NetworkAppliance®

The evolution of storage.™

VFM™ (Virtual File Manager) 5.6
Manage Physical Resources Guide

Part Number 215-01126

Copyright © 2001-2005 NuView, Inc. All rights reserved.

Copyright © 2003-2005 Network Appliance, Inc. All rights reserved. Printed in the U.S.A.

No part of this book covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owners.

Software derived from copyrighted material of NuView, Inc. is subject to the following license and disclaimer:

Network Appliance and NuView, Inc. reserve the right to change any products described herein at any time, and without notice. Network Appliance and NuView assume no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by Network Appliance and NuView, Inc. The use and purchase of this product do not convey a license under any patent rights, trademark rights, or any other intellectual property rights of Network Appliance or NuView, Inc.

This product includes software developed by the Apache Software Foundation.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark information

NuView®, StorageX®, and associated logos are registered trademarks or trademarks of NuView, Incorporated. Other product and company names are trademarks of their respective owners.

NuView Incorporated, 738 Highway 6 South, Suite 850, Houston, Texas 77079 (www.nuview.com).

NetApp® and the Network Appliance design are registered trademarks of Network Appliance, Inc. in the United States, Canada, the European Union, and Japan. Network Appliance is a registered trademark of Network Appliance, Inc. in Monaco and a trademark of Network Appliance, Inc. in the United States and Canada. SnapMirror is a registered trademark of Network Appliance, Inc. in the United States.

VFM™ and the VFM logo are trademarks of Network Appliance, Inc.

Table of Contents

PREFACE ..... **I**

CHAPTER 1 INTRODUCTION **1**

THE PHYSICAL VIEW 1

CHAPTER 2 WORKING WITH FILERS IN VFM **3**

HOW TO WORK WITH NETAPP FILERS 3
Set SNMP community string *3*
Change the shell credentials of a filer *4*
Create a report of multiple filers *5*
Enable or disable all SnapMirror backups *5*
Filers not identified correctly *5*
Create a SnapMirror on a filer *5*
Create a volume on a filer *6*
Create a qtree on a filer *6*
Enable vFilers to participate in a filer disaster recovery policy *7*
Schedule snapshots on multiple filers *7*
Enable or suspend snapshot schedules for multiple filers *9*
Take a snapshot of a volume immediately *10*
Change the snapshot reserve for multiple volumes *10*
Restore a snapshot *11*

CHAPTER 3 SETTING REPLICATION PROPERTIES **13**

HOW TO SET REPLICATION PROPERTIES 13
Set data transfer rate limit *13*
Specify a proxy machine *13*
Disallow deployment of replication agents *14*

CHAPTER 4 WORKING WITH PHYSICAL RESOURCES **15**

The Physical View *15*
HOW TO MANAGE MACHINES USING VFM 16
Add a machine to the physical view *16*
Remove a machine from a folder *16*
Create shares *17*
Duplicate shares *17*
Display drives *19*
View attributes of a machine or drive *19*
View attributes of a shared folder *20*
View attributes of an export *20*
Update security of a folder *20*
Refresh a machine *21*
Change the shell credentials of a UNIX machine *21*
Set NFS credentials *22*

APPENDIX **25**

GLOSSARY **27**

INDEX **31**

Preface

What the guide covers

This guide describes how you can use VFM™ (Virtual File Manager) technology to manage the machines and NetApp® filers that participate in the namespace or in VFM policies.

The guide is divided into the following sections.

- **Chapter 1 Introduction** – Provides an overview of the VFM Physical View tree.
- **Chapter 2 Working with NetApp filers** – Explains how to use VFM to manage NetApp filers.
- **Chapter 3 Setting replication properties** – Explains how to use VFM to configure replication properties on machines participating in the namespace.
- **Chapter 4 Working with Physical Resources** – Explains how to manage Windows® and UNIX® machines.
- **Appendix** – Provides a list and description of the VFM documents.
- **Glossary** – Provides definitions of terms used in this guide.

Audience

This guide is for network administrators who are familiar with Windows NT®, Windows 2000, Windows Server™ 2003, and DFS. It does not cover basic system or network administration topics.

Typographic conventions

- **Bold** text - Items on a dialog box or page on the VFM console that you are instructed to click.
- *<text in italics>* - Substitute the text within the greater than and less than symbols with the value requested.

Using the online help

- Certain icons appear to the left of a topic title to indicate that the information provided applies only to a specific operating system, type of DFS root, or data transfer protocol.

Icon	Description
Win2K	Indicates that the information applies only to DFS roots on Windows 2000 or Windows Server 2003, Enterprise Edition.
domain root	Indicates that the information applies only to domain-based roots.
W2K3	Indicates that the information applies only to DFS roots on Windows Server 2003.
CIFS	Indicates that the information applies only to CIFS data transfer.

- In the table of contents, a new topic is represented as a page with a red asterisk , and an entire section of new topics is represented as a book with a red asterisk .
- Definitions of new terms are available wherever they appear in help topics. The first time a new term appears in a help topic, it appears as a green hyperlink.
- Context help contains detailed information about a dialog box or view, and might include links to related topics. Press **F1** or click **Help**.

Support

Contact NetApp technical support, 24 x 7.

Support is either through the web at http://now.netapp.com or by phone. See http://www.netapp.com/support for details.

Support phone numbers:

- 888 4-NETAPP (US and Canada)
- (1-888-463-8277)
- (408) 822-4700
- 800-44-NETAPP (EMEA/Europe)
- 800-800-0800 (Asia/Pacific)

Notes:

- You can also contact technical support by clicking **Support** on the **Help** menu.
- To get your product build number and license information, click **About Virtual File Manager** on the **Help** menu.

Enter new license key

Enter a new license key for the VFM client and server components when you want to extend the VFM evaluation period or when you purchase additional licenses from VFM.

1. Contact NetApp to request a new license key.
2. On the **Help** menu, click **About Virtual File Manager**.
3. Click **Edit Serial Numbers**.
4. In the License Type list, click the appropriate item.
5. If you selected "Evaluation" as the license type, type the new activation key.
6. If you selected "Full" as the license type, select a product number from the Product list and type the new activation key.
7. Click **OK**.

Chapter 1 Introduction

This document explains how to use VFM to manage Windows and UNIX machines and NetApp filers that participate in the namespace or in VFM policies.

