

VERITAS Volume Manager Storage Administrator™ 3.2

Administrator's Guide

Solaris

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VERITAS

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Contents

Preface	xi
Introduction	xi
Audience	xi
Organization	xi
Related Documents	xii
Conventions	xiii
Getting Help	xv
Downloading and Running VRTSexplorer	xv
Chapter 1. Introduction to the Storage Administrator	1
Introduction	1
The Volume Manager Storage Administrator	2
Storage Administrator Features	2
The Main Window	5
The Object Tree and Grid	7
The Menu Bar	8
The Toolbar	9
The Status Area	10
The Command Launcher	10
Storage Administrator Icons	11
Task Roadmap	16
Setup Tasks	16
Maintenance Tasks	17
Repair/Recovery Tasks	18



Chapter 2. Getting Started	21
Introduction	21
Installation and Setup	23
Starting VERITAS Volume Manager Storage Administrator	24
Auto-start Mode	24
Running VERITAS Volume Manager Storage Administrator in Read-Only Mode	27
Selecting Objects	28
Viewing Objects and Object Properties	28
The Tree and Grid View	29
The Object View Window	32
Navigating the Object View Window	36
The Volume Layout Details Window	38
Navigating the Volume Layout Details Window	38
The Volume to Disk Mapping Window	39
Navigating the Volume to Disk Mapping Window	40
The Object Properties Window	41
Navigating the Object Properties Window	43
Accessing Tasks	44
Running Tasks From the Menu Bar	44
Running Tasks From a Popup Menu	45
Running Tasks From the Command Launcher	46
Using Dialog Boxes	48
Specifying Objects in Dialog Boxes	49
Specifying Disks and Disk Groups in Dialog Boxes	49
Specifying Object Sizes in Dialog Boxes	50
Viewing Commands	50
The Task Request Monitor Window	50
The Command Log	53
Setting User Preferences	54
The Customize Window	54



General	56
Main Window	57
Font	57
Color	58
Object View Color	59
Geometry	60
Tree/Grid	60
Toolbar	61
Layout Details	61
Object View	62
Hosts	62
Searching for Objects or Free Space	64
Responding to Alerts	65
Printing	68
Exiting the Storage Administrator	68
Chapter 3. Disk Tasks	69
Introduction	69
Disk Task Roadmap	71
Adding a Disk to VxVM	73
Scanning Disks	77
Designating a Disk as a Hot-Relocation Spare	78
Reserving a Disk	79
Renaming a Disk	80
Offlining a Disk	81
Onlining a Disk	82
Mirroring a Disk	83
Evacuating a Disk	84
Disconnecting a Disk	85
Replacing a Disk	86



Unrelocating a Disk	88
Recovering Volumes on a Disk	90
Removing a Disk	91
Forcing Initialization of a Disk	93
Viewing Disk Properties	94
Disabling a Controller	95
Enabling a Controller	96
Renaming an Enclosure	97
Creating a Disk Group	98
Upgrading a Disk Group	100
Renaming a Disk Group	101
Deporting a Disk Group	102
Importing a Disk Group	103
Recovering Volumes in a Disk Group	105
Clearing Relocation Information for a Disk Group	106
Destroying a Disk Group	107
Moving Objects Between Disk Groups	108
Splitting A Disk Group	110
Joining Disk Groups	112
Activating a Disk Group	113
Viewing Disk Group Properties	115
Chapter 4. Volume Tasks	117
Introduction	117
Volume Task Roadmap	119
File System Task Roadmap	121
Creating a Volume	122
Resizing a Volume	135
Renaming a Volume	137
Changing a Volume Layout	138



Adding a Mirror to a Volume	141
Adding a Log to a Volume	143
Stopping a Volume	145
Starting a Volume	146
Creating a Snapshot Copy of a Volume	147
Merging a Snapshot Volume	150
Dissociating a Snapshot Volume	151
Aborting a Snapshot	152
Preparing to Restore a Volume From Backup	153
Recovering a Volume	154
Repairing a Mirror	155
Disabling a Mirror	156
Removing a Mirror From a Volume	157
Removing a Log From a Volume	159
Removing a Volume	160
Associating a Plex	161
Dissociating a Plex	161
Moving a Subdisk	163
Splitting a Subdisk	165
Joining Subdisks	166
Removing a Subdisk	167
Viewing Volume Properties	168
Adding a File System to a Volume	169
Mounting a File System on a Volume	170
Cluster Mounting a File System on a Cluster Node	171
Unmounting a File System on a Volume	172
Removing a Cluster Mounted File System	173
Resizing a File System	174
Creating a Snapshot Copy of a File System	176
Checking a File System on a Volume	178



Viewing File System Properties	179
Creating a QuickLog Volume	180
Enabling a QuickLog Device for a File System	181
Disabling a QuickLog Device for a File System	182
Removing a QuickLog Volume	183
Chapter 5. Host and Cluster Tasks	185
Introduction	185
Host and Cluster Task Roadmap	186
Connecting to a Host	187
Disconnecting a Host	188
Setting Up Automatic Host Connections	189
Working with Clusters	190
Starting a Cluster	192
Stopping a Cluster	193
Starting a Node	194
Stopping a Node	195
Creating a Shared Disk Group	196
Importing a Shared Disk Group	198
Upgrading a Cluster	200
Chapter 6. Troubleshooting	201
Introduction	201
Alerts	202
Disk Troubleshooting	203
Volume Troubleshooting	208
General Troubleshooting	210
Client/Server Problems	210
Configuration Changes	211
Glossary	213



Index219
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Preface

Introduction

This guide describes how to use the VERITAS Volume Manager Storage Administrator™ (VMSA). The VERITAS Volume Manager Storage Administrator is the graphical user interface (GUI) for the VERITAS Volume Manager™ (VxVM).

Audience

This guide is intended for system administrators responsible for configuring and maintaining systems using VxVM. This guide assumes the following:

- ◆ A basic understanding of system administration
- ◆ A working knowledge of the UNIX operating system
- ◆ Familiarity with VxVM and related concepts

Organization

This guide is organized as follows:

- ◆ Chapter 1, “Introduction to the Storage Administrator,” describes the main components of VMSA.
- ◆ Chapter 2, “Getting Started,” describes how to set up and start using VERITAS Volume Manager Storage Administrator.
- ◆ Chapter 3, “Disk Tasks,” describes how to set up and use disks with VERITAS Volume Manager Storage Administrator.
- ◆ Chapter 4, “Volume Tasks,” describes how to create and use volumes and related objects with VERITAS Volume Manager Storage Administrator.
- ◆ Chapter 5, “Host and Cluster Tasks,” describes how to access and use hosts and clusters with VERITAS Volume Manager Storage Administrator.



- ◆ Chapter 6, “Troubleshooting,” provides information about VERITAS Volume Manager Storage Administrator alerts, object states, and other troubleshooting topics.
- ◆ The Glossary defines terms that relate to VERITAS Volume Manager Storage Administrator.

Related Documents

The following documents provide related information:

- ◆ *VERITAS Volume Manager Administrator’s Guide*
- ◆ *VERITAS Volume Manager Troubleshooting Guide*
- ◆ *VERITAS Volume Manager Installation Guide*
- ◆ *VERITAS Volume Manager Release Notes*
- ◆ *VERITAS Volume Manager Hardware Notes*
- ◆ VERITAS Volume Manager and VERITAS Volume Manager Storage Administrator manual pages

Conventions

The following table describes the typographic conventions used in this guide.

Typeface	Usage	Examples
monospace	Computer output, file contents, files, directories, software elements such as command options, function names, and parameters	Read tunables from the <code>/etc/vx/tunefstab</code> file. See the <code>ls(1)</code> manual page for more information.
<i>italic</i>	New terms, book titles, emphasis, variables to be replaced by a name or value	See the <i>User's Guide</i> for details. The variable <code>ncsize</code> determines the value of...
monospace (bold)	User input; the “#” symbol indicates a command prompt	<code># mount -F vxfs /h/filesys</code>
<i>monospace (bold and italic)</i>	Variables to be replaced by a name or value in user input	<code># mount -F fstype mount_point</code>

Symbol	Usage	Examples
%	C shell prompt	
\$	Bourne/Korn/Bash shell prompt	
#	Superuser prompt (all shells)	
\	Continued input on the following line	<code># mount -F vxfs \ /h/filesys</code>
[]	In a command synopsis, brackets indicates an optional argument	<code>ls [-a]</code>
	In a command synopsis, a vertical bar separates mutually exclusive arguments	<code>mount [suid nosuid]</code>

The following table describes terms associated with the use of the mouse:

Term	Definition
<i>Click</i>	Press and release the mouse button.
<i>Double-click</i>	Click the mouse button twice (quickly).
<i>Right-click</i>	Press and release the right mouse button.



Term	Definition
<i>Press and Hold</i>	Press and continue to hold down the mouse button.
<i>Point</i>	Move the tip of the pointer onto an item on the screen.
<i>Select</i>	Click the mouse button while the pointer is directly over the item to be selected.
<i>Drag</i>	Slide the mouse while pressing a mouse button.



Getting Help

If you have any comments or problems with the VERITAS products, contact the VERITAS Technical Support:

- ◆ U.S. and Canadian Customers: 1-800-342-0652
- ◆ International Customers: +1 (650) 527-8555
- ◆ Email: support@veritas.com

For license information (U.S. and Canadian Customers):

- ◆ Phone: 1-925-931-2464
- ◆ Email: license@veritas.com
- ◆ Fax: 1-925-931-2487

For software updates:

- ◆ Email: swupdate@veritas.com

For additional technical support information, such as TechNotes, product alerts, and hardware compatibility lists, visit the VERITAS Technical Support Web site at:

- ◆ <http://support.veritas.com> (U.S. and Canada Customers)

For additional information about VERITAS and VERITAS products, visit the Web site at:

- ◆ <http://www.veritas.com>

Downloading and Running VRTSexplorer

If you have access to the Internet, you can use the VRTSexplorer program to assist Technical Support in diagnosing the cause of your problem as follows:

1. Use a web browser or the `ftp` program to download the VRTSexplorer program at the following URL:

```
ftp://ftp.veritas.com/pub/support/vxexplore.tar.Z
```

Save the file to a temporary directory such as `/tmp` as shown in these instructions. If you download the file to a different directory, substitute its pathname for `/tmp` throughout.

2. Log in as `root` on the affected system, and use the following commands to extract the contents of the downloaded file to the directory `/tmp/VRTSexplorer`:

```
# cd /tmp
# zcat vxexplore.tar.Z | tar xvf -
```



3. Run the `VRTSexplorer` program located in the `VRTSexplorer` directory by entering the following command:

```
# /tmp/VRTSexplorer/VRTSexplorer
```

4. When `VRTSexplorer` prompts you for a destination directory for the information that it collects, press Return to accept the default directory `/tmp`, or enter a pathname of your own choice. `VRTSexplorer` writes the results of its investigations to a compressed tar file named `VRTSexplorer.case_number.tar.Z` in the specified directory.
5. Use the file upload facility of your web browser or the `ftp` program to transfer the file output by `VRTSexplorer` to the VERITAS Customer Support anonymous FTP site:

```
ftp://ftp.veritas.com/incoming
```

6. Call VERITAS Customer Support on 1-800-342-0652, inform them that you have run `VRTSexplorer` and tell them the name of the file that you transferred to the FTP site.
Alternatively, if you have already been assigned a call ID number by Customer Support, e-mail `support@veritas.com` including your case ID number in the subject line.

For more information about the `VRTSexplorer` program, consult the `README` file located in the `VRTSexplorer` directory.

Introduction

This chapter provides a brief introduction to the VERITAS Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator). This chapter describes the main components of VERITAS Volume Manager Storage Administrator and contains a summary of common tasks.

The following topics are discussed in this chapter:

- ◆ **The Volume Manager Storage Administrator**
 - Storage Administrator Features
- ◆ **The Main Window**
 - The Object Tree and Grid
 - The Menu Bar
 - The Toolbar
 - The Status Area
 - The Command Launcher
- ◆ **Storage Administrator Icons**
- ◆ **Task Roadmap**
 - Setup Tasks
 - Maintenance Tasks
 - Repair/Recovery Tasks



The Volume Manager Storage Administrator

VERITAS Volume Manager Storage Administrator is the graphical user interface for VERITAS Volume Manager (VxVM). You can use VERITAS Volume Manager Storage Administrator to administer disks, volumes, and file systems on local or remote machines.

VERITAS Volume Manager Storage Administrator is a Java-based interface that consists of a server and a client. The VERITAS Volume Manager Storage Administrator server runs on a UNIX machine that is running VxVM. The VERITAS Volume Manager Storage Administrator client runs on any machine that supports the Java Runtime Environment.

Storage Administrator Features

VERITAS Volume Manager Storage Administrator provides the following features:

- ◆ Ease of Use

VERITAS Volume Manager Storage Administrator is a task-based user interface that provides access to tasks through menus or a task list. With VERITAS Volume Manager Storage Administrator, administrators can easily navigate and configure their systems. Administrators can use VERITAS Volume Manager Storage Administrator to browse through all of the objects on the system or view detailed information about a specific object.

- ◆ Remote Administration

With VERITAS Volume Manager Storage Administrator, administrators can perform VxVM administration remotely or locally. The VERITAS Volume Manager Storage Administrator client runs on UNIX or Windows machines.

- ◆ Java-based Interface

The VERITAS Volume Manager Storage Administrator client is a pure Java-based interface. Administrators can run VERITAS Volume Manager Storage Administrator as a Java application.

- ◆ Scalability

VERITAS Volume Manager Storage Administrator can handle systems containing a large number of disks. Administrators can view all of the objects on the system or focus on a specific object or set of objects.

- ◆ Security

VERITAS Volume Manager Storage Administrator can only be run by users with appropriate privileges. Administrators can restrict the use of VERITAS Volume Manager Storage Administrator to a specific set of users. VERITAS Volume Manager Storage Administrator does not support communication between the client and server across a firewall.



- ◆ Read-only Mode

Administrators can run VERITAS Volume Manager Storage Administrator in read-only mode, which is useful for monitoring, training, or browsing purposes. Read-only mode allows administrators to view objects on the system, but prevents administrative actions from taking effect.



◆ Multiple Host Support

The VERITAS Volume Manager Storage Administrator client can provide simultaneous access to multiple host machines. The administrator can use a single VERITAS Volume Manager Storage Administrator client session to connect to multiple hosts, view the objects on each host, and perform administrative tasks on each host. Each host machine must be running the VERITAS Volume Manager Storage Administrator server.

◆ Multiple Views of Objects

VERITAS Volume Manager Storage Administrator provides multiple views of objects:

- The main window tree and grid view lists objects on the system.
- The Object View window displays a graphical view of volumes, disks, and other objects in a disk group.
- The Volume Layout Details window displays a close-up graphical view of a single volume and its components.
- The Volume to Disk Mapping window shows the relationships between volumes and their underlying disks.

The Main Window

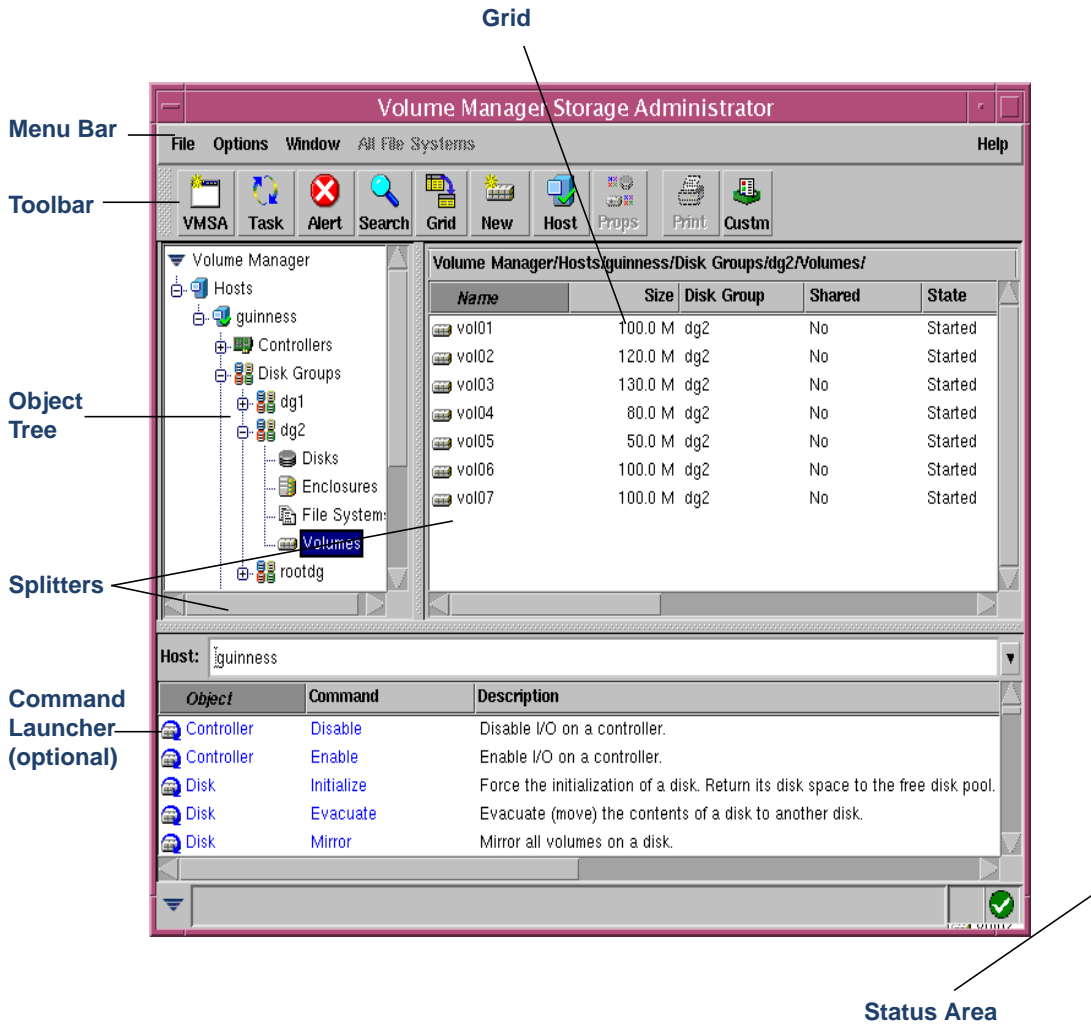
The VERITAS Volume Manager Storage Administrator main window (see “[Main Window](#)” on page 6) consists of:

- ◆ a hierarchical tree of objects
- ◆ a grid that lists objects and their properties
- ◆ a menu bar
- ◆ a toolbar
- ◆ a status area
- ◆ a Command Launcher (hidden by default)

The toolbar and Command Launcher can be separated from and reattached to the main window (this is known as *docking*). The grid can be replicated in a separate window.



Main Window



The Object Tree and Grid

The VERITAS Volume Manager Storage Administrator main window is divided into two main panes:

◆ Left Pane (Object Tree)

The left pane contains the *object tree*, which is a dynamic hierarchical display of VERITAS Volume Manager objects and other objects on the system. Each node in the tree represents a group of objects of the same type. Each object group has a group icon and a group name.

The following object groups typically appear as nodes in the object tree:

- **Hosts** – Any host machines connected to the current VERITAS Volume Manager Storage Administrator client session.
- **Controllers** – All controllers on the system.
- **Disk Groups** – All disk groups on the system.
- **Disks** – All disks on the system.
- **Enclosures** – All enclosures (disk arrays) on the system.
- **File Systems** – All mounted file systems on the system.
- **Free Disk Pool** – Any disks that are under VxVM control, but do not belong to a disk group.
- **Uninitialized Disks** – Any disks that are not under VxVM control.
- **Volumes** – All volumes on the system.
- **Clusters** (optional) – Sets of hosts that share sets of disks. Clusters are only visible in a cluster environment with the optional VERITAS Volume Manager cluster functionality.

You can expand nodes (by clicking on the plus sign) to reveal the hierarchy under each node. When you select a group icon (or node) in the object tree, objects of that type appear in the right pane.

◆ Right Pane (Grid)

The right pane contains a *grid*, which is a tabular display of objects and their properties. The grid displays objects that belong to the group icon that is currently selected in the object tree (left pane). The grid is dynamic and constantly updates its contents to reflect changes to objects.

You can sort the contents of a property column in the grid by clicking on the column heading. You can reverse the sort order by clicking on the column heading again.



The *splitter* is the vertical bar that separates the object tree from the grid. You can resize the left and right panes by pressing and holding the mouse button over the splitter and dragging the splitter to the left or right.

The Menu Bar

The menu bar at the top of the main window contains the following menus:

- ◆ **File**

The **File** menu provides access to the New menu, which creates volumes, disk groups, and file systems. The **File** menu also establishes new host connections, prints the contents of the main window, closes the main window, provides access to an object Properties window, or exits VERITAS Volume Manager Storage Administrator.

- ◆ **Options**

The **Options** menu provides access to the Customize window, which displays and sets user preferences for the VERITAS Volume Manager Storage Administrator components. The **Options** menu also saves or loads user preferences, removes any alert icons from the status area, and sets VERITAS Volume Manager Storage Administrator to read-only mode.

- ◆ **Window**

The **Window** menu opens (launches) another VERITAS Volume Manager Storage Administrator main window, the Task Request Monitor window, the Alert Monitor window, the Object Search window, a copy of the main grid, or the Command Launcher.

- ◆ **Selected** (context sensitive)

The **Selected** menu is a context-sensitive menu that launches tasks on a selected object. The **Selected** menu is dynamic and changes its options based on the type of object that is selected. By default, the **Selected** menu is greyed out. When an object is selected, the **Selected** menu is renamed and provides access to tasks appropriate for the selected object. For example, **Selected** becomes **Volumes** when a volume is selected. The **Volumes** menu provides access to volume tasks.

- ◆ **Help**

The **Help** menu provides access to online help for VERITAS Volume Manager Storage Administrator.

The Toolbar

The toolbar consists of the following set of buttons:

- ◆ **Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator)**

The VERITAS Volume Manager Storage Administrator button launches an additional VERITAS Volume Manager Storage Administrator main window.

- ◆ **Task**

The **Task** button launches the Task Request Monitor window. The Task Request Monitor window displays a list of tasks performed in the current session. Each task is listed with the user who performed the task, the task status, and the start and finish times for the task.

- ◆ **Alert**

The **Alert** button launches the Alert Monitor window. The Alert Monitor window identifies any objects that have experienced failures or errors and describes the problems. When an object fails or experiences an error, an alert icon appears in the status area of the main window and/or on the object icon.

- ◆ **Search**

The **Search** button launches the Object Search window, which is used to search for objects on the system. The Object Search window contains a set of tabbed pages, each of which contains search options for a particular type of object.

- ◆ **Grid**

The **Grid** button launches a window that contains a copy of the main grid. The new grid window continues to display and update the objects shown when the grid copy was created.

- ◆ **New**

The **New** button launches the New Volume dialog box. This dialog box is used to create a volume.

- ◆ **Host**

The **Host** button launches the Connect to Host dialog box. This dialog box is used to establish a connection to a host machine.

- ◆ **Properties (Props)**

The **Props** button launches the Object Properties window for a selected object. The Object Properties window displays detailed information about the selected object and related objects.



- ◆ **Print**

The **Print** button launches the Print dialog box for a selected object. This dialog box is used to print details about a specific object.

- ◆ **Customize (Custm)**

The **Custm** button launches the Customize window, which is used to set user preferences. The Customize window allows you to customize the appearance of the components of VERITAS Volume Manager Storage Administrator. The Customize window contains a set of tabbed pages, each of which contains preference options for a particular aspect of VERITAS Volume Manager Storage Administrator.

The *toolbar handle* is the thin bar next to the toolbar. You can use the toolbar handle to separate the toolbar from the main window or move the toolbar to the bottom, side, or top of the main window. To reposition the toolbar, press and hold the mouse button over the toolbar handle and drag the toolbar to its new location.

The Status Area

The status area is at the bottom of the main window. When an object fails or experiences an error, an alert (error) icon appears in the status area. The Alert Monitor window provides details about the error. You can access the Alert Monitor window by clicking on the alert icon in the status area.

The Command Launcher

The Command Launcher displays a list of tasks that can be performed on objects. Each task is listed with the object type, the command (action), and a description of the task. When you click on a task in the Command Launcher list, the task is launched (started) and the dialog box for the task appears.












The Command Launcher is hidden by default. You can display or hide the Command Launcher by choosing **Window > Command Launcher**. You can separate or attach the Command Launcher and the main window by choosing **Options > Customize** and clicking Dock Command Launcher in the Customize window Main Window tab.

The splitter is the horizontal bar that separates the Command Launcher from the object tree and grid. When the Command Launcher is attached to the main window, you can adjust the Command Launcher height by placing the pointer over the horizontal splitter and then pressing and holding the mouse button to drag the splitter to the desired position.

You can sort the items listed in the Command Launcher by object type, command, or task description by clicking on the appropriate column heading. You can reverse the sort order by clicking on the column heading again.

Storage Administrator Icons

The following table shows icons that appear in VERITAS Volume Manager Storage Administrator.













Icon	Description
Object Icons:	
	Volume Manager
	host
	disconnected host
	disk
	free disk
	foreign disk
	offline disk
	uninitialized disk
	disk group
	deported disk group
	volume














Icon	Description
	plex
	mirror
	snapshot
	log
	subdisk
	controller
	enclosure (disk array)
	subpath (Dynamic Multipathing)
	file system
	cluster
	cluster node (host)
	shared disk groups
	cluster-shareable disk group







Icon	Description
	QuickLog file system
	QuickLog volume
Object View Icons:	
	concatenated layout
	striped layout
	RAID-5 layout
	concatenated pro layout
	striped pro layout
	mirrored layout
	mixed layout
Toolbar Icons:	
	Storage Administrator window
	Task Request Monitor window
	Alert Monitor window



Icon	Description
	Search window
	Grid Copy window
	New Volume dialog box
	Host connection dialog box
	Object Properties window
	Customize window
	Print dialog box
	expand disks
	collapse disks
	expand volumes
	collapse volumes
	projection

Icon	Description
Task Status Icons:	
	task in progress
	successful task
	failed task
	paused task
	cancelled task
	exited task
Performance Monitoring Icons:	
	slowest response time
	slow response time
	default
Miscellaneous Icons:	
	alert
	error message



Icon	Description
	information
	question
	warning
	Command Launcher task
	customization change
	check mark

Task Roadmap

This section provides a summary of common VERITAS Volume Manager Storage Administrator tasks. The tasks are grouped into setup tasks, ongoing maintenance tasks, and repair or recovery tasks. The procedures for these and other tasks are included in later chapters.

Setup Tasks

If you are using VxVM and VERITAS Volume Manager Storage Administrator for the first time, you need to install both products, place your disks under VERITAS Volume Manager control, and create volumes.

▼ To install and set up the Storage Administrator

- ◆ Install and initialize VxVM.
- ◆ Install VERITAS Volume Manager Storage Administrator.
- ◆ Start VERITAS Volume Manager Storage Administrator.

These tasks are described in [Chapter 2](#) and the *VERITAS Volume Manager Installation Guide*.

▼ **To set up disks**

- ◆ Place uninitialized disks under VERITAS Volume Manager control.
- ◆ Create additional disk groups for the new disks (optional).
- ◆ Designate one or more disks as hot-relocation spares (optional).

These tasks are described in [Chapter 3](#).

▼ **To set up volumes and file systems**

- ◆ Create volumes.
- ◆ Place file systems on volumes (optional).
- ◆ Create mirrors for any volumes that need to be redundant.

These tasks are described in [Chapter 4](#).

▼ **To access hosts and clusters**

- ◆ Connect to additional host machines.
- ◆ Create shared disk groups.

These tasks are described in [Chapter 5](#).

Maintenance Tasks

After you have set up your disks and volumes, you need to perform some or all of the following maintenance tasks.

▼ **To monitor objects**

- ◆ Use the main window tree (left pane) and grid (right pane) to view disks, volumes, file systems, and other objects on the system.
- ◆ Use the Object View window to display a graphical view of disks, volumes, and other objects in a particular disk group.
- ◆ Use the Volume to Disk Mapping window to view the relationships between volumes and their underlying disks.
- ◆ Use the Volume Layout Details window to display a graphical view of a particular volume and its components.
- ◆ Use the object Properties window to view detailed information about a selected object.



- ◆ Use the Alert Monitor window to view information about errors or failures associated with objects that are marked with alert icons.

These windows are described in [Chapter 2](#).

▼ **To maintain disks**

- ◆ Place more disks under VERITAS Volume Manager control.
- ◆ Create more disk groups.
- ◆ Upgrade disk groups to the current disk group version.

These tasks are described in [Chapter 3](#).

▼ **To maintain volumes**

- ◆ Increase the size of volumes as users and applications require more space.
- ◆ Change the layouts of volumes.
- ◆ Add mirrors to any unmirrored volumes that should be redundant.
- ◆ Create snapshot copies of volumes and then back up the volumes.
- ◆ Reorganize the space occupied by volumes (by moving subdisks to other disks).

These tasks are described in [Chapter 4](#).

▼ **To maintain file systems**

- ◆ Place additional file systems on volumes.
- ◆ Increase the size of file systems as users and applications require more space.
- ◆ Create snapshot copies of `vxfs` file systems and then back up the file systems.

These tasks are described in [Chapter 4](#).

Repair/Recovery Tasks

If disk and/or system failures occur, VxVM generally performs any necessary recovery operations automatically. However, depending on the circumstances, you may need to attempt to recover from the situation as follows.

▼ **To protect volumes from disk failure**

- ◆ Evacuate a failing disk.
- ◆ Replace a failed disk.

These tasks are described in [Chapter 3](#).

▼ To repair/recover volumes

- ◆ Recover a volume.
- ◆ Recover all volumes on a failed disk.
- ◆ Recover all volumes in a disk group.
- ◆ Start a volume.
- ◆ If a volume is not recoverable, restore the volume from backup.

These tasks are described in [Chapter 3](#), [Chapter 4](#), and [Chapter 6](#).

▼ To repair/recover file systems

- ◆ Perform a file system consistency check on any file systems that may be damaged.

These tasks are described in [Chapter 4](#).





Introduction

This chapter describes how to set up and start using the VERITAS Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator). This chapter focuses on how to use the main components of VERITAS Volume Manager Storage Administrator.

The following topics are discussed in this chapter:

- ◆ [Installation and Setup](#)
- ◆ [Starting VERITAS Volume Manager Storage Administrator](#)
- ◆ [Running VERITAS Volume Manager Storage Administrator in Read-Only Mode](#)
- ◆ [Selecting Objects](#)
- ◆ [Viewing Objects and Object Properties](#)
 - [The Tree and Grid View](#)
 - [The Object View Window](#)
 - [The Volume Layout Details Window](#)
- ◆ [The Volume to Disk Mapping Window](#)
 - [The Object Properties Window](#)
- ◆ [Accessing Tasks](#)
 - [Running Tasks From the Menu Bar](#)
 - [Running Tasks From a Popup Menu](#)
 - [Running Tasks From the Command Launcher](#)
- ◆ [Using Dialog Boxes](#)
 - [Specifying Objects in Dialog Boxes](#)
- ◆ [Viewing Commands](#)
 - [The Task Request Monitor Window](#)



- The Command Log
- ◆ Setting User Preferences
 - The Customize Window
- ◆ Searching for Objects or Free Space
- ◆ Responding to Alerts
- ◆ Printing
- ◆ Exiting the Storage Administrator

Installation and Setup

VERITAS Volume Manager Storage Administrator consists of a server (`vmsa_server`) and a client (`vmsa`). You must install and run the VERITAS Volume Manager Storage Administrator server on a UNIX machine running VERITAS Volume Manager (VxVM). You can install and run the VERITAS Volume Manager Storage Administrator client on any machine that supports the Java Runtime Environment.

Before you can use VERITAS Volume Manager Storage Administrator, perform the following procedures:

1. Install VxVM on the machine to be administered. Run `vxinstall` to create the `rootdg` disk group and initialize at least one disk.
2. Install the VERITAS Volume Manager Storage Administrator server and client on the machine to be administered.
3. If users other than root need to access VERITAS Volume Manager Storage Administrator, set up security to specify which users can run VERITAS Volume Manager Storage Administrator.
4. If you plan to run the VERITAS Volume Manager Storage Administrator client from a machine other than the machine to be administered, install the VERITAS Volume Manager Storage Administrator client on the machine where the client will run.
5. Start the VERITAS Volume Manager Storage Administrator server on the machine to be administered.
6. Start the VERITAS Volume Manager Storage Administrator client.

Refer to the *VERITAS Volume Manager Installation Guide* for details on how to install and set up VxVM and VERITAS Volume Manager Storage Administrator.



