

PORTLOCK

Physical-to-Virtual Migration with Portlock Storage Manager

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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 with Microsoft Virtual Server, 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, you already have some level of experience working with Virtual Server and virtual machines. 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 and the 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, Windows, VMware and Microsoft Virtual Server. 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 and facilitate server-to-server migration. 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.

The operating system can be restored automatically as part of the recovery/migration process, making a physical-to-virtual migration as easy as possible. The Portlock Boot CD (NetWare/WinPE) is a bootable CD-ROM that contains Portlock Storage Manager in various configurations for installation/execution for 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 (NetWare/WinPE) may be downloaded for free for currently licensed Portlock Storage Manager customers. Non-current customers may purchase the Portlock Boot CD (NetWare/WinPE) from <https://secure.portlock.com/store/>.

Considerations before Migrating

Before you perform a physical-to-virtual migration, there are some issues to consider, regardless of the operating system you will be migrating.

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 Virtual Server?"

Preparatory Procedures for Migration

Backup your system and 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 and Subnet. What specific configurations are required for your computer?

Target or Guest Machine

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 two gigabytes in size at first, but will grow to its allocated size as more space is needed.

Processor

For best results with Microsoft Virtual Server and SCVMM working together with NetWare after the migration, you will want to consider running Virtual Server 2005 R2 SP1 on a computer that has an AMD-V or Intel-VT processor. Virtual Server 2005 R2 SP1 is the first version to provide hardware-assisted virtualization.

NOTE: If you are managing your server remotely, be sure to check your firewall exceptions tab of your windows firewall utility. Enable Windows Remote Management and Virtual Server Exception in your Firewall.

Netware 4.x, 5.x, 6.x, 6.5.x

The Portlock Boot CD for Netware 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 for netware is available for download at 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 mount the ISO image directly from a location on your host machine. You may find it more convenient to use the ISO image directly because you don't have to remove the CD from the drive if you need the CD-ROM for another application.

If you have not already done so, you will need to first create your virtual machine either from the Virtual Server Administrative website or Virtual Machine Manager. For more information on creating virtual machines, please view the Microsoft Virtual Server documentation.

Portlock Storage Manager Installation Methods

The required file(s) may be downloaded from the Portlock download site:

<http://www.portlock.com/products/storagemanager/evaluate/>

Installing Portlock Storage Manager Natively on NetWare Servers using NWConfig or Pinstall Methods

File(s): Download the zipped version of the NetWare-based install.

Option 1: Unzip and execute NWConfig or Pinstall

Option 2: OR: Create the directory SYS:/STORMGR. Unzip into this directory. No installation is required.

Option 3: 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.

Quick Installation of Portlock Storage Manager on Novell Open Enterprise Server (6.5)

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.

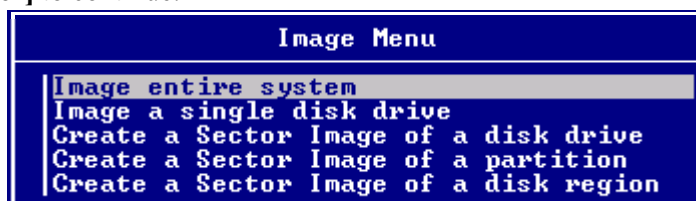
Once you have started your physical server and you have Portlock Storage Manager installed and the booting and your license is installed, continue to the Main Menu of Portlock Storage Manager. As you can see from the menu there is an extensive amount of features that will assist you in managing your physical and virtual machines.

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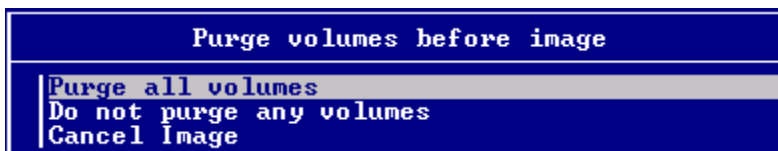
Physical Server

Because this is the source server and we want to make sure that the new destination server has all of the latest information from NetWare Directory Services (NDS) in a multi-server environment, Portlock Storage Manager will need to dismount all of the Netware volumes on the server. This process will be done automatically once prompted. Portlock Storage Manager will also remount all volumes that have been dismounted.

The imaging process will give you the following options for your physical server. Choose to **Image entire system** and press **[Enter]** to continue.



When selecting to image your system, you will receive a list of all the partitions that reside on the device you selected. You may skip a partition for the imaging process by pressing **[F5]**. By default, Portlock Storage Manager will select all partitions on your device. Press **[Enter]** to image your entire server and view the image status next to each partition.

