

# **StorageWorks Cluster Backup by Compaq**

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## **Installation Instructions**

Part Number 192801-002

January 2002 (Second Edition)

This booklet provides instruction on how to setup and configure a two-node, Microsoft Cluster Server (MSCS) with backup software and tape libraries or direct-attach tape drives.

***COMPAQ***

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StorageWorks Cluster Backup by Compaq Installation Instructions  
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## About This Guide

This booklet provides instruction on how to setup and configure a two-node, Microsoft Cluster Server (MSCS) with backup software and tape libraries or direct-attach tape drives.

This guide is intended for end users and Compaq support personnel.

## Important Safety Information

Before installing this product, read the *Important Safety Information* document provided with your hardware.

## Symbols and Conventions Used in This Guide

The following symbols and words mark special messages throughout this guide:



**WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



**CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

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**IMPORTANT:** Text set off in this manner presents clarifying information or specific instructions.

**NOTE:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

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This document uses the following conventions:

- *Italic type* is used for complete titles of published guides or variables. Variables include information that varies in system output, in command lines, and in command parameters in text.
- **Bold type** is used for emphasis, for onscreen interface components (window titles, menu names and selections, button and icon names, and so on), and for keyboard keys.
- `Monospace typeface` is used for command lines, code examples, screen displays, error messages, and user input.
- Sans serif typeface is used for uniform resource locators (URLs).

## Related Documentation

For additional information on the topics covered in this guide, refer to the following documentation:

- *TL891DLX DLT MiniLibrary Configuration Guide*
- *TL891 MiniLibrary Configuration Guide*
- *SSL2000 Series Library Reference Guide*
- *MSL5026 Library User Guide*

## Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations:

### Compaq Technical Support

In North America, call the Compaq Technical Support Phone Center at 1-800-OK-COMPAQ. Telephone support is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

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Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for worldwide Technical Support Centers are listed on the Compaq website:

[www.compaq.com](http://www.compaq.com)

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Model name and number of add-on boards and other hardware
- Name and revision level of third-party software
- Operating system type and revision level

### **Compaq Website**

The Compaq website has information on this product, as well as the latest drivers and flash ROM images. You can access the Compaq website by logging on to the Internet at [www.compaq.com](http://www.compaq.com).

### **Compaq Authorized Reseller**

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- Elsewhere, see the Compaq website for locations and telephone numbers.

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## Configuring the ProLiant CL380 for Cluster Backup

Your *ProLiant*<sup>™</sup> CL380 cluster backup solution can be configured using any one of the following libraries:

- *StorageWorks*<sup>™</sup> TL891 MiniLibrary by Compaq
- *StorageWorks* TL891DLX MiniLibrary by Compaq
- *StorageWorks* SSL2020 MiniLibrary by Compaq
- *StorageWorks* MSL5026 MiniLibrary by Compaq

See the appropriate section in this guide for your MiniLibrary installation.

The cluster backup solution can also be configured with a standalone tape drive. The process for connecting a standalone device is different than the process outlined in this document for connecting a tape library. Standalone tape drives can be connected separately to their own controllers, but you must manually configure drive pooling for backup failover to occur properly. For more information, refer to the “Configuring Standalone Tape Drives in a Cluster Backup Environment” section, later in this document, and the documentation shipped with the backup software.

The installation process for the cluster backup solution can be divided into three parts:

- Install and set up cluster server hardware and software. Refer to the server documentation for more information.
- If necessary, update the system partition on each server node. See the “Updating System Partitions” section later in this document.
- Install the MiniLibrary or standalone drives into the cluster as described in the following sections of this document.
- Install the backup software.
  - If your configuration consists of two nodes sharing a single MiniLibrary device, use cluster backup installation procedures.
  - If your configuration uses standalone drives connected to each node individually, install the backup software as described in the “Backup Software Setup” section later in this document.

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## Updating System Partitions

If the system partition on the server nodes was created with a SmartStart version prior to 4.8, you must update the System Configuration Utility (SCU) within the system partition on each node. This update allows you to change the IDs on the SCSI HBAs in each node. To update the SCU, perform the following steps:

1. Download the latest version of SCU from [www.compaq.com](http://www.compaq.com).
2. Run the SCU executable that you downloaded and follow the instructions given to build the system configuration diskettes.
3. Reboot the server node. When prompted, press **F10** to access the existing system partition.
4. Select **Upgrade System Partition**.
5. Select **Update System Configuration**.
6. When prompted, insert the diskettes that you created when you downloaded the SCU.
7. Restart the server.
8. Repeat steps 3 through 7 for the second node.

## Installing a TL891 MiniLibrary

Before connecting the TL891 MiniLibrary to the *ProLiant* CL380, check the revision number on the black and white barcode label on the rear of the unit. If the revision is B04, you must first complete the procedure in the following section to change the “TL891 MiniLibrary SCSI ID setting.” If the revision is not B04, skip to the “Installing the Library” section.

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## Changing the TL891 MiniLibrary SCSI ID Setting

These steps are only required if the revision on the black and white bar code label on the rear of your unit show that it is B04.

1. Power up the library and wait until the Power-On Self-Test (POST) completes and the default screen is displayed on the control panel display. The display may vary depending on the number of drives in the library. The Ready LED indicator lights green, and the library status window displays the following:

DLT0: No Tape

DLT1: No Tape

Loader Idle

2. At the **Default** screen, press the **Enter** button. The **Main Menu** displays the following:

Load/Unload

Show Status Menu

Maintenance Menu

Configure Menu

3. Press the **Down Arrow** button. Select the **Configure** menu and press the **Enter** button. The **Configure** submenu displays the following:

Set Data Format

Set SCSI

Set Library Mode

Set Element Base

4. Press the **Down Arrow** button to select **Set SCSI**, and then press the **Enter** button. The **SCSI** submenu displays the following:

Library Parity:

\*Enabled

Library Bus ID:

\*0

- 
5. Press the **Down Arrow** button to select **Library Bus ID**, and then press the **Enter** button.
  6. Press the **Up Arrow** button until **1** is displayed below the library bus ID.
  7. Press the **Enter** button to accept the SCSI ID of **1** as shown below:  
Library Bus ID:  
\*1
  8. Press the **Esc** button to activate the new SCSI ID setting.

