

Digital Clusters for Windows NT™ Prioris™ Cluster Kit

Installation Guide

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About This Guide

Introduction

This guide provides information on how to install the Prioris Cluster kit for Windows NT, which includes the Digital Clusters for Windows NT software and the necessary hardware components to build a Prioris Cluster.



NOTE: If you do not wish to install the Prioris Cluster kit yourself, contact Digital Customer Service. For a nominal fee, a Customer Service Technician can install it for you.

Organization

This guide contains the following:

Chapter 1: *About This Guide* — Describes the purpose and organization of this installation guide.

Chapter 2: *Introduction* — Provides an overview of the Prioris Clusters for Windows NT, lists the server requirements for installing Digital Clusters for Windows NT, and lists the available Prioris Cluster kits.

Chapter 3: *Site Preparation* — Provides information on selecting a proper operating site and shows how to arrange the Prioris Cluster kit hardware.

About This Guide

Chapter 4: *Hardware Installation* — Describes how to install the Prioris Cluster kit hardware.

Chapter 5: *Software Installation* — Describes how to install the Digital Clusters for Windows NT software.

Chapter 6: *Obtaining Service* — Provides instructions on how to register the Expansion Storage Box(es) and servers as well as how to access technical information.

Special Notices

Three kinds of special notices are used in this guide to emphasize specific information.



WARNING: Indicates the presence of a hazard that can cause personal injury if the hazard is not avoided.



CAUTION: Indicates the presence of a hazard that might cause damage to hardware or that might corrupt software.



NOTES: Used to provide additional information.

2

Introduction

Overview

The *Digital Clusters for Windows NT* software and the *Prioris Clusters* kits are new offerings from Digital. *Digital Clusters for Windows NT* provides a general-purpose, high-availability solution for Digital servers. The *Prioris Clusters* kit includes the *Digital Clusters for Windows NT* software and the hardware components necessary to loosely couple two Prioris servers. The kit includes an external storage pedestal, a BA356 Expansion Storage Box, which contains a single array of disk devices that can be accessed through either one or two servers. The disk device array is configured so that during normal operations disks are dedicated to a specific server. In the event of a failure, a “failover” occurs — the disks that were dedicated to the failed server become accessible by the surviving server. This product eliminates the “inaccessibility of data” problem that occurs if a disk array is connected to one server and that server fails.

The *Prioris Cluster* kits are available with either one or two BA356 Expansion Storage Boxes.

Server Requirements

The Prioris servers in the cluster must be a Prioris XL (590 or greater), Prioris HX, Prioris ZX 5000MP, or Prioris ZX 6000MP Series with the following minimum requirements:

- 16 MB of RAM
- SVGA monitor
- SCSI controller for control of the boot device and CD-ROM (might be included on the main logic board)
- 340 MB minimum hard disk drive for boot
- Network card for LAN interface
- Two or three button mouse
- CD-ROM drive attached to the bootable SCSI controller
- Keyboard
- Microsoft Windows NT Server, version 3.51

Prioris Cluster Kit Contents

The following table lists the contents of the Prioris Cluster kits.

Kit Number: FR-BA356	-NT	-N2
BA356 Storage Expansion Box	1	1
DWZZB-VW Differential to Single-Ended Converter	1	1
DE450 Ethernet Adapter (kit)	2	
2944W Differential Wide SCSI Adapter (Adaptec™)	2	
Wide Differential SCSI Cable (5 meters)	2	1
Wide Differential SCSI Y-cable	2	
Wide Differential SCSI Terminator	1 ⁽¹⁾	
Private Network Cable, Crossover TP (7 meters)	1	
NT Cluster Software Kit	1	
Prioris Server Clusters for Windows NT Installation Guide	1	

⁽¹⁾ The Wide Differential SCSI Terminator is not used in the dual Storage Expansion Box configuration, because both ends of the shared SCSI bus are terminated at the Differential to Single-Ended Converters.

Introduction



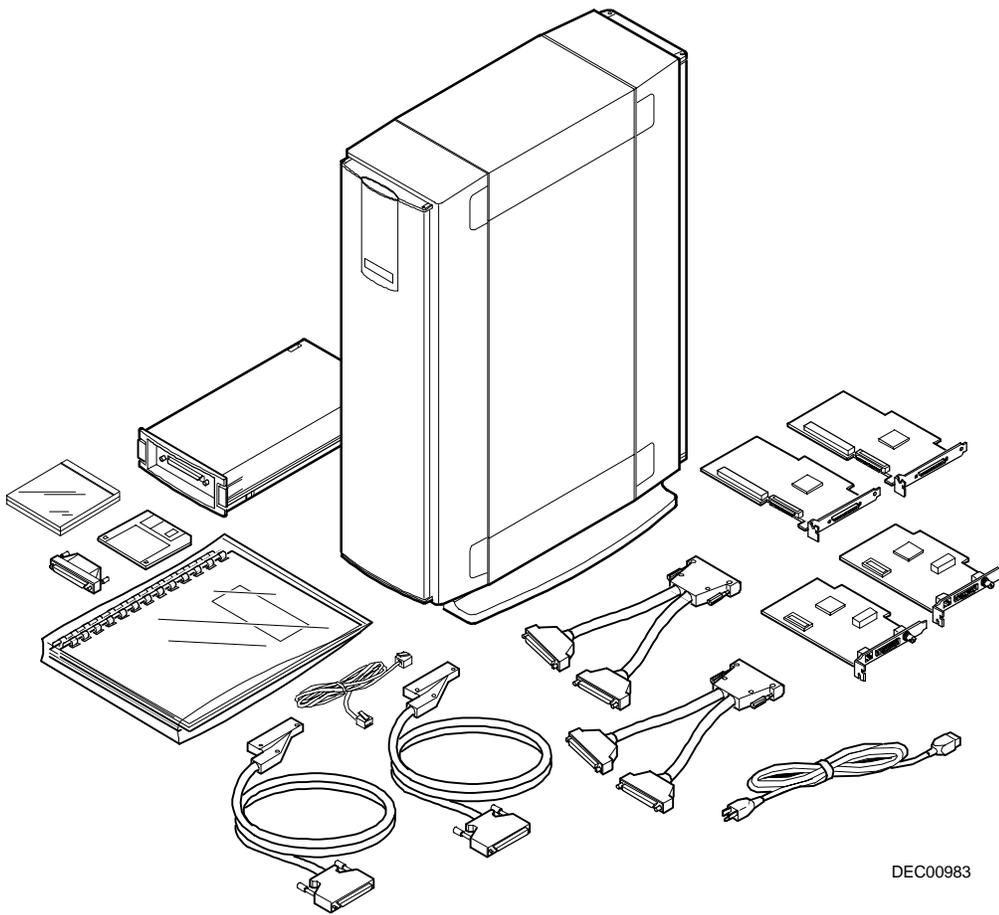
NOTE: The two DE450 Ethernet Adapters are used for the backup private network connection between the two servers. They are connected point-to-point with the twisted-pair cable provided with this kit. This cable cannot be used to interface to a network hub or switch. Use a network card of your choice to connect to your LAN.