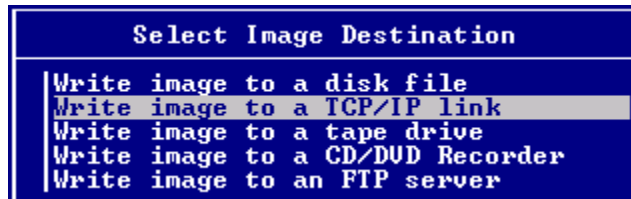


If you have volumes present, you will be asked if you wish to purge all volumes. This will cleanup all of your deleted files on your server. This is not required to continue with the imaging process.

Status	D#	P#	Partition or Volume Type	Size
IMAGE	1	1	FAT16 <NWLOCALVOL> 8 KB Clusters	502 MB
IMAGE	1	2	NSS Pool SYS	3,999 MB

Write Image to a TCP/IP Link

Portlock Storage Manager provides you with several different types of destinations for ease of management. For a physical-to-virtual migration, you will want to choose **Image to a TCP/IP Link**. This is the same process as a physical-to-physical migration.



NOTE: For Netware 6.5 SP3 and above you will be given the option for online and offline imaging. Portlock Online Imaging provides block-based imaging for NetWare 6.5 SP3 or later NSS Pools while they are active with mounted volumes. Portlock Online Imaging depends upon Novell SnapShot Backup. An NSS Pool, which can be empty, is used by Novell SnapShot Backup to store the deltas during an image command. Portlock Storage Manager automatically freezes the selected pools, creates the snapshots, images the pools, thaws the selected pools and finally deletes the snapshots.

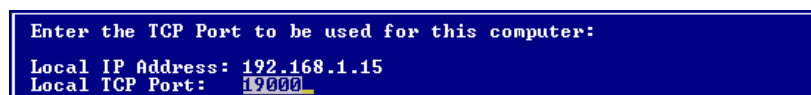
Portlock Storage Manager can compress the image as it is being written. For a server-to-server migration, you should not enable compression because it can slow the process down. From the **Compression Mode** menu, select whether to disable or enable **Software Write Compression** and press **[Enter]** to continue.



When transferring an image via TCP/IP, one side needs to be a server and the other side needs to be a client. The system that is running as a server must be started first. The system running as a server will listen for a connection from the other system (client). Select the TCP/IP mode for this system and press **[Enter]** to continue.

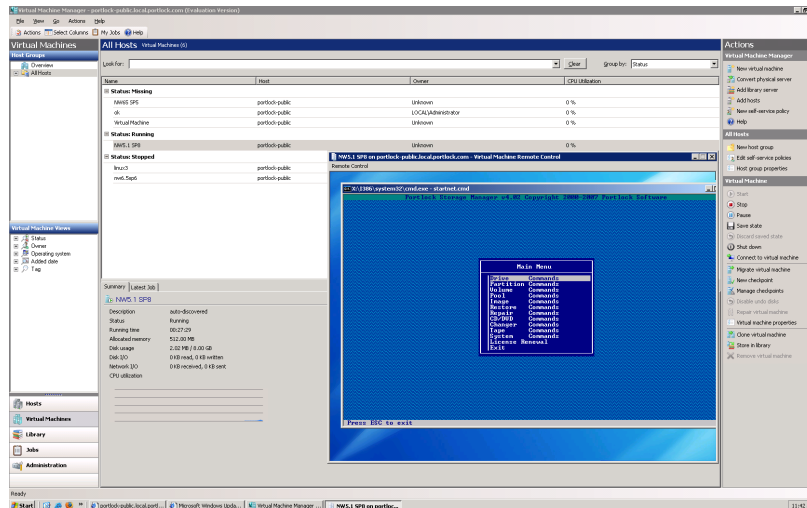


When selecting **TCP/IP Server** mode, Portlock Storage Manager will provide you with the IP address of your server and then listen for a connection from the client side. At this point you will continue to your virtual machine side while your physical server awaits a connection.