Topics are arranged in the following chapters:

- Chapter 2 Working with NetApp filers
- Chapter 3 Setting replication properties
- Chapter 4 Working with physical resources

The Physical View

The Physical View shows machines participating in the namespace or a policy and machines you add to folders you create in the Physical View tree.

- The **Namespace Resources** folder in the Physical View tree is automatically populated with a list of the machines participating in the logical namespace. You can create additional folders in the Physical View to organize your view of the machines. You can add machines to the folders you create whether or not the machines participate in the logical namespace.
- Machines in the Physical View tree that do not participate in the namespace appear with this icon .
- A machine can appear in multiple folders.
- You can only add and remove machines from Physical View folders that you create. VFM automatically maintains the contents of the following folders:
    - All Resources
    - Namespace Resources
    - NetApp Filer Resources
- After you add a machine to a user-defined folder in the Physical View tree, you can drag a shared folder on the machine to a root in the Logical View to create a link in the namespace. When you do this, VFM adds the machine to the **Namespace Resources** folder.

  Note: You cannot drag an export in the Physical View to a root in the Logical View because links cannot reference exports.

- NetApp filers appear in the Physical View tree with a NetApp-specific icon or , indicating whether they participate in the namespace.
- NetApp vFiler images appear in the Physical View tree with a NetApp-specific icon or , indicating whether they participate in the namespace.
- UNIX machines appear in the Physical View with a unique icon .

Chapter 2 Working with filers in VFM

VFM makes it easy for you to integrate your NetApp filers into your namespace.

- NetApp filers in the Physical View tree
    - **Integrated management of NetApp filers -** VFM provides integrated in-context access to the FilerView® management tool. When a NetApp filer is selected in the Physical View, a “Manage” tab hosting the FilerView UI is added to the right pane.
    - **Display of NetApp-specific information -** VFM displays information from the NetApp filer, including Data ONTAP™ version, filer volume names, filer system status information, and NETBIOS aliases in use on the filer.
- NetApp vFiler™ in the Physical View tree
    - Unlike a NetApp filer, vFilers do not display a "Manage" tab in the right pane when they are selected in the Physical View. Vfilers are managed through their hosting filer.
    - The platform information for a vFiler is "Data ONTAP" without any revision number. This is because vFilers do not support SNMP.
- If VFM misidentified a filer or vFiler, right-click the machine, click **Properties**, and select the correct machine identity setting.
- See the VFM Troubleshooting Guide if filers are misidentified either as generic machines or as vFilers, or if FilerView does not appear in the Manage tab.

How to work with NetApp filers

This section provides instructions about how to use VFM to manage filers participating in the namespace or a storage policy.

Set SNMP community string

VFM uses the SNMP community string in the process of identifying NetApp filers and UNIX machines. VFM uses "public" as the default value. You can set the value for a specific machine.

1. In the Physical View tree, right-click a machine and click **Properties**.
2. On the General tab, type a name in the **SNMP community string** field.
3. Click **OK**.

Note: To set application-wide defaults, click **Options** on the **Tools** menu and then click **System Options**.

Change the shell credentials of a filer

To manage filers that are members of a policy, you must configure VFM with the system or administrative user account and password of NetApp filers. Normally, VFM uses RSH to communicate with filers. You can choose to use SSH.

Notes:

- **RSH**

  When user name and password are left blank, VFM uses "root" as the user name with no password. You can specify different credentials for a filer or UNIX machine. You can also change the default RSH shell credentials that all new filers and UNIX machines added to VFM will use.

- **SSH**

  Before you can use SSH, you must configure VFM to use the remote shell. See "Use SSH shell credentials" in the VFM Advanced Configuration and Techniques Guide for instructions about how to perform the following tasks:

  - Install and configure OpenSSH.
  - Generate a key-pair.
  - Copy the public key to the filers using SSH.
  - Cache the keys.
  - Provide the location of the plink and pscp executables.

- **To set default RSH or SSH shell credential** that all new filers and UNIX machines will use, see "Set default remote shell credentials" in the VFM Advanced Configuration and Techniques Guide. Machines already known to VFM are not affected.

1. Right-click the filer either in the Physical View or beneath the policy in which it is contained and then click **Properties**.
2. Click the **Shell** tab.
3. Select a type in the **Shell Type** list.
4. Perform one of the following actions:
   - If you select RSH, type the user name and password that will be used by VFM to communicate with the filer.
   - If you select SSH, type the location of the private key and then type the user name that will be used by VFM to communicate with the filer. When VFM uses SSH to communicate with UNIX machines and filers, SSH is configured without a password or passphrase.
5. Click **Fresh Filer Information**.
6. Click **OK**.

Create a report of multiple filers

VFM enables you to create NetApp-specific reports containing information about multiple filers.

1. Perform one of the following actions:
   - On the **Reports** menu, point to **NetApp**, and then click a report.
   - Right-click Reports Reports or Physical View Physical View, point to **NetApp**, and then click a report.
   - Right-click the **Namespace Resources** folder under the Physical View tree or on the Properties tab of Physical View, point to **NetApp**, and then click a report.
2. Select all or individual filers.
3. Click **Next**.
4. Optionally, type a name for the report.
5. Click **Finish**.

Enable or disable all SnapMirror backups

VFM enables you to enable or disable all the SnapMirror® backups on a filer.

1. Right-click a filer and click **Properties**.
2. Click the **NetApp Filer** tab.
3. Perform one of the following actions:
   - To enable all the SnapMirrors, select **Enable SnapMirrors**.
   - To disable all the SnapMirrors, clear **Enable SnapMirrors**.
4. Click **OK**.
5. Click **Done**.

Filers not identified correctly

You can change a machine setting if VFM does not correctly identify a NetApp filer or vFiler in the Physical View.

1. Right-click the machine and click **Properties**.
2. Select the appropriate machine identity.
3. Click **OK**. When a filer is correctly identified, additional properties tabs appear.

Create a SnapMirror on a filer

Configure a SnapMirror on a filer. To manage filers, you must configure VFM with the system or administrative user account and password of the filer. You must have write access to *C$\etc* on the filer. See "SnapMirror Policies" in the VFM Data Movement Policies Guide for more information.

