

Sun™ StorEdge™ Volume Manager Storage Administrator 1.0 User's Guide



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Part No. 805-5709-10
Revision A, July 1998

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Preface

This guide describes how to use the Sun™ StorEdge™ Volume Manager Storage Administrator. The Volume Manager Storage Administrator is the Graphical User Interface (GUI) for the Volume Manager.

This guide is intended for system administrators responsible for configuring and maintaining systems using the Sun StorEdge Volume Manager.

This guide assumes:

- A basic understanding of system administration
- A working knowledge of the UNIX operating system
- Familiarity with the Sun StorEdge Volume Manager and related concepts

How This Book Is Organized

This guide is organized as follows:

- Chapter 1 “Introduction,” describes the main components of the Volume Manager Storage Administrator.
- Chapter 2 “Getting Started,” describes how to set up and start using the Volume Manager Storage Administrator.
- Chapter 3 “Disk Tasks,” describes how to set up and use disks with the Volume Manager Storage Administrator.
- Chapter 4 “Volume Tasks,” describes how to create and use volumes with the Volume Manager Storage Administrator.

The Glossary defines terms that relate to the Volume Manager Storage Administrator.

Using UNIX Commands

This document does not contain information on basic UNIX[®] commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris 2.x Handbook for SMCC Peripherals*
- AnswerBook[™] online documentation for the Solaris[™] 2.x software environment
- Other software documentation that you received with your system

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface or Symbol	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output.	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output.	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Command-line variable; replace with a real name or value.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be <code>root</code> to do this. To delete a file, type <code>rm filename</code> .

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	<i>machine_name</i> %
C shell superuser	<i>machine_name</i> #
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documentation

Title	Part Number
Volume Manager Installation Guide	805-5707-10
Volume Manager Storage Administrator Release Notes	805-5710-10
Volume Manager System Administrator's Guide	805-5706-10

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Introduction

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

The following topics are discussed in this chapter:

- The Volume Manager Storage Administrator
- The Main Window
- Task Roadmap
- Storage Administrator Icons

The Volume Manager Storage Administrator

The Sun StorEdge Volume Manager Storage Administrator is the graphical user interface (GUI) for Volume Manager. The Storage Administrator is an interface based on the Java™ programming language that can be run from a Web browser or as a Java application. The Storage Administrator allows you to administer disks, volumes, and file systems on local or remote machines.

The Storage Administrator consists of a server and a client. The Storage Administrator server runs on a UNIX machine that is running the Sun StorEdge Volume Manager. The Storage Administrator client runs on any machine that supports the Java Runtime Environment.

Storage Administrator Features

The Volume Manager Storage Administrator provides the following features:

- **Ease of Use**

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

- **Remote Administration**

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

- **Java-Based Interface**

The Storage Administrator client is a pure Java-based interface. Administrators can run the Storage Administrator from a Web browser or as a Java application.

- **Scalability**

The 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**

The Storage Administrator can only be run by users with appropriate privileges. Administrators can restrict the use of the Storage Administrator to a specific set of users.

The Main Window

The Volume Manager Storage Administrator's main window (see Figure 1-1) 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.

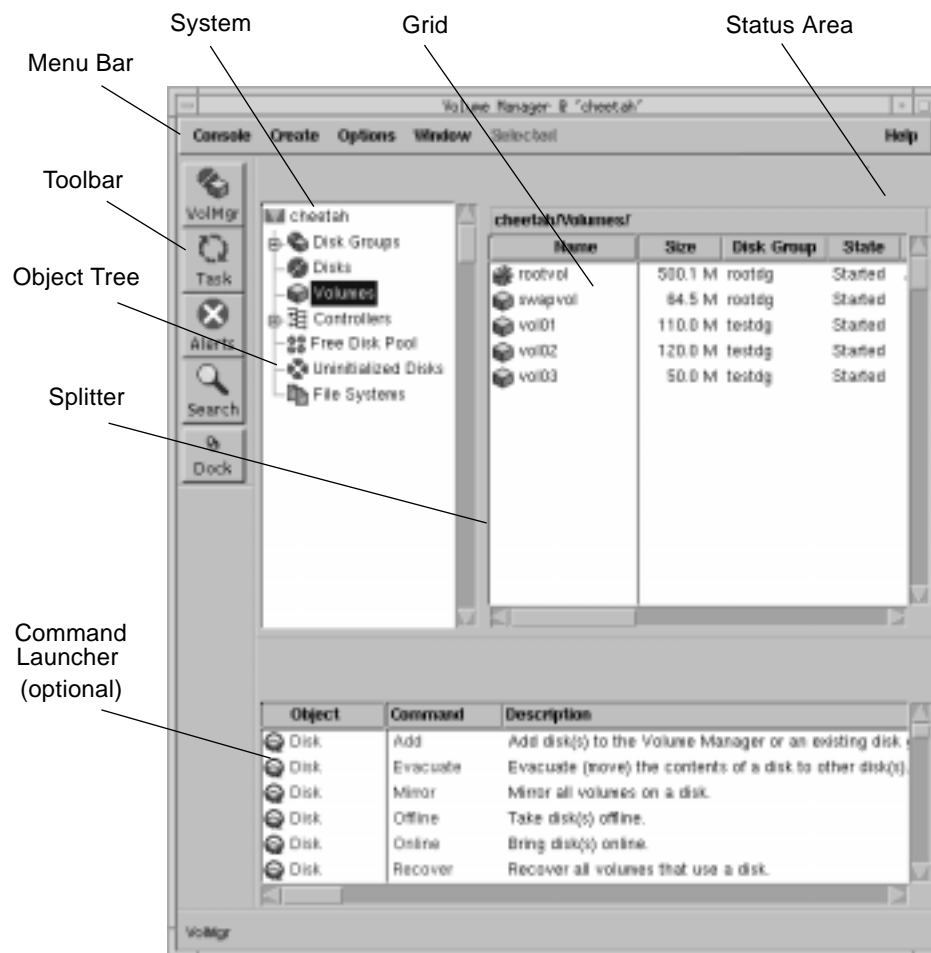


FIGURE 1-1 Main Window

The Object Tree and Grid

The Storage Administrator's 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 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 system name is at the top of the tree.

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

- Disk Groups — All disk groups on the system.
- Disks — All disks on the system.
- Volumes — All volumes on the system.
- Controllers — All controllers on the system.
- Free Disk Pool — Any disks that are under Volume Manager control, but do not belong to a disk group.
- Uninitialized Disks — Any disks that are not under Volume Manager control.
- File Systems — All mounted file systems on the system.

You can expand these 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 clicking on the splitter and dragging it to the left or right.

The Menu Bar

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

■ Console

The Console menu closes the main window or exits the Storage Administrator.

■ Create

The Create menu creates volumes, disk groups, or file systems.

■ Options

The Options menu provides access to the Preferences window and saves or loads user preferences. The Preferences window displays and sets user preferences for the components of the Storage Administrator.

- Window

The Window menu opens (launches) another Storage Administrator main window, the task request monitor, the alerts window, the search window, a copy of the main grid, or the Command Launcher.

- Selected (context sensitive)

The Selected menu is a context-sensitive menu that changes its name and menu options when the selected object changes. By default, the Selected menu is greyed out. When an object is selected, Selected 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 the Storage Administrator.

The Toolbar

The toolbar consists of a set of buttons that provide access to the following windows:

- Volume Manager

The Volume Manager (VolMgr) button launches an additional 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.

- Alerts

The Alerts button displays the Alert Monitor window. The Alert Monitor window identifies any objects that have experienced failures or errors and describes the problem(s). 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's icon.

- Search

The Search button displays 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.

The Dock button separates the toolbar from the main window or attaches the separated toolbar to the main window.

The Status Area

The status area of the main window is below the menu bar. When an object fails or experiences some other error, an alert/error icon appears in the status area. The Alert Monitor window provides details on 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, task (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 > Preferences > Main Window and clicking Dock Command Launcher.

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.

Task Roadmap

This section provides a summary of common Volume Manager Storage Administrator tasks. The tasks are grouped into preliminary installation and 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 the Volume Manager and the Storage Administrator for the first time, you need to install both products, place your disks under Volume Manager control, and create volumes (and file systems).

▼ To install and set up the Storage Administrator

Install the Volume Manager and run `vxinstall` before you install the Storage Administrator (see the *Sun StorEdge Volume Manager Installation Guide* for details).

- Install the Storage Administrator.
- Start the Storage Administrator.

These tasks are described in Chapter 2.

▼ To set up disks

- Place uninitialized disks under 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 create an alternate boot disk (optional)

- Place the boot (root) disk under Volume Manager control and choose encapsulation to convert the contents of the disk to volumes.
- Mirror the boot (root) disk to provide an alternate boot disk.

These tasks are described in Chapter 3.

▼ To set up volumes & 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.

Maintenance Tasks

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

▼ To maintain disks

- Place more disks under Volume Manager control, as necessary.
- Create more disk groups, as necessary.

These tasks are described in Chapter 3.

▼ To maintain volumes

- Increase the size of volumes as users require more space.
- 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), if necessary.

These tasks are described in Chapter 4.

▼ To maintain file systems

- Place additional file systems on volumes, as necessary.
- Increase the size of file systems as users 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, the Volume Manager may perform 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.
- If a volume is not recoverable, restore the volume from backup.

These tasks are described in Chapter 3 and Chapter 4.





▼ 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.

Storage Administrator Icons

The following table shows icons that appear in the Storage Administrator.