Starting VERITAS Volume Manager Storage Administrator

Only users with appropriate privileges can run VERITAS Volume Manager Storage Administrator. Refer to the *VERITAS Volume Manager Installation Guide* for information on VERITAS Volume Manager Storage Administrator security and access permissions.

You can use VERITAS Volume Manager Storage Administrator to administer the local machine or a remote machine. The VERITAS Volume Manager daemon (`vxconfigd`) and the VERITAS Volume Manager Storage Administrator server (`vmsa_server`) must be running on the machine to be administered. Once VERITAS Volume Manager Storage Administrator is installed, the VERITAS Volume Manager Storage Administrator server starts up automatically at system startup.

▼ To start the VERITAS Volume Manager Storage Administrator server

- ❖ If the VERITAS Volume Manager Storage Administrator server is not already running, enter the following command to start it:

```
# vmsa_server &
```

- ❖ To confirm that the VERITAS Volume Manager Storage Administrator server is running, use the following command:

```
# vmsa_server -q
```

Note If you are using the `sh` shell, start the command as follows to allow the VMSA server to continue running after you log out:

```
# nohup ./vmsa_server &
```

Auto-start Mode

The VMSA server has an auto-start mode that starts the server on an as-needed basis. In auto-start mode, the VMSA server automatically starts whenever a VMSA client tries to connect to the server and the server is not already running. If no VMSA clients are connected for a certain amount of time (15 minutes, by default), the server automatically terminates and restarts at the next client connection.

1. To start the server in auto-start mode, use the following command:

```
autostart on
```

2. To confirm that auto-start mode is enabled, run the following:

```
netstat -a | grep vmsa
```

The output should show that a VMSA service has a LISTEN state:




```
* .vmsa      * .*      0      0      0      0 LISTEN
```

- Auto-start mode remains in effect across system reboots. To disable auto-start mode, use the following command:

```
autostart off
```

For more information about auto-start mode, refer to the `autostart` (1M) manual page.

▼ To start the VERITAS Volume Manager Storage Administrator client

UNIX

- To administer the *local* UNIX machine, use the following command:

```
# vmsa
```

- To administer a *remote* UNIX machine, use the following command:

```
# vmsa remote_machine_name
```

Windows

- To administer a *remote* UNIX machine, choose **Start > Programs > VERITAS Volume Manager Storage Administrator > VERITAS Volume Manager Storage Administrator**.

At startup, the VERITAS Volume Manager Storage Administrator client displays the Connect to Host dialog box. To start the VERITAS Volume Manager Storage Administrator session, complete this dialog box as follows:

Server Host:	Enter the name of the machine to be administered. Both the VxVM and the VERITAS Volume Manager Storage Administrator server must be running on this machine.
User Name:	Enter your login name. Only users with appropriate privileges can run VERITAS Volume Manager Storage Administrator.
Password:	Enter your password.
Options	To use the specified user as the default setting for any future host connections from this VERITAS Volume Manager Storage Administrator client session, select Default User .

When you have provided all necessary information in the dialog box, click **OK**. The VERITAS Volume Manager Storage Administrator main window appears.



Note Entries for your user name and password must exist in the password file or corresponding NIS (Network Information Name Service) table on the machine to be administered. Your user name must also be included in the VERITAS group entry (`vrtsadm`, by default) in the group file or NIS group table. If the `vrtsadm` entry does not exist, only `root` can run VERITAS Volume Manager Storage Administrator.

The VERITAS Volume Manager Storage Administrator client can provide simultaneous access to multiple host machines. After you have started VERITAS Volume Manager Storage Administrator on one host, you can connect to additional hosts from the same session. Each host machine must be running the VERITAS Volume Manager Storage Administrator server.

Running VERITAS Volume Manager Storage Administrator in Read-Only Mode

VERITAS Volume Manager Storage Administrator can be run in a read-only mode that is useful for monitoring, training, or browsing purposes. Read-only mode allows you to view objects on the system through VERITAS Volume Manager Storage Administrator, but prevents administrative actions from taking effect. When VERITAS Volume Manager Storage Administrator is in read-only mode, the main window and dialog box title bars contain the string `[Read-only Mode]`.

The default mode for VERITAS Volume Manager Storage Administrator is full operational mode. Read-only mode can be enabled on a per-host or per-user basis. The VERITAS Volume Manager Storage Administrator server and/or client can be set to read-only mode. All client connections to a read-only server are in read-only mode.

To specify a list of users who are only permitted to run VERITAS Volume Manager Storage Administrator in read-only mode, add a group named `vrtsro` to the `/etc/group` file or NIS Network Information Name Service (NIS) group table on the machine to be administered. The `vrtsro` group must include the names of any users who are allowed to run VERITAS Volume Manager Storage Administrator in read-only mode, but are not allowed to run it in full operational mode.

You can run VERITAS Volume Manager Storage Administrator in read-only mode using one of the following procedures:

- ❖ From the main window, choose **Options > Read-Only Mode** to turn read-only mode on (or off) for the current session.
- ❖ Start the server in read-only mode using the following command:

```
# vmsa_server -r
```

Read-only mode remains in effect until you stop and restart the server. To stop the server, use the following command:

```
# vmsa_server -k
```
- ❖ Start the client in read-only mode using the following command:

```
# vmsa -r
```
- ❖ Connect to a host machine as a user who only has permission to run VERITAS Volume Manager Storage Administrator in read-only mode on that host. This enables read-only mode on the specified host machine.



Selecting Objects

You can select objects in most VERITAS Volume Manager Storage Administrator windows using the following procedures:

- ❖ To select a single object, click on the object.
- ❖ To select multiple objects, hold down the Control key while selecting the objects. The objects that you select in this way do not have to be adjacent.
- ❖ To select a range of adjacent objects, select the first object and then hold down the Shift key while selecting the last object in the range. You can also select multiple adjacent objects by pressing and holding the mouse button while dragging the pointer over the desired objects.

For information on how to select objects from dialog boxes, refer to “[Using Dialog Boxes](#)” on page 48.

Viewing Objects and Object Properties

VERITAS Volume Manager Storage Administrator provides the following views of objects and their properties:

- ◆ **Tree and Grid View**

The main window tree and grid view displays volumes, disks, file systems, and other objects on the system. The grid also displays a limited set of properties for listed objects.
- ◆ **Object View Window**

The Object View window displays a graphical view of disks, volumes, and other objects in a particular disk group.
- ◆ **Volume Layout Details Window**

The Volume Layout Details window displays a close-up graphical view of a single volume and its components (mirrors/plexes and subdisks).
- ◆ **Volume to Disk Mapping Window**

The Volume to Disk Mapping window shows the relationships between volumes and their underlying disks.
- ◆ **Object Properties Window**

The object Properties window contains detailed information about a specific object.

This section describes how to use these views to display objects and their properties.



The Tree and Grid View

The main window tree and grid view displays volumes, disks, file systems, and other objects on the system. The object tree is a hierarchical display of object groups. The grid is a tabular display of objects and a limited set of properties. VERITAS Volume Manager Storage Administrator constantly monitors objects on the system and makes appropriate changes to the tree and grid displays.

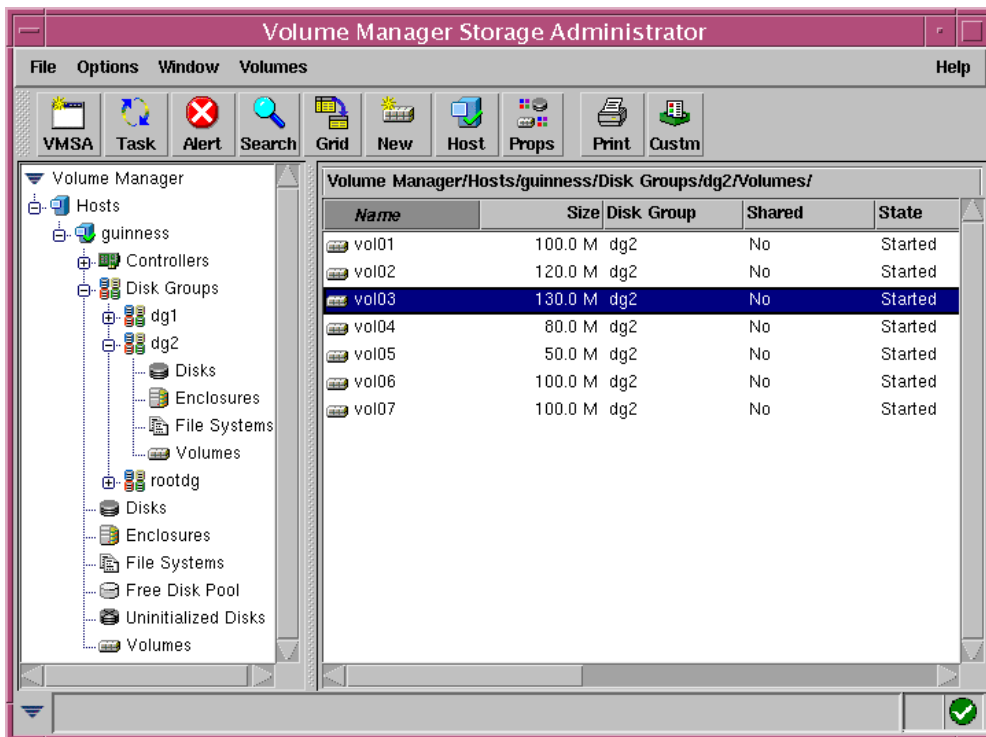
The **File** menu creates new objects or connections, prints information from the window, or accesses an object properties window. The **File** menu also closes the window or exits VERITAS Volume Manager Storage Administrator. The **Options** menu accesses user preferences and sets VERITAS Volume Manager Storage Administrator to read-only mode. The **Window** menu and the toolbar buttons launch other VERITAS Volume Manager Storage Administrator windows. The context-sensitive **Selected** and popup menus access tasks or properties for a selected object. To access the popup menu for an object, right-click on the object.

For more information about this view, see the description of the object tree and grid in [Chapter 1](#).

“[Tree/Grid View of Volumes](#)” shows how a volume appears in the tree and grid view. The object tree is in the left pane and the grid is in the right pane.



Tree/Grid View of Volumes



You can view objects in the tree and grid using the following procedures:

- ❖ To expand or collapse the hierarchy under a particular object group node in the tree, click on the plus sign (+) or minus sign (-) icon next to that node.
- ❖ To display the objects in an object group, click on the appropriate object group in the object tree. All objects that belong to the selected object group appear in the grid.

Examples:

To display all volumes, click on **Volumes** in the object tree. All volumes on the system appear in the grid. Each volume is listed with a set of properties.

To display all volumes in the `rootdg` disk group, expand the **Disk Groups** node (by clicking +), then expand the **rootdg** node and click on the **Volumes** group under **rootdg**. Only volumes in the `rootdg` disk group appear in the grid.

- ❖ To display the objects in an object group that is listed in the grid, double-click on the object group in the grid. All objects that belong to the object group appear in the grid.

Example:

To display the volumes in a disk group listed in the grid, go to the grid and double-click on the disk group name, then double-click on **Volumes**. All volumes in the disk group appear in the grid.

Note that double-clicking on an object that does not contain other objects (children) displays the Properties window for the object instead of its children.

- ❖ To sort the objects in the grid by a specific property, click on the appropriate property column heading. To reverse the sort order, click on the column heading again.

Example:

To sort volumes by size, click on the Size column heading in the grid.

- ❖ To resize a grid column, place the pointer over the line that divides the column headings and then press and hold the mouse button to drag the column divider to the desired position.
- ❖ To resize the left (tree) and right (grid) panes, place the pointer over the vertical splitter and then press and hold the mouse button to drag the splitter to the desired position.
- ❖ To make a copy of the contents of the grid, choose **Window > Copy Main Grid**. A copy of the grid appears in a separate window. The new grid window continues to display and update the objects that were shown when you created the grid copy. You can



create multiple copies of the grid and use these grid windows to display different sets of objects. For example, you can display volumes in one grid window and disks in another.

- ❖ To print the contents of the grid, choose **File > Print Grid** and complete the Print dialog box. To print details about a specific object displayed in the grid, select the object, choose **File > Print**, and then complete the Print dialog box.

The Object View Window

The Object View window displays a graphical view of the volumes, disks, and other objects in a particular disk group. The Object View window is dynamic, so the objects displayed in this window are automatically updated when object properties change. You can select objects or perform tasks on objects in the Object View window. For instructions on navigating the Object View window, see “[Navigating the Object View Window](#)” on page 36.

The Object View window consists of two main panes, as follows:

- ◆ **Volume Pane (top)**

The volume pane is a graphical display of volumes in a particular disk group. This pane can display various levels of detail for volumes. You can display volumes in one of the following modes:

- *Basic mode*—minimal information about a volume. This mode displays a compressed view of volumes.
- *Layout mode*—volume components and layout. This mode displays volume subdisks and mirrors, as well as any columns or logs.
- *Expanded (detailed) mode*—detailed information about a volume and its components. This mode displays volume and component properties.

- ◆ **Disk Pane (bottom)**

The disk pane is a graphical display of disks in a particular disk group. This pane can display various levels of detail for disks. You can display disks in one of the following modes:

- *Basic mode*—minimal information about a disk. This mode displays a compressed view of disks.
- *Layout mode*—disk regions and layout. This mode displays the subdisks and free space on a disk.
- *Expanded (detailed) mode*—detailed information about a disk, its subdisks, and free space. This mode displays properties of the disk and its regions.



You can move the horizontal splitter to adjust the relative heights of both panes. To resize the volume and disk panes, place the pointer over the horizontal splitter and then press and hold the mouse button to drag the splitter to the desired position.

The menu bar at the top of the Object View window contains the following menus:

◆ **File**

The **File** menu provides access to the **New** menu, which creates volumes and file systems. The **File** menu also displays another disk group, prints the properties of a selected object, closes the Object View window, or provides access to an object Properties window.

◆ **Options**

The **Options** menu provides access to the **Volumes** and **Disks** menus, which set the display mode for all volumes or disks in the Object View and expand or collapse all volumes or disks. The **Options** menu also clears projection settings.

◆ **Window**

The **Window** menu launches a window that displays any dissociated objects or launches the Projection window.

◆ **Selected** (context sensitive)

The context-sensitive **Selected** menu accesses tasks or properties for a selected object. The **Selected** menu name and options depend on the type of object that is selected.

The toolbar at the top of the Object View window has the following set of buttons:

◆ **Expand Volume**

The **Expand Volume** button shows more detailed information about all volumes in the Object View. This button displays objects in layout mode or detailed mode, depending on the previous mode.

◆ **Collapse Volume**

The **Collapse Volume** button hides details for all volumes in the Object View. This button displays objects in layout mode or basic mode, depending on the previous mode.

◆ **Expand Disk**

The **Expand Disk** button shows more detailed information about all disks in the Object View. This button displays objects in layout mode or detailed mode, depending on the previous mode.

◆ **Collapse Disk**

The **Collapse Disk** button hides details for all disks in the Object View. This button displays objects in layout mode or basic mode, depending on the previous mode.



- ◆ **Project**

The **Project** button launches the Projection window.

- ◆ **Print**

The **Print** button prints the properties of a selected object.

The *toolbar handle* is the thin bar next to the toolbar. You can use the toolbar handle to separate the toolbar from the window or move the toolbar to the bottom, side, or top of the window. To reposition the toolbar, press and hold the mouse button over the toolbar handle and drag the toolbar to its new location.

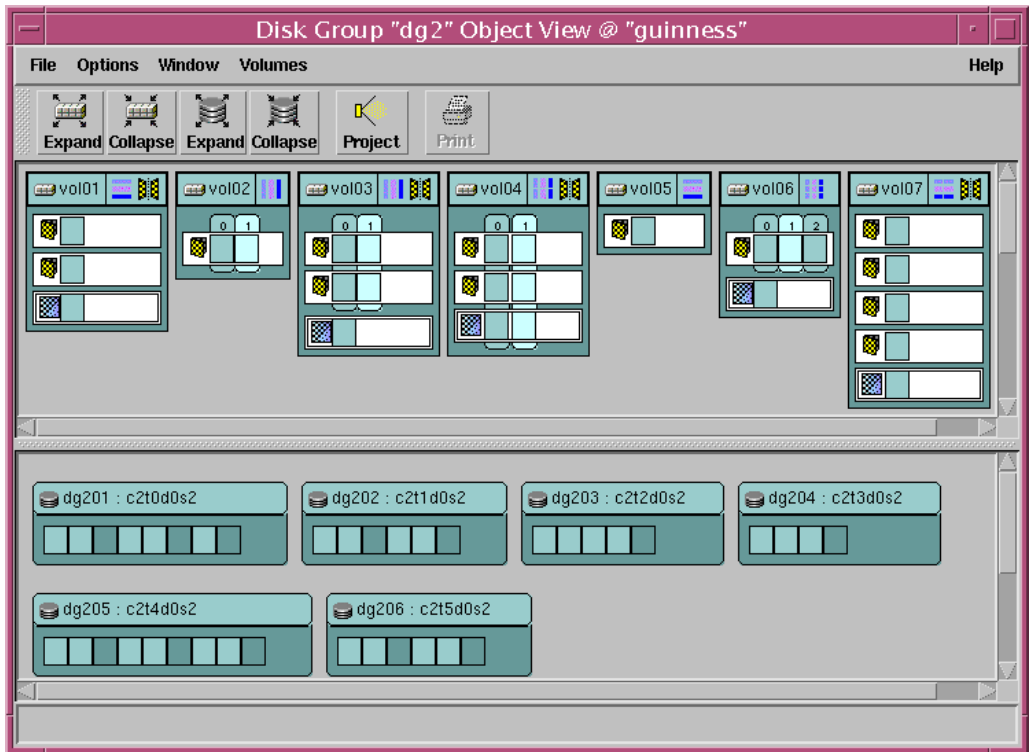
Projection shows the relationships between objects by highlighting objects that are related to or part of a specific object. When both disks and volumes are in layout mode or detailed mode, clicking on a subdisk in a volume (or disk) highlights the location of the subdisk on the corresponding disk (or volume). To access additional projection options, select an object in the Object View and then use the Projection window (**Window > Projection**) to choose the type of object to be highlighted.

In the Object View, you can move subdisks by dragging the subdisk icons to their new locations. You can drag a subdisk to another disk or a gap on the same disk. To move a subdisk, place the pointer over the subdisk and then press and hold the mouse button to drag the subdisk to another location. Note that moving subdisks reorganizes volume disk space and must be done with caution.

The Object View window displays plexes and subdisks that are associated with volumes. To view Volume Manager objects that are not associated with volumes (such as dissociated plexes), open the Dissociated Object View window (**Window > Show Dissociated**).

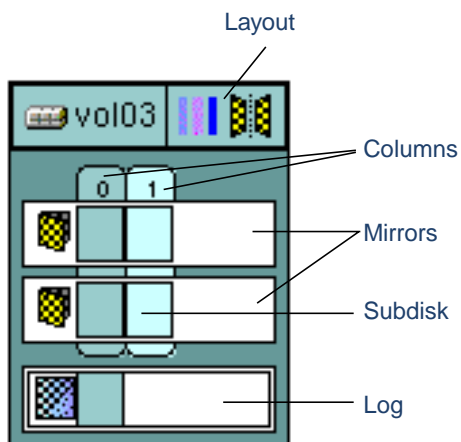
“[Object View Window](#)” on page 35 shows how volumes and disks appear in the Object View.

Object View Window



“Volume in Object View” shows how the components of a volume appear in the Object View.

Volume in Object View



Navigating the Object View Window

You can view objects in the Object View window using the following procedures:

- ❖ To display the Object View window, select a disk group (in the main window grid) and then choose **Disk Groups (Selected menu) > Object View**.
- ❖ To show the layouts and components of all volumes in the Object View window (layout mode), choose **Options > Volumes > Layout**.
- ❖ To compress all volumes in the Object View and show minimal information about each volume (basic mode), choose **Options > Volumes > Basic**.
- ❖ To show detailed information about all volumes in the Object View (detailed mode), choose **Options > Volumes > Layout** and then **Options > Volumes > Expand All**. To hide some of the details about the volumes, choose **Options > Volumes > Collapse All**.
- ❖ To show or hide details about a particular volume in the Object View, click on the volume icon on the left side of the volume. This expands or collapses the volume.
- ❖ To show the layouts and regions of all disks in the Object View window (layout mode), choose **Options > Disks > Layout**.

- ❖ To compress all disks in the Object View and show minimal information about each disk (basic mode), choose **Options > Disks > Basic**.
- ❖ To show detailed information about all disks in the Object View (detailed mode), choose **Options > Disks > Layout** and then **Options > Disks > Expand All**. To hide some of the details about the disks, choose **Options > Disks > Collapse All**.
- ❖ To show or hide details about a particular disk in the Object View, click on the disk icon on the left side of the disk. This expands or collapses the disk.
- ❖ To perform a task on an object in the Object View window, select the object and choose a task from the **Selected** or popup menu. To access the popup menu for an object, right-click on the object.
- ❖ To refresh the Object View window, right-click on the background area of the window and choose **Reset Server** from the popup window. Click **OK** in the **Reset Server** dialog box. This should update the contents of the Object View window and fix any display problems. Under normal circumstances, the Object View window automatically updates its contents to reflect object changes and does not require a manual refresh.
- ❖ To view the properties window for an object in the Object View window, select the object and choose **Properties** from the **Selected** or popup menu.
- ❖ To print the properties of a particular object, select the object and then choose **File > Print**.
- ❖ To close the Object View window, choose **File > Close**.



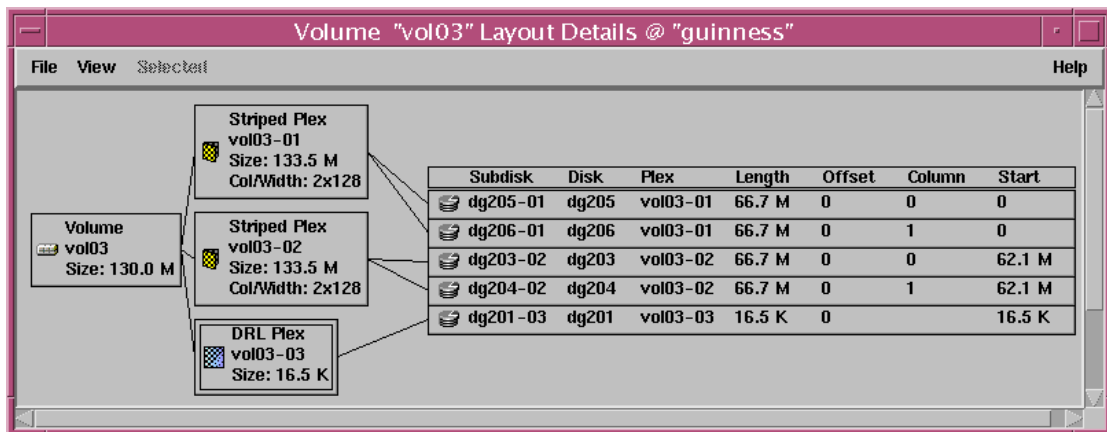
The Volume Layout Details Window

The Volume Layout Details window displays a graphical view of layout, components, and properties of the selected volume. You can select objects or perform tasks on objects in the Volume Layout Details window. The Volume Layout Details window is not dynamic, so the objects displayed in this window are not automatically updated when the volume properties change. For instructions on navigating the Volume Layout Details window, see “[Navigating the Volume Layout Details Window](#).”

The **File** menu changes or updates the contents of the Volume Layout Details window, prints information from the window, or closes the window. The **View** menu changes the way objects are displayed in this window. The context-sensitive **Selected** and popup menus access tasks or properties for a selected object. To access the popup menu for an object, right-click on the object.

“[Volume Layout Details Window](#)” shows how a volume appears in the Volume Layout Details view.

Volume Layout Details Window



Navigating the Volume Layout Details Window

You can view objects in the Volume Layout Details window using the following procedures:

- ❖ To display the Volume Layout Details window for a volume, click on the volume (in the main window grid) and then choose **Volumes (Selected menu) > Show Layout**.

- ❖ To update (refresh) the graphical view to show any recent changes to the current volume, choose **File > Update**. The Volume Layout Details window does not update object properties automatically.
- ❖ To view a different volume, choose **File > Open** and then specify another volume in the Open Volume dialog box.
- ❖ To hide the detailed information within each object, choose **View > Compress Display**. To show details for a particular object in the compressed display, click on that object.
- ❖ To highlight objects that are related to or part of a specific object, choose **View > Project On Selection** and then click on an object. To highlight any subdisks on the same disk as a specific subdisk, choose **View > Subdisk Projection** and then click on a subdisk.
- ❖ To print the properties of a particular object, select the object and then choose **File > Print** and complete the Print dialog box.

The Volume to Disk Mapping Window

The Volume to Disk Mapping window displays a tabular view of volumes and their underlying disks. Volumes are listed in the top row of the table and disks are listed in the left column of the table. Each circle icon in the table indicates that part of the corresponding volume is located on the corresponding disk.

This window can also display details such as the subdisks and gaps (free space) on each disk. Each subdisk or gap is listed with its disk offset and length. When subdisks are shown, circles show the relationship between volumes and subdisks.

The Volume to Disk Mapping window is dynamic, so the contents of this window are automatically updated when objects are added, removed, or changed. For instructions on navigating the Volume to Disk Mapping window, see “[Navigating the Volume to Disk Mapping Window](#)” on page 40.

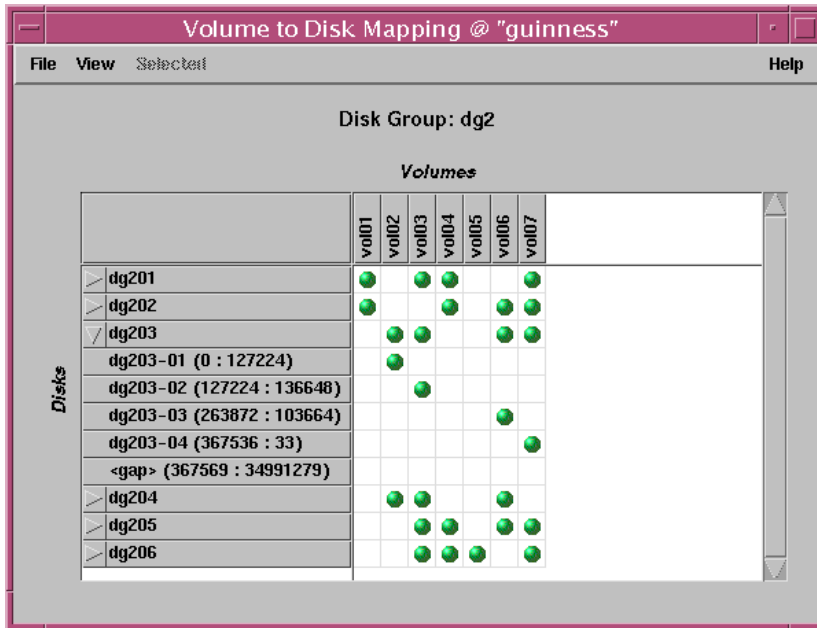
The File menu prints information from the window or closes the window. The **View** menu changes the way objects appear in the Volume to Disk Mapping window. The context-sensitive **Selected** and popup menus access tasks or properties for a selected object. To access the popup menu for an object, right-click on the object.

The Volume to Disk Mapping window has a performance monitoring feature that ranks volume response time. When performance monitoring is turned on (**View > Performance Monitoring**), the icons in the table change. The volumes with the slowest reads/writes are shown as red icons. Volumes with relatively slow response time are shown as yellow icons. All other volumes are shown as green icons.



“Volume to Disk Mapping Window” on page 40 shows how the relationships between volumes and disks are shown in the Volume to Disk Mapping window.

Volume to Disk Mapping Window



Navigating the Volume to Disk Mapping Window

You can view volumes and their associated disks using the following procedures:

- ❖ To display the Volume to Disk Mapping window for all volumes in a disk group, click on the disk group (in the main window grid) and then choose **Disk Groups (Selected menu) > Disk/Volume Map**.
- ❖ To display all of the subdisks and gaps on a particular disk, click the arrow to the left of the disk name. Any subdisks and gaps are listed below the disk name. To hide the subdisks and gaps, click the arrow again.
- ❖ To display all of the subdisks and gaps on all disks, choose **View > Expand All**. To hide all of the subdisks and gaps on all disks, choose **View > Collapse All**.
- ❖ To highlight a disk row, click on the disk name. To highlight a volume column, click on the volume name. To highlight both the disk and volume associated with a particular circle, click on the circle.

- ❖ To activate the performance monitoring feature, choose **View > Performance Monitoring**. Volumes with relatively slow read/write performance are shown as circular red icons.
- ❖ To change the criteria that determine which disks are displayed as slow performers, select **View > Perf. Monitoring Parameters** and complete the Performance Monitoring Parameters dialog box. This dialog box allows you to configure how many disks are shown as slowest and next slowest performers, the sampling interval, and whether to show the slowest performers for reading, for writing, or for both reading and writing.
- ❖ To print the properties of a particular object, select the object and then choose **File > Print** and complete the Print dialog box.

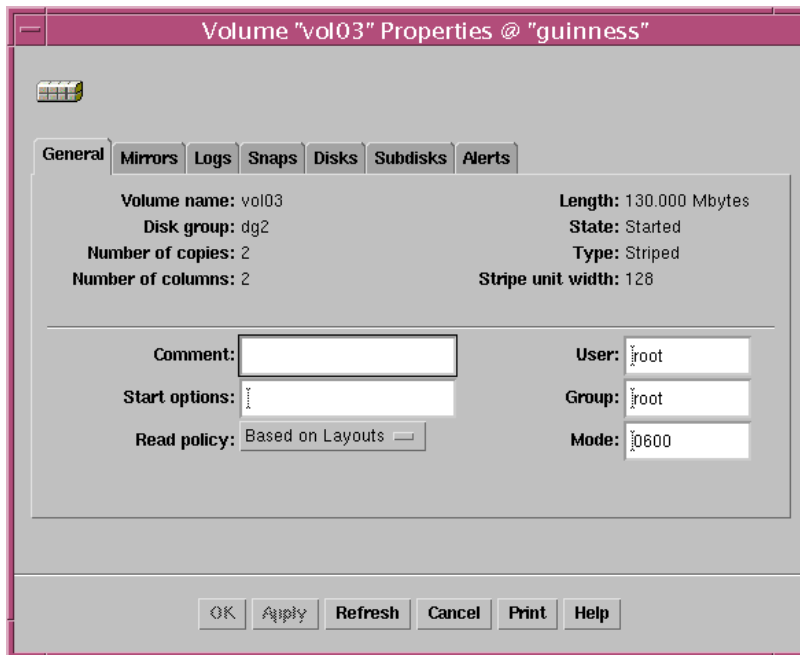
The Object Properties Window

The Object Properties window contains detailed information about the selected object. The Properties window contains a set of tabbed pages, each of which contains information about the object and related objects. The tab labels and page contents vary, depending on the type of object selected. You can display a different page by clicking on the appropriate tab label. Some object properties can be changed through the Properties window for the object. For instructions on navigating the Object Properties window, see “[Navigating the Object Properties Window](#)” on page 43.

“[Volume Properties Window](#)” shows how a volume appears in the Volume Properties window.



Volume Properties Window



Navigating the Object Properties Window

You can view object properties using the following procedures:

- ❖ To view the properties of an object, click on the object (in the main window grid) and then choose **Properties** from the **Selected** or popup menu. You can also access the Properties window by double-clicking on the object.

Example:

To display volume properties, either click on a volume and then choose **Volumes > Properties** or double-click on a volume.

Note that double-clicking on an object that has children may display the children of the object instead of the Properties window.

- ❖ To go to a tab in a properties window, click the appropriate tab label.
- ❖ To update the contents of the Properties window to reflect current properties for the object, click Refresh.
- ❖ To change any of the editable items in the Properties window, make the appropriate changes and then click **OK**. This changes the settings for *all* properties tabs in the Properties window.
- ❖ To print the contents of the Properties window, click Print and complete the Print dialog box.



Accessing Tasks

Most VERITAS Volume Manager Storage Administrator tasks are performed by selecting objects and/or tasks and then completing the resulting dialog boxes. With VERITAS Volume Manager Storage Administrator, you can access tasks from the following:

- ◆ the menu bar
- ◆ a context-sensitive popup menu
- ◆ the Command Launcher

This section describes how to run tasks from menus and the Command Launcher.

Running Tasks From the Menu Bar

You can launch tasks from the **File** and **Selected** menus in the main window menu bar, as shown in “[Menu Bar](#).” The **File > New** menu creates new VERITAS Volume Manager objects (volumes and disk groups) and file systems. The context-sensitive **Selected** menu launches tasks on a selected object. The **Selected** menu is dynamic and changes its name and options based on the type of object that is selected in the tree or grid.

