

# Portlock Storage Manager

User Guide

[www.portlocksoftware.com](http://www.portlocksoftware.com)



**PORTLOCK**

# **Portlock Storage Manager Version 3.09 User Guide**

Storage Manager by Portlock Software

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# CHAPTER 1

## Introduction

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### What is Portlock Storage Manager?

Portlock Storage Manager is a software storage management product. Portlock Storage Manager is designed to minimize the management, setup, installation and reconfiguration time for Novell NetWare 3.x, 4.x, 5.x and 6.x servers. Copy, create, clone, image, restore, and resize NetWare and DOS partitions and volumes including NSS, NSS Storage Groups and NSS Storage Pools. Disaster or quick recovery of failed servers is very fast and dramatically simplified.

Portlock Storage Manager supports creating images of NetWare servers. Portlock Storage Manager images can be stored on disk files, TCP/IP communication links, FTP servers and SCSI tape drives. Third generation imaging technology supports streaming to the fastest SCSI tape drives using high performance communications over TCP/IP for server to server cloning.

Portlock Storage Manager provides full-featured control over the size and layout of DOS and NetWare partitions, volumes, NSS volumes and NSS Storage Pools. Compaq, IBM and DELL Diagnostic partitions are also supported.

Novell has chosen Portlock Storage Manager for the NetWare 6 evaluation CD. Install time for NetWare 6 went from 75 minutes to less than 10 minutes.

### Design Philosophy of Portlock Storage Manager

Portlock Storage Manager breaks commands into groups of commands based upon the concept of Disk, Partition, Volume, Image, Restore and Repair. If your goal is to resize a volume, then use the command Volume Resize, located under Volume Commands. If you want to resize a partition, then use the command Partition Resize under Partition Commands.

Before you can modify a storage item, you must select it. Once an item is selected, a command menu will be displayed with the supported commands for that item.

Portlock Storage Manager executes under MS-DOS as an executable and under NetWare as a NetWare Loading Module (NLM). Executing under DOS supports “bare-metal” disaster recoveries without first requiring a NetWare installation.

## Before Loading Portlock Storage Manager

We recommend installing the latest NetWare Service Packs especially if you are using NSS. However, this is not a requirement. Our Quality Assurance Department attempts to test Storage Manager on all versions of NetWare with all Service Pack releases.

Verify your NetWare and NSS volumes prior to modifying them with Storage Manager. Storage Manager does perform a volume check on Traditional and NSS volume prior to beginning any modification operation. This ensures that there is no volume corruption, but even more importantly, ensures that Storage Manager supports the feature set of the volumes. Novell is constantly improving NetWare and this may result in new file system features being added. Storage Manager checks every data structure in a volume to ensure that all features are recognized and supported.

BACKUP your data. The real purpose for servers is to share and manage data. Protect your data by maintaining current and reliable backups before any storage management operation.

Install and use an Uninterruptible Power Supply (UPS). Portlock Storage Manager attempts, wherever possible, to design its features to be fault-tolerant. However, not every disk operation can withstand power failures. Protect your servers with a UPS.

Portlock Storage Manager does not require that client's logoff from the server. Instead of trying to go around NetWare, Portlock Storage Manager works with NetWare. Servers usually do not need to be rebooted after running Portlock Storage Manager. Only the volume being modified needs to be dismounted. However, when a volume is dismounted, files on that volume are no longer accessible. If a volume is dismounted when files are open, users will not be able to write to these files.

## Loading Portlock Storage Manager

The default installation directory for Portlock Storage Manager is SYS:/STORMGR. To load Portlock Storage Manager, type: "load sys:/stormgr/stormgr." We recommend including the logfile command line option: "load sys:/stormgr/stormgr -logfile=sys:/stormgr.log." To execute Portlock Storage Manager from DOS, type: "stormgr -logfile=c:/stormgr.log." Add the "-tcpip" command line option if you will be using TCP/IP (needed only for DOS).

As a shortcut, create a file in the SYS:/SYSTEM directory named "stormgr.ncf." Place the following command line into this file: load sys:/stormgr/stormgr -logfile=sys:/stormgr.log.

Now, you can just type "stormgr" at the server console and load Portlock Storage Manager without specifying the path and options.

## Copying Portlock Storage Manager to a floppy diskette

To use Portlock Storage Manager from a bootable floppy diskette:

**FORMAT** the first floppy diskette with DOS. Then configure this diskette based upon Appendix E.

**COPY** the following files to the second floppy diskette:

- stormgr.exe (DOS executable)
- stormgr.clm (compressed version of STORMGR.NLM)
- stormgr.lic (license file)
- tcpipn.nlm (supports TCP/IP with the Novell Client 32 for DOS)

**BOOT** the server using the floppy diskette.

If you will be using the Novell Client to attach to another NetWare server, create a bootable TCP/IP diskette using the Novell DOS Client. There are a number of preconfigured TCP/IP boot diskettes on our web site <http://www.portlocksoftware.com>.

Portlock Storage Manager supports TCP/IP for communications from DOS. The TCP/IP stack supported is the Novell Client32 TCP/IP. When starting Portlock Storage Manager from DOS, use the command line option “-tcpip,” which will enable TCP/IP support in Portlock Storage Manager. If you see the error message “Error: Could not obtain a TCP/IP socket” from Portlock Storage Manager, then the Novell TCP/IP stack is not installed or configured correctly.

See Appendix E for an example configuration.

## Supporting SCSI Devices under DOS

By default, the DOS version of Portlock Storage Manager uses the INT13 and Extended INT13 interfaces to detect and interface to disk drives. For SCSI devices, we recommend adding the appropriate ASPI device driver to the config.sys file when using Portlock Storage Manager from DOS. These ASPI device drivers are written by the SCSI controller manufacturer and are downloadable from their web site. To access a SCSI tape drive, an ASPI device driver is required.

**Note:** When running Portlock Storage Manager from DOS, verify that Portlock Storage Manager is seeing the entire capacity of the disk drive. Many systems have BIOS limitations of 8 GB. Adding an ASPI device driver will usually correct this problem. For some systems, you may need to update the motherboard BIOS.

## Configuring TCP/IP for DOS

Portlock Storage Manager supports TCP/IP for communications from DOS. The TCP/IP stack supported is the Novell Client32 TCP/IP. Install the Novell Client selecting the option to install TCP/IP.

When starting Portlock Storage Manager from DOS, use the command line option “-tcpip,” which will enable TCP/IP support in Portlock Storage Manager. If you see the error message “Error: Could not obtain a TCP/IP socket” from Portlock Storage Manager, then the Novell TCP/IP stack is not installed or configured correctly. See Appendix F for an example configuration.

Portlock Storage Manager is already configured to use NetWare’s TCP/IP stack. You may need to load the appropriate drivers and frame types.

## Technical Support

Portlock Software is committed to providing support for its products that exceeds the industry standard for software companies. We provide support via our web site, email and the telephone.

**Note:** *Technical Support is only available in English.*

### Before Contacting Technical Support:

- Verify that you are running the current version of Portlock Storage Manager. We update our products very often. The **README** file may indicate that we have already corrected your problem.
- Run Portlock Storage Manager with the **-logfile** command line option. Technical Support will usually ask for the logfile so that we can see your hardware and software configuration.
- Write down any error or warning messages exactly as displayed by Portlock Storage Manager. This will often help Technical Support identify the location of the error in the Portlock Storage Manager source code. This can greatly speed up resolution of a support issue.

## **Contacting Technical Support by EMAIL:**

When sending email to Technical Support [support@portlocksoftware.com](mailto:support@portlocksoftware.com), please include the following information when possible:

- Detailed description of the problem including warning or error information
- The logfile created by Storage Manager
- NetWare version and Service Pack
- Hardware make and model
- Details about the storage devices
- Other information that might help us understand the issue

You can expect a reply from our Technical Support within **ONE** business day.

## **Contacting Technical Support by Telephone:**

If you are reporting a problem with Portlock Storage Manager, our preferred support contact is by email. However, sometimes you just want to ask a simple question to clarify how to best use Portlock Storage Manager. Give us a call, we will try our best to help you best use Portlock Storage Manager.

When calling Technical support prepare the following information before calling:

- Detailed description of the problem including warning or error information
- The logfile created by Portlock Storage Manager
- NetWare version and Service Pack
- Hardware make and model
- Details about the storage devices
- Other information that might help us understand the issue

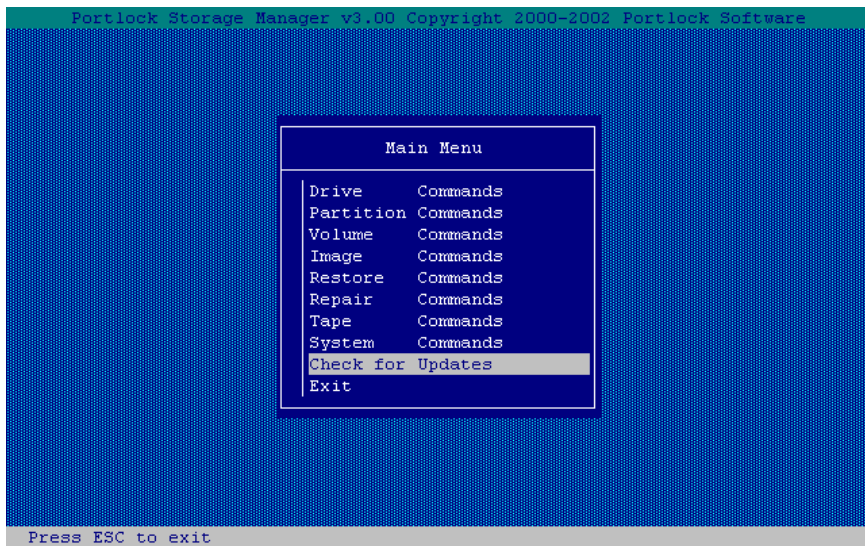
## **Corporate Web Site:**

The Portlock Software web site [www.portlocksoftware.com](http://www.portlocksoftware.com) includes documents, technical support information, answers to frequently asked questions, tips and techniques, and newsletters that may help you better understand and use Portlock Storage Manager.

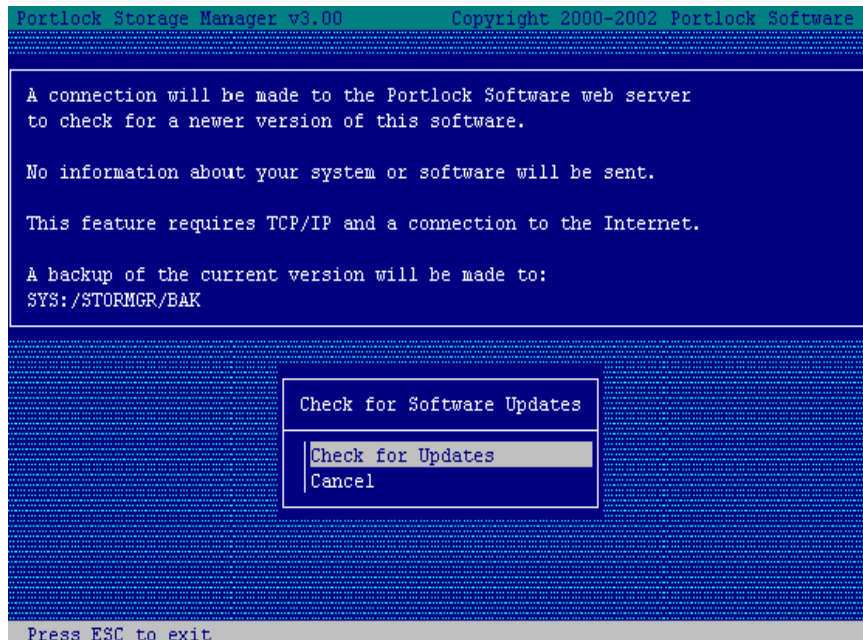
## Updating Portlock Storage Manager

Portlock Storage Manager supports updating itself from our web site to the latest version. Select the command Check for Updates from the Main Menu.

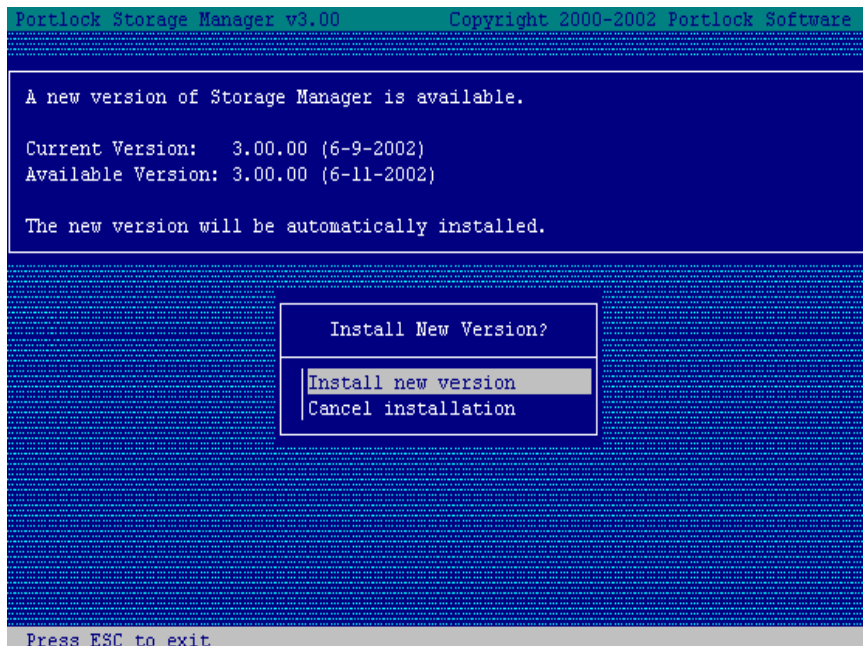
In order to update the Portlock Storage Manager Software, a connection will be made to the Portlock Software web server to check for a newer version. No information about your system or software will be sent. This feature requires TCP/IP and a connection to the Internet. A backup of the current version will be made to: SYS: /STORMGR/BAK.



From the Main Menu, select Check for Updates and press [Enter].



In order to begin the update, select **Check for Updates** from the Check for Software Updates screen and press [Enter].



Once the server is connected, the **Update Availability** Screen will appear informing you if there is a new version of Portlock Storage Manager. Select **Install new version** and press [Enter].





# CHAPTER 2

## **Installing Portlock Storage Manager**

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### **Installing Portlock Storage Manager on DOS**

If you are installing from a CD-ROM, insert the CD-ROM into your drive. If you downloaded the software from our web site, the software is packaged as a zip file. Create a temporary directory on your system and unzip the files.

We recommend putting the files into a directory C:\STORMGR. The software is already configured, and no further configuration is necessary.

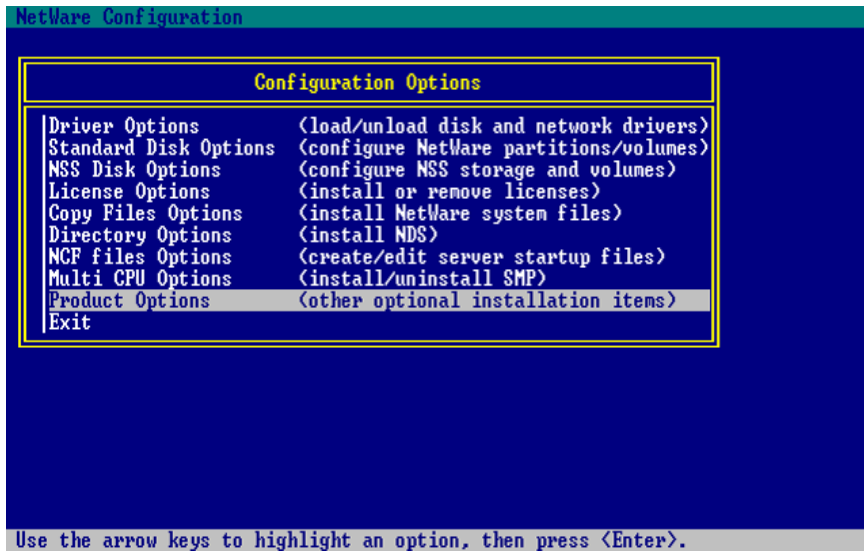
We do recommend using DOS 6.22. To enable maximum memory for Storage Manager, add himem.sys and emm386.exe to your config.sys. Also see Appendix E.

### **Installing Portlock Storage Manager on NetWare**

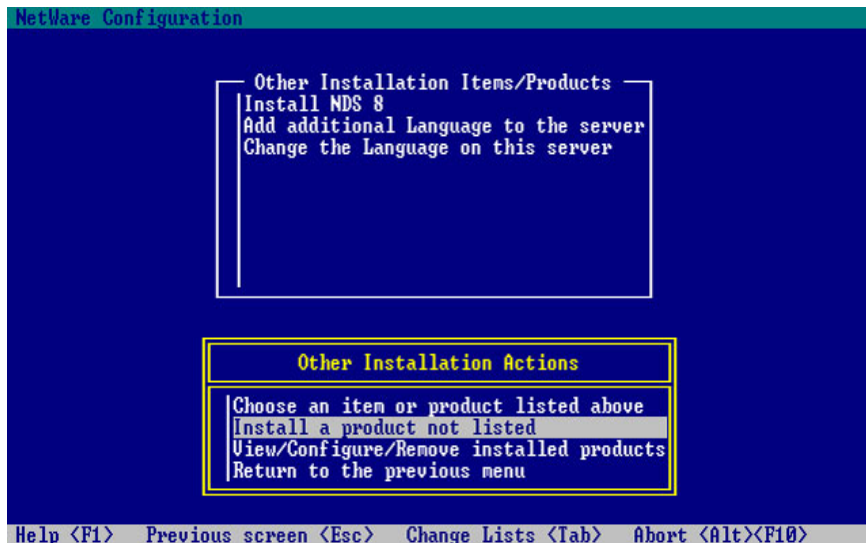
If you are installing from a CD-ROM, insert the CD-ROM into your drive. If you downloaded the software, the software is packaged as a zip file. Create a temporary directory on your system and unzip the files. This software does not require an installation; however, there are three supported installation methods:

## Method One using INSTALL.NLM or NWCONFIG.NLM

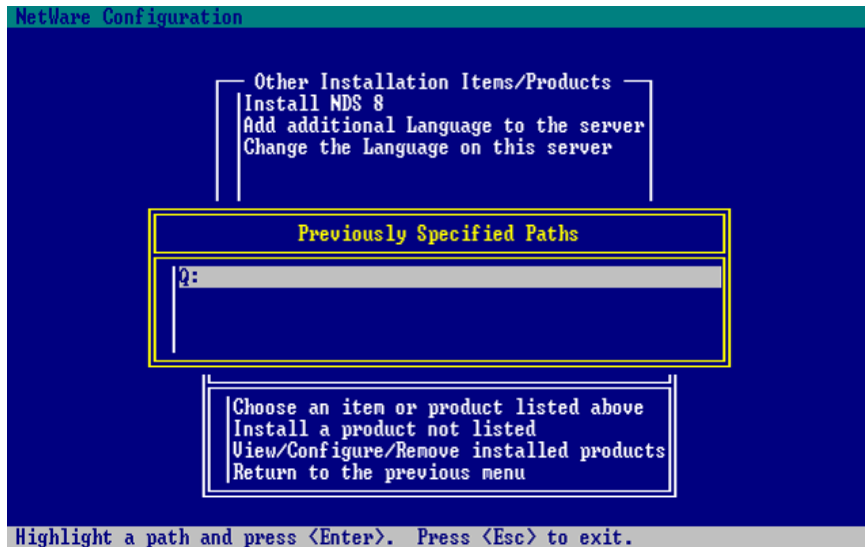
First, copy the files either to a floppy or to a temporary directory on your server.



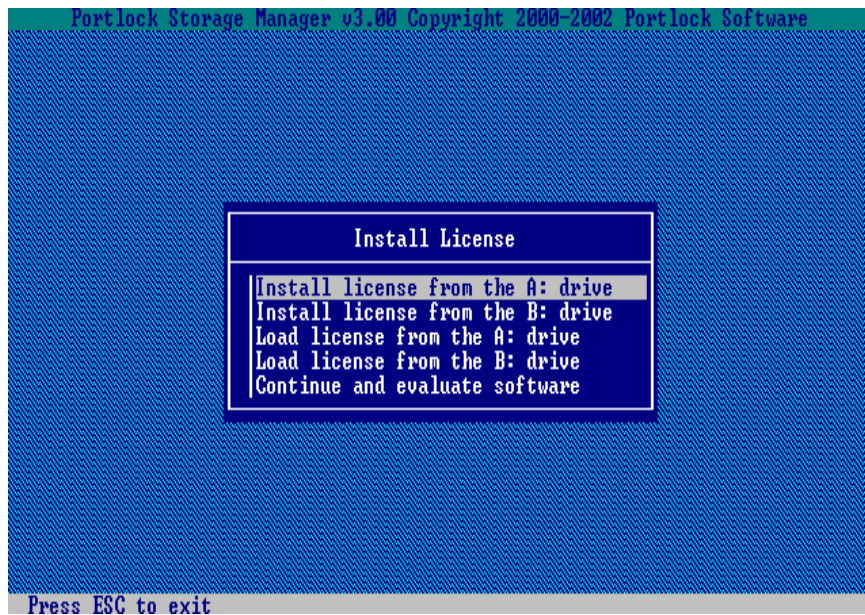
From the **Configuration Options** menu, select “**Product Options**” and press [Enter].



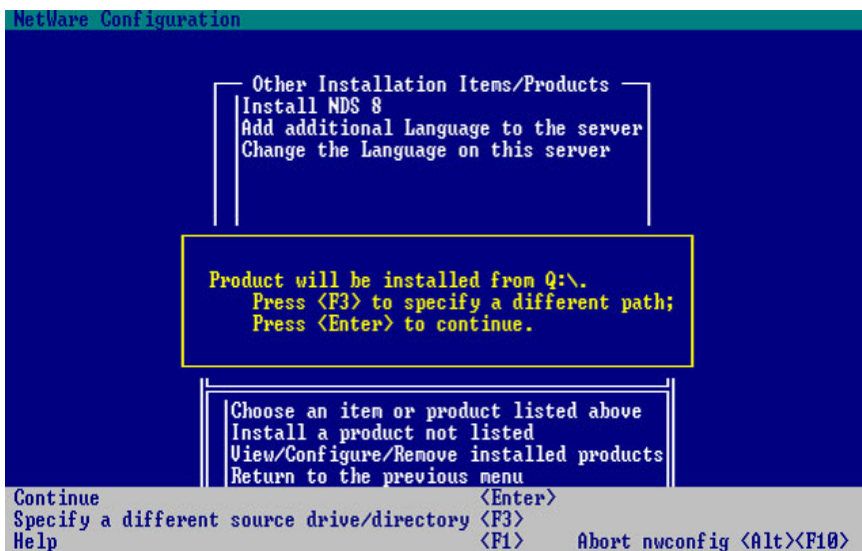
From the Other Installation Actions menu, select “Install a product not listed.”



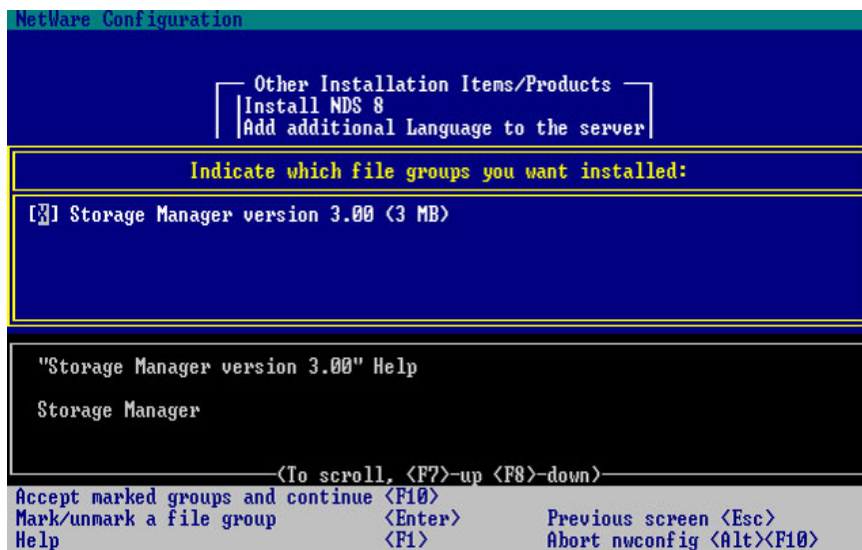
Type "E:\STORMGR," where as E:\ is the drive letter of your CD-ROM drive, or specify the path where the software was copied (e.g. SYS:\TMP).



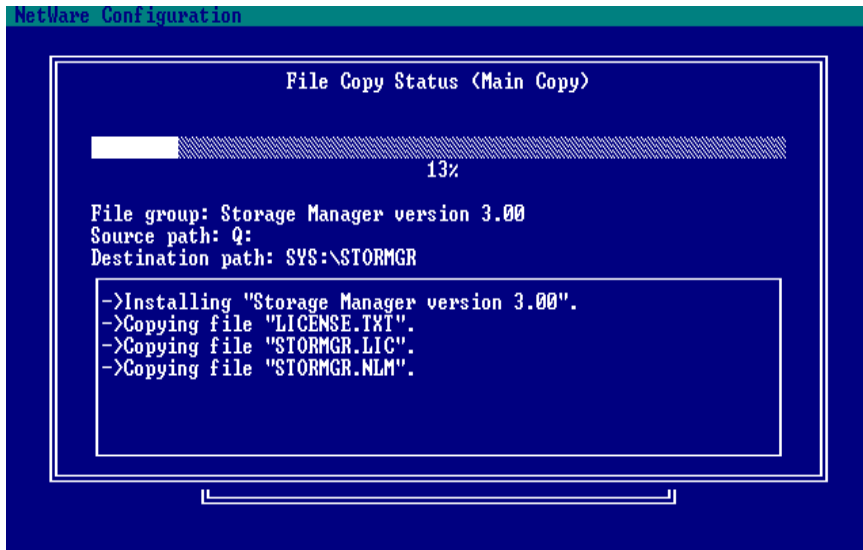
The last installation task is to install the license file from the **Install License Screen**. Choose the Install license option with the appropriate drive and press [Enter].



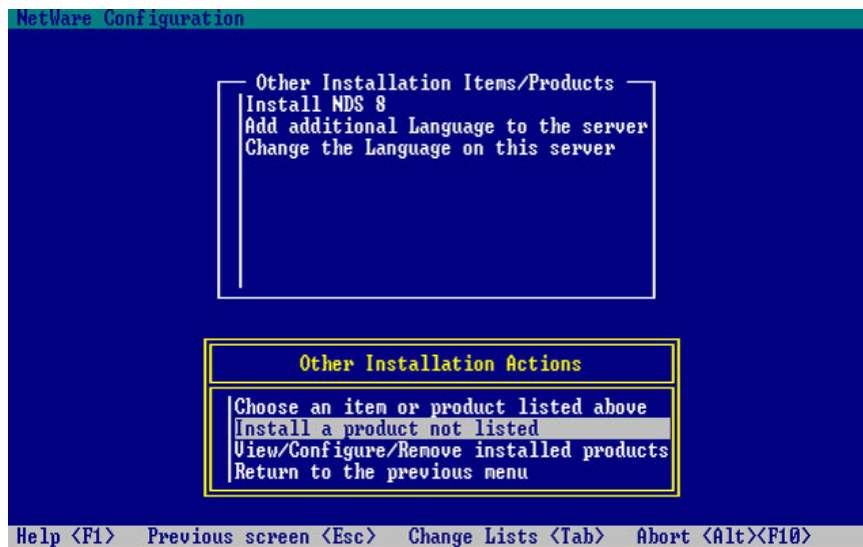
Storage Manager will be installed to the location specified in the previous screen.



Additional files can also be installed (if available).



The file copy status screen will appear indicating the progress of the installation.



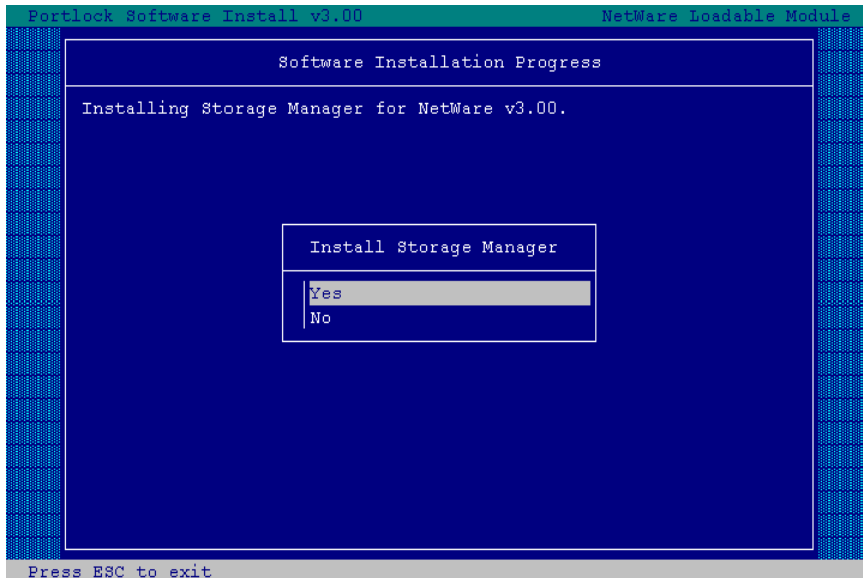
After installation is complete, you will be directed back to the “**Other installation screen.**”

## Method Two using the directory SYS:/STORMGR

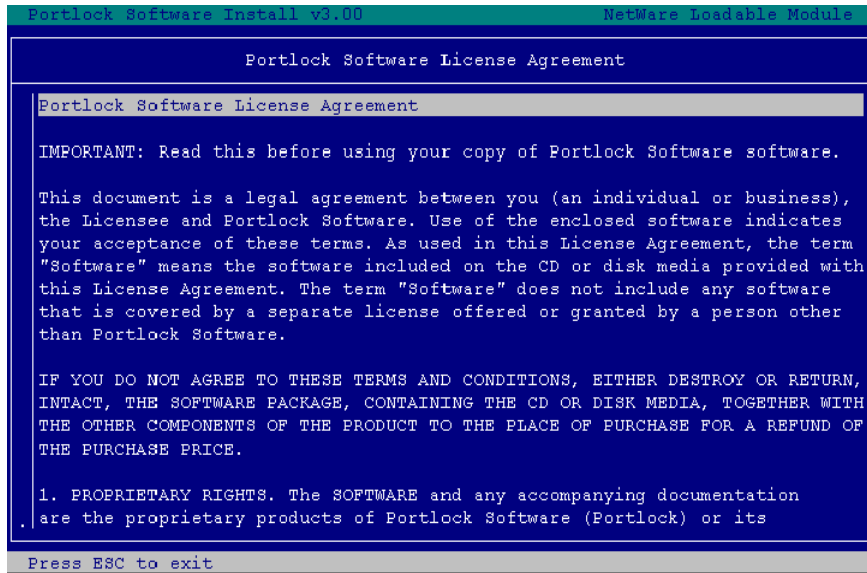
To install Storage Manager using the directory SYS:/STORMGR, copy the files to the SYS:/STORMGR directory on your server. The software can also be copied to any directory on your server.

## Method Three using PINSTALL.NLM

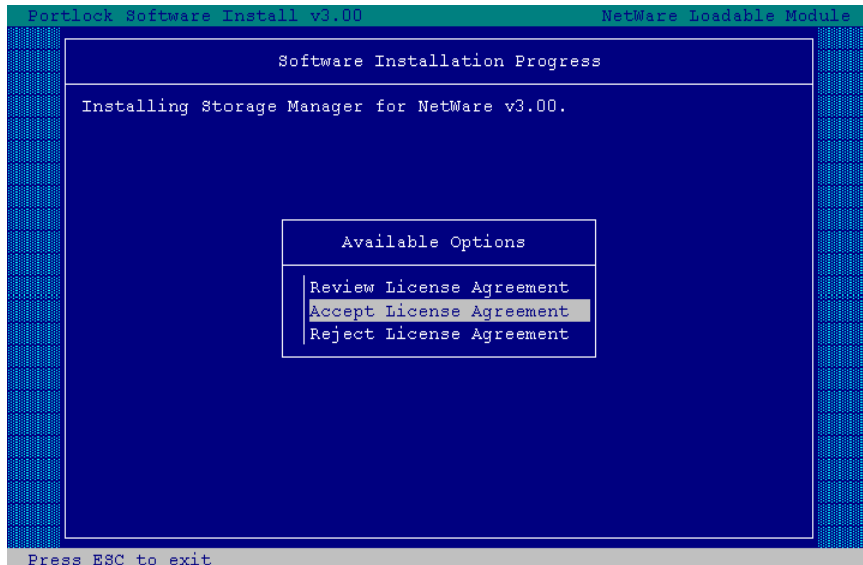
From the server console, type: “**load a:pinstall.nlm**” if the files are on a floppy diskette, or type “**load <path>/pinstall.nlm**” if the files are on a directory on the server.



From the **Install Storage Manager** screen, choose **YES** to begin installing Portlock Storage Manager. Press [Enter] to continue.



This screen shows the Portlock Software License Agreement. After reviewing the license agreement, hit [Enter] to continue and accept the license agreement or [ESC] to return to the previous screen.



From the **Available Options** menu, choose the option **Accept License Agreement** and press [Enter] to continue with the installation.

```

Portlock Software Install v3.00                               NetWare Loadable Module

Software Installation Progress

Installing Storage Manager for NetWare v3.00.

Destination Directory: SYS:/STORMGR
Copying file q:/license.txt
Copying file q:/readme.txt
Copying file q:/history.txt
Copying file q:/imagemgr.nlm
Copying file q:/imagemgr.exe
Copying file q:/stormgr.exe
Copying file q:/stormgrv.exe
Copying file q:/stormgr.lic
Copying file q:/stormgr.nlm
Copying file q:/stormgr.pdf

Press ESC to exit

```

After accepting the license agreement, the status screen will display showing which files have been copied, the location (the default installation directory is “SYS:/STORMGR”), and if the installation was successful.

```

Portlock Software Install v3.00                               NetWare Loadable Module

Software Installation Progress

Installing Storage Manager for NetWare v3.00.

Destination Directory: SYS:/STORMGR
Copying file q:/license.txt
Copying file q:/readme.txt
Copying file q:/history.txt
Copying file q:/imagemgr.nlm
Copying file q:/imagemgr.exe
Copying file q:/stormgr.exe
Copying file q:/stormgrv.exe
Copying file q:/stormgr.lic
Copying file q:/stormgr.nlm
Copying file q:/stormgr.pdf
Copying file q:/svrupd10.nlm
Copying file q:/svrupdxx.nlm
Copying file q:/tcpipn.nlm

The installation was successful.
Type "load sys:/stormgr/stormgr" to execute.

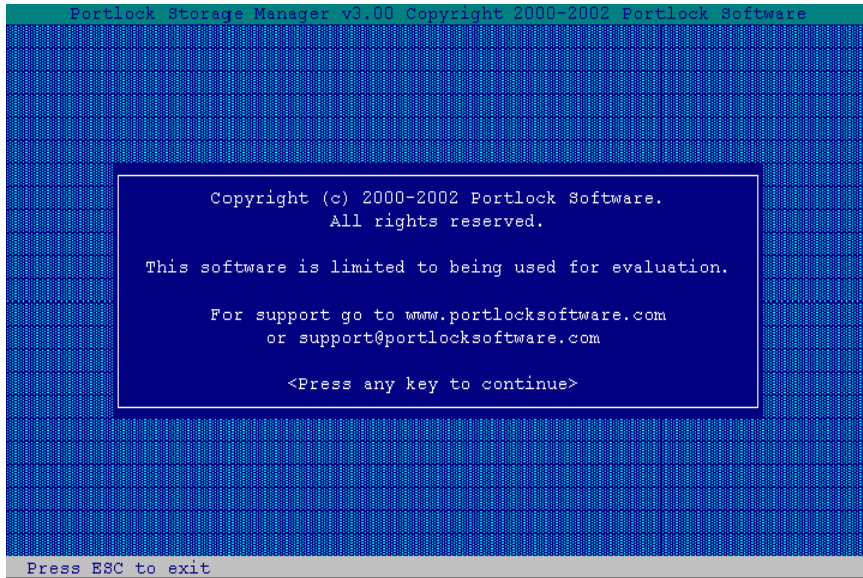
Press ESC to exit

```

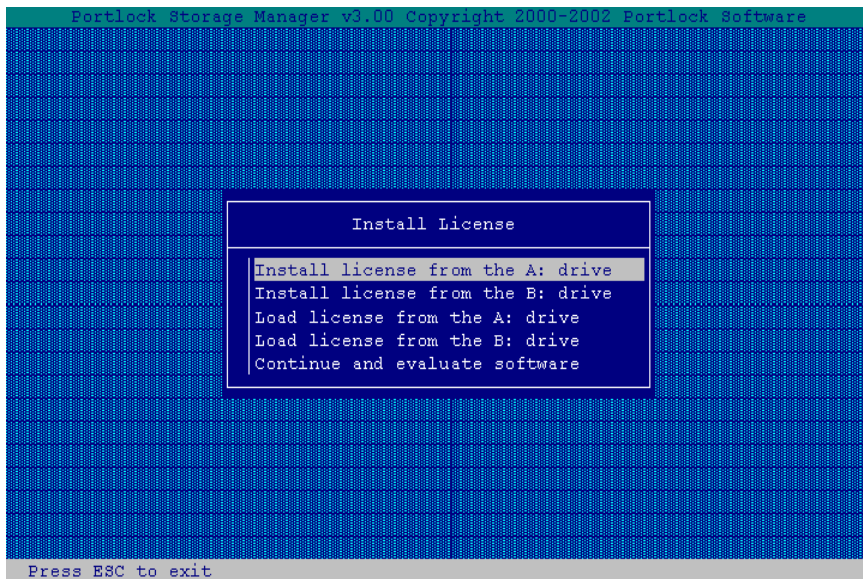
This screen is showing that the installation of Storage Manager was successful.

To execute the software, type: “**load sys:/stormgr/stormgr**” at the server console.



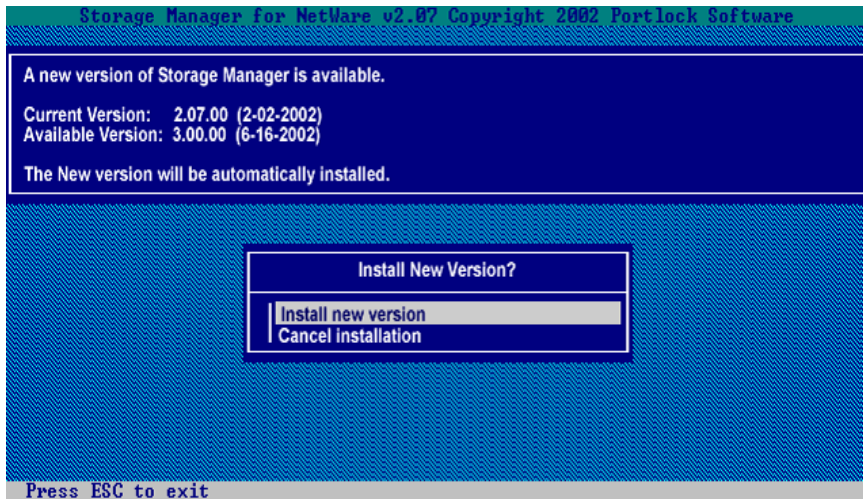


The Storage Manager copyright screen will display. Press [ESC] to exit.

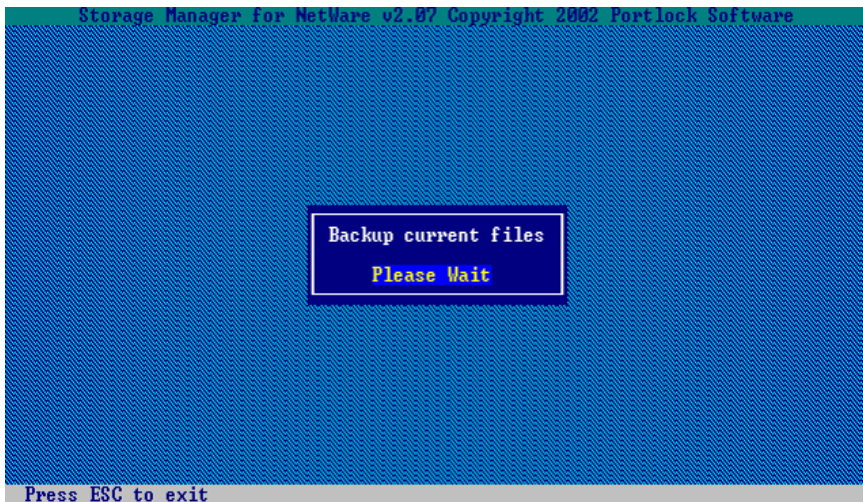


You are now prompted to install the license diskette, or to continue the evaluation of the software. To install the production version of the software, you must insert the license diskette into the A: drive. Press [Enter] once completed.

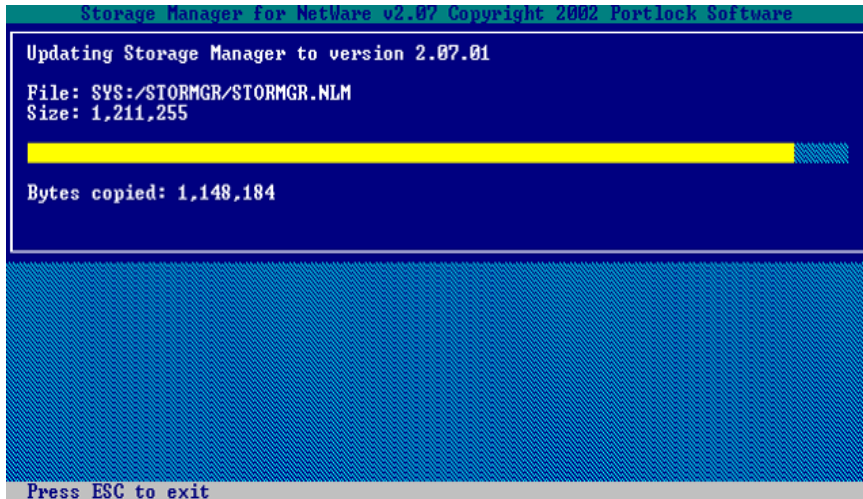
## Installing a Newer Version of Portlock Storage Manager



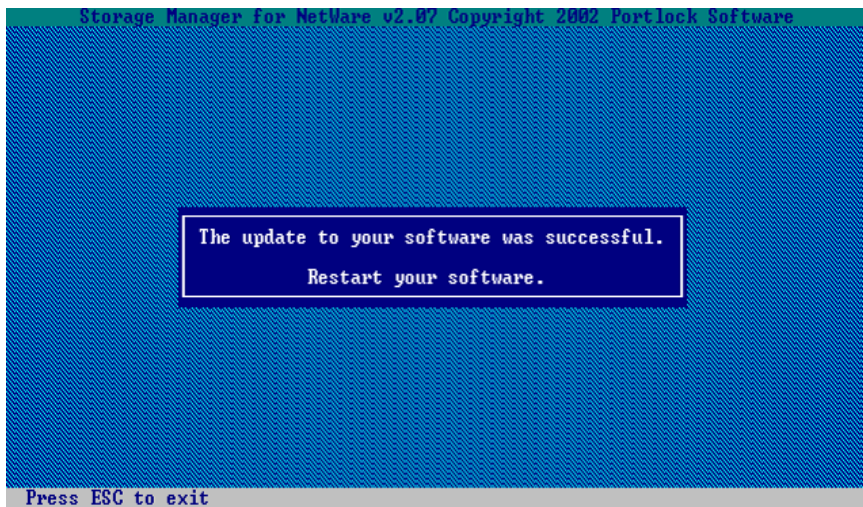
From the **Install New Version** screen, select “**Install New Version**” and press [ENTER].



After deciding to Install new version, Portlock Storage Manager will back up the current version and name it BAK.

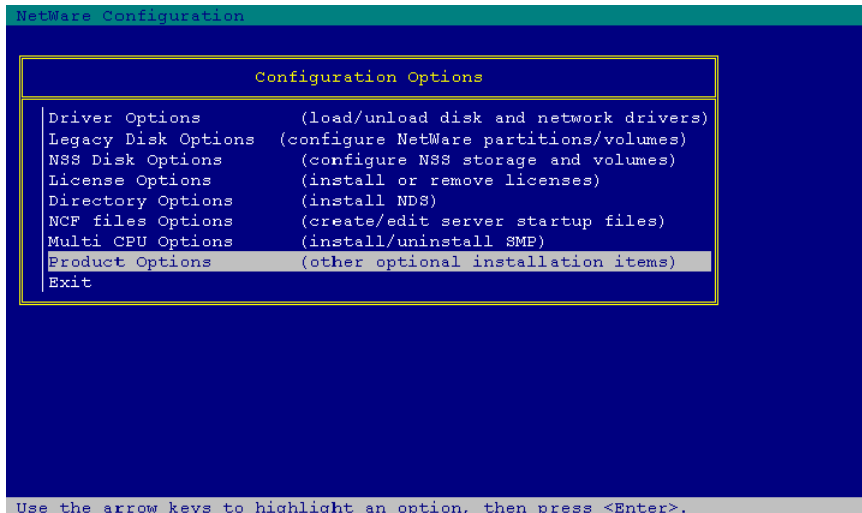


The **Update Process Screen** will appear while the update is taking place.

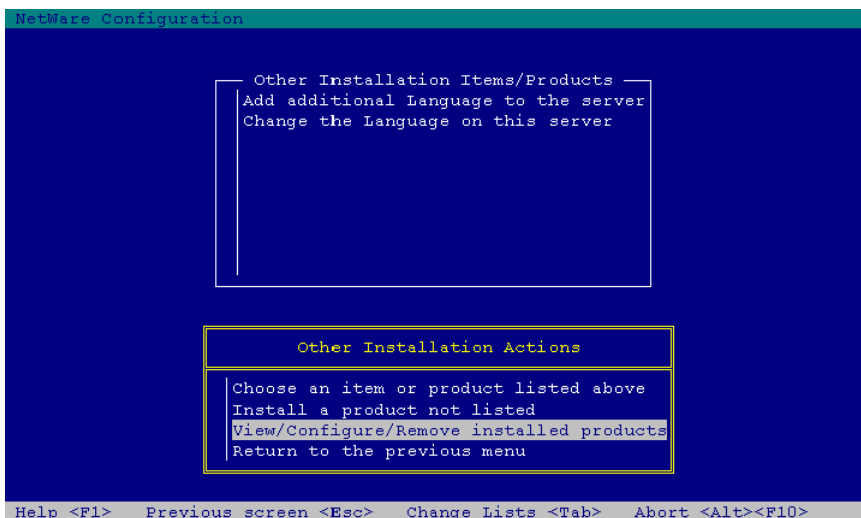


The **Update Success** screen will appear indicating the update was successful. You will now need to unload and reload Portlock Storage Manager to run the newly downloaded version.

## Uninstalling Portlock Storage Manager using NW Config



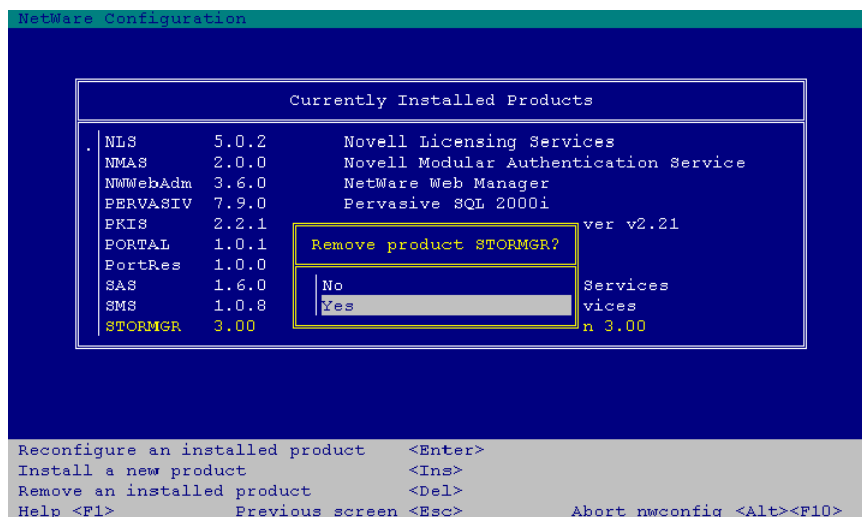
To remove the software, use INSTALL.NLM (NW 3 & 4) or NWCONFIG.NLM (NW 5 & 6). First select **Product Options** from the **Configuration Options** menu and press [Enter].



From the **Other Installation Actions** menu, select **View/Configure/Remove installed products** and press [Enter].



Select **Storage Manager** from the **Currently Installed Products** list and press delete.



The **Remove Product Storage Manager** screen will appear asking you to choose YES or NO. Select the option **YES** and press [Enter].



# CHAPTER 3

## Drive Commands

---

The **Drive Command** displays information about a device and the host adapter that it is connected to. This includes the partition table information, device size, and the geometry and adapter characteristics.

This command can help with diagnosing problems with the interface to a device. For example, you have installed a new 120 GB IDE disk drive, but NetWare only sees 32 GB. By using the Drive Information Command, you could verify what size the NetWare device driver is reporting to the operating system. If the Drive Information Command also displays 32 GB, then the problem is with the device driver and the manufacturer should be contacted to obtain an updated device driver.

To execute the **Drive Information Command**, start Storage Manager using one of the following parameters:

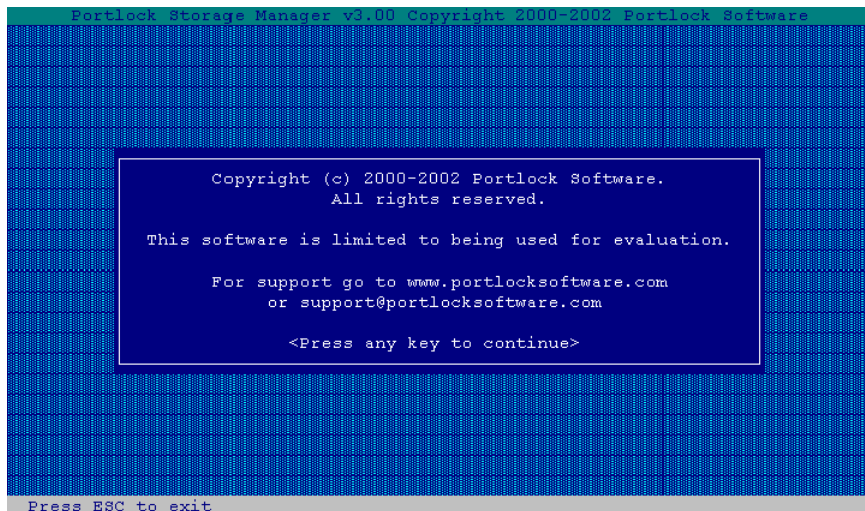
For NetWare:

- “load sys:/stormgr/stormgr–logfile=sys:/stormgr.log”

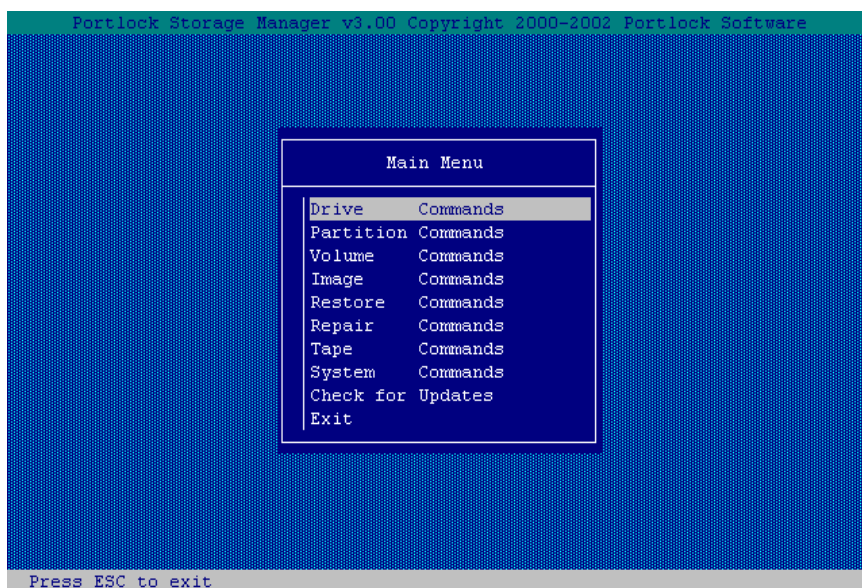
For DOS:

- “stormgr–logfile=c:/stormgr.log”





The Portlock Software copyright screen will display. Press any key until the **Main Menu** appears.



The Main Menu offers access to all the features of Storage Manager quickly and easily. From the **Main Menu** screen, choose “**Drive Commands**” and press [Enter].



Portlock Storage Manager v3.00

Copyright 2000-2002 Portlock Software

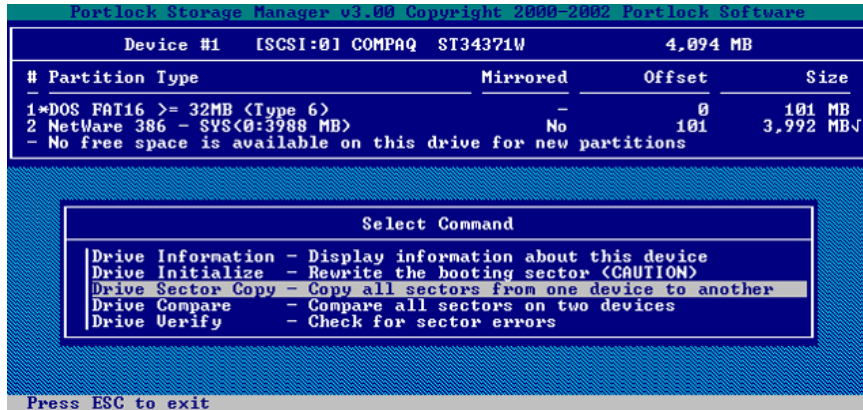
Device #1		[SCSI] COMPAQ ARRAY CONTROLLER	8,673 MB	
#	Partition Type	Mirrored	Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-	0	203 MB
2	NetWare 6 Master Partition Table	-	203	4,012 MB
a)	NetWare 6 - SYS(0:4005 MB)	No	203	4,010 MB✓
-	Free space: 1 segment (4458 MB)			4,458 MB

Select Drive

Device #1	[SCSI] COMPAQ ARRAY CONTROLLER	8,673 MB
Device #2	[SCSI] COMPAQ ARRAY CONTROLLER	34,702 MB
Device #3	[SCSI] COMPAQ ARRAY CONTROLLER	34,731 MB

Press ESC to return - F5: Display in MB - F6: sectors - F7: cylinders

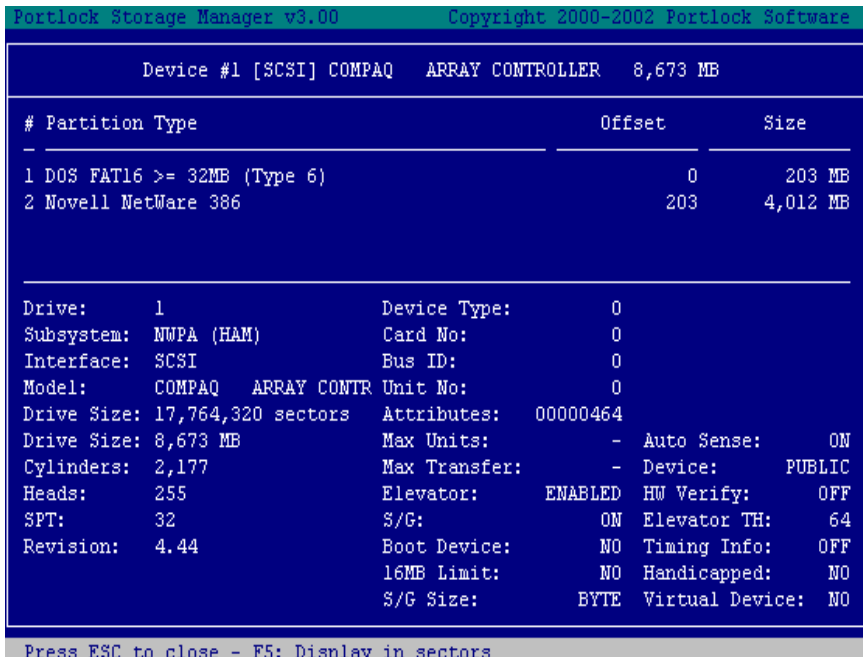
The **Select Drive** screen will appear displaying a list of devices that have been configured on your system. The top part of the screen displays the partitions configured on a device, and the bottom part displays the configured devices. To change the device, scroll thru the list of devices using the up and down arrow keys. Once you have decided which device to manage, press [Enter].



From the **Select Command** menu, you are given five choices:

- 1 Drive Information
- 2 Drive Initialize
- 3 Drive Sector Copy
- 4 Drive Compare
- 5 Drive Verify

For this example, choose the **Drive Information** option. Drive Information displays all drive information such as partition type, size, cylinders and sectors. Press [Enter] to continue.



The Drive Information window will appear.

The following is an explanation of the Drive Information window.

Descriptor	Explanation
<b>Drive:</b>	This is the drive number of the NetWare device. Drive numbers start at 1. For example, if a system has 5 disk devices the valid drive numbers would be 1 to 5.
<b>Subsystem:</b>	This displays the subsystem type. NetWare supports several different interfaces: <ul style="list-style-type: none"> <li>· NWPA – NetWare Peripheral Architecture</li> <li>· NWIO – NetWare I/O Architecture</li> <li>· EMU – NetWare Emulator</li> </ul>
<b>Interface:</b>	This displays the device interface type. NetWare supports several different device types: <ul style="list-style-type: none"> <li>· IDE– Intelligent Device Interface</li> <li>· EIDE – Enhanced Intelligent Device Interface</li> <li>· SCSI – Small Computer Systems Interface</li> <li>· I2O – Intelligent I/O Architecture, which is a higher-level interface that moves the device driver onto the controller.</li> </ul>
<b>Model:</b>	This displays the make and model of the disk drive as reported by the drive's firmware.
<b>Drive Size:</b>	This displays the size of the disk drive in two fields. The first field displays the drive size in sectors, and the second in Megabytes.*
<b>Cylinders:</b>	This field displays the number of logical cylinders for the drive. Modern drives no longer have a correlation between logical cylinders and physical cylinders.
<b>Heads:</b>	This field displays the number of logical heads for the drive. Modern drives no longer have a correlation between logical heads and physical heads.
<b>SPT:</b>	This field displays the number of logical sectors per track for the drive. Modern drives no longer have a correlation between logical sectors per track and physical sectors per track.
<b>Revision:</b>	This field displays the firmware version of the disk drive as reported by the drive's firmware.

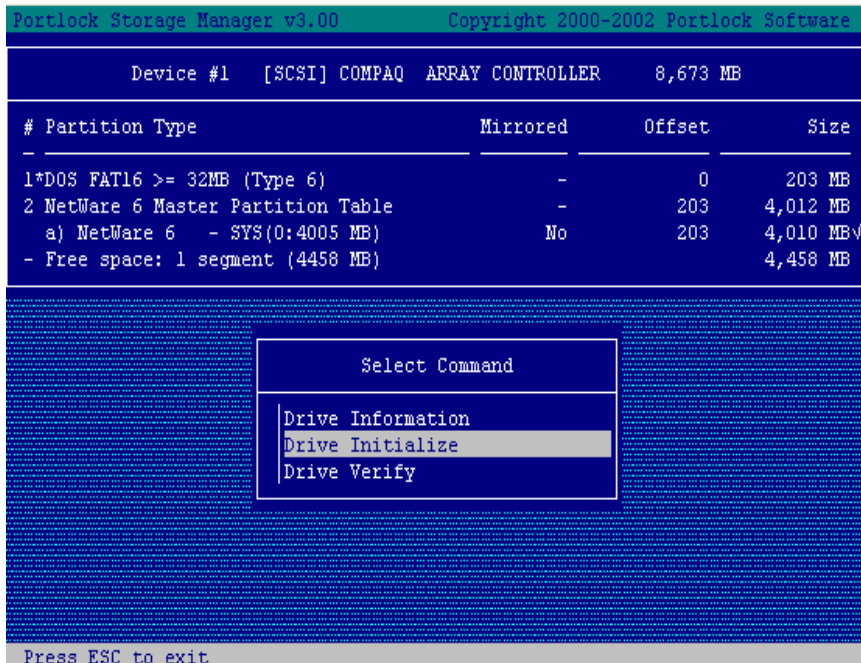
Device Type:	<p>This field contains a value representing the type of device. The following is a list of valid device types:</p> <table><tr><td>0</td><td>Direct Access Device – Hard Disk</td></tr><tr><td>1</td><td>Sequential Access Device – Tape Drive</td></tr><tr><td>2</td><td>Printer Device</td></tr><tr><td>3</td><td>Processor Device</td></tr><tr><td>4</td><td>Write Once Device – WORM</td></tr><tr><td>5</td><td>CD-ROM Device</td></tr><tr><td>6</td><td>Scanner Device</td></tr><tr><td>7</td><td>Optical Memory Device – MO</td></tr><tr><td>8</td><td>Media Changer Device</td></tr><tr><td>9</td><td>Communications Device</td></tr></table>	0	Direct Access Device – Hard Disk	1	Sequential Access Device – Tape Drive	2	Printer Device	3	Processor Device	4	Write Once Device – WORM	5	CD-ROM Device	6	Scanner Device	7	Optical Memory Device – MO	8	Media Changer Device	9	Communications Device
0	Direct Access Device – Hard Disk																				
1	Sequential Access Device – Tape Drive																				
2	Printer Device																				
3	Processor Device																				
4	Write Once Device – WORM																				
5	CD-ROM Device																				
6	Scanner Device																				
7	Optical Memory Device – MO																				
8	Media Changer Device																				
9	Communications Device																				
Card No.:	<p>This field contains the host adapter card number generated by the HAM. This is used internally by NetWare to enumerate host adapters.</p>																				
Bus. ID.:	<p>This field contains the SCSI ID for SCSI devices or the HAM generated index for IDE devices.</p>																				
Unit No:	<p>This field contains the SCSI LUN for SCSI devices or the device number for the IDE devices: 0 for Master and 1 for Slave.</p>																				
Attributes:	<p>This field contains the attributes associated with a device and the adapter to which it is attached. This field is displayed as a hex value.</p>																				
Max Units:	<p>This field indicates the maximum number of bytes that the host adapter can transfer per I/O request. If this field is -, the host adapter can handle any size transfer.</p>																				
Max Transfer:	<p>This field indicates the maximum number of units (i.e., sectors) that the host adapter can transfer per I/O request. If this field is -, the host adapter can handle any size transfer.</p>																				
Elevator:	<p>When set to ENABLED, automatic sorting of requests is enabled. When set to DISABLED, automatic sorting of requests is disabled.</p>																				
S/G:	<p>When set to ON, the adapter supports Scatter/Gather requests. When set to OFF, the adapter does not support scatter/gather requests.</p>																				
Boot Device:	<p>When set to YES, this device is the boot device. If the HAM could not determine the booting device, this field is set to NO.</p>																				

16 MB Limit	When set to YES, this adapter can only access the first 16 MB of memory space. When set to NO, this adapter can access all of the physical memory.
S/G Size:	This field displays the granularity of the Scatter/Gather elements. When set to BYTE, the Scatter/Gather granularity is in bytes. When set to SECTOR, the Scatter/Gather granularity is in sectors.
<b>Auto Sense:</b>	This field displays whether the adapter automatically retrieves error information from the device when an I/O error occurs. When set to ON, this adapter has auto error sense active. When set to OFF, this adapter has auto error sense inactive.
Device:	This field displays the status of a device. When set to PRIVATE, the device is in the private state. When set to PUBLIC, the device is set to the public state.
HW Verify:	This field displays the capability of the device to perform hardware verifies on write commands. When set to ON, the device is capable of performing hardware verifies on write commands. When set to OFF, the device is not capable of performing hardware verifies.
Elevator TH:	This field displays the maximum number of requests that the HAM prefers to be processing at a given time.
Timing Info:	This field displays if the HAM timing information field is valid.
<b>Handicapped:</b>	This field displays the status of the Handicapped Read Flag. When set to ON, it indicates that if this device is mirrored, it will not be given read requests, provided that it is mirrored with a non-handicapped device. If all devices are handicapped then this device may still receive read requests. This flag is used to increase read performance if the mirrored devices are of differing response times.
Virtual Device:	When set to ON, this device is a virtual device. When set to OFF, this device is a normal device. Virtual devices can send control to normal devices and does not generate interrupts to complete requests.

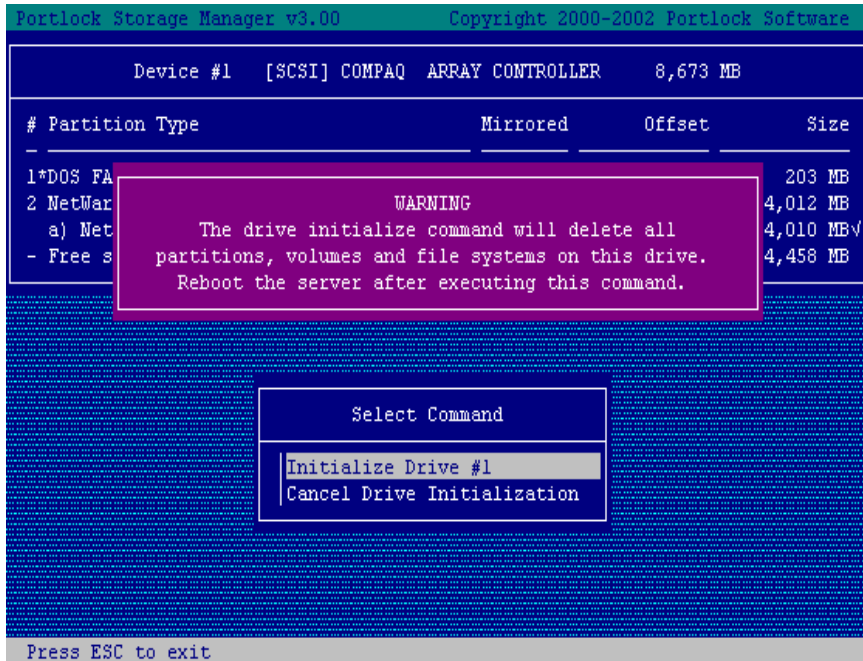
## Drive Initialize Command

The **Drive Initialize Command** will rewrite the boot sector of a device. This will delete all partition table information. This command is designed to be used on new devices that do not yet have a valid partition table.

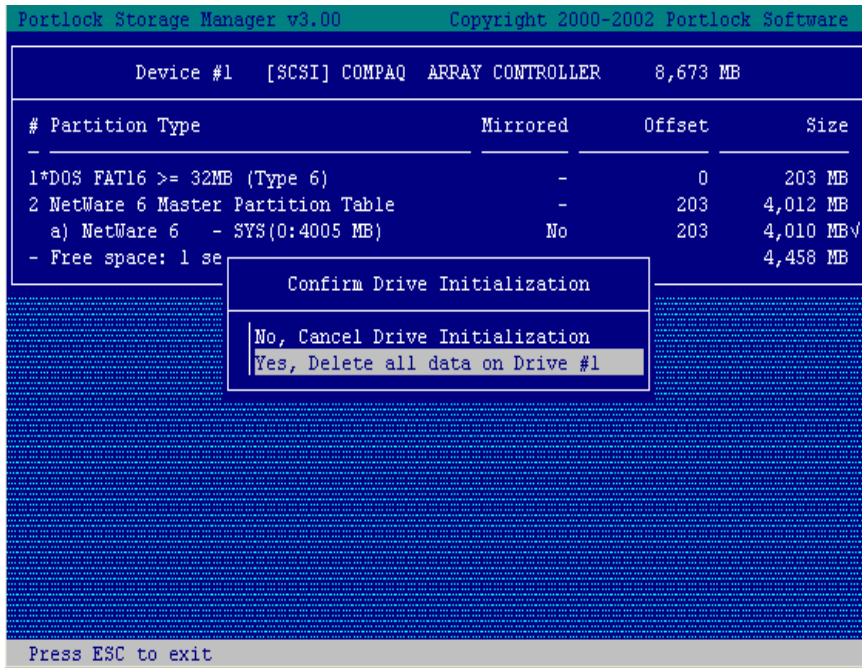
**WARNING: Do not execute this command on devices with valid partitions and volumes. Doing so will delete everything.**



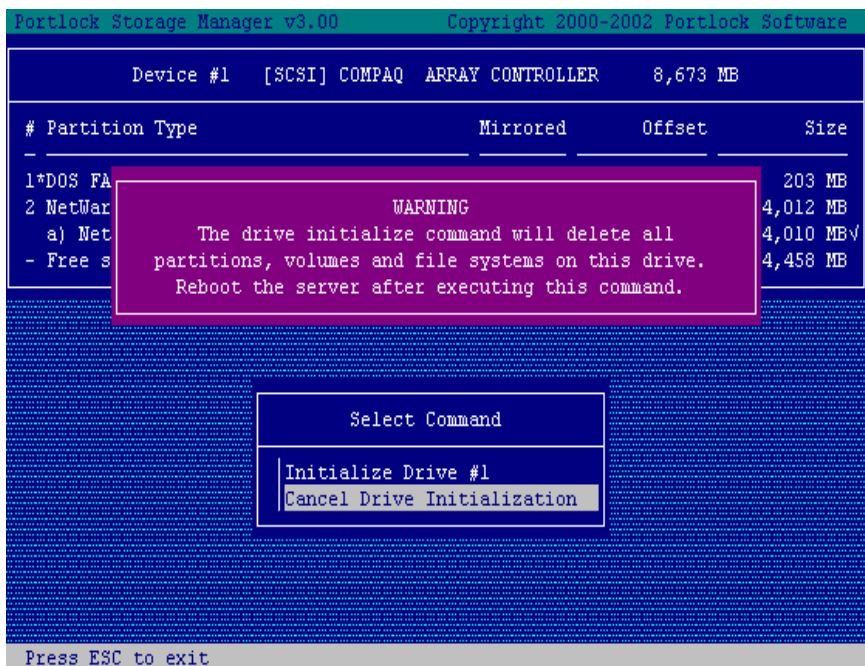
From the **Select Command** menu, choose “**Drive Initialize**” and press [Enter].



You will be prompted to this warning screen informing you that the **Drive Initialization Command** will delete all partitions, volumes and file systems on this drive. Reboot the server after executing this command. You can continue by selecting **Initialize Drive #1** or press **Cancel Drive Initialization**. Press [Enter] to continue.



To confirm Drive Initialization, choose the option “**Yes, Delete all data on Drive #1**” from the **Confirm Drive Initialization** menu. Press [Enter] to continue.

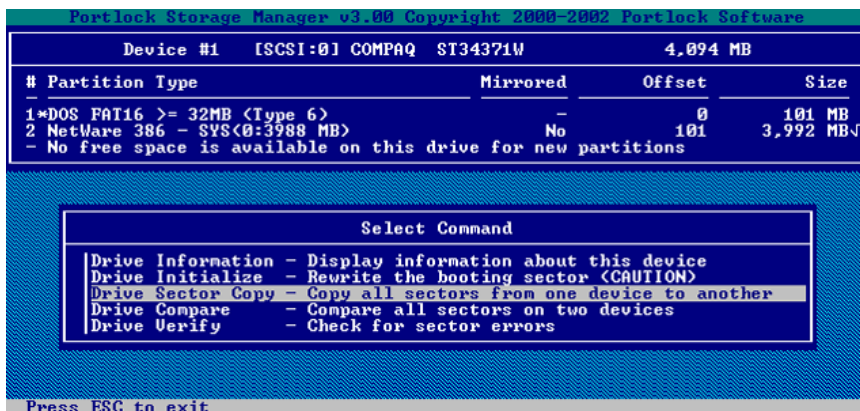


When you select **Initialize Drive**, this screen appears. You are given the option to “**Initialize Drive #1**” or to “**Cancel Drive Initialization.**”

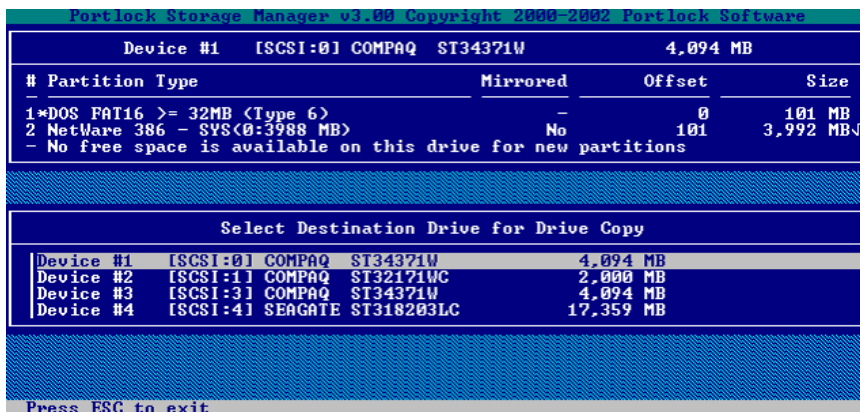


## Drive Sector Copy

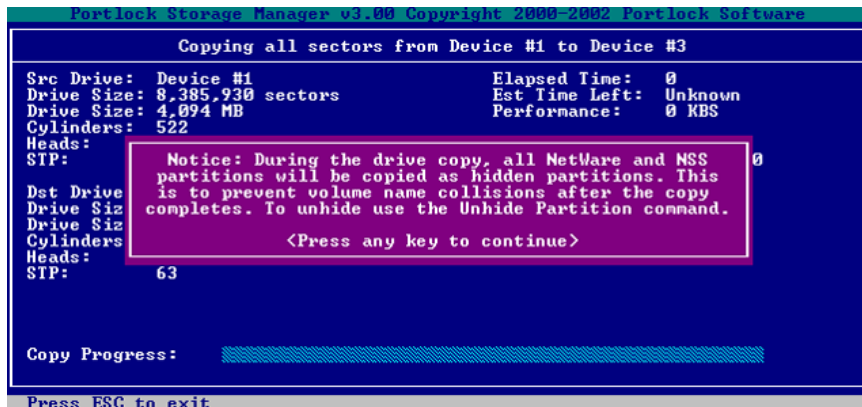
The Drive Sector Copy Command is used to copy one disk drive to another. The two drives will be an exact copy of each other. This command is typically used during Data Recovery.



