



# **SANnet II U320 SCSI Array Quick Installation Guide**

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## CHAPTER 1

# Getting Started

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This guide provides basic instructions on how to unpack and connect your SANnet II U320 SCSI array.



**Figure 1-1** SANnet II U320 SCSI Array (Front View)

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**Note** – The *SANnet II U320 SCSI Array Installation, Operation, and Service Manual* contains detailed information about site planning, unpacking, connecting, maintaining, troubleshooting, and configuring your array. You can also find information regarding SCSI array specifications, LEDs, cabling JBODs, and connector pinouts.

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This chapter includes the following topics:

- “Site Planning” on page 1-2
- “Unpacking the Array” on page 1-2
- “Customer-Provided Cables” on page 1-3
- “Related Documentation” on page 1-3
- “Mounting the Array in Racks and Cabinets” on page 1-3
- “What to Do Next” on page 1-13

## 1.1 Refer to Your Release Notes

Refer to the *SANnet II U320 SCSI Array Release Notes* to see late-breaking information including required patches and supported hardware and software. The release notes and other documentation for this product are available online at:

<http://www.dothill.com/manuals>

## 1.2 Site Planning

Refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual* for your array to see detailed information about preinstallation site planning. Fill out the preinstallation worksheet before you unpack and set up your SANnet II U320 SCSI array.

## 1.3 Unpacking the Array

Follow these guidelines for unpacking the equipment:



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**Caution** – Always use two people to remove the unit from its container, to avoid personal injury or damage to the equipment during installation. A fully loaded unit weighs approximately 57.2 pounds (26 kilograms).

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1. Select a suitable area for unpacking.
2. Store all packing material and boxes for possible equipment returns.
3. Check the Contents Sheet in your product package. See “Related Documentation” on page 1-3.  
The Contents Sheet summarizes the standard contents for your product.
4. Compare the packing slip and the list of parts with the items you received.  
If the list of parts on your packing slip does not match the items you received, or any items appear damaged, immediately notify your carrier agent and the supplier who prepared your shipment.
5. Carefully examine the cables provided in the package.  
If any cable appears to be damaged, contact the Technical Service department for an immediate replacement.
6. Check the list of “Customer-Provided Cables” on page 1-3.  
These are required to complete your installation.



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**Caution** – You must purchase or provide 320M-compliant SCSI cables for connecting the SANnet II U320 SCSI array to host servers.

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## 1.4 Customer-Provided Cables

Customers must provide the following cables.

- One Ultra 320 SCSI cable per host to connect a host to a RAID array, expansion unit or JBOD; up to two host cables might be needed per array.

To obtain qualified cables, consult your Dot Hill sales representative.

## 1.5 Related Documentation

Your SANnet II U320 SCSI array package contains the manuals listed below in PDF format. The book part number is used for the PDF filename assigned to each book.

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<b>Title</b>	<b>Part Number</b>
<i>SANnet II U320 SCSI Array Release Notes</i>	83-00003499
<i>SANnet II U320 SCSI Array Best Practices Manual</i>	83-00003500
<i>SANnet II Family Safety, Regulatory, and Compliance Manual</i>	83-00002666
<i>SANnet II Family RAID Firmware 4.1x User's Guide</i>	83-00003435
<i>SANnet II Family FRU Installation Guide</i>	83-00002708
<i>SANnet II Family Rack Installation Guide for 2U Arrays</i>	83-00002365
<i>SANnet II U320 SCSI Array Installation, Operation, and Service Manual</i>	83-00003498

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## 1.6 Mounting the Array in Racks and Cabinets

This section describes mounting SANnet II 200 family arrays in supported racks and cabinets. Refer to the *SANnet II Family Rack Installation Guide for 2U Arrays* for instructions on how to install and prepare a rack or cabinet for mounting your array.

Topics covered include the following:

- “Overview of Rackmount Kits” on page 1-4
- “Required Site and Chassis Preparation” on page 1-4
- “One-Person Installation Requirements” on page 1-4
- “Reviewing the Tools” on page 1-5
- “What to Do Next” on page 1-13

## 1.6.1 Overview of Rackmount Kits

For late-breaking news about additional supported racks and cabinets, refer to the Release Notes for the model of the array that you are installing. You can find the Release Notes at:

<http://www.dothill.com/manuals/>

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**Tip** – The instructions in this guide can save you a lot of time if you read them carefully. The entire assembly procedure should take less than 30 minutes if you follow all the instructions provided in this guide.

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SANnet II 200 family arrays support:

- Standard 19-inch EIA Rack Cabinets
- Standard 19-inch Telco Racks (flushmount and center of gravity)

## 1.6.2 Required Site and Chassis Preparation

Before rackmounting, be sure to check your site location and confirm that you have cables with adequate lengths to connect to servers and to power outlets.



