Quantum

User's Guide

Quantum vmPRO

6-67535-03 Rev A

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Contents

Preface xiii

Chapter 1 Quantum vmPRO Overview 1

Quantum vmPRO 1

Quantum vmPRO Requirements 2
- Notes 2

Quantum vmPRO and Quantum Vision 3

Quantum vmPRO GUI 4
- Home 4
- VMs 6
- Alerts 9
- Tasks 10
- SmartMotion Backup 12
- Configure 13
- Operations 16
- Help 18
- Refresh 19

Chapter 2 Getting Started With Quantum vmPRO 21

Access Quantum vmPRO 21

Accessing the Quantum vmPRO GUI 22
Accessing the Console Setup Wizard 22
Accessing the Console Command Line 25

Set Up and Configure Quantum vmPRO 26
Network Settings 26
Configure Quantum vmPRO 28
View Your Virtual Machines 32

Upgrade Quantum vmPRO 32
Check for Updates 32
Perform an Online Upgrade 34
Perform an Offline Upgrade 36

Chapter 3 Working With Quantum vmPRO 37

Access Your Virtual Machines 37
SmartMotion NAS Target Protocol Selection 38
CIFS 38
NFS 39

Back Up, Store, and Recover Data 39
Using Your Current Backup and Recovery Solution 40
Using Folders to Facilitate Multiple Backup Polices 40
Using SmartMotion Backup 40
Using Additional Storage 42
Using Backup Policies 44
Determining a Retention Policy 47
Selecting VMs for Export 47
Recovering VMs 49
Recovering Individual Files 54

Modify Your Configuration 57
Configuration Wizard Reminders 57
Accessing the Servers 59
Add an ESX Server 62
Add an ESX Server When There is an Existing vCenter Server . 64
Add a vCenter Server 67
Edit a ESX Server 72
Edit a vCenter Server 73
Delete ESX Servers 75
Delete a vCenter Server 76
Manage Users 77
Reports, Alerts, and Autosupport 79

Time and NTP 81

Set Up and Manage Groups 82
Set Up Groups 83
Manage Groups 86
Increase Backup Throughput 87
Group Mode Licensing 88
Update Group Members When the Master's IP Address/ Hostname Changes 88
Import the Configuration Settings for Groups 89

Create and Manage Folders 92
Create Folders 93
Move VMs to New Folders 94
Rename or Delete a Folder 95

Chapter 4 Quantum vmPRO Advanced Usage 97

Active Directory Backup and Recovery 97
Quantum VSS Writer 98
Requirements for Active Directory Backup and Recover Support 98
Install the Quantum VSS Writer 98
Enable Quiesce for VMs 99
VMware Tools Out of Date 102
Uninstall the VSS Writer 102
VSS Resources 102

Embed the Quantum vmPRO GUI in vSphere Client 103
Register the vCenter Plugin 103
Use the vCenter Plugin Once It Has Been Registered 104

Quantum vmPRO Support for External Monitoring 105
SNMP Support 105
Nagios Support 106

Synchronize With the Time Server 107

vSphere Changed Block Tracking (CBT) Support 108
CBT Considerations 108
Enable CBT for VMs 109
Schedule Your Changed Block Tracking Resets 112
Recover From a CBT-Enabled Backup 113

Appendix A **Console Commands List** **115**

autosupport 116
cbt 117
config 117
filesys 117
group 118
help 119
import 120
log 120
nagios 121
net 121
ntp 123
nw 123
SmartMotion 125
snmp 125
ssh 126
system 126
tsm 127
vss 128

Figures

Figure 1 Home tab View 6
Figure 2 Virtual Machines tab. 7
Figure 3 Folders tab 8
Figure 4 Resources tab 9
Figure 5 Alerts tab 10
Figure 6 Backup tab 11
Figure 7 Recovery tab 11
Figure 8 History tab 12
Figure 9 SmartMotion Backup drop-down list 13
Figure 10 Configure drop-down list 16
Figure 11 Operations drop-down list 18
Figure 12 Help drop-down list 19
Figure 13 Quantum vmPRO GUI 22
Figure 14 Select Your Appliance 23
Figure 15 Select the Console tab 23
Figure 16 The Console Welcome Screen 24
Figure 17 Console Login Prompt 24
Figure 18 Console Setup Wizard: Changing Settings 25

Figure 19 Entering Networking Information 28
Figure 20 Configuration Wizard Welcome Page 29
Figure 21 Viewing Virtual Machines 32
Figure 22 Software Updates Bar 33
Figure 23 Accessing Software Updates 33
Figure 24 Configure Software Updates 34
Figure 25 Configuring Proxy Settings 35
Figure 26 Mapping a Network Drive 39
Figure 27 Selecting the SmartMotion Backup Options 41
Figure 28 Selecting the Backup Policy 41
Figure 29 Viewing Backed up VMs 42
Figure 30 Copied VMs 42
Figure 31 Available Storage 43
Figure 32 Configure Storage 43
Figure 33 DXi Target Configured for Additional Storage 44
Figure 34 Available Backup Policies 45
Figure 35 Configure Backup Policy 46
Figure 36 Selecting VMs to Export 48
Figure 37 Configure Virtual Machine 49
Figure 38 Accessing the Recovery Wizard 50
Figure 39 Recover Virtual Machines Wizard 50
Figure 40 Recovering a VM 52
Figure 41 Drill down to a Specific VM 52
Figure 42 Selecting Action on conflict setting 53
Figure 43 Starting a Recovery for a VM 53
Figure 44 Selecting a Recovery Policy 54
Figure 45 Recovery Started 54
Figure 46 Recovering an Individual File 56
Figure 47 Configuration Wizard: Exiting the Wizard 58

Figure 48 Discover Now 59
Figure 49 Discovery Started 59
Figure 50 Accessing the Configuration Wizard 60
Figure 51 Configuration Wizard: Welcome 60
Figure 52 Configuration Wizard: ESX Servers List 61
Figure 53 Configuration Wizard: Servers (vCenter) 61
Figure 54 Configuration Wizard: Select Server Type 62
Figure 55 Configuration Wizard: Add Server 63
Figure 56 Configuration Wizard: Configure Server 63
Figure 57 Configuration Wizard: Configure Server Verification 64
Figure 58 Configuration Wizard: No vCenter is Configured 65
Figure 59 Configuration Wizard: Select Server Type 65
Figure 60 Configuration Wizard: Add Server 66
Figure 61 Configuration Wizard: Configure Server 66
Figure 62 Configuration Wizard: Configure Server Verification 67
Figure 63 Configuration Wizard: No vCenter is Configured 68
Figure 64 Configuration Wizard: Servers List 68
Figure 65 Configuration Wizard: Select Server Type 69
Figure 66 Configuration Wizard: Configure Server 70
Figure 67 Configuration Wizard: Selecting Items to Export 71
Figure 68 Configuration Wizard: Configure Server Verification 71
Figure 69 Configuration Wizard: Configure Server 72
Figure 70 Configuration Wizard: Configure Server Verification 73
Figure 71 Configuration Wizard: Configure Server 74
Figure 72 Configuration Wizard: Configure Server Verification 75
Figure 73 Configuration Wizard: Deleting a Server 76
Figure 74 Configuration Wizard: No vCenter is Configured 77
Figure 75 Accessing User Management 78
Figure 76 Configure User List 79

Figure 77 Configure User 79
Figure 78 Configure Email 80
Figure 79 Configure Reports and Alerts 81
Figure 80 Configuration Wizard: Time & NTP 82
Figure 81 Group Membership 84
Figure 82 Creating a New Group 84
Figure 83 Joining an Existing Group 85
Figure 84 Lists of Nodes 86
Figure 85 Adding a Node Column 86
Figure 86 Selecting a Node. 87
Figure 87 Operations drop-down list 90
Figure 88 Remove the Old Nodes 91
Figure 89 Folders tab 93
Figure 90 Configure Folder. 93
Figure 91 Selecting VMs to Move 94
Figure 92 Configure Virtual Machine 95
Figure 93 Selecting VMs to Enable For Quiesce 99
Figure 94 Configure Virtual Machine 100
Figure 95 Enable Quiesce 101
Figure 96 VMs List (Quiesce Enabled) 102
Figure 97 Configuration Wizard: vCenter Plugin 103
Figure 98 Register vCenter Plugin. 104
Figure 99 Synchronize With Time Server. 107
Figure 100 Synchronize Time Dialog. 107
Figure 101 Selecting VMs to Enable For CBT 110
Figure 102 Configure Virtual Machine 111
Figure 103 VMs List (CBT Enabled) 112
Figure 104 Scheduling CBT Resets 113
Figure 105 Accessing the Recovery Wizard 114

Tables

Table 1 SNMP Commands 105
Table 2 Nagios Commands 106
Table 3 Nagios Console Commands 106

Preface

This manual introduces Quantum vmPRO and discusses Quantum vmPRO configuration and operation.

Audience

This manual is written for Quantum vmPRO operators and administrators. It is assumed that this audience has at least a basic understanding regarding the use and function of the following products and applications:

- VMware
- UNIX®
- backup and recovery systems in general

Document Organization

Following is a brief description of chapter contents.

- Chapter 1, Quantum vmPRO Overview provides an overview of all the functions and features that can be accessed from the vmPRO GUI.
- Chapter 2, Getting Started With Quantum vmPRO provides information about accessing and configuring Quantum vmPRO.
- Chapter 3, Working With Quantum vmPRO provides information about using Quantum vmPRO to access and work with virtual machines.

- Chapter 4, Quantum vmPRO Advanced Usage provides information about advanced features of Quantum vmPRO.
- Appendix A, Console Commands List provides a list of Quantum vmPRO console commands and usage information.

Notational Conventions

This manual uses the following conventions:

Convention	Example
User input is shown in bold font.	**cd /tmp/VISION/**
Computer output and command line examples are shown in monospace font.	`Sample output`
User input variables are enclosed in angle brackets.	**http://<ip_address>**

For UNIX and Linux commands, the command prompt is implied.	`./setup-linux.bin`
	is the same as
	`# ./setup-linux.bin`

File and directory names, menu commands, button names, and window names are shown in bold font.	**/tmp/VISION/**
Menu names separated by arrows indicate a sequence of menus to be navigated.	**Configuration > Licensing**

The following formats indicate important information:

Note: Note emphasizes important information related to the main topic.

Caution: Caution indicates potential hazards to equipment or data.

WARNING: Warning indicates potential hazards to personal safety.

Related Documents

The following Quantum documents are also available for Quantum vmPRO:

Document No.	Document Title	Document Description
6-67534	*Quantum vmPRO Release Notes*	Compatibility and support information about the latest release of Quantum vmPRO.
6-66527	*Quantum Vision User's Guide*	Describes the Quantum Vision web-based user interface, management, configuration, and operation.
6-67612	*Quantum DXi V1000 User's Guide*	Describes the Quantum DXi V1000 web-based user interface, operations, and configuration.
6-67081	*Quantum DXi--Series Command Line Interface (CLI) Guide*	Describes the CLI commands for DXi V1000 Software.

For the most up to date information on Quantum vmPRO, see:

http://www.quantum.com/ServiceandSupport/Index.aspx

Contacts

Quantum company contacts are listed below.

Quantum Corporate Headquarters

To order documentation on the vmPRO or other products contact:

Quantum Corporation *(Corporate Headquarters)*
1650 Technology Drive, Suite 700
San Jose, CA 95110-1382

Technical Publications

To comment on existing documentation send email to:

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  http://www.quantum.com/ServiceandSupport/Services/GuardianInformation/Index.aspx

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Worldwide End-User Product Warranty

For more information on the Quantum Worldwide End-User Standard Limited Product Warranty:

http://www.quantum.com/pdf/QuantumWarranty.pdf

Chapter 1

Quantum vmPRO Overview

This chapter introduces the Quantum vmPRO and describes the Quantum vmPRO's requirements, interface with Quantum Vision, and presents an overview of the vmPRO's Graphical User Interface (GUI).

- Quantum vmPRO
- Quantum vmPRO Requirements
- Quantum vmPRO and Quantum Vision
- Quantum vmPRO GUI

Quantum vmPRO

The Quantum vmPRO virtual appliance consists of a Linux virtual server running vmPRO software. It is deployed from an OVF template into a compatible customer-provided VMware vSphere ESX or ESXi environment.

The Quantum vmPRO technology consists of three main components:

- **SmartView**™ presents the ESX environment as a virtual NAS file system (an NFS or CIFS share). This provides a simple integration point for third-party applications.
- **SmartRead**™ is automatically invoked whenever a read is performed of the virtual file system. It performs progressive

optimization of the **vmdk** files, leaving out whitespace and deleted and unused blocks, and organizing the data stream for efficiency.

- **SmartMotion**™ optionally provides simple backup services by initiating a scheduled *push* of specified **vmdk** files (leveraging SmartRead) to any specified NAS mount point. The mount point may be resident on plain NAS storage, or may be on a deduplication system such as the Quantum DXi.

SmartView and SmartMotion have different characteristics with respect to backup window, file level recovery, and DR functionality, as outlined in later sections. Your requirements will dictate the most appropriate deployment method.

Quantum vmPRO Requirements

The following are the system requirements for the Quantum vmPRO.

- One or more VMware ESX or ESXi servers, versions 4.0 or higher (paid versions only; the free ESXi license does not enable certain storage features required by Quantum vmPRO); or a VMware vCenter server, version 4.0 update 2 or later.
- 12 GB of free disk space.
- At least 1280 MB of free RAM.
- Gigabit NIC port for data movement on the Quantum vmPRO host server.
- Internet Explorer, Firefox, Safari, or Google Chrome with Adobe Flash 9 or Flash 10 plugin

Notes

- If multiple VLANS are present, the Quantum vmPRO network should be configured on the VLAN that has access to the ESX or vCenter server(s) to be protected. This VLAN must be accessible by the backup software client that will connect to Quantum vmPRO.
- In environments with DHCP, Quantum vmPRO will automatically acquire a network address. However, Quantum recommends configuring a static IP address during configuration.

- On Windows Backup Servers, the Quantum vmPRO appliance can join an Active Directory domain, and any authenticated user can be used for CIFS backup. Where there is no Active Directory integration, a local user with the same user context as the Quantum vmPRO admin user (sysadmin/sysadmin) will be needed for CIFS backups.
- In environments with numerous ESX or ESXi servers and many virtual machines, multiple Quantum vmPRO appliances may be deployed on more than one ESX or ESXi servers to increase overall performance and throughput.
- Do not clone a vmPRO. Cloned appliances are not supported.

Quantum vmPRO and Quantum Vision

Quantum Vision provides various interactive status, history, and device reports using at-a-glance status reports and automatically generated alerts to provide an overview of all systems. Quantum Vision also provides trend analysis and real-time data capture that help users make decisions concerning capacity planning, troubleshooting, replication operations, and performance tuning. Vision will accesses the vmPRO API to gather alert and backup information to fulfill its status and reporting requirements.

Quantum vmPRO GUI

The following is an overview of the functions and options you can access from the Quantum vmPRO GUI. The overview contains the following sections:

- Home
- VMs
- Alerts
- Tasks
- SmartMotion Backup
- Configure
- Operations
- Help
- Refresh

Home

The **Home** tab displays a general status view of the appliance. The following information is presented (see Figure 1):

Active Alerts

This panel displays all the alerts that the appliance has received within the past 24 hours.

Last 24 Hrs SmartRead

This panel displays the amount of data that has been moved (backed up) within the past 24 hours. Hold the cursor over a line or bar on the chart to see details about the underlying data.

Last 24 Hrs I/O Reduction

This panel displays the amount of data reduction achieved within the past 24 hours. Hold the cursor over a line or bar on the chart to see details about the underlying data.

Summary

This pane displays the number of **Servers** and **VMs** (Virtual Machines) that the appliance is managing and (if DXis are configured) the hostname, or IP address, of the DXis that the appliance can access for additional storage.

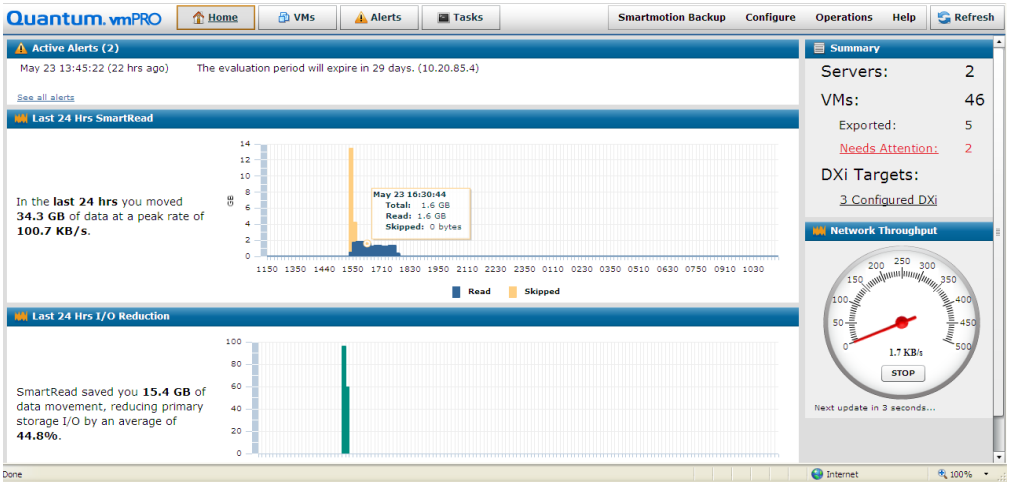
For **VMs**, the number of VMs that are **Exported** and the number that need attention are displayed. The **Needs Attention** link opens the **Resources** display (same as that accessed from the **VMs** tab) allowing you to get more information regarding the VMs that need attention.

If DXis are configured, the **DXi Target** link will open the native management interface for the DXi.

Network Throughput

This pane displays the speed at which the current backup session is processing.

Figure 1 Home tab View



VMs

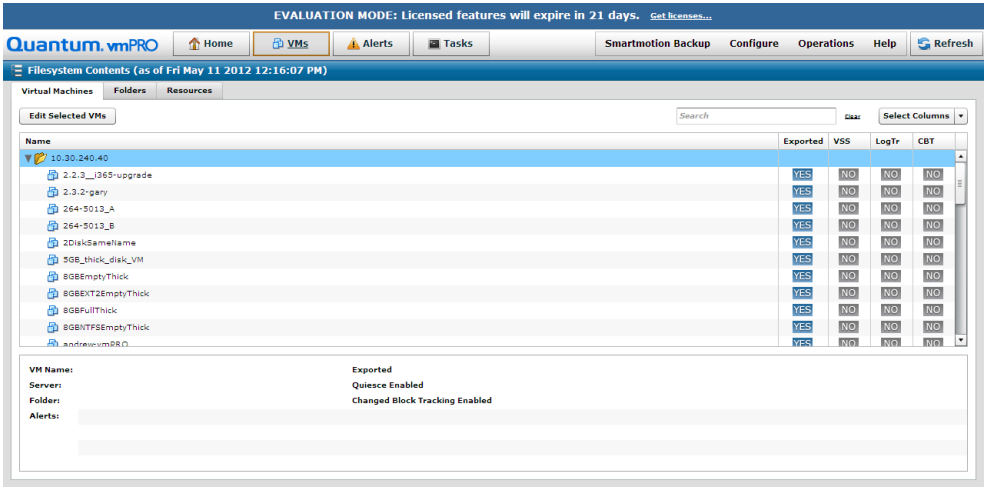
The **VMs** tab displays status information about the virtual machines that are resident on the appliance. The following information is presented:

Virtual Machines

The **Virtual Machines** tab displays (see Figure 2) the following information for each VM: **Name**, **Datastore**, **Server**, **Node**, **Exported**, **VSS**, **LogTr** (log truncation), and **CBT**. The information displayed can be modified to your preferences by selecting the columns to display from the **Select Columns** drop-down list. The VM's **Folder** IP address, **Quiesce Enabled** setting, and **Alerts** are also displayed in the screen's lower pane.

Once a VM is selected, you can modify the VM's configuration settings: **Node**, **Folder**, **Exported**, **Change Block Tracking Enabled**, and **VSS Configuration** settings (for Microsoft Windows-based VMS only) from the **Configure Virtual Machine** dialog box.

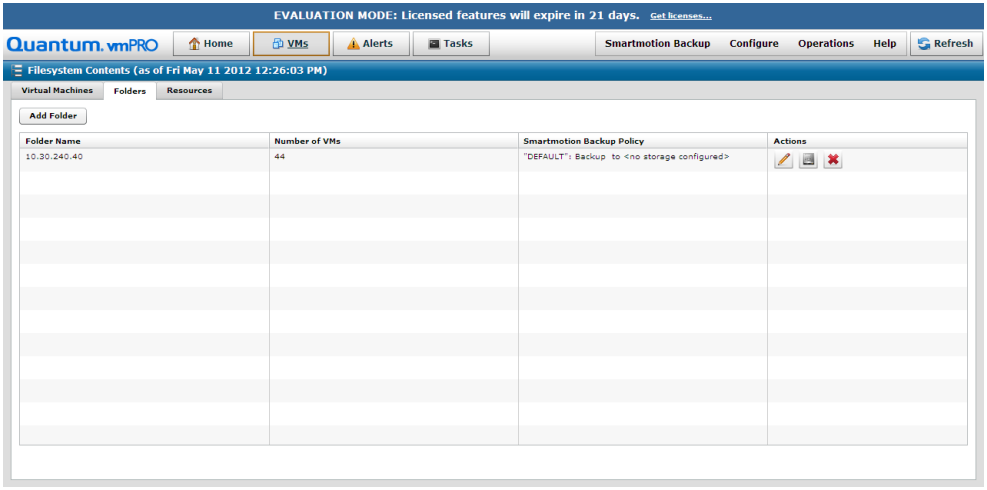
Figure 2 Virtual Machines tab



Folders

The **Folders** tab (see Figure 3) allows you to add, back up, edit (configure), or delete a folder. For each folder, the **Folder Name**, **Number of VMs**, **SmartMotion Backup Policy**, and **Actions** are displayed. For more information regarding the use of folders, see Create and Manage Folders on page 92

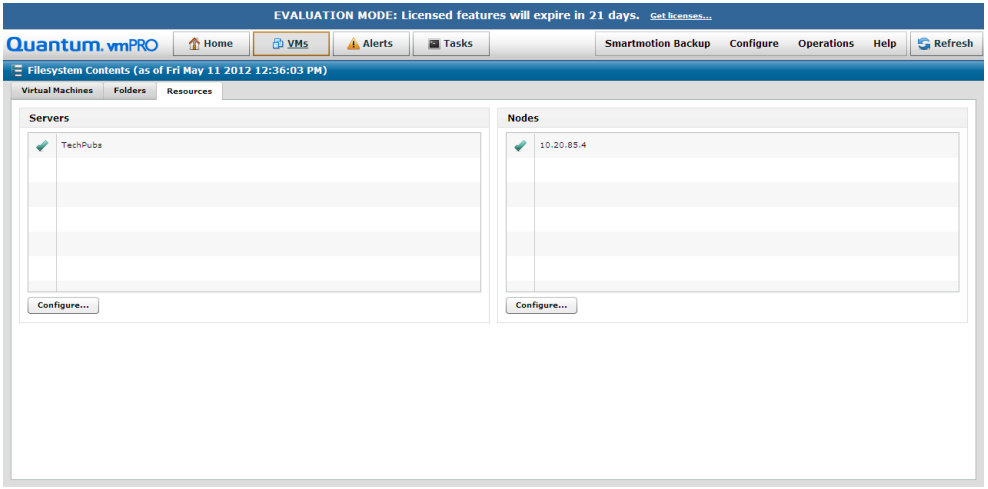
Figure 3 Folders tab



Resources

The **Resources** tab (see Figure 4) display a list of **Servers** and a list of **Nodes.** You can add, edit (change a server's **Label** and the authentication **Username** and **password**), or delete a server from the **Configure Serve List** dialog box. For nodes, you can edit (change a node's **Label**), send an email notification, or delete a node from the **Configure Node List** dialog box.

Figure 4 Resources tab



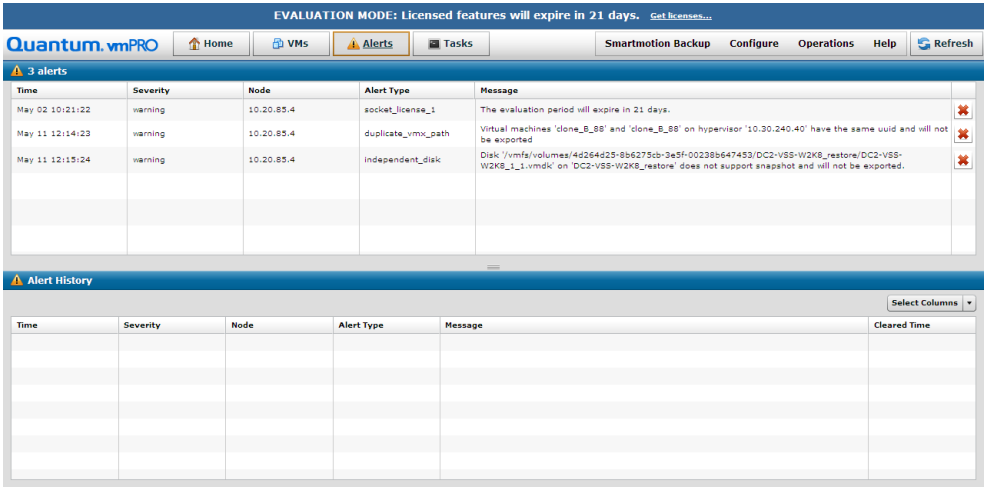
Alerts

The **Alerts** tab (see Figure 5) displays a list of current alerts and an **Alert History** list. For both lists, the following information is presented for each alert: **Time, Severity, Node, Alert Type**, and **Message.**

You can clear alerts that are displayed in the current alerts list by selecting the **X** in the list's last column.