For the Prioris Cluster shared SCSI bus to operate properly, the Adaptec 2944W Differential Wide SCSI Adapter must NOT have its SCSI bus terminators installed. Make sure that the 2944W SCSI controllers do not have terminators in sockets RN1 through RN12. Remove the terminators if they are installed. There should be 12 empty sip sockets.

Tools Needed

- A Phillips screwdriver

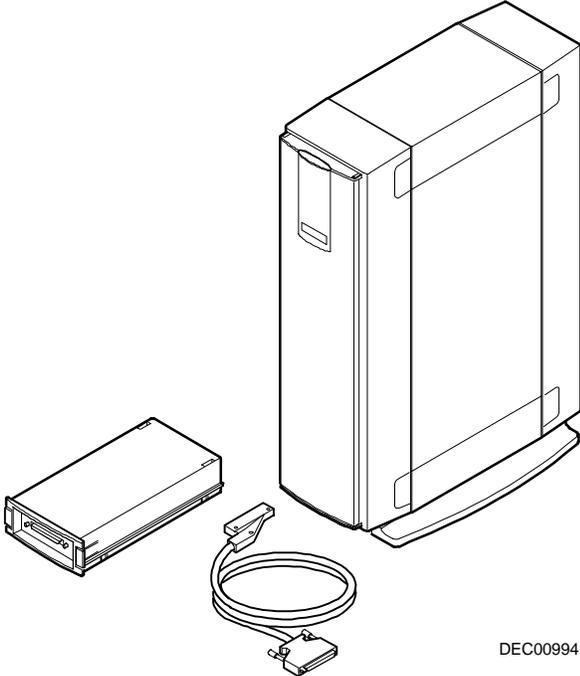
Introduction



DEC00983

Figure 1. Cluster Kit Contents FR-BA356-NT

Introduction



DEC00994

Figure 2. Cluster Kit Contents FR-BA356-N2

3

Site Preparation

Site Location

Select a suitable area for assembly and use. Make sure that your workspace:

- Is located next to electrical outlets and a telephone jack
- Is free from excessive heat, dust, and direct sunlight
- Allows at least 7 inches of clearance on each side and at least 12 inches in back for proper air flow

Refer to “Technical Specifications” in your Prioris Server User’s Guide for temperature and humidity information.

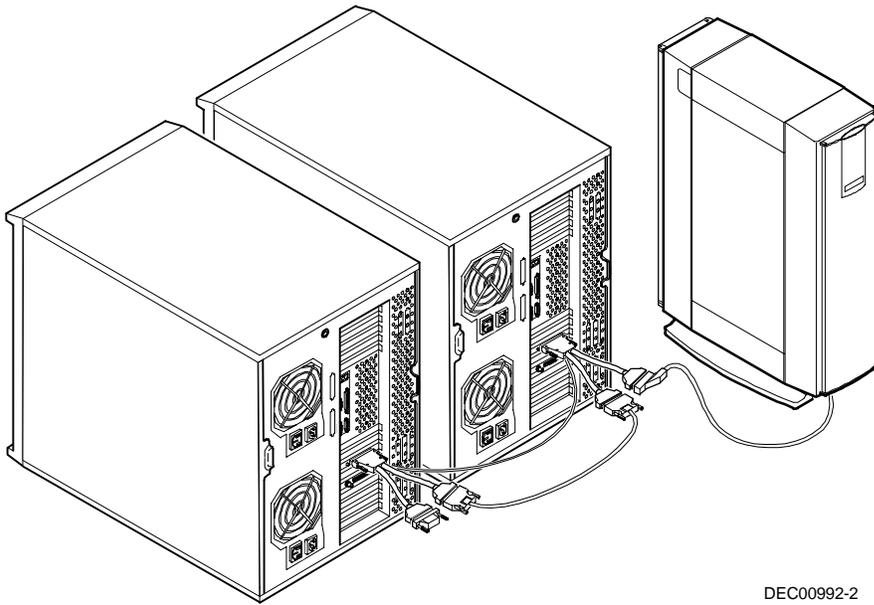
Site Preparation

Layout

The layout of your servers and Expansion Storage Boxes depends upon whether you are using one or two Expansion Storage Boxes.