Icon	Description
Objects:	
	disk
	free disk
	uninitialized disk
	disk group

Icon	Description
	deported disk group
	volume
	root/boot volume
	RAID-5 volume
	plex/mirror
	subdisk
	controller
	disk array
	subpath (Dynamic Multipathing)
	file system
	system/machine
Task Status:	
	task in progress
	successful task

Icon	Description
	failed task
Toolbar:	
	Volume Manager window
	Task Request Monitor window
	Alert Monitor window
	Search window
Miscellaneous:	
	alert
	error
	information
	question
	warning
	Command Launcher task

Getting Started

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

The following topics are discussed in this chapter:

- Installation and Setup
- Starting the Storage Administrator
- Selecting Objects
- Viewing Objects and Object Properties
- Accessing Tasks
- Using Dialog Boxes
- Viewing Commands
- Setting User Preferences
- Searching for Objects or Free Space
- Responding to Alerts
- Exiting the Storage Administrator

Installation and Setup

The Sun StorEdge Volume Manager Storage Administrator consists of a server and a client. You must install and run the Storage Administrator server on a UNIX machine running the Volume Manager. You can install and run the Storage Administrator client on any machine that supports the Java Runtime Environment.

Before you can use the Volume Manager Storage Administrator, you need to do the following:

- Install the Sun StorEdge Volume Manager on the machine to be administered. Run `vxinstall` to create the `rootdg` disk group and initialize at least one disk.
- Install the Storage Administrator server and client on the machine to be administered.
- Set up security to specify which users can run the Storage Administrator (optional). By default, only `root` can run the Storage Administrator.
- If you plan to run the Storage Administrator client from a Web browser, set up a HyperText Transfer Protocol (HTTP) server on the machine to be administered.
- If you plan to run the Storage Administrator client from a machine other than the machine to be administered, install the Storage Administrator client on the machine where the client will run.
- Start the Storage Administrator server on the machine to be administered.
- Start the Storage Administrator client.

Refer to the *Sun StorEdge Volume Manager Installation Guide* for details on how to install the Volume Manager and set up `rootdg`. Refer to the *Sun StorEdge Volume Manager Storage Administrator Release Notes* for details on how to install and set up the Storage Administrator.

Starting the Storage Administrator

Before you start the Volume Manager Storage Administrator, make sure you have completed the tasks listed in “Installation and Setup” on page 16.

Note – Only users with appropriate privileges can run the Storage Administrator. Refer to the *Sun StorEdge Volume Manager Storage Administrator Release Notes* for information on Storage Administrator security and access permissions.

You can use the Storage Administrator to administer the local machine or a remote machine. You can start the Storage Administrator as an application or from a Web browser, as follows.

▼ Starting the Storage Administrator as an application

UNIX

- To administer the *local* UNIX machine, type:

```
vxvm
```

Make sure that the Session Initiation dialog box (described in “The Session Initiation Dialog Box” on page 19) contains the local machine name.

- To administer a *remote* UNIX machine, type:

```
vxvm machine_name
```

Make sure that the Session Initiation dialog box (described in “The Session Initiation Dialog Box” on page 19) contains the remote machine name.

Microsoft Windows NT/Microsoft Windows 95

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

Specify the remote machine name in the Session Initiation dialog box (described in “The Session Initiation Dialog Box” on page 19).

▼ Starting the Storage Administrator from a Web browser

In order to access the Storage Administrator via a Web browser, you must set up and run an HTTP server on the machine to be administered. See the *Volume Manager Storage Administrator Release Notes* for information on how to set up the HTTP server.

- **To access the Storage Administrator from a Web browser, start the browser and then go to the following location (URL):**

`http://machine_name/vxvm/index.html`

Click on the Sun StorEdge Volume Manager button in the browser window. Specify the appropriate machine name in the Session Initiation dialog box (described in “The Session Initiation Dialog Box” on page 19).

Note – Currently, HotJava and Netscape Navigator™ (with Java Development Kit support) are the only Web browsers that fully support the Storage Administrator. You can download HotJava from <http://www.javasoft.com>; you can download Netscape from <http://www.netscape.com>.

The Session Initiation Dialog Box

At startup, the Storage Administrator displays the Session Initiation dialog box. To start the Storage Administrator session, complete this dialog box as follows:

Server Host:	Type the name of the machine to be administered. Both the Volume Manager and the Storage Administrator server must be running on this machine.
User Name:	Type your login name. Only users with appropriate privileges can run the Storage Administrator.
Password:	Type your password.

When you have provided all necessary information in the dialog box, click Ok. The 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 the Storage Administrator.

Selecting Objects

You can select objects in most Storage Administrator windows in the following ways:

- **To select a single object, click on the object. To deselect the object, click on the object again.**
- **To select/deselect 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 31.

Viewing Objects and Object Properties

The Volume Manager Storage Administrator provides three main views of objects and their properties:

- **Tree and Grid View**

The main window’s tree and grid view displays volumes, disks, file systems, and other objects on the system.

- **Graphical View**

The Volume Layout Details window displays a graphical view of a single volume and its components (mirrors/plexes and subdisks).

- **Object Properties Window**

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

This section describes how to use the tree/grid view, the graphical view, and the Properties window to view objects and their properties.

The Tree and Grid View

The main window's 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. The Storage Administrator constantly monitors objects on the system and makes appropriate changes to the tree and grid displays. For more information about this view, see the description of the object tree and grid in Chapter 1.

Figure 2-1 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.

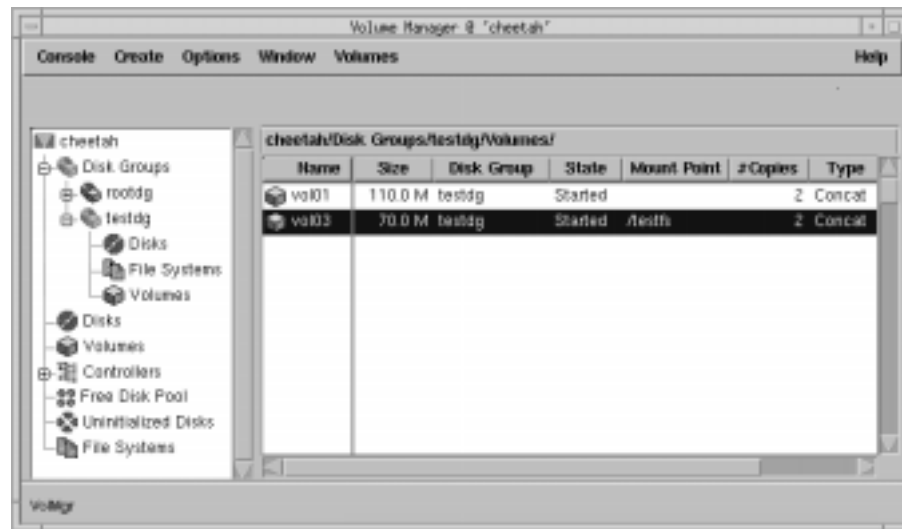


FIGURE 2-1 Tree/Grid View of Volumes

You can view objects in the tree and grid in the following ways:

- 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 object's Properties window 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 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.**

The Graphical View

The Volume Layout Details window displays a graphical view of the selected volume's layout, components, and properties. 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's properties change.

The View menu changes the contents of the Volume Layout Details window. The Selected menu accesses tasks or properties for an object. Context-sensitive popup menus are also accessible in this window (by right-clicking on an object).

Figure 2-2 shows how a volume appears in the graphical view.

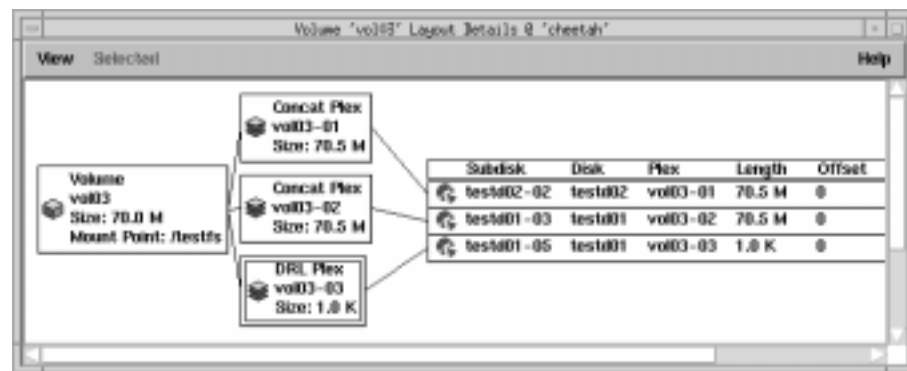


FIGURE 2-2 Volume Layout Details Window

You can view objects in the graphical view in the following ways:

- To display the Volume Layout Details window for a volume, click on the volume (in the main window grid) and then choose Volumes > Show Layout.
- To update (refresh) the graphical view to show any recent changes to the current volume, choose View > Update. The Volume Layout Details window does not update object properties automatically.

- To view a different volume, choose **View > 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 > Projection on Selection** and then click on an object. To highlight any subdisks on the same disk a specific subdisk, choose **View > Subdisk Projection** and then click on a subdisk.

The Object Properties Window

The object Properties window contains detailed information about the selected object. Some object properties can be changed through the object's Properties window. 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 tab label.

Figure 2-3 shows how a volume appears in the Volume Properties window.