**NOTE:** For about 15 seconds, the front panel displays **SCSI Param. Update**.

When the update is complete, the front panel returns to the **Configure** menu.

## Installing the Library

1. Install an HVD Compaq Dual Channel Wide-Ultra SCSI-3 Controller into an available slot in each server node.  
  
**IMPORTANT:** Do not use the LVD controller card that is preinstalled in the CL380 to connect a HVD TL891 library. HVD and LVD devices are not compatible.
2. Connect the MiniLibrary to the cluster as follows:
  - a. Connect the cable from the HVD controller in node 1 to the leftmost SCSI port on the back of the MiniLibrary.
  - b. Connect the cable from the HVD controller in node 2 to the rightmost SCSI port on the back of the MiniLibrary.
  - c. Use the two short SCSI cables provided with your MiniLibrary to daisy chain the remaining four middle SCSI ports.

**IMPORTANT:** Because each SCSI controller acts as a terminator in this configuration if a server failure occurs during backup operations, do not disconnect the failed server until the backup is complete on the functioning node.

**NOTE:** A terminator is not required because the SCSI HBAs act as terminators for one another. This is true even if one of the servers is powered off.

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3. Make sure that the HBAs in each server node connected to the TL891 have different SCSI ID numbers. Also, make sure that the HBA SCSI IDs do not conflict with the TL891 SCSI ID settings. By default, the TL891 controller ID should be 0, and the TL891 drive IDs should be 4 and 5. Use the library's front panel to determine the SCSI IDs used by the library. To verify and/or change the SCSI ID settings of the HBAs in each node, do the following:

**IMPORTANT:** Make a note of each SCSI ID setting. When the node 2 HBA is configured, it cannot have the same ID as the node 1 HBA. For example, if the node 1 HBA is set for SCSI ID 6, then node 2 HBA must be set to ID 7.

- a. Reboot the server. When prompted, press **F10** to access the **System Partition** screen.
  - b. Select **System Configuration** and press **Enter**.
  - c. Select **Hardware Configuration** and press **Enter**.
  - d. Select **Review or Modify Hardware Settings**.
  - e. Select **View or Edit Details**.
  - f. Select the **Compaq Dual Channel Wide-Ultra SCSI-3 Controller**.
  - g. Highlight the **SCSI ID** option and press **Enter**.
  - h. Select the desired SCSI ID setting and press **Enter**.
  - i. Repeat substeps a through h for the second node.
4. Power off both server nodes.
  5. Power on the library.
  6. Wait approximately 90 seconds for the library to complete the POST cycle, and then power on server node 1.
  7. Observe the POST sequence of node 1 carefully. You should see all installed libraries and drives listed. If the list is incomplete, do the following:
    - a. Verify that there is not a SCSI ID conflict.
    - b. Verify that the library is properly cabled.
    - c. Verify that there are no bent pins or damaged cables with the SCSI connections.

- 
8. Let server node 1 load the operating system.
  9. Power on node 2 and let it load the operating system.
  10. Use Device Manager to verify that the operating system sees your library and tape drives. It is not important that drivers be loaded in Device Manager. The drivers are loaded during the backup software installation.
  11. Install the backup software. Follow the installation instructions for loading backup software in a cluster environment.

## Installing a TL891DLX MiniLibrary

To connect the TL891DLX MiniLibrary to a *ProLiant* CL380 cluster configuration:

1. Connect the MiniLibrary to the cluster as follows:
  - a. Connect a cable from the available VHDCI SCSI port in node 1 to the leftmost SCSI port on the back of the MiniLibrary.  
  
**NOTE:** Some server models might have a yellow warning sticker beneath the available VHDCI SCSI port on the back of each node that says "DO NOT USE." You can safely ignore this warning.
  - b. Connect the cable from the available VHDCI SCSI port in node 2 to the rightmost SCSI port on the back of the MiniLibrary.
  - c. Use the two short SCSI cables provided with your MiniLibrary to daisy chain the remaining four middle SCSI ports on the back of the MiniLibrary.

**IMPORTANT:** Because each SCSI controller acts as a terminator in this configuration if a server failure occurs during backup operations, do not disconnect the failed server until the backup is complete on the functioning node.

**NOTE:** A terminator is not required because the SCSI HBAs act as terminators for one another. This is true even if one of the servers is powered off.

- 
2. Make sure that the HBAs in each server node connected to the TL891DLX have different SCSI ID numbers. Also, make sure that the HBA SCSI IDs do not conflict with the TL891DLX SCSI ID settings. By default, the TL891DLX controller ID should be 0, and the TL891DLX drive IDs should be 4 and 5. Use the library's front panel to determine the SCSI IDs used by the library. To verify and/or change the SCSI ID settings of the HBAs in each node, do the following:

**IMPORTANT:** Make a note of each SCSI ID setting. When the node 2 HBA is configured, it cannot have the same ID as the node 1 HBA. For example, if the node 1 HBA is set for SCSI ID 6, then the node 2 HBA must be set to ID 7.