If you are using one Expansion Storage Box and two servers, locate your equipment as shown in Figure 3.

Site Preparation

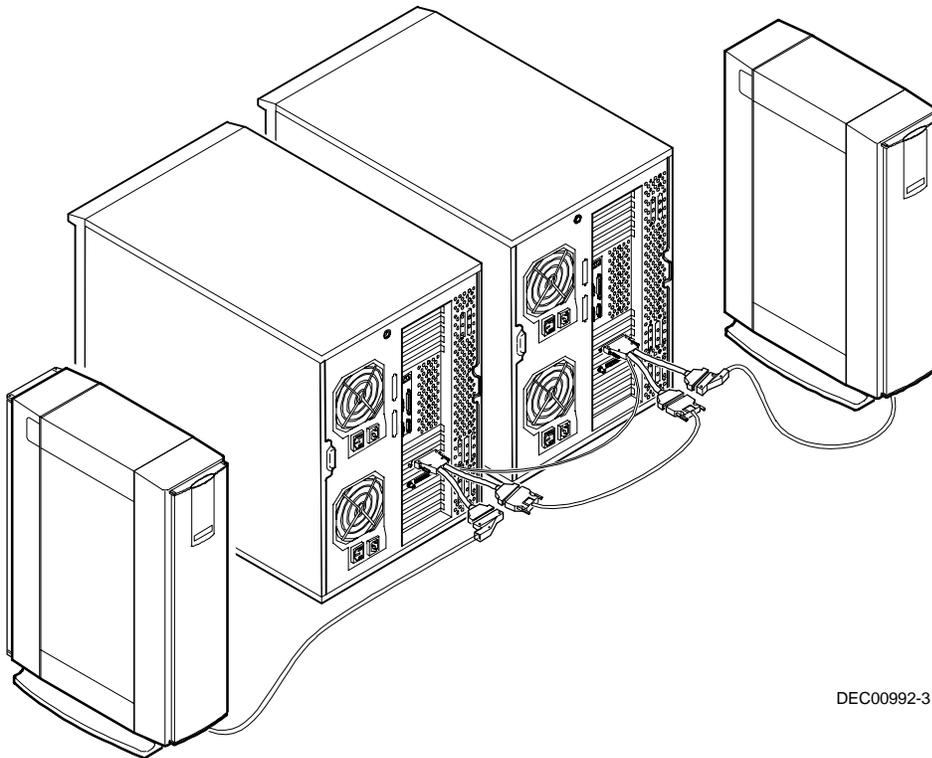


DEC00992-2

Figure 3. Prioris Cluster Layout using One Expansion Storage Box

Site Preparation

If you are using two Expansion Storage Boxes and two servers, locate your equipment as shown in Figure 4.



DEC00992-3

Figure 4. Prioris Cluster Layout using Two Expansion Storage Boxes

4

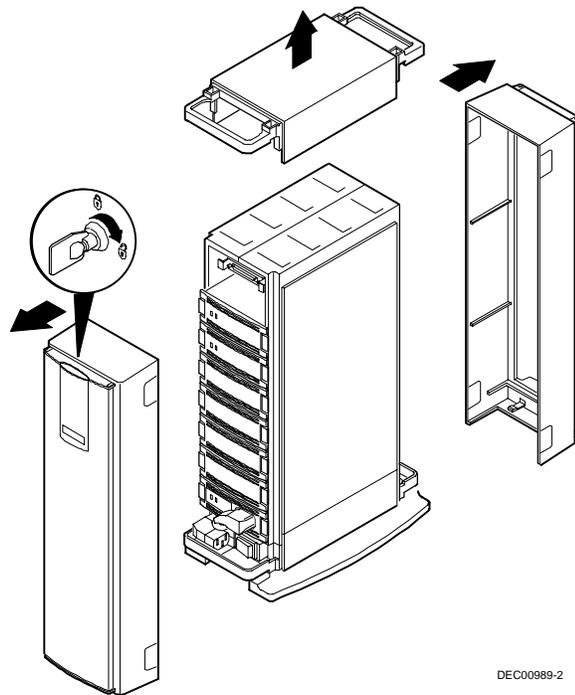
Hardware Installation

Prepare the Expansion Storage Box

After you remove the Expansion Storage Box from the shipping carton:

1. Remove the top, rear, and front panels.

Refer to the BA356 user's guide for more information.