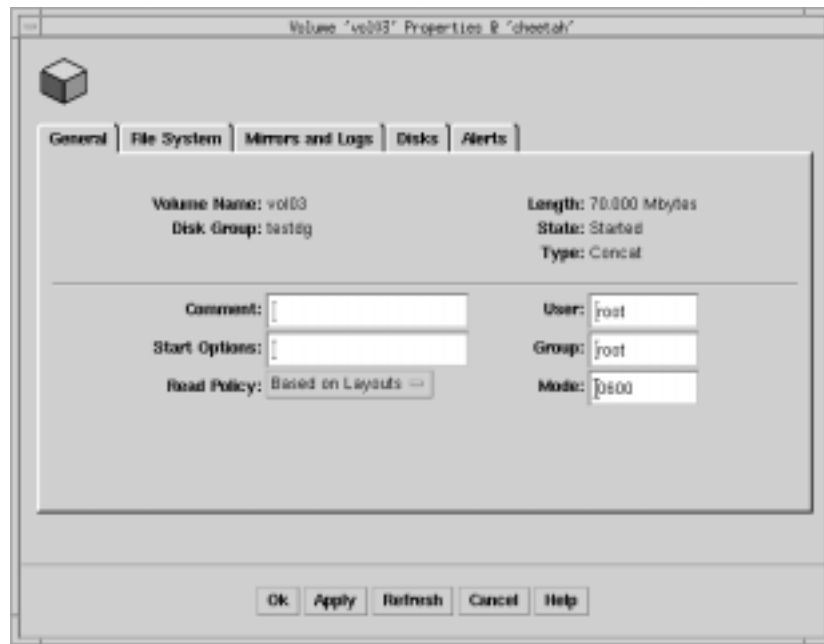


FIGURE 2-3 Volume Properties Window

You can view object properties in the following ways:

- To view the properties of an object, click on the object (in the main window grid) and then choose Properties from the *Selected* 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 displays the object's children instead of the Properties window.

- **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 update the contents of the Properties window to reflect current properties for the object, click Refresh.**

Accessing Tasks

Most Volume Manager Storage Administrator tasks are performed by selecting objects and/or tasks and then completing the resulting dialog boxes. With the 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 Create and Selected menus in the menu bar. The Create menu creates new 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. Figure 2-4 shows how the Selected menu changes when a volume is selected.

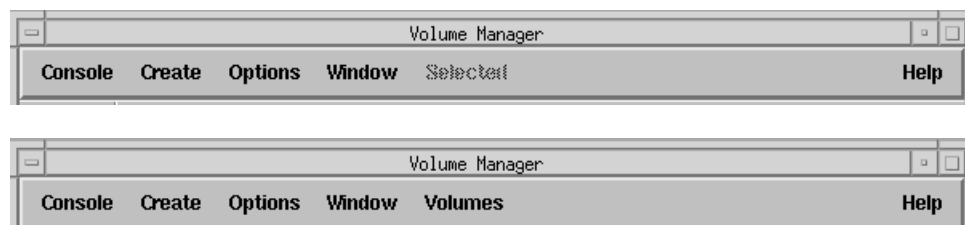


FIGURE 2-4 Menu Bar With Selected/Volumes Menu

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

Example:

To create a volume, choose Create > Volume. Complete the Create Volume dialog box, then click Ok.

- 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's name, select the volume in the grid. The **Selected** menu becomes the **Volumes** menu. Choose **Volumes > Rename**. Type the volume's new name in the **Rename Volume** dialog box, then click **Ok**.

Running Tasks From a Popup Menu

A context-sensitive popup menu launches tasks on the selected object. Popup menus do not contain all of the tasks that can be applied to the selected object; additional tasks are available through the menu bar or the Command Launcher.

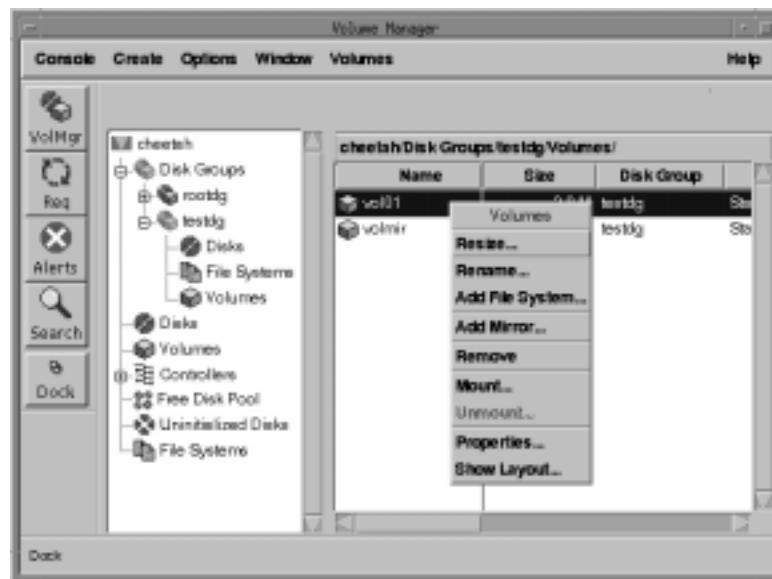


FIGURE 2-5 Context-Sensitive Popup Menu

- 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 launches tasks from a list of objects and associated Volume Manager 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 View menu attaches (docks) the Command Launcher to the main window and closes the Command Launcher window.

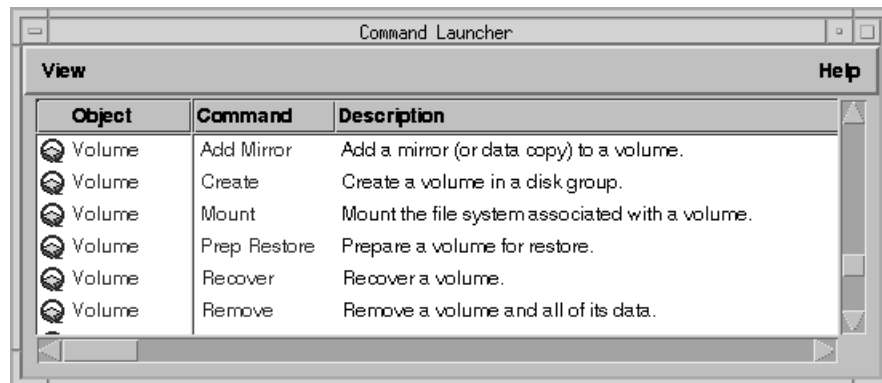


FIGURE 2-6 The Command Launcher

- To display the Command Launcher, choose Window > Command Launcher. To hide the Command Launcher, choose Window > Command Launcher again. You can also show or hide the Command Launcher by choosing Options > Preferences > Main Window and clicking Show Command Launcher.
- To perform a task on a specific type of object, select the appropriate object-task combination from the Command Launcher list.

Example:

To create a volume, choose Volume Create from the Command Launcher. Complete the Create Volume dialog box.

- To separate or attach (dock) the Command Launcher and the main window, choose Options > Preferences > Main Window and click Dock Command Launcher.

- 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 adjust the height of the Command Launcher when it is attached to the main window, choose **Options > Preferences > Main Window** and specify the new height (in pixels) in the **Docked Command Launcher Height** field.

Using Dialog Boxes

The Volume Manager Storage Administrator uses dialog boxes to communicate with the administrator. Administrators typically use dialog boxes to submit tasks or other requests. 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 type 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	Close the dialog box and cancel the current task/request. (If you have already clicked Apply, this does not cancel the task that is in progress.)

Specifying Objects in Dialog Boxes

Most Storage Administrator dialog boxes contain one or more object name fields. If you select an object before you select the task, the resulting dialog box may include the selected object's name. If the object name field is empty, you can specify an object in one of these ways:

- Type the object's name.
- 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. Figure 2-7 shows a sample browse dialog box.

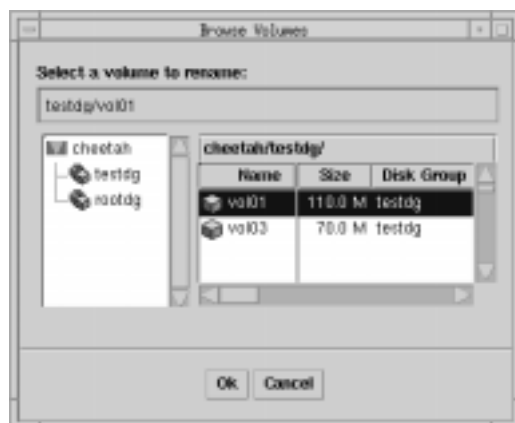


FIGURE 2-7 Browse Dialog Box

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 or Shift key and click on each object.

You can specify the object's disk group 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:

- device name* The physical disk device name (or *disk access name*).
- disk name* The Volume Manager disk name (or *disk media name*). This is the logical name given to the disk by the Volume Manager or the administrator.

Some dialog box fields require the device name and others require the Volume Manager disk name. In some cases, you can precede the Volume Manager disk name with an exclamation mark (!*disk name*) to specify any disk *other than* that disk.

Specifying Object Sizes in Dialog Boxes

When you type 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

The Volume Manager Storage Administrator logs all user requests performed by the Storage Administrator. You can view the Storage Administrator task history in either of these locations:

- The Task Request Monitor Window
- The Command Log File

This section describes how to use the Task Request Monitor window and the command log file to view information about completed tasks and tasks in progress.

The Task Request Monitor Window

The Task Request Monitor window 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 View menu removes finished tasks and closes the window. The Tasks menu accesses task properties. Context-sensitive popup menus are also accessible in the Task Request Monitor window (by right-clicking on a task).