Menu Bar



- ❖ To create a new object, choose the type of object to be created from the **File > New** menu. This launches a dialog box.

Example:

To create a volume, choose **File > New > Volume**. Complete the New Volume dialog box.

- ❖ To perform a task on an object with the **Selected** menu, select the object and choose the appropriate task from the **Selected** menu. If this launches a dialog box, complete the dialog box.

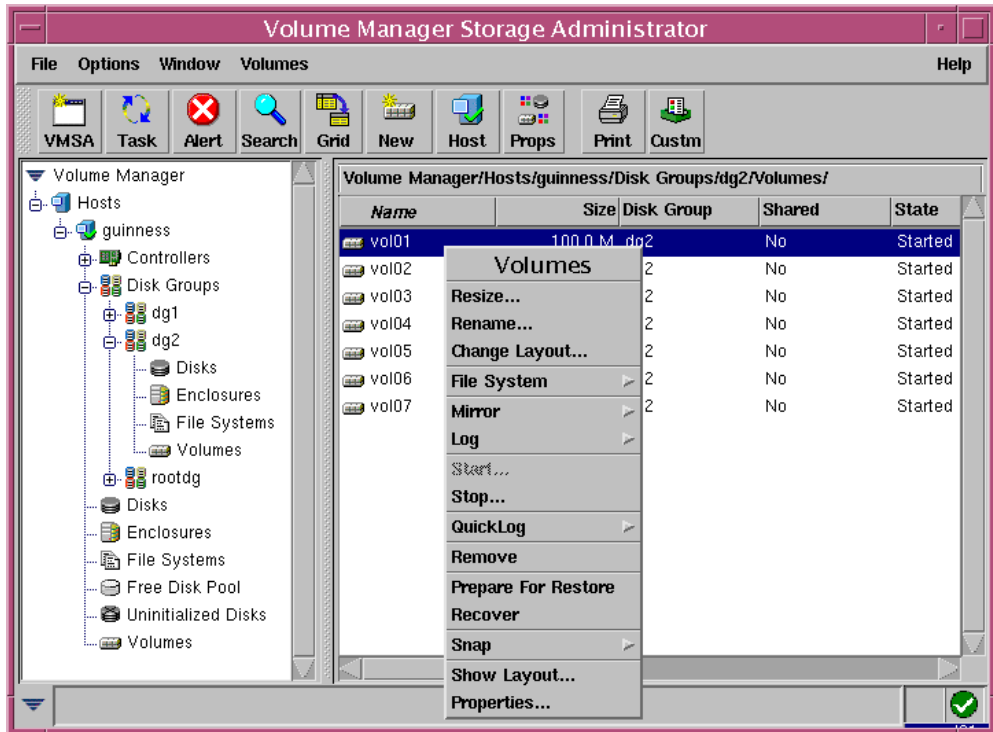
Example:

To change a volume name, select the volume in the grid. Choose **Volumes > Rename** from the **Selected** menu. Enter the new volume name in the Rename Volume dialog box; then click **OK**.

Running Tasks From a Popup Menu

A context-sensitive popup menu, as shown in “[Context-Sensitive Popup Menu](#),” launches tasks on the selected object. A popup menu provides access to tasks or options appropriate for the selected object. Popup menus are available in the main window and most other windows.

Context-Sensitive Popup Menu



- ❖ To perform a task on an object with the popup menu, right-click on the object and choose the appropriate task in the popup menu. If this launches a dialog box, complete the dialog box.



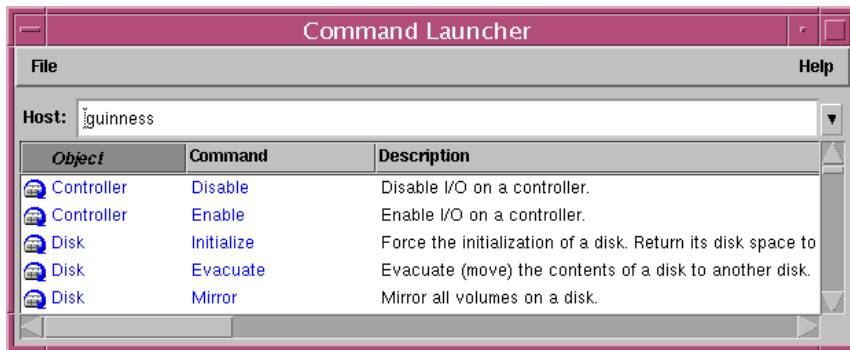
Running Tasks From the Command Launcher

The Command Launcher window, as shown in “[Command Launcher](#)” on page 46, launches tasks from a list of objects and associated Storage Administrator tasks. The Command Launcher lists each task with an object type and a task description.

The Command Launcher can be displayed as part of the main window (docked) or as a separate window. The Command Launcher can also be hidden. When the Command Launcher is attached to the main window, tasks are context sensitive. However, tasks are not context sensitive when the Command Launcher is separated from the main window.

The **File** menu attaches (docks) the Command Launcher to the main window and closes the Command Launcher window.

Command Launcher



You can use the Command Launcher as follows:

- ❖ To display the Command Launcher, choose **Window > Command Launcher** (from the main window). To hide the Command Launcher, choose **Window > Command Launcher** again. You can also show or hide the Command Launcher by choosing **Options > Customize** and clicking Show Command Launcher in the Main Window tab of the Customize window.
- ❖ To perform a task on a specific type of object, select the appropriate object-task combination from the Command Launcher list. Make sure that the **Hosts** field contains the name of the host machine where the task will be performed.

Example:

To add a disk, choose Disk Add from the Command Launcher list. Complete the Add Disk dialog box.

- ❖ To sort the items listed in the Command Launcher by object type, command, or task description, click on the appropriate column heading. To reverse the sort order in a column, click on the column heading again.
- ❖ To separate or attach (dock) the Command Launcher and the main window, choose **Options > Customize** and click Dock Command Launcher in the Main Window tab of the Customize window.
- ❖ To adjust the height of the Command Launcher when it is attached to the main window, choose **Options > Customize** and specify the new height (in pixels) in the Docked Command Launcher Height field in the Main Window tab of the Customize window. Alternatively, you can place the pointer over the horizontal splitter and then press and hold the mouse button to drag the splitter to the desired position.



Using Dialog Boxes

Administrators typically use dialog boxes to submit tasks or other requests to VERITAS Volume Manager Storage Administrator. Dialog boxes can contain selectable buttons and/or fields that accept information. Some dialog box fields contain default values that can be changed. Items that are not applicable are greyed out.

- ❖ To use a dialog box, select the appropriate items and/or enter the appropriate information and then click one of the following buttons to initiate or cancel the task/request:

OK	Perform the current task/request and close the dialog box.
Apply	Perform the current task/request and continue to display the dialog box.
Cancel	Cancel the current task/request and close the dialog box. (If you have already clicked Apply, this does not cancel the task that is in progress.)

Some dialog boxes contain the following buttons:

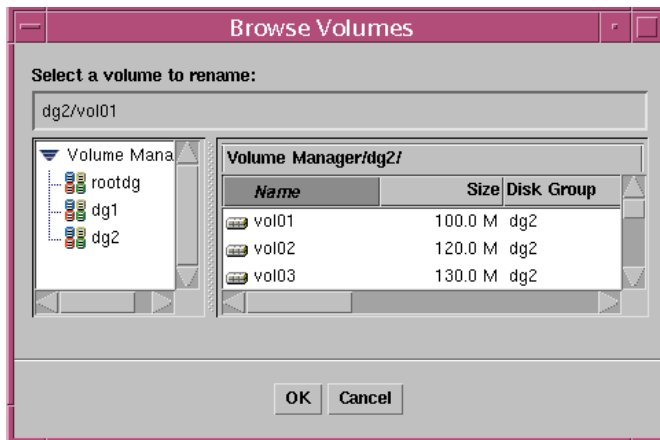
Browse	View and select existing objects.
Exit	Exit from VERITAS Volume Manager Storage Administrator.
Help	Display information about the contents of the dialog box.
Reset	Reset the contents of the dialog box (and any associated dialog boxes) to the default settings.
Show Options	Show optional settings for this task.
View	View existing objects.

Specifying Objects in Dialog Boxes

Most VERITAS Volume Manager Storage Administrator dialog boxes contain one or more object name fields. If you select an object before you launch the task, the resulting dialog box may include the name of the selected object. If the object name field is empty, you can specify an object using one of the following procedures:

- ◆ Enter the name of the object.
- ◆ Click the **Browse** button next to the object name field and then select the object from the resulting browse dialog box. Most browse dialog boxes consist of a tree (left pane) and grid (right pane). To select an object in a browse dialog box, click on the appropriate object group in the tree and then click on the desired object in the grid. “Browse Dialog Box” shows a sample browse dialog box.

Browse Dialog Box



In some cases, you can specify multiple objects (separated by white space) in a single field. To select multiple objects from a browse dialog box, hold down the Control key and click on each object. To select a range of adjacent objects, select the first object and then hold down the Shift key while selecting the last object in the range.

Specifying Disks and Disk Groups in Dialog Boxes

You can specify the disk group for an object by preceding the object name with the disk group name (*diskgroup_name/object_name*). The disk group name is required if there are multiple objects with the same name (in different disk groups) on the system.



Disks in disk groups have two names, as follows:

- ◆ *device name*

The physical disk device name (or *disk access name*).

- ◆ *disk name*

The VERITAS Volume Manager disk name (or *disk media name*). This is the logical name given to the disk by the VERITAS Volume Manager or the administrator.

Some dialog box fields require the device name and others require the VERITAS Volume Manager disk name.

Specifying Object Sizes in Dialog Boxes

When you enter the size of an object in an input field, you can specify sectors, kilobytes, megabytes, or gigabytes by appending an *s*, *k*, *m*, or *g* to the size. If you do not specify a size unit, the size defaults to sectors.

Viewing Commands

VERITAS Volume Manager Storage Administrator logs all task requests. You can view the VERITAS Volume Manager Storage Administrator task history (including tasks in progress) in either of these locations:

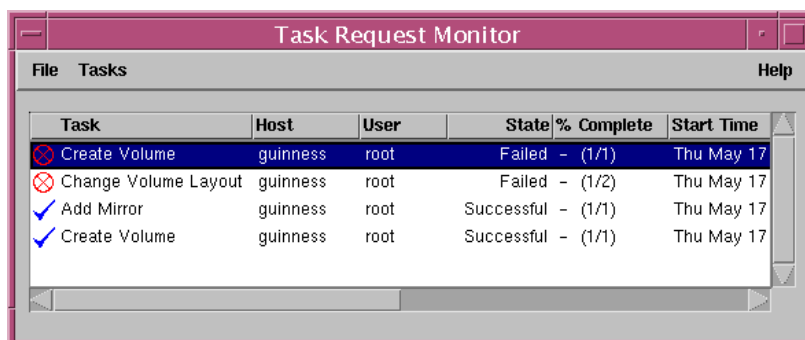
- ◆ The Task Request Monitor Window
- ◆ The Command Log File

The Task Request Monitor Window

The Task Request Monitor window, as shown in “[Task Request Monitor](#)” on page 51, displays a history of tasks performed in the current session (and any other sessions running on the machine). Each task is listed with properties such as the user who performed the task, the task status, and the start/finish times.

The **File** menu removes finished tasks or closes the window. The **Tasks** and popup menus stop/restart tasks and access task properties.

Task Request Monitor



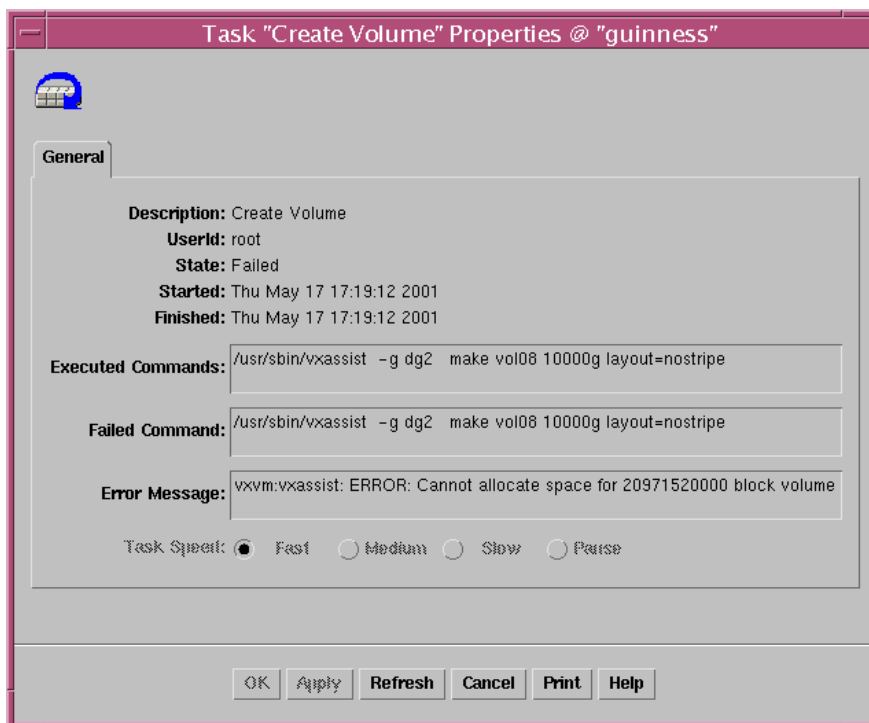
You can use the Task Request Monitor window as follows:

- ❖ To display the Task Request Monitor, choose **Window > Tasks** (from the main window) or click on the **Task** button in the toolbar.
- ❖ To cancel a selected task, choose **Tasks > Abort**. To temporarily stop a task, choose **Tasks > Pause**. To continue a task, choose **Tasks > Resume**.
- ❖ To view task properties and the low-level commands used to perform a task, select the task and choose **Properties** from the **Tasks** or popup menu. You can also access task properties by double-clicking on the task.
- ❖ To sort the tasks by task type, click on the Task column heading. To sort the tasks by property, click on the appropriate property column heading. To reverse the sort order, click on the column heading again.
- ❖ To remove completed tasks from the window, choose **File > Remove Finished Tasks**.
- ❖ To print the contents of this window, choose **File > Print Grid** and complete the Print dialog box. To print details about a specific task, select the task, choose **File > Print**, and then complete the Print dialog box.



The Task Properties window, as shown in “[Task Properties Window](#),” shows information about a specific task. Task properties include the user who performed the task, the task status, the start/finish times, and the low-level commands used to perform the task. For failed tasks, the Task Properties window includes any relevant error messages. You can copy commands from the Executed Commands field to the command line or a script file.

Task Properties Window



The Command Log

The command log file contains a history of VERITAS Volume Manager Storage Administrator tasks performed in the current session and previous sessions. The command log file contains a description of each task, along with properties such as the user who performed the task, the task status, the start/finish times, and the low-level commands used to perform the task. For failed tasks, the command log includes any relevant error messages.

By default, the command log is located in `/var/opt/vmsa/logs/command` on the server. You can view the command log file through the VERITAS Volume Manager Storage Administrator Command Log View window.

The following example shows some sample command log file entries:

```

Create Volume
Description: Create Volume
User: root
Started: November 18, 2000 4:36:11 PM PDT
Finished: November 18, 2000 4:36:12 PM PDT
State: Successful
Executed Commands:
    /usr/sbin/vxassist -g rootdg make vol15 3m layout=nostripe

Create Volume FAILED!
Description: Create Volume
User: root
Started: November 18, 2000 4:36:56 PM PDT
Finished: November 18, 2000 4:36:56 PM PDT
State: Failed
Executed Commands:
    /usr/sbin/vxassist -g rootdg make vol16 13g layout=nostripe
Failed Command: /usr/sbin/vxassist -g rootdg make vol16 13g
layout=nostripe
Error Message: vxvm:vxassist: ERROR: Cannot allocate space for
27262976 block volume

```

- ❖ To access the Command Log View window, select a host and choose **Hosts > View Command Log**.
- ❖ To update the contents of the Command Log View window, choose **File > Refresh**.
- ❖ To search for some specific text in the Command Log View window, choose **Window > Find** and complete the Find dialog box.
- ❖ To close the Command Log View window, choose **File > Close**.



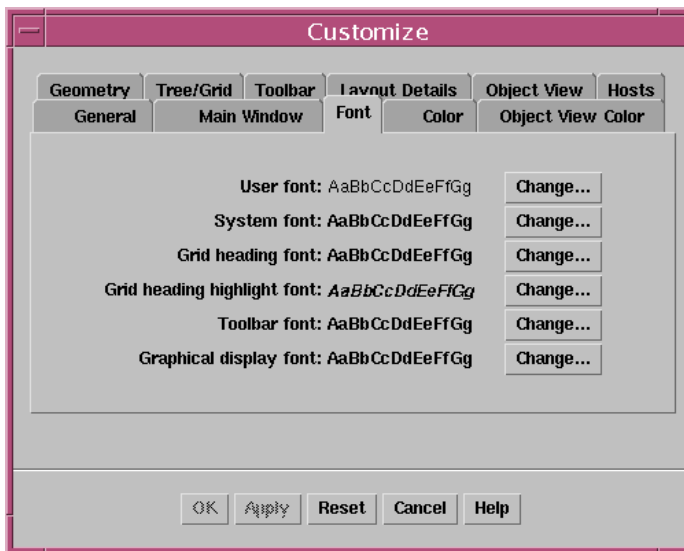
Setting User Preferences

You can change the way items appear in VERITAS Volume Manager Storage Administrator windows. This section describes how to use the Customize window to customize the way VERITAS Volume Manager Storage Administrator appears.

The Customize Window

The Customize window, as shown in “[Customize Window](#),” displays current user preferences for the components of VERITAS Volume Manager Storage Administrator and allows you to change these settings. The Customize window contains a set of tabbed pages, each of which contains preference options for a particular aspect of VERITAS Volume Manager Storage Administrator. You can display a different page by clicking on the appropriate tab label.

Customize Window



You can use the Customize window as follows:

- ❖ To display the Customize window, choose **Options > Customize** (from the main window) or click on the **Customize** button in the toolbar.
- ❖ To change preference settings, make the appropriate selections in the Customize window, then click **OK**. This changes the settings for *all* tabs in the Customize window. To reset the settings to the previous settings, click **Reset** (before you click **OK**).

When you change preference settings, the customization change icon appears in the tab label of the tab that contains changes. This icon disappears when you click **OK**, **Apply**, or **Reset**. The customization change icon also appears in the status area of the main window.

- ❖ To save your preference settings and apply them to future VERITAS Volume Manager Storage Administrator sessions, choose **Options** > Save Customization. You can also save your preference settings by clicking the customization change icon in the status area.

If the Auto-Save Preferences on Exit preference is set (in the **General** tab), VERITAS Volume Manager Storage Administrator saves all of your preference settings when you exit VERITAS Volume Manager Storage Administrator using the **File** menu.

VERITAS Volume Manager Storage Administrator saves user preferences in *user's_home_directory/.vmsa/VMpreference.prf* on the machine where the client is running.

- ❖ To reload your previously saved preferences, choose **Options** > **Load Customization**.

The Customize window contains the following preference tabs:

- ◆ [General](#)
- ◆ [Main Window](#)
- ◆ [Font](#)
- ◆ [Color](#)
- ◆ [Object View Color](#)
- ◆ [Geometry](#)
- ◆ [Tree/Grid](#)
- ◆ [Toolbar](#)
- ◆ [Layout Details](#)
- ◆ [Object View](#)
- ◆ [Hosts](#)

The following sections summarize the preference settings available in each of these tabs.



General

Set the following general preferences:

Set Text Field Input to Replace Mode	Set user input to replace mode. This highlights any existing text in a field and replaces that text with the new text.
Show Task Options	Show/hide optional settings in task dialog boxes.
Show Confirmation Dialogs	Show/hide confirmation dialogs for tasks that may have serious consequences (such as data loss). Confirmation dialogs require users to confirm that a task should be performed. Confirmation dialogs typically appear for tasks that remove objects. Note If you hide confirmation dialogs, most tasks are performed immediately and without any form of confirmation.
Auto-Save Preferences on Exit	Save all current user preferences when the user exits VERITAS Volume Manager Storage Administrator using File > Exit .
Flush Images	Draw images slightly slower than usual to prevent the X server from growing. This is recommended if you plan to leave VERITAS Volume Manager Storage Administrator running for long periods of time.
Dynamic Splitter	Redraw the contents of the window panes while the splitter is being moved to resize the panes.
Default Display Unit	Set the default size unit for areas that display object sizes. If Best Choice is set, VERITAS Volume Manager Storage Administrator uses an appropriate size unit.
Summary Decimal Precision	Set the decimal point precision for object sizes displayed in the grid and other areas that display summaries.
Task Decimal Precision	Set the decimal point precision for object sizes displayed in task-related dialog boxes and areas that display detailed information.



Main Window

Set the following preferences for the main window:

Show Status Bar	Show/hide the status bar area (at the bottom of the main window). The status bar displays alert icons when failures or errors occur.
Show Command Launcher	Show/hide the Command Launcher. The Command Launcher contains a list of selectable tasks.
Dock Command Launcher	Attach/detach the Command Launcher and the main window.
Docked Command Launcher Height	Set the height of the Command Launcher portion of the main window.

Font

Set the font size, family, and style for the following:

User Font	Set the font for user input and objects displayed in the tree and grid.
System Font	Set the font for labels, menus, buttons, and other items displayed by VERITAS Volume Manager Storage Administrator.
Grid Heading Font	Set the font for grid headings.
Grid Heading Highlight Font	Set the font for grid headings that are highlighted for sorting purposes.
Toolbar Font	Set the font for the toolbar buttons.
Graphical Display Font	Set the font for objects in the Volume Layout Details window.

- ❖ To access the Font Selector, click **Change**. Change the font size using the **Size** slider. Use the Family and Style options to change the font family and style.



Color

Set the following preferences for colors:

Background Color	Set the background color for all VERITAS Volume Manager Storage Administrator windows.
Foreground Color	Set the color for foreground text in VERITAS Volume Manager Storage Administrator windows.
Tree/Grid Color	Set the background color for the tree and grid.
Connecting Line Color	Set the color for the lines that connect items in the tree.
Selection Color	Set the color for selected items.
Selection Foreground Color	Set the color for foreground text in selected items.
Focus Highlight Color	Set the color for the item that has input focus.
Link Color	Set the color for links (such as the links to tasks in the Command Launcher).
Projection Color	Set the color for the lines that show object relationships in the Volume Layout Details window.

- ❖ To access the Color Selector, click **Change**. Change colors by clicking on a color in the color wheel or sliding the **Red**, **Green**, **Blue**, and **Brightness** sliders to the appropriate positions.



Object View Color

Set the following preferences for colors in the Object View window:

Disk Titlebar Color	Set the color of the titlebar for disks in the Object View.
Disk Body Color	Set the background color for disks in the Object View.
Disk Gap Color	Set the color for gaps (free space) on disks in the Object View.
Plex Gap Color	Set the color for gaps in plexes in the Object View.
Dissociated Subdisk Color	Set the color for dissociated subdisks in the Object View.
Odd Column Color	Set the color for odd-numbered columns in volumes in the Object View.
Even Column Color	Set the color for even-numbered columns in volumes in the Object View.
Plex Body Color	Set the background color for plexes in the Object View.
Dissociated Plex Color	Set the color for dissociated plexes in the Object View.
Volume Titlebar Color	Set the color of the titlebar for volumes in the Object View.
Volume Body Color	Set the background color for volumes in the Object View.
Unavailable Volume Color	Set the color for inaccessible volumes in the Object View.
Object Border Color	Set the color for object borders in the Object View.

- ❖ To access the Color Selector, click **Change**. Change colors by clicking on a color in the color wheel or sliding the **Red**, **Green**, **Blue**, and **Brightness** sliders to the appropriate positions.



Geometry

Set the width and height (in pixels) for the following windows:

- ◆ Main Window
- ◆ Object Search Window
- ◆ Alert Monitor Window
- ◆ Task Request Monitor Window
- ◆ Volume Layout Details Window
- ◆ Command Launcher Window
- ◆ Grid Copy Window
- ◆ Object View Window
- ◆ Dissociated Object View Window

If you resize one of these windows via your window manager, the Geometry preference for that window changes to the new size automatically.

Tree/Grid

Set the following tree and grid preferences:

Display Full Path	Display path information in the tree and grid.
Auto Scroll Grid	When an object is added or changed, scroll through the objects until the new/changed object is visible in the grid.
Double-Click Always Displays Properties	When the administrator double-clicks on an object, always display the properties window for the object. If this preference is not set, double-clicking on an object with children (such as a disk group) displays the object children instead of its properties window.
Splitter Position	Move the splitter to adjust the relative sizes of the tree and grid panes.
Column Header Alignment	Align column headings above the data in each column (best fit) or at the left, right, or center of each column.
Selector Tree/Grid Width	Set the width (in pixels) of the tree and grid in browse dialog boxes that contain a tree and a grid.



Selector Grid Width	Set the width (in pixels) of the grid in browse dialog boxes that contain a grid only.
Visible Selector Rows	Set the number of rows displayed in the tree and grid in browse dialog boxes.

Toolbar

Set the following preferences for the toolbar:

Show Toolbar	Show/hide the toolbar.
Position	Place the docked toolbar at the top, bottom, or side of the main window.
Presentation	Display icons and/or labels on the buttons in the toolbar.

Layout Details

Set the following preferences for the Volume Layout Details window:

Compress Display	Compress the graphical display of objects so that details are hidden.
Projection on Selection	When an object is selected, highlight objects that are related to or part of that object.
Subdisk Projection	When a subdisk is selected, highlight other subdisks on the same disk.



Object View

Set the following preferences for the Object View window:

Use Volume Basic Mode	Display volumes in basic mode by default.
Expand Volumes Within Mode	Display expanded view of volumes (layout mode) by default.
Use Disk Basic Mode	Display disks in basic mode by default.
Expand Disks Within Mode	Display expanded view of disks (layout mode) by default.
Enable Drag and Drop	Allow administrators to move subdisks by dragging subdisk icons to new locations within the Object View.
Splitter Position	Move the splitter to adjust the relative sizes of the volume and disk panes.
Start Drag Tolerance	Set the number of pixels the mouse must move before drag and drop is activated.

Hosts

Set the following preferences for accessing and displaying host machines:

Connect	Automatically connect to the specified host at VERITAS Volume Manager Storage Administrator startup.
Default Host	Use this host machine as the default host.
Auto-Expand	In the main window object tree, expand the specified host node and display the hierarchy under that host.

- ❖ To specify a host machine, click **Add** and enter the host machine name in the Hosts column of the grid. To select a preference for the host, click in the appropriate column. Check marks indicate which preferences are selected for the corresponding host. To turn off a host preference setting, click on the appropriate check mark.
- ❖ To remove a host machine from the host preferences list, select the host and click **Delete**.



- ❖ To clear the settings for all hosts in the preferences list, click **Clear**.
- ❖ To turn on the Connect setting for all listed hosts, click **Connect All**.
- ❖ To change a host name, select the host and either click the **Edit** button or use the following keys:

F2	Insert mode
Any key	Replace mode
Return	Apply change
Esc	Cancel change



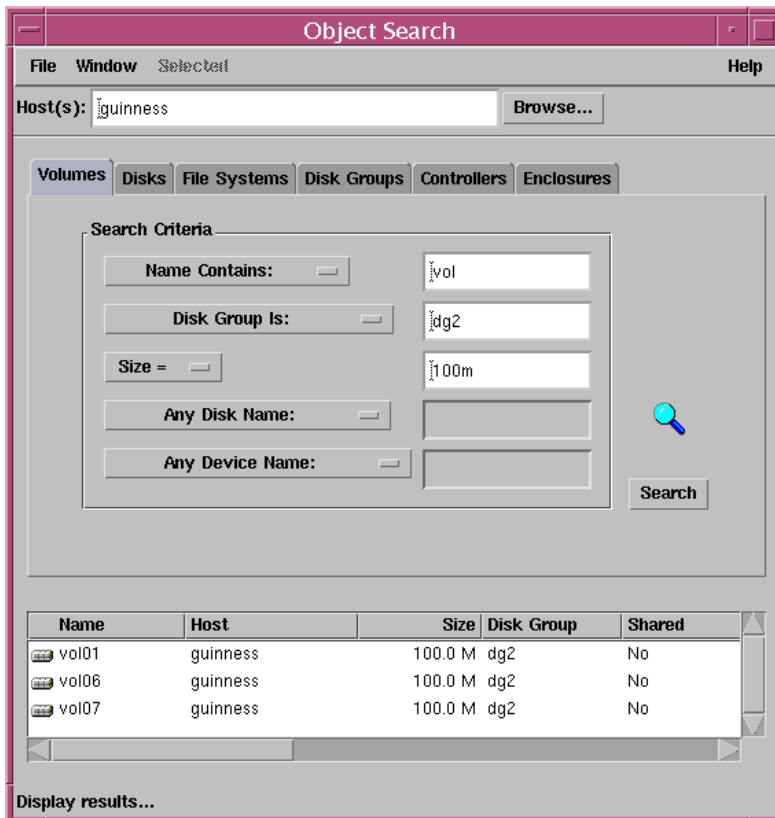
Searching for Objects or Free Space

The Search window, as shown in “[Object Search Window](#),” searches the specified host machines for objects that match the specified search criteria. Any objects that match the search criteria are listed in the grid in the lower half of the search window, along with their properties. Objects displayed in the search window are monitored and removed from the window if they no longer meet the current search criteria.

The Search window contains a set of tabbed pages, each of which contains search options for a particular type of object. You can display a different page by clicking on the tab label.

The Search window has menus similar to those in the main menu. The File menu prints information from the window or closes the window. The Window menu opens other windows or a copy of the current search results grid. The context-sensitive **Selected** and popup menus access tasks or properties for a selected object in the search results grid. To access the popup menu for an object, right-click on the object in the lower half of the Search window.

Object Search Window



You can use the Search window as follows:

- ❖ To display the Search window, choose **Window > Search** (from the main window) or click on the Search button in the toolbar.
- ❖ To begin a search, enter your search criteria and then click **Search**. Make sure that the Hosts field contains the name of the host machines where the search will be performed.
- ❖ To sort the objects in the search results grid by name or property, click on the appropriate column heading. To reverse the sort order, click on the column heading again.
- ❖ To view the properties of an object listed in the search results grid, select the object and choose **Properties** from the **Selected** or popup menu. You can also access object properties by double-clicking on the object.
- ❖ To open a window that contains a copy of the current search results grid, choose **Window > Copy Search Grid**. To open another Search window, choose **Window > Search**.
- ❖ To perform a task on an object listed in the search results grid, select the object and choose a task from the **Selected** or popup menu.
- ❖ To print the contents of the search results grid, choose **File > Print Grid** and complete the Print dialog box. To print details about a specific object displayed in the search results grid, select the object, choose **File > Print**, and then complete the Print dialog box.

Responding to Alerts

When an object fails or experiences an error, an alert icon appears in the status area of the main window and/or on the object icon (see “[Alerts for a Volume](#)” on page 66). If an alert icon appears, you should review the contents of the Alert Monitor window. The Alert Monitor window lists information about objects that have failed or experienced other errors (see “[Alert Monitor Window](#)” on page 67). Each object is listed with a description of the failure or error.

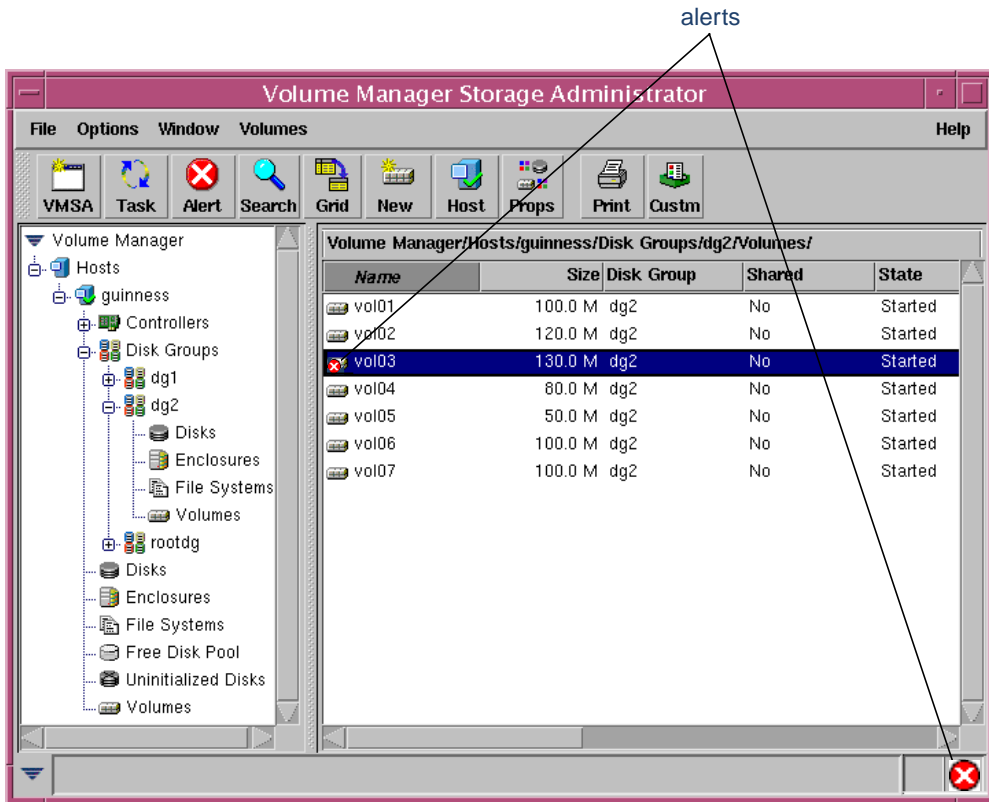
After you review the alerts listed in the Alert Monitor window, the alert icon at the bottom of the main window changes to a check mark to let you know that you have reviewed current alerts. If more alerts are added to the Alert Monitor window, the check mark icon changes to the alert icon to let you know that there are new alerts.