1. Right-click the filer in the Physical View and click **Properties**.

2. Click the **SnapMirrors** tab.
3. Click **Create**.
4. Select the source and destination.
5. Click the **Options and Schedule** tab and set up the replication schedule.
6. Click **OK**.
7. Click **Done**.

Create a volume on a filer

Configure a volume on a NetApp filer.

1. Perform one of the following actions:
   - Right-click a filer and click **Create Volume**.
   - Right-click the Volumes folder under a filer in the Physical View tree and click **Create Volume**.
   - Select a filer in the Physical View tree to show a Properties tab in the right pane. Right-click anywhere on the page and click **Create Volume**.
   - Select the Volume folder under a filer in the Physical View tree to show a Properties tab in the right pane. Right-click anywhere on the page and click **Create Volume**.
2. In the **New Volume Name** field, type the name of the volume. The name can contain letters, numbers, and the underscore character "_". The first character must be a letter or an underscore.
3. In the **RAID Group Size** field, type the number of disks per RAID group in the volume. The maximum value is 28 and the default value is 14.
4. Select a language from the list provided.
5. Select one of the following options:
   - **Automatic Disk Selection** enables the system to decide which disks to add, based on your response to the **Number of Disks** to add to the volume and the **size of the disks** to be added.
   - **Manual Disk Selection** enables you to select the disks to add to the new volume.
6. Click **Create**.

Note: To manage filers, you must configure VFM with the system or administrative user RSH account and password of the filer. See "Manage SnapMirrors" in the VFM Data Movement Policies Guide for more information.

Create a qtree on a filer

Configure a qtree on a NetApp filer. To manage filers, you must configure VFM with the system or administrative user RSH account and password of the filer. See "Change the shell credentials of a filer" for more information.

1. Right-click a filer in the Physical View and click **Properties**.
2. Click the **QTrees** tab and then click **Create**.

3. Select the filer.
4. Select the volume on the filer where you want to create the qtree.
5. Type a name for the qtree.
6. Select the appropriate security style.
7. Select to enable or disable oplocks.
8. Click **OK**.

Enable vFilers to participate in a filer disaster recovery policy

To enable a vFiler to participate in a filer disaster recovery policy, the filer that hosts the vFiler must be known to VFM.

1. If the vFiler does not appear in a folder in the Physical View, add the vFiler to a folder.
2. Right-click the vFiler and click **Properties**.
3. Click the **NetApp Filer** tab.
4. Type the name of the filer in the **Hosting Filer** field, or select the filer from the list provided.
5. Click **OK**.
6. Click **Done**.

Schedule snapshots on multiple filers

VFM enables you to schedule snapshots on multiple NetApp filers. This is a convenient way to change the snapshot schedule and reserve setting on multiple filers without requiring you to repeat the changes on each individual filer.

To manage filers, you must configure VFM with the system or administrative user account and password of the filer. You must also have write access to *C$\etc* on the filer. See "Manage SnapMirrors" in the VFM Data Movement Policies Guide for more information.

Note: VFM warns you if some of the volumes on the selected filers are members of other snapshot scheduling policies. When a snapshot scheduling policy manages filer-initiated snapshots and the snapshot schedule of a volume is changed outside the policy, VFM restores the schedule to the policy settings the next time the policy schedule runs.

1. Perform one of the following actions:
   - Right-click a folder in the Physical View and click **Set snapshot schedule**.
   - Select a folder in the Physical View to show a Properties tab in the right pane. Select multiple filers on the Properties tab, right-click, and then click **Set snapshot schedule**.

2. Perform one of the following actions:

If...	**Then do this...**
You want VFM to manage the snapshots, select **Add this volume to a Snapshot Scheduling policy**.	• When you select an existing policy 1. Click **Next**. The name of the policy and a list of the volumes to be added to the policy appears. 2. Click **Finish**. The volumes on the selected filers are added to the policy. • When you click **New Policy** to create a new policy 1. Type a word or phrase that best describes the policy in the **Name** field. 2. Click the **Virtual File Manager Settings** or **Filers Settings** tab and set the schedule for the policy. 3. Click **OK**. A status report appears. 4. Click **Done**. The new policy appears on the list of snapshot scheduling policies. 5. Click **Next**. The name of the policy and a list of the volumes to be added to the policy appears. 6. Click **Finish**. The volumes on the selected filers are added to the new policy.
You want the volumes managed by their respective filers, select **Set the schedule for this volume, but don't add it to a policy**.	1. Click **Next**. Normally, **Set the snapshot schedule** and **Enable scheduled snapshots** options are selected. 2. Type the number of weekly, daily, and hourly snapshots to retain. 3. Select the time you want to initiate snapshots on the volumes,

If...	Then do this...
	and then click **Next**. 4. Perform one of the following actions: • Select **Don't modify the snapshot reserve** if you want to retain the current reserve on the selected volumes. • Select **Set the snapshot reserve** if you want all the selected volumes to have the same reserve. Type the amount of space on the volumes to reserve for snapshots. 5. Click **Next**. A list of the changes to be made appears. 6. Click **Finish**.

Enable or suspend snapshot schedules for multiple filers

VFM enables you to stop the snapshot schedule from running on volumes on multiple filers. The schedules are not deleted.

1. Perform one of the following actions:
   - Right-click a folder in the Physical View and click **Set snapshot schedule**.
   - Select a folder in the Physical View to show a Properties tab in the right pane. Select multiple filers on the Properties tab, then right-click and click **Set snapshot schedule**.
2. Click **Next**. The option **Set the schedule for this volume, but don't add it to a policy** is selected.
3. Click **Next**.
4. Select or clear the **Enable scheduled snapshots** check box based on whether you want to enable or suspend the snapshot schedule for the selected items, and then click **Next**.
5. Click **Next**. A list of the changes to be made appears.
6. Click **Finish**.

Notes:

- Suspending a snapshot schedule does not prevent you from manually taking a snapshot. Select a folder in the Physical View that contains filers to show a Properties tab in the right pane. Select the filers with volumes you want to take a snapshot of, then right-click and click **Take snapshot now**.
- Existing snapshots on the selected volumes are not deleted when you suspend the schedule.

Take a snapshot of a volume immediately

VFM enables you to manually take a snapshot of NetApp filers.