- a. Reboot the server. When prompted, press **F10** to access the **System Partition** screen.
  - b. Select **System Configuration** and press **Enter**.
  - c. Select **Hardware Configuration** and press **Enter**.
  - d. Select **Review or Modify Hardware Settings**.
  - e. Select **View or Edit Details**.
  - f. Select the **Compaq Dual Channel Wide-Ultra SCSI-3 Controller**.
  - g. Highlight the **SCSI ID** option and press **Enter**.
  - h. Select the desired SCSI ID setting and press **Enter**.
  - i. Repeat substeps a through h for the second node.
3. Power off both server nodes.
  4. Power on the library.
  5. Wait approximately 90 seconds for the library to complete the POST cycle, and then power on server node 1.
  6. Observe the POST sequence of node 1 carefully. You should see all installed libraries and drives listed. If the list is incomplete, do the following:
    - a. Verify that there is not a SCSI ID conflict.
    - b. Verify that the library is properly cabled.
    - c. Verify that there are no bent pins or damaged cables with the SCSI connections.

- 
7. Let server node 1 load the operating system.
  8. Power on node 2 and let it load the operating system.
  9. Use Device Manager to verify that the operating system sees your library and tape drives. It is not important that drivers be loaded in Device Manager. The drivers are loaded during the backup software installation.
  10. Install the backup software. Follow the installation instructions for loading backup software in a cluster environment.

## Installing an SSL2020 MiniLibrary

To connect the SSL2020 MiniLibrary to a *ProLiant* CL380 cluster configuration, do the following:

### Connecting a Single-Drive Configuration

If your SSL2020 MiniLibrary has a single drive, refer to Figure 1 and connect the cables as follows:

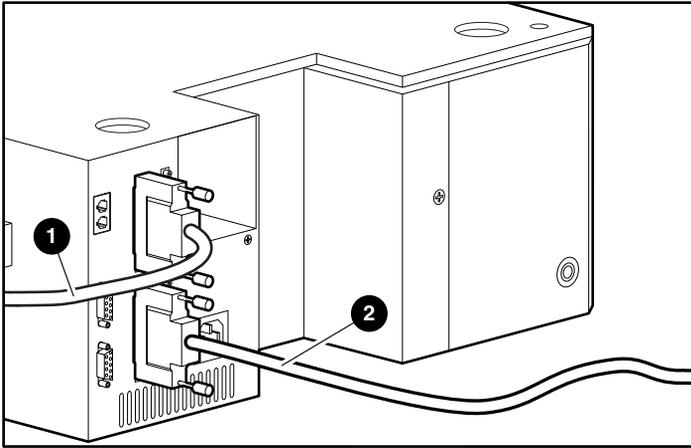
1. Locate the four 68-pin SCSI ports on the back of the SSL2020 MiniLibrary. The two left ports labeled DRV1 + LIB (stacked vertically) are used to connect to the server nodes.
2. Connect one (it doesn't matter which one) of the left SCSI ports labeled DRV1 + LIB on the back of the library to the available VHDCI SCSI port in node 1.

**NOTE:** Some server models might have a yellow warning sticker beneath the available VHDCI SCSI port on the back of each node that says "DO NOT USE." You can safely ignore this warning.

3. Connect the remaining left SCSI port on the back of the library to the available VHDCI SCSI port in node 2.

**IMPORTANT:** Because each SCSI controller acts as a terminator in this configuration if a server failure occurs during backup operations, do not disconnect the failed server until the backup is complete on the functioning node.

**NOTE:** A terminator is not required because the SCSI HBAs act as terminators for one another. This is true even if one of the servers is powered off.



**Figure 1: Connecting an SSL2020 MiniLibrary with a single-drive configuration**

- ❶ To server node HBA      ❷ To server node HBA

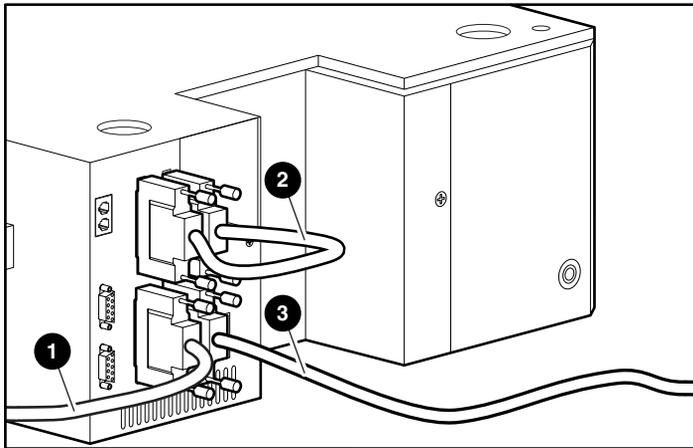
## Connecting a Dual-Drive Configuration

If your SSL2020 MiniLibrary has two drives, refer to Figure 2 and connect the cables as follows:

1. Locate the four 68-pin SCSI ports on the back of the SSL2020 MiniLibrary. Connect the top two ports together using the short 68-to-68 pin cable that is provided with the library.
2. Connect one (it doesn't matter which one) of the bottom two SCSI ports on the back of the library to the available VHDCI SCSI port in node 1.

**NOTE:** Some server models might have a yellow warning sticker beneath the available VHDCI SCSI port on the back of each node that says "DO NOT USE." You can safely ignore this warning.

3. Connect the remaining SCSI port on the back of the library to the available VHDCI SCSI port in node 2.



**Figure 2: Connecting an SSL2020 MiniLibrary with a dual-drive configuration**

- ❶ To server node HBA
- ❷ Short SCSI cable
- ❸ To server node HBA

## Completing the Installation

1. Make sure that the HBAs in each server node connected to the MiniLibrary have different SCSI ID numbers. Also, make sure that the HBA SCSI IDs do not conflict with the MiniLibrary SCSI ID settings. By default, the MiniLibrary controller ID should be 0, and the MiniLibrary drive IDs should be 4 and 5. Use the MiniLibrary's front panel to determine the SCSI IDs used by the MiniLibrary. To verify and/or change the SCSI ID settings of the HBAs in each node, do the following:

**IMPORTANT:** Make a note of each SCSI ID setting. When the node 2 HBA is configured, it cannot have the same ID as the node 1 HBA. For example, if the node 1 HBA is set for SCSI ID 6, then the node 2 HBA must be set to ID 7.