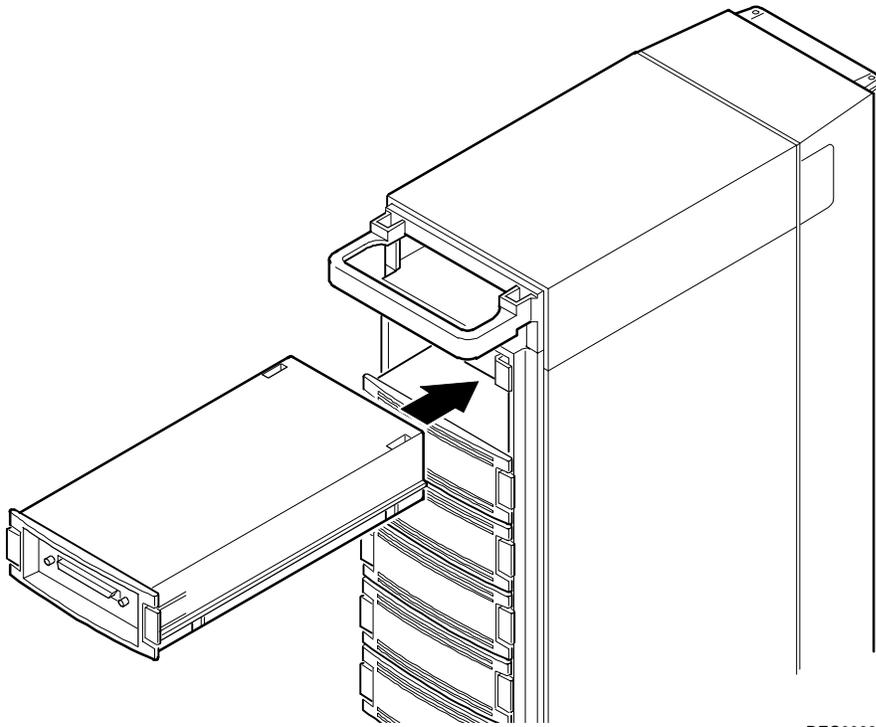


DEC00989-2

Figure 5. Removing Panels

Hardware Installation

2. Place the Differential to Single-Ended Converter (DWZZB-VW) into slot 0 (top slot) of the Expansion Storage Box.



DEC00987

Figure 6. Installing the Differential to Single-Ended Converter

3. Remove the Personality module from the very top of the Expansion Storage Box by pulling it straight out.
4. Set the switches on the left side of the Personality module as follows:

For...	Set Switches...	To...	Supports up to...
First (or only) Expansion Storage Box	1, 2, 3	On	Six drives
Second Expansion Storage Box	4, 5, 6, 7, 8	Off	Five drives (default as shipped)

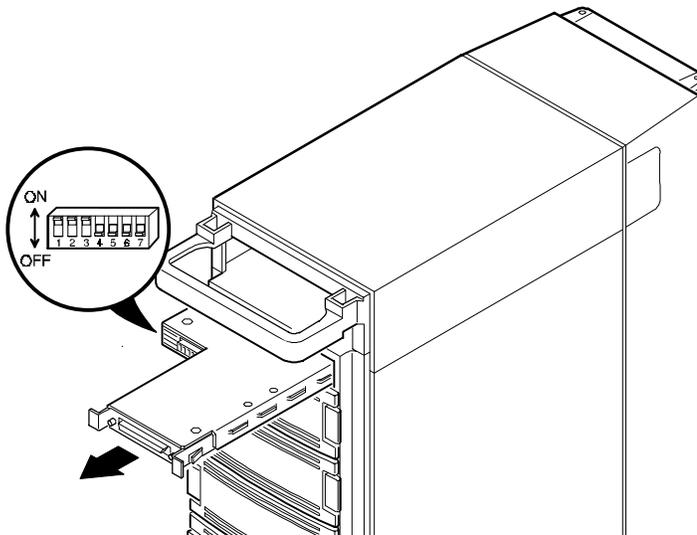


Figure 7. Setting Switches

Hardware Installation

5. Install the Personality module back into the Expansion Storage Box.
6. Install any new hard drives into the available Expansion Storage Box disk bays. If you are using narrow (8-bit SCSI) drives, install them so they are configured to occupy the lower SCSI IDs. If only narrow drives are used, configuration is limited to one Expansion Storage Box.

The slot allocations for the Expansion Storage Boxes are shown in the following table.

Expansion Storage Box Slot	First (or only) Expansion Storage Box	Second Expansion Storage Box
0	Differential to Single-Ended Converter	Differential to Single-Ended Converter
1	Disk ID08	Disk ID01
2	Disk ID09	Disk ID02
3	Disk ID10	Disk ID03
4	Disk ID11	Disk ID04
5	Disk ID12	Disk ID05
6	Disk ID13	N/A - host controller
7	Power supply	Power supply

Prepare the Servers

You need to have two servers that meet the minimum requirements listed earlier in this guide.



WARNING: Unplug both servers before installing any Adaptec or Ethernet cards or connecting the cables.



NOTE: If you have not already done so, connect the mouse, keyboard, and monitor cables to the server. Refer to the manufacturer's documentation for more information.

Each server should already have a network interface card. The Prioris Cluster kit contains two additional network interface (Ethernet) cards. Install one of these Ethernet cards into an available PCI slot in each server.

The Prioris Cluster kit also contains two Adaptec SCSI controllers. You need to install an Adaptec SCSI controller into an available PCI slot in each server.

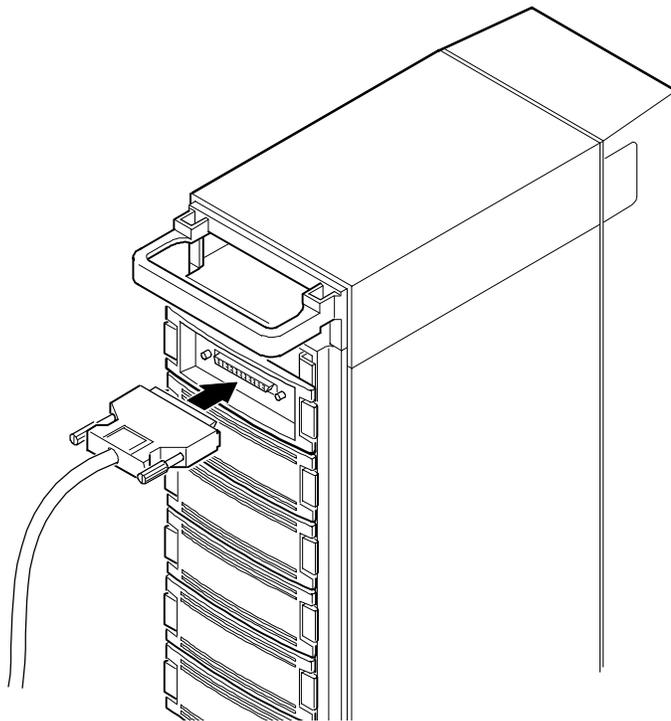


NOTE: If you have a Prioris HX or ZX server, use the brake located at the bottom of your server to lock your server in place.