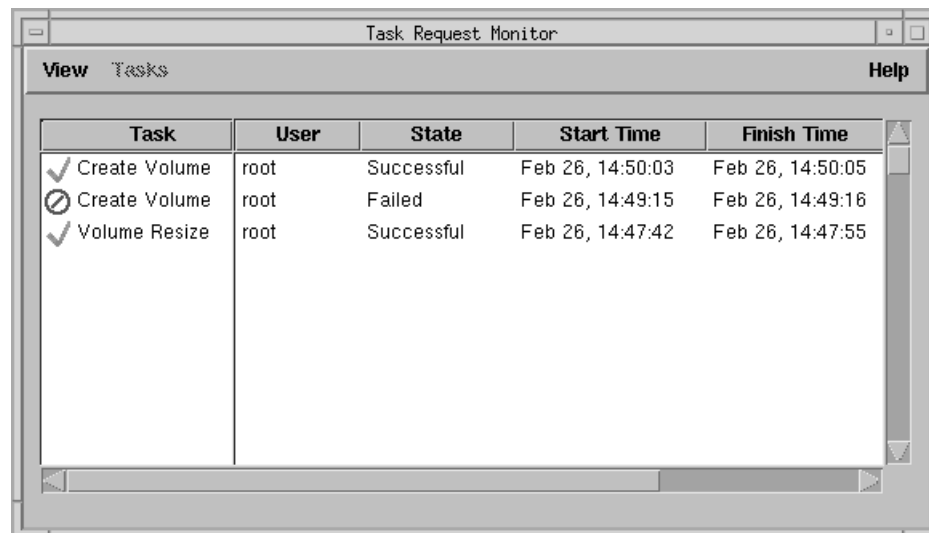


FIGURE 2-8 Task Request Monitor

- To display the Task Request Monitor, click on the Task button (in the toolbar) or choose Window > Request Monitor from the main window.
- To sort the tasks by task type, click on the Task 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 view task properties and the low-level command(s) used to perform a task, click on the task and choose Tasks > Properties. You can also access task properties by double-clicking on the task.

The Task Properties window shows the Volume Manager and other commands that the Storage Administrator used to perform a given task. You can copy commands from the Executed Commands field to the command line or a script file. For failed tasks, the Task Properties window includes any relevant error messages.

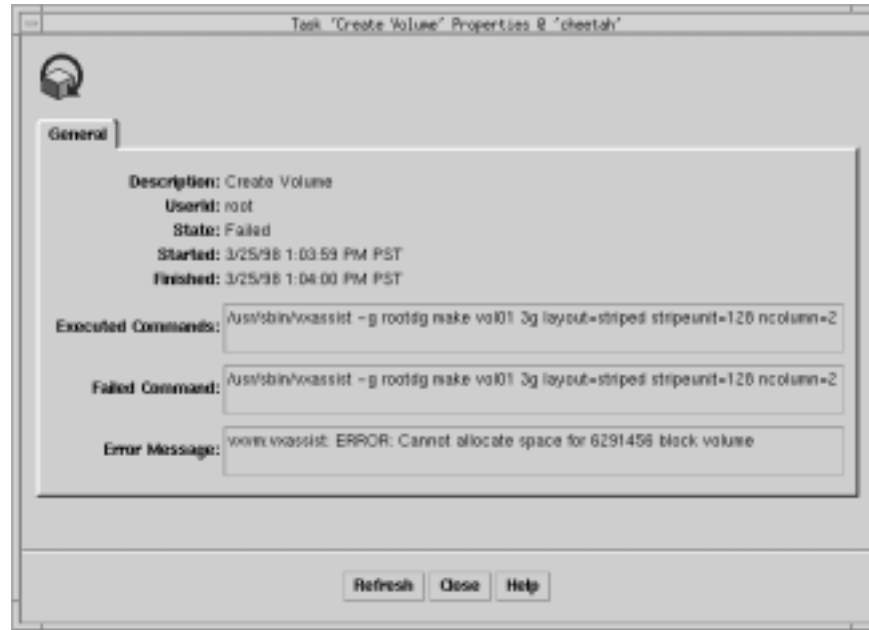


FIGURE 2-9 Task Properties Window

The Command Log File

The command log file contains a history of Volume Manager Storage Administrator tasks performed in the current session and previous sessions. By default, the command log is located in `/var/opt/vmsa/logs/command` on the server. 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.

The following example shows some sample command log file entries:

```
Create Volume
Description: Create Volume
User: root
Start Date: Thu Feb 26 14:58:55 PST 1998
Finish Date: Thu Feb 26 14:58:56 PST 1998
```

State: Successful
Executed Commands:
 /usr/sbin/vxassist -g testdg make vol04 3g layout=nostripe

Create Volume FAILED!
Description: Create Volume
User: root
Start Date: Thu Feb 26 15:00:12 PST 1998
Finish Date: Thu Feb 26 15:00:14 PST 1998
State: Failed
Executed Commands:
 /usr/sbin/vxassist -g testdg make vol05 5g layout=nostripe
Failed Command: /usr/sbin/vxassist -g testdg make vol05 5g
layout=nostripe
Error Message: vxvm:vxassist: ERROR: Cannot allocate space for
10485760 block volume

Setting User Preferences

You can change the way items appear in the main window and other Storage Administrator windows. This section describes how to use the Preferences window and preference shortcuts to customize the way the Storage Administrator appears.

The Preferences Window

The Preferences window allows you to specify your preferences for how you would like to view the components of the Storage Administrator. The Preferences window contains a set of tabbed pages, each of which contains preference options for a particular aspect of the Storage Administrator. You can display a different page by clicking on the tab label.

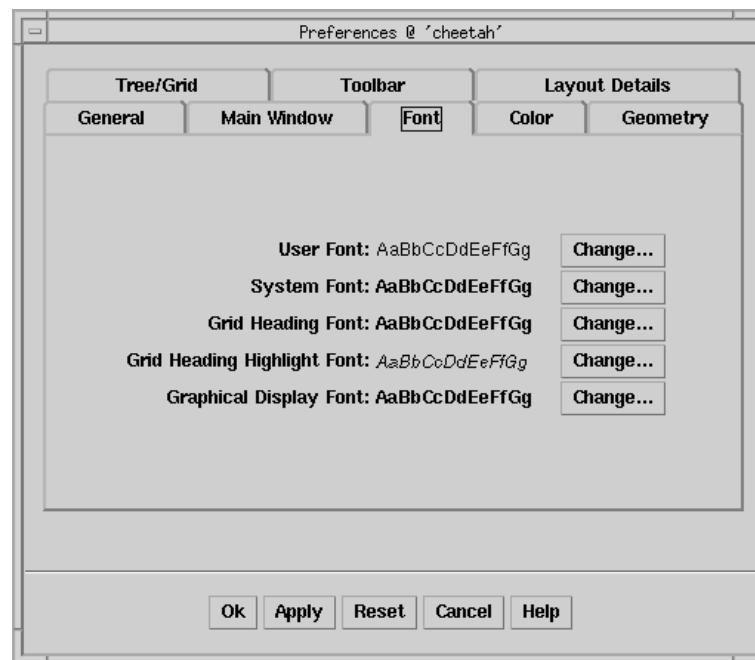


FIGURE 2-10 Preferences Window

- To display the Preferences window, choose Options > Preferences from the main window menu bar.
- To change preference settings, make the appropriate selections in the Preferences window, then click Ok. This changes the settings for *all* tabs in the Preferences window. To reset the settings to the previous settings, click Reset (before you click Ok).
- To save your preferences for future Storage Administrator sessions, choose Options > Save Preferences. The Storage Administrator saves user preferences in `/var/opt/vmsa/user_name/preferences`, by default.
- To reload your previously saved preferences, choose Options > Load Preferences.

The Preferences window contains the following preference tabs:

- General
- Main Window
- Font
- Color
- Geometry
- Tree/Grid
- Toolbar
- Layout Details

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

General

Set the following general preferences:

Select Text in Field on Enter	Set user input to replace mode. This highlights any existing text in a field and replaces that text with the new text.
Show Confirmation Dialogs	<p>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.</p> <p>Note: If you hide confirmation dialogs, most tasks are performed immediately and without any form of confirmation.</p>
Auto-Save Preferences on Exit	Save all current user preferences when the user exits the Storage Administrator.
Flush Images	Draw images slightly slower than usual to prevent the X server from growing. This is recommended if you plan to leave the Storage Administrator running for long periods of time.
Default Display Unit	Set the default size unit for areas that display object sizes. If Best Choice is set, the 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 top of the main window). The status bar displays alert icons when failures or errors occur.
Show Message Area	Show/hide the message area (at the bottom of the main window).
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 the 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.
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 by sliding the Size slider. Use the Family and Style menu to change the font family and style.**

Color

Set the following preferences for colors:

Background Color	Set the background color for all Storage Administrator windows.
Foreground Color	Set the color for foreground text in 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.
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.**

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

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.
Splitter Position	Move the splitter to adjust the relative sizes of the tree and grid panes.
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.
--------------	------------------------

Dock Toolbar	Attach/detach the toolbar and the main window.
Position	Place the docked toolbar at the side or top 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.

Preference Shortcuts

- To resize the left (tree) and right (grid) panes, place the pointer over the splitter and then press and hold the mouse button to drag the splitter to the desired position.
- 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. The column widths cannot be saved with other user preferences.
- To sort the objects in a grid column, click on the column heading of the object property to be sorted. To reverse the order of the objects, click on the column heading again. The sort order cannot be saved with other user preferences.
- To acknowledge and clear an alert icon displayed in the status area, choose Options > Clear Alert Status.

Searching for Objects or Free Space

The Search window searches the system for objects that match the specified 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.

Any objects that match the search criteria are listed 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 has menus similar to those in the main menu. Context-sensitive popup menus are also accessible in the lower half of the Search window (by right-clicking on an object).