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**Caution** – We recommend that two people install each array. One person can install the array if the rail kit contains front and rear brackets with flanges that provide support.

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## 1.6.3 One-Person Installation Requirements

Two people should install each array; however, one person can install the array:

- In a cabinet if the rail kit contains front and rear brackets with flanges that provide support
- In a Telco rack if the person has an appropriate equipment lift that can ensure safety and ease of installation

For a one-person installation, remove the power supplies and disk drives to reduce weight and to be safe. If possible, position the array on top of another device or shelf in the rack to hold the unit as you attach all the brackets.



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**Caution** – If you have only one person to perform the installation in a cabinet and do not have rear brackets with flanges or special equipment lift, you must remove the power supplies and hard disk drives from the array before installing the array in a rack.

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To reduce the weight of the array during the rackmounting procedure, refer to the *SANnet II Family FRU Installation Guide* for your array, and follow instructions on removing drives and power supplies. A fully populated array weighs over 50 pounds; an array without drives and power supplies weighs about 30 pounds.

## 1.7 Reviewing the Tools

The following tools are used to complete this procedure:

- Medium Phillips screwdriver
- Allen wrench (provided; used with 6-mm screws and #12-24 x 3/8-inch sockethead screws)



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**Caution** – Do not use any power tools with any procedures. Power tools may strip or damage connections.

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**Note** – It is possible for customer-supplied racks to have several different sizes of threaded holes. Rackmount kits have several different sizes of panhead screws and socket-head screws in order to fit these different racks. Sockethead screws are supplied for the front mounting ears when the diameter of the screw is too large for panhead screws to fit.

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### 1.7.1 Cabinet Mounting

This section explains how to mount SANnet II 200 family arrays using adjustable mounting brackets for depth ranges between 22 to 36 inches (55.88 to 91.44 cm).

The topics covered are:

- “Reviewing the Components” on page 1-6
- “Installing the Array into a Cabinet” on page 1-9



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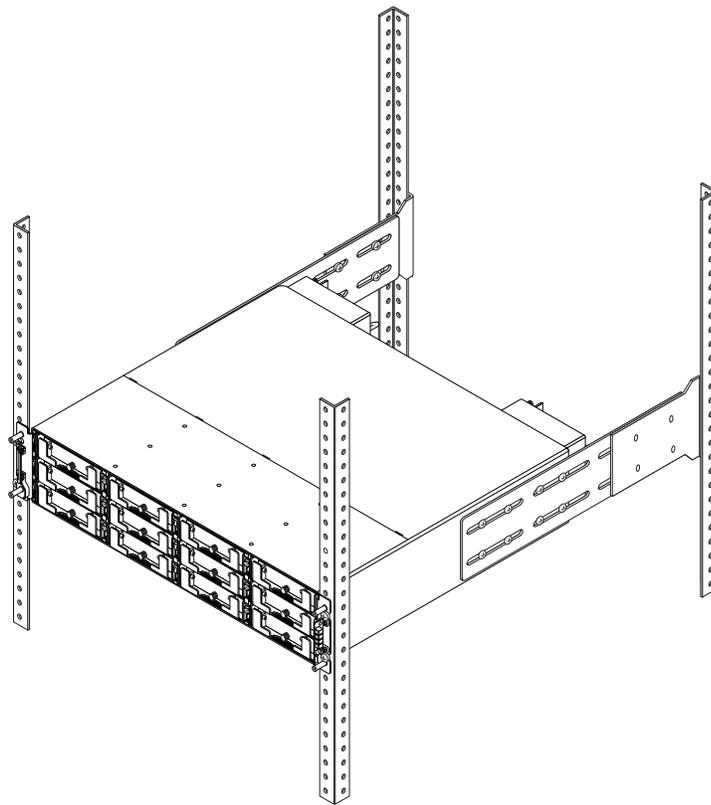
**Caution** – If you only have one person to perform the installation and do not have rear brackets with flanges, you must remove the power supplies and hard disk drives from the array before installing the array in a rack, and if possible position the array on top of another device or shelf in the rack to hold the unit as you attach all the brackets.

---

To reduce the weight of the array during the rackmounting procedure, refer to the *SANnet II Family FRU Installation Guide*, and follow instructions on removing drives and power supplies. A fully populated array weighs over 50 pounds; an array without drives and power supplies weighs about 30 pounds.

## 1.7.2 Reviewing the Components

The following figure displays a completed installation of an array in a cabinet.