Connect the Wide Differential SCSI Cable to the Storage Expansion Box

The five meter wide differential SCSI cable has one straight connector and one right-angled connector.

1. Plug the straight cable connector into the connector on the front of the Differential to Single-Ended Converter. **Do not** connect it to the Personality module.



DEC00994

Figure 8. Connecting the Differential to Single-Ended Converter Cable

2. Bring the cable up and over the top of the Storage Box, down the back side of the box, and under the cable holder.

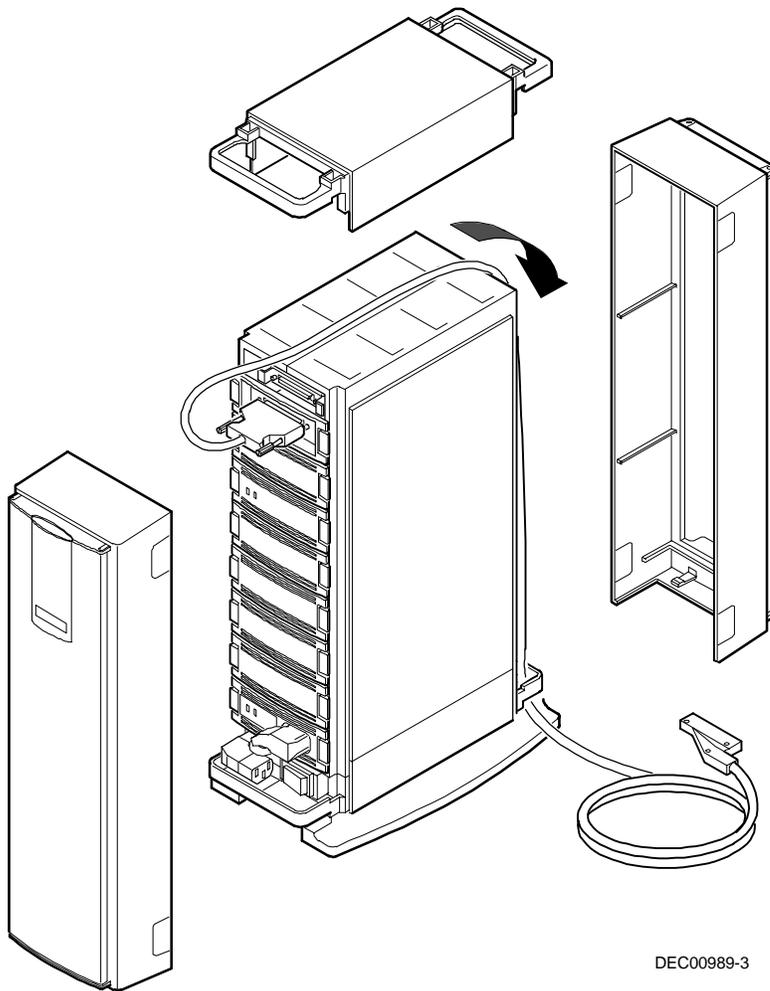


Figure 9. Cable Routing

Hardware Installation

- Put the top, front, and rear panels back on the Storage Box.