1. Perform one of the following actions:
    - To take a snapshot of all the volumes on a NetApp filer, right-click the filer and click **Take snapshot now**.
    - To take a snapshot of selected volumes on a NetApp filer, select the filer to show a Properties tab in the right pane. Under Volumes, select the volumes, right-click, and click **Take snapshot now**.
    - To take a snapshot of the volumes on multiple NetApp filers, right-click the folder in the Physical View that contains filers and click **Take snapshot now**.
2. Type a name for the snapshot.
3. Optionally, select **Run batch before snapshot** and type the UNC path of a script file that you want to run.
4. Optionally, select **Run batch after snapshot** and type the UNC path of a script file that you want to run.
5. Click **OK**.

Change the snapshot reserve for multiple volumes

VFM enables you to change the snapshot reserve for volumes on multiple filers.

1. Perform one of the following actions:
    - To change the snapshot reserve for all the volumes on a NetApp filer, right-click the filer and click **Set snapshot schedule**.
    - To change the snapshot reserve for selected volumes on a NetApp filer, select the filer to show a Properties tab in the right pane. Under Volumes, select the volumes, right-click, and click **Set snapshot schedule**.
    - To change the snapshot reserve for the volumes on multiple NetApp filers, right-click the folder in the Physical View that contains filers and click **Set snapshot schedule**.
2. Click **Next**.
3. Make sure that the option **Set the schedule for this volume, but do not add it to this policy** is selected. Click **Next**.
4. Select **Don't modify the snapshot schedule** and click **Next**.
5. Make sure that the option **Set the snapshot reserve** is selected. Type the amount of space the volumes must reserve for snapshots.
6. Click **Next**. Verify the changes that are to be made to the volumes.
7. Click **Finish**.

Restore a snapshot

Restore snapshot data to its original location on a NetApp filer.

1. Select a filer or volume in the Physical View to show tabs in the right pane.
2. Click the **Snapshots** tab.
3. Right-click a snapshot and click **Restore**.
4. Click **Yes**.

Chapter 3 Setting replication properties

This chapter explains how to set replication properties on machines participating in the namespace or a storage policy.

- To set throttling limits, see "Set data transfer rate limit".
- To specify a Windows or UNIX machine as a proxy to host a replication agent instead of having the agent deployed to a machine participating in a policy, see "Specify a proxy machine".
- To prevent deployment of agents to individual Windows machines, see "Disallow deployment of data move agents".

How to set replication properties

This section provides instructions about how to set replication properties.

Set data transfer rate limit

Set the VFM replication data transfer rate limit or bandwidth throttling for a machine.

1. In the Physical View tree, right-click a machine and click **Properties**.
2. Click the **Agent** tab.
3. Perform one of the following actions:
    - If the machine is running the Windows operating system, make sure that **Allow a replication agent to be deployed to this host** is selected.
    - If the machine is running a UNIX operating system, make sure that **Use replication agent on this host or use default proxy** is selected.
4. Select the business hours for weekdays and weekends.
5. Type or select a rate, in bytes per second, for business and non-business hours.
6. Click **OK**.

Specify a proxy machine

Normally, VFM deploys Windows and UNIX replication agents on machines participating in policies that transfer data. You can specify a proxy machine to host the replication agent instead of having the agent deployed to a machine participating in the policy.

- VFM uses the replication agent on the VFM server or monitoring agent machine for non-Windows, non-UNIX machines transferring CIFS or NFS data. You can override this behavior by specifying proxy machines to host replication agents for transfers or file difference reports that would ordinarily try to deploy an agent to the selected machine.

- For Windows and UNIX replication agent system requirements, see "Manage replication agents" in the VFM Advanced Configuration and Techniques Guide.

1. In the Physical View tree, right-click a machine and click **Properties**.
2. Click the **Agent** tab.
3. Perform one of the following actions:
   - Select **Use default proxy**, to use the machine you specified as the default system option.

     Note: To set default Windows and UNIX replication agents, see "Specify default replication agents."

   - Select **Use this specified proxy**, to select a machine you want VFM to deploy a replication agent. Type the path of the machine in the appropriate text box, or click ... **Browse** to locate the machine in your network.
4. Click **OK**.

Disallow deployment of replication agents

Normally, replication agents are installed on Windows or UNIX machines participating in policies that transfer CIFS or NFS data. You can prevent deployment of agents to individual machines.

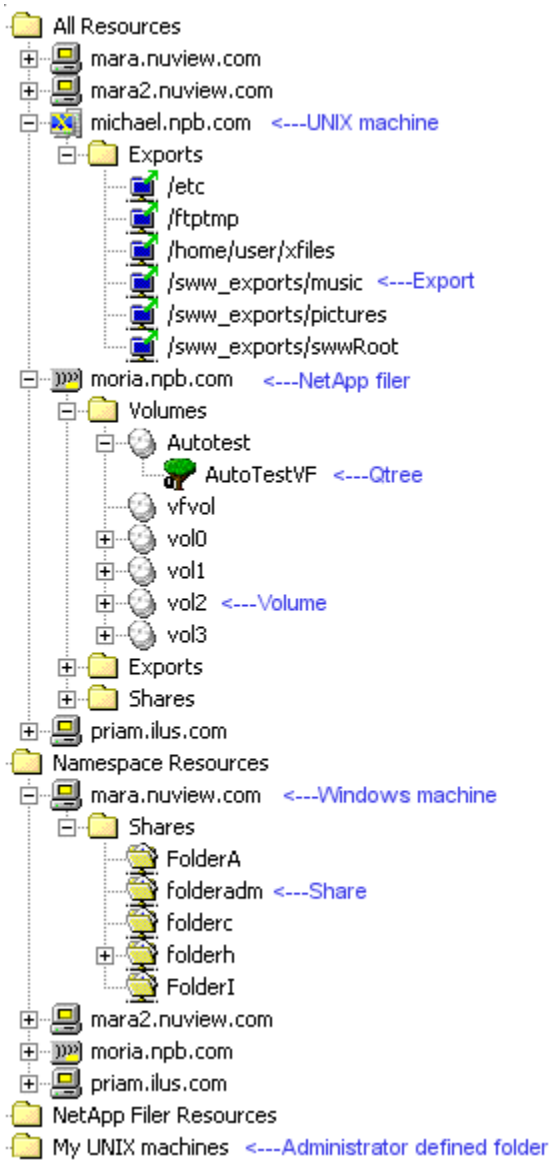
1. On the Physical View tree, right-click a machine and click **Properties**.
2. Click the **Agent** tab.
3. Clear **Allow replication agent to be deployed to this host**.
4. Click **OK**.