From the **Select Command** menu, select the option **Drive Sector Copy** to copy all sectors from one device to another and press [Enter].



From the **Select Destination Drive for Drive Copy** menu, choose the drive you want to copy and press [Enter].



During the drive copy, all NetWare and NSS partitions will be copied as hidden partitions. This is to prevent volume name collisions after the copy completes. To unhide, use the Unhide Partition command. Press any key to continue.



At this screen, the system asks you whether you want to continue with the drive copy or cancel the drive copy. To continue, select **Yes** and press [Enter].


```

Portlock Storage Manager v3.00 Copyright 2000-2002 Portlock Software

Copying all sectors from Device #1 to Device #3

Src Drive: Device #1                      Elapsed Time: 33
Drive Size: 8,385,930 sectors              Est Time Left: 16:52
Drive Size: 4,094 MB                      Performance: 4,008 KBS
Cylinders: 522
Heads: 255                               Current Sector: 264,576
STP: 63                                 Total Sectors: 8,385,930

Dst Drive: Device #3                      Read Errors: 0
Drive Size: 8,385,930 sectors              Write Errors: 0
Drive Size: 4,094 MB
Cylinders: 522
Heads: 255
STP: 63

Copy Progress:   3.15%

Press ESC to exit

```

At this screen, the system is beginning the copy process.

```


Portlock Storage Manager v3.00 Copyright 2000-2002 Portlock Software

Copying all sectors from Device #1 to Device #3

Src Drive: Device #1                      Elapsed Time: 12:41
Drive Size: 8,385,930 sectors              Est Time Left: 0
Drive Size: 4,094 MB                      Performance: 5,509 KBS
Cylinders: 522
Heads: 255                               Current Sector: 8,385,930
STP: 63                                 Total Sectors: 8,385,930

Dst Drive: Device #3                      0
Drive Size: 35,551                        0
Drive Size: 17,359
Cylinders: 2,213
Heads: 255
STP: 63

Drive copy completed with no errors
<Press any key to return>

Copy Progress:   100%

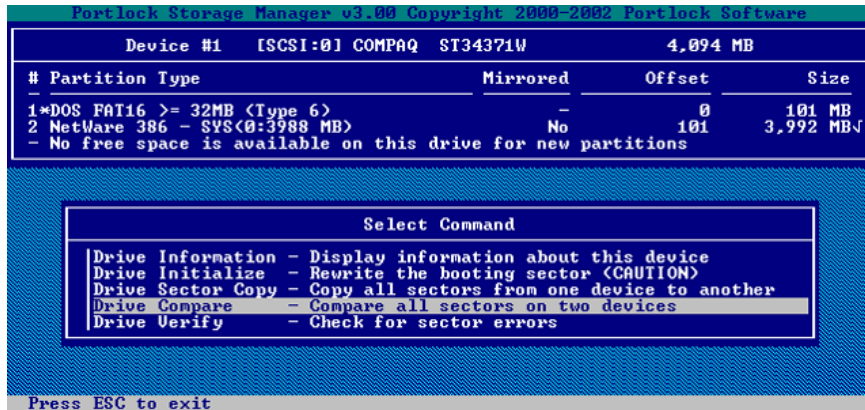
Press ESC to exit

```

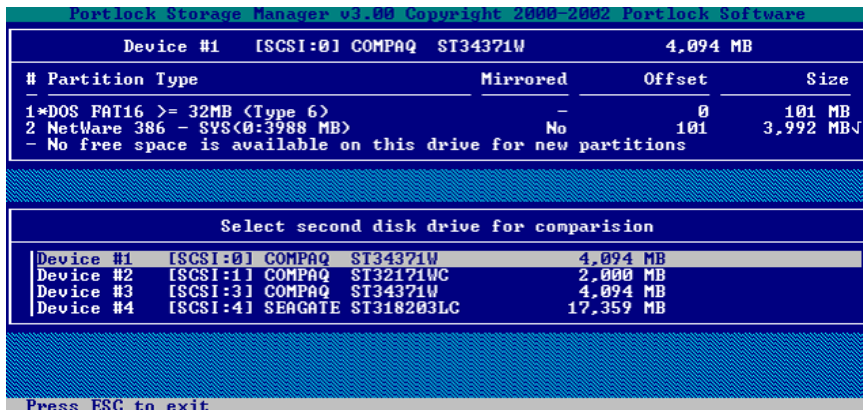
This screen will appear informing you that the Drive copy has been completed with no errors. Press any key to return.

## Drive Compare

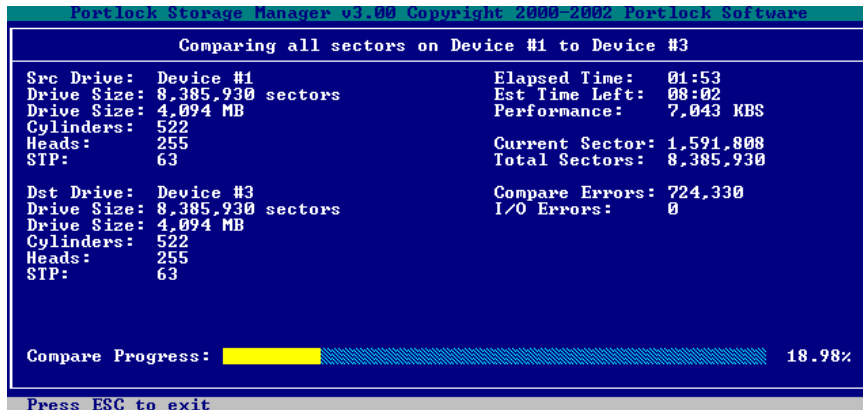
The Drive Compare command will compare two disk drives. This command can be ran after a Drive Sector Copy to verify that the copy was successful.



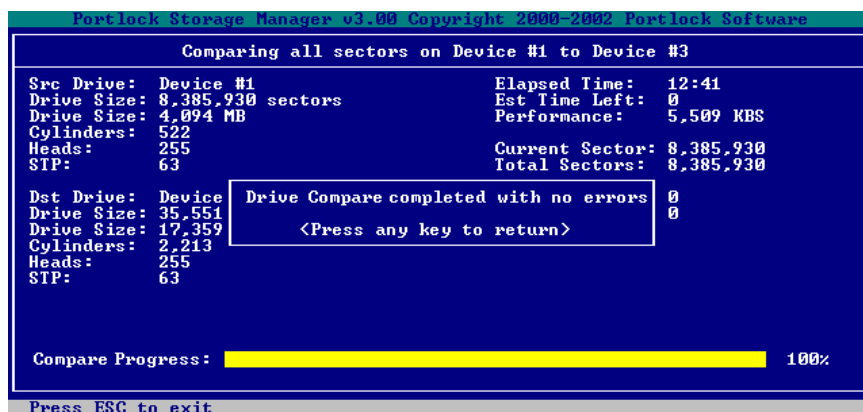
From the **Select Command** menu, choose the option **Drive Compare** to compare all sectors on two devices and press [Enter] to continue.



At this screen, select the second disk drive for comparison and press [Enter].



This screen shows the progress of the sectors being compared.

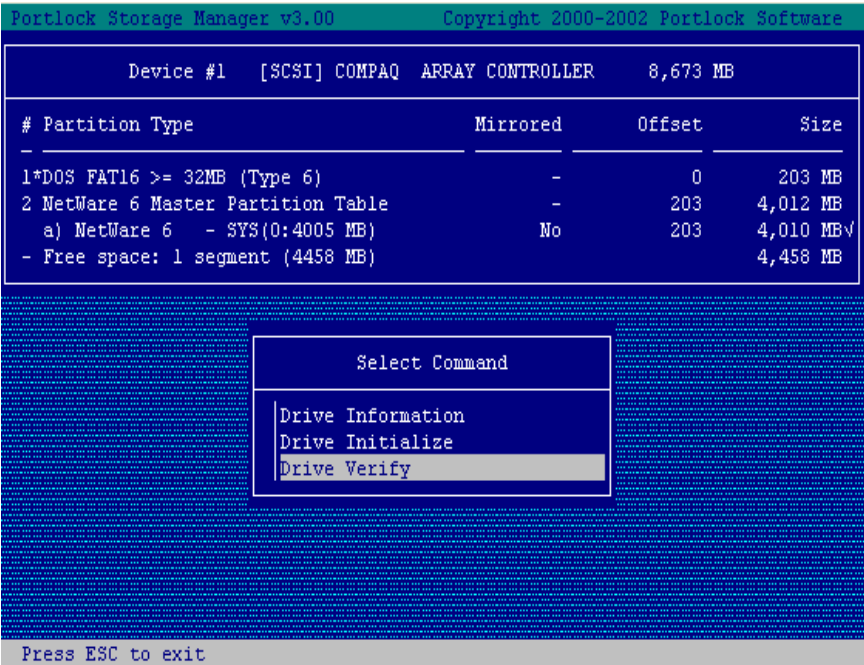


When this screen appears, the Drive Compare is complete. This screen will inform you of how many read and compare errors occurred during the compare. Press any key to return.

# Drive Verify Command

The **Drive Verify Command** will perform a test of the disk device. There are several types of tests including Read-Only and Read-Write. Read-Only commands will not modify the media, and are safe to run when there are partitions and volumes present. The Read-Write commands are destructive, and will destroy partitions and volumes.

**WARNING:** Do not execute Read-Write commands on a device with valid partitions and volumes. Doing so will delete everything.



From the **Select Command** menu, choose “**Drive Verify.**”

Portlock Storage Manager v3.00		Copyright 2000-2002 Portlock Software	
Device #1	[SCSI] COMPAQ ARRAY CONTROLLER	8,673 MB	
# Partition Type	Mirrored	Offset	Size
1*DOS FAT16 >= 32MB (Type 6)	-	0	203 MB
2 NetWare 6 Master Partition Table	-	203	4,012 MB
a) NetWare 6 - SYS(0:4005 MB)	No	203	4,010 MB ✓
- Free space: 1 segment (4458 MB)			4,458 MB
<div> <div>Select Verify Type</div> <div> Read-Only Sequential Verify  Read-Only Random Verify  Read-Write Sequential Verify  Read-Write Random Verify </div> </div>			
This verify will perform a read-only check of the disk drive. Sectors will be read from the drive to check for read errors. No data will be written to the disk drive.			
Press ESC to exit			

From the **Select Verify Type** menu, select a type of disk verify. For this example, the “**Read-Only Sequential Verify**” will be selected. Once selected, press [Enter].

The following is a detailed explanation of the verify operations:

1. **Read-Only Sequential Verify**

This method performs a read-only sequential scan of the disk drive. Various block sizes are supported from 1 sector to 512 sectors per I/O. No data is written to the drive. This method is also a quick method to determine the read performance of a disk drive.

2. **Read-Only Random Verify**

This method performs a read-only random scan of the disk drive. The software generates a random number which determines the sector to read. Various block sizes are supported from 1 sector to 512 sectors per I/O. No data is written to the drive. This method is quick in determining the random I/O performance of a disk drive.

3. **Read-Write Sequential Verify**

This method verifies that data can be written to a disk drive and then read back. A data pattern that is unique to each sector is written to the disk and then compared on read back. Various block sizes are supported from 1 sector to 512 sectors per I/O. For this verify mode, an option is to perform an extensive verify, which writes multiple data patterns to the disk drive.

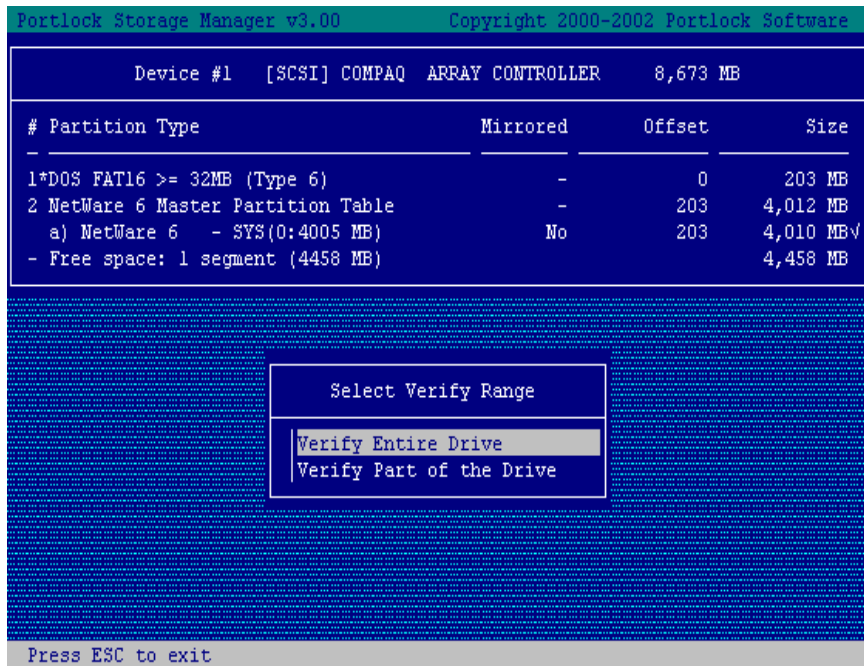
This includes performing a bit-walk data pattern to detect missing sector bits. Data is written to the drive, which will destroy all partitions, volumes, and data on the disk drive.

4. **Read-Write Random Verify**

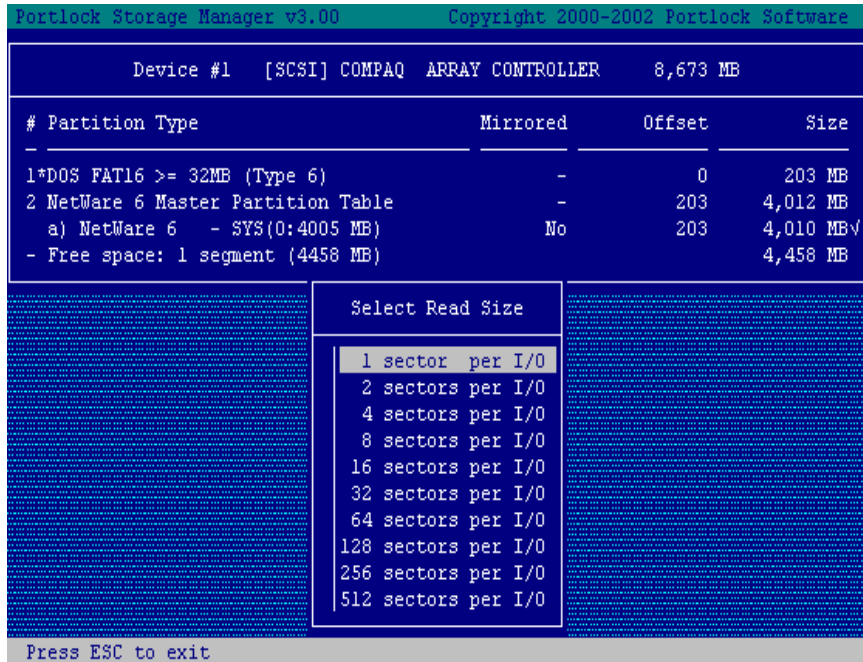
This method verifies that the data can be written to a disk drive and then read back. The software generates a random number that is used to determine the sector to write/read. Various block sizes are supported from 1 sector to 512 sectors per I/O. For this verify mode, an option is to perform an extensive verify, which writes multiple data patterns to the disk drive. This includes performing a bit-walk data pattern to detect missing sector bits. Data is written to the drive, which will destroy all partitions, volumes and data on the disk drive.



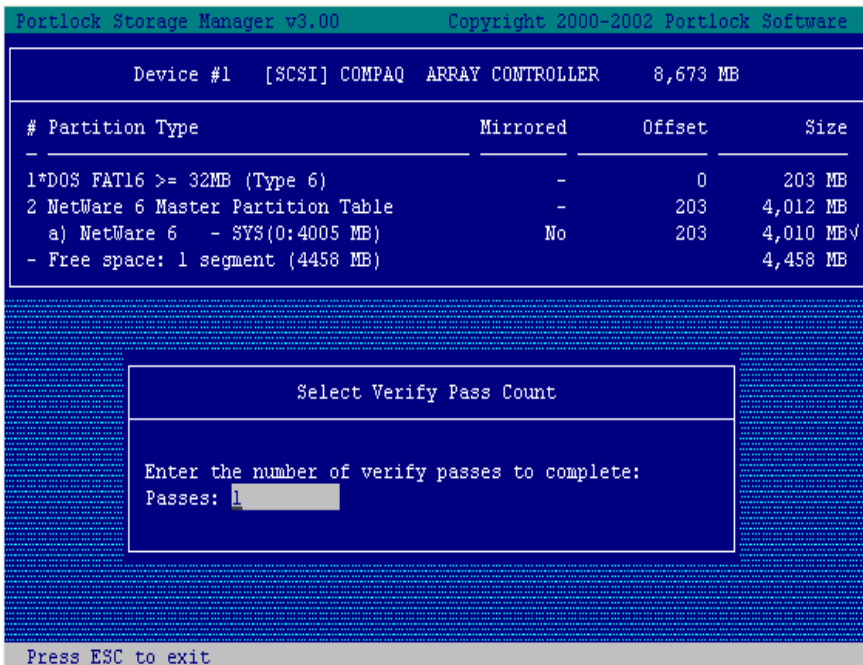
Storage Manager supports testing either entire devices or part of a device.



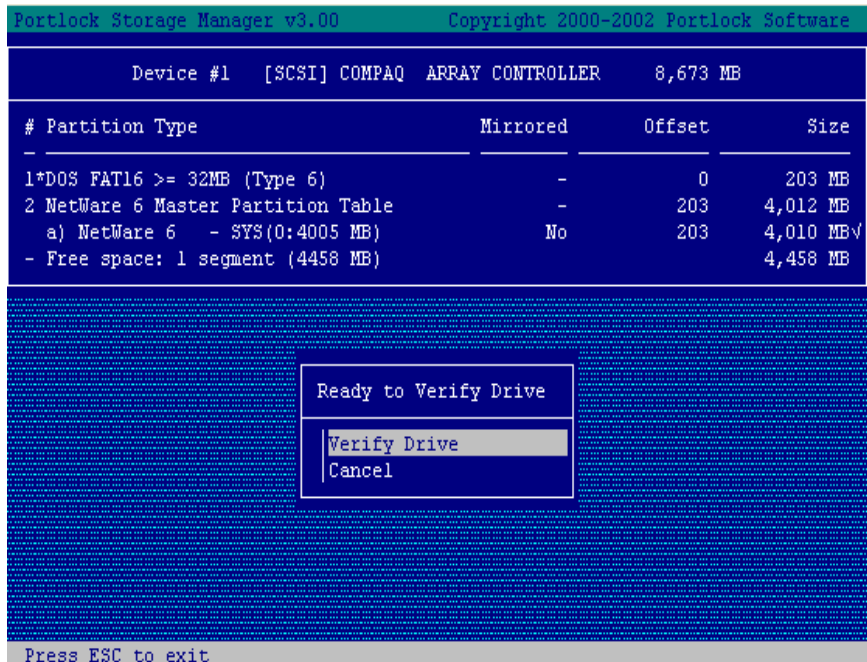
To verify the entire device, choose “**Verify Entire Device**” from the **Select Verify Range** menu.



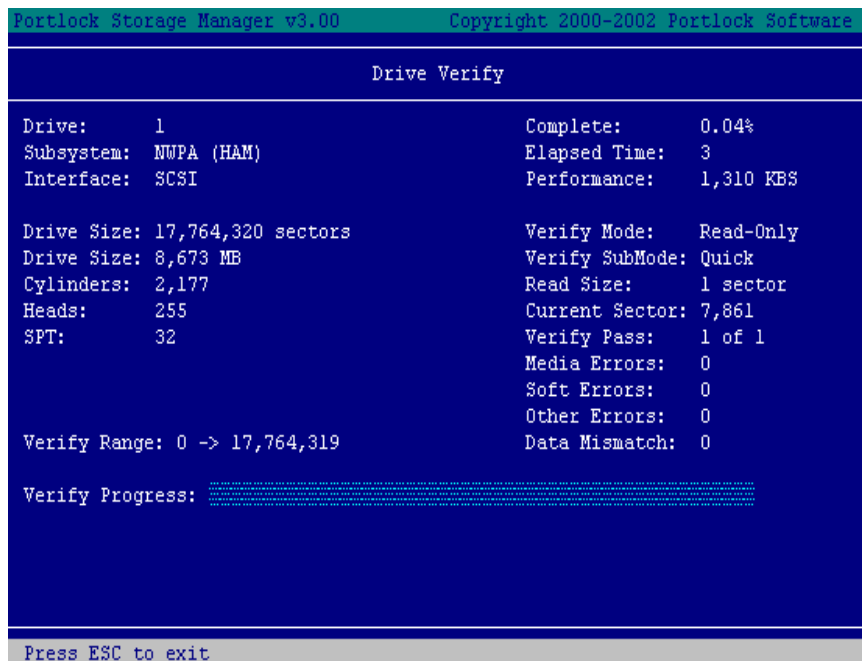
From the **Select Read Size** menu, select the desired read size. For this example, select the option “1 sectors per I/O” and press [Enter].



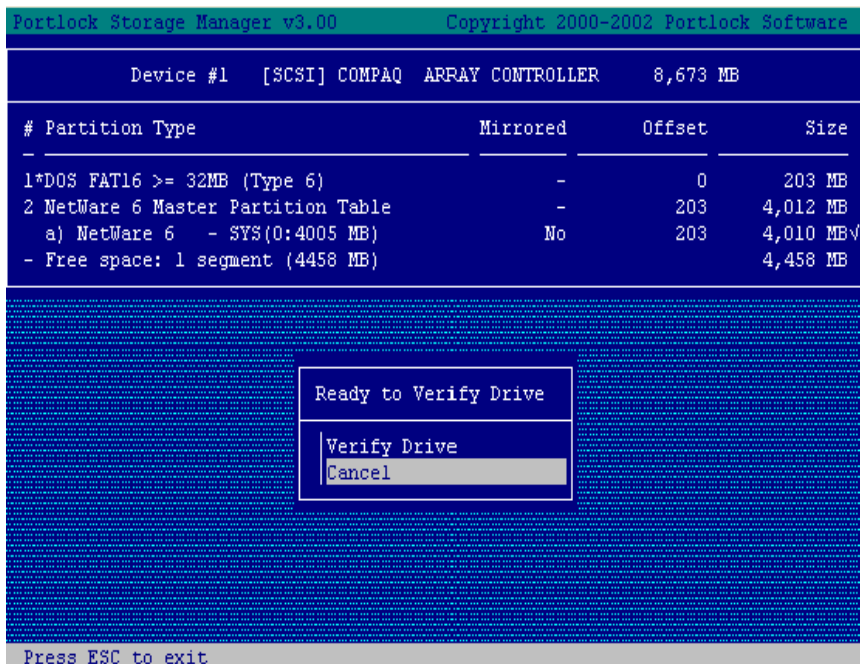
The **Select Verify Pass Count** menu will appear. You will be asked to enter the number of verify passes to complete. Press [Enter] once you enter the number.



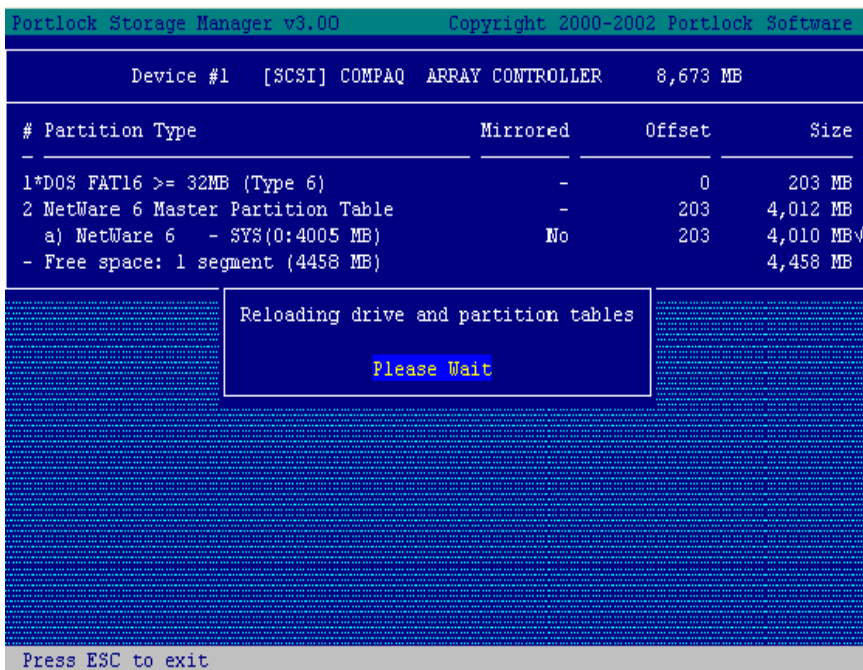
From the **Ready to Verify Drive** menu, choose the option “**Verify Drive.**”



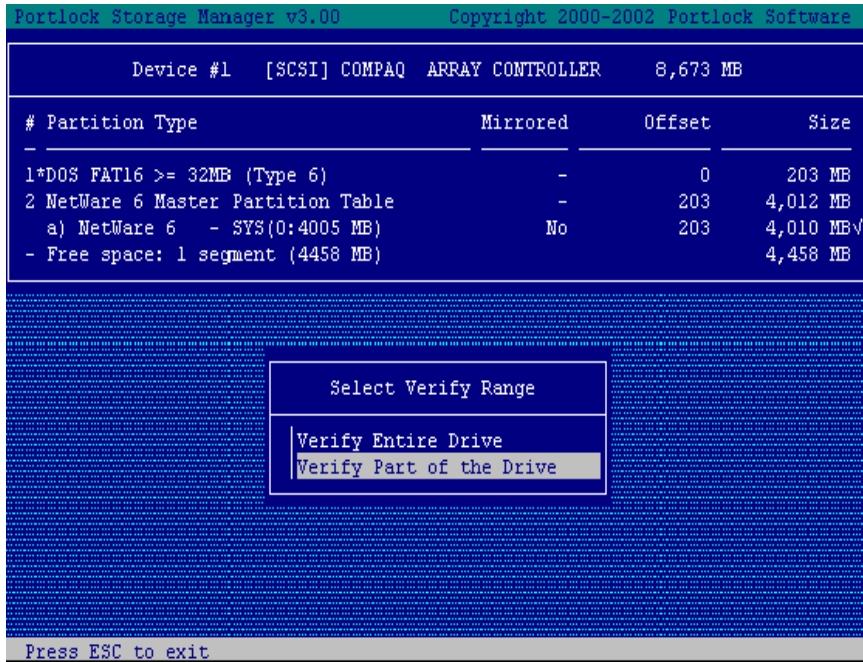
The **Drive Verify Progress Window** will appear.



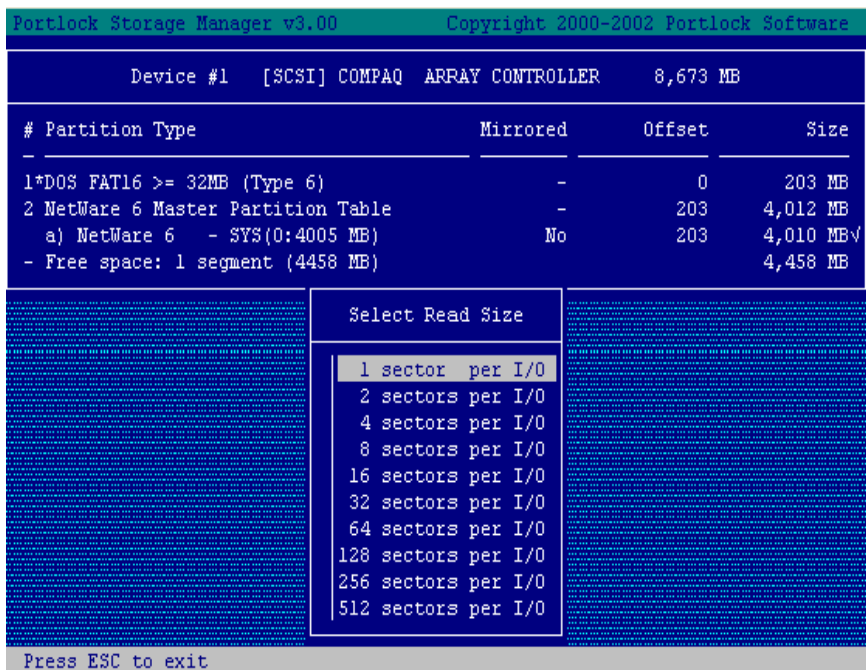
To cancel drive verification, select **Cancel** from the **Ready to Verify Drive** menu and press [Enter].



After canceling the drive verification, this screen will appear informing you that the system is reloading the drive and partition tables.



From the **Select Verify Range** menu, select “Verify Part of the Drive” and press [Enter].

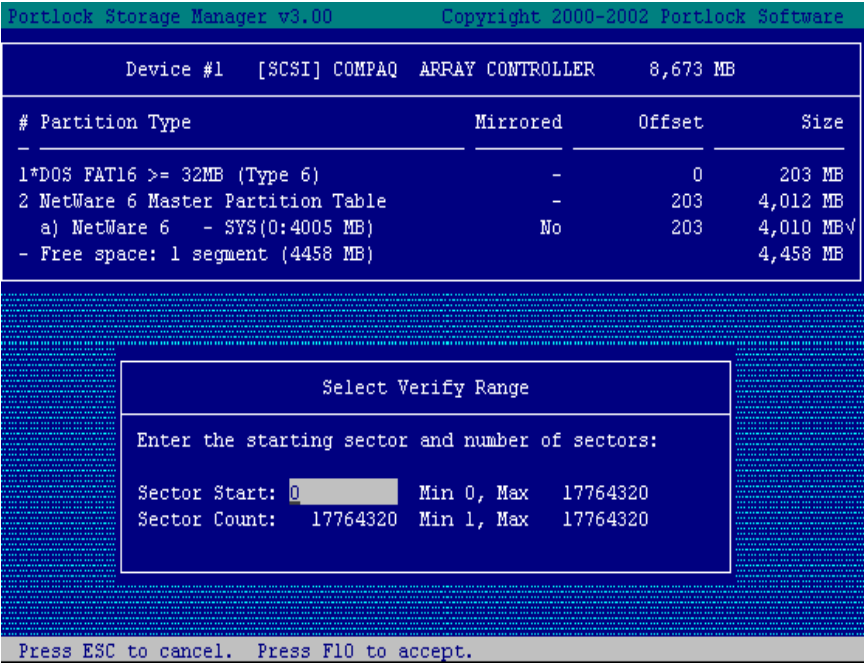


From the **Select Read Size** menu, select the desired read size. For this example, select “1 sector per I/O” and press [Enter].

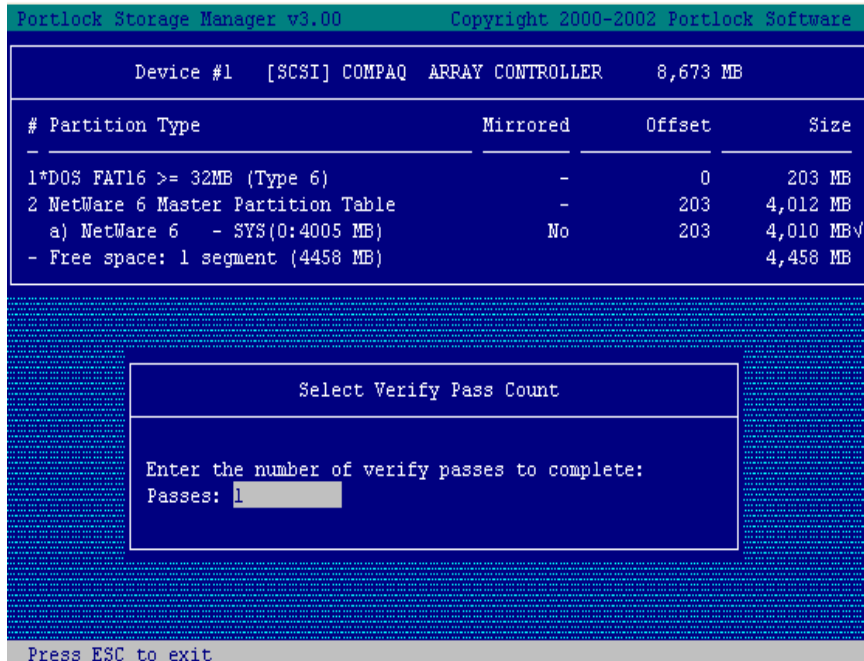
Storage Manager supports various size I/O operations. The size of an I/O is measured in sectors. The larger the I/O size, the faster most drives can transfer data. Most devices are limited to 128 sectors (64 KB) per I/O operation. Some devices can transfer larger amounts.

For most device tests, select 128 sectors per I/O, as this matches the typical I/O size for traditional NetWare volumes.

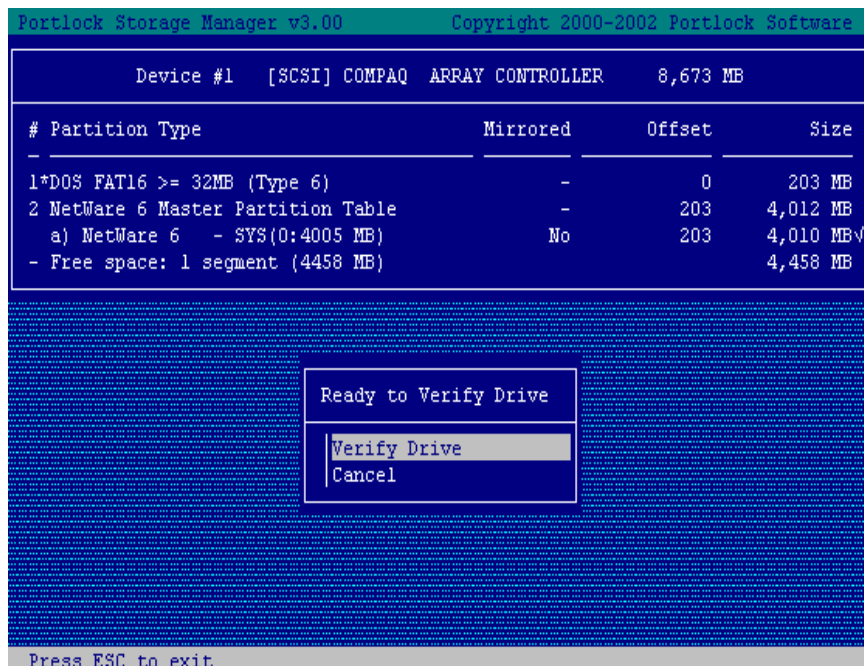
**Note:** NetWare uses 8 sectors per I/O for NSS partitions.



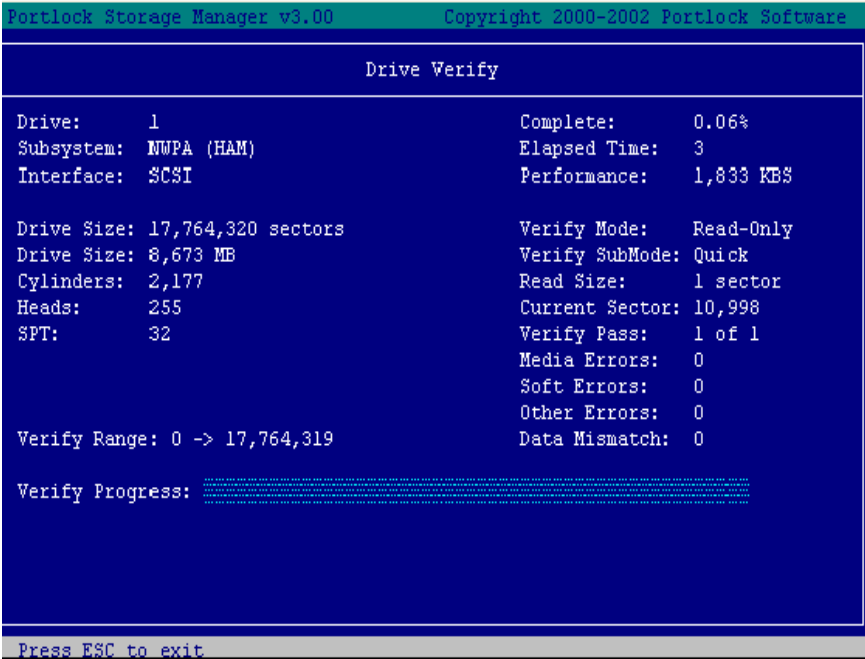
From the **Select Verify Range** menu, select the desired starting sector and number of sectors and press [Enter].



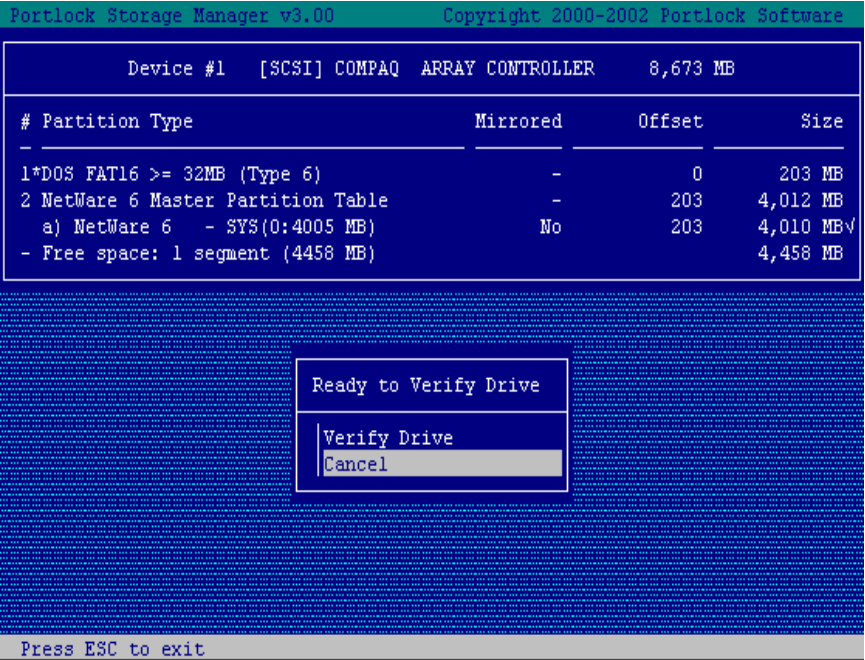
The **Select Verify Pass Count** menu will appear. You will be asked to enter the number of verify passes to complete. Once entered, press [Enter].



From the **Ready to Verify Drive** menu, select “**Verify Drive**” and press [Enter].

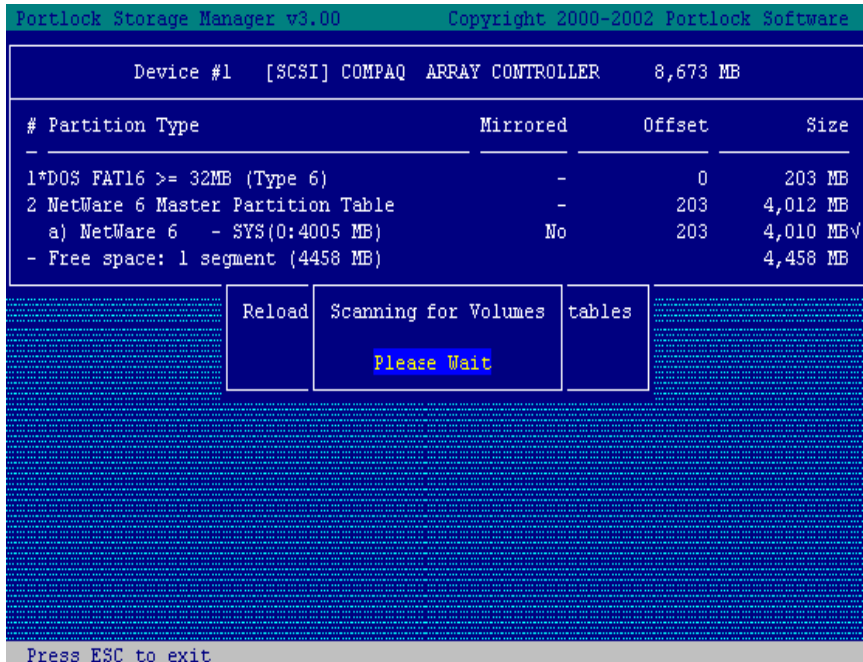


The Drive Verify Progress Window will appear.

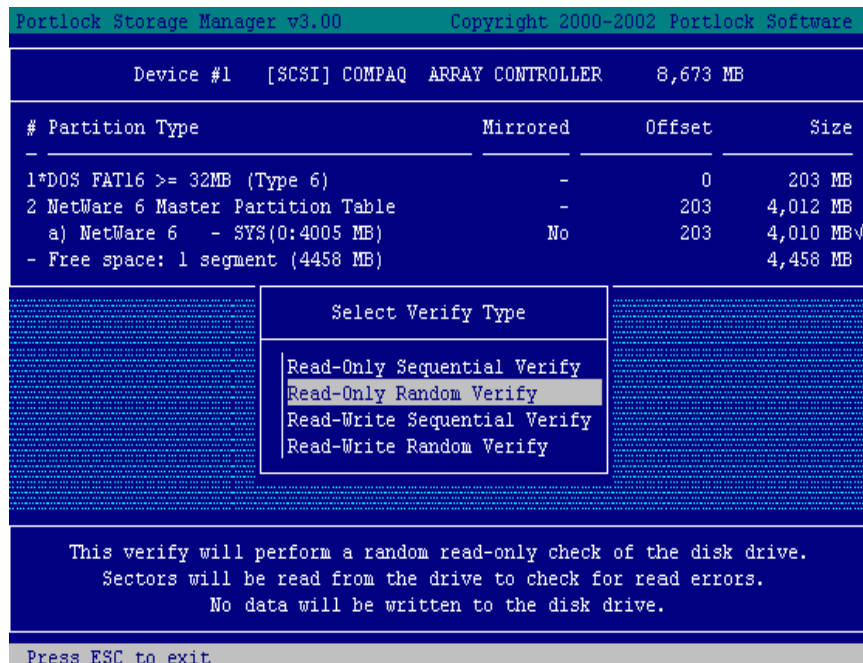


To cancel drive verification, select “Cancel” from the Ready to Verify Drive menu and press [Enter].



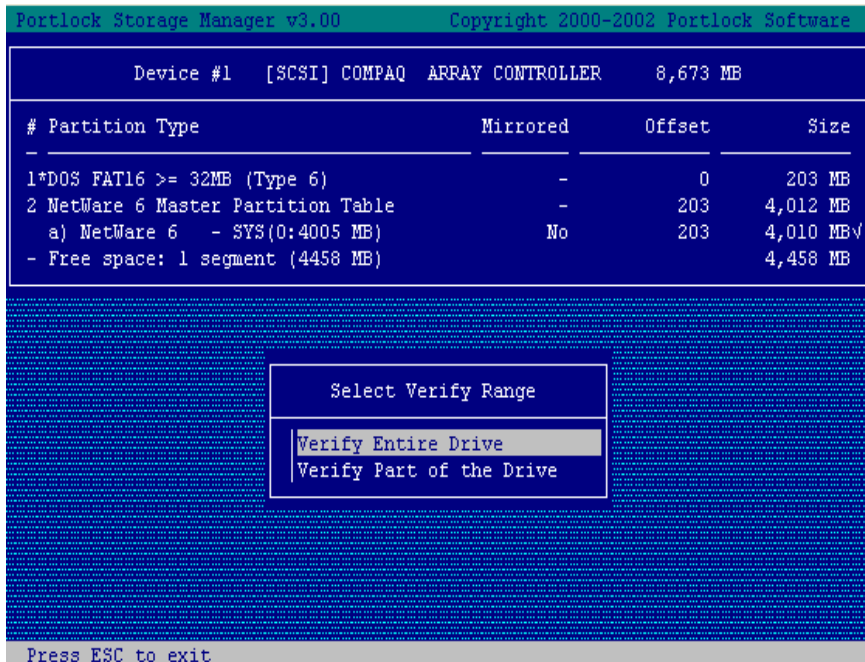


Once the drive verification is cancelled, this screen will appear telling you that the system is reloading

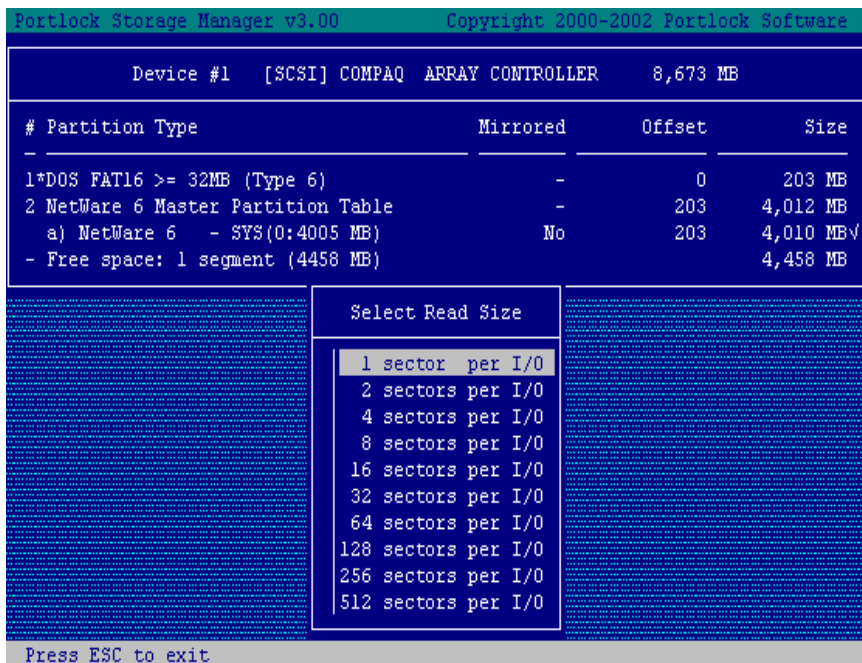


From the **Select Verify Type** menu, select the option “**Read-Only Random Verify**” and press [Enter].

This verify will perform a read-only check of the disk drive. Sectors will be read from the drive to check for read errors. No data will be written to the disk drive.



From the **Ready to Verify Drive** menu, select “**Verify Drive**” or “**Cancel**.” For this example, we will select **Verify Drive**.



From the **Select Read Size** menu, select the desired read size. For this example, select the option “**1 sector per I/O**” and press [Enter].

Portlock Storage Manager v3.00 Copyright 2000-2002 Portlock Software

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB
# Partition Type	Mirrored	Offset	Size
1*DOS FAT16 >= 32MB (Type 6)	-	0	203 MB
2 NetWare 6 Master Partition Table	-	203	4,012 MB
a) NetWare 6 - SYS(0:4005 MB)	No	203	4,010 MB✓
- Free space: 1 segment (4458 MB)			4,458 MB

Select Verify Pass Count

Enter the number of verify passes to complete:

Passes:

Press ESC to exit

The **Select Verify Pass Count** menu will appear. You will be asked to enter the number of verify passes to complete. Press [Enter] once completed.

Portlock Storage Manager v3.00 Copyright 2000-2002 Portlock Software

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB
# Partition Type	Mirrored	Offset	Size
1*DOS FAT16 >= 32MB (Type 6)	-	0	203 MB
2 NetWare 6 Master Partition Table	-	203	4,012 MB
a) NetWare 6 - SYS(0:4005 MB)	No	203	4,010 MB✓
- Free space: 1 segment (4458 MB)			4,458 MB

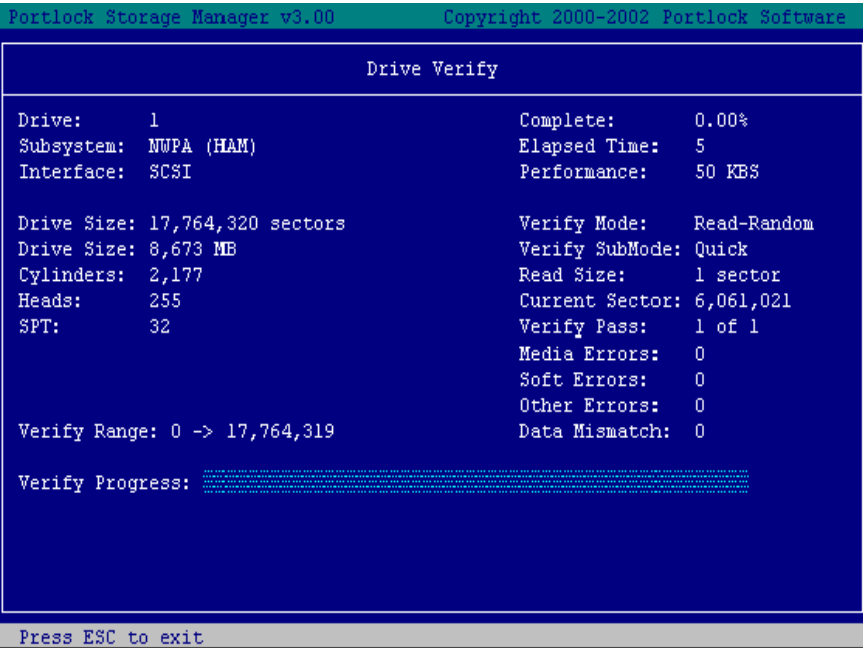
Ready to Verify Drive

Verify Drive

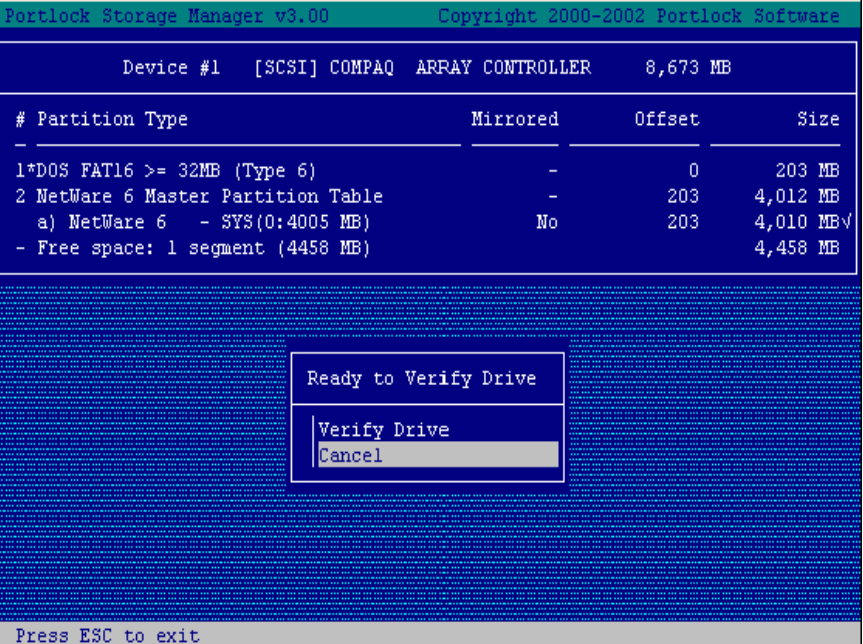
Cancel

Press ESC to exit

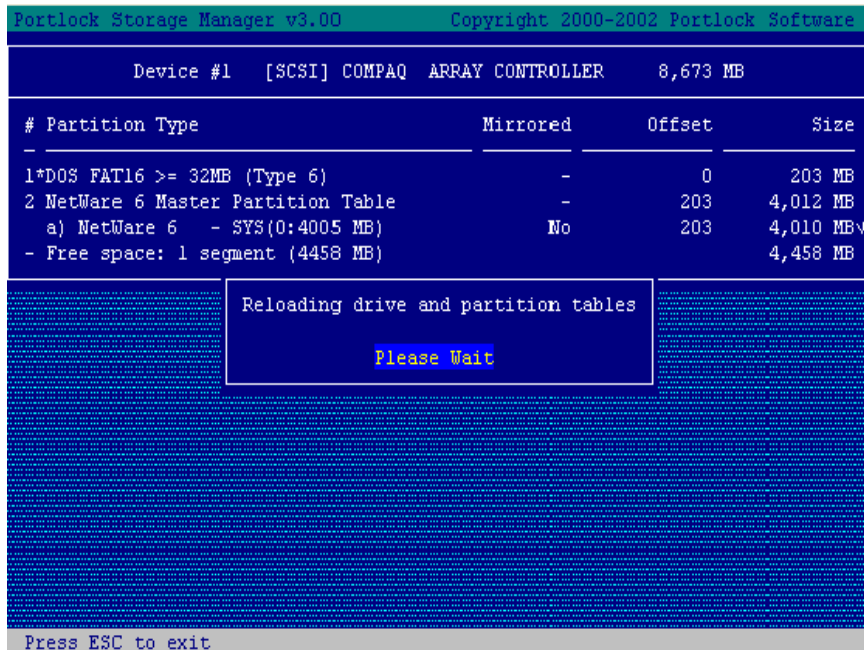
From the **Ready to Verify Drive** menu, select “**Verify Drive**” or “**Cancel**.” For this example, we will select “**Verify Drive**.”



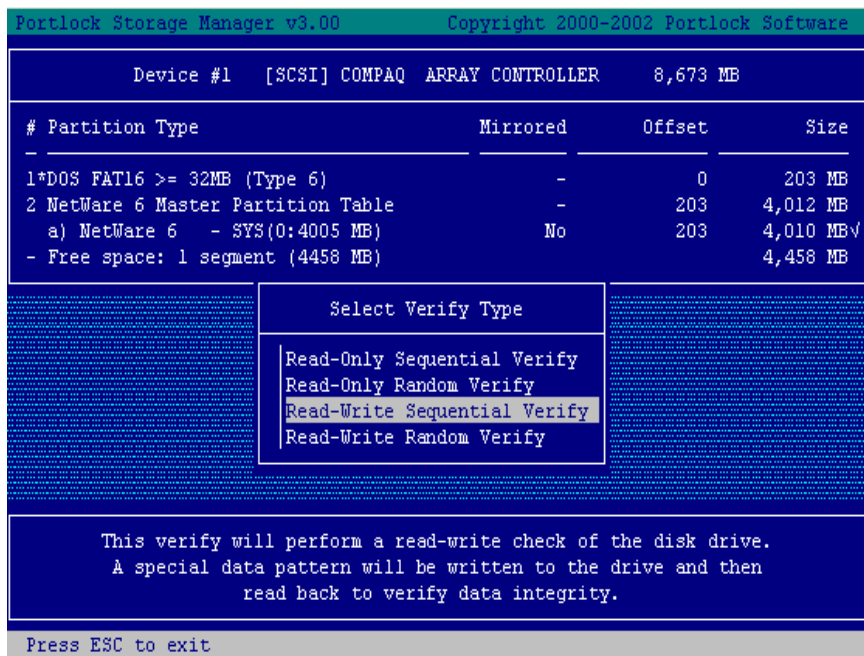
The Drive Verify Progress Window will appear.



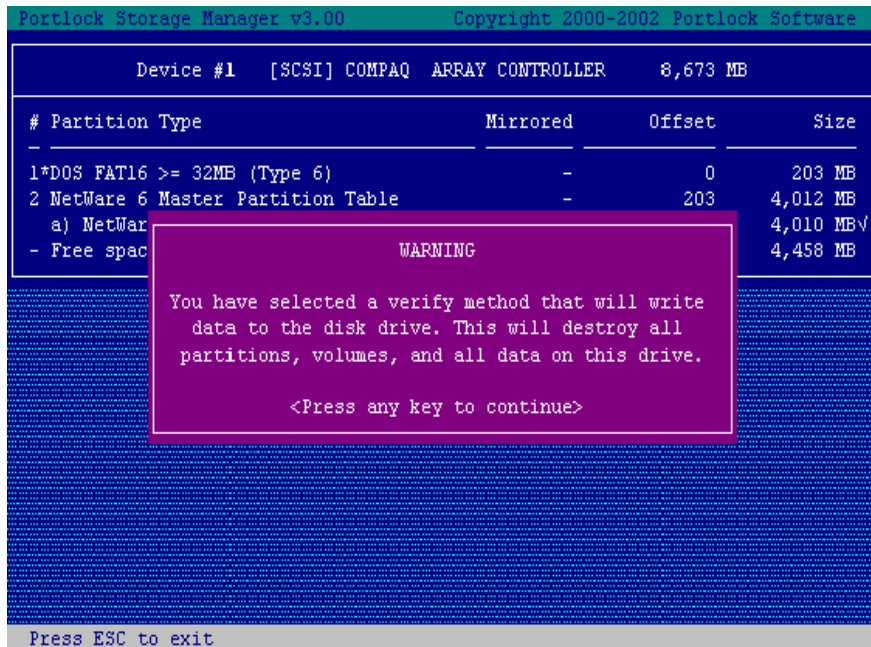
To cancel drive verification, select the “Cancel” option from the **Ready to Verify Drive** menu and press [Enter].



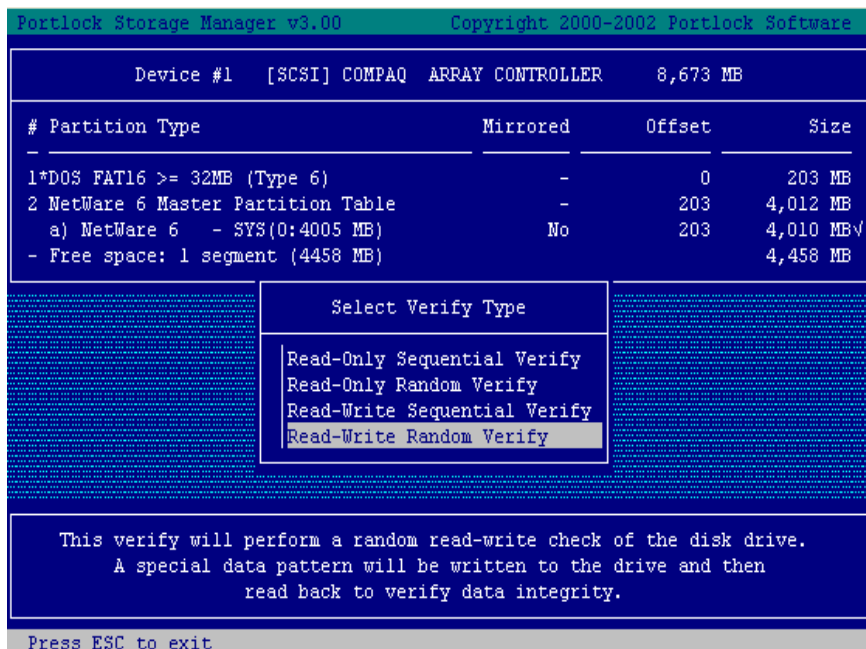
Once the drive verification is cancelled, this screen will appear telling you that the system is reloading the drive and partition tables.



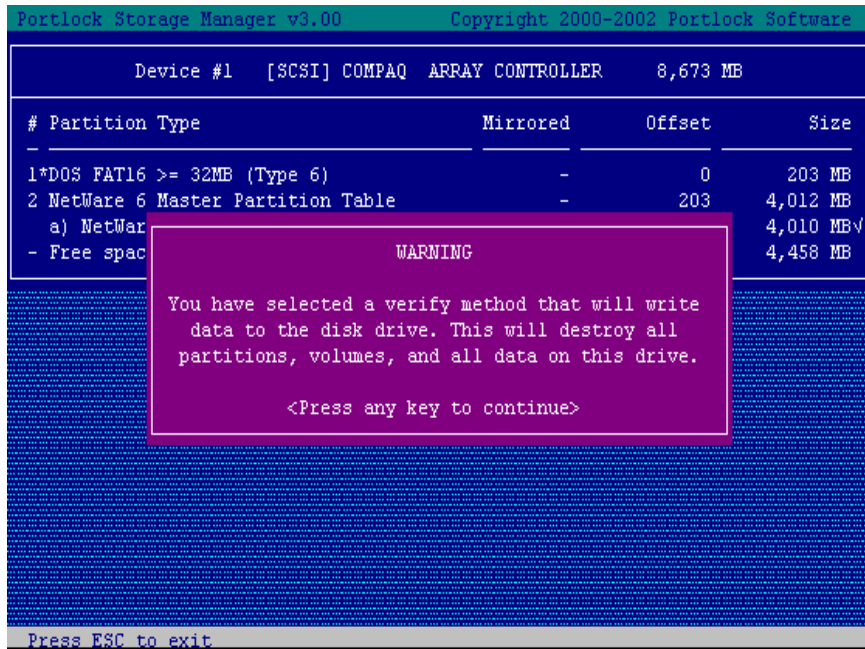
From the **Select Verify Type** menu, select “**Read Write Sequential Verify**” and press [Enter]. This type of verify will perform a read-write check of the disk drive. A special data pattern will be written to the drive and then read back to verify data integrity.



This warning screen will appear informing you that you have selected a verify method that will write data to the disk drive. This will destroy all partitions, volumes, and all data on this drive.



From the **Select Verify Type** menu, select the option **Read-Only Random Verify** and press [Enter]. This verify will perform a random read-write check of the disk drive. A special data pattern will be written to the drive, and then read back to verify data integrity.



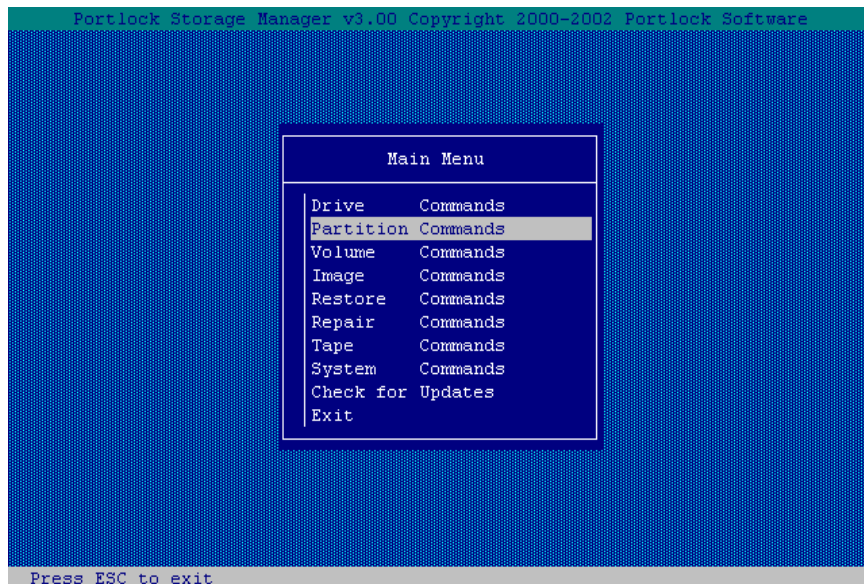
Once the **Read-Write Random Verify** option is selected, this warning screen will appear informing you that you have selected a verify method that will write data to the disk drive. This will destroy all partitions, volumes, and all data on this drive.





# CHAPTER 4

## Partition Commands



From the **Main Menu** screen, choose “**Partition Commands**” and press [Enter].

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software					
Device #1		[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB	
#	Partition Type	Mirrored		Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-		0	203 MB
2	NetWare 6 Master Partition Table	-		203	4,012 MB
a)	NetWare 6 - SYS(0:4005 MB)	No		203	4,010 MB√
- Free space: 1 segment (4458 MB)					4,458 MB
Select Drive					
Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB		
Device #2	[SCSI] COMPAQ	ARRAY CONTROLLER	34,702 MB		
Device #3	[SCSI] COMPAQ	ARRAY CONTROLLER	34,731 MB		
Press ESC to return - F5: Display in MB - F6: sectors - F7: cylinders					

The **Select Drive** menu screen appears displaying a list of all storage devices currently on the system and a list of any and all partitions on the currently selected drive. Notice that this screen also displays the mirror status, the offset and the size in MB of each of these partitions. To change the device, scroll thru the list of devices using the up and down arrow keys. Because device #1 holds the partition we wish to copy, we will proceed by highlighting it and pressing [Enter].

## Activate Partition

```
Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software
```

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB
#	Partition Type	Mirrored	Offset
1	DOS FAT16 >= 32MB (Type 6)	-	0
2	NetWare 6 Master Partition Table	-	203
a)	NetWare 6 - SYS(0:4005 MB)	No	203
- Free space: 1 segm			4,458 MB

Select Partition Command

- Activate Partition
- Combine NW 6 Master Partitions
- Convert to a NW 6 Partition
- Copy Partition
- Create Partition
- Delete Partition
- Display Partition Map
- Hide Partition
- Move / Resize Partition
- Unhide Partition
- Verify NetWare Partition

Press ESC to exit

The Partition Command menu now appears. Select Activate Partition and press [Enter] to continue.

```
Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software
```

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB
#	Partition Type	Mirrored	Offset
1	DOS FAT16 >= 32MB (Type 6)	-	0
2	NetWare 6 Master Partition Table	-	203
a)	NetWare 6 - SYS(0:4005 MB)	No	203
- Free space: 1 segment (4458 MB)			4,458 MB

Select partition to activate

1	DOS FAT16 >= 32MB (Type 6)	203 MB
2	NetWare 6 - SYS(0:4005 MB)	4,012 MB

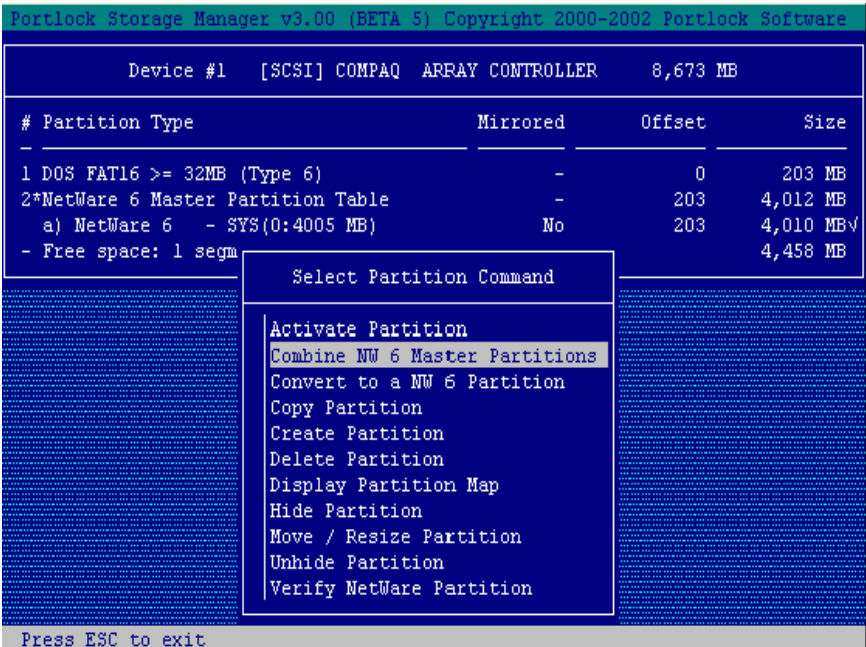
Press ESC to exit

From the **Select partition to activate** screen, choose the partition you want to activate and press [Enter].



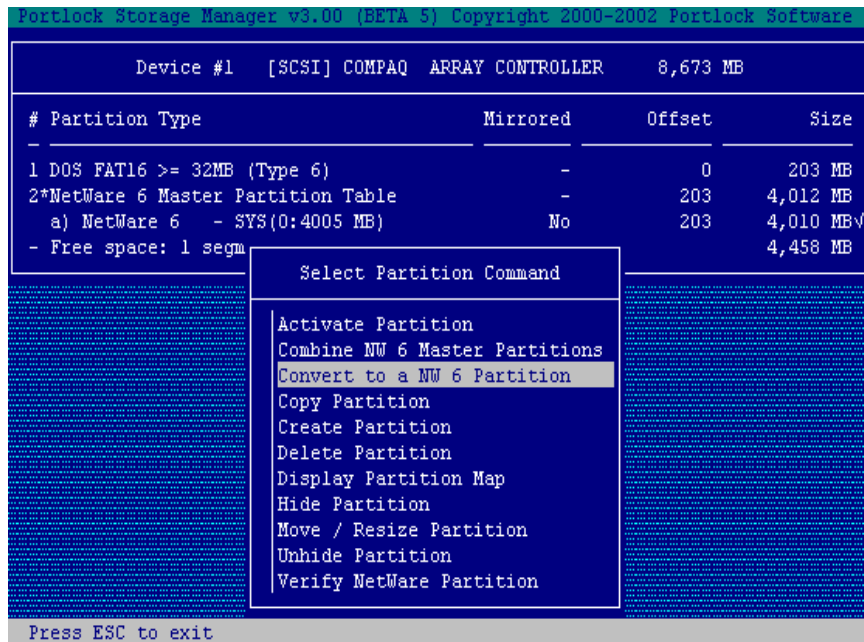
Once you select the partition, this screen will appear while the system is reloading the drive and partition tables.

## Combine NW 6 Master Partitions



From the **Select Partition Command** menu, select “**Combine NW 6 Master Partitions**” and press [Enter]. You will then be prompted to the **Partition Activation** screen. Press ESC to exit.

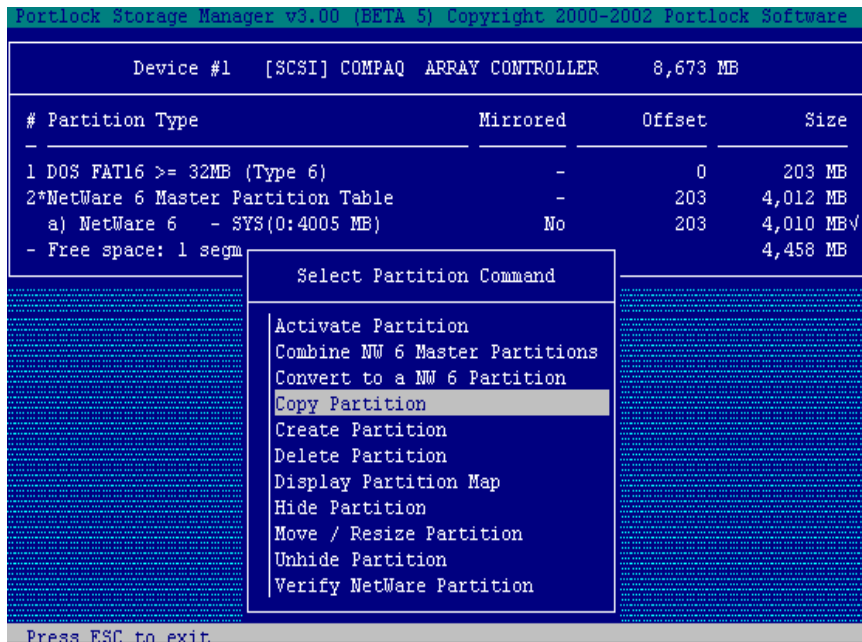
## Convert to a NW 6 Partition



From the **Select Partition Command** menu, select the option “**Convert to a NW 6 Partition**” and press [Enter].

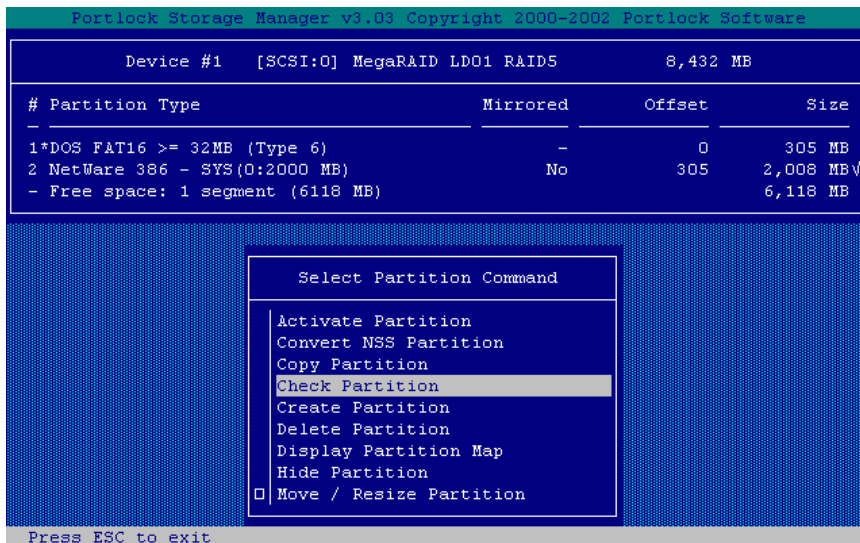
## Copy Partition

The Copy Partition command copies a partition from one device to another.



From the **Select Partition Command** menu, select the option “Copy Partition” and press [Enter].

## Check Partition



From the **Select Partition Command** menu, select the option “Check Partition” and press [Enter].

```

Portlock Storage Manager v3.03 Copyright 2000-2002 Portlock Software

Device #1  [SCSI:0] MegaRAID LDO1 RAID5      8,432 MB

# Partition Type      Mirrored      Offset      Size
- - - - -
1*DOS FAT16 >= 32MB (Type 6)      -      0      305 MB
2 NetWare 386 - SYS(0:2000 MB)      No      305      2,008 MB
- Free space: 1 segment (6118 MB)      6,118 MB

Select partition to check

1 DOS FAT16 >= 32MB (Type 6)      305 MB
2 NetWare 386 - SYS(0:2000 MB)      2,008 MB

Press ESC to exit

```

Next, select the partition you want to check and press [Enter].

```

Portlock Storage Manager v3.03 Copyright 2000-2002 Portlock Software

DOS FAT16 >= 32 MB Partition Check on Device #1, Partition #1

Device #:      1
Partition #:    1
Partition Size: 306 MB
Partition Type: DOS FAT16 >= 32 MB
Device Information: Success
Partition Table: Success
FAT Boot Sector: Success
FAT Tables:     Success

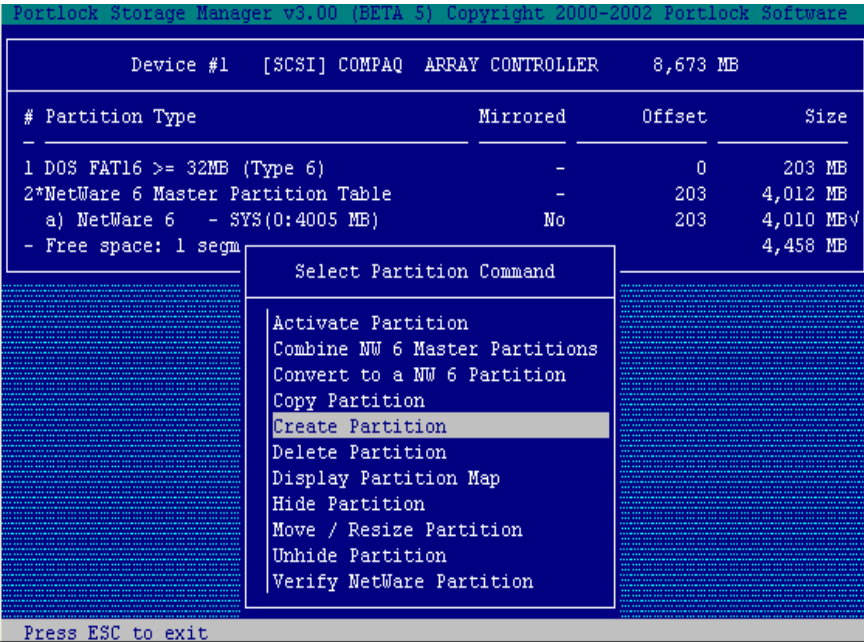
Partition Check successful - Press any key to close screen.

