SANtricity ES Storage Manager
Volume Copy User Guide

Version 10.77

May 2011

51331-00, Rev. A

Revision History

Version and Date	Description of Changes
51331-00, Rev. A May 2011	Initial release of the document.

LSI Corporate Headquarters
Milpitas, CA
800-372-2447

Email
globalsupport@lsi.com

Website
www.lsi.com

Table of Contents

Volume Copy Premium Feature

This topic describes how to obtain, activate, and use the Volume Copy premium feature for SANtricity ES Storage Manager Version 10.77.

About the Volume Copy Premium Feature

The Volume Copy premium feature enables you to create a point-in-time copy of a volume by creating two separate volumes, the source volume and the target volume, on the same storage array. Volume Copy performs a byte-by-byte copy from the source volume to the target volume; therefore, the data on the target volume is identical to the data on the source volume. For more information about the Volume Copy premium feature, go to these topics:

- Components of the Volume Copy Premium Feature
- Improve Storage Array Performance
- Expand Storage Capacity
- Create Data Backup Volumes on page 2

Components of the Volume Copy Premium Feature

The Volume Copy premium feature includes these components:

- The Create Copy wizard, which guides you through these steps in creating a Volume Copy:
    a. Selecting a source volume from a list of available volumes
    b. Selecting a target volume from a list of available volumes
    c. Setting the copy priority for the volume copy
- The Copy Manager, where you can perform these actions:
    — Monitor the progress of a volume copy
    — Stop a volume copy
    — Recopy a volume copy
    — Remove copy pairs
    — Change target volume permissions
    — Change copy priority

Improve Storage Array Performance

Volume Copy enables you to improve storage array performance in these ways:

- Obtain better performance by moving data to drives with higher transfer rates.
- Obtain better performance by moving data to drives with newer technologies.

Expand Storage Capacity

As your storage requirements change, you can use the Volume Copy premium feature to expand storage capacity.

- Move data to pools with larger-capacity drives.
- Move data to a volume in a pool within the same storage array with larger-capacity drives.
- Move data to pools that use larger-capacity drives within the same storage array.

Create Data Backup Volumes

With Volume Copy, you can create a backup of a volume by copying data from one volume to another volume in the same storage array. You can use the target volume as a backup for the source volume, for system testing, or to back up to another device, such as a tape drive.

Obtaining the Volume Copy Premium Feature Key

Before you can create a volume copy, you must obtain the Volume Copy premium feature key and enable the premium feature. If you have purchased the Volume Copy premium feature, contact your Sun Customer Care Center representative to obtain the premium feature key.

The Sun Customer Care Center representative will need the 30-character string in the Feature Enable Identifier field in the Premium Features and Feature Pack Information window in Array Management Window of the storage array.

To obtain the Volume Copy premium feature, perform these steps:

1. In the Array Management Window, select **Storage Array >> Premium Features**.

    The Premium Features and Features Pack dialog opens and shows a list of premium features installed on the storage array.

2. Find and record the 30-character string in the Feature Enable Identifier field.

    The Sun Customer Care Center representative uses the Feature Enable Identifier to generate the premium feature key.

3. Copy the Volume Copy premium feature key to a directory from which you can retrieve it when you are ready to enable the premium feature.

    The default directory is `C:\\Documents and Settings\My Documents`.

Enabling the Volume Copy Premium Feature

After you have obtained the Volume Copy premium feature key, perform these steps to enable the Volume Copy premium feature:

1. On the menu bar in the Array Management Window, select **Storage Array >> Premium Features**.

    The Premium Features and Features Pack dialog opens and shows a list of premium features installed on the storage array.

2. Select **Volume Copy**, and click **Enable**.

    The `My Documents` directory appears.

3. Is the Volume Copy premium feature key in the `My Documents` directory?

    — **Yes** – Go to step 5.

    — **No** – Navigate to the appropriate directory.

4. Select the Volume Copy premium feature key file, and click **OK**.

    The Enable Premium Features confirmation message appears.

5. Click **Yes**.

    The Premium Features installed on storage array list shows Volume Copy as enabled.