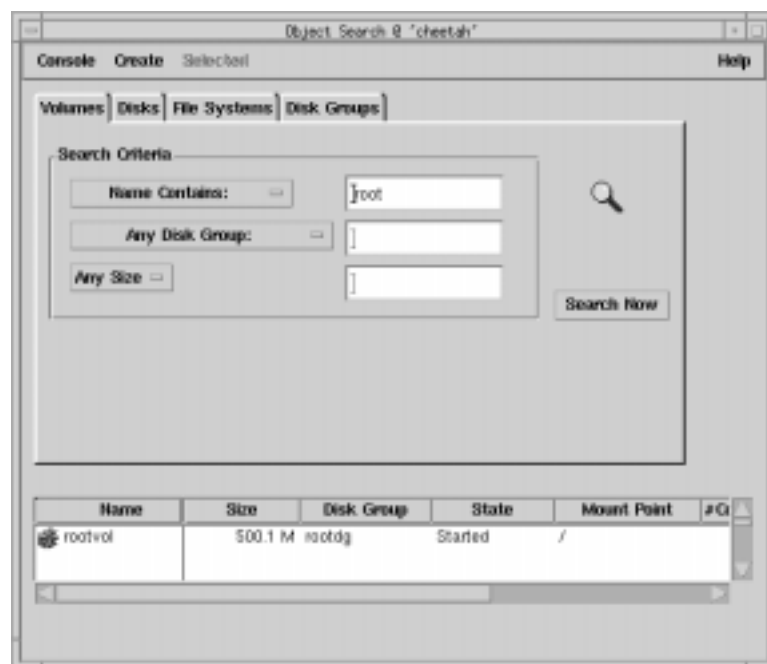


FIGURE 2-11 Object Search Window

- **To display the Search window, click the Search button in the toolbar or choose Window > Search.**
 - **To begin a search, enter your search criteria and then click Search Now.**
-

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's icon (see Figure 2-12). 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 Figure 2-13). Each object is listed with a description of the failure or error.

The Alert menu accesses properties for objects with alerts and closes the window. Context-sensitive popup menus are also accessible in the Alert Monitor window (by right-clicking on an object).

After reviewing the alert(s) 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 object's Properties window.

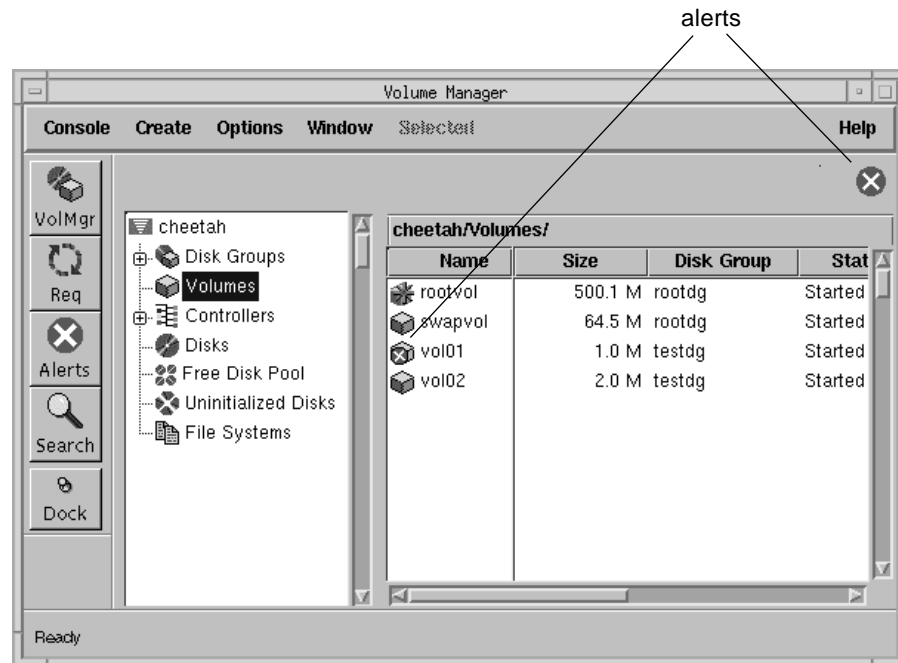


FIGURE 2-12 Alerts for a Volume

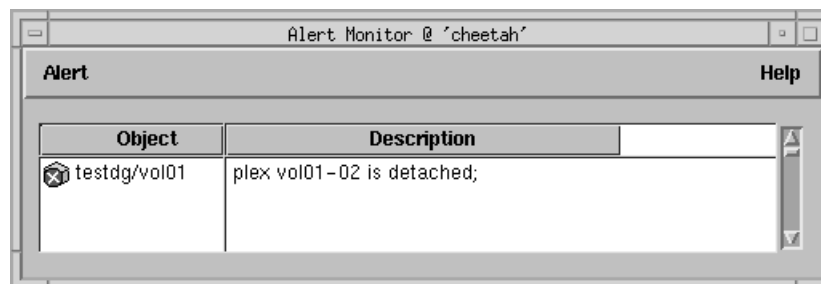


FIGURE 2-13 Alert Monitor Window

- To display the Alert Monitor window, click the Alerts button in the toolbar or choose Window > Alerts. 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 Alert > Object Properties. You can also access object properties by double-clicking on the object.

Exiting the Storage Administrator

- To exit the Volume Manager Storage Administrator client, choose Console > Exit.

Disk Tasks

This chapter describes how to set up and use disks and disk groups with the 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 the Volume Manager
- Designating a Disk as a Hot-Relocation Spare
- Renaming a Disk
- Offlining a Disk
- Onlining a Disk
- Mirroring a Disk
- Evacuating a Disk
- Replacing a Disk
- Recovering Volumes on a Disk
- Removing a Disk
- Displaying a DMP Node

The following disk group tasks are discussed in this chapter:

- Creating a Disk Group
- Renaming a Disk Group
- Deporting a Disk Group
- Importing a Disk Group
- Recovering Volumes in a Disk Group
- Destroying a Disk Group
- Moving a Disk Group

Disk Task Roadmap

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

To do this...	Use this procedure...
Disk Setup Tasks:	
Place new disk(s) under Volume Manager control	Adding a Disk to the Volume Manager
Set up new disk group(s)	Creating a Disk Group
Precautionary Tasks:	
Add disk(s) as hot-relocation spare(s)	Designating a Disk as a Hot-Relocation Spare
Place the root (boot) disk under Volume Manager control	Adding a Disk to the Volume Manager
Make an alternate boot (root) disk	Mirroring a Disk
Maintenance Tasks:	
Place additional disks under Volume Manager control	Adding a Disk to the Volume Manager
Add more disk space to a disk group	Adding a Disk to the Volume Manager
Create additional disk groups	Creating a Disk Group
Recovery Tasks:	
Move volumes off failing disks	Evacuating a Disk
Replace failed disk(s)	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
Other Tasks:	

To do this...	Use this procedure...
Change a disk's name	Renaming a Disk
Change a disk group's name	Renaming a Disk Group
Temporarily prevent access to a disk	Offlining a Disk
Restore access to an offline disk	Onlining a Disk
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 Volume Manager control	Removing a Disk
Move a disk group to another system	Moving a Disk Group
Destroy a disk group (permanently)	Destroying a Disk Group

Adding a Disk to the Volume Manager

New disks must be set up on the system, placed under Volume Manager control, and added to a disk group before they can be used for volumes. The add disk(s) task performs all of these tasks to prepare new disks for Volume Manager use. You can also use this task to place the root disk under Volume Manager control or to add a disk to a disk group.

▼ To add a disk to the Volume Manager

1. If the disk is brand new, select the system name (at the top of the tree) and choose **System > Scan Disks** 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 Volume Manager control.
3. Choose **Disks > Add (menu) or Disk Add (Command Launcher)**.
4. Complete the Add Disk(s) dialog box as follows:

Disk(s):	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
----------	---

Add Disk(s) to:	Specify where the disk(s) should be placed: <ul style="list-style-type: none"> To add the disk(s) to an existing disk group, select Existing Disk Group. Type 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. Type the name of the new disk group in the Disk Group Name field. The new disk group will be 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 Volume Manager control, but do not belong to a disk group and cannot be used to create volumes.
Options:	To set up any new disks on the system, click Scan Disks. This runs the disk setup commands appropriate for the operating system.

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 will be destroyed. If you encapsulate the disk, any existing data will be preserved in volumes.**
6. **If you chose to encapsulate the disk, reboot the system.**

▼ To place the root disk under Volume Manager control

1. **Select the root (boot) disk.**
2. **Choose Disks > Add (menu) or Disk Add (Command Launcher).**
3. **Complete the Add Disk(s) dialog box as follows:**

Disk(s):	If the correct disk name is not already displayed in this field, type the root disk's 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. Type the root disk group name (<code>rootdg</code>) in the Disk Group Name field or click Browse to select <code>rootdg</code> .

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 will be preserved in volumes.**
5. **Reboot the system.**

▼ To add a disk to a disk group

1. Go to the free disk pool and select the disk to be added to a disk group.
2. Choose Disks > Add (menu) or Disk Add (Command Launcher).
3. Complete the Add Disk(s) dialog box as follows:

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

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

Notes:

- Disks must be under Volume Manager control and in a disk group before they can be used to create volumes.
 - When a disk is placed under Volume Manager 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 need to 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 (`rootdg`). If the root disk is placed in any other disk group, the root disk cannot be used to boot the system.
 - After placing the root disk under Volume Manager control, it is recommended that you create an alternate boot disk by mirroring the root disk (see "Mirroring a Disk" on page 57).
-

Designating a Disk as a Hot-Relocation Spare

This procedure 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 Volume Manager objects and data. The system administrator is notified of the failure and relocation details via electronic mail. After successful relocation, you may want to replace the failed disk (see “Replacing a Disk” on page 58).

▼ To designate a disk as a hot-relocation spare

1. Follow the instructions in “Adding a Disk to the Volume Manager” on page 51” to place the disk under Volume Manager control.
2. Select the disk to be designated as a hot-relocation spare.
3. Choose **Disks > Properties**.
4. In the disk properties window, go to the **General** tab and select **Spare**. Click **Ok**.