```

This screen shows you the status of the partition check.

# Create Partition

The Create Partition command allows you to select the type of partition you want to create.



From the **Select Partition Command** menu, select the option “**Create Partition**” and press [Enter].



```

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software

```

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB
# Partition Type		Mirrored	Offset Size
1 DOS FAT16 >= 32MB (Type 6)		-	0 203 MB
2*NetWare 6 Master Partition Table		-	203 4,012 MB
a) NetWare 6 - SYS(0:4005 MB)		No	203 4,010 MB✓
- Free space: 1 segment (4458 MB)			4,458 MB

```

Select type of partition to create
DOS FAT16 Partition
NetWare 6 Traditional Partition
NetWare 6 NSS Partition

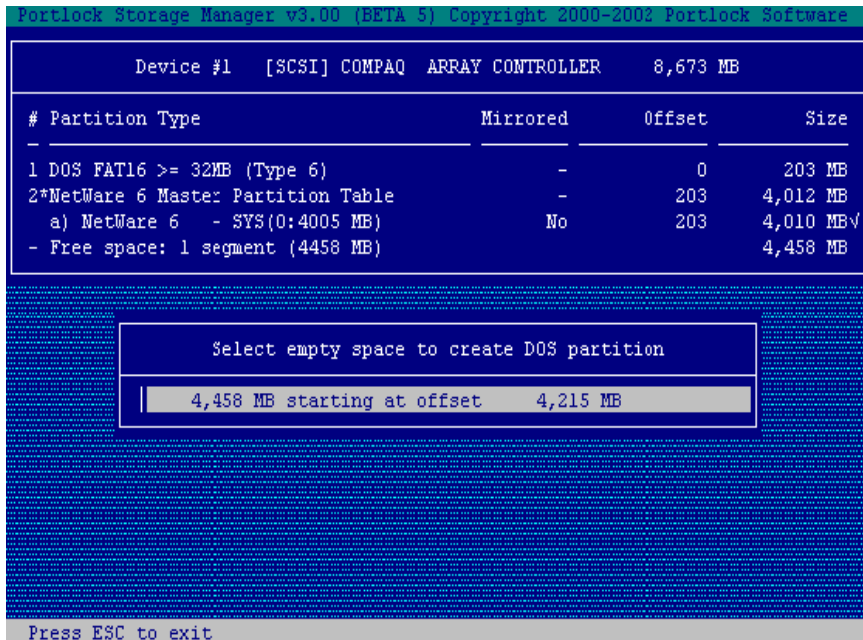
```

Press ESC to exit

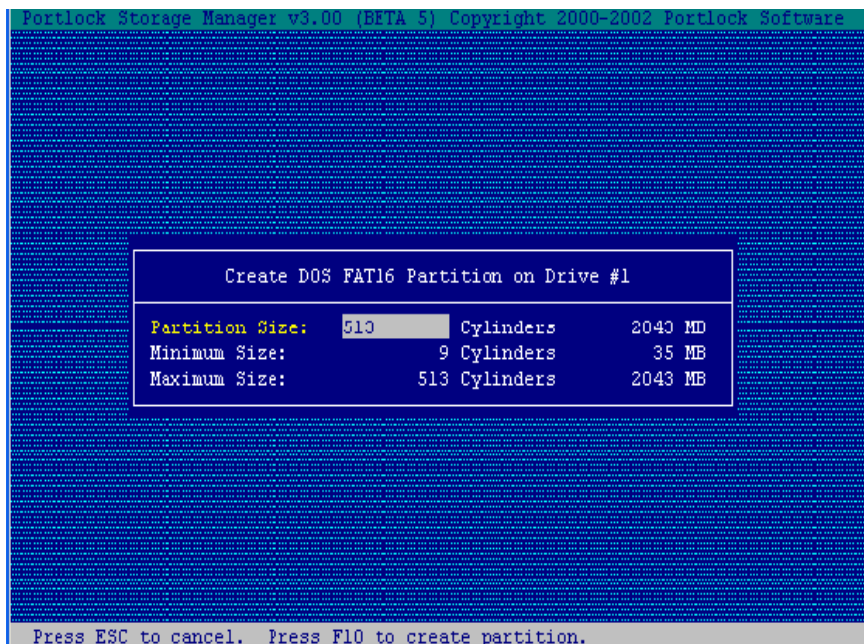
From the **Select Type of partition to create** menu, you have three choices:

1. DOS FAT 16 Partition
2. NetWare 6 Traditional Partition
3. NetWare 6 NSS Partition

Select the type of partition you want to create and press [Enter]. For this example, the “**DOS FAT16**” option will be selected. Press [Enter] once completed.



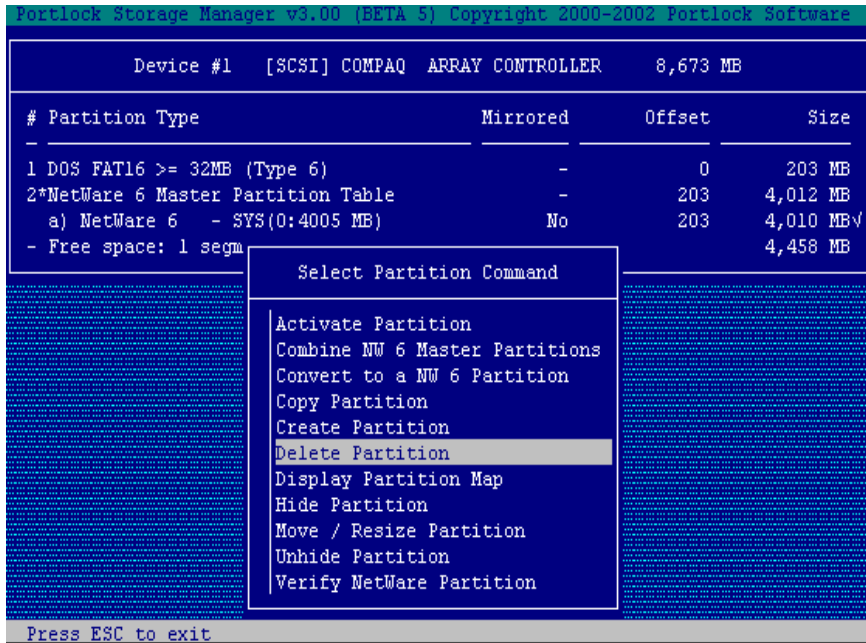
From the **Select empty space to create DOS partition** menu, select the space for the DOS Partition and press [Enter].



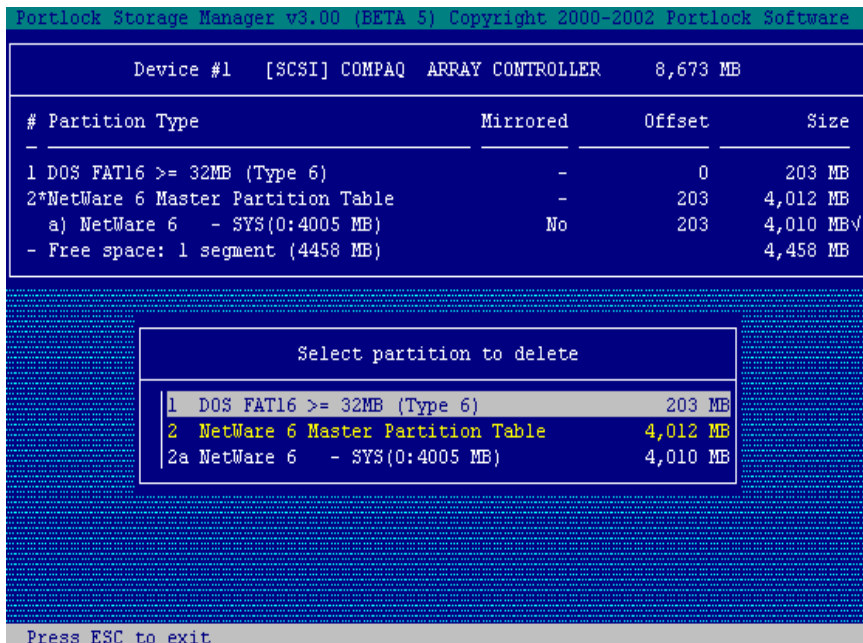
From the **Create DOS FAT16 Partition on Drive #1** menu, enter in the partition size and press [Enter].

## Delete Partition

The Delete Partition command allows you to delete any type of partition.



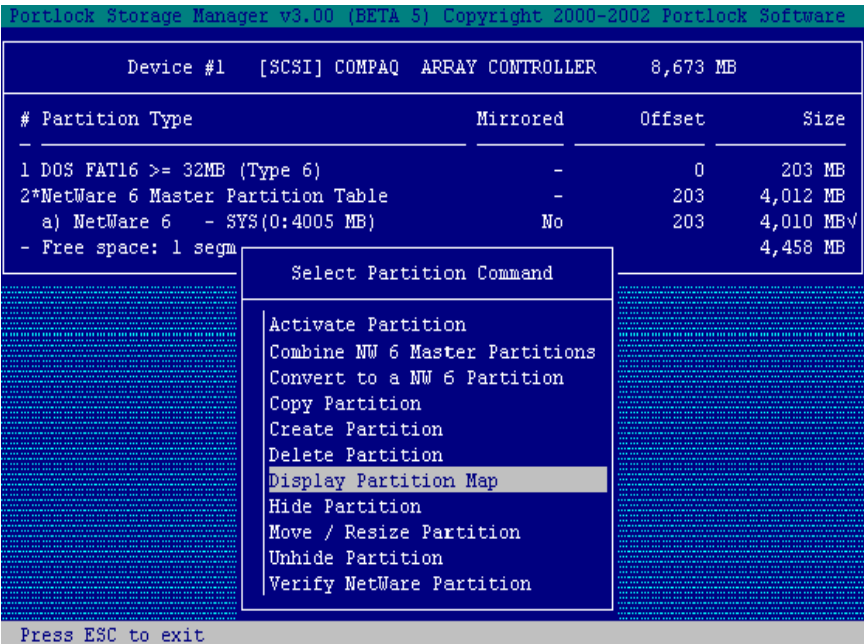
From the **Select Partition Command** menu, select “Delete Partition” and press [Enter].



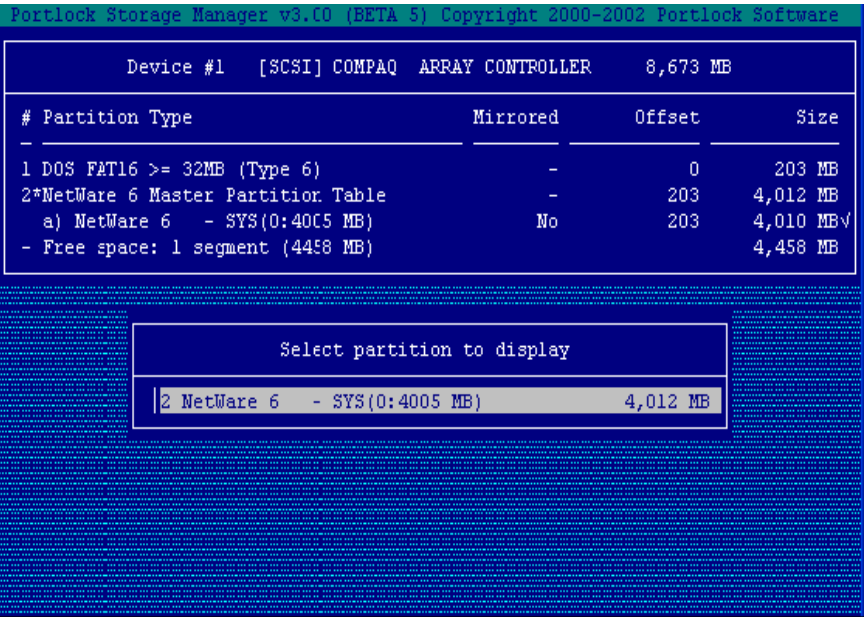
From this menu, select the partition you want to delete and press [Enter].

# Display Partition Map

The Display Partition Map displays the partitions on the drive, with their location, name, and starting and ending positions.



From the **Select Partition Command** menu, select the option “**Display Partition Map**” and press [Enter].



From this menu, select the partition to display and press [Enter].

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software

Partition (8,217,120 - 4,012 MB)	Segment	Offset	Last
NetWare 6 Master Partition Table		0	8,217,119
a NetWare 6 NSS Partition		0	8,212,479
b Free Space Partition		8,212,480	8,217,119

Press ESC to exit

This screen displays the NetWare 6 Partition Table. Press [ESC] to exit.

## Hide Partition

The Hide Partition Commands allows you to hide partitions.

```
Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software
```

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB
-----------	---------------	------------------	----------

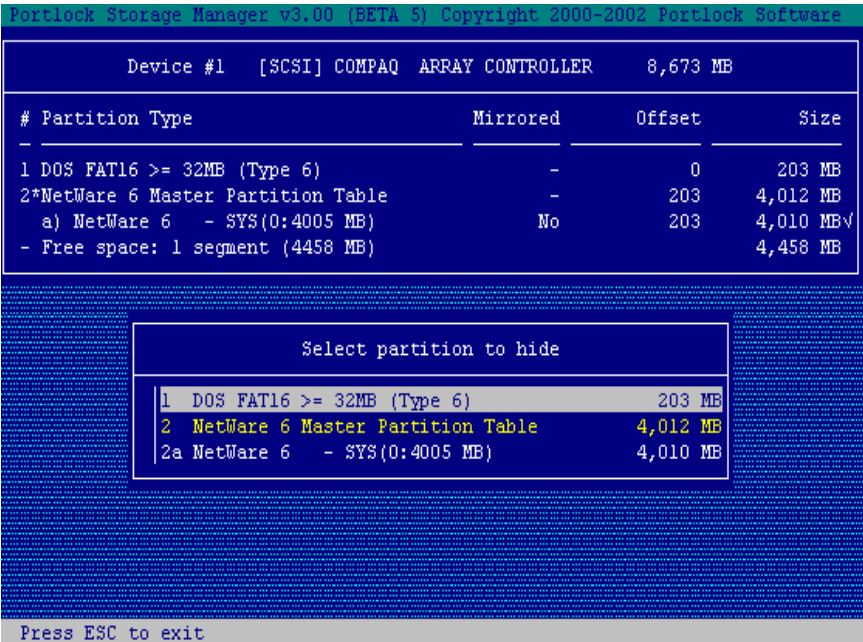
#	Partition Type	Mirrored	Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-	0	203 MB
2*	NetWare 6 Master Partition Table	-	203	4,012 MB
a)	NetWare 6 - SYS(0:4005 MB)	No	203	4,010 MB✓
-	Free space: 1 segment			4,458 MB

Select Partition Command

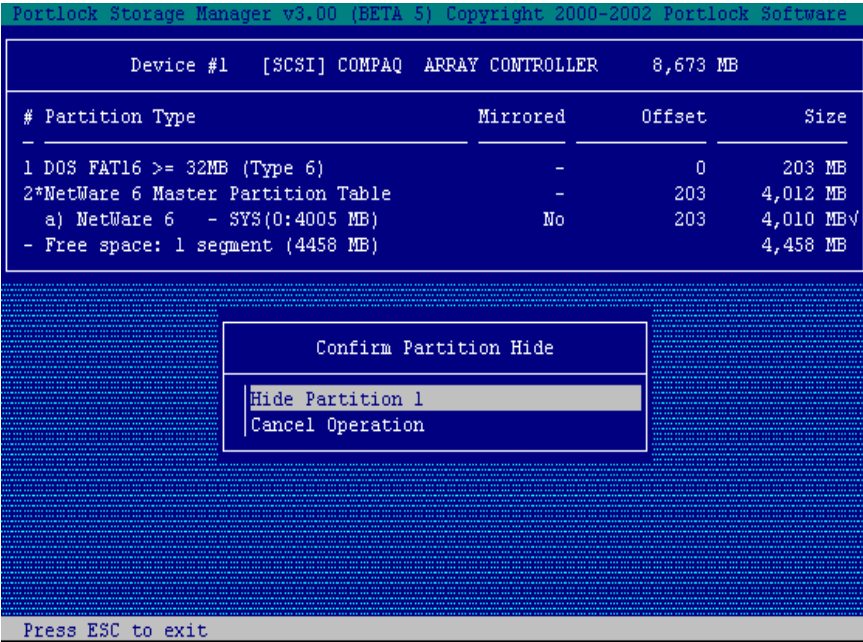
- Activate Partition
- Combine NW 6 Master Partitions
- Convert to a NW 6 Partition
- Copy Partition
- Create Partition
- Delete Partition
- Display Partition Map
- Hide Partition
- Move / Resize Partition
- Unhide Partition
- Verify NetWare Partition

Press ESC to exit

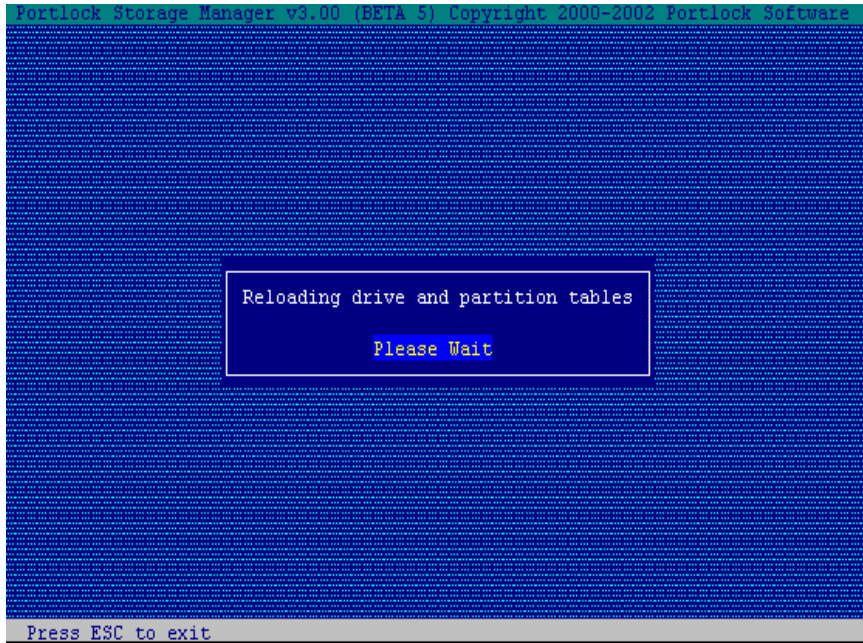
From the **Select Partition Command** menu, select the option “**Hide Partition**” and press [Enter].



From the **Select partition to hide** menu, choose the option “DOS FAT16>=32MB (Type 6)” and press [Enter].



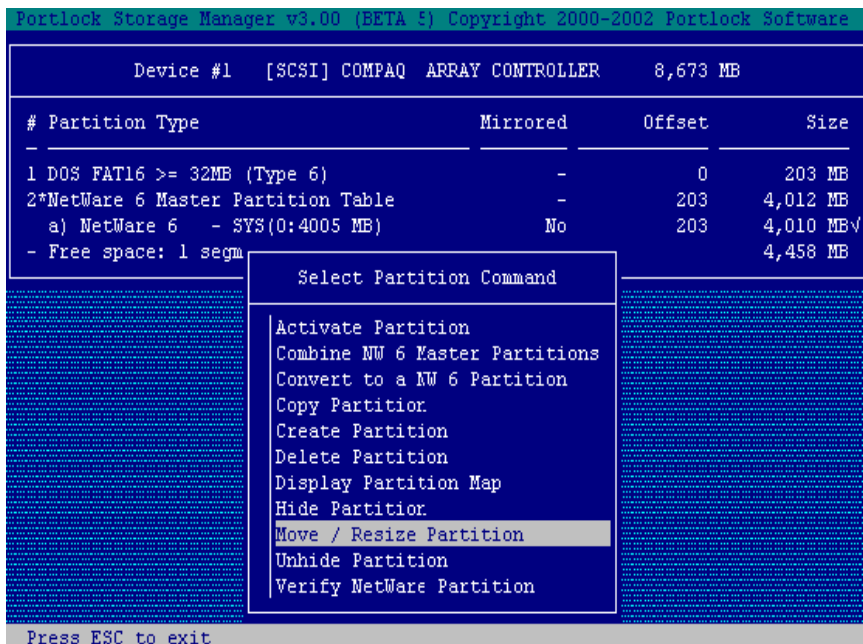
From the **Confirm Partition Hide** menu, you have the options to Hide Partition 1 or Cancel Operation. For this example, the option “**Hide Partition 1**” is selected. Press [Enter].



When this screen appears, the system is reloading the drive and partition tables.

## Move/Resize Partition

The Move/Resize Partition command resizes and moves NetWare and NSS partitions.



From the **Select Partition Command** menu, select “**Move/Resize Partition**” and press [Enter].

```

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software

Device #1  [SCSI] COMPAQ  ARRAY CONTROLLER      8,673 MB

# Partition Type          Mirrored      Offset      Size
-
1 DOS FAT16 >= 32MB (Type 6)      -          0      203 MB
2*NetWare 6 Master Partition Table      -      203      4,012 MB
  a) NetWare 6 - SYS(0:4005 MB)      No      203      4,010 MB✓

Notice: The Move / Resize Partition command is not available for NetWare 6.

      This command will be added in a future version

      <Press any key to return>

Press ESC to exit

```

This activation screen will appear. Press any key to return.

## Unhide Partition

The Unhide Partition command makes the partition accessible again.

```

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software

Device #1  [SCSI] COMPAQ  ARRAY CONTROLLER      8,673 MB

# Partition Type          Mirrored      Offset      Size
-
1 DOS FAT16 >= 32MB (Type 6)      -          0      203 MB
2*NetWare 6 Master Partition Table      -      203      4,012 MB
  a) NetWare 6 - SYS(0:4005 MB)      No      203      4,010 MB✓
- Free space: 1 segm              4,458 MB

Select Partition Command

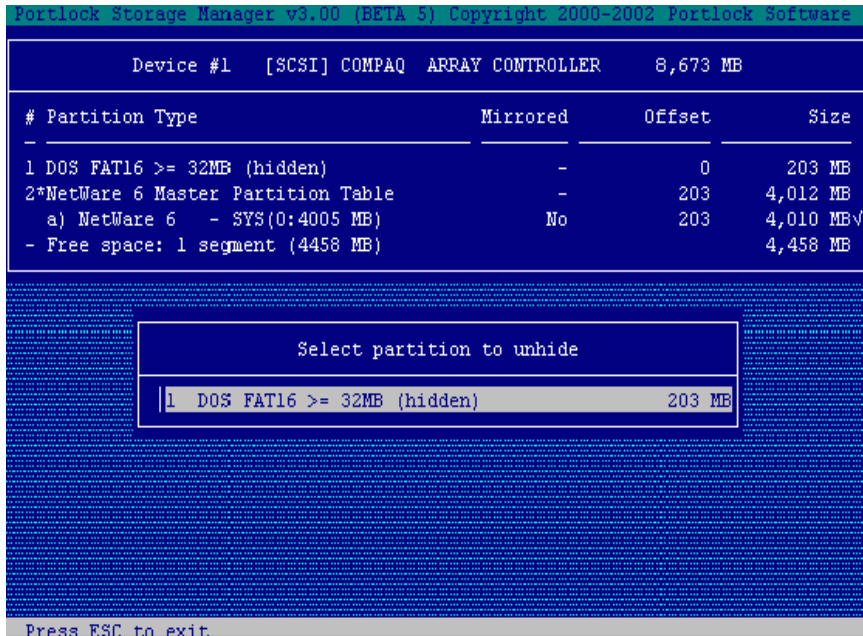
Activate Partition
Combine NW 6 Master Partitions
Convert to a NW 6 Partition
Copy Partition
Create Partition
Delete Partition
Display Partition Map
Hide Partition
Move / Resize Partition
Unhide Partition
Verify NetWare Partition

Press ESC to exit

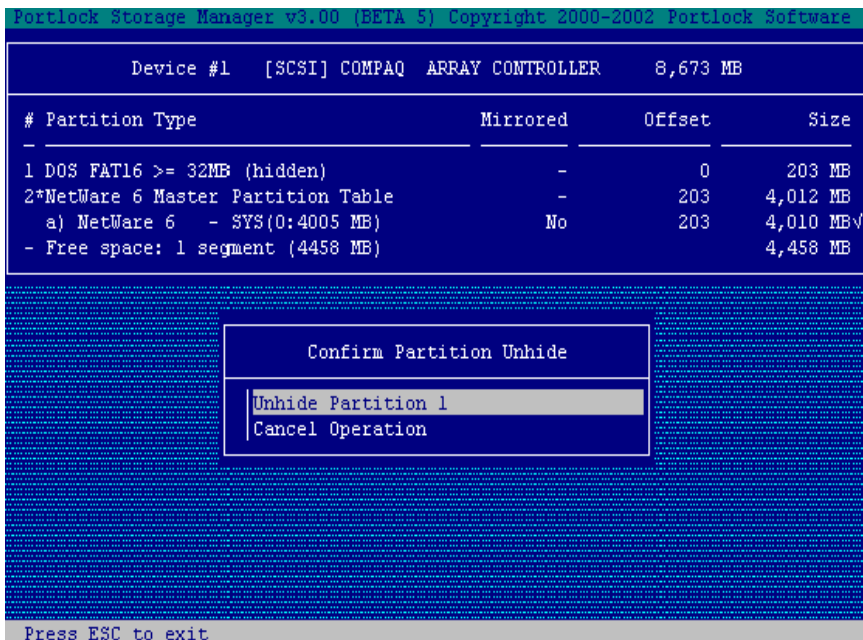
```

From the **Select Partition Command** menu, select the option “**Unhide Partition**” and press [Enter].

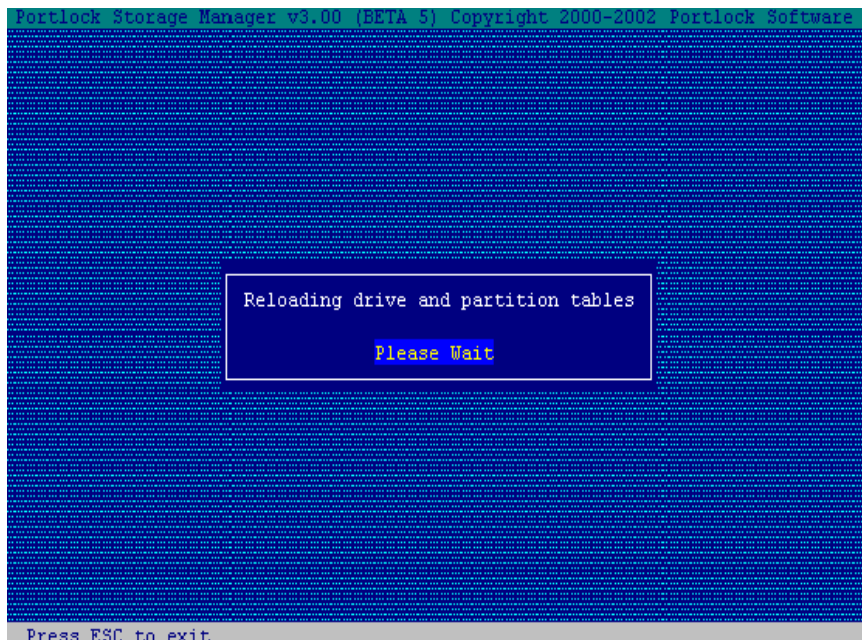




From the **Select partition to unhide** menu, select the option “**DOS FAT 16**” and press [Enter].



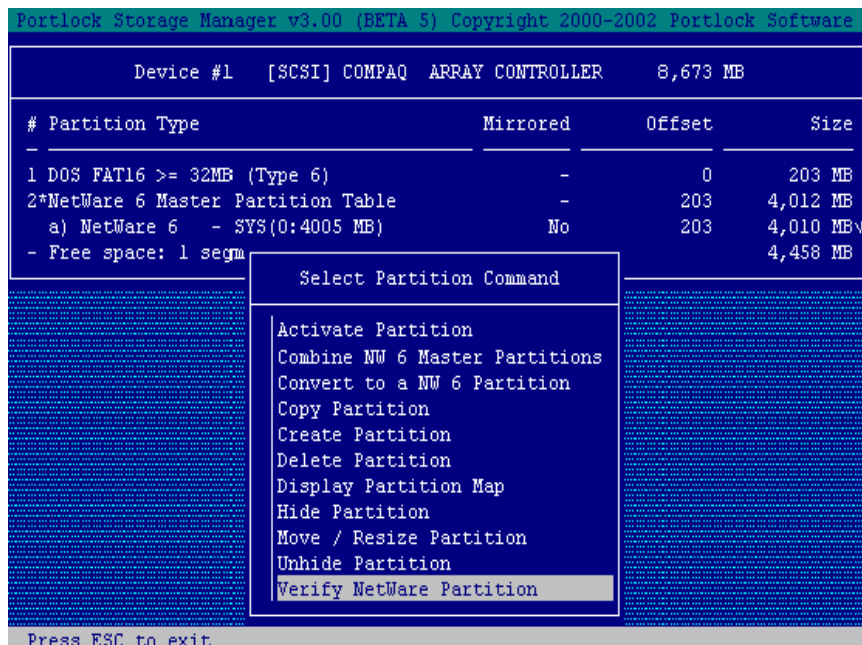
From the **Confirm Partition Unhide** menu, choose the option “**Unhide Partition 1**” and press [Enter].



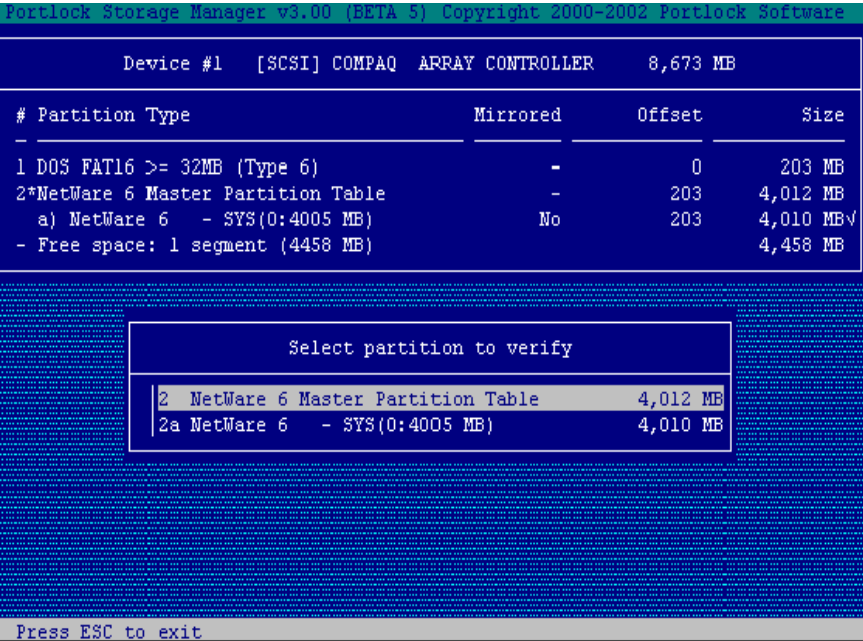
The activation screen will appear while the system is reloading the drive and partition tables.

## Verify NetWare Partition

The Verify NetWare Partition command allows you to hotfix sectors when a read or write media error occurs.



From the **Select Partition Command** menu, select **Verify NetWare Partition** and press [Enter].



From the **Select partition to verify** menu, select the partition you would like to verify and press [Enter].

```

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software

Device #1  [SCSI] COMPAQ  ARRAY CONTROLLER  8,673 MB

# Partition Type          Mirrored      Offset      Size
- - - - -
1 DOS FAT16 >= 32MB (Type 6)      -           0        203 MB
2*NetWare 6 Master Partition Table      -        203      4,012 MB
  a) NetWare 6   - SYS(0:4005 MB)      No        203      4,010 MB✓
- Free space: 1 segment (4458 MB)                        4,458 MB

Select Hotfix Mode

Hotfix Sector Errors
Do nothing for Errors

This mode will hotfix sectors when a read or write media error occurs.
If any of the sectors are hotfixed, the server will need to be rebooted.
A read I/O size of 8 sectors is recommended.

Press ESC to exit

```

From the **Select HotFix Mode** menu, you have two options:

1. Hotfix Sector Errors
2. Do nothing for errors

The HotFix Mode will Hotfix sectors when a read or write media error occurs. If any of the sectors are hotfixed, the server will need to be rebooted. A read I/O size of 8 sectors is recommended. For this example, the “Hotfix Sector Errors” option is selected. Press [Enter].

Portlock Storage Manager v3.00 (BETA 5) Copyright 2000-2002 Portlock Software

Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB	
#	Partition Type	Mirrored	Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-	0	203 MB
2	NetWare 6 Master Partition Table	-	203	4,012 MB
a)	NetWare 6 - SYS(0:4005 MB)	No	203	4,010 MB✓
-	Free space: 1 segment (4458 MB)			4,458 MB

Select Hotfix Mode

Hotfix Sector Errors

Do nothing for Errors

This mode will not hotfix sectors when a read or write media error occurs.  
The software will log the error to the logfile only. The display field  
"Blocks Needing Hotfix" will keep track of these errors.

Press ESC to exit

From the **Select Hotfix Mode** menu, select the option “**Do nothing for errors.**” Selecting this option will not Hotfix sectors when a read or write media error occurs. The software will log the error to the logfile only. The display field “Blocks Needing Hotfix” will keep track of these errors.

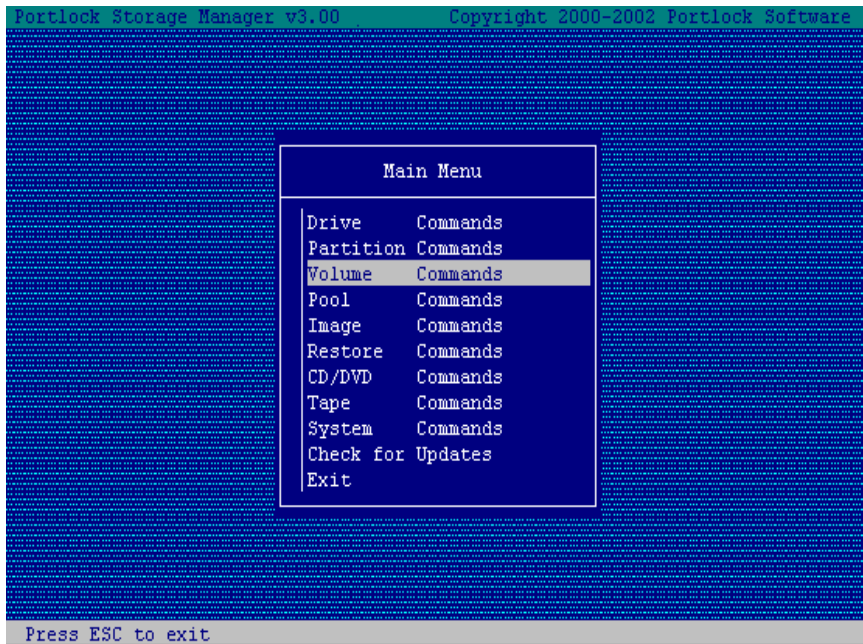




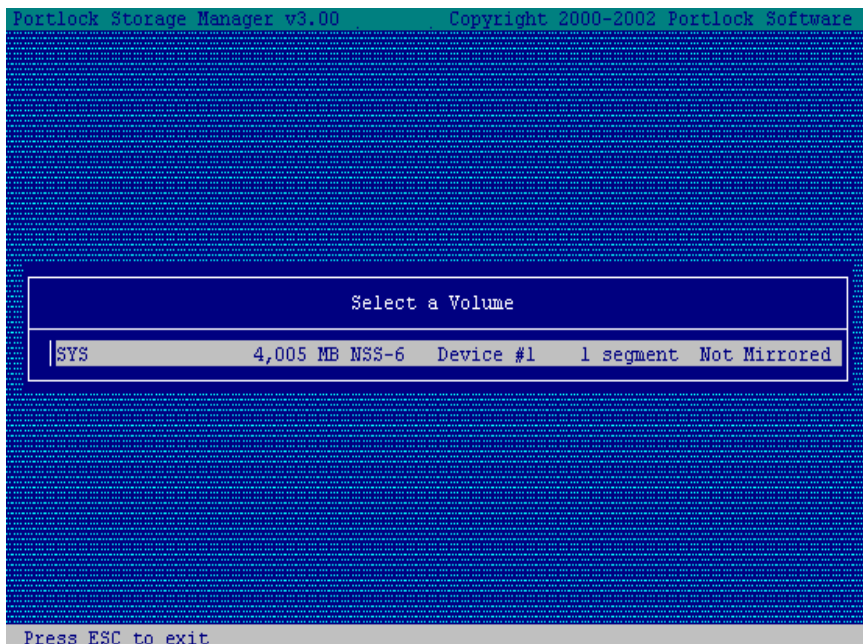


# CHAPTER 5

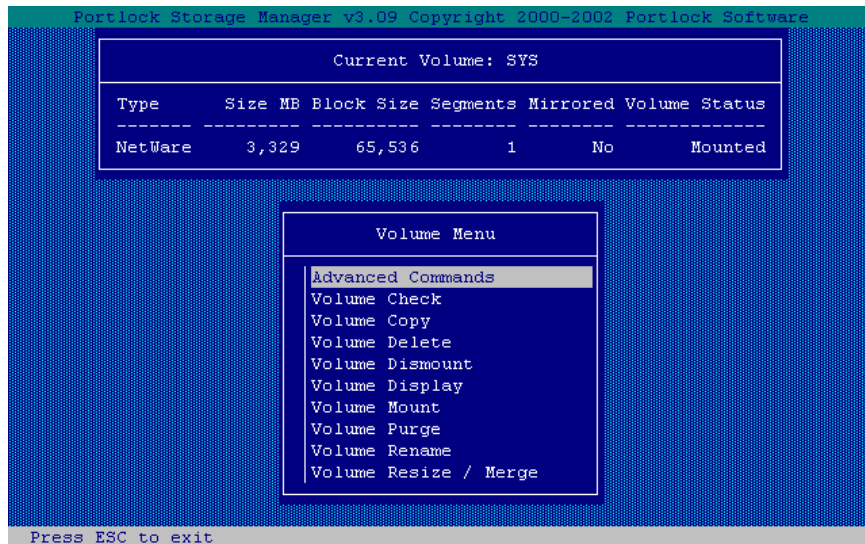
## Volume Command



From the **Main Menu**, choose “**Volume Commands**” and press [Enter].



Storage Manager now displays the Volume Selection menu with a list of all volumes currently on the server. Since the SYS volume is the only volume that is on our server, we will choose it by pressing [Enter].

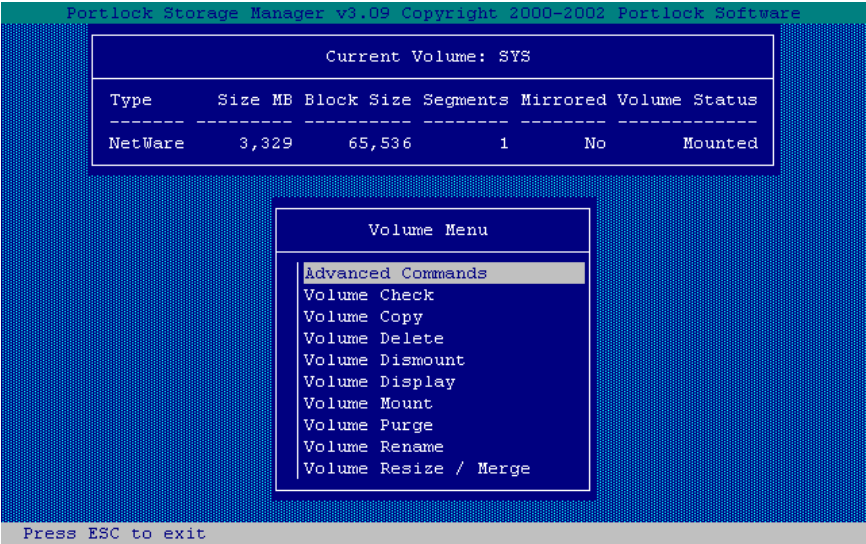


After the volume scan is complete, you will be prompted to the **Volume Menu**. You have the following options:

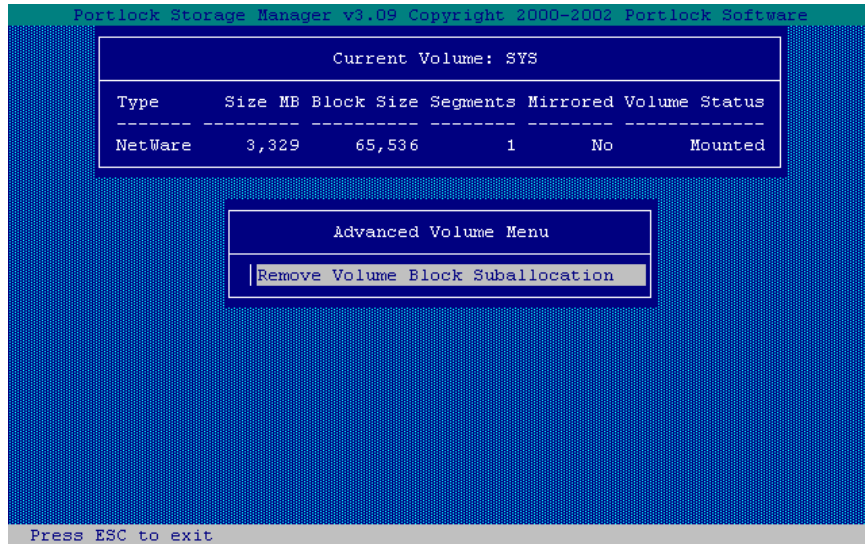
- 1 Advanced Commands
- 2 Volume Check
- 3 Volume Copy
- 4 Volume Delete
- 5 Volume Dismount
- 6 Volume Display
- 7 Volume Mount
- 8 Volume Purge
- 9 Volume Rename
- 10 Volume Resize/Merge
- 11 NSS Volume Commands

# Advanced Commands

This command operates on dismounted volumes, and can be run from NetWare or from DOS. This command removes Block Suballocation from a volume and disables future Block Suballocation providing that the command completely converts every file. This command will stop once the number of free blocks on a volume goes below 100 blocks. Compressed files remain compressed after the conversion. If this command stops due to not enough free space or an error condition, then Block Suballocation will be left enabled.



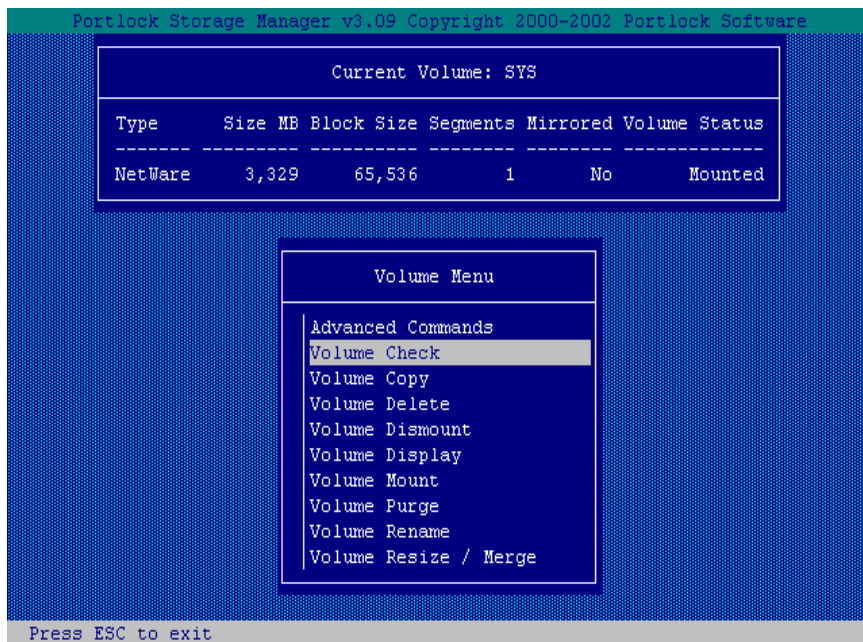
From the Volume Menu, select **Advanced Commands** and press [Enter].



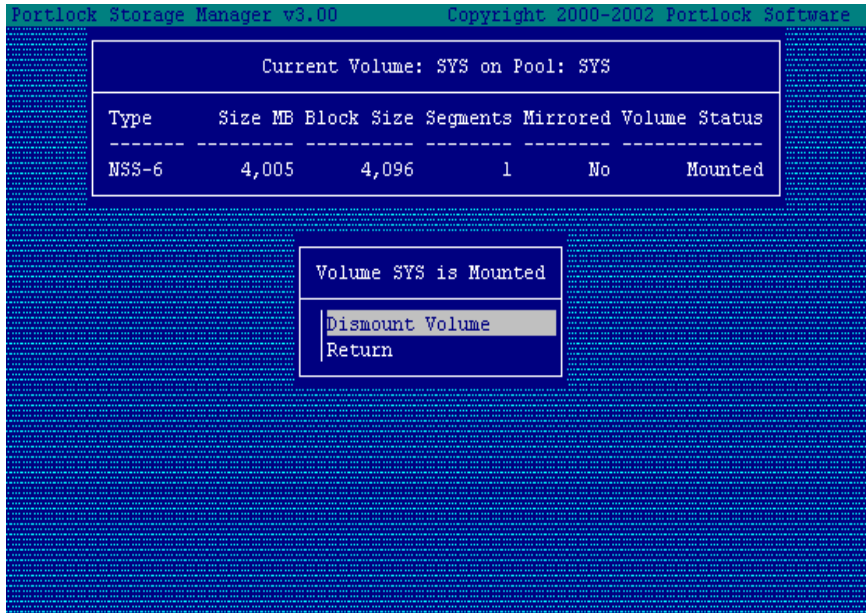
At the Advanced Volume Menu, press [Enter] to Remove Volume Block Suballocation.

## Volume Check

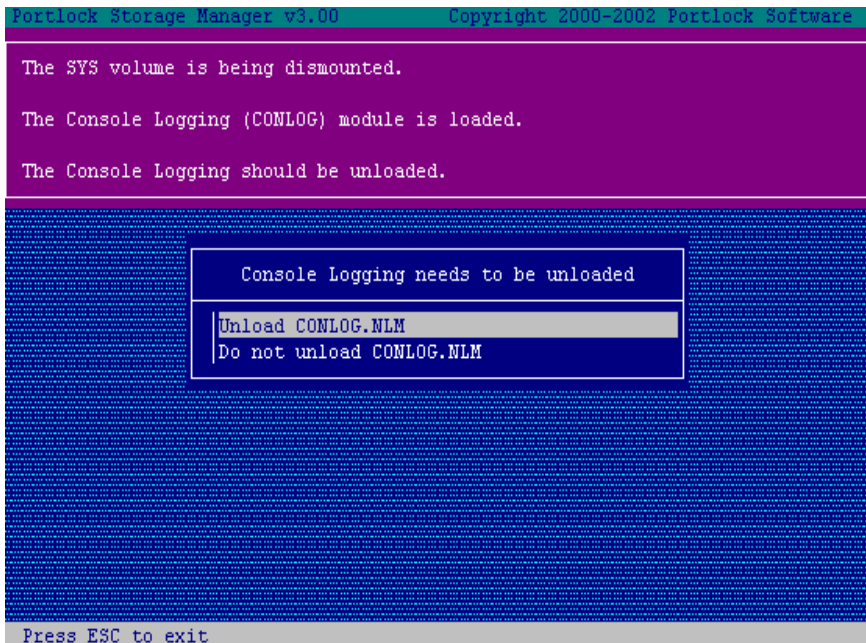
The Volume Check command allows a quick, comprehensive check of the volume.



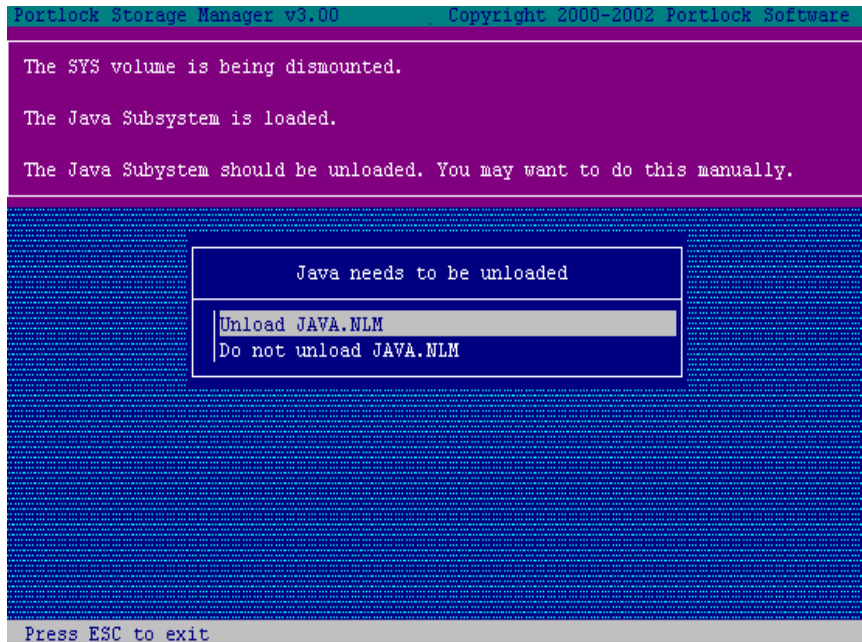
For this example, choose “**Volume Check.**” Press [Enter].



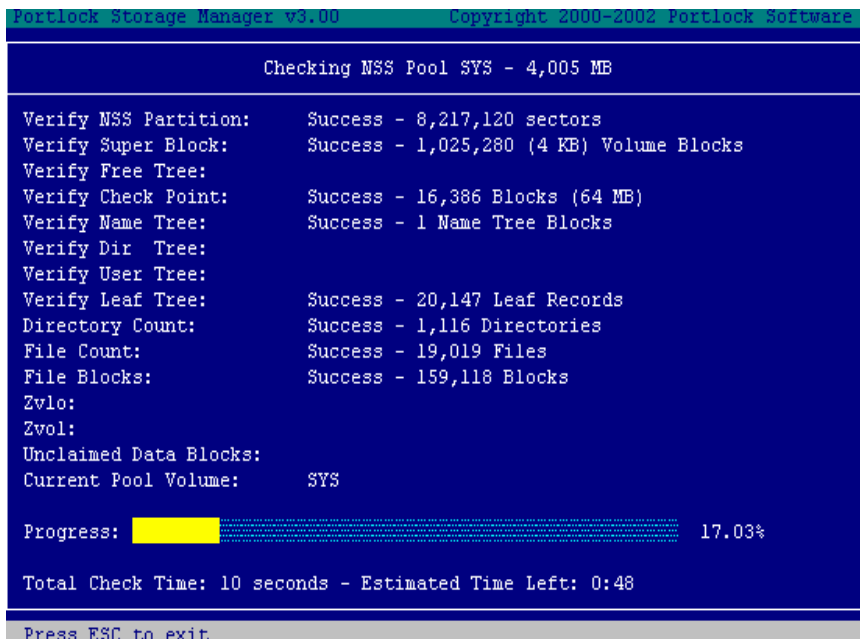
From the **Volume SYS is Mounted** screen choose **Dismount Volume** and press [Enter].



From the **Console Logging needs to be unloaded** screen, choose “**Unload CONLOG.NLM**” and press [Enter].



From the **Java needs to be unloaded** screen choose the option “**Unload JAVA.NLM.**”



Next, the **Volume Check Progress** screen will appear.



```
Portlock Storage Manager v3.00      Copyright 2000-2002 Portlock Software

Checking NSS Pool SYS - 4,005 MB

Verify NSS Partition:      Success - 8,217,120 sectors
Verify Super Block:        Success - 1,025,280 (4 KB) Volume Blocks
Verify Free Tree:          Success - 841,231 Free Blocks (3,286 MB)
Verify Check Point:        Success - 16,386 Blocks (64 MB)
Verify Name Tree:          Success - 753 Name Tree Blocks
Verify Dir Tree:           Success - 0 Dir Tree Blocks
Verify User Tree:          Success - 2 User Tree Blocks
Verify Leaf Tree:          Success - 22,232 Leaf Records
Directory Count:           Success - 1,133 Directories
File Count:                Success - 21,087 Files
File Blocks:               Success - 163,821 Blocks
Zvlo:                      Success
Zvol:                      Success
Unclaimed Data Blocks:     Success - Processed 1,025,280 Data Blocks
Current Pool Volume:       SYS

Progress:  100.00%

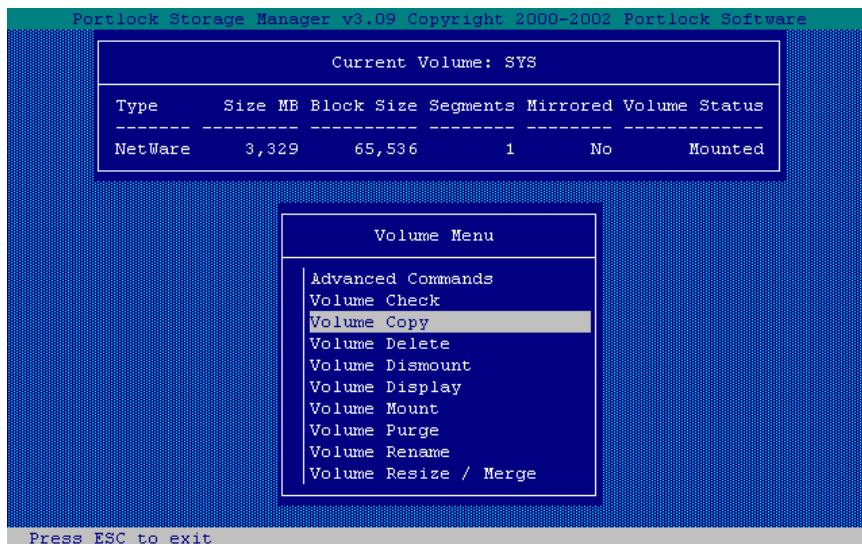
Total Check Time: 15 seconds - Estimated Time Left: 0:00

Volume Check was successful - Press any key to close screen.
```

This screen shows the volume check completed. Press any key to close the screen.

## Volume Copy

The Volume Copy command allows you to select the volume you wish to copy and its destination.



The Volume Command menu now appears. Notice that the status of the volume selected appears on the upper portion of the screen. As you can see, it contains useful information such as the volume type, size in MB, block size, number of segments in the volume, mirror status, and mounted status. From this menu, select Volume Copy and press [Enter]. A menu will appear indicating to work with the volume, it must be dismounted. Dismount the volume by pressing [Enter].

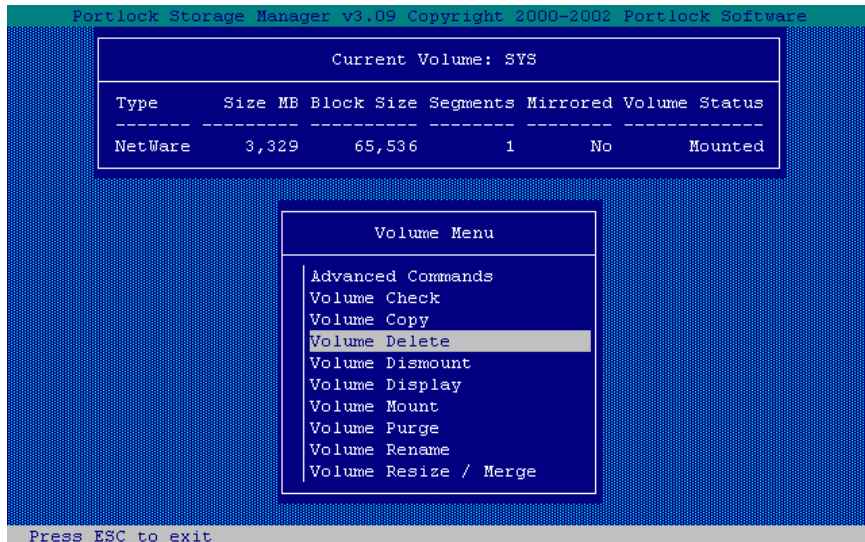
The next screen, asks you to select the type of volume copy. At this point, you have three choices: (1) Copy all allocated data, which is the fastest and recommended mode (2) Copy all the data including unused space, which takes more time or (3) Copy individual volume segments, which is used mainly for data recovery.

After selecting the copy type, you must select the destination drive for the volume copy. Because NetWare requires unique volume names, a new name for each volume being copied must be assigned. Name the new volume and press [Enter]. Now the actual volume copy process will take place. You can see there is an abundance of useful information contained on the actual progress screen.

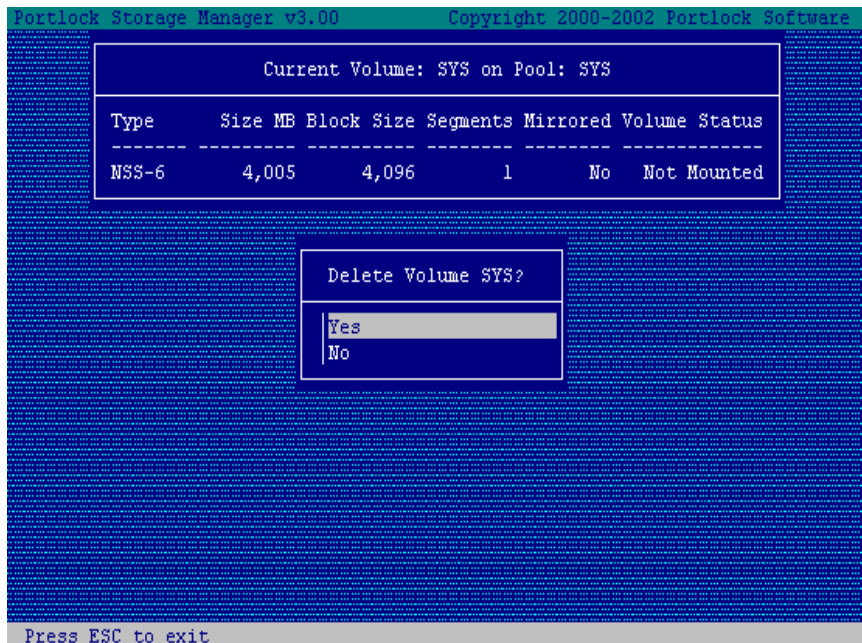
Once the copying process has completed, a window will pop up indicating that the volume copy was complete. From here, press [ESC] to return to the Volume Commands menu. Because the SYS volume was dismounted and the new volume has never been mounted, Storage Manager gives you the choice of mounting the volumes before returning to the Volume Commands menu. Proceed to remount the volumes. At the Volume Commands menu, press [ESC] once more to return to the screen that displays the list of all volumes currently on the system. Notice that the volume you just created is now on the list. This verifies that the operation was a success. Press the [ESC] to return to the Main Menu.

## Volume Delete

The Volume Delete command allows you to select and delete a volume.



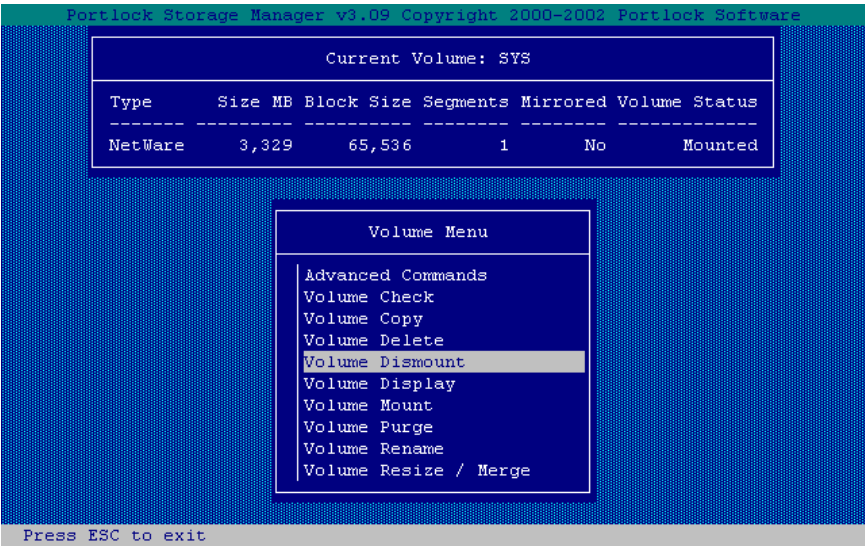
From the **Volume Menu**, select the option “**Volume Delete**” and press [Enter].



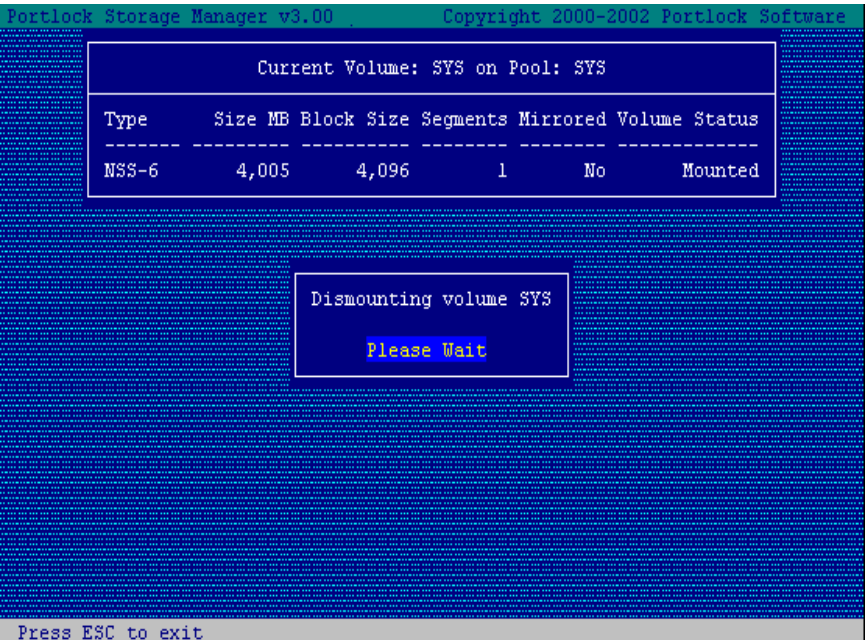
Once the “**Volume Delete**” option is selected, you are prompted to choose “**Yes**” or “**NO**” to Delete Volume SYS from the **Delete Volume SYS** menu. For this example, select “**Yes**” and press [Enter].

# Volume Dismount

The Volume Dismount commands allows you to dismount the volume.



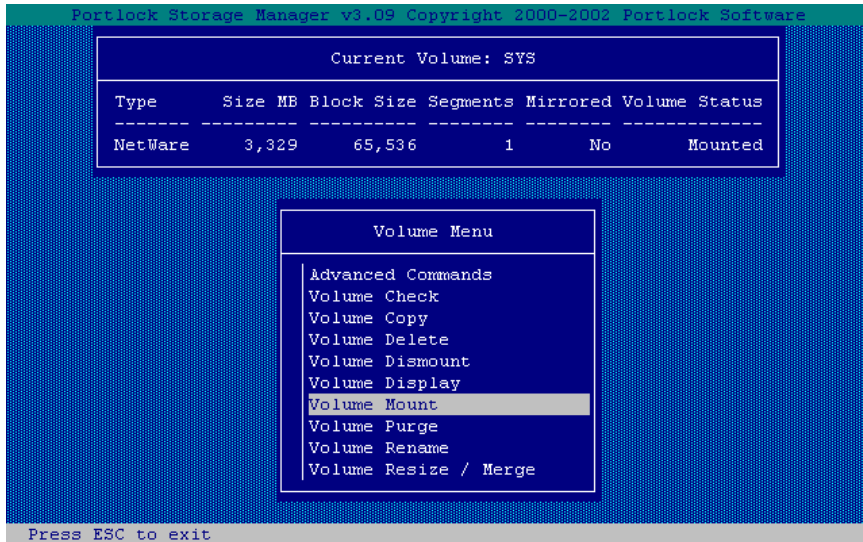
From the **Volume Menu**, choose the option **Volume Dismount** and press [Enter].



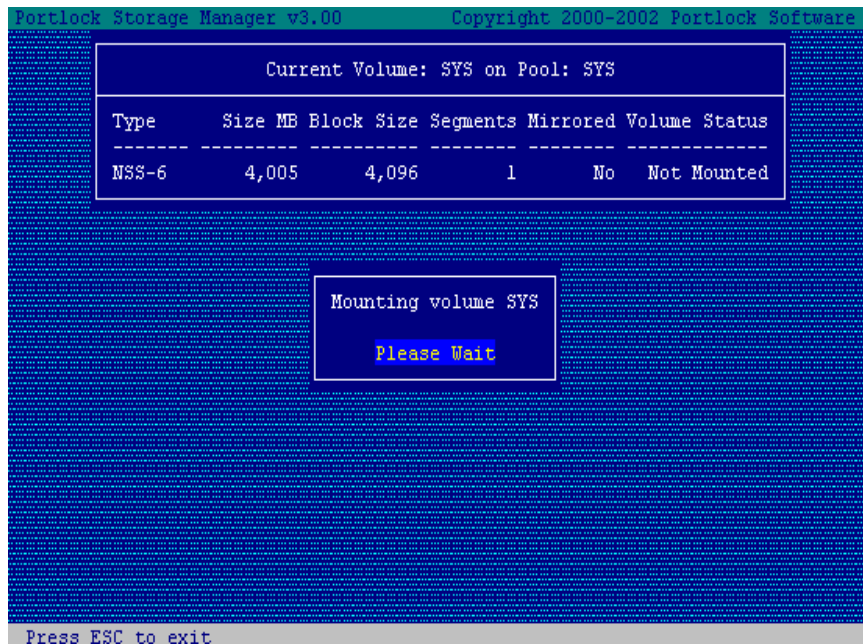
The **Dismount Volume** screen will appear informing you that the system is dismounting volume SYS. Please Wait.

# Volume Mount

The Volume Mount command enables you to mount a volume.



From the **Volume Menu**, choose the option **Volume Mount** and press [Enter].



Once you select **Volume Mount**, this screen will appear informing you that the system is mounting volume SYS.

## Volume Purge

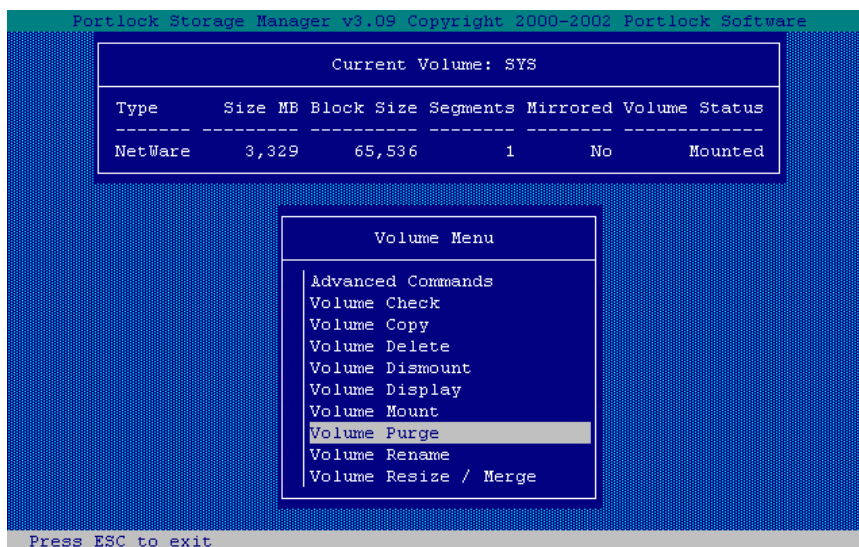
The Volume Purge command purges files from a volume that has files that have been deleted. In NetWare, you can delete a file and NetWare will actually save this file. You can recover a file by using the Salvage feature of NetWare. The Volume Purge command deletes all of these saved files.

### Traditional Volume Support

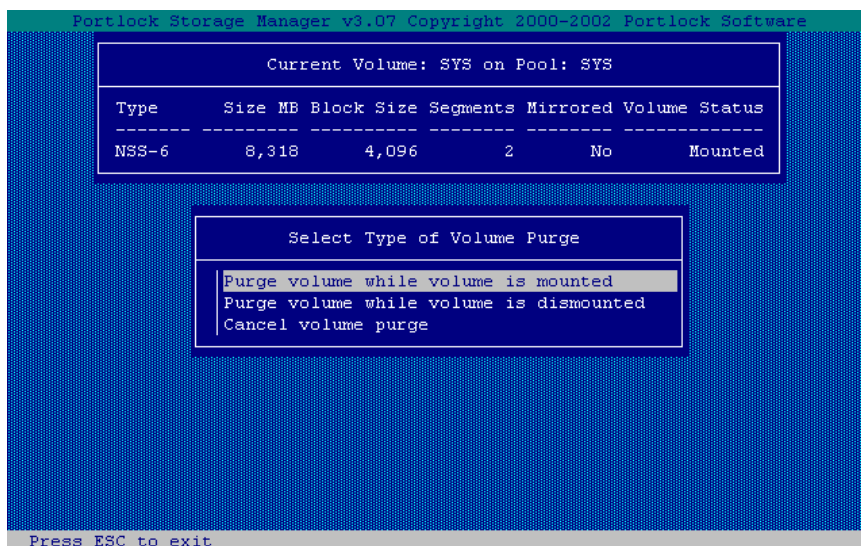
Storage Manager has the capability to purge volumes. Volumes can be purged when mounted or dismounted and can be purged from NetWare or DOS. Storage Manager can purge a dismounted volume faster than NetWare can purge a volume that is mounted.

### NSS Volume Support

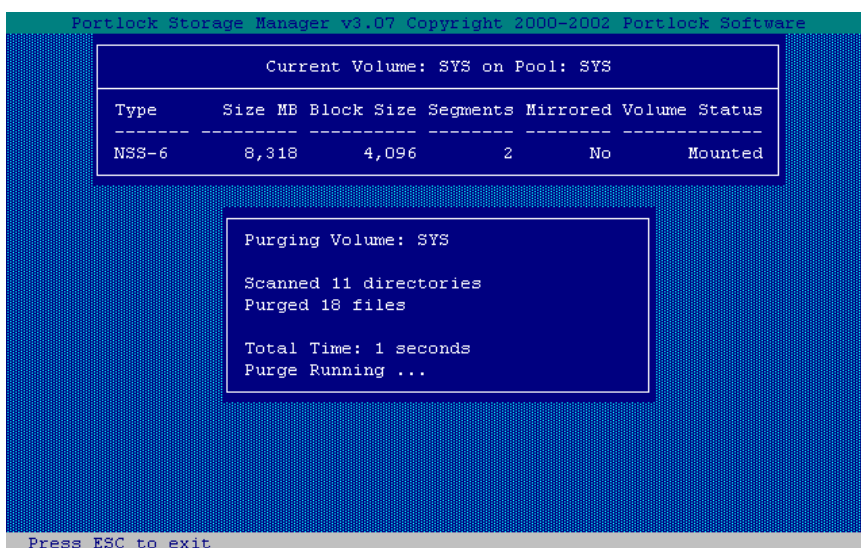
Volumes can only be purged when mounted. This also means that Storage Manager cannot purge an NSS volume from DOS.



To begin using the purge utility, select Volume Purge from the Storage Manager Volume Menu and press [Enter].



At this screen, select the type of Volume Purge that you want to complete and press [Enter] to continue.



The Volume Purge Status screen will appear. This screen provides useful information about the volume you want to purge. In the top screen, you are provided with information on the type of volume, size in MB, block size, number of segments, and mirror and volume status. In the bottom box, you are provided with information on the number of scanned directories, number of purged files and total time. Press [ESC] to exit.



```
Portlock Storage Manager v3.07 Copyright 2000-2002 Portlock Software

Current Volume: SYS on Pool: SYS

Type      Size MB Block Size Segments Mirrored Volume Status
-----
NSS-6      8,318      4,096      2      No      Mounted

Purging Volume: SYS

Scanned 1,965 directories
Purged 502 files

Total Time: 23 seconds
Purge has completed

Press ESC to exit
```

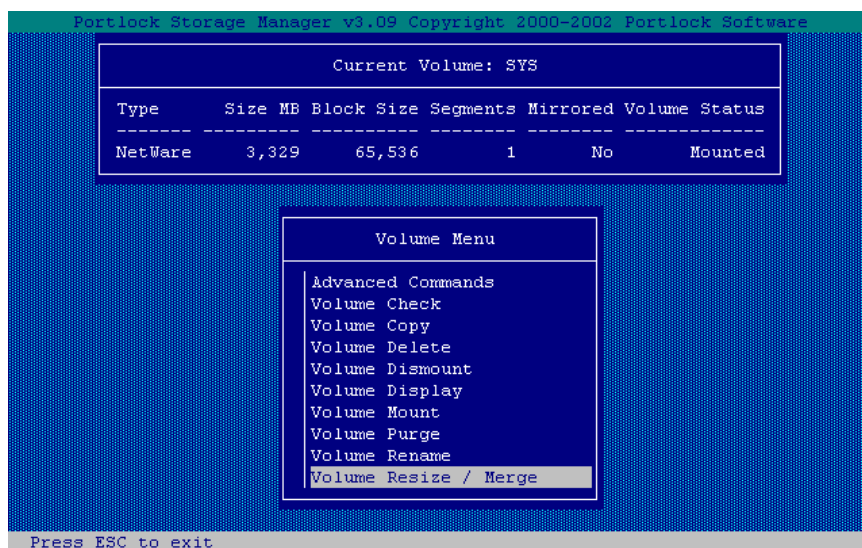
This screen informs you that the Volume Purge is complete. Press [ESC] to exit.



