wavy lines in shades of yellow, orange, and red, resembling a digital or data visualization. The text "Section Two" is centered in a large, white, sans-serif font.

# Section Two

## **Installing Portlock Storage Manager**

---



## Installing Portlock Storage Manager

### Portlock Storage Manager Install Methods

The required file(s) may be downloaded from the Portlock download site:  
<http://www.portlock.com/download.htm>.

1.) Remote installation of Portlock Storage Manager on NetWare using Portlock

Install. File(s): Portlock Storage Manager Windows-based Installer.

2.) Installation of Portlock Storage Manager natively on NetWare servers from a floppy diskette. File(s): Minimum files to run Portlock Storage Manager from a floppy. Unzip to a formatted floppy diskette.

3) Installation of Portlock Storage Manager natively on NetWare servers using NWConfig

or Pinstall methods. File(s): Download the zipped version NetWare-based Install. Unzip and execute NWConfig or Pinstall,

OR

Minimum files to run Portlock Storage Manager on a NetWare server. Create the directory SYS:/STORMGR. Unzip into this directory. No installation is required.

OR

Minimum install package for installation directly on a NetWare server. Create a temporary directory on your NetWare server and unzip these files into this directory.

NetWare 3.x & 4.x - run PINSTALL.NLM to install.

NetWare 5.x & 6.x - run NWCONFIG.NLM to install.

## Setting up Portlock Install on Your Windows Machine

Portlock Install is a Windows-based program that will remotely install Portlock Storage

Manager on a NetWare server. You must install the program on your Windows desktop or server before you can perform remote installations.

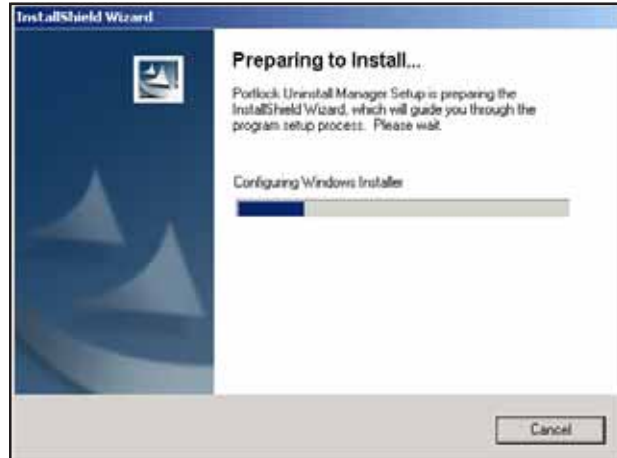
All of the files necessary to perform remote installations of Portlock Storage Manager

will be installed. Several programs, including Portlock Install, Portlock Remote, and

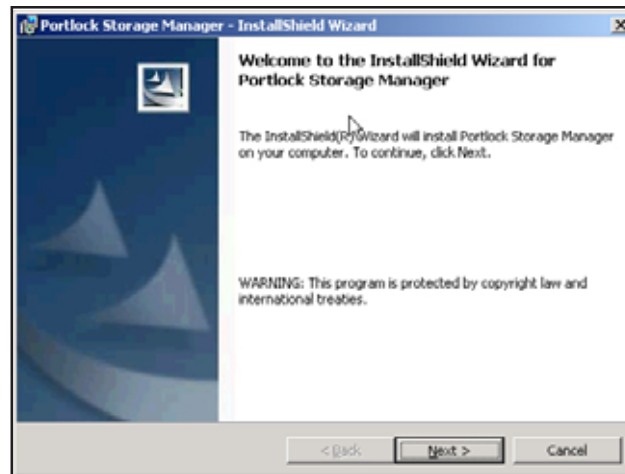
Portlock Check For Updates, plus users guides, web access URLs, and support files

will also be installed.

To begin the installation, download the Portlock Storage Manager Windows-based Installer (setup.exe). Run Setup.exe.

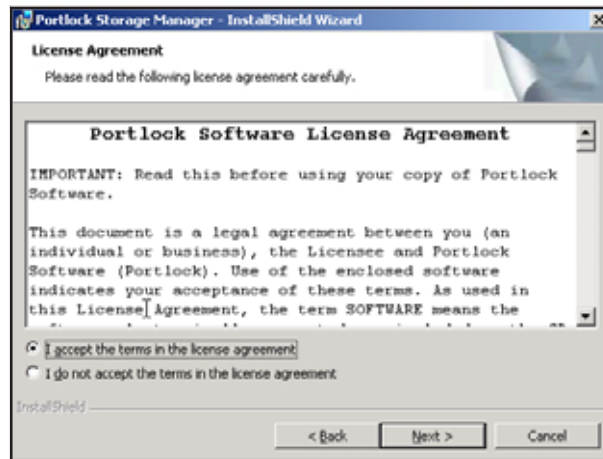


The Portlock Uninstall Manager Wizard welcome screen will appear. Press the Next button to continue with the uninstall. The Portlock Storage Manager Install Shield Wizard will start by configuring the Windows installer. The wizard will install Portlock Uninstall Manager on your Windows computer. To continue, click **Next**.

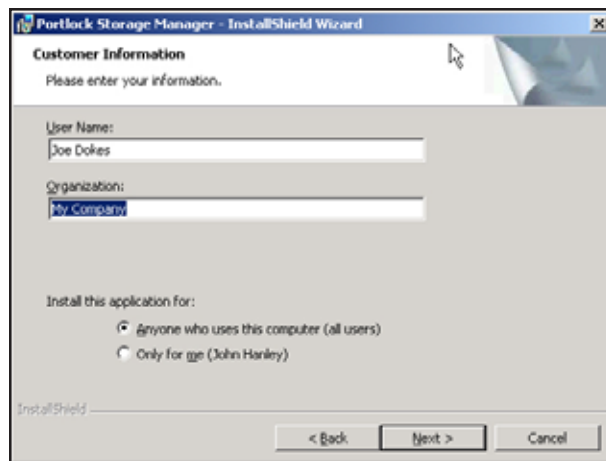


When the installation of Portlock Uninstall Manager has completed, click **Finish** to continue.

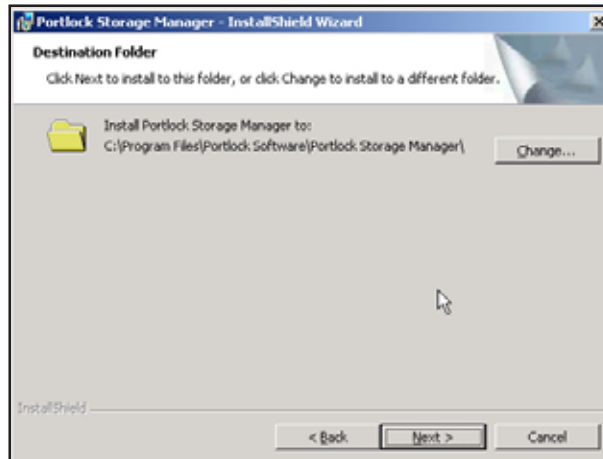
The Portlock Storage Manager Install Shield Wizard opening screen will appear. Press the **Next** button to continue.



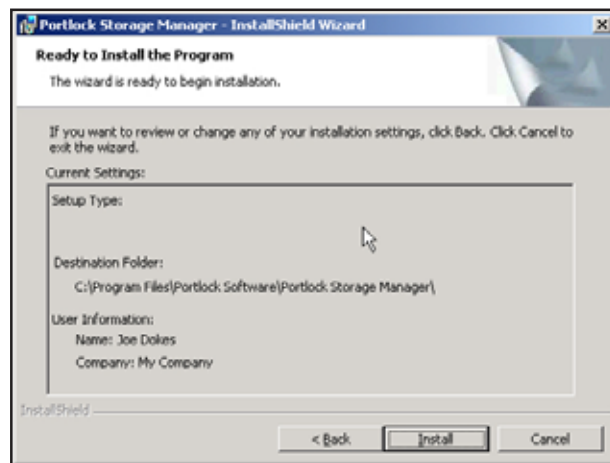
At this point, read the Portlock Software License Agreement carefully and once finished, if you accept the terms of the license agreement, click I accept and then click **Next**.



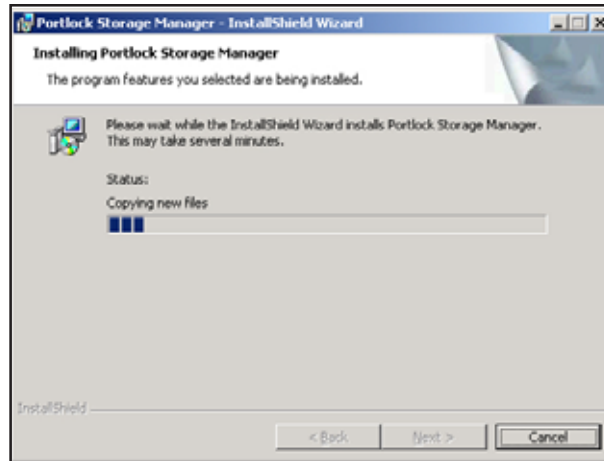
You will now be prompted to enter in your User Name and Organization. You also will be asked whether you wish to install this application for **Anyone who uses this computer (all users)** or **Only for me**. Press the Next button to continue.



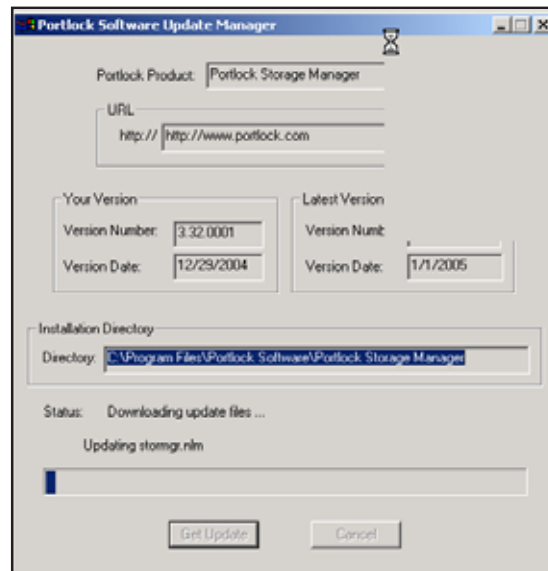
At this screen, select the destination where you wish to Install Portlock Storage Manager. Click Next to install to the folder listed, or click Change to install to a different folder.



If you want to review or change any installation settings, click Back. Click Cancel to exit the wizard. Click Install to complete the installation. Your progress will be visible.



When complete, the successful installation panel will display. Click Finish to exit the installer.



If a newer version of Portlock Storage Manager is available, a screen will appear prompting to upgrade to the latest version of Portlock Storage Manager. Click Yes to upgrade to the latest version. Click **Get Update** button to continue upgrade process.

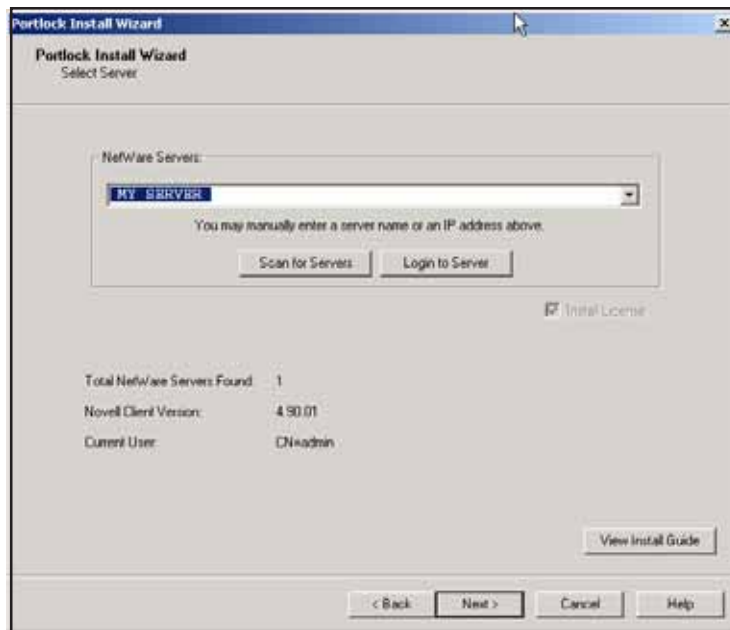
## Using Portlock Storage Manager Installer for NetWare

The Portlock Server Installation Wizard will install Portlock Storage Manager to Novell NetWare servers. You will select a NetWare server, log-in, and the required product files will be copied to the NetWare server.



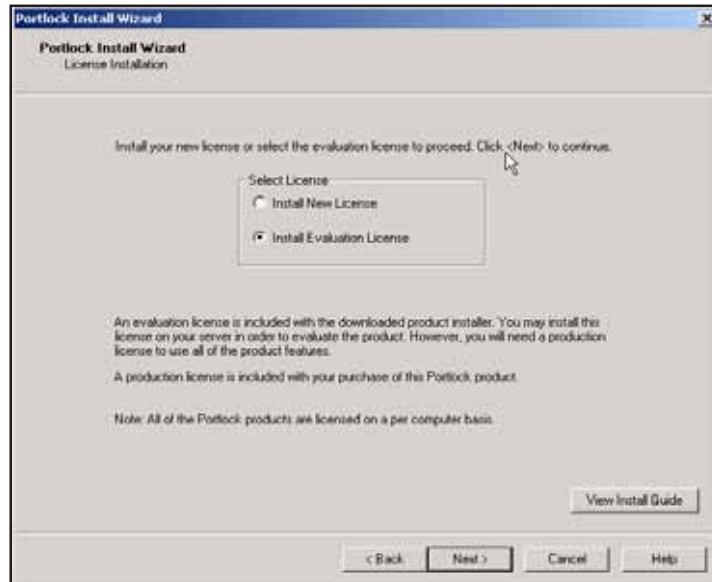
To begin the installation, press **Next**.



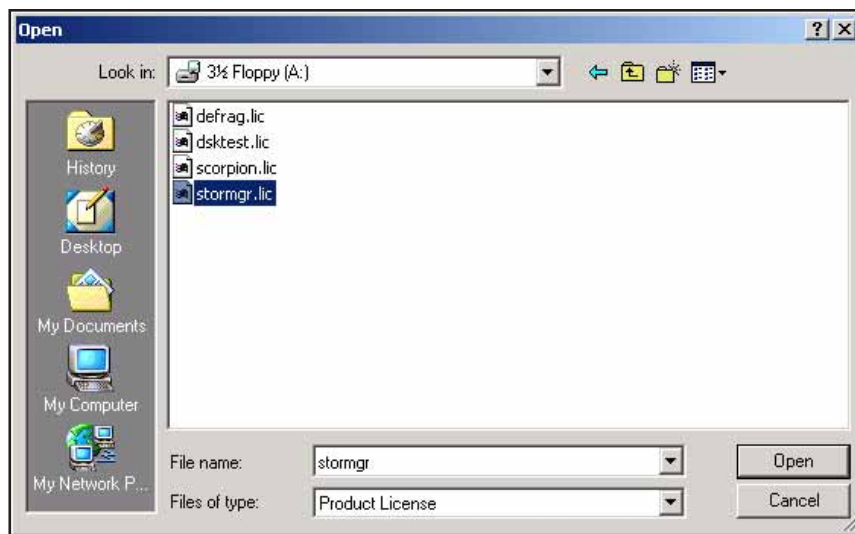


At this point, press the **Scan for Servers** button to locate the target NetWare server. When you click the **Scan for Servers** button, your computer will perform a scan for all available NetWare servers that can be detected. If the server you wish to install the software is not detected, enter the server name or IP address manually into the dialog box.

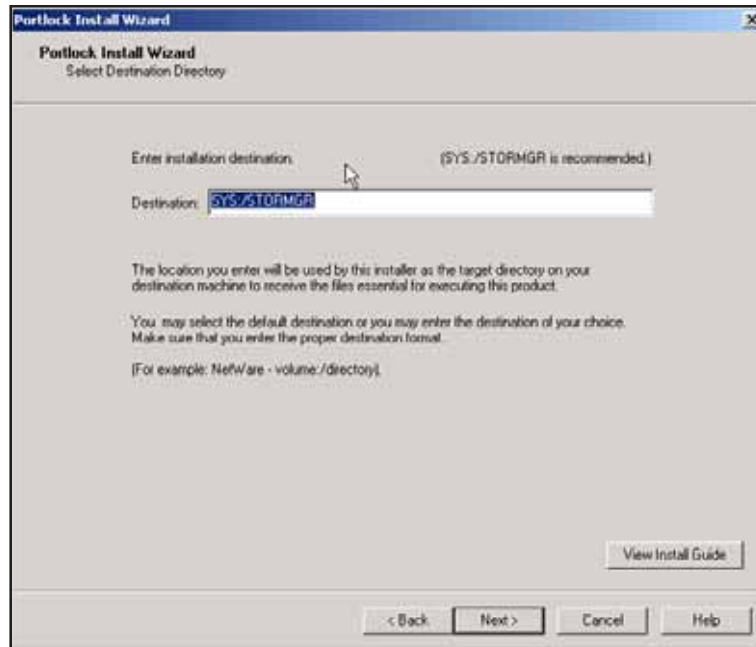
If your server still cannot be detected after entering the server name or IP address, check to see if the server is available on the network.



You may select a production license for your installation or simply continue with the evaluation license. Select the license type and click **Next** to continue. You will then be asked to locate the .lic file.



This screen shows the Portlock Storage Manager license (**stormgr.lic**) file selected.

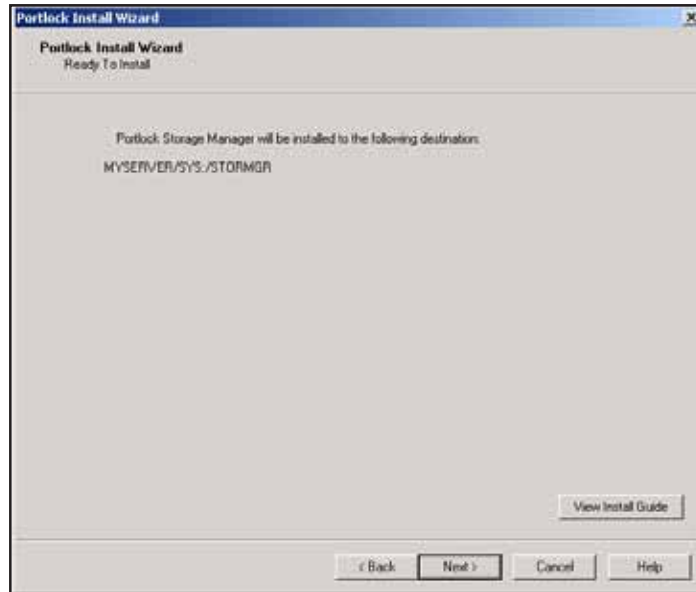


The default destination on the server you selected previously is the SYS volume in a subdirectory called STORMGR. After installation on the server is complete, you will be able to load Portlock Storage Manager by typing the following command at the destination server console prompt:

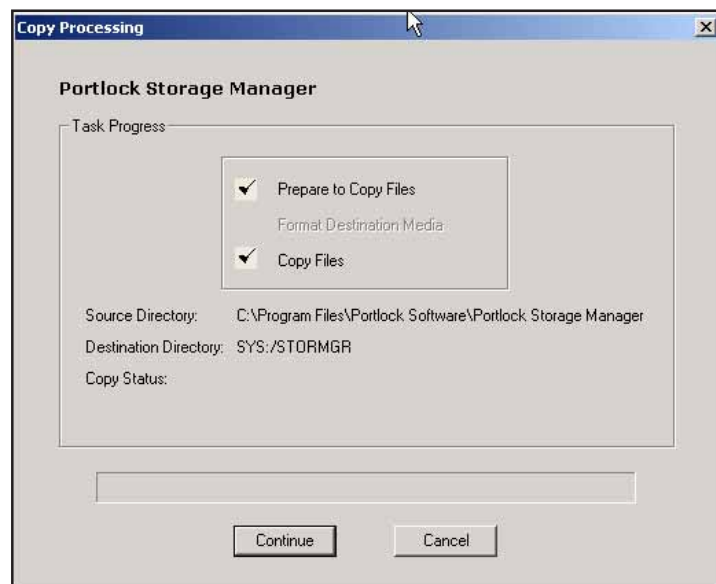
LOAD SYS:STORMGR\STORMGR to load Portlock Storage Manager.