- a. Reboot the server. When prompted, press **F10** to access the **System Partition** screen.
- b. Select **System Configuration** and press **Enter**.
- c. Select **Hardware Configuration** and press **Enter**.

- 
- d. Select **Review or Modify Hardware Settings**.
  - e. Select **View or Edit Details**.
  - f. Select the **Compaq Dual Channel Wide-Ultra SCSI-3 Controller**.
  - g. Highlight the **SCSI ID** option and press **Enter**.
  - h. Select the desired SCSI ID setting and press **Enter**.
  - i. Repeat substeps a through h for the second node.
2. Power off both server nodes.
  3. Power on the MiniLibrary.
  4. Wait approximately 90 seconds for the MiniLibrary to complete the POST cycle, and then power on server node 1.
  5. Observe the POST sequence of node 1 carefully. You should see all installed libraries and drives listed. If the list is incomplete, do the following:
    - a. Verify that there is not a SCSI ID conflict.
    - b. Verify that the library is properly cabled.
    - c. Verify that there are no bent pins or damaged cables with the SCSI connections.
  6. Let server node 1 load the operating system.
  7. Power on node 2 and let it load the operating system.
  8. Use Device Manager to verify that the operating system sees your library and tape drives. It is not important that drivers be loaded in Device Manager. The drivers are loaded during the backup software installation.
  9. Install the backup software. Follow the installation instructions for loading backup software in a cluster environment.

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## Installing a MSL5026 MiniLibrary

To connect the MSL5026 MiniLibrary to a *ProLiant* CL380 cluster configuration, follow these procedures.

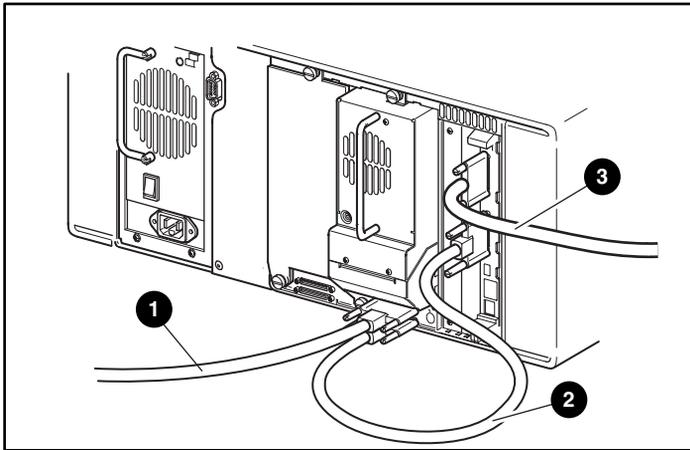
### Connecting a Single-Drive Configuration

If your MSL5026 MiniLibrary has a single drive, refer to Figure 3 and connect the cables as follows:

1. Locate the six VHDCI SCSI connectors on the back of the MSL5026 MiniLibrary. Two connectors are located beneath each drive bay. The two connectors on the far right of the back panel are for the library controller card.
2. Connect the top VHDCI SCSI connector on the back of the MSL5026 MiniLibrary controller card to the available VHDCI SCSI port in node 1.

**NOTE:** Some server models might have a yellow warning sticker beneath the available VHDCI SCSI port on the back of each node that says "DO NOT USE." You can safely ignore this warning.

3. Daisy chain the bottom VHDCI SCSI connector on the library controller card to one of the VHDCI ports under drive 1 using one of the short cables provided.
4. Connect the remaining VHDCI port under drive 1 to the available VHDCI SCSI port in node 2.



**Figure 3: Connecting an MSL5026 MiniLibrary with a single-drive configuration**

- ❶ To server node HBA
- ❷ Short SCSI cable
- ❸ To server node HBA

**NOTE:** In a single-drive configuration, the two VHDCI ports under the blanking panel for drive 2 remain unused.

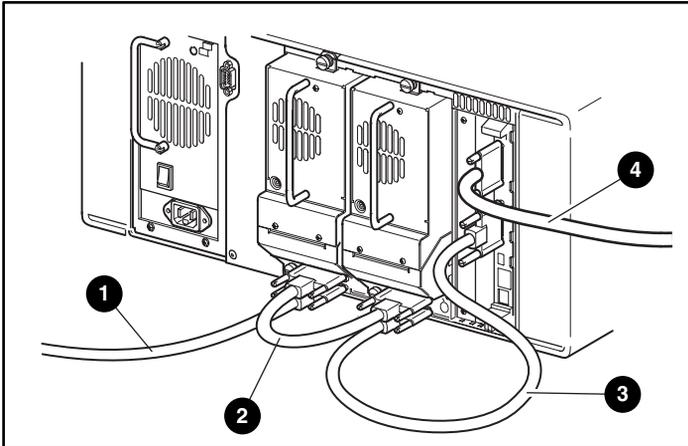
## Connecting a Dual-Drive Configuration

If your MSL5026 MiniLibrary has two drives, refer to Figure 4 and connect the cables as follows:

1. Locate the six VHDCI SCSI connectors on the back of the MSL5026 MiniLibrary. Two connectors are located beneath each drive bay. The two connectors on the far right of the back panel are for the library controller card.
2. Connect the top VHDCI SCSI connector on the back of the MSL5026 MiniLibrary controller card to the available VHDCI SCSI port in node 1.