**Figure 1-2** Rackmounted Cabinet Array With Chassis Ears and Bezels Removed, After Installation

Before mounting the SANnet II 200 family array into a cabinet, check the following parts lists and refer to Figure 1-3 during installation.

**Table 1-1** FHDW001-R2 Rack Kit, 2U,19-inch Wide Cabinet, 22-28 Inches Deep

Major Components			Fasteners		
Qty.	Part Number	Description	Qty.	Part Number	Description
2	71-00000552	side brackets	16	01-00000142	#8-32.x 3/16-in. flathead screws
2	71-00000621	rear brackets with flanges <sup>1</sup>	10	01-00000186	#8-32 x 1/4-in. panhead screws
2	79-00000100	front support brackets <sup>2</sup>	16 <sup>3</sup>	01-00000483	#10-32 x 1/2-in. panhead screws and/or
				01-00000489	#10-32 x 1-in. panhead screws

**Table 1-1** FHDW001-R2 Rack Kit, 2U,19-inch Wide Cabinet, 22-28 Inches Deep

	12	02-00000018	#10 flat washers
	5	01-00000151	6-mm socket cap screws
	9	01-00000152	6-mm panhead screws
	16	01-00000150	5-mm panhead screws
	15	01-00000148	#10-32 cage nut, UNF
1	09-00000064	5-mm Allen wrench for 6-mm socket cap screws	

1. The U-shaped flanges support the side brackets and eliminate the need for a second person to support the array while assembling and tightening screws.

2. Temporary support brackets to aide one-person-installs can be removed once front ears are secured.

3. Rackmount kits may contain 16 count #10-32 x 1/2-in. and/or 16 count #10-32 x 1-in. panhead screws.

**Table 1-2** FHDW002-R2 Rack Kit, 2U,19-inch Wide Cabinet, 28-36 Inches Deep

Major Components			Fasteners		
Qty.	Part Number	Description	Qty.	Part Number	Description
2	71-00000553	side brackets	16	01-00000142	#8-32 x 3/16-in. flathead screws
2	71-00000622	rear brackets with flanges <sup>1</sup>	10	01-00000186	#8-32 x 1/4-in. panhead screws
2	79-00000100	front support brackets <sup>2</sup>	16 <sup>3</sup>	01-00000483	#10-32 x 1/2-in. panhead screws and/or
				01-00000489	#10-32 x 1-in. panhead screws
			12	02-00000018	#10 washers
			5	01-00000151	6-mm socket cap screws
			9	01-00000152	6-mm panhead screws
			16	01-00000150	5-mm panhead screws
			15	01-00000148	#10-32 cage nut, UNF
1	09-00000064	5-mm Allen wrench for 6-mm socket cap screws			

1. The U-shaped flanges support the side brackets and eliminate the need for a second person to support the array while assembling and tightening screws.