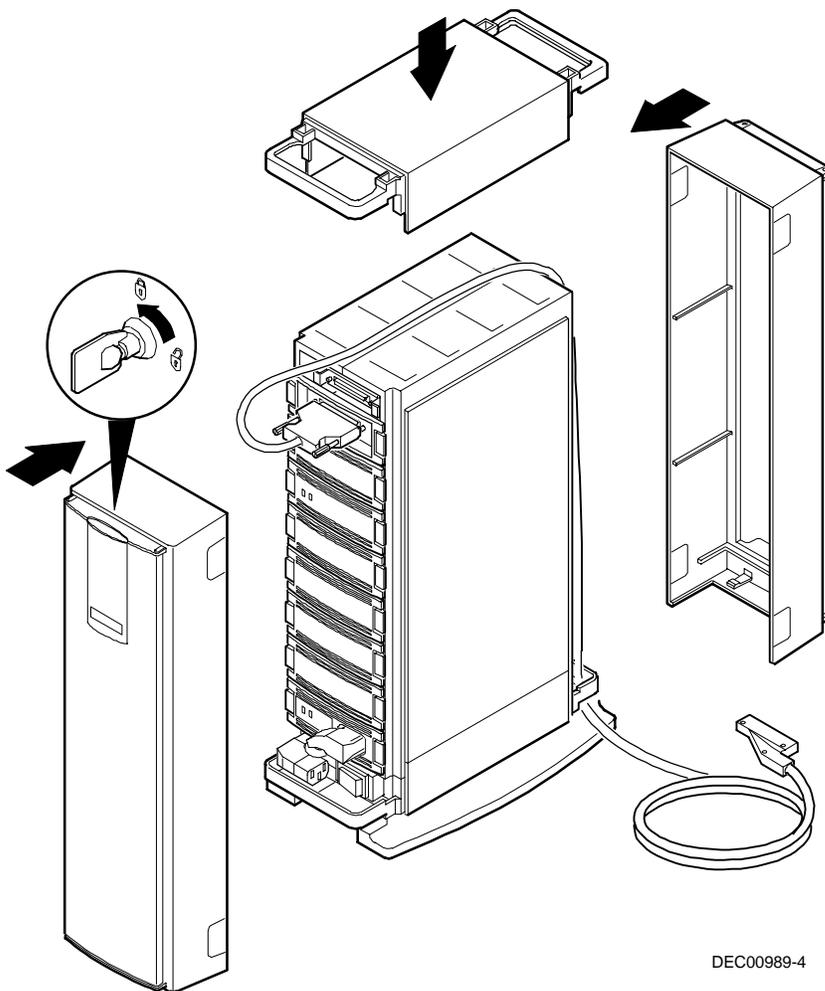
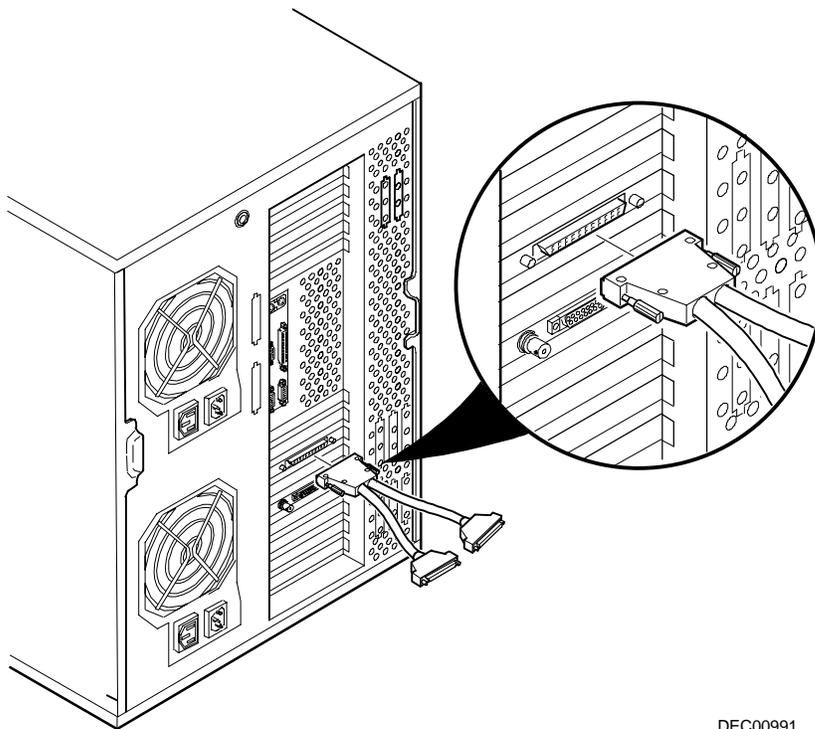


Figure 10. Replacing Panels

Connect the Wide Differential SCSI Y-cable to the Servers

1. Connect one Y-cable to the Adaptec 2944W Differential Wide SCSI Adapter bulkhead connector at the rear of the server.
2. Connect the other Y-cable to the 2944W of the second server.