Volume Copy States

In a volume copy, each copy relationship maintains its state independently. The available volume copy states follow:

- **Halted** – The initial state of a volume copy request. No data is moving between the source volume and the target volume. The source volume can accept I/O requests. The target volume can accept read requests. Based on its permission levels, the target volume can either accept or reject I/O requests.
- **Copy-Pending** – A volume copy operation was requested but has not yet started. Both the source volume and the target volume reject I/O requests.
- **Copy-in-Progress** – Data is being copied from the source volume to the target volume. Both the source volume and the target volume reject I/O requests.
- **Copy Failed** – Data copying between the source volume and the target volume has stopped. Host I/O requests are rejected.
- **Complete** – After the copy operation is complete, all data has been transferred from the source volume to the target volume. Source I/O requests are available. Based on its permission levels, the target volume can either accept or reject I/O requests.

Input/Output Performance During a Volume Copy Operation

During a volume copy operation, data is read from the source volume and written to the target volume in the same storage array. Because the volume copy operation diverts controller processing resources from normal I/O activity, I/O activity in the storage array can become degraded. You can use the volume copy modification priority feature to designate how much processing time is allocated for a volume copy operation compared to normal I/O activity. For more information, go to these topics:

- System Performance Factors
- Copy Modification Priority Setting on page 3
- Copy Modification Priority Rate on page 4

System Performance Factors

These factors contribute to system performance:

- I/O activity
- Volume RAID level
- Volume configuration – The number of drives in the pool or cache parameters
- Volume type – Snapshot volumes might take more time to copy than standard volumes

Copy Modification Priority Setting

The copy modification priority setting balances I/O activity with volume copy activity on a storage array. You can select the copy modification priority while you are creating a new volume copy, or you can change it later by using the Copy Manager.

- Higher volume copy priorities allocate more resources to the volume copy operation and might degrade I/O performance.
- Lower volume copy priorities allocate fewer resources to the volume copy operation and have less impact on normal I/O performance.

Copy Modification Priority Rate

Five copy modification priority rates are available:

- Lowest
- Low
- Medium
- High
- Highest

I/O activity is prioritized, and the volume copy takes longer, when the copy modification priority is set to the lowest priority rate. When the volume copy is prioritized, I/O activity for the storage array might be affected.

Volume Copy Restrictions

The maximum allowable number of volume copies in a storage array depends on the number of target volumes that are available on the storage array. For more specific information about volume copy restrictions, go to the following topics:

- Read/Write Restrictions
- Source Volume Restrictions
- Target Volume Restrictions
- Volume Copy and T10 Protection Information Restrictions

Read/Write Restrictions

During a volume copy operation, the source volume rejects write requests. After a volume copy operation is finished, the copy request can be removed.

- All information about the state of the volume copy is lost.
- I/O restrictions are removed.
- Both the source volume and the target volume can accept read requests and write requests.

Source Volume Restrictions

You can use these types of volumes as source volumes:

- A standard volume
- A snapshot volume
- The source volume of a snapshot volume
- The primary volume in a remote volume mirror

You cannot use these types of volumes as source volumes:

- The secondary volume in a remote volume mirror
- A volume currently in a modification operation
- A volume that is reserved by the host

You cannot use volumes in these statuses as source volumes:

■   A source volume or a target volume in another volume copy that is in either a Failed status, and In Progress status, or a Pending status
■   A volume in a Failed status
■   A volume in a Degraded status

Target Volume Restrictions

You can use a volume as a target volume in only one volume copy at a time. The capacity of the target volume must be equal to or greater than the usable capacity of the source volume. You can use these types of volumes as target volumes:

■   A standard volume
■   The source volume of a disabled or a failed snapshot volume
■   The primary volume in a remote volume mirror

Volume Copy and T10 Protection Information Restrictions

Volume Copy operations are allowed based on T10 Protection Information attributes when the T10 Protection Information premium feature is enabled on the storage array. When a volume to be copied is T10 Protection Information protected, the target volume also should be, but is not required to be, protected. Protection information is supplied and checked for the source volume and the target volume in the following manner:

■   **Both the source volume and the target volume are T10 Protection Information protected** –
    —   All protection information fields are verified when reading data from the source volume. The **Guard Tag** field and the **Reference Tag** field are propagated from the source volume to the target volume.
    —   The fields are then verified when writing data to the target volume. The application target value provided by the source volume is verified, and then it is replaced by the value associated with the target volume as the data is transmitted to the target volume.

