COMPAQ
Technology Brief

Contents

Compaq Cluster Backup Solution

Abstract: The Compaq Cluster Backup Solution Kit combines hardware, backup software, applications, and services to provide continuous backup support in case of a failure. The Compaq Cluster Backup Solution provides seamless and automatic backup support.

This brief discusses configurations, backing up a cluster, and the hardware and software limitations of the Compaq Cluster Backup Solution.

Notice

Introduction

Clusters provide high availability of data and applications for users. In a cluster, two or more servers (called nodes) are linked in a network and run cluster software that allows each node access to a shared SCSI bus that connects any number of tape devices. Clusters improve availability by transferring data, applications, and services to another node if a failure occurs on the primary node. The process of transferring applications and services from the primary node to a secondary node in the event of a failure is called failover. In a failover during a backup, the tape devices on the shared SCSI bus and the virtual server are kept available.

The Compaq Cluster Backup Solution Kit combines hardware, backup software, applications, and services to provide continuous backup support in case of a failure for the Compaq *ProLiant*™ CL1850/R and CL380 servers. The Cluster Backup Solution uses storage backup devices, various configurations, and a variety of transport methods to provide seamless and automatic backup and restoration.

The Cluster Backup Solution application seamlessly restarts the backup application from the secondary node in the event of a failure during a backup. Users can experience a short interruption in service during a failover. Without any user intervention, the failed backup tape is ejected and a new tape will be used. The backup automatically restarts the failover job. Figure 1 shows a Cluster Backup Solution configuration.
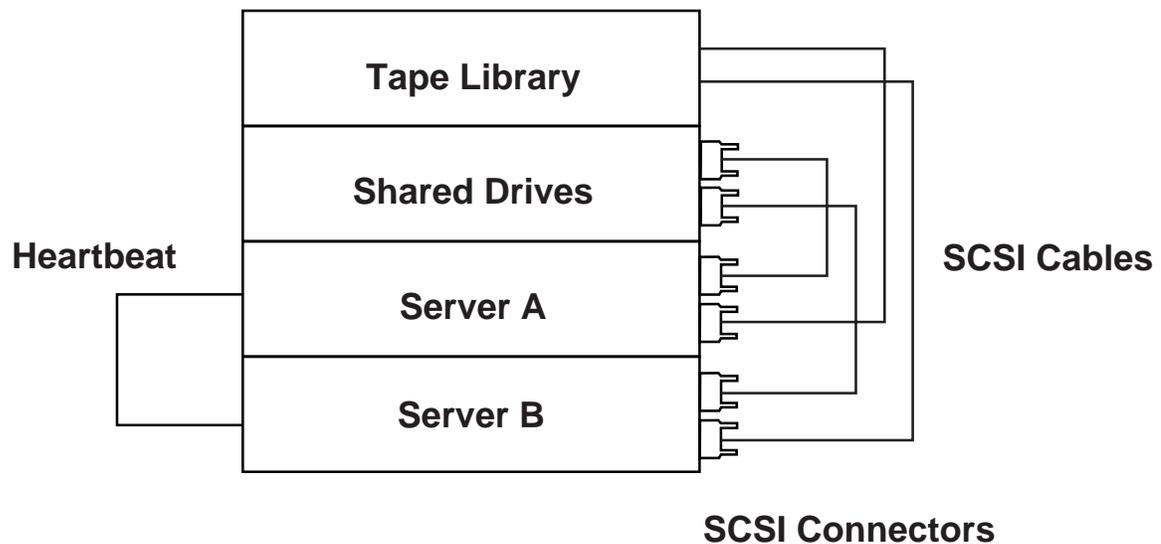
Figure 1: Cluster Backup Solution diagram

Hardware Components

The following hardware components support the Cluster Backup Solution:

- Compaq *StorageWorks*™ SSL2020 AIT Library

- StorageWorks TL891 DLT Mini-Library

- Compaq AIT 50 GB Tape Drive

- Compaq 35/70 GB DLT Drive

- Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller (for the Cluster Backup Connectivity Kit – LVD)

- Compaq Dual Channel Wide-Ultra SCSI-3 Controller (for the Cluster Backup Connectivity Kit – HVD)

- 12-foot VHDCI SCSI cables

Software Components

The following software components support the Cluster Backup Solution:

- VERITAS Backup Exec™ 8.0 for Microsoft Windows 2000 and Windows NT

- VERITAS Backup Exec™ 8.0 Agent Accelerator for Microsoft Windows 2000 and Windows NT

- VERITAS Backup Exec™ 8.0 Library Expansion Option for Microsoft Windows 2000 and Windows NT

Configuring Hardware

The Compaq Cluster Backup Connectivity kits include all the required hardware components for configuring a Cluster Backup Solution except the storage backup devices which must be purchased separately.