Note: For detailed information about replication agents, such as system requirements and instructions about how to manually deploy agents, see "Manage replication agents" in the VFM Advance Configuration and Techniques Guide.

Chapter 4 Working with physical resources

This chapter provides instructions about managing machines from the VFM Physical View.

The Physical View



How to manage machines using VFM

This section provides instructions about managing machines using VFM.

Add a machine to the physical view

Create a folder in the Physical View to contain the machines that you want to add.

1. Right-click Physical View and click **Add folder**.
2. Type a name for the folder and click **OK**.
3. Perform one of the following actions:
   - Drag a machine from the **Namespace Resources** or **All Resources** folder to the folder you created.
   - Drag a machine from Windows Explorer to the folder you created in the Physical View tree or on the **Properties** tab of Physical View.
   - Right-click the folder you created and click **Add Machine**. Use this option to add UNIX NFS machines to the Physical View.

Notes:

- It is recommended that you reference machines using their NETBIOS name rather than IP address or fully qualified DNS name.
- If a machine appears in the Physical View with a name that is not what you expect, check whether DNS reverse lookups are configured correctly for the machine.

Remove a machine from a folder

Remove a machine from a user-defined folder and delete user-defined folders in the Physical View tree.

To remove a machine:

1. In the Physical View tree, open a user-defined folder.
2. Right-click a machine and click **Remove from folder**.

Notes:

- If the machine participates in the namespace, the machine continues to appear in the **Namespace Resources** folder.
- If the machine is not participating in the namespace but appears more than one user-defined folder, the machine is removed only from the folder you indicated.

To delete a user-defined folder:

Right-click a folder and click **Delete**.

Create shares

Create a share on one or more machines and set share and folder permissions. In addition, you can add the shares to a new or existing link, or create new links for each share. This is a quick way of setting up shares for use in a disaster recovery or replication policy.

1. Right-click a machine in the **Physical View** tree and click **Create shares**.
2. Click **Next**.
3. Type the appropriate information and click **Next**. When creating shares on a NetApp filer, you must use the NetApp naming convention (for example, c:\vol\voln\<directory name>, where "n" is the appropriate volume number and "<directory name>" is the name of the directory to be shared.
4. Select the machines where you want to create the share and click **Next**.
5. Perform one of the following actions:
    - Select **Do not modify any DFS links** if you do not want to add the shares to a link.
        - Click **Next**.
        - Click **Finish**.
    - Select one of the other options if you want to add the shares to the namespace.
        - Click **Next**.
        - Select a DFS root or DFS link, depending on the option you selected, and then click **Next**.
        - Click **Finish**.

Notes: You can also create shares on a machine by performing one of the following actions:

- Drag a share from a machine in the Physical View tree to another machine in the Physical View tree.
- Drag a share on the **Properties** tab of any item in the Logical View or Physical View to a machine in the Physical View tree.

Duplicate shares

Copy multiple shares from one server to another server. You can specify whether to copy all the shares on the source server or only the shares referenced in your namespace. You can also run batch files before and after each share is created.

Note: Data is not migrated. To migrate data, create a migration policy.

1. On the **Tools** menu, click **Create shares**.

2. Click **Next**.
3. Select **Duplicate Shared From** and then type the name of the source and destination servers or browse for the servers in your network.
4. Click **Next**.
5. Select one of the following options:
    - **Only duplicate shares referenced by the logical namespace -** Select this if you only want to duplicate the shares on the source server that are referenced in your namespace.
    - **Duplicate all shares -** Select this if you want to duplicate all the shares on the source server. This option enables you to duplicate hidden shares.
6. Select **Run pre-creation batch file** and type the path of the batch file or click **Browse**. The batch file runs before each share is created. See the notes at the end of this topic for information about running batch files in VFM and more information about the batch file.
7. Select **Run post-creation batch file** and type the path of the batch file or click **Browse**. The batch file runs after each share is created. See the notes at the end of this topic for information about running batch files in VFM and more information about the batch file.
8. Click **Next**.
9. Review the list of source and destination shares.
    - Clear the shares that you do not want to duplicate.
    - To change a destination path, click the destination path and type a new path or click ... **Browse** to locate a new share.
    - To change the destination path for multiple selected shares, click **Rebase**.
    - Clear **Warn if destination already contains files or folders** if you do not want VFM to check for destination shares that are not empty.
10. Click **Next**. VFM checks for empty destination shares and destination shares that do not exist.
11. If VFM finds destination shares that are not empty, the shares appear in a list. You can continue or select each share and type a different destination share, browse for another share, or remove the share from the duplication process. If VFM finds destination shares that do not exist, the shares appear in a list with a suggested local path for each share.
        - To change the local path for multiple items, select the items and click **Rebase**. Type your changes and click **OK**.
        - To change one local path, select the item and type a new path.
        - To accept all or some of the suggested local paths, select the items on the list and click **Create Destination Share**.
12. Click **Next**.
13. VFM displays a list of source and destination paths that are validated. You can clear items that you do not want to duplicate or change the destination path of an item.
14. Click **Next**.
15. Perform one of the following actions:
    - Select **Do not modify any DFS links** if you do not want to add the shares to a link.
        1. Click **Next**.

2. Click **Finish**.

- Select one of the other options if you want to add the shares to the namespace.
  1. Click **Next**.
  2. Select a DFS root or DFS link, depending on the option you selected, and then click **Next**.
  3. Click **Finish**.

Notes:

- See "Running batch files" in the VFM Advanced Configuration and Techniques Guide for detailed information about configuring batch files to run in VFM storage policies.
- See "Batch files" in the VFM Advanced Configuration and Techniques Guide for detailed information about the example scripts provided by VFM.

Display drives

By default, VFM displays servers and shared folders in the **Physical View** tree. You can select to display the drives.

1. On the **Tools** menu, click **Options**.
2. Select the **Show drives in physical views** check box.
3. Click **OK**.

Note: Displaying drives in the Physical View requires gathering additional data from servers; this process can slow the display of information in VFM when managing a large configuration or configurations in which servers are inaccessible.