## Volume Resize/Merge

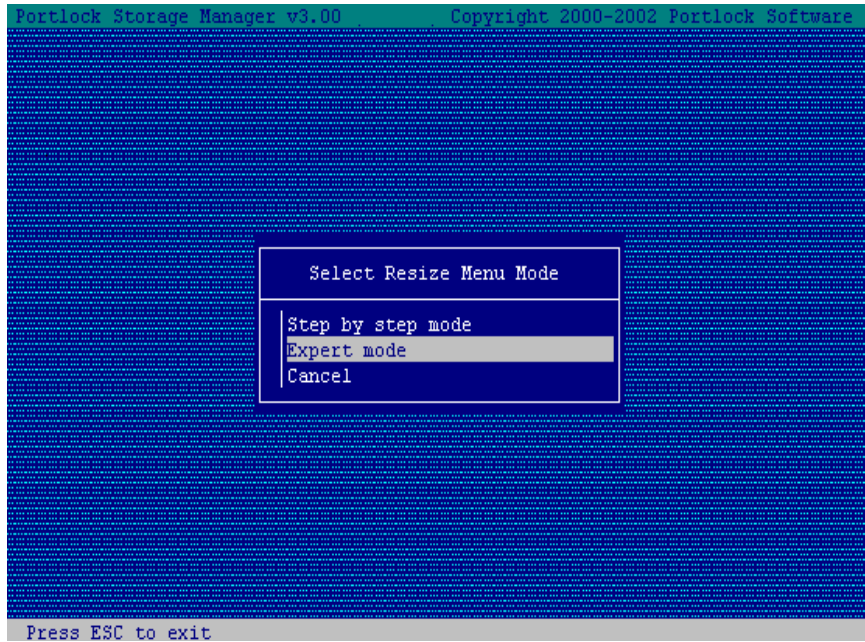
The Volume Resize for NetWare command resizes NetWare volumes. A volume can be resized larger or smaller and can consist of one or more volume segments. A volume is resized by modifying the size of an individual segment. To resize more than one volume segment, repeat the resize operation for each volume segment. To delete a volume segment, change its size to zero. The data from the selected segment will first be moved to other segments, then the segment will be deleted.

From the Main Menu select the Volume Command option. The volume selection screen appears displaying a list of all volumes currently on the server and some important information pertaining to them, such as size in MB, file system, what device their on, how many segments they have, and mirror status. Since the SYS volume is the only volume on the server, highlight it and press [Enter].

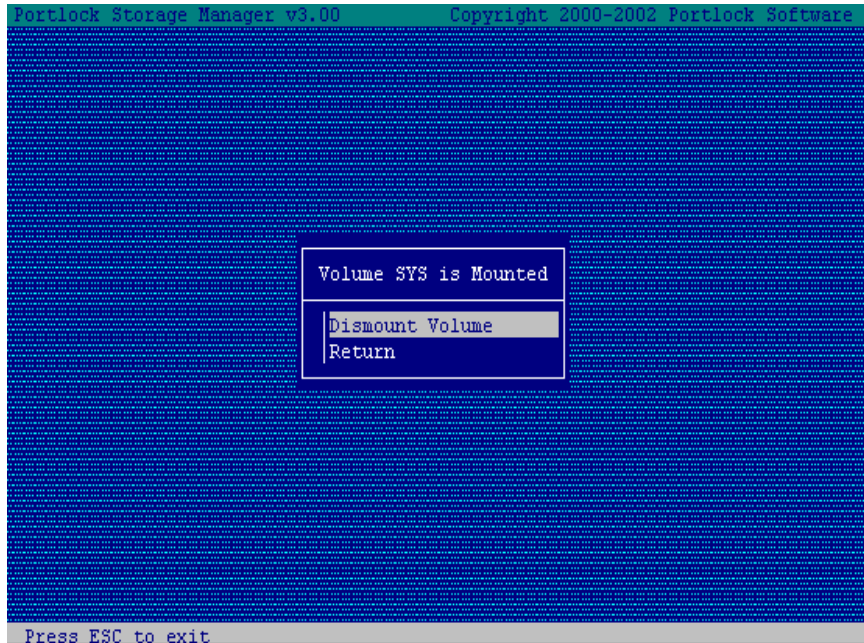


The Volume Command menu now appears. Notice that the status of the selected volume appears on the upper portion of the screen. As you can see, it contains some useful information such as the volume type, its size in MB, its block size, the number of segments in the volume, its mirror status, and if it is mounted or not.

From this menu, cursor down to the Volume Resize/Merge Command and press [Enter].



The next menu that appears is the Resize Mode menu. You are given three selections to choose from. The first is Step-by-step mode, which will walk you through the procedure step-by-step. The Second is Expert mode and the third is Cancel. For this example, select Expert mode and press [Enter] to continue.



Before we can work with the SYS volume, it must be dismounted. A dialog box appears asking you to dismount the volume. Go ahead and dismount the volume by pressing [Enter].

Storage Manager will dismount the volume and perform an automatic volume check before proceeding.

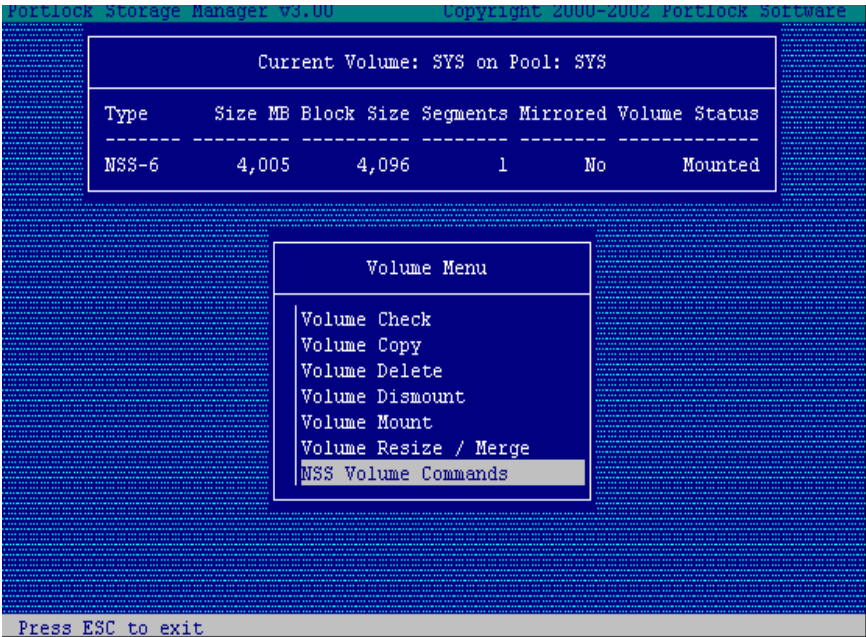
The next screen indicates for you to select the Resize Type. A volume can be resized by either moving either the ending position or the starting position. Choose to resize the volume by moving the ending position and press [Enter] to continue.

Because the volume only has one segment, cursor down to the new segment size field and enter the new value. To reduce the size of the volume, enter 5000 into the field and press [Enter]. Press the F10 function key to choose the new volume size. A confirmation screen will appear asking you if you want to resize the volume segment 0 from 8434 to 5000. Choose Yes by pressing [Enter].

A dialog box appears asking you if you would like to defragment the directory tables. It is recommended to defragment the directory tables. Press [Enter] to continue.

Storage Manager will now go ahead and resize the volume and defragment the directory tables. When completed, you will be returned to the Volume Command menu.

# NSS Volume Commands



From the **Volume Menu**, choose the option **NSS Volume Commands** and press [Enter].

```

Portlock Storage Manager v3.00      Copyright 2000-2002 Portlock Software
-----
Current Volume: SYS on Pool: SYS
-----
Type      Size MB Block Size Segments Mirrored Volume Status
-----
NSS-6      4,005      4,096      1      No      Mounted
-----

NSS Volume Menu
-----
Activate Volume
Deactivate Volume
Verify Volume
Rebuild Volume
Upgrade Volume to NSS version 3
Salvage Options
Directory Quota Options
User Space Restriction Options
-----

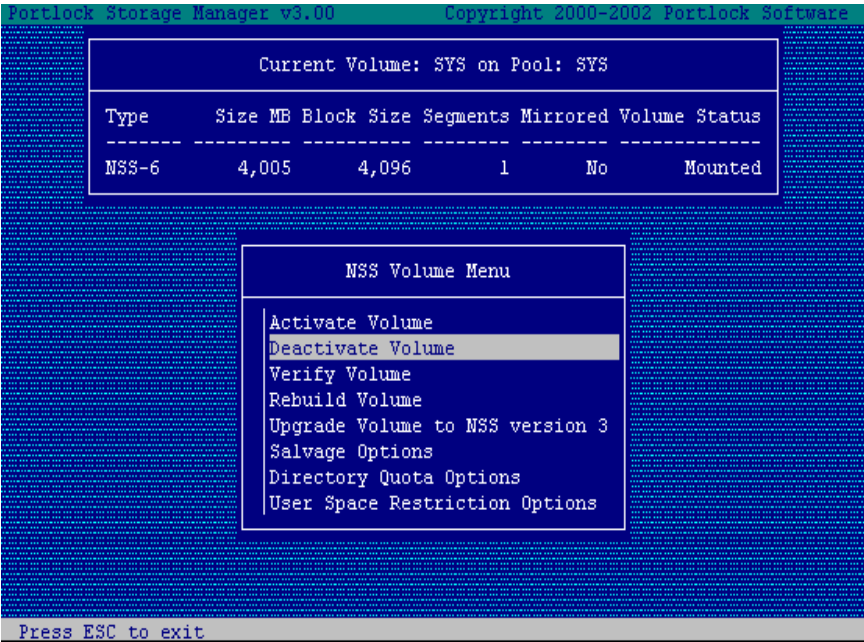
Press ESC to exit

```

From the **NSS Volume Menu**, you have the following choices:

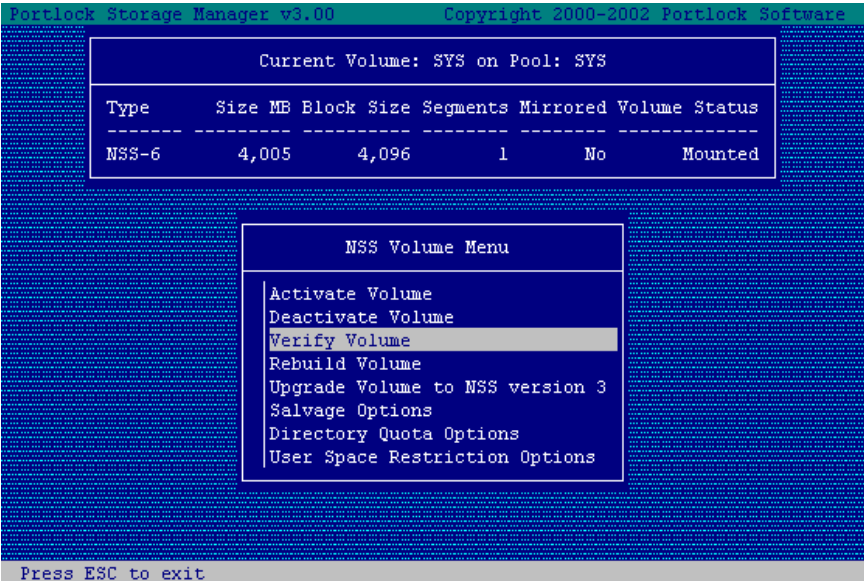
1. Activate Volume
2. Deactivate Volume
3. Verify Volume
4. Rebuild Volume
5. Upgrade Volume to NSS version 3
6. Salvage Option
7. Directory Quota Options
8. User Space Restriction Options

For this example, choose **Activate Volume** and press [Enter].

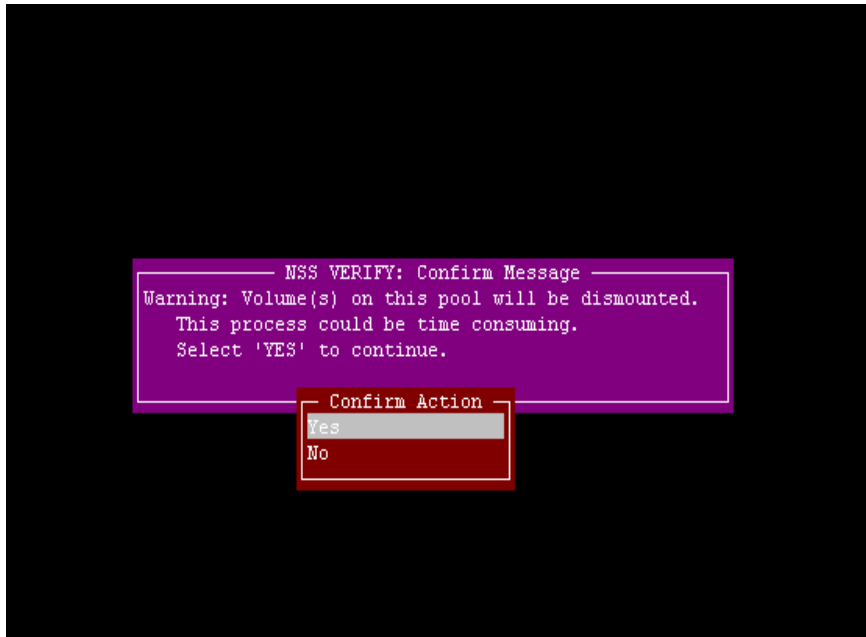


From the **NSS Volume Menu**, choose the option **Deactivate Volume** and press [Enter].

## Verify Volume

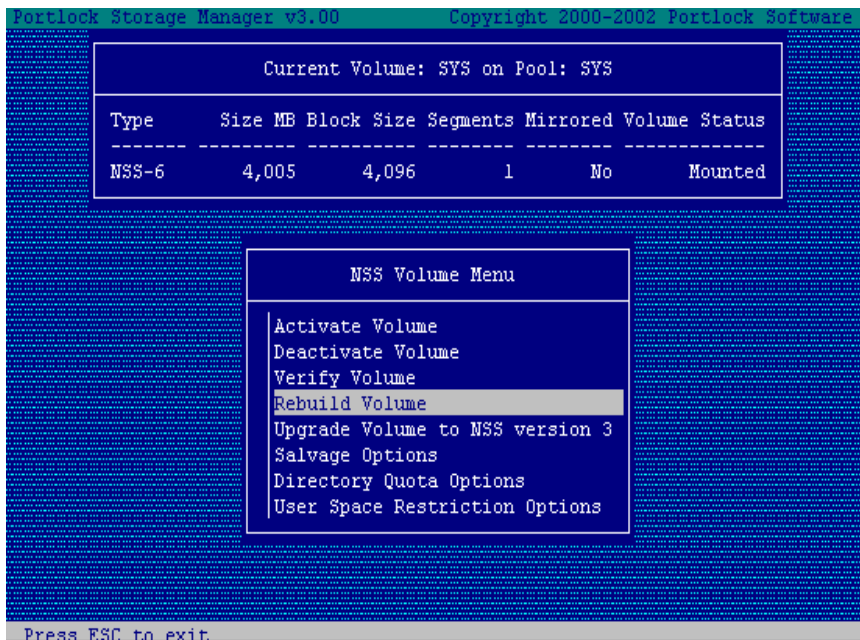


From the **NSS Volume Menu**, choose the option **Verify Volume** and press [Enter].

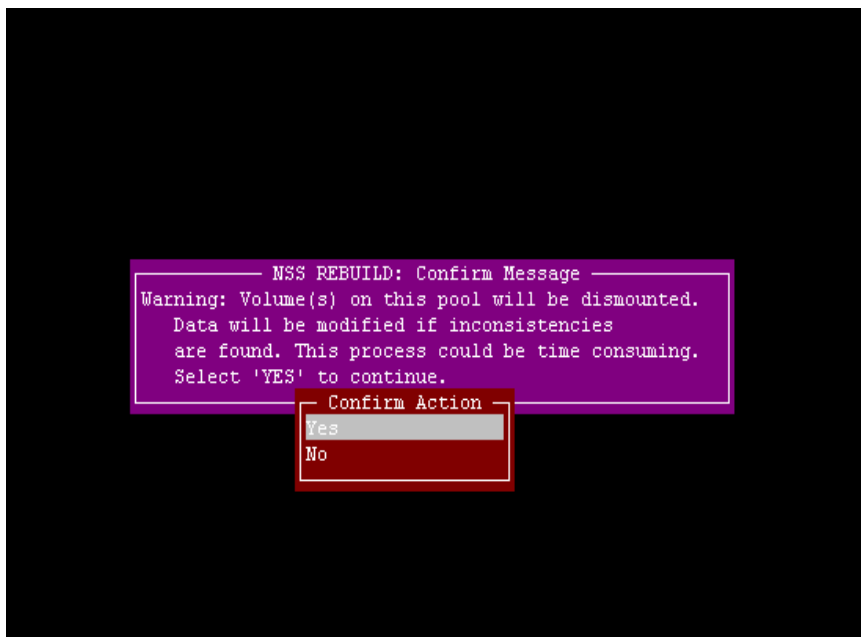


Once you choose the option to Verify the Volume, the **NSS Verify** screen will appear warning you that the volume(s) on this pool will be dismounted. This process could be time consuming. Select “**Yes**” to confirm or “**No**” to Cancel and press [Enter].

## Rebuild Volume



From the **NSS Volume Menu**, choose the option to **Rebuild Volume** and press [Enter].



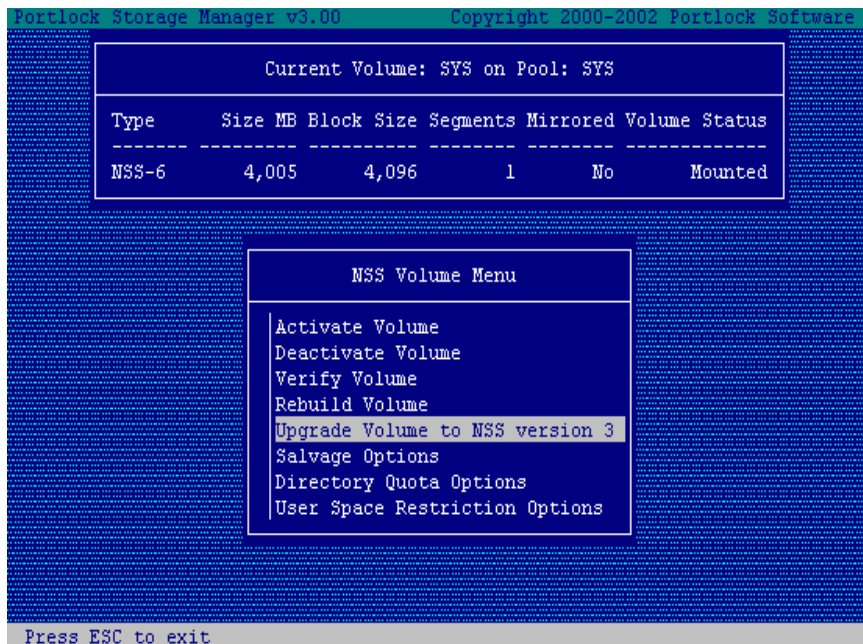
Once you select **Rebuild Volume**, the **NSS Rebuild Confirmation** screen will appear. This screen warns you that the volume(s) on this pool will be dismounted. Data will be modified if inconsistencies are found. This process could be time consuming. Select “**Yes**” to continue or “**No**” to cancel and press [Enter].



## Upgrade Volume to NSS version 3

Storage Manager support two types of volume conversions:

- 1 Convert a Type 1 NSS volume into a Type 2 NSS volume. A type 1 NSS volume exists in a Type 1 NSS Partition. A Type 1 NSS partition can only hold one NSS volume. A Type 2 NSS partition (also called a Storage Group) can hold any number of NSS volumes.
- 2 Convert a NSS version 2.0 volume (format used for NetWare 5) into an NSS Version 3.0 volume (format used for NetWare 6). In reality, Storage Manager does not convert the volume format itself, but calls a function inside NetWare 6 to do the conversion. Follow the steps below to Upgrade your volume to NSS version 3.



From the **NSS Volume Menu**, choose the option **Upgrade Volume to NSS version 3**.

```
Portlock Storage Manager v3.00      Copyright 2000-2002 Portlock Software

Current Volume: SYS on Pool: SYS

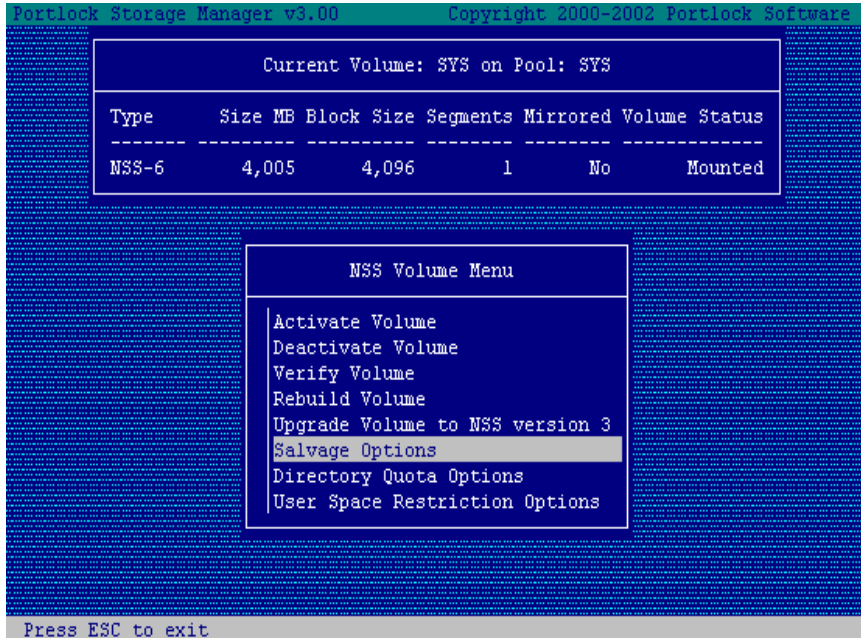
Type      Size MB Block Size Segments Mirrored Volume Status
-----
NSS-6      4,005      4,096          1          No      Mounted

Notice: Volume SYS has already been upgraded to NSS Version 3

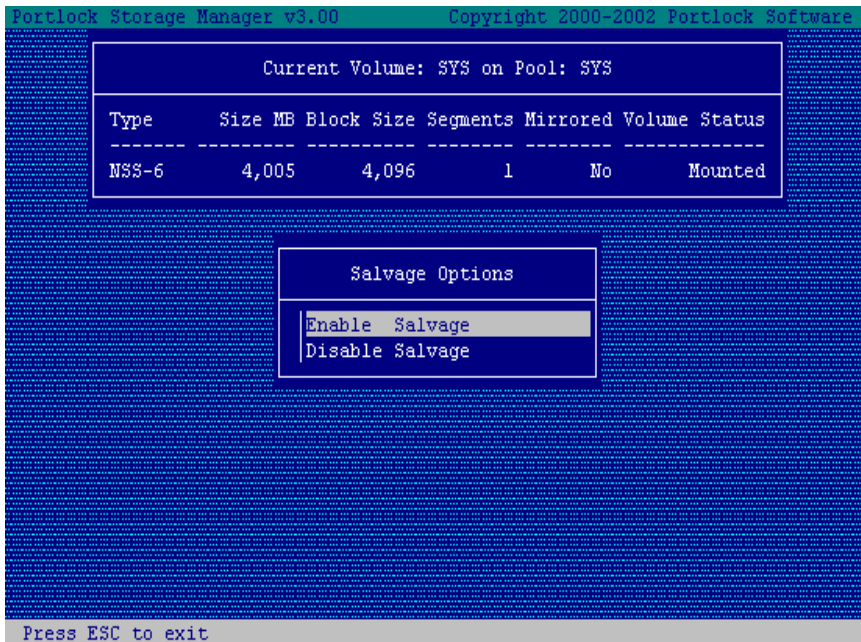
Press ESC to exit
```

Once selected, the upgrade notice screen will appear. Press [Enter] to continue.

## Upgrade Volume to NSS version 3

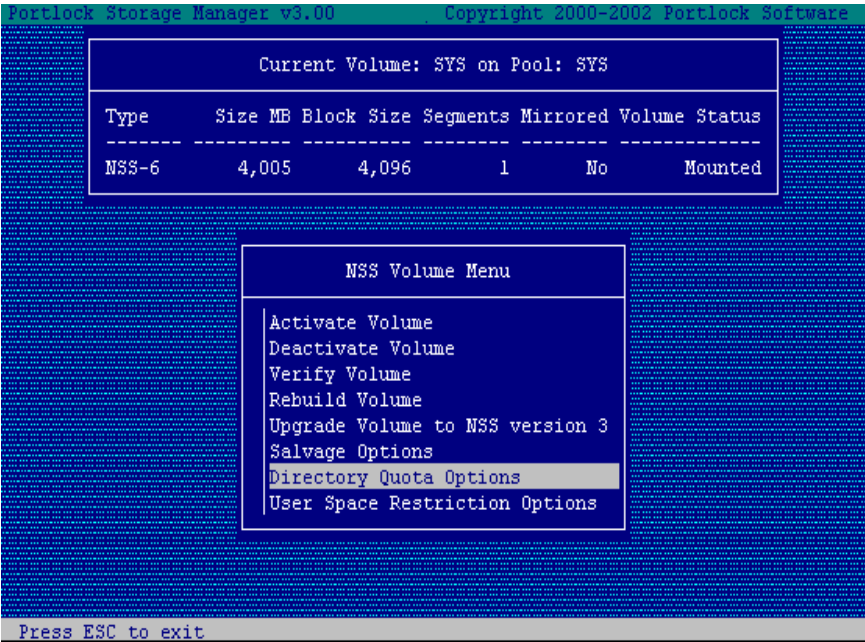


From the **NSS Volume Menu**, choose the option **Salvage Options** and press [Enter].

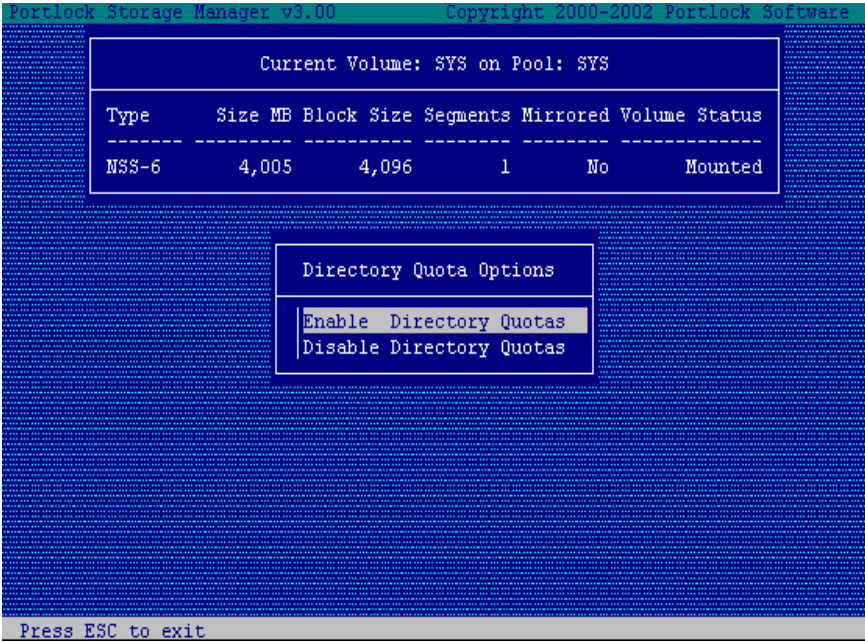


From the **Salvage Options** menu, you have the choice to **Enable Salvage** or to **Disable Salvage**. For this example, we will enable salvage. Press [Enter].

# Directory Quota Options

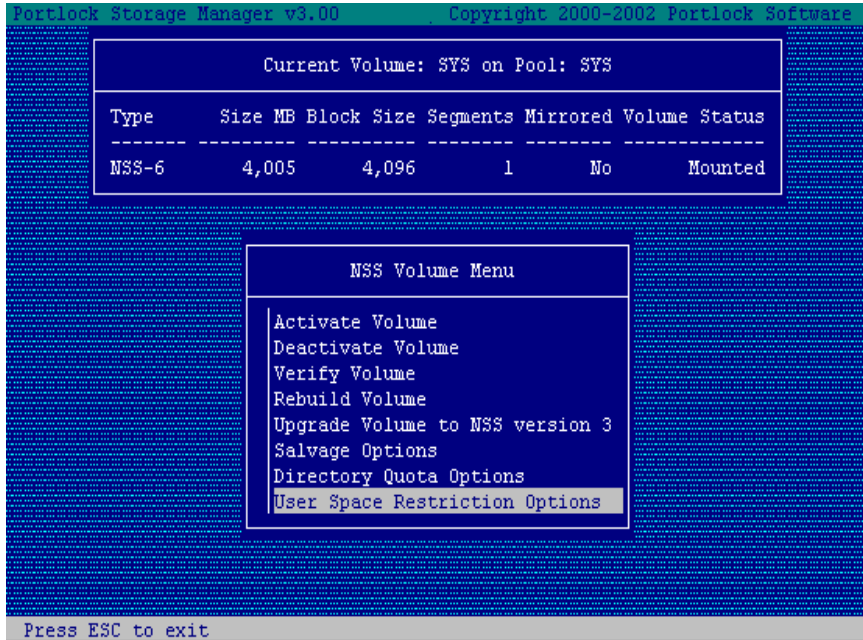


From the **NSS Volume Menu**, choose **Directory Quota Options** and press [Enter].

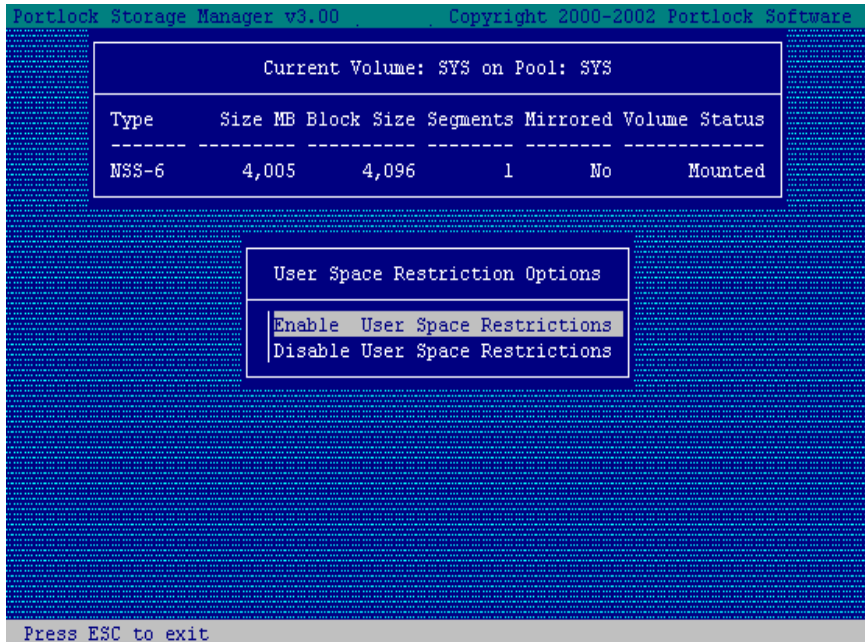


From the **Directory Quota Options** menu, you have the choice to Enable Directory Quotas or Disable Directory Quotas. For this example, the option **Enable Directory Quotas** is selected. Press [Enter].

# User Space Restriction Options



From the **NSS Volume Menu**, select **User Space Restriction Options** and press [Enter].



The **User Space Restriction Options** screen will appear giving you the option to:

1. Enable User Space Restrictions
2. Disable User Space Restrictions

For this example, the **Enable User Space Restrictions** option is selected. Press [Enter].

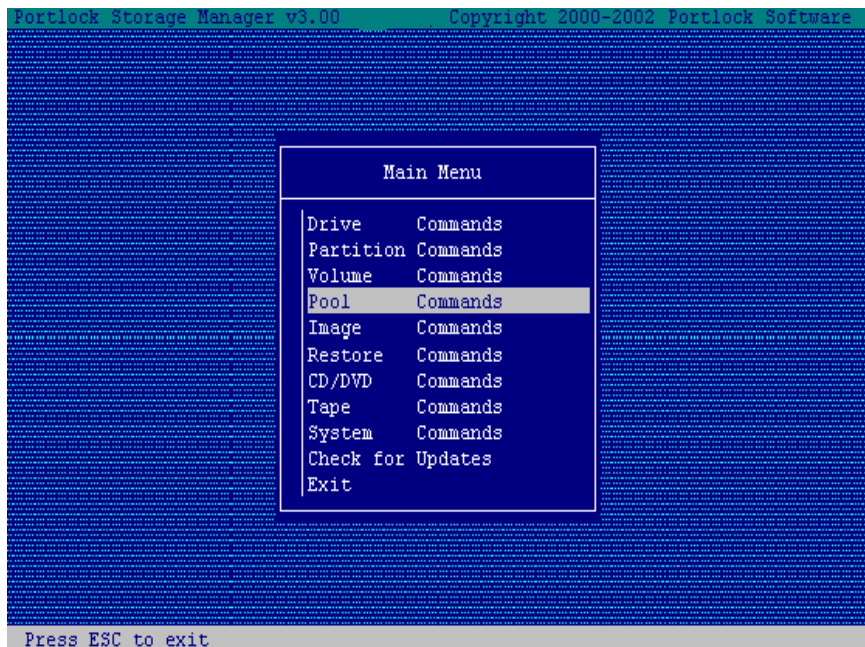




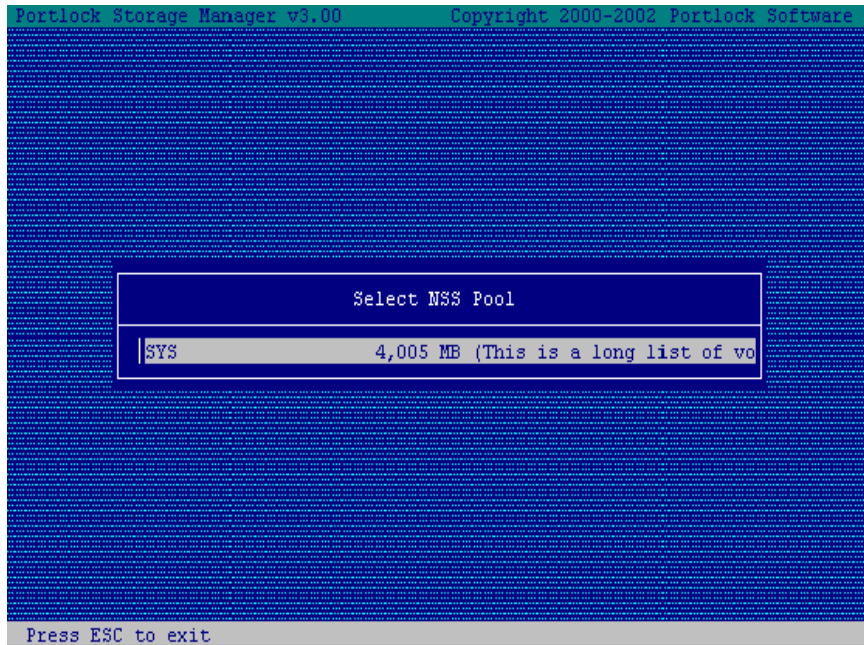


# CHAPTER 6

## Pool Command

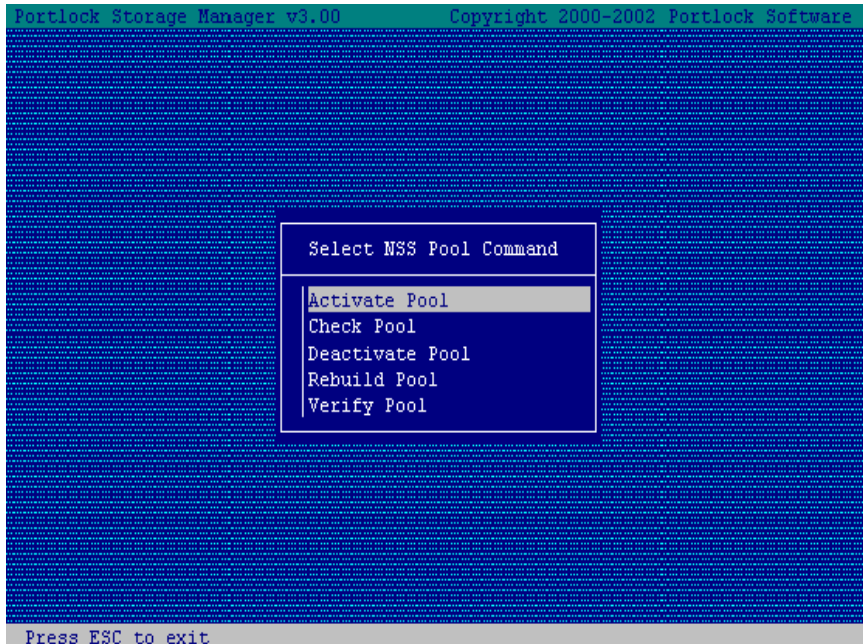


From the **Main Menu**, choose **Pool Commands** and press [Enter].



At this screen, select the **NSS Pool** and press [Enter].

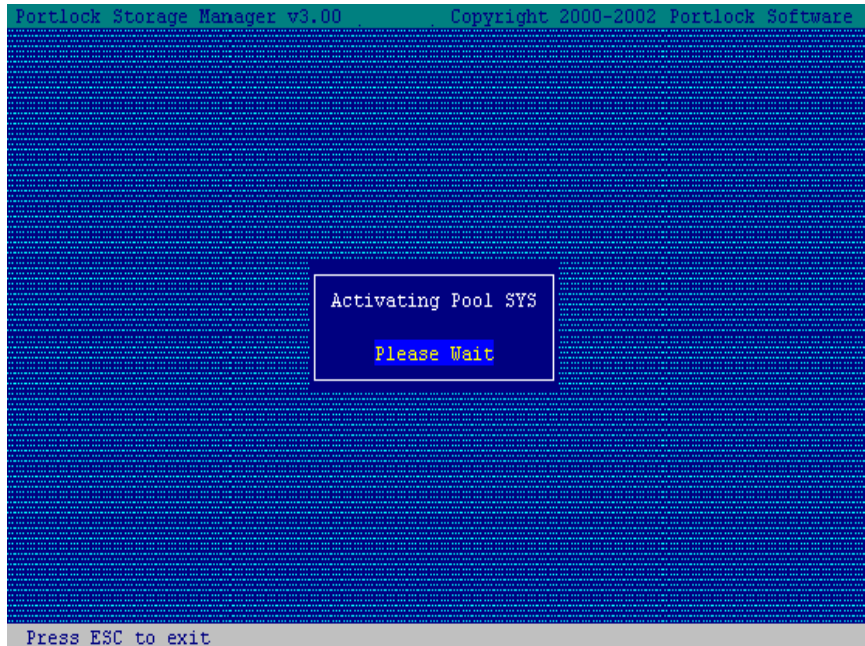
# Activate Pool



From the **Select NSS Pool Command** menu, you have a number of options to choose from:

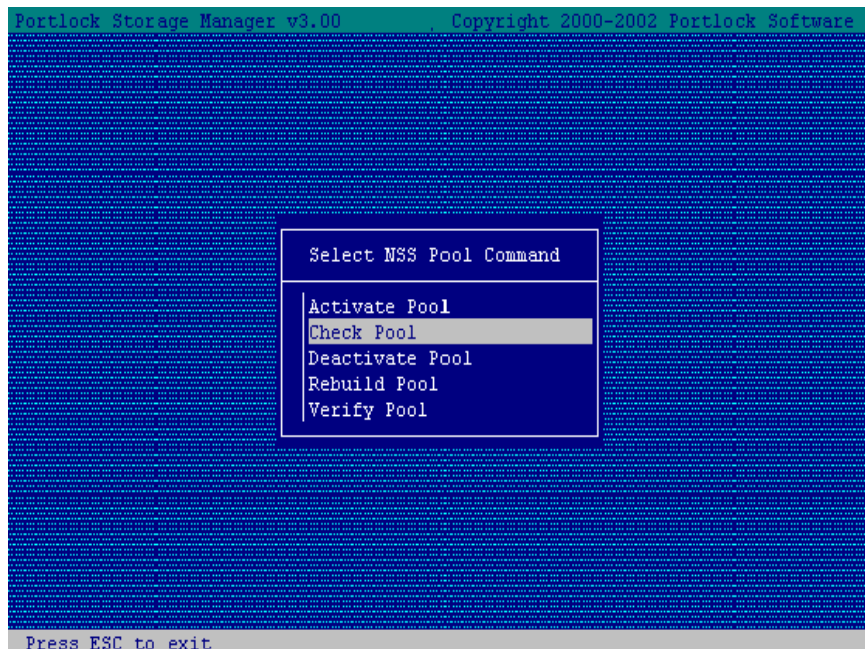
1. Activate Pool
2. Check Pool
3. Deactivate Pool
4. Rebuild Pool
5. Verify Pool

For this example, the **Activate Pool** option will be selected. Press [Enter].

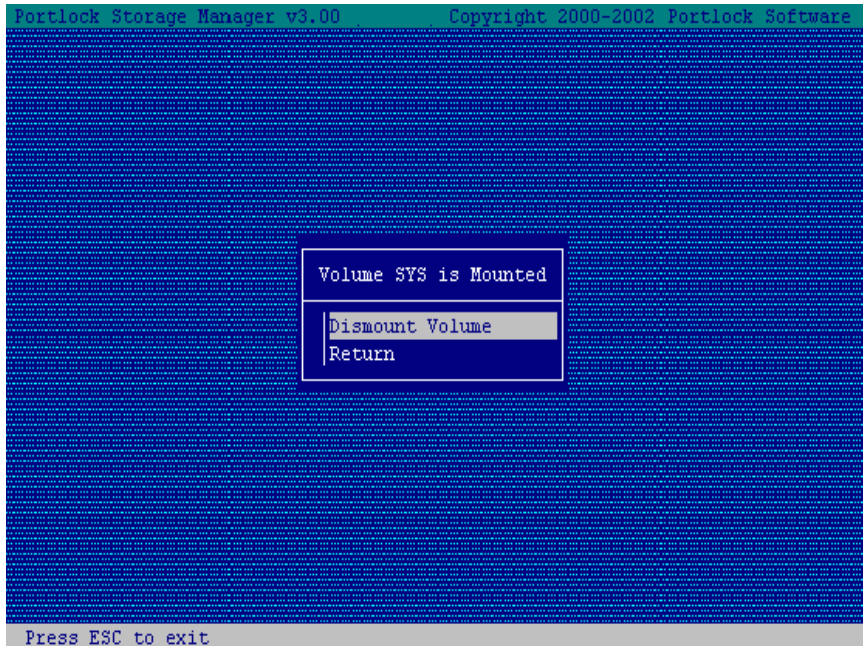


The following screen will appear while the system is activating the SYS Pool.

## Check Pool



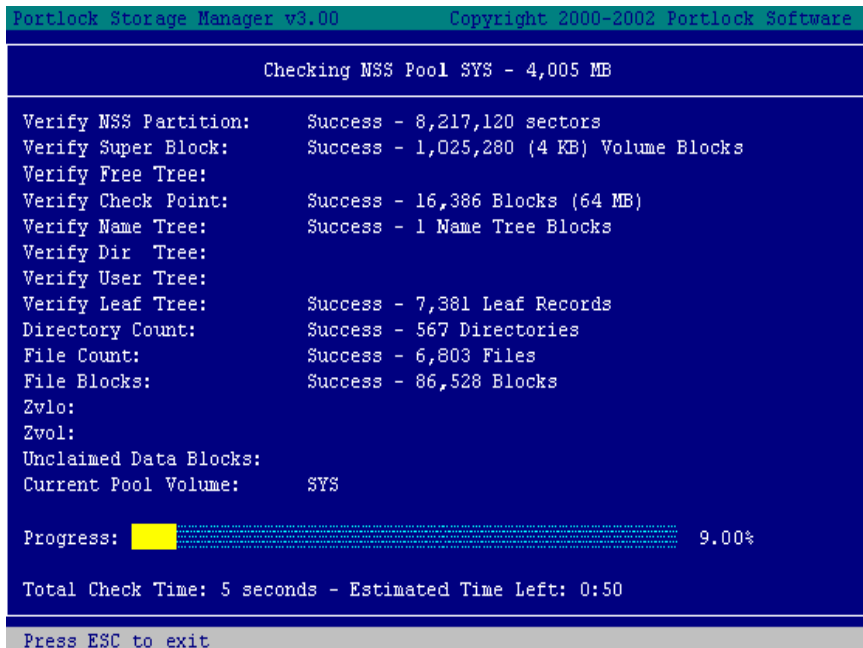
From the **Select NSS Pool Command** menu, select the option **Check Pool** and press [Enter].



From the **Volume SYS is Mounted** screen, you have two options:

1. Dismount Volume
2. Return to the Pool Command menu

For this example, the **Dismount Volume** option is selected. Press [Enter].



Once the Dismount Volume option is selected, the **Check Pool Progress** screen will appear.

```

Portlock Storage Manager v3.00                                Copyright 2000-2002 Portlock Software

```

---

```

                Checking NSS Pool SYS - 4,005 MB

```

---

```

Verify NSS Partition:      Success - 8,217,120 sectors
Verify Super Block:       Success - 1,025,280 (4 KB) Volume Blocks
Verify Free Tree:         Success - 840,200 Free Blocks (3,282 MB)
Verify Check Point:       Success - 16,386 Blocks (64 MB)
Verify Name Tree:         Success - 753 Name Tree Blocks
Verify Dir Tree:          Success - 0 Dir Tree Blocks
Verify User Tree:         Success - 2 User Tree Blocks
Verify Leaf Tree:         Success - 22,237 Leaf Records
Directory Count:          Success - 1,133 Directories
File Count:               Success - 21,092 Files
File Blocks:              Success - 164,852 Blocks
Zvlo:                    Success
Zvol:                    Success
Unclaimed Data Blocks:    Success - Processed 1,025,280 Data Blocks
Current Pool Volume:      SYS

```

---

```

Progress:  100.00%

```

---

```

Total Check Time: 18 seconds - Estimated Time Left: 0:00

```

---

```

Volume Check was successful - Press any key to close screen.

```

This screen shows the Check Pool progress screen completed. Press any key to close the screen.

## Deactivate Pool

Portlock Storage Manager v3.00 Copyright 2000-2002 Portlock Software

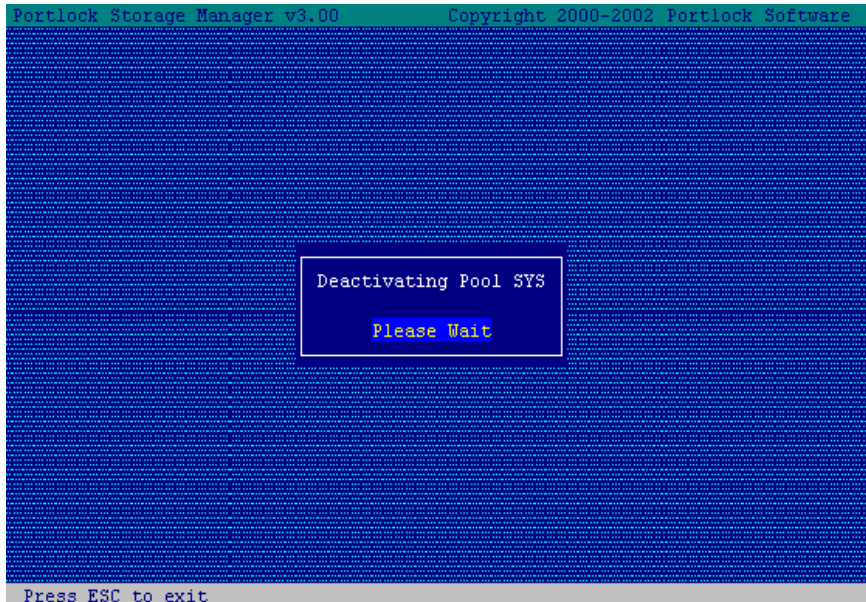
Select NSS Pool Command

- Activate Pool
- Check Pool
- Deactivate Pool
- Rebuild Pool
- Verify Pool

Press ESC to exit

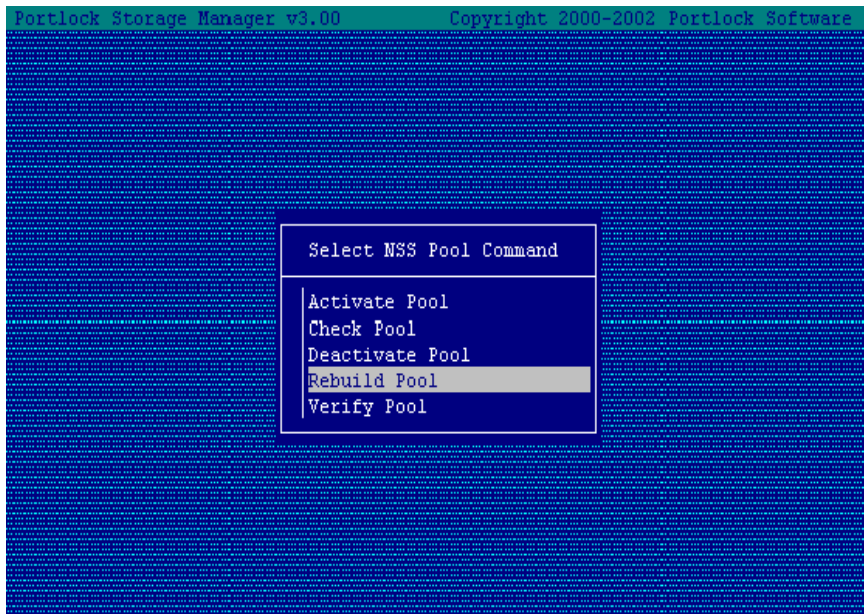
From the **Select NSS Pool Command** menu, select **Deactivate Pool** and press [Enter].



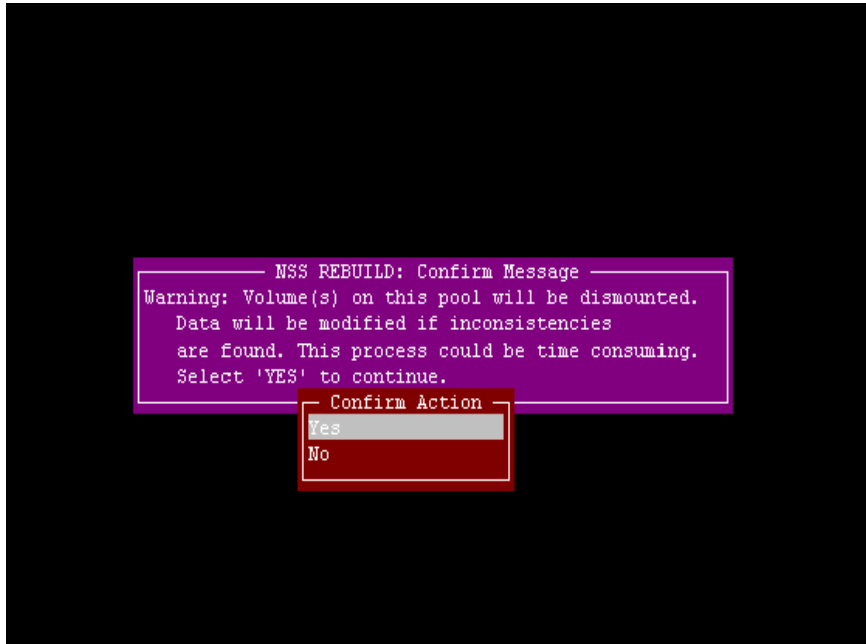


Once the Deactivate Pool option is selected, the following screen will appear informing you that the Pool SYS is Deactivating.

## Rebuild Pool



From the **Select NSS Pool Command** select the option **Rebuild Pool** and press [Enter].

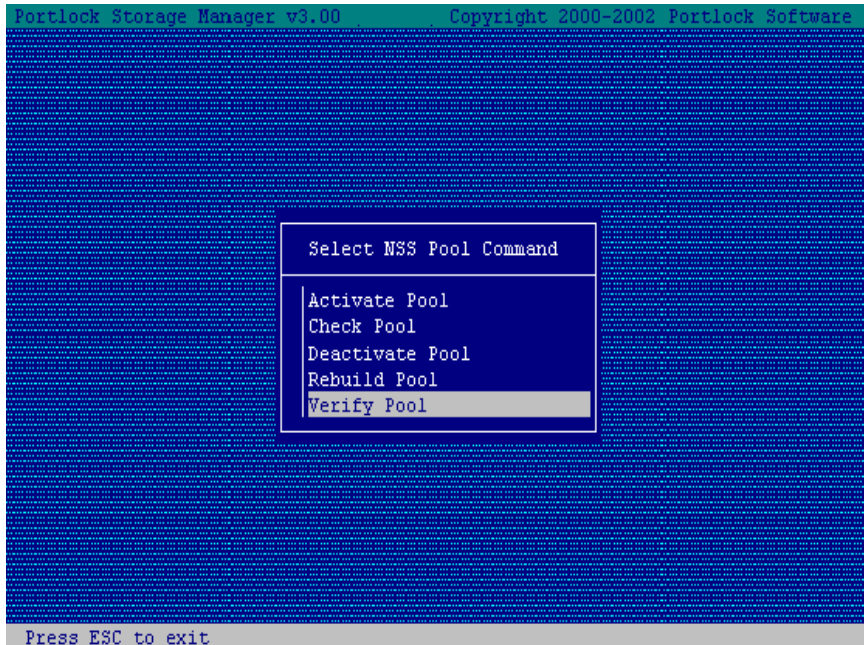


The **NSS Rebuild** screen will appear. You have the option to continue with the rebuild or to choose No to cancel the rebuild. This screen warns that volumes on this pool will be dismantled and data will be modified if inconsistencies are found.

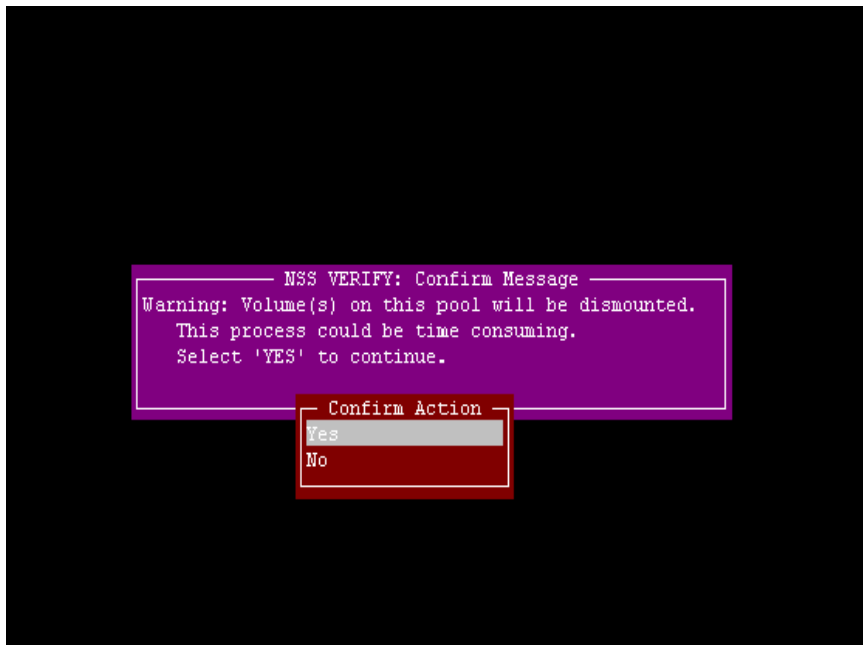
For this example, choose “**Yes**” to continue and press [Enter].



# Verify Pool



From the **Select NSS Pool Command** menu, select the option **Verify Pool** and press [Enter].



The **NSS Verify Pool** screen will appear. You have the option to continue the verify by selecting “**Yes**” or cancel the verify by selecting “**No**.” This screen warns that volumes on this pool will be dismounted if “**Yes**” is chosen and that the process could be time consuming. For this example, choose “**Yes**” to continue and press [Enter].



# CHAPTER 7

## Image Command

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Storage Manager images Compaq, Dell and IBM Diagnostic Partitions, DOS FAT16 Partitions, Traditional Volumes and NSS Volumes. NetWare Partitions are not imaged, only the volumes within the NetWare Partition. Imaging the NetWare partition is not necessary as they are created on the fly by Storage Manager during a restore. Note: DOS FAT12 partitions are not supported.

Storage Manager images Traditional and NSS volumes by storing the volume data blocks and file system structure into the image. This allows the volumes to be resizable during the restore. Storage Manager implements a third generation technology for imaging NetWare servers that maximizes the performance of the image and restore commands. For most systems, Storage Manager can easily stream the fastest SCSI tape drives such as the DLT-8000 or the Super-DLT.

An entire NetWare server can be saved into an image that can be stored as an image file on another server or as an image written to a SCSI tape drive. Images can consist of multiple files that are “spanned.” Spanning supports images that are larger than the media to which they are written does.

Restoring an image can be done from DOS or from NetWare. An entire server or just portions of the server can be restored from the image. Storage Manager does not support individual file recovery from images. This is a deliberate design decision due to our goal of very high performance and compressibility of images.

Compaq Diagnostic partitions are not resizable when restored. This is deliberate, as Diagnostic partitions are special types of partitions.

DOS Partitions are not resizable during the restore. This is a limitation of Storage Manager that will be corrected in a future release. DOS partitions are restored to the same size as the original partition.

Storage Manager images Traditional and NSS volumes by storing the volume data blocks and file system structure into the image. This allows the volumes to be resizable during the restore. Storage Manager implements a third generation technology for imaging NetWare servers that maximizes the performance of the image and restore commands. For most systems, Storage Manager can easily stream the fastest SCSI tape drives such as the DAT, DLT, SDLT, AIT or LTO.

Storage Manager can image a NetWare server while NetWare is running or from DOS. Device drivers written for NetWare are 32-bit drivers that have been optimized for performance. For this reason we recommend imaging servers from NetWare instead of from DOS.

DOS device drivers are typically 16-bit real-mode drivers that are usually not optimized for performance, but rather for small memory size. You will often see a two-to-one performance difference between DOS device drivers and NetWare device drivers.

Storage Manager supports both the NWPA (HAM) drivers and NWIO (DSK) drivers for communicating with tape drives. When using the NWPA interface, Storage Manager interfaces directly with the HAM drivers. When using the NWIO interface, Storage Manager uses the ASPI interface. NWPA drivers are faster.

Storage Manager only supports ASPI drivers for communicating with tape drives under DOS. ASPI drivers provide an interface to SCSI Host Adapters that is consistent across various makes and models of SCSI Controllers.

## Considerations when Imaging a Server

There are several considerations that need to be made when you image a server. The information contained in this section should be used as a guideline only. If you are unsure then please consult a Novell Professional or the Novell Support Knowledgebase at <http://support.novell.com> or you could even ask a question in the Novell newsgroups [support-forums.novell.com](http://support-forums.novell.com) using either a newsreader or a web browser.

The first thing you need to know is what sort of image do you want to do. For example, do you want to do a Disaster Recovery, clone a server to a new hardware platform or upgrade the hard drive space of an image? You may wish to have a default server image to be used when you wish to deploy a new server.

There are two types of environments where there are different considerations that you need to take into account in the event of an image and restore of a server. Before we go into the two types of situations, you need to understand that Storage Manager backs up an entire volume. This means that even files that have been deleted and not yet been purged by NetWare are also backed up as part of the imaging process and then restored. If you do not want to bring over the deleted files, then you need to run a purge of each of the volumes by using the Novell Toolbox.nlm program or the DOS Purge command.

Storage Manager should not be considered a normal backup solution for your server as it does not by design support individual file backup or restores. You need to have another backup mechanism for this. If you choose to use Storage Manager as a backup mechanism (not recommended), you will have to restore the entire volume on your server to get that one file back!

### Single Server Environment

If you have a single server environment that you will be using Storage Manager on, this is a simpler environment for the imaging and restoration.

## Disaster Recovery

If you are using Storage Manager to have an off-site disaster recovery image, you need to understand that when you restore the image all the data will be at the currently backed up version. This means that any email, documents are only imaged at the time of the image. Any newer files will not be part of the image that you have.

For disaster recovery, you would need to restore the image that you made with Storage Manager and then overwrite the information with the latest version of the backup.

This will give you a server that has all of the data up to the most recent backup that you restored. Your only consideration is that all of your userids and passwords for these userids will be the ones that were used when the Storage Manager image was created. Some backup software does support restoration of NDS objects, which in a single server tree can be OK but please consult your backup software manual for information regarding this.

## Cloning a server

This method is used when you are upgrading your hardware platform for your server. In this case, you would use Storage Manager to make an image of the server so that you can restore it onto your new server.

The only consideration is that once the image is restored to the new server, you may have to modify the server so that it supports the new disk controller and NIC (Network Interface Card) before your users will be able to login to the server.

Please consult the manuals that came with your new hardware to ensure that you have the correct drivers loaded for the disk subsystem under NetWare.

## Upgrade of Hard Drives

This is the simplest solution for upgrading your server. All you have to do is make an image of your server, take out the existing drives, install the new, and then restore the Storage Manager Image resizing the volumes as appropriate.

## Multiple Server Environments

The main consideration in a multi-server environment is that you must consider the implications upon NDS (Novell Directory Services). NDS is a dynamic database that contains all object information for your network such as userids and passwords.

When you take a server offline or a link to a remote site is down, NDS keeps a record of changes that have been made (ie user has changed their password) that will be synced out to the other servers on your network. Because of this, you need to be aware of the effects of imaging and restoration of servers using Storage Manager in this environment.

## Disaster Recovery / Test Lab

If you are creating images to be used for disaster recovery of a server or even to be used in a test environment, you must be careful about how they are used.

If the server is being imaged for disaster recovery, when you restore it, the existing server information may need to be removed from the tree and treated as a crashed server in NDS. There are other options that can be used for this, which are discussed in the Novell Knowledgebase at <http://support.novell.com>. If you are not able to find the information in the Novell Knowledgebase, then please consult your local Novell Professional before proceeding.

If you are cloning a server to be used in a test environment, you must make sure that the restored server is not located anywhere on the production network as this may cause severe problems in NDS for both the users and the servers. It should only be used on an isolated network.

## Cloning a Server

When you clone the server to do an upgrade to a new hardware platform, you also have some NDS issues to consider. When you image a server, it is basically a snapshot of the whole server at the time of imaging. Based on this, you would be best to dismount all of the volumes on the server before you start the imaging process. This will then halt any changes on the server from occurring to ensure that an exact copy of the server is made.

When the imaging process is completed, you should remove the network cable from the back of the server to ensure that if the server is accidentally rebooted, it cannot attach to the network and cause problems for the users and NDS.

If the hardware that you are upgrading to is similar, you may not need to make any changes. You will need to ensure that any new drivers are loaded for the server to be able to load NetWare such as disk device drivers and NIC (Network Interface Card). Without these loaded, the server may boot to a NetWare server prompt without loading any volumes.

Once you have loaded any new device drivers the server will boot up fine and any changes that have been made in NDS while you were performing this process will be sent to the server.

## Upgrade of Hard Drives

This is much the same as the procedure outlined in the Cloning a Server section. You need to make the same considerations from the point of view of NDS and dismounting of volumes.

If you are also changing the disk controller, you will need to add the device driver so that NetWare can mount the volumes.

## Deployment of new servers into existing environment

If you are making an image of a server so that you can use it to deploy new servers, you can image the server that you want to make a template.

Once this image has been created, you will need to restore it to a temporary server on an isolated LAN and then remove NDS from it and change both the Novell Server Name and the ServerID to be something unique. Failure to do this could cause issues for your production LAN.

Reboot the server and use Storage Manager to image the server. This image can then be used as a template for new server deployments.

## Preparing to image a NetWare server

**Step 1: DECIDE** what you want to image.

You may only want to archive a single volume, a set of volumes, or an entire server.

**Step 2: VERIFY** that the partitions and volumes are free from logical errors.

- DOS partitions: run **scandisk** on each DOS partition.
- NetWare Traditional volumes: run **VREPAIR** on each

volume.

- NetWare NSS volumes, run **nss /verify=volume** for each volume.

**Step 3: VERIFY** that Directory Services has no errors (Ignore for NetWare 3.x)

- Run “**DSREPAIR**” on the server.

**Step 4: DECIDE** if you want to purge the NetWare volumes.

- Purging volumes reduces the time to image and the size of the image file. Purging volumes is not necessary for Storage Manager but files that have not been purged will also be imaged which will require additional image space.

**Step 5: DECIDE** where you want to write the image.

- Storage Manager can write images to files, SCSI tape drives, and to another server via TCP/IP.

**Step 6: DECIDE** how the image will be restored.

- If the restore will be performed from NetWare, there are not many issues. If the restore is to be performed from DOS, then you need to make sure that Storage Manager can see your controllers and disk drives correctly from DOS. Not all controllers have drivers written for DOS. Not all controllers report the true drive size from DOS.

**Tip:** If you will be imaging a large NetWare server, consider imaging the server in two steps. The first image would be the booting DOS partition and the SYS volume. The second image would be everything else. Then during a full machine restore, the DOS partition and SYS volume could be restored from DOS, then reboot into NetWare and restore the rest of the system. This can reduce the restore time by 2x or more.

**Tip:** Keep the combined size of the booting DOS partition and the SYS volume under 8 GB. This will ensure that there are no BIOS problems when restoring from DOS. A number of RAID controllers only support the first 8 GB of an array from DOS mode. If you are not sure, run Storage Manager from DOS with the logfile option, then review the logfile. Storage Manager reports device geometry in the logfile.



The following is an explanation of each of the four supported image destinations.

## 1 Writing an image to a disk file

Storage Manager can write a server image to a disk file either on a DOS partition or a NetWare volume (both Traditional and NSS). There are a few factors to consider: **1)** What do you want to do with the image, e.g. create a series of 600 MB files to be written to a CD-ROM. **2)** What type of media are you writing to, e.g. You are writing the image to a removable JAZ drive and will need to switch JAZ cartridges every 1 GB. **3)** The maximum file size that the file system supports, e.g. DOS partitions are limited to files of 2 GB, NetWare volumes to 4 GB.

Storage Manager supports limiting the size of each image file to any size in multiples of 1,000,000 bytes. If you want to create an image that is limited to 600 MB for writing to a CD-ROM, specify a size of **600** in the “**Split image files at: 600 MB**” field. If you want to use removable media and you want to exchange the media when full, specify “**Wait after each image file change**” field. If you would like to write images to a NetWare partition and have Storage Manager auto name each file after the first one, specify “**Auto name image files**” field.

Auto naming of image files will cause Storage Manager to start writing with the name of the image file that you specify. Let's say that you specified an image file name of “**nwserver.img**”. When the file size limit is reached, a new file is created with a suffix of “**.000**,” e.g. “**nwserver.000**.” As each file fills, a new file is created, e.g. “**nwserver.001**,” etc. If the disk runs out of space, then you will be prompted for a new filename, and the process can repeat on the new disk drive or volume.

## 2 Writing an image to another computer using TCP/IP

Storage Manager supports sending an image over a TCP/IP link. The machine that is running on the other end of the TCP/IP link can be Storage Manager running in **Restore Mode**, which implements server-to-server cloning. The other end of the TCP/IP link can also be Image Manager, which can receive data from TCP/IP and write it as a disk file, or write it to a SCSI tape drive. The latter supports a multi-server environment with only one SCSI tape drive.

When using Storage Manager on two servers, one executing the “**Image Server**” command and the other server executing the “**Restore Server**” command you can clone servers at very high speeds. With 100-Megabit full duplex Ethernet, speeds of 7 Megabytes per second are easily achieved. You can even use an Ethernet “Cross-over” cable to minimize network traffic on your backbone.

Storage Manager has been written with special performance features for high-speed tape drives such as the SDLT, which can write at a sustained 11 Megabytes per second. With the increased size of disk drives / RAID arrays, classic file-by-file backup methods are just too slow.

### 3 Writing an image to a SCSI tape drive

Storage Manager supports all SCSI tape drives that support writing in “**Variable Length Mode.**” Storage Manager does not support tape drives that only support “Block Mode.” This is not an issue as all modern SCSI tape drives support Variable Length Mode that provides better tape capacity and higher performance.

Storage Manager writes to a SCSI tape drive using a 32,768-byte block size. This block size was chosen to maximize performance and tape capacity. Storage Manager will write to a tape until the “**Early Warning of End of Media**” is detected. Then, a filemark is written to the tape and the tape is rewound. Then, the cycle repeats itself with a new tape until all data to be imaged has been written to tape.

Storage Manager encodes header information while writing to tape. This header information ensures that data written to tape can be verified when read back. If compression is enabled, additional information is written to ensure the validity of the uncompressed data.

### 4 Writing an image to a CD/DVD

Currently, Storage Manager supports the HP DVD100i (DVD+R and DVD+RW), the HP DVD200i (DVD+R and DVD+RW) and the Panasonic LF-D311SC (DVD-RAM). Support for the HP DVD100i was added to version 2.06. Storage Manager supports the creation of bootable CD-R and CD-RW using the HP DVD100i / 200i and support for the Panasonic LF-D311SC was added starting with version 2.08. To turn on this support, add the command line option `-dvd`. For example: `load sys:/stormgr/stormgr -dvd`. We have added support for the external IDE->SCSI converters. Other SCSI based DVDs will be tested also.

Support for DVD burners is very solid. Just insert media into the drive, execute the Image Command and an image will be written to the device.

Storage Manager supports formatting DVD+RW media in the background. To monitor the status of a background format, select the Format Command with the “Foreground Format” option. Storage Manager will detect the background format and display the updated format status.

To cancel a DVD format and to restart at a later time, use the Storage Manager “Eject CD/DVD” command. This command will detect a format in progress and issue a Close Session Command to stop the media format.

Storage Manager can now read images from DVDs when running from DOS. Writing to DVDs from DOS is not yet supported. Some functionality is not supported when running from DOS.

You can mix different types of media when creating images with Storage Manager. For each media type (CD-R, CD-RW, DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM), Storage Manager uses the appropriate format. For example, you could use one DVD+RW and one CD-RW when you only need to image 5 GB of data.

## 5 Writing an image to an FTP Server

Storage Manager now supports using FTP servers to store server images. Save images to or restore images from FTP servers. This includes NAS devices that support the FTP protocols. Create a “Disaster Recovery” image of your server and save it onto one of your FTP servers. Then you can install this image using FTP or HTTP onto a “bare-metal” machine.

*Supports “bare-metal” restores from files, tape drives, CD-ROMs, DVDs, FTP and Web Servers.*

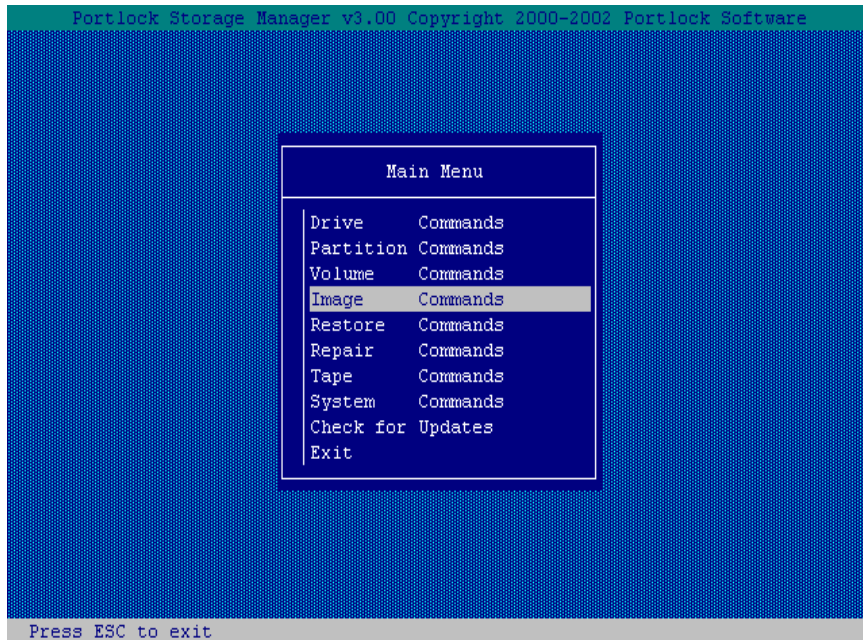
Note: Some FTP servers are case sensitive for file names. This means that if a file is “DOS.img” then specifying “dos.img” will not work.

## Writing an image to a Disk File

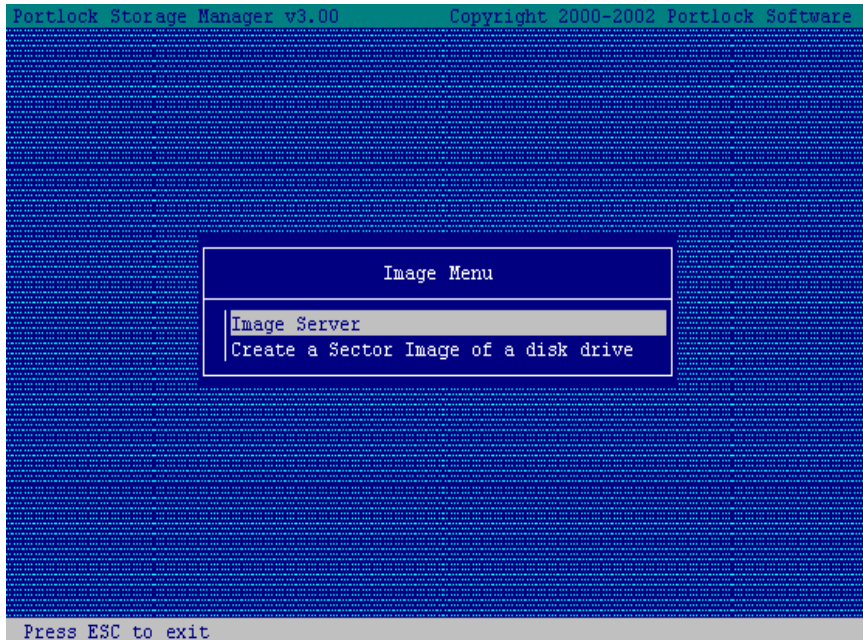
Storage Manager can write a server image to a disk file either on a DOS partition or a NetWare volume (both Traditional and NSS). There are a few factors to consider: **1)** What do you want to do with the image, e.g. create a series of 600 MB files to be written to a CD-ROM. **2)** What type of media are you writing to. e.g. You are writing the image to a removable JAZ drive and will need to switch JAZ cartridges every 1 GB. **3)** The maximum file size that the file system supports, e.g. DOS partitions are limited to files of 2 GB, NetWare volumes to 4 GB.

Storage Manager supports limiting the size of each image file to any size in multiples of 1,000,000 bytes. If you want to create an image that is limited to 600 MB for writing to a CD-ROM, specify a size of **600** in the **“Split image files at: 600 MB”** field. If you want to use removable media and you want to exchange the media when full, specify **“Wait after each image file change”** field. If you would like to write images to a NetWare partition and have Storage Manager auto name each file after the first one, specify **“Auto name image files”** field.