For the **Alert History** list, the **Cleared Time** is displayed for each alert. The information displayed in the **Alert History** list can be modified to your preferences by selecting the columns to display from the **Select Columns** drop-down list.

Figure 5 Alerts tab



Tasks

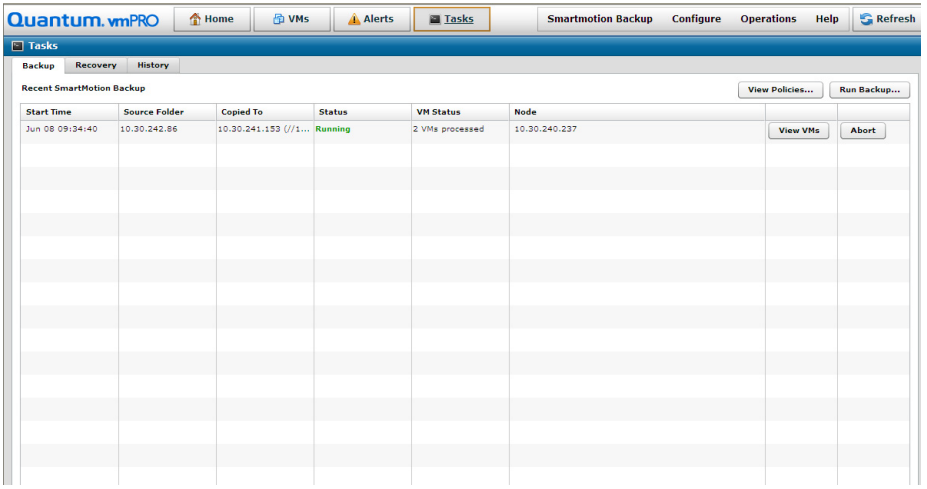
The **Tasks** tab displays information about the following topics:

Backup

The **Backup** tab (see Figure 6) displays **Recent SmartMotion Backup** activity and allows you to **View Polices** and to start a backup by selecting **Backup now**. For each SmartMotion task, the following information is displayed: **Start Time**, **Source Folder**, **Copied To**, **Status**, **VM Status,** and **Node**.

View Polices allows you to **Create a new policy**, **Set default Policy**, edit an existing policy, or delete a policy from the **Available Backup Policy** dialog box.

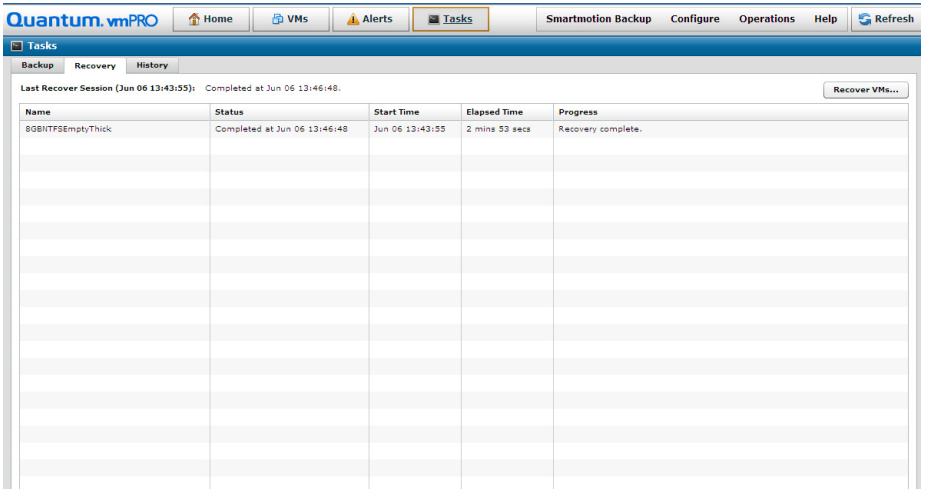
Figure 6 Backup tab



VM Recovery

The **Recovery** tab (see Figure 7) allows you to start a **Recover VMs** task. For each recovered VM, its **Name**, **Status**, **Start Time**, **Elapsed Time**, and **Progress** are displayed.

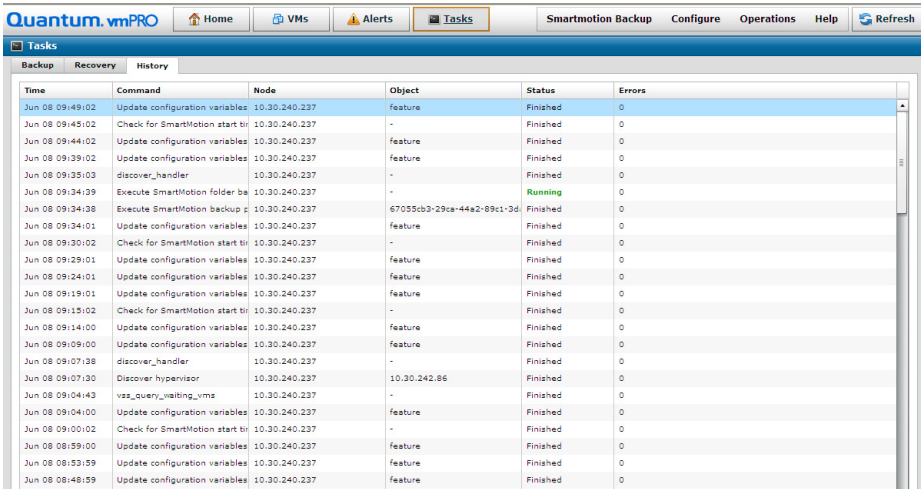
Figure 7 Recovery tab



History

The **History** tab (see Figure 8) displays the **Time**, **Command**, **Node**, **Object**, **Status** and **Errors** associated with each task.

Figure 8 History tab



SmartMotion Backup

The **SmartMotion Backup** drop-down list (see Figure 9) allows you to perform the following functions:

Backup

Select **Backup** to begin a SmartMotion backup session by selecting the backup policy in the **Run SmartMotion Backup** dialog box. You can also edit the policy before starting the backup.

Recover

Select **Recover** to open the **Recover Virtual Machine Wizard** to recover all VMs in directory (by selecting the folder) or a specific VM. You can also access the **Manage Storage** facility from this wizard.

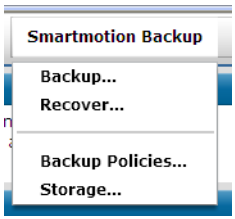
Backup Policies

Select **Backup Policies** to **Create a new policy**, **Set default Policy**, edit an existing policy, or delete a policy from the **Available Backup Policy** dialog box.

Storage

Select **Storage** to add, edit (configure), or delete storage from the **Available Storage** dialog box. To add or edit storage, you will enter or modify the **Hostname**, **Nickname**, **Device**, **Protocol**, **Share**, **Sub-folder**, **Mount options**, **CIFS User**, and **CIFS Password** information in the **Configure Storage** dialog box.

Figure 9 SmartMotion Backup drop-down list



For more information regarding the use of SmartMotion, see Using SmartMotion Backup on page 40.

Configure

The **Configure** drop-down list (see Figure 10) allows you to configure or access the following components:

Servers

Select **Servers** to add a server to the appliance, modify an existing server's configuration, or delete a server from the appliance. You will enter or modify the server's **Hostname** (add), **Label**, **Username**, and **Password** in the **Configure Server** dialog box.

CIFS

Select **CIFS** to configure all vmPRO CIFS shares. You will select or clear the **Enable Quantum Support share** option, select an

Authentication Method, enter the **Domain Name, NETBIOS Name, Valid Users, Valid Groups** and **Domain Controllers** information, select or clear the **Enable CIFS access** option, and join a domain in the **Configure CIFS** dialog box.

NFS

Select **NFS** to configure a NFS share. You will enter the **Export** mount, **Host Specification** and any **Options** (comma separated list, such as: ro,insecure,anonid=500,no_root_squash) in the **Add NFS Export** dialog box.

Email

Select **Email** to set your **From Address** for all email sent by the appliance. You will also enter the **SMTP Server** information in the **Configure Email** dialog box.

Reports & Alerts

Select **Reports & Alerts** to create a **Recipients** list of email address to receive reports and alert emails. You also select or clear the **CC: Quantum Support Team** option, select or clear the **Email a report every day** option, select or clear the **Upload a report to Quantum support site every day** option, select the email **Format, View Report Now**, and **Send Report Now** in the **Configure Reports & Alerts** dialog box.

Advanced Settings

Select **Advanced Settings** to clear or select the **Automatically export newly discovered VMS** option in the **Configure Advanced Settings** dialog box. By default, when you deploy a new appliance, the *Auto-Export* feature is set to *active*. This setting automatically enables SmartView and SmartMotion capabilities for any new VM discovered in the vCenter inventory.

This is convenient for un-attended backup of remote, isolated, or fully automated vSphere environments, or anywhere that new VMs are frequently created because new VMs are automatically protected.

Please note the following:

- Auto-Export must be used with caution, since excessive addition of VMs to a backup job may cause it to run longer than anticipated.
- Be mindful of the capacity and utilization of the target storage when using Auto-Export, since too many new VMs may overburden the target.
- Use caution when enabling Auto-Export in large environments. See the sizing guidelines below for recommendations regarding the volume of VMs to assign to each vmPRO.
- Account for any new VMs that may become Auto-Exported due to a vMotion/DRS operation relocating them onto a vSphere host being managed by vmPRO, and plan for available capacity in your backup target.

Be aware also that *automatic* does not mean set-and-forget. Each VM that is protected consumes space on the target storage device, so as the population of VMs grows, so does the storage requirement.

When the target storage capacity exceeds 80% utilization, the appliance will generate an alert to warn the administrator that the storage device is nearing full capacity.

Users

Select **Users** to add users. You will enter the **User name**, **Password**, and select their access privileges in the **Configure User List** dialog box.

Downloads

Select **Downloads** to download reports and existing support bundles by browsing to **<vmPRO-Host_IP>/api/downloads**. You will clear or select **Enable downloadable files from the Quantum vmPRO,** and clear or select **Require HTTP authentication Downloads** to allow downloadable files from the appliance in the **Configure Downloads** dialog box.

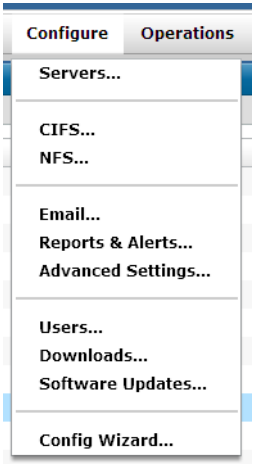
Software Updates

Select **Software Updates** to schedule and check for vmPRO software updates. Select **Check now** to check for software updates. You can also select to automatically check for software updates daily or weekly in the **Configure Software Updates** dialog box. A list of currently available updates is also displayed.

Config Wizard

Select **Config Wizard** to access the **Quantum vmPRO Configuration Wizard**. The **Quantum vmPRO Configuration Wizard** initiates wizards that guide you through the configuration steps for **Licenses**, **Servers**, **File Sharing**, **Storage**, **Backup Policy Email**, **Reports & Alerts**, **Time & NTP**, and **vCenter Plugin**.

Figure 10 Configure drop-down list



Operations

The **Operations** drop-down list (see Figure 11) allows you to perform or access the following functions:

Discover Now

Select **Discover Now** to find (discover) all the virtual machines that are candidates for export (can be backed up).

View Report

Select **View Report** to display a report the contains the follow information: Report time, Report Reason, vmPRO URL, Admin Email, Version, System Uptime, Controller UUID, Current Alerts, Alerts from Log, Licenses, Configured Servers, Virtual Machines, SmartMotion, Alert History, Command History, Performance History, VM Statistics, vmPRO Appliance Status, and Log files.

Synchronize With Time Server

Select **Synchronize With Time Server** to synchronize system time with the time servers.

Gather Support Logs

Select **Gather Support Logs** to create and upload support packages to assist Quantum technical support.

Save vmPRO Configuration

Select **Save vmPRO Configuration** to save a copy of your current configuration.

Import vmPRO Configuration

Select **Import vmPRO Configuration** to import a saved configuration.

Note: Importing is only supported by vmPRO appliances with factory default settings.

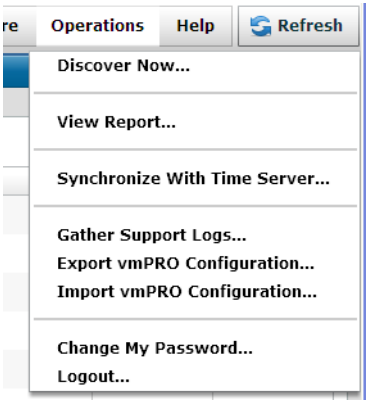
Change My Password

Select **Change My Password** to change your current password.

Logout

Select **Logout** to end your current vmPRO session.

Figure 11 Operations drop-down list



Help

The **Help** drop-down list (see Figure 12) allows you to access the following vmPRO help facilities:

Online Help

Select **Online Help** to access vmPRO help information, such as Release Notes, User's Guide, Technical Notes, and Knowledge Base articles.

About

Select **About** to display the **Privacy Statement**, vmPRO version, Flash runtime, Quantum copyright, and Quantum patent information.

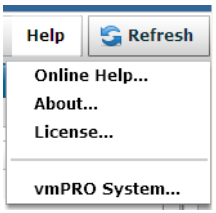
License

Select **License** to display the **Quantum vmPRO End User License Agreement**.

vmPro System

Select **vmPro System** to display individual **Log Files** information, **Network**, **Disk**, **CPU**, **Memory**, and **GUI Errors** information.

Figure 12 Help drop-down list



Refresh

The **Refresh** facility allows you to refresh the current information that is being displayed by the appliance.

Chapter 2

Getting Started With Quantum vmPRO

This chapter helps you to get started with Quantum vmPRO and contains the following sections:

- Access Quantum vmPRO
- Set Up and Configure Quantum vmPRO
- Upgrade Quantum vmPRO

Access Quantum vmPRO

Once you have installed Quantum vmPRO, you will have the following three means of accessing the Quantum vmPRO appliance and its configuration:

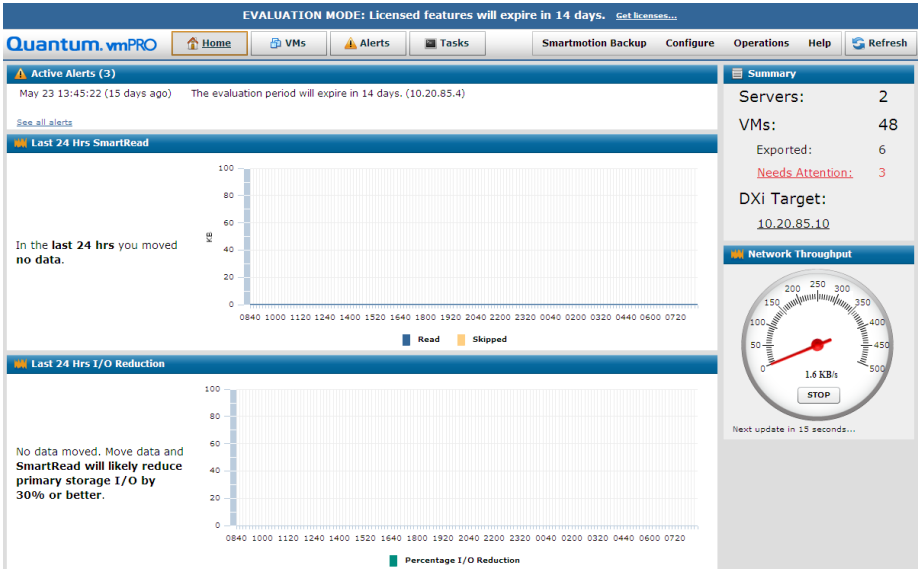
- Accessing the Quantum vmPRO GUI
- Accessing the Console Setup Wizard
- Accessing the Console Command Line

Accessing the Quantum vmPRO GUI

The primary means of interacting with Quantum vmPRO is through its GUI (see Figure 13). Access the GUI by entering the IP address of the Quantum vmPRO appliance in the address field of your Web browser and logging in with your Quantum vmPRO appliance's username and password.

The default username/password for your appliance is **sysadmin/sysadmin**. You can change the password by selecting **Change Password** from the **Operations** drop-down list in the GUI.

Figure 13 Quantum vmPRO GUI



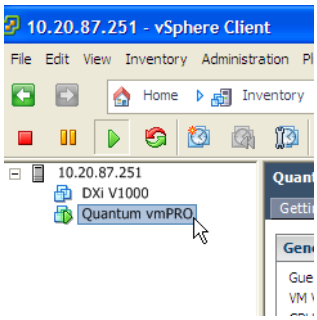
Accessing the Console Setup Wizard

Network settings are controlled via the console **Setup** wizard.

To access the **Setup** wizard:

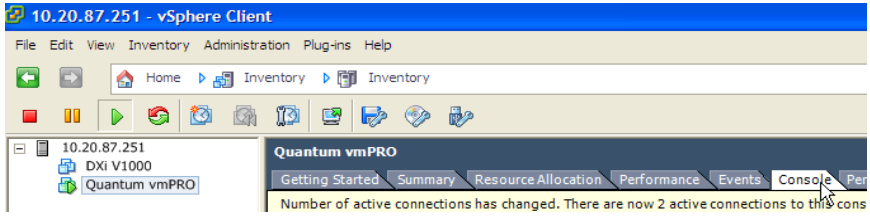
1. Log in to your VMware vSphere Client.
2. After the vSphere client opens, if necessary, click **Home,** and then **Inventory**.
3. Select your appliance in the VMware vSphere Client's left panel (see Figure 14).

Figure 14 Select Your Appliance



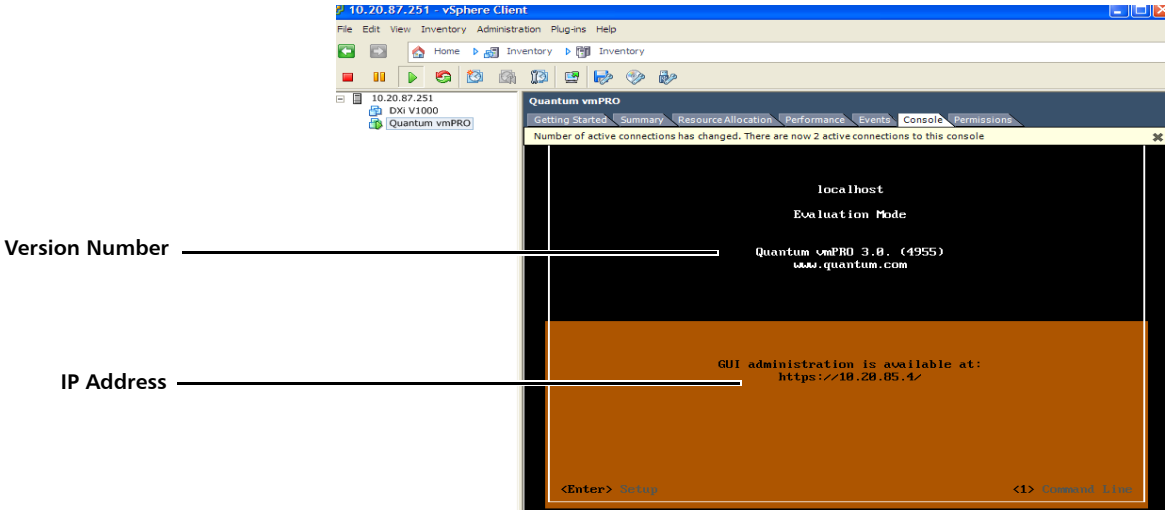
4 Select the **Console** tab in the VMware vSphere Client's right panel (see Figure 15).

Figure 15 Select the Console tab



You will see a screen displaying your Quantum vmPRO version and the IP address for your appliance (see Figure 16).

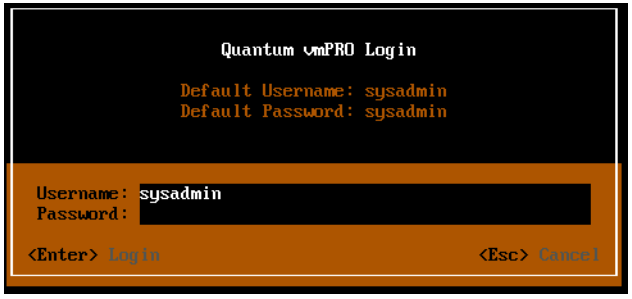
Figure 16 The Console Welcome Screen



5 Click anywhere inside the console screen, and then press **<Enter>.**

6 You will be prompted to log into your Quantum vmPRO appliance (see Figure 17). The default username and password are **sysadmin/ sysadmin**. (See Accessing the Quantum vmPRO GUI on page 22 for information on changing your appliance's password.) After entering the default username and password press **<Enter>**. The Console Setup Wizard displays (see Figure 19).

Figure 17 Console Login Prompt

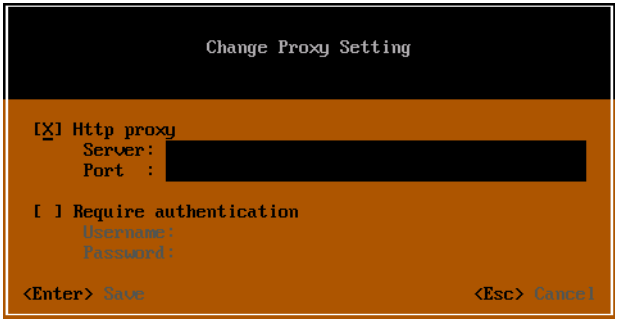


Using the Console Setup Wizard

- To free the cursor from the console screen, press **<crtl+alt>**.
- To navigate the selections, use the Up/Down arrow keys. The current setting appears in the right column, along with an explanation of that setting.
- To go to a screen that allows you to change the setting, press **<Enter>** on a setting.
- To change settings preceded by square brackets ([ ]), use the arrow keys to move the cursor to the selection.
- To activate an input area, press the spacebar. An X or * inside the brackets ([X] or [*]) indicates that the item is selected (see Figure 18).
- To save the setting, press **<Enter>**.

Note: Keyboard command reminders appear at the bottom of each screen in the **Setup** console.

Figure 18 Console Setup Wizard: Changing Settings



Accessing the Console Command Line

Occasionally you may need to use a Quantum vmPRO function via the console command line, which is accessed from your VMware vSphere client.

1 Follow steps 1through 4 of as shown in Accessing the Console Setup Wizard.

2 Click anywhere inside the console screen, and then press **<1>** to dismiss the console wizard. (If you are logged in, press **<Esc>** until you have logged out and are back at the starting screen.)

3 Log in with your appliance's username and password and you will go to the console command line.

Type **help**, and then press **<Enter>** to see a list of command line commands, or refer to the console commands list (see Console Commands List on page 115).

To return to the **Setup** wizard, type **exit**, and then press **<Enter>.**

Set Up and Configure Quantum vmPRO

You can have Quantum vmPRO up and running in just a few minutes.

1 If you have not yet installed your Quantum vmPRO, refer to the online Quantum vmPRO Download and Installation Guide to do so now.

Note: You will need a valid e-mail address and password to access the *vmPRO Download and Installation Guide*.

2 Refer to Network Settings on page 26 and Configure Quantum vmPRO on page 28 to finish setting up Quantum vmPRO.

Note: For Tivoli Storage Manager, after you install your Quantum vmPRO appliance, we recommend installing the TSM Linux agent in Quantum vmPRO. For more information, refer to the following online support article: Installing and using the TSM Client on a Quantum vmPRO virtual appliance

Network Settings

To set network settings for your Quantum vmPRO appliance:

1 Log in to access the console **Setup** wizard (see Accessing the Console Setup Wizard).

2 Follow the conventions presented in Using the Console Setup Wizard to use the **Setup** wizard and enter your networking information (see Figure 19). You can set or modify the following network setting:

- **Hostname**

  Set the virtual appliance name.

- **Search Domains**

  Add up to 6 domains.

- **Network**

  Set the method (DHCP of Manual) by which the IP addresses are assigned or change them if necessary.

- **Network Reset**

  Manually reset the network.

- **DNS Server**

  Set the method (Automatic or Manual) by which the DNS servers are set or change them if necessary.

- **Proxy Setting**

  Change the Proxy setting and require authentication if necessary.

- **Group Membership**

  For an explanation of **Group Membership**, see Set Up and Manage Groups on page 82. If you have multiple Quantum vmPRO appliances, you can group them so that you can manage several appliances from one master. You can create groups during initial setup, or you can return to the **Setup** console to manage groups later.

- **System Shutdown**

  Manually shutdown the system.

Figure 19 Entering Networking Information

If you have dismissed the **Setup** console and are at the command line, you can return to the **Setup** console by typing **exit** at the command line. You may have to log in to return to the console.