Note: The only hardware difference is that the configuration using the TL891 DLT Mini-Library requires an HVD controller, while the configuration using the SSL2020 AIT Library and external drives uses the pre-installed Compaq 64-Bit Dual Channel Wide Ultra2 SCSI controller in the server.

StorageWorks TL891 DLT Mini-Library Configuration

Note: The TL891 DLT Mini-Library configuration requires the user to install one HVD controller card into each cluster server.

Use the following steps to set up a TL891 DLT Mini-Library configuration:

1. Install the controller cards into each cluster server. In a basic installation, controller slots 3 and 4 are available in each cluster server.

Note: Verify that each controller card is seated correctly to ensure proper operation.

2. Connect a SCSI cable to port 1 of the HVD controller of each cluster server. If port 1 is already being used, connect the SCSI cable to port 2 of the HVD controller.

IMPORTANT: To ensure proper operation, connect the SCSI cable to port 1 on the HVD controller before using port 2.
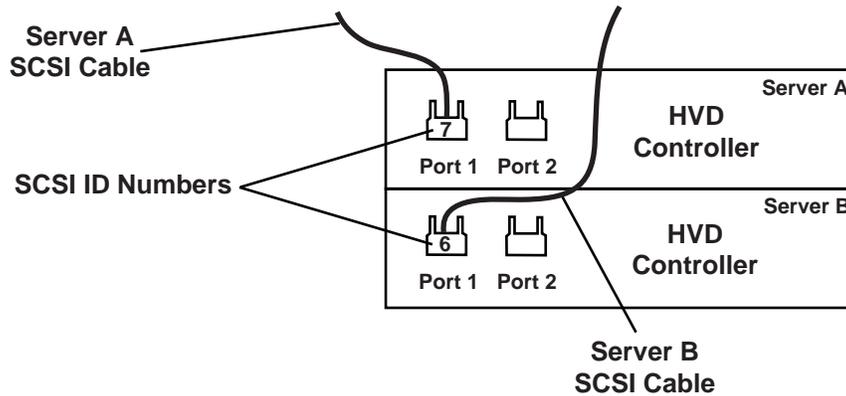
Figure 2: Connecting SCSI cables to an HVD controller

IMPORTANT: Connect the SCSI cables to the corresponding ports on each cluster server. If a SCSI cable is connected to port 1 on server A, then connect a SCSI cable to port 1 on server B.

3. Connect the SCSI cables from each cluster server to the following connectors on the TL891 DLT Mini-Library.

   a. Connect the SCSI cable for server A to SCSI connector 1 on the TL891 DLT Mini-Library.

   b. Connect the SCSI cable for server B to SCSI connector 4 on the TL891 DLT Mini-Library.
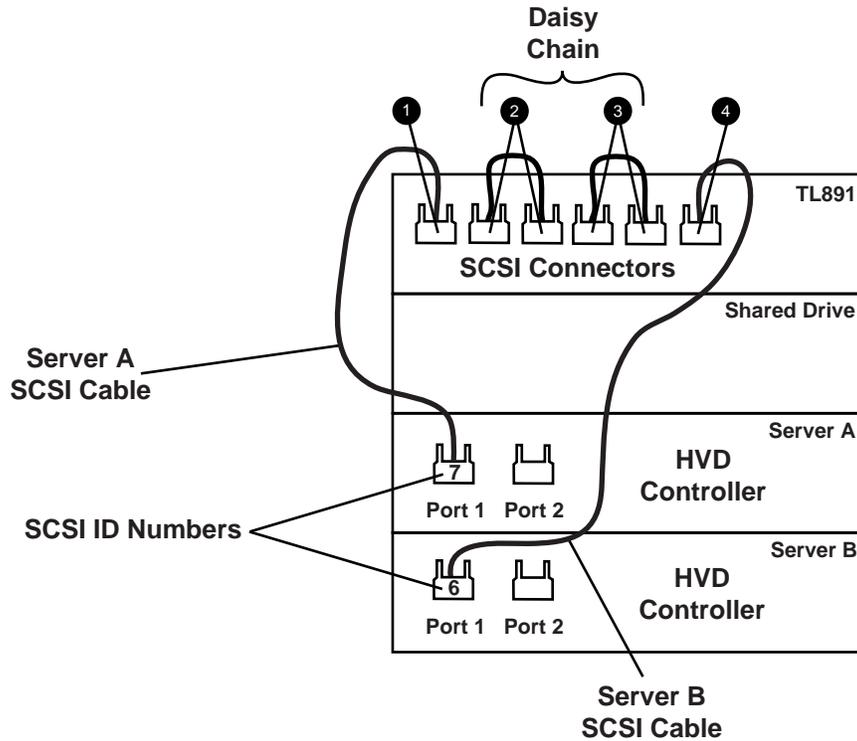
Figure 3: Connecting SCSI cables to the StorageWorks TL891 DLT Mini-Library

