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

THE NETWORK IS THE COMPUTER™

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

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Contents

Preface vii

1. Introduction 1

The Volume Manager Storage Administrator 1

Storage Administrator Features 2

The Main Window 3

The Object Tree and Grid 4

The Menu Bar 5

The Toolbar 7

The Status Area 8

The Command Launcher 8

Task Roadmap 9

Setup Tasks 9

Maintenance Tasks 10

Repair/Recovery Tasks 10

Storage Administrator Icons 11

2. Getting Started 15

Installation and Setup 16

Starting the Storage Administrator 17

The Session Initiation Dialog Box 19
Selecting Objects 20
Viewing Objects and Object Properties 20
The Tree and Grid View 21
The Graphical View 22
The Object Properties Window 25
Accessing Tasks 27
Running Tasks From the Menu Bar 27
Running Tasks From a Popup Menu 28
Running Tasks From the Command Launcher 29
Using Dialog Boxes 31
Specifying Objects in Dialog Boxes 31
Specifying Object Sizes in Dialog Boxes 32
Viewing Commands 33
The Task Request Monitor Window 33
The Command Log File 35
Setting User Preferences 37
The Preferences Window 37
General 39
Main Window 40
Font 40
Color 41
Geometry 42
Tree/Grid 42
Toolbar 42
Layout Details 43
Preference Shortcuts 44
Searching for Objects or Free Space 45

Responding to Alerts 46

Exiting the Storage Administrator 48

3. Disk Tasks 49

Disk Task Roadmap 50

Adding a Disk to the Volume Manager 51

Designating a Disk as a Hot-Relocation Spare 54

Renaming a Disk 54

Offlining a Disk 55

Onlining a Disk 56

Mirroring a Disk 57

Evacuating a Disk 58

Replacing a Disk 58

Recovering Volumes on a Disk 59

Removing a Disk 60

Displaying a DMP Node 61

Creating a Disk Group 62

Renaming a Disk Group 63

Deporting a Disk Group 64

Importing a Disk Group 65

Recovering Volumes in a Disk Group 67

Destroying a Disk Group 67

Moving a Disk Group 68

4. Volume Tasks 71

Volume Task Roadmap 72

File System Task Roadmap 73

Creating a Volume 74

Resizing a Volume 81

Renaming a Volume 82
Adding a Mirror to a Volume 82
Adding a Log to a Volume 83
Stopping a Volume 85
Starting a Volume 86
Creating a Snapshot Copy of a Volume 86
Preparing to Restore a Volume From Backup 88
Recovering a Volume 88
Repairing a Mirror 89
Disabling a Mirror 90
Removing a Mirror From a Volume 91
Removing a Log From a Volume 92
Removing a Volume 93
Moving a Subdisk 93
Splitting a Subdisk 94
Joining Subdisks 95
Adding a File System to a Volume 96
Mounting a File System on a Volume 97
Resizing a File System 98
Creating a Snapshot Copy of a File System 99
Unmounting a File System on a Volume 100
Checking a File System on a Volume 101

Glossary 103

Index 107

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

CHAPTER 4

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 `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size. To determine the largest possible size for the volume, click Maxsize.
Layout:	Choose Concatenated for the volume layout.
Options:	• 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 `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (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 `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size.
Options:	• 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 `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (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 `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size.
Options:	• 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:	Choose Concatenated or Striped for the volume layout. For a striped volume, provide the following information: 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 `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size.
Mirror Info:	• Select Mirrored. In the Total Number of Mirrors field, type the total number of mirrors for the volume.
Options:	• 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.
	Specify *one* of the following: • To increase the volume size *by* 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 *by* 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. To specify a size unit, attach an `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size.