Auto naming of image files will cause Storage Manager to start writing with the name of the image file that you specify. Let’s say that you specified an image file name of **“nwserver.img”**. When the file size limit is reached, a new file is created with a suffix of **“.000,”** e.g. **“nwserver.000.”** As each file fills, a new file is created, e.g. **“nwserver.001,”** etc. If the disk runs out of space, then you will be prompted for a new filename, and the process can repeat on the new disk drive or volume.



To image a NetWare server, first load Storage Manager. Then, select the **“Image Commands”** option from the **Main Menu**.



From the **Image Menu**, you have two options:

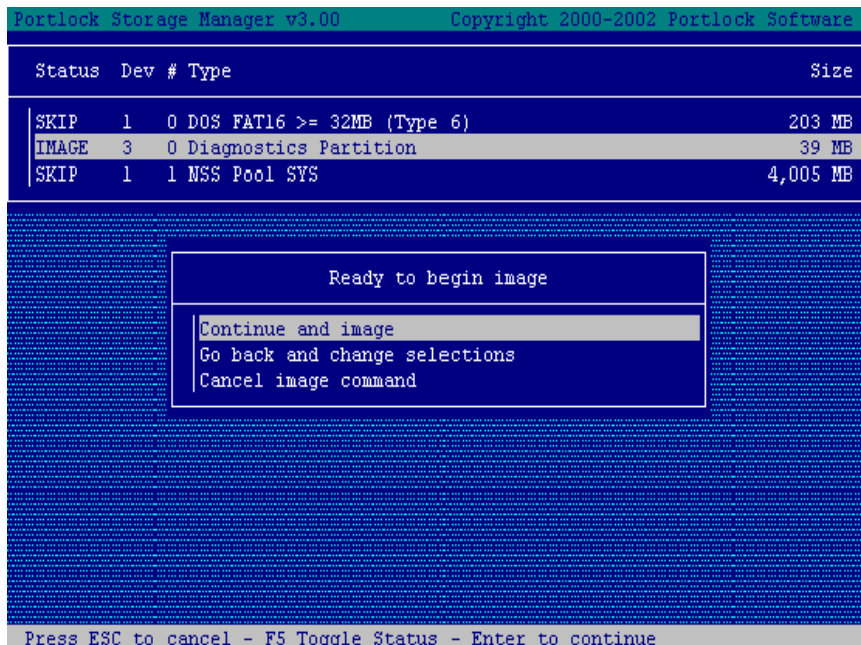
1. Image Server
2. Create a sector Image of a disk drive

For this example, we will want to image the entire server so we will select **Image Server** and press [Enter] to continue.

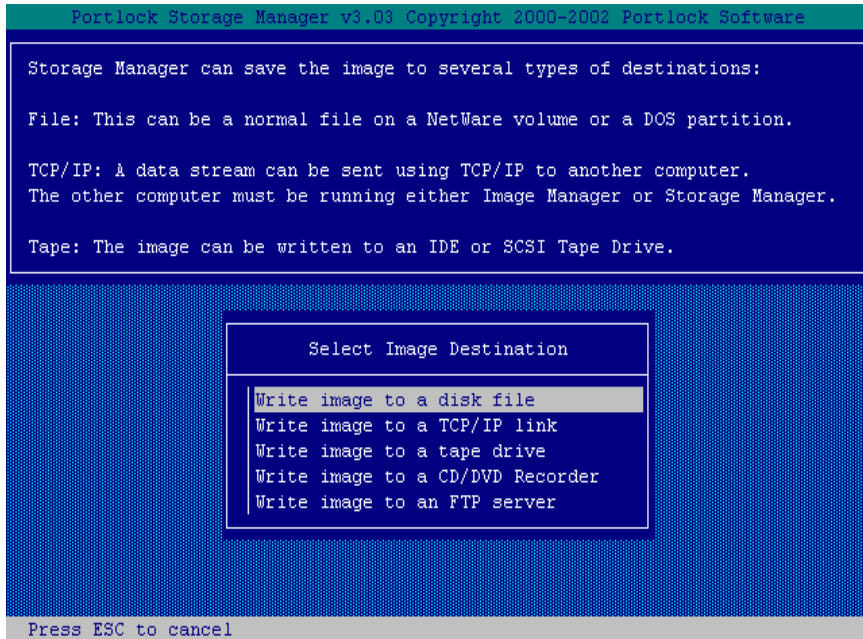
Portlock Storage Manager v3.00				Copyright 2000-2002 Portlock Software	
Status	Dev #	Type	Size		
IMAGE	1	0 DOS FAT16 >= 32MB (Type 6)	203 MB		
IMAGE	3	0 Diagnostics Partition	39 MB		
IMAGE	1	1 NSS Pool SYS	4,005 MB		

Press ESC to cancel - F5 Toggle Status - Enter to continue

This brings up a status screen revealing all items on the server that can be imaged. These items can either be volumes or partitions. In our case, we have a diagnostic partition, a DOS partition, as well as a Netware SYS volume. If you do not see a volume or DOS partition that you expect, make sure that you have the correct device drivers loaded. By default Storage Manager images all server partitions and volumes. To skip an item, scroll the highlighted bar down and then press the F5 function key, which will alternatively enable or disable an item. Press [Enter] to continue.



A confirmation screen will appear. Choose the option Continue and image and press enter. At this time, only the volumes that are to be imaged will be dismounted. This is done to prevent data from being changed during the image process.

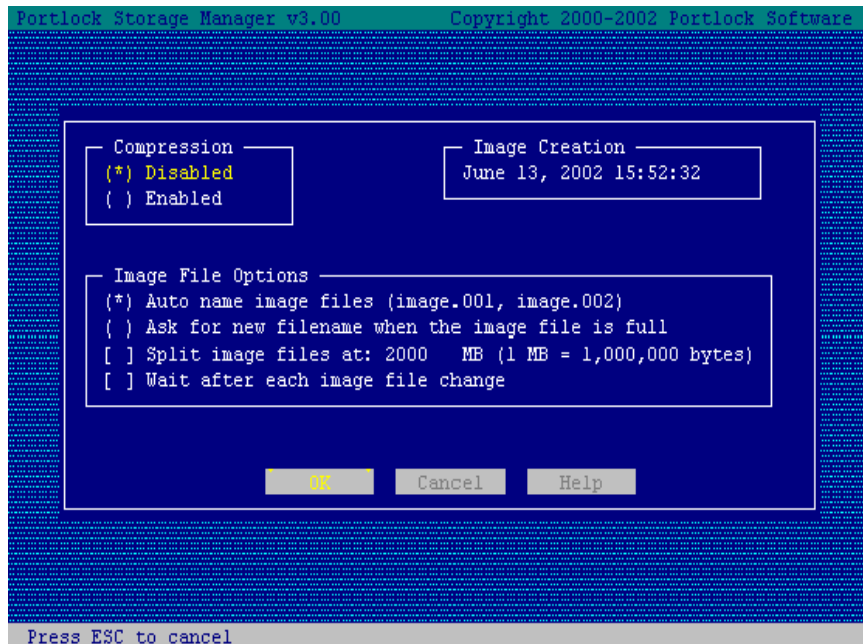


From the **Select Image Destination** menu, you must determine where you want the image to be written. Five destinations are supported:

1. Disk file
2. Another machine using TCP/IP
3. SCSI tape drive
4. CD/DVD
5. FTP Server

For this example, we will select **Write image to a disk file** and press [Enter]. This can be a normal file on a NetWare volume or a DOS partition.

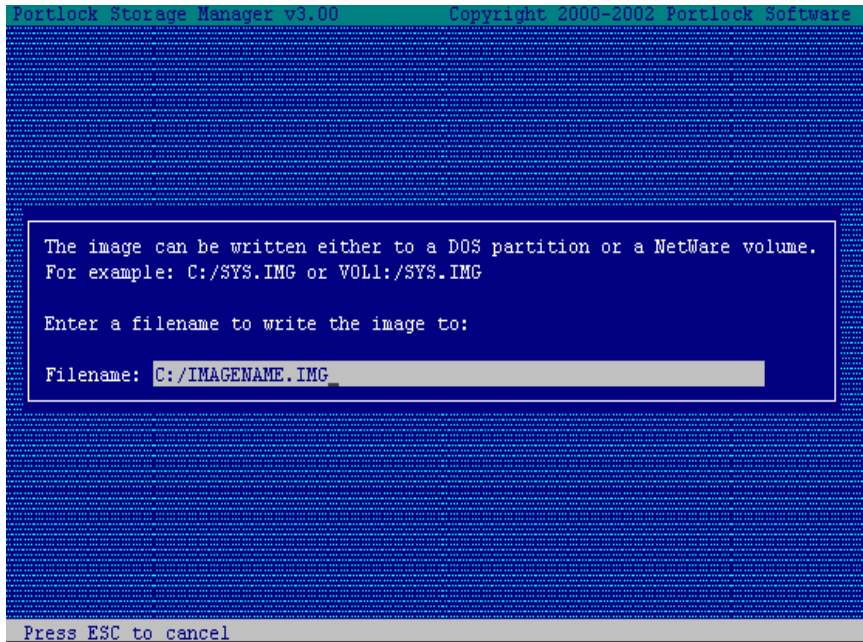




An options screen appears having several selectable options pertaining to the image being created. The first option you are given is compression, which can either be enabled or disabled. Enabling compression will create smaller file sizes but will take longer to image and restore. Disabling compression will allow for faster imaging and restoring but results in larger file sizes. The Second Option box is image file options. They are :

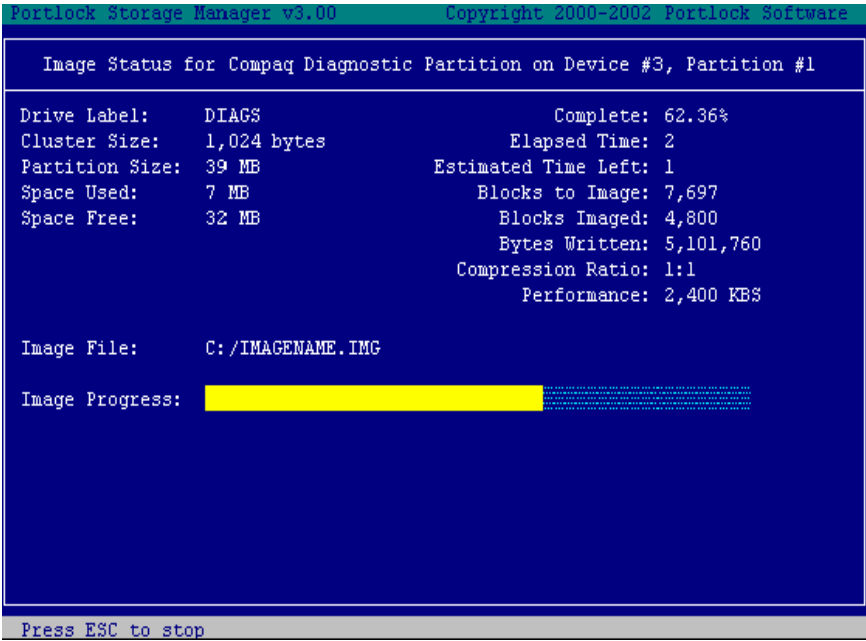
- 1 Auto name image files, which by selecting will name the files with an increasing numeric extension for each image file such as .001 .002 and so on.
- 2 Ask for new image file name when the image file is full, which by selecting will allow the user to input a new file name for every file.
- 3 Split Image Files at 2000 MB, which by enabling this option will automatically split the entire image file into 2000 MB segment.
- 4 Wait after each image file change, which by enabling the fourth option will pause the process after each image file change.

Since all the choices are pertinent to our example, we will press [Enter] to continue.



At this point, you are prompted to type in the filename and destination for the image being created. The image can be written to a DOS partition by using C:/ or to a NetWare volume by using the “volumename”:/ . In this example, we will type in “C:/IMAGENAME.img” and press enter to continue.

Storage Manager will automatically create an image file of the items selected and save it as “IMAGENAME.IMG” on the root directory of the C: drive.



An Image Status screen will transpire for each of the partitions or volumes selected. As you can see, there is an abundance of useful information contained on the actual progress screen, such as information on the volume being copied, percent complete, elapsed time, estimated time left, performance in Kilobytes per second, a copy progress indicator bar, as well as few others. The bottom of the screen shows you the status of the Image process.

Portlock Storage Manager v3.00				Copyright 2000-2002 Portlock Software	
Status	Dev #	Type	Size		
SKIP	1	0 DOS FAT16 >= 32MB (Type 6)	203 MB		
SUCCESS	3	0 Diagnostics Partition	39 MB		
SKIP	1	1 NSS Pool SYS	4,005 MB		

Image Complete - Press ESC or ENTER to close screen.

Once the entire process is complete, the Main Device status screen is shown – verifying the success or failure of each individual item. Notice that the device we imaged was successful. Press [Esc] to return to the original Main Menu.

Portlock Storage Manager v3.00				Copyright 2000-2002 Portlock Software	
Status	Dev #	Type	Size		
SKIP	1	0 DOS FAT16 >= 32MB (Type 6)	203 MB		
IMAGE	3	0 Diagnostics Partition	39 MB		
SKIP	1	1 NSS Pool SYS	4,005 MB		

Ready to begin image

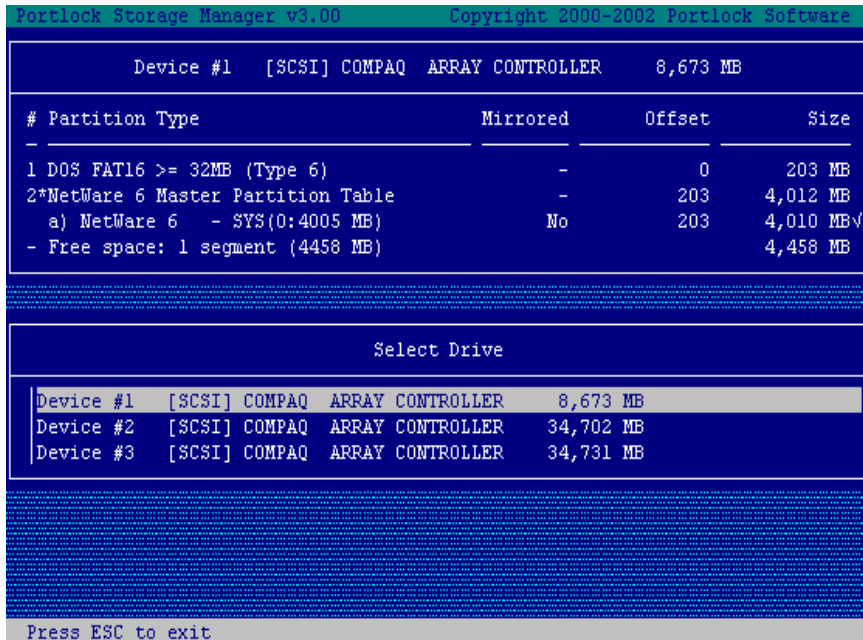
Continue and image

Go back and change selections

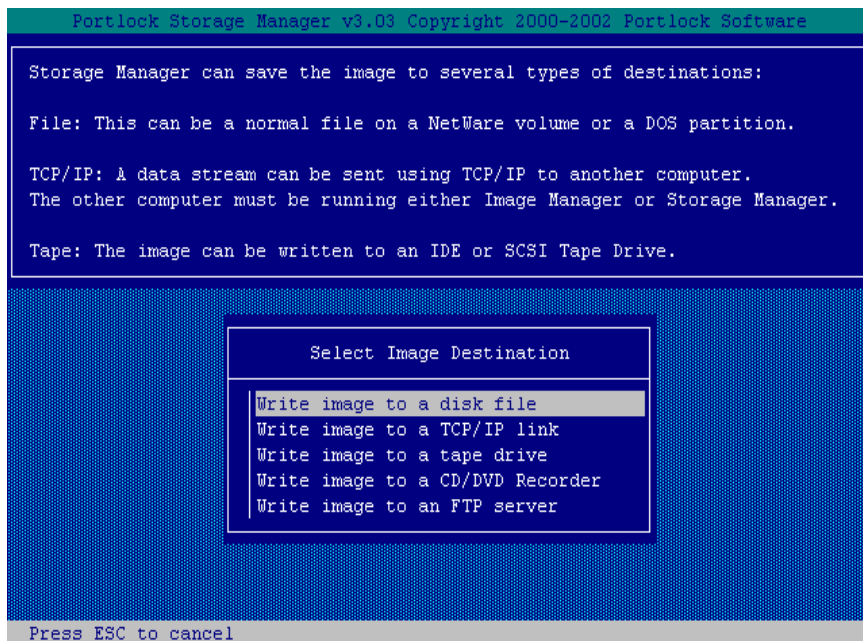
Cancel image command

Press ESC to cancel - F5 Toggle Status - Enter to continue

From the **Image Menu**, select the option **Create a Sector Image of a disk drive** and press [Enter].



From the **Select Drive** menu, select the drive you want to image and press [Enter].



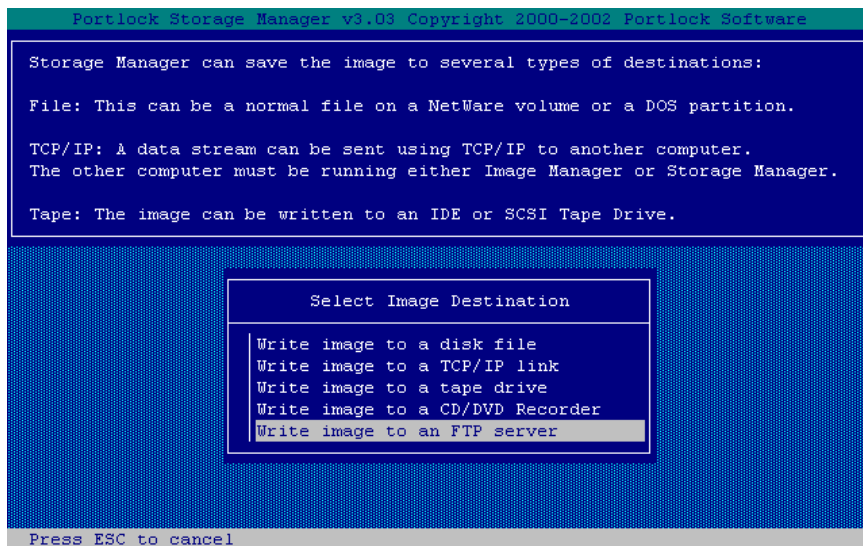
From the **Select Image Destination** screen, select the destination for the image and press [Enter].

## Writing an image to an FTP server

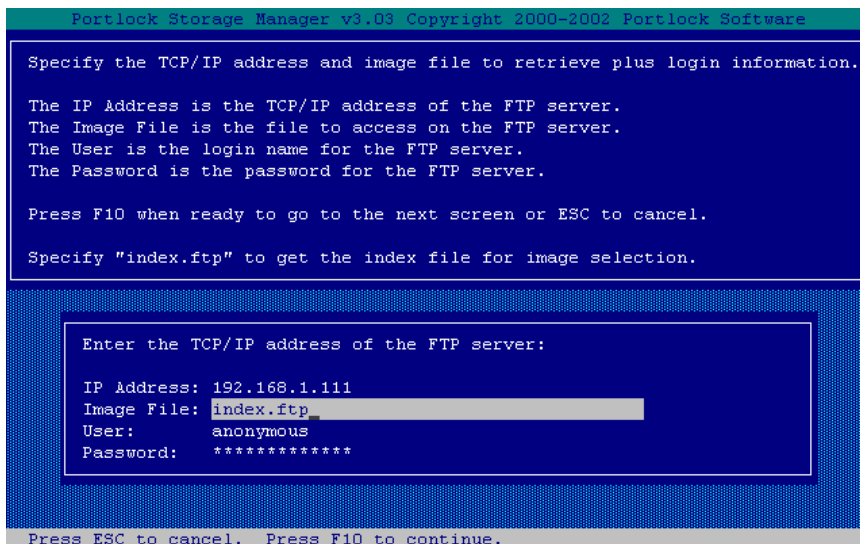
One of the newest features in Storage Manager is the ability to image and restore using a remote FTP server. This ability gives Network Administrators the ability to easily store and retrieve images of volumes, partitions, and even entire servers. This ability is good for backups; as well as, for storing and retrieving images that are used in a test environment.

Along with the ability to retrieve and store images on a remote FTP server, administrators can organize their images using a simple text file called “index.ftp,” which can be placed on the server. This file contains the names of the images on the server; as well as, comments on each. This index.ftp file is “static” meaning it must be created manually and placed on the server.

Note: Some FTP servers are case sensitive for file names. This means that if a file is “DOS.img” then specifying “dos.img” will not work.

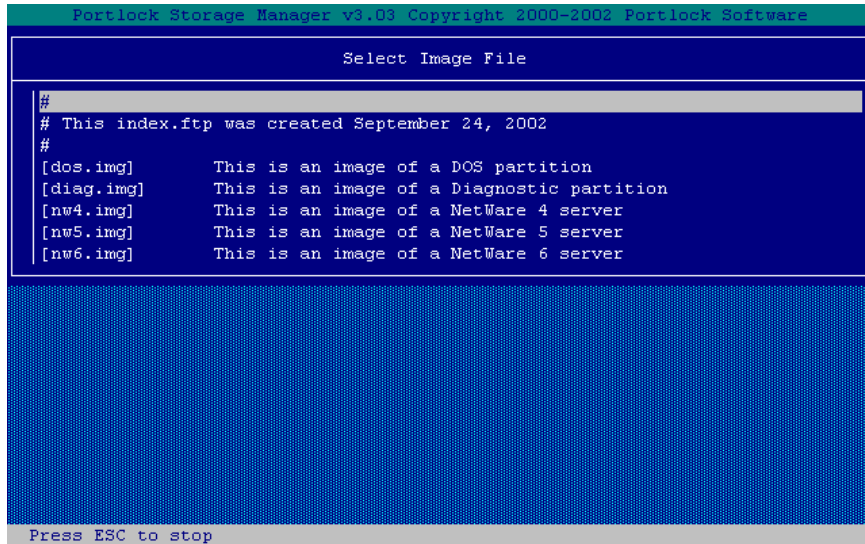


From the Select Image Destination menu, select the option Write image to an FTP server and press [Enter].

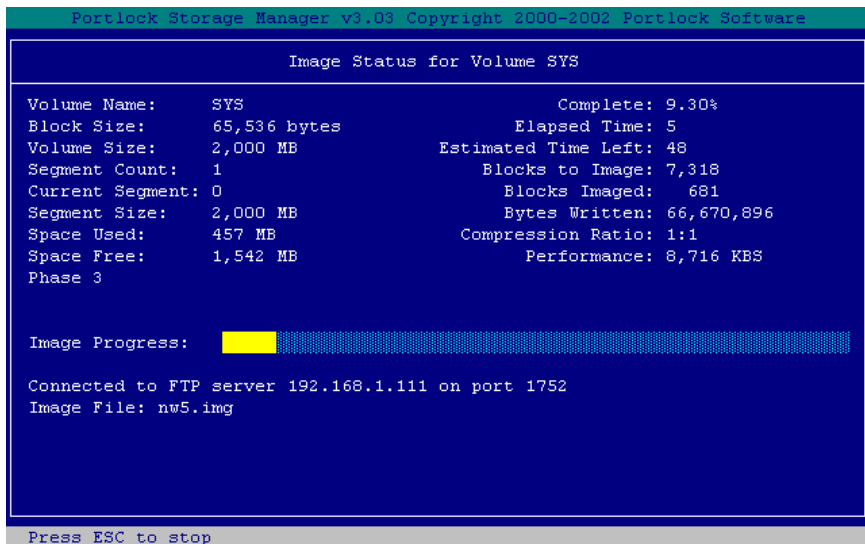


At this point, you are prompted to enter the IP address, the name of the file that is to be accessed, the user name and the password of the remote FTP server. For this example, we will use the file name “index.ftp” to open a list of currently available images on the FTP server. Once we have entered the correct information for the remote FTP server, we will connect to it by pressing the F10 function key.

Note: Some FTP servers are case sensitive for file names. This means that if a file is “DOS.img” then specifying “dos.img” will not work.



As you can see there are 5 different images that we could use. The “index.ftp” file is not automatically created. It is a “static” user created file, which is put on the FTP server that contains comments, remarks and a selectable list of images. This option is mainly used if someone would like to have a lot of different images on the FTP server but didn’t want to remember the names and details of every image. Cursor down to the nw5.img file and select it by pressing [Enter]. Storage Manager will communicate with the server and start the actual imaging process. It will also be simultaneously sending the image to the FTP server to be stored as an image file.

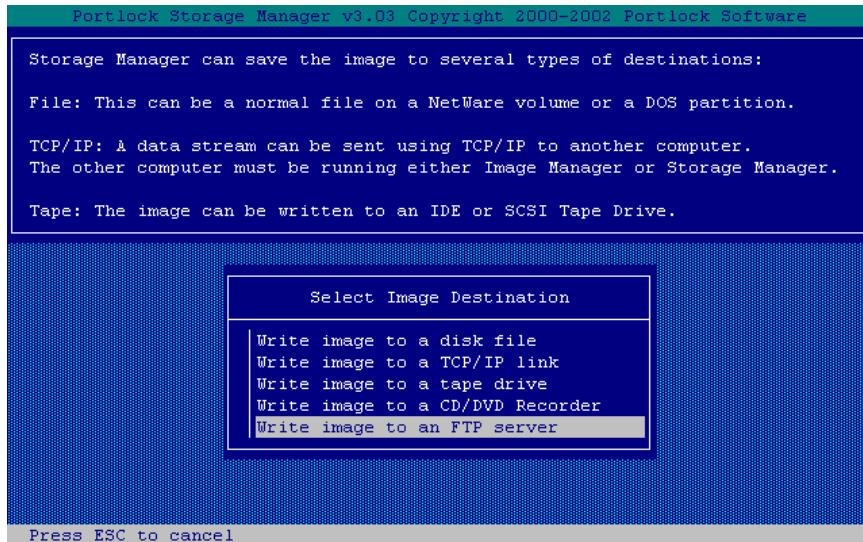


The Image Status screen will appear. There is an abundance of useful information contained on the actual progress screen, such as the copy progress indicator bar, information on the volume being copied, percent complete, elapsed time, estimated time left, performance in Kilobytes per second, as well as few others. Once the entire process is complete, the Main Device Status screen will appear verifying the success or failure of each individual item. Press [Esc] to return to the Main Menu.

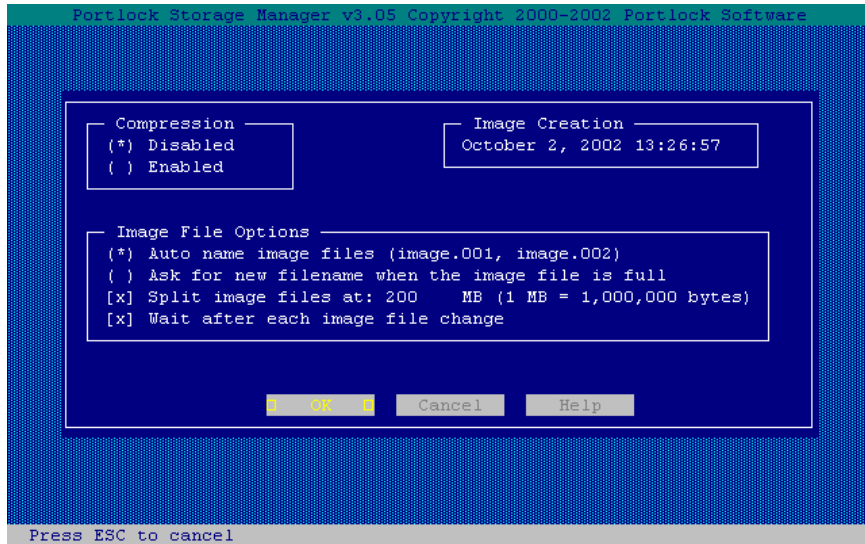


# Writing an image to an FTP server with Image Spanning

Writing an image to an FTP server with Image Spanning breaks files up into pieces that are smaller.



From the Select Image Destination menu, select the option Write image to an FTP server and press [Enter].



The Image Option screen appears having several selectable options pertaining to the image being created. The first option is compression. You can choose to enable or disable compression. Enabling compression will create smaller file sizes but will take longer to image and restore. Disabling compression will allow for faster imaging and restoring but results in larger file sizes.

Next, you are given four image file options:

- 1 **Auto Name Image Files**, which by selecting this option will name our files with an increasing numeric extension for each image file such as .001, .002 and so on.
- 2 **Ask for New Image File Name when the Image File is Full**, which selecting this option will allow the user to input a new file name for every file.
- 3 **Split Image Files at 2000 MB**, which by enabling this option will automatically split the entire image file into 2000 MB segments.
- 4 **Wait after each image file change**, which by enabling will pause the process after each image file change.

Since all the choices are pertinent to our example, we will press [Enter] to continue.

```

Portlock Storage Manager v3.05 Copyright 2000-2002 Portlock Software

Specify the TCP/IP address and image file to retrieve plus login information.

The IP Address is the TCP/IP address of the FTP server.
The Image File is the file to access on the FTP server.
The User is the login name for the FTP server.
The Password is the password for the FTP server.

Press F10 when ready to go to the next screen or ESC to cancel.

Specify "index.ftp" to get the index file for image selection.

Enter the TCP/IP address of the FTP server:

IP Address: 192.168.1.111
Image File: test.001
User:      anonymous
Password:  *****

Press ESC to cancel.  Press F10 to continue.

```

At this point, you are prompted to specify the TCP/IP address of the FTP server, the image file name and location of the file, as well as the username and password for the remote FTP server. Press the F10 function key when ready to continue or [ESC] to cancel and return to the previous screen.

Note: Some FTP servers are case sensitive for file names. This means that if a file is “DOS.img” then specifying “dos.img” will not work.

```

Portlock Storage Manager v3.05 Copyright 2000-2002 Portlock Software

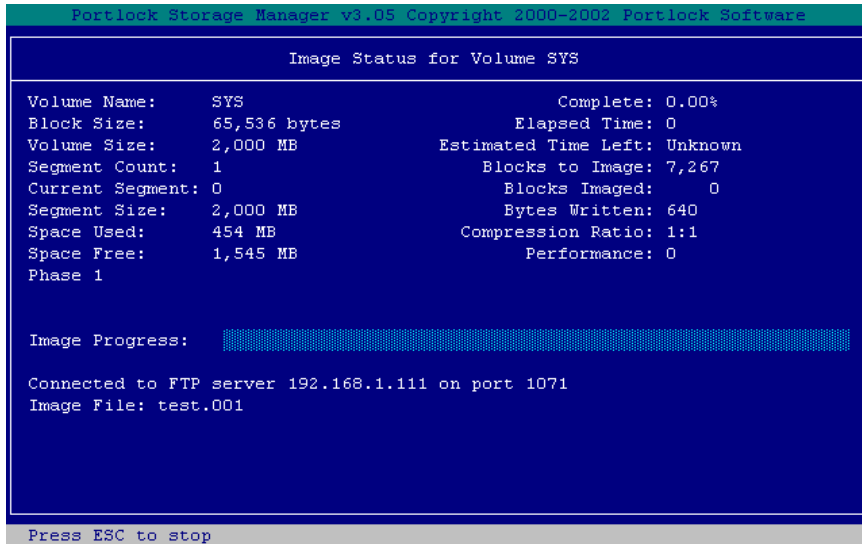
STAT: Connecting to FTP server 192.168.1.111 on port 21 ...
STAT: Connected to FTP server 192.168.1.111 on port 21
RESP: 220 Serv-U FTP Server v4.0 for WinSock ready...
SEND: USER anonymous
RESP: 331 User name okay, please send complete E-mail address as password.
SEND: PASS <password_is_hidden>
RESP: 230 User logged in, proceed.
SEND: TYPE I
RESP: 200 Type set to I
SEND: PASV
RESP: 227 Entering Passive Mode (1,1,1,1,1,1)
STAT: Connecting to 192.168.1.111:71 ...

Trying to connect to FTP server
Please Wait

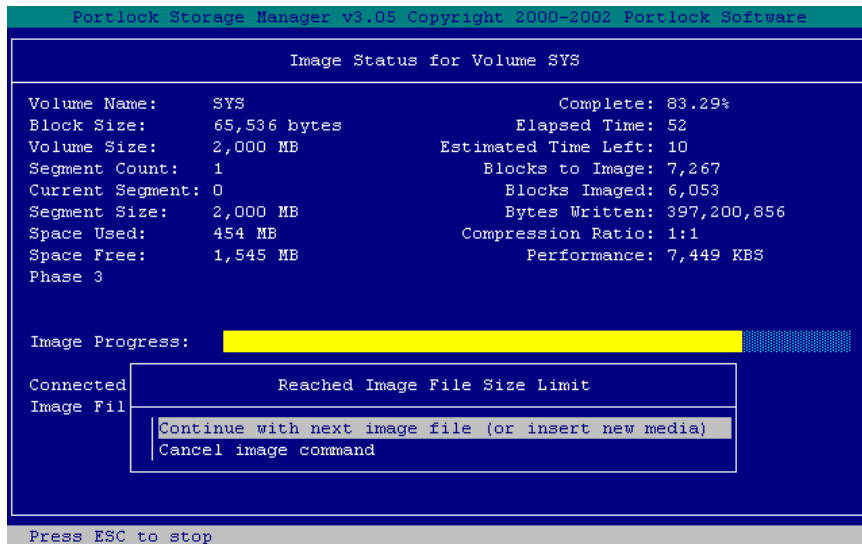
Press ESC to stop

```

When this screen appears, you are provided with information about the status of the login process. This screen informs you that the system is trying to connect to the FTP server.



This screen provides you with the Image Status for Volume SYS.



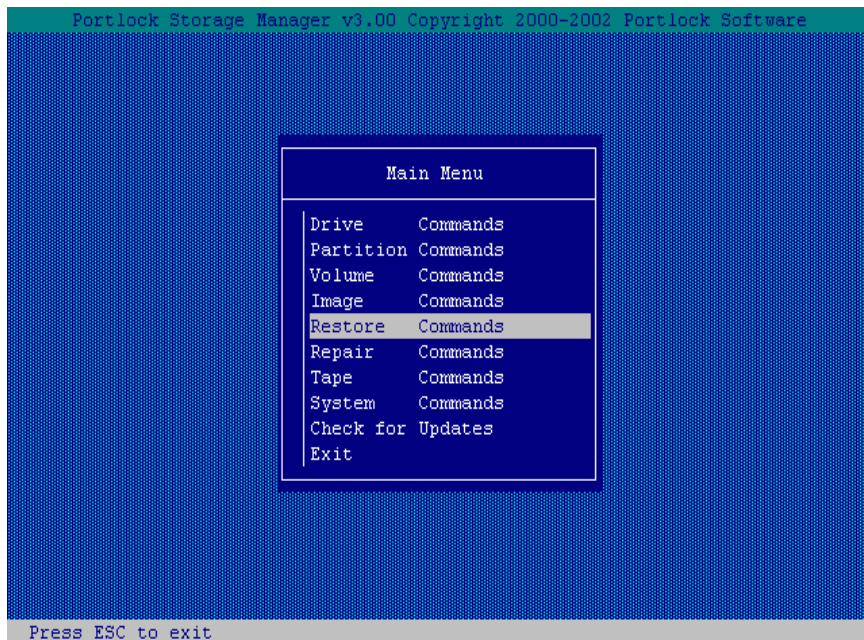
This screen informs you that the Image File Size Limit has been reached. Choose one of two options: Continue with next image file (or insert new media) or Cancel image command and press [Enter].





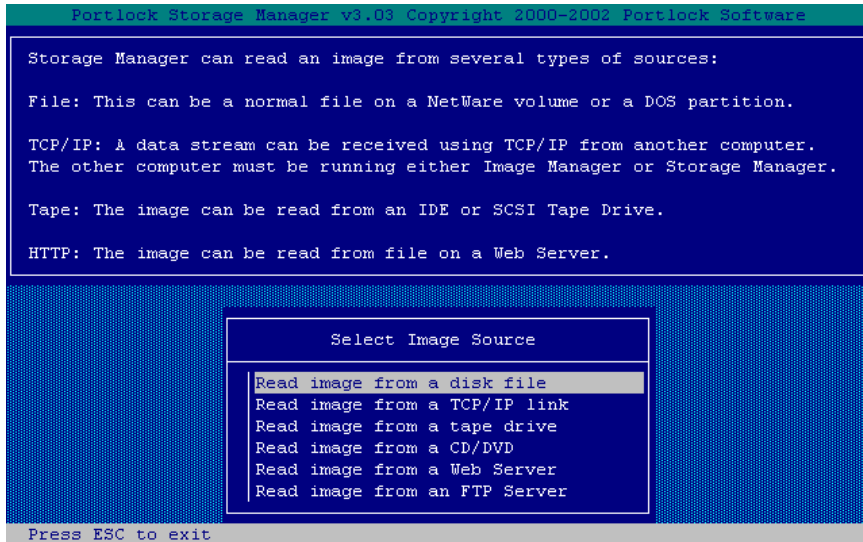
# CHAPTER 8

## Restore Command

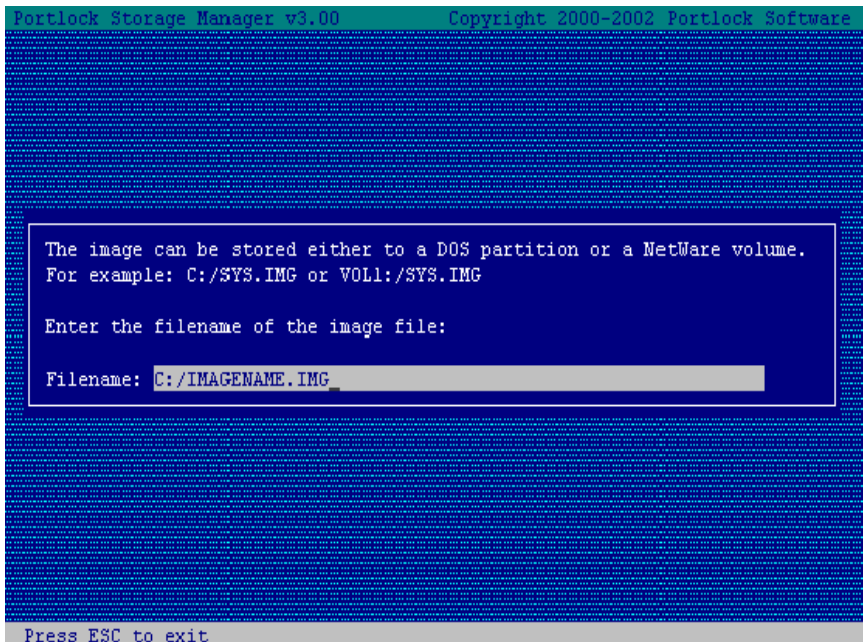


To begin the restore process, choose **Restore Commands** from the **Main Menu** screen and press [Enter].

## Read image from a disk file

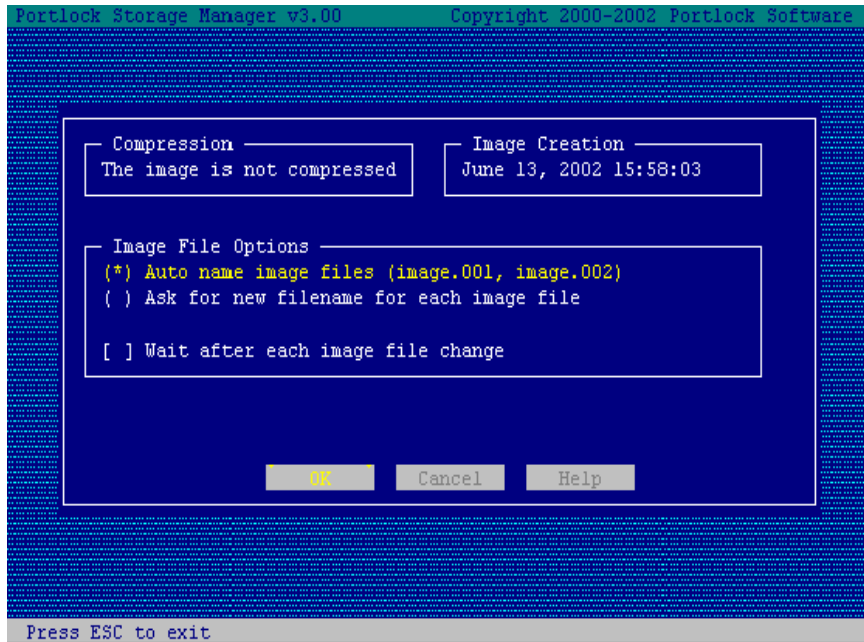


For this example, **Read image from a disk file** is selected. When reading an image from a disk file this can be a normal file on a NetWare volume or a DOS partition. Once the source is selected, press [Enter].

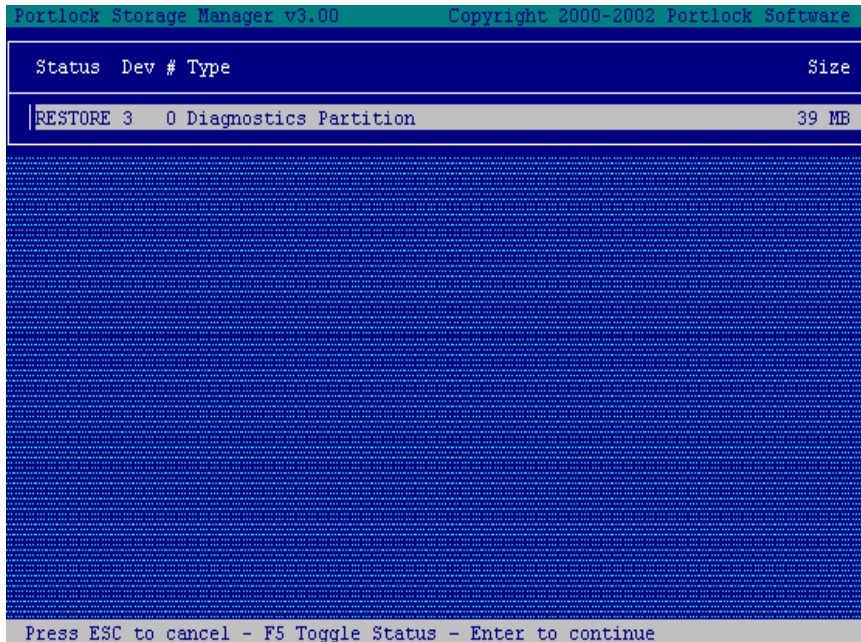


The image can be stored to either a DOS partition or a NetWare volume. From this menu, enter the filename of the image file and press [Enter].

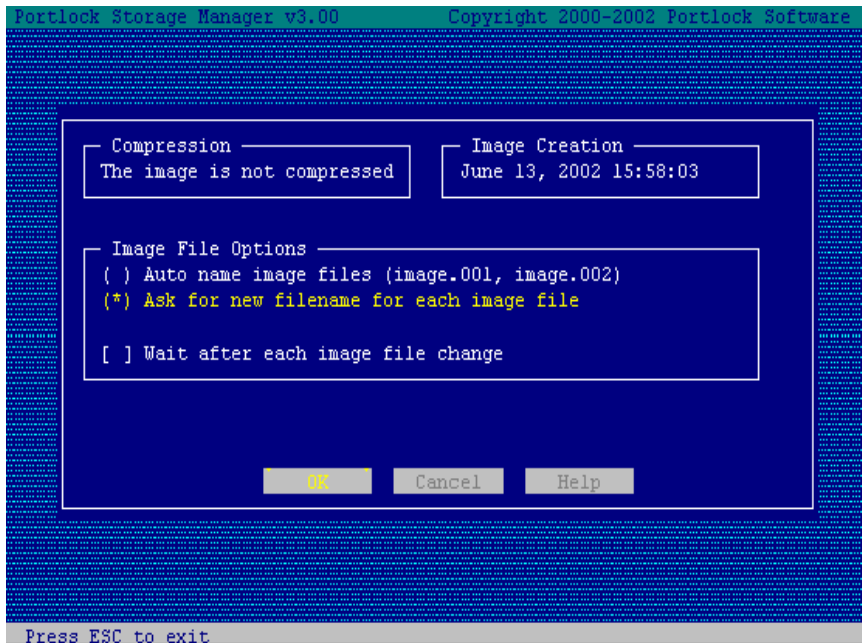




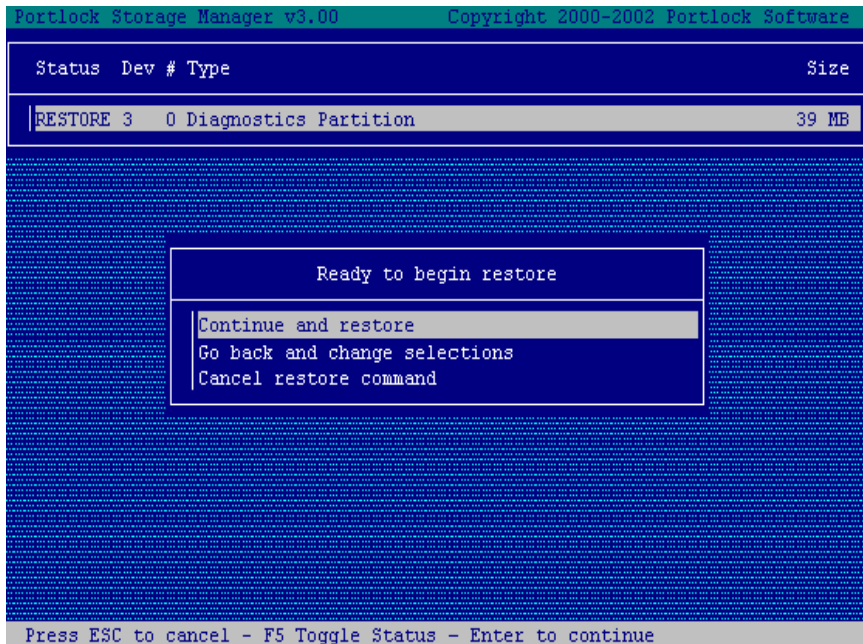
From the **Image File Option** screen, you have the option to: (1) Auto name image files, (2) Ask for a new filename for each image file, or (3) Wait after each image file change. This screen tells you about image compression and the date of the image creation. For this example, we will choose to **Auto name image files** and select OK.



This screen shows you the status, device number and type of the image. Press [Enter] to continue.

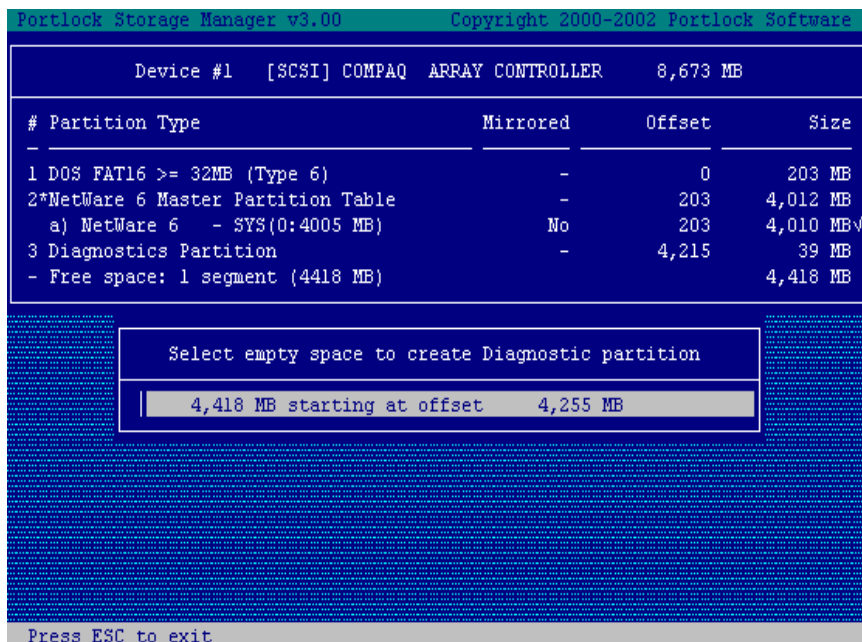


From the **Image File Options** screen, choose the option **Ask for new filename for each image file** and press OK.

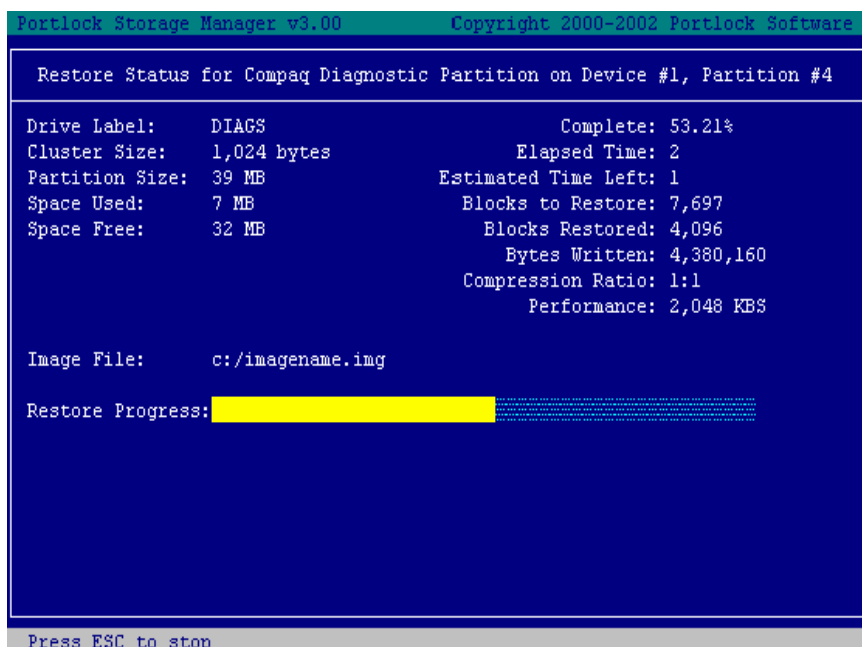


From the **Ready to begin restore** screen, you have three options: (1) Continue and restore, (2) Go back and change selection or (3) Cancel restore command.

For this example, the **Continue and restore** is selected. Press [Enter] to continue.



From the **Select Empty Space** screen, select the space to which you want to create the diagnostic partition and press [Enter].



The **Restore Progress** screen will appear showing you the progress of your restore.

```

Portlock Storage Manager v3.00      Copyright 2000-2002 Portlock Software

  Status  Dev #  Type                                     Size
  -----
|SUCCESS 3   0  Diagnostics Partition                      39 MB
|

Restore Complete - Press Escape or Enter to close screen.

```

The **Restore Success** screen will then appear. Press [Esc] or [Enter] to close the screen.

```

Portlock Storage Manager v3.00      Copyright 2000-2002 Portlock Software

  Device #1  [SCSI] COMPAQ  ARRAY CONTROLLER      8,673 MB

# Partition Type                                     Mirrored  Offset  Size
- - - - -
1 DOS FAT16 >= 32MB (Type 6)                        -           0    203 MB
2*NetWare 6 Master Partition Table                   -          203   4,012 MB
  a) NetWare 6 - SYS(0:4005 MB)                      No          203   4,010 MB✓
3 Diagnostics Partition                              -         4,215     39 MB
- Free space: 1 segment (4418 MB)                                4,418 MB

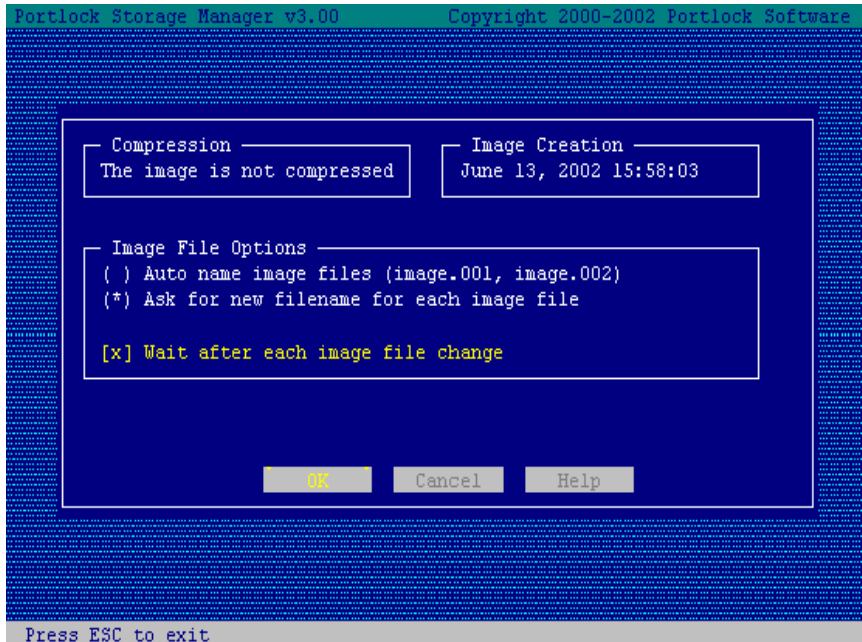
Select destination drive to create Diagnostic partition

Device #1  [SCSI] COMPAQ  ARRAY CONTROLLER      8,673 MB
Device #2  [SCSI] COMPAQ  ARRAY CONTROLLER     34,702 MB
Device #3  [SCSI] COMPAQ  ARRAY CONTROLLER     34,731 MB

Press ESC to exit

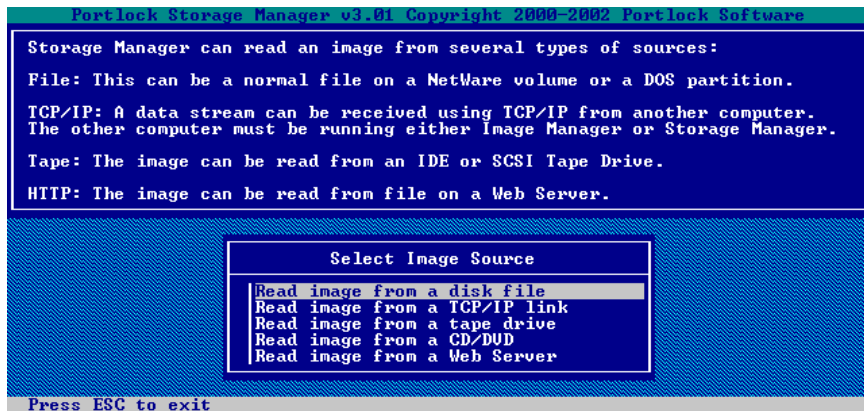
```

From the **Select destination drive to create diagnostic partition** screen, you can choose the device to create. Press [Enter] when selected.

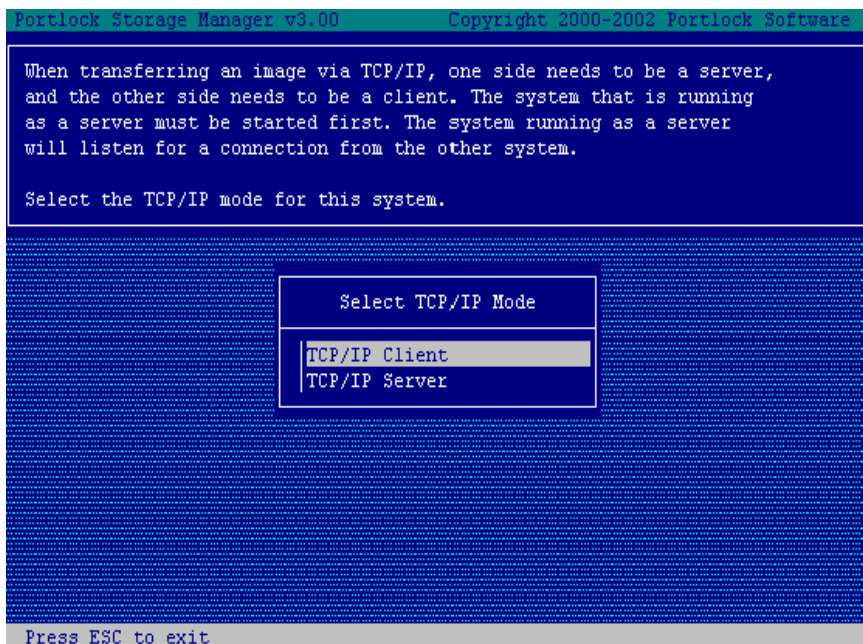


From the **Image File Options** screen, choose **Ask for new Filename for each image file** and **Wait after each image file change** and press the OK button.

## Read image from a TCP/IP link



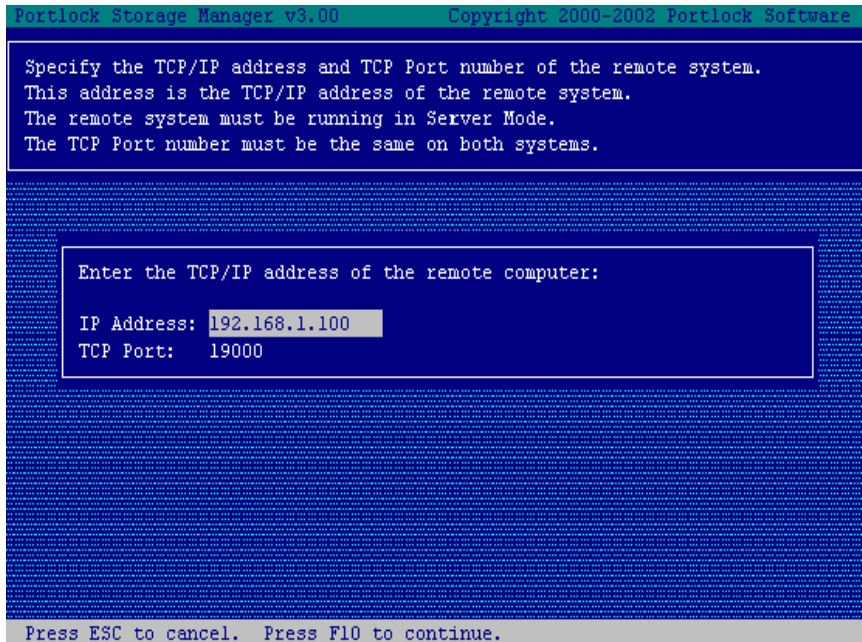
From the **Select Image Source** menu, choose the option **Read image from a TCP/IP link**. With a TCP/IP link, a data stream can be received from another computer. The other computer must be running either Image Manager or Storage Manager.



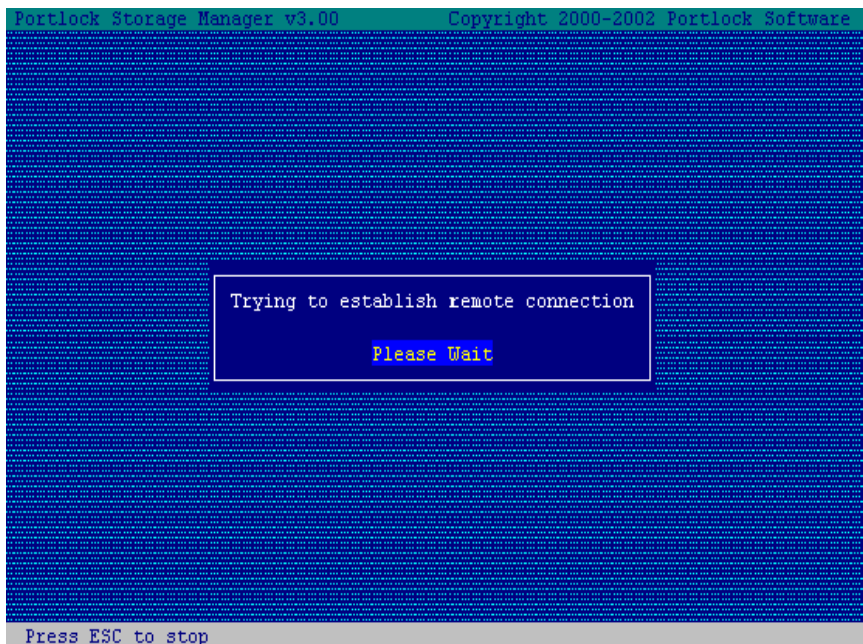
From the **Select TCP/IP Mode** menu, select the TCP/IP mode for this system. You can choose from TCP/IP Client or Server.

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. For this example, the option TCP/IP Client is selected. Press [Enter] to continue.



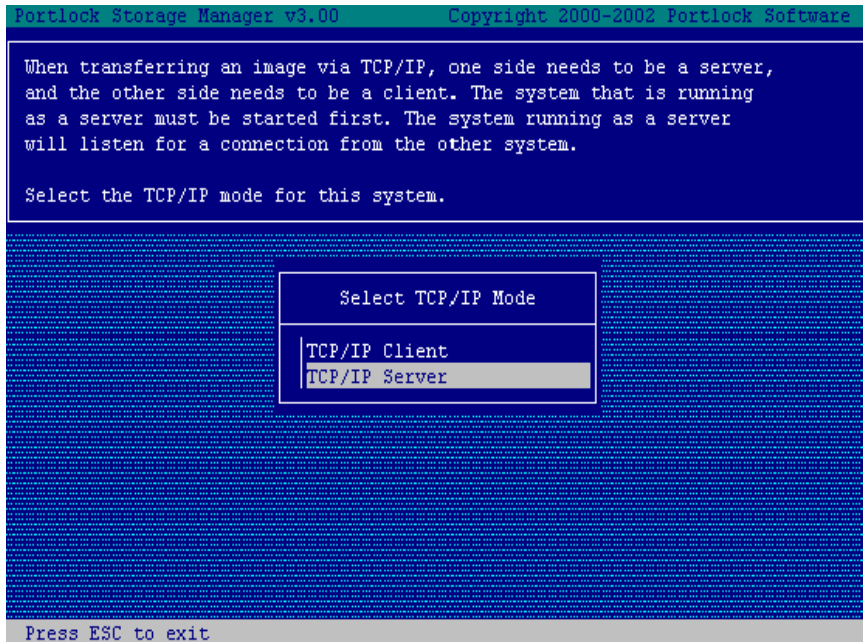


From this screen, specify the **IP address** and **TCP Port** of the remote system. This address is the TCP/IP address of the remote system. The remote system must be running in Server Mode. The TCP Port number must be the same on both systems. Once you enter in the TCP/IP address of the remote computer, press [Enter].

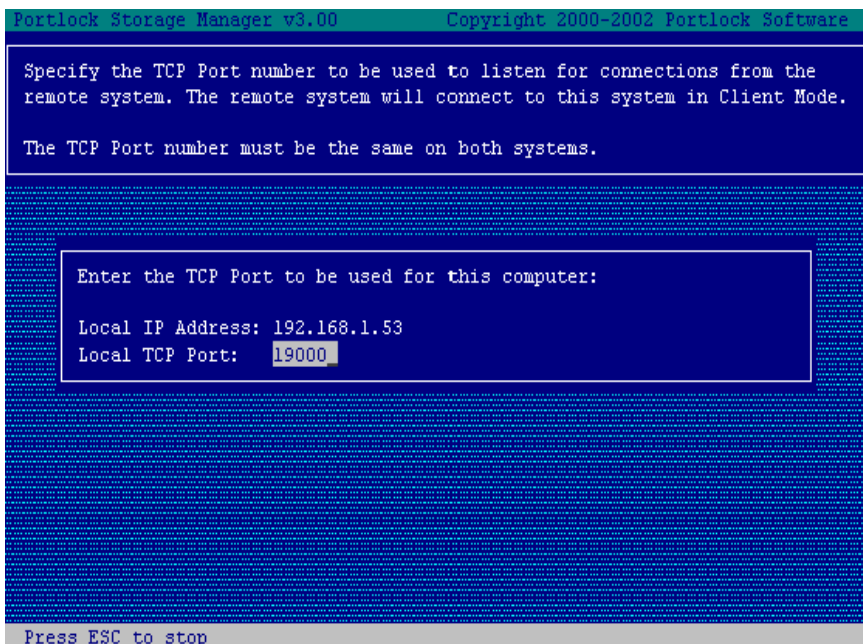


This screen will then appear and will try to establish a remote connection.





From this screen, select the **TCP/IP mode** for this system. For this example, the **TCP/IP Server** will be selected. Once selected, press [Enter].

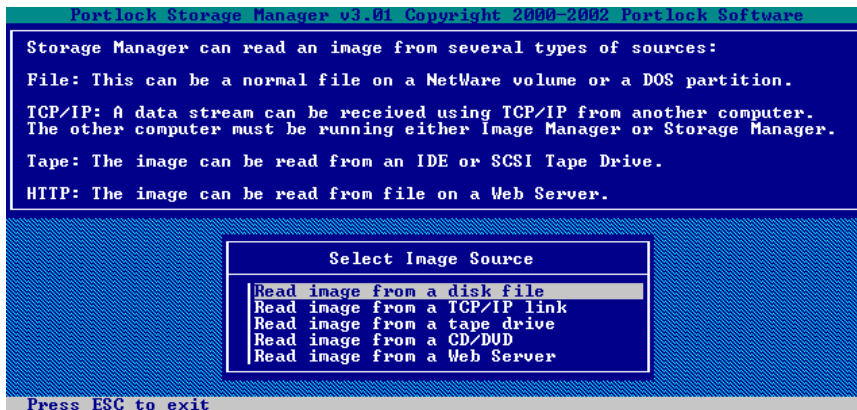


From this screen, specify the **TCP Port number** to be used to listen for connections from the remote system. The remote system will connect to this system in Client Mode. The TCP Port number must be the same on both systems. Enter the TCP Port to be used for this computer and press [Enter].

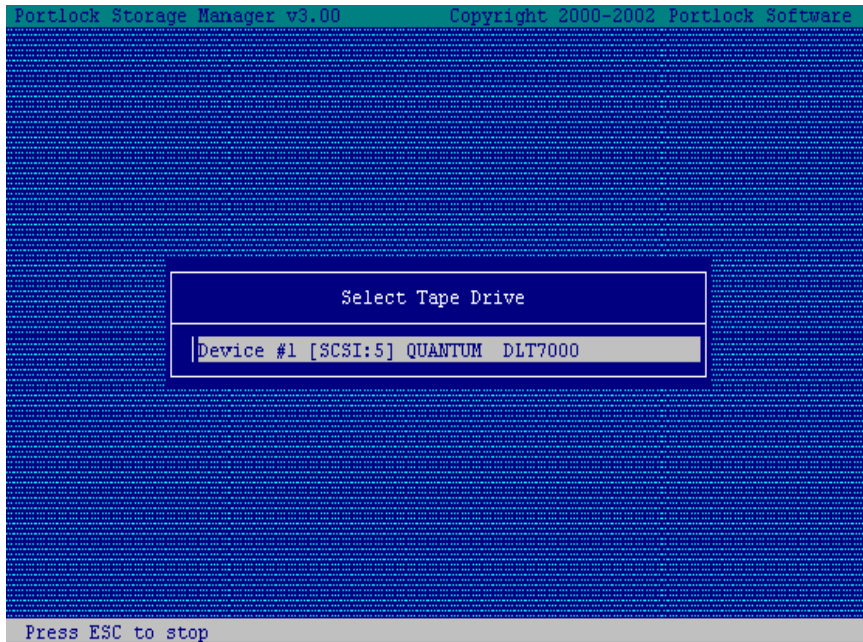


At this screen, the system will be waiting for a connection to be established.

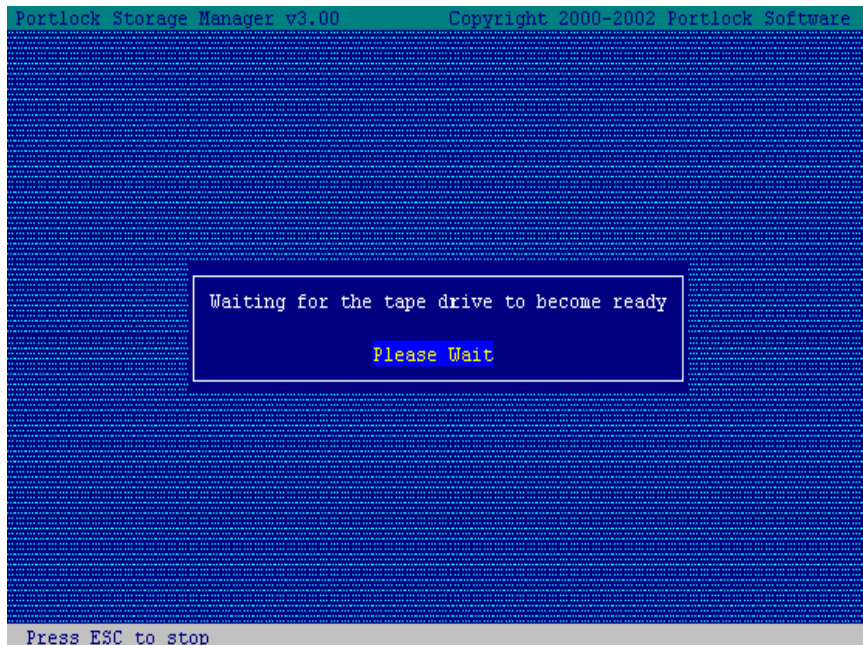
## Read image from a tape drive



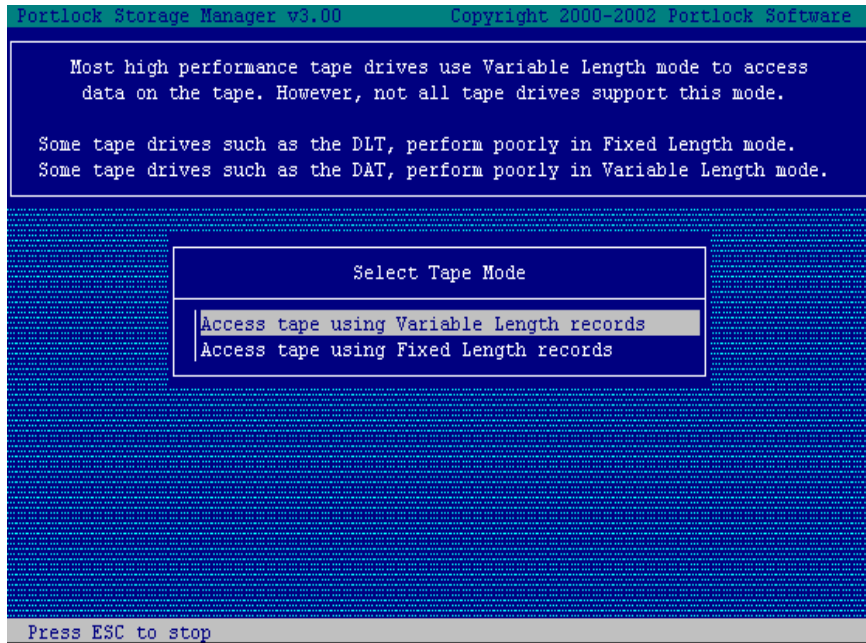
From the **Select Image Source** screen, select the option to **read image from a tape drive**. The image can be read from an IDE or SCSI Tape Drive.



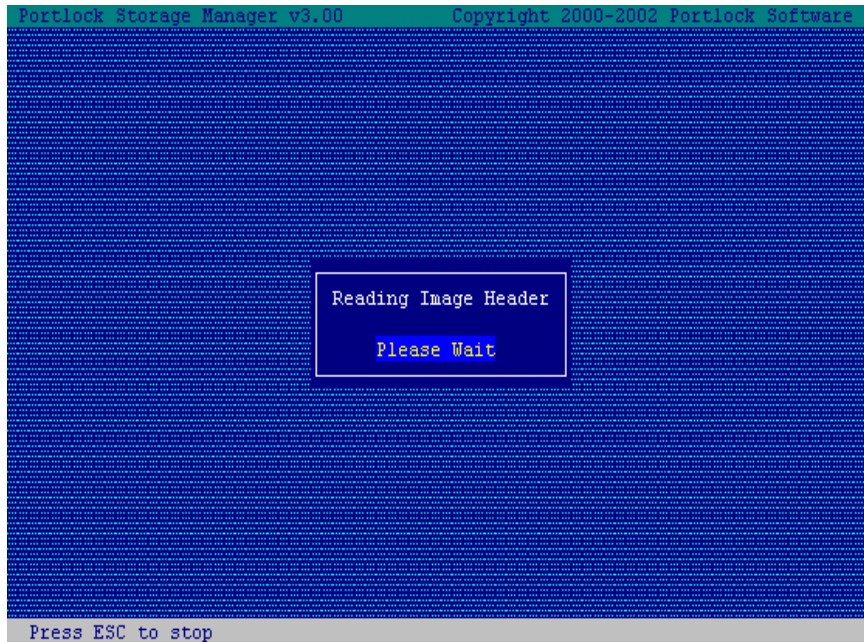
From the **Select Tape Drive** screen, choose the device you want to manage and press [Enter].



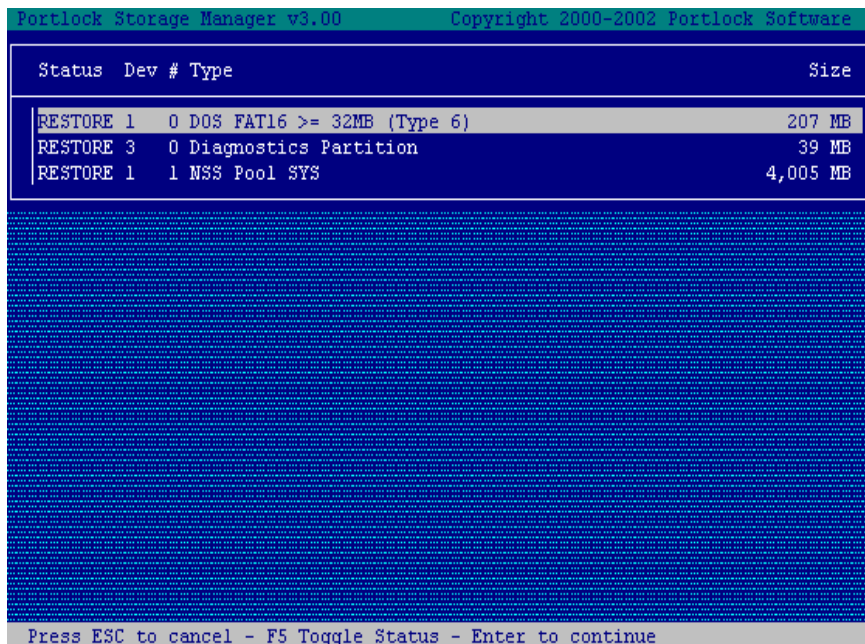
At this screen, the system is waiting for the tape drive to become ready.