To choose another destination volume such as: VOL1:, use the following syntax under an install directory: VOL1:STORMGR\STORMGR. This would change the LOAD command syntax to:

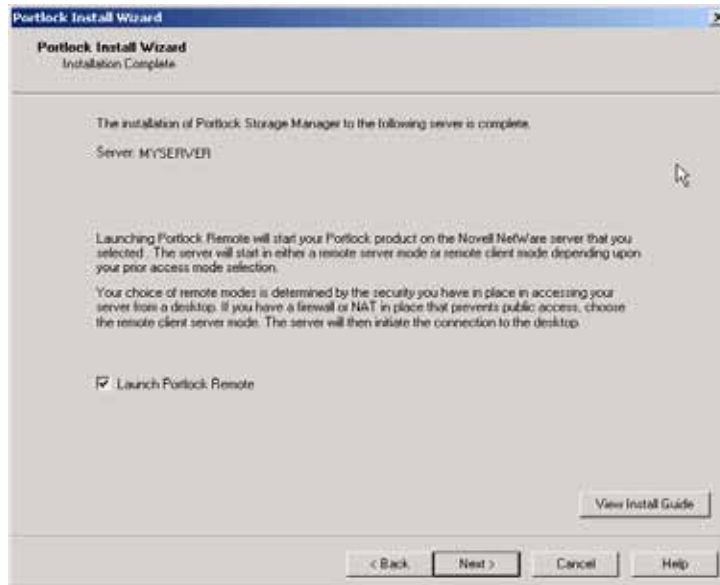
LOAD VOL1:\STORMGR\STORMGR.



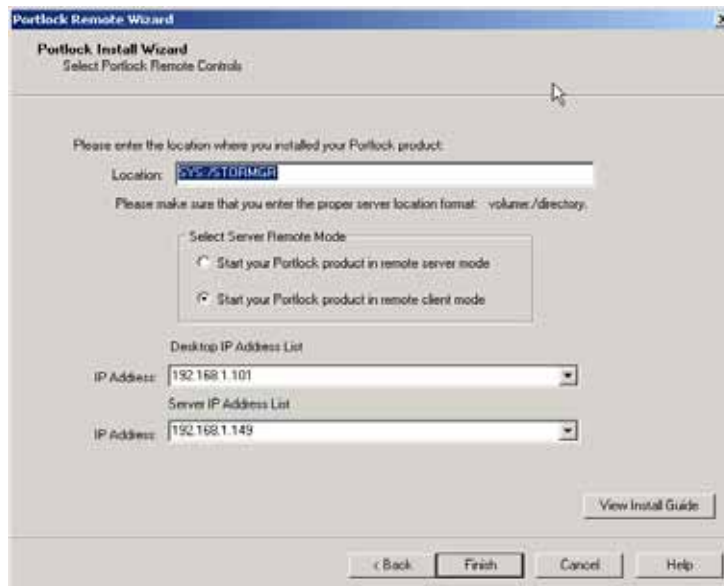
At this point, Portlock Storage Manager is ready to be installed. Press the **Back** button to return to the previous screen or the **Next** button to begin the install.



Press the Continue button to complete the installation. When done, press the Done button.



The new installation is now complete. Launch a remote access session by checking the Launch Portlock Remote box and pressing Next.



This screen will prompt you for which server mode to launch. Select the mode based on your prior server access mode selection. Click the **Finish** button.

## Quick Installation of Portlock Storage Manager on Novell Open Enterprise Server

1. Start a bash shell at the NetWare server console. Type "bash" at the server prompt.
2. Create a directory to store the Portlock Storage Manager files. Type "mkdir sys:/ stormgr" at the bash prompt.
3. Switch directories to sys:/stormgr. Type "cd /stormgr" at the bash prompt.
4. Download Portlock Storage Manager: Type "wget www.portlock.com/ filename.zip" at the bash prompt.
5. Unzip the files. Type "unzip filename.zip" at the bash prompt.
6. Copy your purchased license (optional). Insert a floppy diskette with your license.  
Type "copy a:stormgr.lic stormgr.lic".
7. Exit the bash shell. Type "exit" at the bash prompt.
8. Start Portlock Storage Manager. Type "sys:/stormgr/stormgr" at the server prompt.



A rectangular graphic with a blue border containing the text 'Section Three'. The background is a dark blue field with glowing, wavy lines in shades of yellow, orange, and red, resembling a digital or data visualization.

# Section Three

## **Creating the Image: Source Machine**

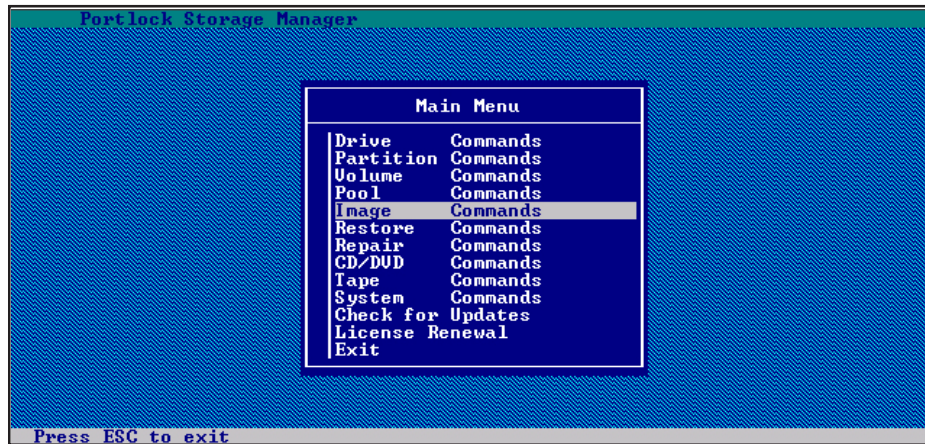
---



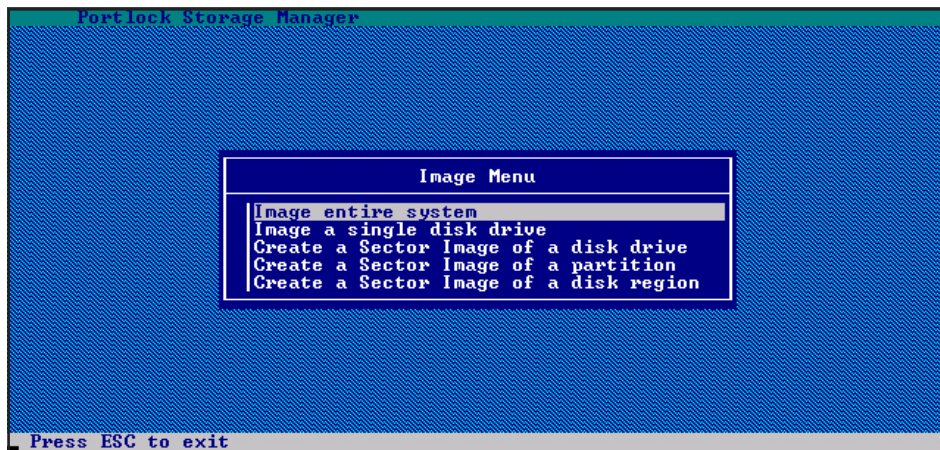
## Creating the Image

### Source Machine - All Operating Systems

After installing Portlock Storage Manager on the source machine you are planning to migrate, load Portlock Storage Manager. At the Main Menu you will see several options.

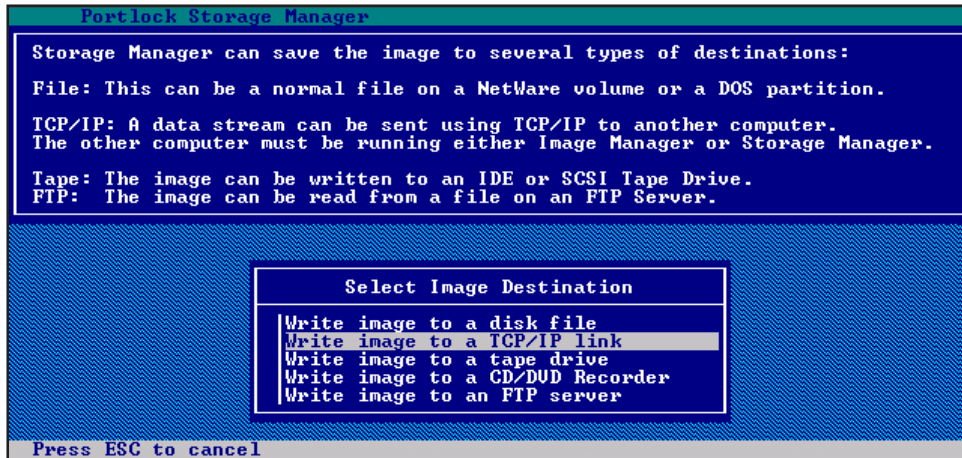


At the **Main Menu**, select **Image Commands** by highlighting it and pressing [ENTER] to continue.

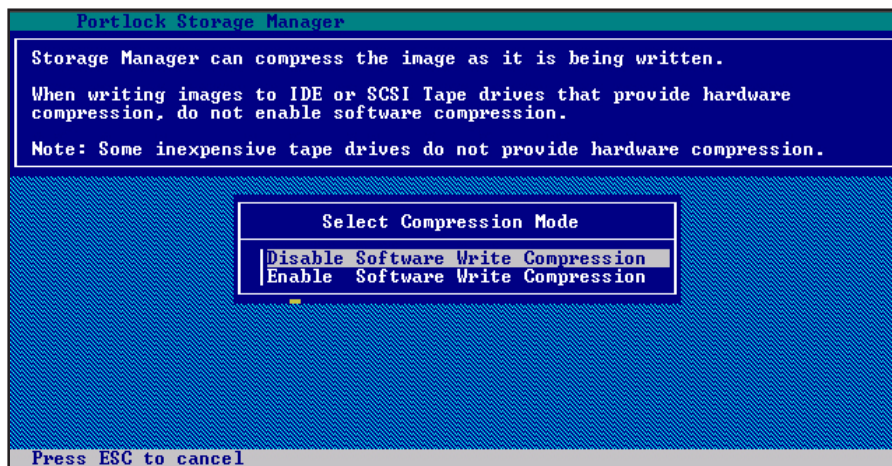


From the **Image Menu**, you have several options: 1. Image Entire System 2. Image a single disk drive 3. Create a sector image of a disk drive 4. Create a sector image of a partition 5. Create a sector image of a disk region

Select **Image Entire System** by highlighting it and press [ENTER] to continue.



From the **Select Image Destination** menu, you can choose to write an image to a disk file, to a TCP/IP link, a tape drive, CD/DVD recorder, or to an FTP server. In this exercise we will select the second option, **Write Image to a TCP/IP link**. Press [Enter] to continue.



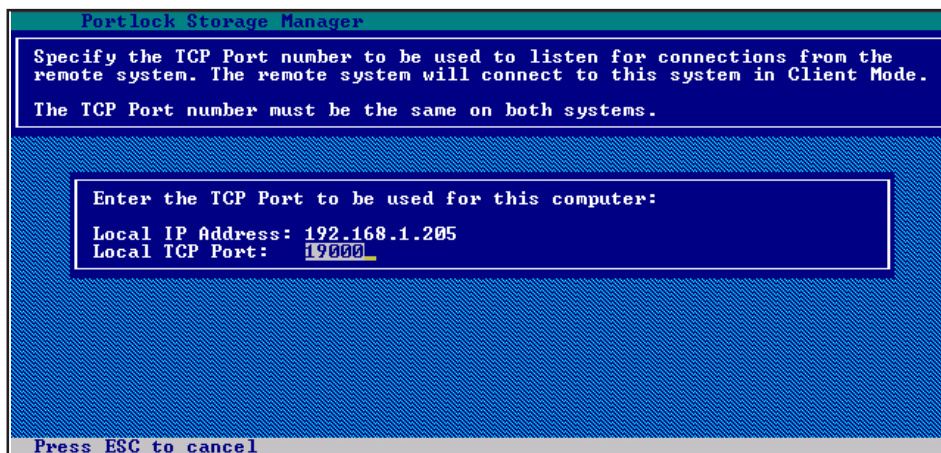
Portlock Storage Manager can compress the image as it is being written. From the **Compression Mode** menu, select whether to **Disable** or **Enable** software write compression and press [Enter] to continue.

For our example, **Disable Software Write Compression** has been chosen.



When writing an image via TCP/IP, one side needs to be in server mode, and the other side needs to be in client mode. We will select the source machine as for server mode. When a computer is selected in server mode, that computer will listen for a connection or call from the computer in client mode.

When the client computer connects via the TCP/IP link, the server computer will begin to send the image to the client.



Specify the IP address and the TCP Port number to be used to listen for connections from the remote system. The remote system will connect to this system in Client Mode. The TCP Port number must be the same on both systems.



A rectangular graphic with a blue border. The background is a dark blue gradient with glowing, wavy lines in shades of purple, pink, and yellow. The text "Section Four" is centered in a large, white, sans-serif font.

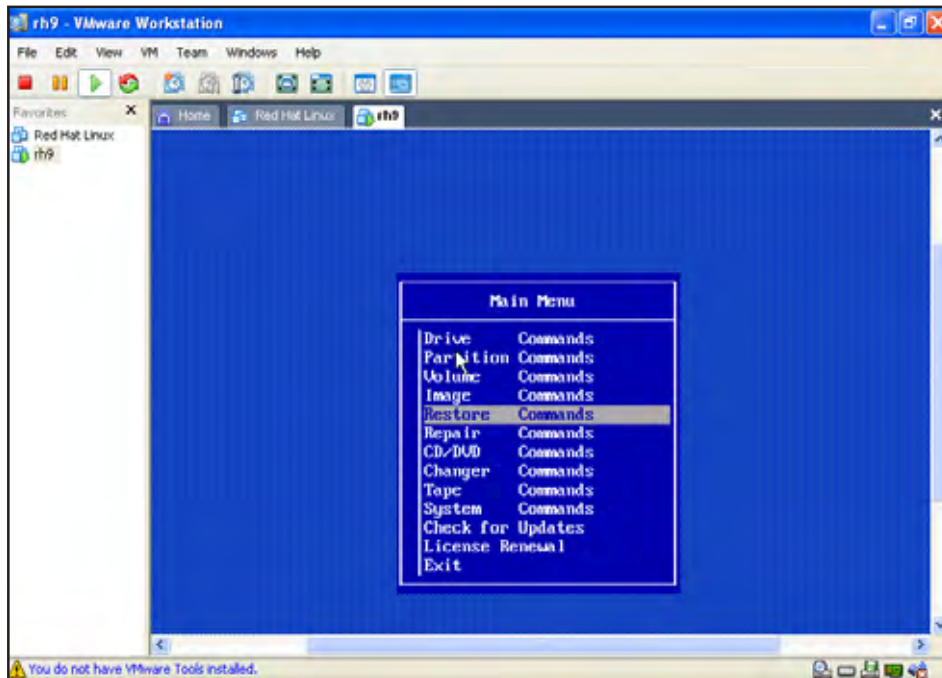
# Section Four

## **Migrating the Image: Source to Target**

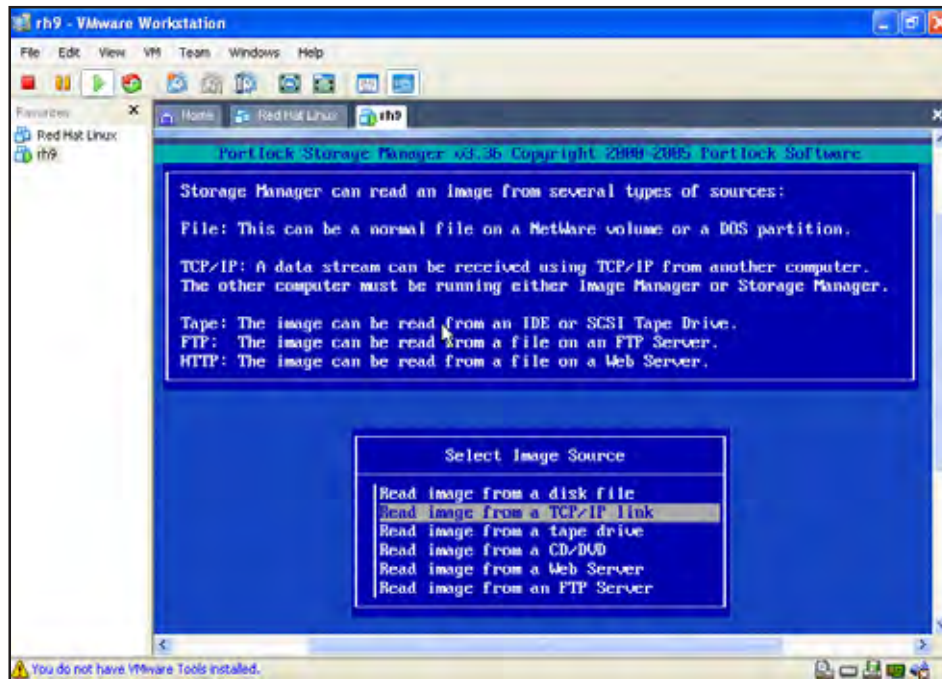
---



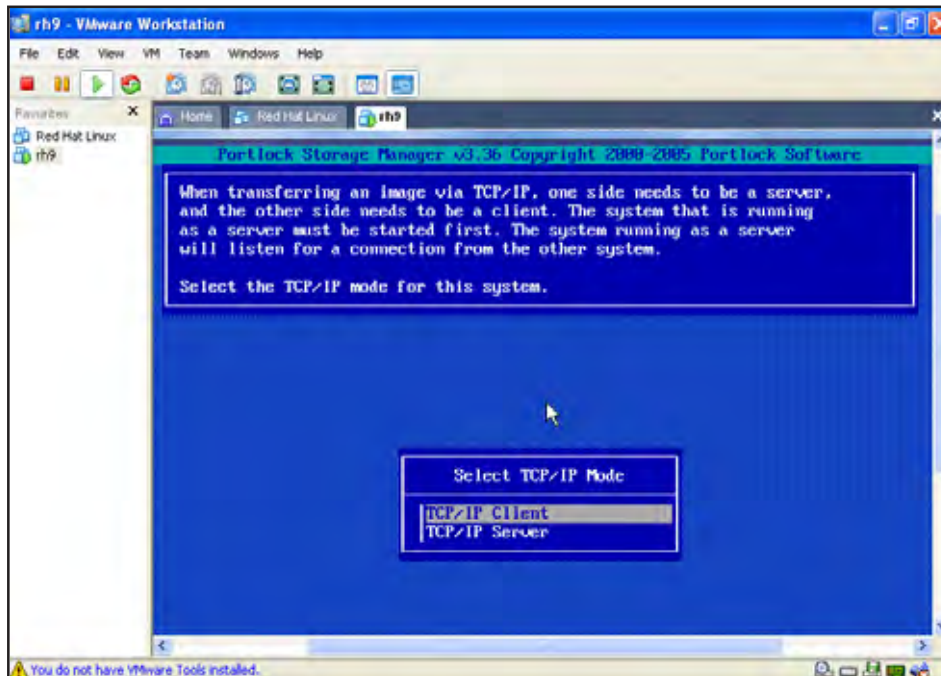
## Migrating the Image: Source to Target All Operating Systems



Once inside the Main Menu, you will have a list of commands to choose from. This list provides you with many options that make managing your server a simplified process. For the purposes of this manual, we will choose the restore commands. Press [Enter] to select option and continue.



Inside of the restore commands you will find several different options to restore your image. Because we are restoring directly from the source machine, we have chose to read the image from TCP/IP link. TCP/IP will connect you directly between the source and target machine. This will provide you with the fastest migration time. Press [Enter] to continue.