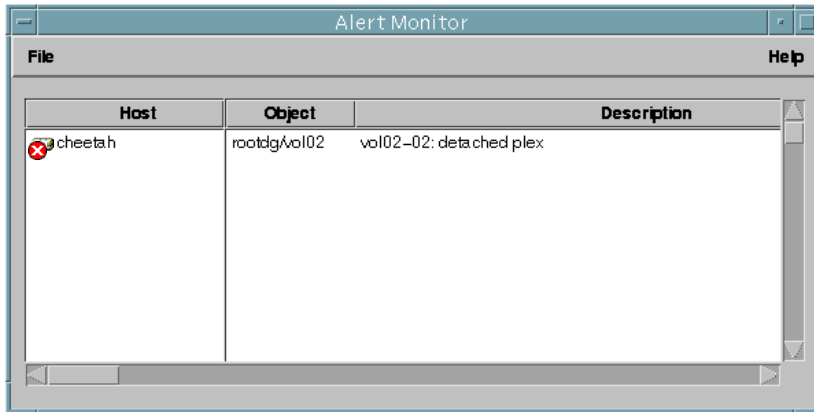
The **File** menu accesses properties for objects with alerts or closes the window. Context-sensitive popup menus also access properties for objects with alerts. To access a popup menu, right-click on an object with an alert.

After reviewing the alerts in the Alert Monitor window, you should try to correct the problem. For more information about an object listed in the Alert Monitor window, go to the Properties window for the object.

Alerts for a Volume



Alert Monitor Window



You can use the Alert Monitor window as follows:

- ❖ To display the Alert Monitor window, choose **Window > Alerts** (from the main window) or click on the Alert button in the toolbar. You can also access the Alert Monitor window by clicking on the alert icon in the status area.
- ❖ To sort alerts by object or description, click on the appropriate column heading. To reverse the sort order, click on the column heading again.
- ❖ To view the properties of an object with an alert, select the object and choose **Object Properties** from the **File** or popup menu. You can also access object properties by double-clicking on the object.
- ❖ To acknowledge and clear the alert icon displayed in the status area of the main window, choose **Options > Clear Alert Status**.



Printing

You can print the contents of some VERITAS Volume Manager Storage Administrator windows. In some cases, you can print information about a specific object instead of the contents of the window.

- ❖ To print the contents of a VERITAS Volume Manager Storage Administrator window, choose **File > Print Grid** and complete the Print dialog box.
- ❖ To print details about a specific object displayed in the window, select the object, choose **File > Print**, and then complete the Print dialog box.
- ❖ To print the contents of a Properties window, click the **Print** button and complete the Print dialog box.

Exiting the Storage Administrator

- ❖ To exit the VERITAS Volume Manager Storage Administrator client, choose **File > Exit**.

Introduction

This chapter describes how to set up and use disks and disk groups with the VERITAS Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator). The Disk Task Roadmap at the beginning of this chapter contains a summary of common disk and disk group tasks.

The following disk tasks are discussed in this chapter:

- ◆ Adding a Disk to VxVM
- ◆ Scanning Disks
- ◆ Designating a Disk as a Hot-Relocation Spare
- ◆ Reserving a Disk
- ◆ Renaming a Disk
- ◆ Offlining a Disk
- ◆ Onlining a Disk
- ◆ Mirroring a Disk
- ◆ Evacuating a Disk
- ◆ Disconnecting a Disk
- ◆ Replacing a Disk
- ◆ Unrelocating a Disk
- ◆ Recovering Volumes on a Disk
- ◆ Removing a Disk
- ◆ Forcing Initialization of a Disk
- ◆ Viewing Disk Properties
- ◆ Disabling a Controller
- ◆ Enabling a Controller



- ◆ **Renaming an Enclosure**

The following disk group tasks are discussed in this chapter:

- ◆ **Creating a Disk Group**
- ◆ **Upgrading a Disk Group**
- ◆ **Renaming a Disk Group**
- ◆ **Deporting a Disk Group**
- ◆ **Importing a Disk Group**
- ◆ **Recovering Volumes in a Disk Group**
- ◆ **Clearing Relocation Information for a Disk Group**
- ◆ **Destroying a Disk Group**
- ◆ **Moving Objects Between Disk Groups**
- ◆ **Splitting A Disk Group**
- ◆ **Joining Disk Groups**
- ◆ **Activating a Disk Group**
- ◆ **Viewing Disk Group Properties**



Disk Task Roadmap

The following table provides a summary of common VERITAS Volume Manager Storage Administrator disk and disk group tasks.

To perform this task ...	Use this procedure ...
<i>Disk Setup Tasks:</i>	
Place new disks under VERITAS Volume Manager (VxVM) control	Adding a Disk to VxVM
Set up new disk groups	Creating a Disk Group
<i>Precautionary Tasks:</i>	
Add disks as hot-relocation spares	Designating a Disk as a Hot-Relocation Spare
Place the boot (root) disk under Volume Manager control	Adding a Disk to VxVM
Make an alternate boot (root) disk	Mirroring a Disk
<i>Maintenance Tasks:</i>	
Place additional disks under VxVM control	Adding a Disk to VxVM
Add more disk space to a disk group	Adding a Disk to VxVM
Create additional disk groups	Creating a Disk Group
Upgrade a disk group	Upgrading a Disk Group
<i>Recovery Tasks:</i>	
Move volumes off failing disks	Evacuating a Disk
Replace failed disks	Replacing a Disk
Attempt to recover all volumes on a disk	Recovering Volumes on a Disk
Attempt to recover all volumes in a disk group	Recovering Volumes in a Disk Group
<i>Other Tasks:</i>	
Change a disk name	Renaming a Disk
Change a disk group name	Renaming a Disk Group
Move objects between disk groups	Moving Objects Between Disk Groups
Split a disk group	Splitting A Disk Group
Join disk groups	Joining Disk Groups
Temporarily prevent access to a disk	Offlining a Disk
Restore access to an offline disk	Onlining a Disk



To perform this task ...	Use this procedure ...
Temporarily prevent access to a disk group	Deporting a Disk Group
Restore access to a deported disk group	Importing a Disk Group
Remove a disk from VxVM control	Removing a Disk
Destroy a disk group (permanently)	Destroying a Disk Group



Adding a Disk to VxVM

New disks must be set up on the system, placed under VxVM control, and added to a disk group before they can be used for volumes. The **Disks > Add** task performs these tasks to prepare new disks for VxVM use. You can also use this task to add a disk to a disk group.

When you place a disk under VxVM control, the disk is either encapsulated or initialized. Encapsulation preserves any existing data on the disk in volumes. Initialization destroys any existing data on the disk.

If you place the root disk under VxVM control, you must encapsulate the disk. If you want to create an alternate boot disk, you can mirror the encapsulated root disk (see “[Mirroring a Disk](#)” on page 83).

This task assigns a default VERITAS Volume Manager disk name to the disk. Once the disk is under VxVM control, you can use the **Rename Disk** task to change the VERITAS Volume Manager disk name (see “[Renaming a Disk](#)” on page 80).

▼ To add a disk to the Volume Manager

1. If the disk is brand new, select the appropriate host machine node and choose **Hosts > Scan Disks (Selected menu)** to set up the disk on the system. This runs the disk setup commands appropriate for the operating system.
2. Select the uninitialized disk to be placed under VxVM control.
3. Choose **Disks > Add (Selected menu)** or **Disk Add (Command Launcher)**.
4. Complete the Add Disk(s) dialog box as follows:

Disk Device(s):	<p>If the correct disk (device) name does not already display in this field, enter the disk device name or click Browse to select the disk.</p> <p>To set up any new disks on the system, click Scan Disks. The Scan Disks procedure runs the disk setup commands appropriate for the operating system.</p>
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<p>Add Disk(s) to:</p>	<p>Specify where to place the disk(s):</p> <ul style="list-style-type: none"> - To add the disk(s) to an existing disk group, select Existing Disk Group. Enter the disk group name in the Disk Group Name field or click Browse to select a disk group. - To add the disk(s) to a new disk group, select New Disk Group. Enter the name of the new disk group in the Disk Group Name field. The new disk group is created for the new disk. - To place the disk(s) in the free disk pool, select Free Disk Pool. Disks in the free disk pool are under VxVM control, but do not belong to a disk group and cannot be used to create volumes.
<p>Options</p>	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To create a shared disk group for the disk(s), select New Disk Group and Create Shared. The Create Shared option is only applicable in a cluster environment. - To specify the VERITAS Volume Manager disk name for the disk, enter a disk name in the Disk Name(s) field. If no VERITAS Volume Manager disk name is specified, VxVM assigns a default name to the disk. - To set the disk group activation mode, click Activation Mode and complete the Activate Disk Group dialog box. The activation mode controls read and write access to volumes in the disk group. - To apply a comment attribute to disks that are placed in a disk group, enter the information in the Comment field.

When you have provided all necessary information in the dialog box, click **OK**.

5. Indicate whether the disk should be initialized or encapsulated. If you initialize the disk, any existing data on the disk is destroyed. If you encapsulate the disk, any existing data is preserved in volumes.
6. If you chose to encapsulate the disk, reboot the system.

▼ **To place the root disk under VxVM control**

1. Select the root (boot) disk.
2. **Choose Disks > Add (Selected menu) or Disk Add (Command Launcher).**



3. Complete the Add Disk(s) dialog box as follows:

Disk Device(s):	If the correct disk (device) name does not already display in this field, enter the root disk name or click Browse to select the disk.
Add Disk(s) to:	Specify that the root disk should be placed in the root disk group. Select Existing Disk Group . Enter the root disk group name (<code>rootdg</code>) in the Disk Group Name field.

When you have provided all necessary information in the dialog box, click **OK**.

4. Indicate that the root disk should be *encapsulated*. When you encapsulate the disk, any existing data is preserved in volumes.
5. Reboot the system.

After placing the root disk under VxVM control, it is recommended that you create an alternate boot disk by mirroring the root disk (see “[Mirroring a Disk](#)” on page 83).

▼ **To add a disk to a disk group**

1. Select the disk to be added to a disk group.
2. Choose **Disks > Add (Selected menu)** or **Disk Add (Command Launcher)**.
3. Complete the Add Disk(s) dialog box as follows:

Disk Device(s):	If the correct disk (device) name is not already displayed in this field, enter the disk name or click Browse to select the disk.
Add Disk(s) to:	Specify where the disks should be placed: <ul style="list-style-type: none"> - To add the disks to an existing disk group, select Existing Disk Group. Enter the disk group name in the Disk Group Name field or click Browse to select a disk group. - To add the disks to a new disk group, select New Disk Group. Enter the name of the new disk group in the Disk Group Name field. The new disk group is created for the new disk.



Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To create a shared disk group for the disks, select New Disk Group and Create Shared. The Create Shared option is only applicable in a cluster environment. - To specify the VERITAS Volume Manager disk name for the disk, enter a disk name in the Disk Name(s) field. If no VERITAS Volume Manager disk name is specified, VxVM assigns a default name to the disk. - To apply a comment attribute to the disk, enter the information in the Comment field.
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When you have provided all necessary information in the dialog box, click **OK**.

<p>Notes:</p> <ul style="list-style-type: none"> - The Disks > Add task requires a disk device name and the location for the new disk (that is, a disk group or the free space pool). - The Disks > Add task sets up disks for VxVM use. Disks must be under VxVM control and in a disk group before they can be used to create volumes. - When a disk is placed under VxVM control, the disk is either initialized or encapsulated. Encapsulation preserves any existing data on the disk in the form of volumes. Initialization destroys any existing data on the disk. Encapsulation is recommended for the root/boot disk and any other disks that contain valuable data. - Disk encapsulation requires a system reboot. - Disks in the free disk pool must be added to a disk group before they can be used to create volumes. - Disks must be online before they can be added to a disk group or the free disk pool. - Disks that already belong to a disk group cannot be added to another disk group or placed in the free disk pool. - Disks cannot be added to deported disk groups. - The root disk must be placed in the root disk group (<code>rootdg</code>). If the root disk is placed in any other disk group, the root disk cannot be used to boot the system. - The VERITAS Volume Manager disk name must be unique within the disk group. - If multiple disks are specified in the Disk Device(s) field and only one disk name is specified in Disk Name(s) field, VxVM appends numbers to the disk name so that each disk name is unique within the disk group.
--



Scanning Disks

The **Scan Disks** procedure checks for new disks and runs the appropriate commands to set up any new disks. You can use this task to make sure that VxVM recognizes any new hardware.

▼ To scan disks

1. Select the host machine to be scanned for new disks.
2. Choose **Hosts > Scan Disks (Selected menu)** or **Disk Scan (Command Launcher)**.
3. Complete the Scan Disk dialog box as follows:

Host(s):	If the correct host name does not already display in this field, enter the host name or click Browse to select the host.
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Notes:

- New disks must be set up on the system before they can be used by VxVM.
- The **Scan Disks** task scans the system for new disks. If any new disks are found, this task runs the appropriate commands to set up the new disks on the system.



Designating a Disk as a Hot-Relocation Spare

The **Spare** option adds a disk to the pool of spare disks available to the hot-relocation feature. If an I/O failure occurs, hot-relocation automatically relocates any redundant (mirrored or RAID-5) subdisks to spare disks and restores the affected VERITAS Volume Manager objects and data. The system administrator is notified of the failure and relocation details via electronic mail. After successful relocation, you can replace the failed disk (see “[Replacing a Disk](#)” on page 86).

▼ To designate a disk as a hot-relocation spare

1. Follow the instructions in “[Adding a Disk to VxVM](#)” on page 73 to place the disk under VxVM control and in a disk group.
2. Select the disk to be designated as a hot-relocation spare.
3. Choose **Disks > Properties (Selected menu)**.
4. In the Disk Properties window, go to the **General** tab and select **Spare**. Click **OK**.

To remove the disk from the pool of hot-relocation spares, open the Disk Properties window and select **Spare** again.

Notes:

- Before you select the **Spare** option, make sure the disk is under VxVM control and in a disk group.
- Any disk in the same disk group can use the spare disk.
- To ensure that sufficient space is available for relocation, provide at least one hot-relocation spare disk per disk group.



Reserving a Disk

The **Reserve** option designates a disk as a reserved disk. A reserved disk is not considered part of the free space pool. If you perform a task that requires disk space and you do not specify a disk, VERITAS Volume Manager Storage Administrator allocates space from disks other than the reserved disk.

▼ To reserve a disk

1. Follow the instructions in “[Adding a Disk to VxVM](#)” on page 73 to place the disk under VxVM control and in a disk group.
2. Select the disk to be reserved.
3. Choose **Disks > Properties (Selected menu)**.
4. In the Disk Properties window, go to the **General** tab and select **Reserve**. Click **OK**.

To return a reserved disk to the free space pool, open the Disk Properties window and select **Reserve** again.

Notes:

- Before you select the **Spare** option, make sure the disk is under VxVM control and in a disk group.
- A reserved disk does not belong to the free space pool and is not available for general use.
- A reserved disk can only be used if you specify the reserved disk when you perform a task.



Renaming a Disk

The **Disk Rename** procedure changes the VERITAS Volume Manager name assigned to a disk. The VERITAS Volume Manager disk name is the name given to the disk by the administrator or VxVM. This procedure does not change the physical disk name (device name).

▼ To rename a disk

1. Select the disk to be renamed.
2. Choose **Disks > Rename (Selected menu)** or **Disk Rename (Command Launcher)**.
3. Complete the Rename Disk dialog box as follows:

Disk Name:	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
New Name:	Enter the new VERITAS Volume Manager disk name.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Rename** task requires the current disk name and a new disk name.
- The new disk name must be unique within the disk group.
- The disk must be in an imported disk group.



Offlining a Disk

The **Disk Offline** procedure prevents VxVM from accessing a disk. A disk must be removed from its disk group before it can be taken offline (see “[Removing a Disk](#)” on page 91). An offline disk remains unavailable until you restore access to the disk (see “[Onlining a Disk](#)” on page 82).

▼ To take a disk offline

1. Select the disk to be taken offline.
2. Choose **Disks > Offline (Selected menu)** or **Disk Offline (Command Launcher)**.
3. Complete the Offline Disk dialog box as follows:

Disk(s):	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
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When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- When a disk is offline, the disk cannot be accessed by VxVM.
- A disk can be taken offline to protect it from unintentional use. Disks should be taken offline if they are not accessible and attempts to access them may have a negative effect on the system.
- Only disks that do not belong to a disk group can be taken offline.
- Disks that are in use cannot be taken offline.



Onlining a Disk

The **Disk Online** procedure restores access to a disk that has been taken offline. The disk is placed in the free disk pool and is accessible to VxVM again. After bringing a disk back online, the disk must be added to a disk group before it can be used for volumes (see “[Adding a Disk to VxVM](#)” on page 73).

▼ **To bring a disk online**

1. Select the disk to be brought online.
2. Choose **Disks > Online (Selected menu)** or **Disk Online (Command Launcher)**.
3. Complete the Online Disk dialog box as follows:

Disk(s):	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
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When you have provided all necessary information in the dialog box, click **OK**.

Notes:
<ul style="list-style-type: none"> - When a disk is brought online, the disk is accessible again. - Only disks in the offline state can be brought online.

Mirroring a Disk

The **Disk Mirror** procedure mirrors (copies) all concatenated volumes on a disk onto another disk and sets up the target disk as a boot disk. This is a convenient way of creating an alternate boot (root) disk, which can be used to boot the system if the original boot disk fails. You can use this procedure to mirror any disk that contains concatenated volumes.

▼ To mirror all concatenated volumes on a disk

1. Select the disk that contains the concatenated volumes to be mirrored onto another disk.
2. Choose **Disks > Mirror (Selected menu)** or **Disk Mirror (Command Launcher)**.
3. Complete the Mirror Disk dialog box as follows:

Disk Name:	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
Options	To specify the disk to contain the new mirrors, click the Browse button next to the Target Disk(s) field and select a disk.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Mirror** task requires a disk name.
- The **Disk Mirror** task is typically used to mirror the contents of the boot disk onto another disk, which can be used as an alternate boot disk. After mirroring the root and swap volumes (which must be named `rootvol` and `swapvol`, respectively), this task sets up the target disk as a boot disk.
- Only concatenated volumes that reside on a single disk are mirrored onto the other disk. Any RAID-5, striped, or spanned volumes on the disk are ignored.
- Only disks in the same disk group can be used to create the new mirrors.
- The target disk must contain sufficient space to accommodate the mirrors.
- A new mirror cannot be created on a disk that already contains a copy of the volume.
- If no disks are assigned, VxVM uses available disk space to create the mirrors.



Evacuating a Disk

The **Disk Evacuate** procedure moves the contents of the volumes on a disk to another disk. If a disk begins to fail, you can attempt to protect/preserve the volumes on that disk by evacuating the disk. You can also evacuate a disk if you plan to remove the disk or use the disk elsewhere.

▼ To evacuate a disk

1. Select the disk that contains the objects and data to be moved to another disk.
2. Choose **Disks > Evacuate (Selected menu)** or **Disk Evacuate (Command Launcher)**.
3. Complete the Evacuate Disk dialog box as follows:

Disk Name:	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
Options	To specify the disks to which the contents of the evacuated disk should be moved, click the Browse button next to the Target Disk(s) field and select a disk.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Evacuate** task requires a disk name.
- The contents of a disk must be evacuated/moved to another disks in the same disk group with sufficient free space.
- If no target disk is specified, VxVM uses an available disks with sufficient free space.
- If the disk being evacuated contains part of a mirrored, striped, or RAID-5 volume, do not move the contents of the disk to another disk containing a copy of the mirrored volume or part of the striped/RAID-5 volume.



Disconnecting a Disk

The **Disconnect Disk** procedure disconnects a VERITAS Volume Manager disk from its underlying physical disk. You can disconnect a disk in preparation for the replacement of a physical disk. After disconnecting a disk, you can use the **Replace Disk** task to reconnect the disk (see “[Replacing a Disk](#)” on page 86).

▼ To disconnect a disk

1. Select the disk to be disconnected.
2. Choose **Hosts > Disconnect Disk (Selected menu)** or **Disk Disconnect (Command Launcher)**.
3. Complete the Disconnect Disk dialog box as follows:

Disk:	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
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When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disconnect Disk** task requires a disk name.
- Disconnecting a disk that contains volumes can result in loss of data or redundancy.



Replacing a Disk

The **Disk Replace** procedure replaces an existing disk with a new physical disk, moves any volumes to the new disk, and attempts to recover any redundant (mirrored or RAID-5) volumes on the disk. Non-redundant volumes cannot be recovered and must be restored from backup, if possible. If the disk being replaced is a boot disk, the **Disk Replace** procedure also sets up the new disk as a boot disk.

You may need to replace a disk if the disk fails and/or needs to be removed and repaired. You can use this task to reconnect a disk that has been disconnected in preparation for replacement (see “[Disconnecting a Disk](#)” on page 85).

If you replace a healthy disk, remove the disk from its disk group and place it in the free disk pool *before* you replace the disk (see “[Removing a Disk](#)” on page 91). If the disk to be replaced has failed and is disconnected, you do not need to remove the disk.

▼ To replace a disk

1. Select the disk to be replaced.
2. Choose **Disks > Replace (Selected menu)** or **Disk Replace (Command Launcher)**.
3. Complete the Replace Disk dialog box as follows:

Disk Name:	If the correct disk name does not already display in this field, enter the VERITAS Volume Manager disk name for the disk to be replaced or click Browse to select the disk.
New Physical Disk:	Enter the physical disk name for the new (replacement) disk or click Browse to select a disk.
Options	To set up any new disks on the system, click Scan Disks . The Scan Disks option runs the disk setup commands appropriate for the operating system.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Replace** task requires the name of the disk to be replaced and the replacement disk name.
- The disk to be replaced must be disconnected or removed from its disk group. If the disk has not failed, remove the disk from its disk group and put it in the free disk pool before you replace the disk.
- The new disk can be a disk in the free disk pool or an uninitialized disk. If the new disk is uninitialized, the **Disk Replace** task places the disk under Volume Manager control.
- The new disk is placed in the disk group of the old disk.



Unrelocating a Disk

The **Disk Unrelocate** procedure moves relocated subdisks back to the original disk. When a disk fails, the hot-relocation feature attempts to move subdisks from the failed disk to other disks. The **Disk Unrelocate** task can be used to return the relocated subdisks to their original disk locations after the original disk is repaired or replaced.

▼ To move relocated subdisks back to a disk

1. Select the disk that contained the subdisks before hot-relocation.
2. Choose **Disks > Unrelocate (Selected menu)** or **Disk Unrelocate (Command Launcher)**.
3. Complete the Unrelocate Disk dialog box as follows:

Disk Name:	If the original disk name does not already display in this field, enter the disk name or click Browse to select the disk. This is the disk that contained the subdisks before they were relocated.
Options	<ul style="list-style-type: none"> - To view subdisks that were relocated by the hot-relocation feature, click View Relocations. - To move the relocated subdisks to a disk other than the original disk, specify an alternate disk in the Alternate Destination Disk field. - To move the subdisks back to their original locations on the original disk, click Use Exact Offsets. If the original locations are not available, it may be necessary to turn off this option so that the subdisks can be moved to any available space on the disk.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Unrelocate** task requires the name of the original disk (even if an alternate disk is specified).
- When a disk fails, the hot-relocation feature attempts to move subdisks from the failed disk to other disks. The **Disk Unrelocate** task can be used to return the relocated subdisks to their original disk locations after the original disk is repaired or replaced.
- It is not possible to return relocated subdisks to their original disks after their disk group relocation information has been cleared with the **Clear Disk Group Relocation Information** task.



Recovering Volumes on a Disk

The **Disk Recover** procedure performs any necessary volume recovery operations on the volumes on a given disk. The recovery operations depend on the types of volumes on the disk and include starting disabled volumes, resynchronizing mirrors in mirrored volumes, and resynchronizing parity in RAID-5 volumes. After successful recovery, the volumes are again available for use.

Alert icons and the Alert Monitor window may provide clues to let you know that volume recovery is needed.

▼ **To recover all volumes on a disk**

1. Select the disk containing the volumes to be recovered.
2. Choose **Disks > Recover (Selected menu)** or **Disk Recover (Command Launcher)**.
3. Complete the Recover Disk dialog box as follows:

Disk(s):	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
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When you have provided all necessary information in the dialog box, click **OK**.

Note:

In some cases, recovery is not possible. If the volume recovery fails, you can attempt to restore the volume from backup.



Removing a Disk

The **Disk Remove** procedure removes a disk from its disk group and either places the disk in the free disk pool or removes the disk from VxVM control. If the disk is returned to the free space pool, the disk must be added to a disk group before it can be used for volumes (see “[Adding a Disk to VxVM](#)” on page 73).

If the disk to be removed contains volumes, you must evacuate the disk before you remove the disk.

▼ To remove a disk from a disk group or from VxVM control

1. Select the disk to be removed.
2. Choose **Disks > Remove (Selected menu)** or **Disk Remove (Command Launcher)**.
3. Complete the Remove Disk dialog box as follows:

Disk Name(s):	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
Select a destination for the disks:	Specify where to place the disk after removal: <ul style="list-style-type: none"> - To remove the disk from its disk group and place it in the free disk pool, select Free Disk Pool. The disk remains under VxVM control. - To remove the disk from VxVM control, select Uninitialized State.



When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Remove** task requires a disk name. You must also specify whether the disk is placed in the free disk pool or removed from VxVM control.
- If the disk contains a volume that has only one mirror and either has a mounted file system or is used as a swap area, you must evacuate the disk before you remove it.
- When a disk is removed from a disk group or VxVM control, the disk cannot be accessed.
- A disk that is in use (i.e., contains volumes) must not be removed. Removing a disk with volumes can result in loss of data or data redundancy. If volumes exist on the disk to be removed, use the **Evacuate Disks** task to move the volumes to another disk.
- The last disk in a disk group cannot be removed. To remove the last disk in a disk group, the disk group must be destroyed. The last disk in the `rootdg` disk group can never be removed.
- Any non-redundant volumes on the removed disk become disabled.

Forcing Initialization of a Disk

Caution Forcing the initialization or reinitialization of a disk can result in data loss.

The **Initialize Disk** procedure forces the initialization of a disk. This procedure can be used to reinitialize a disk. This task is intended for use in troubleshooting disks that have already been placed under VxVM control. To initialize a disk for VxVM use, use the **Add Disks** task instead (see “[Adding a Disk to VxVM](#)” on page 73).

▼ To (re)initialize a disk

1. Select the disk to be initialized.
2. Choose **Hosts > Initialize Disk (Selected menu)** or **Disk Initialize (Command Launcher)**.
3. Complete the **Initialize Disk** dialog box as follows:

Disk Name:	If the correct disk name does not already display in this field, enter the disk name or click Browse to select the disk.
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When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Initialize Disk** task requires a disk name.
- The **Initialize Disk** task forces the (re)initialization of a disk and can result in data loss.
- The **Initialize Disk** task overwrites existing disk header and configuration information on the disk. Any volume copies or regions located on the disk are not accessible after you reinitialize the disk.



Viewing Disk Properties

The Disk Properties window contains detailed information about the selected disk. The Properties window contains a set of tabbed pages, each of which contains information about the disk and related objects. You can display a different page by clicking on the appropriate tab label.

- ❖ To view the properties of a disk, select the disk and then choose **Properties** from the **Disks** or popup menu. You can also access the Disk Properties window by double-clicking on the disk.
- ❖ To find available space on the disk, click on the **Subdisks** tab. Areas of free space are listed as “gaps” in the **Subdisks** tab. To sort the subdisks and gaps by their location on the disk, click the **Disk Offset** column heading.
- ❖ To update the contents of the Properties window to reflect current properties for the disk, click **Refresh**.
- ❖ To print the contents of the Properties window, click **Print** and complete the Print dialog box.



Disabling a Controller

The **Controller Disable** procedure disables I/O to a controller. This procedure also prevents the Dynamic Multipathing (DMP) feature from accessing the paths associated with a controller. You can disable access to a controller in preparation for hardware maintenance.

▼ To enable a controller

1. Select the controller to be disabled.
2. Choose **Controller Disable** (Command Launcher).
3. Complete the Disable Controller dialog box as follows:

Controller Name(s):	If the correct controller name does not already display in this field, enter the controller name or click Browse to select the controller.
Options	Click Show Options to access the optional settings for this task. <ul style="list-style-type: none"> - To disable all enclosures (disk arrays) associated with this controller, select All Enclosures. - To disable specific enclosures associated with this controller, enter the enclosure names in the Selected Enclosures field or click Browse to select the enclosures.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Controller Disable** task requires a controller name.
- The **Controller Disable** task prevents I/O and the DMP feature from accessing the paths associated with the specified controller.
- The specified controller cannot contain the last enabled path to the root disk.



Enabling a Controller

The **Controller Enable** procedure enables I/O to a controller. If the Dynamic Multipathing (DMP) feature is enabled, this procedure also restores access to the paths associated with a controller.

▼ To enable a controller

1. Select the controller to be enabled.
2. Choose **Controller Enable** (Command Launcher).
3. Complete the Enable Controller dialog box as follows:

Controller Name(s):	If the correct controller name does not already display in this field, enter the controller name or click Browse to select the controller.
Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To enable all enclosures (disk arrays) associated with this controller, select All Enclosures. - To enable specific enclosures associated with this controller, enter the enclosure names in the Selected Enclosures field or click Browse to select the enclosures.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Controller Enable** task requires a controller name.
- The **Controller Enable** task makes the paths associated with the specified controller available to I/O and the DMP feature.

Renaming an Enclosure

The **Enclosure Rename** procedure changes the name of an enclosure (disk array).

▼ **To rename an enclosure**

1. Select the enclosure to be renamed.
2. Choose **Enclosures > Rename (Selected menu)** or **Enclosure Rename (Command Launcher)**.
3. Complete the Rename Enclosure dialog box as follows:

Enclosure Name:	If the correct enclosure name does not already display in this field, enter the name or click Browse to select the enclosure.
New Name:	Enter the new enclosure name.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Enclosure Rename** task requires the current enclosure name and a new enclosure name.
- The new enclosure name must be unique within the disk group.



Creating a Disk Group

The **Disk Group Create** procedure creates an additional disk group. Disks must be placed in disk groups before they can be used by VxVM. The default disk group (`rootdg`) is usually created during VxVM installation and always exists on a system running VxVM. You can create additional disk groups to organize your disks into logical sets of disks.

When you place a disk under VxVM control, the disk is either encapsulated or initialized. Encapsulation preserves any existing data on the disk in volumes. Initialization destroys any existing data on the disk.

▼ To create a disk group

1. Select the appropriate host machine.
2. Choose **File > New > Disk Group (Selected menu)** or **Disk Group Create (Command Launcher)**.
3. Complete the New Disk Group dialog box as follows:

Disk Group Name:	Enter the name of the disk group to be created. Click View to view the names of existing disk groups. To set up any new disks on the system, click Scan Disks . This runs the disk setup commands appropriate for the operating system.
Disk Device(s):	Select the disks to be placed in the new disk group.
Options	Click Show Options to access the optional settings for this task. <ul style="list-style-type: none"> - To create a shared disk group, select Create Shared. This option is only applicable in a cluster environment. - To specify the VERITAS Volume Manager disk name for the disk, enter a disk name in the Disk Name(s) field. If no VERITAS Volume Manager disk name is specified, VxVM assigns a default name to the disk. - To set the disk group activation mode, click Activation Mode and complete the Activate Disk Group dialog box. The activation mode controls read and write access to volumes in the disk group. - To apply a comment or attribute to disks that are placed in the disk group, enter the information in the Comment field.