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:	• 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	• 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. • To specify `mkfs` 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:	• 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).**

I

icons, 11
  alerts, 47
  errors, 47
importing disk groups, 65
input
  size units, 32
installation, 9

J

joining subdisks, 95

L

logging, 83
  disabling, 92
logs
  adding to volumes, 83
  command log, 35
  disabling, 92
  DRL, 84
  RAID-5, 84
  removing, 92
  task log, 35

M

main window, 3
  preference settings, 40
main window status area, 8
maintenance tasks, 10
menu bar, 5
  accessing tasks, 27
menus, 5, 27
  Console, 5
  context-sensitive, 6, 28
  Create, 5, 27
  Help, 6
  Options, 5, 37
  popup, 28
  preferences, 5, 37
  Selected, 6, 27
  Window, 6
mirror tasks, 71
mirrored volumes, 75, 79
mirroring disks, 57
mirroring volumes, 79, 82
mirrors
  adding to volumes, 82
  detaching, 90
  disabling, 90
  removing, 91
  repairing, 89
monitoring alerts, 8, 46
monitoring tasks, 33
mounting file systems, 97
moving disk groups, 68
moving subdisks, 93

O

object properties
  displaying, 25
  in grid, 21
object properties window, 20, 25
object tree, 4
objects
  displaying, 20
  searching, 45
  selecting, 20, 31
  sorting, 22
  viewing, 20
offline disks, 55
online disks, 56
Options menu, 5, 37

P

plexes
  see *mirrors*
popup menus, 28
preferences, 37
  color, 41
  fonts, 40
  general, 39
  main window, 40
  Options menu, 5
  setting, 5, 37

shortcuts, 44
toolbar, 42
tree and grid, 42
volume layout details window, 43
window size, 42
preferences window, 37
properties, 25
in grid, 21
in properties window, 25
properties window, 20, 25

R

RAID-5 logging, 83
RAID-5 volumes, 75, 78
recovering disks, 59
recovering volumes, 59, 67, 88
recovery, 11
disk, 59
volume, 59, 67, 88
recovery tasks, 10
remote administration, 2
removing disk groups, 67
removing disks, 60
removing logs, 92
removing mirrors, 91
removing volumes, 93
renaming disk groups, 63
renaming disks, 54
renaming volumes, 82
repairing mirrors, 89
replacing disks, 58
resizing file systems, 98

Command Launcher, 8
disk, 49
disk group, 49
disk maintenance, 10
disk setup, 9
displaying, 33
file system, 71
file system maintenance, 10
from Command Launcher, 29
from menus, 27, 28
list, 9
maintenance, 10
mirror, 71
monitoring, 33
properties, 34
recovery, 10
repair, 10
roadmap, 9
running, 27
setup, 9
subdisk, 71
underlying commands, 34
viewing, 33
volume, 71
volume maintenance, 10
volume recovery, 11
volume repair, 11
volume setup, 9
toolbar, 7
Alerts button, 7
Dock button, 7
preference settings, 42
Search button, 7
Task button, 7
Volume Manager button, 7
tree, 4, 20, 21
preference settings, 42

U

uninitialized disks, 5
unmounting file systems, 100
user preferences, 37

V

viewing commands, 33
viewing objects, 20
graphical view, 22
properties, 25
tree / grid, 21
volume layout details window, 22
preference settings, 43
Volume Manager Storage Administrator, 1
volume name
changing, 82
volume size
changing, 81
volume task roadmap, 72
volume tasks, 71
roadmap, 72
volumes
adding file systems, 96
adding logs, 83
adding mirrors, 82
and file systems, 96, 97
backup and restore, 88
concatenated, 74, 75
creating, 74, 75, 76, 78, 79
detaching mirrors, 90
disabling, 85
enabling, 86
graphical view, 20, 22
joining subdisks, 95
maintenance tasks, 10
mirrored, 75, 79
mounting file systems, 97
moving subdisks, 93
preparing to restore, 88
RAID-5, 75, 78
reattaching mirrors, 89
recovering, 59, 67, 88
recovery tasks, 11
removing, 93
removing logs, 92
removing mirrors, 91
renaming, 82
repair tasks, 11
repairing mirrors, 89
resizing, 81
setup tasks, 9
snapshot copies, 86

splitting subdisks, 94
starting, 86
stopping, 85
striped, 75, 76
task roadmap, 72
unmounting file systems, 100

W

Window menu, 6
windows
alert monitor, 46
graphical view, 22
main window, 3
object properties, 20, 25
preferences, 37, 38
resizing, 5, 42
search, 45
setting size preferences, 42
task request monitor, 33
volume layout details, 22