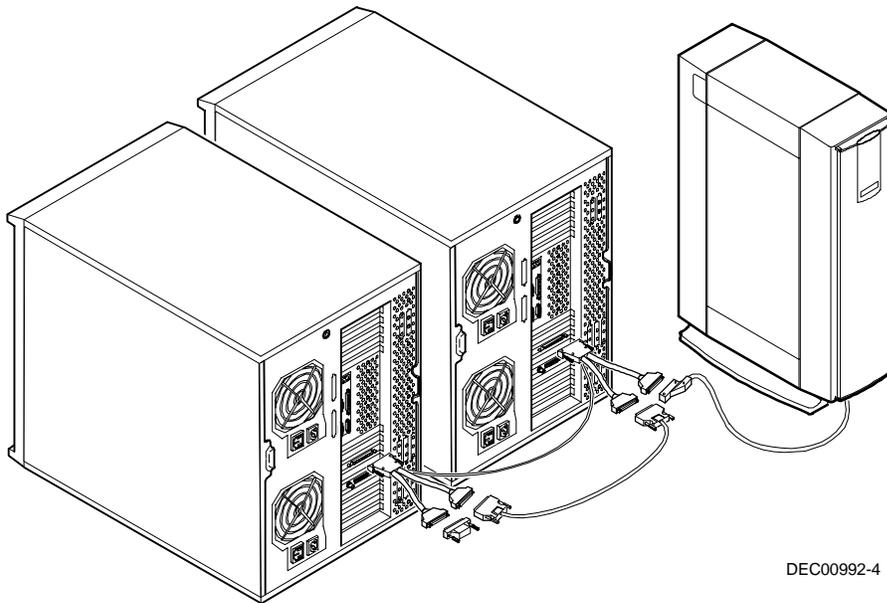


DEC00991

Figure 11. Connecting the Y-Cable

Connect the Servers and Storage Boxes

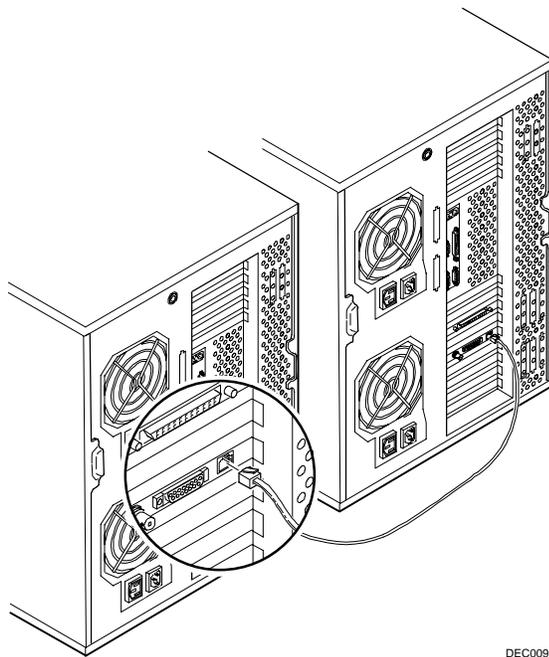
1. Connect the right-angled connector of the Storage Box SCSI cable to one end of the Y-cable (from the server nearest the Storage Box). Make sure all connectors are tight.
2. If you are using two Storage Boxes, connect the right-angled connector of the second Storage Box SCSI cable to one end of the Y-cable on the other server.
3. Connect another 5-meter Wide Differential SCSI Cable from the Y-cable of one server to the Y-cable of the other server.



DEC00992-4

Figure 12. Connecting the Servers and One Storage Box

4. Connect the Private Network Cable between the DE450 Ethernet Adapters in each server.



DEC00990

Figure 13. Connecting the Private Network Cable

Connect a Terminator

If you are using only one Expansion Storage Box, locate the Terminator and attach it to the remaining connector on the “Y” cable (see Figure 3). Make sure the terminator is tight.

Connect the Power Cords

1. Connect the Storage Box power cord to the power outlet; however, **do not** turn on the power yet.
2. Connect the power cord from each server to the power outlet.



CAUTION: Do not attempt to modify or use an external 100 Vac (Japan only) or 115 Vac power cord for 240 Vac input power. Modifying either cord can cause severe equipment damage.

5

Software Installation

Run the SCU

Since you added a PCI Ethernet and SCSI expansion board to your server, you need to run the System Configuration Utility (SCU), which asks you to create a diskette with the new configuration information. You will need a 3.5" formatted diskette for this procedure.

The SCU is located on your ServerWORKS Quick Launch CD-ROM disk. Refer to the *Quick Launch Reference Guide* included with the ServerWORKS software kit for detailed installation procedures.

1. Locate the Quick Launch CD-ROM disk in your ServerWORKS software kit.
2. Power on the server.



NOTE: Do not turn the Expansion Storage Boxes on until after you install the Cluster software.

3. Insert the CD-ROM disk.
4. Press Ctrl + Alt + Del to reboot the server.

Since you installed PCI expansion boards in the server, the SCU is automatically invoked when you boot from the Quick Launch CD-ROM so you can configure the newly added expansion boards.



NOTE: Alternately, you can launch the SCU during the Quick Launch boot sequence by holding down the right-ALT key.

Software Installation

5. Press the Enter key to display the SCU introductory screen.
6. If no configuration errors appear, the Welcome screen displays. Press the Enter key to display the Main SCU menu.



NOTE: If a configuration error appears, the Welcome screen displays information about the error and tells you to reconfigure your server. You can press the F1 key at any time to display a help screen.

7. Select the Configure Your Computer menu option.
8. Repeat steps 2 through 7 with the second server.



NOTE: The *Digital Clusters for Windows NT* software installation assumes that Windows NT operating system has already been installed on your servers. However, if it hasn't, follow the steps outlined in the next procedure.

Configure the Adaptec

Use this procedure on each server to configure the Adaptec 2944W SCSI controllers:

1. Power on the server. Keep both Expansion Storage Boxes powered off.
2. During the boot process, watch the screen carefully. When the banner for the 2944W appears, press <Ctrl> A. This invokes the “SCSI Select Utility.”
3. Set the following parameters for both servers:
 - a. Select "Configure/View host adapter settings."
Set the SCSI ID of one server to 6.
Set the SCSI ID of the other server to 7.
 - b. Select the “Advanced Configuration Option.”
Set “Reset SCSI Bus at IC Initialization” to “Disabled” on both servers.
4. Save and Exit. The server will reboot automatically.
5. Repeat this procedure on the other server.

Install the Windows NT Operating System

If you want the cluster to be a member of a domain and there are no domain controllers on the LAN, then you must configure one of the servers as a Primary Domain Controller and the other as Backup Domain Controller. Refer to your Microsoft Windows NT documentation for detailed installation instructions.



NOTE: You need to have Microsoft Windows NT Server and Service PAK 4 as a minimum, which are available on the Cluster CD-ROM.

Using Quick Launch Express Installation

For unattended installation of the *Microsoft Windows NT* software, use the *Quick Launch* Express Installation as follows:

1. Boot the Prioris server with the Quick Launch CD-ROM disk in the CD-ROM drive.
2. Select the “Installations and Utilities” button on the main menu.
3. Select the network operating system button.
4. Select the Windows NT version from the dropdown list.
5. Click on the “Continue” button.
6. Fill the Installation Information fields and radio buttons. A sample Windows NT Install page is shown on the following page.

The following is an example of the type of information to enter in the fields on the Window NT installation information sheet. Remember to mark down the Server Name and the Domain Name. The Server names **must be** different, but the Domain names **must be** the same.

Software Installation

User's Name

Enter your full name for use with Windows NT on the server.

Organization Name

Enter your organization name for use on the server.