When you have provided all necessary information in the dialog box, click **OK**.



4. Indicate whether the disk should be initialized or encapsulated. If you initialize the disk, any existing data on the disk will be destroyed. If you encapsulate the disk, any existing data will be preserved in volumes.
5. If you chose to encapsulate the disk, reboot the system.

Notes:

- The **Disk Group Create** task requires a disk group name and the name of at least one disk.
- The disk group name must be unique.
- The new disk group must contain at least one disk.
- Only disks that are online and do not belong to a disk group can be used to create a disk group.
- When a disk is placed under VxVM control, the disk is either initialized or encapsulated. Encapsulation preserves any existing data on the disk in the form of volumes. Initialization destroys any existing data on the disk. Encapsulation is recommended for the root/boot disk and any other disks that contain valuable data.
- The Volume Manager disk name must be unique within the disk group.
- If multiple disks are specified in the Disk Device(s) field and only one disk name is specified in Disk Name(s) field, VxVM appends numbers to the disk name so that each disk name is unique within its disk group.



Upgrading a Disk Group

The **Disk Group Upgrade** procedure upgrades a disk group to the disk group version that is compatible with the current VERITAS Volume Manager release. Some new features and tasks only work on disk groups with the current disk group version, so you must upgrade existing disk groups before you perform these tasks. However, after you upgrade a disk group, you cannot access that disk group from machines running earlier releases of VxVM.

To determine if a disk group needs to be upgraded, select the disk group and open the Disk Group Properties window. The Version field of the Properties window indicates whether the disk group has been upgraded to the current disk group version.

▼ To upgrade a disk group

1. Select the disk to be upgraded to the current version.
2. Choose **Disks Groups > Upgrade (Selected menu)** or **Disk Group Upgrade (Command Launcher)**.
3. Complete the Upgrade Disk Group dialog box as follows:

Disk Group(s):	If the correct disk group name does not already display in this field, enter the disk group name or click Browse to select the disk group.
----------------	---

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- Disk groups created with earlier releases of VxVM must be upgraded before they can take advantage of new features and tasks in the current release.
- If a disk group is upgraded to the current disk group version, you cannot import that disk group on a machine running an earlier VERITAS Volume Manager release. Disk groups that must remain backward compatible with earlier releases of VxVM must not be upgraded.



Renaming a Disk Group

The **Disk Group Rename** procedure changes the name of an existing disk group. You can rename a disk group to provide a more appropriate name or to avoid a name conflict with a disk group to be imported.

▼ To rename a disk group

1. Select the disk group to be renamed.
2. Choose **Disks Groups > Rename (Selected menu)** or **Disk Group Rename (Command Launcher)**.
3. Complete the Rename Disk Group dialog box as follows:

Disk Group Name:	If the correct disk group name does not already display in this field, enter the disk group name or click Browse to select the disk group.
New Name:	Enter the new name for the disk group.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Group Rename** task requires the current disk group name and a new disk group name.
- The new disk group name must be unique.
- The **Disk Group Rename** task deports and re-imports the disk group. If volumes in the disk group are in use, the deport fails and the disk group is not renamed.
- The **Disk Group Rename** task updates the file system table file, if necessary.
- If the disk group contains volumes with mounted file systems, you may need to unmount the file systems.



Deporting a Disk Group

The **Disk Group Deport** procedure makes a disk group and its volumes inaccessible. Once deported, a disk group cannot be used until it is imported. You can deport a disk group to make the disk group *temporarily* unavailable.

While a disk group is deported, you cannot remove and reuse any of its disks. To remove disks, you must import the disk group and then either destroy the disk group (to remove all of its disks) or remove selected disks from the disk group.

▼ To deport a disk group

1. Select the disk group to be deported.
2. Choose **Disk Groups > Deport (Selected menu)** or **Disk Group Deport (Command Launcher)**.
3. Complete the Deport Disk Group dialog box as follows:

Disk Group Name:	If the correct disk group name does not already display in this field, enter the disk group name or click Browse to select the disk group.
Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To change the name of the disk group at deport, enter a new disk group name in the New Name field. - To set up a host machine to import the deported disk group at reboot, enter the host ID in the New Host field.

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Group Deport** task requires a disk group name.
- A deported disk group cannot be accessed. To access a deported disk group, the disk group must be imported.
- The `rootdg` disk group cannot be deported.
- A disk group cannot be deported if any volumes in that disk group are in use (open).
- When a disk group is deported, the host ID stored on all disks in the disk group is cleared and the disk group is not re-imported automatically when the system is rebooted. However, if you specify a host in New Host option, the specified host imports the disk group at reboot.



Importing a Disk Group

The **Import Disk Group** procedure makes a deported (inaccessible) disk group and its volumes accessible again. To import a deported disk group, you must know the disk group former name and this disk group name must remain unused. In addition, at least one disk formerly assigned to the deported disk group must remain unused.

▼ To import a disk group

1. Select the appropriate host machine node.
2. Choose **Hosts > Import Disk Group (Selected menu)** or **Disk Group Import (Command Launcher)**.
3. Complete the Import Disk Group dialog box as follows:

Disk Group Name:	Enter the name of the disk group to be imported or click Browse to select the disk group.
Options	<p>Click Show Options to access the optional settings for the Import Disk Group task.</p> <ul style="list-style-type: none"> - To start all volumes in the disk group at import, select Start All Volumes. - To clear the existing host ID stamp on all disks in the disk group at import, select Clear Host ID. Do not use this option if another host is using any disks in the disk group. - To force the disk group import when the host cannot access all disks in the disk group, select Force Import. This option can be used to import a disk group that contains a failed disk, but can lead to disk group inconsistency if all disks are still usable. - To import the disk group as a shared disk group, select Import Shared. This option is only applicable in a cluster environment. - To change the name of the disk group at import, enter a new disk group name in the New Name field. To indicate that the name change is temporary, select Use New Name as Temporary.



When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Import Disk Group** task requires a disk group name.
- Only deported disk groups can be imported.
- A deported disk group cannot be imported if another disk group with the same name has been created since the disk group was deported.
- A disk group import can fail if the host cannot find one or more disks in the disk group. If the import fails because a disk has failed, you can import the disk group by selecting the **Force Import** option. If the import fails for another reason, a forced import can cause serious problems.
- When a disk group is imported, the system stamps its host ID on all disks in the disk group. A disk group import fails if one of the disks is stamped with a host ID that does not match the others. This ensures that dual-ported disks cannot be managed (and possibly corrupted) by two systems at the same time. If you are *sure* that the disk group is *not* in use by another host, you can clear the host IDs and import the disk group by selecting the **Clear Host ID** option.

Recovering Volumes in a Disk Group

The **Disk Group Recover** procedure performs any necessary volume recovery operations on the volumes in a given disk group. The recovery operations depend on the types of volumes in the disk group and include starting disabled volumes, resynchronizing mirrors in mirrored volumes, and resynchronizing parity in RAID-5 volumes. After successful recovery, the volumes are again available for use.

Alert icons and the Alert Monitor window may provide clues to let you know that volume recovery is needed.

▼ To recover all volumes in a disk group

1. Select the disk group containing the volumes to be recovered.
2. Choose **Disk Groups > Recover (Selected menu)** or **Disk Group Recover (Command Launcher)**.
3. Complete the Recover Disk Group dialog box as follows:

Disk Group(s):	If the correct disk group name does not already display in this field, enter the disk group name or click Browse to select the disk group.
----------------	---

When you have provided all necessary information in the dialog box, click **OK**.

Note:

In some cases, recovery is not possible. If the volume recovery fails, you can attempt to restore the volume from backup.



Clearing Relocation Information for a Disk Group

The **Disk Groups Clear Relocation Information** procedure clears hot-relocation alerts and removes relocation data from a disk group.

▼ **To clear relocation information for a disk group**

1. Select the disk group containing hot-relocation information to be cleared.
2. Choose **Disk Groups > Clear Relocation Information (Selected menu)** or **Disk Group Clear Relocation Info (Command Launcher)**.
3. Complete the Clear Disk Group Relocation Information dialog box as follows:

Disk Group(s):	If the correct disk group name does not already display in this field, enter the disk group name or click Browse to select the disk group.
----------------	---

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- Hot-relocation automatically relocates subdisks from a failed disk to other disks. The disk group records information about the hot-relocation and former subdisk locations. After successful hot-relocation, alerts can remain on objects in VERITAS Volume Manager Storage Administrator. The **Disk Groups Clear Relocation Information** task removes all records of the former subdisk locations from the disk group and clears any alerts.
- After the disk group relocation information has been cleared, it is not possible to use the **Disk Unrelocate** task to return the relocated subdisks to their original disks.



Destroying a Disk Group

Caution Destroying a disk group can result in data loss.

The **Destroy Disk Group** procedure *permanently* removes a disk group from VxVM control. This procedure also reinitializes all of the disks in the disk group as empty disks and places them in the free disk pool for reuse.

Destroy a disk group *only* if you are sure that you no longer need the volumes and data in the disk group. Since the last disk in a disk group cannot be removed, destroying a disk group is useful for freeing the last disk in a disk group for reuse.

▼ To destroy a disk group

1. Select the appropriate host machine node.
2. Choose **Hosts > Destroy Disk Group (Selected menu)** or **Disk Group Destroy (Command Launcher)**.
3. Complete the Destroy Disk Group dialog box as follows:

Disk Group Name:	Enter the name of the disk group to be destroyed or click Browse to select the disk group.
------------------	---

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- Use the **Destroy Disk Group** task with caution. Destroying a disk group permanently removes the disk group from VxVM control and can result in data loss.
- When a disk group is destroyed, its disks are returned to the free disk pool. Any volumes in the disk group are removed.
- The `rootdg` disk group cannot be destroyed.
- A disk group cannot be destroyed if any volumes in that disk group are in use (open) and/or contain mounted file systems.



Moving Objects Between Disk Groups

The following procedure moves a self-contained set of VERITAS Volume Manager Storage Administrator objects between imported disk groups. This operation is performed on VERITAS Volume Manager Storage Administrator objects such as disks or top-level volumes, and includes all component objects such as sub-volumes, plexes and subdisks.

▼ **To perform a disk group move operation:**

1. Select **Disk Groups > Move**.
2. Complete the Move Disk Group Dialog Box as follows:

Disk Group Name:	Enter the name of the disk group from which objects are to be moved or click Browse to select the disk group.
Target Disk Group Name	Enter the name of the disk group into which objects are to be moved, or click Browse to select the disk group.
Select Objects to move	Enter the objects to be moved, or click Browse to select the disk objects. If you click Browse , a further dialog box will be displayed with the following options: <ul style="list-style-type: none"> - To select volumes to move, click Select Volumes, and choose from the displayed list. To select all of the listed volumes, click Select All. - To select disks to move, click Select disks, and choose from the displayed list. - Click on OK.
Expand	Click Expand to specify that the objects that are actually moved should include all other disks that contain subdisks that are associated with the specified objects or with objects that they contain. For example, if you specify that disk01 should be moved and disk01 contains vol1 which is also located on disk02, then by using the Expand button, you ensure that disk02 will also be moved.
Show Dependencies	Click Show Dependencies to display the objects affected by the move.



Note:

- Before moving volumes between disk groups, stop all applications that are accessing the volumes, and unmount all file systems that are configured in the volumes.
- The objects to be moved must be self-contained, meaning that the disks that are moved must not contain any other objects that are not intended for the move.
- This operation fails if it would remove all the disks from the source disk group. Volume states are preserved across the move.
- The reconfiguration must involve an integral number of physical disks.
- Objects to be moved must not contain open volumes.
- Data change objects (DCOs) and snap objects that have been dissociated by Persistent FastResync cannot be moved between disk groups.
- VERITAS Volume Replicator (VVR) objects cannot be moved between disk groups.
- For a disk group move to succeed, the source disk group must contain at least one disk that can store copies of the configuration database after the move.
- For a disk group move to succeed, the configuration database in the target disk group must be able to accommodate information about all the objects in the enlarged disk group.
- The operation can only be performed on the master node of a cluster if either the source disk group or the target disk group is shared.



Splitting A Disk Group

The disk group split operation involves splitting the contents of an imported disk group and creating a new disk group (the Target disk group) with the objects defined in the dialog box. This operation is performed on VERITAS Volume Manager Storage Administrator objects such as disks or top-level volumes, and includes all component objects such as sub-volumes, plexes and subdisks.

▼ **To perform a disk group split operation:**

1. Select **Disk Groups > Split**.
2. Complete the Split Disk Group Dialog Box as follows:

Disk Group Name:	Enter the name of the disk group from which objects are to be split or click Browse to select the disk group.
Target Disk Group Name	Enter the name of the target disk group which will consist of the objects to be split.
Select Objects to move	Enter the objects to be split, or click Browse to select the disk objects. If you click Browse , a further dialog box will be displayed with the following options: <ul style="list-style-type: none"> - To select volumes to move, click Select Volumes, and choose from the displayed list. To select all of the listed volumes, click Select All. - To select disks to move, click Select disks, and choose from the displayed list. - Click on OK.
Expand	Click Expand to specify that the objects that are actually split should include all other disks that contain subdisks that are associated with the specified objects or with objects that they contain. For example, if you specify that disk01 should be split of and disk01 contains vol1 which is also located on disk02, then by using the Expand button, you ensure that disk02 will also be split off.
Show Dependencies	Click Show Dependencies to display the objects affected by the split.



Note:

- Before carrying out the split operation, stop all applications that are accessing the volumes, and unmount all file systems that are configured in the volumes.
- The objects to be split off must be self-contained, meaning that the disks that are split must not contain any other objects that are not intended for the move.
- This operation fails if it would remove all the disks from the source disk group. Volume states are preserved across the split.
- An existing deported disk group is destroyed if it has the same name as the target disk group.
- The reconfiguration must involve an integral number of physical disks.
- Objects to be split off must not contain open volumes.
- Data change objects (DCOs) and snap objects that have been dissociated by Persistent FastResync cannot be moved between disk groups.
- VERITAS Volume Replicator (VVR) objects cannot be moved between disk groups.
- The operation can only be performed on the master node of a cluster if either the source disk group or the target disk group is shared.



Joining Disk Groups

The following procedure joins two disk groups by moving all VERITAS Volume Manager objects from an imported source disk group to an imported target disk group. The source disk group is removed when the join is complete. This operation is performed on VERITAS Volume Manager Storage Administrator objects such as disks or top-level volumes, and includes all component objects such as sub-volumes, plexes and subdisks.

▼ **To perform a disk group join operation:**

1. Select **Disk Groups > Join**.
2. Use the disk group name shown or use **Browse** to list available disk groups and then select one of them.
3. Enter the target disk group name or use **Browse** to list available disk groups and then select one of them.

Note:

- Before performing a join operation, stop all applications that are accessing the volumes, and unmount all file systems that are configured in the volumes.
- The reconfiguration must involve an integral number of physical disks.
- Objects to be joined must not contain open volumes.
- Data change objects (DCOs) and snap objects that have been dissociated by Persistent FastResync cannot be moved between disk groups.
- VERITAS Volume Replicator (VVR) objects cannot be moved between disk groups.
- For a disk group join to succeed, both the source and target disk groups must contain at least one disk that can store copies of the configuration database after the split.
- The operation can only be performed on the master node of a cluster if either the source disk group or the target disk group is shared.



Activating a Disk Group

The **Disk Group Activation** procedure sets the activation mode for a disk group. The disk group activation mode controls read and write access to volumes in the specified disk group.

▼ To activate a disk group

1. Select the disk group to be activated.
2. Choose **Disk Groups > Activation (Selected menu)** or **Disk Group Activate/Deactivate (Command Launcher)**.
3. Complete the Activate Disk Group dialog box as follows:

Disk Group Name:	Enter the name of the disk group to be activated or click Browse to select the disk group.
Activation Mode:	<p>Select one of the following disk group activation modes:</p> <ul style="list-style-type: none"> - To disallow read and write access for volumes in the disk group, select Off. - To allow read and write access for volumes in the disk group, select Read Write. - To allow read only access for volumes in the disk group, select Read Only. <p>In a cluster environment, you can select one of the following additional options for shared disk groups:</p> <ul style="list-style-type: none"> - To give the current node exclusive write access for volumes in the shared disk group, select Exclusive Write. No other nodes in the cluster can have write access to the disk group. - To give the current node write access for volumes in the shared disk group, select Shared Write. Other nodes in the cluster can share write access to this disk group. - To give the current node read access for volumes in the shared disk group, select Shared Read. The current node cannot have write access to the disk group, but other nodes in the cluster may have write access.



When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Groups Activation** task requires a disk group name.
- In a cluster environment, you must specify the disk group activation mode on a per-node basis.
- The **Exclusive Write**, **Shared Write**, and **Shared Read** modes are only applicable for shared disk groups in a cluster environment. The **Read Write** mode is not available for shared disk groups.
- For shared disk groups, the default activation mode is **Off**. For non-shared disk groups, the default activation mode is **Read Write**.
- Disk group activation settings are not persistent, so you may need to reset the activation mode when you reboot the machine.

Viewing Disk Group Properties

The Disk Group Properties window contains detailed information about the selected disk group. The Properties window contains a set of tabbed pages, each of which contains information about the disk group and related objects. You can display a different page by clicking on the appropriate tab label.

- ❖ To view the properties of a disk group, select the disk group and then choose **Properties** from the **Disk Groups** or popup menu.
- ❖ To update the contents of the Properties window to reflect current properties for the disk group, click **Refresh**.
- ❖ To print the contents of the Properties window, click **Print** and complete the Print dialog box.





Introduction

This chapter describes how to create and use volumes with the VERITAS Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator). It also includes information on how to use file systems with volumes. The Volume Task Roadmap and File System Task Roadmap at the beginning of this chapter contain summaries of common volume and file system tasks.

The following volume tasks are discussed in this chapter:

- ◆ [Creating a Volume](#)
- ◆ [Resizing a Volume](#)
- ◆ [Renaming a Volume](#)
- ◆ [Changing a Volume Layout](#)
- ◆ [Adding a Mirror to a Volume](#)
- ◆ [Adding a Log to a Volume](#)
- ◆ [Stopping a Volume](#)
- ◆ [Starting a Volume](#)
- ◆ [Creating a Snapshot Copy of a Volume](#)
- ◆ [Merging a Snapshot Volume](#)
- ◆ [Dissociating a Snapshot Volume](#)
- ◆ [Aborting a Snapshot](#)
- ◆ [Aborting a Snapshot](#)
- ◆ [Recovering a Volume](#)
- ◆ [Repairing a Mirror](#)
- ◆ [Disabling a Mirror](#)
- ◆ [Removing a Mirror From a Volume](#)



- ◆ Removing a Log From a Volume
- ◆ Removing a Volume
- ◆ Associating a Plex
- ◆ Associating a Plex
- ◆ Moving a Subdisk
- ◆ Splitting a Subdisk
- ◆ Joining Subdisks
- ◆ Removing a Subdisk
- ◆ Viewing Volume Properties

The following file system tasks are discussed in this chapter:

- ◆ Adding a File System to a Volume
- ◆ Mounting a File System on a Volume
- ◆ Cluster Mounting a File System on a Cluster Node
- ◆ Unmounting a File System on a Volume
- ◆ Removing a Cluster Mounted File System
- ◆ Removing a Cluster Mounted File System
- ◆ Creating a Snapshot Copy of a File System
- ◆ Checking a File System on a Volume
- ◆ Viewing File System Properties

The following VERITAS QuickLog tasks are discussed in this chapter:

- ◆ Creating a QuickLog Volume
- ◆ Enabling a QuickLog Device for a File System
- ◆ Disabling a QuickLog Device for a File System
- ◆ Removing a QuickLog Volume

Volume Task Roadmap

The following table provides a summary of common VERITAS Volume Manager Storage Administrator volume tasks.

To perform this task ...	Use this procedure ...
<i>Volume Setup Tasks:</i>	
Create new volumes	Creating a Volume
<i>Precautionary Tasks:</i>	
Mirror (copy) volumes onto other disks for redundancy	Adding a Mirror to a Volume
Create mirrored volumes	Creating a Volume
Add a log to a mirrored volume	Adding a Log to a Volume
Add a log to a RAID-5 volume	Adding a Log to a Volume
<i>Maintenance Tasks:</i>	
Add space to volumes	Resizing a Volume
Change volume layouts	Changing a Volume Layout
Add mirrors to volumes that should be redundant	Adding a Mirror to a Volume
Create a snapshot copy of a volume for backup	Creating a Snapshot Copy of a Volume
Merge a snapshot copy of a volume with the original volume	Merging a Snapshot Volume
Permanently break the association between a snapshot and its original volume	Dissociating a Snapshot Volume
Abort the taking of a snapshot	Aborting a Snapshot
Move portions of volumes to other disk space	Moving a Subdisk
<i>Recovery Tasks:</i>	
Attempt to recover a volume	Recovering a Volume
Attempt to recover all volumes on a disk	Recovering Volumes on a Disk (see Chapter 3)
Attempt to recover all volumes in a disk group	Recovering Volumes in a Disk Group (see Chapter 3)
Prepare to restore a volume from backup	Aborting a Snapshot
Repair or reattach a disabled volume mirror	Repairing a Mirror



To perform this task ...	Use this procedure ...
<i>Other Tasks:</i>	
Change a volume name	Renaming a Volume
Temporarily prevent access to a volume	Stopping a Volume
Restore access to a stopped volume	Starting a Volume
Temporarily prevent access to a volume mirror	Disabling a Mirror
Remove a mirror from a volume	Removing a Mirror From a Volume
Remove a DRL log from a volume	Removing a Log From a Volume
Remove a RAID-5 log from a volume	Removing a Log From a Volume
Remove a volume	Removing a Volume

File System Task Roadmap

The following table provides a summary of common VERITAS Volume Manager Storage Administrator file system tasks. Note that some of these tasks are only available for the VERITAS File System™ (VxFS).

To perform this task ...	Use this procedure ...
<i>File System Setup Tasks:</i>	
Create a volume with a file system	Creating a Volume
Place a file system on an existing volume	Adding a File System to a Volume
Mount a file system on a volume	Mounting a File System on a Volume
Mount a file system in cluster mode	Cluster Mounting a File System on a Cluster Node
<i>Maintenance Tasks:</i>	
Add more space to a file system	Removing a Cluster Mounted File System
Create a snapshot copy of a file system for backup	Creating a Snapshot Copy of a File System
<i>Recovery Tasks:</i>	
Perform a file system consistency check	Checking a File System on a Volume
<i>Other Tasks:</i>	
Unmount a file system	Unmounting a File System on a Volume
Remove a cluster mounted file system	Removing a Cluster Mounted File System



Creating a Volume

VxVM uses logical volumes to organize and manage disk space. A volume is made up of portions of one or more physical disks, so it does not have the physical limitations of a physical disk.

A volume can provide greater capacity and better availability and performance than a single physical disk. A volume can be extended (grown) across multiple disks to increase capacity, mirrored (copied) on another disk to provide data redundancy, and/or striped across multiple disks to improve I/O performance.

You can use VERITAS Volume Manager Storage Administrator to create the following types of volumes:

- ◆ Concatenated Volume

A concatenated volume is made up of one or more disk regions that are linked together (concatenated) in a linear fashion. A concatenated volume can consist of disk regions on multiple disks; a concatenated volume that extends across two or more disks is also known as a *spanned volume*.

Note that the data in this type of volume cannot be recovered if the underlying disk fails. However, a concatenated volume can be mirrored (copied) onto another disks to protect its data against disk failure.

- ◆ Striped Volume

Striped volume data is interleaved (striped) across two or more physical disks. Striped volume data is spread across the disks alternately and evenly in small, equal-sized portions of data called *stripe units*. Striping improves performance.

Note that the data in this type of volume cannot be recovered if one of the underlying disks fails. However, a striped volume can be mirrored (copied) onto another disks to protect its data against disk failure.

- ◆ RAID-5 Volume

RAID-5 volume data is interleaved (striped) across three or more physical disks. Within each stripe across the set of disks, the data on one of the disks is parity data. If one of the physical disks fails, the parity data can be used to reconstruct and recover the lost data.

Note that RAID-5 volumes cannot be mirrored.

◆ **Mirrored Volume**

Volumes with concatenated or striped layouts can be mirrored to increase data availability. All of the data in a mirrored volume is duplicated on at least one other physical disk. If one of the disks fails, the data can still be accessed from one of the remaining disks.

The plexes in a mirrored volume typically have the same layout, but a volume can consist of plexes with different layouts. A mirrored volume has a “mixed” layout if the plexes in the volume have different layouts.

◆ **Layered Volume**

A layered volume is built on one or more other volumes. The underlying volumes are typically mirrored. In layered volumes, mirroring is done at a lower level and with smaller granularity than with non-layered volumes, so each mirror covers a relatively small storage region.

Layered volumes tolerate disk failure better than non-layered volumes and provide improved data redundancy. If a disk in a layered volume fails, only a portion of the redundancy is lost and recovery time is usually quicker than it would be for a non-layered volume. Layered volumes also reduce the chance that two disk failures will result in lost data.

The underlying volumes in a layered volume are used exclusively by VxVM and are not intended for user manipulation.

With VERITAS Volume Manager Storage Administrator, you can create the following types of layered volumes:

- **Concatenated Pro Volume**

A concatenated pro volume is a layered volume that concatenates several underlying mirror volumes.

- **Striped Pro Volume**

A striped pro volume is a layered volume that stripes several underlying mirror volumes.



The following table summarizes the advantages and disadvantages of each volume layout.

Layout Comparison

Layout	Advantages	Disadvantages
Concatenated	<ul style="list-style-type: none"> - The volume can consist of disk regions that are not adjacent. - The volume can span multiple disks. A spanned volume can have a greater capacity than a single disk. - The volume can be mirrored to protect data against disk failure and reduce the risk of data loss. 	<ul style="list-style-type: none"> - There is a risk of data loss if the volume is not mirrored. - Spanning a volume across multiple disks increases the chance that a disk failure will result in the failure of the volume. - Concatenation does not improve I/O performance.
Striped	<ul style="list-style-type: none"> - Striping provides improved read and write performance. - Striping can help to balance the I/O load from multi-user applications across multiple disks. - The volume can be mirrored to protect data against disk failure. 	<ul style="list-style-type: none"> - There is a risk of data loss if the volume is not mirrored. - Striping a volume across multiple disks increases the chance that a disk failure will result in the failure of the volume. - A striped volume requires at least two disks.
RAID-5	<ul style="list-style-type: none"> - RAID-5 provides protection against disk failure and reduces the risk of data loss. - RAID-5 provides data redundancy by storing parity (a calculated value) on the disks. If a disk fails, the parity is used to reconstruct the missing data. - RAID-5 requires less storage space than mirroring. - RAID-5 provides improved read performance. 	<ul style="list-style-type: none"> - RAID-5 provides relatively slow write performance. - RAID-5 volumes cannot be mirrored. - A RAID-5 volume requires at least three disks. If logging is enabled, a RAID-5 volume requires at least four disks. - A RAID-5 volume cannot survive multiple disk failures. However, optional RAID-5 logs reduce this risk. - If one of the volume disks is inaccessible, performance is degraded.



Layout Comparison

Layout	Advantages	Disadvantages
Mirrored	<ul style="list-style-type: none"> - Mirroring provides protection against disk failure and reduces the risk of data loss. - Mirroring provides data redundancy by maintaining multiple complete copies of volume data on different disks. - Mirroring provides improved read performance. 	<ul style="list-style-type: none"> - A mirrored volume requires extra disk space. Each mirror requires enough disk space to contain a complete copy of the volume.
Concatenated Pro	<ul style="list-style-type: none"> - The volume is layered, and concatenates several underlying mirror volumes. This provides improved data redundancy and reduces the impact of disk failures. This type of volume is also known as a concatenated-mirror volume. - Recovery time is quicker than with regular concatenated volumes that are mirrored. - The volume can consist of disk regions that are not adjacent. - The volume can span multiple disks. A spanned volume can have a greater capacity than a single disk. 	<ul style="list-style-type: none"> - A concatenated pro volume requires at least two disks. - Concatenation does not improve I/O performance. - Layered volumes consist of more VERITAS Volume Manager objects than non-layered volumes and are likely to fill up the disk group configuration database sooner. When the configuration database is full, you cannot create more volumes in the disk group.
Striped Pro	<ul style="list-style-type: none"> - The volume is layered, and stripes several underlying mirror volumes. This provides improved data redundancy and reduces the impact of disk failures. This type of volume is also known as a striped-mirror volume. - Recovery time is quicker than with regular striped volumes that are mirrored. - Striping provides improved read and write performance. - Striping can help to balance the I/O load from multi-user applications across multiple disks 	<ul style="list-style-type: none"> - A striped pro volume requires at least four disks. - Layered volumes consist of more VERITAS Volume Manager objects than non-layered volumes and are likely to fill up the disk group configuration database sooner. When the configuration database is full, you cannot create more volumes in the disk group.



▼ **To create a concatenated volume**

The following procedure creates a concatenated volume that consists of one or more regions of the specified disks. This procedure also gives you the options of placing a file system on the new volume or mirroring the volume.

You can use this procedure to create a regular concatenated volume or a concatenated pro volume. A concatenated pro volume is layered and mirrored.

1. Select the appropriate host machine.
2. Choose **File > New > Volume (Selected menu)** or **Volume Create (Command Launcher)**.
3. Complete the New Volume dialog box as follows:

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
Volume Name:	Enter the new volume name (or accept the default name).
Size:	Enter the volume size. The default size unit is sectors. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size. To determine the largest possible size for the volume, click Maxsize after choosing the volume layout and options.
Layout:	Choose Concatenated or Concatenated Pro for the volume layout.

Options	<ul style="list-style-type: none"> - To mirror the volume, select Mirrored. In the Total Number of Mirrors field, enter the total number of mirrors for the volume. <p>Note Concatenated pro volumes are mirrored by default.</p> <p>To enable logging for a mirrored volume, select Enable Logging.</p> <ul style="list-style-type: none"> - To place the volume on specific disks, click Assign Disks and select the disk(s) and the storage layout policy that you want to use from the Space Allocation dialog box. - To place a file system on the volume, click Add File System and specify the file system type and mount point in the Add File System dialog box. - To clear the volume before enabling it for general use, select Initialize Zero. - To prevent the creation of a layered volume, select No Layered Volumes. In cases where a layered volume layout is appropriate, VxVM can create a layered volume when a non-layered layout is specified. This option ensures that the volume has a non-layered layout. If a layered (Pro) layout is selected, this option is ignored. - To add a comment attribute for the volume, enter the information in the Comment field.
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After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The task to create a concatenated volume requires a disk group name, volume name, volume size, and volume layout.
- The volume size should be less than or equal to the available free space on the disks.
- If no disks are assigned, VxVM uses available space on disks in the selected disk group.
- The data in a concatenated volume is not protected against disk failure unless the volume is mirrored. At least one additional disk is required to mirror a concatenated volume.
- Concatenated pro volumes are mirrored by default, so a concatenated pro volume requires more disks than an unmirrored concatenated volume.
- You cannot use a concatenated pro volume for a `root` or `swap` volume.
- If a file system is placed on the volume and the **Mount at Boot** option is selected, the file system table file automatically updates.
- You can use the Space Allocation dialog box to specify that the volume is to be mirrored or striped across controllers, trays, targets, or enclosures. You can also select ordered allocation. Ordered allocation uses the specified storage to first concatenate disks, then to form columns, and finally to form mirrors.



▼ **To create a striped volume**

The following procedure creates a striped volume that is spread across two or more disks. This procedure also gives you the options of placing a file system on the new volume or mirroring the volume.

You can use this procedure to create a regular striped volume or a striped pro volume. A striped pro volume is layered and mirrored.

1. Select the appropriate host machine.
2. Choose **File > New > Volume (Selected menu)** or **Volume Create (Command Launcher)**.
3. Complete the New Volume dialog box as follows:

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
Volume Name:	Enter the new volume name (or accept the default name).
Size:	Enter the volume size. The default size unit is sectors. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size. To determine the largest possible size for the volume, click Maxsize after choosing the volume layout and options.
Layout:	Choose Striped or Striped Pro for the volume layout. In the Number of Columns field, specify the number of columns (disks) across which the volume should be striped. A striped volume requires at least two disks. To specify a stripe unit size other than the default, enter the stripe unit size in the Stripe Unit Size field. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.