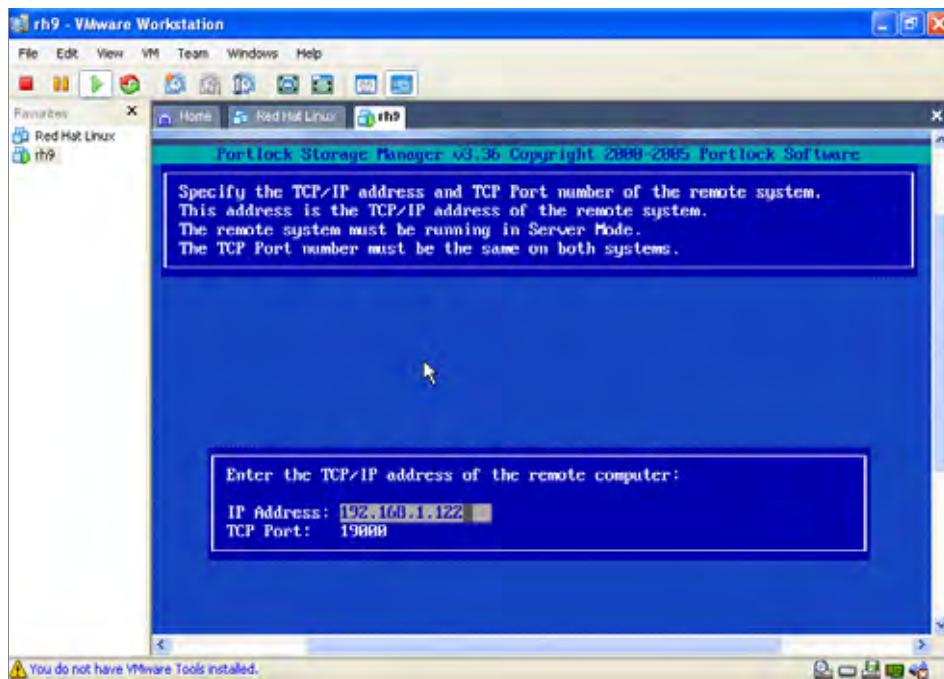


When choosing TCP/IP you will need to setup your source machine as the server and the target machine as the client. This will provide you with a direct connection between the two machines.

Be sure when setting up your TCP/IP connection that you start your server mode first. The server will then wait for a connection from the target machine.

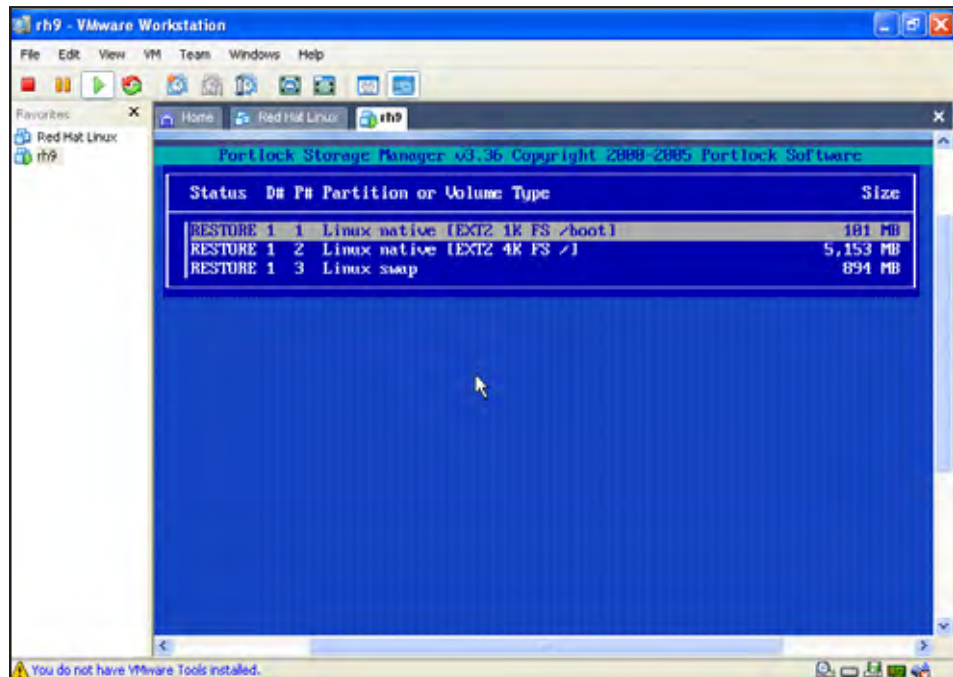
Press [Enter] to continue.



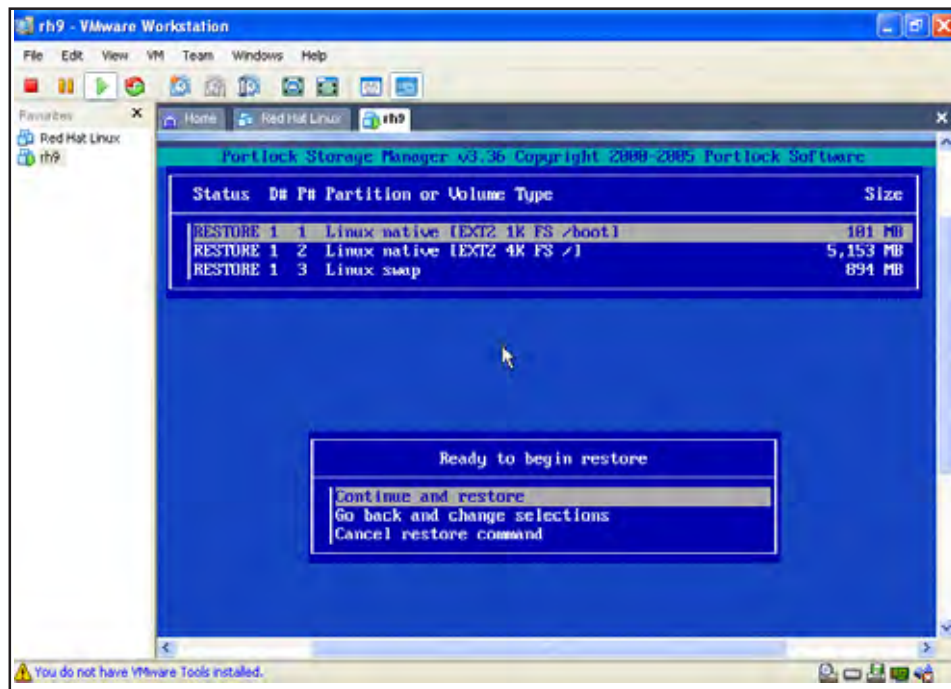


Inside of the client mode you will need to enter the appropriate IP address and TCP Port of that of the source machine, once entered correctly press [F10] to connect to your source machine, if you entered the correct IP address and TCP Port you will be able to see your imaged partitions which you plan to restore. Press [F10] to continue.

## Restoring the Image to the Target Machine Linux

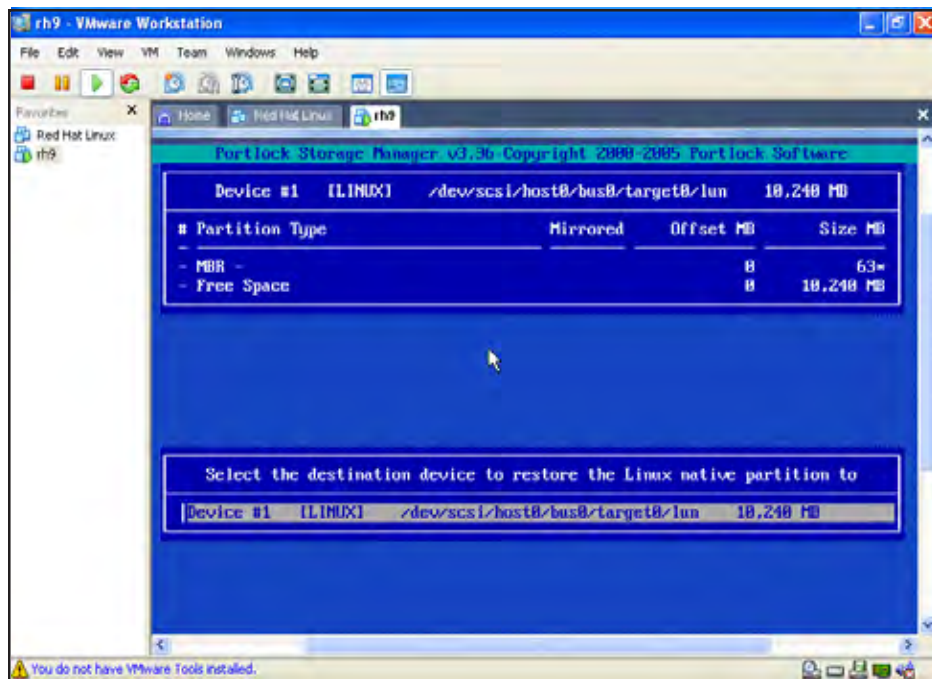


When restoring your image you are given the option to skip multiple partitions with [F5]. By skipping a partition you can restore a single partition to a different location. This is useful if you wish to have a backup of a specific partition. For this example we are restoring the entire image from the source machine. Press [Enter] to continue.

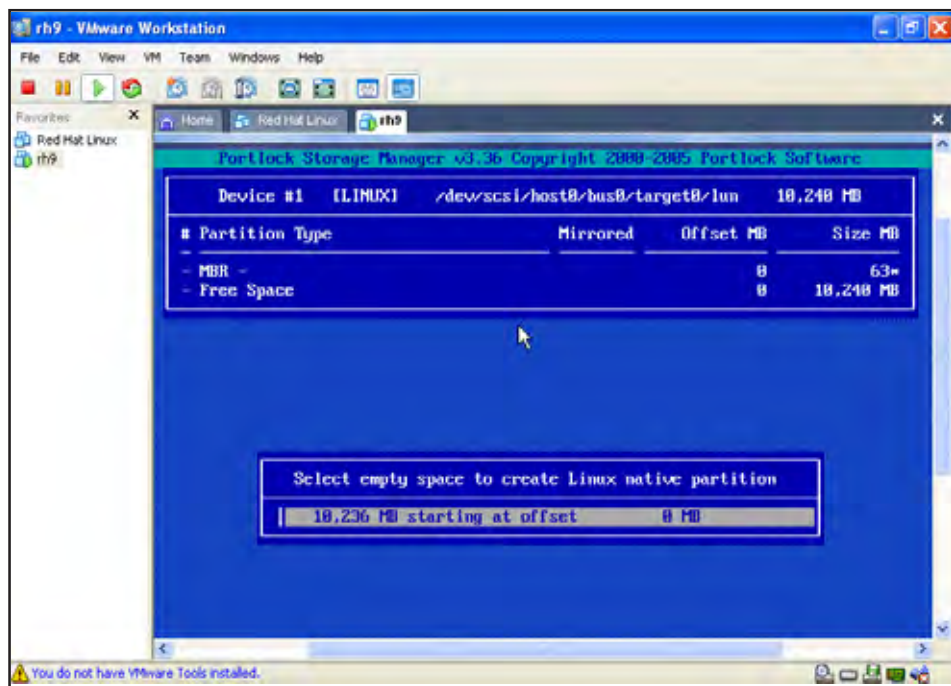


By selecting continue and restore you are beginning to the restore process. If you are unsure about any of your partitions, you should go back and change your selections, or cancel the restore command at this time.

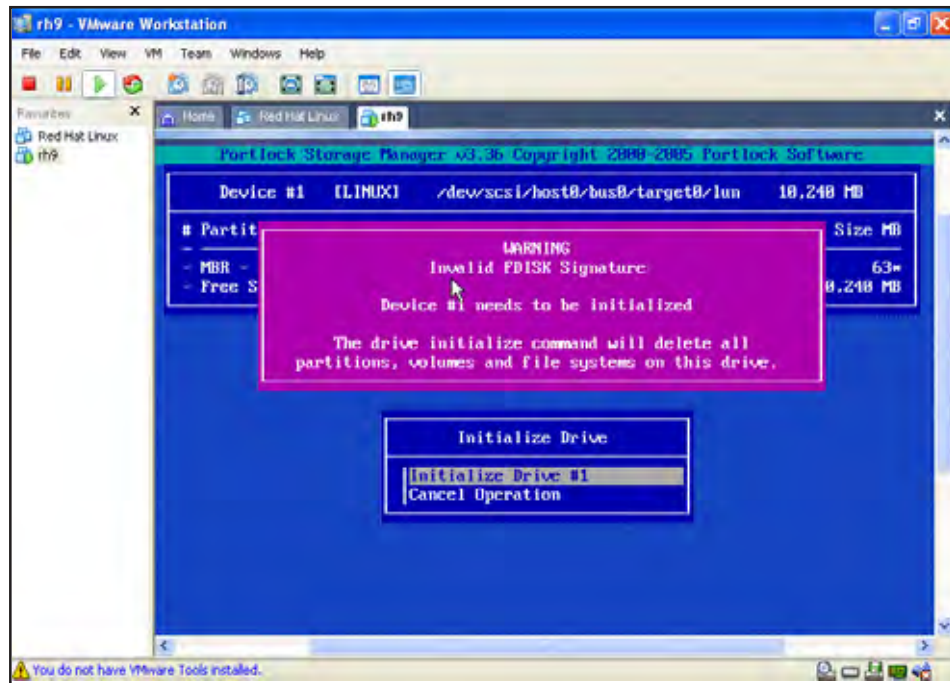
Press [Enter] to continue



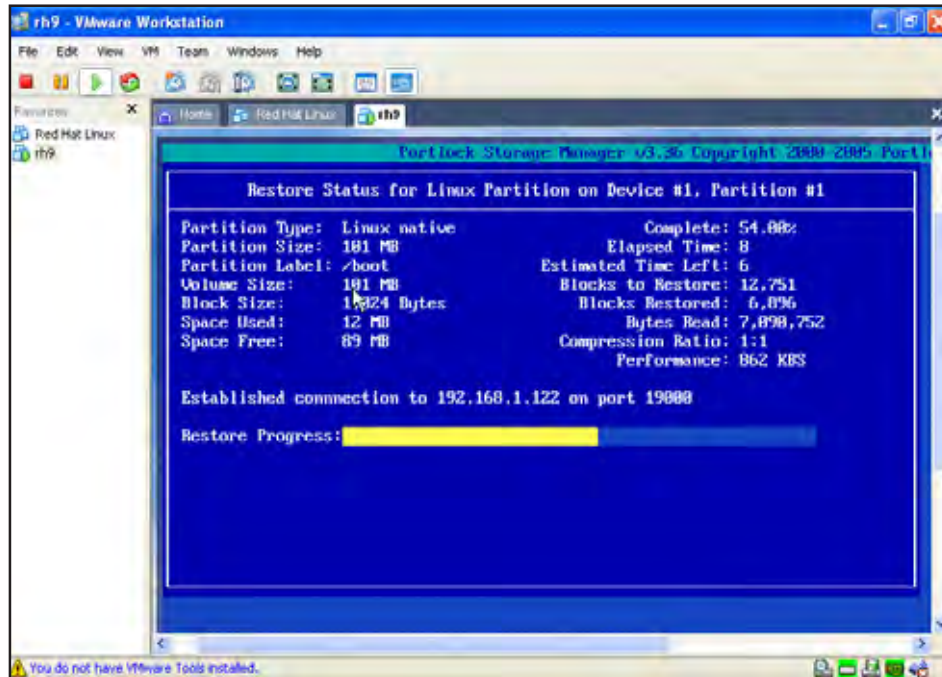
If you have more than one device to choose from on your target machine, choose the device you wish to restore your image to. You will need to make sure that your device has enough room to store your image on. If you need to, you can store your image on multiple devices.  
Press [Enter] to continue.



You can now select the empty space that you wish to store your image. If there is not enough space to store your image you will need a second device to store the additional partitions. Press [Enter] to continue.

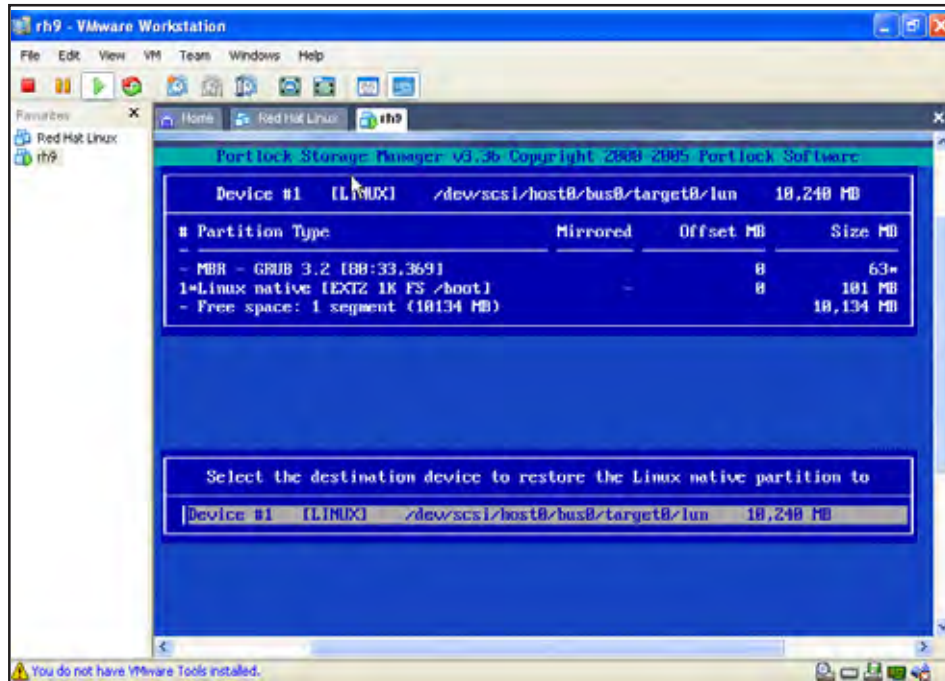


Once you have selected the empty space to create your Linux partition you will be asked to initialize your device you are restoring to. This will delete all partitions and file systems on the drive ensuring there is no data currently on this device. After selecting to initialize, skip the phase to write all new sectors. Press [Enter] to continue.



The first partition that will restore from your source machine is the boot partition. This will only take a short moment as the boot partition is normally very small. Once restored you will be able to see your boot partition in the device that had chosen for your partition.



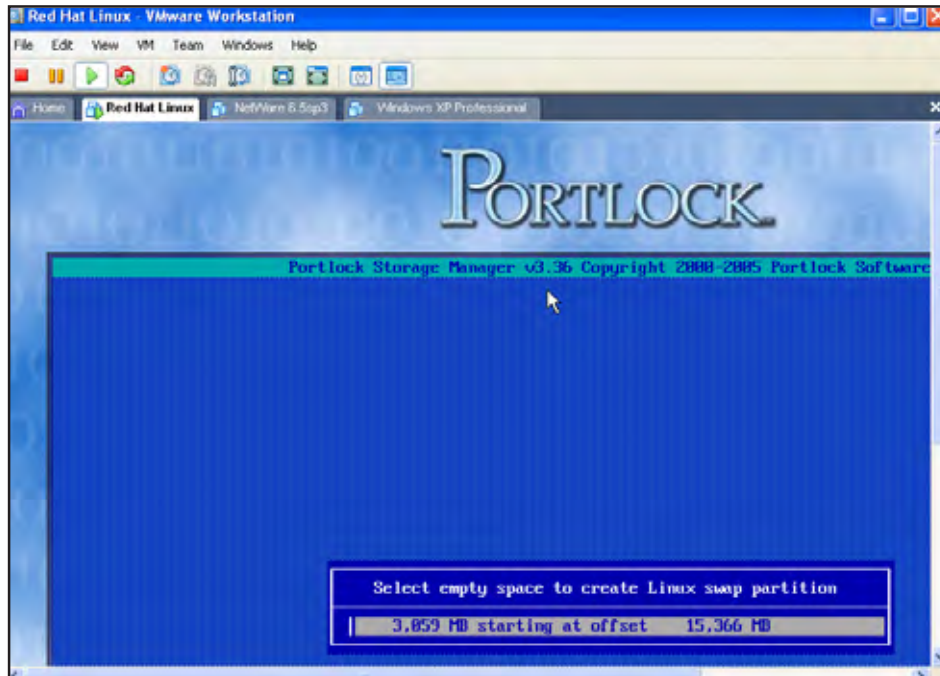


At this point you will select the next device in which to store your second partition.  
 A drive holds up to four primary partitions, so you can restore to the same device as your boot partition, as long as there is enough space.  
 If not you will need a second device.  
 Press [Enter] to continue

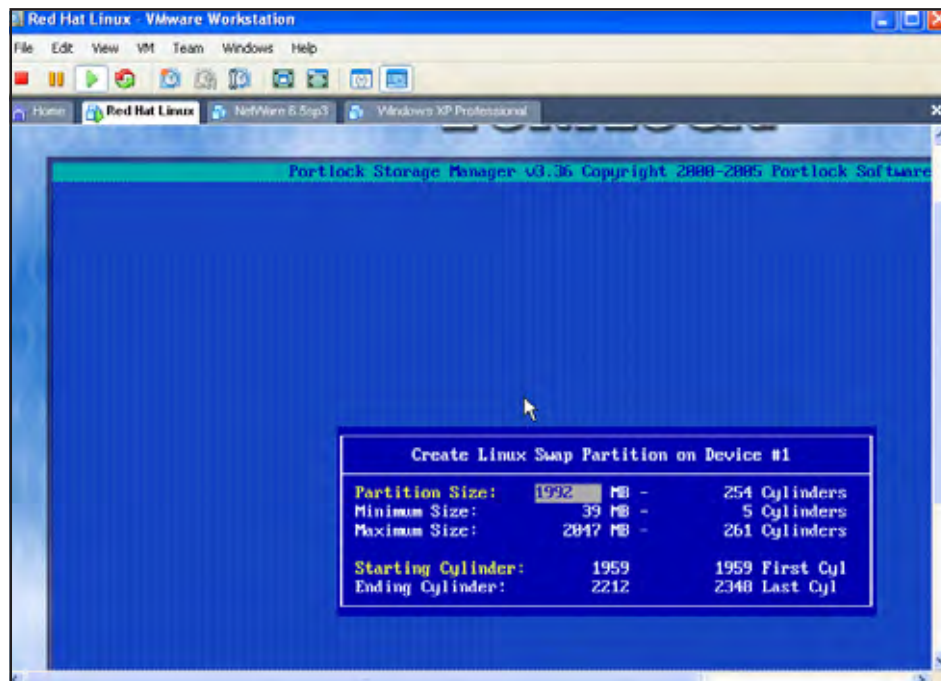




The root partition is typically a very large partition that holds a lot of information. For this reason, the restore of this partition may take several minutes depending on the size.