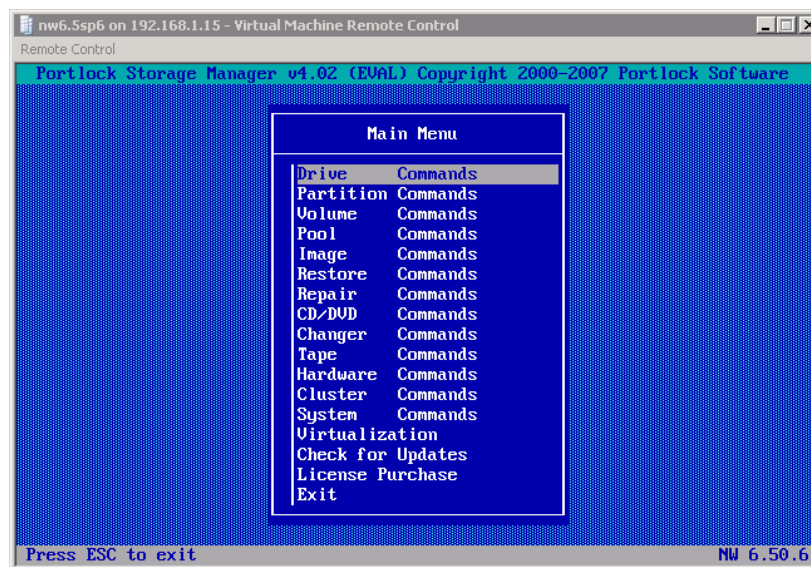


Microsoft Virtual Machine Manager Restore Process

Below you will find the Portlock Storage Manager Boot CD for Netware running inside a virtual machine. This operation can be completed from either the Virtual Server or Virtual Machine Manager Console. Now that setup for your physical side is complete, you may continue with the remaining steps for migrating to your virtual machine.



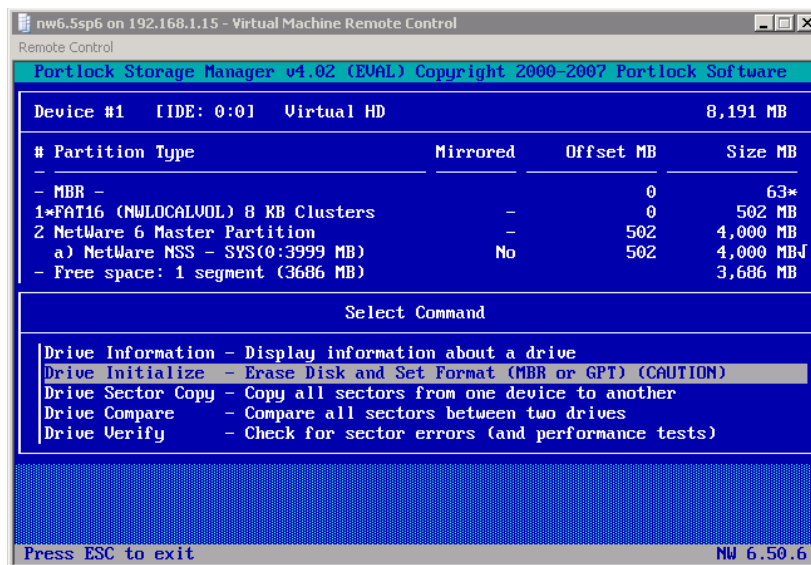
Before beginning the restore process from your virtual machine, it is a good idea to initialize your virtual hard drive, as a newly created virtual hard drive will have unallocated space. This can be accomplished from the **Drive Commands** within Portlock Storage Manager.



Physical-to-Virtual Migration with Portlock Storage Manager

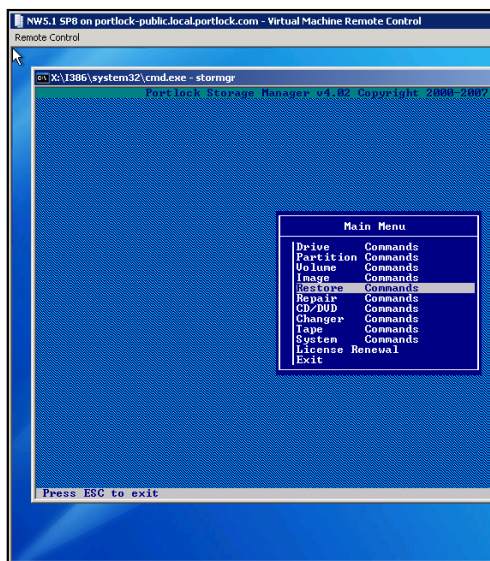
Choose **Drive Initialize** from the selections provided. Continue and choose the option for writing all sectors with a data pattern. It is not necessary to let this run the entire length of your drive, but letting it run for the first couple GB does ensure a pattern was created.

Warning: This will erase existing data (if any) that resides on your virtual hard drive.