Options	<ul style="list-style-type: none">- To mirror the volume, select Mirrored. In the Total Number of Mirrors field, enter the total number of mirrors for the volume. Note Striped pro volumes are mirrored by default. To enable logging for a mirrored volume, select Enable Logging.- To stripe the volume across specific disks, click Assign Disks and select the disks and the storage layout policy that you want to use from the Space Allocation dialog box.- To place a file system on the volume, click Add File System and specify the file system type and mount point in the Add File System dialog box.- To clear the volume before enabling it for general use, select Initialize Zero.- To prevent the creation of a layered volume, select No Layered Volumes. In cases where a layered volume layout is appropriate, VxVM can create a layered volume when a non-layered layout is specified. This option ensures that the volume has a non-layered layout. If a layered (Pro) layout is selected, this option is ignored.- To add a comment attribute for the volume, enter the information in the Comment field.
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After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The task to create a striped volume requires a disk group name, volume name, volume size, and volume layout.
- A striped volume requires at least two disks.
- The volume size should be less than or equal to the available free space on the disks.
- If no disks are assigned, VxVM uses available space on disks in the selected disk group.
- The data in a striped volume is not protected against disk failure unless the volume is mirrored. At least one additional disk is required to mirror a striped volume.
- Striped pro volumes are mirrored by default, so a striped pro volume requires more disks than an unmirrored striped volume.
- You cannot use a striped pro volume for a `root` or `swap` volume.
- If a file system is placed on the volume and the **Mount at Boot** option is selected, the file system table file is automatically updated.
- You can use the Space Allocation dialog box to specify that the volume is to be mirrored or striped across controllers, trays, targets, or enclosures. You can also select ordered allocation. Ordered allocation uses the specified storage to first concatenate disks, then to form columns, and finally to form mirrors.

▼ **To create a RAID-5 volume**

The following procedure creates a RAID-5 volume that is spread across two or more disks and contains parity information. This procedure also gives you the option of placing a file system on the new volume.

1. Select the appropriate host machine.
2. Choose **File > New > Volume (Selected menu) or Volume Create (Command Launcher)**.
3. Complete the New Volume dialog box as follows:

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
Volume Name:	Enter the new volume name (or accept the default name).



Size:	<p>Enter the volume size in the Size field. The default size unit is sectors. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.</p> <p>To determine the largest possible size for the volume, click Maxsize after choosing the volume layout and options.</p>
Layout:	<p>Choose RAID-5 for the volume layout.</p> <p>In the Number of Columns field, specify the number of columns (disks) across which the volume should be striped. A RAID-5 volume requires at least three disks (or four disks if logging is enabled).</p> <p>To specify a stripe unit size other than the default, enter the stripe unit size in the Stripe Unit Size field. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.</p>
Options	<ul style="list-style-type: none"> - To stripe the volume across specific disks, click Assign Disks and select the disks and the storage layout policy that you want to use from the Space Allocation dialog box. - To place a file system on the volume, click Add File System and specify the file system type and mount point in the Add File System dialog box. - To enable RAID-5 logging for the volume, select Enable Logging. VxVM adds an appropriate number of logs to the volume. - To clear the volume before enabling it for general use, select Initialize Zero. - To add a comment attribute for the volume, enter the information in the Comment field.



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The task to create a RAID-5 volume requires a disk group name, volume name, volume size, and volume layout.
- A RAID-5 volume requires at least three disks. If logging is enabled, a RAID-5 volume requires at least four disks.
- RAID-5 volumes cannot be mirrored.
- The volume size should be less than or equal to the available free space on the disks.
- For a RAID-5 volume, the size specified in the Size field is the usable space in the volume. Volume Manager allocates additional space for the volume parity information. The disks across which the RAID-5 volume is striped must, therefore, contain additional free space for the volume parity information.
- If no disks are assigned, VxVM uses available space on disks in the selected disk group.
- If a file system is placed on the volume and the **Mount at Boot** option is selected, the file system table file is automatically updated.
- You can use the Space Allocation dialog box to specify that the volume is to be mirrored or striped across controllers, trays, targets, or enclosures. You can also select ordered allocation. Ordered allocation uses the specified storage to first concatenate disks, then to form columns, and finally to form mirrors.

▼ **To create a mirrored volume**

The following procedure creates a concatenated or striped volume that is mirrored (copied) on at least one other disk. If one of the disks fails, data on the volume can be accessed from the surviving disks.

You can use this procedure to create a regular mirrored volume or a layered mirrored volume. Concatenated pro and striped pro volumes are layered and mirrored by default.

1. Select the appropriate host machine.
2. Choose **File > New > Volume (Selected menu)** or **Volume Create (Command Launcher)**.
3. Complete the New Volume dialog box as follows:

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
Volume Name:	Enter the new volume name (or accept the default name).



Size:	<p>Enter the volume size in the Size field. The default size unit is sectors. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.</p> <p>To determine the largest possible size for the volume, click Maxsize after choosing the volume layout and options.</p>
Layout:	<p>Choose Concatenated, Striped, Concatenated Pro, or Striped Pro for the volume layout.</p> <p>For a striped or striped pro volume, provide the following information:</p> <ul style="list-style-type: none"> - In the Number of Columns field, specify the number of columns (disks) across which the volume should be striped. A striped volume requires at least two disks. - To specify a stripe unit size other than the default, enter the stripe unit size in the Stripe Unit Size field. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.
Mirror Info:	<p>Select Mirrored. In the Total Number of Mirrors field, enter the total number of mirrors for the volume.</p> <p>Note Concatenated pro and striped pro volumes are mirrored by default.</p>
Options	<ul style="list-style-type: none"> - To place the volume on a specific disks, click Assign Disks and select the disks and the storage layout policy that you want to use from the Space Allocation dialog box. - To place a file system on the volume, click Add File System and specify the file system type and mount point in the Add File System dialog box. - To enable Dirty Region Logging (DRL) for the volume, select Enable Logging. VxVM adds an appropriate number of logs to the volume. - To clear the volume before enabling it for general use, select Initialize Zero. - To prevent the creation of a layered volume, select No Layered Volumes. In cases where a layered volume layout is appropriate, VxVM can create a layered volume when a non-layered layout is specified. This option ensures that the volume has a non-layered layout. If a layered (Pro) layout is selected, this option is ignored. - To add a comment attribute for the volume, enter the information in the Comment field.



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The task to create a mirrored volume requires a disk group name, volume name, volume size, and volume layout.
- A mirrored volume requires at least two disks. If logging is enabled, the volume requires at least one additional disk.
- Only concatenated or striped volumes can be mirrored.
- You can use the Space Allocation dialog box to specify that the volume is to be mirrored or striped across controllers, trays, targets, or enclosures. You can also select ordered allocation. Ordered allocation uses the specified storage to first concatenate disks, then to form columns, and finally to form mirrors.

Resizing a Volume

The **Volume Resize** procedure changes the size of a volume. If users require more space on a volume, you can use this procedure to increase the size of the volume. If a volume contains unused space that you need to use elsewhere, you can use this procedure to shrink the volume. If the volume contains a file system, this procedure also resizes the file system.

▼ To resize a volume

1. Select the volume to be resized.
2. Choose **Volumes > Resize (Selected menu)** or **Volume Resize (Command Launcher)**.
3. Complete the Resize Volume dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
New Size:	<p>Specify <i>one</i> of the following:</p> <ul style="list-style-type: none"> - To increase the volume size <i>by</i> a specific amount of space, use the Add By field to specify how much space should be added to the volume. - To decrease the volume size <i>by</i> a specific amount of space, use the Subtract By field to specify how much space should be removed from the volume. - To specify the new volume size, enter the size in the Desired Size field. <p>To determine the largest possible size for the volume, click Maxgrow after choosing options.</p> <p>The default size unit is sectors. To specify a size unit, attach an s (sectors), k (kilobytes), m (megabytes), or g (gigabytes) to the size.</p>
Options	To use a specific disk for the additional space, click Assign Disks and select the disk you want to use from the Space Allocation dialog box.



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Volume Resize** task requires a volume name and either the desired size or the amount of space to add to or subtract from the volume size.
- A volume containing a file system other than VxFS cannot be shrunk.
- Shrinking a volume with an unmounted file system can result in data loss, so a volume containing an unmounted file system cannot be shrunk.
- When a volume is shrunk, the resulting extra space is returned to the free space pool.
- When the volume size is increased, sufficient disk space must be available. When increasing the size of a volume, VxVM assigns the necessary new space from available disks.
- You cannot grow or shrink any volume associated with an encapsulated root disk (`rootvol`, `usr`, `var`, `opt`, `swapvol`, and so on) because these map to a physical underlying partition on the disk and must be contiguous. If you attempt to grow `rootvol`, `usrvol`, `varvol`, or `swapvol`, the system could become unbootable if you need to revert back to booting from slices. It can also prevent a successful Solaris upgrade and you might have to do a fresh install. Additionally, the `upgrade_start` script might fail.



Renaming a Volume

The **Volume Rename** procedure changes the name of a volume. If the volume has a file system, this procedure also makes the necessary changes to the file system table file and allows you to specify a new mount point for the file system.

▼ To rename a volume

1. Select the volume to be renamed.
2. Choose **Volumes > Rename (Selected menu)** or **Volume Rename (Command Launcher)**.
3. Complete the Rename Volume dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
New Name:	Enter the new name for the volume.
Options	If the volume contains a file system and you want to change the mount point when the volume is renamed, enter a new mount point in the New Mount Point field.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Volume Rename** task requires the current volume name and a new volume name.
- The new volume name must be unique within the disk group.
- If the volume contains a file system, the file system table file is automatically updated (if necessary).



Changing a Volume Layout

The **Volume Change Layout** procedure changes the layout of a volume without interrupting access to data. You can use this task to change the redundancy or performance characteristics of an existing volume.

You can view the progress of the layout task through the **Relayout Status Monitor** window. You can also use the **Relayout Status Monitor** window to pause, abort, continue, or reverse the layout task. The **Relayout Status Monitor** appears automatically when a layout task begins. When a volume relayout is in progress, paused, or aborted, you can also access the **Relayout Status Monitor** through the **Volume Properties** window.

▼ To change a volume layout

1. Select the volume to be changed to a different layout.
2. Choose **Volumes > Change Layout (Selected menu)** or **Volume Change Layout (Command Launcher)**.
3. Complete the **Change Volume Layout** dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Layout:	<p>Choose the new volume layout:</p> <ul style="list-style-type: none"> - Concatenated Change the volume to a simple, concatenated volume. - Striped Change the volume to a striped volume. - RAID-5 Change the volume to a RAID-5 volume. - Concatenated Pro Change the volume to a layered concatenated volume. - Striped Pro Change the volume to a layered striped volume. <p>For a striped, RAID-5, or striped pro volume, provide the following information:</p> <ul style="list-style-type: none"> - In the Number of Columns field, specify the number of columns (disks) across which the volume should be striped. - To specify a stripe unit size other than the default, enter the stripe unit size in the Stripe Unit Size field. To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.

Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To retain the original volume size when the volume layout changes, click Retain Volume Size at Completion. - To specify the size of the pieces of data that are copied to temporary space during the volume relayout, enter the size in the Temp Space Size field. - To specify additional disk space to be used for the new volume layout (if needed), specify the disk in the Disk(s) field or click Browse to select a disk. - To specify the temporary disk space to be used during the volume layout change, specify the disk in the Temp Disk(s) field or click Browse to select a disk. - If the volume contains plexes with different layouts, specify the plex to be changed to the new layout in the Target Plex field.
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4. After you have provided all necessary information in the dialog box, click **OK**. The **Layout Status Monitor** window appears. This window provides you with the following information and options:

Volume Name:	The name of the volume that is undergoing a layout change.
Initial Layout:	The original layout of the volume.
Desired Layout:	The new layout for the volume.
Status:	The status of the relayout task.
% Complete:	The progress of the relayout task.
Options	<ul style="list-style-type: none"> - To stop the relayout task temporarily, click Pause. - To cancel the relayout task, click Abort. - To resume the paused or aborted relayout task, click Continue. - To undo the layout changes and return the volume to its original layout, click Reverse.



If you need to pause, abort, continue, or reverse a layout task after you close the **Relayout Status Monitor** window, you can access the **Relayout Status Monitor** through the **Volume Properties** window.

Notes:

- The **Volume Change Layout** task requires a volume name and a different volume layout.
- Volumes remain accessible during online relayout.
- This task may take a long time, depending on the volume size and other factors. The **Relayout Status Monitor** shows the progress of the layout change and allows you to abort, pause, or reverse the task.
- If no disk space is specified, VxVM uses available space on disks in the current disk group.
- If the temporary space size is not specified, VxVM uses an appropriate size. Specifying a larger temporary space size speeds up the layout change process because larger pieces of data are copied at a time. If the specified temporary space size is too small, VxVM uses a larger size.
- If all of the plexes in the volume have identical layouts, VxVM changes all plexes (except log plexes) to the new layout. If the volume contains plexes with different layouts, a target plex must be specified. When a target plex is specified, VxVM changes the layout of the target plex and leaves the other plexes in the volume alone.
- Log plex layouts do not change. VxVM removes and/or replaces log plexes, depending on the new layout.
- If the volume length changes as a result of the layout change and the volume contains a file system, the file system length is automatically adjusted (if possible).
- A volume cannot undergo multiple relayouts at the same time.
- This task cannot be used to change the layout of a volume with a sparse plex.
- This task may fail for volumes that were not created by VERITAS Volume Manager Storage Administrator or the `vxassist` command.
- If the relayout is reversed, the volume returns to its original layout. However, data in the volume may not return to its original storage location.
- During a relayout, many other tasks are unavailable for the volume.
- A mirrored or striped volume requires at least two disks.
- A RAID-5 volume requires at least three disks.



Adding a Mirror to a Volume

The **Volume Add Mirror** procedure creates a mirror (copy) of a volume on a disk that is not already being used by the volume. If one of the disks fails, the volume data can be accessed from the surviving disks. A volume can have multiple mirrors.

▼ To add a mirror to an existing volume

1. Select the volume to be mirrored.
2. Choose **Volumes > Mirror > Add (Selected menu)** or **Volume Add Mirror (Command Launcher)**.
3. Complete the Add Mirror dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To specify the layout for the mirror, select Concatenated or Striped. For a striped mirror, specify the number of columns and stripe unit size. - To add more than one mirror, enter the number of mirrors in the Mirror Quantity field. - To place the mirror on a specific disk, enter the disk name in the Disk Name(s) field or click Browse to select a disk.



After you have provided all necessary information in the dialog box, click **OK**. Adding a mirror requires resynchronization, so this task may take some time.

Notes:

- The **Volume Add Mirror** task requires a volume name.
- Once mirrored, the data in the volume is redundant. If a disk fails, the data remains available on the surviving mirror (on another disk).
- The new mirror cannot be created on a disk that already contains a copy of the volume. Each mirror must reside on a separate disk.
- Sufficient disk space must be available to accommodate the additional mirrors.
- Only disks in the same disk group as the volume can be used to create the new mirror.
- If no disks are assigned, VxVM uses available disk space to create the mirror.
- A RAID-5 volume cannot be mirrored.
- To mirror the root volume (and other volumes required to boot the system) onto an alternate boot disk, use the Mirror Disk task.
- A volume can contain up to 32 plexes (mirrors).

Adding a Log to a Volume

The **Volume Add Log** procedure adds the appropriate type of log to a mirrored or RAID-5 volume.

▼ To add a DRL log to a mirrored volume

The following procedure adds a Dirty Region Logging (DRL) log to a mirrored volume. DRL uses this log to track the regions of the volume that change due to I/O writes. If a system failure occurs, DRL uses the information in the log to recover only the portions of the volume that need recovery. This speeds up recovery time for mirrored volumes.

For DRL to be in effect, a mirrored volume must have at least one DRL log. You can create additional DRL logs (on different disks) to mirror the DRL information.

1. Select the mirrored volume to contain the log.
2. Choose **Volumes > Log > Add (Selected menu)** or **Volume Add Log (Command Launcher)**.
3. Complete the Add Log dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Options	To place the log on a specific disk, enter the name of the disk in the Disk Name field or click Browse to select a disk.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Volume Add Log** task requires a volume name.
- When a log is added to a mirrored volume, DRL is activated for that volume.

▼ To add a log to a RAID-5 volume

The following procedure adds a log to a RAID-5 volume. RAID-5 logs speed up the resynchronization time for RAID-5 volumes after a system failure. A RAID-5 log maintains a copy of the data and parity being written to the volume at any given time. If a system failure occurs, VxVM can “replay” the RAID-5 log to resynchronize the volume. This copies the data and parity that was being written at the time of failure from the log to the appropriate areas of the RAID-5 volume.



You can create multiple RAID-5 logs (on different disks) to mirror the log information. Ideally, each RAID-5 volume has at least two logs.

1. Select the RAID-5 volume to contain the log.
2. Choose **Volumes > Log > Add (Selected menu)** or **Volume Add Log (Command Launcher)**.
3. Complete the Add Log dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Options	To place the log on a specific disk, enter the name of the disk in the Disk Name field or click Browse to select a disk.

After you have provided all necessary information in the dialog box, click **OK**.

Note:

The Volume Add Log task requires a volume name.
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Stopping a Volume

The **Volume Stop** procedure disables a volume. When a volume is stopped, it is not available for use until it is restarted (refer to “[Starting a Volume](#)” on page 146). Stopping a volume is a safe way of temporarily preventing access to a volume.

▼ To stop a volume

1. Select the volume to be stopped.
2. Choose **Volumes > Stop (Selected menu)** or **Volume Stop** (Command Launcher).
3. Complete the Stop Volume dialog box as follows:

Volume(s):	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
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After you have provided all necessary information in the dialog box, click **OK**. The volume state changes to STOPPED.

Note:

A volume cannot be stopped if it is in use (open) or it has a mounted file system.



Starting a Volume

The **Volume Start** procedure attempts to enable (start) a stopped volume. When a volume is successfully restarted, the volume is available for use again. This procedure also performs any appropriate resynchronization operations on the volume.

Under normal circumstances, volumes are automatically started when the system reboots. You can use this procedure to restart a volume that you stopped manually or to attempt to restart a volume that was stopped in some other manner. If a volume cannot be started, the volume remains unusable.

▼ To start a volume

1. Select the (stopped) volume to be started.
2. Choose **Volumes > Start (Selected menu)** or **Volume Start (Command Launcher)**.
3. Complete the Start Volume dialog box as follows:

Volume(s):	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
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After you have provided all necessary information in the dialog box, click **OK**. The volume state changes to **STARTED**.

Notes:

- Starting a RAID-5 volume enables the volume and resynchronizes parity, if necessary.
- Starting a mirrored volume enables the volume and resynchronizes the mirrors to ensure that they are consistent.

Creating a Snapshot Copy of a Volume

The **Snap** procedure prepares a volume for backup by creating a new volume that is a snapshot copy of an existing volume. This is done by attaching a new mirror to the existing volume, copying the volume data to the new mirror, detaching the new mirror, and then creating a new (snapshot) volume from the new mirror. The snapshot volume is an exact copy of the original volume. You can use the snapshot volume to make a backup of the original volume at a convenient time. After the backup is made, you can remove the snapshot volume (see “[Removing a Volume.](#)”). You can also merge a snapshot volume with its original volume or permanently break the link between the snapshot and the original volume.

You can use the **Snapshot Interactive** menu to perform all the steps used in the **Snap** procedure on a single volume. For multiple volumes, you can use individual commands from the **Snap** menu to perform these steps. Working with multiple volumes makes preparation for backup faster and easier. The commands on the menu are: **snapstart**, **snapshot**, **snapabort**, **snapclear** and **snapback**.

▼ To create a snapshot copy of the data on a single volume

1. Select the volume to be copied to a snapshot.
2. Choose **Volumes > Snap > Snapshot Interactive (Selected menu)** or **Volume > Snapshot Interactive (Command Launcher)**.
3. Complete the Volume Snapshot dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Snapshot Name:	Enter the name for the snapshot copy of the volume.



Options	<ul style="list-style-type: none"> - To place the snapshot on a specific disks, click Assign Disks and select the disks you want to use. - To enable the FastResync (FR) feature for the volume, select Enable FastResync. FastResync speeds up the resynchronization of mirrors in a volume. Resynchronization is necessary when a detached/unavailable mirror is (re)attached to a volume. Enabling FastResync on an existing mirrored volume can also be accomplished through the Volumes > Properties dialog. To enable persistent or non-persistent FastResync, you require an additional license. - To create a read-only snapshot volume, select Read Only. <p>Note FR was formerly known as Fast Mirror Resynchronization (FMR).</p>
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4. After you have provided all necessary information in the dialog box, click **Snapstart** to start the first phase of the snapshot procedure. This creates a snapshot mirror of the volume to be backed up. This may take some time. When the snapshot mirror is complete, the following message appears at the bottom of the dialog box:

Click Snapshot to create the snapshot volume.

If you want to abort the Snapshot, select **Volumes > Snap > Snapabort**.

5. When the snapshot mirror is ready, click **Snapshot** to complete the snapshot. This creates a snapshot copy of the original volume.

If you decide not to make a snapshot volume, you can remove the snapshot mirror after the snapstart phase. To remove the snapshot mirror, click **Remove Snapshot Mirror**.

<p>Notes:</p> <ul style="list-style-type: none"> - FastResync is not supported for RAID-5 volumes - The Volume Snapshot Interactive task requires a volume name and a snapshot name. - The snapshot volume is an exact copy of the original volume at the time the snapshot phase of the procedure starts. - After you create the snapshot copy of the volume, remember to back it up to tape or some other media. Remove the snapshot volume when it is no longer needed. - The snapstart phase of this task may take a long time, depending on the size of the volume. - If you remove the snapshot mirror, you cannot create a snapshot volume until you repeat the snapstart phase of the procedure.
--



▼ **To create a snapshot copy of data on multiple volumes**

1. Select the volume to be copied to a snapshot.
2. Choose **Volumes > Snap > Snapstart (Selected menu)** or **Volume > Snapstart (Command Launcher)**.
3. Enter the volume names or names in the Volume Snapstart dialog box:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Options	- To place the snapshot on a specific disks, click Assign Disks and select the disks you want to use.

4. Click **OK** or **Apply** to start the first phase of the snapshot procedure. This creates a snapshot mirror of the volume to be backed up. This may take some time. When the snapshot mirror is complete, the following message appears at the bottom of the dialog box:

Click Snapshot to create the snapshot volume.

If you want to abort the Snapshot, select **Volumes > Snap > Snapabort**.

5. When the snapshot mirror is ready, click **Snapshot** to complete the snapshot. This creates a snapshot copy of the original volume.

If you decide not to make a snapshot volume, you can remove the snapshot mirror after the snapstart phase. To remove the snapshot mirror, click **Remove Snapshot Mirror**.

Notes:

- The **Volume Snapshot** task requires a volume name.
- The snapshot volume is an exact copy of the original volume at the time the snapshot phase of the procedure starts.
- After you create the snapshot copy of the volume, remember to back it up to tape or some other media. Remove the snapshot volume when it is no longer needed.
- The snapstart phase of this task may take a long time, depending on the size of the volume.
- If you remove the snapshot mirror, you cannot create a snapshot volume until you repeat the snapstart phase of the procedure.



Merging a Snapshot Volume

The **Volume Snapback** procedure merges a snapshot copy of a volume with the original volume. The snapshot plex is detached from the snapshot volume and attached to the original volume. The snapshot volume is removed. This task resynchronizes the data in the volume so that the plexes are consistent. By default, the data in the original plex is used for the merged volume.

▼ To merge a snapshot volume with its original volume

1. Select the snapshot volume to be merged with its original volume.
2. Choose **Volumes > Snapback (Selected menu)** or **Volume Snapback (Command Launcher)**.
3. Complete the Snapback Volume dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Options	To replace the data in the original volume with the data from the snapshot volume, select Resync From Replica Volume .

Note:

The **Volume Snapback** feature is not supported for RAID-5 volumes.



Dissociating a Snapshot Volume

The **Volume Snapclear** procedure permanently breaks the association between a snapshot and its original volume. The snapshot volume becomes an independent volume.

▼ **To dissociate a snapshot volume from its original volume**

1. Select the snapshot volume to be dissociated from its original volume.
2. Choose **Volumes > Snapclear (Selected menu)** or **Volume Snapclear (Command Launcher)**.
3. Complete the Snapclear Volume dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
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Aborting a Snapshot

The **Volume Snapabort** procedure allows you to abort the snapshot procedure before it completes. If you have started the procedure, through **Snapstart**, but have not yet clicked on **Snapshot** to complete the procedure, you can select **Snapabort** to abort the procedure.

▼ **To abort the snapshot procedure**

1. Select the snapshot volume to be dissociated from its original volume.
2. Choose **Volumes > Snapabort**.
3. Complete the Snapabort Volume dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
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Preparing to Restore a Volume From Backup

The **Volume Prepare Restore** procedure stops the volume, sets the volume to an uninitialized state, and restarts the volume (without resynchronizing the volume mirrors). The volume can then be reloaded from backup.

This procedure is intended for raw image backups and is not appropriate for file system backups. This procedure is useful for disaster recovery. If the data on a volume is corrupted and you know that you need to restore the volume from backup, you can use this procedure to prepare the volume for restoration.

▼ To prepare a volume for a restore from backup

1. Select the volume to be restored from backup.
2. Choose **Volumes > Prepare For Restore (Selected menu)** or **Volume Prepare Restore** (Command Launcher).
3. Complete the Prepare Volume For Restore dialog box as follows:

Volume(s):	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
------------	---

After you have provided all necessary information in the dialog box, click **OK**. After you have completed this task, you can restore the volume data from backup.

Note:

If the volume contains a mounted file system, the file system must be unmounted before this task can proceed. This task does not remount the file system.



Recovering a Volume

The **Volume Recover** procedure performs any necessary volume recovery operations on a volume. The recovery operations depend on the type of volume and include starting disabled volumes, resynchronizing mirrors in mirrored volumes, and resynchronizing parity in RAID-5 volumes. After successful recovery, the volume is again available for use.

Alert icons and the Alert Monitor window can provide clues to let you know that volume recovery is needed.

▼ To recover a failed volume

1. Select the volume to be recovered.
2. Choose **Volumes > Recover (Selected menu)** or **Volume Recover (Command Launcher)**.
3. Complete the Recover Volume dialog box as follows:

Volume(s):	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
------------	---

After you have provided all necessary information in the dialog box, click **OK**.

Note:

In some cases, recovery is not possible. If the volume recovery fails, you can attempt to restore the volume from backup.

Repairing a Mirror

The **Mirror Repair** procedure repairs a disabled mirror by reattaching the mirror to its volume. This involves copying data from an active mirror on the volume to the mirror being attached. Once attached, the mirror is accessible for reads and writes again.

Alert icons and the Alert Monitor window may provide clues to let you know that a mirror needs to be repaired.

▼ To repair a mirror

1. Select the volume that contains the mirror to be repaired.
2. Choose **Volumes > Mirror > Repair (Selected menu)** or **Mirror Repair (Command Launcher)**.
3. Complete the Repair Mirror dialog box as follows:

Select a mirror to repair:	Select the mirror to be repaired.
----------------------------	-----------------------------------

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- This task recovers the mirror so that it has the same contents as other mirrors in the volume.
- This task can take a long time, depending on the amount of data in the volume.



Disabling a Mirror

Note Disabling a mirror can result in loss of data redundancy.

The **Mirror Disable** procedure disables a mirror by temporarily detaching the mirror from its volume. A detached mirror is inaccessible for reads and writes, but is still associated with its volume. Once disabled, the mirror remains detached from its volume until you either reattach the mirror (see “[Repairing a Mirror](#)” on page 155) or restart the volume.

▼ To disable a mirror in a volume

1. Select the volume that contains the mirror to be disabled.
2. Choose **Volumes > Mirror > Disable (Selected menu)** or **Mirror Disable (Command Launcher)**.
3. Complete the Disable Mirror dialog box as follows:

Select a mirror to disable:	Select the mirror to be disabled.
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After you have provided all necessary information in the dialog box, click **OK**.

<p>Notes:</p> <ul style="list-style-type: none"> - Volume reads and writes cannot be directed to a disabled mirror. - If a volume only has two mirrors and one mirror is disabled, the volume is not redundant while the mirror is disabled. - The last mirror in a volume cannot be disabled. - When a volume is restarted, any disabled (detached) mirrors reattach to the volume automatically.

Removing a Mirror From a Volume

Caution Removing a mirror can result in loss of data redundancy.

The **Mirror Remove** procedure removes a mirror from its volume. This procedure breaks the link between the mirror and its volume and returns the mirror disk space to the free space pool for reuse. You can remove an extra mirror from a volume to make the underlying disk space available for use elsewhere. However, this may leave the volume unmirrored and unprotected against disk failure.

▼ To remove a mirror from a volume

1. Select the volume that contains the mirror to be removed.
2. Choose **Volumes > Mirror > Remove (Selected menu)** or **Mirror Remove (Command Launcher)**.
3. Complete the Remove Mirror dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Removal Method:	Specify the mirrors and/or number of mirrors to be removed: <ul style="list-style-type: none"> - To specify how many mirrors should be removed, select By Quantity/disk. Enter the number of mirrors to be removed in the Mirror Quantity field. - To specify the disks on which mirrors should be preserved, select By Quantity/disk. Enter the disk names in the Preserved Disk(s) field or click Browse to select a disk. - To specify the name of the mirror to be removed, select By Mirror. Enter the mirror name in the Mirror Name field or click Browse to select a mirror.



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Mirror Remove** task requires a volume name. This task also requires the number of mirrors to remove, a disk name, or a mirror name.
- If a volume only has two mirrors and one mirror is removed, the volume is no longer redundant.
- The last mirror (plex) cannot be removed from a volume.
- When a mirror is removed, the space occupied by that mirror is returned to the free space pool.

Removing a Log From a Volume

The **Log Remove** procedure removes a log from a mirrored or RAID-5 volume. For a mirrored volume, this removes a DRL log from the volume. For a RAID-5 volume, this removes a RAID-5 log from the volume.

▼ To remove a log from a volume

1. Select the volume that contains the RAID-5 or DRL log to be removed.
2. Choose **Volumes > Log > Remove (Selected menu)** or **Log Remove (Command Launcher)**.
3. Complete the Remove Log dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Removal Method:	Specify the logs and/or number of logs to be removed: <ul style="list-style-type: none"> - To specify how many logs should be removed, select By Quantity/disk. Enter the number of logs to be removed in the Log Quantity field. - To specify the disks on which logs should be preserved, select By Quantity/disk. Enter the disk names in the Preserved Disk(s) field or click Browse to select a disk. - To specify the name of the log to be removed, select By Log. Enter the log name in the Log Name field or click Browse to select a log.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- This task requires a volume name.
- If the only log is removed from a volume, logging (either dirty region logging or RAID-5 logging) is no longer in effect for that volume. When logging is disabled, recovery time increases.



Removing a Volume

Caution Removing a volume can result in data loss.

This procedure permanently removes a volume and all of its data. You should only remove a volume if you are sure that you do not need the data in the volume (or the data is backed up elsewhere). You can remove a volume to make the underlying disk space available for use elsewhere.

▼ To remove a volume

1. Select the volume to be removed.
2. Choose **Volumes > Remove (Selected menu)** or **Volume Remove (Command Launcher)**.
3. Complete the Remove Volume dialog box as follows:

Volume(s):	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
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After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- Removing a volume destroys all of the data in that volume.
- When a volume is removed, the space it occupied is returned to the free space pool.



Associating a Plex

The **Plex Associate** procedure associates (attaches) a plex to a volume. This involves copying data from an active mirror on the volume to the new plex (mirror).

▼ To associate a plex

1. Choose **Plex Associate** (Command Launcher).
2. Complete the Associate Plex dialog box as follows:

Plex Name:	Enter the plex name or click Browse to select the plex.
Volume Name:	Enter the name of the volume to be associated with the plex or click Browse to select a volume.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Plex Associate** task requires a plex name and a volume name.
- The **Plex Associate** task connects a plex to a volume.
- The **Plex Associate** task can take a long time, depending on the amount of data in the volume.

Dissociating a Plex

The **Plex Dissociate** procedure dissociates a plex from its volume. This disconnects the plex from its volume and reduces volume data redundancy.

▼ To dissociate a plex

1. Choose **Plex Dissociate** (Command Launcher).
2. Complete the Dissociate Plex dialog box as follows:

Plex Name:	Enter the plex name or click Browse to select the plex.
------------	--



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Plex Dissociate** task requires a plex name.
- The **Plex Dissociate** task breaks the link between the plex and its volume. The plex remains inaccessible until it is (re)associated with a volume.
- Dissociating a plex from a volume can result in loss of data redundancy.



Moving a Subdisk

The **Subdisk Move** procedure moves the contents of a volume subdisk from one disk to another. This is useful for moving portions of a volume to a different disk for improved performance.

You can use the Object View window (**Disk Groups > Object View**) or the Volume to Disk Mapping window (**Disk Groups > Disk/Volume Map**) to view the subdisks and gaps on disks in a disk group. In the Object View window, you can move a subdisk by placing the pointer over the subdisk and then pressing and holding the mouse button to drag the subdisk to another location.