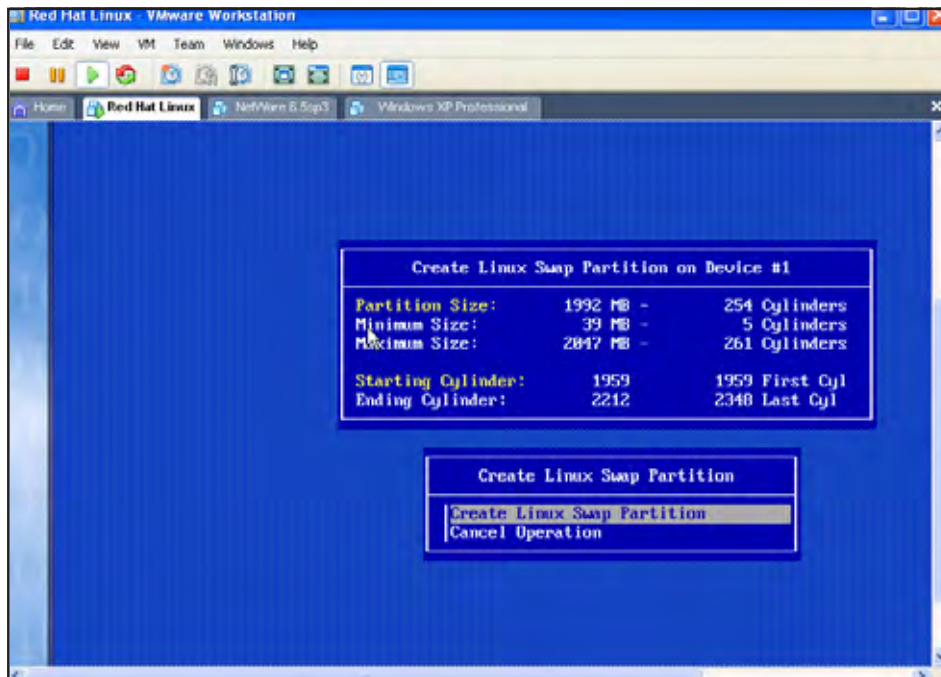


From the creation of your Linux swap partition you have the capability to resize with the limitation of a minimum and maximum size. Once you have decided on a size for your swap partition press [F10] to continue.

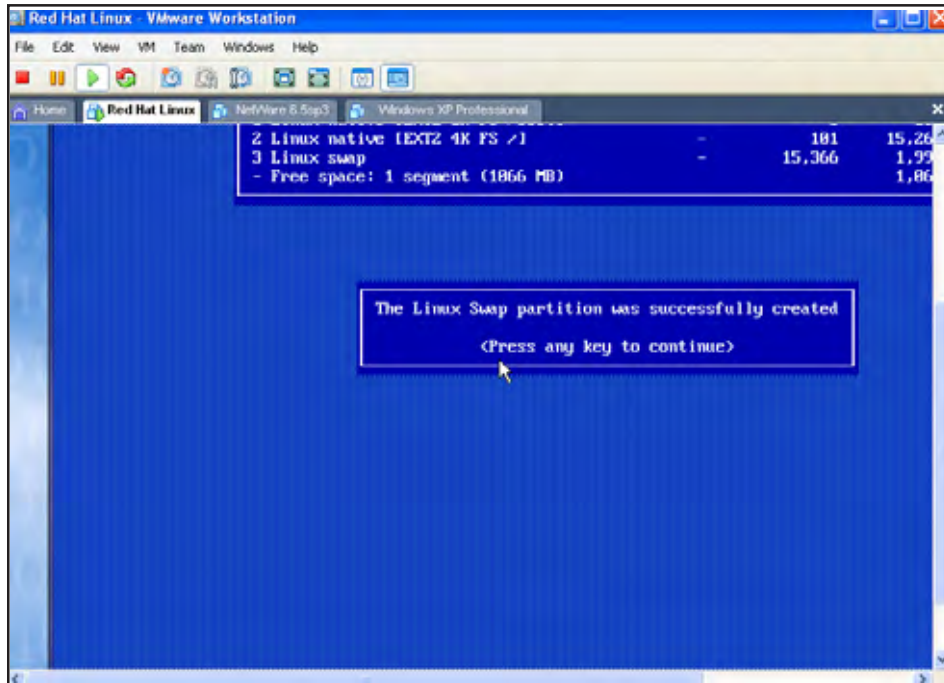


Once your root partition has completed, you will need to restore your swap partition. The swap partition is where any unused items are placed until they are needed again. You will select the left over empty space of your disk drive to begin creating your swap partition and it's size.

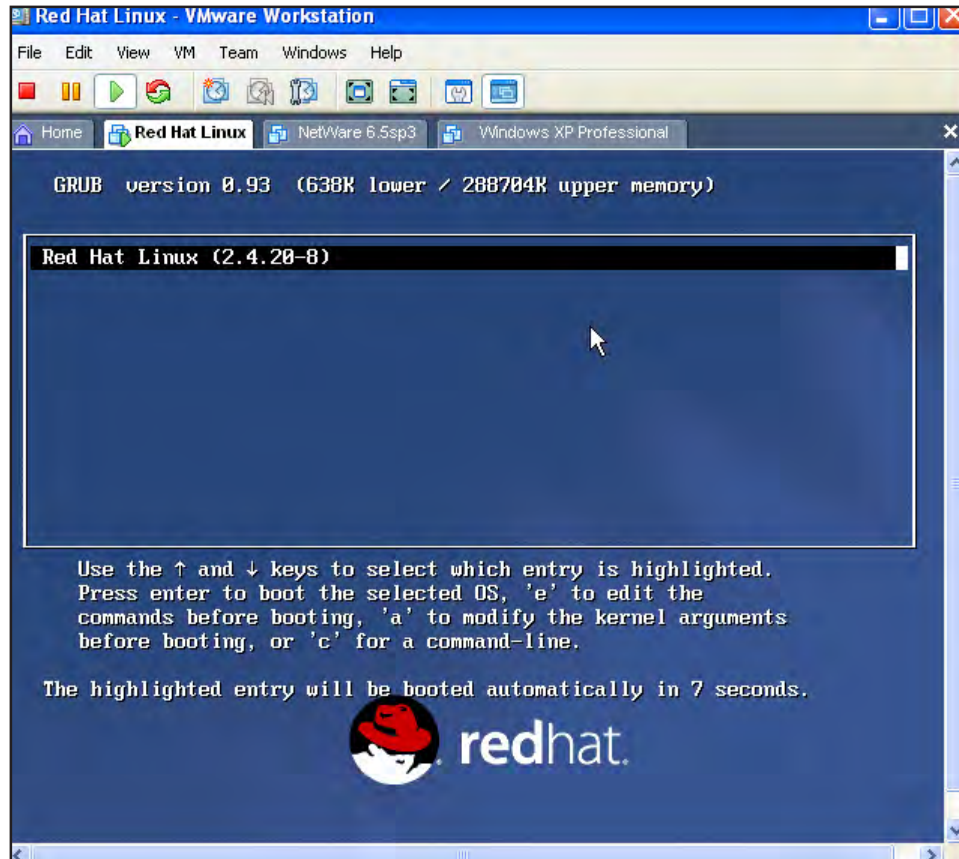
Press [Enter] to continue.



At this point, creating the Linux swap partition save any size changes that you have made. If you are unsure about your swap partition size, cancel the operation to review your partition table and size.

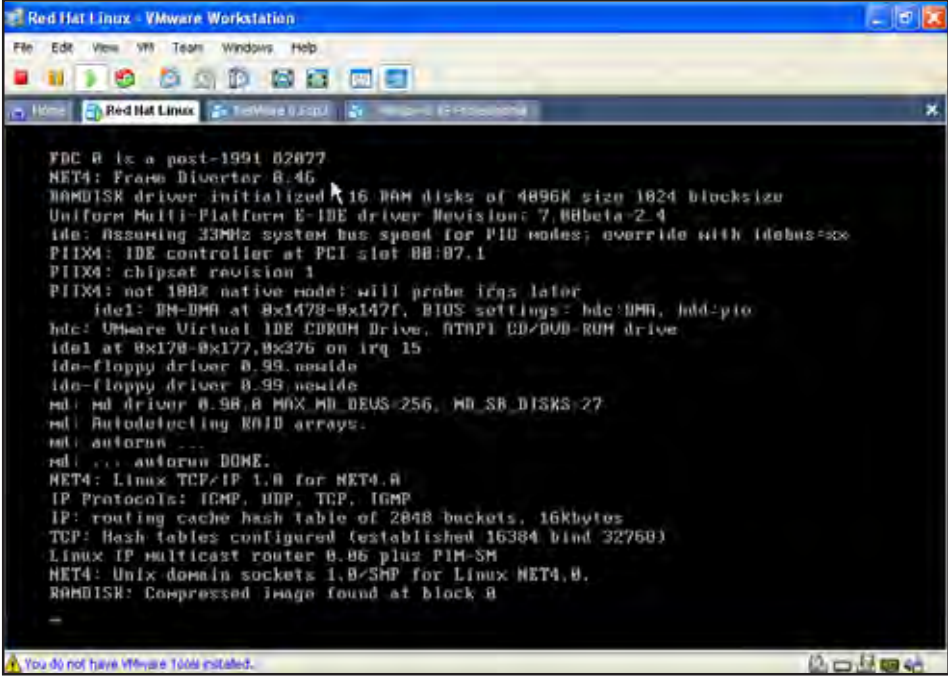


Once your swap partition has been successfully created, you have completed the restore process. Now exit Portlock Storage Manager and reboot, or simply click the reset button from your VMWare menu selection.  
Press any key to continue.



Your Linux machine will now begin to boot up. From this screen you will see your OS and kernel version that you have just restored. The OS version will automatically boot itself if you do not select an entry.

## Load and Configure Drivers Linux

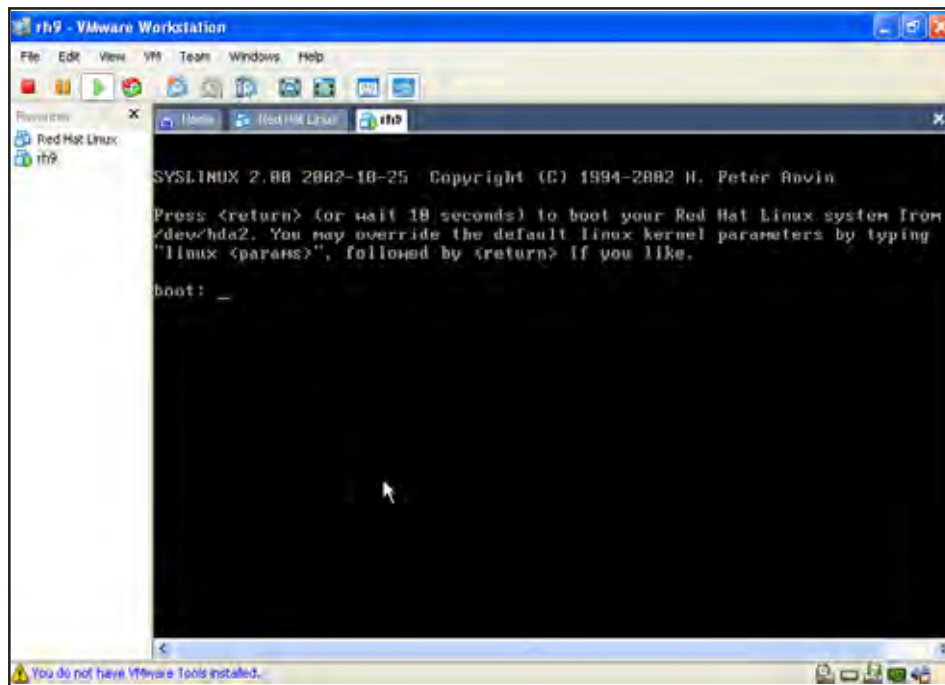


```
Red Hat Linux - VMware Workstation
File Edit View VM Team Windows Help
Home Red Hat Linux VMware 9.0.3.0 VMware 62-Processor0
FDC 0 is a post-1991 02077
NET4: Frame Director 0.46
RAMDISK driver initialized: 16 RAM disks of 4096K size 1024 blocksize
Uniform Multi-Platform E-IDE driver Revision: 7.00beta-2.4
ide: Assuming 33MHz system bus speed for PIO modes; override with idebus=xx
PIIX4: IDE controller at PCI slot 00:07.1
PIIX4: chipset revision 1
PIIX4: not 100% native mode: will probe irqs later
  ide1: BM-DMA at 0x1478-0x147f. BIOS settings: hdc:DMA, hdd:pio
hdc: VMware Virtual IDE CDROM Drive. ATAPI CD-ROM drive
ide1 at 0x170-0x177,0x376 on irq 15
ide-floppy driver 0.99.newside
ide-floppy driver 0.99.newside
md: md driver 0.98.8 MAX_MD_DEVS=256, MD_SB_DISKS=27
md: Autodetecting RAID arrays.
md: autorun ...
md: ... autorun DONE.
NET4: Linux TCP/IP 1.0 for NET4.0
IP Protocols: ICMP, UDP, TCP, IGMP
IP: routing cache hash table of 2048 buckets, 16kbytes
TCP: Hash tables configured (established 16384 bind 32768)
Linux IP multicast router 0.06 plus PIM-SM
NET4: Unix domain sockets 1.0/SMP for Linux NET4.0.
RAMDISK: Compressed image found at block 0
--
You do not have VMware Tools installed.
```

When you reach this screen, you will see that this is all the further your Linux OS will boot. The Linux OS is only booted up to this point because there are still some devices and card controllers that we have to configure.

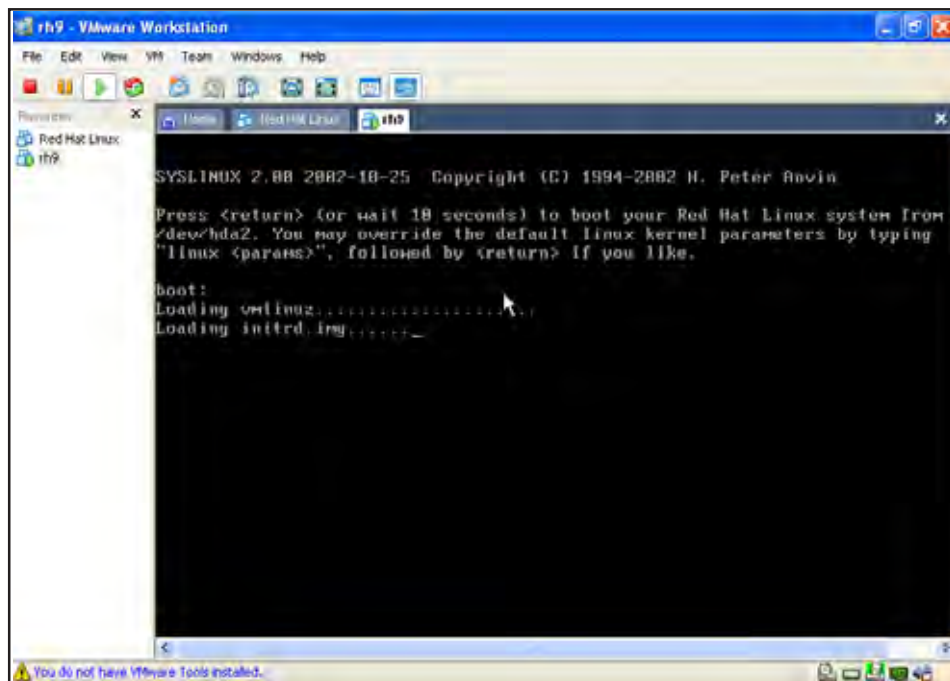
Insert the Linux floppy boot disk that you created earlier and reboot your virtual machine.



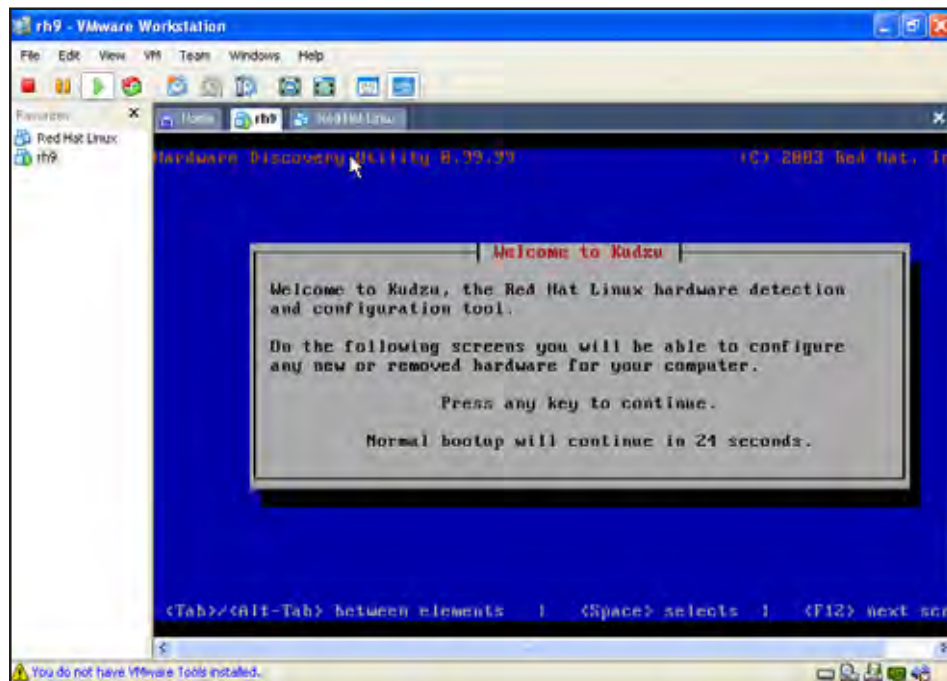


After booting from your Linux floppy boot disk you will come to the screen shown above. The Redhat Linux system will boot after 10 seconds or you may press [Enter] to begin the system boot.