2. Temporary support brackets to aide one-person-installs can be removed once front ears are secured.

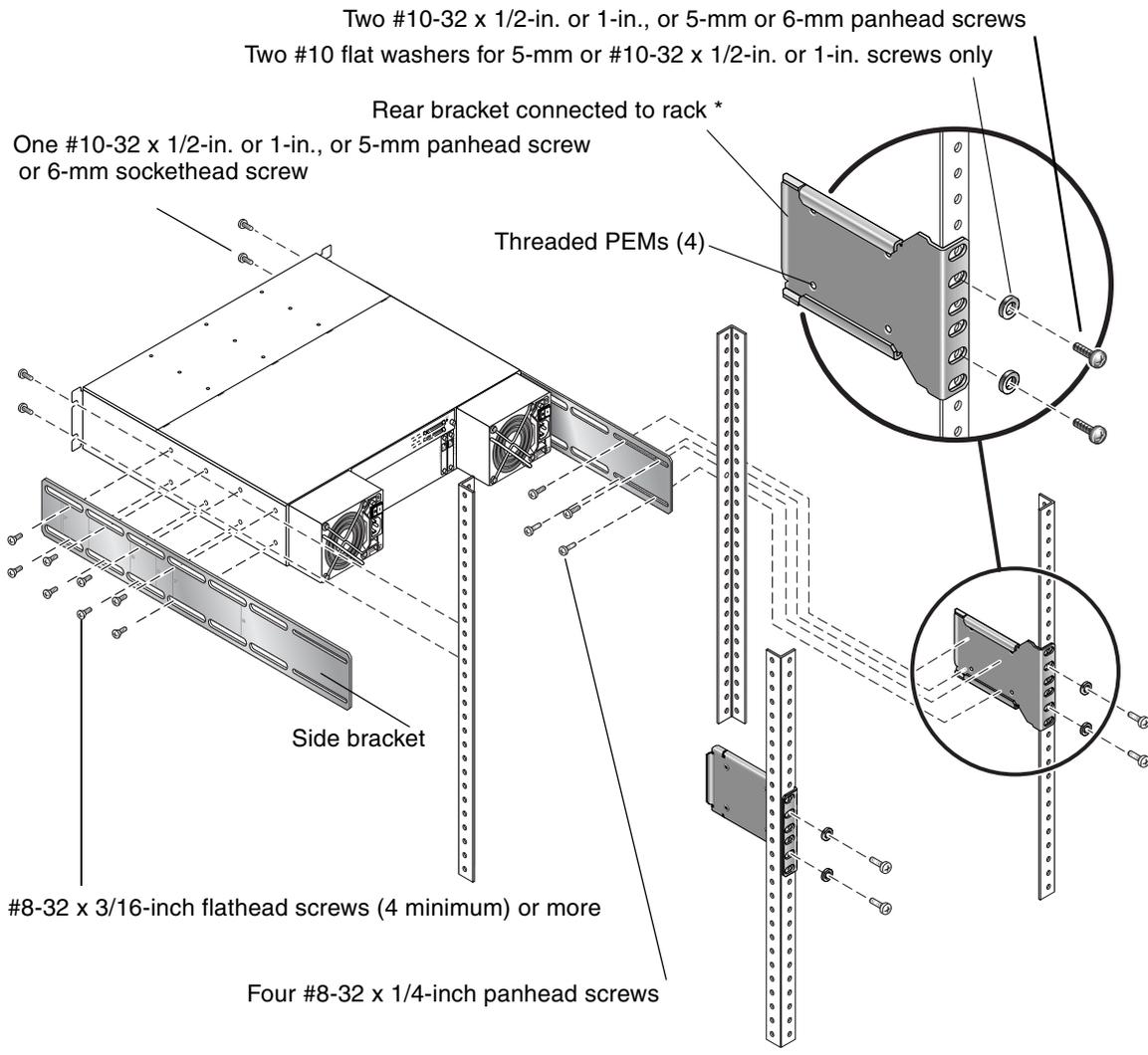
3. Rackmount kits may contain 16 count #10-32 x 1/2-in. and/or 16 count #10-32 x 1-in. panhead screws.

**Note** – It is possible for customer-supplied racks to have several sizes of threaded holes. Rackmount kits have several sizes of panhead screws and sockethead screws in order to fit these various racks. Sockethead screws are supplied for the front mounting ears when the diameter of the screw is too large for panhead screws to fit.

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**Note** – When you finish the installation, you will have unused screws left in your rackmount kit. This does not indicate a problem with your installation. Several types of screws are included for different rack configurations, and extra screws are provided in case any are misplaced.

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**Figure 1-3** Cabinet Rackmount (22- to 28-Inch Deep Rack in a 19-Inch Wide Cabinet)

\* Flanged rear brackets support the side brackets and enable a easy one-person installation.

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**Note** – Alternate screws can be used with the appropriate racks: 5-mm panhead screws (front and back), or 6-mm sockethead screws (front) and 6-mm panhead screws (back).

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**Caution** – Do not use any power tools with any procedures. Power tools can strip or damage connections.

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### 1.7.3 Installing the Array into a Cabinet

Be sure to review “One-Person Installation Requirements” on page 1-4 and “Reviewing the Tools” on page 1-5 before rackmounting the array.

Refer to the parts list in Table 1-1 and Table 1-2 and the illustration in Figure 1-3 during installation. The tables list the major components and fasteners required to install an array into the cabinet.

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**Note** – While the number of screws and bracket types differ based on the depth of the rack and the kit that you purchase, the procedure to install the racks is the same.

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1. Determine the position at which the array will be installed.

Install the first array at the *bottom* of the rack, and install each subsequent chassis above the previous one unless otherwise indicated in the RPM manual.