After the hardware setup is complete, run the Compaq System Configuration Utility.

Note: If the system partition is not installed, insert the SmartStart CD before rebooting the server and follow the onscreen instructions to configure the system.

Figure 4 shows a completed TL891 DLT Mini-Library configuration.
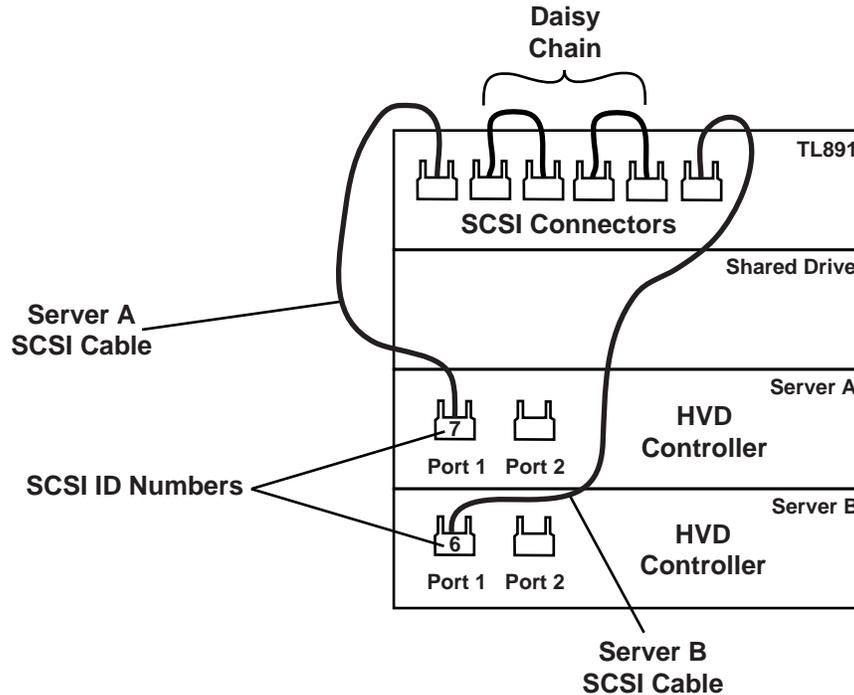
Figure 4: StorageWorks TL891 DLT Mini-Library configuration

Setting SCSI IDs for a New Installation

Refer to the "Configuring the System" and "Configuring Server Node 1" sections in the *Compaq ProLiant CL1850R or CL380 Installation Guide* for detailed instructions on setting SCSI IDs for a new installation. During the system configuration, ensure that the adapter card in each server node connected to the TL891 DLT Mini-Library has a different SCSI ID number than the other. Ensure that these SCSI IDs do not conflict with the TL891 DLT Mini-Library SCSI ID setting. By default, the IDs should be 0, 4, and 5, respectively.