> **NOTE** In this case, the I/O controller must be able to verify and replace the Application Tag on the fly.

■   **The source volume is T10 Protection Information protected, but the target volume is not T10 Protection Information protected** – Protection information is verified as the data is read from the source volume. Protection information is then verified and removed as the data is written to the target volume.
■   **The target volume is T10 Protection Information protected, but the source volume is not T10 Protection Information protected** – T10 Protection Information information is inserted as data is written to the target volume.

Table 1 Allowable Volume Copy Operations

Volume T10 Protection Information Attributes				Volume Copy Operation Allowed	Application Tag Notes	
Source Volume		Target Volume			Source Application Tag Source	Target Application Tag Source
T10 Protection Information Enabled	ATO	T10 Protection Information Enabled	ATO			
No	N/A	No	N/A	Yes		
No	N/A	Yes	Controller	Yes		
No	N/A	Yes	Host	Yes		
Yes	Controller	No	N/A	Yes	Source default	

Volume T10 Protection Information Attributes				Volume Copy Operation Allowed	Application Tag Notes	
Source Volume		Target Volume			Source Application Tag Source	Target Application Tag Source
T10 Protection Information Enabled	ATO	T10 Protection Information Enabled	ATO			
Yes	Host	N/A	N/A	Yes	Host Application Tag	
Yes	Controller	Yes	Controller	Yes	Source Default	Source Application Tag
Yes	Controller	Yes	Host	No		
Yes	Host	Yes	Controller	No		
Yes	Host	Yes	Host	Yes	Host Application Tag	Source Application Tag

NOTE Application Tag Ownership (ATO) shows whether the portion of the T10 Protection Information information that is the application tag is owned by the controllers and should be validated for correctness.

Volume Copy and Snapshot Volumes

These topics describe how Volume Copy works with snapshot volumes.

Designating a Source Volume of a Snapshot Volume as the Target Volume of a Volume Copy

To designate the source volume of a snapshot volume as the target volume of a volume copy, you must disable all snapshot volumes that are associated with the source volume before you can select it as a target volume. If any snapshot volumes are associated with the target volume, the volume copy operation fails all of the associated snapshot volumes.

Restoring Data to a Source Volume from its Associated Snapshot Volume

To restore data to a source volume from its associated snapshot volume, use Volume Copy to copy data from the snapshot volume back to the source volume.

ATTENTION Possible loss of data access – If you are using the Windows 2000 operating system or the Linux operating system, use Volume Copy with the Snapshot Volume premium feature to restore snapshot volume data to the source volume. Otherwise, the source volume and the target volume can become inaccessible to the host.

To restore the data to the source volume, perform these steps:

1. Create a volume copy of the snapshot volume, and copy the data from the snapshot volume to the target volume of the volume copy.
2. Copy the data from the target volume back to the source volume.

NOTE Another method for producing a copy of the secondary volume is to create a snapshot volume of the secondary volume, and then perform a volume copy operation on the snapshot volume.

Volume Copy and Journaling File System Formatting

If the source volume was formatted with a journaling file system, the storage array might reject a read request to the source volume, and an error message might appear. The journaling file system driver issues a write request before it tries to issue the read request. The controller rejects the write request. This situation might result in an error message that states that the source volume is write protected.

- To prevent rejected write requests, do not try to access a source volume that is participating in a volume copy operation while it is in an In Progress status.
- To prevent an error message from appearing, make sure that the read-only permission for the target volume is disabled after the volume copy has finished.

Creating a Volume Copy

Before you can create a volume copy, the premium feature must be enabled on the storage array. When you create a volume copy, make sure that the capacity of the target volume is equal to or greater than the capacity of the source volume.

ATTENTION Potential loss of data – A volume copy overwrites all existing data on the target volume, automatically makes the target volume read-only to the hosts, and fails all snapshot volumes that are associated with the target volume.

Selecting the Source Volume and the Target Volume in a Volume Copy Pair

NOTE A target volume must have a capacity equal to or greater than the source volume. Only volumes that meet that criteria are candidates to be the target volume.

1. In the Array Management Window, select the **Logical** tab.
2. In the Logical pane, select the volume to copy.
3. On the menu bar, select **Volume >> Copy >> Create**.