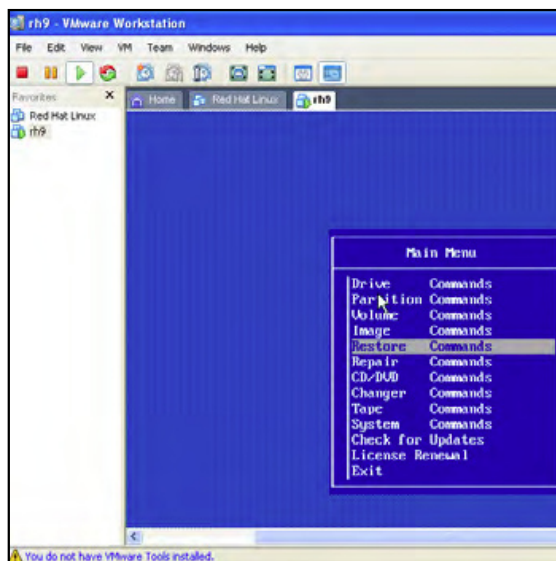


To continue with the physical-to-virtual connection, select the **Restore Command** from the **Main Menu** of Portlock Storage Manager on your virtual machine as shown below.

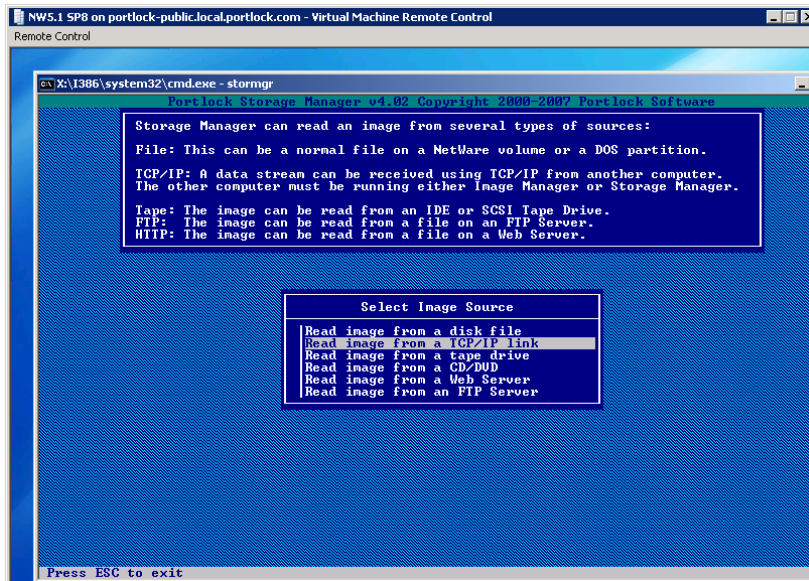
Microsoft Virtual Server



VMware Workstation

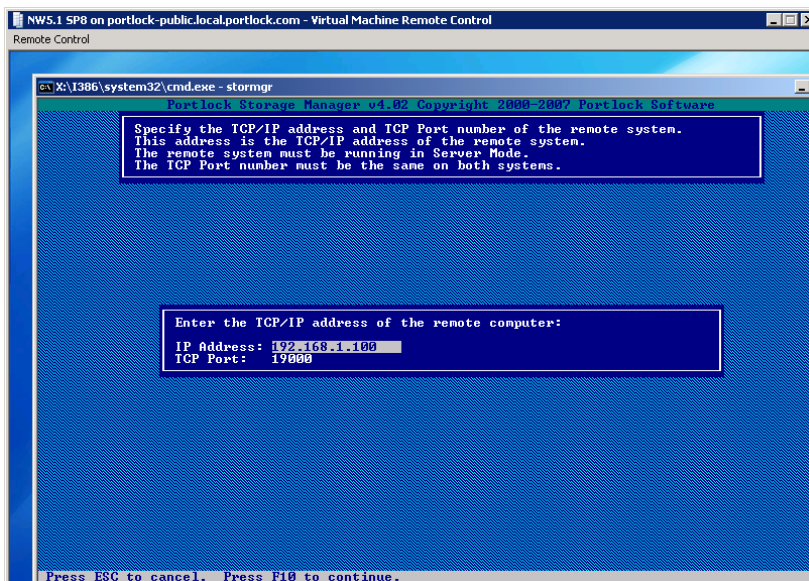


The restore commands provide you with several different options to restore your image. Because we are restoring directly from the source machine, we chose to read the image from a TCP/IP link. TCP/IP will connect you directly between the source and target machine. This will provide you with the fastest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