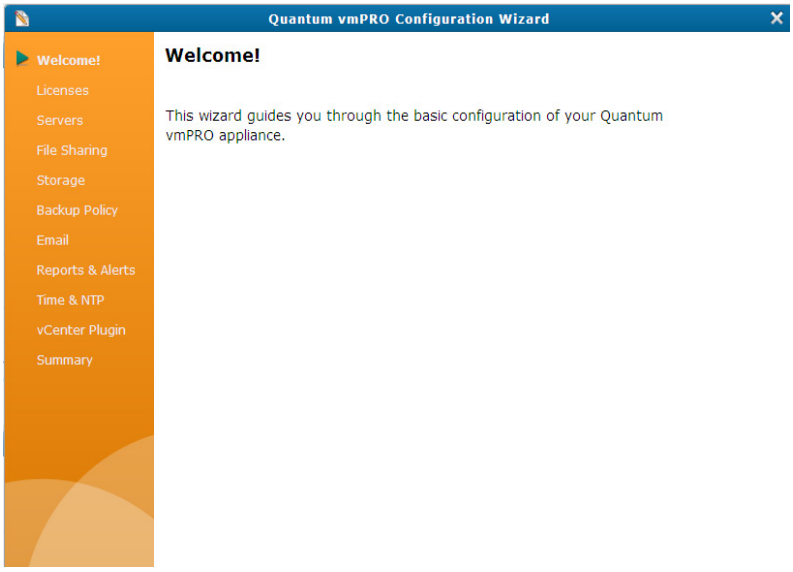
Configure Quantum vmPRO

To configure your Quantum vmPRO appliance:

1. In a browser, enter the IP address for the Quantum vmPRO appliance. This brings you to the Quantum vmPRO GUI interface.
2. Log in. (Default username/password: **sysadmin/sysadmin**.)
3. Follow the **Configuration Wizard** (see Figure 20) to configure **Licenses**, **Servers**, **File Sharing**, **Storage**, **Backup Policy**, **Email**, **Reports & Alerts**, **Time & NTP**, and **vCenter Plugin**.

Note: You can return to the **Configuration Wizard** later by selecting it from the **Configure** drop-down list in the Quantum vmPRO GUI.

Figure 20 Configuration Wizard Welcome Page



Licenses

Enter your registered Quantum support email address and password to retrieve your licenses.

Servers

1. Choose whether to configure a vCenter or ESX server.

   When configuring the appliance, you have the option of specifying either a single vCenter server hostname for VM discovery, OR one or more standalone ESX hosts, but not both simultaneously.

   If you have the option of using a vCenter server, it is recommended that you use this option, for ease of use and reduced management overhead by auto discovering all ESX hosts.

2. Specify your ESX server or vCenter's fully qualified name or IP address.

   - Only one vCenter per appliance is supported.
   - If a vCenter is configured for an appliance, no individual ESX servers can be configured for that appliance.

3 Add a label for your information.

4 Type your password.

5 Click **Test Login** to verify the connection to the ESX server or vCenter.

6 When the login information is correct, click **Save**.

7 Click **Next**.

8 If you added an ESX server, you will go on to the **File Sharing** section.

9 If you added a vCenter, you will first be given the opportunity to designate a subset of the vCenter to be exported by the appliance. Check the servers/folders to be exported and click **Next**.

File Sharing

1 Be sure that both NFS and CIFS are enabled if you want to use both, or clear the check box for the protocol you will not use.

2 Both NFS and CIFS offer further configuration options on subsequent screens.

3 If you need to set up Active Directory authentication for CIFS, you can do so after you finish the initial installation and setup of your appliance. For more information, refer to the online support article: Active Directory Authentication Support in Quantum vmPRO

Storage

You can add and configure network storage. You will need to input or select the **Hostname**, **Nickname**, **Device**, **Protocol** (NFS or CIFS), **Share**, **Sub-folder**, and **Mount options**. If you will be using a CIFS share for added storage, you can also enter its user and password information.

Backup Policy

Create a new backup policy, modify an existing backup police, select an existing one as your default backup policy, or delete a backup policy. You will input or select the **Name**, **Copy Mode**, **Storage** (network storage location), time at which to **Automatically copy virtual machines daily**, whether to **Send email report when complete**, and

whether to **Delete virtual machine copies after** X **days** (where **X** is the user defined number of days).

Email

Enter the email address that should be used in the **From** field on email sent by the Quantum vmPRO appliance. Enter the hostname or IP address of your SMTP server, and, if required by your SMTP server, your login details. Click **Send Test Email** to verify that you entered the information correctly.

Reports and Alerts

Enter recipients for email messages containing reports and alerts. Copying the Quantum support team on those messages allows for pro-active responses to potential issues.

Time and NTP

To set the time:

1. Select your time zone. The time zone of the Quantum vmPRO appliance and the vCenter or ESX server(s) must match.
2. If you want to use your own NTP server instead of the default, click **Add NTP Server**.

vCenter Plugin

The Quantum vmPRO GUI can be embedded directly into vSphere Client when it is connected to a vCenter Server. See the section Embed the Quantum vmPRO GUI in vSphere Client on page 103 for complete information.

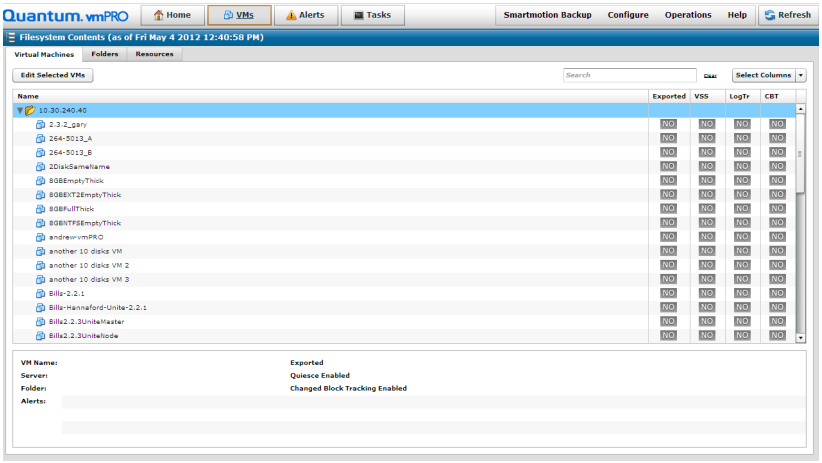
Summary Screen

Be sure to click **Save**, **Next** (to review your changes), and **Finish** at this screen to save your changes.

View Your Virtual Machines

When you have completed configuring your vmPRO, you can see the virtual machines in the configured server(s). On the vmPRO GUI, select the **VMs** tab. On the VMs page, select the **Virtual Machines** tab. Your configured server will appear on the **Virtual Machines** tab as a folder which you can open to see the VMs (see Figure 21).

Figure 21 Viewing Virtual Machines



Upgrade Quantum vmPRO

Quantum vmPRO can be upgraded by either an online or an offline method.

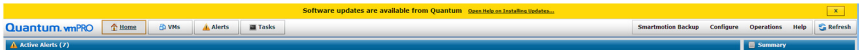
- Check for Updates
- Perform an Online Upgrade
- Perform an Offline Upgrade

Check for Updates

To check for Quantum vmPRO updates or to configure automatic checks, go to the Quantum vmPRO GUI and select **Software Updates** from the **Configure** drop-down list.

If you are using the check for updates automatically option, a **Software updates** bar appears in the GUI just above the main tab when updates are available (see Figure 22).

Figure 22 Software Updates Bar

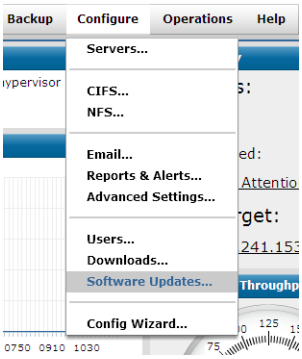


If there are software updates, use the **system upgrade** command from the vmPRO's console command line interface to install them (see Accessing the Console Command Line on page 25).

To configure when you receive notifications regarding software updates, or manually check for software updates, do the following:

1 From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Software updates** (see Figure 23).

Figure 23 Accessing Software Updates

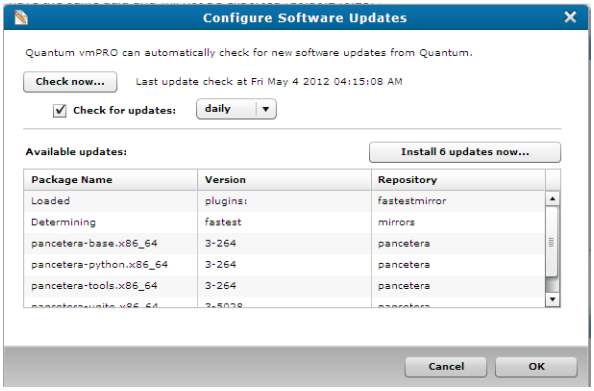


2 To manually check for software updates, select **Check now** (see Figure 24).

3 To receive automatic notification for software updates, select **Check for updates**, and then select **daily** or **weekly**.

4 Click **OK**.

Figure 24 Configure Software Updates



Perform an Online Upgrade

The online upgrade uses port 443 and goes to read **updates.pancetera.com**. Updates are usually a couple of megabytes in size, and use signed, private key/public key encryption to verify and authenticate the update.

1. Run this command from the command line of your Quantum vmPRO appliance:

   ```
   system upgrade
   ```

2. You will be asked for confirmation before the upgrade starts. Once you confirm, the upgrade process checks for Quantum vmPRO updates and automatically downloads and installs any updates found. No interaction is required.

3. To see any GUI changes that were part of the upgrade, you must start a new instance of the GUI.

Proxy Support for Upgrades

If you need proxy support to access the Internet, you can configure proxy support in your Quantum vmPRO appliance. Currently proxy support can be configured for upgrades only.

1. Log in to access the console **Setup** wizard (see Accessing the Console Setup Wizard).
2. Select **Proxy Setting**.
3. Enter and save your information (see Figure 25).

Figure 25 Configuring Proxy Settings

Perform an Offline Upgrade

If your Quantum vmPRO appliance does not have Internet access, you can perform an offline upgrade.

Requirements

- You will need read and write access to **\unite-host\quantum-upgrade** on the appliance. Currently **\quantum-upgrade** is exported with CIFS only; no NFS access is available yet.
- You will need to download the zip file containing the upgrade RPMs from: https://mosaic.quantum.com/downloads/QuantumvmPROUpgrade.zip

  The upgrade zip file will contain one or more of these Quantum vmPRO upgrade RPMs: **-unite**, **-base**, and **-tools**. The zip file may also contain third party RPMs.

Procedure

1. Extract the RPM files from **QuantumvmPROUpgrade.zip** and place them in the appliance's **\quantum-upgrade** folder.
2. At the command line, run this command:

   ```
   system upgrade local
   ```

3. You will be asked for confirmation before the upgrade starts. Once you confirm, simply wait for the upgrade to finish.
4. Delete all files from the **quantum-upgrade** folder.
5. To see any GUI changes that were part of the upgrade, you must start a new instance of the GUI.

Chapter 3

Working With Quantum vmPRO

This chapter describes how to work with Quantum vmPRO and contains the following sections:

- Access Your Virtual Machines
- Back Up, Store, and Recover Data
- Modify Your Configuration
- Set Up and Manage Groups
- Create and Manage Folders

Access Your Virtual Machines

Both CIFS and NFS see the Quantum vmPRO appliance as a single file system as long as you have enabled CIFS and/or NFS in order to make **/export** available.

If you need to enable or configure CIFS or NFS, go to the **Configure** drop-down list in the Quantum vmPRO GUI.

SmartMotion NAS Target Protocol Selection

Depending on the makeup of the VMs populating your vSphere environment, their applications, and the data within them, you may choose between the CIFS and NFS protocols for sending backup data, based on which is a best fit.

For example, if you would like the SmartMotion backup files on the DXi or other NAS to be directly available to Windows systems, you may prefer to use the CIFS protocol. When UNIX/Linux/vSphere host integration is a priority, you may determine NFS to be more appropriate.

Additionally, depending on the contents of the data inside the VM disks, you may observe substantially different performance characteristics during backup and recovery between the two protocols.

Since no two vSphere environments are entirely alike, you should conduct a test backup and recovery with at least 40 GB worth of data over each protocol to observe the throughput and job completion time characteristics. This will allow you to choose the protocol best suited to your operations.

Protocol Considerations

Some protocol considerations to keep in mind include:

The NFS protocol type is supported as a Datastore type by vSphere.

VMware vSphere ESX hosts can mount a SmartMotion NAS backup target to allow for direct recovery of the backup images when using the NFS protocol to send backup data.

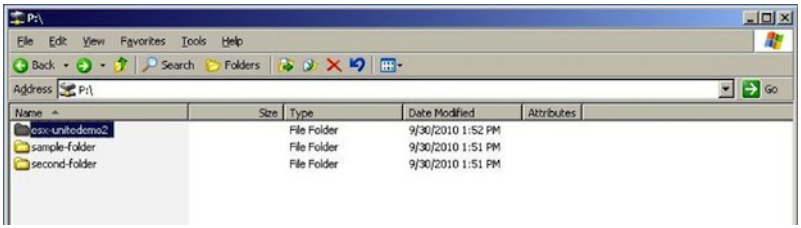
The appliance supports using a *sparse writing* approach when sending backup images using the NFS protocol, reducing the I/O overhead and time required for a backup job.

CIFS

On a Windows server, you can map **<vmPRO-Host_IP>\export** as a network drive. To do so, go to **Start > My Computer**. From the **Tools** menu in the **My Computer** window, select **Map Network Drive**.

You can then access all of your ESX servers and virtual machines through the mapped network drive (see Figure 26). You can even use drag and drop to copy a running virtual machine.

Figure 26 Mapping a Network Drive



NFS

On a UNIX server, you can create a mount point on the server, and then NFS mount **<vmPRO-Host>/export** on the server's mount point.

Back Up, Store, and Recover Data

This section describes the use of vmPRO's various tools and features that you can use to back up, store, and recover your data.

For more detailed and specific information regarding vSphere ESX host datastore and storage considerations, see the **vSphere ESX Host Notes and Best Practices** section of the Quantum vmPRO Best Practices Guide.

Caution: DXi V1000 should not be backed up by the vmPRO. When a DXi V1000 appliance is managed by a vmPRO appliance, the DXi V1000 appliance should be disabled from being exported on the vmPRO. If you want to backup your DXi V1000 appliance, it should be replicated to another DXi appliance.

Note: If your backup target is powered down or in a disconnected state, your vmPRO GUI will time-out. If you see messages or behavior to this effect, check the status of your backup target, and then proceed when the backup target it functioning normally.

Using Your Current Backup and Recovery Solution

With Quantum vmPRO, you can use your current backup and recovery solution. If you need assistance, consult the product-specific technical notes on the Quantum Support site. Refer to the online support article: Quantum vmPRO and Your Backup Solution

Using Folders to Facilitate Multiple Backup Polices

You can set up folders within your Quantum vmPRO file system to facilitate multiple backup policies on a single appliance (see Create and Manage Folders on page 92). You may want to use folders in conjunction with the group management feature for better load balancing (see Set Up and Manage Groups on page 82).

Using SmartMotion Backup

Quantum's **SmartMotion Backup** feature allows the Quantum vmPRO appliance to push data from **/export** to external storage on a scheduled basis and recover it easily.

Each vmPRO appliance can have multiple backup policies and each policy will have its own schedule; however, a specific policy can only be run once per day. Also, if you are executing backup polices in a group configuration, only one policy can run at a time on a particular node, but all nodes can be running a policy. In other words, the master node can be running a unique backup policy and each member node in the group configuration can be running a unique backup policy.

Before beginning any backup, make sure you have designated the data to be backed up as being available for export.

For ESX servers, go to the VMs tab and select the VMs you want to export. For more information, see Selecting VMs for Export on page 47.

For a vCenter, access the Configuration Wizard for servers, and select the entire vCenter, or select the appropriate subsets. This information will be reflected in the backup policy for the vCenter. For more information, see Add a vCenter Server on page 67.

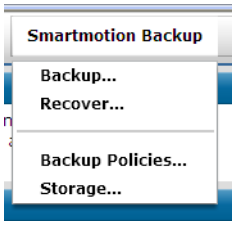
SmartMotion can be used on its own, or it can leverage the data movement utilities of your NAS target and/or your WAN accelerator.

Note: For greatest efficiency, enable CBT (Changed Block Tracking) on the VMs to be backed up (see vSphere Changed Block Tracking (CBT) Support on page 108).

To begin a SmartMotion backup session do the following:

1 Select **Backup** from the **SmartMotion Backup** drop-down list (see Figure 27).

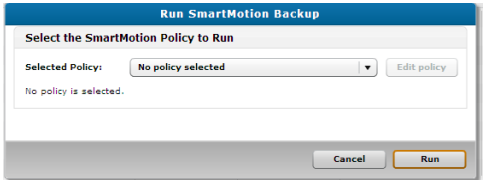
Figure 27 Selecting the SmartMotion Backup Options



2 From the **Run SmartMotion Backup** dialog box (see Figure 28), select the appropriate backup policy, and click **Run**. If necessary, you can edit the policy before starting the backup. This will be necessary if you have not selected a storage location for your backup (see Using Backup Policies, Step 3 on page 45.

Note: If your VMs are in folders, you will need to configure your folder so that it is assigned to the appropriate backup policy, (see Step 5 Select a SmartMotion Backup Policy. on page 93)

Figure 28 Selecting the Backup Policy



When the SmartMotion backup has completed, you can view the list of VMs that have been copied.

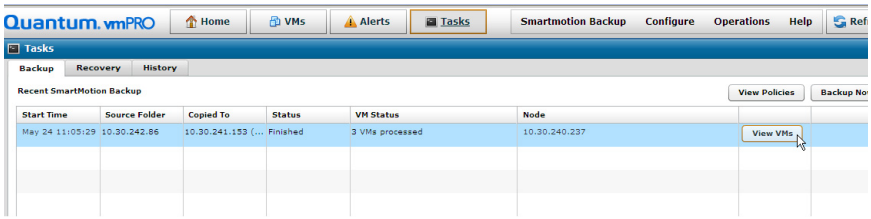
To see the copied VMs, do the following:

1 From the vmPRO GUI, select the **Tasks** tab.

2 From the **Tasks** screen, select the **Backup** tab.

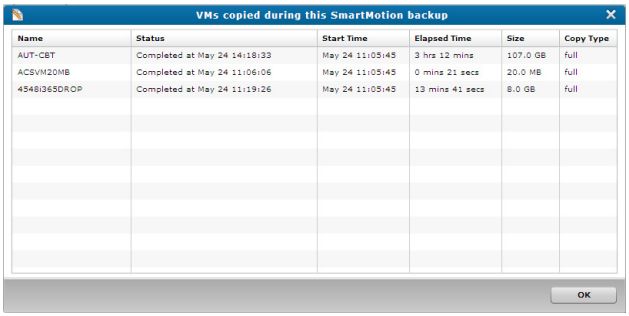
3 From the **Backup** screen, select **View VMs** (see Figure 29).

Figure 29 Viewing Backed up VMs



A dialog box of the copied VMS displays (see Figure 30).

Figure 30 Copied VMs



Using Additional Storage

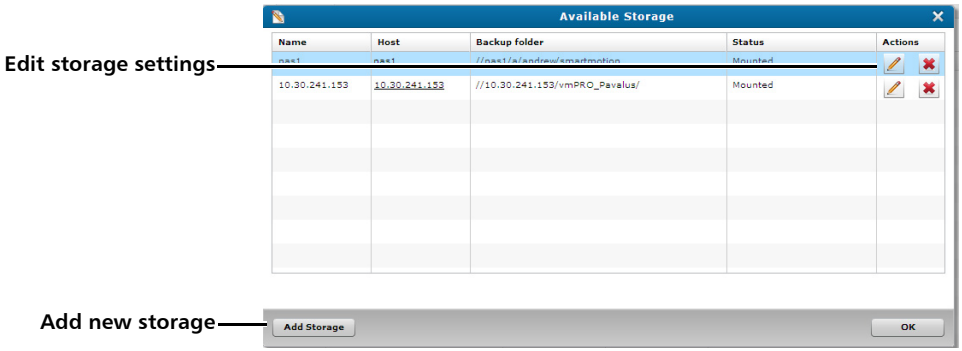
In order to perform SmartMotion backups, you will need to add, edit (configure), and delete storage locations.

To add or edit additional storage locations:

1. From the **SmartMotion Backup** drop-down list, select **Storage** (see Figure 27).
2. From the **Available Storage** dialog box (see Figure 32).
   a. To modify the configuration settings of existing storage, select the entry, and then click the pencil icon.
   b. To add new storage, click **Add Storage**.

Note: To delete a storage location, select the entry, and then click the red X.

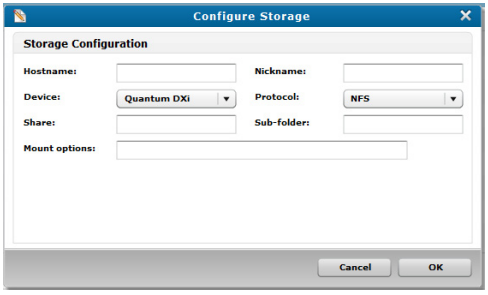
Figure 31 Available Storage



3 From **Configure Storage** dialog box, enter or modify the following settings (see Figure 32):

- **Hostname** (or IP address)
- **Nickname**
- **Device**
- **Protocol**
- **Share**
- **Sub-folder**
- **Mount options**
- **CIFS User**
- **CIFS Password**

Figure 32 Configure Storage



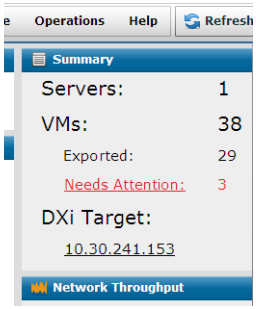
4 Click **OK**.

Access a DXi V1000 for Additional Storage

DXi V1000 provides a backup solution that integrates deduplication and replication to connect backup and disaster recovery protection across distributed environments.

If a DXi V1000 is configured as an additional storage target for your Quantum vmPRO appliance, you will see a text heading, **DXi Target:,** in the **Summary** pane on the **Home** page and a link to the native management interface for the DXi (see Figure 33).

Figure 33 DXi Target Configured for Additional Storage



Before you can access a DXi V1000 for additional storage, it must be configured with either CIFS or NFS shares that your vmPRO can access. To accomplish this task, see the *Quantum DXi V1000 User's Guide, 6-67612-01*, or contact the system administrator for the DXi V1000.

To designate a DXi V1000 for additional storage, select **Quantum DXi** as the **Device** in Step 3 of Using Additional Storage.

Note: If your **Protocol** is CIFS, be sure to enter the **CIFS User** name and **CIFS Password** exactly as enter in the DXi V1000 NAS configuration settings.

Using Backup Policies

In order to perform SmartMotion backups, you will need to add, edit (configure), and even delete backup polices. You can also designate a backup policy to be your default backup policy.

Note: When an appliance is removed from a group, the link between the backup policy and the storage no longer exists. For any node appliances which have left a group, you must re-create the backup policy.

To add or edit a backup policy:

1 From the **SmartMotion Backup** drop-down list, select **Backup Policies** (see Figure 27).

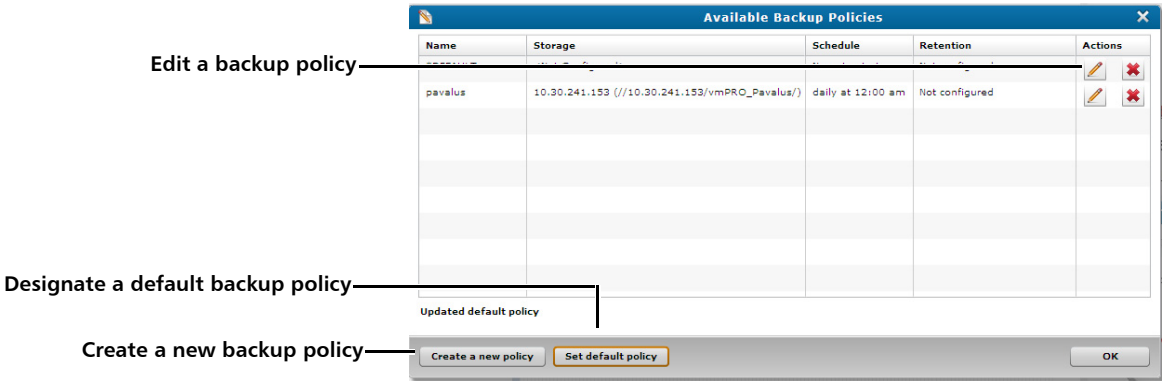
2 From the **Available Backup Policies** dialog box (see Figure 34), do the following:

   a To modify an existing backup policy, select the entry, and then click the pencil icon.

   b To add a new backup policy, click **Create a new policy**.

Note: To delete a backup policy, select the entry, and then click the red X.

Figure 34 Available Backup Policies



3 From the **Configure Backup Policy** dialog box (see Figure 35), enter or modify the following settings:

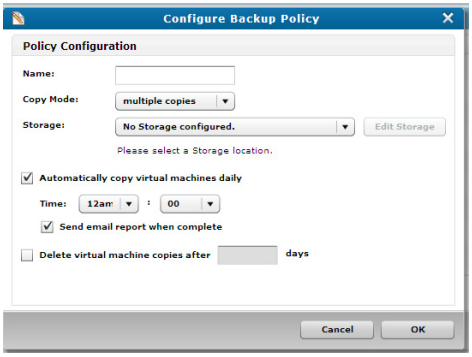
- **Name**
- **Copy Mode**
- **Storage**

- **Automatically copy virtual machines daily** (If selected, select **Time** at which to perform the copy.)
- **Send email report when complete**
- **Delete virtual machine copies after X days** (Where **X** is the user defined number of days.)

Note: Creating multiple backup polices provides the ability to have multiple backup schedules, backup to multiple targets, and supports multiple retention (date at which backups are deleted) polices.

