VERITAS Volume Manager Storage Administrator for VVR™ 3.1.1

Administrator's Guide

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Preface

This guide describes how to use the VERITAS Volume Manager Storage Administrator for VVR™ (VMSA-VVR) to configure and administer the VERITAS Volume Replicator (VVR). VMSA-VVR is the Graphical User Interface (GUI) for VVR.

This guide is for system administrators who configure and maintain VVR and assumes:

- A basic understanding of system administration
- A working knowledge of the UNIX operating system
- A basic understanding of VERITAS Volume Manager (VxVM) and the VERITAS Volume Manager Storage Administrator

Note If this document is dated more than six months prior to the date you are installing VMSA-VVR, contact VERITAS Customer Support to confirm that you have the latest supported version.

This guide contains VVR specific information and is a supplement to the VERITAS Volume Manager Storage Administrator documentation set. Refer to the *Volume Manager Storage Administrator Administrator's Guide* for information about Volume Manager. For detailed information about VVR, refer to the *Volume Replicator Administrator's Guide*.

Organization

Chapter 1, “Introducing Volume Manager Storage Administrator for VVR,” explains how to get started with Volume Manager Storage Administrator for VVR. This chapter gives information specific to the Volume Manager Storage Administrator for VVR. It also gives a road map of the common VVR tasks.

Chapter 2, “Configuring VVR,” describes how to set up and configure VVR using Volume Manager Storage Administrator for VVR.

Chapter 3, “Monitoring VVR,” describes the different views provided by Volume Manager Storage Administrator for VVR and explains how to use these views to monitor VVR.

Chapter 4, “Administering VVR Using VMSA-VVR,” gives the procedures for performing RVG, data volume, and Secondary tasks required to maintain and administer VVR, using VMSA-VVR.

Related VERITAS Documents

Volume Manager Storage Administrator for VVR Release Notes

Volume Manager Storage Administrator Administrator's Guide

Volume Manager Storage Administrator Release Notes

Volume Manager Installation Guide

Volume Manager Administrator's Guide

Volume Manager Reference Guide

Volume Manager Release Notes

Volume Replicator Administrator's Guide

Volume Replicator Release Notes

Volume Replicator Configuration Notes

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Conventions

Typeface	Usage	Examples
`monospace`	Computer output, files, directories, software elements such as command options, function names, and parameters	Add all system names to the `/etc/hosts` file. See the `ls`(1) manual page for more information.
`monospace` (**`bold`**)	User input	# **`vxrvg -g hrdg start hr_rvg`**
italic	New terms, book titles, emphasis, variables replaced with a name or value	See the *User's Guide* for details.

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

Term	Definition
Click	Press and release the mouse button.
Double-click	Click the mouse button twice (quickly).
Right-click	Press and release the right mouse button.
Press and Hold	Press and continue to hold down the mouse button.
Point	Move the tip of the pointer onto an item on the screen.
Select	Click the mouse button while the pointer is directly over the item to be selected.
Drag	Slide the mouse while pressing a mouse button.

Introducing Volume Manager Storage Administrator for VVR 1

Volume Manager Storage Administrator for VVR (VMSA-VVR) is the Graphical User Interface (GUI) for the Volume Replicator (VVR). This chapter describes the main components of VMSA-VVR and contains a summary of common tasks.

Volume Manager Storage Administrator for VVR provides a distributed environment for configuring, monitoring, and administering VVR. If you perform a task on the Primary host, VMSA-VVR performs equivalent tasks on all the hosts in the VVR environment. You can use VMSA-VVR to set up and administer replicated configurations and to administer VVR objects, such as data volumes or RLINKs, on local or remote nodes.

The Storage Administrator consists of a server and a client. The server runs on a host that runs VERITAS Volume Replicator. The VMSA server must be running on all the hosts in the replicated configuration. The client can run on any machine that supports the Java Runtime Environment. For detailed information on getting started and working with the Storage Administrator, refer to the *VERITAS Volume Manager Storage Administrator Administrator's Guide*.

Replicated Configuration

The Volume Manager Storage Administrator for VVR can access and display VVR configurations on multiple host machines simultaneously. It provides a distributed environment to configure, monitor, and administer VVR.

VMSA-VVR performs tasks for a replicated configuration. Data is replicated from a Primary node, where the application is running, to one or more Secondary nodes. An RVG on the Primary node and its counterparts on the Secondary nodes make up a Replicated Configuration.

The name of the Primary RVG represents the replicated configuration. To perform a task on all the hosts, perform the task on the Primary RVG. For example, if you add a data volume to the Primary RVG of a replicated configuration, VMSA-VVR adds a corresponding data volume to the corresponding RVGs on all the hosts. These tasks must be launched within the replicated configuration hierarchy.

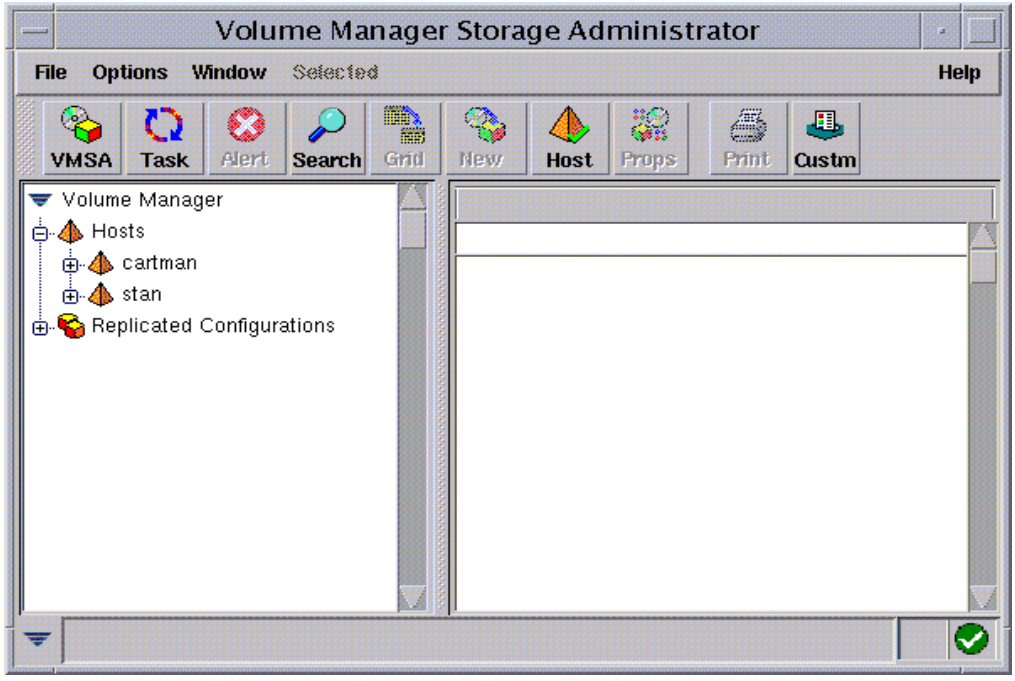
Working With VMSA-VVR

This section explains the VMSA-VVR windows and icons.