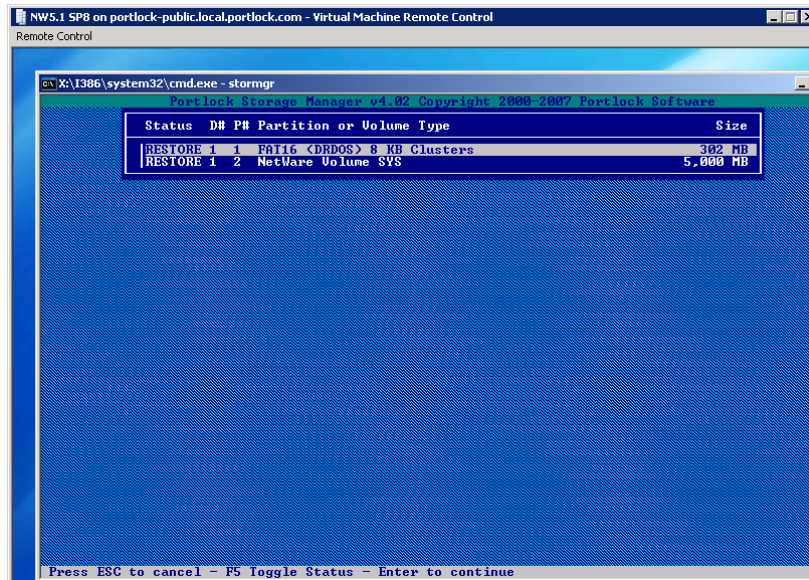
When choosing TCP/IP, you will need to setup your source machine as the server and the target machine as the client. This will provide you with a direct connection between the two machines. Be sure when setting up your TCP/IP connection that you start your server mode first. The server will then wait 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 the source machine. 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 that you plan to restore. Press **[F10]** to continue.



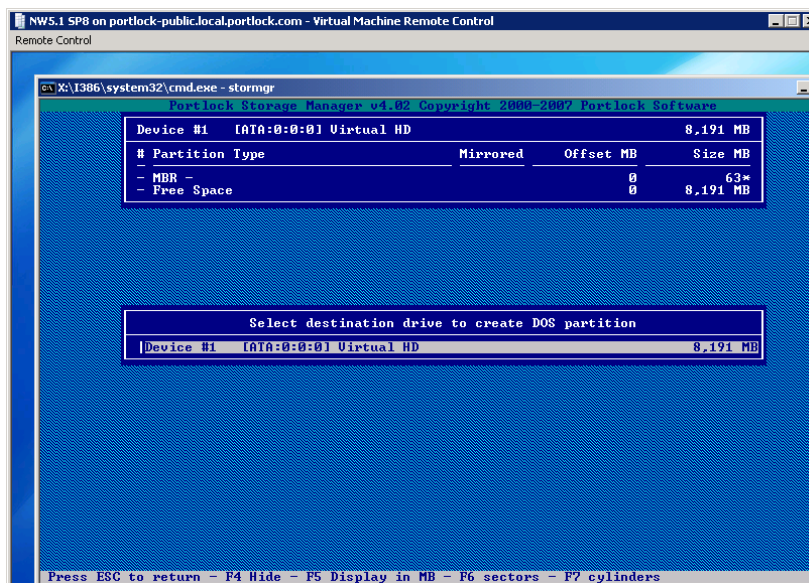
Physical-to-Virtual Migration with Portlock Storage Manager

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. In this example, we are restored the entire image form the source machine. Press **[Enter]** to continue.

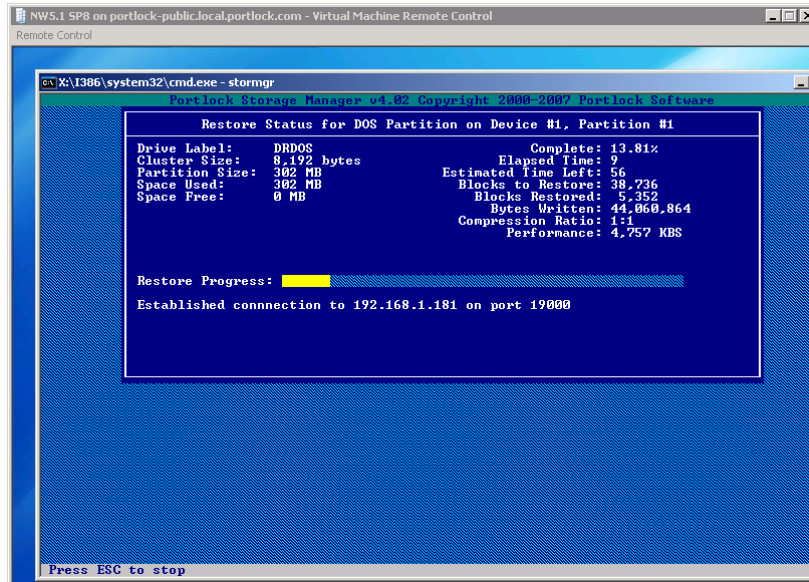


If you have more than one device to choose from on your target machine, choose the device you wish to restore your image to. You will need to make sure that your device has enough room to store your image. If you need to, you can store your image on multiple devices. Press **[Enter]** to continue.