View attributes of a machine or drive

View the properties and references of a machine or drive that appear in the Physical View tree. In the Physical View tree, click the machine or drive to display the following tabs in the right pane:

- **Properties -** Displays the characteristics or parameters of the selected machine or drive. Right-click an item on the tab to view a context menu.
- **Status** - Shows information concerning attempts by VFM to communicate with the machine or filer.
- **Replication Tasks -** Shows information about replication operations.
- **Snapshots** - Shows information about snapshots. This tab only appears if a folder contains NetApp or Windows Powered NAS/Windows Storage Server filer, the item selected is a filer, or a volume on a filer.
- **References -** Shows the DFS link referencing the machine or shared folder. Right-click a root or link to view a context menu.
- **Events** - Shows the history of events for the item selected.

- **Manage** - Only appears if the device selected is a NetApp or Windows Powered NAS/Windows Storage Server filer. You can access FilerView or the Windows Powered NAS/Windows Storage Server Web Management UI from this tab.
- **Reports** - Shows a list of reports generated that reference the machine or filer.

View attributes of a shared folder

View the attributes of a CIFS shared folder. The Physical View tree can contain shared folders that participate in the namespace and shared folders that do not participate in the namespace.

In the Physical View tree, click a machine, click the **Shares** folder, and then click the share. The following tabs appear in the right pane:

- **Properties** - Displays the characteristics or parameters of the selected share. Right-click anywhere on the tab to view a context menu.
- **Replication Tasks** - Shows information about replication operations.
- **References -** Shows the DFS links that reference the shared folder. Right-click a root or link to view a context menu.
- **Events -** Shows the history of events for the item selected.
- **Reports** - Shows a list of reports generated that reference the shared folder.

Note: The application displays share information that is returned by the system hosting the share. Information such as local path and connection limit might not be displayed for a share if the system hosting the share does not provide this information.

View attributes of an export

View the attributes of an export . In the Physical View tree, click a machine, click the **Exports** folder, and then click the export. The following tabs appear in the right pane:

- **Properties** - Displays the name and security permissions of the selected export. Right-click anywhere on the tab to view a context menu.
- **Replication Tasks** - Shows information about replication operations.
- **Events** - Shows information about the export.
- **Reports** - Shows a list of reports generated that reference the export.

Update security of a folder

Update permissions for a shared folder.

1. Perform one of the following actions:
    - Click a link in the Logical View. On the **Properties** tab, right-click a target.
    - Click a domain-based root in the Logical View. On the **Properties** tab, right-

click a replica.

- Right-click a folder in the Physical View.
- Click a replication policy under the **Replication Policies** folder in Admin View. Click the **Replication** tab that appears in the right pane. Right-click a shared folder.

2. Click **Properties**.
3. Click the **Security** tab.
4. Update permissions and click **OK**.

Note: If the "Unable to display security information" message appears when you click the Security tab, you do not have permission to view or edit the security of the folder.

Refresh a machine

Update the information about a machine and all the shared folders on the machine.

Notes:

- To refresh the information about all the items in both the Logical View and Physical View, click **Refresh all** on the **View** menu.
- To refresh the information about all the items in the Logical View or Physical View, right-click Logical View or Physical View in the tree and click **Refresh**.

Change the shell credentials of a UNIX machine

To manage UNIX machines that are members of a policy, you must configure VFM with the system or administrative user account and password of the machines. Normally, VFM uses RSH to communicate with UNIX machines. You can choose to use SSH.

Notes:

- **RSH**

  When user name and password are left blank, VFM uses "root" as the user name with no password. You can specify different credentials for a filer or UNIX machine. You can also change the default RSH shell credentials that all new filers and UNIX machines added to VFM will use.

- **SSH**

  Before you can use SSH, you must configure VFM to use the remote shell. See "Use SSH shell credentials" in the VFM Advanced Configuration and Techniques Guide for instructions about how to perform the following tasks:

  - Install and configure OpenSSH.
  - Generate a key-pair.
  - Copy the public key to the filers using SSH.
  - Cache the keys.
  - Provide the location of the plink and pscp executables.

- To set default RSH or SSH shell credential that all new filers and UNIX machines will use, see "Set default remote shell credentials" in the VFM Advanced Configuration and Techniques Guide. Machines already known to VFM are not affected.

1. Right-click the UNIX machine either in the Physical View or beneath the policy in which it is contained, and then click **Properties**.
2. Click the **Shell** tab.
3. Select a type in the **Shell Type** list.
4. Perform one of the following actions:
   - If you select RSH, type the user name and password that will be used by VFM to communicate with the machine.
   - If you select SSH, type the location of the private key and then type the user name that will be used by VFM to communicate with the filer. When VFM uses SSH to communicate with UNIX machines and filers, SSH is configured without a password or passphrase.
5. Click **OK**.

Set NFS credentials

Normally, UNIX replication agents use root (0) when communicating with the source and destination during NFS data transfers. VFM enables you to change the NFS credentials for individual filers and UNIX machines appearing in the Physical View. You can also set default NFS credentials for all new UNIX machines and filers added to the Physical View. The NFS credentials of filers and UNIX machines already appearing in the Physical View are not changed.

To set NFS credentials for a filer or UNIX machine:

1. Right-click the UNIX machine either in the Physical View or beneath the policy in which it is contained, and then click **Properties**.
2. On the General tab, type a different **Default User ID** and/or **Default Group ID**.
3. Click **OK**.

To set default NFS credentials:

1. On the **Tools** menu, click **Options**.
2. Click **System Options** to show a dialog box in the right pane.
3. Under NFS Settings, type a different **Default User ID** and/or **Default Group ID**.
4. Click **OK**.

Appendix

The following table lists the VFM guides. The list is arranged in ascending order by document title.