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

Set SCSI IDs for a new installation by inserting the Compaq SmartStart CD (4.80 or later) and then following these steps:

1.   Select Hardware Configuration, then press **Enter**.

2.   Select Review or Modify Hardware Settings.

3.   Select View or Edit Details.

4.   Scroll down to the Compaq Dual Channel Wide-Ultra SCSI-3 Controller.

5.   Highlight the SCSI ID option, then press **Enter**.

6.   Select the desired SCSI ID setting, then press **Enter**.

Setting SCSI IDs for an Existing Cluster

Ensure that the adapter card in each server node connected to the TL891 DLT Mini-Library has a different SCSI ID number than the other adapter card. Ensure that these SCSI IDs do not conflict with the TL891 DLT Mini-Library SCSI ID setting. By default the IDs should be 0, 4, and 5, respectively.

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

Set SCSI IDs for an existing cluster by either inserting the Compaq SmartStart CD (4.80 or later) or by pressing **F10** to enter the Compaq System Configuration Utility, and then following these steps:

1.   Select Hardware Configuration, then press **Enter**.

2.   Select Review or Modify Hardware Settings.

3.   Select View or Edit Details.

4.   Scroll down to the Compaq Dual Channel Wide-Ultra SCSI-3 Controller.

5.   Highlight the SCSI ID option, then press **Enter**.

6.   Select the desired SCSI ID setting, then press **Enter**.

StorageWorks SSL2020 AIT Library Configuration

The SSL2020 AIT Library configuration connects port 2 of the Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller, which is located in slot 2 of the cluster servers.

IMPORTANT: Ignore the "Do Not Use" sticker on port 2 of the Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller.

Use the following steps to set up a SSL2020 AIT Library configuration:

1.   Connect the SCSI cables to port 2 of server A and server B.
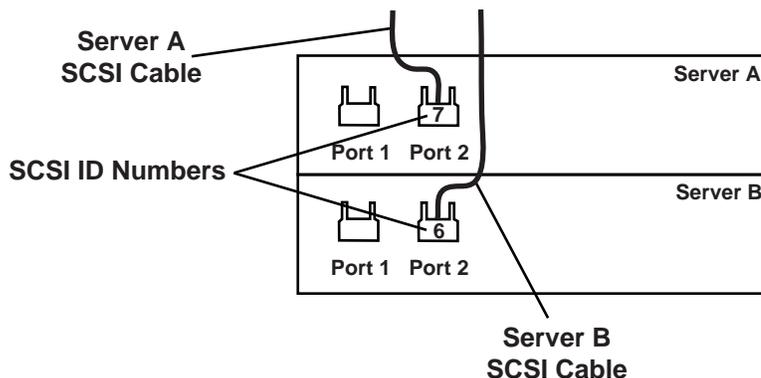
Figure 5: Connecting SCSI cables to the servers

2. Connect the SCSI cables from each cluster server to the following connectors on the SSL2020 AIT Library.

    a. Connect the SCSI cable for server A to SCSI connector 1 on an SSL2020 AIT Library.

    b. Connect the SCSI cable for server B to SCSI connector 2 on an SSL2020 AIT Library.
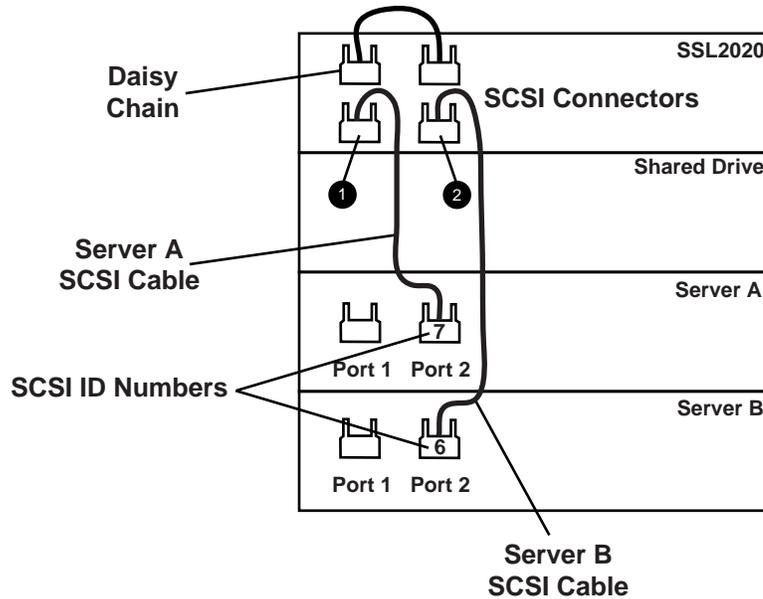
Figure 6: Connecting SCSI cables to a StorageWorks SSL2020 AIT Library

After the hardware setup is complete, run the Compaq System Configuration Utility.