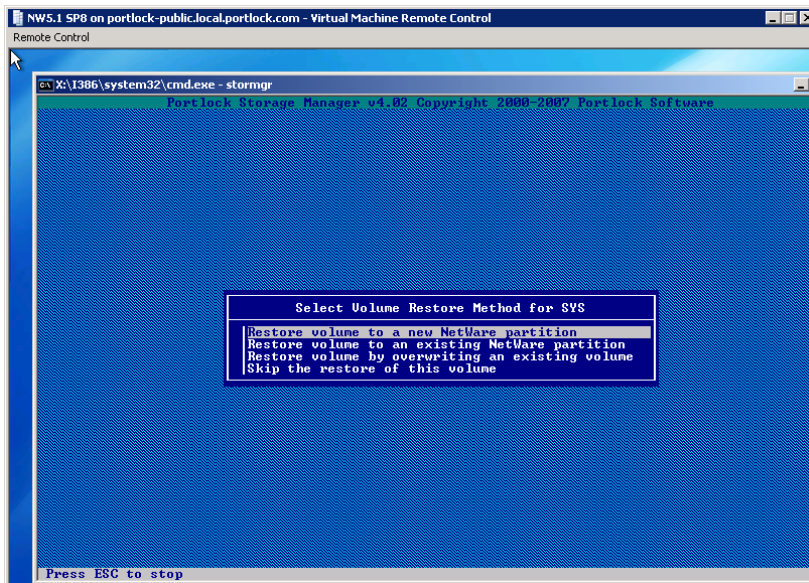
You can now select the empty space that you wish to store your image. If there is not enough space to store your image you will need a second device to store the additional partitions. Press **[Enter]** to continue.



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.

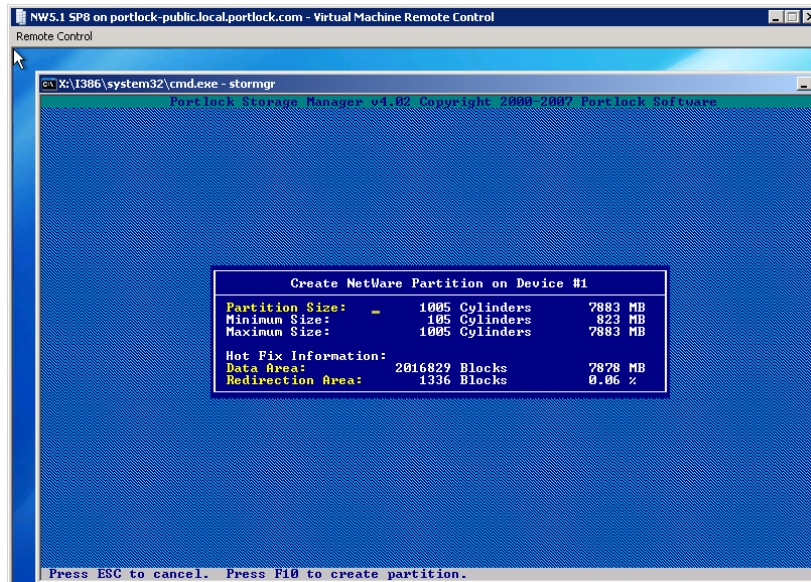


For Netware 5.1 you will be asked for a restore method. If you are migrating to a new virtual machine then you will need to select restore to a new NetWare partition. Press **[Enter]** to continue.