Notes:

- Any disk in the same disk group can use the spare disk.
 - To make sure that sufficient space is available for relocation, try to provide at least one hot-relocation spare disk per disk group.
-

Renaming a Disk

This procedure changes the Volume Manager name of a disk. The Volume Manager disk name is the name given to the disk by the administrator or the Volume Manager. 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 (menu)** or **Disk Rename (Command Launcher)**.

3. Complete the Rename Disk dialog box as follows:

Disk Name:	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
New Name:	Type the new Volume Manager disk name.

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

Notes:

- The new disk name must be unique within the disk group.
 - The disk must be in an imported disk group.
-

Offlining a Disk

This procedure prevents the Volume Manager 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 60). An offline disk remains unavailable until you restore access to the disk (see “Onlining a Disk” on page 56).

▼ **To take a disk offline**

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

Disk Name:	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
------------	---

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 the Volume Manager.
 - 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

This procedure restores access to a disk that has been taken offline. The disk is placed in the free disk pool and is accessible to the Volume Manager 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 the Volume Manager” on page 51).

▼ To bring a disk online

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

Disk Name:	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
------------	---

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

Notes:

- When a disk is brought online, the disk is accessible again.
 - Only disks in the offline state can be brought online.
-

Mirroring a Disk

This 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 (menu) or Disk Mirror (Command Launcher).**
3. **Complete the Mirror Disk dialog box as follows:**

Disk Name:	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
Target Disks:	To specify the disk(s) to contain the new mirrors, type the target disk name or click Browse Disks and complete the target disk dialog box.

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

Notes:

- This 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 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 mirror(s).
 - A new mirror cannot be created on a disk that already contains a copy of the volume.
 - If no disks are assigned, the Volume Manager uses available disk space to create the mirror(s).
-

Evacuating a Disk

This 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 (menu) or Disk Evacuate (Command Launcher).**
3. **Complete the Evacuate Disk dialog box as follows:**

Disk Name:	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
Target Disks:	To specify the disk(s) to which the contents of the evacuated disk should be moved, type the target disk name or click Browse Disks and complete the target disk dialog box.

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

Notes:

- The contents of a disk must be evacuated/moved to other disk(s) in the same disk group with sufficient free space.
 - If no target disk is specified, the Volume Manager will use available disk(s) with sufficient free space.
 - If the disk being evacuated contains part of a mirrored, striped, or RAID-5 volume, the contents of the disk should not be moved to another disk containing a copy of the mirrored volume or part of the striped/RAID-5 volume.
-

Replacing a Disk

This 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 should be

restored from backup, if possible. If the disk being replaced is a boot disk, this 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.

If you replace a healthy disk, you need to 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 60). 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 (menu) or Disk Replace (Command Launcher).**
3. **Complete the Replace Disk dialog box as follows:**

New Physical Disk:	Type the physical disk name for the new (replacement) disk or click Browse to select a disk.
Disk Name:	If the correct disk name is not already displayed in this field, type the Volume Manager disk name for the disk to be replaced or click Browse to select the disk.

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

Notes:

- The disk to be replaced must be disconnected or removed from its disk group. If the disk has not failed, it may be necessary to remove the disk from its disk group 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, this task places the disk under Volume Manager control.
 - The new disk is placed in the old disk’s disk group.
-

Recovering Volumes on a Disk

This 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 should be available for use again.

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 (menu) or Disk Recover (Command Launcher).**
- 3. **Complete the Recover Disk dialog box as follows (if applicable):**

Disk Name:	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
------------	---

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

Notes:

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

Removing a Disk

This procedure removes a disk from its disk group and either places the disk in the free disk pool or removes the disk from Volume Manager 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 the Volume Manager” on page 51). You can use this procedure to remove a disk permanently or to prepare a disk for replacement.

▼ **To remove a disk from a disk group or Volume Manager**

- 1. **Select the disk to be removed.**
- 2. **Choose Disks > Remove (menu) or Disk Remove (Command Launcher).**

3. Complete the Remove Disk dialog box as follows:

Disk(s):	If the correct disk name is not already displayed in this field, type the disk's name or click Browse to select the disk.
After removing disk:	Specify how to handle 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 Return to Free Disk Pool. The disk will remain under Volume Manager control.• To remove the disk from Volume Manager control, select Return to Uninitialized State.
Options:	To move the contents of the disk to another disk(s) before the disk is removed, select Evacuate. Click Target Disks to specify the disk(s) to which the contents of the disk should be moved.

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

Notes:

- When a disk is removed from a disk group or Volume Manager control, the disk cannot be accessed.
 - A disk that is in use (i.e. contains volumes) should 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, you can select Evacuate 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 deported or removed. The last disk in the `rootdg` disk group can never be removed.
 - Any non-redundant volumes on the removed disk become disabled.
 - If the disk contains data and you do not evacuate the disk, the disk removal will cause the disk to become disconnected. If this happens, you can use the Replace Disk task to fix the disconnected disk.
-

Displaying a DMP Node

This procedure displays the Dynamic Multipathing node that corresponds to the selected subpath.

▼ To display a Dynamic Multipathing node

1. Select the system name (at the top of the tree).

2. Choose System > Get DMP Node.

3. Complete the Get DMP Node dialog box as follows:

Subpaths:	Type the subpath to the DMP node to be displayed or click Browse to select the subpath.
-----------	---

4. Click Apply.

The DMP node that corresponds to the selected subpath should appear in the DMP Node: field.

Creating a Disk Group

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

▼ To create a disk group

1. Choose Create > Disk Group (menu) or Disk Group Create (Command Launcher).

2. Complete the Create Disk Group dialog box as follows:

Disk Group Name:	Type the name of the disk group to be created. Click View to view the names of existing disk groups.
Disk(s):	Select the disk(s) to be placed in the new disk group.
Options:	To set up any new disks on the system, click Scan Disks. This runs the disk setup commands appropriate for the operating system.

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

3. 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.

4. If you chose to encapsulate the disks, reboot the system.

Notes:

- 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 Volume Manager 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.
-

Renaming a Disk Group

This procedure changes the name of an existing disk group. You might rename a disk group to provide a more appropriate name or avoid a name conflict with a disk group to be imported.

▼ To rename a disk group

1. **Select the disk to be renamed.**
2. **Choose Disks Groups > Rename (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 is not already displayed in this field, type the disk group's name or click Browse to select the disk group.
New Name:	Type the new name for the disk group.

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

Notes:

- The new disk group name must be unique.
 - The rename task deports and reimports the disk group. If volumes in the disk group are in use, the deport fails and the disk group is not renamed.
 - This 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

This procedure makes a disk group inaccessible. Once deported, a disk group cannot be used until it is imported. Disks in a deported disk group retain knowledge of the deported disk group until they are removed or reused (assigned to another disk group). If a disk group's name or disks are reused while the disk group is deported, the deported disk group may not be importable.

You can deport a disk group to make the disk group *temporarily* unavailable. Since the last disk in a disk group cannot be removed, deporting a disk group is useful for freeing the last disk in a disk group for removal and reuse.

▼ To deport a disk group

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

Disk Group Name:	If the correct disk group name is not already displayed in this field, type the disk group's name or click Browse to select the disk group.
Options:	Use the following expert options with caution: <ul style="list-style-type: none">• To change the name of the disk group at deport, type a new disk group name in the New Name field.• To set up a host machine to import the deported disk group at reboot, type the host ID in the New Host field.

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

Notes:

- A deported disk group is inaccessible.
 - 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 reimported automatically when the system is rebooted. However, if you specify a host in New Host expert option, the specified host will import the disk group at reboot.
-

Importing a Disk Group

This procedure makes a deported (inaccessible) disk group accessible again. To import a deported disk group, you must know the disk group's 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 system name (at the top of the tree).**
2. **Choose System > Import Disk Group (menu) or Disk Group Import (Command Launcher).**

3. Complete the Import Disk Group dialog box as follows:

Disk Group Name:	Type the name of the disk group to be imported or click Browse to select the disk group.
Options:	<p>Use the following expert options with caution:</p> <ul style="list-style-type: none">• To start all volumes in the disk group at import, click Start All Volumes.• To clear the existing host ID stamp on all disks in the disk group at import, click Clear Host ID. Do not use this option if another host is using any disk(s) in the disk group.• To force the disk group import when the host cannot access all disks in the disk group, click 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, type a new disk group name in the New Name field. To indicate that the name change is temporary, click Use New Name as Temporary.

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

Notes:

-
- 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.
 - If all disks associated with a deported disk group have been reused since the disk was deported, that disk group cannot be imported.
 - A disk group import may 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 clicking the Force Import expert 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 clicking the Clear Host ID expert option.
-

Recovering Volumes in a Disk Group

This 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 should be available for use again.

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 (menu) or Disk Group Recover (Command Launcher).**
3. **Complete the Recover Disk Group dialog box as follows (if applicable):**

Disk Group Name:	If the correct disk group name is not already displayed in this field, type the disk group's name or click Browse to select the disk.
------------------	---

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

Notes:

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

Destroying a Disk Group

Caution – Destroying a disk group can result in loss of data.

This procedure *permanently* removes a disk group from Volume Manager control. This also reinitializes all of the disks in the disk group as empty disks and places them in the free disk pool for reuse. This task should be used with caution.

▼ To destroy a disk group

1. **Select the system name (at the top of the tree).**
2. **Choose System > Destroy Disk Group (menu) or Disk Group Destroy (Command Launcher).**
3. **Complete the Destroy Disk Group dialog box as follows:**

Disk Group Name:	Type 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:

- When a disk group is destroyed, its disk space is returned to the free space pool.
 - The `rootdg` disk group cannot be destroyed.
 - A disk group cannot be destroyed if any volumes in that disk group are in use (open).
-

Moving a Disk Group

This procedure moves a disk group (and the Volume Manager objects in that disk group) from one system to another. This relocates the disk group's configuration to the new system.