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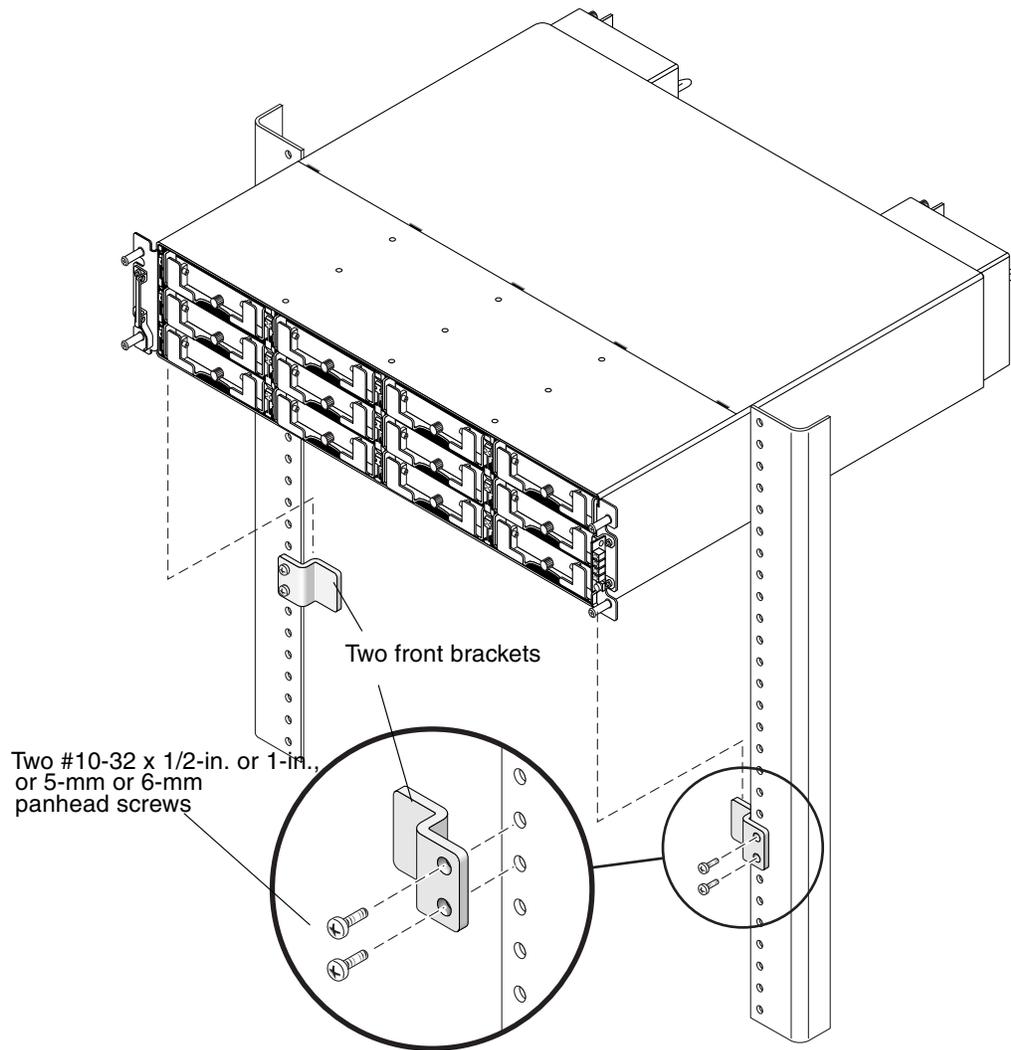
**Note** – Keep all hardware items in plastic bags until you are ready to use them. This will enable you to correctly identify the screws and avoid confusion.

---

2. Before rackmounting, be sure to check your site location and confirm that you have cables with adequate lengths to connect to servers and to power outlets.
3. **(Square-cut European-style racks only).** Insert the cage nuts in the corresponding holes on the front and rear of the rack.
4. **(Optional).** Before you mount the unit, screw the front support brackets into position on the rack face. The front support brackets enable one person to easily position and support the front of the unit in the rack.
  - a. Attach each front bracket to the rack face (See Figure 1-4):

To connect the front brackets, use a minimum of two screws per front bracket.  
Use the appropriate screws for the rack:

    - #10-32 x 1/2-inch panhead screws  
or
    - #10-32 x 1-inch panhead screws  
or
    - 5-mm panhead screws  
or
    - 6-mm panhead screws



**Figure 1-4** Front Bracket Position on the Rack Face

5. Remove the bezel (front faceplate) and the two plastic ear caps from the front of the chassis.



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**Caution** – The plastic ear caps are snap-on parts that require some care when you remove them. Remove the right plastic ear caps carefully to avoid breaking the push button reset switch that is directly below the ear cap.

---

To remove a plastic ear cap (both caps are removed the same way):

- a. Squeeze both sides of the cap at the top and the bottom.
- b. Turn the cap toward the center of the array until it disengages and pull it free.

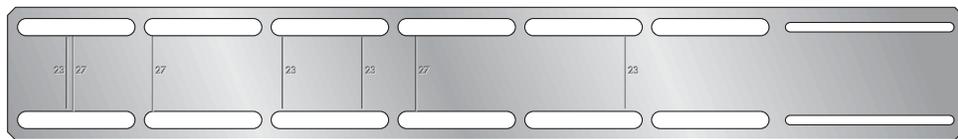
6. Attach the side brackets to the left and right sides of the chassis.