4 Click **OK**.

Figure 35 Configure Backup Policy



Note: If your VMs are in folders, you will need to configure your folder so that it is assigned to the appropriate backup policy, (see Step 5 Select a SmartMotion Backup Policy. on page 93)

To designate a backup policy to be your default backup policy

1 From the **SmartMotion Backup** drop-down list, select **Backup Policies** (see Figure 27).

2 From the **Available Backup Policies** dialog box (see Figure 34), select the backup policy that you want to use as your default backup policy.

3 Click **Set default policy**.

Determining a Retention Policy

Determining how many backups to keep and for how long, is based on a number of factors. The number of backups that can be retained is highly dependent on the characteristics of the target NAS storage device. The rate of storage utilization is dependent on a number of factors such as deduplication and the rate of unique block creation in the VM guests. In general, it is best to start with a lower number of backups retained until the capacity growth rate can be observed, for example between 7 to 14 days.

Use the following to help you determine your retention policy:

- Deduplication-Enabled Target - DXi and other deduplicating NAS targets will generally achieve 10:1 to 20:1 reduction in aggregate backup volume, enabling greater retention periods than with comparably sized non-deduplicating storage devices. Full and Differential/CBT backups will have approximately the same storage utilization impact on targets that perform deduplication.
- Non-Deduplicating Target - Non-deduplicating NAS targets will consume disk more rapidly. Here full and Differential/CBT backups will have different impacts, with the CBTs generally being approximately 15% to 30% the size of a full backup depending on your environment.
- Regardless of the type of storage target in use, the biggest factor affecting the rate of storage utilization is the rate at which unique data blocks are generated by guest VMs.

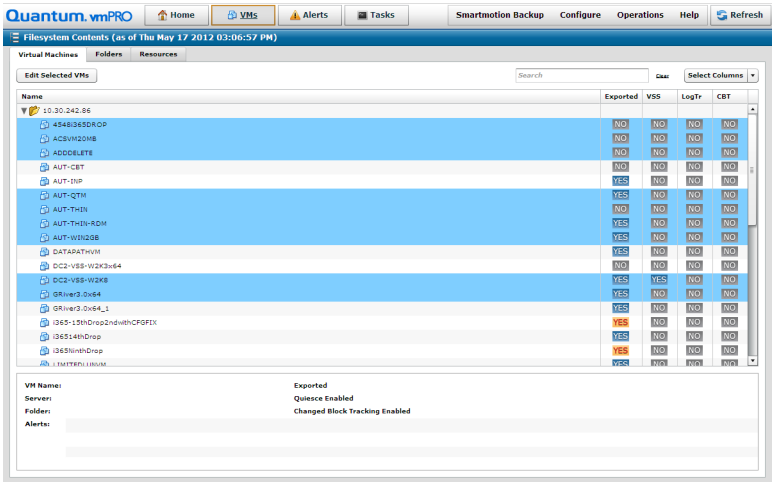
Selecting VMs for Export

To select VMs for export (enable or make available for backup), do the following:

1. From the Quantum vmPRO GUI, click **VMs**.
2. On the **VMs** screen, click the **Virtual Machines** tab.
3. From the VMs table, select the VMs that you want to export. You may need to open a folder (by clicking it) to access the VMs (see Figure 36).
    - To select consecutive VMs in the list, hold down **<Shift>** and click the first and last VM in the series.
    - To select non-consecutive VMs, hold down **<Ctrl>** and click each VM you want to select.
    - If you want to backup all the VMs in a folder, select the folder.

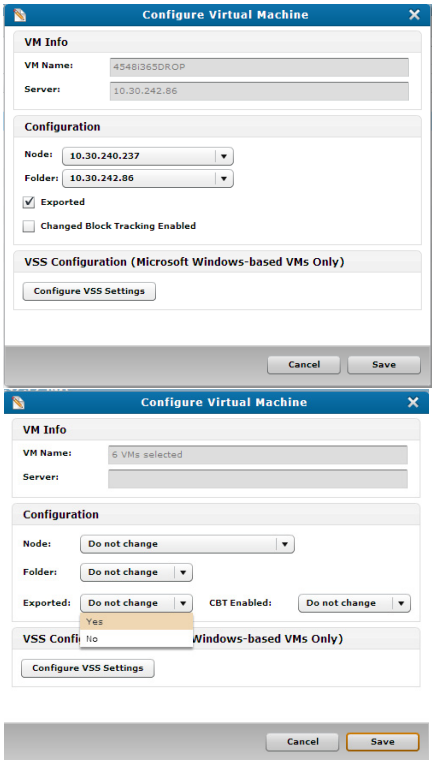
4 Click **Edit Selected VMs** above the VM list.

Figure 36 Selecting VMs to Export



5 In the **Configure Virtual Machine** dialog box, select **Exported** if you have selected only one VM, or select **Yes** on the **Exported** drop-down list if you have selected multiply VMs (see Figure 37).

Figure 37 Configure Virtual Machine



6 Click **Save**.

Recovering VMs

Before starting a recovery, verify that you have enough free space on target datastores. The appliance will not warn you that there is not enough space available before executing a batch operation.

Note: After recovering a VSS enabled VM with Active Directory installed, the VM will be automatically rebooted twice during the VSS restore process. These reboots can take several minutes. During this time, you should not attempt to use the VM.

For the fastest access to file level recovery, configure the **Mount options** (see Using Additional Storage, Step 3 on page 43) setting on the appliance to point directly to the location of the SmartMotion backups. This setting is preserved through reboots of the appliance and provides

file level access to the backups at the **<vmPRO-Host_IP>\recover\files** CIFS share.

To recover VMs, use the vmPRO **Recovery Wizard**.

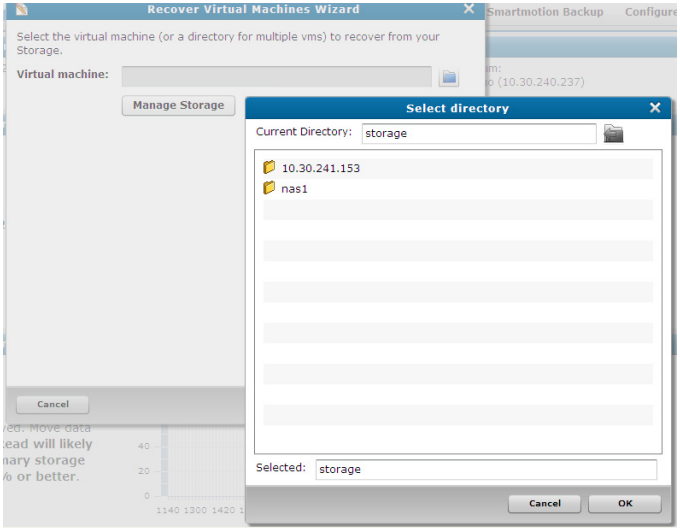
1 From the **SmartMotion Backup** drop-down list, select **Recover** (see Figure 38).

Figure 38 Accessing the Recovery Wizard

2 From the **Recover Virtual Machines Wizard**, use the browse feature, folder icon, to locate the VMs you want to recover (see Figure 39).

3 From the **Select directory** dialog box, select the virtual machine (or a directory for multiple VMs) to recover from your storage, and then click **OK**.

Figure 39 Recover Virtual Machines Wizard



4 From the **Recover Virtual Machines Wizard**, you can recover all the VMs in the directory, or chose a specific VM to recover (see Figure 40).

a To recover all VMs in the directory, select **Select all VMs in the directory**. Proceed to Step 5.

b You can recover a single VM in either of two ways:

- Select **Choose the VM to recover (only top level directory may be selected**; browse to the VM, and then select it. Proceed to Step 5.
- Or you can continue to drill down to the specific VM, and then click **OK** (see Figure 41).

  On the next **Recover Virtual Machine Wizard** dialog box, click **Next.**

  On the **Recover Virtual Machine Wizard** (Select the target virtual machine configuration) dialog box, make the appropriate selections, and then click **Next** (see Figure 42).

  Note: Select **rename** for the **Action on conflict** option to avoid any interruptions during the restore due to VM name conflicts on the datastore.

  The **Recover Virtual Machine Wizard** (Verify the configuration of the VM to be restored) dialog box displays (see Figure 43). Proceed to Step 7.

Figure 40 Recovering a VM

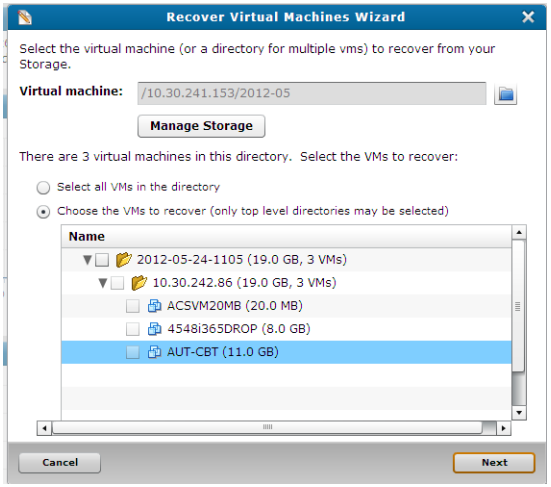


Figure 41 Drill down to a Specific VM

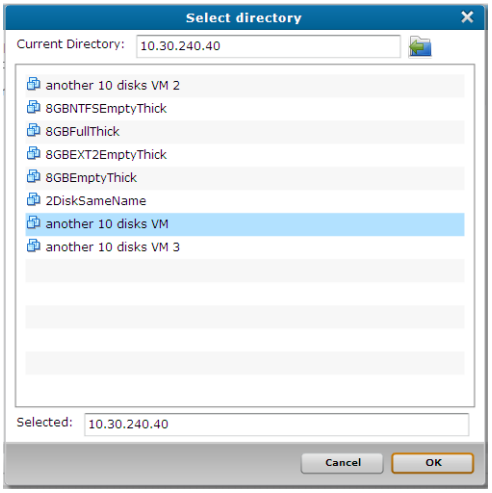


Figure 42 Selecting Action on conflict setting

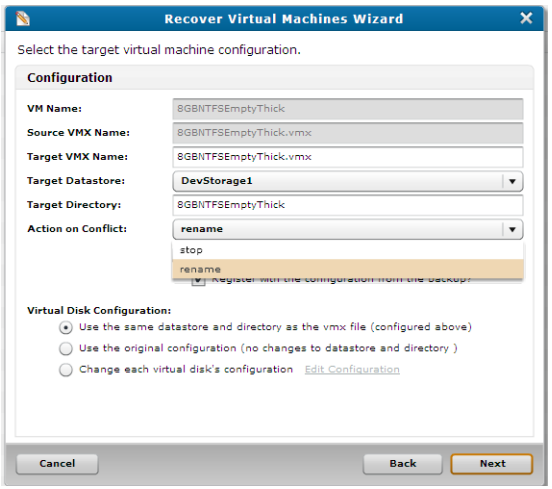
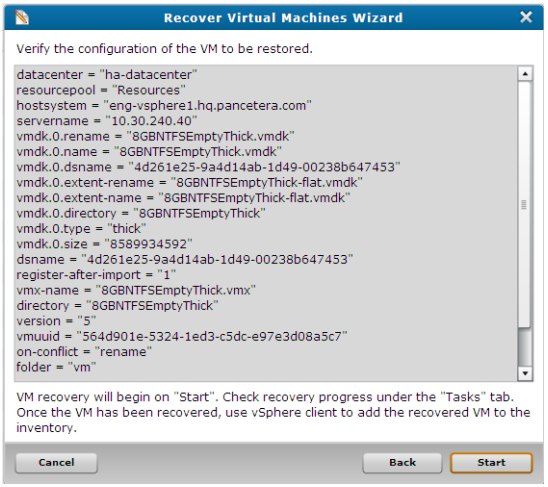


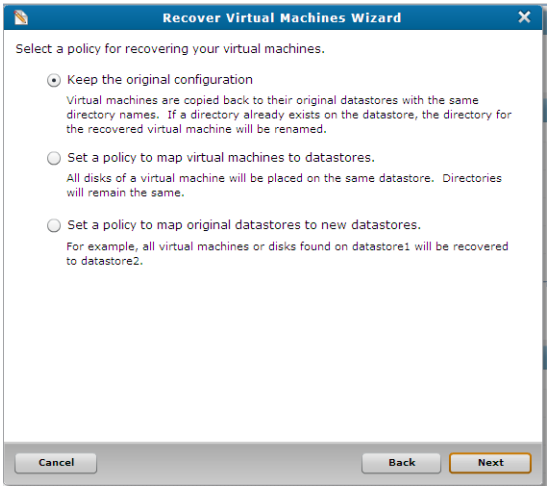
Figure 43 Starting a Recovery for a VM



5 Click **Next**.

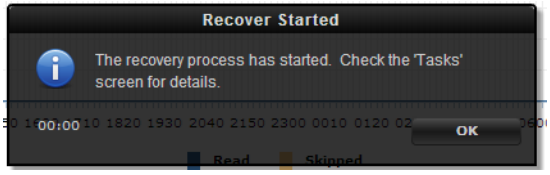
6 Select the appropriate policy for recovering the VMs (see Figure 44), and then click **Next**.

Figure 44 Selecting a Recovery Policy



7 Click **Start.** The **Recovery Started** alert box displays (see Figure 45)

Figure 45 Recovery Started



Recovering Individual Files

Individual files in backed-up virtual machines are available without running the recovery process. File-level recovery allows you to use the vmPRO appliance to access the files within the virtual disks that are backed up. Using Windows Explorer (not a browser) on your local computer, enter the UNC path **<vmPRO-Host_IP>\recover\files**, and then drill down the directory structure to the file (see Figure 46).

Note: File-level recovery for dynamic volumes that span multiple disks is currently not supported.

The vmPRO SmartView feature supports the following file system types:

- EXT2, EXT3, and EXT4
- NTFS
- FAT

The vmPRO SmartView feature supports the following partition types:

- MBR (Master Boot Record) partitions.
- GPT (GUID Partition Table) partitions.

The vmPRO SmartView feature also works with supported file systems that are embedded in LVM2 volumes that do not span multiple virtual disks.

Limitations

The vmPRO SmartView feature has limited support for Windows dynamic disks. For Windows 2003, only a simple Windows dynamic disks with a single partition is supported. If there are multiple partitions on a Windows 2003 dynamic disk, file-level access will only be available for the first partition.

The vmPRO SmartView feature does not support the following:

- Windows dynamic disks that span multiple drives
- Windows dynamic disks that are striped
- Windows dynamic disks that use RAID
- Windows 2008 dynamic disks file level access
- volumes that span multiple virtual disks
- Solaris UFS file systems
- file systems on raw (un-partitioned disks)
- any file system types that are not explicitly listed as supported

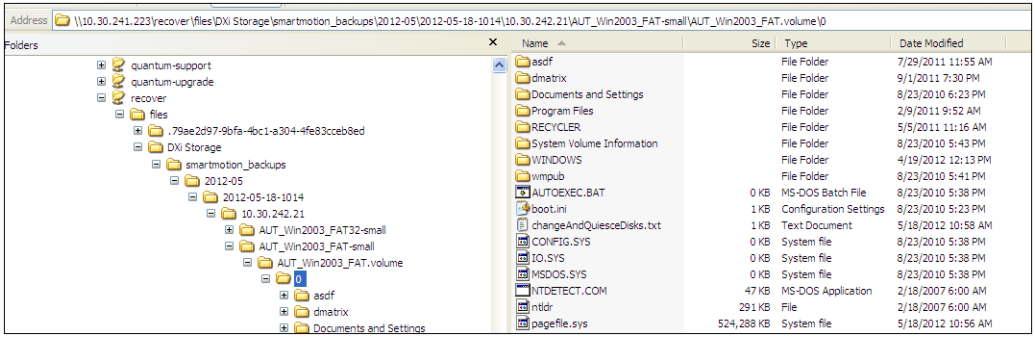
Note: When a third-party backup application is in use, you must use the third-party backup application to recover the entire virtual machine to a network share and then mount that share onto vmPRO using the vmPRO Recover Wizard (see Recovering VMs, Step 1 on page 50). (When using SmartMotion, only the target backup storage needs to mounted using the vmPRO Recover Wizard.)

In general, the drill-down process will proceed as follows:

1. CIFS mount the vmPRO **/recover** share.
2. **cd** to the **files** directory. Verify that you are in the **/recover/files** directory.
3. There is a directory for each configured target storage. **cd** to your backup data.

   When you **cd** into a VM directory it will contain a **.volume** directory for each disk.
4. **cd** into the **.volume** directory. There you will see directories named **0**, **1**, **2**,... etc. for each partition on the disk. You can **cd** into each numbered directory to access the files for the respective partition.

Figure 46 Recovering an Individual File



Modify Your Configuration

You can modify your Quantum vmPRO appliance's setup at any time. Networking settings are managed via the console **Setup** wizard, and most other configuration is managed via the Quantum vmPRO GUI.

See Access Quantum vmPRO on page 21 if you need reminders for accessing the **Setup** wizard or the Quantum vmPRO GUI.

This section contains instructions for common modifications you might need to make.

Configuration Wizard Reminders

Any time you make configuration changes using the wizard, you must exit the wizard using the **Summary** option to save your updates.

Before your Quantum vmPRO appliance can *see* the new servers that you have added, they must be *Discovered*. This discovery process usually takes place automatically; however, there are times when you might want to run a discovery manually, possibly as troubleshooting tool.

Saving Your Configuration Changes

To save your configuration change, do the following:

1 From the **Configuration Wizard**, select **Summary**. You will see a summary of all your changes (see Figure 47).

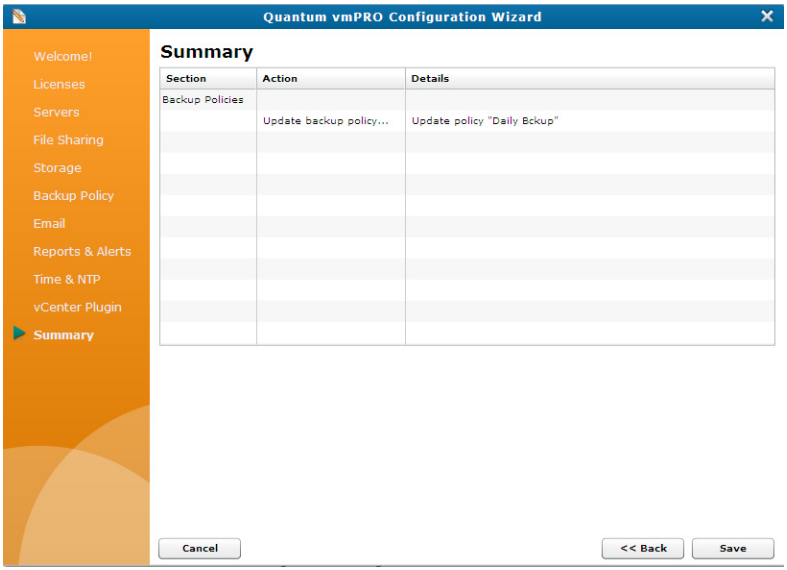


Figure 47 Configuration Wizard: Exiting the Wizard

2 Click **Save**.

3 Click **Next**.

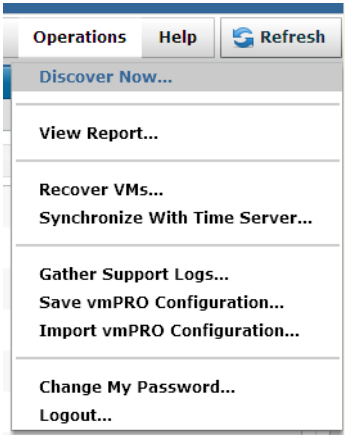
4 On the final screen, click **Finish**.

Discovering Newly Added Servers

To discover newly added servers, do the following:

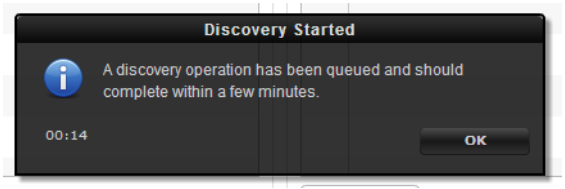
From the **Operations** drop-down list, select **Discover Now** (see Figure 48).

Figure 48 Discover Now



The **Discovery Started** alert box will advise you as to how long the discovery will take (see Figure 49).

Figure 49 Discovery Started

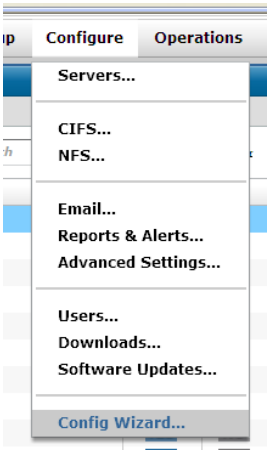


Accessing the Servers

You will use the **Servers** section of the **Configuration Wizard** to add, edit, or delete servers configured for your Quantum vmPRO appliance.

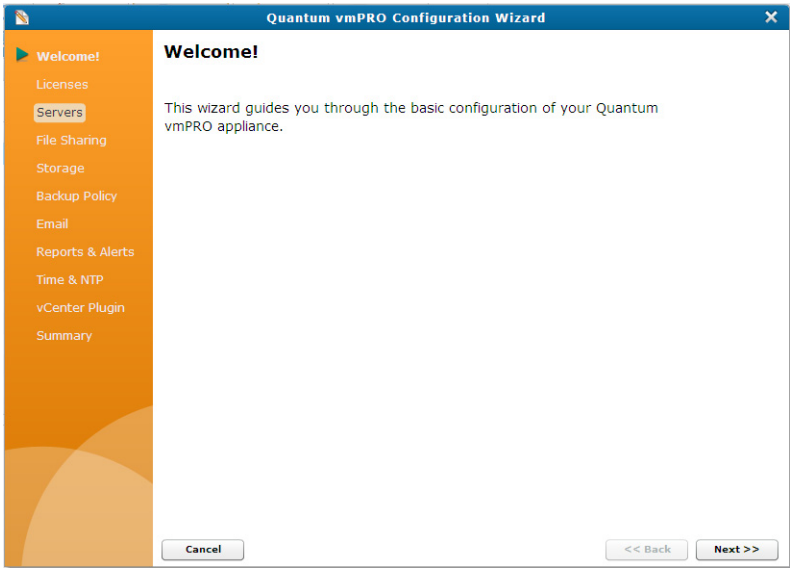
1 From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Config Wizard** (see Figure 50).

Figure 50 Accessing the Configuration Wizard



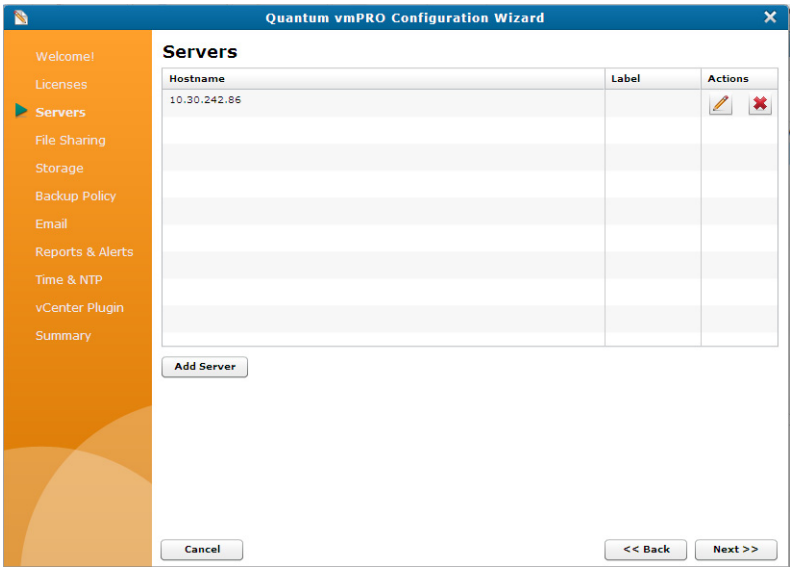
2 From the **Configuration Wizard** welcome screen, select **Servers** (see Figure 51).

Figure 51 Configuration Wizard: Welcome



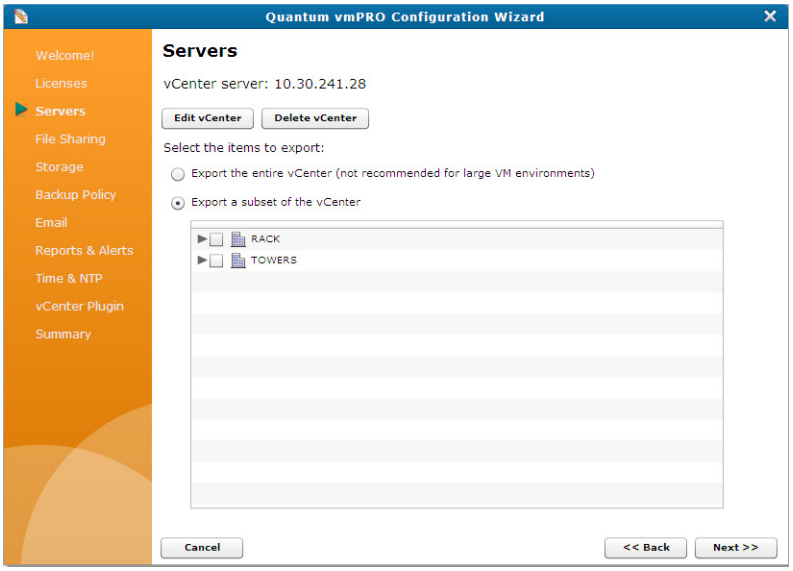
If you currently have an ESX server or servers configured, the **Servers** list will open (see Figure 52).