**NOTE:** Some server models might have a yellow warning sticker beneath the available VHDCI SCSI port on the back of each node that says “DO NOT USE.” You can safely ignore this warning.

3. Daisy chain the bottom VHDCI SCSI connector on the library controller card to one of the VHDCI ports under drive 1 using one of the short cables provided.
4. Use the second short VHDCI to VHDCI cable to daisy chain from drive 1 to one of the VHDCI ports under drive 2.
5. Connect the last available VHDCI port on drive 2 to the available VHDCI SCSI port in node 2.



**Figure 4: Connecting an MSL5026 MiniLibrary with a dual-drive configuration**

- |   |                    |   |                     |
|---|--------------------|---|---------------------|
| ❶ | To server node HBA | ❷ | Shortest SCSI cable |
| ❸ | Short SCSI cable   | ❹ | To server node HBA  |

**IMPORTANT:** Because each SCSI controller acts as a terminator in this configuration, if a server failure occurs during backup operations, do not disconnect the failed server until the backup is complete on the functioning node.

**NOTE:** A terminator is not required because the SCSI HBAs act as terminators for each other. This is true even if one of the servers is powered off.

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## Completing the Installation

1. Make sure that the HBAs in each server node connected to the MiniLibrary have different SCSI ID numbers. Also, make sure that the HBA SCSI IDs do not conflict with the MiniLibrary SCSI ID settings. By default, the MiniLibrary controller ID should be 0, and the MiniLibrary drive IDs should be 4 and 5. Use the MiniLibrary's front panel to determine the SCSI IDs used by the MiniLibrary. To verify and/or change the SCSI ID settings of the HBAs in each node, do the following:

**IMPORTANT:** Make a note of each SCSI ID setting. When the node 2 HBA is configured, it cannot have the same ID as the node 1 HBA. For example, if the node 1 HBA is set for SCSI ID 6, then the node 2 HBA must be set to ID 7.

- a. Reboot the server. When prompted, press **F10** to access the **System Partition** screen.
  - b. Select **System Configuration** and press **Enter**.
  - c. Select **Hardware Configuration** and press **Enter**.
  - d. Select **Review or Modify Hardware Settings**.
  - e. Select **View or Edit Details**.
  - f. Select the **Compaq Dual Channel Wide-Ultra SCSI-3 Controller**.
  - g. Highlight the **SCSI ID** option and press **Enter**.
  - h. Select the desired SCSI ID setting and press **Enter**.
  - i. Repeat substeps a through h for the second node.
2. Power off both server nodes.
  3. Power on the MiniLibrary.
  4. Wait approximately 90 seconds for the MiniLibrary to complete the POST cycle, and then power on server node 1.

- 
5. Observe the POST sequence of node 1 carefully. You should see all installed libraries and drives listed. If the list is incomplete, do the following:
    - a. Verify that there is no SCSI ID conflict.
    - b. Verify that the library is cabled properly.
    - c. Verify that there are no bent pins or damaged cables with the SCSI connections.
  6. Let server node 1 load the operating system.
  7. Power on node 2 and let it load the operating system.
  8. Use Device Manager to verify that the operating system sees your library and tape drives. It is not important that drivers be loaded in Device Manager. The drivers are loaded during the backup software installation.
  9. Install the backup software. Follow the installation instructions for loading backup software in a cluster environment.

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## Configuring the ProLiant DL380 for Cluster Backup

Your cluster backup solution can be configured with either a *StorageWorks* SSL2020 MiniLibrary by Compaq or a *StorageWorks* MSL5026 MiniLibrary by Compaq. See the corresponding section in this document for MiniLibrary installation instructions.

The cluster backup solution can also be configured with a standalone tape drive. The process for connecting a standalone device is different than the process outlined in this document for connecting a tape library. Standalone tape drives can be connected separately to their own controllers, but you must manually configure drive pooling for backup failover to occur properly. For more information, refer to the “Configuring Standalone Tape Drives in a Cluster Backup Environment” section, later in this document, and the documentation shipped with the backup software.

The installation process for the cluster backup solution can be divided into five parts:

- Install and set up cluster server hardware. Refer to the server documentation for more information.
- Configure the host bus adapters (HBAs) for multi-initiator support if both nodes are sharing a storage device (library). See the corresponding section later in this document for specific instructions.
- Install the HBAs into the cluster nodes. Refer to the server documentation or to the documentation that ships with the HBA for specific installation instructions.
- Install the MiniLibrary or standalone drives into the cluster as described in the following sections of this document.
- Install the backup software.
  - If your configuration consists of two nodes sharing a single MiniLibrary device, use cluster backup installation procedures.
  - If your configuration uses standalone drives connected to each node individually, install the backup software as described in the “Backup Software Setup” section later in this document.

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## Configuring the HBAs for Multi-Initiator Support

Compaq recommends that you configure the cluster before installing the library. After installing your cluster and verifying that it is functioning properly, power off both nodes. For the cluster backup solution to work properly, you must configure the HBAs for multi-initiator support if you are sharing a single device (such as a library) between two servers that each have a SCSI controller (initiator). When using the Compaq *ProLiant* DL380 packaged cluster, you must have one SCSI HBA installed in each node. The following Compaq HBAs are supported:

- 64-Bit/66-MHz Dual Channel Ultra3 SCSI Adapter (129803-B21)
- 64-Bit/66-MHz Single Channel Ultra3 SCSI Adapter (154457-B21)

Before installing the HBAs into the server nodes, complete the following procedure to configure each HBA for multi-initiator support:

1. If you are using a dual-channel HBA, place jumpers on pins J3 and J5 on the HBA prior to inserting it into the server. These jumpers are located next to the internal SCSI ports on the adapter.