▼ To move a disk group from one machine to another

1. **Unmount and stop all volumes in the disk group to be moved. (See Chapter 4 for information on how to unmount and stop volumes.)**
2. **Follow the instructions in “Deporting a Disk Group” on page 64 to deport the disk group to be moved to the other system.**
3. **Attach all of the physical disks in the disk group to the new system.**
4. **On the new system, follow the instructions in “Importing a Disk Group” on page 65 to import the disk group.**

5. **Select the system name (at the top of the tree) and choose System > Scan Disks to set up the newly attached disks on the system. This runs the disk setup commands appropriate for the operating system.**
6. **Follow the instructions in “Recovering Volumes in a Disk Group” on page 67 to restart and recover all volumes in the disk group on the new system.**

Notes:

- The Volume Manager and the Storage Administrator (server) must be running on both systems.
-

Volume Tasks

This chapter describes how to create and use volumes with the 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
- 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
- Preparing to Restore a Volume From Backup
- Recovering a Volume
- Repairing a Mirror
- Disabling a Mirror
- Removing a Mirror From a Volume
- Removing a Log From a Volume
- Removing a Volume
- Moving a Subdisk
- Splitting a Subdisk
- Joining Subdisks

The following file system tasks are discussed in this chapter:

- Adding a File System to a Volume
- Mounting a File System on a Volume
- Resizing a File System
- Creating a Snapshot Copy of a File System
- Unmounting a File System on a Volume
- Checking a File System on a Volume

Volume Task Roadmap

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

To do this...	Use this procedure...
Volume Setup Tasks:	
Create new volume(s)	Creating a Volume
Precautionary Tasks:	
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
Maintenance Tasks:	
Add space to volumes	Resizing a Volume
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
Move portions of volumes to other disk space	Moving a Subdisk

To do this...	Use this procedure...
Recovery Tasks:	
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	Preparing to Restore a Volume From Backup
Repair or reattach a volume's disabled mirror	Repairing a Mirror
Other Tasks:	
Change a volume's 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's 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 Volume Manager Storage Administrator file system tasks.

To do this...	Use this procedure...
File System Setup Tasks:	
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
Maintenance Tasks:	
Add more space to a file system	Resizing a File System
Create a snapshot copy of a file system for backup	Creating a Snapshot Copy of a File System
Recovery Tasks:	
Perform a file system consistency check	Checking a File System on a Volume
Other Tasks:	
Unmount a file system	Unmounting a File System on a Volume

Creating a Volume

The Volume Manager 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 contain a file system or a database.

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, or striped across multiple disks to improve I/O performance.

This section describes how to use the 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 disk(s) to protect its data against disk failure.

■ Striped Volume

A striped volume's data is interleaved (striped) across two or more physical disks. A striped volume's data is spread across the disks alternately and evenly in small 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 disk(s) to protect its data against disk failure.

■ RAID-5 Volume

A RAID-5 volume's 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. 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.

▼ To create a concatenated volume

This procedure creates a concatenated volume that consists of one or more regions of the specified disk(s). This procedure also gives you the options of placing a file system on the new volume or mirroring the volume.

1. **Choose Create > Volume (menu) or Volume Create (Command Launcher).**
2. **Complete the Create Volume dialog box as follows:**

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

Size:	Type the volume size. 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.
Layout:	Choose Concatenated for the volume layout.
Options:	<ul style="list-style-type: none"> • To mirror the volume, select Mirrored. In the Total Number of Mirrors field, type the total number of mirrors for the volume. • To place the volume on a specific disk, click Assign Disks and select the disk you want to use from the Space Allocation - Create Volume 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 add a comment attribute for the volume, type the information in the Comment field.

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

Notes:

- The volume size should be less than or equal to the available free space on the disk(s).
 - If no disks are assigned, the Volume Manager 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.
 - 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.
-

▼ To create a striped volume

This 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.

1. Choose Create > Volume (menu) or Volume Create (Command Launcher).

2. Complete the Create Volume dialog box as follows:

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
------------------	--

Volume Name:	Type the new volume's name (or accept the default name).
Size:	Type the volume size. 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.
Layout:	Choose Striped 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, type 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, type the total number of mirrors for the volume. • To stripe the volume across specific disks, click Assign Disks and select the disks you want to use from the Space Allocation - Create Volume 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 add a comment attribute for the volume, type the information in the Comment field.

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

Notes:

- A striped volume requires at least two disks.
 - The volume size should be less than or equal to the available free space on the disk(s).
 - If no disks are assigned, the Volume Manager 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.
 - 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.
-

▼ To create a RAID-5 volume

This 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. **Choose Create > Volume (menu) or Volume Create (Command Launcher).**
2. **Complete the Create Volume dialog box as follows:**

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
Volume Name:	Type the new volume's name (or accept the default name).
Size:	Type the volume size in the 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. To determine the largest possible size for the volume, click Maxsize.
Layout:	Choose RAID-5 for the volume layout. 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. To specify a stripe unit size other than the default, type 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 stripe the volume across specific disks, click Assign Disks and select the disks you want to use from the Space Allocation - Create Volume 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 specify the number and size(s) of RAID-5 logs for the volume, click Log Details. By default, the Volume Manager will create one RAID-5 log with an appropriate size.• To add a comment attribute for the volume, type the information in the Comment field.

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

Notes:

- A RAID-5 volume requires at least three disks.
 - RAID-5 volumes cannot be mirrored.
 - The volume size should be less than or equal to the available free space on the disk(s).
 - For a RAID-5 volume, the size specified in the Size field is the usable space in the volume. The Volume Manager allocates additional space for the volume's parity information. The disks across which the RAID-5 volume will be striped should therefore contain additional free space for the volume's parity information.
 - If no disks are assigned, the Volume Manager 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.
 - This task automatically creates a RAID-5 log for the volume. To specify a different number of logs or no logs, click the Log Details button and complete the Log Details Dialog box.
-

▼ To create a mirrored volume

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

1. Choose **Create > Volume (menu) or Volume Create (Command Launcher)**.
2. Complete the Create Volume dialog box as follows:

Disk Group Name:	Either accept the default disk group or click Browse to select another disk group.
Volume Name:	Type the new volume's name (or accept the default name).
Size:	Type the volume size in the Size field. To specify a size unit, attach an s (sectors), k (kilobytes), m (megabytes), or g (gigabytes) to the size. To determine the largest possible size for the volume, click Maxsize.

Layout:	<p>Choose Concatenated or Striped for the volume layout.</p> <p>For a striped volume, provide the following information:</p> <p>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.</p> <p>To specify a stripe unit size other than the default, type 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>
Mirror Info:	<ul style="list-style-type: none"> • Select Mirrored. In the Total Number of Mirrors field, type the total number of mirrors for the volume.
Options:	<ul style="list-style-type: none"> • To place the volume on a specific disk(s), click Assign Disks and select the disks you want to use from the Space Allocation - Create Volume 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 add a comment attribute for the volume, type the information in the Comment field. • To specify the number and size(s) of Dirty Region Logging (DRL) logs for the volume, click Log Details. By default, the Volume Manager will create one DRL log with an appropriate size.

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

Notes:

- A mirrored volume requires at least two disks.
 - Only concatenated or striped volumes can be mirrored.
 - This task automatically creates a Dirty Region Logging log for the volume. To specify a different number of logs or no logs, click the Log Details button and complete the Log Details Dialog box.
-

Resizing a Volume

This 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 (menu) or Volume Resize (Command Launcher).**
3. **Complete the Resize Volume dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
	<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, type the size in the Desired Size field. <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>

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

Notes:

- A volume containing a `ufs` file system cannot be shrunk.
 - A volume containing an unmounted `vxfs` file system cannot be shrunk. Shrinking a volume with an unmounted file system can result in data loss.
 - When the volume size is increased, sufficient disk space must be available. When increasing the size of a volume, the Volume Manager assigns the necessary new space from available disks.
 - When a volume is shrunk, the resulting extra space is returned to the free space pool.
-

Renaming a Volume

This 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 (menu) or Volume Rename (Command Launcher).**
3. **Complete the Rename Volume dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
New Name:	Type 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, type a new mount point in the New Mount Point field.

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

Notes:

- 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).
-

Adding a Mirror to a Volume

This 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's data can be accessed from the surviving disk(s). 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 (menu)** or **Volume Add Mirror (Command Launcher)**.
3. Complete the Add Mirror dialog box as follows:

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
Options:	<ul style="list-style-type: none">• To specify the layout for the mirror, click Layout and complete the Mirror Layout Details dialog box.• To place the mirror on a specific disk(s), click Assign Disks and select the disks you want to use.

When 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:

- Once mirrored, the data in the volume is redundant. If a disk fails, the data will remain available on the surviving mirror (on another disk).
 - Only disks in the same disk group as the volume can be used to create the new mirror.
 - The new mirror must have a concatenated or striped layout.
 - A RAID-5 volume cannot be mirrored.
 - The new mirror cannot be created on a disk that already contains a copy of the volume.
 - If no disks are assigned, the Volume Manager uses available disk space to create the mirror.
 - The number of available disks must be sufficient to accommodate the layout type of the mirror(s).
 - To mirror the root volume (and other volumes required to boot the system) onto an alternate boot disk, use the Mirror Disk task.
-

Adding a Log to a Volume

This procedure adds the appropriate type of log to a mirrored or RAID-5 volume.

▼ To add a DRL log to a mirrored volume

This 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 (menu) or Volume Add Log (Command Launcher).**
3. **Complete the Add Log dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
Disk:	To place the log on a specific disk, type the name of the disk or click Browse Disks to select a disk.

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

Notes:

- When a log is added to a mirrored volume, dirty region logging is activated for that volume.
-

▼ To add a log to a RAID-5 volume

This 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, the Volume Manager 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 should have at least two logs.