VMSA-VVR Main Window

To use the VVR features on the Volume Manager Storage Administrator, the optional VVR functionality must be activated on the hosts connected to the VMSA servers. To activate the VVR feature, you must install a VVR license on each host where the VMSA servers run. Figure 1 shows the VMSA_VVR main window.

Figure 1. The VMSA-VVR Main Window



Object Tree and Grid View

This section describes the left pane (object tree) and the grid view.

Left Pane (Object Tree)

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

The following VVR objects display in the VMSA-VVR object tree:

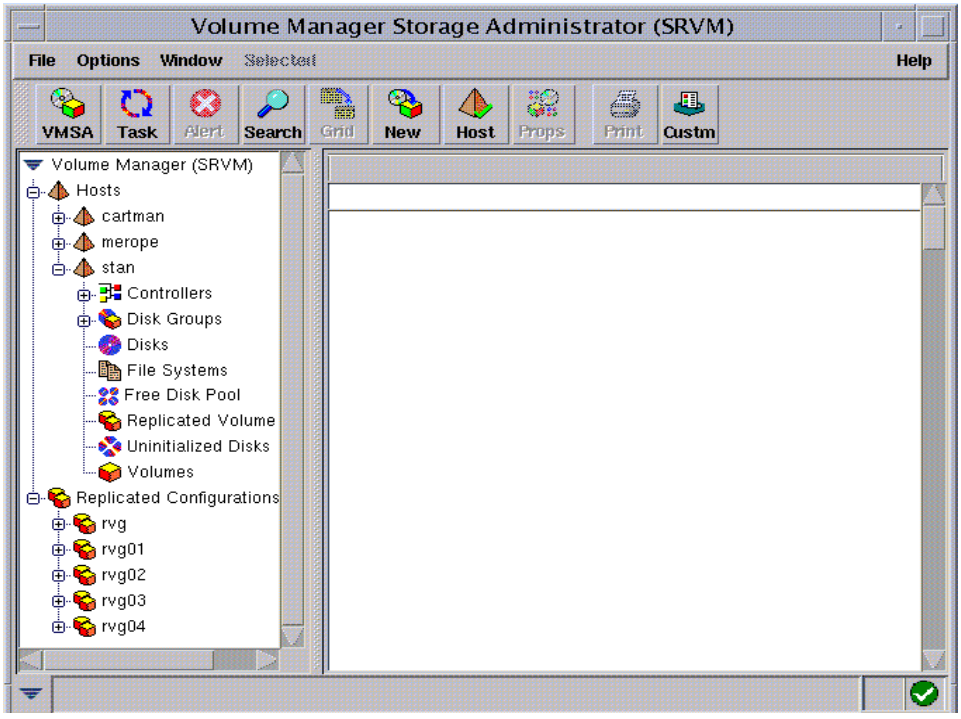
- Replicated Volume Groups (RVGs)— Provides information about each RVG on a selected host. Any task that you perform on the RVG is performed on the selected host only.
- Replicated Configurations—Each Primary RVG and its counterpart RVGs on all the Secondary nodes make up a replicated configuration. The Replicated Configuration icon lists the names of the Primary RVGs on all the connected hosts.

  If two Primary RVGs have identical names on different hosts or are on the same host in different disk groups, you would have identical names in this list. If you have a Secondary RVG on one of the connected hosts, VMSA-VVR enables connection to its Primary. Note that the Replicated Configuration icon appears on the object tree only if you have a VVR license.

  Unconnected hosts are not displayed in the tree.

Note Do not use VMSA tasks to perform VVR tasks. While using VVR, use the Replicated Configurations icon to perform VMSA-VVR tasks. Use VMSA tasks to create and view volumes.

Figure 2. Left Pane (Object Tree) Showing VMSA-VVR Objects.

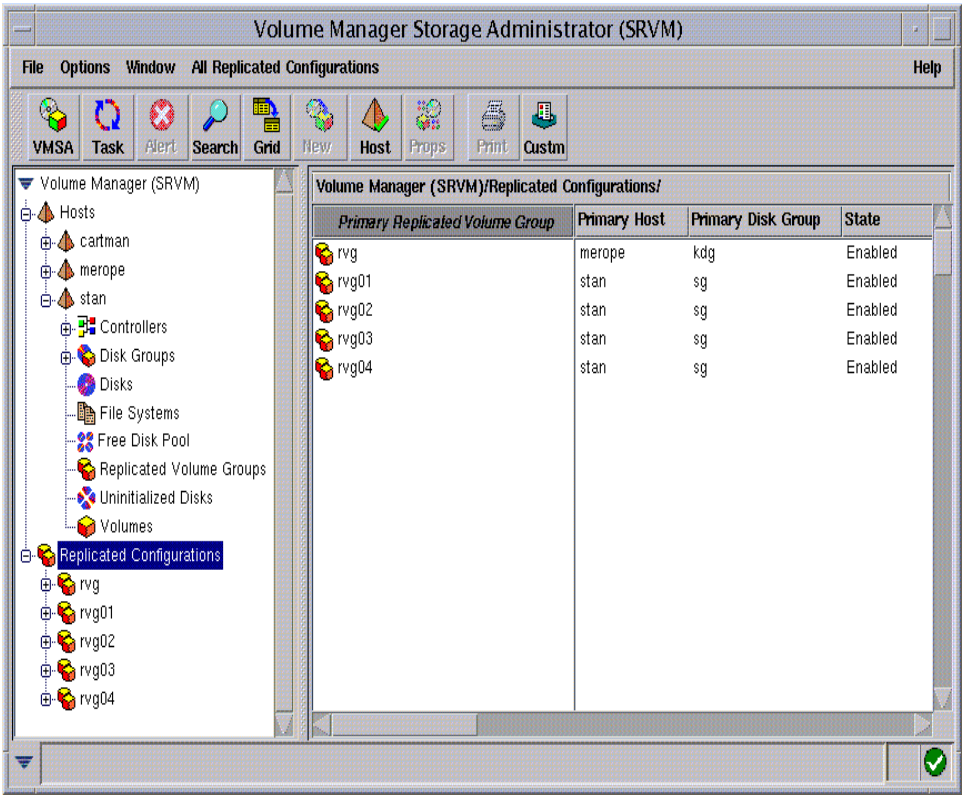


Right Pane (Grid)

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

To sort the contents of a property column in the grid, click the column heading. To reverse the sort order, click the column heading twice.

Figure 3. Right Pane (Grid)



The splitter is the vertical bar that separates the object tree from the grid. To resize the left and right panes, hold the mouse button over the splitter and drag it to the left or right.

- To display the Primary RVGs in a replicated configuration, expand the Replicated Configuration hierarchy.
- To hide the Primary RVGs, collapse the Replicated Configuration hierarchy.

The Selected Menu on the Menu Bar

The menu bar contains a Selected menu, which launches tasks on a selected object. It changes options based on the type of object that is selected. When you select an object, VMSA renames the Selected menu and provides access to appropriate tasks. For example, Selected becomes Replicated Configurations when you select a Primary RVG under the Replicated Configurations icon. VMSA-VVR performs replicated configuration tasks for the selected configuration on all the hosts.

Popup Menus

The popup menus access tasks or properties for a selected object. To access the popup menu for an object, select the object in the grid, and then right-click on the object.