If you are using a single-channel HBA, place jumpers on pins J2 and J6 on the HBA prior to inserting it into the server. These jumpers are located next to the internal SCSI ports on the adapter.

**IMPORTANT:** The jumper settings described in step 1 change the HBAs from auto termination to permanent termination on the SCSI bus. Failure to set the above jumpers properly causes the server to lock up during startup.

2. Insert the adapters into an available PCI slot in each of the two server nodes.
3. Power on the first server node (or the second server node if you have already configured the first node) and observe the Power-On Self-Test (POST) sequence. At the **Press F8 for multi-initiator support** prompt, press **F8**. If you do not see this prompt, the following conditions may exist:
  - You are not using a supported HBA.
  - The HBA has not been properly inserted into a PCI slot.
  - The adapter firmware is outdated and must be upgraded.

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Check for these conditions and make any necessary corrections. Go to [www.compaq.com](http://www.compaq.com) for the latest adapter firmware.

4. Enter the port number to which the library is connected and press **Enter**. You are then prompted to change the SCSI ID of the adapter. The default value is ID 7.
5. If you are configuring node 1, select **Yes** and verify that the SCSI ID for this node is 7.

If you are configuring node 2, select **Yes** and change the ID of the adapter from 7 to 6.

**IMPORTANT:** Because the two server nodes are sharing the same library, you must change one of the HBA IDs from 7 to 6 to prevent an ID conflict.

6. When you see the prompt **Do you want to change the status of SCSI bus reset**, select **Yes** and change the status of the SCSI bus reset at IC initialization from **Enable** to **Disable**.
7. Press **X** to exit the multi-initiator configuration. The configuration changes are saved and the server restarts. Immediately after the server begins the restart, power the server off.
8. Repeat steps 3 to 7 for node 2.

When you have finished, both server nodes should already be powered off. You are now ready to install the library.

## Installing a StorageWorks SSL2020 MiniLibrary

If you have not yet configured the HBAs for multi-initiator support, you must do so now. Refer to the previous section, “Configuring the HBAs for Multi-Initiator Support,” in this document for instructions. When the HBAs are properly configured and installed, proceed with the following steps to install the *StorageWorks* SSL2020 MiniLibrary by Compaq.

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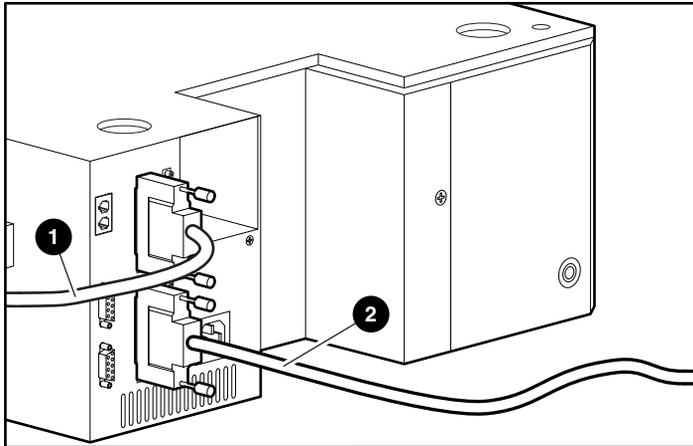
## Connecting a Single-Drive Configuration

If your SSL2020 MiniLibrary has a single drive, refer to Figure 5 and connect the cables as follows:

1. Locate the four 68-pin SCSI ports on the back of the SSL2020 MiniLibrary. The two left ports labeled DRV1 + LIB (stacked vertically) are used to connect to the server nodes.
2. Connect one (it doesn't matter which one) of the left SCSI ports labeled DRV1 + LIB on the back of the library to the SCSI HBA on node 1.
3. Connect the remaining left SCSI port on the back of the library to the SCSI HBA on node 2.

**IMPORTANT:** Because each SCSI controller acts as a terminator in this configuration if a server failure occurs during backup operations, do not disconnect the failed server until the backup is complete on the functioning node.

**NOTE:** A terminator is not required because the SCSI HBAs act as terminators for one another. This is true even if one of the servers is powered off.



**Figure 5: Connecting an SSL2020 MiniLibrary with a single-drive configuration**

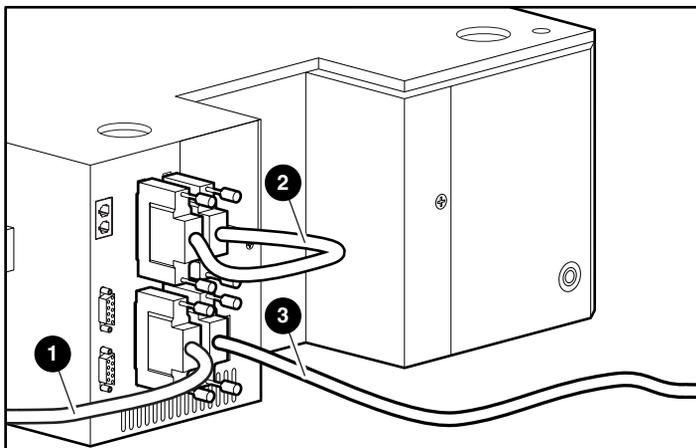
- ❶ To server node HBA      ❷ To server node HBA

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## Connecting a Dual-Drive Configuration

If your SSL2020 MiniLibrary has two drives, refer to Figure 6 and connect the cables as follows:

1. Locate the four 68-pin SCSI ports on the back of the SSL2020 MiniLibrary. Connect the top two ports together using the short 68-to-68 pin cable that is provided with the library.
2. Connect one (it doesn't matter which one) of the bottom two SCSI ports on the back of the library to the SCSI HBA on node 1.
3. Connect the remaining SCSI port on the back of the library to the SCSI HBA on node 2.