    The Introduction (Create Copy) wizard appears. The Source volume table shows the available volumes you can select as the source volume. The volume you selected in the Logical pane is highlighted, but you can select any volume in the list.
4. Select the source volume, and click **Next**.

    One of these actions occurs:
    — When one or more volumes meet the criteria to be a target volume, the Target volume table appears.
    — If no volumes meet the criteria to be a target volume, the No Target Volume Candidates Found message appears. Click **OK** to return to the Source volume table, and select another source volume.
5. In the Target volume table, select the target volume.
6. On the **Select copy priority** slide bar, select the priority for allocating system resources to the copy operation, and click **Next**.

    The Preview (Create Copy) wizard appears.
7. In the text box, type `Yes` to confirm starting the copy operation, and click **Finish**.
    — The volume copy starts, and data is read from the source volume and written to the target volume.

— In the Logical pane in the Array Management Window, Operation in Progress icons appear on the source volume and the target volume and show that the volume copy is in either a Pending status or an In Progress status.

— After the copy operation has finished, the Copy Started (Create Copy) message appears asking whether you want to copy another source volume.

About the Controller Ownership/Preferred Path

During a volume copy, the same controller must own both the source volume and the target volume. If both volumes do not have the same preferred controller when the volume copy starts, the ownership of the target volume is automatically transferred to the preferred controller of the source volume.

■ When the volume copy is completed or is stopped, ownership of the target volume is restored to its preferred controller.

■ If ownership of the source volume is changed during the volume copy, ownership of the target volume is also changed.

If a controller fails under any of the following conditions, you must manually change controller ownership to the alternate controller to allow the volume copy to finish.

■ A volume copy has a status of In Progress.

■ The preferred controller of the source volume fails.

■ The ownership transfer does not occur automatically during a failover.

ATTENTION Possible loss of data – Verify that either the volumes are not in use or a multi-path driver is installed on the host. If you change the controller ownership/preferred path while an application is using one of the volumes, I/O activity is disrupted, and I/O errors occur unless a multi-path host is installed on the host.

ATTENTION If a multi-path driver is not installed on the host, or if the multi-path driver is not the RDAC multi-path driver, you must make operating system-specific modifications to make sure that the moved pools can be accessed on the new path.

After a volume copy has been created, you can change its controller ownership and preferred path settings. Go to Changing the Controller Ownership/Preferred Path for a Volume Copy.

Changing the Controller Ownership/Preferred Path for a Volume Copy

1. In the Array Management Window, select the **Logical** tab.

2. In the Logical pane, select the volume for which to change the controller ownership and preferred path.

3. On the menu bar, select **Volume >> Change >> Ownership/Preferred Path**.

4. Select the available controller.

NOTE A dot identifies the current preferred path and current controller, which are grayed-out and cannot be changed.

The Confirm Change Ownership/Preferred Path message appears.

5. Click **Yes**.

About the Controller Ownership/Preferred Path

During a volume copy, the same controller must own both the source volume and the target volume. If both volumes do not have the same preferred controller when the volume copy starts, the ownership of the target volume is automatically transferred to the preferred controller of the source volume.

- When the volume copy is completed or is stopped, ownership of the target volume is restored to its preferred controller.
- If ownership of the source volume is changed during the volume copy, ownership of the target volume is also changed.

If a controller fails under any of the following conditions, you must manually change controller ownership to the alternate controller to allow the volume copy to finish.

- A volume copy has a status of In Progress.
- The preferred controller of the source volume fails.
- The ownership transfer does not occur automatically during a failover.

ATTENTION Possible loss of data – Verify that either the volumes are not in use or a multi-path driver is installed on the host. If you change the controller ownership/preferred path while an application is using one of the volumes, I/O activity is disrupted, and I/O errors occur unless a multi-path host is installed on the host.

ATTENTION If a multi-path driver is not installed on the host, or if the multi-path driver is not the RDAC multi-path driver, you must make operating system-specific modifications to make sure that the moved pools can be accessed on the new path.

After a volume copy has been created, you can change its controller ownership and preferred path settings. Go to Changing the Controller Ownership/Preferred Path for a Volume Copy on page 8.