▼ To move a subdisk to another disk

1. Select the subdisk to be moved to another disk.
2. Choose **Subdisks > Move (Selected menu)** or **Subdisk Move** (Command Launcher).
3. Complete the Move Subdisk dialog box as follows:

Source Subdisks:	If the correct subdisk name does not already display in this field, enter the subdisk name or click Browse to select the subdisk.
Target Disk Name:	Enter the name of the disk to which the subdisk should be moved or click Browse to select a disk.
Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To specify whether the subdisk can be split into smaller subdisks that fit in available spaces on the target disk, select one of the Move Policy options. The One to One options do not split the subdisks. The Split as Required option splits the subdisks. - To specify the minimum disk offset for the subdisk, enter the offset in the Starting Offset for Gap Search field.



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Subdisk Move** task requires a subdisk name and a disk name.
- Subdisks are typically moved to reorganize disk space.
- The disk space occupied by the original subdisk is returned to the free space pool.
- A subdisk in a mirrored, striped, or RAID-5 volume should not be moved to a disk that already contains a copy or part of that volume.
- If the **Subdisk Move** task fails and leaves some unused subdisks (that is, subdisks that are not associated with a volume) on the system, you can use the **Subdisk Remove** task to free the space occupied by the unused subdisks.

Splitting a Subdisk

The **Subdisk Split** procedure divides a subdisk into two or more smaller subdisks. Once split, the smaller subdisks can be moved elsewhere or rejoined later. This is useful for reorganizing volumes and/or improving performance.

You can use the Object View window (**Disk Groups > Object View**) or the Volume to Disk Mapping window (**Disk Groups > Disk/Volume Map**) to view the subdisks in a disk group. You can use the Volume Layout Details window (**Volumes > Show Layout**) to view subdisks in a specific volume.

▼ To split a subdisk into multiple subdisks

1. Select the subdisk to be split into multiple subdisks.
2. Choose **Subdisks > Split (Selected menu)** or **Subdisk Split (Command Launcher)**.
3. Complete the Split Subdisk dialog box as follows:

Subdisk Name:	If the correct subdisk name does not already display in this field, enter the subdisk name or click Browse to select the subdisk.
Number of Target Subdisks:	Enter the number of subdisks into which the subdisk should be split. A subdisk can be split into two or more subdisks.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Subdisk Split** task requires a subdisk name and the number of subdisks to result from the split.
- The name of the first subdisk remains the same as the selected subdisk. Other subdisks are automatically named by VxVM.
- The new, smaller subdisks occupy the same regions of the disk that the original subdisk occupied.
- The original subdisk must contain a sufficient number of sectors for the specified split to work.
- A Dirty Region Logging log subdisk cannot be split.



Joining Subdisks

The **Subdisk Join** procedure joins two or more subdisks together to form a single, larger subdisk. Subdisks can only be joined together if they belong to the same volume and occupy adjacent regions of the same disk and mirror.

You can use the Object View window (**Disk Groups > Object View**) or the Volume to Disk Mapping window (**Disk Groups > Disk/Volume Map**) to view the subdisks in a disk group. You can use the Volume Layout Details window (**Volumes > Show Layout**) to view subdisks in a specific volume.

▼ To join subdisks

1. Select the subdisks to be combined into a single subdisk.
2. Choose **Subdisks > Join (Selected menu)** or **Subdisk Join (Command Launcher)**.
3. Complete the Join Subdisks dialog box as follows:

Source Subdisks:	If the correct subdisk names do not already display in this field, enter the subdisk names or click Browse to select the subdisks. Specify at least two subdisks.
Target Subdisk Name:	Enter the name of the new, combined subdisk.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Subdisk Join** task requires two or more existing subdisk names and a new (joined) subdisk name.
- Only contiguous subdisks on the same disk can be joined.
- The subdisks to be joined must belong to the same volume and mirror.
- For a striped volume, the subdisks must be in the same column.
- The joined subdisk name can be the name of one of the subdisks being joined.



Removing a Subdisk

The **Subdisk Remove** procedure removes a subdisk from a disk. This task applies to subdisks that are not associated with volumes. This provides a way to return the disk space occupied by unused subdisks to the free space pool.

You can use the Disk Properties window (**Disks > Properties**) to view subdisks that are not associated with volumes.

▼ To remove a subdisk

1. Select the disk with the subdisk to be removed.
2. Choose **Disks > Properties (Selected menu)**.
3. In the Disk Properties window, go to the Subdisks tab and select the subdisk to be removed.
4. Choose **Remove** (popup menu) or **Subdisk Remove** (Command Launcher).
5. Complete the Remove Subdisk dialog box as follows:

Subdisks:	If the correct subdisk name does not already display in this field, enter the subdisk name or click Browse to select the subdisk.
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After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- You cannot remove a subdisk that is associated with a volume.
- When a subdisk is removed, the space it occupied returns to the free space pool.



Viewing Volume Properties

The Volume Properties window contains detailed information about the selected volume. The Properties window contains a set of tabbed pages, each of which contains information about the volume and related objects. You can display a different page by clicking on the appropriate tab label.

- ❖ To view the properties of a volume, select the volume and then choose **Properties** from the **Volumes** or popup menu. You can also access the Volume Properties window by double-clicking on the volume.
- ❖ To update the contents of the Properties window to reflect current properties for the volume, click **Refresh**.
- ❖ To print the contents of the Properties window, click **Print** and complete the Print dialog box.

Adding a File System to a Volume

The **Volume Add File System** procedure places a file system on an existing volume and mounts the file system. This also updates the file system table file, if necessary.

▼ To add a file system to an existing volume

1. Select the volume to contain the file system.
2. Choose **Volumes > File System > New (Selected menu)** or **Volume Add File System (Command Launcher)**.
3. Complete the New File System dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Mount Point:	Enter the mount point for the file system.
FS Type:	Select the file system type.
Options	<ul style="list-style-type: none"> - To mount the file system automatically at system startup, select Mount at Boot. If this is selected, the file system table file is also updated at system startup. - To specify mount options, click Mount Details and specify the appropriate options in the Mount Details dialog box. - To specify <code>mkfs</code> command options, click New File System Details and specify the appropriate options in the New File System Details dialog box.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Volume Add File System** task requires a volume name and a file system type. If **Mount at Boot** is selected, a file system mount point is also required.
- When the file system is mounted, the file system table file is automatically updated.
- If the path specified for the mount point does not already exist, it is created.
- The mount point must be an absolute pathname (that is, it must begin with /).



Mounting a File System on a Volume

The **Volume Mount** procedure mounts a file system that already exists on a volume and updates the file system table file, if necessary.

▼ To mount a file system on an existing volume

1. Select the volume that contains the file system to be mounted.
2. Choose **Volumes > File System > Mount (Selected menu)** or **Volume Mount (Command Launcher)**.
3. Complete the Mount File System dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Mount Point:	Enter the mount point for the file system.
Options	<ul style="list-style-type: none"> - To mount the file system automatically at system startup, select Mount at Boot. If this is selected, the file system table file will also be updated at system startup. - To specify mount options, click Mount Details and specify the appropriate options in the Mount Details dialog box.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Volume Mount** task requires a volume name. If **Mount at Boot** is selected, a file system mount point is also required.
- The specified volume must contain a file system.
- The file system table file is automatically updated.
- If the path specified for the mount point does not already exist, it is created.
- The mount point must be an absolute pathname (that is, it must begin with /).



Cluster Mounting a File System on a Cluster Node

The **Volume Cluster Mount** procedure mounts a VxFS file system on a selected volume in cluster (*shared*) mode. See the `mount_vxfs(1M)` and `fsclustadm(1M)` manual pages for more information on mounting cluster file systems.

▼ To cluster mount a file system from a node

1. Select the volume that contains the file system to mount in cluster mode.
2. Choose **Volumes > File System > Cluster Mount (Selected menu)**.
3. Complete the Cluster Mount dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Cluster Node:	To mount a specific cluster node, enter the name of the node in the Cluster Node field or click Browse to select a node.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The specified volume must contain a file system.
- The file system table file is automatically updated.
- After you perform a cluster mount from VMSA, the mount becomes persistent; that is, the next time the system is restarted, the file system mounts automatically.
- The first file system mounted in a cluster becomes the *primary* file system in that cluster. To change the primary file system, select a file system in the cluster and choose **File Systems > Set Primary**.



Unmounting a File System on a Volume

The **Volume Unmount** procedure unmounts a file system.

▼ **To unmount a file system on a volume**

1. Select the volume containing the file system to be unmounted.
2. Choose **Volumes > File System > Unmount (Selected menu)** or **Volume Unmount (Command Launcher)**.
3. Complete the Unmount File System dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Cluster Node:	If the correct cluster node name does not already display in this field, enter the cluster node name or click Browse to select the cluster node.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The specified volume must contain a mounted file system.
- The cluster file system primary cannot be unmounted until all the cluster file system secondaries are unmounted.



Removing a Cluster Mounted File System

The **File Systems Remove** procedure unmounts a cluster file system and removes its resource information from the cluster configuration file..

▼ **To remove a cluster file system from the cluster configuration**

1. Select the volume containing the file system to be removed.
2. Choose **File Systems > Remove (Selected menu)** or **CFS Remove (Command Launcher)**.
3. Complete the Remove dialog box as follows:

File System(s):	If the correct cluster file system does not already display in the field, enter the device name or mount point, or click Browse to select the cluster file system.
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After you have provided all necessary information in the dialog box, click **OK**.



Resizing a File System

The **File System Resize** procedure changes the size of a file system and the underlying volume. If users require more space, you can use this procedure to increase the size of the file system. If a VxFS file system is too large and you need the space elsewhere, you can use this procedure to shrink the file system.

▼ To resize a file system on a volume

1. Select the file system to be resized.
2. Choose **File Systems > Resize (Selected menu)** or **File System Resize (Command Launcher)**.
3. Complete the Resize File System dialog box as follows:

File System Name:	If the correct file system name does not already display in this field, enter the file system name or click Browse to select the file system.
New Size:	<p>Specify <i>one</i> of the following:</p> <ul style="list-style-type: none"> - To increase the file system size <i>by</i> a specific amount of space, use the Add By field to specify how much space should be added to the file system. - To decrease the file system size <i>by</i> a specific amount of space, use the Subtract By field to specify how much space should be removed from the file system. - To specify the new file system size, enter the size in the Desired Size field. <p>To determine the largest possible size for the file system, click Maxgrow after choosing options.</p> <p>To specify a size unit, attach an <i>s</i> (sectors), <i>k</i> (kilobytes), <i>m</i> (megabytes), or <i>g</i> (gigabytes) to the size.</p>
Options	To use a specific disk for the additional space, click Assign Disks and select the disk you want to use from the Space Allocation dialog box.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **File System Resize** task requires a file system name and either the desired size or the amount of space to add to or subtract from the file system size.
- When the file system is resized, the underlying volume is also resized.
- Only VxFS file systems can be shrunk.
- The file system to be resized must be on a volume.
- For cluster mounted file systems, resizing can only be done on the CVM master node.



Creating a Snapshot Copy of a File System

The **File System Snapshot** procedure prepares VxFS for online backup by creating a snapshot copy of the file system. This is done by creating a new volume, mounting a snapshot file system on the new volume, and copying the contents of the original file system to the snapshot file system. The snapshot file system is a consistent copy of the original file system at the time the snapshot was made. You can use the snapshot file system to make a backup of the original file system at a convenient time. After the backup is made, you can remove the snapshot file system by removing the underlying snapshot volume (see “[Removing a Volume](#)” on page 160).

▼ To create a snapshot copy of file system data

1. Select the file system to be backed up.
2. Choose **File Systems > Snapshot (Selected menu)** or **File System Snapshot (Command Launcher)**.
3. Complete the File System Snapshot dialog box as follows:

File System Name:	If the correct file system name does not already display in this field, enter the file system name or click Browse to select the file system.
Snapshot Mount Point:	Enter the mount point for the snapshot copy of the file system.
Snapshot Size:	Enter the size of the snapshot copy of the file system.
Options	To place the snapshot on a specific disks, click Assign Disks and select the disks you want to use.



After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **File System Snapshot** task requires a file system name, a snapshot mount point, and a snapshot size.
- The **File System Snapshot** task is only available for VxFS file systems.
- The snapshot file system is an exact copy of the original file system at the time the snapshot was created.
- After you create the snapshot copy of the file system, remember to back it up to tape or some other media. Remove the snapshot file system when it is no longer needed.
- Users can continue to use the original file system during this snapshot backup procedure.
- Refer to the *VERITAS File System Administrator's Guide* for guidelines on choosing the snapshot file system size.
- Snapshot functionality does not work on cluster file systems.



Checking a File System on a Volume

The **File System Check** procedure checks an unmounted file system on a volume for consistency (using the `fsck` command). This procedure can also attempt to repair the file system, if necessary. See the `fsck_vxfs(1M)` manual page for more information on file system checking.

▼ **To check a file system on a volume**

1. Select the volume containing the file system to be checked.
2. Choose **Volumes > File System > Check (Selected menu)** or **File System Check (Command Launcher)**.
3. Complete the Check File System dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Options	<ul style="list-style-type: none"> - To check and attempt to repair the file system, select Check And Repair. - To check the file system without repairing it, select Check With No Repair. - To unmount the file system, run <code>fsck</code>, and then mount the file system, select Unmount And Check, Then Mount. - To unmount the file system and then run <code>fsck</code>, select Unmount And Check.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:
<ul style="list-style-type: none"> - The specified volume must contain a file system. The file system must be unmounted. - VERITAS Volume Manager Storage Administrator assumes that <code>fsck</code> does not require user input. If user input is required, this task fails and <code>fsck</code> must be run at the command line.

Viewing File System Properties

The File System Properties window contains detailed information about the selected file system. The Properties window contains a set of tabbed pages, each of which contains information about the file system and related objects. You can display a different page by clicking on the appropriate tab label.

- ❖ To view the properties of a file system, select the file system and then choose **Properties** from the **File Systems** or popup menu. You can also access the File System Properties window by double-clicking on the file system.
- ❖ To update the contents of the Properties window to reflect current properties for the file system, click **Refresh**.
- ❖ To print the contents of the Properties window, click **Print** and complete the Print dialog box.



Creating a QuickLog Volume

The **Volume Make FS Log** procedure designates a volume as a QuickLog™ volume. After setting up a QuickLog volume, you can enable a QuickLog device for a file system.

▼ To designate a volume as a QuickLog volume

1. Select the volume to be used for the QuickLog device.
2. Choose **Volumes > QuickLog > Make Log (Selected menu)** or **QuickLog Make Log (Command Launcher)**.
3. Complete the Make QuickLog Log dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
Log Device Number:	Select the number of the log device (vxlog 1-31) to attach to the volume. Log devices are listed in /dev/qlog.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Volume Make FS Log** task is only available if QuickLog is installed/licensed.
- The **Volume Make FS Log** task requires a volume name and a log device number (1-31).
- Only VxFS file systems can be used with a QuickLog device.
- The specified volume cannot contain a file system.
- The size of the specified volume must be at least 32MB.
- QuickLog does not operate on VxFS cluster file systems.



Enabling a QuickLog Device for a File System

The **QuickLog Enable** procedure enables a QuickLog device on a VxFS file system. Before you enable a QuickLog device, you must designate a volume as a QuickLog volume (see “[Creating a QuickLog Volume](#)” on page 180).

▼ To enable a QuickLog device for a file system

1. Select the file system on which to enable a QuickLog device.
2. Choose **File Systems > QuickLog > Enable (Selected menu)** or **QuickLog Enable (Command Launcher)**.
3. Complete the Enable QuickLog dialog box as follows:

File System Name:	If the correct file system name does not already display in this field, enter the file system name or click Browse to select the file system.
Log Device Number:	Select the number of the log device (vxlog 1-31) to be enabled for the file system. Log devices are listed in <code>/dev/qlog</code> .
Options	To enable QuickLog on the file system automatically at system startup, select Mount at Boot. If this is selected, the file system table file will also be updated at system startup.

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- This task is only available if QuickLog is installed/licensed.
- This task requires a file system name.
- Only VxFS file systems can be used with a QuickLog device.
- The specified QuickLog device must already have a designated QuickLog volume.
- If no log device number is specified, the least-loaded device is used.
- QuickLog does not operate on VxFS cluster file systems.



Disabling a QuickLog Device for a File System

The **QuickLog Disable** procedure disables QuickLog for a VxFS file system.

▼ To disable a QuickLog device for a file system

1. Select the file system to have QuickLog disabled.
2. Choose **File Systems > QuickLog > Disable (Selected menu)** or **QuickLog Disable (Command Launcher)**.
3. Complete the Disable QuickLog dialog box as follows:

File System Name:	If the correct file system name does not already display in this field, enter the file system name or click Browse to select the file system.
-------------------	--

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **QuickLog Disable** task is only available if QuickLog is installed/licensed.
- The **QuickLog Disable** task requires a file system name.
- QuickLog does not operate on VxFS cluster file systems.



Removing a QuickLog Volume

The **Quicklog Remove** procedure detaches a QuickLog volume from a QuickLog device. Before you remove a QuickLog volume, you must disable QuickLog for all QuickLog-enabled file systems using that QuickLog device (see “[Disabling a QuickLog Device for a File System](#)” on page 182).

▼ To remove a QuickLog volume

1. Select the QuickLog volume to be detached.
2. Choose **Volumes > QuickLog > Remove Log (Selected menu)** or **Quicklog Remove (Command Launcher)**.
3. Complete the QuickLog Remove Log dialog box as follows:

Volume Name:	If the correct volume name does not already display in this field, enter the volume name or click Browse to select the volume.
--------------	---

After you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Quicklog Remove** task is only available if QuickLog is installed/licensed.
- The **Quicklog Remove** task requires a volume name.
- QuickLog must be disabled for all QuickLog-enabled file systems using the QuickLog device before the QuickLog volume can be detached.
- QuickLog does not operate on VxFS cluster file systems.





Introduction

This chapter describes how to access and use host machines and clusters with VERITAS Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator). The Host and Cluster Task Roadmap at the beginning of this chapter contains a summary of common host and cluster tasks.

VERITAS Volume Manager Storage Administrator can access and display multiple host machines simultaneously. VERITAS Volume Manager Storage Administrator only provides access to cluster-related features if the optional VERITAS Volume Manager (VxVM) cluster functionality is present.

The following host tasks are discussed in this chapter:

- ◆ [Connecting to a Host](#)
- ◆ [Disconnecting a Host](#)
- ◆ [Setting Up Automatic Host Connections](#)

The following cluster tasks are discussed in this chapter:

- ◆ [Working with Clusters](#)
- ◆ [Starting a Cluster](#)
- ◆ [Stopping a Cluster](#)
- ◆ [Starting a Node](#)
- ◆ [Stopping a Node](#)
- ◆ [Creating a Shared Disk Group](#)
- ◆ [Importing a Shared Disk Group](#)
- ◆ [Upgrading a Cluster](#)



Host and Cluster Task Roadmap

The following table provides a summary of common VERITAS Volume Manager Storage Administrator host and cluster tasks.

To perform this task ...	Use this procedure...
<i>Setup Tasks:</i>	
Connect to and administer another host machine	Connecting to a Host
Set up a shared disk group	Creating a Shared Disk Group
Start a cluster	Starting a Cluster
<i>Other Tasks:</i>	
Stop a cluster	Stopping a Cluster
Add a node to a cluster	Starting a Node
Prevent access to a node in a cluster	Stopping a Node
Disconnect from a host machine	Disconnecting a Host
Access a deported disk group for cluster use	Importing a Shared Disk Group



Connecting to a Host

The **Host Connect** procedure establishes a connection to a host machine from a VERITAS Volume Manager Storage Administrator client session. VERITAS Volume Manager Storage Administrator can provide simultaneous access to multiple host machines.

▼ To connect to a host

1. Choose **File > Connect (Selected menu)** or **Host Connect (Command Launcher)**.
2. Complete the Connect to Host dialog box as follows:

Server Host:	Enter the name of the machine to be administered. Both VxVM and the VERITAS Volume Manager Storage Administrator server must be running on this machine.
User Name:	Enter your login name. Only users with appropriate privileges can run VERITAS Volume Manager Storage Administrator on the specified machine.
Password:	Enter your password for the machine to be administered.
Options	To use the specified user as default settings for any future host connections from VERITAS Volume Manager Storage Administrator, select Default User .

When you have provided all necessary information in the dialog box, click **OK**. The new host appears in the object tree in the main window.

Notes:

- This task requires a host machine name, user name, and password.
- Both VxVM and the VERITAS Volume Manager Storage Administrator server must be running on the machine to be administered.
- Only users with appropriate privileges can run VERITAS Volume Manager Storage Administrator.
- Entries for the user name and password must exist in the password file or corresponding Network Information Name Service (NIS) table on the machine to be administered.
- The user name (or the user's group ID) must be included in the `vrtsadm` group entry in the group file or NIS group table on the machine to be administered.



Disconnecting a Host

The **Host Disconnect** procedure disconnects a host machine from the current VERITAS Volume Manager Storage Administrator session. When a host machine is disconnected, VERITAS Volume Manager Storage Administrator cannot administer that machine. To restore access to a disconnected host machine, you must reconnect to the host.

▼ To disconnect a host

1. Select the host machine to be disconnected from VERITAS Volume Manager Storage Administrator.
2. Choose **Hosts > Disconnect (Selected menu)** or **Host Disconnect (Command Launcher)**.
3. Complete the Disconnect Host dialog box as follows (if applicable):

Host(s):	Enter the name of the host machine or click Browse to select the host.
----------	---

When you have provided all necessary information in the dialog box, click **OK**. The disconnected host remains in the object tree in the main window, but its icon changes to the disconnected host icon.

Setting Up Automatic Host Connections

The procedure to set up automatic host connections causes VERITAS Volume Manager Storage Administrator to automatically connect to specified hosts at startup. You can specify which hosts should connect to the VERITAS Volume Manager Storage Administrator client at startup and how to display those hosts in the main window object tree.

▼ To set up automatic host connections

1. Choose **Options > Customize** from the main window menu bar.
2. Click on the **Hosts** tab in the Customize window.
3. To specify a host machine, click **Add** and enter the host machine name in the Hosts column of the grid.
4. To automatically connect to the specified host at VERITAS Volume Manager Storage Administrator startup, click in the **Connect** column. A check mark indicates that the Connect preference is set for the host. If you want the object tree to display the hierarchy of objects under the host at startup, click in the **Auto-Expand** column.
5. When you have completed your selections, click **OK**.
6. Choose **Options > Save Customization** from the main window menu bar.
Your host settings take effect the next time you start VERITAS Volume Manager Storage Administrator.

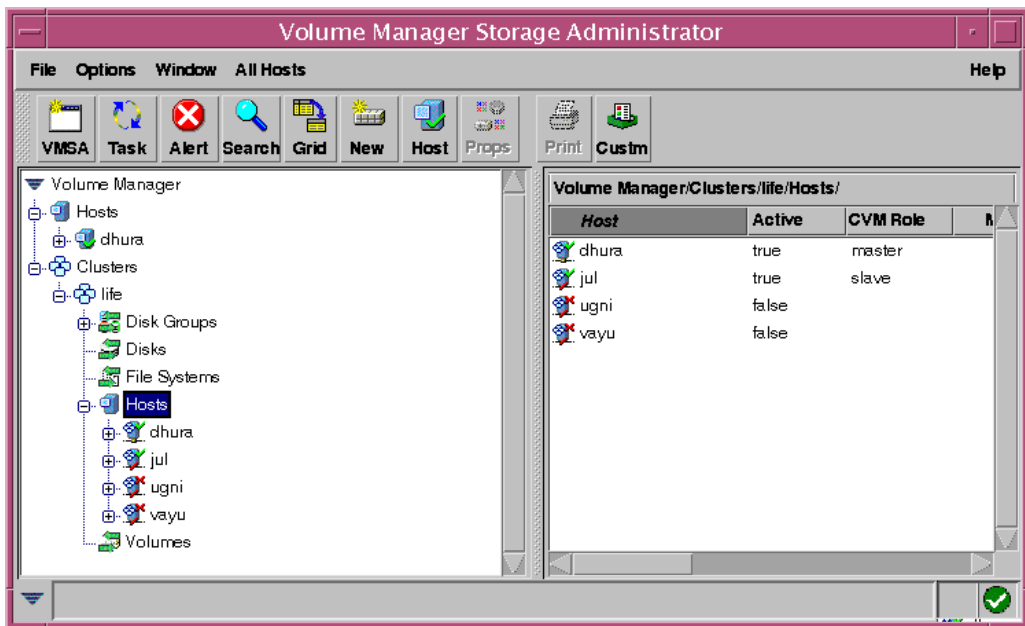


Working with Clusters

VxVM includes an optional cluster feature that enables VxVM to be used in a cluster environment. To activate the cluster feature, you must obtain a license for the VERITAS Volume Manager cluster functionality.

After adding a VERITAS Volume Manager cluster license to the machine, you must restart the VERITAS Volume Manager Storage Administrator server to enable cluster support in VERITAS Volume Manager Storage Administrator. When a cluster license is present on a machine, VERITAS Volume Manager Storage Administrator displays a Clusters icon in the object tree (even if the machine is not currently set up as a node in a cluster). When a cluster is shown in the tree, all active/inactive nodes that are members of the cluster display in the tree, as shown in “[Tree/Grid View of a Cluster.](#)”

Tree/Grid View of a Cluster



- ❖ To display the objects in a cluster, expand the cluster hierarchy (by clicking on the plus sign next to the Clusters icon).
- ❖ To determine which node is the master in a cluster, expand the cluster hierarchy for the appropriate cluster and select **Hosts** from the cluster hierarchy. The grid displays the names and properties of the nodes in the cluster. The Type column indicates which node is the master.

The Cluster Properties window also indicates which node is the master. To access this window, select a cluster and choose **Properties** from the Selected or popup window.

Notes:

- When VERITAS Volume Manager Storage Administrator is connected to a single host, that host is auto-expanded; that is, the hierarchy of objects under that host is fully displayed in the dialog.
- If VERITAS Volume Manager Storage Administrator is connected to more than one host, the hierarchy of objects is not auto-expanded. You can implement expansion either by selecting **Options > Customize > Hosts** and clicking in the **Auto-Expand** column, or by expanding each host individually.
- Connecting to a slave node automatically connects to a master node.
- Connecting to a master node does not automatically connect to the slave nodes, unless you have indicated that you want this to happen by selecting **Options > Customize > Hosts** and clicking in the appropriate position.
- Until VERITAS Volume Manager Storage Administrator connects to a node in the cluster, the host icon will appear with a red slash '/' in the lower right corner.
- A non-connected node will not expand until a connection is established.



Starting a Cluster

The **Cluster Start** procedure starts a cluster. If the cluster is not already started, you must use this task to start the cluster before you can access the shared objects in the cluster.

▼ To start a cluster

1. Select the Clusters icon at the top of the cluster portion of the object tree.
2. Choose **All Clusters > Start Cluster (Selected menu)** or **Cluster Start (Command Launcher)**.
3. Complete the Start Cluster dialog box as follows:

Cluster Node:	Enter the name of any machine in the cluster or click Browse to select a host.
---------------	---

When you have provided all necessary information in the dialog box, click **OK**. The cluster and its objects appear in the object tree.

Notes:

- The **Cluster Start** task is only applicable in a cluster environment.
- A cluster must be started before you can access the shared objects on the machines in the cluster.

Stopping a Cluster

The **Cluster Stop** procedure stops a cluster and makes the shared objects in the cluster inaccessible from VERITAS Volume Manager Storage Administrator.

▼ To stop a cluster

1. Select the cluster to be stopped.
2. Choose **Clusters > Stop Cluster (Selected menu)** or **Cluster Stop (Command Launcher)**.
3. Complete the Stop Cluster dialog box as follows (if applicable):

Cluster:	Enter the name of the cluster or click Browse to select a cluster.
----------	---

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Cluster Start** task is only applicable in a cluster environment.
- A cluster must be started before you can access the shared objects on the machines in the cluster.



Starting a Node

The **Cluster Start Node** procedure activates a node (host) in a cluster. This causes the node to join the cluster. A node must be started before it can access shared objects in the cluster. If a node has been stopped for some reason, you can use this task to restart the node.

▼ To start node in a cluster

1. Select the node (host) to be started.
2. Choose **Cluster Nodes > Start Node (Selected menu)** or **Cluster Start Node (Command Launcher)**.
3. Complete the Start Cluster Node dialog box as follows (if applicable):

Cluster Node:	Enter the name of the host machine or click Browse to select the host.
---------------	---

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Cluster Start** task is only applicable in a cluster environment.
- A cluster must be started before you can access the shared objects on the machines in the cluster.



Stopping a Node

The **Cluster Stop Node** procedure stops a node (host) in a cluster and makes that node inaccessible to the cluster. A stopped node cannot access shared objects in the cluster. If the stopped node is the master node, another node in the cluster automatically becomes the new master.

▼ To stop a node in a cluster

1. Select the node (host) to be stopped.
2. Choose **Cluster Nodes > Stop Node (Selected Menu)** or **Cluster Stop Node (Command Launcher)**.
3. Complete the Stop Cluster Node dialog box (if applicable) as follows:

Cluster Node:	Enter the name of the host machine or click Browse to select the host.
---------------	---

When you have provided all necessary information in the dialog box, click **OK**.

4. Confirm that you want to stop this node.

Notes:

- The **Cluster Stop Node** task is only applicable in a cluster environment.
- When a node is stopped, the node cannot access the shared objects in the cluster.
- If the master node is stopped, another node in the cluster automatically becomes the new master.



Creating a Shared Disk Group

The **Disk Group Create** procedure creates a shared disk group for use in a cluster environment. Disks must be placed in disk groups before they can be used by VxVM. The default disk group (`rootdg`) is usually created during VxVM installation and always exists on a system running VxVM. You can create additional disk groups to organize your disks into logical sets of disks.

When you place a disk under VxVM control, the disk is either encapsulated or initialized. Encapsulation preserves any existing data on the disk in volumes. Initialization destroys any existing data on the disk.

▼ To create a disk group

1. Select the host machine that is the master node.
2. Choose **File > New > Disk Group (Selected menu) or Disk Group Create (Command Launcher)**.
3. Complete the New Disk Group dialog box as follows:

Disk Group Name:	Enter the name of the disk group to be created. Click View to view the names of existing disk groups. To set up any new disks on the system, click Scan Disks . This runs the disk setup commands appropriate for the operating system.
Disk Device(s):	Select the disks to be placed in the new disk group.
Cluster Settings	Click Show Options to access the optional settings for this task. Select Create Shared to create a shared disk group.
Options	Click Show Options to access the optional settings for this task. <ul style="list-style-type: none"> - To specify the VERITAS Volume Manager disk name for the disk, enter a disk name in the Disk Name(s) field. If no VERITAS Volume Manager disk name is specified, VxVM assigns a default name to the disk. - To apply a comment or attribute to disks that are placed in the disk group, enter the information in the Comment field.

When you have provided all necessary information in the dialog box, click **OK**.



4. Indicate whether to initialize or encapsulate the disk. If you initialize the disk, any existing data on the disk is destroyed. If you encapsulate the disk, any existing data is preserved in volumes.
5. If you encapsulate the disk, reboot the system.

Notes:

- The **Disk Group Create** task requires a disk group name and the name of at least one disk.
- The disk group name must be unique.
- The new disk group must contain at least one disk.
- Only disks that are online and do not belong to a disk group can be used to create a disk group.
- When a disk is placed under VxVM control, the disk is either initialized or encapsulated. Encapsulation preserves any existing data on the disk in the form of volumes. Initialization destroys any existing data on the disk. Encapsulation is recommended for the root/boot disk and any other disks that contain valuable data.
- The VERITAS Volume Manager disk name must be unique within the disk group.
- If multiple disks are specified in the Disk Device(s) field and only one disk name is specified in Disk Name(s) field, VxVM appends numbers to the disk name so that each disk name is unique within its disk group.



Importing a Shared Disk Group

The **Disk Group Import** procedure makes a deported (inaccessible) disk group and its volumes accessible in a cluster environment. To import a deported disk group as shared, you must know the former name of the disk group and this disk group name must remain unused. In addition, at least one disk formerly assigned to the deported disk group must remain unused.

▼ To import a disk group

1. Select the host machine that is the master node.
2. Choose **Hosts > Import Disk Group (Selected menu)** or **Disk Group Import (Command Launcher)**.
3. Complete the Import Disk Group dialog box as follows:

Disk Group Name:	Enter the name of the disk group to be imported or click Browse to select the disk group.
Cluster Settings	Click Show Options to access the optional settings for this task. Select Import Shared to import the disk group as a shared disk group.
Options	<p>Click Show Options to access the optional settings for this task.</p> <ul style="list-style-type: none"> - To start all volumes in the disk group at import, select Start All Volumes. - To clear the existing host ID stamp on all disks in the disk group at import, select Clear Host ID. Do not use this option if another host is using any disks in the disk group. - To force the disk group import when the host cannot access all disks in the disk group, select Force Import. This option can be used to import a disk group that contains a failed disk, but can lead to disk group inconsistency if all disks are still usable. - To change the name of the disk group at import, enter a new disk group name in the New Name field. To indicate that the name change is temporary, select Use New Name as Temporary.