**Figure 6: Connecting an SSL2020 MiniLibrary with a dual-drive configuration**

- |   |                    |   |                  |
|---|--------------------|---|------------------|
| ❶ | To server node HBA | ❷ | Short SCSI cable |
| ❸ | To server node HBA |   |                  |

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## Completing the Installation

1. Make sure that the SCSI IDs used on the SSL2020 do not conflict with ID6 or ID7 that the SCSI HBAs are using. By default, the IDs on the SSL2020 are 0, 4, and 5, respectively. Use the library's front panel to determine the SCSI IDs used by the library. Refer to the *Compaq StorageWorks SSL2020 User Guide* for further instructions.
2. Power on the library.
3. Wait approximately 90 seconds for the library to complete the POST cycle, and then power on server node 1.
4. Observe the POST sequence of node 1 carefully. You should see all installed libraries and drives listed. If the list is incomplete, do the following:
  - a. Verify that there is not a SCSI ID conflict.
  - b. Verify that the library is properly cabled.
  - c. Verify that there are no bent pins or damaged cables with the SCSI connections.
5. Let server node 1 load the operating system.
6. Power on node 2 and let it load the operating system.
7. Use Device Manager to verify that the operating system sees your library and tape drives. It is not important that drivers be loaded in Device Manager. The drivers are loaded during the backup software installation.
8. Install the backup software. Follow the installation instructions for loading backup software in a cluster environment.

## Installing a StorageWorks MSL5026 MiniLibrary

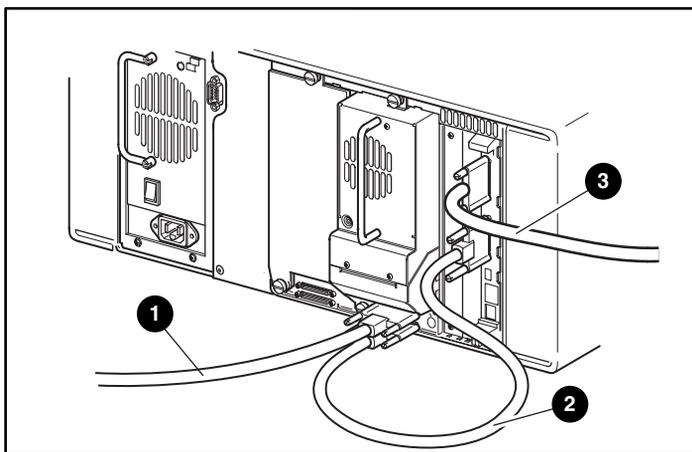
If you have not yet configured the HBAs for multi-initiator support, you must do so now. Refer to the "Configuring the HBAs for Multi-Initiator Support" section earlier in this document for instructions. When the HBAs are properly configured and installed, proceed with the following steps to install the *StorageWorks* MSL5026 MiniLibrary by Compaq.

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## Connecting a Single-Drive Configuration

If your MSL5026 MiniLibrary has a single drive, refer to Figure 7 and connect the cables as follows:

1. Locate the six VHDCI SCSI connectors on the back of the MSL5026 MiniLibrary. Two connectors are located beneath each drive bay. The two connectors on the far right of the back panel are for the library controller card.
2. Connect the top VHDCI SCSI connector on the back of the MSL5026 MiniLibrary controller card to the HBA of server node 1.
3. Daisy chain the bottom VHDCI SCSI connector on the library controller card to one of the VHDCI ports under drive 1 using one of the short cables provided.
4. Connect the remaining VHDCI port under drive 1 to the HBA of server node 2.



**Figure 7: Connecting an MSL5026 MiniLibrary with a single-drive configuration**

- |   |                    |   |                  |
|---|--------------------|---|------------------|
| ❶ | To server node HBA | ❷ | Short SCSI cable |
| ❸ | To server node HBA |   |                  |

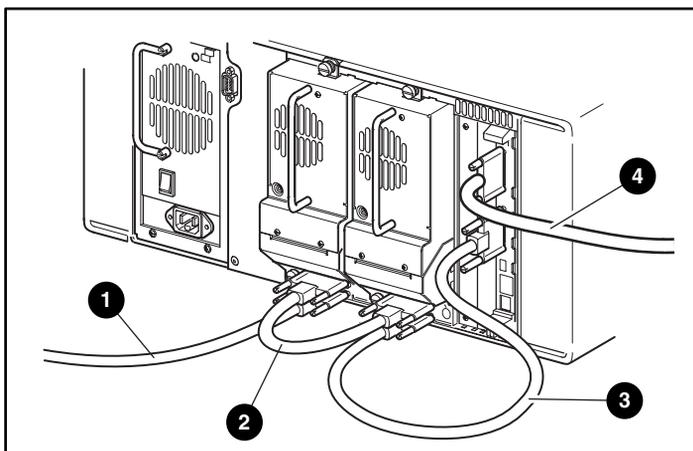
**NOTE:** In a single-drive configuration, the two VHDCI ports under the blanking panel for drive 2 remain unused.

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## Connecting a Dual-Drive Configuration

If your MSL5026 MiniLibrary has two drives, refer to Figure 8 and connect the cables as follows:

1. Locate the six VHDCI SCSI connectors on the back of the MSL5026 MiniLibrary. Two connectors are located beneath each drive bay. The two connectors on the far right of the back panel are for the library controller card.
2. Connect the top VHDCI SCSI connector on the back of the MSL5026 MiniLibrary controller card to the HBA of server node 1.
3. Daisy chain the bottom VHDCI SCSI connector on the library controller card to one of the VHDCI ports under drive 1 using one of the short cables provided.
4. Use the second short VHDCI to VHDCI cable to daisy chain from drive 1 to one of the VHDCI ports under drive 2.
5. Connect the last available VHDCI port on drive 2 to the HBA of server node 2.