Figure 52 Configuration Wizard: ESX Servers List



If you currently have a vCenter configured, the **vCenter server** screen will open (see Figure 53).

Figure 53 Configuration Wizard: Servers (vCenter)



Add an ESX Server

To add an ESX Server, do the following:

1. Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.
2. At the **Servers** list, click **Add Server**.
3. Select **ESX Server (multiple ESX servers may be managed)** (see Figure 54).

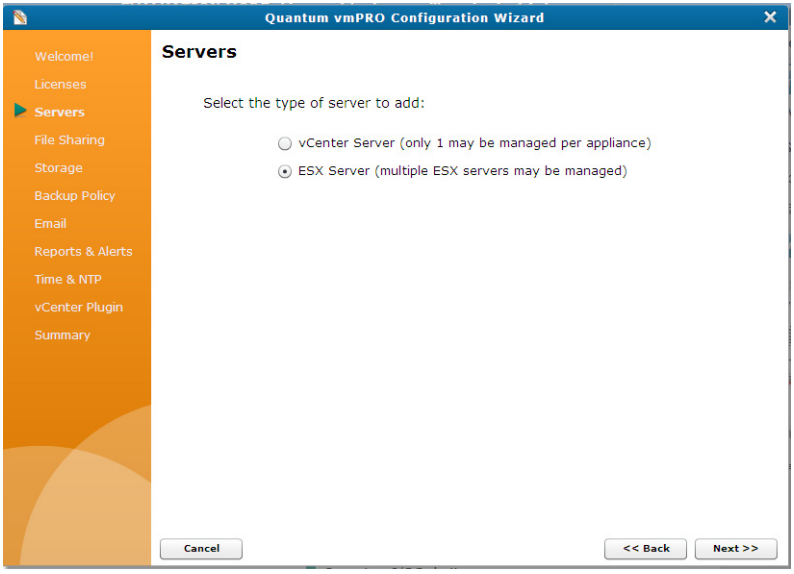
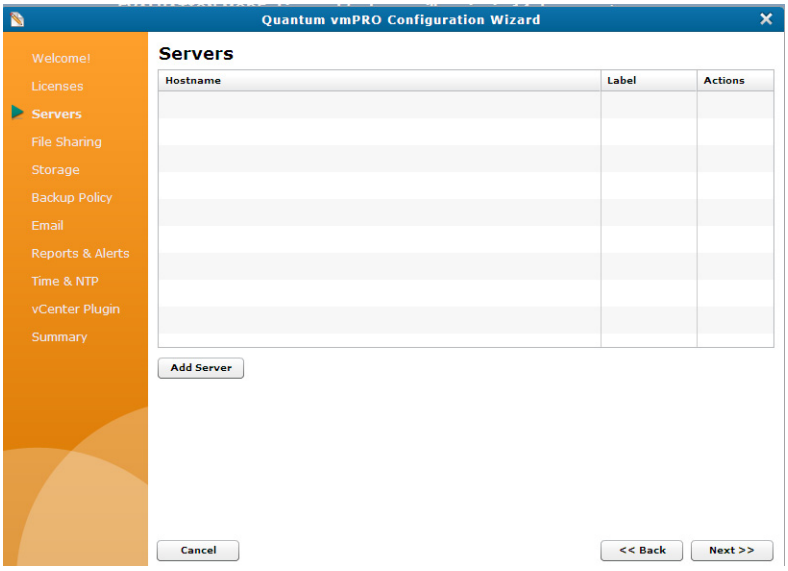


Figure 54 Configuration Wizard: Select Server Type

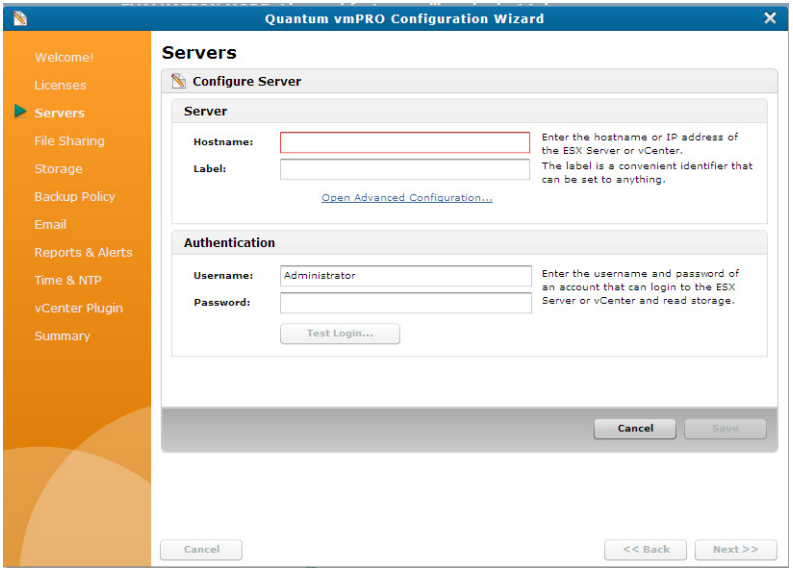
4. Click **Next**.
5. At the **Servers** list, click **Add Server** (see Figure 55).

Figure 55 Configuration Wizard: Add Server



6 Fill in the **Configure Server** form (see Figure 56).

Figure 56 Configuration Wizard: Configure Server

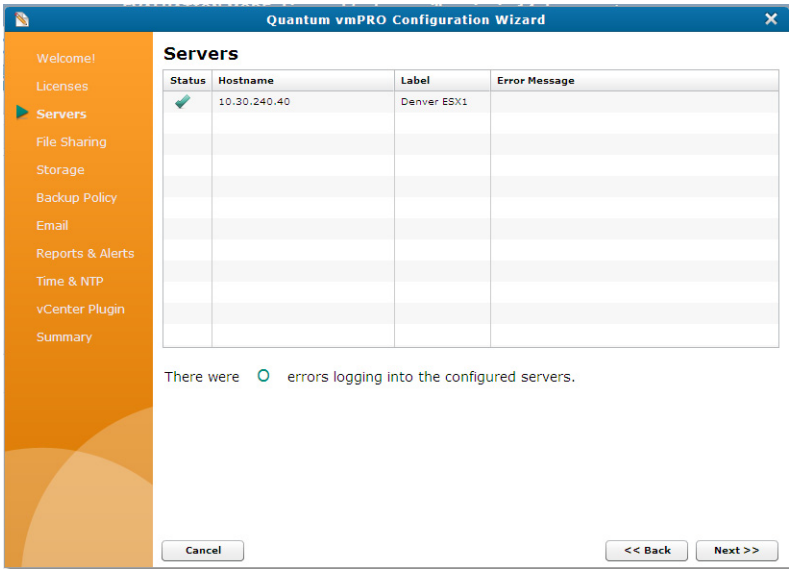


7 Click **Save**.

8 Click **Next**.

9 You will see a verification of your new configuration (see Figure 57).

Figure 57 Configuration Wizard: Configure Server Verification



10 From the **Configuration Wizard**, select **Summary** to go to the summary page and make your changes permanent.

11 Click **Save**, then **Next**, then **Finish**.

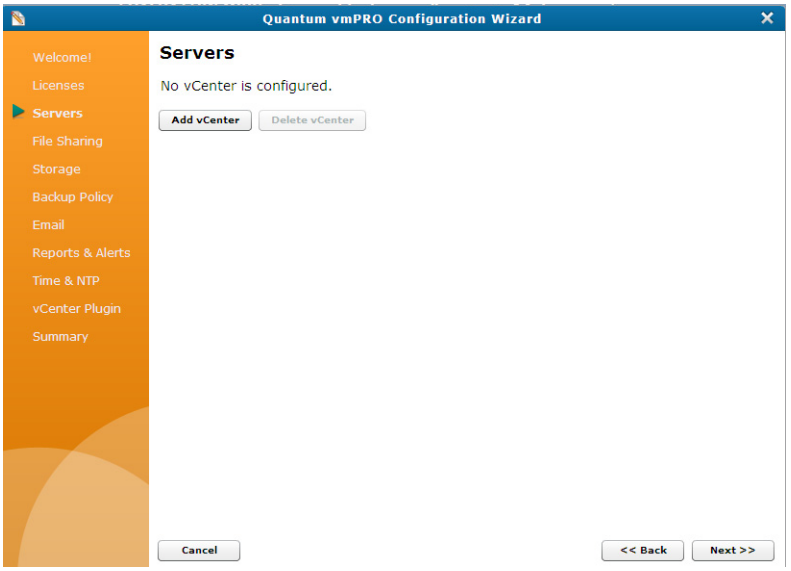
Add an ESX Server When There is an Existing vCenter Server

A Quantum vmPRO appliance cannot be configured with both an ESX server and a vCenter at the same time. You will have to delete the vCenter and then add the ESX server.

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.

2 At the **vCenter server** screen, click **Delete vCenter**. You will see the message **No vCenter is configured** (see Figure 58).

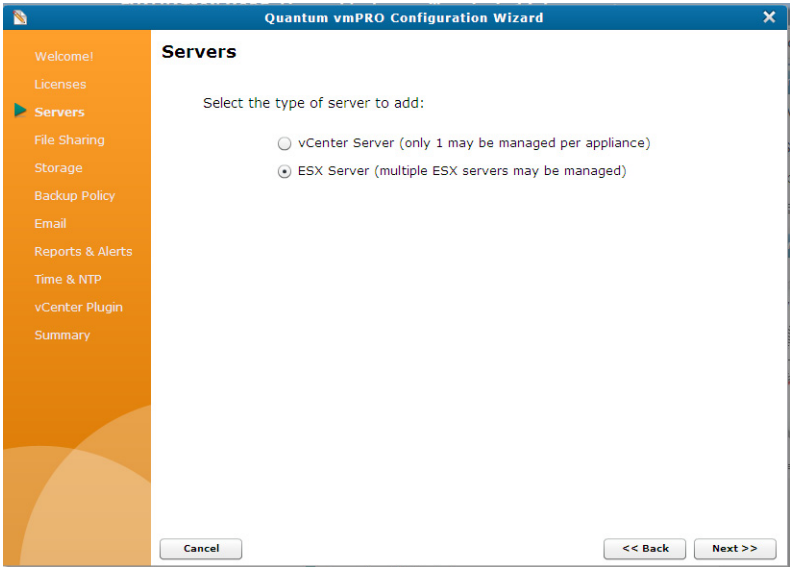
Figure 58 Configuration Wizard: No vCenter is Configured



3 From the **No vCenter is configured** page, click **Back**.

4 Select **ESX Server** (see Figure 59).

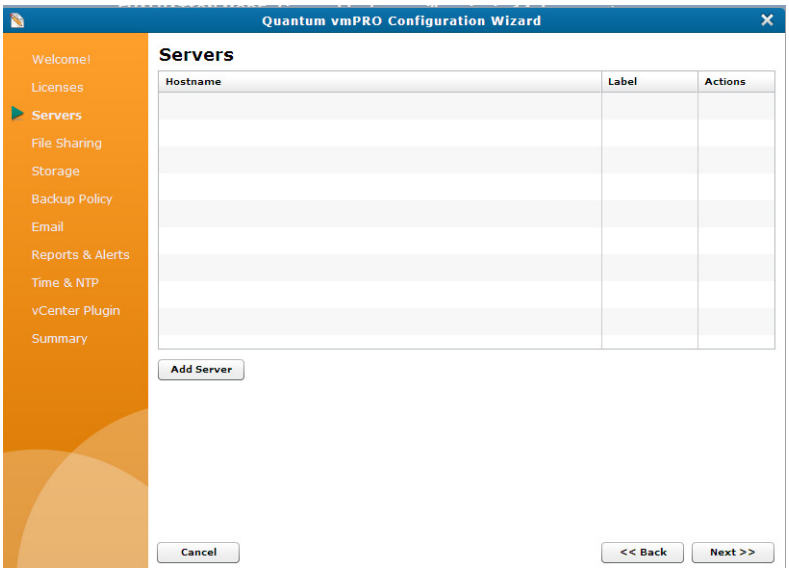
Figure 59 Configuration Wizard: Select Server Type



5 Click **Next**.

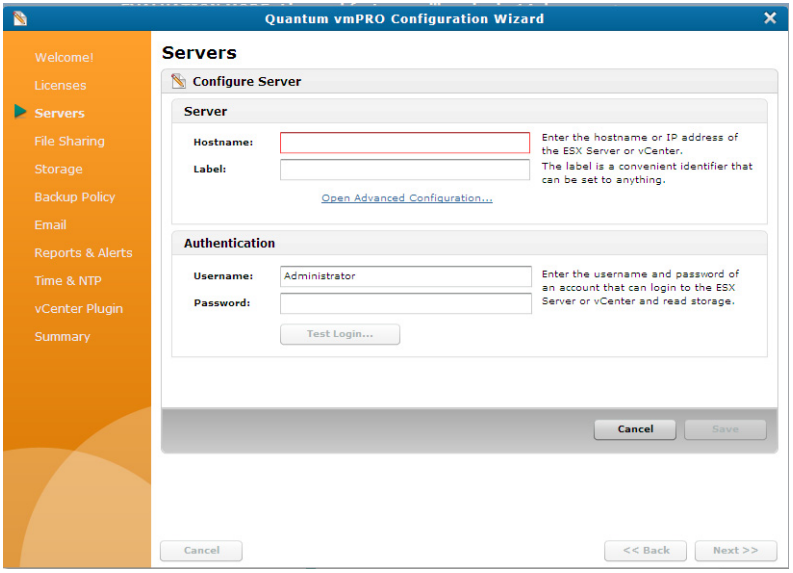
6 At the **Servers** list, click **Add Server** (see Figure 60).

Figure 60 Configuration Wizard: Add Server



7 Fill in the **Configure Server** form (see Figure 61).

Figure 61 Configuration Wizard: Configure Server



8 Click **Save** and you will see your server added to the list.

9 Click **Next** and you will see a verification of your new configuration. (see Figure 62).

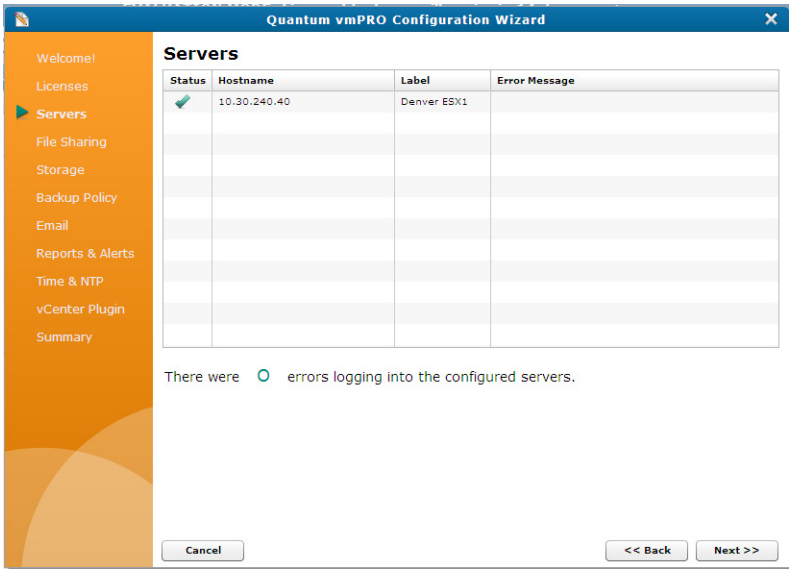


Figure 62 Configuration Wizard: Configure Server Verification

10 From the **Configuration Wizard**, select **Summary** to go to the summary page and make your changes permanent.

11 Click **Save**, then **Next**, then **Finish**.

Add a vCenter Server

A Quantum vmPRO appliance only supports one vCenter server at a time. You must delete all existing servers (ESXs and vCenter) and then add the new vCenter server.

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.

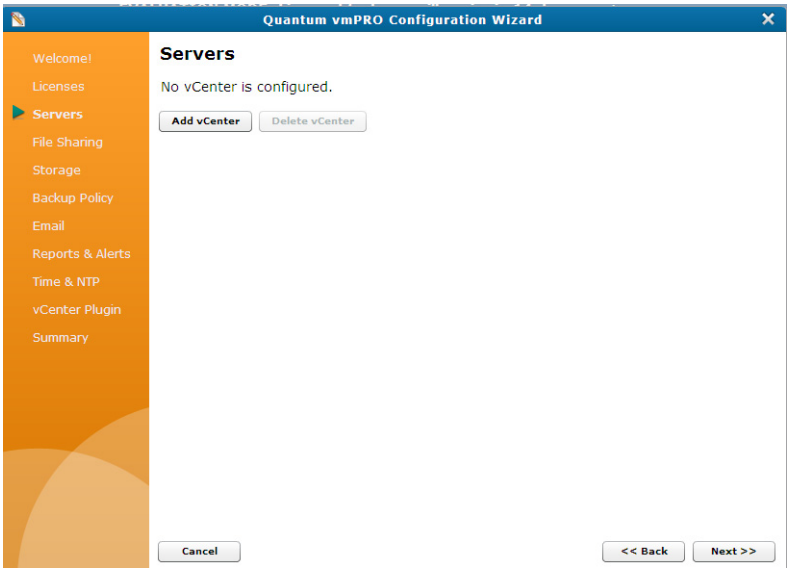
2 If there are any existing servers, delete them.

- To delete a vCenter:

  a At the **vCenter server** screen, click **Delete vCenter**. You will see the message, **No vCenter is configured** (see Figure 63).

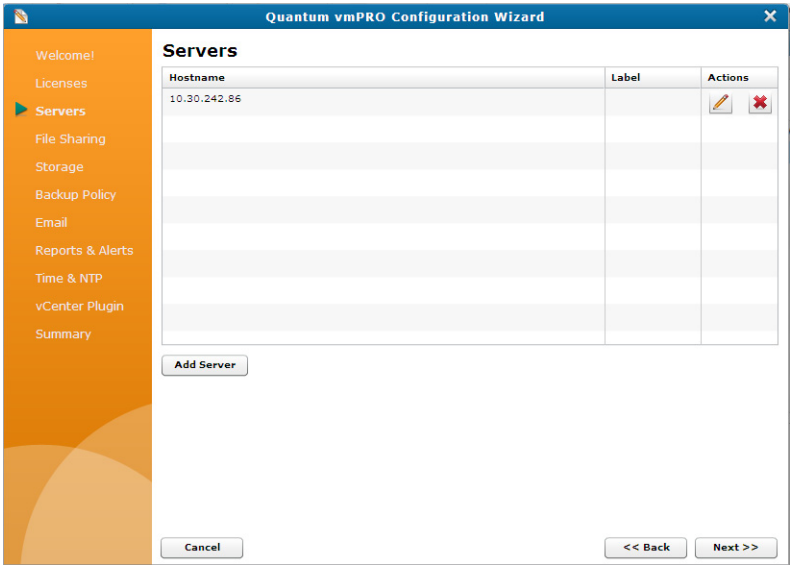
  b Click **Add vCenter**.

Figure 63 Configuration Wizard: No vCenter is Configured



- To delete ESX servers:
  - **a** Click the red **X** icon in the **Actions** column of the **Servers** list. The server will be removed from the list (see Figure 64).

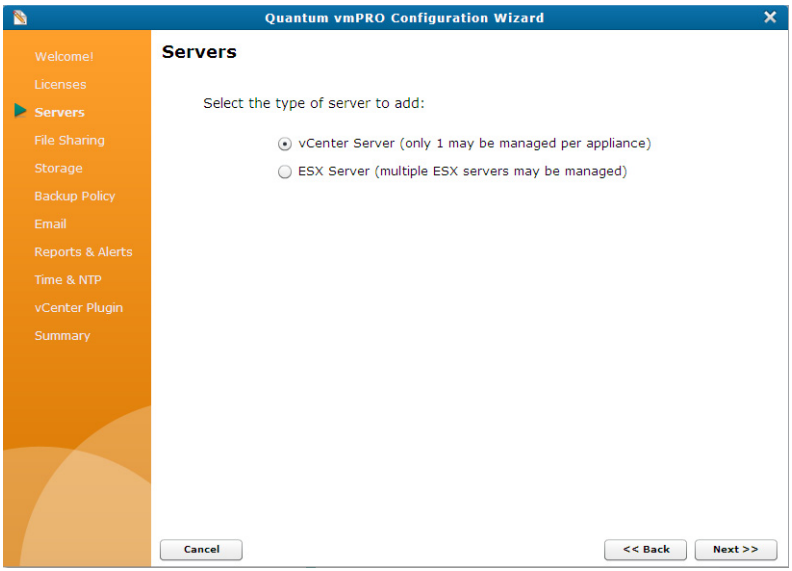
Figure 64 Configuration Wizard: Servers List



b Click **Back**.

c Select **vCenter Server** (see Figure 65).

Figure 65 Configuration Wizard: Select Server Type



d Click **Next**.

3 Fill in the **Configure Server** form (see Figure 66).

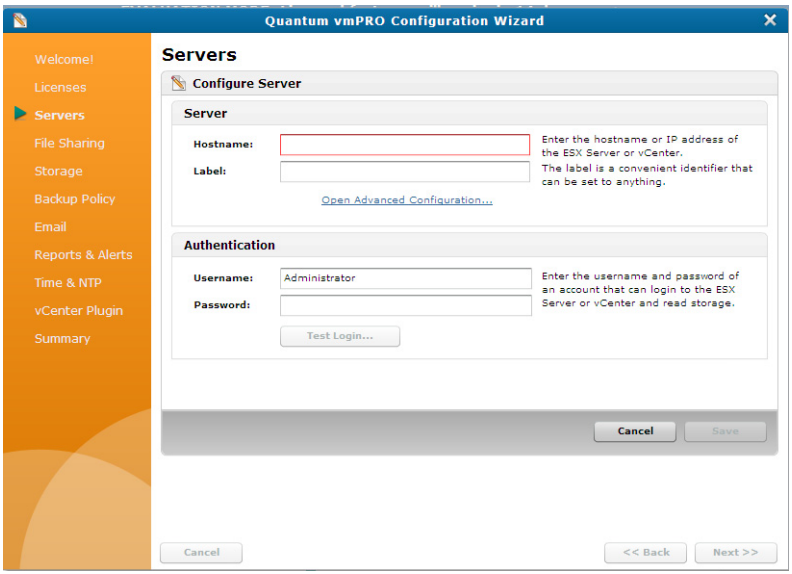
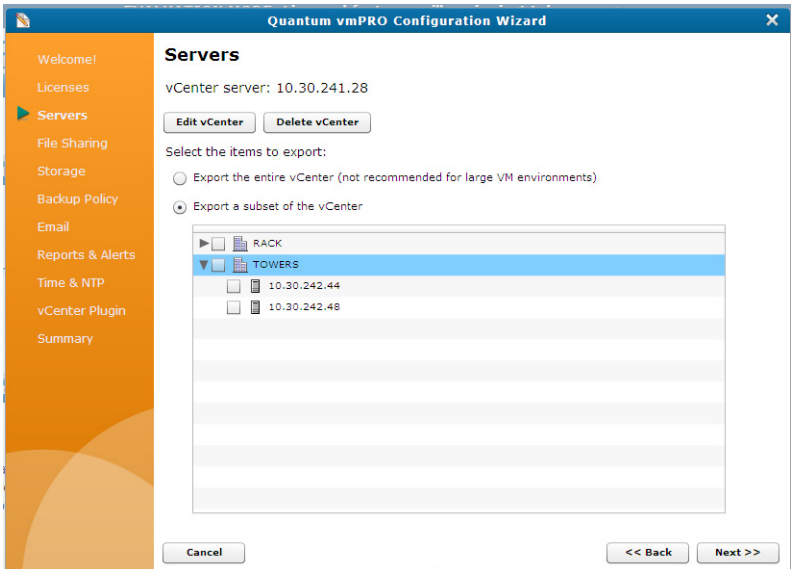


Figure 66 Configuration Wizard: Configure Server

4 Click **Save**.

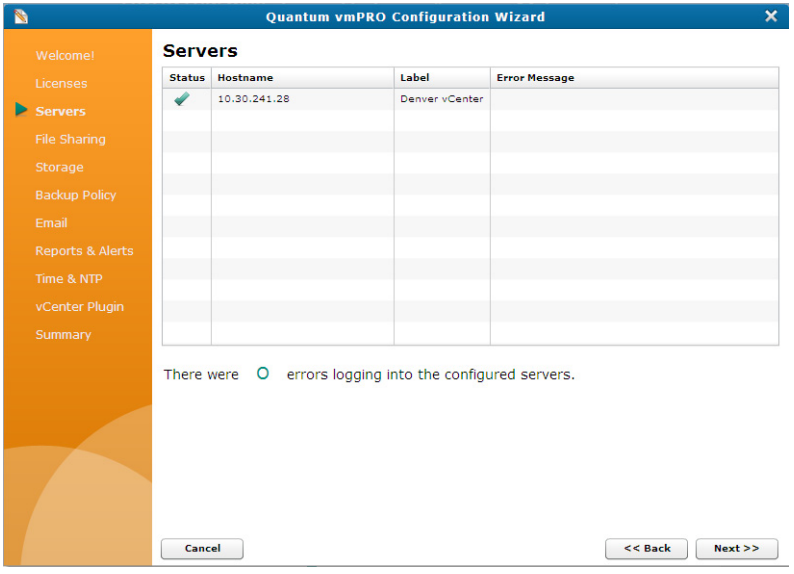
5 Select whether to export your entire vCenter, or a subset. If you select the subset option, you will need to select the items to export (see Figure 67).