IMPORTANT: Configure one server at a time to avoid SCSI ID conflicts.

Note: If the system partition is not installed, insert the SmartStart CD before rebooting the server and follow the onscreen instructions to configure the system.

Figure 7 shows a completed SSL2020 AIT Library configuration.
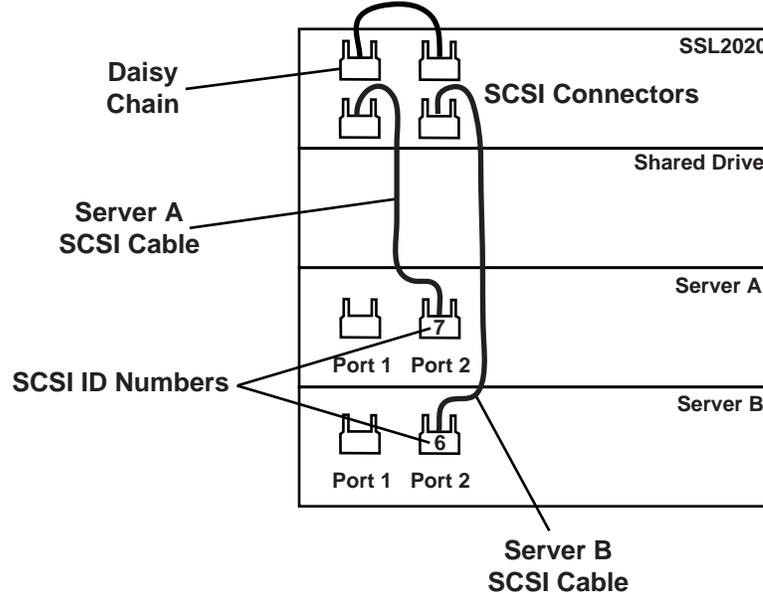
Figure 7: StorageWorks SSL2020 AIT Library configuration

Setting SCSI ID for a New Installation

Refer to the "Configuring the System" and "Configuring Server Node 1" sections in the *Compaq ProLiant CL1850R or CL380 Installation Guide* for detailed instructions on setting SCSI IDs for a new installation. During the system configuration, ensure that the adapter card in each server node connected to the SSL2020 AIT Library has a different SCSI ID number than the other. Ensure that these SCSI IDs do not conflict with the SSL2020 AIT Library SCSI ID setting. By default the IDs should be 0, 4, and 5, respectively.

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

Set SCSI IDs for a new installation by inserting the Compaq SmartStart CD (4.80 or later) and then following these steps:

1. Select Hardware Configuration, then press **Enter**.

2. Select Review or Modify Hardware Settings.

3. Select View or Edit Details.

4. Scroll down to the Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller.

5. Highlight the SCSI ID option, then press **Enter**.

6. Select the desired SCSI ID setting, then press **Enter**.

Setting SCSI ID for an Existing Cluster

Ensure that the adapter card in each server node connected to the SSL2020 AIT Library has a different SCSI ID number than the other. Ensure that these SCSI IDs do not conflict with the SSL2020 AIT Library SCSI ID setting. By default the IDs should be 0, 4, and 5, respectively.

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

Set SCSI IDs for an existing cluster by either inserting the Compaq SmartStart CD (4.80 or later) or by pressing **F10** to enter the Compaq System Configuration Utility, and then following these steps:

1. Select Hardware Configuration, then press **Enter**.

2. Select Review or Modify Hardware Settings.

3. Select View or Edit Details.

4. Scroll down to the Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller.

5. Highlight the SCSI ID option, then press **Enter**.

6. Select the desired SCSI ID setting, then press **Enter**.

Compaq 35/70 GB DLT Drive or Compaq AIT 50 GB Tape Drive Configuration

The 35/70 GB DLT Drive or the AIT 50 GB Tape Drive configuration uses port 2 of the Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller, which is located in slot 2 of the cluster servers.

IMPORTANT: The 35/70 GB DLT Drive and the AIT 50 GB Tape Drive cannot be used together in the same configuration.