The popup menus perform the following tasks:

- Displaying configurations
- Hiding replicated configurations
- Viewing the properties of a host in a replicated configuration
- Viewing the properties of data volumes in a replicated configuration
- Viewing the properties of a replicated volume group on a node

Use the following instructions to perform these tasks:

- To display the replicated configurations in a Replicated Configurations hierarchy, expand the hierarchy.

- To hide the replicated configurations in a Replicated Configurations hierarchy, collapse the Replicated Configurations hierarchy.

- To view the properties of a host in the replicated configuration, expand Replicated Configurations and select a configuration. The grid displays the Data Volumes and Hosts icon. From the grid, double-click the Hosts icon to display the names and properties of the nodes in the Replicated Configuration in the grid. The Role column indicates whether a node is the Primary or the Secondary.

- To view the properties of the data volumes in a replicated configuration, expand Replicated Configurations and select a configuration. The grid displays the Data Volumes and Hosts icon. From the grid, double-click the Data Volumes icon to displays the names and properties of the data volumes in the replicated configuration on the Primary. The State column indicates whether the state of a data volume is STARTED.

- To view the properties of a Replicated Volume Group on a node, use the Replicated Volume Group properties window. Expand the host whose RVGs you want to view. To access the Replicated Volume Group properties window, select the Replicated Volume Group icon on the object tree and select an RVG from the grid; then choose Properties from the popup (right-click) window. The Replicated Volume Group Properties window displays information for the selected RVG.

Task Roadmap

This section provides a list of the common Volume Replicator tasks. The tasks are grouped into setup and configuration tasks, monitoring tasks, and ongoing administration tasks.

Setup and Configuration

If you are using the Volume Manager and the Storage Administrator for the first time, you must install both products, place your disks under Volume Manager control, and create volumes. You can then configure and set up VVR.

- ✔ Install and set up the Storage Administrator
- ✔ Access hosts
- ✔ Set up replication
- ✔ Synchronize the Secondary
- ✔ Add a new Secondary
- ✔ Set up Mode of Replication, Latency Protection, and SRL Protection

Chapter 2, "Configuring VVR" describes these tasks.

Monitoring Objects

Chapter 3, "Monitoring VVR" describes these tasks.

Administration Tasks

After you have set up and configured VVR, you might need to perform some or all of the following administration tasks.

- ✔ Administering Secondaries
- ✔ Administering VVR
- ✔ Administering data volumes

Chapter 4, "Administering VVR Using VMSA-VVR" describes these tasks.

Configuring VVR 2

This chapter explains how to use VMSA-VVR to set up VVR. You can set up replication when data volumes are empty or when data volumes contain existing data. You can set up replication and synchronize the Secondary whether the applications are active or inactive. The following sections describe how to set up replication when the data volumes are empty, and to synchronize the Secondary when the data volumes contain valid data.

Setting Up Replication

This section explains how to set up replication when the data volumes are empty or when data volumes contain valid data, and the application is active or inactive. To set up replication, the data volumes must exist on the Primary but not on the Secondary. If the volumes do not exist, create new volumes on the Primary before you create a replicated configuration.For information on how to create new volumes, refer to the *VERITAS Volume Manager Storage Administrator Administrator's Guide*.

Note Volumes must not exist on the Secondary.

To set up replication, perform the following steps:

1. Create a Replicated Configuration using existing data volumes.
2. Start replication.
3. Verify the configuration using the Replicated Configuration Properties Windows.

Creating a Replicated Configuration

This section explains how to create a replicated configuration on all the connected hosts. VMSA-VVR also enables you to set up the same node on the Primary and the Secondary.

▼ To create a Replicated Configuration

1. Choose File > New > Replicated Configurations.
2. Complete the Replicated Configurations dialog box as follows:

Primary Host	Enter the name of the Primary host or Browse to select the Primary host.
Primary Disk Group	Enter the name of the Primary disk group or Browse to select the Primary Disk Group.
Data Volume Name(s)	Enter the name of the data volumes or Browse to select the data volumes. Note that the Browse dialog box shows volumes that qualify as part of a replicated configuration. A volume that qualifies must not be a RAID-5 volume, must not be associated to an RVG, and must not have a DRL. If you enter the name of an unqualified volume, the task will fail.
RVG Name	Enter the name of the RVG. This is optional. If you do not enter a name, VMSA-VVR creates an default RVG name.
SRL Name	Enter the name of the Storage Replicator Log (SRL). The SRL must not already exist and must have a unique name.
SRL Size	If the SRL volume does not exist, enter the size of the SRL. You are not required to enter the size if the SRL exists. The default size unit is sectors. To specify a size unit, attach an `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size. Click the Maxsize button to specify a maximum size for the SRL.
Show Options	Click Show Options to specify a Secondary. Enter a host-disk group pair or select Browse to navigate to the Secondary host-disk group pair.
Options	To add mirrors to all the data volumes and SRLs on all the Secondaries, select Mirror. To associate DCM logs to all the data volumes on all the Secondaries, select DCM.

Click OK. To add a new Secondary after you have created a replicated configuration, see “Adding a New Secondary” on page 17.

Notes

- This task requires a Primary host name, Primary disk group name, data volume name(s), and SRL name.
- VMSA-VVR creates the replicated configuration and the corresponding VVR objects on the specified Secondaries.
- VMSA-VVR assigns the same default name to the RVG, data volumes, and SRL on all the Secondaries in the replicated configuration.
- If you do not enter the host-diskgroup pair, VMSA-VVR creates a replicated configuration on the Primary only. You can add a Secondary later by using the Add Secondary task.
- This task adds mirrors to the data volumes on the connected Secondaries in the replicated configuration. It does not add mirrors to the data volumes on the Primary. To add mirrors to data volumes on the Primary, use the Volumes task, Adding a Mirror to a Volume. For instructions, see the *Volume Manager Storage Administrator Administrator's Guide*.
- This task adds DCM logs to the data volumes on the connected Secondaries in the replicated configuration. It does not add DCM logs to the data volumes on the Primary. To add DCM logs to data volumes on the Primary, use the Volumes task, Adding a DCM to a Volume.
- If a failure occurs on one of the hosts when VMSA-VVR is manipulating the replicated configuration, it does not rollback the completed tasks to recover the VVR configuration to the previous state. Use VMSA or the command-line interface to complete or undo the unsuccessful tasks.

Starting Replication

To start replication, assess your needs, and select one of the following options:

- Force Attach option
- Automatic Synchronization Attach option
- Backup and Checkpoint Attach option

For detailed information, see the *Volume Replicator Administrator's Guide*.

Use the Force Attach option to start replication when the data volumes are empty and the application is inactive.

Use the Automatic Synchronization Attach option or the Backup and Checkpoint Attach option to synchronize the Secondary when the data volumes contain valid data and the application is either active or inactive.

The Automatic Synchronization Attach option copies the data on the Primary to the Secondary over the network using the Data Change Map (DCM) mechanism. This DCM mechanism requires that each data volume in the Primary RVG has a DCM associated with it.

The Backup and Checkpoint Attach option is useful for low bandwidth networks or very large data sets. When using checkpoints, you backup the data on the Primary and restore it on the Secondary and do not have to use the network to transfer the data.