Monitoring the Progress of a Volume Copy in the Copy Manager

You can monitor the progress of a volume copy in the Copy Manager only while the volume copy is in a Pending status or in an In Progress status. However, in the storage array profile, you can view both the progress of the volume copy operation and detailed information about all existing volume copies.

- The Copy Manager shows all existing copy pairs for all volume copies for the storage array.
- The Status column for the volume copy pair shows the completion percentage of the operation.
- You can stop a volume copy operation while it is in an In Progress status. You can re-copy it later or remove the copy pairs.

For more complete information about the Copy Manager, go to Copy Manager Operations on page 10.

To open the Copy Manager, perform these steps:

1. In the Array Management Window, select the **Logical** tab.
2. On the menu bar, select **Volume >> Copy >> Copy Manager**.

   The Copy Manager appears.

Viewing Additional Information about a Volume Copy in the Storage Array Profile

In the storage array profile, you can view detailed information about the volumes in a volume copy and the status of the volume copy operation. You can also view detailed information about all existing volume copies in the storage array.

1. In the Array Management Window, select the **Summary** tab.
2. Click **Storage Array Profile**.

   The summary page for the storage array appears.
3. Select the **Volumes** tab.

   The summary page for the selected volume appears.
4. Select the **Copies** tab.

   The summary page for the volume copies appears. The summary page shows detailed information about all existing volume copies in the storage array.

Viewing the Physical Components and Logical Elements of a Source Volume in a Volume Copy

You can view visual representations of the physical components and the logical elements of a source volume in a volume copy.

1. In the Array Management Window, select the **Logical** tab.
2. In the Logical pane, right-click the source volume, and perform either of these actions:
   — **View the associated logical elements of the target volume** – Select **View >> Associated Logical Elements**. The View Associated Logical Elements pop-up appears and shows a visual representation of the logical elements of the target volume.
   — **View the associated physical elements of the source volume** – Select **View >> Associated Physical Components**. The View Associated Physical Components pop-up appears and shows a visual representation of the physical components of the source volume.

Viewing the Logical Elements of a Target Volume in a Volume Copy

1. In the Array Management Window, select the **Logical** tab.
2. In the Logical pane, right-click the target volume.
3. Select **View >> Associated Logical Elements**.

   The View Associated Logical Elements pop-up appears and shows a visual representation of the logical elements of the target volume.

Copy Manager Operations

You can perform these actions in the Copy Manager:

- Restart a volume copy operation that is in a Stopped status. For detailed instructions, go to Re-Copying a Volume Copy on page 11.

- Stop a volume copy operation that is in a Pending status or an In Progress status. For detailed instructions, go to Stopping an In-Progress Volume CopyStopping an In-Progress Volume Copy on page 12.
- Remove copy pairs that are in a Stopped status or a Completed status. For detailed instructions, go to Removing a Volume Copy Pair from a Storage Array on page 12.
- Change the volume copy modification priority settings. You can change these settings while the volume copy is in a Pending status, an In Progress status, or a Stopped status. For detailed instructions, go to Changing the Modification Priority of a Volume Copy on page 13.
- Change permissions for a target volume that is in a Completed status or a Stopped status. For detailed instructions, go to Changing the Target Volume Permissions for a Volume Copy on page 13.
- Monitor the progress of a volume copy operation while it is in a Pending status or an In Progress status. For detailed instructions, go to Monitoring the Progress of a Volume Copy in the Copy Manager on page 9.

NOTE You can also monitor the progress of a volume copy in the storage array profile.

Re-Copying a Volume Copy

You can create a new volume copy from a source volume to its target volume.

- A volume re-copy starts the volume copy again from the beginning.
- You can use the re-copy feature to start a failed volume copy operation or a stopped volume copy operation or to re-copy an already completed volume copy.

ATTENTION Possible loss of data – A volume re-copy operation overwrites existing data on the target volume. If the hosts have been mapped to the source volume, the data that is copied to the target volume when you perform the re-copy operation might have changed since the previous volume copy was created.

To re-copy a completed volume copy, perform these steps:

1. Stop all I/O to the source volume and the target volume.
2. Unmount any file systems on the source volume and the target volume.
3. In the Array Management Window, select the Logical tab.
4. On the menu bar, select Volume >> >> Copy >> >> Copy Manager.