Figure 67 Configuration Wizard: Selecting Items to Export



6 Click **Next,** and you will see a verification of your new configuration (see Figure 68).

Figure 68 Configuration Wizard: Configure Server Verification



7 From the **Configuration Wizard**, select **Summary** to go to the summary page and make your changes permanent.

8 Click **Save**, then **Next**, then **Finish**.

Edit a ESX Server

To edit an ESX Server, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.

2 Click the pencil icon in the **Actions** column of the **Servers** list.

3 Edit the **Configure Server** form (see Figure 69).

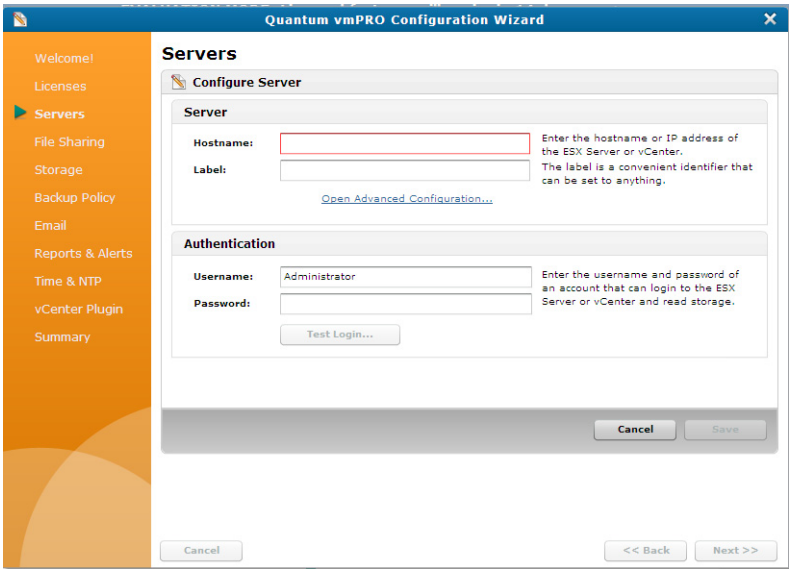


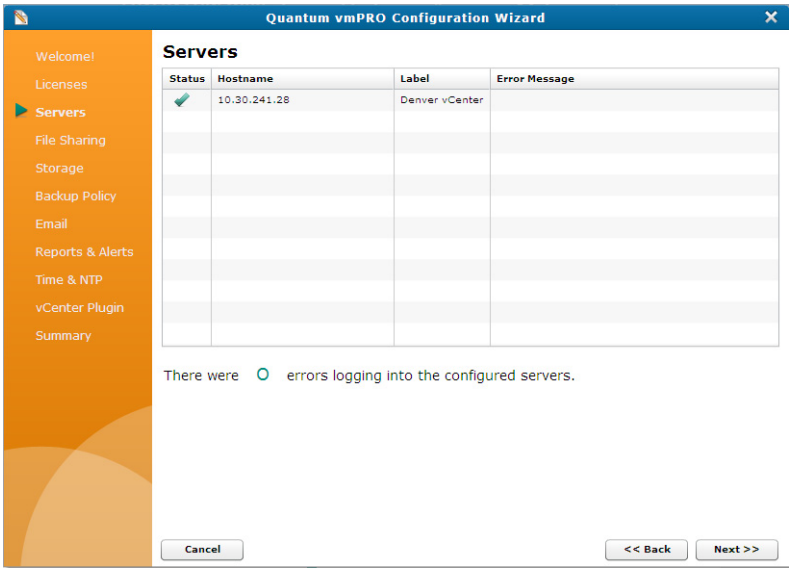
Figure 69 Configuration Wizard: Configure Server

4 Click **Save**.

5 Click **Next**.

6 You will see a verification of your new configuration (see Figure 70).

Figure 70 Configuration Wizard: Configure Server Verification



7 From the **Configuration Wizard**, select **Summary** to go to the summary page and make your changes permanent.

8 Click **Save**, then **Next**, then **Finish**.

Edit a vCenter Server

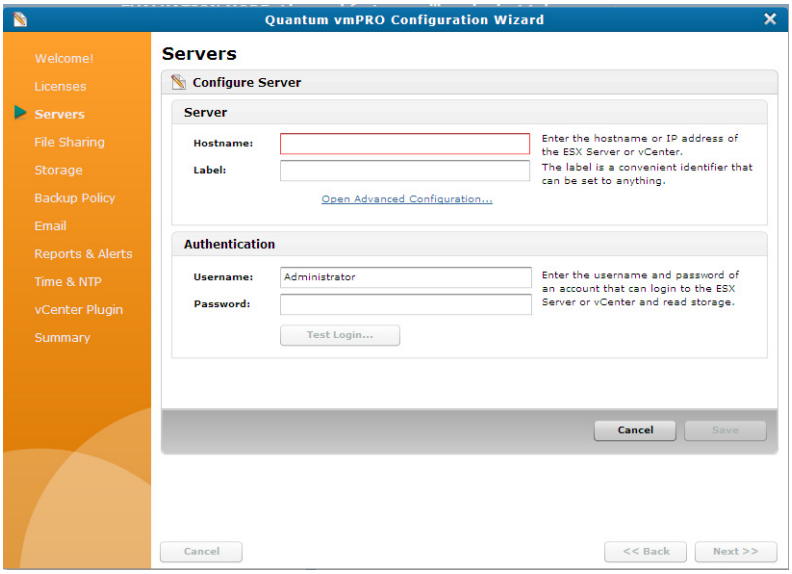
To edit a vCenter, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.

2 Click **Edit vCenter**.

3 Edit the **Configure Server** form (see Figure 71).

Figure 71 Configuration Wizard: Configure Server



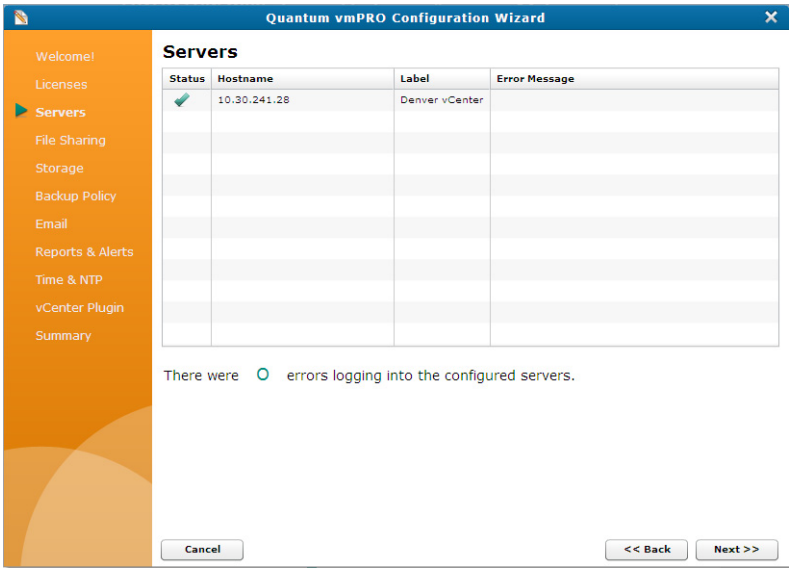
4 Click **Save**.

5 Make changes if needed to your **Export** selections.

6 Click **Next**.

7 You will see a verification of your new configuration (see Figure 72).

Figure 72 Configuration Wizard: Configure Server Verification



8 From the **Configuration Wizard**, select **Summary** to go to the summary page and make your changes permanent.

9 Click **Save**, then **Next**, then **Finish**.

Delete ESX Servers

To delete one or more ESX servers, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.

2 Click the red **X** icon in the **Actions** column of the **Servers** list. The server will be removed from the list.

3 If one or more ESX servers remain, you can save the new configuration by selecting **Summary**, and then clicking **Save**, then **Next**, and then **Finish**.

OR

If you deleted the only configured server, you need to add a new server.

- Add a new ESX server:

  a Click **Add Server**.

b Follow the wizard; see complete instructions to Add an ESX Server on page 62.

- Add a new vCenter server:
  a Click **Back** at the bottom of the **Servers** screen.
  b Select **vCenter**.
  c Click **Next**.
  d Click **Add Server** and add a new server as described in the section Add a vCenter Server on page 67.

Delete a vCenter Server

To delete a vCenter Server, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 59.

2 Click **Delete vCenter** (see Figure 73).

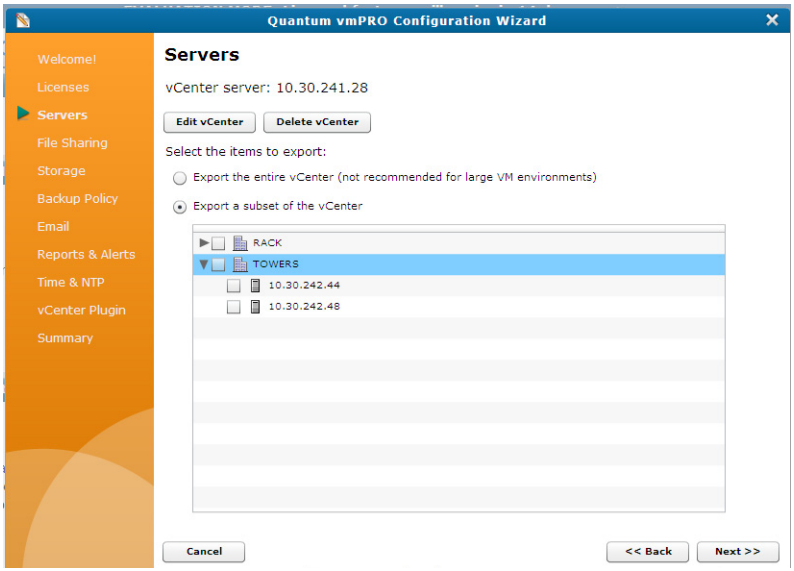


Figure 73 Configuration Wizard: Deleting a Server

You will go to a page that says, **No vCenter is configured** (see Figure 74).

Figure 74 Configuration Wizard: No vCenter is Configured

3 You must now configure a new server.

- Configure a new vCenter server:
  - **a** From the **No vCenter is configured** page, click **Add vCenter**.
  - **b** Add a new server as described in the section Add a vCenter Server on page 67.
- Configure an ESX server:
  - **a** From the **No vCenter is configured** page, click **Back**.
  - **b** Select **ESX server** and click **Next**
  - **c** Click **Add Server** and configure a new ESX server as described in the section Add an ESX Server on page 62.

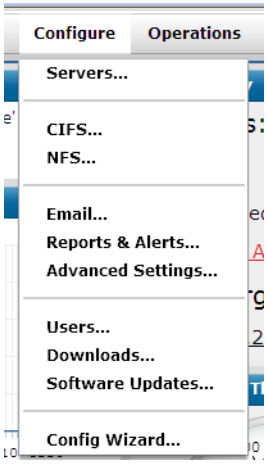
Manage Users

Quantum vmPRO has two levels of user privilege: Admin and User. Admin users have full privileges, while those with User privileges are more limited to basic operations, and cannot make configuration changes.

Create and manage users from the Quantum vmPRO GUI (See Access Quantum vmPRO on page 21 for information on accessing the GUI).

1 From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Users** (see Figure 75).

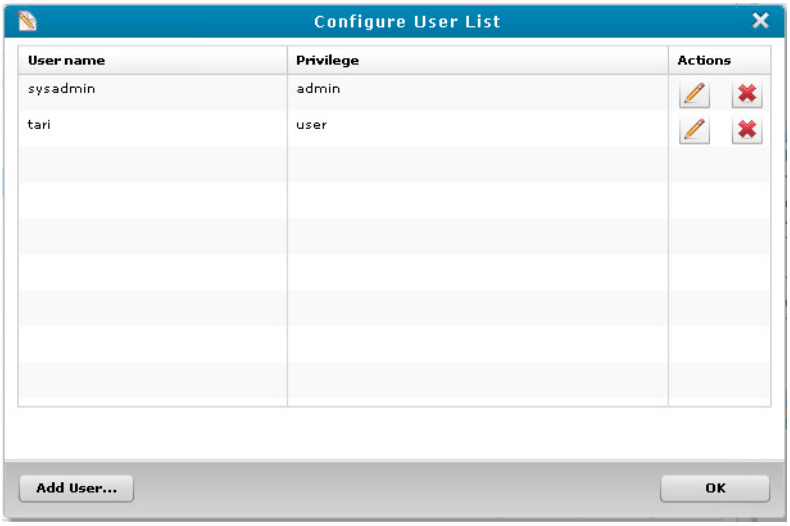
Figure 75 Accessing User Management



2 To add a new user, click **Add User**; or, to modify or delete an existing user, select that user's **Edit** (pencil) or **Delete** (**X**) icon in the **Actions** column (see Figure 76).

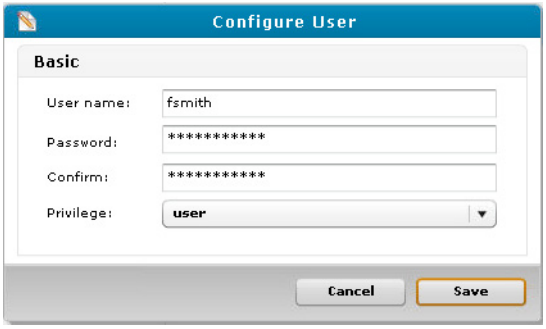
Note: You cannot delete user **sysadmin**. Also, you cannot change a username.

Figure 76 Configure User List



3 If you are editing or adding a user, fill in and save the **Configure User** form (see Figure 77).

Figure 77 Configure User



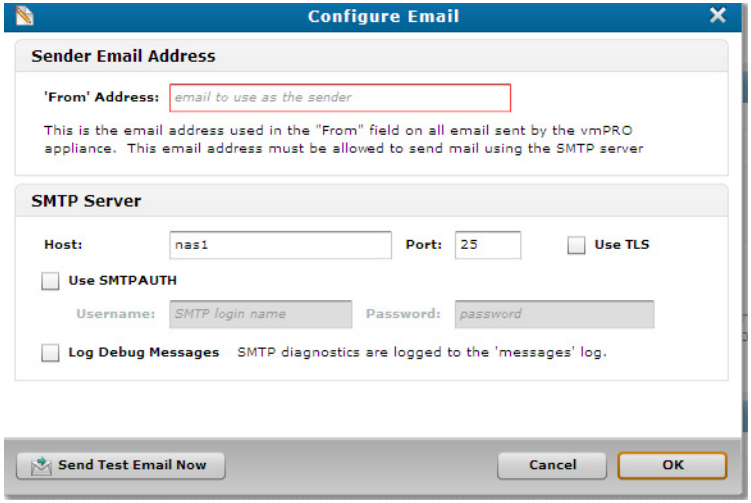
Reports, Alerts, and Autosupport

Quantum vmPRO's reports and alerts not only keep you informed; they also enable autosupport from the Quantum team, and enable you to view statistical analysis of your appliance's performance when you log into the Quantum support site.

To get these benefits, configure your appliance to email daily reports and alerts to you and copy the Quantum support team, and also to upload a daily report to the Quantum support site.

1. Make sure that your firewall allows access to **support.Quantum.com** on port 443.
2. Log into the Quantum vmPRO GUI (See Access Quantum vmPRO on page 21).
3. Check your email settings by selecting **Email** from the **Configure** drop-down list (see Figure 75).
   - The **'From' Address** field must contain the email address to be used for all email sent from the Quantum vmPRO appliance, and the **Host** and **Port** fields must contain correct information for your SMTP server (see Figure 78). (SMTP Auth is not required.)
   - If you click **Send Test Email Now**, you should receive a test email at the email address in the **'From' Address** field.
   - Click **OK** to save your changes.

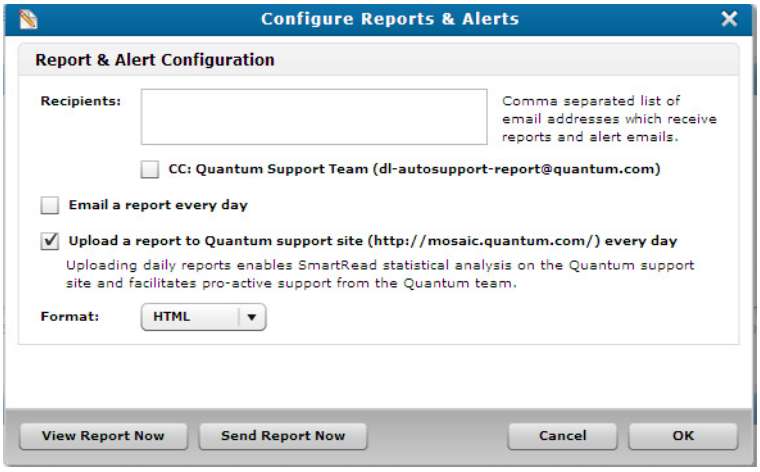
Figure 78 Configure Email



4. To configure reporting, select **Reports & Alerts** from the **Configure** drop-down list (see Figure 75).
   - Check the box next to **CC: Quantum Support Team**.
   - Check the box next to **Email a report every day**.

- Check the box next to **Upload a report to Quantum support site every day**
- Click **Send Report Now** to test your configuration. Within a few minutes, you should see your report on the support site at support.Quantum.com (check the **Appliances** tab of your **My Appliances** page).
- Click **OK** to save your changes (see Figure 79).

Figure 79 Configure Reports and Alerts



Time and NTP

Quantum vmPRO can use NTP servers to control the internal clock.

The time zone of the Quantum vmPRO Appliance must match the time zone of the vCenter or ESX server(s).

In a vCenter environment all hosts (including the vmPRO appliance), the vCenter server, and all ESX or ESXi hosts managed by the vCenter server must have their system time synchronized to the same NTP servers.

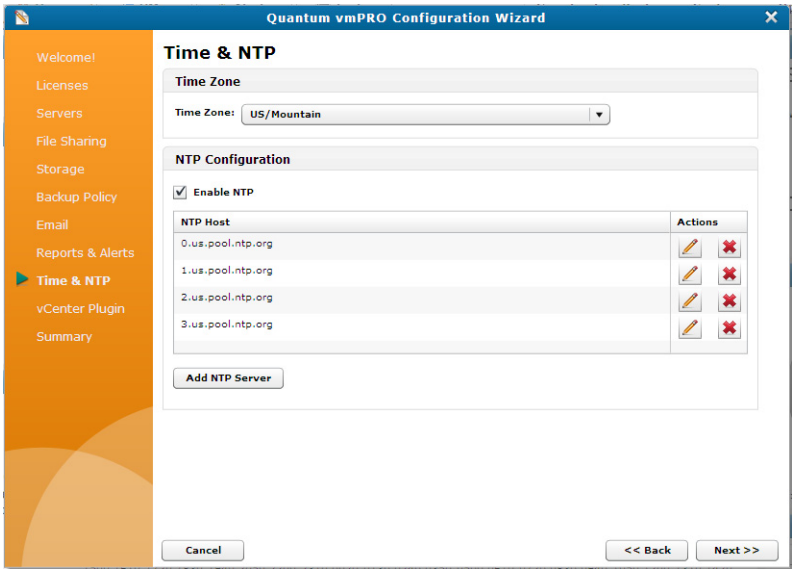
Note: Where time service is not available, all hosts must have their time manually set to the same time.

1 Log into the Quantum vmPRO GUI (See Access Quantum vmPRO on page 21).

2 From the Select **Configure** drop-down list, select **Config Wizard** to open the **Quantum vmPRO Configuration Wizard** (see Figure 75).

3 Select **Time & NTP** (see Figure 80).

Figure 80 Configuration Wizard: Time & NTP



4 Make your additions and changes to your **Time Zone** and **NTP** settings.

5 Select **Summary** (or click **Next** until you get to the summary page).

6 Click **Save**, then **Next**, then **Finish** to make your changes permanent.

Set Up and Manage Groups

If a single appliance does not provide enough throughput to complete backups in the desired window, additional appliances may be deployed in the environment.

Group Mode streamlines the management of multiple appliances. When configuring Group Mode, one appliance is selected as the master. You

then configure and manage all the other appliances from the master appliance.

Use the following to help you set up your groups:

- Before deploying multiple appliances in Group Mode, confirm each appliance has network connectivity and DNS resolution. Use the **net ping** command from the appliance's console command line to verify that each appliance can ping the other appliances that will be part of the group (ping by name if using DNS). Perform this test before creating the group, to ensure proper functioning of the group deployment.
- DNS resolution failures or IP routing issues in the group deployment may cause backup jobs to fail for VMs assigned to the misconfigured nodes.
- Verify that all group members/nodes have been upgraded to the same release version of the appliance, for example 3.0.
- Create your folders on the master appliance. They will appear on all nodes.

Set Up Groups

To set up groups, configure a Quantum vmPRO appliance as the group's master, and then add appliances to the group.

Groups are created using the console **Setup** wizard. See Access Quantum vmPRO on page 21 for information on accessing and using the console **Setup** wizard.

Create the Group's Master

1. Log into to the console **Setup** wizard for the Quantum vmPRO appliance that will be your group's master.
2. Select **Group Membership** (see Figure 81).

Figure 81 Group Membership

3 Press **<Enter>** to go to the **Change Group Membership** screen. (If an appliance is already configured as a master appliance, you will not be able to go to the **Change** screen, because no changes can be made to a master's group membership until all its members have been removed.)

4 On the **Change Group Membership** screen, select **Create a new group** (use the arrow keys to move the cursor to **Create** and then press the spacebar) (see Figure 82).

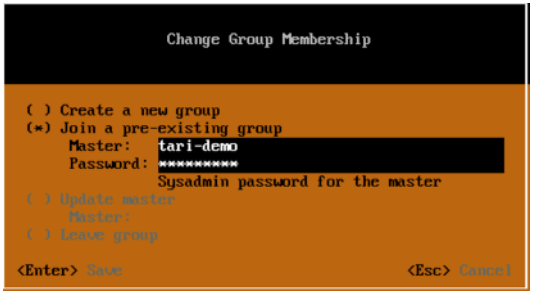
Figure 82 Creating a New Group

5 Press **<Enter>** to save the change, and the group will be created with the current Quantum vmPRO appliance as the master. You can now add other Quantum vmPRO appliances to the group.

Add Quantum vmPRO Appliances to a Group

1. Log into the console **Setup** wizard for a Quantum appliance you want to make a member of a group.
2. Select **Group Membership** and press **<Enter>** to go to the **Change Group Membership** screen.
3. At the **Change Group Membership** screen, select **Join a pre-existing group**.
4. Enter the IP address or resolvable hostname for the Quantum vmPRO appliance that is the master of the group you want to place the current appliance in.
5. Enter the **sysadmin** password for the master appliance (see Figure 83).

Figure 83 Joining an Existing Group



6. Press **<Enter>** to save the changes, and the Quantum vmPRO appliance will join the specified group.

Remove a Quantum vmPRO Appliance From a Group

1. Log into the **Setup** console for the Quantum vmPRO appliance to be removed from the group.
2. Select **Group Membership**.
3. From the **Change Group Membership** screen, select **Leave group**.
4. Save the changes.

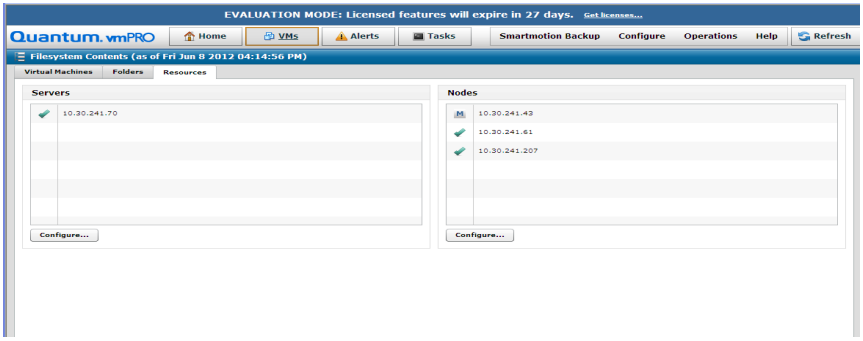
Note: You cannot remove a master appliance from a group unless all other appliances have already been removed from the group.

Manage Groups

Once you have created a master and added appliances to it, you must configure and manage all group members from the master appliance. If you go to the GUI for a group member that is not a master, you will see a warning reminding you to go to the group's master appliance to manage all appliances in the group. The warning includes a **Go to master** button that will take you to the GUI for the master appliance. Quantum does not support configuring a node appliance independently of its master.

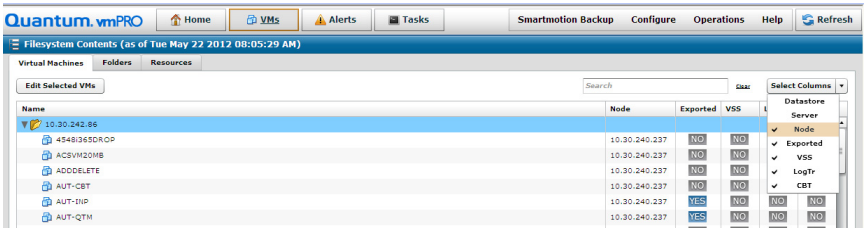
You can see the list of nodes on the **Resources** screen of the master appliance's **VMs** tab. (see Figure 84).

Figure 84 Lists of Nodes



On the VMs table, accessed by clicking **VMs** on the vmPRO GUI and then selecting the **Virtual Machines** tab, you can add a **Node** column so that you can see which node each VM is associated with. Open the **Select Columns** drop-down list and check **Node** (see Figure 85).