Attach up to eight #8-32 x 3/16-inch flathead screws on each side to allow some adjustment to the placement. Make sure you use at least four screws on each side. (Torque to 18 inch-pounds.)

- a. Use the alignment marks (depth in inches) stamped into the side brackets to position the brackets and screws.

Determine the depth you require and align the last (rearmost) alignment mark on the side bracket with the last mounting holes on the chassis.

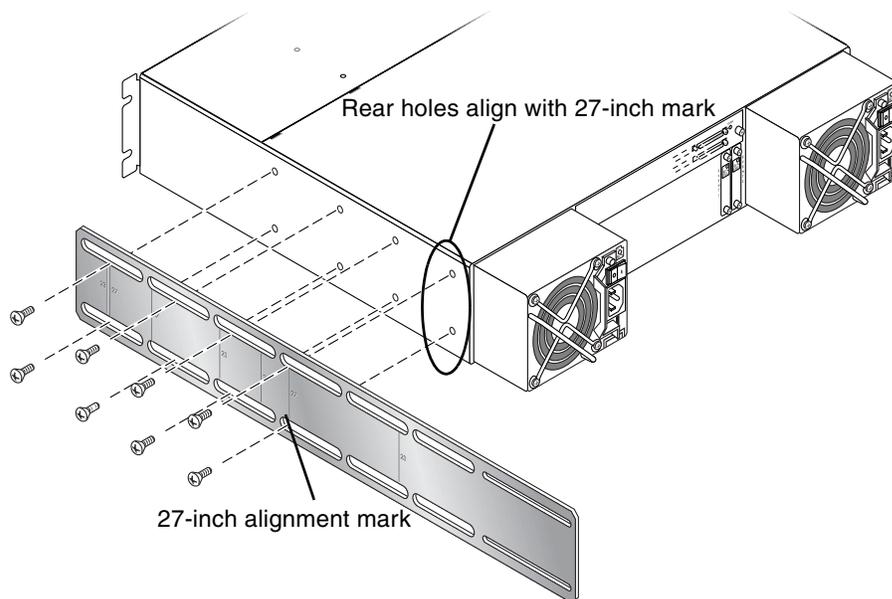
Make sure the alignment mark corresponding to the depth you want lines up with the top and bottom threaded holes on the side of the chassis closest to the rear.



**Figure 1-5** Side Bracket With Alignment Marks

- b. Insert the first two screws on each side through the side bracket slots above and below the alignment mark and into the last pair of rear threaded holes in the chassis.

In Figure 1-6 the 27-inch alignment mark is positioned above and below the last pair of rear threaded holes. This positions the array for a 27-inch deep rack.



**Figure 1-6** Aligning a Side Bracket With the Rear Threaded Holes on the Side of the Array

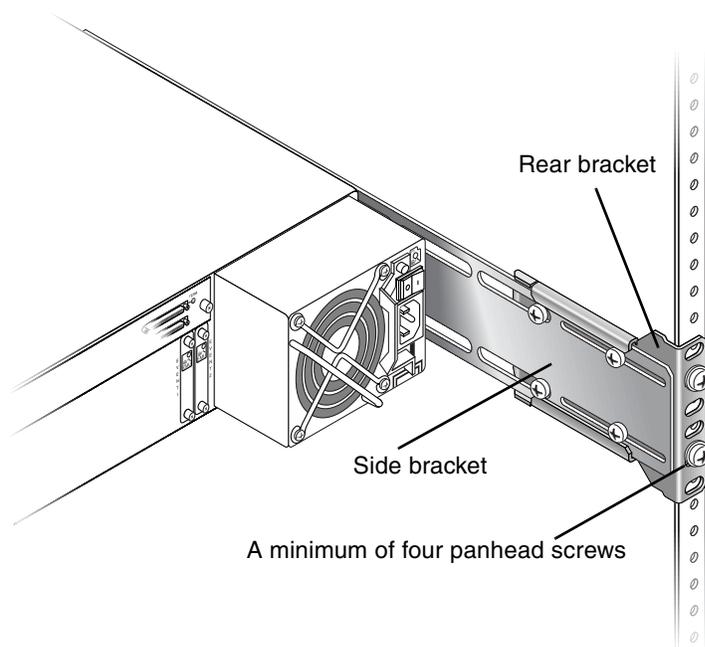
- c. Insert up to six other screws through the side bracket slots into the other threaded holes in the chassis. (Torque to 18 inch-pounds.)

7. Use a total of four screws and four washers to attach the rear brackets to the rear vertical posts (two screws to attach each bracket to a post).

a. Attach each rear bracket with two screws.