When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Disk Group Import** task requires a disk group name.
- Only deported disk groups can be imported.
- A deported disk group cannot be imported if another disk group with the same name has been created since the disk group was deported.
- A disk group import can fail if the host cannot find one or more disks in the disk group. If the import fails because a disk has failed, you can import the disk group by selecting the **Force Import** option. If the import fails for another reason, a forced import can cause serious problems.
- When a disk group is imported, the system stamps its host ID on all disks in the disk group. A disk group import should fail if one of the disks is stamped with a host ID that does not match the others. This ensures that dual-ported disks cannot be managed (and possibly corrupted) by two systems at the same time. If you are *sure* that the disk group is *not* in use by another host, you can clear the host IDs and import the disk group by selecting the **Clear Host ID** option.



Upgrading a Cluster

The **Cluster Rolling Upgrade** procedure upgrades a cluster and its nodes while the cluster remains accessible. This is accomplished by upgrading one node in the cluster at a time so that at least one node remains online at all times. When all of the nodes in the cluster are upgraded, the cluster protocol version is upgraded to support the new version of the software.

▼ To upgrade a cluster

1. Upgrade each node in the cluster to the new software version as follows:
 - a. Stop the node (as described in “[Stopping a Cluster](#)” on page 193).
 - b. Upgrade the software on the node.
 - c. Restart the node (as described in “[Starting a Node](#)” on page 194).
 - d. Repeat these steps for each node in the cluster, one node at a time.
2. Select the cluster to be upgraded.
3. Choose **Clusters > Rolling Upgrade (Selected menu)** or **Cluster Rolling Upgrade (Command Launcher)**.
4. Complete the Rolling Upgrade dialog box as follows (if applicable):

Cluster:	Enter the name of the cluster or click Browse to select a cluster.
----------	---

When you have provided all necessary information in the dialog box, click **OK**.

Notes:

- The **Cluster Rolling Upgrade** task is only applicable in a cluster environment.
- This task upgrades the cluster to a new protocol version while the cluster remains accessible.
- All nodes in the cluster must be upgraded to the new version of the software before the cluster is upgraded. To avoid shutting down the cluster, you must stop, upgrade, and restart one node in the cluster at a time.
- Once the cluster is upgraded, it cannot be downgraded to the previous version.



Introduction

This chapter provides information about VERITAS Volume Manager Storage Administrator (VERITAS Volume Manager Storage Administrator) alerts, object states, and other troubleshooting topics. This chapter also contains suggestions on how to fix some common problems. If you are unable to resolve a problem by following the instructions in this chapter, contact Customer Support for additional information.

The following topics are discussed in this chapter:

- ◆ Alerts
- ◆ Disk Troubleshooting
- ◆ Volume Troubleshooting
- ◆ General Troubleshooting
 - Client/Server Problems
 - Configuration Changes



Alerts

When an object fails or experiences an error, an alert icon appears on the object and the object state usually changes to an unhealthy state. The unhealthy object also appears in the Alert Monitor window, which summarizes the problem and indicates whether any associated objects have problems. When an object enters an unhealthy state and has an alert, you should review the contents of the Alert Monitor window and then try to correct the problem. For more information about an object listed in the Alert Monitor window, review the object Properties window.

- ❖ To display the Alert Monitor window, click the **Alert** button in the toolbar or choose **Window > Alerts**.
- ❖ To view the properties of an object listed in the Alert Monitor window, select the object and choose **Object Properties** from the **Alert** or popup menu. You can also access object properties by double-clicking on the object.

Disk Troubleshooting

The disk state indicates the current condition of a disk. The disk state appears in the state column of the grid and in the Disk Properties window. When a disk is unhealthy, an alert icon appears on the disk and the disk is listed in the Alert Monitor window. This section describes the following disk states and provides suggestions on how to correct problems associated with the unhealthy states:

- ◆ Disk State: Imported
- ◆ Disk State: Free
- ◆ Disk State: Not Setup
- ◆ Disk State: Import Failed
- ◆ Disk State: Disconnected
- ◆ Disk State: Deported
- ◆ Disk State: Offline
- ◆ Disk State: Not Initialized
- ◆ Disk State: Locked
- ◆ Disk State: Inactive
- ◆ Disk State: Foreign Owned

Disk State: Imported

The disk is accessible and has no known problems. The disk is under VERITAS Volume Manager (VxVM) control and belongs to a disk group. This is the normal disk state. No user action is required.

Disk State: Free

The disk is in the Free Disk Pool. A disk in the Free Disk Pool is under VxVM control, but does not belong to a disk group.

- ❖ To make the disk available for VxVM use, add the disk to a disk group.



Disk State: Not Setup

The disk is not under VxVM control.

- ❖ To make the disk available for VxVM use, place the disk under VxVM control and add the disk to a disk group.

Disk State: Import Failed

The disk was previously under VxVM control, but VxVM cannot access the disk and/or configuration information for the disk. The disk is not available for use. This can happen after you upgrade VxVM. This can also happen if some disks are inaccessible at system startup.

- ❖ Make sure that the physical disk is turned on, plugged in, and attached to the computer. Repair any disk, controller, or cable problems. Scan the disks on the system (**Hosts > Scan Disks**) to make sure that VxVM recognizes all attached hardware. Try to import the disk group for the disk.
- ❖ If the disk group is imported and the disk does not have a VERITAS Volume Manager disk name, place the disk under VxVM control and add the disk to a disk group.

Disk State: Disconnected

The connection between the VERITAS Volume Manager disk and the underlying physical disk (device) is broken. This can occur when a disk fails or when you disconnect a disk.

- ❖ Make sure that the physical disk is turned on, plugged in, and attached to the computer. Repair any disk, controller, or cable problems. Scan the disks on the system (**Hosts > Scan Disks**) to make sure that VxVM recognizes any newly attached hardware.
- ❖ Try to reconnect the disconnected VERITAS Volume Manager disk to its physical disk (using the **Replace Disk** task).
- ❖ If you cannot fix the problem, replace the disk with another physical disk.

Disk State: Deported

The disk belongs to a disk group that is currently deported. The disk is not available for use in the deported disk group and cannot be added to a new disk group.

- ❖ To return the disk to a usable state, import the disk group for the disk.
- ❖ To move the disk to another disk group, import the current disk group, remove the disk, and add the disk to a new disk group.
- ❖ If the disk group import fails and you want to free the disk space for use in other disk groups, you can use the **Initialize Disk** task (**Hosts > Initialize Disk**) or the following command to reinitialize the disk:

```
# vxdisk -f init device_name
```

Caution This command overwrites the disk header and configuration information on the disk. Any volume copies or regions located on the disk are not accessible after you reinitialize the disk.

Disk State: Offline

VxVM cannot access the disk.

- ❖ To return the disk to an accessible state, bring the disk online.

Disk State: Not Initialized

A configuration error prevents the disk from being used.

- ❖ To make the disk available for VxVM use, place the disk under VxVM control and add the disk to a disk group.
- ❖ If the disk cannot be added to VxVM using VERITAS Volume Manager Storage Administrator, it can be necessary to reinitialize the disk with the **Initialize Disk** task (**Hosts > Initialize Disk**) or the following command:

```
# vxdisk -f init device_name
```

Caution This command overwrites the disk header and configuration information on the disk. Any volume copies or regions located on the disk are not accessible after you reinitialize the disk.



Disk State: Locked

The disk belongs to a disk group that is currently imported by another machine or was last imported by another machine and was not deported cleanly. The disk is not currently usable on the local machine.

- ❖ To make all of the disks in the disk group available for use on the local machine, deport the disk group on the remote machine and then import the disk group on the local machine.
- ❖ To make one disk available for use on the local machine, remove the disk from its disk group (on the other machine) and add it to a disk group on the local machine.
- ❖ If the disk group is *not* imported on another machine, it can be necessary to re-import the disk group and clear the host ID on all disks in the disk group. You can do this by selecting the **Clear Host ID** option in the Import Disk Group dialog box or by running the following command:

```
# vxdg -C import disk_group
```

Caution If any of the disks in the disk group are in use by another machine, this command can cause the disks to be managed by two systems at the same time, which can lead to corruption.

Disk State: Inactive

The disk appears to belong to a disk group, but is not active in the disk group. The disk may have become (temporarily) inaccessible. Alternatively, the disk may have been inaccessible at disk group import, but may be accessible now.

- ❖ Make sure that the physical disk is turned on, plugged in, and attached to the computer. Repair any disk, controller, or cable problems. Scan the disks on the system (**Hosts > Scan Disks**) to make sure that VxVM recognizes any newly attached hardware.
- ❖ It may be necessary to reattach the disk to its disk group with the **Replace Disk** task or the following command:

```
# /etc/vx/bin/vxreattach [device_name]
```

After a successful reattach, volume recovery can be necessary.

- ❖ If the reattach fails and you want to free the disk space for use, you can use the **Initialize Disk** task (**Hosts > Initialize Disk**) or the following command to reinitialize the disk:

```
# vxdisk -f init device_name
```

Caution This command overwrites the disk header and configuration information on the disk. Any volume copies or regions located on the disk is not accessible after you reinitialize the disk.

Disk State: Foreign Owned

The disk is under the control of another disk management product. The disk is not available for use with VxVM.

- ❖ To make the disk available for VxVM use, remove the disk from the other disk management product control and place the disk under VxVM control.



Volume Troubleshooting

The volume state indicates the current condition of a volume. The volume state appears in the state column of the grid and in the Volume Properties window. When a volume is unhealthy, an alert icon appears on the volume and the volume is listed in the Alert Monitor window. This section describes the following volume states and provides suggestions on how to correct problems associated with the unhealthy states:

- ◆ [Volume State: Started](#)
- ◆ [Volume State: Stopped](#)
- ◆ [Volume State: Uninitialized](#)
- ◆ [Volume State: Degraded](#)
- ◆ [Volume State: Unusable](#)

Volume State: Started

The volume is accessible and has no known problems. This is the normal volume state. No user action is required.

Volume State: Stopped

The volume is disabled and is not available for use.

- ❖ To return the volume to a usable state, start the volume.

Volume State: Uninitialized

The volume is enabled, but is not initialized. If this state appears during volume creation, no user action is necessary.

- ❖ To put the volume in a usable state, start the volume.

Volume State: Degraded

The RAID-5 volume is in a degraded mode. This usually occurs when one or more subdisks are unavailable and read requests require data reconstruction. An underlying disk may have failed completely or there may be I/O errors on part of a disk. Alternatively, an underlying disk may be disconnected.

- ❖ Make sure that the physical disks are turned on, plugged in, and attached to the computer. Repair any disk, controller, or cable problems. Scan the disks on the system (**Hosts > Scan Disks**) to make sure that VxVM recognizes any newly attached hardware.

To return the RAID-5 volume to a healthy state, recover the volume.

- ❖ If there has been a partial or complete disk failure, either replace the disk or move the affected subdisks to another disk.

Volume State: Unusable

The RAID-5 volume is unusable. This usually occurs when there is a double disk failure (that is, when two subdisks in the same stripe or the parity and one subdisk in a stripe are damaged or inaccessible). The underlying disks may have failed or become inaccessible.

- ❖ Make sure that the physical disks are turned on, plugged in, and attached to the computer. Repair any disk, controller, or cable problems. Scan the disks on the system (**Hosts > Scan Disks**) to ensure that VxVM recognizes any newly attached hardware.

Run the following command to reattach the disks to their disk group:

```
# /etc/vx/bin/vxreattach [device_name]
```

To return the RAID-5 volume to a healthy state, recover the volume.

- ❖ If two of the volume disks have failed, the RAID-5 volume data is unusable. Replace the failed disks and then try to restart the volume by running the following command:

```
# vxvol -f start volume_name
```

Restore the volume from backup.

To prevent this problem in the future, enable logging for RAID-5 volumes.



General Troubleshooting

This section contains suggestions on how to correct some general problems that may occur when you try to use VERITAS Volume Manager Storage Administrator.

Client/Server Problems

This section describes some VERITAS Volume Manager Storage Administrator client and server problems and provides suggestions on how to correct these problems. For more information about the client and server, refer to the `vmsa(1M)` and `vmsa_server(1M)` manual pages.

User is not authorized to connect to the server.

This error can occur for the following reasons:

- ◆ The user name is incorrect.
- ◆ The password is incorrect.
- ◆ The user does not have an account on the machine.
- ◆ The password and group files or NIS tables do not contain entries for the user.
- ◆ The user is not listed in the `vrtsadm` group entry.
- ❖ Enter the user name and password again. If the same error appears, ask the administrator of the machine to make sure that your user name is included in the `vrtsadm` group entry and your user name and password are entered correctly in the appropriate password and group files or NIS tables.

There is no such server.

The specified host machine does not exist or is not in the Domain Name System (DNS).

- ❖ Check the machine name and enter the machine name again.

Unable to connect to the server.

The VERITAS Volume Manager Storage Administrator server may not be running on the machine to be administered.

- ❖ Make sure the server is running (`vmsa_server -g`) and the client and server are properly configured. If necessary, restart the VERITAS Volume Manager Storage Administrator server.

Possible client/server versions mismatch.

The VERITAS Volume Manager Storage Administrator client and server versions may be incompatible.

- ❖ Check the client and server versions using the following commands:

```
# vmsa -V
# vmsa_server -V
```

If necessary, upgrade the client or server.

Server connection lost.

The VERITAS Volume Manager Storage Administrator server has been stopped.

- ❖ Restart the server.

The server seems to have multiple addresses.

The server (host) may be known by multiple addresses.

- ❖ Try to specify one of the server IP addresses as the server host name.

Configuration Changes

VERITAS Volume Manager Storage Administrator is dynamic, so VERITAS Volume Manager Storage Administrator automatically displays new objects or changes to existing objects on the system. These changes or additions are usually reflected in VERITAS Volume Manager Storage Administrator immediately (or within a short time).

If you add objects (such as new disks) to the system and VERITAS Volume Manager Storage Administrator does not display these objects within a short time, you can force VERITAS Volume Manager Storage Administrator to check for new objects in one of the following ways:

- ❖ Scan the disks on the system (**Hosts > Scan Disks**) to make sure that VxVM recognizes any newly attached hardware.
- ❖ Update the VERITAS Volume Manager Storage Administrator server configuration database (**Hosts > Reset Server**).





Glossary

alert

An indication that an error or failure has occurred on an object on the system. When an object fails or experiences an error, an alert icon appears.

alert icon

An icon that indicates that an error or failure has occurred on an object on the system. Alert icons usually appear in the status area of the main window and on the group icon of the affected object.

Alert Monitor

A window that provides information about objects that have failed or experienced errors.

browse dialog box

A dialog box that is used to view and/or select existing objects on the system. Most browse dialog boxes consist of a tree and grid.

button

A window control that the user clicks to initiate a task or display another object (such as a window or menu).

CFS

Cluster file system. A VxFS file system mounted on a selected volume in cluster (*shared*) mode.

check box

A control button used to select optional settings. A check mark usually indicates that a check box is selected.

children

Objects that belong to an object group.



cluster

A set of host machines (*nodes*) that shares a set of disks.

cluster file system

See CFS.

Command Launcher

A window that displays a list of tasks that can be performed on VERITAS Volume Manager (VxVM) or other objects. Each task is listed with the object type, task (action), and a description of the task. A task is launched by clicking on the task in the Command Launcher. The Command Launcher can be separated from or attached to the main window.

command log

A log file that contains a history of VERITAS Volume Manager Storage Administrator (VMSA) tasks performed in the current session and previous sessions. Each task is listed with the task originator, the start/finish times, the task status, and the low-level commands used to perform the task.

Command Log View window

A window that displays the VERITAS Volume Manager Storage Administrator command log file.

device name

The physical disk device name (or *disk access name*).

dialog box

A window in which the user submits information to VMSA. Dialog boxes can contain selectable buttons and/or fields that accept information.

disk group

A set of disks that are under VxVM control and share a common configuration. A disk group configuration is a set of records containing detailed information on existing VERITAS Volume Manager objects (such as disk and volume attributes) and their relationships. Each disk group has an administrator-assigned name. The root disk group (`rootdg`) is a special private disk group that always exists. Volumes can only be created on disks that belong to disk groups.

disk name

The VERITAS Volume Manager disk name (or *disk media name*). This is the logical name given to the disk by VxVM or the administrator.



dock

To separate or attach the main window and a subwindow.

enclosure

A disk array.

free disk pool

Disks that are under VxVM control, but do not belong to a disk group.

gap

A disk region that does not contain VERITAS Volume Manager objects (subdisks).

graphical view

A window that displays a graphical view of objects. In VMSA, the graphical views include the Object View window and the Volume Layout Details window.

grid

A tabular display of objects and their properties. The grid lists VERITAS Volume Manager objects, disks, controllers, or file systems. The grid displays objects that belong to the group icon that is currently selected in the object tree. The grid is dynamic and constantly updates its contents to reflect changes to objects.

group icon

The icon that represents a specific object group.

GUI

Graphical User Interface.

host

A machine or system.

launch

To start a task or open a window.

main window

The main VERITAS Volume Manager Storage Administrator window. This window contains a tree and grid that display volumes, disks, and other objects on the system. The main window also has a menu bar, a toolbar, and an optional Command Launcher.



menu

A list of options or tasks. A menu item is selected by pointing to the item and clicking the mouse.

menu bar

A bar that contains a set of menus for the current window. The menu bar is typically placed across the top of a window.

mirror

A copy of a volume and its data. There can be several mirrors per volume. The terms *mirror* and *plex* are used synonymously.

node

In the Storage Administrator tree, a node is an element attached to the tree.

In a cluster environment, a node is a host machine in a cluster.

object group

A group of objects of the same type. Each object group has a group icon and a group name. In VMSA, object groups include disk groups, disks, volumes, controllers, free disk pool disks, uninitialized disks, and file systems.

object tree

A dynamic hierarchical display of VERITAS Volume Manager objects and other objects on the system. Each node in the tree represents a group of objects of the same type.

Object View Window

A window that displays a graphical view of the volumes, disks, and other objects in a particular disk group. The objects displayed in this window are automatically updated when object properties change. This window can display detailed or basic information about volumes and disks.

plex

A copy of a volume and its data. There can be several plexes per volume. The terms *mirror* and *plex* are used synonymously.

popup menu

A context-sensitive menu that only appears when you click on a specific object or area.

properties window

A window that displays detailed information about a selected object.



radio buttons

A set of buttons used to select optional settings. Only one radio button in the set can be selected at any given time. These buttons toggle on or off.

read-only mode

Read-only mode allows you to view objects on the system through VMSA, but prevents administrative actions from taking effect.

scroll bar

A sliding control that is used to display different portions of the contents of a window.

Search window

The VERITAS Volume Manager Storage Administrator search tool. The Search window provides a set of search options that can be used to search for objects on the system.

Selected menu

A context-sensitive menu that changes its menu options to match the type of object that is selected. By default, the **Selected** menu is greyed out. When an object is selected, the **Selected** menu provides access to tasks appropriate for the selected object.

splitter

A bar that separates two panes of a window (such as the object tree and the grid). A splitter can be used to adjust the sizes of the panes.

status area

An area of the main window that displays an alert icon when an object fails or experiences some other error.

subdisk

A set of contiguous disk blocks that form a logical disk segment. Subdisks are associated with plexes (mirrors) to form volumes.

task properties window

A window that displays detailed information about a task listed in the Task Request Monitor window.

Task Request Monitor

A window that displays a history of tasks performed in the current VERITAS Volume Manager Storage Administrator session. Each task is listed with the task originator, the task status, and the start/ finish times for the task.



toolbar

A set of buttons used to access VERITAS Volume Manager Storage Administrator windows. These include another main window, a task request monitor, an alert monitor, a search window, and a customize window.

tree

A dynamic hierarchical display of objects on the system. Each node in the tree represents a group of objects of the same type.

uninitialized disks

Disks that are not under VxVM control.

volume

A virtual disk or entity that is made up of portions of one or more physical disks.

Volume Layout Details Window

A window that displays a graphical view of a volume and its components. The objects displayed in this window are not automatically updated when the volume properties change.

Volume to Disk Mapping Window

A window that displays a tabular view of volumes and their underlying disks. This window can also display details such as the subdisks and gaps on each disk.

VMSA

VERITAS Volume Manager Storage Administrator.

VxFS

VERITAS File System.

VxVM

VERITAS Volume Manager.



Index

A

- accessing tasks 44
- activating disk groups 113
- adding
 - disks 73
 - file systems 169
- alert monitor 65
- alerts
 - detecting 65
 - icons 10, 66
 - monitoring 65
 - on disks 203
 - on volumes 208
 - responding to 65
- Alerts button 9
- associating plexes 161
- auto-start mode, VMSA 24

B

- backing up file systems 176
- boot disk
 - mirroring 83
 - placing under VxVM control 74
- browsing dialog boxes 49
- buttons
 - in dialog boxes 48
 - toolbar 9

C

- CFS mounting 171
- changing volume layouts 138
- checking file systems 178
- client 23
- cluster nodes
 - cluster mounting file system on 171
 - starting 194
 - stopping 195
- clusters
 - accessing 17

- creating shared disk groups 196
- defined 7
- file system in, primary 171
- importing disk groups 198
- starting 192
- starting a node 194
- stopping 193
- stopping a node 195
- upgrading 200
- color preference settings 58, 59
- Command Launcher 10, 46
- command log 53
- commands, viewing 50
- concatenated volumes 122, 126
- connecting to hosts 187, 189
- controllers
 - disabling 95
 - enabling 96
- creating
 - disk groups 98
 - file systems 169
 - shared disk groups 196
 - volumes 122, 126, 128, 130, 132
- Customize button 10
- Customize window 54

D

- deporting disk groups 102
- destroying disk groups 107
- dialog boxes
 - browsing 49
 - buttons 48
 - inputting size units 50
 - selecting objects 49
 - using 48
- dirty region logging 143
- disabling
 - controllers 95
 - mirrors 156



-
- disconnecting
 - disks 85
 - hosts 188
 - disk arrays, renaming 97
 - disk group name, changing 101
 - disk group versions 100
 - disk groups
 - activating 113
 - adding disks 73, 75
 - clearing hot-relocation information 106
 - creating 98, 196
 - deporting 102
 - destroying 107
 - importing 103, 198
 - joining 112
 - moving objects between 108
 - preventing access 102
 - properties 115
 - recovering volumes 105
 - removing 107
 - removing disks 91
 - renaming 101
 - restoring access 103, 198
 - splitting 108, 110
 - task roadmap 71
 - upgrading 100
 - disks
 - adding 73
 - adding to disk group 75
 - adding to Volume Manager 73
 - alternate boot disk 83
 - boot 83
 - changing names 97
 - disconnecting 85
 - encapsulating 74
 - evacuating 84, 187
 - forced initialization 93
 - free disk pool 7
 - hot-relocation spares 78
 - initializing 74, 93
 - maintenance tasks 18
 - mirroring 83
 - moving contents 84, 187
 - names, changing 80
 - new 73
 - offline 81
 - online 82
 - placing under Volume Manager control 73
 - preventing access 81
 - properties 41, 94
 - recovering 90
 - reinitializing 93
 - removing 91
 - renaming 80
 - replacing 86
 - restoring access 82
 - scanning 73
 - setup tasks 17
 - states 203
 - task roadmap 71
 - troubleshooting 93, 203
 - uninitialized 7
 - unrelocating 88
 - Volume Manager 73
 - volume mapping 28, 39
 - displaying
 - commands 50
 - disk group properties 115
 - disk properties 94
 - dissociated objects 34
 - file system properties 179
 - object properties 28
 - Object Properties window 41
 - objects 28
 - volume properties 168
 - dissociated objects, displaying 34
 - dissociating plexes 161
- E**
- Enabling 148
 - enabling controllers 96
 - encapsulating disks 74
 - enclosures, renaming 97
 - errors. See alerts
 - evacuating disks 84, 187
- F**
- fast mirror resynchronization. See FR
 - fast resynchronization. See FR
 - File 8
 - File menu 8, 44
 - file system size, changing 174
 - file system task roadmap 121
 - file systems
 - and volumes 169, 170
 - backup 176
 - checking 178
 - cluster mounting on cluster node 171



- creating 169
 - maintenance tasks 18
 - primary in cluster 171
 - repair tasks 19
 - repairing 178
 - resizing 174
 - setup tasks 17
 - snapshot copies 176
 - task roadmap 121
 - unmounting 172, 173
 - FMR. See FR
 - font preference settings 57
 - FR 148
 - free disk pool 7
 - free space 39, 64, 94
- G**
- graphical view
 - Object View window 28
 - object view window 32
 - preference settings 61
 - volume layout details 38
 - grid
 - and tree view 28, 29
 - defined 7
 - preference settings 60
 - Grid button 9
- H**
- help 8
 - Help menu 8
 - Host button 9
 - hosts
 - accessing 17
 - accessing multiple hosts 4
 - connecting 9, 189
 - connecting at startup 189
 - connecting to 187
 - defined 7
 - disconnecting 188
 - preference settings 62
 - hot-relocation
 - clearing disk group information 106
 - designating spare disk 78
 - unrelocating disk 88
- I**
- icons
 - alerts 66
 - errors 66
 - Storage Administrator 11
 - importing
 - disk groups 103
 - shared disk groups 198
 - initializing disks 74, 93
 - inputting size units 50
 - installation setup tasks 16
- J**
- joining
 - disk groups 112
 - joining subdisks 166
- L**
- layered volumes 123
 - logs
 - adding to volumes 143
 - command log 53
 - disabling 159
 - DRL 143
 - QuickLog 180, 181
 - RAID-5 143
 - removing 159
 - task log 53
- M**
- main window
 - description of 5
 - preference settings 57
 - status area 10
 - maintenance tasks 17
 - menus
 - context-sensitive 8, 45
 - File 44
 - Help 8
 - Options 8, 54
 - popup 45
 - preferences 8, 54
 - running tasks from 44
 - Selected 8, 44
 - types of 8
 - Window 8
 - mirrored volumes 123, 132
 - mirroring
 - disks 83
 - volumes 132, 141
 - mirrors
 - adding to volumes 141
 - detaching 156
 - disabling 156



- removing 157
- repairing 155
- mixed layout volumes 123
- monitoring
 - alerts 10, 65
 - performance 39
 - tasks 50
- mounting file systems 170
- moving
 - subdisks 34, 163
- multiple host support 4

N

- New button 9

O

- object properties
 - displaying 41, 94, 115, 168, 179
 - in grid 29
 - window 41
- object tree 7
- Object View window preference settings 59, 62
- Object View window, described 28
- objects
 - displaying 28
 - searching 64
 - selecting 28, 49
 - sorting 31
 - viewing 28
- offline disks 81
- online disks 82
- Options menu 8, 54

P

- performance monitoring 39
- placing disks under Volume Manager control 73
- plexes
 - See also mirrors
 - associating 161
 - dissociating 161
- popup menus 45
- preferences
 - color 58, 59
 - Customize window 10
 - fonts 57
 - general 56
 - hosts 62
 - main window 57

- object view 59, 62
- Options menu 8
 - setting 8, 54
 - toolbar 61
 - tree and grid 60
 - Volume Layout Details window 61
 - window size 60

- primary file system in cluster 171
- Print button 10
- printing 10, 68
- projection 34
- projection window 34
- properties
 - disk 94
 - Disk Group Properties window 115
 - disk groups 115
 - Disk Properties window 94
 - File System Properties window 179
 - in grid 29
 - Object Properties window 41
 - Object Properties window, described 28
 - Props button 9
 - Volume Properties window 168
 - volumes 168, 179

Q

- QuickLog logs 180, 181

R

- RAID-5 logging 143
- RAID-5 volumes 122, 130
- read-only mode 3
- recovering
 - disks 90
 - volumes 19, 90, 105, 154
- recovery tasks 18
- relayout 138
- remote administration 2
- removing
 - disk groups 107
 - disks 91
 - logs 159
 - volumes 160
- renaming
 - disk arrays 97
 - disk groups 101
 - disks 80
 - enclosures 97
 - volumes 137
- repairing mirrors 155



- replacing disks 86
- resizing
 - file systems 174
 - volumes 135
- roadmap, disk task 71
- root disk
 - mirroring 83
 - placing under VxVM control 74
- running tasks 44

S

- scanning disks 73
- Search button 9
- search window 64
- searching 64
- security 2, 23
- Selected menu 8, 44
- selecting objects 28, 49
- server 23
- setup tasks 16
- shared disk groups 196, 198
- size units, inputting 50
- snapshot copies of file systems 176
- snapshot copies of volumes 147
- snapshots
 - copy of file system 176
 - copy of volume 147
 - dissociating 151, 152
 - merging 150
- sorting objects 31
- spare disks 78
- splitter 8
- splitting
 - disk groups 108, 110
- splitting subdisks 165
- starting cluster nodes 194
- starting clusters 192
- starting the Storage Administrator 24
- starting volumes 146
- status area 10
- stopping cluster nodes 195
- stopping clusters 193
- stopping volumes 145
- Storage Administrator
 - client 23
 - defined 2
 - features 2
 - installation 23
 - main window 5

- server 23
- starting 24
- striped volumes 122, 128
- subdisks
 - graphical view 38
 - joining 166
 - moving 34, 163
 - removing 167
 - splitting 165
 - viewing 38

T

- Task button 9
- task history 50
- task launcher 10
- task log 53
- task monitor 50
- task request monitor 50
- tasks
 - accessing 44
 - Command Launcher 10
 - disk maintenance 18
 - disk setup 17
 - displaying 50
 - file system maintenance 18
 - from Command Launcher 46
 - from menus 44, 45
 - list 16
 - maintenance 17
 - monitoring 50
 - properties 51, 52
 - recovery 18
 - repair 18
 - roadmap 16
 - running 44
 - setup 16
 - underlying commands 51, 52
 - viewing 50
 - volume maintenance 18
 - volume recovery 19
 - volume repair 19
 - volume setup 17
- toolbar
 - buttons 9
 - preference settings 61
- tree
 - and grid view 28, 29
 - object 7
 - preference settings 60



- troubleshooting
 - disk states 203
 - volume states 208

U

- uninitialized disks 7
- unmounting file systems 172, 173
- unrelocating disks 88
- upgrading clusters 200
- user preferences 54

V

- viewing commands 50
- viewing objects
 - and object properties 28
 - graphical view 38
 - properties 41, 94, 115, 168, 179
 - tree and grid 29
- VMSA
 - auto-start mode 24
- vmsa_server 23
- Volume Layout Details window
 - described 28, 38
 - preference settings 61
- volume layouts 122, 138
- Volume Manager Storage Administrator 2
- volume name, changing 137
- volume size, changing 135
- volume states 208
- volume task roadmap 119
- volume to disk mapping window 39
- Volume to Disk Mapping window, described 28
- volumes
 - adding file systems 169
 - adding logs 143
 - adding mirrors 141
 - and file systems 169, 170
 - associating plexes 161
 - backup and restore 153
 - changing layout 138
 - concatenated 122, 126
 - concatenated pro 123
 - creating 9, 122, 126, 128, 130, 132
 - detaching mirrors 156
 - disabling 145
 - disk mapping 28, 39
 - dissociating plexes 161
 - dissociating snapshots 151, 152
 - enabling 146

- graphical view 28, 38
- joining subdisks 166
- layered 123
- layout 28
- maintenance tasks 18
- merging snapshots 150
- mirrored 123, 132
- mixed layout 123
- mounting file systems 170
- moving subdisks 163
- preparing to restore 153
- properties 41, 168, 179
- RAID-5 122, 130
- reattaching mirrors 155
- recovering 90, 105, 154
- recovery tasks 19
- relayout 138
- removing logs 159
- removing mirrors 157
- removing volumes 160
- renaming 137
- repair tasks 19
- repairing mirrors 155
- resizing 135
- setup tasks 17
- snapshot copies 147
- splitting subdisks 165
- starting 146
- stopping 145
- striped 122, 128
- striped pro 123
- task roadmap 119
- troubleshooting 208
- underlying disks 28, 39
- unmounting file systems 172, 173

- VRTSexplorer xv

- VxVM

- obtaining system information xv

W

- Window menu 8
- windows
 - alert monitor 65
 - command log view 53
 - graphical view 38
 - main window 5
 - object properties 28, 41
 - object view 32
 - preferences 54, 55



resizing 8, 60
search 64
setting size preferences 60

task request monitor 50
volume layout details 38
volume to disk mapping window 39