Figure 85 Adding a Node Column



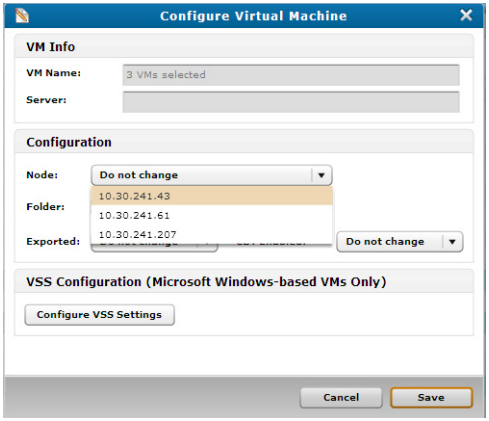
Increase Backup Throughput

Increasing the number of nodes and correctly selecting VMs to be backed up by each node can increase overall backup throughput.

To select or change the node to which VMs are assigned, do the following:

1. From the Quantum vmPRO GUI, click **VMs**.
2. At the VMs screen, click the **Virtual Machines** tab.
3. From the VMs table, select one or more VMs whose node you want to select or change. You may need to open a folder (by clicking it) to access the VMs.
   - To select consecutive VMs in the list, hold down **<Shift>** and click the first and last VM in the series.
   - To select non-consecutive VMs, hold down **<Ctrl>** and click each VM you need to select.
   - If you need to select all the VMs in a folder, select the folder.
4. Click **Edit Selected VMs** above the VM list.
5. In the **Configure Virtual Machine** dialog box, select the appropriate node from the **Node** drop-down list (see Figure 86).
6. Click **Save**.

Figure 86 Selecting a Node



Group Mode Licensing

If you find that you need to increase the performance of a vmPRO, you can do so by distributing backups across other vmPRO nodes using a single capacity based license. Once installed, the single license is shared by the group and the capacity of the entire group is managed by the one capacity license.

To take advantage of Group Mode Licensing, you must install multiple vmPRO appliances, designate one as the Master, and then add the other vmPRO appliances as nodes of the Master. To accomplish this, do the following:

1. Install a vmPRO (the one you want to use as the Master). Follow the procedure as presented in the online Quantum vmPRO Download and Installation Guide.

   Note: You will need a valid e-mail address and password to access the vmPRO Installation Guide.

2. Install the capacity license that you have purchased. Follow the instructions presented by the Licenses Wizard (see Configure Quantum vmPRO on page 28.
3. Configure the vmPRO as the Master (see Create the Group's Master on page 83).
4. Install all the vmPRO appliances that you want to be nodes (appliances managed by this Master) by following the instructions presented in Step 1 of this procedure.
5. Configure each node (add it to the group managed by this master) (see Add Quantum vmPRO Appliances to a Group on page 85).

Update Group Members When the Master's IP Address/ Hostname Changes

If a master appliance's hostname or IP address changes (in other words, the command `net set hostname` was run on the master), the appliances in the group must be updated and restarted. Both operations are performed from the Quantum vmPRO command line. See Access Quantum vmPRO on page 21 for information on accessing the Quantum vmPRO appliance's command line.

1. Update the group member appliance to the master appliance's new IP address/hostname using this command:

   ```
   group update master <master>
   ```

The `group update master` command assumes that the master is the same appliance but with a new IP address. The command should not be used in any other circumstance. After you run `net set hostname` on a master appliance, you will see a reminder to run `group update master` on the appliances in the group.

2 Restart the Quantum vmPRO appliance using this command:

```
system reboot
```

Import the Configuration Settings for Groups

This procedure will allow you to transfer the configuration settings of all the members of a vmPRO group (master and all nodes) to new appliances and have the new group function as the original did.

Note: Only the configuration settings of the previous/old group's master vmPRO appliance needs to be saved.

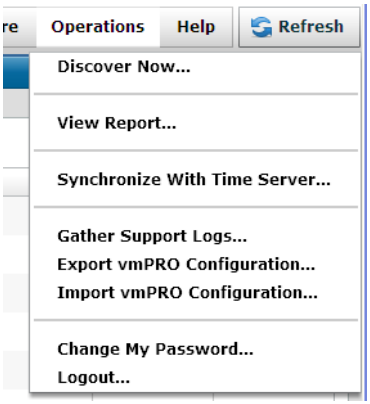
1 Save the previous/old master appliance's configuration settings: From the previous/old master appliance's vmPRO GUI, select **Export vmPRO Configuration** from the **Operations** drop-down list (see Figure 87).

Note: Remember the file name and its location when you download it.

2 Import the master configuration package to the new factory default appliance: From the new appliance's vmPRO GUI, select **Import vmPRO Configuration** from the **Operations** drop-down list (see Figure 87). User the **Browse** button to locate and select the file you downloaded in the previous step. This appliance will be the new master.

Note: The importing of a saved/exported configuration package of a master appliance will automatically create a new master appliance.

Figure 87 Operations drop-down list



3 For each node that needs to be recovered, deploy a new appliance. Follow the procedure as presented in the online Quantum vmPRO Download and Installation Guide to deploy each new appliance.

Note: You will need a valid e-mail address and password to access the *vmPRO Download and Installation Guide*.

4 For each node, access its console Setup wizard and join the group. (See Add Quantum vmPRO Appliances to a Group on page 85.)

5 Manually reassign the VMs from the old nodes to the new nodes:

a From the master appliance's vmPRO GUI, click **VMs**.

b At the VMs screen, click the **Virtual Machines** tab (see Figure 91).

c From the VMs table, select the VMs that are to be reassign. You can also type **node:<node_name>** in the search field to help you find the VMs.
You may need to open a folder (by clicking it) to access the VMs.

- To select consecutive VMs in the list, hold down **<Shift>** and click the first and last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and click each VM you need to select.
- If you need to reassign all the VMs in a folder, select the folder.

d Select **Edit Selected VMs**.

e On the **Configure Virtual Machine** dialog box, select the appropriate node from the **Node** drop-down list, and then select **Save** (see Figure 86).

6 Remove the old nodes:

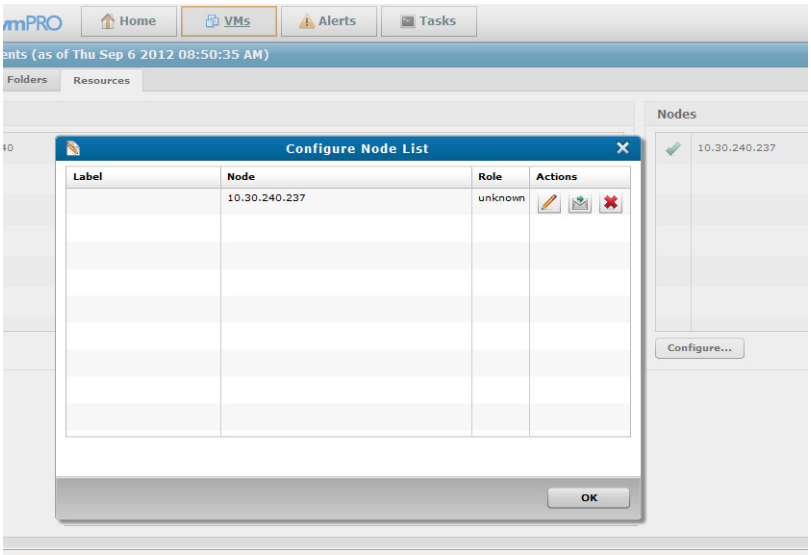
a From the master appliance's vmPRO GUI, click **VMs**.

b At the VMs screen, click the **Resources** tab.

c Under the **Nodes** pane, click **Configure**.

d On the **Configure Nodes List** dialog box, click the (red) **X** for each node that you want to remove (see Figure 88). (This will avoid the confusion of having *orphaned* nodes.)

Figure 88 Remove the Old Nodes



7 Reboot all nodes using the VMware vSphere console or from the each appliance's command console using the command **system reboot**.

Create and Manage Folders

By default, the appliance organizes your VMs in folders named for their respective vSphere ESX hosts. These folders are separate from your existing folder structures inside vSphere, and they are used in the appliance to allow you to refine and optimize the backup loads across your appliances.

If you add a vCenter server, your VMs will all appear in a single initial folder with the name of that vCenter server. Alternately if you add one or more ESX servers, your VMs appear in folders corresponding to the ESX host on which they reside.

You can create additional folders to visually organize your VMs and to manage multiple backup policies which will facilitate higher throughput. If you are using Group Mode, folders that you create on the master appliance will appear on all node appliances.

Folders are a powerful construct within the appliance. They enable you not only to organize your VMs visually, but also to manage multiple Differential CBT backup rotation schedules, and the distribution of backup jobs across multiple appliance nodes. If you are using Group Mode, all folders that you create on the master appliance will appear on all node appliances.

Note: If you have multiple Quantum vmPRO appliances and have placed them in groups, the folders created on the master appliance will be used to manage all the appliances in the group, so create your folders from the GUI of the master appliance.

Use the following to help you set up your folders:

- Add folders and divide your VMs among them to enable multiple backup rotation policies.
- Define folders that reflect your organization's needs. For example, name folders and group VMs according to backup schedules or classes of VMs such as Production, QA, and Development.
- Stagger full backups across different weeks to shorten long full backup windows.

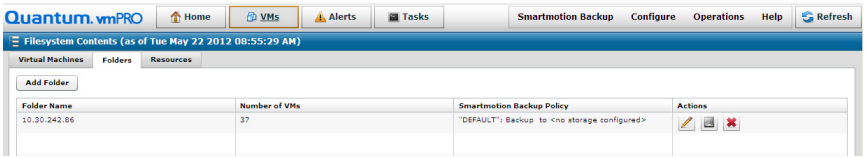
- Assign folders and VMs to be managed by the different appliance nodes in a group to distribute the backup load.

Create Folders

To create a folder, do the following:

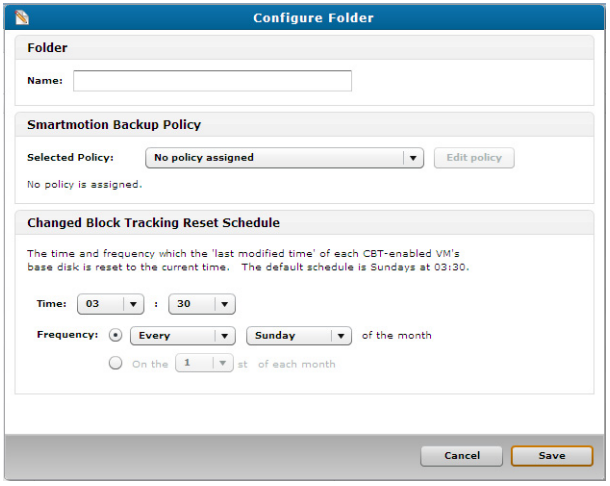
1. From the Quantum vmPRO GUI, click **VMs**. (See Access Quantum vmPRO on page 21 for information on accessing the GUI.)
2. At the VMs screen, click the **Folders** tab (see Figure 85).

Figure 89 Folders tab



3. On the **Folders** screen, click **Add Folder**.
4. In the **Configure Folder** dialog box, enter a name for the folder (see Figure 90).

Figure 90 Configure Folder



5. Select a **SmartMotion Backup Policy**.
6. If you are using Changed Blocked Tracking on the VMs, you can change the CBT reset schedule for the folder if you wish. (See

vSphere Changed Block Tracking (CBT) Support on page 108 for more information.)

7 Click **Save**, and you will see the new folder appear in the list on the **Folders** tab.

8 Add as many folders as you need.

Move VMs to New Folders

To move VMs to a new folder, do the following:

1 From the Quantum vmPRO GUI, click **VMs**.

2 At the VMs screen, click the **Virtual Machines** tab.

3 From the VMs table, select one or more VMs to move into a new folder. You may need to open a folder (by clicking it) to access the VMs.

- To select consecutive VMs in the list, hold down **<Shift>** and click the first and last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and click each VM you need to select.
- If you need to move all the VMs in a folder to the same new folder, simply select the folder.

4 Click **Edit Selected VMs** above the VM list (see Figure 91).

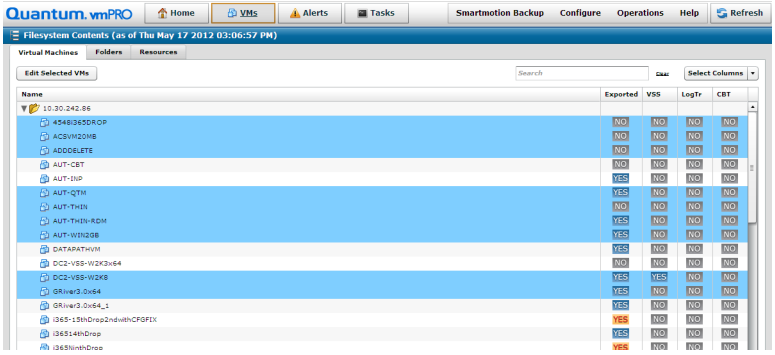
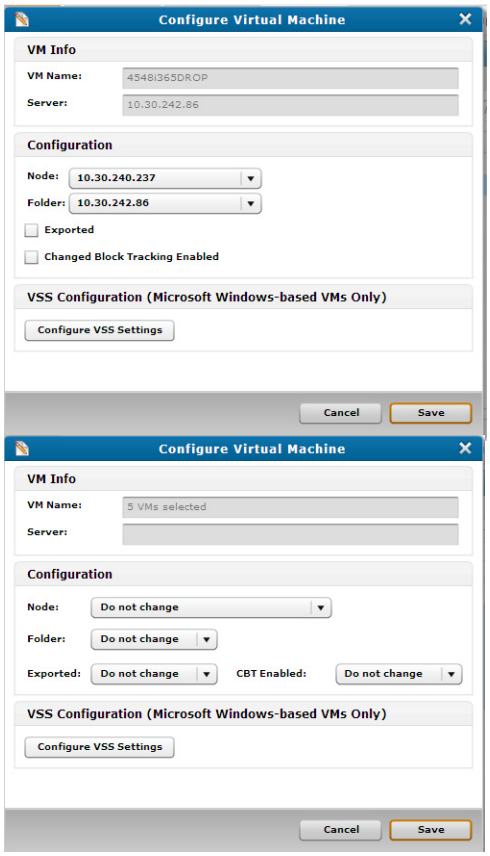


Figure 91 Selecting VMs to Move

5 In the **Configure Virtual Machine** dialog box, select the folder to move the VM or VMs to. The dialog box will look different according to whether you have chosen one or multiple VMs to move (see Figure 92).

Figure 92 Configure Virtual Machine



6 Click **Save**. You will return to the **Virtual Machines** tab, where you will see the VMs listed in their new folders.

Rename or Delete a Folder

To rename or delete a folder, select **VMs** on the Quantum vmPRO GUI, and then select the **Folders** tab.

In the **Actions** column on the **Folders** tab, you can select the **Edit** (pencil) or **Delete** (**X**) icon for the folder you need to work with.

Before you can delete a folder, you must move all the VMs out of that folder.

Chapter 4

Quantum vmPRO Advanced Usage

This chapter describes advanced features of Quantum vmPRO and contains the following sections:

- Active Directory Backup and Recovery
- Embed the Quantum vmPRO GUI in vSphere Client
- Quantum vmPRO Support for External Monitoring
- Synchronize With the Time Server
- vSphere Changed Block Tracking (CBT) Support

Active Directory Backup and Recovery

Quantum vmPRO supports application-consistent quiescing of Windows 2003 32bit/64bit, application-consistent quiescing of Windows 2008 32bit/64bit, and Windows 2008 R2. Quantum's VSS Writer supports automating non-authoritative recovery of Active Directory, Exchange 2007, Exchange 2010 and SQL Server 2008 from the snapshot.

Note: Before beginning a VSS backup, ensure that the VM has enough free disk space. VSS backups will fail when the VM is low on free disk space. For more information, see http://technet.microsoft.com/en-us/library/cc708051(v=ws.10).aspx.

Note: VSS requires VMware Tools to be up to date.

Quantum VSS Writer

The VSS Writer prepares Windows for a VMware snapshot and automates a non-authoritative restore of Windows Domain Controller when the virtual machine is restored. When restoring a Windows Active Directory Domain Controller from a snapshot image, Quantum automatically boots the VM in the restore mode and performs the necessary steps to prevent a "USN rollback" so that directory replication will work correctly.

Requirements for Active Directory Backup and Recover Support

- Windows Server 2003 and above
- VMware tools (latest build preferred)
- The Quantum VSS Writer
- Enabled Quiesce on VMs

Install the Quantum VSS Writer

To install the Quantum VSS agent, do the following:

1. Download the appropriate version of **QuantumVSS.exe** from **\\<vmPRO IP>\quantum-support\vss**.

   In this share you will see two folders, 2003 and 2008. In the 2003 folder you will find the **QuantumVSS.exe** that supports Windows 2003. In the 2008 folder there are two sub folders, 32bit and 64bit, each has a **QuantumVSS.exe** that supports Windows 2008 32 or 64 bit servers respectively.

2. Install the correct Quantum VSS on the Windows VM by double clicking the **QuantumVSS.exe** file and following the instructions.

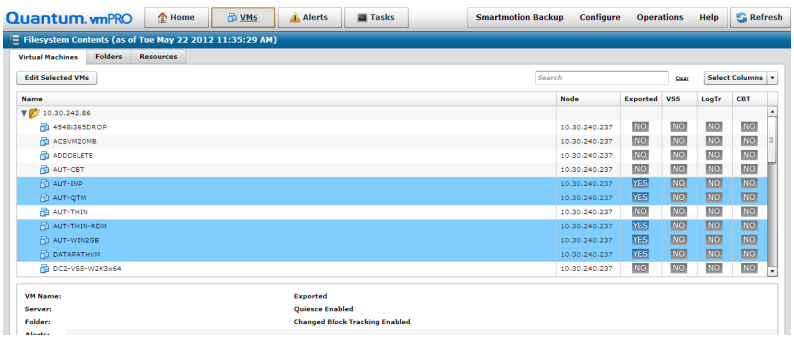
Enable Quiesce for VMs

Enable Quiesce for VMs from the Quantum vmPRO GUI (see Access Quantum vmPRO on page 21 if you need information on accessing the GUI).

1. From the Quantum vmPRO GUI, click **VMs**.
2. From the **VMs** screen, select the **Virtual Machines** tab.
3. In the VM table on the **Virtual Machines** tab, select the VM or VMs for which you need to enable Quiesce (see Figure 93).
   - To select consecutive VMs in the list, hold down **<Shift>** and click the first and last VM in the series.
   - To select non-consecutive VMs, hold down **<Ctrl>** and click each VM you need to select.
   - You can select a folder to edit all the VMs in that folder.

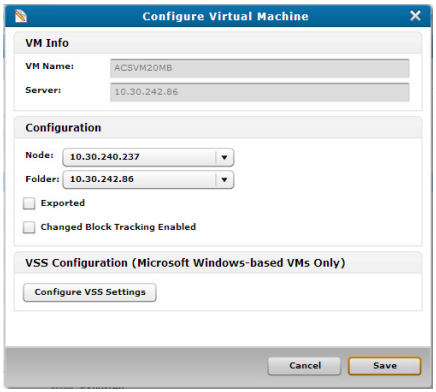
     By default, all your VMs are in a single folder, named for their vCenter or ESX server, but you can see create more folders and move VMs into them to facilitate VM management (see Create and Manage Folders on page 92).

Figure 93 Selecting VMs to Enable For Quiesce



4. Click **Edit Selected VMs**.
5. In the **Configure Virtual Machine** dialog box, check **Configure VSS Settings** (see Figure 94).

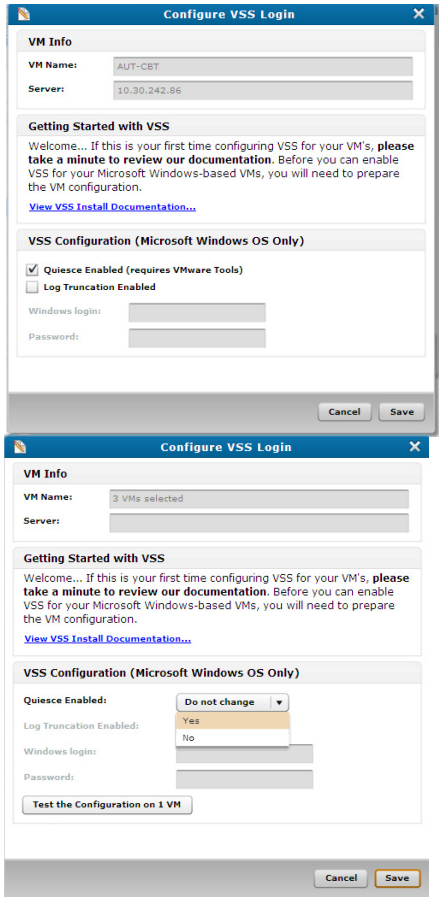
Figure 94 Configure Virtual Machine



6 From the **Configure VSS Login** dialog box, select **Quiesce Enabled (requires VMware tools)** if you have selected one VM to quiesce; select **Yes** in the **Quiesce Enabled** drop-down list if you have selected multiple VMs to quiesce (see Figure 95).

If necessary, Log truncation can be enabled at this time by selecting **Log Truncation Enabled** and providing the login credential for the VM. Log Truncation allows the vmPRO to trigger transaction log truncation after a backup completes. This will occur automatically after a SmartMotion backup or it can be triggered manually from the vmPRO GUI after a third party backup has completed. Failure to handle the truncation of the log files can cause a system disk or partition to become full, which will lead to application downtime.

Figure 95 Enable Quiesce

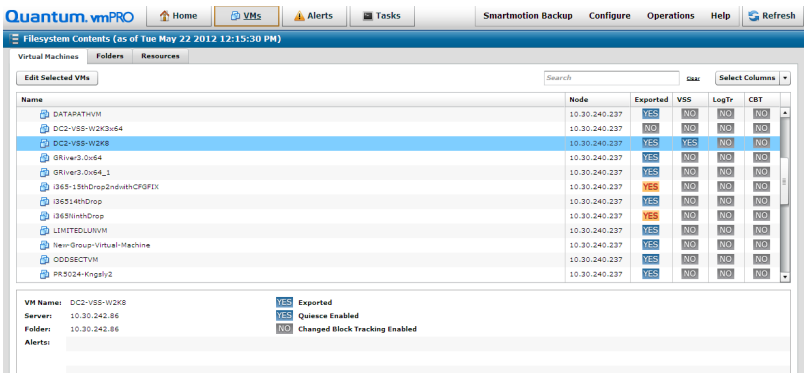


7 Click **Save**. If you configure a large number of VMs, the process may take some time.

8 When the process is finished, you can view your changes in the VMs table (see Figure 96).

- The **VSS** column on the Virtual Machines tab shows whether Quiesce is enabled for each VM.
- If you do not see a **VSS** column, you can click the **Select Columns** drop-down list to add the column.
- When you select a single VM, you will see further details about that VM at the bottom of the table.

Figure 96 VMs List (Quiesce Enabled)



VMware Tools Out of Date

VSS requires VMware tools to be up to date. If VSS (quiesce) is enabled on a VM and its VMware Tools is out of date, the issue will be reported in the Quantum vmPRO GUI.

- On the **Virtual Machines** tab of the **Home** page, the VM's **YES** in the VSS column will be red.
- If you mouse over a VM that has a red **YES**, you will see an error message.
- You will also receive alert messages if VMware Tools is out of date for any VM's. If cleared, the alert message will reappear every 15 minutes until you update VMware Tools and perform a discover, or disable VSS (Quiesce) for the VMs.

Uninstall the VSS Writer

Use the Windows Control Panel **Add/Remove Programs** to uninstall the VSS Writer.

VSS Resources

Information about what VMware tools can (and cannot) do with VSS:

- Working with Microsoft Volume Shadow Copy

Information about Active directory recover:

- How to detect and recover from a USN rollback in Windows Server 2003
- Active Directory Backup and Restore

Embed the Quantum vmPRO GUI in vSphere Client

The Quantum vmPRO GUI can be embedded directly into vSphere Client when it is connected to a vCenter Server. To use this feature, a Quantum plugin must be registered with the vCenter server.

Register the vCenter Plugin

Register the plugin from the Quantum vmPRO GUI (see Access Quantum vmPRO on page 21).

1. From the **Configure** drop-down list, select **Config Wizard**.
2. From the **Configuration Wizard** welcome screen, select **vCenter Plugin** (see Figure 97).

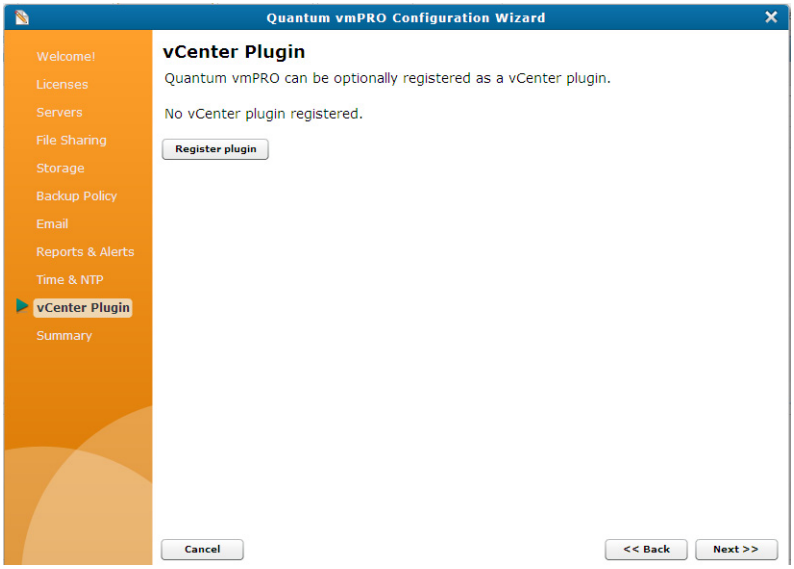


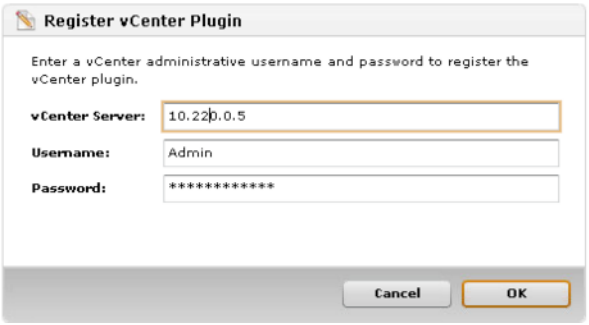
Figure 97 Configuration Wizard: vCenter Plugin

3. Click **Register plugin**.
4. In the **Register vCenter Plugin** form, enter the IP address or resolvable hostname of your vCenter server.