**Figure 8: Connecting an MSL5026 MiniLibrary with a dual-drive configuration**

- |   |                    |   |                     |
|---|--------------------|---|---------------------|
| ① | To server node HBA | ② | Shortest SCSI cable |
| ③ | Short SCSI cable   | ④ | To server node HBA  |

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**IMPORTANT:** Because each SCSI controller acts as a terminator in this configuration, if a server failure occurs during backup operations, do not disconnect the failed server until the backup is complete on the functioning node.

**NOTE:** A terminator is not required because the SCSI HBAs act as terminators for each other. This is true even if one of the servers is powered off.

## Completing the Installation

1. Make sure that the SCSI IDs used on the MSL5026 do not conflict with ID6 or ID7 that the SCSI HBAs are using. By default, the IDs on the MSL5026 are 0, 4, and 5, respectively. Use the library's front panel to determine the SCSI IDs used by the library. Refer to the *Compaq StorageWorks MSL5026 User Guide* for further instructions.
2. Power on the library.
3. Wait approximately 90 seconds for the library to complete the POST cycle, and then power on server node 1.
4. Observe the POST sequence carefully. You should see a library and drive(s) listed. If you do not see the library and/or drives, do the following:
  - a. Verify that there is no SCSI ID conflict.
  - b. Verify that the library is cabled properly.
  - c. Verify that there are no bent pins or damaged cables with the SCSI connections.
5. Let server node 1 load the operating system.
6. Power on node 2 and let it load the operating system.
7. Use Device Manager to verify that the operating system sees your library and tape drives. It is not important that drivers be loaded in Device Manager. The drivers are loaded during the backup software installation.
8. Install the backup software. Follow the installation instructions for loading backup software in a cluster environment.

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## Configuring Standalone Tape Drives in a Cluster Backup Environment

Using a single library shared between two server nodes is not required to achieve backup cluster failover capability. Alternatively, you can use tape drives connected independently to each server node to achieve backup failover redundancy.

### Hardware Setup

There are two ways that you can attach standalone drives to the Compaq packaged cluster:

- Using the internal hot-pluggable tape drive bay in the DL 380G2 server (this option is not available with the CL380 cluster).
- Connecting an external storage box via a slotted PCI SCSI controller.

### Internal Tape Drive Bay Configuration

This configuration is only available with the *ProLiant* DL380. To use this configuration, insert a hot-pluggable tape drive into the last available drive bay in the server. The tape slot is labeled with a small tape icon on the front bezel. Drive pooling can be set up to configure the drives for cluster failover. See the “Backup Software Setup” section, later in this document.

- Advantages:
  - Easy installation
  - No extra hardware required (the drive runs off of the embedded array controller)
- Disadvantages:
  - Only half-height devices can be installed into these slots. A full-height DLT tape drive cannot fit into the drive bay.
  - Limited to AIT and DDS technology

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## External Storage Configuration

To use this configuration, connect an external storage box to your servers using the following procedure:

1. Install a SCSI HBA into each cluster node. The following HBAs are supported:
  - 64-Bit/66-MHz Dual Channel Ultra3 SCSI Adapter (129803-B21)
  - 64-Bit/66-MHz Single Channel Ultra3 SCSI Adapter (154457-B21)
2. Connect one or more tape drives independently to the HBA in each node. The devices do not need to be shared or cabled between the two servers.
3. Terminate the end of each device or chain of devices connected to each HBA.
4. Set up drive pooling and configure the drives for cluster failover. See the documentation shipped with your backup software for more information.

This configuration has the following considerations:

- Advantages:
  - Allows use of DLT technology.
  - Provides greater scalability.
- Disadvantages:
  - External storage requires more hardware.
  - Additional cabling is required.
  - A PCI slot is required for each SCSI controller that is used.

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## Backup Software Setup

For a complete listing of supported backup software, refer to the Compaq website at [www.compaq.com](http://www.compaq.com). Refer to the installation instructions included with the software for detailed instructions. There are two possibilities for configuring backup software:

- Install the backup software locally (on the C: drive) of each node.
- Install the backup software on the shared storage.

### Installing the Backup Software Locally

- Advantages:
  - Allows both nodes to perform backups independently of one another. This is called an active/active backup environment. Both nodes can backup data simultaneously.
  - Utilizes the combined capacity of both drives
  - Provides a smaller backup window when using two drives
- Disadvantage:
  - Does not provide failover capability. If one node fails, then every job scheduled to run on that device cannot execute.

### Installing the Backup Software on Shared Storage

- Advantage:
  - Allows the cluster server capabilities to be used to create fault-tolerant backups. This is the best solution if backups must be made nightly.
- Disadvantages:
  - Requires the drives to be configured in a drive pool. This is called an active/passive configuration. From within the backup software, one of the drives in the pool is displayed as being online on the active node. The other drive in the drive pool is displayed as being offline and is unusable until a failover event occurs.
  - Does not utilize the combined capacity of two drives

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## Tips

- The Media Overwrite Protection Level setting can affect whether or not a job starts on a node.
- If you are configuring an active/passive solution that enables you to have fault-tolerant backups, you should first prepare the media in the failover drive. The backup job may not start on the failover node depending on the following conditions:
  - The Media Overwrite Protection Level selection
  - The type of backup: append or overwrite
- To avoid problems, make sure there is clean media in the redundant drive so the job can start without manual intervention in the case of a failover. Quick erasing the tape in the redundant drive prepares the tape for backup.