- To synchronize the Secondary using automatic synchronization, select Autosync Attach. This option is unavailable if the volumes do not have DCMs. For instructions, see "Adding Data Change Maps to Data Volumes" on page 47
- To synchronize the Secondary using block-level device backup and Primary checkpoint, select Checkpoint Attach. For detailed steps on how to use this option see "Setting Up Replication Using Backup and Checkpoint Attach" on page 14.
- For instructions on how to use the Checkpoint Attach option, see "Setting Up Replication Using Backup and Checkpoint Attach" on page 14.

▼ To start replication

1. Select Replicated Configurations in the object tree window. From the grid, select the Primary RVG of the replicated configuration for which you want to start replication.

2. Choose Replicated Configurations > Start Replication (Selected menu) or Start Replication (Popup menu).

3. Complete the Start Replication dialog box as follows:

Secondary Name(s)	Enter the name of the Secondary host to attach or click Browse to select the Secondary.
Options: Force Attach Autosync Attach Checkpoint Attach	To start replication when the data volumes are empty and the application is inactive, select Force Attach. To synchronize the Secondary using automatic synchronization, select Autosync Attach. This option is unavailable if the volumes do not have DCMs. For instructions, see "Adding Data Change Maps to Data Volumes" on page 47 To synchronize the Secondary using block-level backup and Primary checkpoint, select Checkpoint Attach. For detailed steps on how to use this option see "Setting Up Replication Using Backup and Checkpoint Attach" on page 14.

Click OK.

- This task requires a Secondary host name.
- After starting replication, the expected connection state is CONNECTED / ATTACHED. Use the RVG Properties Window (RLINK tab) to check the connection state.
- When performing automatic synchronization on multiple RLINKs, automatic synchronization proceeds at the rate of the slowest RLINK.
- If the Primary goes down and synchronization is interrupted, the synchronization continues from where it had stopped when the Primary comes up.
- To use the Automatic Synchronization Attach Option, each data volume in the Primary RVG must have a DCM associated with it. If a Primary volume does not have a DCM log and you try to use this option, the operation will fail.
- The Secondary remains inconsistent while the automatic synchronization operation is in progress, but becomes consistent when it completes. If the Primary is receiving updates faster than they can be sent to the Secondary, the Secondary may never be synchronized.

Verifying the Replicated Configuration

Use the Replicated Configuration Properties window to verify the Replicated Configuration. For detailed information, see "Viewing Replicated Configuration Properties"and "Viewing Replicated Volume Group Properties" in Chapter 3.

- To access the Replicated Configuration Properties window, select a Replicated Configuration from the grid, and choose Properties from the Selected or Popup menu.
- To determine if replication has started and the Primary and Secondary nodes are attached and connected, click the Connections tab in the Replicated Configuration Properties window. The Connection state must be CONNECTED / ATTACHED on each node.

Setting Up Replication Using Backup and Checkpoint Attach

This section explains how to set up replication using a backup and checkpoint attach when data volumes contain data. This procedure synchronizes the Secondary while the application is active or inactive. Setting up replication using backup and checkpoint attach involves the following tasks:

1. Starting a Checkpoint (page 15).
2. Backing Up the Data Volumes in the Primary RVG (page 15).
3. Ending a Checkpoint (page 16).
4. Restoring the Backup to the Data Volumes on the Secondary (page 16).
5. Starting Replication Using Checkpoint Attach (page 16).
6. Verifying the Configuration (page 16).

Starting a Checkpoint

Before you start to back up the data volumes on the Primary, place a checkstart marker in the SRL. This procedure puts the marker in the SRL and enables VVR to determine when the Secondary becomes consistent.

▼ To start a checkpoint

1. Select Replicated Configurations in the object tree window. From the grid, select the Primary RVG of the Replicated Configuration for which you want to start a checkpoint.
2. Choose Replicated Configurations > Start Checkpoint (Selected menu) or Start Checkpoint (Popup menu).
3. In the Start Checkpoint dialog box, enter a name for the checkpoint and click OK.

Notes

- This task requires a checkpoint name.
- Start a checkpoint before the backup starts.
- Record the checkpoint name because a subsequent checkpoint operation could overwrite this name.
- The Awaiting Checkend property of the replicated configuration, which displays in the grid, is set to True.
- The Checkpoint property, which displays in the grid, is set to the checkpoint name.

Backing Up the Data Volumes in the Primary RVG

After starting a checkpoint, make a block-level backup of the data volumes in the Primary RVG using `dd` or some other block-level backup utility. You must back up the raw device. Do not use a logical backup utility, such as `tar`.

Ending a Checkpoint

After the backup of the Primary data volumes is complete, end the checkpoint. This procedure puts a checkend marker in the SRL, which enables VMSA-VVR to find out when the Secondary becomes consistent

▼ To end a checkpoint

1. Select Replicated Configurations in the object tree window. From the grid, select the Primary RVG of the replicated configuration on which you have started a checkpoint.
2. Choose Replicated Configurations > End Checkpoint (Selected menu) or End Checkpoint (Popup menu).
3. To confirm that you want to end the checkpoint, click YES.

Notes

- End a checkpoint after the backup of the Primary is complete.
- The Awaiting Checkend property of the replicated configuration is set to False.

Restoring the Backup to the Data Volumes on the Secondary

Restore the backup to the data volumes on the Secondary. Ensure that the correct backup is restored on each data volume.

Starting Replication Using Checkpoint Attach

In the Start Replication dialog box, select the Checkpoint Attach option. For instructions, see “Starting Replication” on page 12.

Verifying the Configuration

Verify the configuration using the Replicated Configuration Properties Window and the RVG Properties Window. See “Verifying the Replicated Configuration” on page 14.

Adding a New Secondary

This section explains how to add a new Secondary after you have created a replicated configuration. VMSA-VVR enables you to add a Secondary to a replicated configuration using the Add Secondary task. This task requires a Secondary host / disk group pair name.

▼ To add a new Secondary

1. Select Replicated Configurations in the object tree window. From the grid, select the Primary RVG.

2. Choose Replicated Configurations > Add Secondary (Selected menu) or Add Secondary (Popup menu).

3. Complete the Add Secondary dialog box as follows:

Host Disk Group Pair(s)	Enter the name of the Secondary host / disk group pair to attach or click Browse to select the host / disk group pair. Note that you must be connected to the host. To connect to the host, see the *Volume Manager Storage Administrator Administrator's Guide*.
Mirror Volumes on This Secondary	To mirror all the data volumes and SRLs on the specified Secondary, select Mirror Volumes on This Secondary.
Add DCM to the Volumes on the Secondary	To associate DCM logs to all the data volumes on the specified Secondary, select Add DCM the Volumes on the Secondary.

Click OK.

Changing the Replication Settings for a Secondary

This section explains how to configure VVR according to your requirements and with available resources. It describes how to change the replication mode, latency protection, and SRL protection using VMSA-VVR. The Replication Settings task enables you to set up or change the replication settings between a selected Primary RVG of a replicated configuration and a selected Secondary. This task requires a Secondary name

Each feature affects performance and must be set up with care. For details on setting up mode of replication, latency protection and SRL protection, see the *Volume Replicator Administrator's Guide*.