    The Copy Manager appears.
5. In the Copy Manager, select the source volume and target volume copy pair.
6. On the menu bar in the Copy Manager, select Copy >> >> Re-copy.

    The Re-Copy dialog appears. To change the copy priority, move the arrow in the Copy Priority slide bar to the left or right.
7. In the text box, type Yes to confirm the re-copy operation, and click OK.

    While a volume re-copy operation is in a Pending status or in an In Progress status, an icon appears next to both the source volume and the target volume.

    You can monitor the progress of a volume copy in the Copy Manager while a volume copy is in a Pending status or in an In Progress status. For more information, go to Monitoring the Progress of a Volume Copy in the Copy Manager on page 9.

    You can view more-detailed information in the Storage Array Profile about which volumes are participating in a volume re-copy and the status of the volume re-copy operation. For more information, go to Viewing Additional Information about a Volume Copy in the Storage Array Profile on page 10.

Stopping an In-Progress Volume Copy

You can stop an In-Progress volume copy before it has finished.

1. In the Array Management Window, select the **Logical** tab.
2. On the menu bar, select **Volume >> Copy Manager**.

   The Copy Manager appears.
3. In the Copy Manager, select one or more copy pairs for which to stop the volume copy.
4. On the menu bar in the Copy Manager, select **Copy >> Remove Copy Pairs**.

   The Stop Copy confirmation message appears.
5. Click **Yes**.

   — The Copy Manager shows the status of the volume copy as Stopped.

   — To start a volume copy again, select one or more volume copy pairs, and select **Copy >> >> Re-Copy** on the menu bar in the Copy Manager.

Removing a Volume Copy Pair from a Storage Array

Removing a volume copy pair breaks the relationship between the source volume and the target volume. After you remove a volume copy pair, you can use the source volume and the target volume again to create new volume copies and new volume copy pairs.

NOTE No data is deleted from either the source volume or the target volume.

After you remove a volume copy pair, these events occur:

■ All copy-related attributes of the volume copy pair, including read-only protection, are removed.
■ Volume copy information for the volume copy pair is removed from the Volume Properties pane and from the storage array profile.
■ The source volume and the target volume no longer appear as a volume copy pair in the Copy Manager.

To remove one or more volume copy pairs, perform these steps:

1. In the Array Management Window, select the **Logical** tab.
2. On the menu bar, select **Volume >> Copy >> Copy Manager**.

   The Copy Manager appears.
3. In the Copy Manager, select one or more volume copy pairs to remove.
4. On the menu bar in the Copy Manager, select **Copy >> Remove Copy Pairs**.

   The Remove Copy Pairs confirmation message appears.
5. Click **Yes**.

   The Remove Copy Pairs - Progress bar shows the progress of the removal operation.
6. Click **OK**.

Changing the Modification Priority of a Volume Copy

The modification priority defines how much processing time and resources are allocated to volume copy modifications compared with system performance. Increasing the modification priority of a volume copy might degrade system performance. You can set the modification priority of a pool, and you can change the modification priority of a volume after the pool has finished. Modification priorities can affect these operations:

- Performing a copyback
- Performing a Dynamic Volume Expansion (DVE)
- Reconstructing a volume
- Initializing a volume
- Changing a volume's segment size
- Defragmenting a pool
- Adding free capacity to a pool
- Changing the RAID level of a pool

To change the modification priority of a volume copy, perform these steps:

1. In the Array Management Window, select the **Logical** tab.
2. In the Logical pane, select the volume for which to change the modification priority.
3. On the menu bar in the Array Management Window, select **Volume >> Change >> Modification Priority**.
   — The Change Modification Priority dialog appears.
   — The Select volumes table shows the volumes and the pools on the storage array.
   — The **Select Modification Priority** slide bar shows the priority level of the highlighted volume.
4. Select one or more volumes for which to change the modification priority.

NOTE When you select a single volume, the **Select Modification Priority** slide bar shows the priority setting of the volume. When you select multiple volumes, the **Select Modification Priority** slide bar shows the priority setting as Lowest for all volumes, regardless of the actual priority for each individual volume.