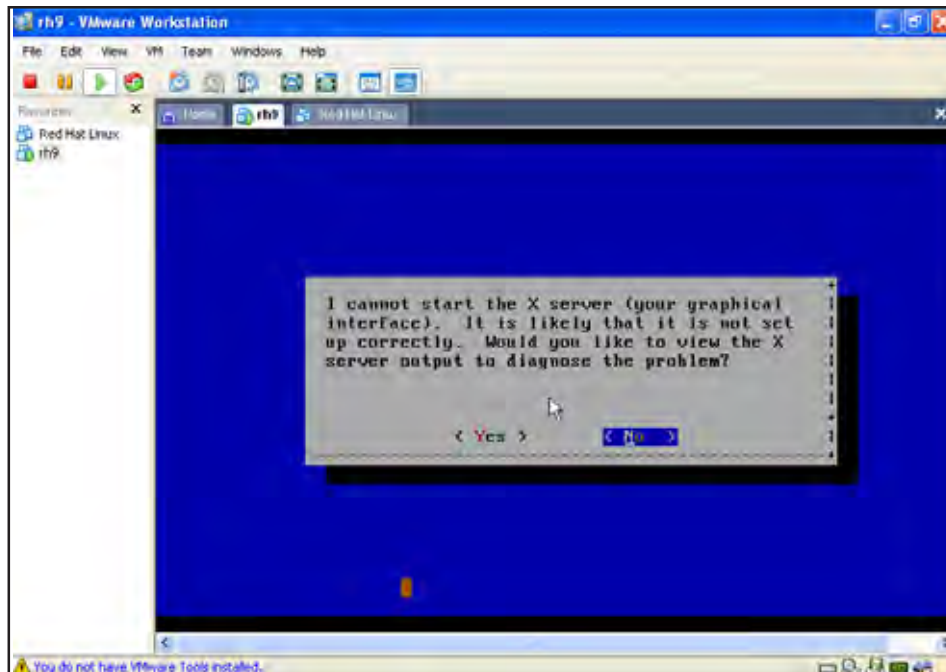




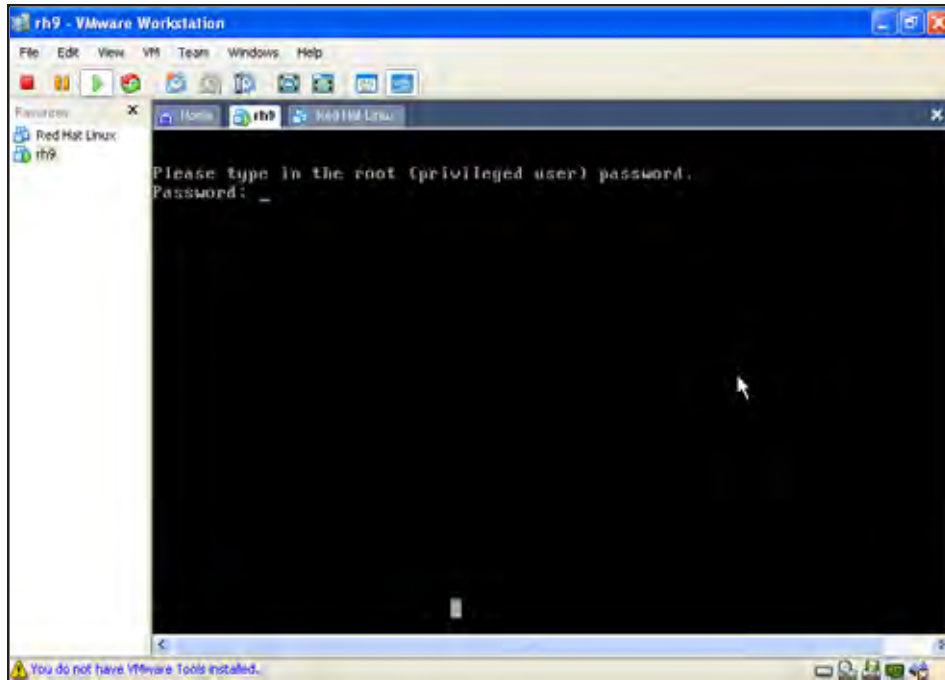
The Redhat Linux system will begin booting. Once completed, you will be taken to the Kudzu configuration tool. This is where you will configure all of your hardware for your Linux system. This is necessary for VMWare to recognize the image that has been restored.



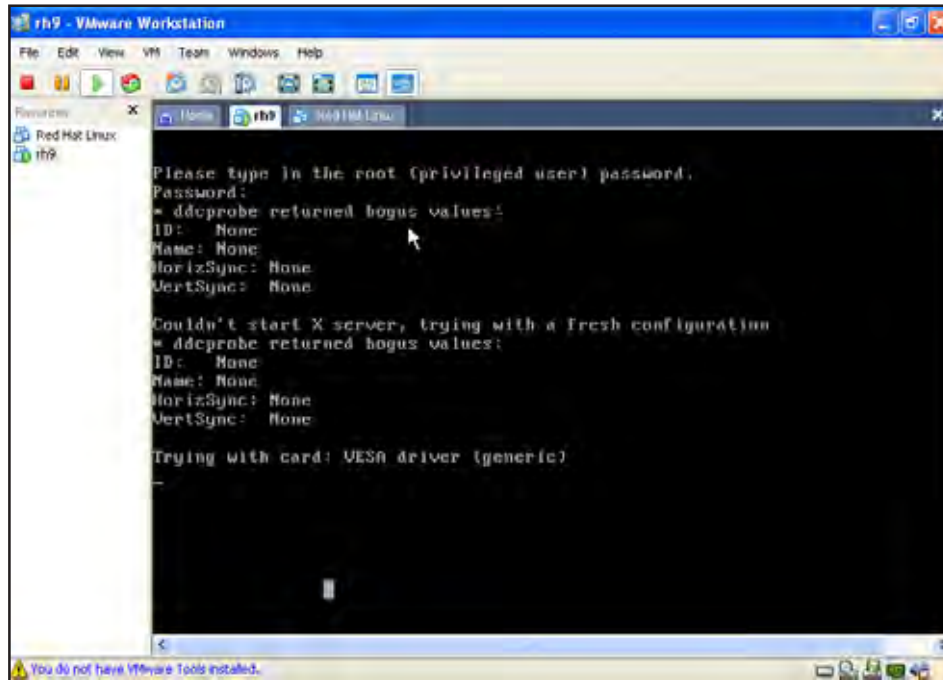
Once inside the Kudzu configuration tool, you will come across any added hardware that has not been configured yet into VMWare. Be sure to configure all of the devices to your new system or some devices might not be detected by a regular reboot. Once your are done with your configuration, reboot your vitual machine with the Linux floppy boot disk again so that your new system detect your newly configured hardware. Press any key to continue.



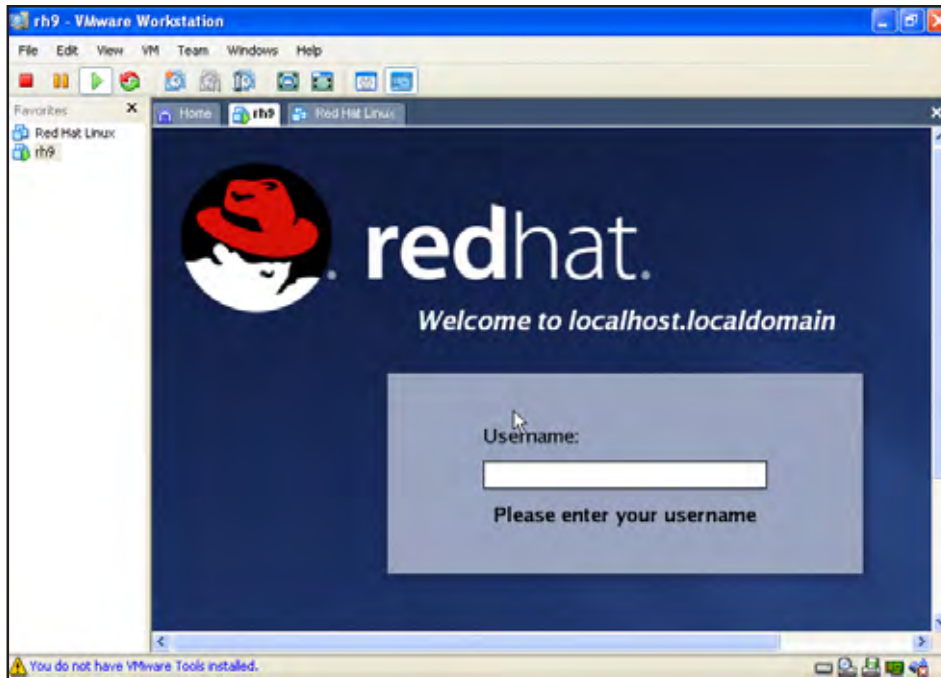
After rebooting your system, Redhat will try and start your graphical user interface; however, this will be unseccessful because you have not set your password for all of your configured hardware. If your with to view the output of this configuration you may, otherwise select No and press [Enter] to continue



To start your Graphical User Interface (GUI) you will need to know the root password of the source machine that you imaged from. This password is case sensitive. If the password does not work in lower-case, try typing it with the [Caps Lock] turned on. Once typed correctly, your machine will begin searching for your server. Press [Enter] to continue.

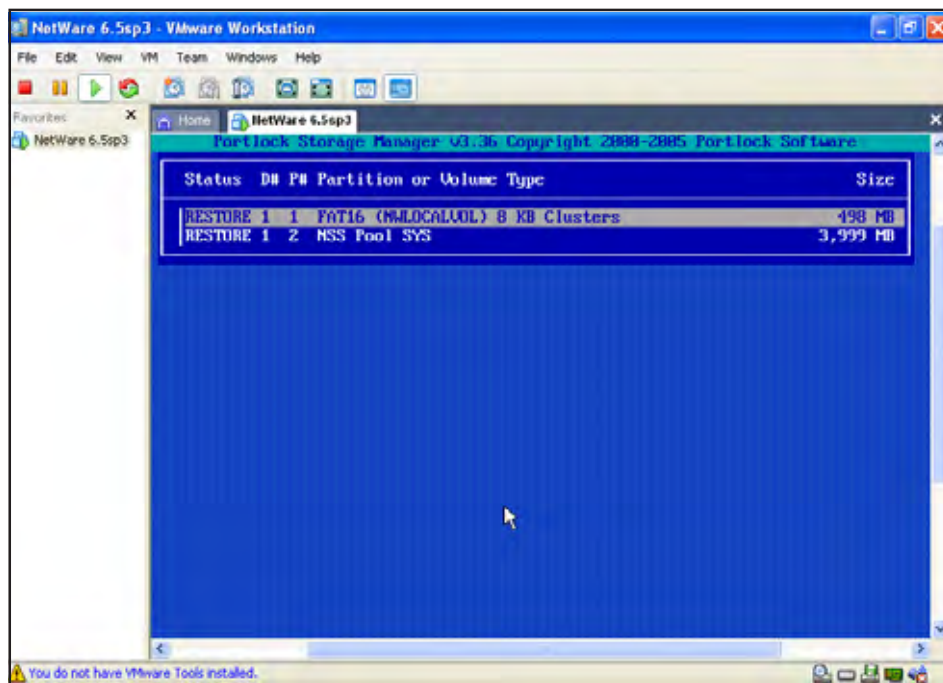


Now that you have typed in your root password, Redhat begins searching for different driver cards to boot your GUI. Once your system locates the driver, your Linux system will completely reboot.

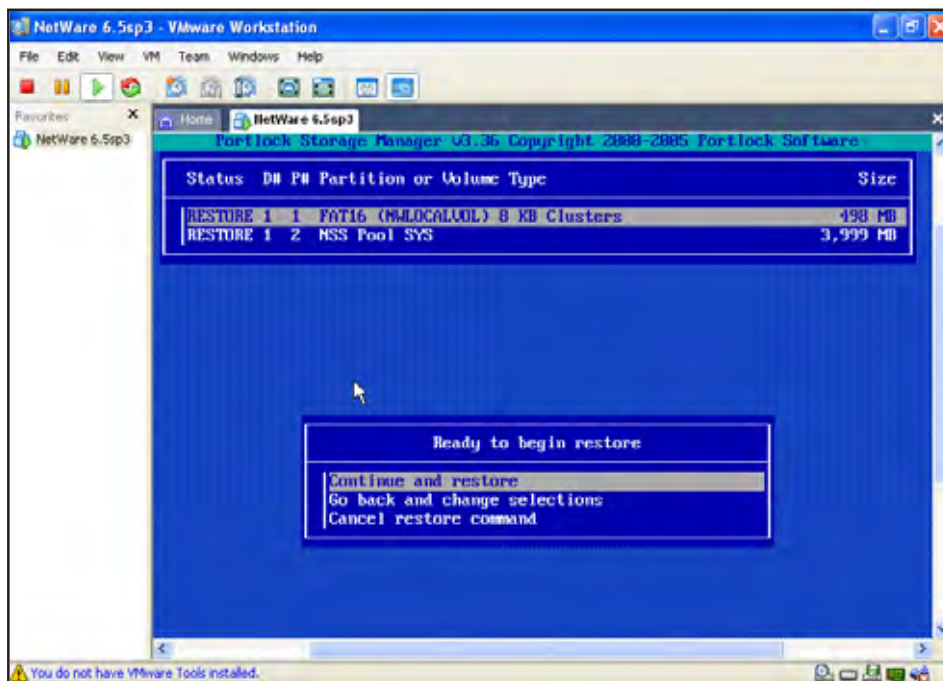


Your Redhat Linux system will now boot every time you start your Redhat virtual machine. Make sure you are using your floppy boot disk. When you wish to start your virtual machine and that you have the same username and password as your source machine to login to your virtual Redhat system.

## Restoring the Image to the Target Machine NetWare 5.1 SP8 & 6.5 SP3



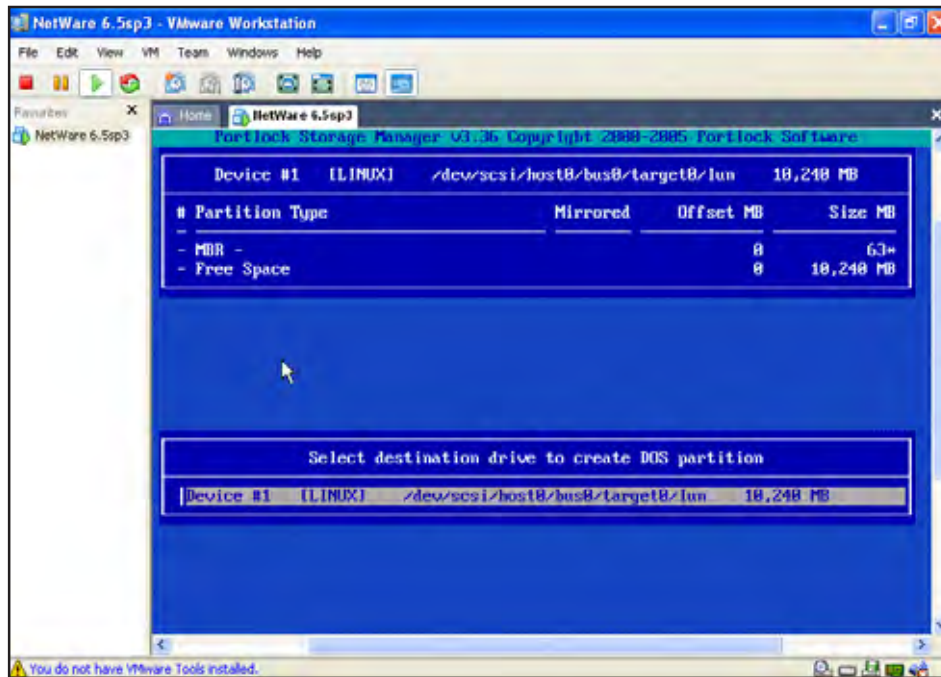
When restoring your image you are given the option to skip multiple partitions with [F5]. By skipping a partition you can restore a single partition to a different location. This is useful if you wish to have a backup of a specific partition. For this example we are restoring the entire image from the source machine. Press [Enter] to continue.



By selecting continue and restore you are beginning the restore process. If you are unsure about any of your partitions, you should go back and change your selections, or cancel the restore command at this time.

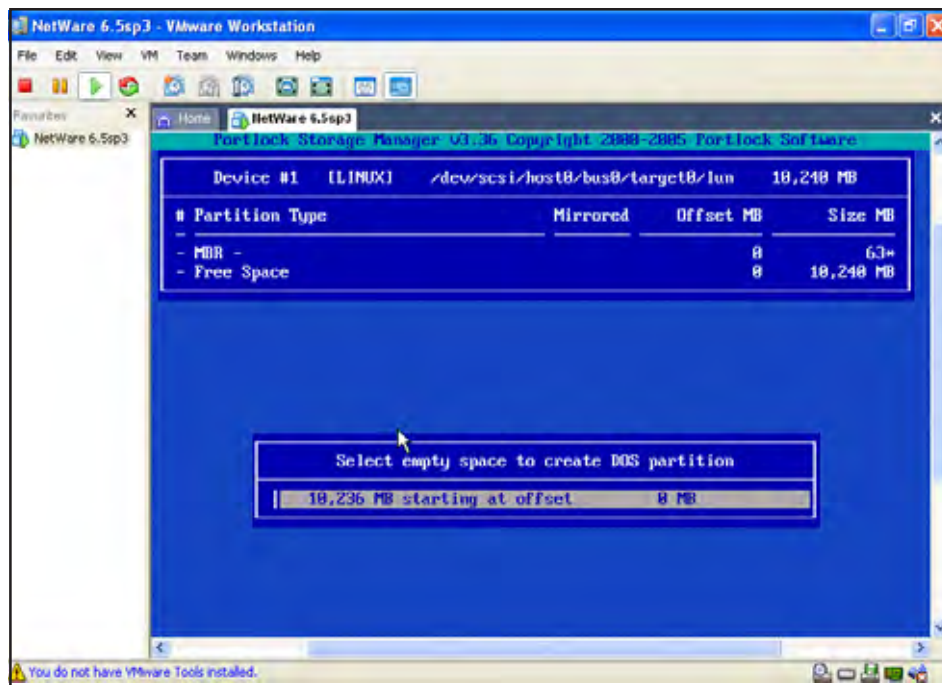
Press [Enter] to continue



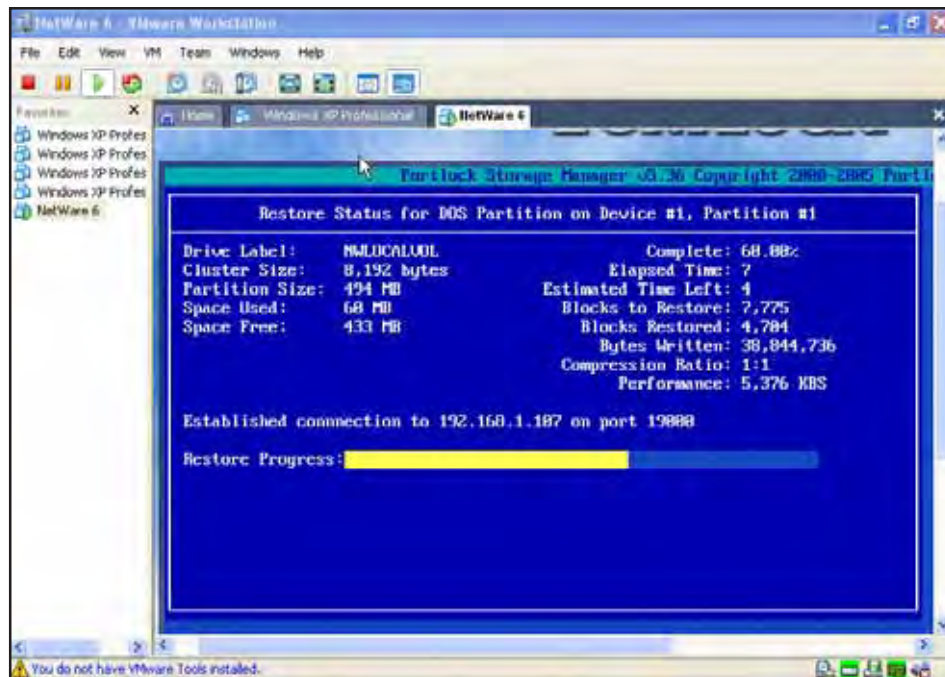


If you have more than one device to choose from on your target machine, choose the device you wish to restore your image to. You will need to make sure that your device has enough room to store your image on. If you need to, you can store your image on multiple devices.

Press [Enter] to continue.