This procedure enables you to perform the following tasks:

- Set up mode of replication

  You can set up VVR to replicate to a Secondary in synchronous or asynchronous mode by setting the synchronous attribute (of the corresponding RLINK) to override, fail, or off.

- Set up latency protection

  The latency protection feature in VVR limits the number of recent updates lost when you replicate in asynchronous mode in a disaster. You can set up latency protection to override, fail, or off. You can specify a `latency_high_mark` and `latency_low_mark`, which indicate when the protection is active or inactive

- Set up SRL protection

  The SRL protection feature in VVR prevents overflow of the SRL. You can set up SRL protection to dcm, override, fail, or off. SRL protection=dcm enables log overflow protection with DCM. Each data volume must have a DCM.

▼ To change replication settings

1. Select Replicated Configurations in the object tree window; then select the Primary RVG for which you want to change replication settings.

2. Choose Replicated Configurations > Replication Settings (Selected menu) or Replication Settings (Pop up menu).

3. Complete the Replication Settings dialog box as follows:

Secondary Name	Enter the name of the Secondary host or click Browse to select the Secondary. The existing replication settings for the selected Secondary display.
Synchronous: off, override, fail	To set the replication to asynchronous mode, select off. To set the replication to *soft synchronous* mode, select override. To set the replication to *hard synchronous* mode, select fail.
Latency Protection: off, override, fail	To disable latency protection, select off. This does not limit the number of waiting updates in the SRL. To enable latency protection and limit the number of waiting updates in the SRL, select override or fail. For details on selecting the override or fail option see, *Volume Replicator Administrator's Guide*.
Low	Enter the numerical limit up to which later updates are stalled in the Primary node's operating system.
High	Enter the numerical limit beyond which you do not want the number of updates waiting in the SRL to grow.
SRL Protection off, override, fail, dcm	To disable SRL protection, select off. If you disable SRL protection, the SRL is allowed to overflow. To enable SRL protection, select dcm, override, or fail. For details on selecting the appropriate option, see *Volume Replicator Administrator's Guide*.

Click OK.

Monitoring VVR 3

This chapter explains how to use the VMSA-VVR properties windows and views to monitor VVR. The "Monitoring Tasks Roadmap" contains a summary of common VVR monitoring tasks. The following sections explain each task in the roadmap.

Monitoring Tasks Roadmap

To monitor replication related objects:

- Use the tree (left pane) and grid (right pane) of the main window to view properties of the replicated configuration, such as Primary RVG, disk group, state, status of checkpoint, checkpoint name, SRLs, data volumes, and RLINKs.
- Use the object properties windows to view detailed information about a selected object.
- Use the Links View Window to display a graphical view of the connection between the Primary and the Secondary host and the percentage of the SRL currently in use.
- Use the Search Window to search the specified host machines for objects, such as RVGs and RLINKs), that match the specified search criteria. For details on how to use the Search Window, see *Volume Manager Storage Administrator Administrator's Guide*.

Viewing VVR Objects and Object Properties

This section describes VVR related views. For additional information and details on how to use VMSA views to display and monitor objects and properties, see *Volume Manager Storage Administrator Administrator's Guide*. VMSA-VVR provides the following views of VVR icons, objects, and properties:

- Object Tree and Grid
- Replicated Configuration Properties Window
- Viewing the Replicated Volume Group Properties Window
- Viewing the Data Volume Properties Window
- Viewing the Disk Group Properties Window
- Monitoring Connections Using the Links View Window

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

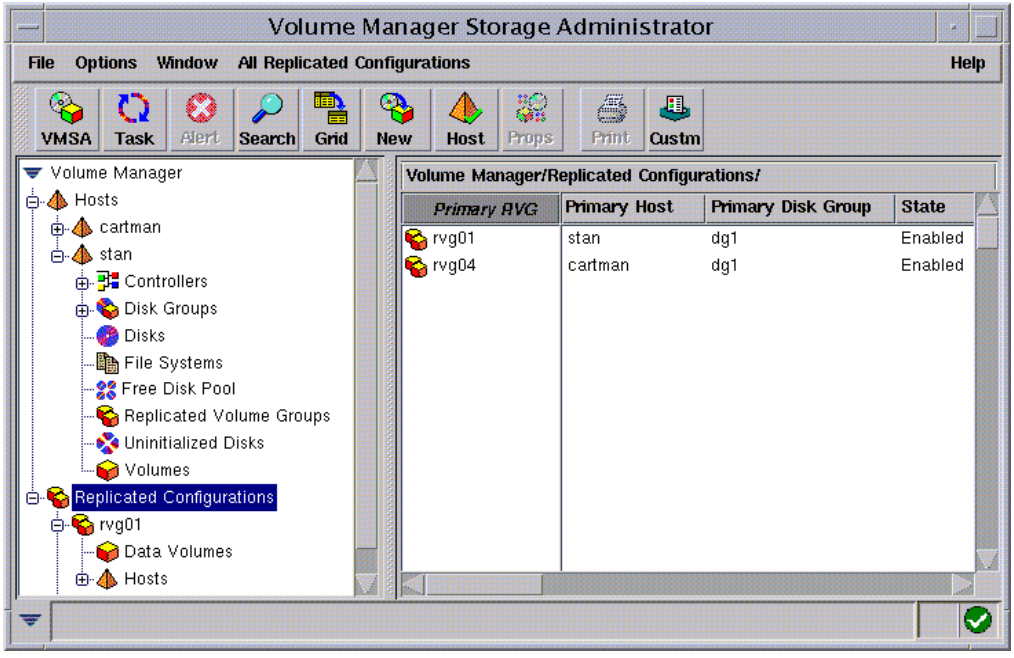
Viewing Objects in the VMSA-VVR Tree and Grid

The tree and grid view in the main window displays VVR icons and objects, such as Replicated Volume Group and Replicated Configurations. The grid also displays a limited set of properties for listed icons and objects.

For an overview and navigation tips, see "Working With VMSA-VVR" in this book.

For additional information on how to use this window, see *Volume Manager Storage Administrator Administrator's Guide.*

Figure 4. The VMSA-VVR Tree and Grid View



Viewing Replicated Configuration Properties

The Replicated Configuration Properties window contains a set of tabbed pages, each of which contains information about the replicated configuration of the selected Primary RVG and related objects.

To access the Replicated Configuration Properties window:

1. Select the Replicated Configurations icon.
2. Select a configuration from the grid.
3. Choose Properties from the Replicated Configuration (selected) menu or the popup menu.

The Replicated Configuration Properties window contains the following properties tabs:

- General
- Data Volumes
- Hosts
- Connections
- Replicated Volume Groups
- Alerts

Viewing General Properties of the Replicated Configuration on the Primary

The General tab page displays the following information about the replicated configuration on the Primary RVG.

Primary RVG Name	Name of the Primary RVG
Primary Disk Group	Name of the disk group that contains the RVG
Primary SRL Name/Log Volume	Name of the SRL
State	State of the RVG. The state of the RVG is ENABLED after starting replication
Number of Data Volumes	Number of data volumes in each RVG
Number of Secondaries	Number of Secondaries in the replicated configuration
Comment	An optional comment about the replicated configuration
User	The user for the replicated configuration

Viewing Properties of Data Volumes in the Replicated Configuration on the Primary

The Data Volume tab page displays the following information about each volume in the Primary RVG of the replicated configuration.