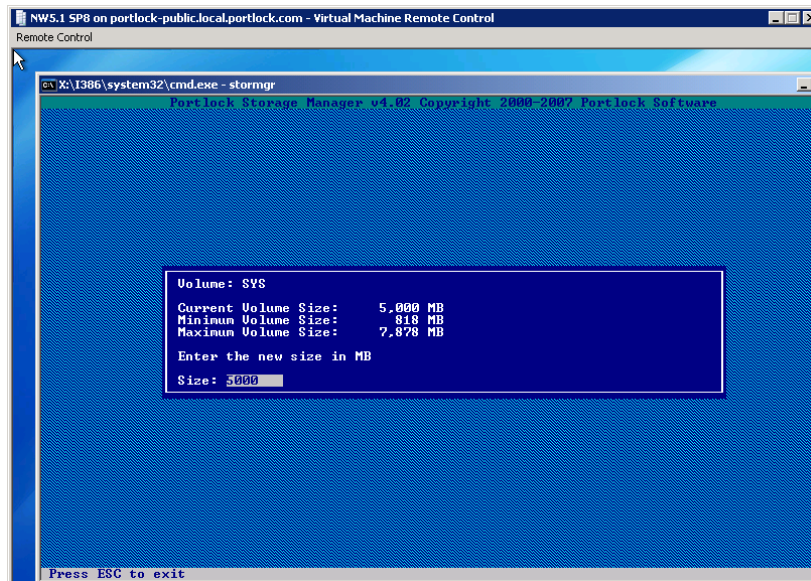


Physical-to-Virtual Migration with Portlock Storage Manager

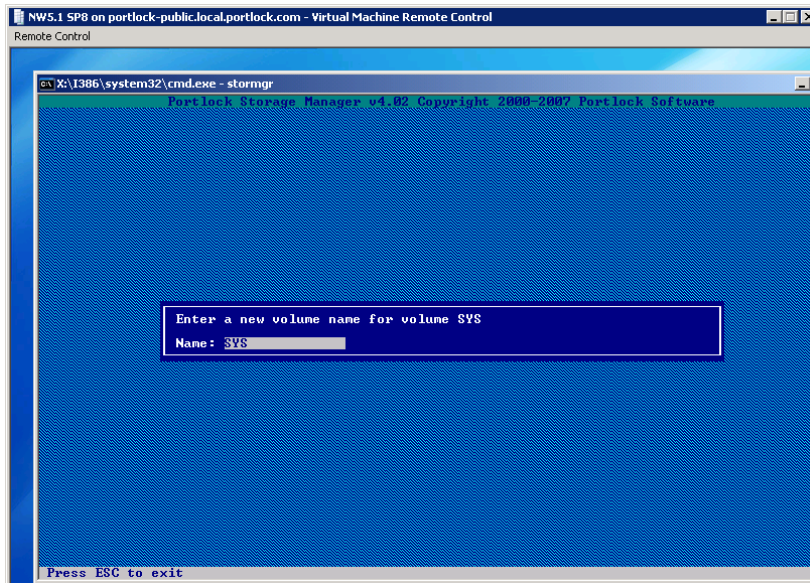
In certain cases Portlock Storage Manager will provide you with the option to resize your partitions. As seen below, you will have a minimum and a maximum partition size. If you are not interested in resizing your partition, leave it set to the default size and press **[F10]** to continue.



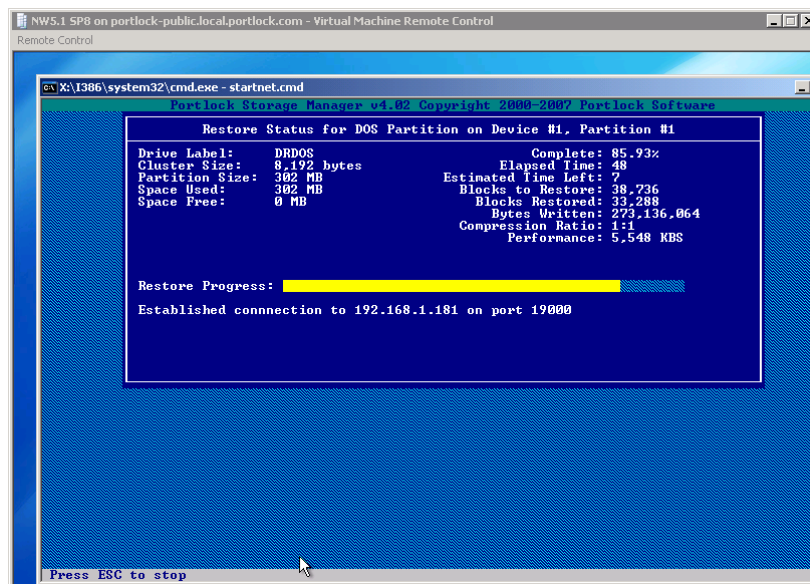
Portlock Storage Manager will provide you with the default partition size. Press **[Enter]** to continue.



Portlock Storage Manager does not allow you to have duplicate pools/volumes with the same name so you will be asked to enter a new volume name for your volume. But because you are going to a virtual disk with no other existing partitions, we recommend that you leave the volume its default name.