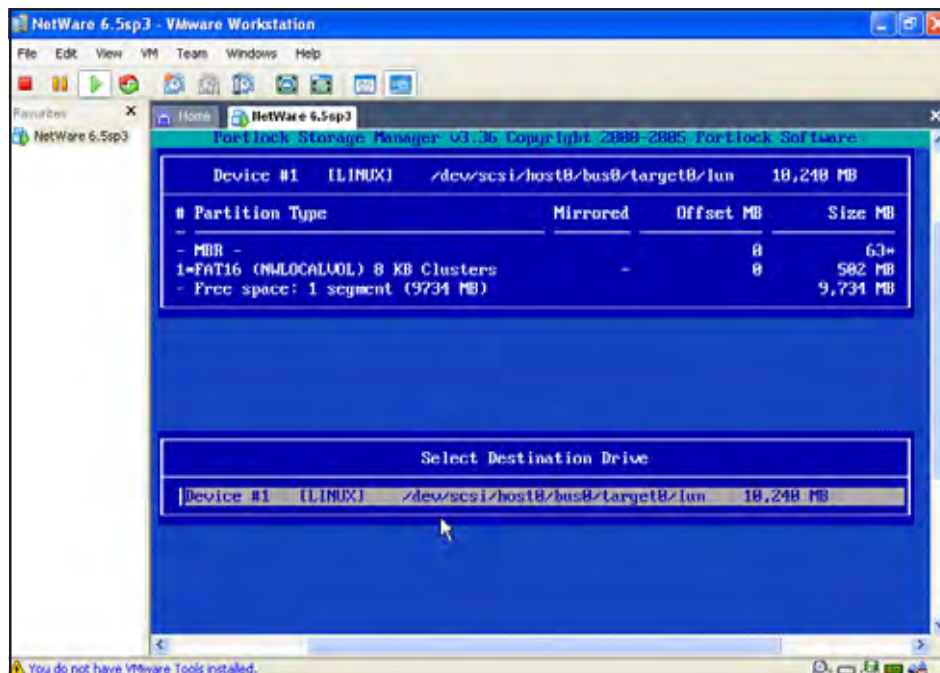


You can now select the empty space that you wish to store your image. If there is not enough space to store your image you will need a second device to store the additional partitions. Press [Enter] to continue.



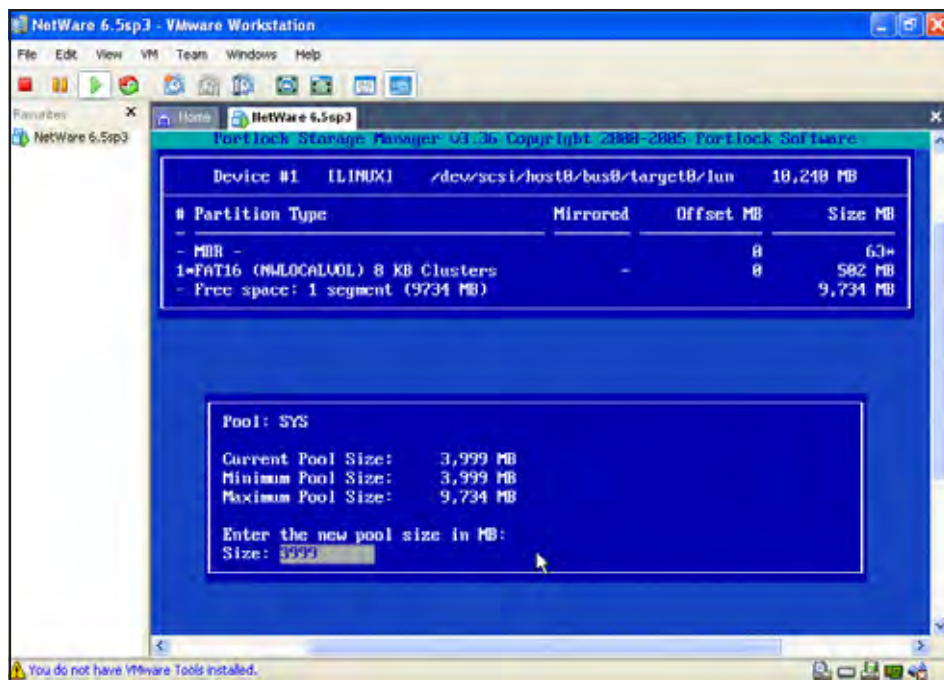
As NetWare restores, you will be asked to enter a new NSS pool name for the destination pool. Because this is a new disk drive you will not need to rename the SYS pool. This is only used when there is already a present SYS pool. Portlock Storage Manager will not allow two pools with the same name.

In fact it is recommended you do not change your SYS pool name.



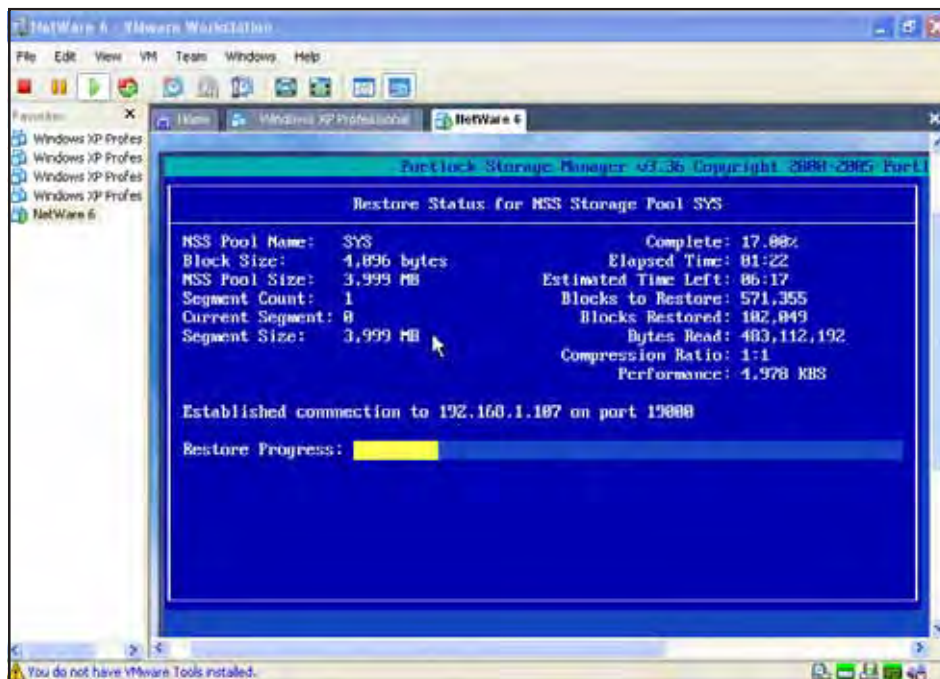
At this point you will select the next device in which to store your second partition.

A drive holds up to four primary partitions, so you can restore to the same device as your boot partition, as long as there is enough space. If not you will need a second device. Press [Enter] to continue



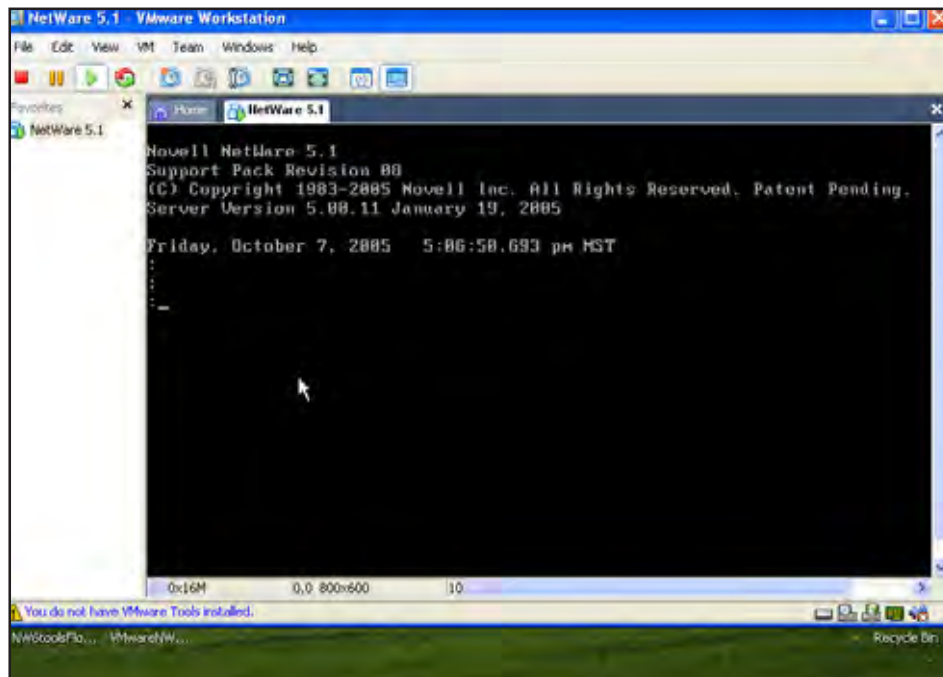
Next select the empty space to create the partition. Press [Enter] to continue.

Enter the size of the new pool in megabytes for the new SYS pool. Press [Enter] to continue.



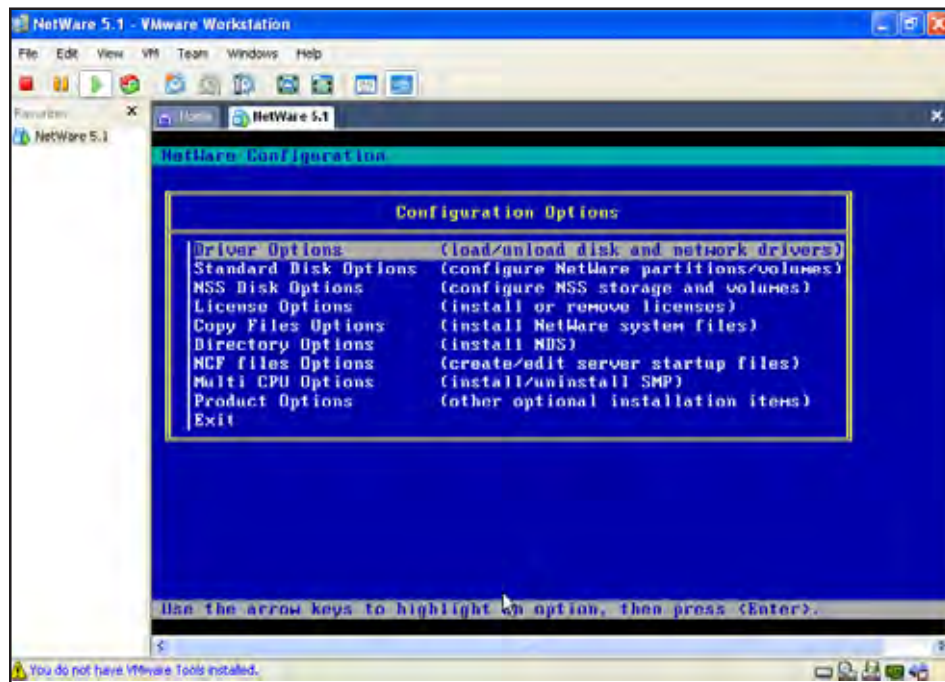
Here the screen shows the status of the SYS pool as it restores. Once image has restored successfully, hit [Esc] to return to the Main Menu to exit Portlock Storage Manager and reboot.

## Load and Configure Drivers NetWare 5.1 SP8



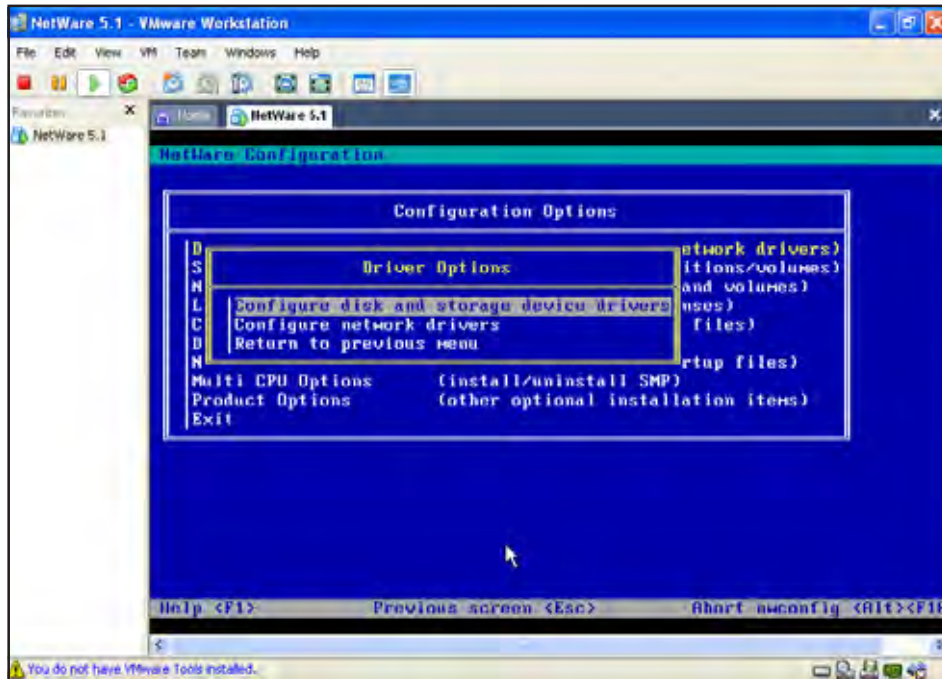
After rebooting your virtual (target) machine, NetWare will begin to boot up until this point. The reason behind this is that there are drivers that need to be loaded for VMware to recognize your source machine that you imaged. Once your virtual machine goes to this point you will need to type in the command **nwconfig**. This will take you into the NetWare Configuration so you can load and configure your disk and storage devices.



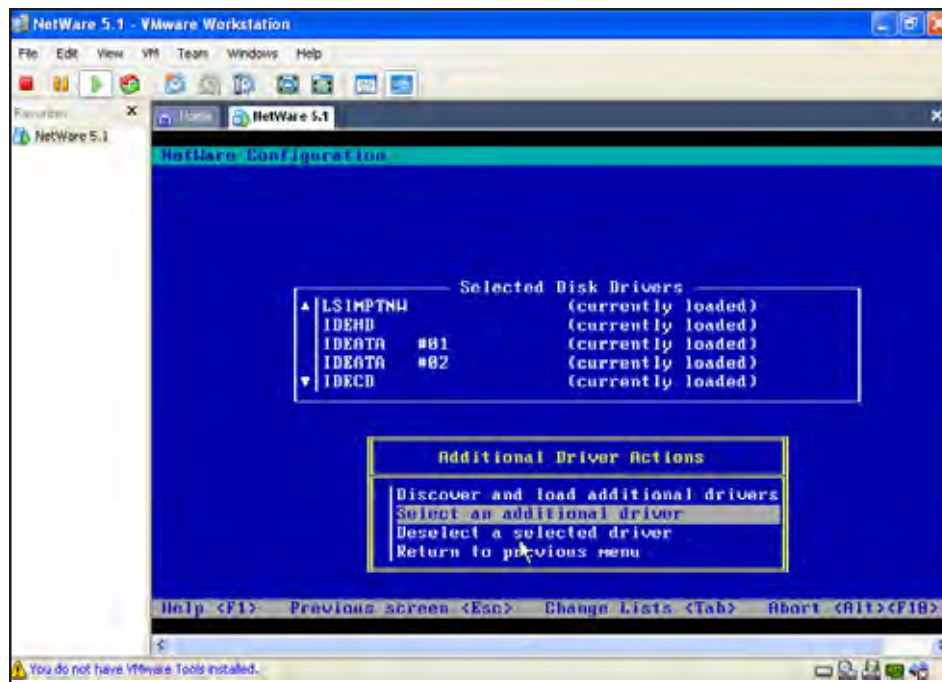


Once instead the NetWare Configuration, choose the driver options so that you can load your disk and network drivers. The other options in the NetWare Configuration are necessary but assist in the configuration of your NetWare virtual machine



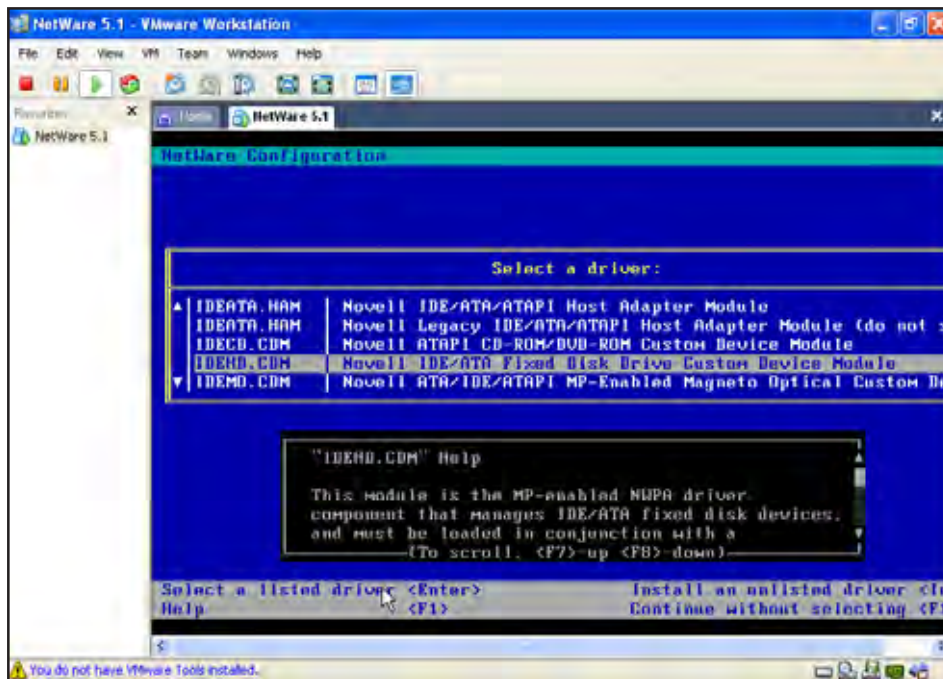


You now have a couple of options. To view and select additional drivers continue with the option to configure your device drivers. If you wish to configure your network drivers you may do so, but this is not a necessary step to boot your NetWare Virtual Machine. You can do this later

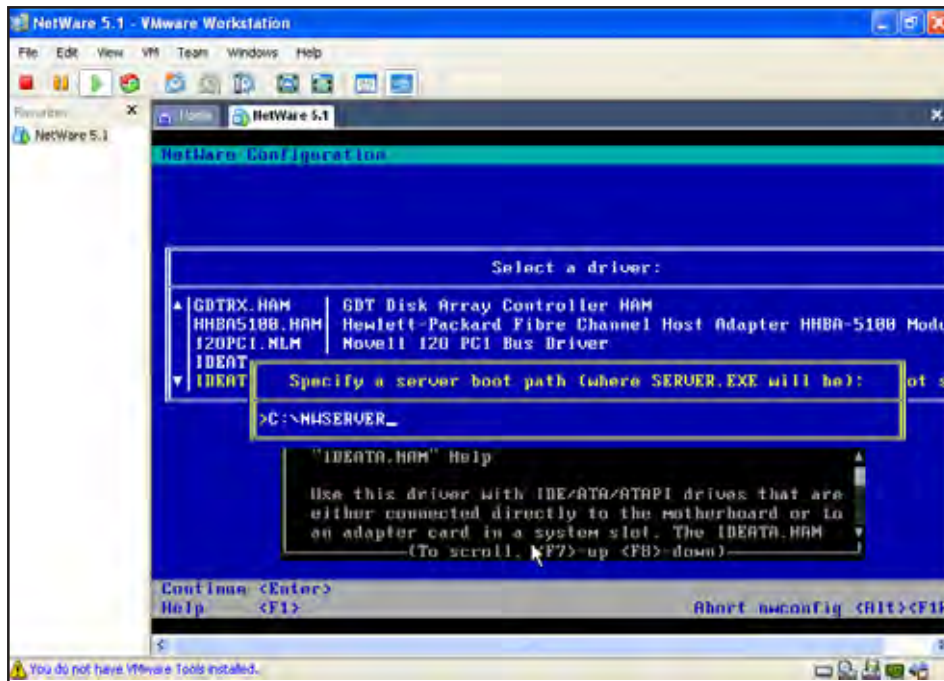


Inside your driver configuration you will be able to see a list of selected drivers that are currently loaded. You will need to select and load additional drivers for your NetWare virtual machine.