Primary Data Volume Name	Name of the Primary data volume
Size	Size of the data volume
Disk Group	Name of the disk group that contains the data volume/RVG
Shared	A CVM volume in the RVG
Replicated Volume Group	Name of the RVG that contains the data volume
State	State of the data volume
Mount Point	Mount point
# Copies	Number of mirrors of the data volume
Type	Layout of data volume

Verifying the State of the Connection Between the Primary and the Secondary Node

The Connection tab page displays the following information about the connection between the Primary and the Secondary. Use the horizontal scroll bar to view details about the replication settings on the Primary (RLINK) and the state of the Primary RLINK. The state of the Primary RLINK is CONNECTED / ATTACHED when the Primary and the Secondary are connected and replication is in progress.

Primary Name	Name of the Primary RLINK
Primary Host	Name of the Primary host
Primary RVG	Name of the Primary RVG
Secondary Name	Name of the Secondary RLINK
Secondary Host	Name of the Secondary host
Synchronous	Displays off, override, or fail, depending on the chosen option
Latency Protection	Displays off, override, or fail depending on the chosen option
Latency High Mark	Specifies the maximum number of waiting updates in the SRL before the protection becomes active and updates stall or fail
Latency Low Mark	Number of updates in the SRL before the protection becomes inactive and updates succeed
SRL Protection	Displays dcm off, override, or fail depending on the chosen option
Time Out	Time to wait before resending a packet
Packet Size	Size of packet
State	State of the connection (RLINK) between the Primary and the Secondary

Viewing Replicated Volume Group Properties

The Replicated Volume Group Properties Window contains a set of tabbed pages, each of which contains information about the selected RVG and related objects.

- To view the properties of an RVG, select the Replicated Volume Groups icon on the object tree, and then select an RVG from the grid. After selecting the RVG from the grid, choose Properties from the Replicated Configuration (selected) menu or the popup menu.

  The Replicated Volume Group Properties window contains the following properties tabs:

  - General
  - Data Volumes
  - RLINKs
  - Alerts

Viewing General RVG Properties

The General tab page displays the following information about the Replicated Volume Group in a VVR environment.

Replicated Volume Group	Name of the RVG
Disk Group	Name of the disk group that contains the RVG
Storage Replicator Log	Name of the SRL
State	State of the RVG
Role	Role of the host (Primary or Secondary)
Comment	An optional comment about the RVG
User	The user for the Replicated Configuration

Viewing the Data Volumes in an RVG

The Data Volumes tab page displays the following information about the Data Volume on the selected host.

Name	Name of the data volume
Size	Size of the data volume
Disk Group	Name of the disk group that contains the data volume
Replicated Volume Group	Name of the RVG that contains the data volume
State	State of the RVG
Mount Point	Location in the file system hierarchy
# Copies	Number of mirrors of the data volume
Type	Layout of the data volume

Viewing the RLINKs in an RVG on the Selected Host

The RLINKs tab page displays the following information about the Primary and Secondary RLINKs in the RVG on the selected host.

Name	Name of the RLINK
Disk Group	Name of the disk group
RVG	Name of the RVG
Local Host	Name of the selected host
Remote Host	Name of the remote host
Remote Disk Group	Name of the disk group on the remote host
Remote RLINK	Name of the RLINK on the remote host
State	◆ State of the connection (RLINK) between the Primary and the Secondary ◆ Displays CONNECTED / ATTACHED when the Primary and the Secondary are attached

Viewing Data Volume Properties

You can view data volume properties using the grid and the Data Volume Properties window. The grid displays limited volume properties. The Volume Properties window contains information about the selected volume.

- To display limited volume properties in the grid, expand the Replicated Configurations icon, select a replicated configuration in the object tree, and then double-click the Data Volumes icon.

  The grid displays the following VVR related information a column headed Replicated Volume Group, which indicates whether the volume belongs to a Replicated Volume Group.

- To view the properties of a volume using the Volume Properties window, select the volume, and then choose Properties from the Volumes or popup menu. You can also open the Volume Properties window by double-clicking the volume.

  The Properties window contains a set of tabbed pages that each contain information about the volume and related objects.

Viewing Disk Group Properties

To view disk group properties, use the grid and the Disk Group Properties window. The grid displays limited disk group properties. The Disk Group Properties window contains detailed information about the selected disk group.

- To display limited disk group properties in the grid, expand the required host, and click the Disk Groups icon.

  The grid displays a column headed #RVGS, which indicates the number of Replicated Volume Groups in each disk group.

- To view the properties of a disk group using the Disk Group Properties window, expand a host, select the Disk Groups icon, and then from the grid, select the disk group for which you want to display properties. Choose Disk Groups > Properties (Selected menu) or Disk Groups > Properties (Popup menu).

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

  The Volume tab page displays a column headed Replicated Volume Group, which indicates the names of the RVG to which each volume belongs.

Monitoring Connections Using the Links View

The Links View displays a graphical view of the replication between the Primary host and the Secondary host. The Links View window is dynamic. The percentage of SRL used and the number of kilobytes outstanding in the SRL are automatically updated. The link between the Primary and Secondary appears broken when the Primary and Secondary are disconnected.

- To display the Links view, select the Replicated Configurations icon; then select a replicated configuration from the grid. Choose Replicated Configuration > Links View (from the Selected menu) or the popup menu (right-click). The Links View displays the view from Primary host.

- To close the Links View, choose View > Close.