Use the appropriate type of screws for the posts:

- Four #10-32 x 1/2-inch or 1-inch panhead screws with #10 washers  
or
- Four 5-mm panhead screws with #10 washers  
or
- Four 6-mm panhead screws (no washers required)



**Figure 1-7** Rear and Side Brackets Assembled

8. Lift the chassis and slide the side brackets into the rear brackets, which are attached to the rear posts.

Adjust the depth of these brackets so that the rear slotted cutouts on the *side brackets* align with the four PEM nuts in the *rear brackets*.

9. Attach each side bracket to a rear bracket (see Figure 1-7):

To connect the rear brackets and side brackets of a 22- to 36-inch deep rack, use a minimum of four screws each and up to a total of four #8-32 x 1/4-inch panhead screws per bracket. (Torque to 18 inch-pounds.)

10. Attach and secure the array's front mounting ears with four appropriate screws (two screws into each ear):
  - Four #10-32 x 1/2-inch or 1-inch panhead screws  
or
  - Four 5-mm panhead screws  
or
  - Four 6-mm socket cap screws
11. Remount all drives and power/fan modules into the array.
12. If you mounted the unit using the optional front support brackets, remove them from the rack face using a standard screwdriver.
13. Reattach the two plastic ear caps and the bezel onto the front of the chassis.

Each plastic cap is replaced the same way, but be sure the cap with the LED labels on the right ear.

  - a. Align the inside round notches of the cap with the round cylindrical posts (ball studs) on the ear.
  - b. Push the top and bottom of the ear cap onto the ear, pressing in on the top side toward the center of the array first.
  - c. Continue pushing the top and bottom of the ear cap onto the ear, pressing on the side toward the outside of the array.

Do not use force when placing a cap on an ear.



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**Caution** – Be careful to avoid “wedging” the reset button below the LEDs on the right ear when you replace the plastic cap over it.

---

- d. Insert the bezel arms into the chassis holes.
  - e. Lift the bezel into position and press it onto the front of the chassis until it is flush with the front.
  - f. Use the key to lock both bezel locks.
14. Connect power cables to the chassis, power on, and check for proper operation of the LEDs.

See “Powering Up and Checking LEDs” on page 2-9.

## 1.8 What to Do Next

1. For cabling with standard configurations, see “Connecting Your SCSI Array” on page 2-1.

For alternate configurations, refer to the *SANnet II U320 SCSI Array Best Practices Manual*.

2. After cabling is complete, print and use the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual* for your array for first-time configuration and basic troubleshooting.
3. Install optional additional software; or, use the firmware application to continue management of the array, and use the software to manage and monitor your array as needed.

## CHAPTER 2

# Connecting Your SCSI Array

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This chapter provides procedures for connecting the array to power and to network devices and for cabling the SANnet II U320 SCSI RAID array for single-bus or split-bus configurations.

For details on cabling the SANnet II U320 SCSI JBOD array, refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual*.

The topics covered in this chapter are as follows:

- “Converting Your Front Bezel Locks So the Keys Cannot Be Removed” on page 2-2
- “Hardware Connections” on page 2-4
- “Connecting the Chassis to an AC Power Outlet” on page 2-5
- “Connecting the Chassis to DC Power Outlets” on page 2-7
- “Powering Up and Checking LEDs” on page 2-9
- “Single-Bus and Split-Bus Configurations” on page 2-10
- “Connecting Cables for a Single-Bus Configuration” on page 2-11
- “Connecting Cables for a Split-Bus Configuration” on page 2-14
- “Connecting Ports to Hosts” on page 2-19
- “Cabling to Expansion Units” on page 2-21
- “Establishing Communications With An Array” on page 2-26
- “Setting Up Out-of-Band Management Over Ethernet” on page 2-30
- “Remaining Steps” on page 2-32
- “Power-On Sequence” on page 2-32
- “Power-Off Procedure” on page 2-33

Before you connect the SANnet II U320 SCSI array to the network, position the SANnet II U320 SCSI array in the rack or in the location where it will remain.



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**Caution** – When positioning the array, do not block the air vents at the front or rear of the unit. Follow all safety precautions specified in the *SANnet II Family Safety, Regulatory, and Compliance Manual*.

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**Caution** – When you power off the array, wait five seconds before you power it back on. If you power the array off and on too quickly, a race condition might occur.