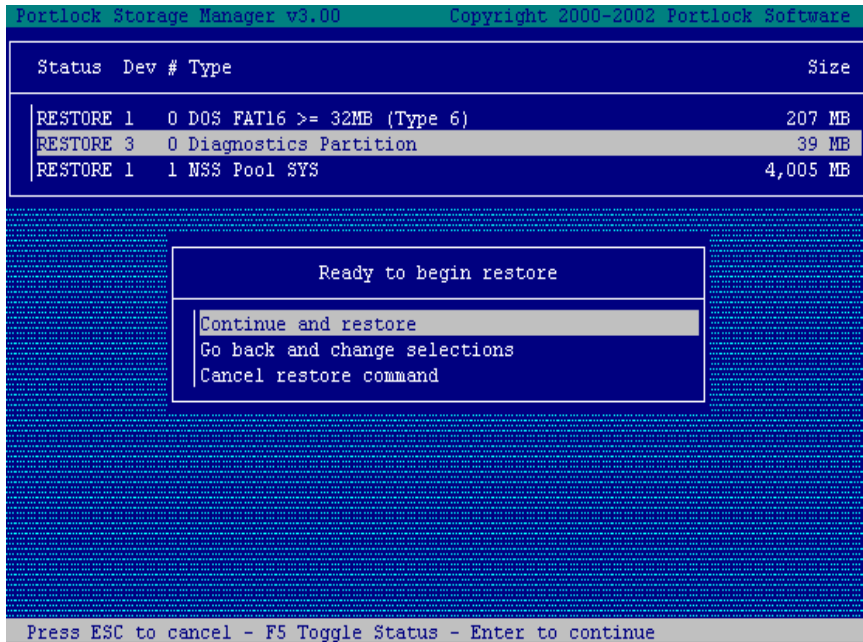
Most tape drives use Variable Length mode to access data on the tape; however, not all tape drives support this mode. From this menu, you can **Access tape using Variable Length records** or **Access tape using Fixed Length records**. For this example, the **Access tape using Variable Length Records** option is selected. Press [Enter] to continue.



At this screen, the system is reading the image header. Please wait.



From this screen, you can select the device you want to restore. Using the F5 function key, you can toggle between **SKIP** and **RESTORE**. Press [Enter] to continue.



At the **Ready to begin restore** screen, you can:

1. Continue and restore
2. Go back and change selections
3. Cancel restore command

For this example, we will choose the option **Continue and restore**. Press [Enter] to continue.

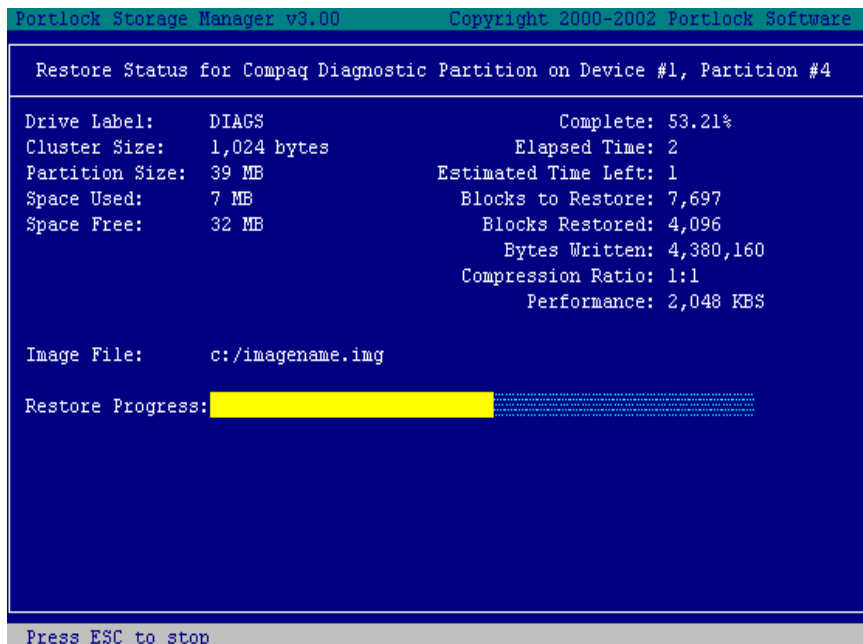
Portlock Storage Manager v3.00			Copyright 2000-2002 Portlock Software		
Device #1		[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB	
#	Partition Type	Mirrored		Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-		0	203 MB
2	*NetWare 6 Master Partition Table	-		203	4,012 MB
a)	NetWare 6 - SYS(0:4005 MB)	No		203	4,010 MB✓
3	Diagnostics Partition	-		4,215	39 MB
4	Diagnostics Partition	-		4,255	39 MB
- Free space: 1 segment (4378 MB)					4,378 MB
Select destination drive to create DOS partition					
Device #1	[SCSI] COMPAQ	ARRAY CONTROLLER	8,673 MB		
Device #2	[SCSI] COMPAQ	ARRAY CONTROLLER	34,702 MB		
Device #3	[SCSI] COMPAQ	ARRAY CONTROLLER	34,731 MB		
Press ESC to exit					

From this screen, you can choose the destination drive to create the DOS partition.

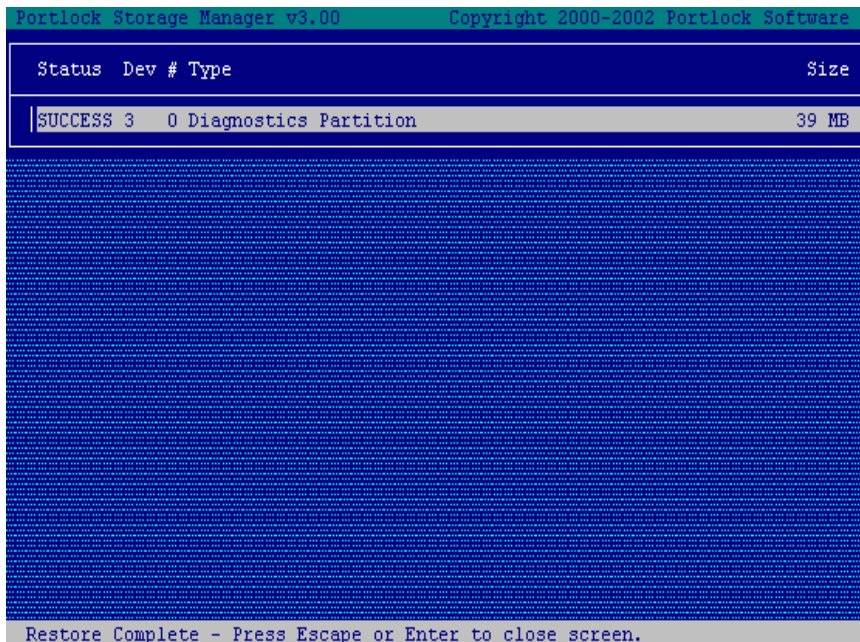
Portlock Storage Manager v3.00			Copyright 2000-2002 Portlock Software		
Device #2		[SCSI] COMPAQ	ARRAY CONTROLLER	34,702 MB	
#	Partition Type	Mirrored		Offset	Size
Free Space				0	34,702 MB
Select empty space to create DOS partition					
34,702 MB starting at offset		0 MB			
Press ESC to exit					

From this screen, you are asked to select the empty space to which you want to create the DOS partition.



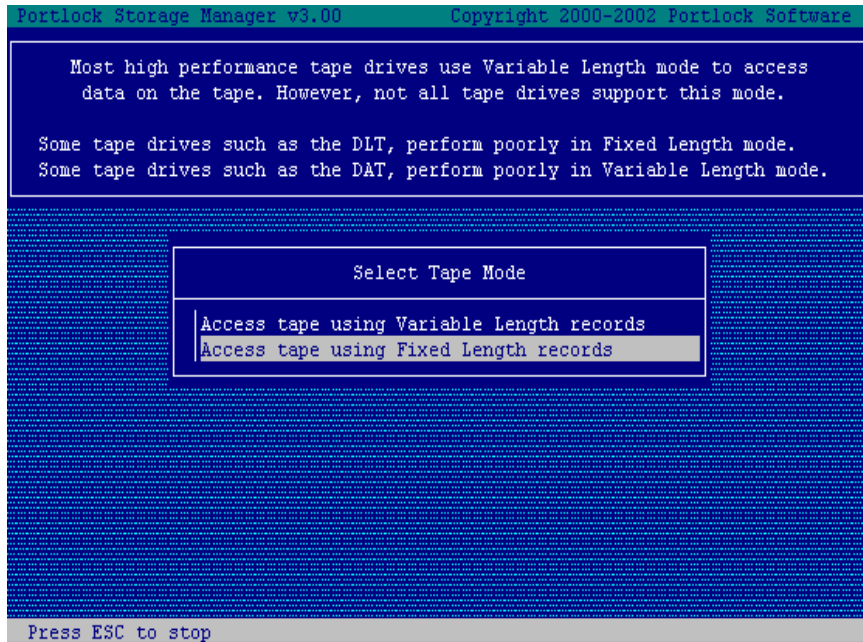


This screen shows the progress of the restore.



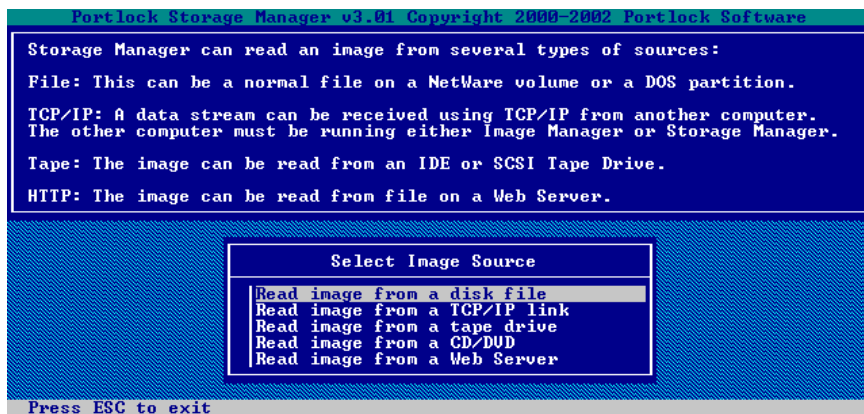
When this screen appears, the restore was a success. Press [ESC] or [Enter] to close the screen.



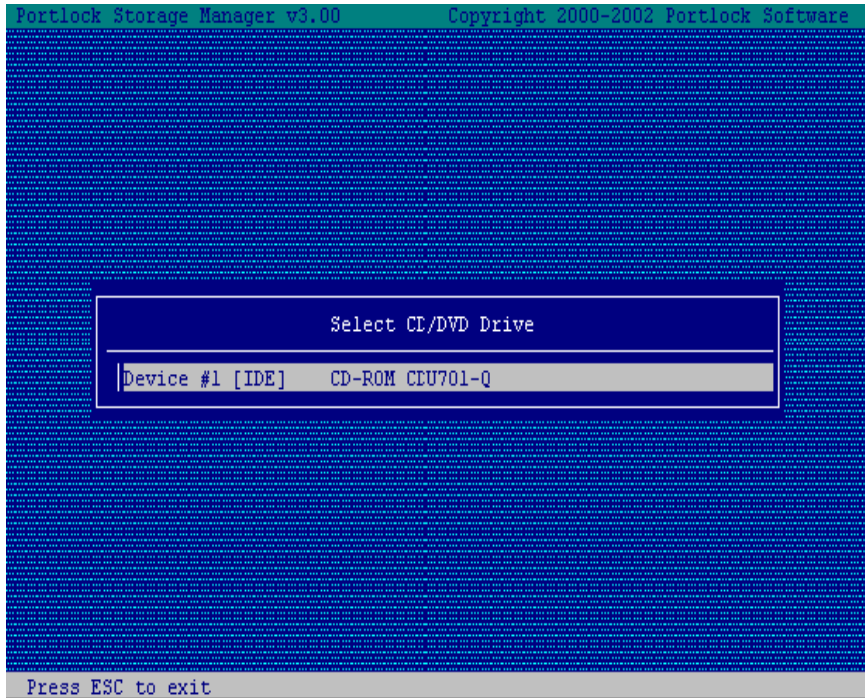


From the **Select Tape Mode** menu, select **Access tape using Fixed Length records** and press [Enter].

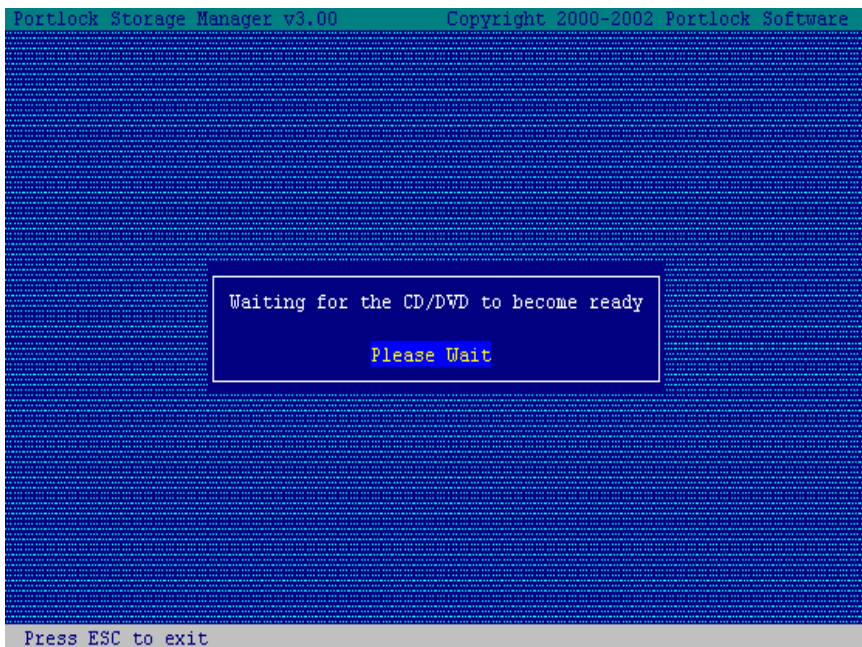
## Read image from a CD/DVD



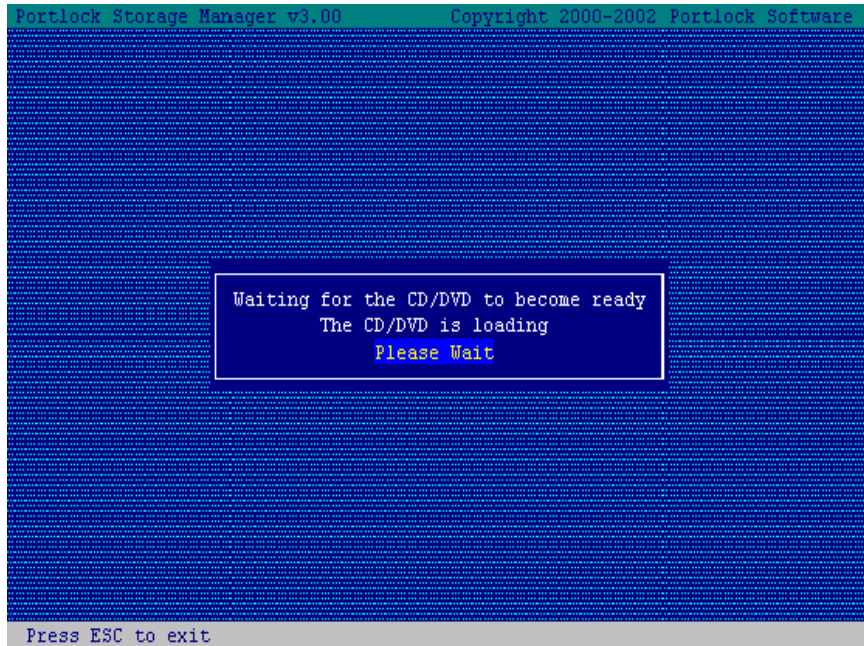
From the **Select Image Source** menu, select **Read image from a CD/DVD** and press [Enter].



This screen contains information about the CD/DVD ROM installed on your server. Press [Enter] to continue.



At this screen, the system is waiting for the CD/DVD to become ready. Please wait



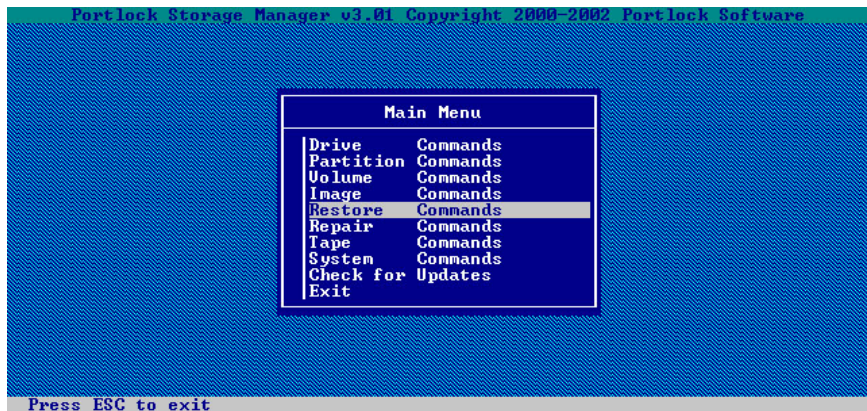
At this screen, the CD/DVD is loading. Please wait.

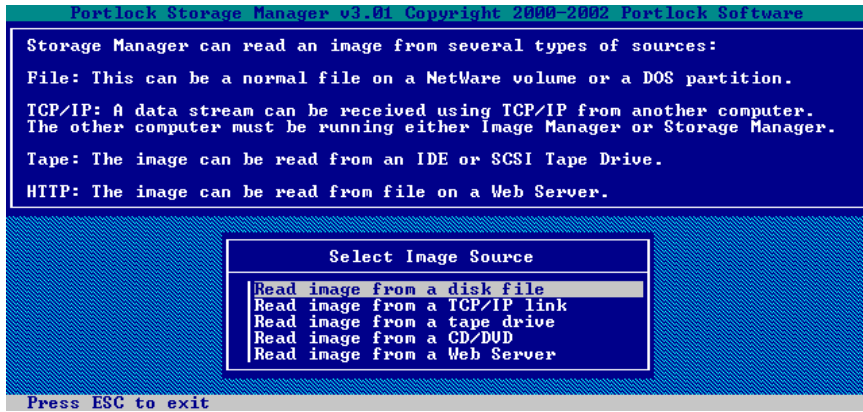
## Read image from a Web Server

Storage Manager has the capability to read an image from a web server. This allows Storage Manager to read a previously created Storage Manager image from a web server using http commands and port 80. The Storage Manager image must be in a directory that an anonymous user could access. It does not have to be seen from a web server just be an unsecured location.

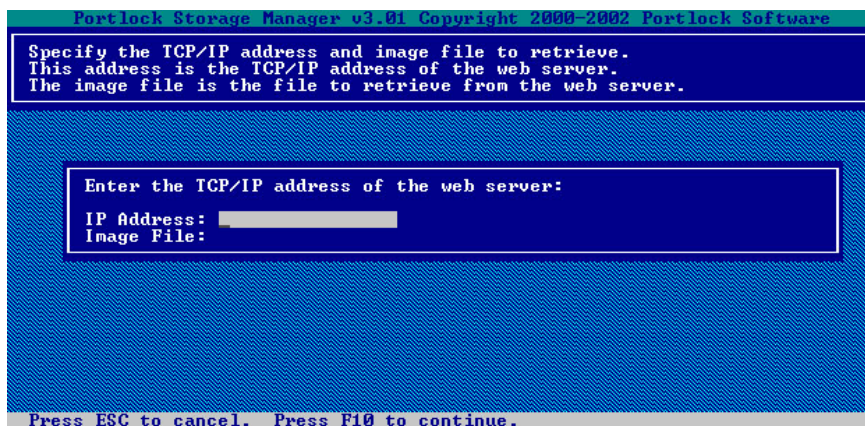
This option allows you to have images of your servers available for Disaster Recovery, Server Deployments or Test servers. You can boot from a Novell Client 32 TCP/IP disk and restore the image using DOS. Examples of these types of disks are available on our website [www.portlocksoftware.com/download.htm](http://www.portlocksoftware.com/download.htm).

To utilize this option, you would choose **Restore** from the **Main Menu** of Storage Manager and press [Enter].



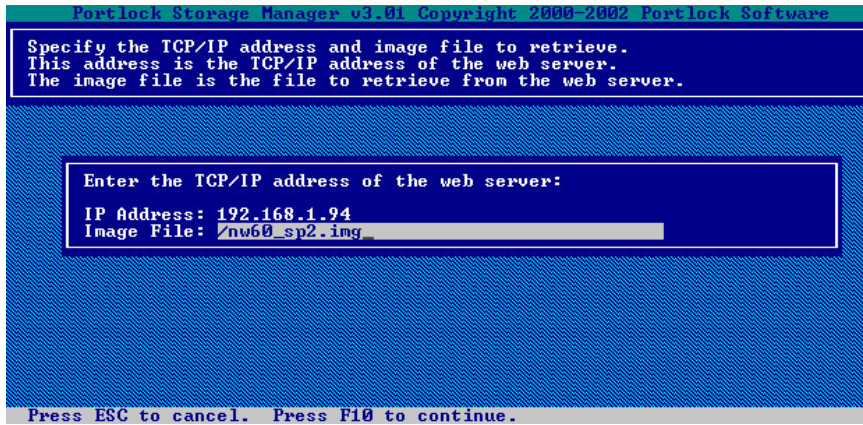


From the **Select Image Source** menu, select the option **Read image from a Web Server** and press [Enter].



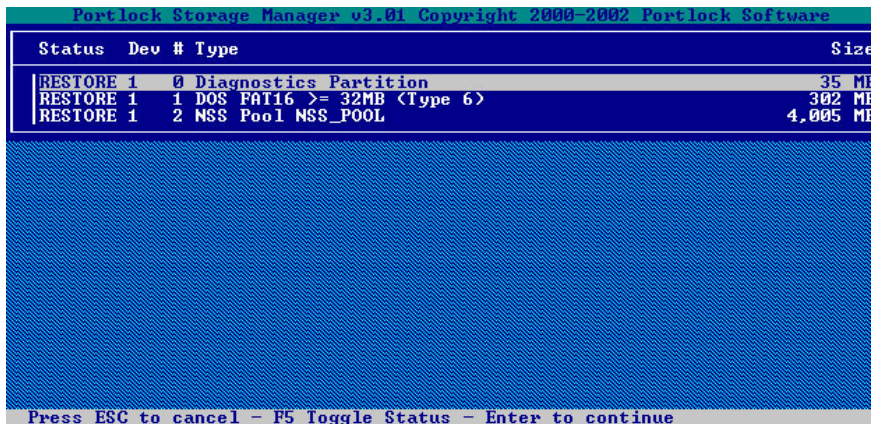
You are then prompted to this screen where you will need to specify the TCP/IP address and image file to retrieve. This address is the TCP/IP address of the web server. The image file is the file to retrieve from the web server.



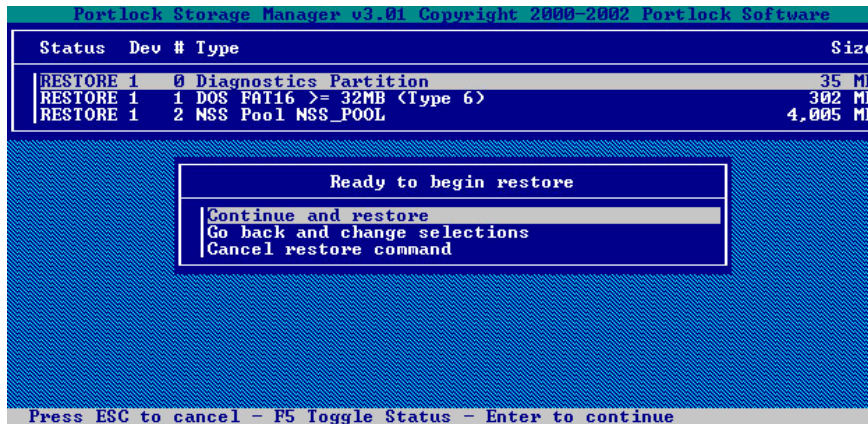


In our example, the TCP/IP address of our web server is 192.168.1.94 and the pathname and file is /nw60\_sp2.img. Once you have typed the required information, press the F10 function key to continue.

Tip: Always start the path with a “/” as most web servers require complete path specifiers.

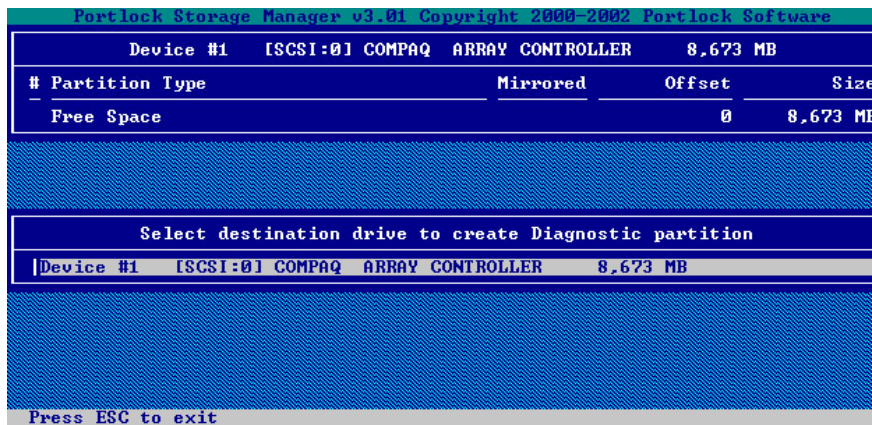


You are now presented with a list of items that can be restored to your server from the image file. As this is a new server, we will allow all partitions to be restored. We will press [Enter] to continue.

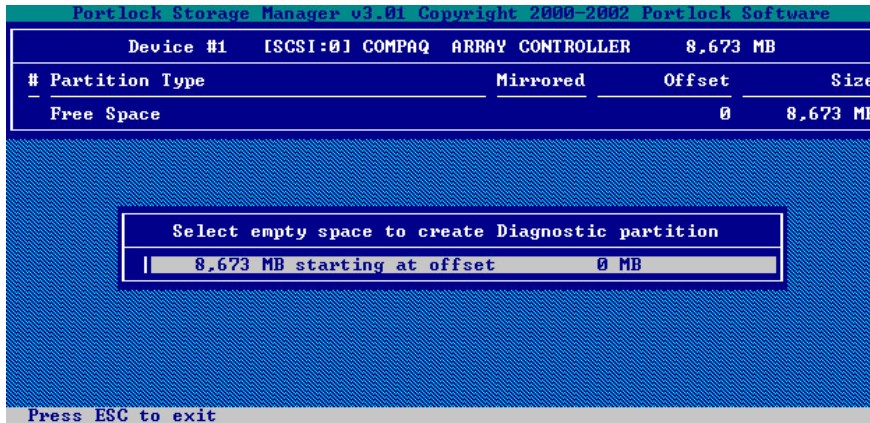


This is a confirmation screen showing what Storage Manager is about to do. As we wish to do a complete restore, we will highlight **Continue and restore** and press [Enter].

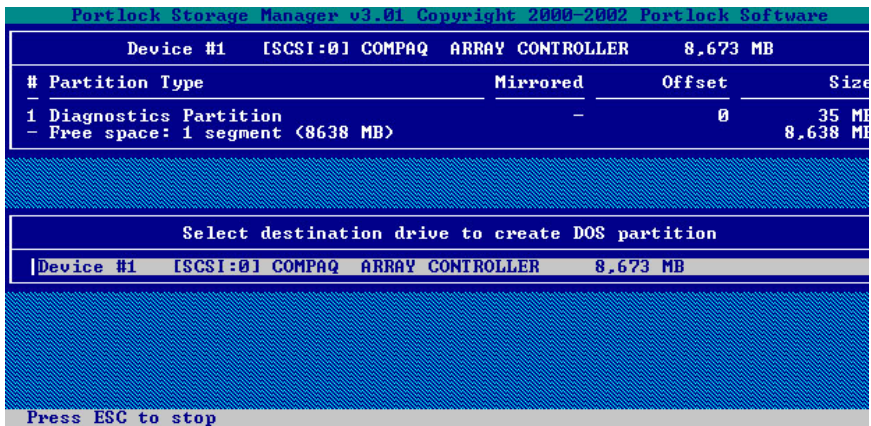
Tip: You can toggle the status of your partitions between SKIP and RESTORE by pressing the F5 function key.



You are now asked to choose the destination for the image that you want restored. Choose the correct destination and press [ENTER] to continue.

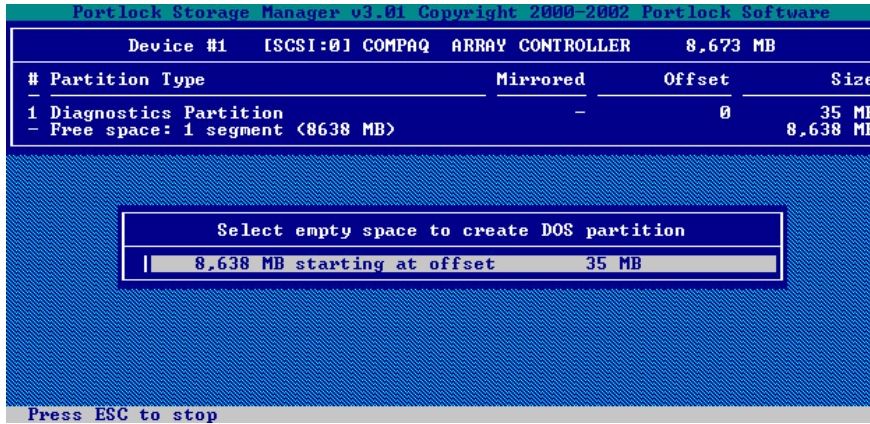


At this screen, select the empty space to create the Diagnostic partition and press [Enter]. The restore of the Compaq Diagnostic partition will commence.

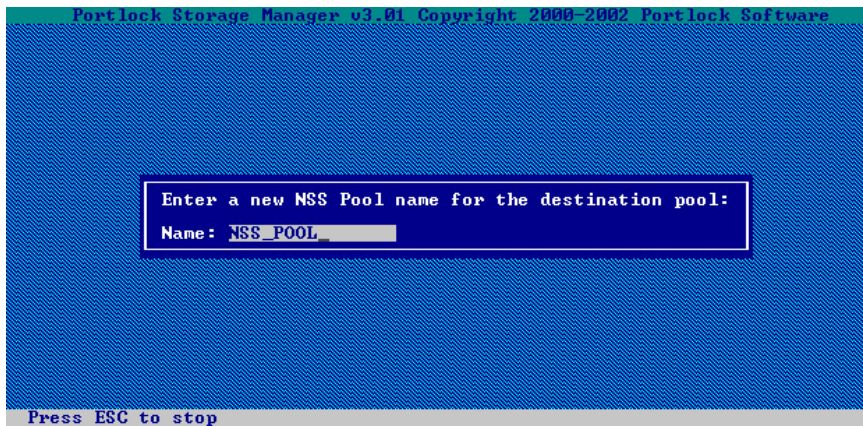


Storage Manager will now ask us where to restore the DOS partition to. Select the boot drive (device #1) to restore the DOS partition to and press [Enter].





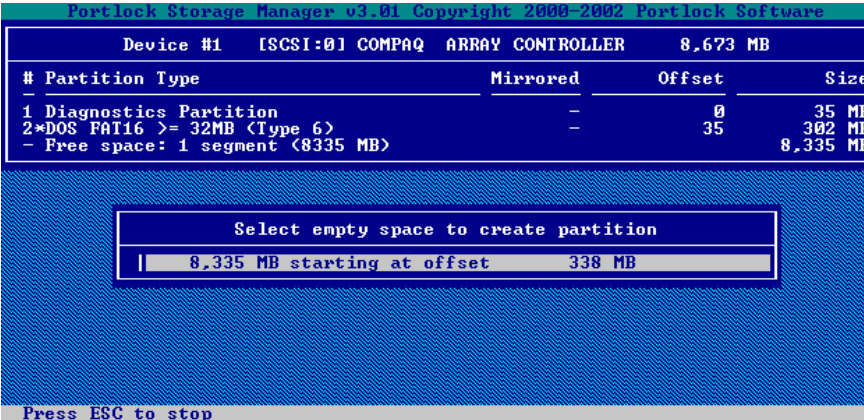
This screen is showing that a new partition is going to be created at the end of the Compaq Diagnostic partition that we restored earlier. Press [Enter] to continue.



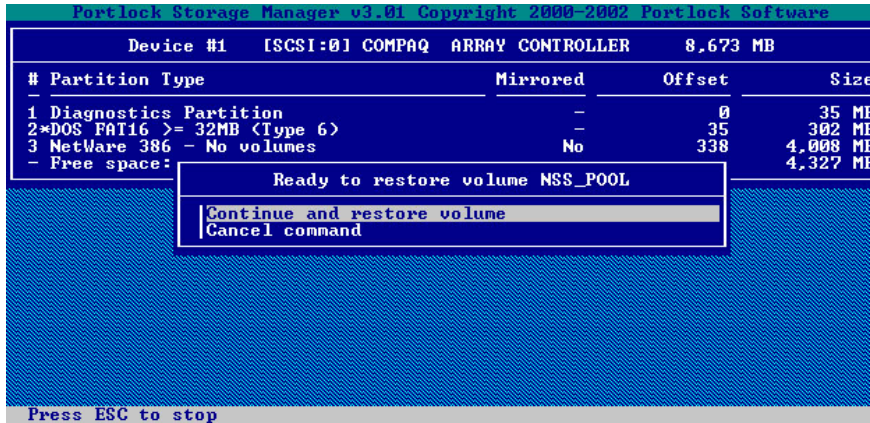
If you are using a NetWare 6.x server, you will be asked to give the NSS Pool a new name. Please enter a name for the NSS Pool. We will use NSS\_POOL for our server. Press [Enter] to continue.



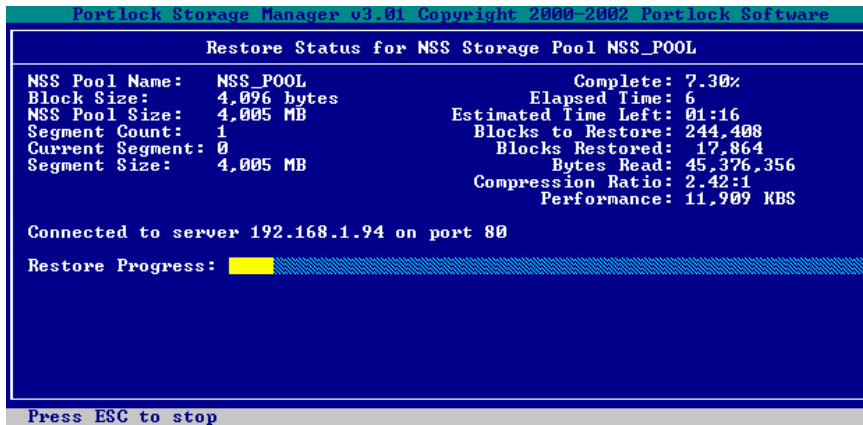
Once again, we will be asked to confirm the drive that we wish to restore the volume to. Select the destination drive and press [Enter].



Storage Manager is telling us that the new partition will begin at 338 MB. Press [Enter] to continue.



Storage Manager is just confirming the restore of the volume / pool.



Now Storage Manager will begin the restore of the image from the web server.

Portlock Storage Manager v3.01 Copyright 2000-2002 Portlock Software			
Status	Dev #	Type	Size
SUCCESS	1	0 Diagnostics Partition	35 MB
SUCCESS	1	1 DOS FAT16 >= 32MB <Type 6>	302 MB
SUCCESS	1	2 NSS Pool NSS_POOL	4,005 MB

Restore Complete - Press Escape or Enter to close screen.

Once the restore is complete, press [Enter] to continue and then you will be presented with the Storage Manager **Main Menu**

Portlock Storage Manager v3.01 Copyright 2000-2002 Portlock Software	
Main Menu	
Drive	Commands
Partition	Commands
Volume	Commands
Image	Commands
Restore	Commands
Repair	Commands
Tape	Commands
System	Commands
Check for Updates	
Exit	

Press ESC to exit

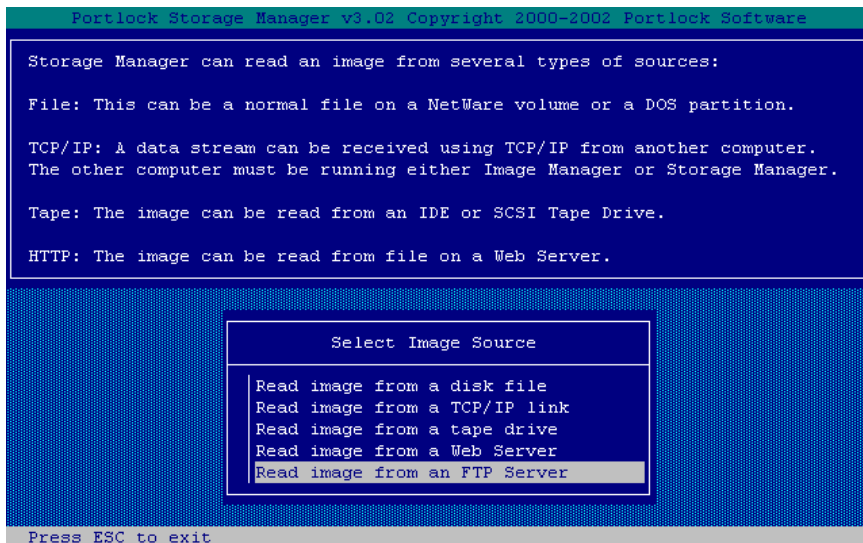
Congratulations, your restore from your web server is complete.

## Read image from an FTP Server

Storage Manager supports using FTP servers to store server images. Save images to or restore images from FTP servers. This includes NAS devices that support the FTP protocols. Create a “Disaster Recovery” image of your server and save it onto one of your FTP servers. Then, you can install this image using FTP or HTTP onto a “bare-metal” machine.

Note: Some FTP servers are case sensitive for file names. This means that if a file is “DOS.img” then specifying “dos.img” will not work.

To utilize this option, you would choose **Restore** from the **Main Menu** of Storage Manager and press [Enter].



From the **Select Image Source Menu**, select the option **Read image from an FTP Server** and press [Enter].



```

Portlock Storage Manager v3.02 Copyright 2000-2002 Portlock Software

Specify the TCP/IP address and image file to retrieve plus login information.

The IP Address is the TCP/IP address of the FTP server.
The Image File is the file to access on the FTP server.
The User is the login name for the FTP server.
The Password is the password for the FTP server.

Press F10 when ready to go to the next screen or ESC to cancel.

```

```

Enter the TCP/IP address of the FTP server:

IP Address: 192.168.1.111
Image File: test.img
User:      anonymous
Password:  support@portlocksoftware.com

```

```

Press ESC to cancel.  Press F10 to continue.

```

At this screen, specify the TCP/IP address and image file to retrieve plus login information. The IP Address is the TCP/IP address of the FTP server. The Image File is the file to access on the FTP server. The User is the login name for the FTP server and the password is the password for the FTP server. Press the F10 function key when ready to go to the next screen or ESC to cancel.

```

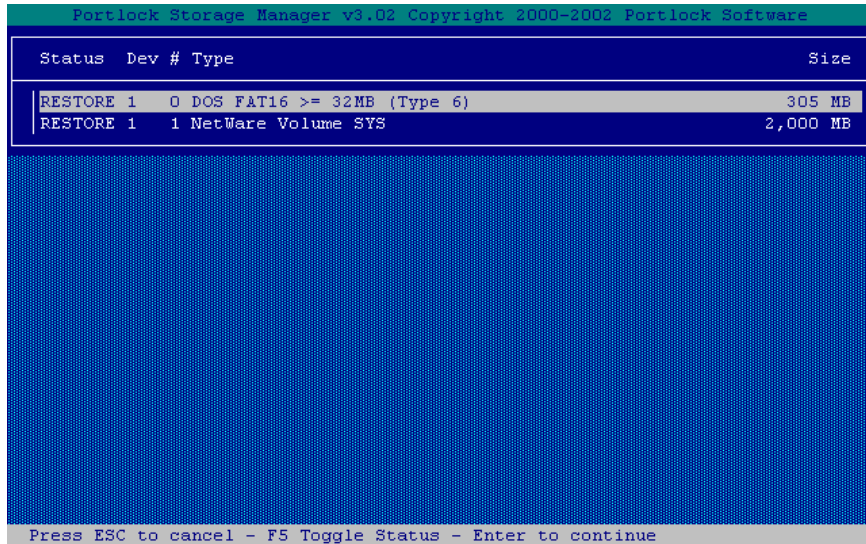
Portlock Storage Manager v3.02 Copyright 2000-2002 Portlock Software

STAT: Connecting to FTP server 192.168.1.111 on port 21 ...
STAT: Connected to FTP server 192.168.1.111 on port 21
RESP: 220 Serv-U FTP Server v4.0 for WinSock ready...
SEND: USER anonymous
RESP: 331 User name okay, please send complete E-mail address as password.
SEND: PASS support@portlocksoftware.com
RESP: 230 User logged in, proceed.
SEND: TYPE I
RESP: 200 Type set to I.
SEND: PASV
RESP: 227 Entering Passive Mode (192,168,1,111,9,215)
STAT: Connecting to FTP server 192.168.1.111 on port 2519 ...
STAT: Connected to F
SEND: RETR test.img
RESP: 150 Opening BINARY mode data connection for test.img (496070424 bytes)
STAT: Connection prepared for file transfer

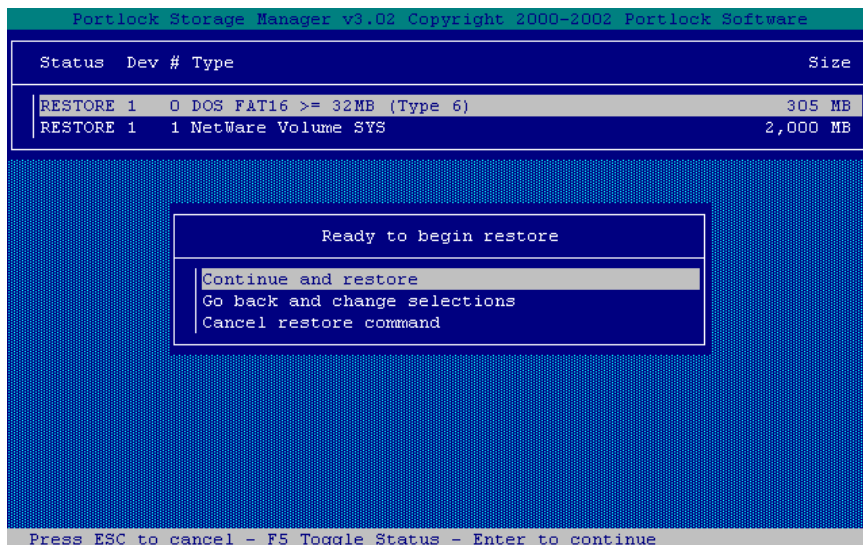
Press ESC to stop

```

At this screen, the system is connecting to the FTP server.



At this screen, you are provided with information about the image you want to restore. You can toggle between SKIP and RESTORE by pressing the F5 function key. Press [Enter] to continue.



From the Ready to begin restore screen, you have the option to Continue and restore, Go back and change selections, or Cancel restore command. For this example, we will select Continue and restore and press [Enter].

```

Portlock Storage Manager v3.02 Copyright 2000-2002 Portlock Software

```

Device #1	[SCSI:0] MegaRAID LD01 RAID5	8,432 MB		
#	Partition Type	Mirrored	Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-	0	305 MB
2	NetWare 386 - SYS(0:2000 MB)	No	305	2,008 MB
- Free space: 1 segment (6118 MB)				6,118 MB

```

Select destination drive to create DOS partition

```

Device #1	[SCSI:0] MegaRAID LD01 RAID5	8,432 MB
-----------	------------------------------	----------

```

Press ESC to exit

```

At this screen, select the empty space to create the DOS partition and press [Enter].

```

Portlock Storage Manager v3.02 Copyright 2000-2002 Portlock Software

```

Device #1	[SCSI:0] MegaRAID LD01 RAID5	8,432 MB		
#	Partition Type	Mirrored	Offset	Size
1	DOS FAT16 >= 32MB (Type 6)	-	0	305 MB
2	NetWare 386 - SYS(0:2000 MB)	No	305	2,008 MB
- Free space: 1 segment (6118 MB)				6,118 MB

```

Select empty space to create DOS partition

```

6,118 MB starting at offset	2,314 MB
-----------------------------	----------

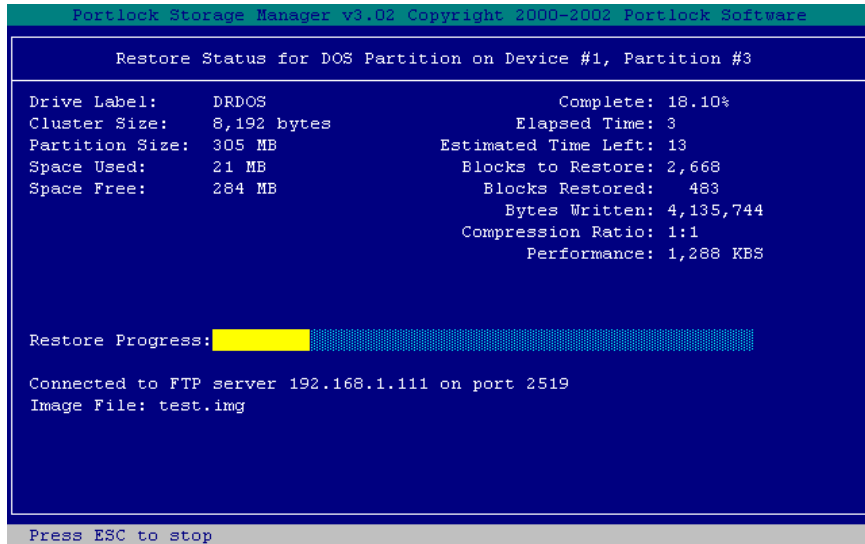
```

Press ESC to exit

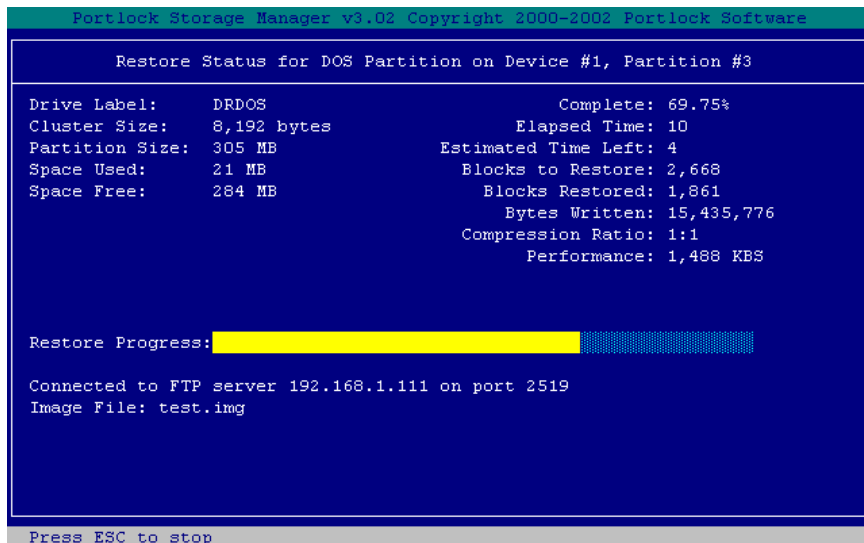
```

At this screen, select the empty space to create the DOS partition and press [Enter].

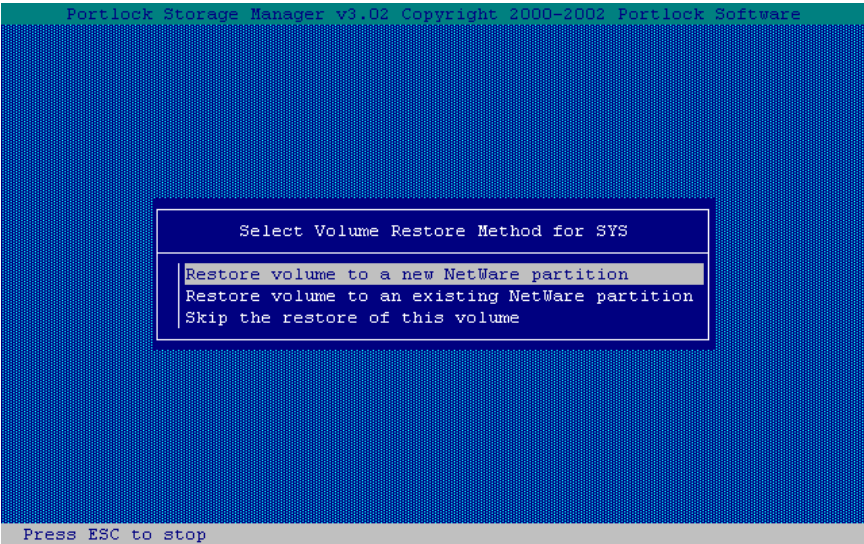




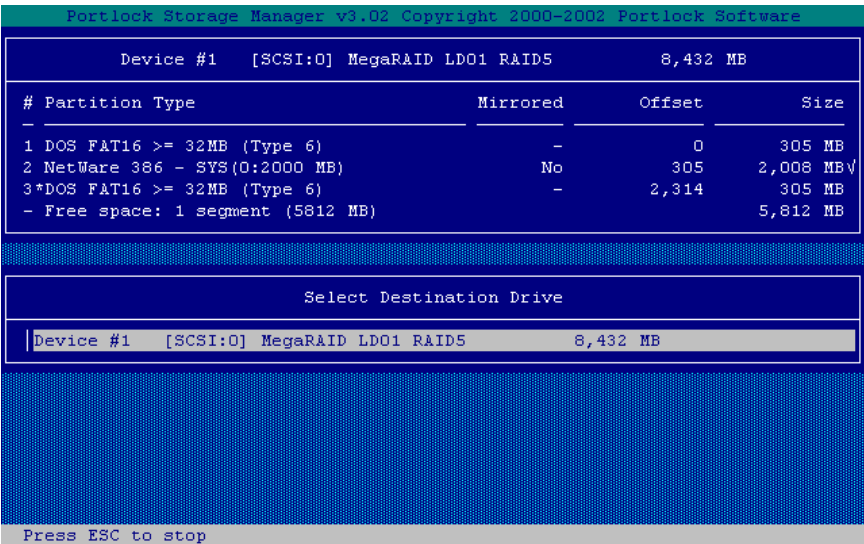
This screen shows you the restore status for the DOS partition.



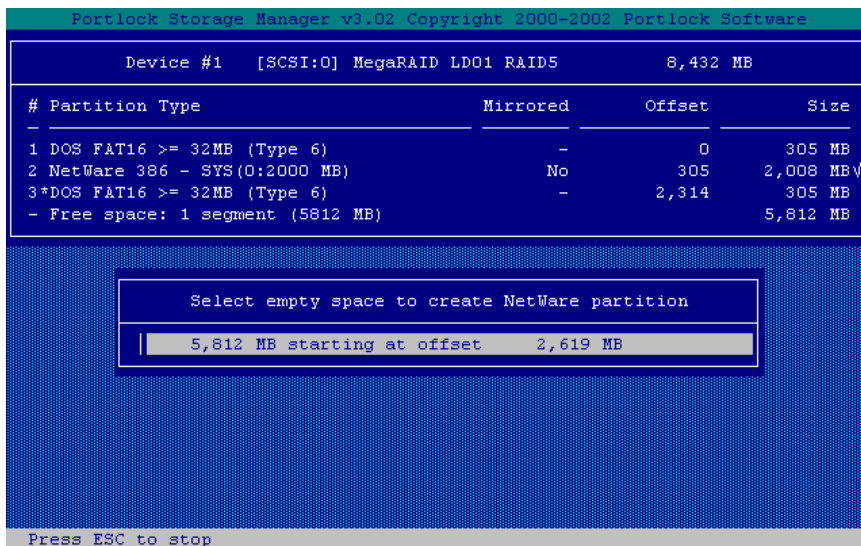
This screen shows you the restore status almost complete.



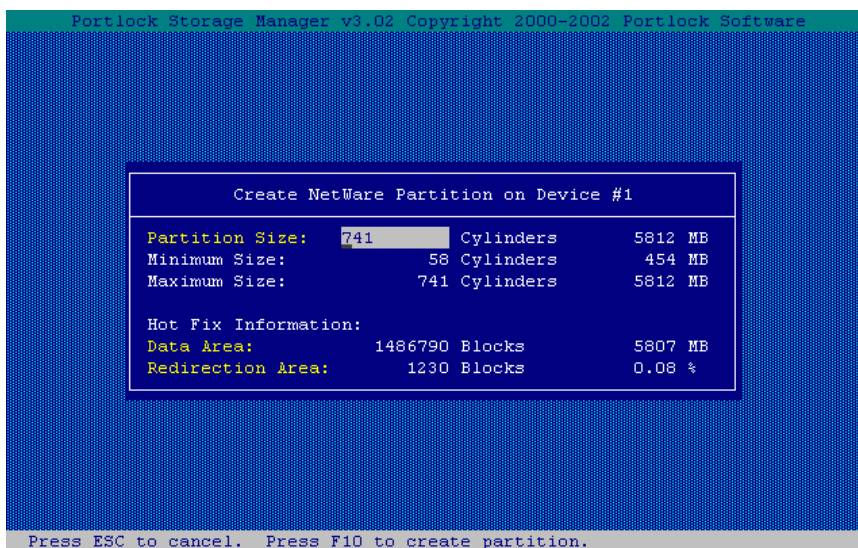
At this screen, you are prompted to select the volume restore method for SYS. You have the option to Restore the volume to a new NetWare partition, Restore the volume to an existing NetWare partition or to Skip the restore of this volume. For this example, we will select Restore the volume to a new NetWare partition and press [Enter].



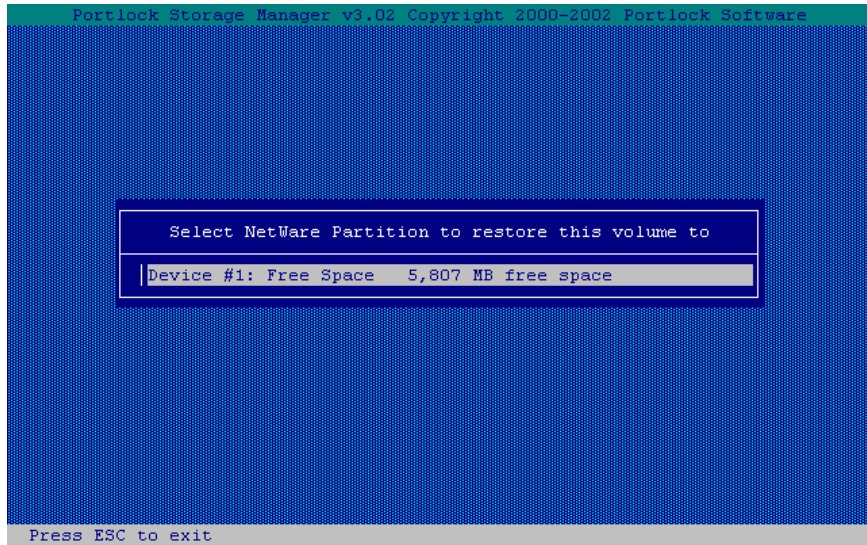
At this screen, select the destination drive to create the NetWare partition and press [Enter].



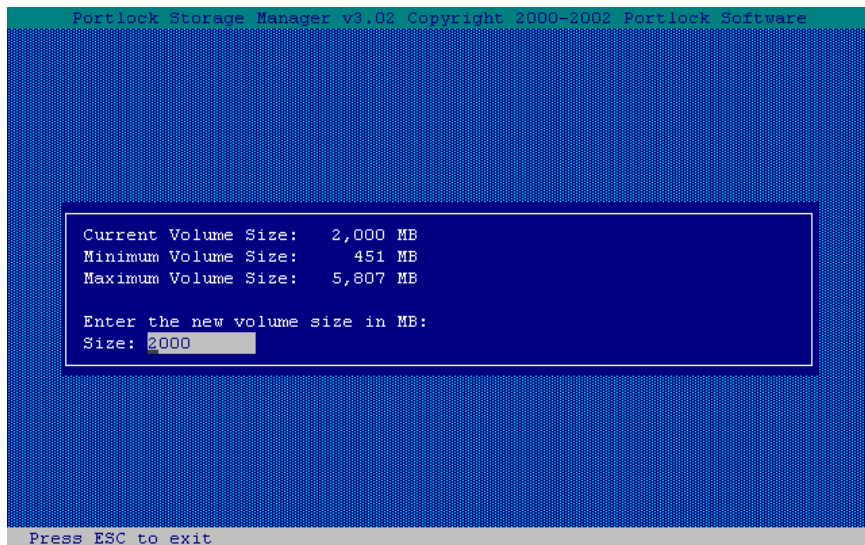
At this screen, select the empty space to create the NetWare partition and press [Enter].



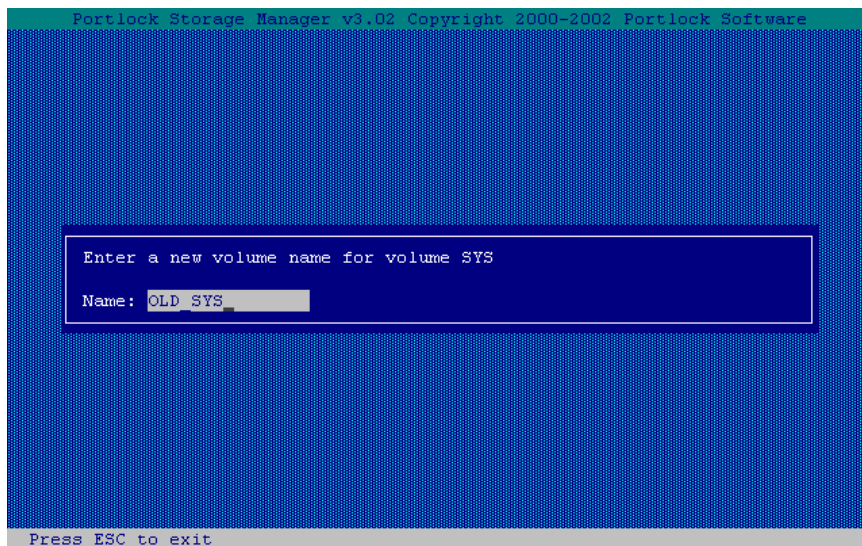
At this screen, you are prompted to enter in the NetWare partition size.



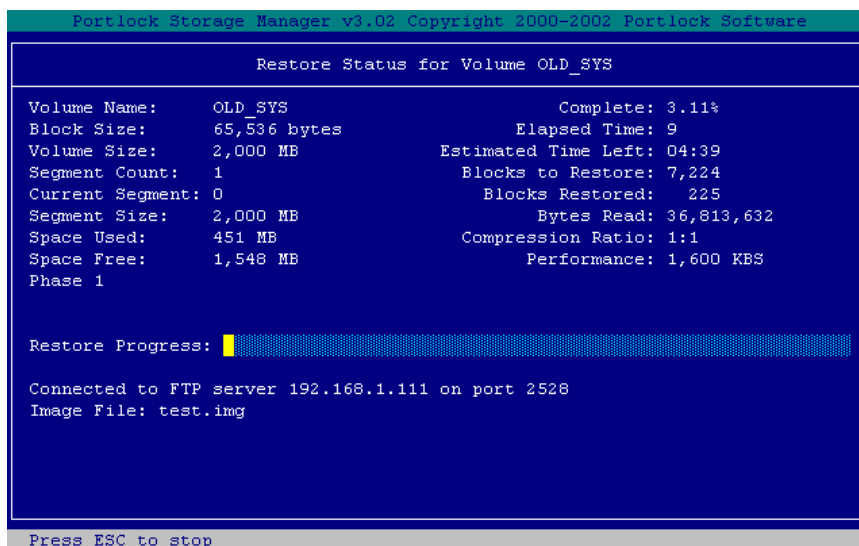
At this screen, select the NetWare partition to restore this volume to and press [Enter].



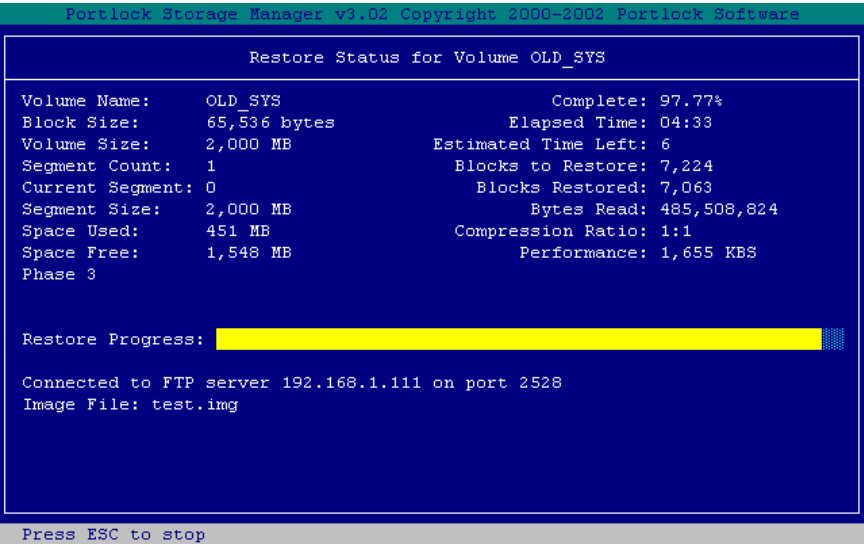
At this screen, enter in the new volume size in MB and press [Enter] to continue.



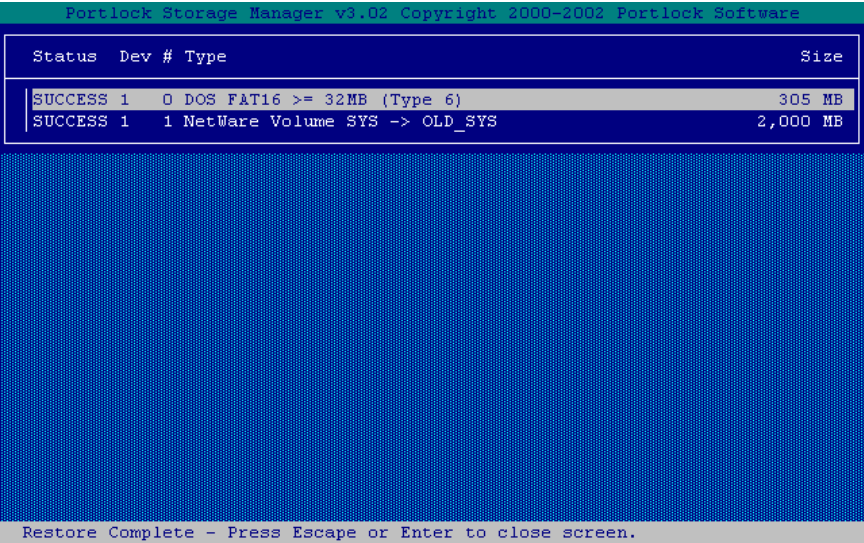
You are now prompted to enter in a new volume name for the volume SYS. Press [Enter] to continue.



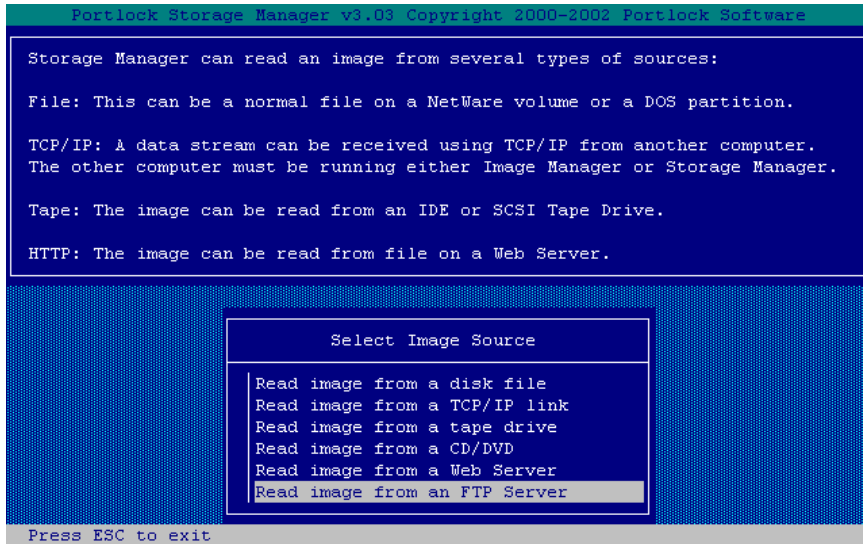
This screen provides the status of the restore.



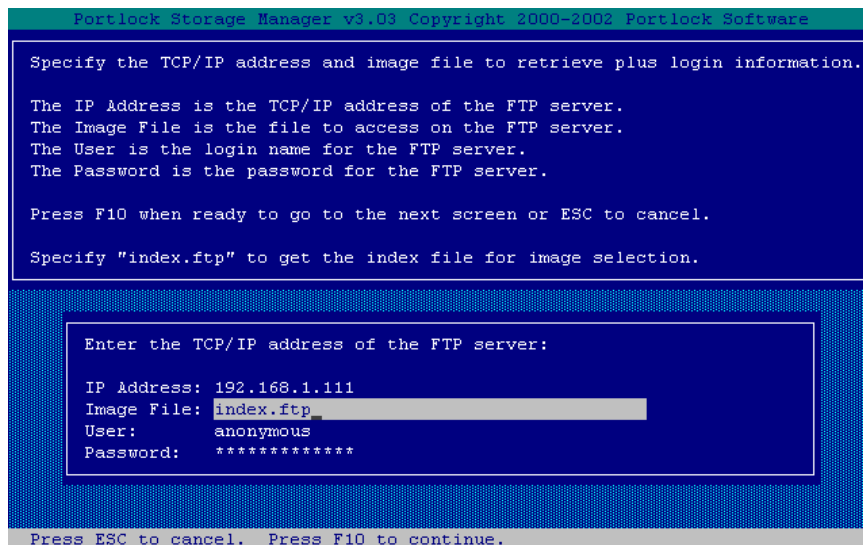
This screen shows the status of the restore almost complete.



This screen shows you that the restore was a success. Press [ESC] or [Enter] to close the screen.



From the Select Image Source menu, select the option Read image from an FTP Server and press [Enter].



At this point, enter the TCP/IP address of the FTP server and press the F10 function key to continue.

```
Portlock Storage Manager v3.03 Copyright 2000-2002 Portlock Software

Select Image File

##
# This index.ftp was created September 24, 2002
#
[dos.img]      This is an image of a DOS partition
[diag.img]     This is an image of a Diagnostic partition
[nw4.img]      This is an image of a NetWare 4 server
[nw5.img]      This is an image of a NetWare 5 server
[nw6.img]      This is an image of a NetWare 6 server

Press ESC to stop
```

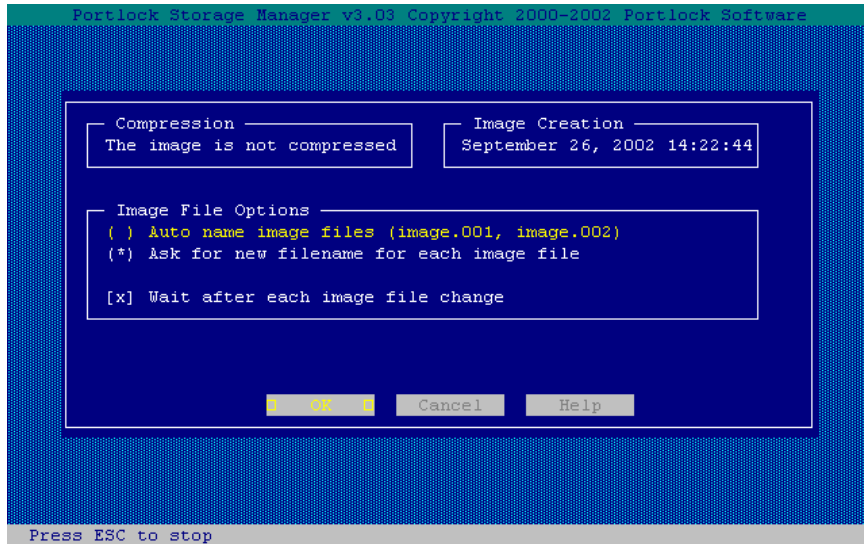
When this screen appears, select the image file and press [Enter].

```
Portlock Storage Manager v3.03 Copyright 2000-2002 Portlock Software

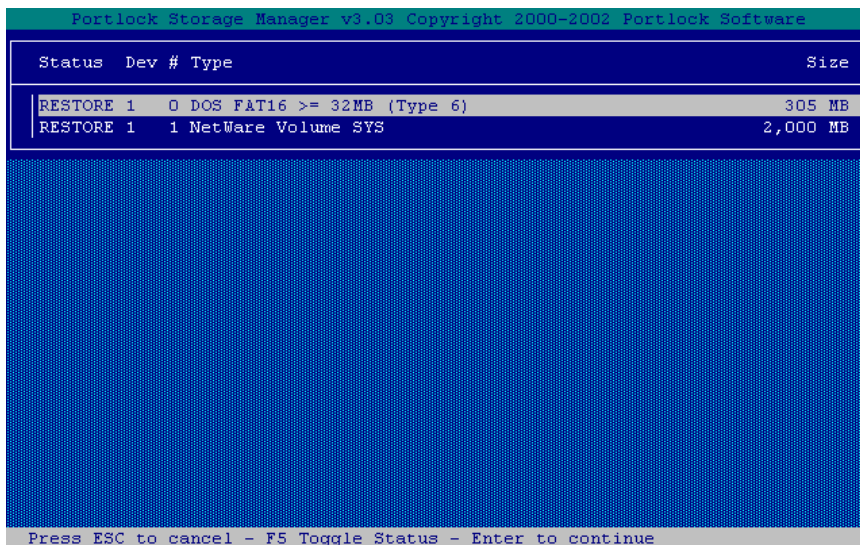
SEND: SIZE nw5.img
RESP: 213 122623704
SEND: PASV
RESP: 227 Entering Passive Mode (192,168,1,111,7,8)
STAT: Connecting to FTP server 192.168.1.111 on port 1800 ...
STAT: Connected to FTP server 192.168.1.111 on port 21
SEND: RETR nw5.img
RESP: 150 Opening BINARY mode data connection for nw5.img (122623704 bytes).
STAT: Connection prepared for file transfer

Press ESC to stop
```





This screen provides information about compression, image creation and gives you image file options. Highlight the OK button and press [Enter] to continue.

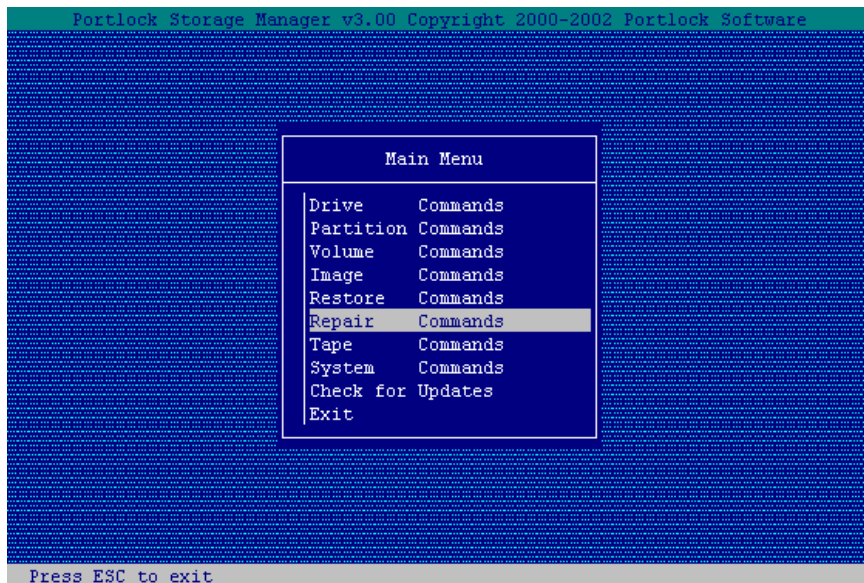


This screen provides us information about the image we want to restore. You can toggle between SKIP and RESTORE by pressing the F5 function key.

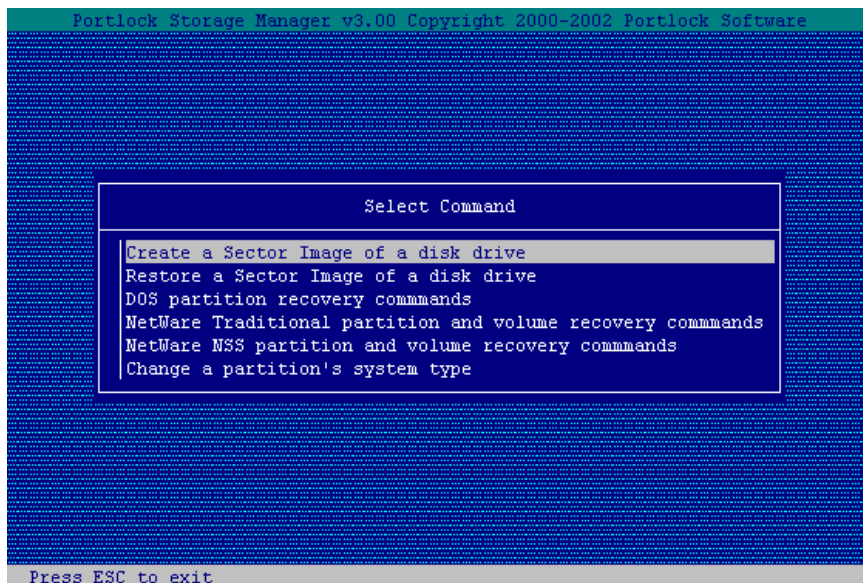


# CHAPTER 9

## Repair Command



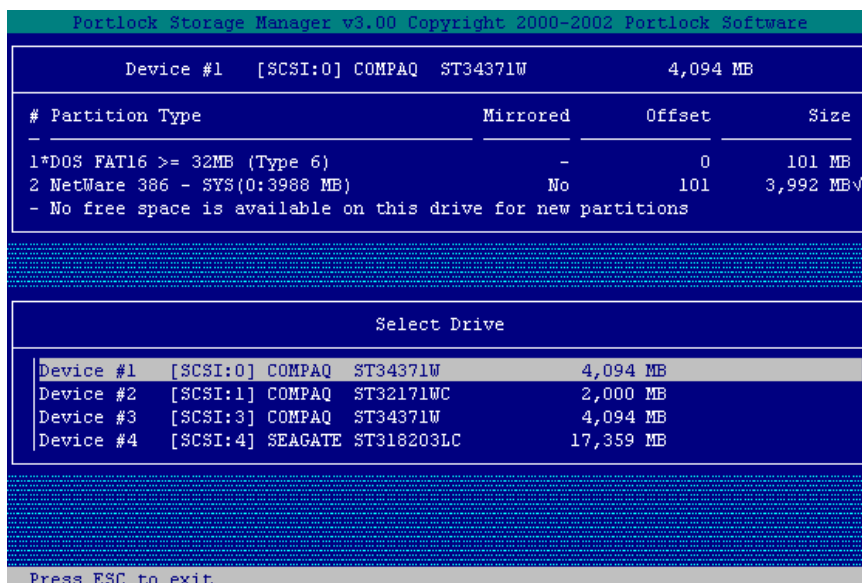
From the Storage Manager Main Menu, select the Repair Command and press [Enter].