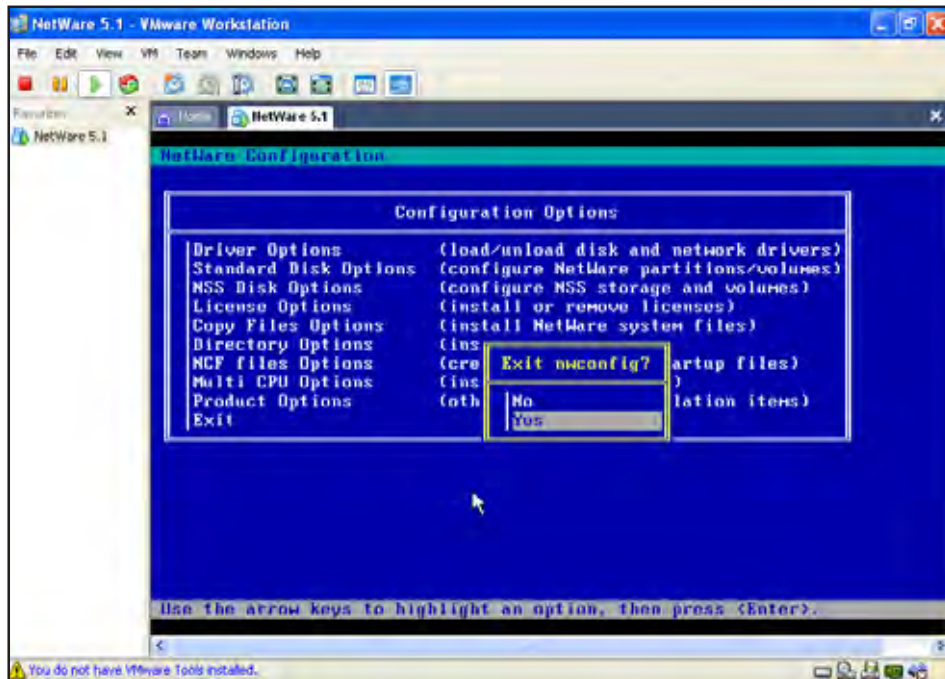
Selecting additional drivers will give you a list of drivers to load, several of which are recommended for Novell.



Once inside the additional drivers menu you will need to load the appropriate drives for your system. For IDE disks you can use the drivers with any version of NetWare (IDEATA, HAM, and IDEHD.CDM), for SCIS you may need to load the BLMM3.HAM driver. For more information on loading drivers for your virtual machine, please refer to the VMWare manual on VMWare tips for NetWare.



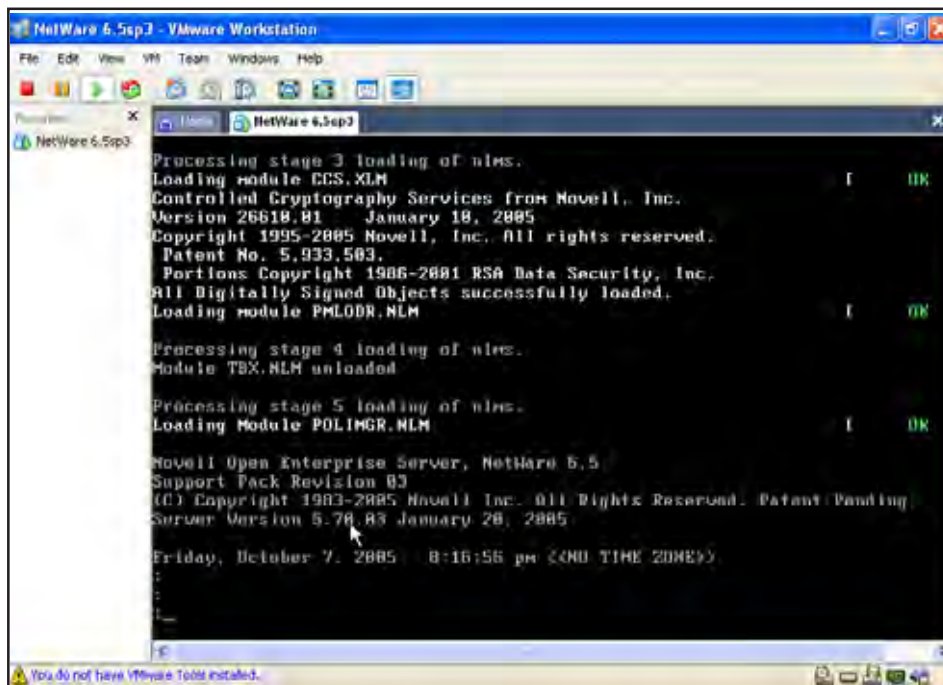
Now that you have selected your drivers you need to specify the boot path where the Server.exe will be held. In this example we chose the default path name C:/NWSERVER. Press [Enter] to continue.



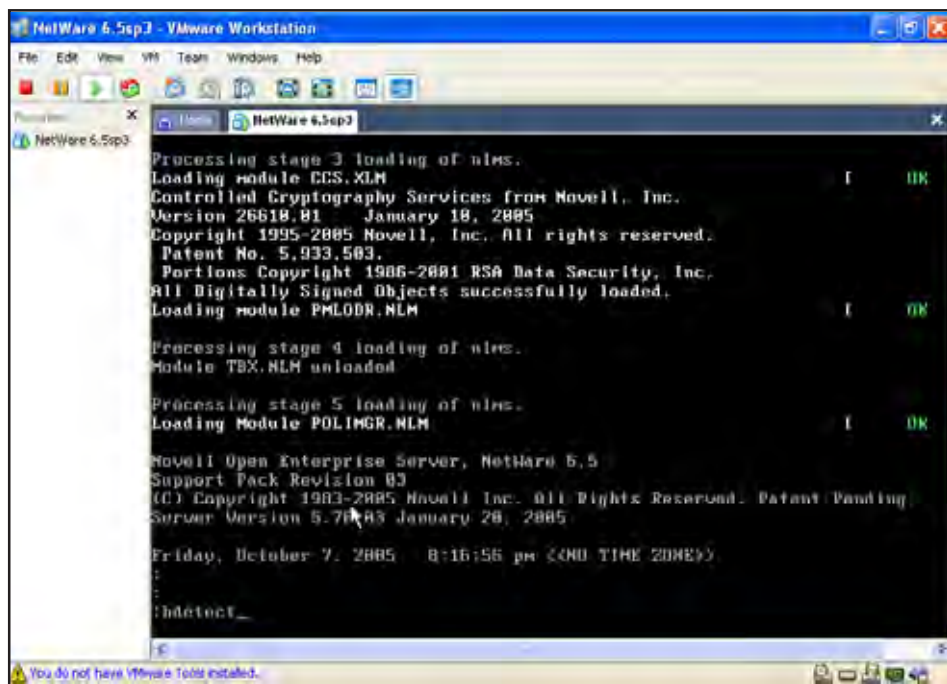
Once you have completed your driver configuration you can exit from NWCONFIG and reset your NetWare virtual machine. Your configuration will be saved and NetWare will now boot up.

A couple of things to consider after you machine boots up is to install VMWare tools to you NetWare guest OS and to take a snapshot of NetWare while booted. This way, if anything happens to your virtual Guest OS, you can return back to its original state with your snapshot.

## Load and Configure Drivers NetWare 6.5 SP3

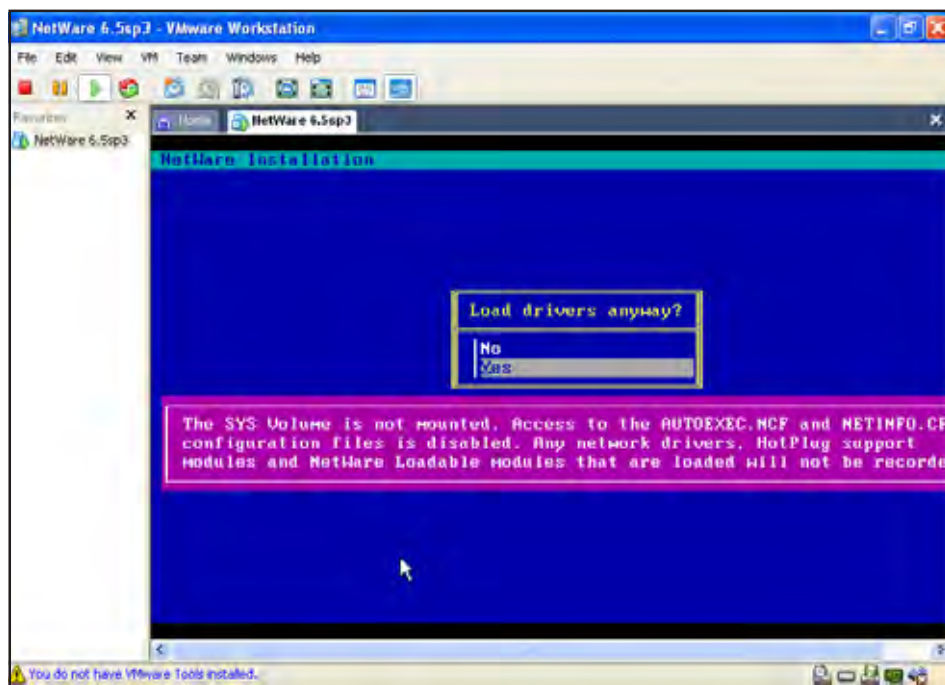


After you have completed your restore from the source machine, reboot or reset your virtual machine. NetWare 6.5 will then boot to this point. The reason for this is because your network board and some storage adapters that will need to be loaded for VMWare.



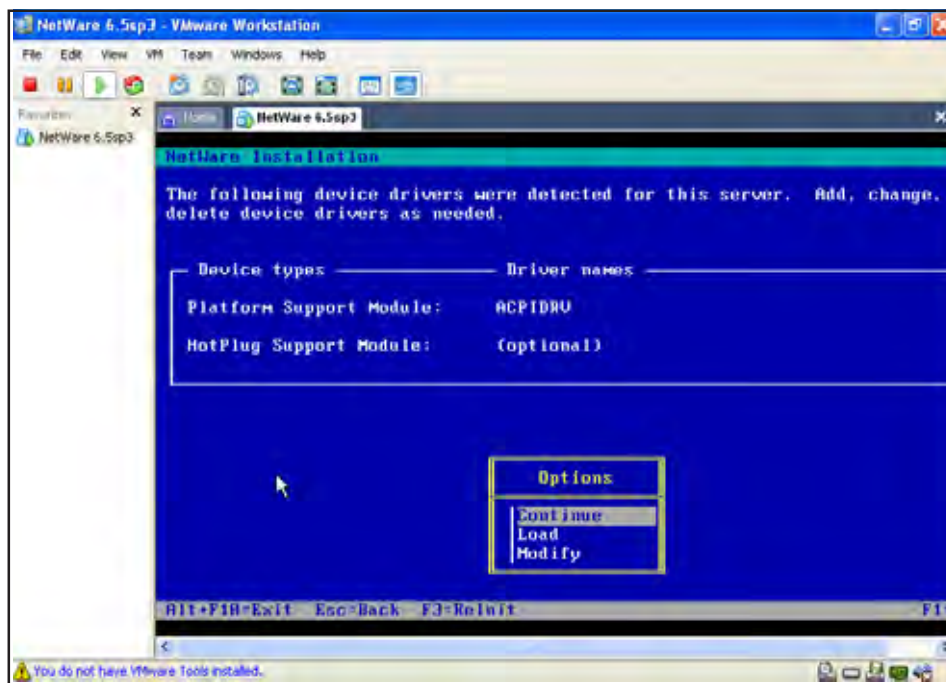
With NetWare 6.5, instead of typing NWConfig, you will use the command HDETECT which will take you to the NetWare installation where you will load your drivers.



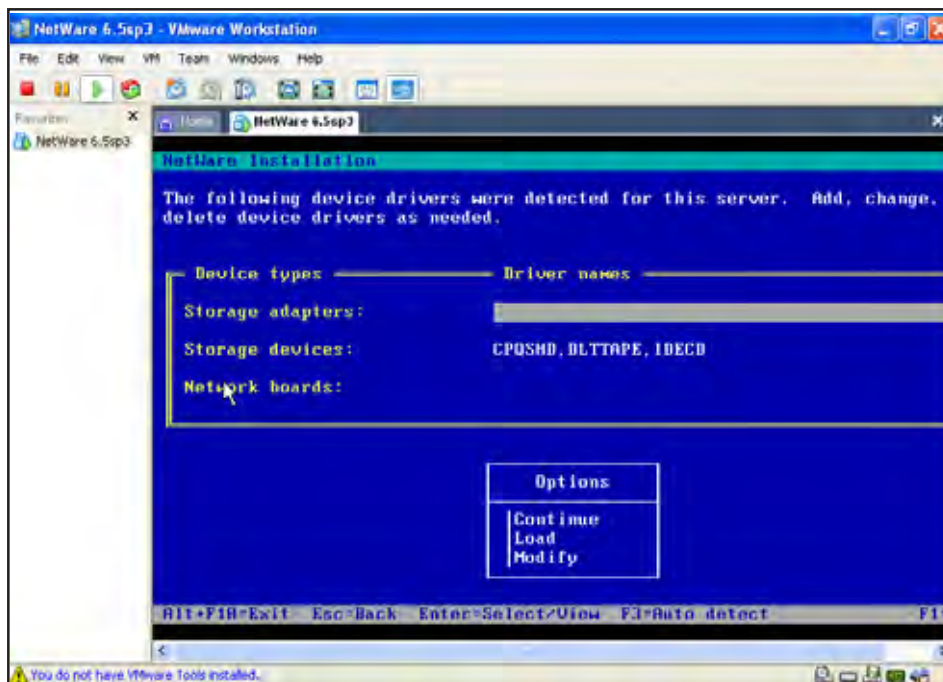


Once inside HDETECT, you will see that the SYS Volume is not mounted. You will want to load the drivers despite this fact. Because once your drivers are loaded you SYS volume will be mounted. This is an important process in booting your NetWare virtual machine.

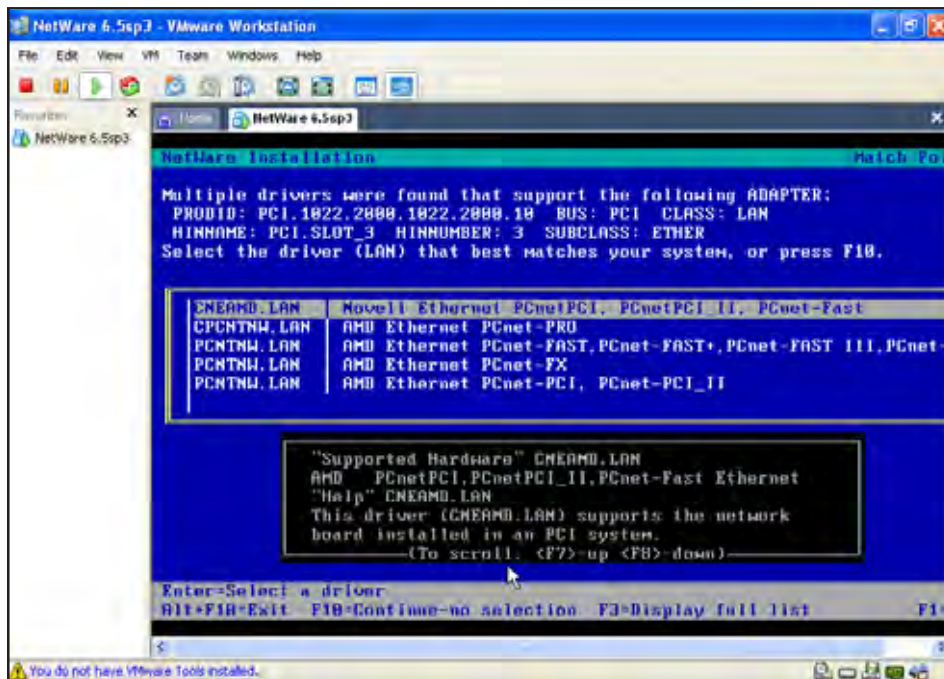




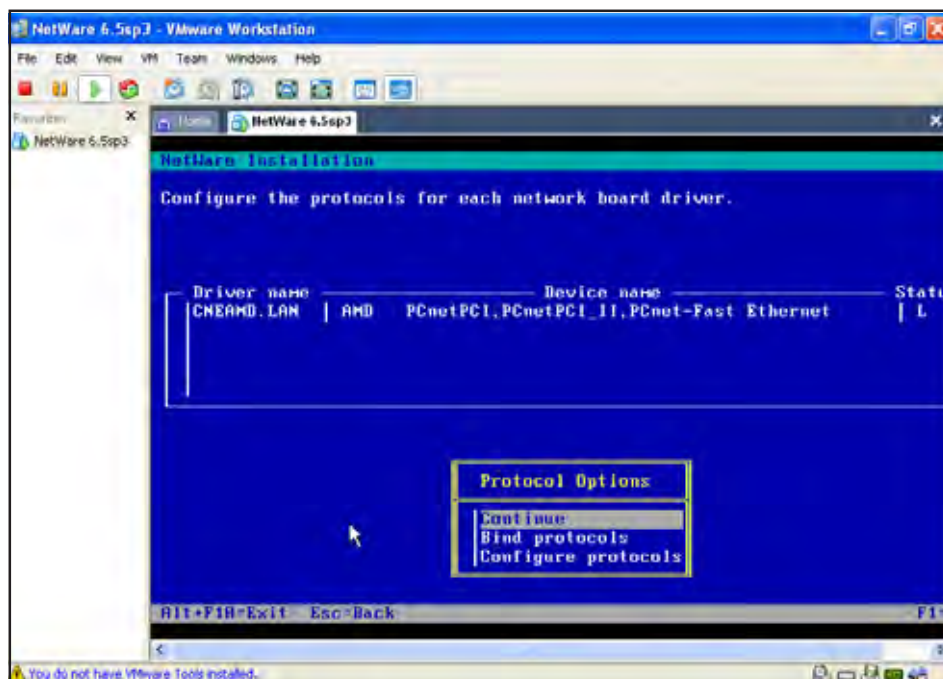
The first menu you will see is the drivers that are already detected, because there are already loaded you can continue through to your storage adapters and devices. If for some reason these are not already loaded be sure to do so. Press [Enter] to continue.



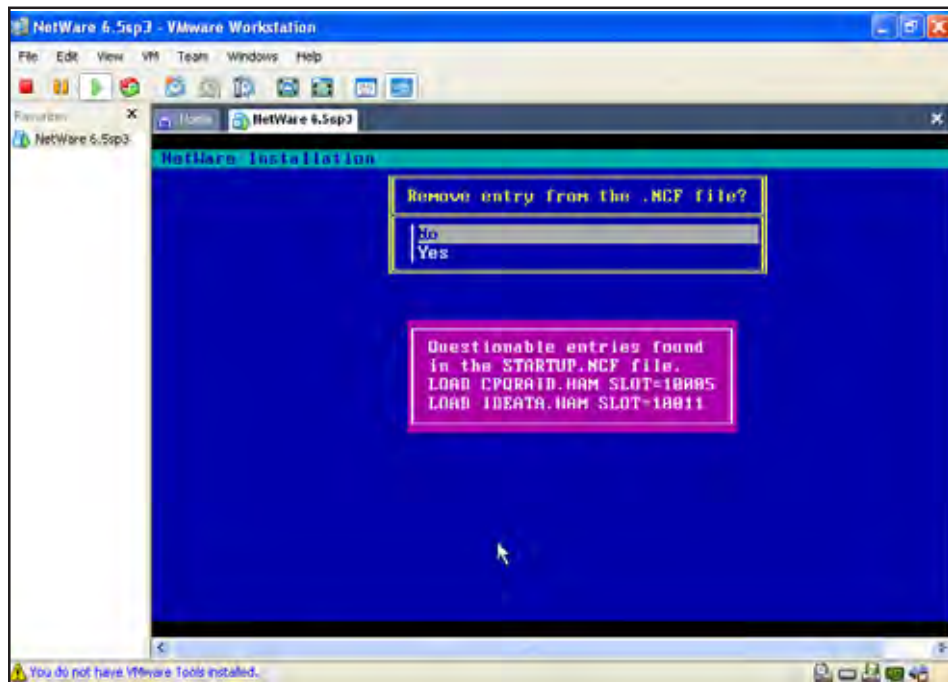
After continuing through to the next driver names list you will see that the drivers for your storage adaptors and network boards are not loaded, you will need to highlight your driver names by using the arrow keys and the you can do an autodetect by pressing [F3]. This will automatically find your necessary drives. Do this for both the storage adaptors and then load them in your options menu box below.