Note: If you need to register your vCenter plugin using an alternate port, enter the IP address and port number using the following format: **<IP_address:port_number>**.

5 Enter the administrative username and password (see Figure 98).

Figure 98 Register vCenter Plugin



6 Click **OK** and the plugin will be registered with the vCenter server.

7 From the **Configuration Wizard**, select **Summary** to go to the summary page.

8 Click **Save**, then **Next**, then **Finish** to make your changes permanent.

You can return to the **Configuration Wizard** if you need to remove the plugin from the vCenter server.

Use the vCenter Plugin Once It Has Been Registered

To use the vCenter plugin, do the following:

1 Restart your vCenter server.

2 Log into your vSphere client.

3 Select a datacenter or datacenter folder from the Inventory view.

4 Select the new tab labeled **Quantum vmPRO <IP address>**, and the Quantum vmPRO GUI will load in the tab. (A window may appear asking whether you want to trust the security certificate; select **Yes**.) You can then log into the GUI as usual.

Note: If the Quantum vmPRO GUI does not load, make sure Adobe Flash Player is installed on the system running the vSphere Client.

Quantum vmPRO Support for External Monitoring

Quantum vmPRO supports external read-only monitoring using SNMP Version 2c. Quantum vmPRO supports MIB-II.

Quantum vmPRO also supports Nagios remote plugin execution using the NRPE add-on. This allows you to monitor aspects of the Quantum vmPRO appliance using an external Nagios application.

SNMP Support

Quantum vmPRO supports external read-only monitoring using SNMP Version 2c. Quantum vmPRO supports MIB-II.

By default, SNMP is on and allows access to any object in the system branch of the tree. SNMP can be configured from the command line of the Quantum vmPRO appliance. Table 1 lists the supported commands.

Table 1 SNMP Commands

Command	Description
`snmp disable`	Turn off SNMP
`snmp enable`	Turn on SNMP
`snmp reset rocommunity`	Reset the read-only community string to public
`snmp set rocommunity <community string>`	Set the read-only community string to an argument
`snmp status`	Show whether SNMP is enabled and print the current read-only community string.

Nagios Support

Quantum vmPRO supports Nagios remote plugin execution using the NRPE add-on. This allows you to monitor aspects of the Quantum vmPRO appliance using an external Nagios application.

Monitoring commands are executed from the external Nagios application using the **check_nrpe** plugin with arguments to specify the host address and command:

```
check_nrpe -H <Quantum vmPRO appliance address> -c
<command>
```

Table 2 lists the supported commands.

Table 2 Nagios Commands

Command	Description
`check_disk`	Check the disk space on the appliance file system
`check_load`	Check the system load average over the last 1, 5 and 15 minutes
`check_mysql`	Check the status of mysql on the appliance
`check_snmp`	Check the status of snmp on the appliance

Table 3 lists commands that are used from the Quantum vmPRO console command line (see Access Quantum vmPRO on page 21 for information on accessing the command line):

Table 3 Nagios Console Commands

Command	Description
`nagios disable`	Disable Nagios on the appliance
`nagios enable`	Enable Nagios on the appliance
`nagios status`	Check status of Nagios

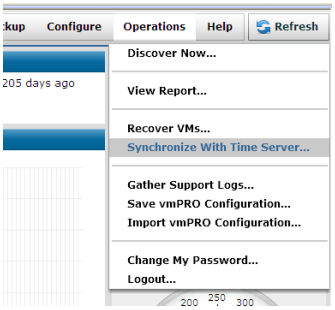
For more information about Nagios, see: www.nagios.org

Synchronize With the Time Server

Synchronize your appliance with the time server using the Quantum vmPRO GUI (see Access Quantum vmPRO on page 21 if you need information on the GUI).

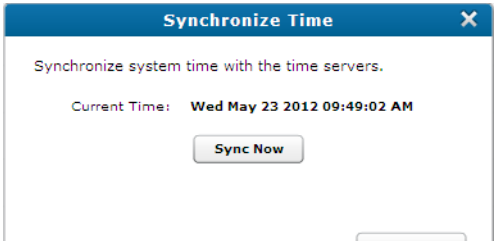
1 From the **Operations** drop-down list in the Quantum vmPRO GUI, select **Synchronize With Time Server** (see Figure 99).

Figure 99 Synchronize With Time Server



2 In the **Synchronize Time** dialog, click **Sync now** (see Figure 100).

Figure 100 Synchronize Time Dialog



3 When the synchronization is complete, you'll see a finished message, and you can click **OK** to dismiss the dialog box.

vSphere Changed Block Tracking (CBT) Support

The appliance's SmartRead and SmartMotion capabilities can leverage VMware's Changed Block Tracking (CBT) feature to identify the virtual disk blocks that have changed, allowing backup and storage processes to avoid unnecessary reads. CBT allows the vmPRO to backup VMs at a differential level; thus, reducing network I/O and allowing backups to finish faster because only the changes to the virtual machine's disk(s) are backed up.This provides the basis for the appliance's differential backup capability. The CBT feature in VMware ESX versions 4.0 and later has been integrated with Quantum vmPRO.

When the CBT feature is enabled for a VM, the Quantum vmPRO appliance will create a **pancbt** file for each base disk (**-flat.vmdk** file) in the **/export** file system. These **pancbt** files contain the changed blocks for their corresponding base disk. Theses differential CBT backup files, designated with the **–pancbt.vmdk** suffix, are not complete **.vmdk** disk images and require recovery through the appliance before being usable. The base disk's mod time will be the start of the reset time, while the **pancbt** files will have newer mod times. (See the section, Schedule Your Changed Block Tracking Resets on page 112, for the default reset schedule and instructions for selecting a different schedule.)

Note: If you are using the free version of ESXi, CBT enable will fail with the error `CBT Error: Error from create snapshot operation`. Only the paid version of ESXi is fully supported.

CBT Considerations

When using CBT, keep the following in mind:

- VMs must be at virtual hardware version 7 for CBT.
- The ESX server must be version 4.0 or above.
- Assumes incremental backups.
- If you are using ESX 4.1, reverting a snapshot resets CBT for that VM. You must then remove all snapshots from the appliance and run the console command `cbt reset <hypervisor> <VM>`.

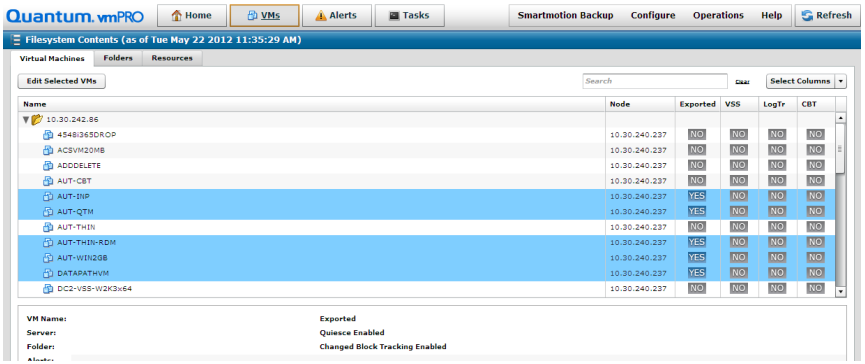
- Moving a VM with Storage vMotion disables CBT. Standard vMotion (i.e., when the vmdk stays in the same physical place, only the ESX host changes) does *not* disable CBT.
- Multiple appliances cannot manage the same VM when the CBT feature is used on the VM.
- Do not schedule CBT resets to occur at the same time as backups. It is recommended that CBT resets be scheduled hours before the start of your backup window to allow enough time for the reset on all CBT-enabled VMs to complete before your backups start.
- Activating or deactivating the CBT feature will trigger the immediate creation and removal of an ESX snapshot for each VM activated, this is required by the VMware API.
- Differential CBT backup files are designated with the -pancbt.vmdk suffix. Unlike a Full backup, these files are not complete. VMware expects .vmdk files to be complete images, thus CBT-based backups require recovery through the vmPRO Recovery Wizard before being usable to ESX.

Enable CBT for VMs

Enable CBT for VMs from the Quantum vmPRO GUI (see Access Quantum vmPRO on page 21 if you need information on the GUI).

1. From the Quantum vmPRO GUI, click **VMs.**
2. Select the **Virtual Machines** tab.
3. In the table on the **Virtual Machines** tab, select the VM or VMs for which you need to enable CBT (see Figure 101).
   - To select consecutive VMs in the list, hold down **<Shift>** and click the first and last VM in the series.
   - To select non-consecutive VMs, hold down **<Ctrl>** and click each VM you need to select.
   - Select a folder to set the CBT settings for that folder (see Create and Manage Folders on page 92).

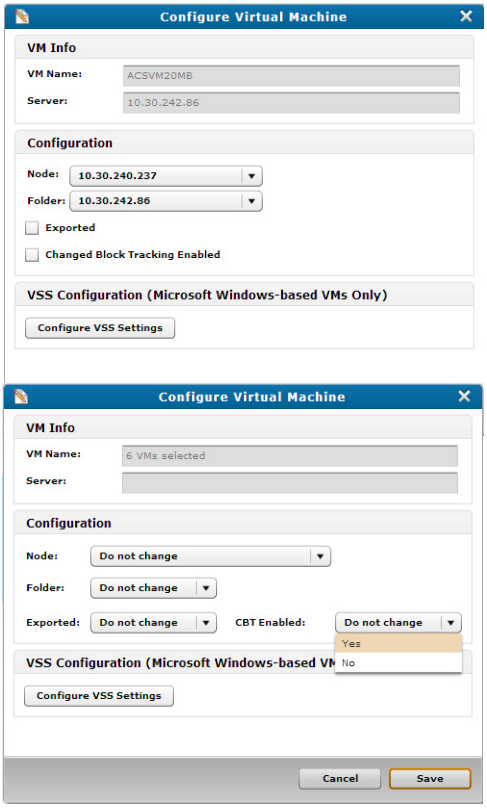
Figure 101 Selecting VMs to Enable For CBT



4 Click **Edit Selected VMs**.

5 In the **Configure Virtual Machine** dialog box, check **Changed Block Tracking Enabled**, or, if you are configuring a folder or a group of VMs, select **Yes** from the **CBT Enabled** drop-down list (see Figure 102).

Figure 102 Configure Virtual Machine

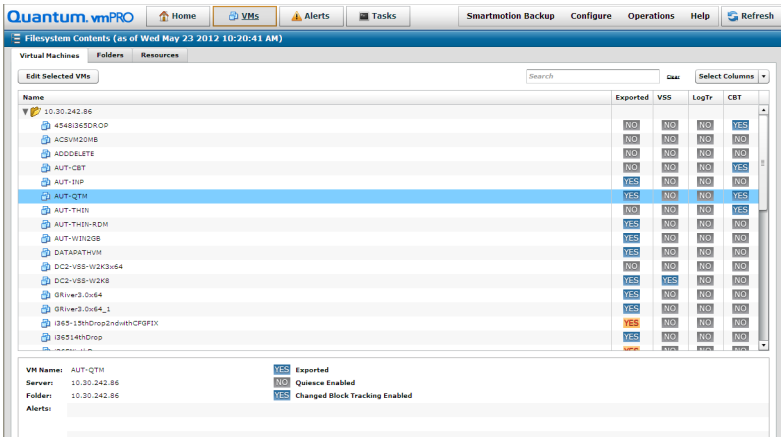


6 Click **Save**.

7 Once your changes are completed, view them in the **CBT** column on the **Virtual Machines** tab (see Figure 103).

- If you do not have a **CBT** column, you can add it from the **Select Columns** drop-down list.
- You can view more details for a particular VM by selecting the VM from the list on the **Virtual Machines** tab and looking at the detailed view below the table.

Figure 103 VMs List (CBT Enabled)



Schedule Your Changed Block Tracking Resets

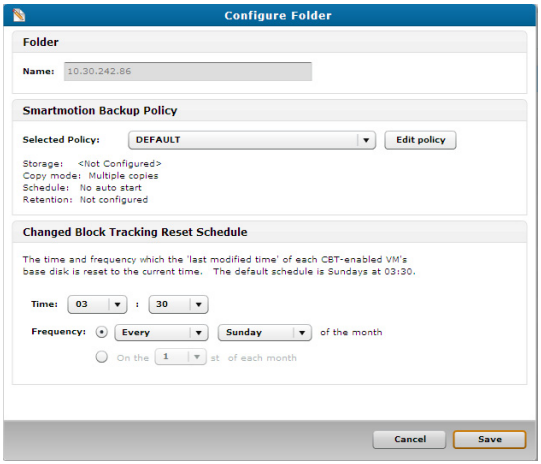
By default, the last modified time for each CBT-enabled VM's base disk is reset to the current time each Sunday at 03:30. You can modify this schedule in the configuration of the folder containing the VMs.

To do so, go to the Quantum vmPRO GUI and click **VMs**. Then select the **Folders** tab. Click the edit button (the pencil icon) for the folder whose CBT reset schedule you need to change, select the time and frequency for your resets, and click **Save** (see Figure 104).

Note: See Create and Manage Folders on page 92 for more details about creating and managing folders.

Note: Do not start your resets at the same time as your backups. We recommend scheduling your resets a few hours before your backups to ensure that all CBT-enabled VMs have been reset before backups begin.

Figure 104 Scheduling CBT Resets



For a one-time, immediate reset of the last modified time for the base disk, use the following console command:

```
cbt reset [all] | [<hypervisor> <vm name>]
```

The last modified time will be reset to the current time.

Recover From a CBT-Enabled Backup

Create your staging area on a host other than the Quantum vmPRO appliance to which you will copy the files listed above. The Quantum vmPRO appliance must be able to read from the staging area.

Note: If you have been using Quantum vmPRO's SmartMotion feature, you do not need to create a staging area; your storage target is your staging area. Skip to the Using SmartMotion Backup on page 40.

Copy these files to the staging area:

-flat.vmdk

Full base disk image.

-pancbt.vmdk

The file containing the changed blocks since the last reset **-flat.vmdk** file was written. You should have one **pancbt** file per flat file; you need only the latest **pancbt** file for each flat file.

.vmx

The VM's configuration file.

Use the Quantum vmPRO **Recovery Wizard** to recover from a CBT-enabled backup. To open the wizard, go to the Quantum vmPRO GUI and select **Recover VMs** from the **Operations** drop-down list (see Figure 105)

Note: See Access Quantum vmPRO on page 21 if you need information on the GUI.

Figure 105 Accessing the Recovery Wizard

Appendix A
Console Commands List

Most Quantum configuration and administration is performed via the Quantum vmPRO GUI or the Quantum vmPRO console wizard. A limited number of functions are available from the appliance's console command line. The preferred way to access the command line is by selecting the appliance in your vSphere client, selecting the Console tab, and exiting the console Setup wizard. See Access Quantum vmPRO on page 21 for more details.

At the command line, entering help lists all commands, and entering the first element of a command lists all commands that start with that element, such as **ssh** or **system**. For example:

```
quantum:bsmith> ssh
Showing commands that start with 'ssh':
   ssh disable
   ssh enable
   ssh status
```

Note that all network commands reflect the network related to the Quantum vmPRO virtual machine.

The commands are:

- autosupport
- cbt
- config

- filesys
- group
- help
- import
- log
- nagios
- net
- ntp
- nw
- SmartMotion
- snmp
- ssh
- system
- tsm
- vss

autosupport

The **autosupport** commands gather log files and sends the package to the email address given in the command if SMTP mail is set up using the **Email** selection from the Quantum vmPRO GUI **Configure** drop-down list.

autosupport send logs [<email-address>]

Email support package.

autosupport upload logs [nocreate]

Upload support package to support site. **Nocreate** flag will not try to create a support package first.

autosupport upload report

autosupport set daily-upload-packages on|off

cbt

The Changed Block Tracking (**cbt**) command is:

cbt reset [all] | [<hypervisor> <vm name> | folder <folder>]

Resets to the last modified time for the base disk to the current time. You can reset all VMs on the appliance, or specify an individual VM.

config

Configuration parameters should be modified using the Quantum vmPRO GUI.

config set date MM/DD/YYYY HH:MM[:SS]

Set the system date and time.

config set time zone <timezone>

Quantum vmPRO uses standard time zone names, such as US/Pacific, Asia/Tokyo, and Europe/Paris. A complete list of time zones is available on the Quantum Support site.

config create https-certificate

Create a new HTTPS SSL certificate.

filesys

The **filesys** commands are:

filesys find <search-term> | vmx | vmdk

List known files and directories. With the vmx command argument, list every .vmx file. With the vmdk argument, list every .vmdk file. A name argument can be a part of a file or directory name.

For example:

```
filesys find quantum
/export/192.168.1.110/quantum-4/
```

```
/export/192.168.1.110/quantum-4/quantum-4.vmx
/export/192.168.1.110/quantum-4/quantum-4.vmdk
/export/192.168.1.110/quantum-4/quantum-4-flat.vmdk
```

filesys list [<export-path>]

With no command argument, list everything mounted under the Quantum vmPRO /export directory. With an export path, list only what is mounted in that path.

For example:

```
filesys list /export/192.168.201.10
```

group

The **group** commands are:

group status

View the Quantum vmPRO appliance's current group membership.

group create master

Make the appliance the master of a group that other appliances can join.

group join <master>

Add the appliance to the group with master <master>.

group leave

Remove the appliance from its current group. (If the appliance is a master, it can only be removed from the group if the group has no other members.)

group update master <master>

Updates the appliance to its master's new ip address/hostname. Assumes that the master is the same appliance. This command should be run on group members only after net set hostname is run on a master.

help

With a command argument, **help** lists the options for the command:

```
quantum:bsmith> help ssh
Showing commands that start with 'ssh':
   ssh disable
   ssh enable
   ssh status
```

With no arguments, **help** lists a summary of top level commands:

```
The following commands are available:
   autosupport
   cbt
   config
   filesys
   group
   import
   log
   msm
   nagios
   net
   ntp
   nw
   smartmotion
   snmp
   ssh
   system
   tsm
   vss
```

import

The **import** commands are used during single step recovery from `/import`.

import mkdir <directory-name>

Create a directory under **/import.**

import rmdir <directory-name>

Removes the directory from **/import**.

import edit <cfg-file>

Edit the **cfg** file found in a directory; e.g., **/import/my_directory/vmname.cfg**.

import show errors <directory-name>

List all error (**.err**) files in **/import** and the errors within them.

import list

Show a list of all files/directories inside **/import**.

log

The **log** commands are:

log list

Display a list of all Quantum vmPRO logs.

log search <phrase>

Search all log files for a character string. The string is handled as plain text, using no regular expressions or pattern matching. If the string contains one or more spaces, enclose the string in quotes. Use `Ctrl/C` to exit.

log view <log-file>

Display the contents of a named log. Use the log list command to find log names. Use `Ctrl/C` to exit.

log watch <log-file>

Display the most recent entries (a few lines) of a named log and update the display whenever a new message is added to the log. Use `Ctrl/C` to exit.

nagios

For more information, see Nagios Support on page 106.

nagios disable

Disable Nagios on the appliance.

nagios enable

Enable Nagios on the appliance.

nagios status

Check the status of Nagios.

net

The **net** commands are:

net hosts add <ipaddr> <host-list>

Add one or more hosts.

net hosts del <ipaddr>

Delete a host.

net hosts reset

Deletes all hosts.

net hosts show

Displays a host.

net nslookup <hostname | ipaddr>

Checks for DNS-to-IP or IP-to-DNS mapping. Used for debugging network problems.

net ping <host>

Confirm a connection between Quantum vmPRO and a host.

net reset

Reset network service.

net set hostname <hostname>

Set a hostname or IP address for the Quantum vmPRO appliance.

net show config [all]

Display the current network driver settings for the Quantum vmPRO Ethernet interface.

net show dhcp

Displays DHCP details.

net show hostname

Displays the current hostname used by Quantum vmPRO.

net show routes

Displays all entries in the IP routing table.

net show status

Display network statistics, including live connections.

net tcpdump start [<tcpdump argument> ...]

Begins a **tcpdump** that will write its output to a file similar to "tcpdump.2010-09-20.09-54.log." Only one **tcpdump** can be running at a time.

Any valid arguments for the **tcpdump** command can be used; for example:

```
net tcpdump start -c 100 executes  tcpdump -c 100
```

net tcpdump stop

Stops a running **tcpdump** and prints the file that was being written to.

There is an 8 MB total size limit on the **tcpdump** output files. Older **tcpdump** log files are deleted to make room for new ones as a

tcpdump is running. If a single **tcpdump** file reaches 8 MB in size, the **tcpdump** will stop automatically.

ntp

Quantum vmPRO can use NTP servers for controlling the internal clock. The **ntp** commands are:

ntp add <server>

Add a time server to the list.

ntp del <server>

Remove a time server from the list.

ntp disable

Stop the use of the NTP service.

ntp enable

Start the NTP service.

ntp reset

Read through the list of time servers and recognize changes.

ntp show

Display the list of time servers.

ntp sync

Synchronize the appliance with the time server

nw

The networker (**nw**) commands are:

nw install

Runs TSM install script provided by pancetera-integ-networker RPM. Customer must install this RPM first.

nw uninstall

Uninstall networker.

nw edit servers file

Edit networker server file.

nw set nsrports <number of ports>

Set number of networker's nsr ports. The port starts from 7937

nw show nsrports

Shows networker's nsr ports setting.

nw enable

Starts networker agent if it is not already running.

nw disable

Stops networker agent if it is running.

nw restart

Restarts networker agent.

nw status

Shows service networker status and `netstat -nlp | grep nsrexecd`.

nw save <save arguments>

Saves files, including directories or entire file systems, to the networker server.

nw mminfo <mminfo arguments>

Reports information about NetWorker media and save sets. The **mminfo** command can produce several different reports depending on the flags specified.

nw recover <recover arguments>

Browses the saved file index and recovers selected files from the networker system.

SmartMotion

The **smartmotion** commands are:

smartmotion abort [<policy name>]

Abort a backup.

smartmotion backup [<policy name>]

Start a backup.

smartmotion set [policy <policy name>] [schedule {never | daily <hr>:<mn>}] [email {enabled|disabled}]

Set smartmotion policy parameters.

smartmotion show policy [<policy name>]

Show SmartMotion Policy.

smartmotion status [<policy name>]

Show backup status.

smartmotion sync

Start a backup of the default policy.

snmp

For more information, see SNMP Support on page 105.

snmp disable

Turn off SNMP.

snmp enable

Turn on SNMP.

snmp reset rocommunity

Reset the read-only community string to public.

snmp set rocommunity <community string>

Set the read-only community string to an argument.

snmp status

Show whether SNMP is enabled and print the current read-only community string.

ssh

The **ssh** commands are:

ssh disable

Disables the SSH service. Attempted logins through SSH fail.

ssh enable

Enables the SSH service, allowing SSH logins to the Quantum vmPRO appliance.

ssh status

Displays whether or not SSH is enabled and running, the process ID number, and active SSH sessions.

system

The **system** commands are:

system reboot

Reboot the Quantum vmPRO virtual machine.

system reset data

Reset vmPRO discovery data.

system restart services [all]

Restart services.

system status [all]

Show various service statuses.

system show date

Display the current day of the week, month and date, and time, including time zone.

system show uptime

Display the time since the last Quantum vmPRO reboot.

system show version [detail|all]

Display the version numbers of the Quantum components. The all option gives version numbers for all open source packages used by Quantum vmPRO. Updates to the open source packages are included in standard Quantum vmPRO updates.

system shutdown

Shuts down the Quantum vmPRO virtual machine.

system upgrade

Checks for Quantum vmPRO updates and then automatically downloads and installs any updates found. No interaction is required. The issues to consider if the Quantum vmPRO host is behind a firewall are that the process uses port 443 and goes to updates.Quantum.com.

Updates are usually a couple of megabytes in size and use signed, private key/public key encryption to verify and authenticate the update. The command does not update an open GUI. To see any GUI changes that were part of the upgrade, close the browser (or browser tab containing the GUI) and start a new instance of the GUI.

tsm

The **tsm** commands are:

tsm install

Runs TSM install script provided by Quantum RPM. Customer must install the RPM first.

tsm edit dsmsys

Edit TSM dsm.sys file.

tsm edit dsmopt

Edit TSM dsm.opt file.

tsm dsmc

Run TSM dsmc command.

tsm enable

tsm disable

tsm status

View TSM status.

tsm restart

vss

The **vss** commands are:

vss query

Get a list of all VMs waiting for VSS backup complete.

vss backup complete [query | all | <vm uuid>]

Send the backup complete command to VSS enabled VMs to trigger log truncation.

vss backup fail [query | all | <vm uuid>]

Complete the backup for VSS enabled VMs, but don't trigger log truncation.