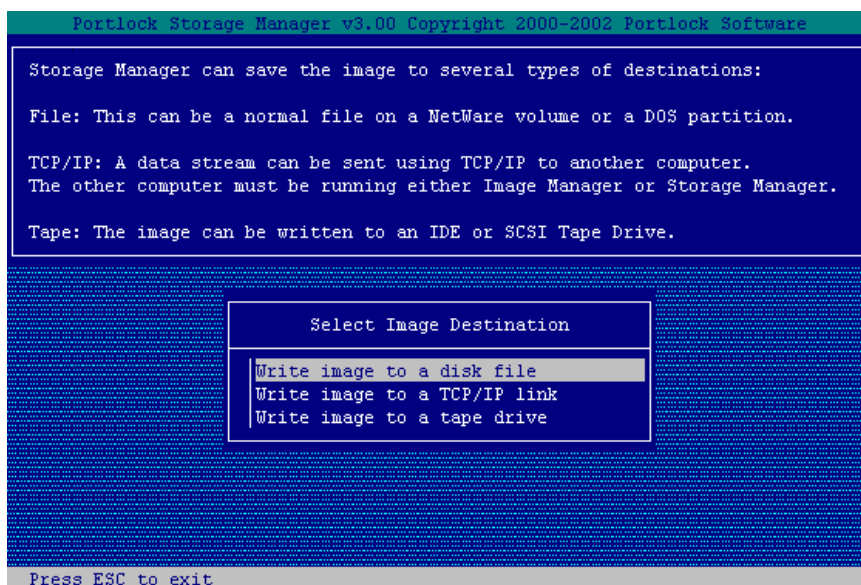
From the Select Command menu, you have six options to choose from:

- 1 Create a Sector Image of a disk drive
- 2 Restore a Sector Image of a disk drive
- 3 DOS partition recovery commands
- 4 NetWare Traditional partition and volume recovery commands
- 5 NetWare NSS partition and volume recovery commands
- 6 Change a partition's system type

For this example, the Create a Sector Image of a disk drive will be selected. Press [Enter] to continue.



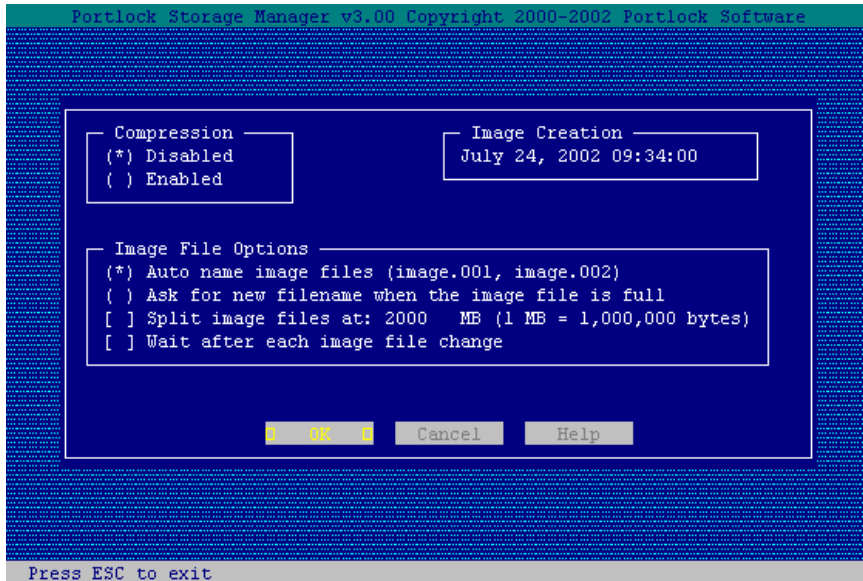
From the Select Drive Menu, select the drive you want to create a sector image of and press [Enter].



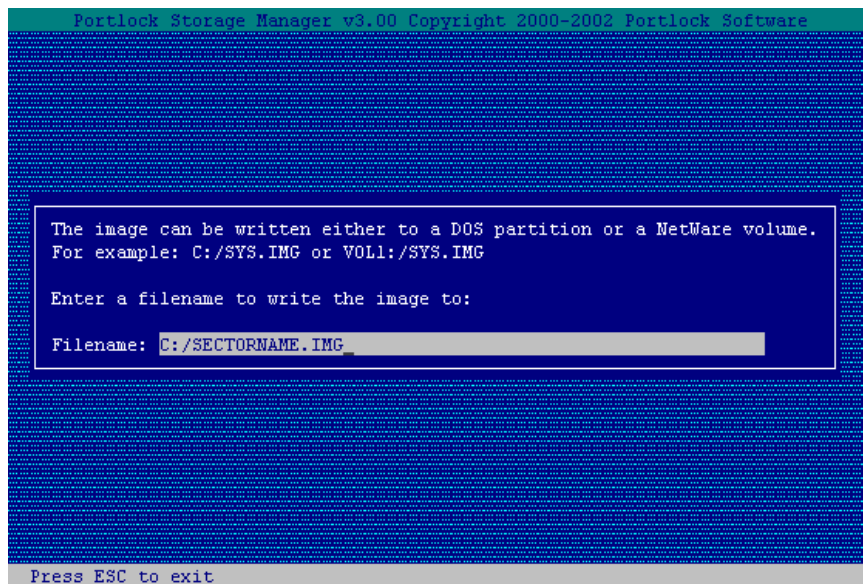
Storage Manager can save the image to several destinations:

- 1 Disk file
- 2 TCP/IP link
- 3 Tape drive

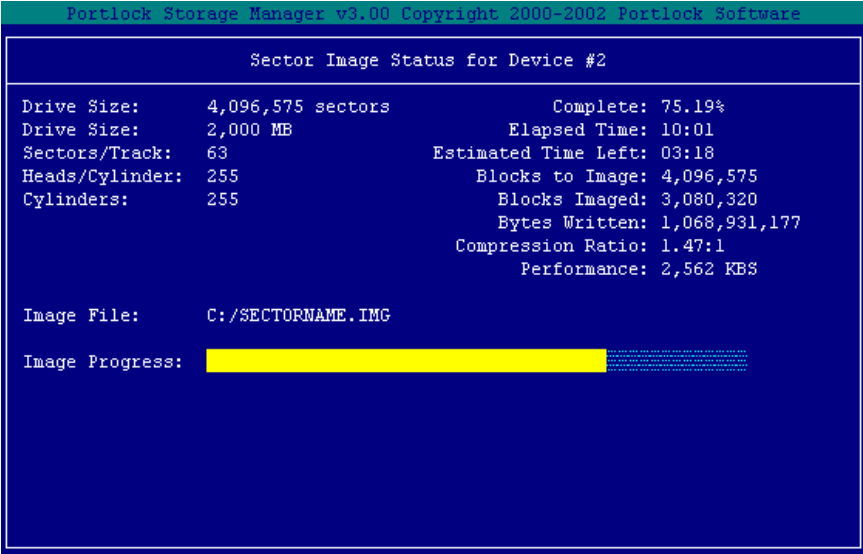
For this example, Write image to a disk file is selected. Press [Enter] to continue.



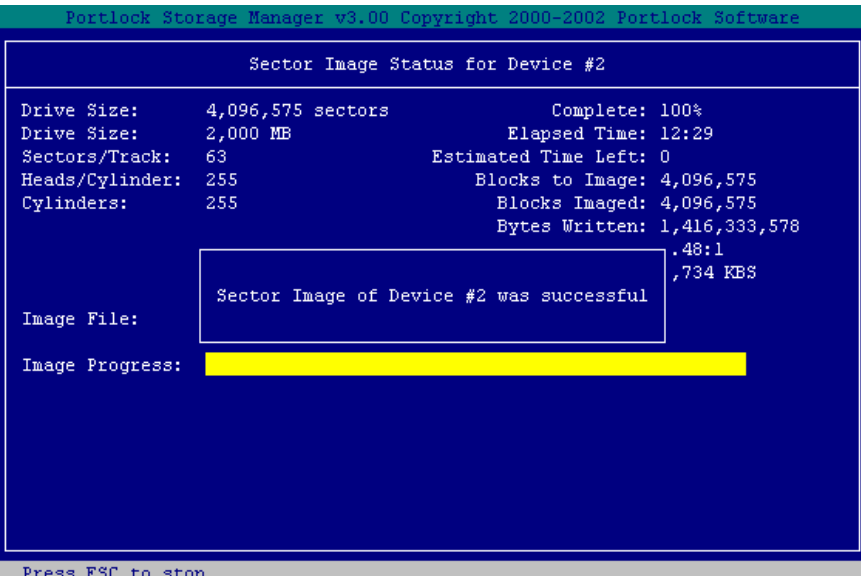
At this screen, you are provided with information about compression, image creation and various image file options. Place an asterick by the options you want to select and highlight the OK button and press [Enter].



The image can be written either to a DOS partition or a NetWare volume. At this screen, enter a filename to write the image to and press [Enter].

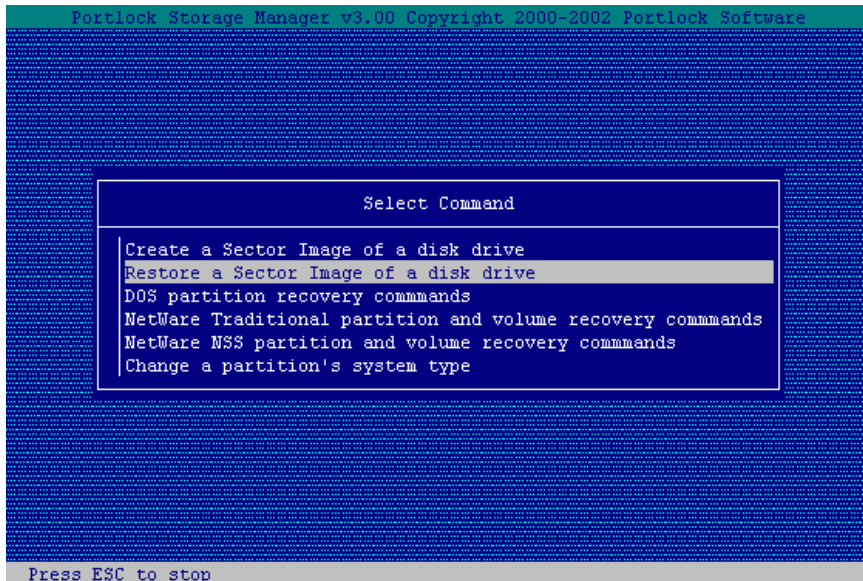


This screen provides you with the status of the device.

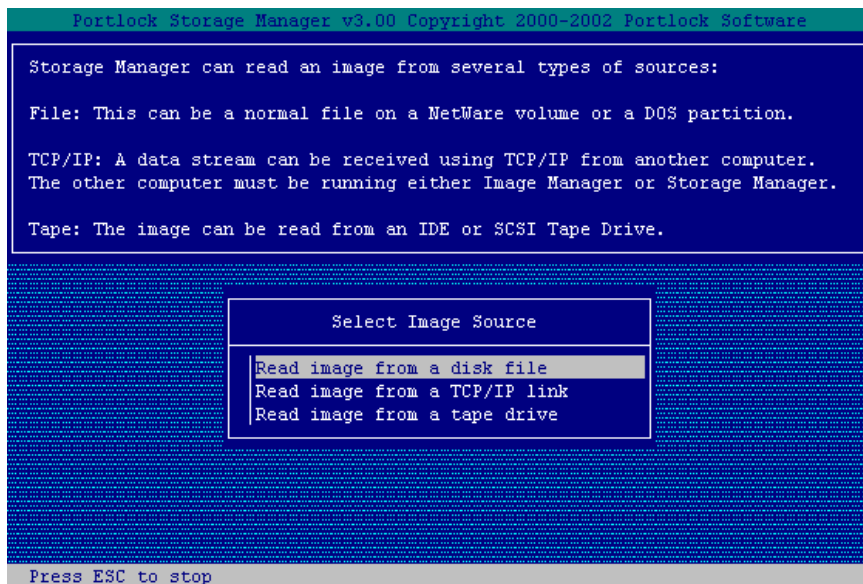


When this screen appears, the imaging process was successful. Press [Enter] to continue.

## Restore a Sector Image of a disk drive

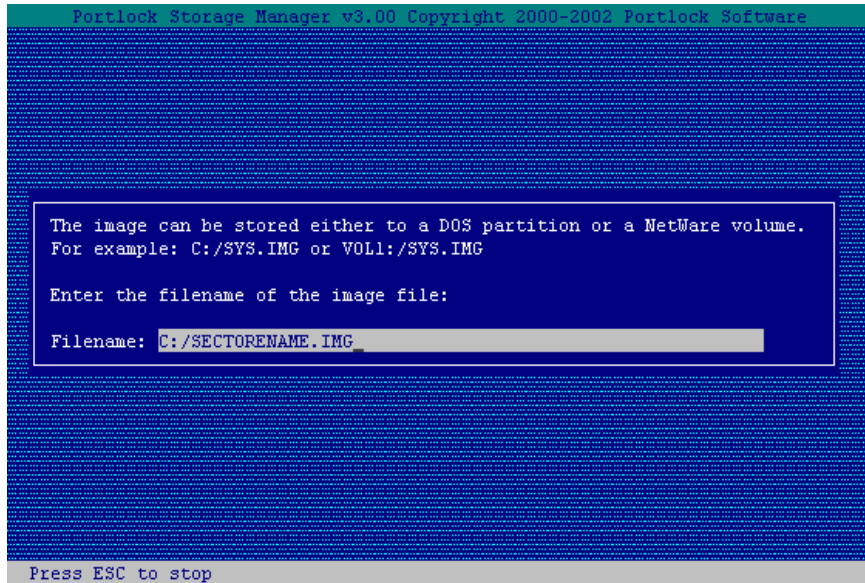


From the Select Command menu, select the option Restore a Sector Image of a disk drive and press [Enter].

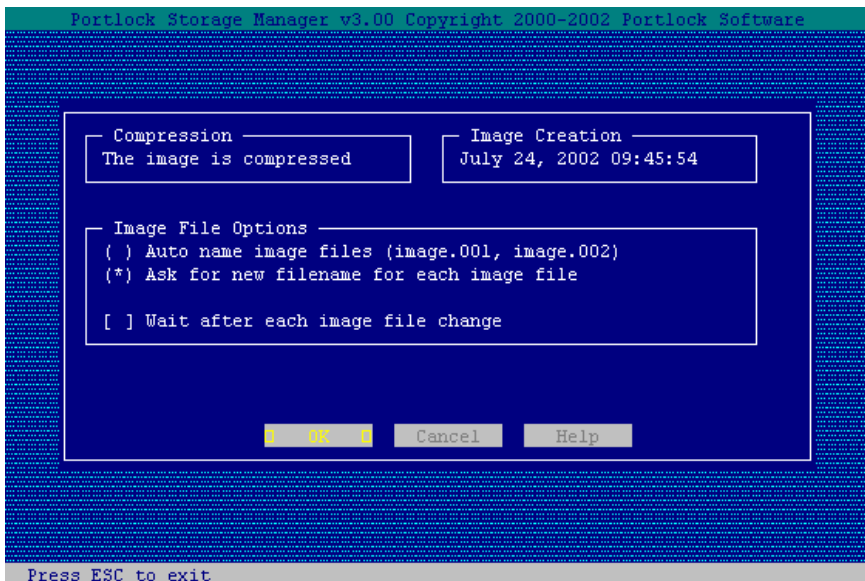


Storage Manager can read an image from several types of sources: disk file, TCP/IP link, or tape drive. For this example, the Read image from a disk file is selected. Press [Enter] to continue.

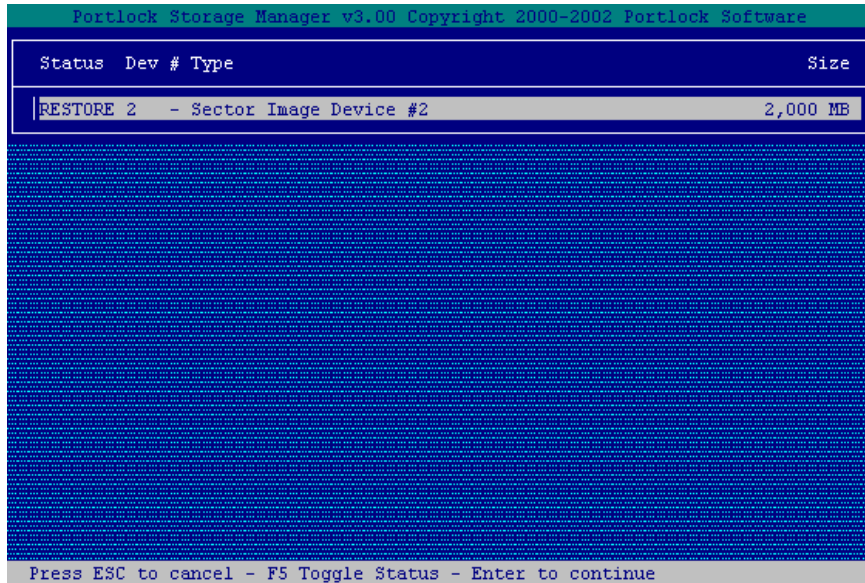




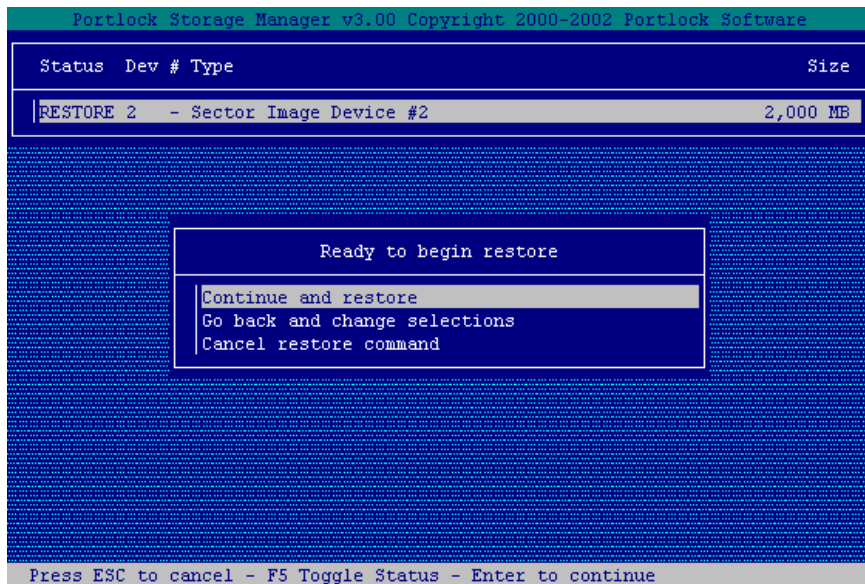
The image can be stored either to a DOS partition or a NetWare volume. Enter the filename of the image file and press [Enter] to continue.



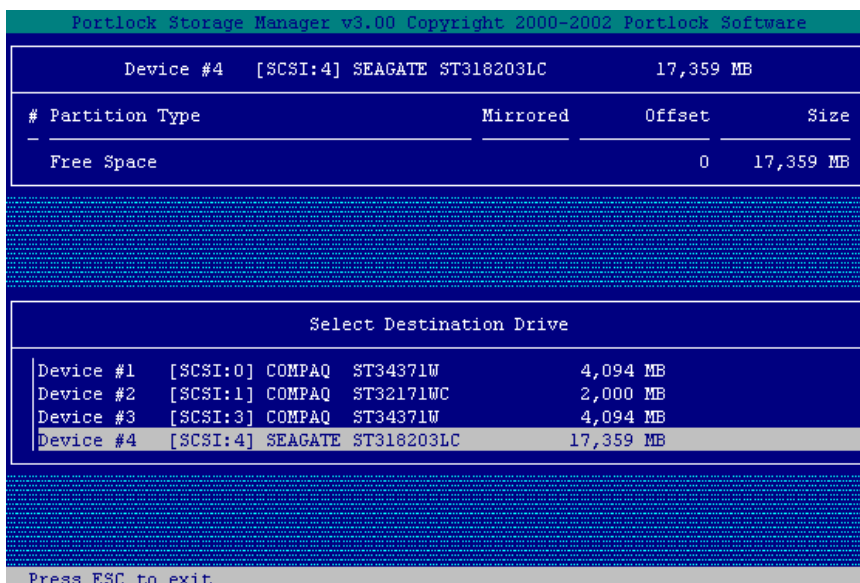
At this screen, you are provided with information about compression, creation date and image file options. Place an asterick by the options you want selected. To continue, highlight the OK button and press [Enter].



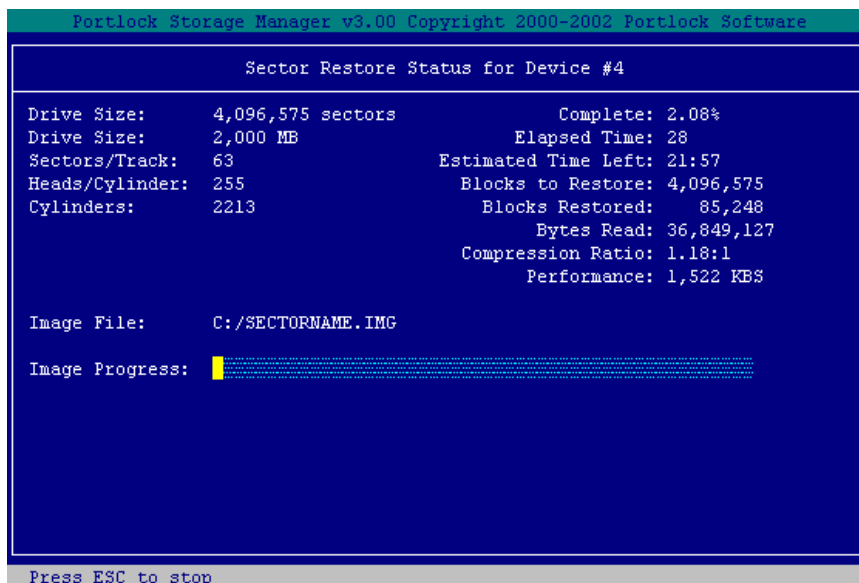
This screen provides you with the status, device number and size of the sector image. Press [Enter] to continue.



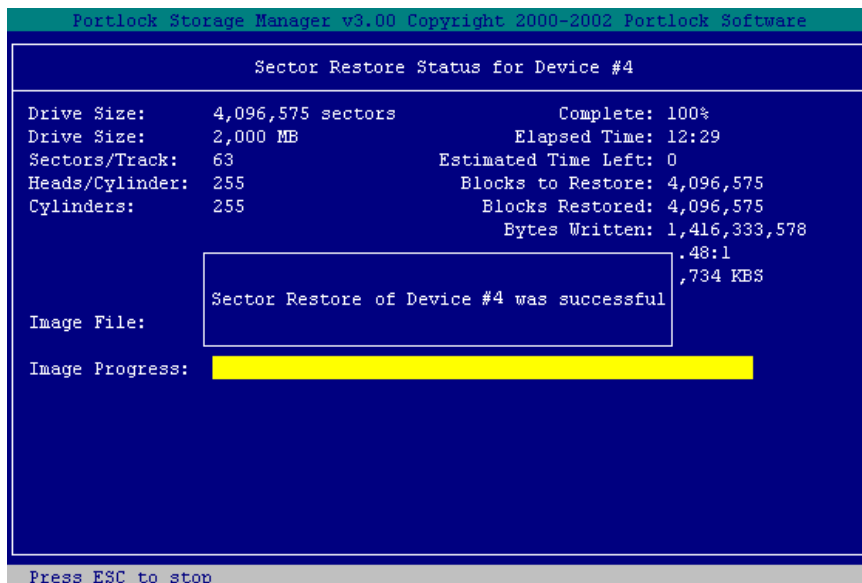
At the Ready to begin restore screen, you have the option to Continue and restore, Go back and change selections or Cancel restore command. For this example, we will select Continue and restore and press [Enter].



At this screen, select the destination drive and press [Enter].

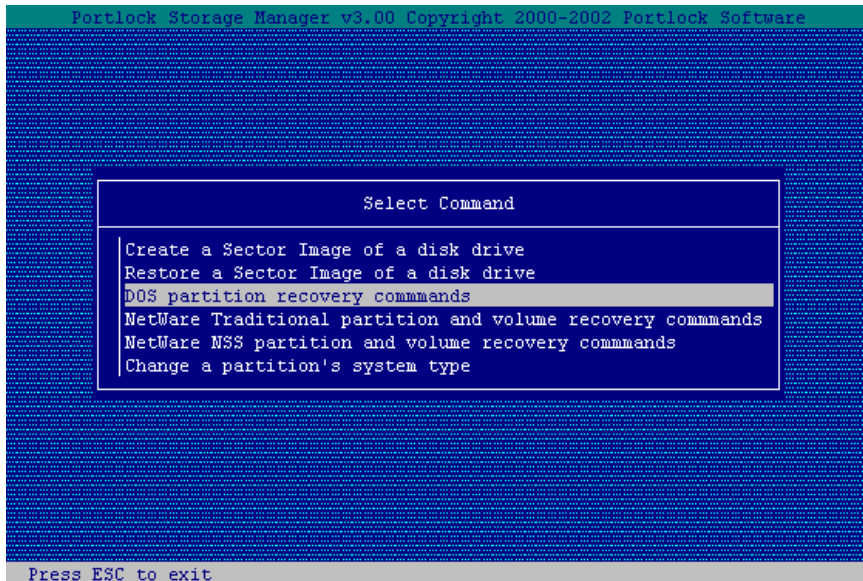


This screen shows the beginning of the imaging process.

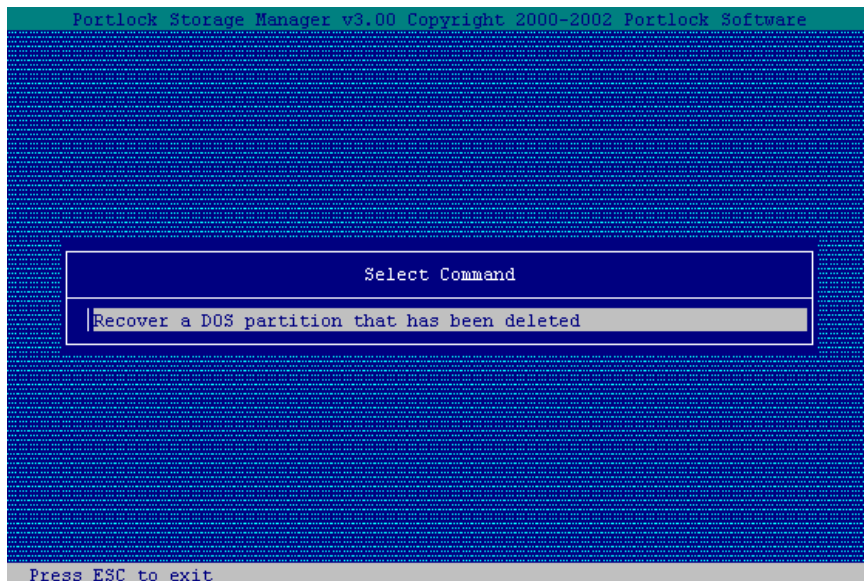


This screen shows that the Sector Restore of the device was completed successfully.

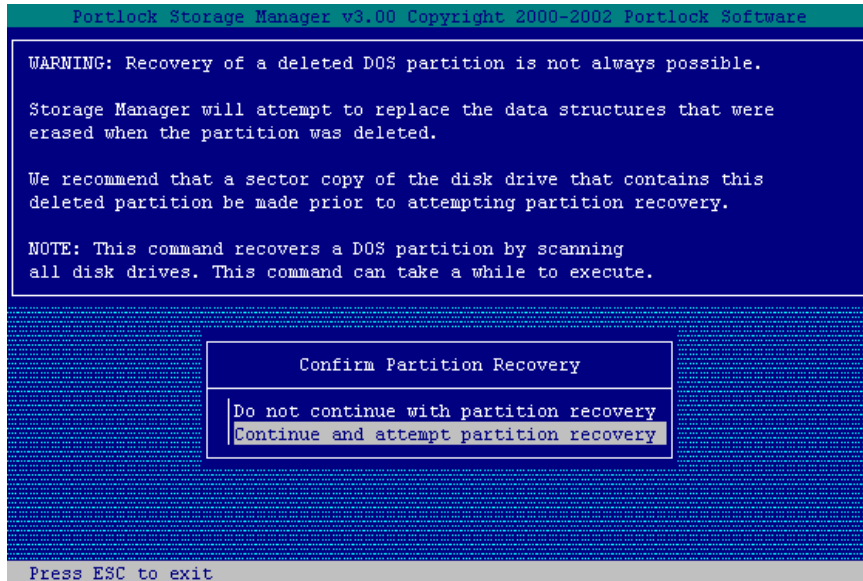
## DOS partition recovery commands



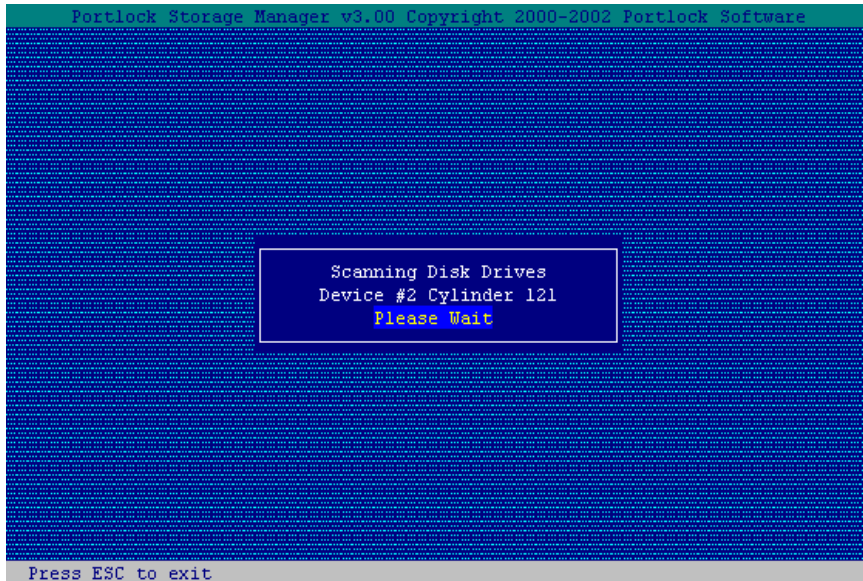
From the Select Command menu, select the option DOS partition recovery commands and press [Enter].



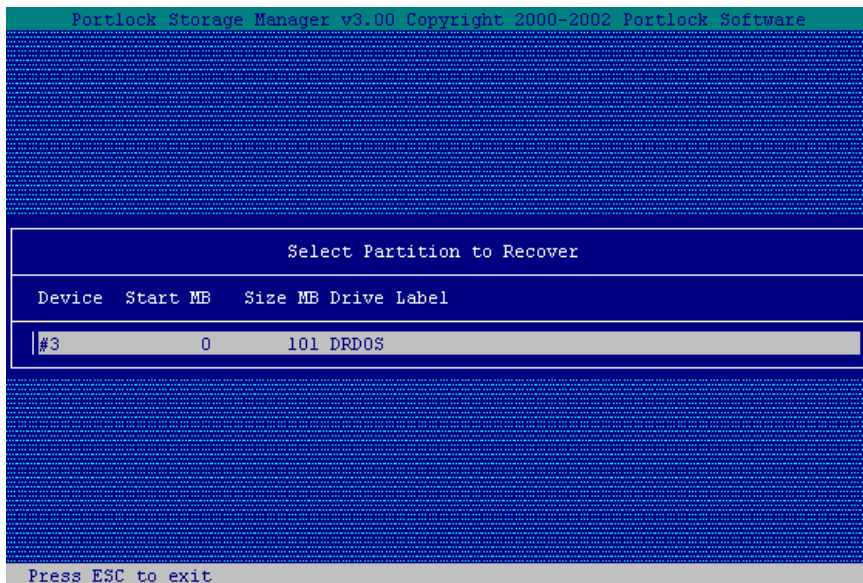
From the Select Command menu, select Recover a DOS partition that has been deleted and press [Enter].



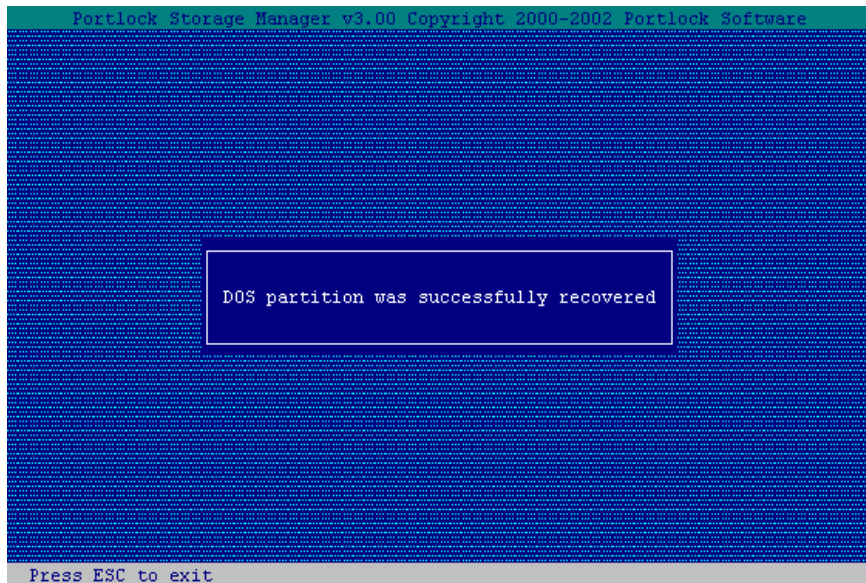
At this screen, you will be informed that recovery of a deleted DOS partition is not always possible. Storage Manager will attempt to replace the data structures that were erased when the partition was deleted. We recommend that a sector copy of the disk drive that contains this deleted partition be made prior to attempting partition recovery. This command recovers a DOS partition by scanning all disk drives. This command can take a while to execute. From the Confirm Partition Recovery menu, you have the options to cancel the partition recovery or to continue and attempt partition recovery. For this example, **Continue and attempt partition recovery** is selected. Press [Enter] to continue.



At this screen, the system is scanning the disk drives. Please Wait.



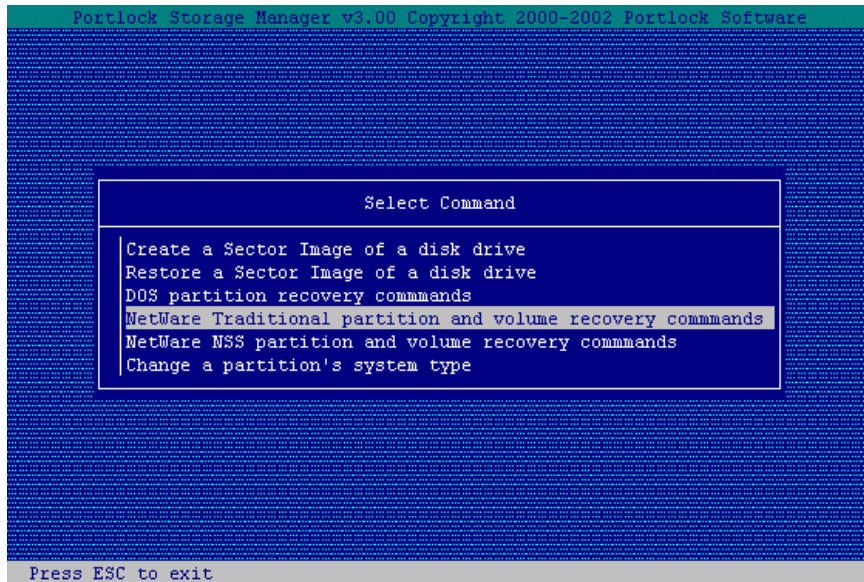
From the Select Partition to Recover menu, select the partition for which you want to recover and press [Enter].



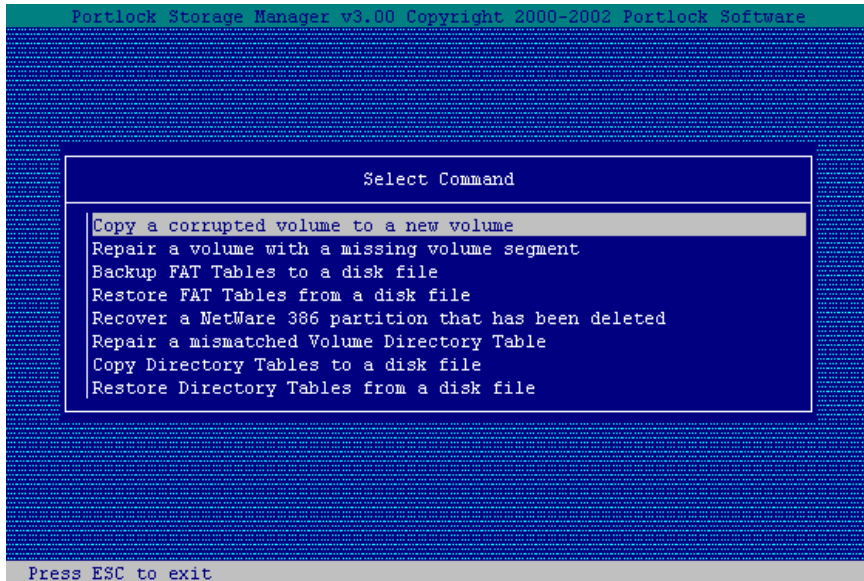
When this screen appears, the DOS partition was successfully recovered.



# NetWare Traditional partition and volume recovery commands



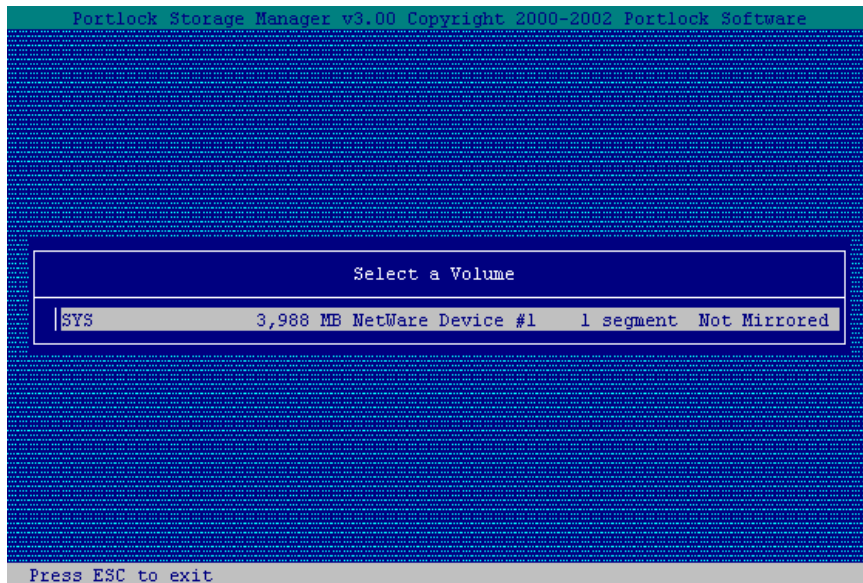
From the Select Command Menu, select the option NetWare Traditional Partition and volume recovery commands and press [Enter] to continue.



From the Select Command menu, you have the options to

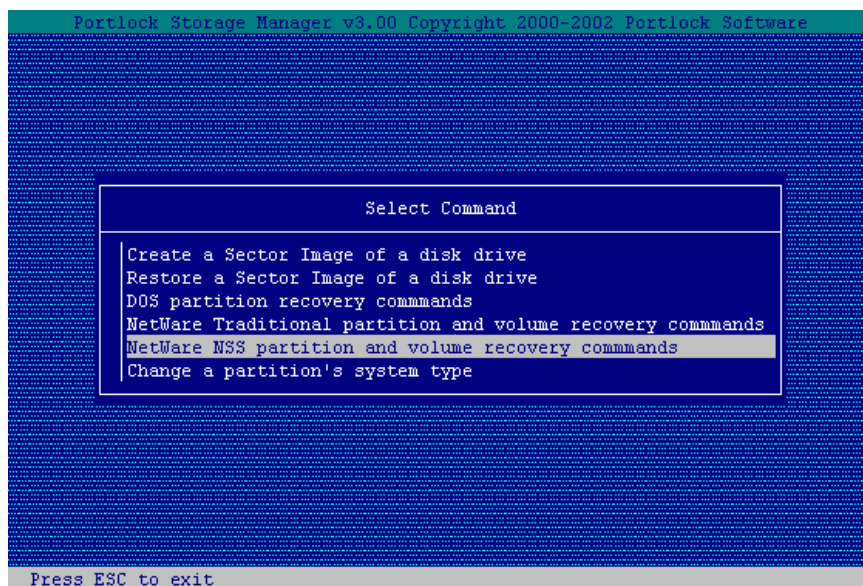
- 1 Copy a corrupted volume to a new volume
- 2 Repair a volume with a missing volume segment
- 3 Backup FAT Tables to a disk file
- 4 Recover a NetWare 386 partition that has been deleted
- 5 Repair a mismatched Volume Directory Table
- 6 Copy Directory Tables to a disk file
- 7 Restore Directory Tables from a disk file

For this example, the Copy a corrupted volume to a new volume is selected. Press [Enter] to continue.

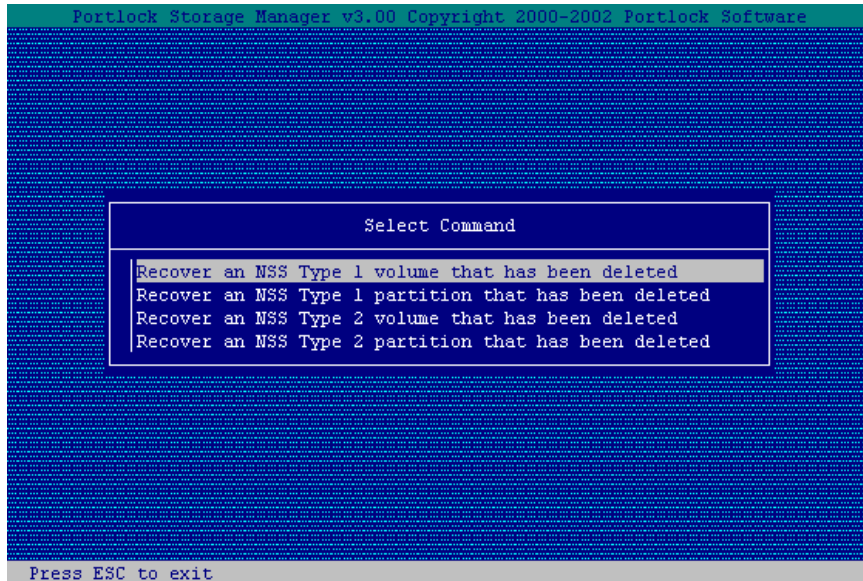


From the Select a Volume menu, select the volume you want to recover and press [Enter].

## NetWare NSS partition and volume recovery commands



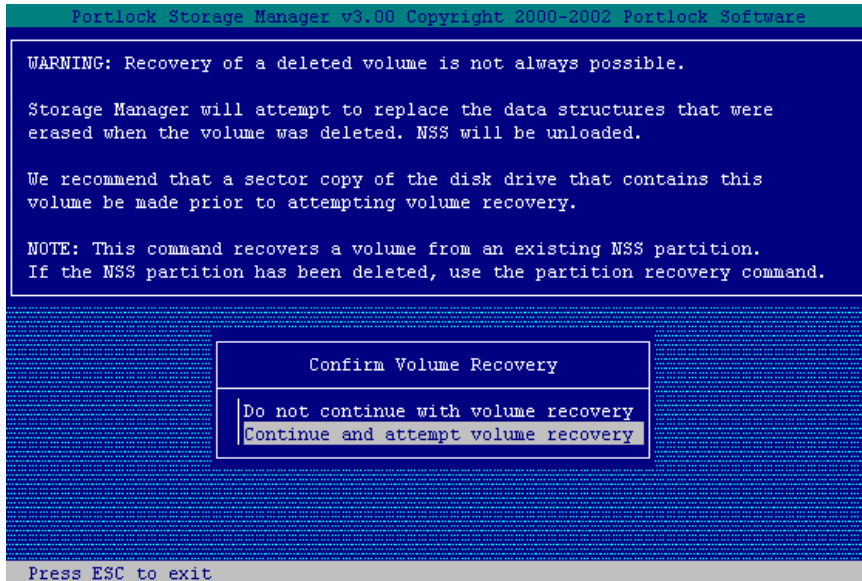
From the Select Command menu, select the option NetWare NSS partition and volume recovery commands and press [Enter] to continue.



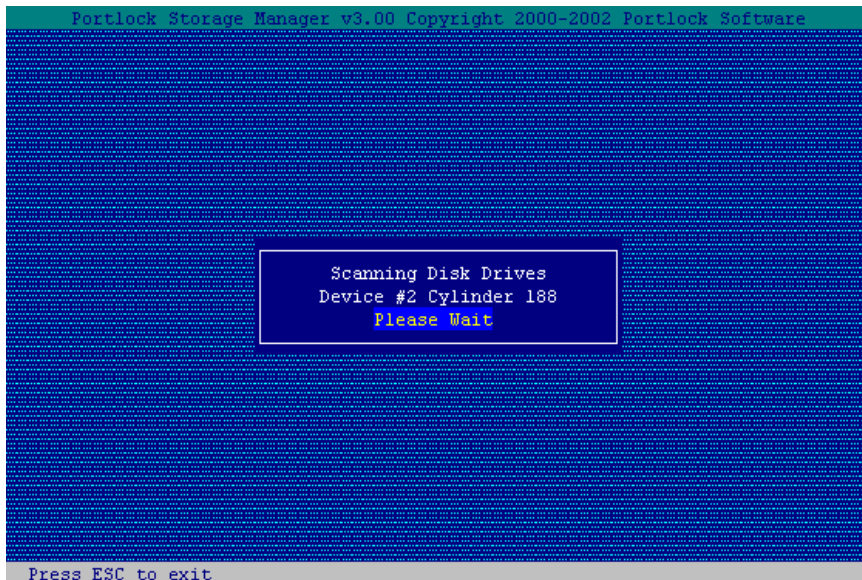
From the Select Command menu, you have the option to

- Recover an NSS Type 1 volume that has been deleted
- Recover an NSS Type 1 partition that has been deleted
- Recover an NSS Type 2 volume that has been deleted
- Recover an NSS Type 2 partition that has been deleted

For this example, the Recover an NSS Type 1 volume that has been deleted is selected. Press [Enter] to continue.

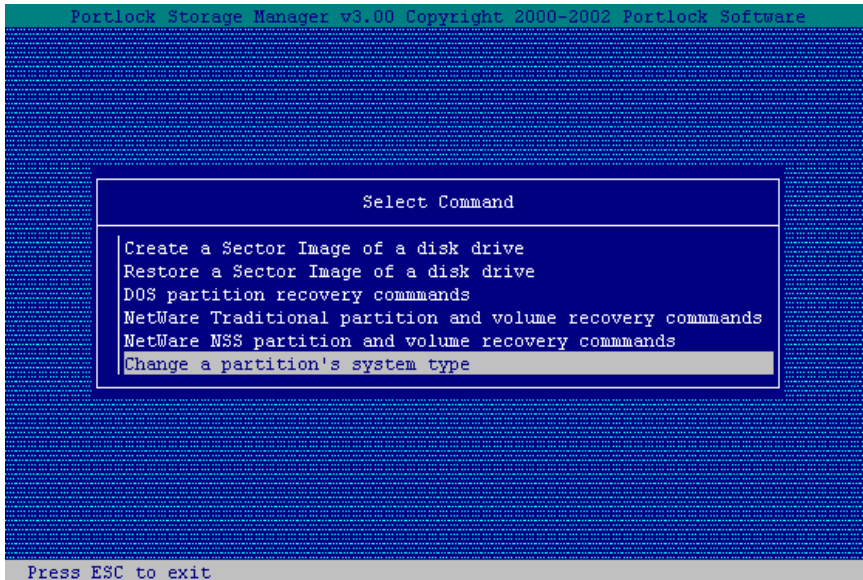


At the Confirm Volume Recovery screen, you are warned that recovery of a deleted volume is not always possible. Storage Manager will attempt to replace the data structures that were erased when the volume was deleted. NSS will be unloaded. We recommend that a sector copy of the disk drive that contains this volume be made prior to attempting volume recovery. This command recovers a volume from an existing NSS partition. If the NSS partition has been deleted, use the partition recovery command. For this example, Continue and attempt volume recovery is selected. Press [Enter] to continue.

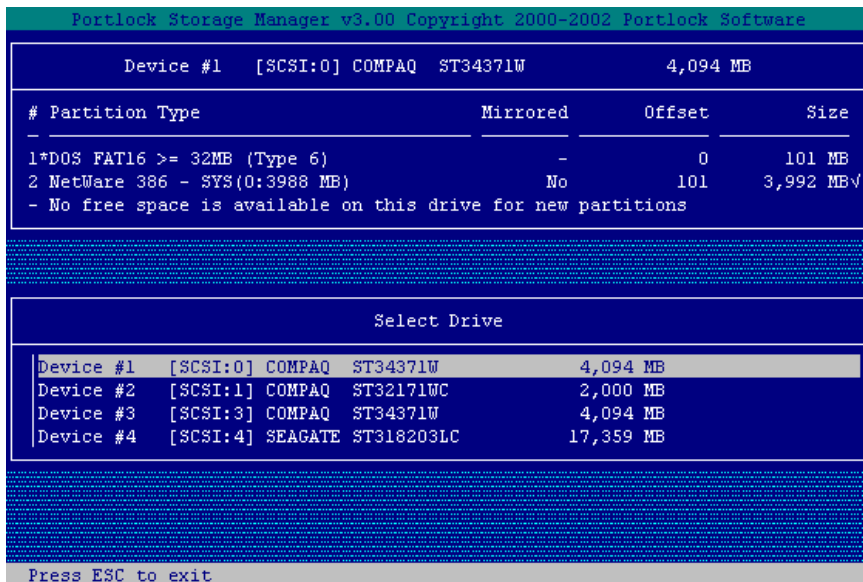


At this screen, the system is scanning the disk drives. Please Wait.

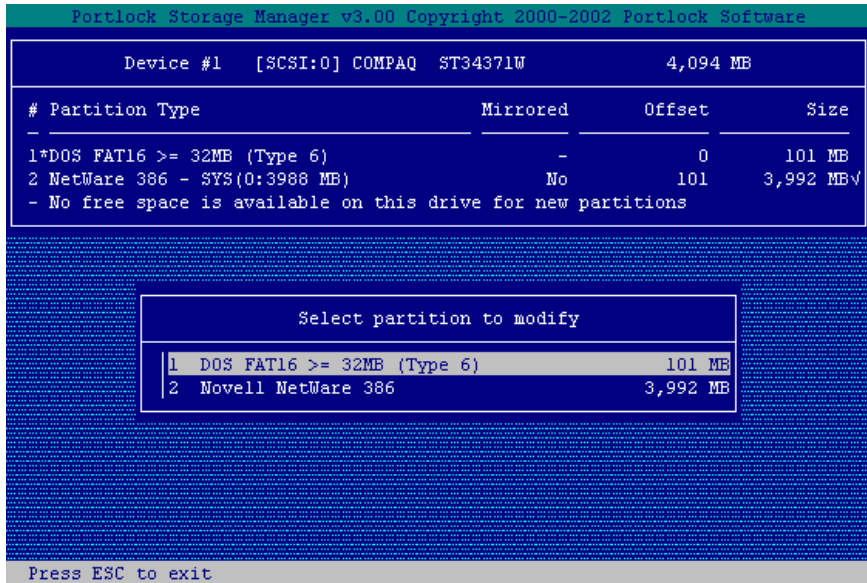
## Change a partition's system type



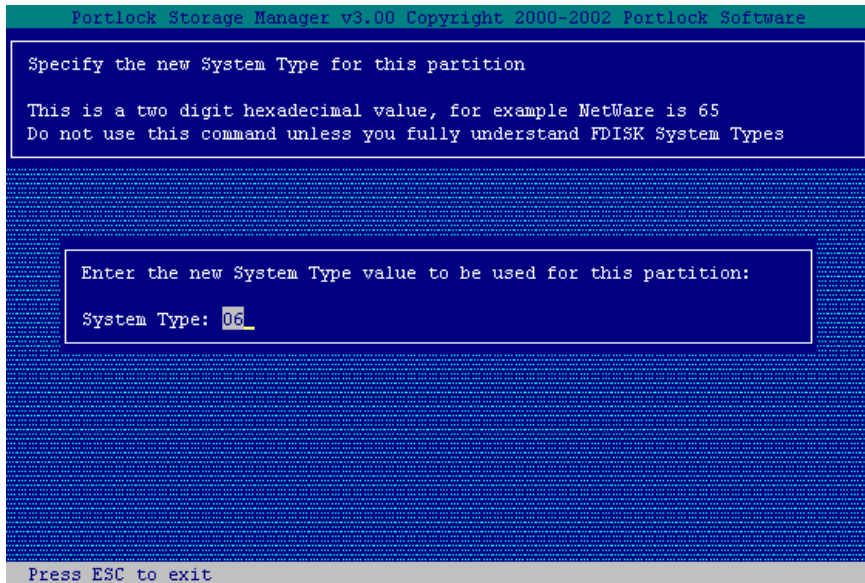
From the Select Command menu, choose the option Change a partition's system type and press [Enter] to continue.



From the Select Drive menu, select the device you want to change. Press [Enter] to continue.

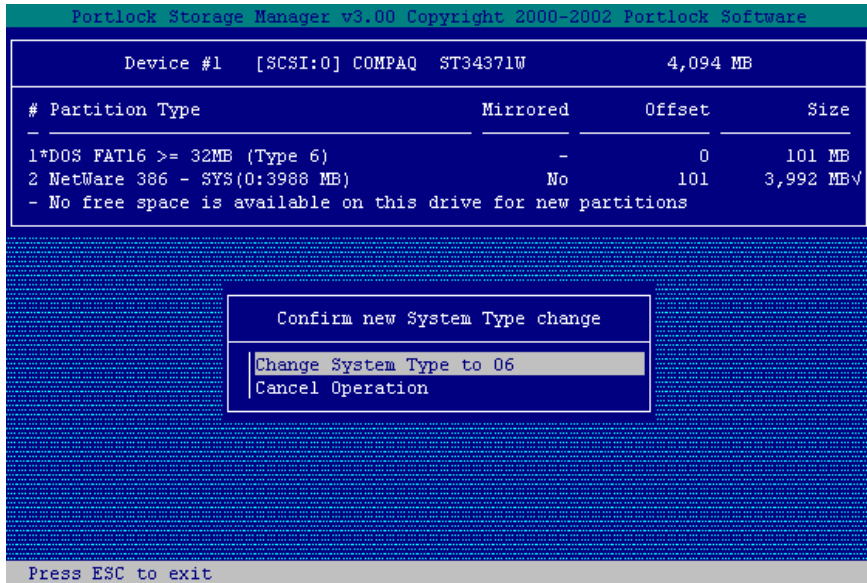


From the Select partition to modify menu, select the partition you want to modify. Press [Enter] to continue.

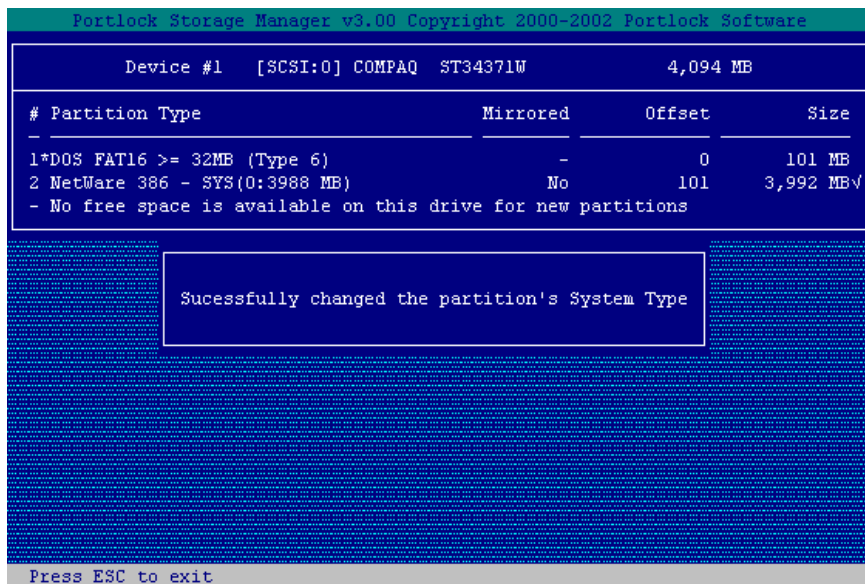


At this screen, specify the new system type for this partition. This is a two digit hexadecimal value, for example NetWare is 65. Do not use this command unless you fully understand FDISK System Types. Press [Enter] to continue.





At the Confirm new System Type change menu, you have the option to Change System Type to 06 or Cancel Operation. For this example, Change System Type to 06 is selected. Press [Enter] to continue.

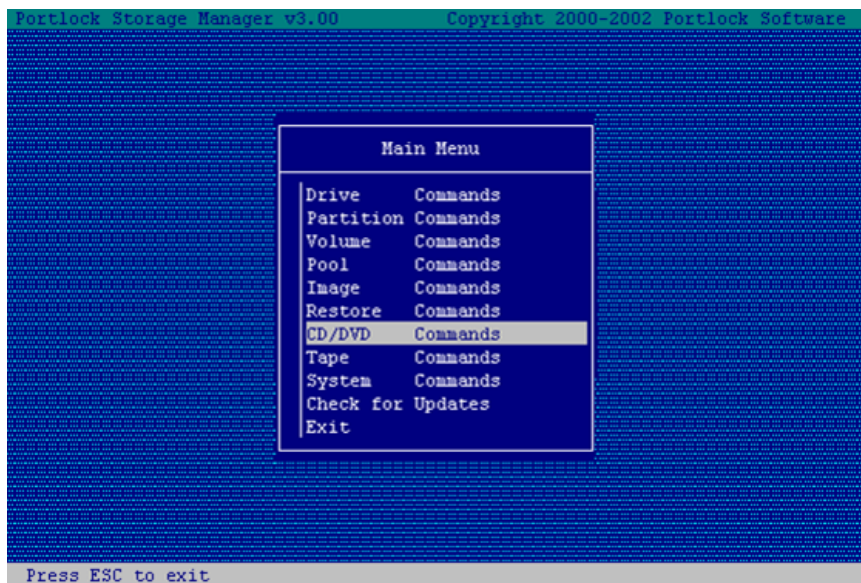


When this screen appears, the system successfully changed the partition's System Type.

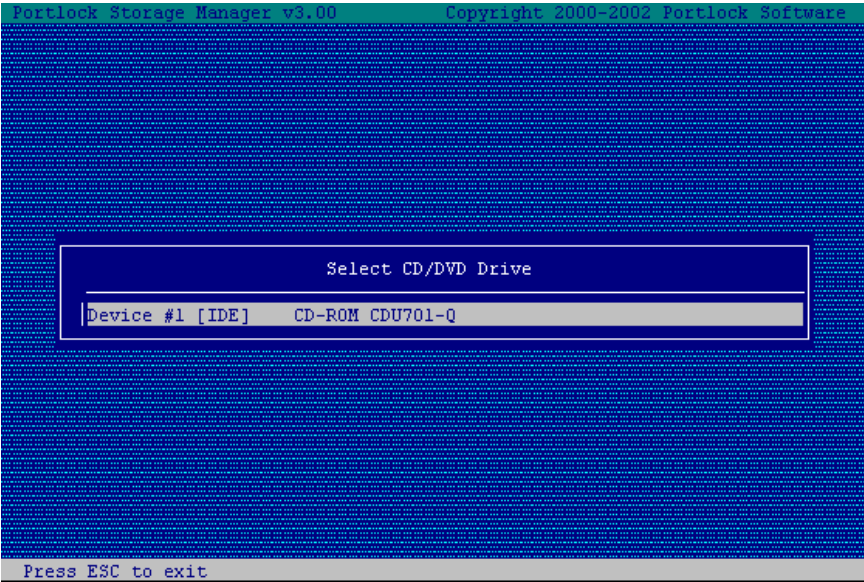


# CHAPTER 10

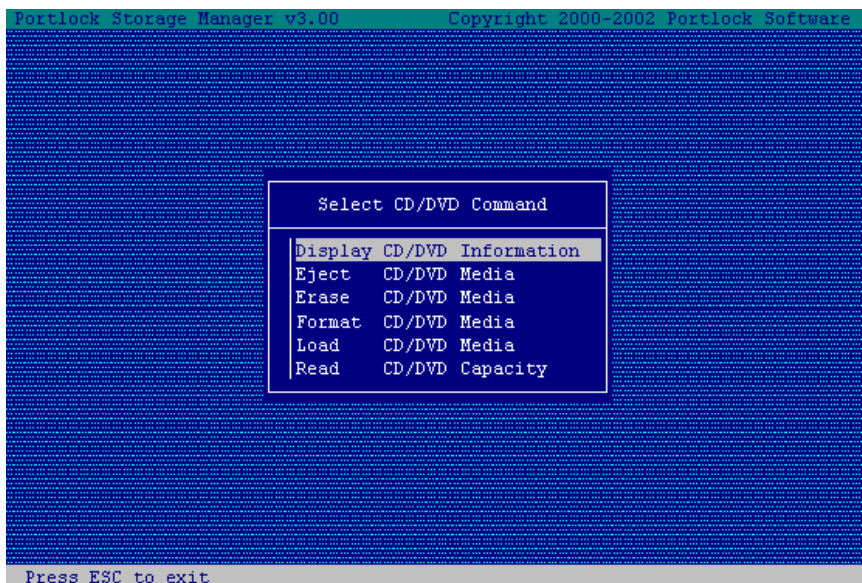
## CD/DVD Command



From the **Main Menu**, choose the option **CD/DVD Commands** and press [Enter].



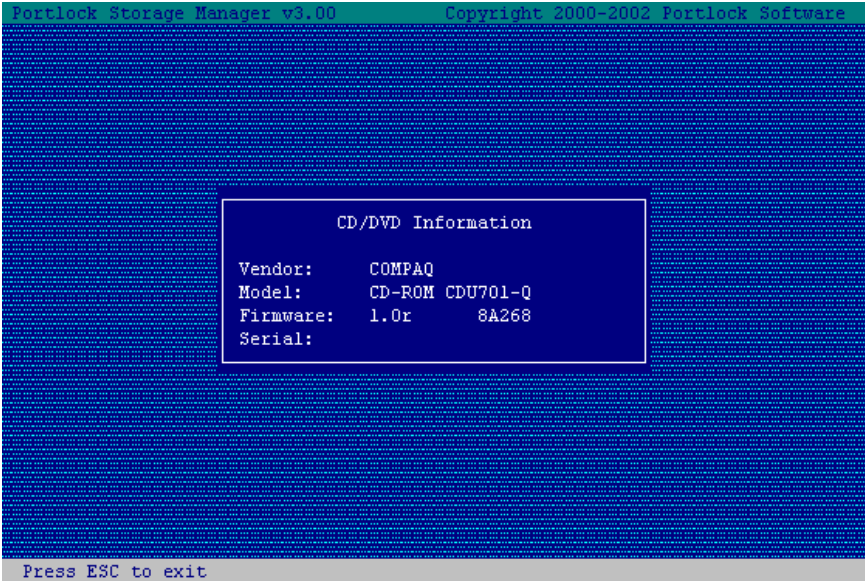
At this screen, select the **CD/DVD Drive** and press [Enter].



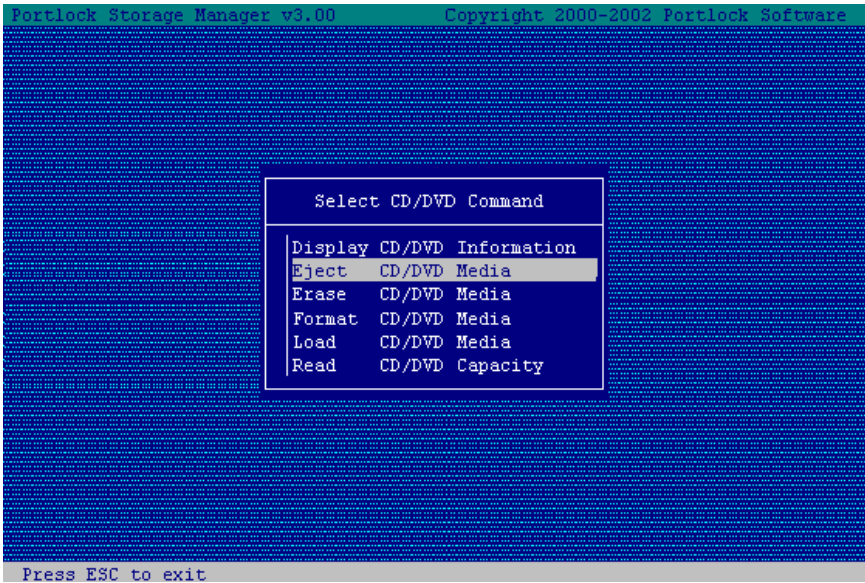
From the **Select CD/DVD Command** menu, you have the following options to choose from:

1. Display CD/DVD Information
2. Eject CD/DVD Media
3. Erase CD/DVD Media
4. Format CD/DVD Media
5. Load CD/DVD Media
6. Read CD/DVD Capacity

For this example, the **Display CD/DVD Information** option is selected. Press [Enter] to continue.



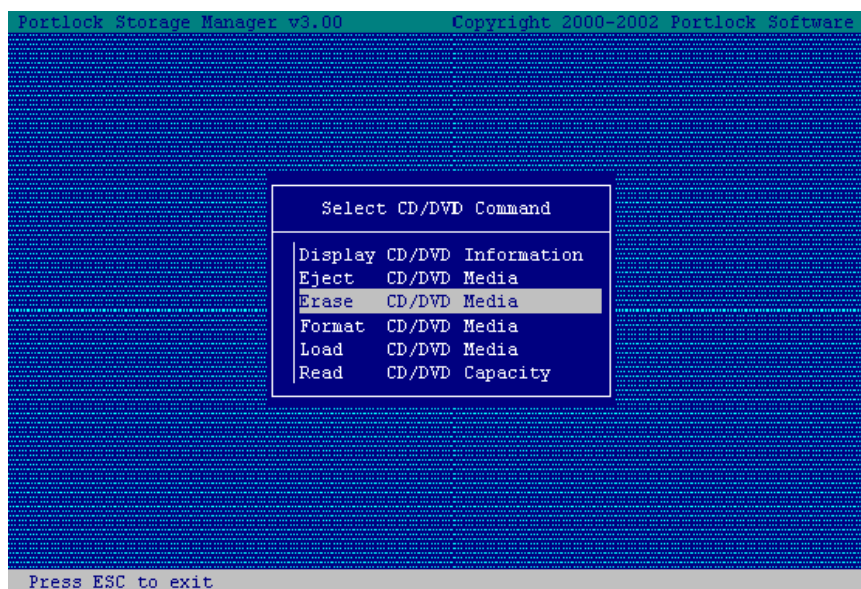
The **CD/DVD Information** menu will provide you information about the Vendor, Model, Firmware and Serial number of the CD/DVD.



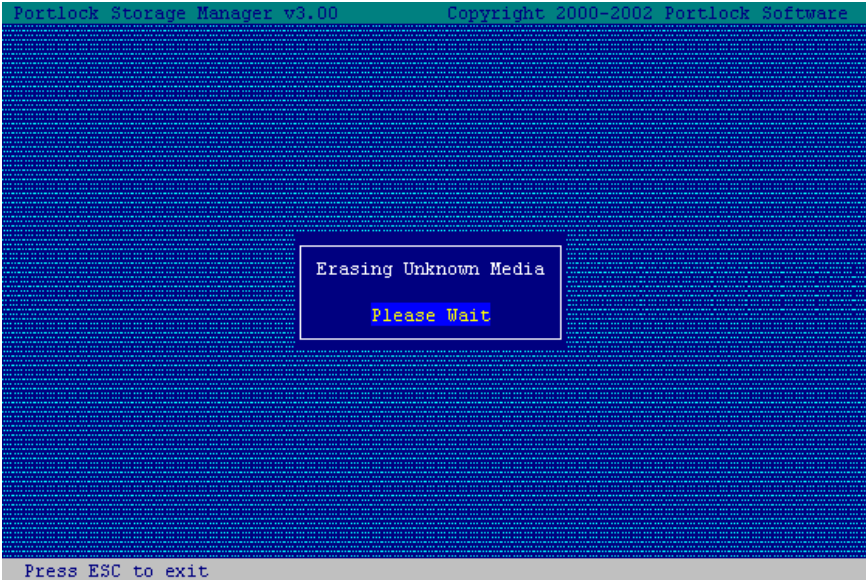
From the **Select CD/DVD Command** menu, select the option **Eject CD/DVD Media** and press [Enter].



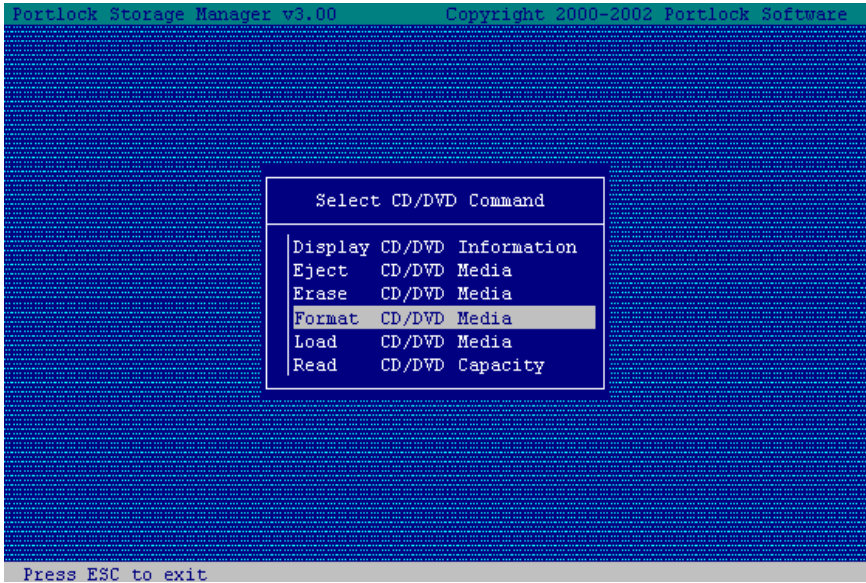
When this screen appears, your CD/DVD was successfully ejected.



From the **Select CD/DVD Command** menu, select the option **Erase CD/DVD Media** and press [Enter].



When this screen appears, the system is erasing unknown media.

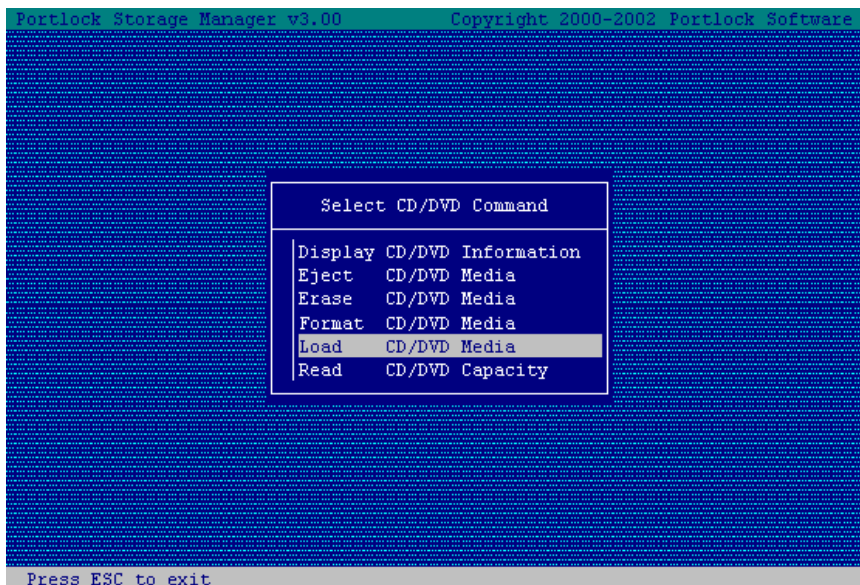


From the **Format CD/DVD Media** menu, choose the option **Format CD/DVD Media** and press [Enter].





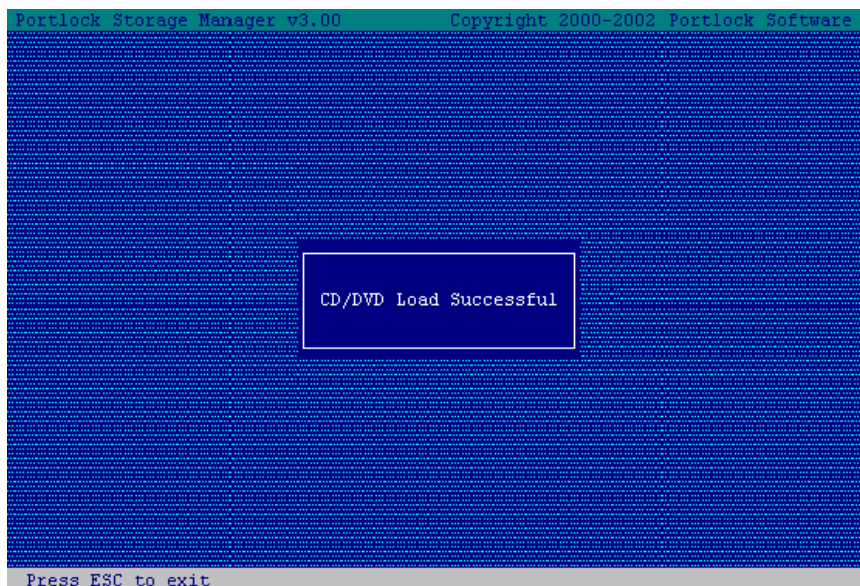
From the **Select Format Mode** menu, select the option **Foreground Format** and press [Enter].