No.	Title	File name	Contents
1.	Advanced Configuration and Techniques	AdvancedConfig.pdf	• Explains how to use VFM to configure security permissions • Explains how to manage replication and monitoring agents • Explains how to run batch files in policies and reports • Explains how to make the VFM server highly available
2.	Data Lifecycle Automation Policies Guide	DataLifecyclePolicies.pdf	Explains how to create and manage archival migration policies to optimize storage.
3.	Data Movement Policies Guide	DataMovePolicies.pdf	• Explains how to transfer CIFS and NFS data by creating migration and replication policies • Explains how to transfer data between NetApp filers by creating SnapMirror policies • Explains how to load balance Windows servers by creating storage load balancing policies
4.	Disaster Recovery Policies Guide	DRPolicies.pdf	Explains how to make data highly available by creating client, filer, and server disaster recovery policies
5.	Getting Started Guide	GettingStarted.pdf	A tutorial to get you started using VFM. It explains how to install VFM and steps you through the process of creating a logical namespace, making the namespace highly available, making data highly available, transferring CIFS and NFS data, creating multiprotocol namespaces, virtualizing user home directories, and backing up data and the namespace.
6.	Manage Physical	PhysicalResources.pdf	Explains how to use VFM to work

No.	Title	File name	Contents
	Resources Guide		with NetApp filers, set replication properties, and work with Windows and UNIX machines
7.	Namespace Guide	Namespace.pdf	Explains how to create a DFS namespace (roots, links, and link targets), namespace creation, permission based, namespace availability, multiprotocol namespace, home folder, and namespace backup policies
8.	Reports Guide	Reports.pdf	Explains how to create and publish reports
9.	Snapshot Policies Guide	SnapshotPolicies.pdf	Explains how to use VFM to manage snapshots on NetApp filers using snapshot access and snapshot scheduling policies
10.	Troubleshooting Guide	Troubleshooting.pdf	• Includes diagnostic information, such as troubleshooting, event IDs, migration, replication, and status indicators • Provides examples of file exclusions and inclusions

Glossary

A

ACE: Access Control Entry, an entry in an Access Control List.

ACL: Access Control List, a list associated with a file that contains information about which users or groups have permission to access or modify the file.

Alternate volume: SEE Replica.

C

Child node: SEE DFS link.

CIFS: Common Internet File System. A file-sharing protocol based on the Microsoft Server Message Block (SMB). It enables you to share file systems over the Internet and Intranet. The CIFS protocol is used primarily for file sharing by Windows platforms.

Client: The user interface component of the application.

Consolidation DFS root: A special stand-alone DFS root that has its configuration information stored locally on a member server. The root must be hosted on Windows Server 2003.

D

Dependencies: The servers, drives, and shared folders that together contain the data published through the DFS namespace

DFS: Microsoft Distributed File System consists of software residing on network servers and clients that transparently links shared folders on different file servers into a single namespace for improved load balancing and data availability. NOTE: This should not be confused with Transarc's DFS product, which is a separate distributed file system product that is not interoperable with the Microsoft product.

DFS branch: SEE Shared folder.

DFS leaf: SEE Shared folder.

DFS link: Located under the DFS root. Forms a connection to one or more shared folders, DFS links, or another DFS root. NOTE: In Windows NT 4 terminology, this is referred to as a child node, a junction point, or an inter-DFS link.

DFS namespace: The logical view of shared file resources seen by users.

DFS path: A UNC path starting at a DFS root. Stand-alone DFS paths are rooted at a stand-alone root, while domain-based paths are rooted at a domain-based DFS root.

DFS root: The share at the top of the DFS topology. The starting point for the DFS links and shared folders that make up the DFS namespace.

DFS topology: Overall logical hierarchy of a distributed file system, including elements such as roots, links, shared folders, and replica sets.

DFS tree: The consolidated DFS view provided by the application, which includes the Admin View, Logical View, Physical View, and Reports.

DFS volume: SEE Shared folder.

Domain-based DFS root: A DFS root that has its configuration information stored in Active Directory. The root can have multiple root targets, which offers fault tolerance and load sharing at the root level.

E

Export: SEE NFS export

F

Fault-tolerant DFS: SEE Domain-based DFS root

FQDN: Fully-qualified Domain Name. A host, domain name, and a top-level domain. For example, www.nuview.com is a fully-qualified domain name where www is the host, .nuview is the second-level domain, and .com is the top-level domain.

FRS: Microsoft File Replication Service.

G

GID: Group Identification Number. A unique number assigned to identify a group of users in UNIX environments.

I

Inter-DFS link: SEE DFS link.

J

Junction point: SEE DFS link.

K

Key-pair: Consists of a public key and a corresponding private key. It is safe to distribute a public key,but a private key must be kept secret.

L

Link target: A DFS link can have as targets: 1 to N shared folders, OR 1 to N stand-alone DFS paths, OR only 1 domain-based DFS path.

M

Migration candidates: Items that match migration criteria in an archival migration policy. You can select which items you want to migrate. Items not selected for migration are automatically added to the exclusion list of the archival migration policy.

Migration tasks: Items to be migrated during a scheduled migration or manually at any time.

Monitoring agent: The component that can be installed to evaluate storage policies from a

different machine than the one where the application server is installed.

N

NFS: Network File System developed by Sun Microsystems. A file-sharing protocol that enables you to share file systems over the Internet and Intranet. NFS is used with both UNIX and non-UNIX computers.

NFS export: A directory that is published for access by NFS clients. The export specifies a directory to be exported and which machines have access to the directory. NFS exports are similar to CIFS shares in that they provide access to directories.

P

Pool: A group of storage locations.

Primary server: An active application server or monitoring agent.

Primary target: In a disaster recovery policy, this is the active target to which users are referred by the DFS root.

Q

qtree: A special directory of the root of a volume that behaves like a virtual subvolume with special attributes.

R

RAID: Redundant Array of Independent Disks enables file access even when a disk in a RAID group is damaged.

References: The DFS link targeting the selected physical item. For example, when you click a server under the Physical View tree, properties and associated DFS links appear.

Replica: A DFS root or DFS shared folder that provides an alternate path for a DFS link. NOTE: In Windows NT 4 terminology, this is referred to as an alternate volume.

Replica set: Two or more DFS roots or DFS shared folders that provide alternate paths for a DFS link.

Replication agent: The component deployed by the application server or monitoring agent component during configuration of storage policies that transfer CIFS data, or when you run a file differencing report. NOTES: Deployment of replication agents can be controlled through a machine's properties dialog box accessible from the Physical View. For data transfer using the NFS protocol, the replication agent must be installed manually.

Report schedule group: Enables you to set a schedule to automatically gather information. A report schedule group can be configured to start during off hours to offload network and computing resources during business hours. You can produce multiple reports from the data gathered without generating additional network traffic.

Report source group: Specifies the location where you want to gather information. It is assigned to a report schedule group. A report source group also enables you to specify batch files to run before and/or after the information is gathered.