1. **Select the RAID-5 volume to contain the log.**
2. **Choose Volumes > Log > Add (menu) or Volume Add Log (Command Launcher).**

3. Complete the Add Log dialog box as follows:

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
Disk:	To place the log on a specific disk, type the name of the disk or click Browse Disks to select a disk.

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

Stopping a Volume

This 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 86). 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 (menu) or Volume Stop (Command Launcher).**
- 3. Complete the Stop Volume dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
--------------	---

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

The volume's state should change to Stopped.

Notes:

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

Starting a Volume

This 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 (menu) or Volume Start (Command Launcher).**
3. **Complete the Start Volume dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
--------------	---

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

The volume's state should change 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

This 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's 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” on page 93).

▼ To create a snapshot copy of a volume’s data

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

Volume Name:	If the correct volume name is not already displayed in this field, type the volume’s name or click Browse to select the volume.
Snapshot Name:	Type the name for the snapshot copy of the volume.
Options:	To place the snapshot on a specific disk(s), click Assign Disks and select the disks you want to use.

4. **When 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.**
5. **When a Click Snapshot to create the snapshot volume message appears at the bottom of the dialog box, 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 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.
-

Preparing to Restore a Volume From Backup

This procedure stops and reinitializes a volume so that the volume can be reloaded from backup. This may be necessary if a volume's mirrors become unsynchronized.

▼ To prepare a volume for a restore from backup

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

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
--------------	---

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

When you have completed this task, you can restore the volume's data from backup.

Notes:

- 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

This 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 should be available for use again.

Alert icons and the Alert Monitor window may 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 (menu) or Volume Recover (Command Launcher).**
3. **Complete the Recover Volume dialog box as follows (if applicable):**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
--------------	---

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

Notes:

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

Repairing a Mirror

This 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 (menu) or Mirror Repair (Command Launcher).**
3. **Complete the Repair Mirror dialog box as follows:**

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

When 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.
 - Depending on the amount of data in the volume, this task may take some time.
-

Disabling a Mirror

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

This 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 (refer to “Repairing a Mirror” on page 89) 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 (menu) or Mirror Disable (Command Launcher).**
3. **Complete the Disable Mirror dialog box as follows:**

Select the mirror to disable:	Select the mirror to be disabled.
-------------------------------	-----------------------------------

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

Notes:

- When a mirror is disabled, volume reads and writes cannot be directed to the 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 should be reattached to the volume automatically.
-

Removing a Mirror From a Volume

Note – Removing a mirror can result in loss of data redundancy.

This procedure removes a mirror from its volume. This breaks the link between the mirror and its volume and returns the mirror's 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 (menu) or Mirror Remove (Command Launcher).**
3. **Complete the Remove Mirror dialog box as follows:**

Select the mirror to remove:	Select the mirror to be removed.
------------------------------	----------------------------------

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

Notes:

- 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

This 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 (menu) or Log Remove (Command Launcher).**
3. **Complete the Remove Log dialog box as follows:**

Select the log to remove:	Select the log to be removed.
---------------------------	-------------------------------

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

Notes:

- 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 (menu) or Volume Remove (Command Launcher).**
3. **Complete the Remove Volume dialog box as follows (if applicable):**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
--------------	---

When 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.
-

Moving a Subdisk

This procedure moves the contents of a volume's subdisk from one disk to another. This is useful for moving portions of a volume to a different disk for improved performance.

▼ To move a subdisk to another disk

1. **Select the volume with the subdisk to be moved.**

2. **Choose Show Layout.**
3. **In the Volume Layout Details window, select the subdisk to be moved to another disk.**
4. **Choose Subdisks > Move (menu) or Subdisk Move (Command Launcher).**
5. **Complete the Move Subdisk dialog box as follows:**

Disk Group Name:	The name of the disk group that contains the subdisk to be moved.
Source Subdisk:	If the correct subdisk name is not already displayed in this field, type the subdisk's name or click Browse to select the subdisk.
Target Disk:	Type the name of the disk to which the subdisk should be moved or click Browse to select a disk.

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

Notes:

- 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.
-

Splitting a Subdisk

This 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.

▼ To split a subdisk into multiple subdisks

1. **Select the volume with the subdisk to be split.**
2. **Choose Show Layout.**
3. **In the Volume Layout Details window, select the subdisk to be split into multiple subdisks.**

4. Choose **Subdisks > Split (menu) or Subdisk Split (Command Launcher)**.

5. Complete the **Split Subdisk dialog box** as follows:

Disk Group Name:	The name of the disk group that contains the subdisk to be split.
Source Subdisk:	If the correct subdisk name is not already displayed in this field, type the subdisk's name or click Browse to select the subdisk.
Number of Subdisks:	Type the number of subdisks into which the subdisk should be split.

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

Notes:

- The name of the first subdisk remains the same as the selected subdisk. Other subdisks are automatically named by the Volume Manager.
 - 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 log subdisk cannot be split.
-

Joining Subdisks

This 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.

▼ To join subdisks

1. **Select the volume with the subdisks to be joined.**
2. **Choose Show Layout.**
3. **In the Volume Layout Details window, select the subdisks to be combined into a single subdisk.**
4. **Choose Subdisks > Join (menu) or Subdisk Join (Command Launcher).**

5. Complete the Join Subdisks dialog box as follows:

Disk Group Name:	The name of the disk group that contains the subdisks to be joined.
Source Subdisks:	If the correct subdisk names are not already displayed in this field, type the subdisk names or click Browse to select the subdisks.
Joined Subdisk Name:	Type the name of the new, combined subdisk.

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

Notes:

- 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.
 - At least two subdisks must be specified.
 - The joined subdisk name can be the name of one of the subdisks being joined.
-

Adding a File System to a Volume

This 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 > Add (menu) or Volume Add File System (Command Launcher).**
- 3. Complete the File System dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
Mount Point:	Type 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 will also be updated at system startup. • To specify <code>mount</code> options, click Mount Details and specify the appropriate options in the Mount Details dialog box. • To specify <code>mkfs</code> command options, click Mkfs Details and specify the appropriate options in the Mkfs Details dialog box.

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

Notes:

- 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

This 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 (menu)** or **Volume Mount File System (Command Launcher)**.
3. Complete the Mount File System dialog box as follows:

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
--------------	---

Mount Point:	Type 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.

When 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.
 - If the path specified for the mount point does not already exist, it will be created.
 - The mount point must be an absolute pathname (that is, it must begin with /).
-

Resizing a File System

This 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 (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 is not already displayed in this field, type the file system's name or click Browse to select the file system.
	<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, type the size in the Desired Size field. <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>

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

Notes:

- When the file system is resized, the underlying volume is also resized.
 - Only `vxfs` file systems can be reduced in size.
 - The file system to be resized must be mounted.
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Creating a Snapshot Copy of a File System

This procedure prepares a `vxfs` file system 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).

▼ To create a snapshot copy of a file system's data

1. **Select the file system to be backed up.**
2. **Choose File Systems > Snapshot (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 is not already displayed in this field, type the file system's name or click Browse to select the file system.
Snapshot Mount Point:	Type the mount point for the snapshot copy of the file system.
Snapshot Size:	Type the size of the snapshot copy of the file system.
Options:	To place the snapshot on a specific disk(s), click Assign Disks and select the disks you want to use.

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

Notes:

- 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 `vxfs` documentation for guidelines on choosing the snapshot file system size.
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Unmounting a File System on a Volume

This 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 (menu) or Volume Unmount (Command Launcher).**

3. **Complete the Unmount File System dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
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When you have provided all necessary information in the dialog box, click Ok.

Notes:

- The specified volume must contain a mounted file system.
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Checking a File System on a Volume

This 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.

▼ 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 (menu) or File System Check (Command Launcher).**
3. **Complete the Check File System dialog box as follows:**

Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
Options:	<ul style="list-style-type: none">• To check and attempt to repair the file system, click Check And Repair.• To check the file system without repairing it, click Check With No Repair.

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

Notes:

- The specified volume must contain a file system. The file system should be unmounted.
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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 affected object's group icon.
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).
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.
Command Launcher	A window that displays a list of tasks that can be performed on Volume Manager 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 Volume Manager Storage Administrator 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.
dialog box	A window in which the user submits information to the Volume Manager Storage Administrator. Dialog boxes can contain selectable buttons and/or fields that accept information.
dock	To separate or attach the main window and a subwindow.

graphical view	A window that displays a graphical view of objects. In the Storage Administrator, the graphical view is called the Volume Layout Details window. See <i>Volume Layout Details window</i> .
grid	A tabular display of objects and their properties. The grid lists 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.
launch	To start a task or open a window.
main window	The main 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.
object group	A group of objects of the same type. Each object group has a group icon and a group name. In the Storage Administrator, object groups include disk groups, disks, volumes, controllers, free disk pool disks, uninitialized disks, and file systems.
object tree	A dynamic hierarchical display of Volume Manager objects and other objects on the system. Each node in the tree represents a group of objects of the same type.
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.
scroll bar	A sliding control that is used to display different portions of the contents of a window.
Search window	The 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 name and 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 is renamed and provides access to tasks appropriate for the selected object.

status area	An area of the main window (below the menu bar) that displays an alert icon when an object fails or experiences some other error.
splitter	The vertical bar that separates the object tree from the grid.
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 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 various Volume Manager Storage Administrator windows. These include another main window, a task request monitor, an alert monitor, and a search window. The Dock button separates the toolbar from the main window or reattaches it to the main window.
tree	A dynamic hierarchical display of objects on the system. See <i>object tree</i> .
ow window	A window that displays a graphical view of a volume and its components. Tasks can be performed on objects in this window. The objects displayed in this window are not automatically updated when the volume's properties change.

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