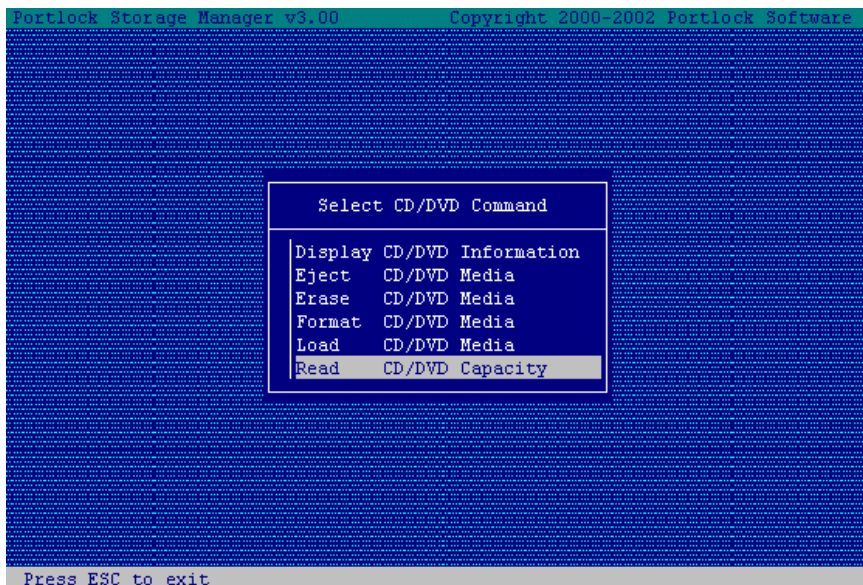
From the **Select CD/DVD Command** menu, choose the option **Load CD/DVD Media** and press [Enter].



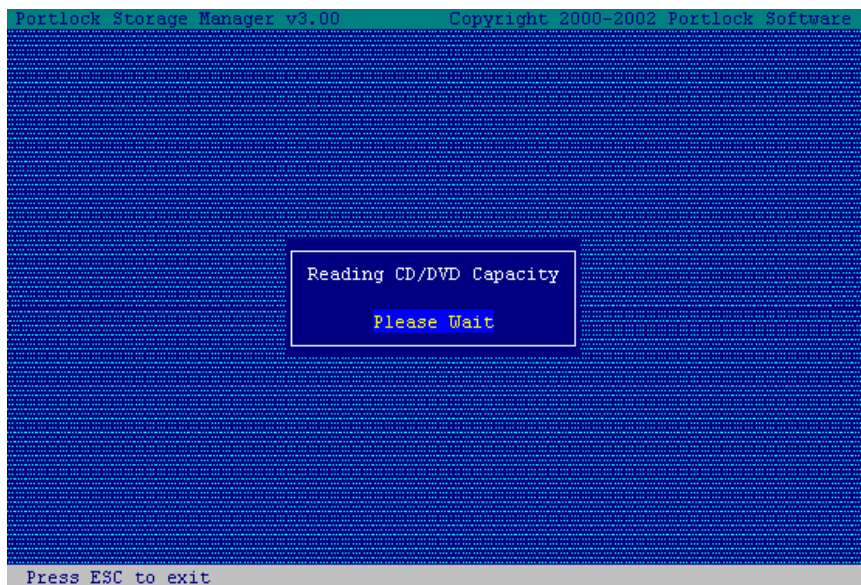
This screen will appear informing you that the system is loading the CD/DVD Media. Press [ESC] to exit.



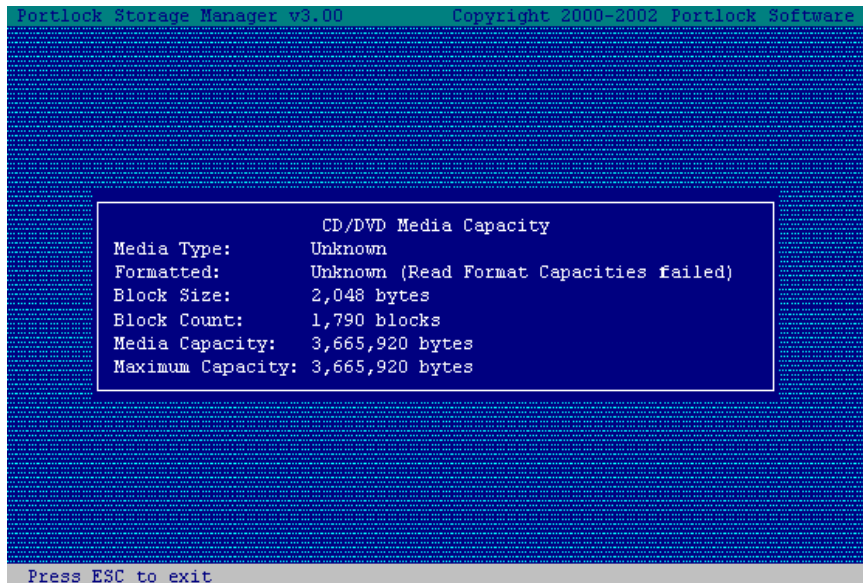
When this screen appears, your CD/DVD was loaded successfully.



From the **Select CD/DVD Command** menu, select the option **Read CD/DVD Capacity** and press [Enter].



When this screen appears, the system is reading the CD/DVD Capacity. Press [ESC] to exit.



From the **CD/DVD Media Capacity** menu, the following information is displayed:

1. Media Type
2. Formatting
3. Block Size
4. Block Count
5. Media Capacity
6. Maximum Capacity

Press [ESC] to exit.

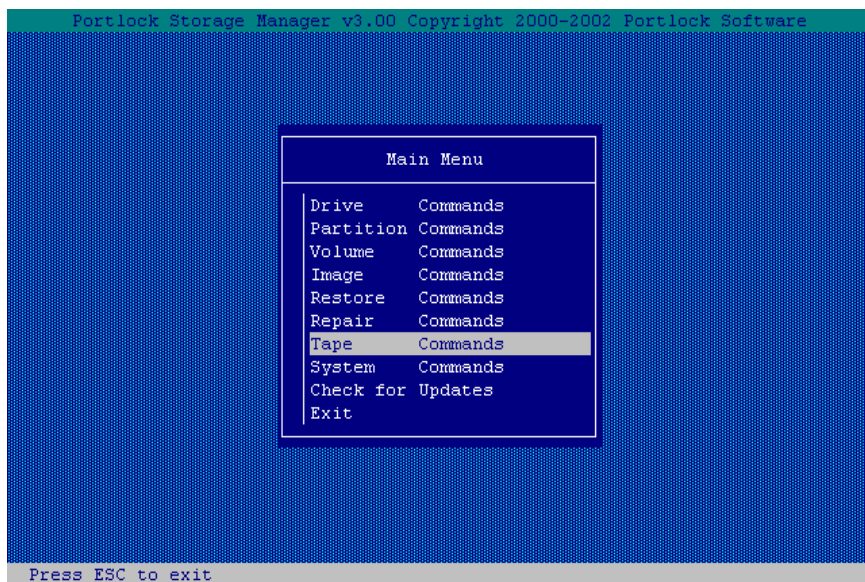


When this screen appears, the system is reading the CD/DVD Configuration.

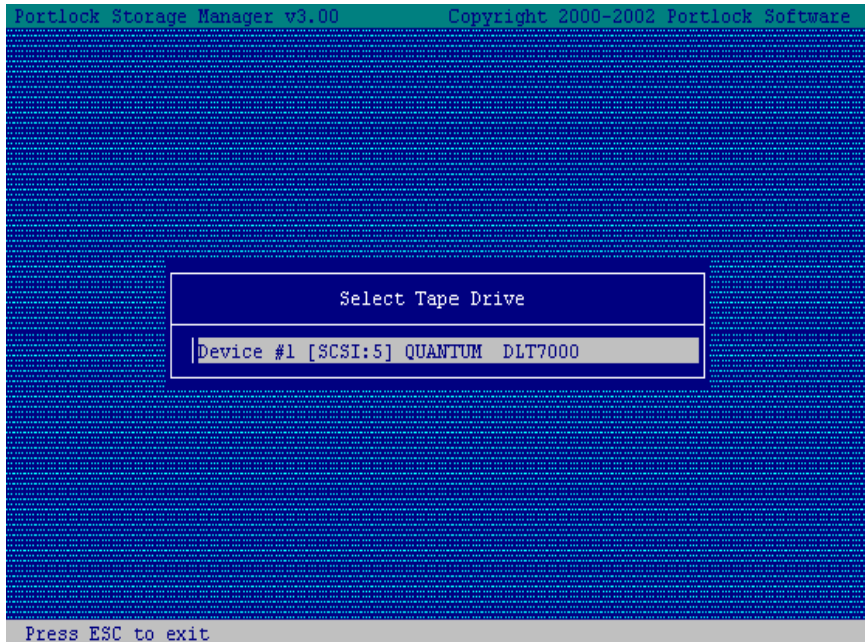


# CHAPTER 11

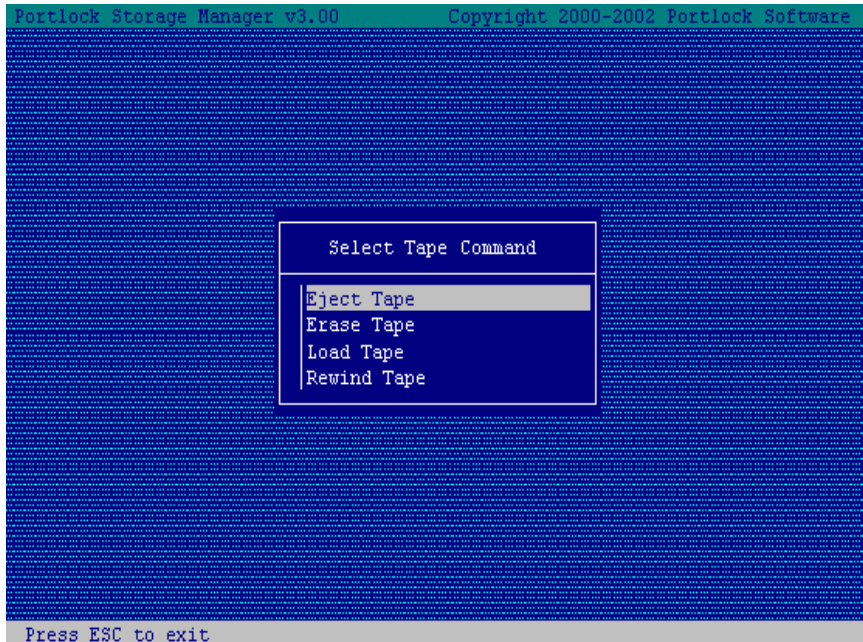
## Tape Command



From the **Main Menu**, choose the option **Tape Commands** and press [Enter] to continue.



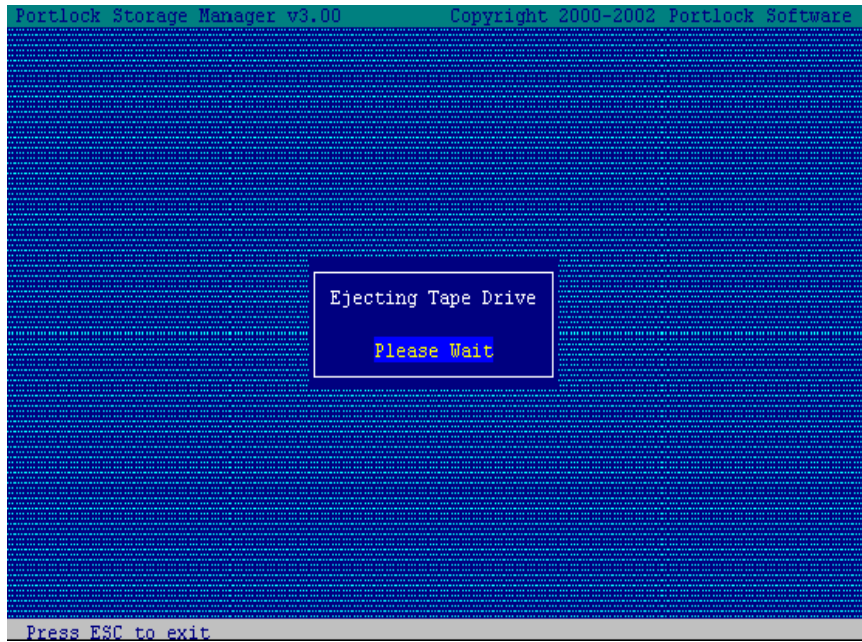
From the **Select Tape Drive** screen, choose the tape device you want to manage and press [Enter].



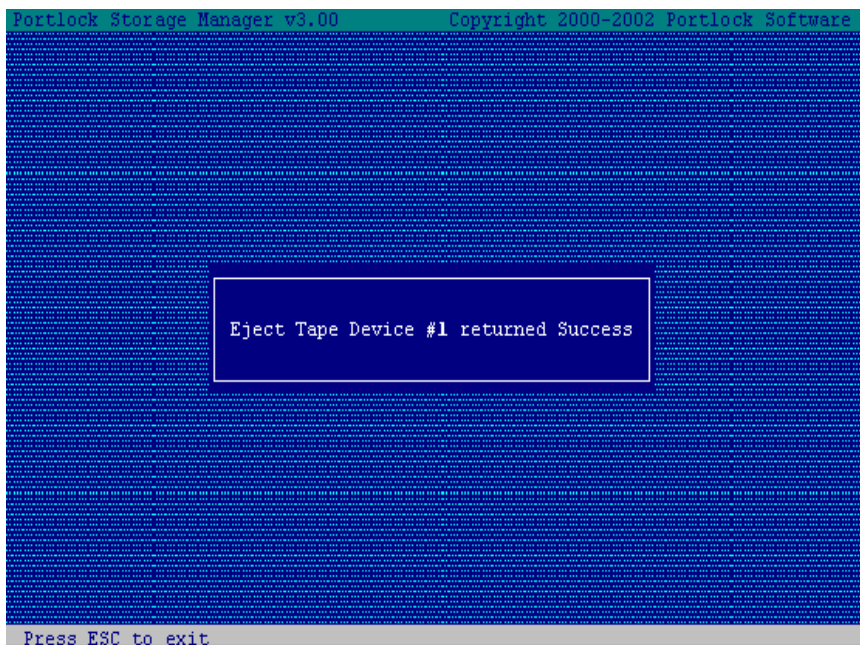
From the **Select Tape Command** menu, you are given four options: (1) Eject Tape, (2) Erase Tape, (3) Load Tape and (4) Rewind Tape

For this example, the **Eject Tape** is highlighted. Once highlighted, press [Enter] to continue.

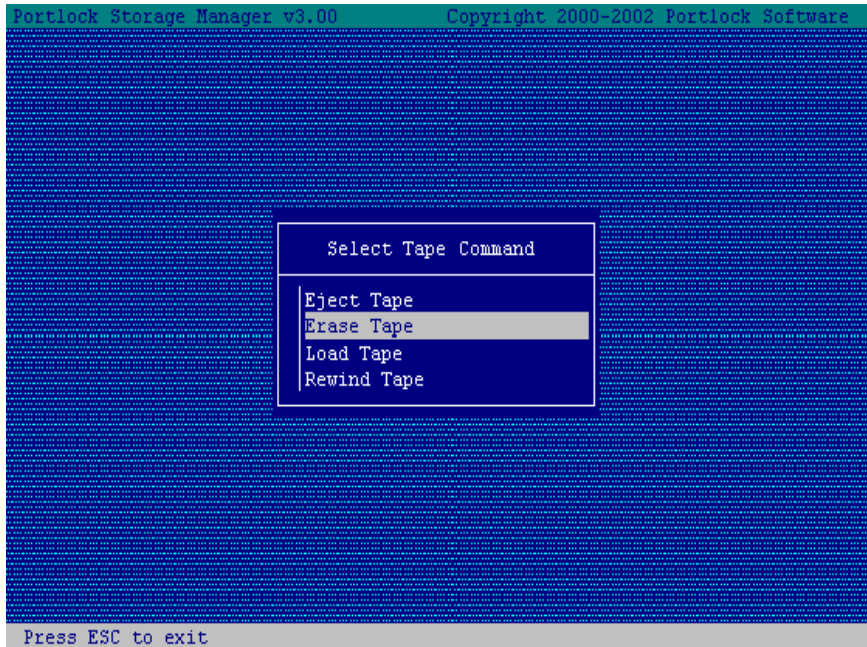




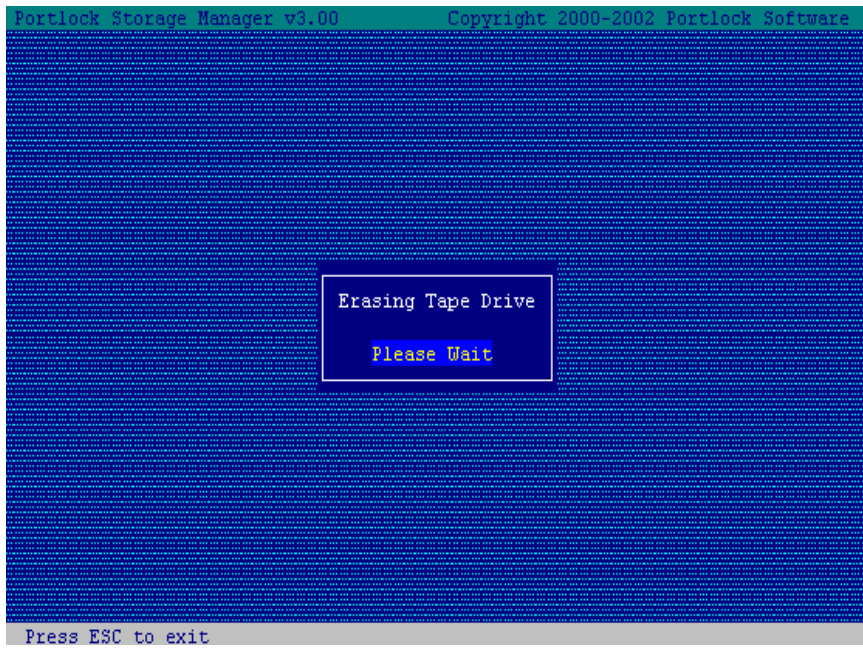
This screen will appear informing you that the tape drive is ejecting.



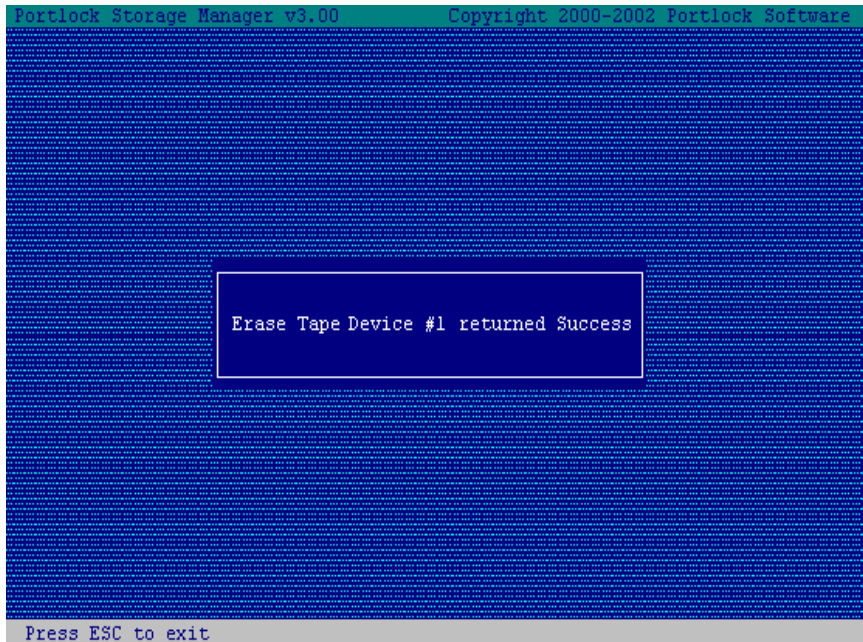
The **Tape Drive Success** screen will appear when the tape device was returned successfully.



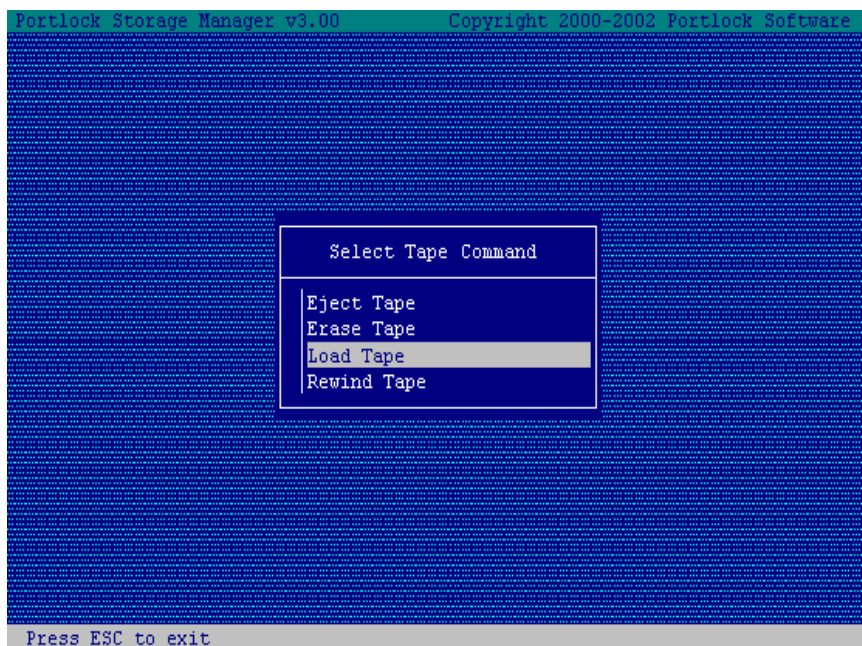
For this example, the **Erase Tape** option will be selected. Press [Enter] once highlighted.



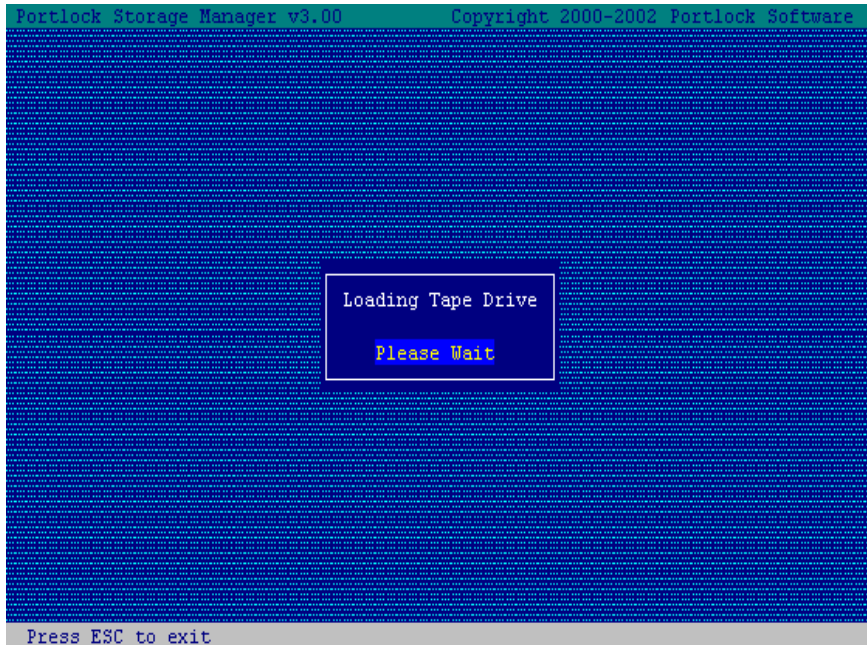
This screen will appear when the system is erasing the tape drive.



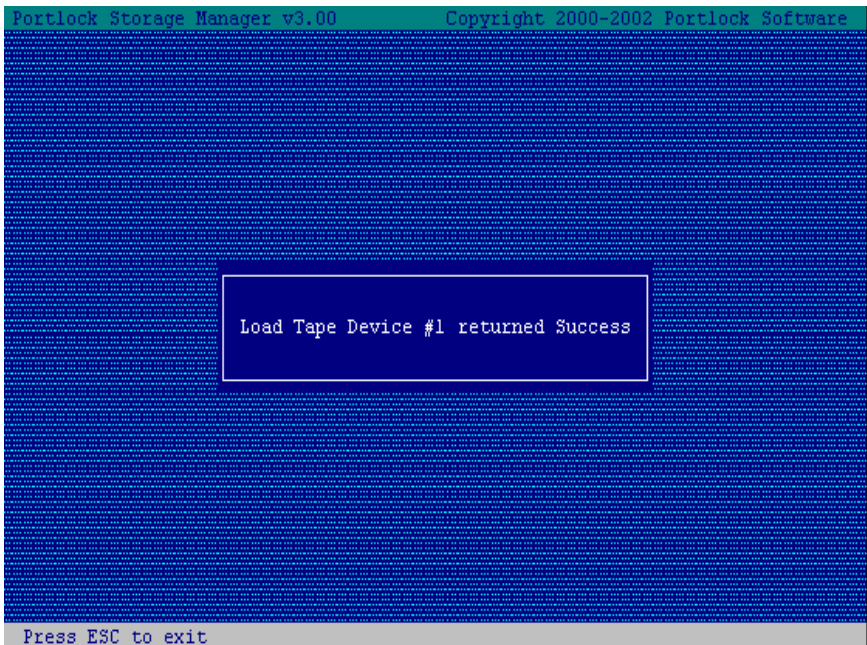
Once the tape drive has been successfully returned, this screen will appear. Press [ESC] to exit.



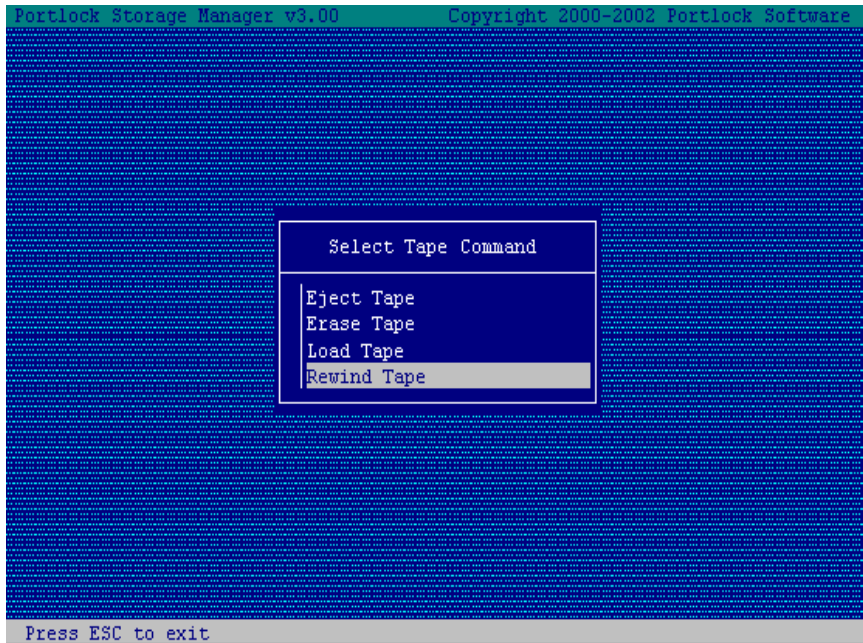
For this example, the **Load Tape** option will be selected. Press [Enter].



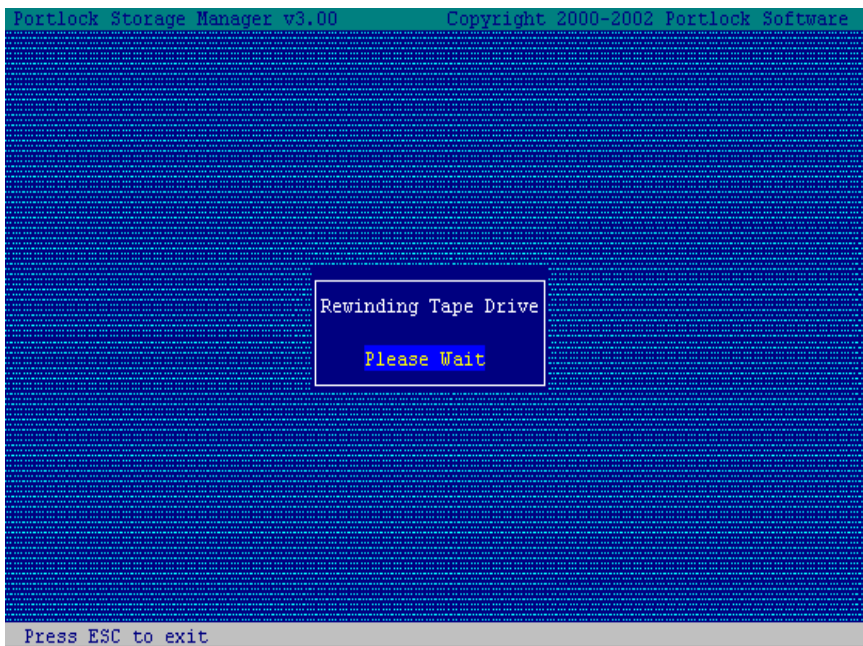
This screen will appear when the tape drive is loading.



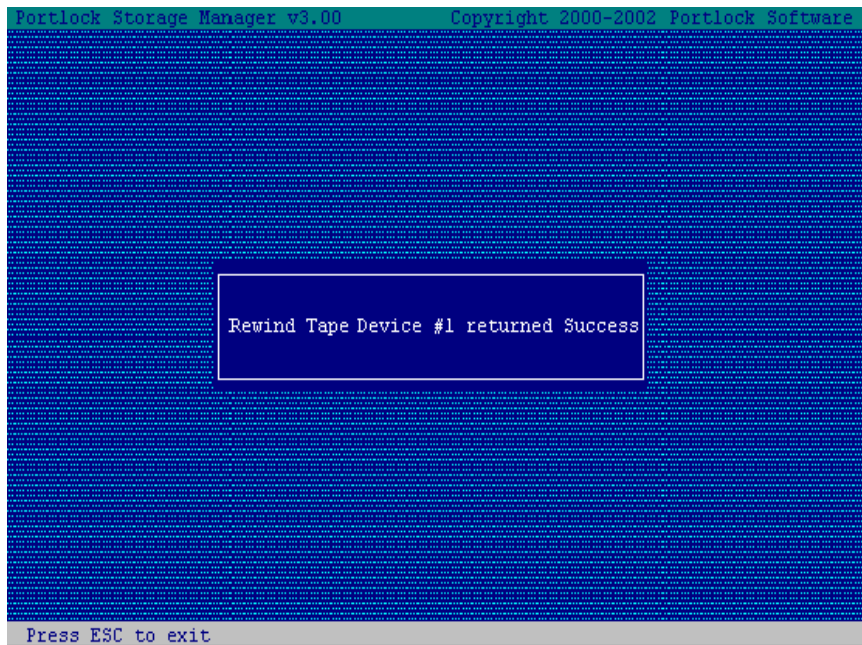
When the tape device has been successfully returned, this screen will appear.



For this example, the **Rewind Tape** option will be selected. Press [Enter] once completed.



This screen will appear when the tape drive is rewinding. Please wait.



This screen appears when the tape device has returned successfully.

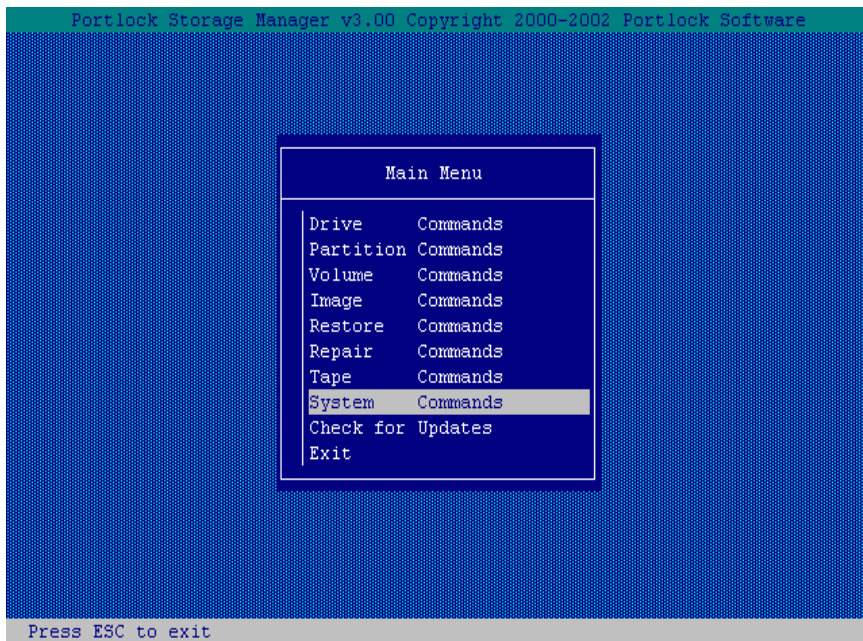




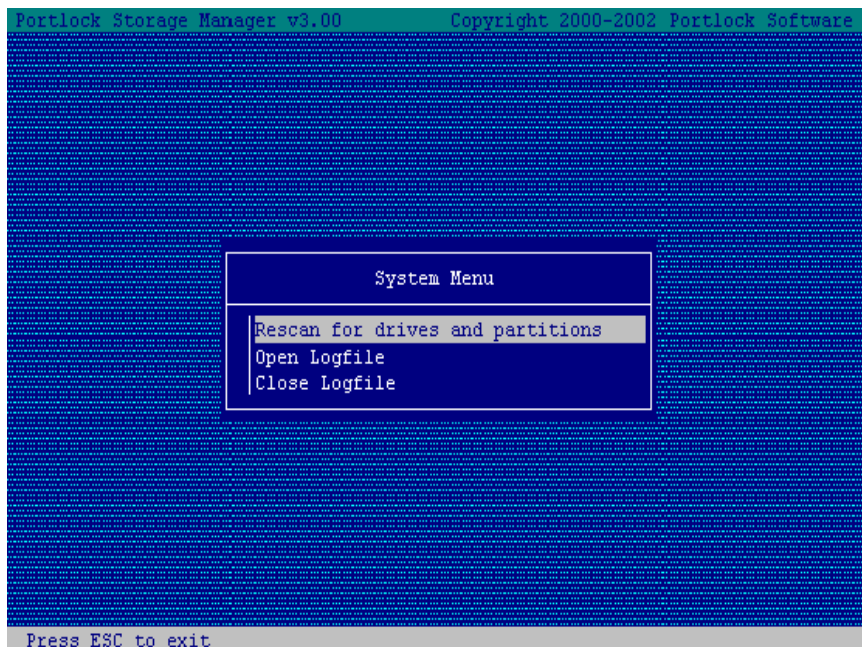


# CHAPTER 12

## System Command



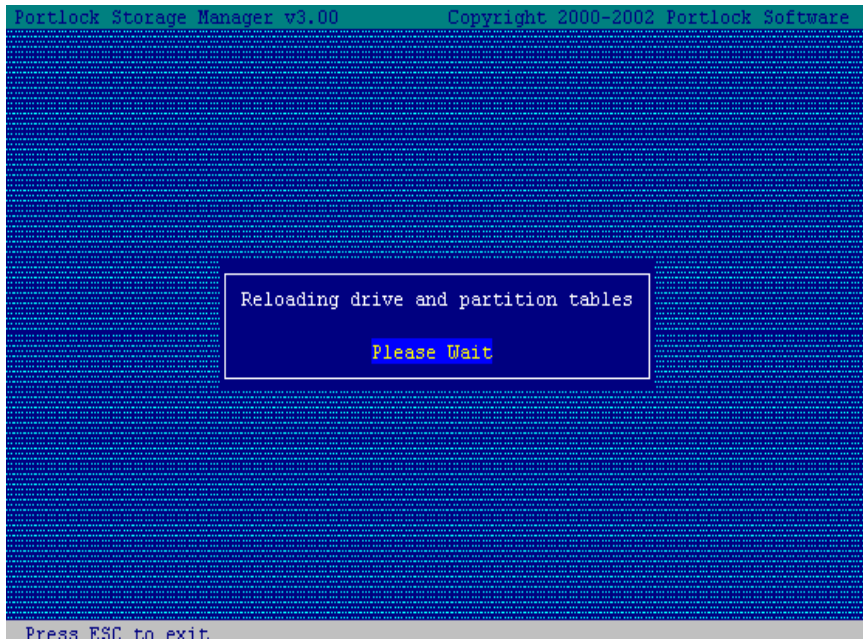
From the **Main Menu**, choose the option **System Commands** and press [Enter].



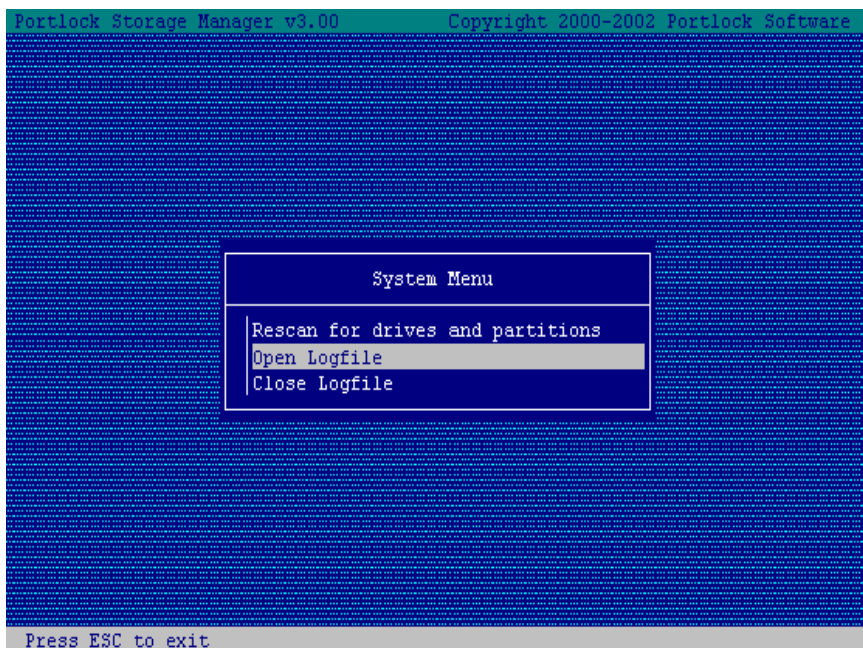
From the **System Menu**, the user has a number of options:

1. Rescan Drives and Partitions
2. Open Logfiles
3. Close logfiles

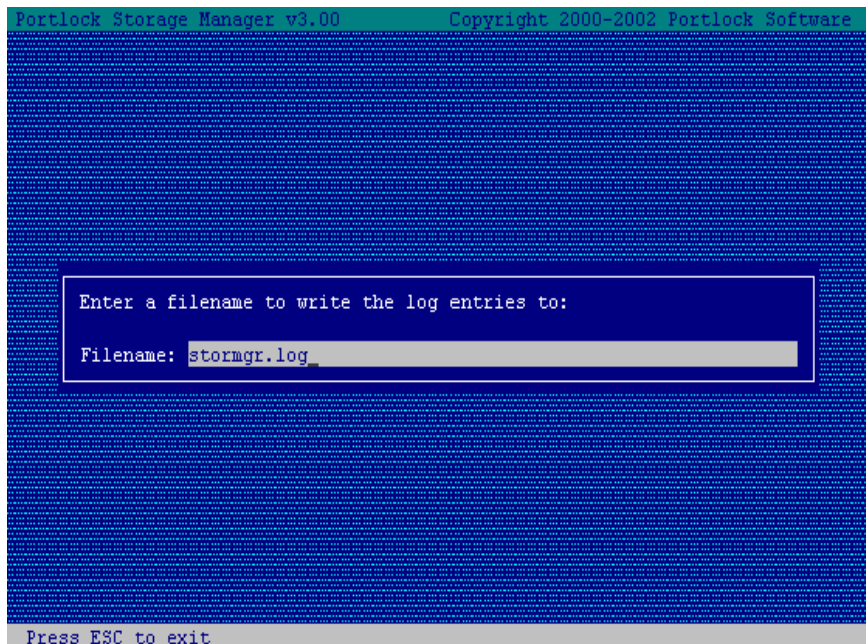
For this example, the **Rescan for drives and partitions** option is selected. Press [Enter].



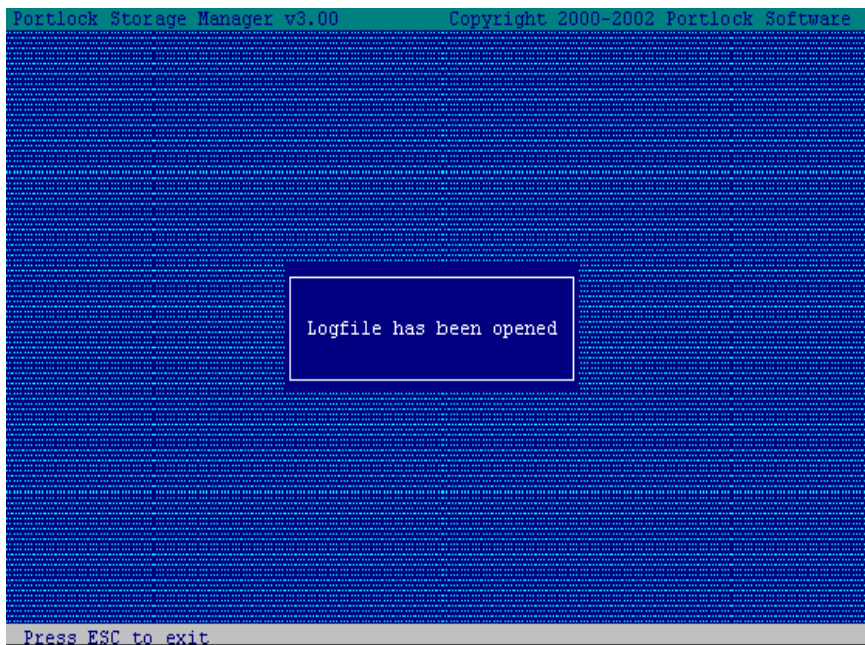
The **Reloading drive and partition tables** menu will appear. Please wait.



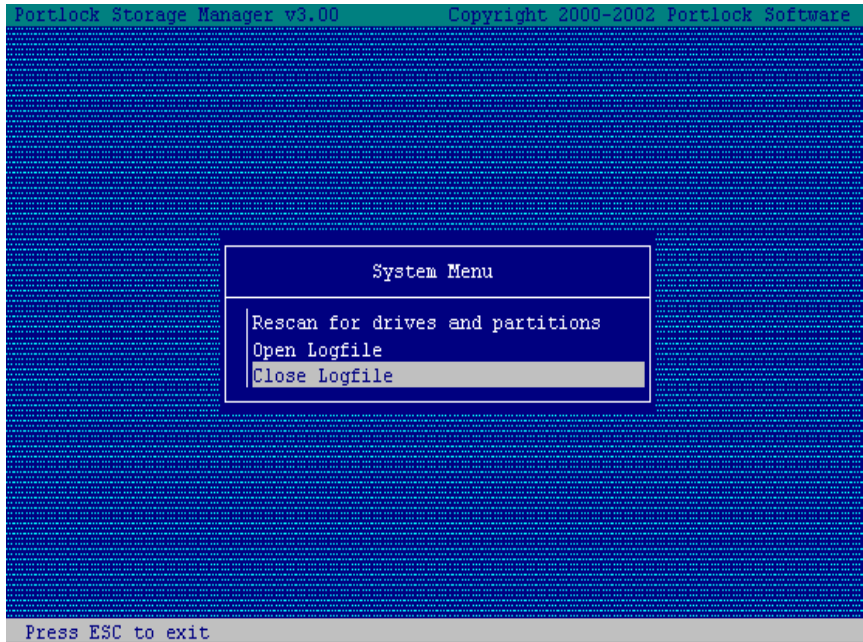
For this example, the **Open logfile** option is selected. This option allows the user to open the Storage Manager Log file. Press [Enter] to continue.



To open the logfile in Storage Manager, type: **stormmgr.log** and press [ENTER].



Once the logfile has been opened, an informative screen will appear with a message reading “**Logfile has been opened.**”



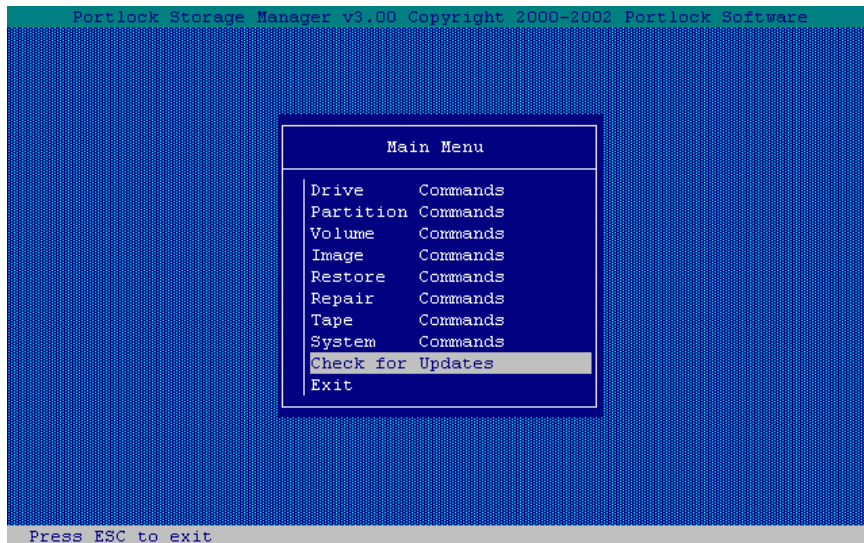
The **Close Logfile** option closes the logfile that has been opened. Press [Enter] to continue. After the logfile has been closed, an informative screen will appear with a message reading “The logfile has been closed.” Press [ESC] to exit.



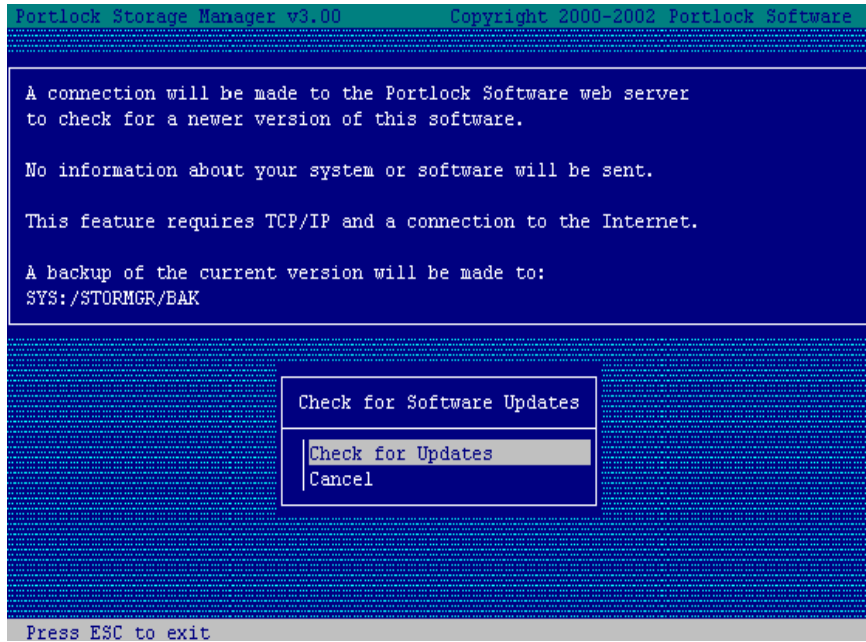
# CHAPTER 13

## Check for Updates

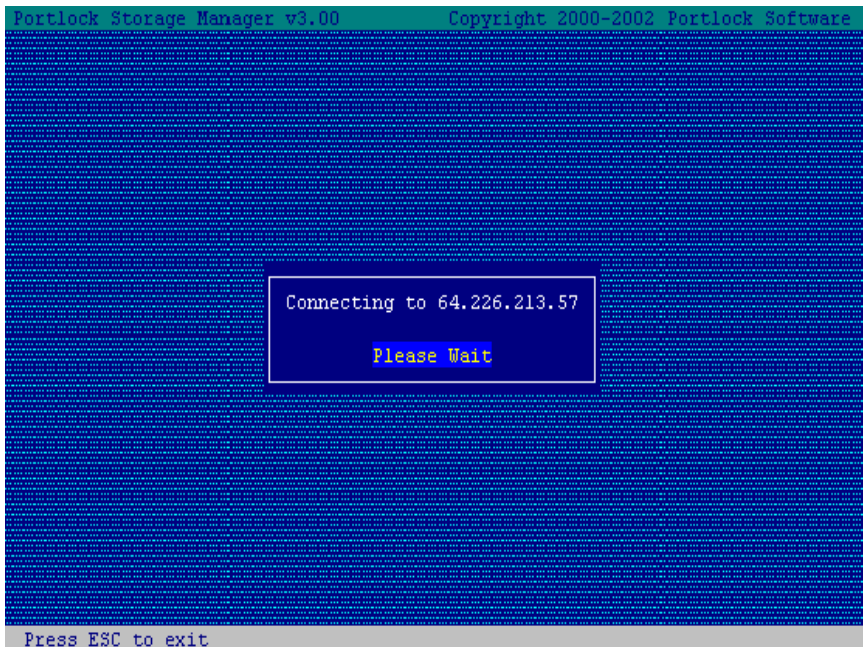
In order to update the Storage Manager Software, a connection will be made to the Portlock Software web server to check for a newer version. No information about your system or software will be sent. This feature requires TCP/IP and a connection to the Internet. A backup of the current version will be made to: SYS: /STORMGR/BAK.



From the Main Menu, select Check for Updates and press [Enter].

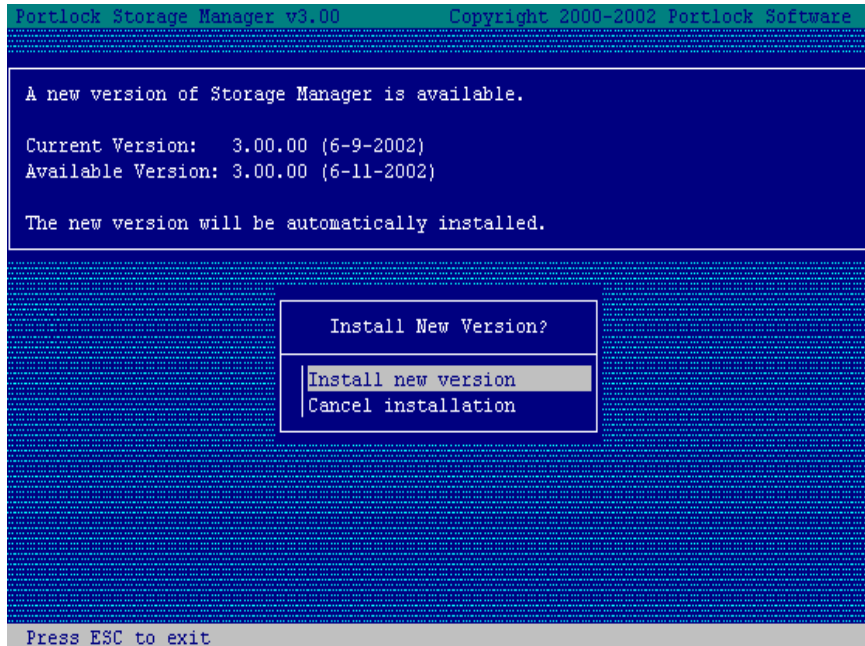


In order to begin the update, select **Check for Updates** from the Check for Software Updates screen and press [Enter].



When this screen appears, the system will be connecting to the server to begin updating the software.





Once the server is connected, the **Update Availability Screen** will appear informing you if there is a new version of Storage Manager.

You are given two options:

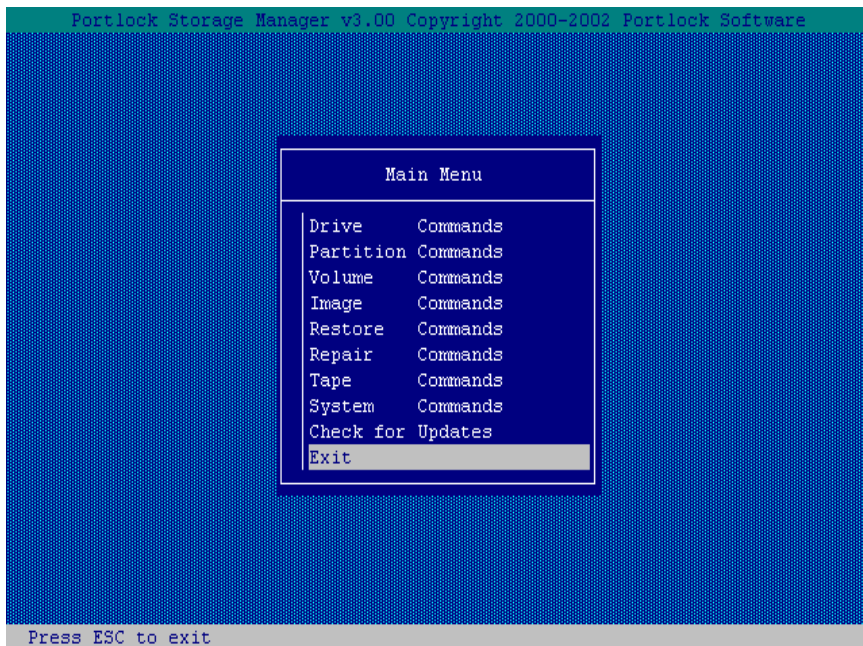
1. Install new version
2. Cancel installation

In this example, the **Install new version** option is highlighted. Press [Enter].

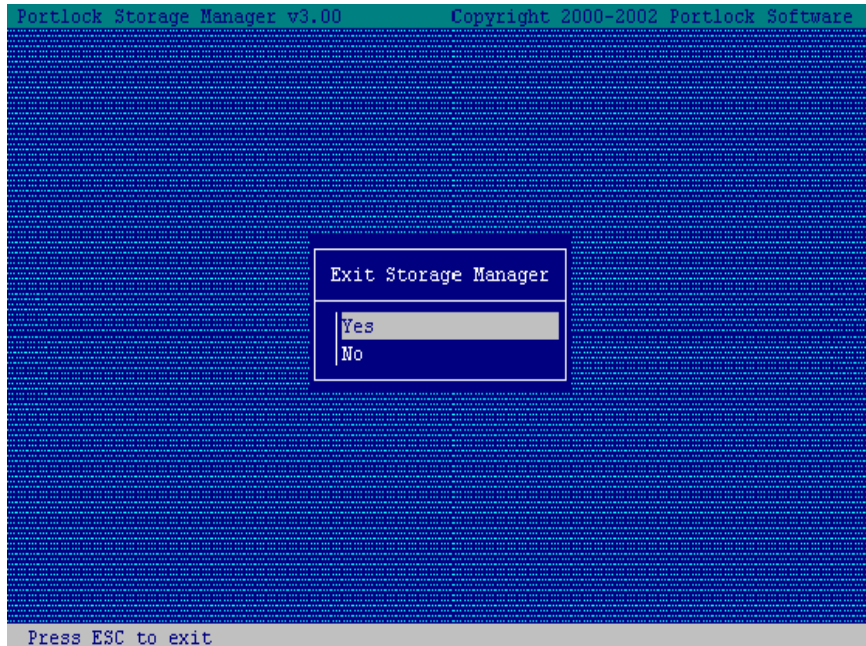


# CHAPTER 14

## Exit Command



To exit Storage Manager, go to the **Main Menu** and select the option **Exit** and press [Enter].



Pressing [Enter] will take you to the **Exit Storage Manager Screen**. From this screen, you have the option to choose **Yes** to exit or **No** to go back to the Main Menu. Press [Enter].





# CHAPTER 15

## Deploying NetWare Servers

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### Using Storage Manager to deploy NetWare Servers

NetWare is a very easy platform to deploy. With a few simple preparation steps, the entire process will proceed smoothly. The following parameters need to be edited:

- Admin User ID and Password
- Server Name in the AUTOEXEC.NCF file
- IPX Internal Network Number
- Storage Device Adapters
- NIC Device Driver
- Server License

Before deploying NetWare servers, read all relevant Novell NetWare documentation.

#### Admin User ID and Password

To deploy a NetWare server into an existing Directory Service Tree, you will need the admin user ID and password (Ignore for NetWare 3.x).

#### Server Name in the AUTOEXEC.NCF file

Each NetWare server requires a unique server name. When deploying NetWare servers, the new server will require a new server name. Edit AUTOEXEC.NCF and locate the line “**file server name servename.**” Change the servename parameter to the new server name.

## **IPX Internal Network Number**

Each NetWare server requires a unique IPX internal network number. Edit **AUTOEXEC.NCF** and locate the line “ipx internal net 123456789.” Change the 123456789 parameter to the new IPX internal Network Number.

## **Storage Device Adapters**

Determine and locate the appropriate device drivers for the storage adapters in your system. Edit the **STARTUP.NCF** file located in the DOS partition and directory where server.exe is executed. Add device drivers for your hardware.

## **NIC Device Driver**

Determine and locate the appropriate device drivers for the network interface controller (NIC) in your system. Edit the **AUTOEXEC.NCF**. Add device drivers for your hardware.

## **Server License**

Each NetWare server requires a unique server license. After deploying a new NetWare server, a new license will need to be installed.



## Deploying a New Server

When using Storage Manager to create an image file that will be used to deploy multiple new NetWare servers, Directory Services must be removed before creating the image and then reinstalled after the image has been deployed.

### Removing Directory Services

At the server console, load either INSTALL.NLM or NWCONFIG.NLM.

1. Select Directory Options
2. Select Remove Directory Services from this server
3. Select Yes to confirm

Directory Services has now been removed from the server. Continue with Storage Manager to create an image of the server.

### Adding Directory Services

At the server console, load either INSTALL.NLM or NWCONFIG.NLM.

1. Select Directory Options
2. Select Install Directory Services onto this server
3. Select Yes to confirm



# Appendix

## STORMGR.NLM Command Line Options

---

Storage Manager supports a number of **Command Line Options** that can be used to modify the behavior of the software.

### Command Syntax:

- stormgr [options]

### Command Line Options:

1. **-cmd=filename:** Specifies a file to be processed for commands. This option turns on Storage Manager Scripting.
2. **-dvd:** This option enables CD/DVD support.
3. **-help:** Displays the help screen. All other options will be ignored.
4. **-logfile=filename:** This option creates a file on either a NetWare volume or a file located on the DOS partition to log status and error information from Storage Manager.
5. **-nodefrag:** After a resize is complete, do not defragment the directory tables. Resizing a volume normally involves moving the FAT and directory tables. The directory tables are then fragmented after a resize. The software will then defragment the directory tables after a resize to improve volume performance.
6. **-nwio:** The software supports using either the older NetWare **NWIO** (DSK) I/O subsystem interface and the newer **NWPA** (HAM) interface. This command line option specifies to use the older **NWIO** (DSK) interface. **Note:** This option is not available on NetWare 5.x servers.
7. **-nwpa:** The software supports using the older NetWare **NWIO** (DSK), I/O subsystem interface and the newer **NWPA** (HAM) interface. This command line option specifies to use the newer **NWPA** (HAM) interface. **Note:** This option is not available on NetWare 3.x servers unless the **NWPA** update package has been installed. This is the only interface available for NetWare 5.x servers.
8. **-os=version:** This option sets the version of NetWare that Storage Manager emulates when running under DOS. Valid versions are 3, 4, and 5.
9. **-port=<tcpip port number>:** This option changes the **TCP/IP** Port number used for **TCP/IP** communications. By default, Storage Manager uses port 19000. Both the sending and receiving processes must use the same port number.



# Appendix

## STORMGR.EXE Command Line Options

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Storage Manager supports a number of COMMAND LINE OPTIONS that can be used to modify the behavior of the software.

**Command Syntax:**

- stormgr [options]

**Command Line Options:**

- 1.-help: Display the help screen. All other options will be ignored.
- 2.-logfile=filename: This option creates a file on a **DOS** partition to log status and error information from Storage Manager.

Example:

- stormgr -logfile=C:/TEST.LOG



# Appendix

## SVRUPD10.NLM Command Line Options

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The module **SVRUPD10.NLM** provides the I/O subsystem interface to NetWare. This module is a dependent of **STORMGR.NLM** and must be loaded for Storage Manager to function correctly.

Normally, this module is auto-loaded by NetWare when **STORMGR.NLM** is loaded. However, it can be loaded prior to **STORMGR.NLM** so that command line options can be set. This is useful to enable debugging options.

This module has its own NetWare screen and I/O errors are reported to this screen and to the logfile if the logfile option is enabled. There is no other user interface to this module.

Storage Manager only uses this module when executing on NetWare. Its equivalent is **STORMGR.EXE** when executing under DOS.

Command Syntax:

- `svrupd10 [options]`

Command Line Options:

1. `-help`  
Display the help screen. All other options will be ignored.
2. `-logfile=filename`  
This option creates a file on either a NetWare volume or a file located on the **DOS** partition to log status and error information from **SVRUPD10.NLM**.
3. `-verbose`  
Enable extra information to be displayed and logged to the logfile.





# D Appendix

## Portlock Storage Manager FAQs

---

1. Which versions of Novell NetWare does Storage Manager support?

Storage Manager supports NetWare 3.12, NetWare 3.20, NetWare 4.10, NetWare 4.11, NetWare 4.20, NetWare 5.0, NetWare 5.1 and NetWare 6.0. Storage Manager runs as an NLM under both NetWare and MS-DOS. For MS-DOS, Storage Manager includes a NLM loadable library interface for execution of NetWare NLMs.

Note: NetWare 3.11 and previous versions are not supported.

2. Does Storage Manager resize NetWare partitions?

Yes, with Storage Manager you can specify the size of a NetWare partition. NetWare partitions can be resized smaller or larger. When the partition resize command is used with the volume resize command, you have full control over the size of your NetWare partitions and volumes.

3. Does Storage Manager resize NetWare volumes?

Yes, with Storage Manager you can specify the size of a NetWare volume. NetWare volumes can be resized smaller or larger. You can resize a NetWare volume by moving the starting or ending position. When the volume resize command is used with the partition resize command, you have full control over the size of your NetWare partitions and volumes.

4. Does Storage Manager support NSS?

Yes, Storage Manager supports resizing Novell NSS partitions, volumes, Storage Groups and Storage Pools.

5. Does Storage Manager support NetWare 6 NSS Storage Pools?

Yes, Storage Manager supports NetWare 6 NSS Storage Pools, volumes and partitions.

6 Does Storage Manager support server to server cloning using TCP/IP?

Yes, Storage Manager supports server to server cloning using TCP/IP. Storage Manager can be used on the “Source Server” running from either MS-DOS or NetWare sending an image data stream over TCP/IP to another server running Storage Manager in restore mode.

7 Does Storage Manager support SCSI tape drives?

Yes, Storage Manager supports imaging and restoring entire servers, or selected volumes and partitions to SCSI tape drives.

8 How fast are the image and restore features of Storage Manager?

Very fast. The image and restore features of Storage Manager are a third generation design. Storage Manager can image at 26 MB / sec (1,560 Megabytes per minute) and restore at 14 MB/ sec (840 Megabytes per minute) if the disk drives and tape drives support these speeds. Using 100 Megabit Ethernet, we routinely see speeds of 7 MB/sec. This means that a NetWare server with 10 GB of data can be restored in less than thirty minutes.

9 Does Storage Manager support compression during Image / Restore?

Yes, Storage Manager supports image compression. There are 10 levels of compression supported. When imaging to a tape drive that supports compression, we recommend that software compression be disabled in Storage Manager and let the tape drive compress the image data.

10 Does Storage Manager copy and resize DOS partitions?

Yes, Storage Manager supports disk to disk cloning of DOS partitions. During the clone (copy), the partition can be resized larger or smaller and the FAT cluster size can be changed.

11 Does Storage Manager copy and resize NetWare volumes?

Yes, Storage Manager supports disk to disk cloning of NetWare volumes. During the clone (copy), the volumes can be resized larger or smaller.

12 Does Storage Manager copy and resize NSS volumes?

Yes, Storage Manager supports disk to disk cloning of NSS volumes. During the clone (copy), the volumes can be resized larger or smaller.





# Appendix

## Creating a bootable floppy diskette with Portlock Storage Manager

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The following example shows how to setup a single floppy bootable diskette with Storage Manager for restoring from SCSI tape on a **Compaq Proliant 1600**.

### Diskette #1:

- From the MS-DOS command prompt format a bootable floppy diskette and copy the system files using “**format A:/s/u.**”
- Copy *stormgr.exe* to this diskette.
- Copy *stormgr.lic* to this diskette.
- Copy *stormgr.clm* to this diskette.
- Copy *tcpipn.nlm* to this diskette.
- Copy *cpqidecd.sys* to this diskette.<sup>1</sup>
- Copy *fws2aspi.sys* to this diskette.<sup>2</sup>
- Copy *mscdex.exe* to this diskette.<sup>3</sup>

Note: STORMGR.CLM is the compressed version of STORMGR.NLM.

### Config.sys:

The config.sys should look like this on the first floppy:

- FILES=40
- lastdrive=Z
- device=a:\cpqidecd.sys /d:cpqcdrom (CD-ROM support if required)<sup>1</sup>
- device=a:\fws2aspi.sys<sup>2</sup>

### Autoexec.bat

The autoexec.bat should look like this:

- a:\mscdex.exe /d:cpqcdrom /l:q /m:25 (CD-ROM support if required).<sup>3</sup>

<sup>1</sup> *cpqidecd.sys* is the driver file for the Compaq CD drive. This file can be downloaded via the Compaq web site or copied from server installation disks.

<sup>2</sup> *fws2aspi.sys* is the SCSI controller driver for the SCSI controller inside the Compaq server. This file can be downloaded via the Compaq web site or copied from server installation disks.

<sup>3</sup> *mscdex.exe* is used to set the DOS CD-ROM parameters.



# Appendix

## Ethernet TCP/IP Boot Diskette Files

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IP Boot Disk for NetWare is for use with Storage Manager for the sending and receiving of images to and from another copy of Storage Manager, Image Manager, restoring an image to an FTP server or retrieving an image from a web server.

Please go to the Portlock Software website [www.portlocksoftware.com/download](http://www.portlocksoftware.com/download) to download the boot diskette file.





# Appendix

## Technical Support

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Portlock Software is committed to providing support for its products that exceeds the industry standard for software companies. We provide support via our web site, email and the telephone.

**Note:** *Technical Support is only available in English.*

### Before Contacting Technical Support:

- Verify that you are running the current version of Storage Manager. We update our products very often. The **README** file may indicate that we have already corrected your problem.
- Run Storage Manger with the **-logfile** command line option. Technical Support will usually ask for the logfile so that we can see your hardware and software configuration.
- Write down any error or warning messages exactly as displayed by Storage Manager. This will often help Technical Support identify the location of the error in the Storage Manger source code. This can greatly speed up resolution of a support issue.

### Contacting Technical Support by EMAIL:

When sending email to Technical Support [support@portlocksoftware.com](mailto:support@portlocksoftware.com), please include the following information when possible:

- Detailed description of the problem including warning or error information
- The logfile created by Storage Manager
- NetWare version and Service Pack
- Hardware make and model
- Details about the storage devices
- Other information that might help us understand the issue

You can expect a reply from our Technical Support within **ONE** business day.

## **Contacting Technical Support by Telephone:**

If you are reporting a problem with Storage Manager, our preferred support contact is by email. However, sometimes you just want to ask a simple question to clarify how to best use Storage Manager. Give us a call, we will try our best to help you best use Storage Manager.

When calling Technical support prepare the following information before calling:

- Detailed description of the problem including warning or error information
- The logfile created by Storage Manager
- NetWare version and Service Pack
- Hardware make and model
- Details about the storage devices
- Other information that might help us understand the issue

## **Corporate Web Site:**

The Portlock Software web site [www.portlocksoftware.com](http://www.portlocksoftware.com) includes documents, technical support information, answers to frequently asked questions, tips and techniques, and newsletters that may help you better understand and use Storage Manager.





# Glossary

## ATA

Supports 1 or 2 hard drives, a 16-bit interface and PIO modes 0, 1 and 2. Also known as IDE.

## ATA-2

Supports faster PIO modes (3 and 4) and multiword DMA modes (1 and 2). Also supports logical block addressing (LBA) and block transfers. ATA-2 is marketed as *Fast ATA* and *Enhanced IDE (EIDE)*.

## BIOS (Basic Input Output System)

The BIOS is built-in software that determines what a computer can do without accessing programs from a disk. On PCs, the BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions.

## Disk

A round plate on which data can be encoded. There are two basic types of disks: *magnetic disks* and *optical disks*.

## EIDE (Enhanced Integrated Drive Electronics)

Short for *Enhanced IDE*, a newer version of the IDE mass storage device interface standard developed by Western Digital Corporation. It supports data rates of between 4 and 16.6 MBps, about three to four times faster than the old IDE standard. In addition, it can support mass storage devices of up to 8.4 gigabytes, whereas the old standard was limited to 528 MB. Because of its lower cost, enhanced EIDE has replaced SCSI in many areas. EIDE is sometimes referred to as *Fast ATA* or *Fast IDE*, which is essentially the same standard, developed and promoted by Seagate Technologies. It is also sometimes called *ATA-2*.

## FAT (File Allocation Table)

File systems used by DOS, DR-DOS, PC-DOS, and the Windows family to store user files and directories. NetWare volumes use a modified form of the DOS FAT.

## FAT-12

A version of the DOS FAT that uses twelve-bit numbers to store disk block addresses.

## FAT-16

A version of the DOS FAT that uses sixteen-bit numbers to store disk block addresses.

## FAT-32

A version of the DOS FAT that uses thirty-two-bit numbers to store disk block addresses.

## GB (Gigabyte)

A GB is 1,073,741,824 bytes. However, most disk drive companies use 1,000,000,000 as a GB when referring to disk drive capacity.

**HotFix**

Hotfixing of disk sectors prevents data from being stored in a bad sector or cluster. During a Hotfix, the operating system automatically detects bad disk sectors, relocates the data to a safe cluster and marks the bad cluster as unusable to the system. This process is transparent to the user, requires no interaction on the user's part and does not report any error messages to any applications.

**IDE (Integrated Drive Electronics)**

An IDE interface is an interface for mass storage devices, in which the controller is integrated into the disk or CD-ROM drive.

**Image**

A method of converting the contents of a hard drive — including its configuration settings and applications — into an image, and then storing the image on a server or burning it onto a CD or another device.

**Input/Output (I/O)**

The term I/O is used to describe any program, operation or device that transfers data to or from a computer and to or from a peripheral device. Every transfer is an output from one device and an input into another. Devices such as keyboards and mice are input-only devices while devices such as printers are output-only. A writable CD-ROM is both an input and an output device.

**Logical Block Addressing (LBA)**

A method used with SCSI and IDE disk drives to translate the cylinder, head, and sector specifications of the drive into addresses that can be used by an enhanced BIOS. LBA is used with drive's that are larger than 528 MB.

**Master**

Refers to an architecture in which one device (the master) controls one or more other devices.

**MB (Megabyte)**

A MB is 1,048,576 bytes. However, most disk drive companies use 1,000,000 as a MB when referring to disk drive capacity.

**NetWare**

A popular local-area network (LAN) operating system developed by Novell Corporation. NetWare is a software product that runs on a variety of different types of LANs, from Ethernets to IBM token-ring networks. It provides users and programmers with a consistent interface that is independent of the actual hardware used to transmit messages.

**NetWare Partition**

A NetWare partition is an area of a disk drive that stores NetWare volumes. A NetWare partition contains three data areas: 1) System Area, HotFix Data Area, and the Data Area. The System Area contains information about the size of the partition. The Hot Fix Data Area contains information about redirected data blocks. The Data Area contains NetWare volumes. A NetWare Partition can contain eight NetWare volume segments. A NetWare volume can consist of one to thirty-two volume segments.

Novell's Definition: A partition created on each network hard disk, from which NetWare volumes are created.

### NetWare Volume

A NetWare volume is a file system that contains user files and data. A NetWare volume can consist of one to thirty-two NetWare volume segments.

#### Novell's Definition:

A fixed amount of physical hard disk storage space. A NetWare volume is the highest level in the NetWare file system directory structure.

### NetWare Volume Segment

A NetWare volume segment is an consecutive area of a NetWare partition. One of more NetWare volume segments make a NetWare volume.

#### Novell's Definition:

A physical division of a volume. A volume can span up to 32 disk drives. If a volume includes more than one drive, each drive in the volume is a volume segment.

### NSS (Novell Storage Services)

#### Novell's Definition:

A high-performance, 64-bit storage and access system that supports very large files as well as large numbers of files and NSS volumes. NSS runs with the traditional NetWare file system in NetWare. NSS installs on the server as a set of NLM programs.

### NSS Admin Volume

#### Novell's Definition:

In NSS, a read-only volume that is automatically created when a storage group and NSS volume are created. This volume contains a dynamic list of objects that NSS uses, and it cannot be deleted.

### NSS Type 0 Partition

An NSS Type 0 Partition is a NetWare Partition without the HotFix Data Area. This partition is not used for NSS volumes, it is used for NetWare volumes that can not be Mirrored or support HotFix Data Areas.

### NSS Type 1 Partition

An NSS Type 0 Partition is a Partition that contains one NSS volume. The NSS volume must be the same size as the partition. This partition can not be mirrored or support Hot Fix Data Areas.

### NSS Type 2 Partition

An NSS Type 2 Partition is a Storage Group than contains one or more NSS volumes.

### NSS Storage Group (See NSS Type 2 Partition)

#### Novell's Definition:

A pool of storage free space that represents logical space owned by NSS. Once free space is claimed by NSS, the free space becomes a managed object which can be divided into other storage groups and NSS volumes.

**Partition**

A partition is a contiguous region of a disk drive used to store data.

**Primary Partition**

A *primary partition* contains a single volume that is the size of the partition.

**Restore**

A method of converting the contents of an Image. When contents of the hard drive are needed again, ghosting software converts the image back to original form.

**SCSI (Small Computer System Interface)**

A method of linking disk drives (and more) to a computer.

**Slave**

Any device that is controlled by another device, called the *master*.







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