   — To select nonadjacent volumes, press and hold the **Ctrl** key, and select each volume.
   — To select adjacent volumes, press and hold the **Shift** key, and select each volume.
   — To select all volumes, click **Select All**.
5. On the **Select Modification Priority** slide bar, select the modification priority for the volume or volumes, and click **OK**.

Changing the Target Volume Permissions for a Volume Copy

Read requests and write requests to the target volume do not take place while the volume copy is in either a Pending status or an In Progress status, or if the volume copy fails. After the volume copy operation is complete, the target volume automatically becomes read-only to the hosts.

- To allow changes to the data on the target volume after the volume copy operation is complete, disable the read-only permissions for the target volume.

- ■ To prevent changes to the data on the target volume after the volume copy operation is complete, enable the read-only permissions for the target volume. You should preserve the data on the target volume under the following circumstances:
    - — You are using the target volume for backup purposes.
    - — You are copying data from one storage array to a larger storage array for greater accessibility.
    - — You are using the data on the target volume to copy back to the base volume of a disabled volume or failed flashcopy volume.

To change target volume permissions, perform these steps:

1. In the Array Management Window, select the **Logical** tab.
2. On the menu bar, select **Volume >>Copy >> Copy Manager**.

    The Copy Manager appears.

3. In the Copy Manager, select one or more copy pairs.
4. Select **Change >> Target Volume Permissions**.
5. Perform one of these actions:

    - — **Disable Read-Only permissions** – Select **Disable Read-Only**. Read-write permissions are enabled on the target volume and are automatically available to hosts after the volume copy has finished.
    - — **Make the target volume read-only to hosts** – Select **Read-Only**. Read-only permissions are enabled on the target volume. Write requests to the target volume are rejected even after the volume copy has finished.

Obtaining the Volume Copy Premium Feature Key

Before you can create a volume copy, you must obtain the Volume Copy premium feature key and enable the premium feature. If you have purchased the Volume Copy premium feature, contact your Sun Customer Care Center representative to obtain the premium feature key.

The Sun Customer Care Center representative will need the 30-character string in the Feature Enable Identifier field in the Premium Features and Feature Pack Information window in Array Management Window of the storage array.

To obtain the Volume Copy premium feature, perform these steps:

1. In the Array Management Window, select **Storage Array >> Premium Features**.

    The Premium Features and Features Pack dialog opens and shows a list of premium features installed on the storage array.

2. Find and record the 30-character string in the Feature Enable Identifier field.

    The Sun Customer Care Center representative uses the Feature Enable Identifier to generate the premium feature key.

3. Copy the Volume Copy premium feature key to a directory from which you can retrieve it when you are ready to enable the premium feature.

    The default directory is `C:\\Documents and Settings\My Documents`.

Disabling the Volume Copy Premium Feature

To disable the Volume Copy premium feature, perform these steps:

1. On the menu bar in the Array Management Window, select **Storage Array >> Premium Features**.

   The Premium Features and Features Pack window opens and shows a list of premium features installed on the storage array.

2. Select **Volume Copy**, and click **Disable**.

   The Disable Premium Features confirmation message appears.

3. Click **Yes**.

   The Premium Features installed on storage array list shows Volume Copy as disabled.

4. Click **Close**.

Volume Copy Troubleshooting Tips

This section provides troubleshooting tips for the Volume Copy premium feature.

Troubleshooting Modification Operations

If you try to create a volume copy at the same time a modification operation is running on either the source volume or the target volume, and the volume copy is in a Pending status, an In Progress status, or a Failed status, the volume copy cannot start.

If a modification operation is running on a source volume or a target volume after a volume copy has been created, the modification operation must complete before the volume copy can start.

While a volume copy is in an In Progress status, no modification operation can take place on either the source volume or the target volume.

Troubleshooting Failed Volume Copy Operations

A volume copy can fail under these conditions:

- A read error from the source volume occurs.
- A write error to the target volume occurs.
- A failure in the storage array occurs that affects the source volume or the target volume, such as a remote volume mirror role reversal.

When a volume copy fails, a critical event is logged in the Event Log, and a Needs Attention icon appears in the Array Management Window.

- When a volume copy is in a Needs Attention status, the host has read-only access to the source volume.
- Read requests from and write requests to the target volume are rejected until the failure is corrected by using the Recovery Guru.

Please
Recycle

51331- 00A