IMPORTANT: Ignore the "Do Not Use" sticker on port 2 of the Compaq 64-Bit Dual Channel Wide Ultra2 SCSI Controller.

Note: A single LVD backup storage device can be configured, but it is not supported in this configuration.

Follow these steps to set up the 35/70 GB DLT Drives or the AIT 50 GB Tape Drives:

1. Connect the SCSI cables to port 2 of server A and server B.
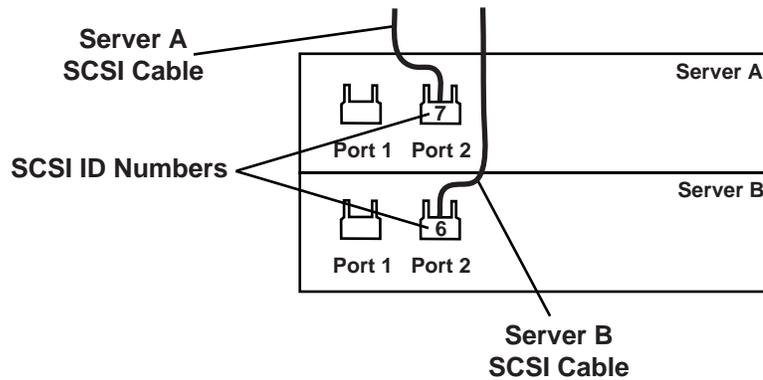
Figure 8: Connecting SCSI cables to the servers

2. Connect the SCSI cables from each cluster server to the following connectors on the either the 35/70 GB DLT Drive or the AIT 50 GB Tape Drive.

    a. Connect the SCSI cable for server A to SCSI connector 1 on either the 35/70 GB DLT Drive 1 or the AIT 50 GB Tape Drive 1.

    b. Connect the SCSI cable for server B to SCSI connector 1 on either the 35/70 GB DLT Drive 2 or the AIT 50 GB Tape Drive 2.
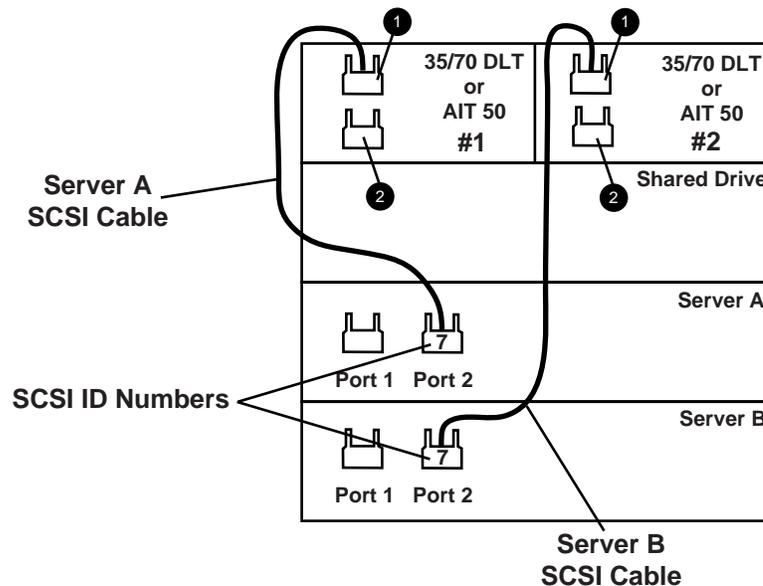
Figure 9: Connecting SCSI cables to the Compaq 35/70 GB DLT Drive or the Compaq AIT 50 GB Tape Drive

Figure 10 shows a completed 35/70 GB DLT Drive or AIT 50 GB Tape Drive configuration using either two 35/70 GB DLT Drives or two AIT 50 GB Tape Drives.
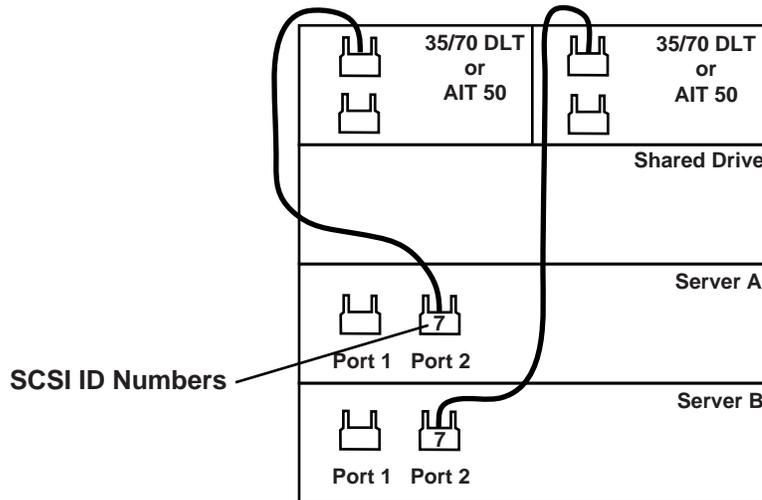
Figure 10: Compaq 35/70 GB DLT Drive or Compaq AIT 50 GB Tape Drive configuration