Report type: Determines what information is gathered. Report types are assigned to report source groups.

S

Secondary target: SEE Standby target.

Server: The component that responds to requests from the client component, monitors the DFS namespace, and processes storage policies.

Shared folder: File or folder in the DFS namespace that can be accessed by users who have proper permissions. NOTE: In Windows NT 4, this is referred to as a DFS volume, leaf, or branch.

SID: Security identifier that uniquely identifies a Windows user or group.

Stand-alone DFS root: A DFS root that has its configuration information stored locally on the host server. The root has a single root target. When the root target is unavailable, the data referenced by links under the root is inaccessible.

Standby server: A machine that is standing by (not active) for the application server or a monitoring agent. During a failover, a standby server can become the active server.

Standby target: A target in a disaster recovery policy that is offline. During a failover, a standby target can become the active target.

Storage location: A combination of a server UNC path and the local path pointing to a directory in the file system. For example, \\rama:c:\ is a storage location representing the C drive on machine "rama" and \\secure.npb.com:/vol/vol0/myqtree is a storage location representing the qtree "myqtree" on volume vol0 on secure.npb.com.

T

Target: LINK TARGET: A shared folder, a DFS link, or a DFS root that is referenced by a DFS link. ROOT TARGET: A shared folder that is referenced by a DFS root. SEE ALSO Link target.

Trustee: The user account, group, or logon session to which an Access Control Entry (ACE) applies.

U

UID: User Identification Number. A unique number assigned to identify a user in UNIX environments.

UNIX file permissions: Control access to files and directories. Permissions can be applied to the owner of a file, a group, or everyone on the UNIX network.

W

Widelink namespace: A logical namespace hosted on a NetApp filer CIFS share that provides the benefits of a namespace without requiring additional Windows servers.

Index

A

Add a machine 16
Agents
  disallow deployment of data move agents ... 14
Agents 14
Attributes
  of a share 20
  of an export 20
Attributes 19
Attributes 20
Attributes 20

B

Bandwidth throttling 13

C

Client disaster recovery policy 13
Community name 3
Computers
  view properties 19
  view references 19
Computers 19
Configure a qtree 6
Create a qtree 6
Create a volume on a filer 6

D

Data distribution 20
Data replication 5
Data transfer
  disallow deployment of data move agents ... 14
  set rate 13
Data transfer 5
Data transfer 13
Data transfer 13
Data transfer 14
Disable SnapMirrors 5
Display drives 19
Drag a machine to a user-defined folder 16
Drives
  view properties 19
  view references 19
Drives 19
Drives 19

E

Enable SnapMirrors 5
Export
  view properties 20
Export 20

F

Filers
  change NFS credentials 23
  change snapshot reserve on multiple volumes 10
  create a volume 6
  data transfer 5
  enable snapshot schedules 9
  misidentified 5
  NetApp reports 5
  schedule snapshots 7
  suspend snapshot schedules 9
  take a snapshot on multiple volumes immediately 10
Filers 4
Filers 5
Filers 5
Filers 5
Filers 6
Filers 7
Filers 9
Filers 10
Filers 10
Filers 19
Filers 23
Folder
  add a folder 17
  add a machine 16
  add multiple folders 17
  create a share 17
  remove a machine 16
Folder 16
Folder 16
Folder 17

H

Hide drives 19

M

Machine identity 5
Machine properties 3, 5, 13
Machines
  add a machine 16
  create a share 17
  disallow deployment of data move agents ... 14
  misidentified 5
  refresh a machine 21
  remove from a folder 16
  set data transfer rate 13
  set SNMP community name 3
  view properties 19
  view references 19

Machines 3
Machines 5
Machines 13
Machines 14
Machines 16
Machines 16
Machines 17
Machines 19
Machines 21

N

NetApp filers
  change snapshot reserve on multiple volumes 10
  configure a qtree.....6
  configure a SnapMirror.....5
  disable SnapMirrors 5
  enable SnapMirrors 5
  enable snapshot schedules.....9
  reports 5
  schedule snapshots 7
  suspend snapshot schedules 9
NetApp filers 5
NetApp filers 5
NetApp filers 5
NetApp filers 6
NetApp filers 7
NetApp filers 9
NetApp filers 10
NetApp filers 19
NFS credentials 23

P

Permissions.....20
Properties
  of a share 20
  of an export 20
Properties.....19
Properties.....20
Properties.....20
Proxy machine.....13

Q

qtree
  create a qtree 6
qtree.....6

R

References 19
Refresh
  data from network 21
Refresh 21
Replication agent
  disallow deployment 14
  specify proxy machine 13
Replication agent.....13
Replication agent 14
Replication policy
  share permissions 20
Replication policy..... 13
Replication policy..... 20
Reports
  NetApp filer reports 5
Reports..... 5
Restore data 11
RSH 4, 22

S

SAK filer 19
Security..... 20
Set SNMP community name 3
Shared folder
  create a share 17
  permissions.....17, 20
  view properties 20
Shared folder 17
Shared folder 20
Shared folder 20
Shares
  duplicate shares 17
Shares 17
Shell credentials.....4, 22
SnapMirror
  disable SnapMirrors on a filer 5
  enable SnapMirrors on a filer..... 5
SnapMirror 5
Snapshots
  change reserve on multiple volumes 10
  enable the schedule on multiple filers 9
  restore data 11
  suspend the schedule on multiple filers..... 9
  take a snapshot immediately..... 10
Snapshots..... 7
Snapshots..... 9
Snapshots..... 10
Snapshots..... 10
Snapshots..... 11
SNMP community name 3
SSH.....4, 22
Suspend snapshot schedules 9

T

Take a manual snapshot..... 10
Throttling..... 13
Turn off SnapMirrors..... 5
Turn on SnapMirrors 5

U

UNIX machine
  change NFS credentials..... 23
  shell credentials..... 22
UNIX machine..... 22

UNIX machine 23
Update information about a machine.....21
User-defined folder.....16

V

vFilers
add to filer disaster recovery policy 7
misidentified.....5
vFilers.....7
View drives in the Physical View tree.....19

Volumes
change snapshot reserve 10
enable the snapshot schedule..... 9
suspend the snapshot schedule 9
take a snapshot immediately..... 10
Volumes..... 9
Volumes..... 10
Volumes..... 10