Server Name

Enter a file server name from 2 to 47 alphanumeric characters. Don't use a period or a space. For a Windows NT cluster, use different server names.

Windows NT Product ID

Enter the identification number, which you can find either inside the back cover or on the registration card.

Windows NT Server Type

Select "Primary Domain Controller" for one of the servers; select "Backup Domain Controller" for the other server.

License

Select either "Per server" (assigned to the server) that allows one connection for basic network services or "Per seat" (which requires a client license) that accesses the server for basic network services.

Time Zone

Select the local time setting for your server.

- Work Group Name
- Domain Name

Selecting these radio buttons displays a field requesting a work group or a domain name. For a Windows NT cluster, use the same domain name on both servers.

Network

- Install NWLink
- Install NetBEUI
- Install TCPIP

Select the appropriate network protocols: Select NWLink or NetBEUI for a small LAN of 1 to 200 clients; select TCPIP for communication across interconnected network.

Use the Windows NT Installation Guide to help with any problems during the installation.

7. Click on the "Done" button.
8. When prompted, insert the network operating system CD-ROM disk into the CD-ROM drive.
9. Follow the installation instructions on the screen.

Software Installation

10. From the Control Panel, select “Network Settings” and “Add Adapter.” Don’t use “Autodetect.” Use “Other” to select drivers that can be loaded manually from Drive A. From the diskettes in the kit:
 - Load the DE450 network driver.
 - Load the driver for the NIC being used as the LAN interface.
11. Create a Cluster Administrator account (i.e. ClusterAdmin) on BOTH servers. This account must have full Administrator privileges, as well as the user right to “Log on as a Service.” Under “Administrator Tools,” select “Policies/User Rights.” Find the ClusterAdmin account you created, and click on “Show Advanced User Rights.” Add the right to “Log on as a Service.”

Refer to your Windows NT documentation for details.



NOTE: This ClusterAdmin account will be used instead of the regular Administrator group to provide security for the domain.

12. Run “Disk Administrator” and then exit. This is a good practice; it locks down the drive device letters.
13. Repeat steps 1 through 12 for the second server.

Using Windows NT Diskettes

Follow the instructions on the screen to install the Windows NT operating system.

1. From the Control Panel, select “Network Settings” and “Add Adapter.” Don’t use “Autodetect.” Use “Other” to select drivers that can be loaded manually from Drive A. From the diskettes in the kit:
 - Load the DE450 network driver.
 - Load the driver for the NIC being used as the LAN interface.
2. Create a Cluster Administrator account (i.e. ClusterAdmin) on BOTH servers. This account must have full Administrator privileges, as well as the user right to “Log on as a Service.” Under “Administrator Tools,” select “Policies/User Rights.” Find the ClusterAdmin account you created, and click on “Show Advanced User Rights.” Add the right to “Log on as a Service.”

Refer to your Windows NT documentation for details.



NOTE: This ClusterAdmin account will be used instead of the regular Administrator group to provide security for the domain.

3. Run “Disk Administrator” and then exit. This is a good practice; it locks down the drive device letters.
4. Repeat the procedure for the second server.

Install the Digital Clusters for Windows NT Software



NOTE: Do not turn on the Expansion Storage Boxes until after you install the *Digital Clusters for Windows NT* software.

1. Insert the Cluster CD-ROM disk in the server's CD-ROM drive. Refer to the *Digital Clusters for Windows NT Configuration and Installation Guide* (which ships with the Windows NT software product) for assistance in installing the server software.
2. Follow the instructions on the screen.
3. Repeat this procedure on the other server.

Start the System

1. Shut down both servers and turn off the power.
2. Power up both of the Expansion Storage Boxes.
3. Power up both servers. Once Windows NT boots on both servers, it might take several minutes for the cluster to initialize and synchronize.
4. To configure and administer your Windows NT cluster, run the "Cluster Administrator." If an error appears indicating that a service did not start, it is likely that you haven't waited long enough for the cluster to initialize. Wait and try again.
5. Install Digital NT Cluster client software on clients that require access to the cluster. Refer to the *Digital Clusters for Windows NT Configuration and Installation Guide* for assistance in installing the cluster client software.
6. Refer to the *Digital Clusters for Windows NT Administrator's Guide* for information on how to configure failover groups and administer the cluster.

6

Obtaining Service

Register Your Expansion Storage Box(es)

Record the Expansion Storage Box model number and serial number here. Also record this information for the two servers used in the cluster.

First BA356 Expansion Storage Box Model Number and Serial Number:

(If applicable) Second BA356 Expansion Storage Box Model Number and Serial Number:

First Server Model Number and Serial Number:

Second Server Model Number and Serial Number:

Send in the Product Registration Card for the Expansion Storage Box(es) (contained in your Priors Cluster kit documentation).

Obtaining Service

If You Need Help

If you have questions about your *Digital Clusters for Windows NT* hardware, software, or warranty, please contact Digital's Customer Service organization.

Before You Call Digital

1. Run the diagnostics shipped with your Prioris server to isolate the problem. You can run the diagnostics from the MS-DOS partition created by Quick Launch or you can use the diagnostics diskette (created if you installed the software using the Quick Launch "Installations and Utilities" button).
2. Have the Expansion Storage Box and servers' model numbers and serial numbers available before you call.
3. Record any error messages and be prepared to describe the sequence of events that led to your problem.

For Technical Information

You can access product information and software updates using the Internet at:

<http://www.pc.digital.com>

<http://www.pc.digital.com/~ftp>

You can also access software updates through Digital's Bulletin Board Service (BBS) by calling:

In the United States: (508) 496-8800