Figure 5. Connected Primary

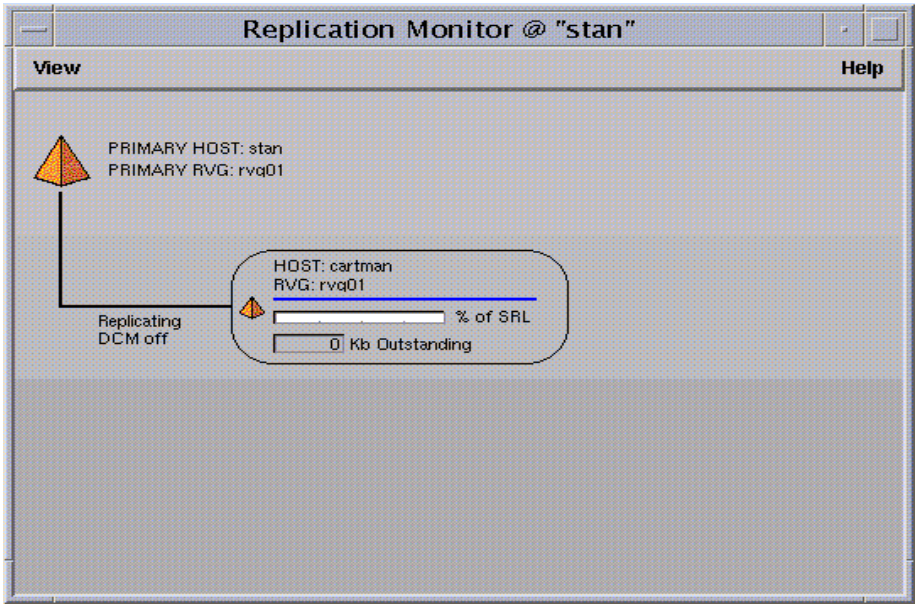
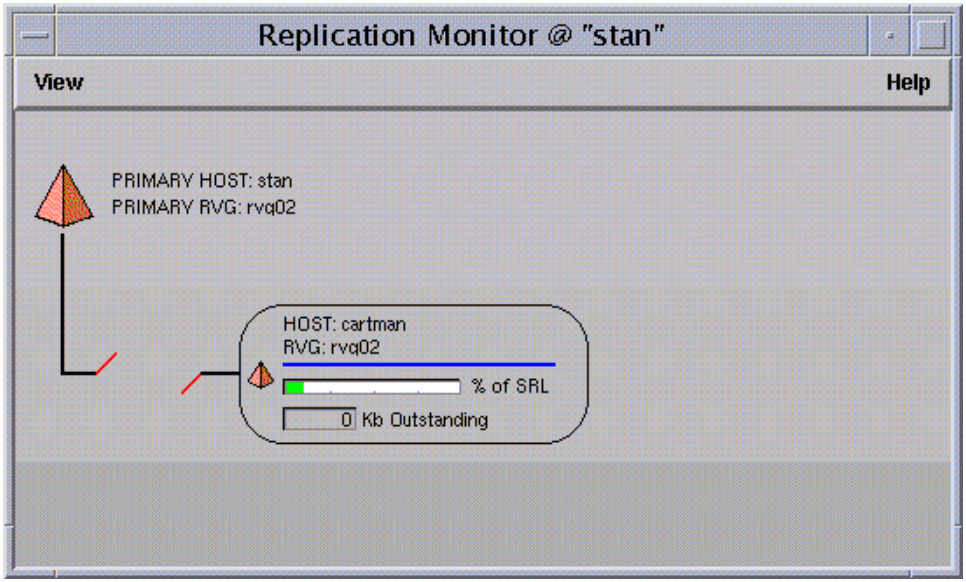


Figure 6. Disconnected Primary and Secondary



Administering VVR Using VMSA-VVR 4

This chapter explains how to administer VVR using VMSA-VVR. The "Administration Tasks Roadmap" contains a summary of common VVR administration tasks.

Administration Tasks Roadmap

The roadmap outlines the administration tasks for VMSA-VVR.

Administration Tasks

After you set up and configure VVR, you might need to perform some or all of the following administration tasks.

▼ **Administering replicated configurations**

Removing a Secondary

Pausing replication from a Secondary host

Resuming replication from a Secondary host

Pausing replication from a Primary host

Resuming replication from a Primary host

Incrementally Resynchronizing the Secondary After SRL Overflow

Removing an RVG and all the objects associated with the RVG

▼ Administering data volumes

Adding new data volumes to RVGs of a replicated configuration

Increasing or decreasing the size of data volumes

Removing data volumes from a replicated configuration

Adding mirrors to data volumes and SRLs

Adding Data Change Map (DCM) logs to data volumes

Adding a DCM to a Volume on the Primary

Administering Replicated Configurations

This section explains how to remove a Secondary from a replicated configuration. It also explains how to pause and resume replication on the Primary and Secondary.

The removed Secondary is no longer replicating. If the RLINK to the Secondary was up-to-date, then the volumes contain data as of the moment of removal; otherwise, the data in the volumes is out-of-date.

Removing a Secondary

Use the Remove Secondary Task to remove a Secondary from a replicated configuration. This task requires a Secondary host name.

▼ To remove a Secondary

1. Select Replicated Configurations in the object tree window. Then, select the Primary RVG of the Replicated Configuration for which you want to remove a Secondary.

2. Choose Replicated Configurations > Remove Secondary (Selected menu) or Remove Secondary (Popup menu).

3. Complete the Remove Secondary dialog box as follows:

Secondary Name(s)	Type the name of the Secondary host to remove or click Browse to select a host.

Click OK.

Pausing Replication From a Secondary Host

You can prevent the Primary from sending new and queued updates in the SRL to the Secondary by pausing replication from a selected Secondary host.

While replication is paused, the network session between the Primary and the Secondary is maintained. However, The state of both the Primary and the Secondary RLINK changes from ACTIVE to PAUSE. You can perform a Secondary PAUSE even when the Secondary is disconnected from the Primary. When the Primary and Secondary reconnect, the Primary detects that the Secondary is paused and does not send updates.

▼ To pause replication from a Secondary host

1. Select Replicated Configurations in the object tree window. Select the Primary RVG of the Replicated Configuration for which you want to pause replication from Secondary.

2. Choose Replicated Configurations > Pause Replication From Secondary (Selected menu) or Pause Replication From Secondary (Popup menu).

3. Complete the Pause Replication From Secondary dialog box as follows:

Secondary Name(s)	Type the name or names of the Secondary hosts from which you want to pause replication or click Browse to select Secondaries.

Click OK.

Resuming Replication From a Secondary Host

This section gives the steps for resuming replication from a Secondary on which replication has been paused. This task requires a Secondary host name.

You can perform a Secondary RESUME even when the Secondary is disconnected from the Primary. When the Primary and Secondary reconnect, the Primary detects that the replication on the Secondary is no longer paused and resumes replication.

▼ To resume replication from a secondary host

1. Select Replicated Configurations in the object tree window. Select the Primary RVG of the Replicated Configuration for which you want to resume replication from the Secondary.

2. Choose Replicated Configurations > Resume Replication From Secondary (Selected menu) or Resume Replication From Secondary (Popup menu).

3. Complete the Resume Replication From Secondary dialog box as follows:

Secondary Name(s)	Type the name or names of the Secondary hosts from which you want to resume replication or click Browse to select Secondaries.

Click OK.

Pausing Replication From a Primary Host

You can prevent the Primary from sending new updates and already queued updates to a Secondary by pausing replication from the Primary host. Pausing replication from the Primary enables you to perform administration tasks, such as making changes to the network connecting two nodes. This task requires a Secondary host name.

During a pause, the Primary continues to log updates to the SRL but does not send the updates to the Secondary. The network session between the Primary and Secondary on behalf of the RLINK is broken. A resume re-establishes the Primary-Secondary network session and allows updates to continue from the point of the pause. If there is volume activity during the pause, a synchronous RLINK is forced to become asynchronous. A previously synchronous RLINK remains asynchronous after the resume until it catches up.

▼ To pause replication from a Primary host

1. Select Replicated Configurations in the object tree window. Select the Primary RVG of the Replicated Configuration for which you want to pause replication.

2. Choose Replicated Configurations > Pause Replication From Primary (Selected menu) or Pause Replication From Primary (Popup menu).

3. Complete the Pause Replication From Primary dialog box as follows:

Secondary Name(s)	Type the name or names of the Secondary hosts to which you want to pause replication or click Browse to select Secondaries.

Click OK.

Resuming Replication From a Primary Host

This section explains how to resume replication from a paused Primary host for a selected Secondary host. This task requires a Secondary host name.

▼ To resume replication on a Primary host

1. Select Replicated Configurations in the object tree window. Then, select the Primary RVG of the Replicated Configuration for which you want to resume replication from the Primary for a selected Secondary.

2. Choose Replicated Configurations > Resume Replication From the Primary (Selected menu) or Resume Replication From the Primary (Popup menu).