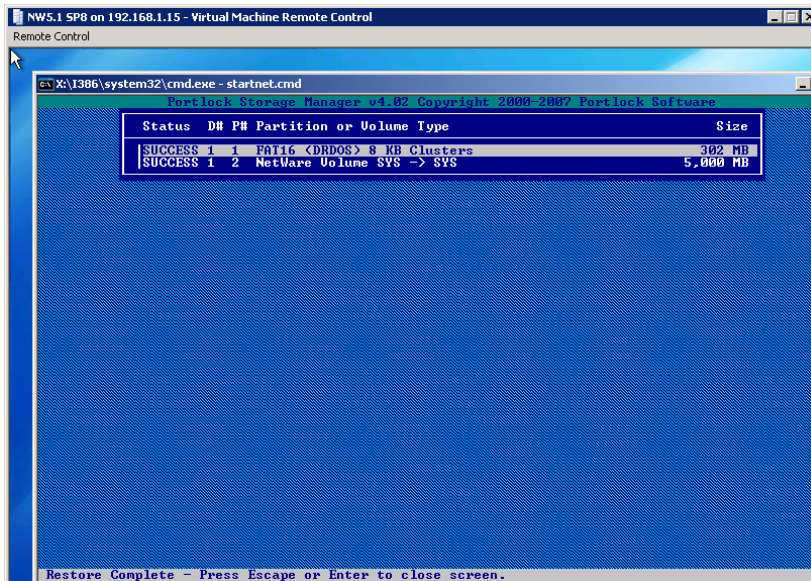


Portlock Storage Manager will now continue with the migration process. The migration is complete once the partition is restored.



Physical-to-Virtual Migration with Portlock Storage Manager

Portlock Storage Manager will now show you your physical partition layout on your virtual machine. If the migration was a success, you can exit and reboot your server.



Netware will detect new hardware and load the necessary drivers. For Netware 5.x & 6.x, use the **nwconfig** command. For Netware 6.5, use the **htdetect** command. Netware will auto-detect your new drivers from one of the previous commands. Once this is complete, reboot your virtual machine. Your migration is now complete.

Netware 4.11 Restore Process

For Netware 4.x, once you have rebooted your server, you should receive something as shown below. Navigate to the nwserver directory by typing `cd nwserver` as also shown below. Now type `server`. Netware 4.x will now continue booting.

1 4.11 on 192.168.1.15 - Virtual Machine Remote Control

```

Starting MS-DOS...

Current date is Tue 05-22-2007
Enter new date (mm-dd-yy): 05-22-2007
Current time is 3:00:39.05p
Enter new time: 3:00:55.05p

Microsoft(R) MS-DOS(R) Version 6.22
(C)Copyright Microsoft Corp 1981-1994.

C:\>
    
```

2 4.11 on 192.168.1.15 - Virtual Machine Remote Control

```

ADSP      MSG      13,698 06-20-96  6:16p
BTRIEVE   MSG      2,253 05-03-96 12:33p
NUT       NLM      27,701 07-01-96  3:43p
NUT       MSG      2,984 10-17-94  2:11p
LCONFIG   SYS      1,574 03-01-94 10:16a
AUTOEXEC  NCF        54 05-22-07 11:41a
DISTRUP   NCF      170 05-22-07 11:41a
NLSSETUP  ILS     5,958 11-17-98  2:32p
ODI       ILS     1,182 11-05-98 12:56p
STARTUP   ILS     1,382 09-09-98  9:37a
NLSSETP2  ILS     5,959 11-17-98  2:32p
ODI2      ILS     1,183 11-05-98  4:57p
411SPACK  ILS     2,011 11-02-98  2:50p
SILENT    ILS    28,952 02-25-99  2:11p
SILENT2   ILS    29,235 02-25-99  2:11p
BACKUP    ILS     3,656 11-02-98  3:26p
SYS       IPS    157,701 02-12-99 10:20a
BOOT      IPS    30,016 02-12-99 10:22a
EXTRA     ICS     496 12-10-98  2:02p
411SPACK  ICS     4,044 12-09-98 10:58a
411SPACK  IPS     3,593 12-09-98 10:59a

512 file(s)
18,987,679 bytes
299,081,728 bytes free

C:\NWSERVER>server
    
```

3 4.11 on 192.168.1.15 - Virtual Machine Remote Control

```

Total server memory: 523,899 Kilobytes

Novell NetWare 4.11 November 3, 1998
(C) Copyright 1983-1996 Novell Inc.
All Rights Reserved.
Patent Pending - Novell Inc.

Tuesday, May 22, 2007 3:05:54 pm MDT

OEM Identification: 999
Maximum Number of License Connections: 5
Installed Licenses:
Serial Number  Connections  License Type  Version  Expiration
63114664       5                WEB/CONN     4.20     NONE

Portions (C) Copyright 1986-1990 RSA Data Security, Inc.

5-22-07 3:05:57 pm: DS-6.0-28
Bindery open requested by the SERVER

5-22-07 3:05:57 pm: DS-6.0-26
Directory Services: Local database is open

TRANSFER:
    
```

4 Portlock Storage Manager interface showing a terminal window with the same boot information as screenshot 3.