Configuring Software

The supported software for the Cluster Backup Solution is VERITAS Backup Exec™ 8.0 for both Windows 2000 and Windows NT. To install the software, follow the documentation included on the VERITAS Backup Exec™ installation disk.

Consider the following issues when configuring the software for the Cluster Backup Solution:

a. Use the Windows Disk Administrator or Windows 2000 Disk Management when configuring the CR3000 RAIDSET to ensure that each server node volume is allocated to C:\DRIVE.

b. Select the public network, not the private network (heartbeat network), when selecting a network.

c. Select the Backup Exec™, tape driver, and autoloader support as the basic options.

d. Create a drive pool which contains both drives when using the 35/70 GB DLT Drive or the AIT 50 GB Tape Drive.

Backing Up a Cluster

To protect all data in the cluster, including file systems, databases, and the cluster quorum, back up the following components:

- **Local disks and System State on each node** — the cluster quorum, which contains recovery information for the cluster and information about changes to the cluster configuration, is included in the System State backup. See "Backing Up Local Disks in a Cluster" in the VERITAS document, *Using Backup Exec™ for Windows NT/2000 with Microsoft Cluster Server.*

- **All disks attached to the shared SCSI bus —** see "Backing Up Disks on the Shared SCSI Bus" in the VERITAS document, *Using Backup Exec™ for Windows NT/2000 with Microsoft Cluster Server.*

- **Virtual servers, which may contain data or applications such as Microsoft SQL Server or Exchange Server —** use VERITAS Backup Exec™ database agents to back up databases. See "Backing Up Database Files in a Cluster" in the VERITAS document *Using Backup Exec™ for Windows NT/2000 with Microsoft Cluster Server.*

Failover

When a failover occurs, the backup jobs that were running are rescheduled. The VERITAS Backup Exec™ services are restarted on the node that is designated at the as the failover node, and the backup jobs are restarted by default. For example, an IT manager has five servers and is backing up all five servers as a single job. If a failure occurs while backing up the third server, the backup job restarts from the beginning of the backup job with the first server. A better way of setting up the backup job will be for the IT manager to create a backup job for each separate server. In this situation, if a failure occurs while backing up the third server, the backup job restarts at the third server, not the first server.

Setting Up Jobs

The way a backup job is set up enhances the effectiveness and time-saving capabilities of the Cluster Backup Solution. The Cluster Backup Solution minimizes the system downtime, so it is important that variable jobs are created instead of one large backup job. If a failure occurs during a large backup job, then the job will restart at the beginning regardless of where the failure occurred. If a failure occurs during variable jobs, the backup job will restart the failed job, not the entire series of completed backup jobs.

Cluster Backup Solution Hardware and Software Limitations

The Cluster Backup Solution, designed for reliability and availability, has the following hardware limitations:

a. If one of the cluster nodes fails, that node cannot be removed, the SCSI cable cannot be disconnected, and the node cannot be restarted while the backup job is in process. This does not include scheduled backup jobs or idle tape devices.

b. While the backup job is in process, the server nodes cannot be rebooted. This limitation is a result of Windows 2000 or Windows NT issuing a BUS RESET when powering up. The BUS RESET will result in a failed job if either server node is rebooted during a backup job. This does not include scheduled backup jobs or idle tape devices.

c. The failover feature of the Cluster Backup Solution supports only backup jobs and does not support restore or inventory jobs.

d. The Cluster Backup Solution does not provide checkpoint failover. A checkpoint failover is the process in which a backup job is started at the exact point of failure during a backup job.