3. Complete the Resume Replication From the Primary dialog box as follows:

Secondary Name(s)	Enter the name or names of the Secondary hosts on which you want to resume replication or click Browse to select Secondaries.

Click OK.

Incrementally Resynchronizing the Secondary After SRL Overflow

If the SRL overflows and log overflow protection is set to dcm, the Secondary can be incrementally synchronized. When the RLINK reconnects, the DCM resynchronization process must be started manually to transfer data from the Primary to the Secondary. The Resync RLINK task enables you to resynchronize the Secondary after SRL overflow.

This task requires the names of the host / disk group / RVG name to be resynchronized. During DCM resynchronization, VVR does not maintain the order of updates to the Secondary. As a result, the Secondary remains inconsistent until the resynchronization operation is complete. If the Secondary volumes are mirrored, you can break off mirrors in order to retain consistent (though out-of -date) copies of data until the resynchronization is complete.

▼ To incrementally resynchronize the Secondary after SRL overflow

1. Select Replicated Configurations in the object tree window. From the grid, select the Primary RVG of the Replicated Configuration for which you want to start resynchronization.

2. Choose Replicated Configurations > Resync RLINKs (Selected menu) or Resync RLINKs (Popup menu).

3. If the Primary Name does not display by default, complete the Resync RLINKs dialog box as follows:

Primary RVG Name	Enter the host / disk group / RVG name or click Browse to select the RVG.

Click OK.

Removing an RVG and all Associated Objects

This procedure enables you to remove an RVG and its associated objects from a Primary or Secondary host. Use this procedure cautiously. Removing an RVG recursively removes the data volumes, SRL, and RLINKs associated with the RVG.

▼ To remove an RVG recursively

1. Select the Replicated Volume Groups icon on the object tree, and then select an RVG from the grid. Then, choose Remove Recursively from the Replicated Configuration (Selected menu) or the Remove Recursively (Popup menu).

2. Removing an RVG recursively destroys the data volumes, SRL, and RLINKs associated with the RVG. If you want to proceed, click Yes.

Administering Data Volumes

This section describes the data volume tasks that you might need to perform after you have set up and configured VVR. This task requires the names of the disk group / data volume pairs to be added.

The specified data volumes are added to each host in the replicated configuration. However, the data volumes being added must be empty and not in use while being added. Volumes must exist on the Primary; if SRL protection has been set to `dcm` the volumes must have Data Change Maps (DCM) associated with them.

Adding New Data Volumes to RVGs of a Replicated Configuration

This procedure enables you to add empty volumes to all the RVGs of a replicated configuration. VMSA-VVR places the added volumes under VVR control. VMSA-VVR adds identical data volumes to the corresponding RVGs in the replicated configuration on all the Secondary hosts, if they do not already exist.

▼ To add data volumes to RVGs of a replicated configuration

1. Select Replicated Configurations in the object tree window. Now, select the Primary RVG of the Replicated Configuration for which you want to add new data volumes.

2. Choose Replicated Configurations > Add Data Volume (Selected menu) or Add Data Volume (Popup menu).

3. Complete the Add Data Volume dialog box as follows:

Data Volume Name(s)	Type the disk group / data volume pair names to add or click Browse to select the data volumes.

Click OK.

Increasing or Decreasing the Size of Data Volumes

This task changes the size of a data volume. If you require more space on a data volume, you can use this procedure to increase the size of the data volume. If a data volume contains unused space that you need to use for another purpose, you can use this procedure to shrink the data volume.

This task requires a data volume name and either the desired size or the amount of space to add to or subtract from the data volume size. The corresponding data volumes are resized on all the hosts in the replicated configuration.

▼ To resize a data volume

1. Select Replicated Configurations in the object tree window. Then, select the Primary RVG of the Replicated Configuration that contains the data volume to be resized.

2. Choose Replicated Configurations > Resize Data Volume (Selected menu) or Resize Data Volume (Popup menu).

3. Complete the Resize Data Volume dialog box as follows:

Data Volume Name:	If the correct volume name is not already displayed in this field, type the volume's name or click Browse to select the volume.
Current Size:	The current size displays in this field.
New Size:	Specify *one* of the following: ◆ To increase the volume size *by* a specific amount of space, use the Add By field to specify how much space should be added to the volume. ◆ To decrease the volume size *by* a specific amount of space, use the Subtract By field to specify how much space should be removed from the volume. ◆ To specify the new volume size, type the size in the Desired Size field. ◆ To determine the largest possible size for the volume, click Maxgrow. The default size unit is sectors. To specify a size unit, attach an `s` (sectors), `k` (kilobytes), `m` (megabytes), or `g` (gigabytes) to the size.
Options:	To use a specific disk for the additional space, click Assign Disks, and select the disk you want to use from the Space Allocation dialog box.

Click OK.

Removing Data Volumes From a Replicated Configuration

This task enables you to remove data volumes from a replicated configuration. It does not destroy the data. The specified data volumes are dissociated from all the hosts in the replicated configuration. They are not destroyed.

This task requires the names of the disk group / data volume pairs to be removed. The data volume being removed must not be in use.

▼ To remove data volumes from a replicated configuration

1. Select Replicated Configurations in the object tree window. Then, select the Primary RVG of the Replicated Configuration for which you want to delete new data volumes.

2. Choose Replicated Configurations > Remove Data Volume (Selected menu) or Remove Data Volume (Popup menu).

3. Complete the Remove Data Volume dialog box as follows:

Data Volume Name(s)	Enter the disk group / data volume pair names to remove or click Browse to select the data volumes.

Click OK.

Adding Mirrors to Data Volumes and SRLs

VMSA-VVR enables you to add mirrors to the data volumes of a replicated configuration on all the connected Secondaries using the Create a Replicated Configuration task. See “Creating a Replicated Configuration” on page 9. It does not add mirrors to the data volumes on the Primary.

To add mirrors to data volumes on the Primary, use the VMSA Volumes task, Adding a Mirror to a Volume. For instructions, see the *Volume Manager Storage Administrator Administrator’s Guide*.

Adding Data Change Maps to Data Volumes

VMSA-VVR enables you to add DCM logs to the data volumes of a replicated configuration on all the connected Secondaries using the Create a Replicated Configuration task. See “Creating a Replicated Configuration” on page 9. It does not add DCM logs to the data volumes on the Primary.

To add DCM logs to data volumes on the Primary, use the following Volumes task, “Adding a DCM to a Volume on the Primary” on page 48.

Adding a DCM to a Volume on the Primary

This task enables you to add a DCM to a data volume on the Primary. VMSA-VVR enables you to add a DCM only to a volume that does not have a DCM or a DRL.You cannot add a DCM to a volume that has a DCM or a Dirty Region Log (DRL). This task requires you to enter the names of the disk group / data volume pair for which DCM is to be added.

1. Select the Volumes icon on the object tree, and then select a volume from the grid. After selecting the volume from the grid, choose DCM > Add from the Volumes (Selected menu) or the Volumes (Popup menu).

2. Complete the Add DCM dialog box, if needed:

Volume Name	Enter the disk group / data volume name for which you want to add a DCM or click Browse to select the disk group / data volume name.

Click OK.

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