Autodetecting your network board may find multiple drivers. If this is the case you will need to select the one that best matches your system. After your selection press [Enter] to continue.

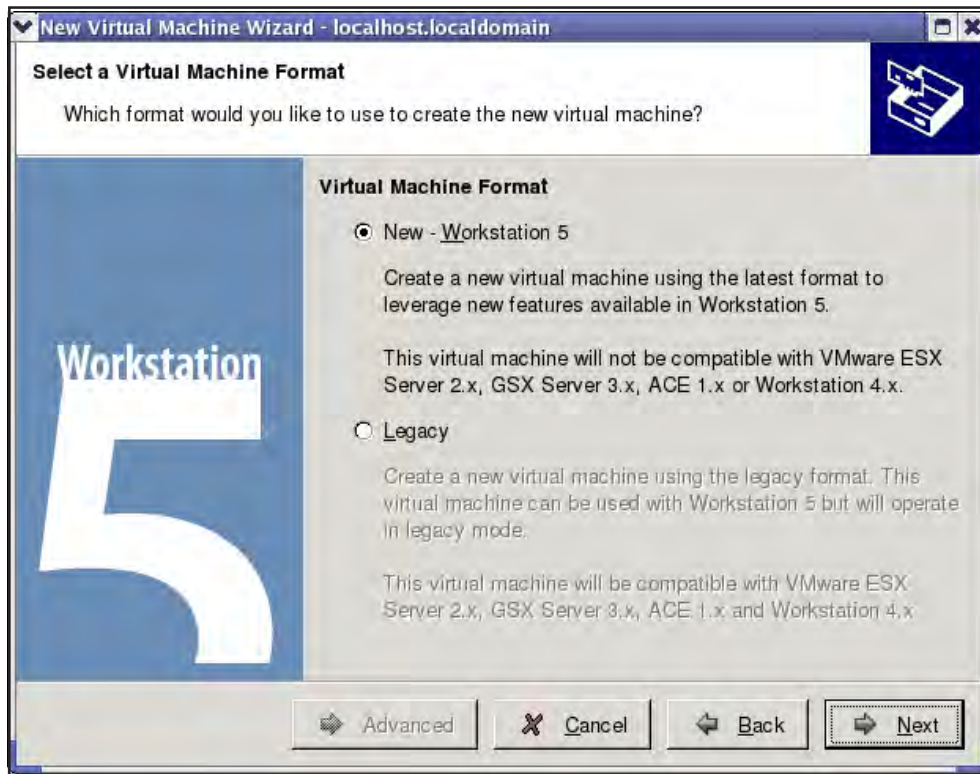


From selecting the appropriate network board for your system you will have the option to configure its protocols. This is not a necessary step. But you may run into some troubles with your network configuration if you don't for example if you wish do a virtual to virtual migration this may be a considerable step.



Once you have finished with loading the drivers for your virtual system you will be asked about some questionable entries in your .NCF file. These are important to your system start up. There is no need to remove these drivers. You can now exit out of the NetWare installation and restart your virtual machine. After your NetWare 6.5 has booted you will want to consider installing your NetWare tools and taking a snapshot of the OS booted just incase anything were to happen so that you can return it to the state it was in.

## Load and Configure Drivers Windows XP Pro

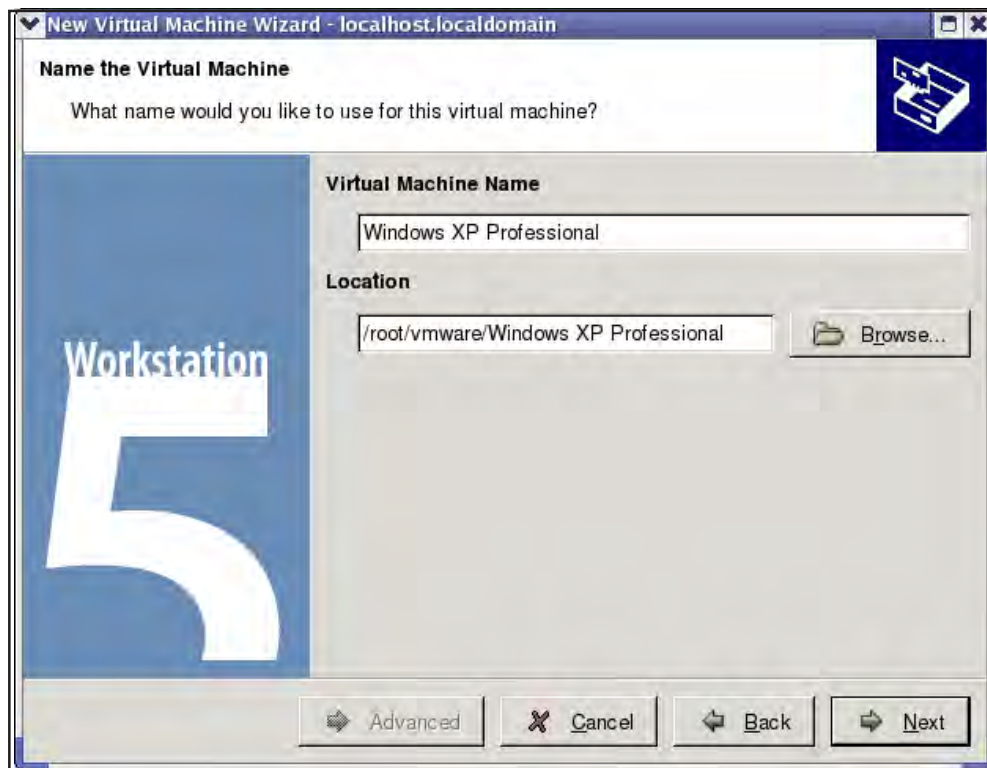


When setting up your Windows virtual machine it is recommended that you select custom and a new workstation 5 virtual format. This will allow you to closely match the disk type and adapters of your source machine. For further information on different virtual formats you should refer to the VMware user manual.



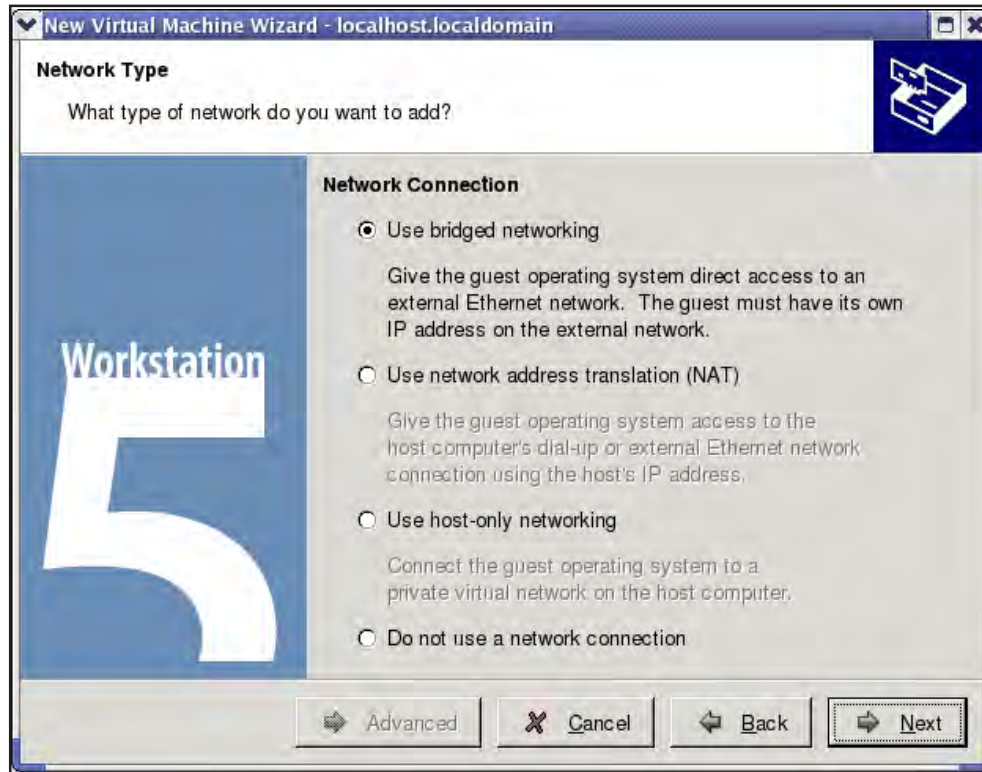
Begin setting up your Windows virtual machine by selecting the appropriate Windows version as your guest operating system. For all of the windows supported platforms refer to the VMware user manual. Select next when you are ready.



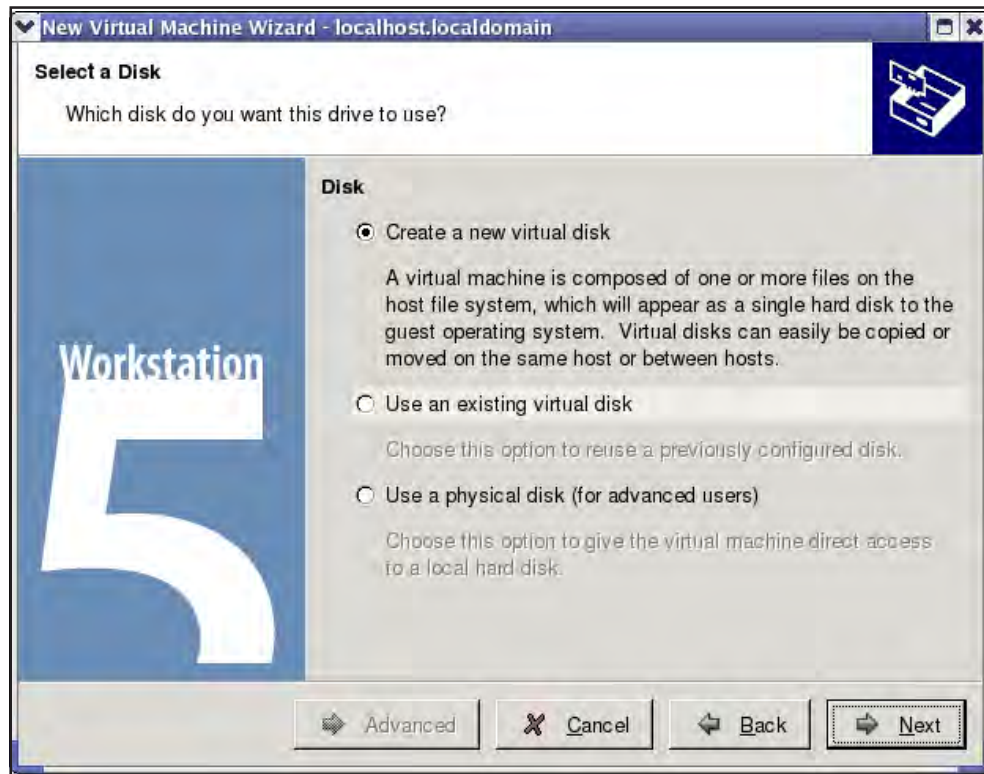


You can give your virtual guest operating system a specific name. This would be useful in a workstation with multiple virtual machines with the same operating system.

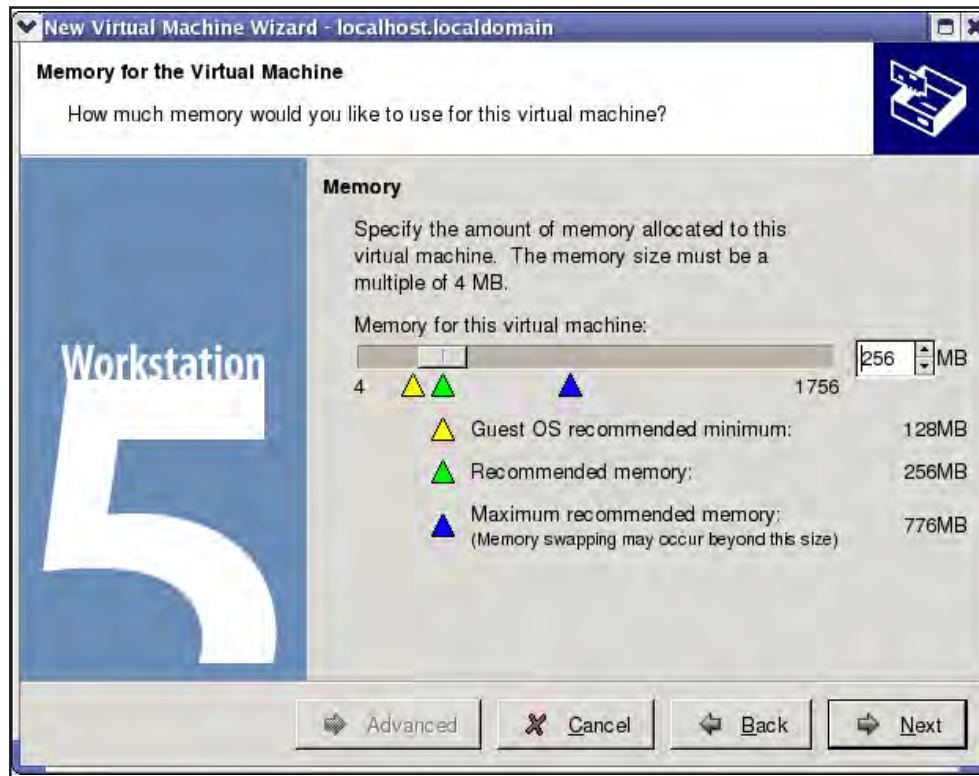




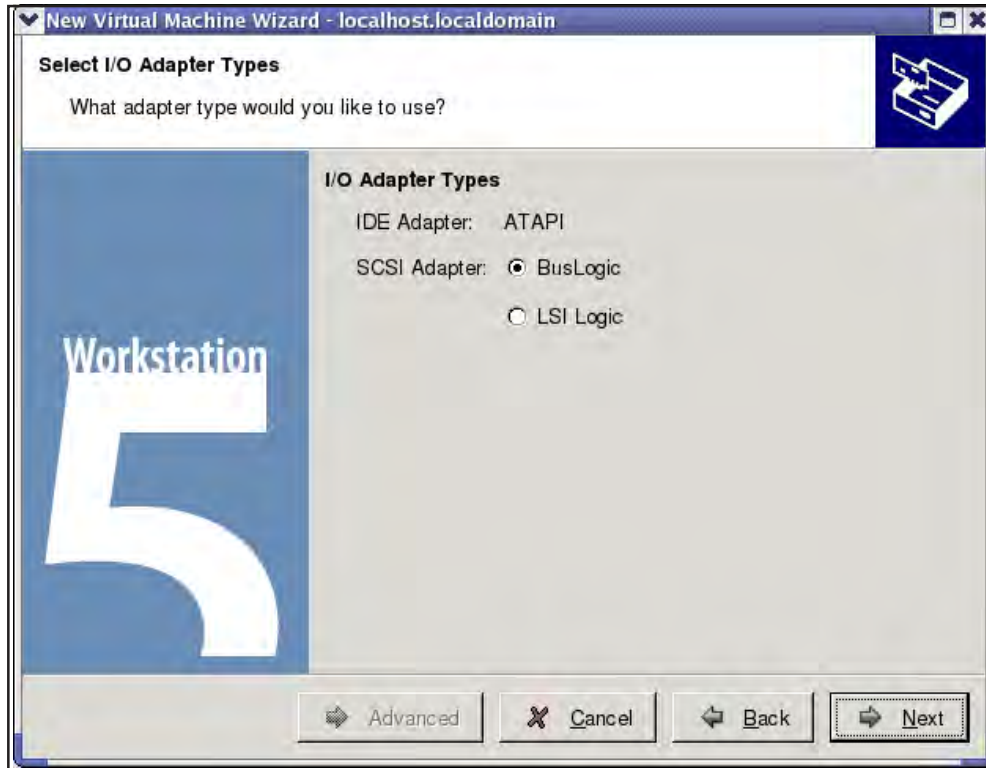
When doing a Windows installation it is a good idea to run in a bridged network that way you have access to the internet on your network. For further information on the rest of the networking options refer to the user manual for VMware workstation.



Select the disc you want your drive to use. Since we do not have an existing virtual disk we will create a new one in which to store our image from the source machine. Don't confuse your virtual disk with your physical disk. The only thing you need to consider is the remaining space on your physical drive.



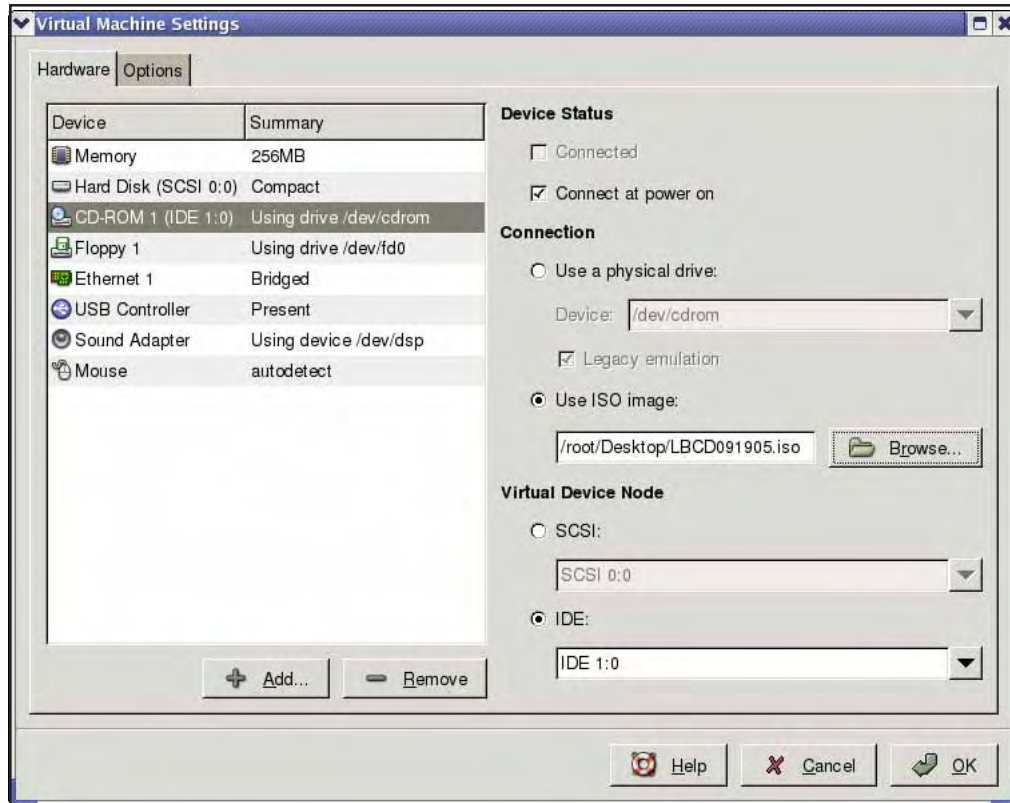
Most of the time the default settings for your virtual memory are ok. There are certain specifications for different operating system that you will need to be aware of. This is obviously also dependant on your physical memory.



Consider the setting of your source machine. Choose the virtual disk type that is right for your operating system. The default disk type depends on the OS that you have selected for your target machine. The disk type chosen should emulate that of the source machine. If you are unsure if SCSI is correctly supported then choose IDE because it's supported by any known OS.



Here you will need to specify the size of your virtual disk capacity. The minimum size being 100mb and the maximum being 950 GB for both SCSI and IDE. The size used will also depend on the drive of you source machine. Refer to the VMware user manual for more information on disk capacity.



You can use the Portlock Boot CD a couple of ways. For this example, we downloaded the ISO from our website and then saved it to the desktop. Once downloaded, browse to its location and select the ISO. Your virtual system will now boot with the Portlock boot CD.





Once you have rebooted your virtual machine you can now see that you have had a successful migration to your target machine with Windows XP Pro. You will now want to consider installing your VMware tool as well as taking a snapshot for our boot machine just in case.