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## 2.1 Converting Your Front Bezel Locks So the Keys Cannot Be Removed

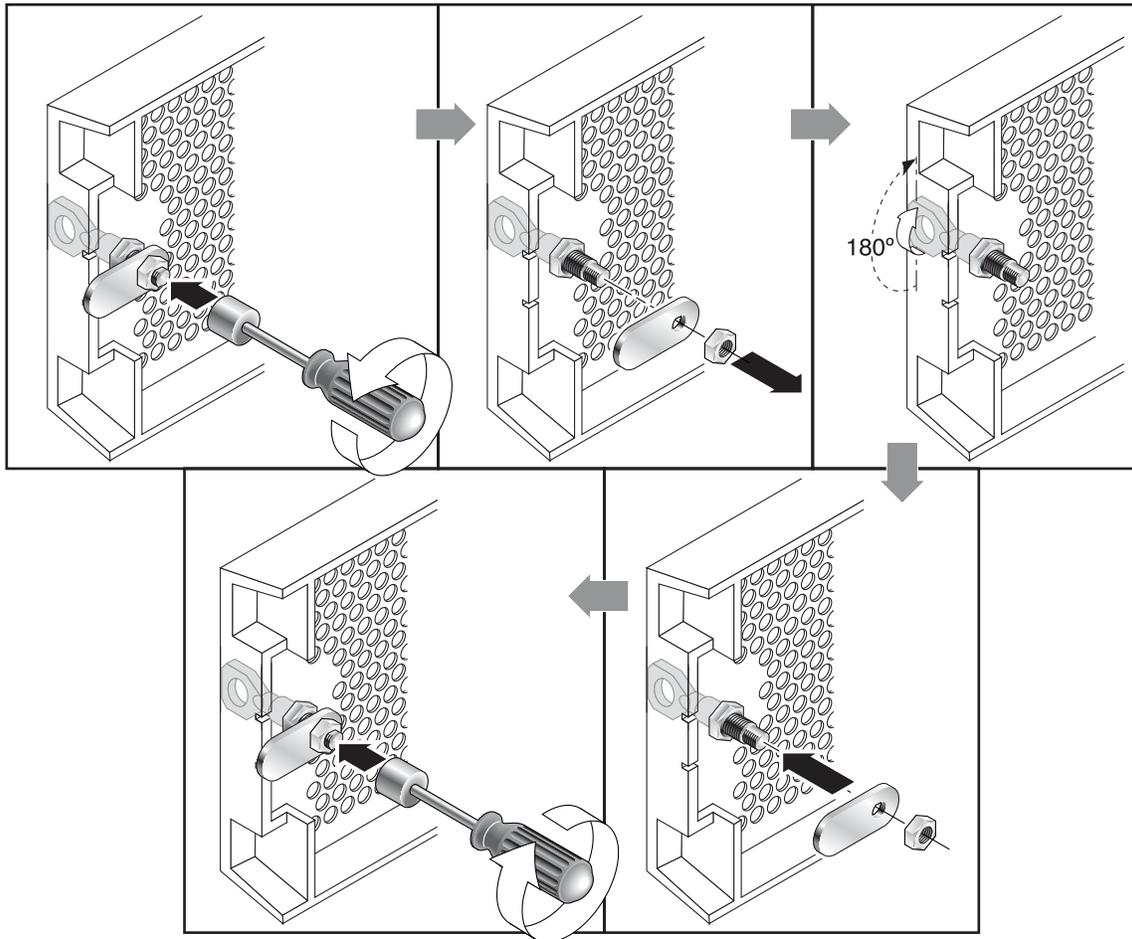
The bezel on your array has two locks whose keys can be removed when the locks are in either the locked or open position. It is possible to reconfigure the locks so that the keys cannot be removed.



**Figure 2-1** Front Bezel and Front Bezel Locks of an Array

To change the locks so the keys cannot be removed, follow these steps.

1. Remove the bezel by gently pivoting the swing arms out of their ear sockets.  
Refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual* for step-by-step instructions on how to remove the bezel.
2. Make sure the key is in the locked position, with the pawl extending horizontally past the edge of the bezel.



**Figure 2-2** Sequence of Steps to Change Front Bezel Locks So Keys Cannot Be Removed

3. Hold the key in place and use a 12-mm or 3/8-inch nut driver to remove the locking nut that holds the pawl in place, as shown in the first panel of Figure 2-2.




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**Caution** – Be sure to hold the key in place. Otherwise there is a risk of breaking the small tab on the lock that serves as a stop.

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4. Lift the pawl off the threaded part of the lock body, as shown in the second panel of Figure 2-2.
5. Set the pawl aside, face up, so that you can remember its orientation when you replace it.
6. Use the key to turn the lock 180 degrees, as shown in the third panel of Figure 2-2.
7. Replace the pawl in the same orientation as before, as shown in the fourth panel of Figure 2-2.

8. Hold the key in place and use the nut driver to refasten the locking nut that holds the pawl in place, as shown in the fifth panel of Figure 2-2. Be careful not to cross-thread the nut.
9. Replace the bezel.

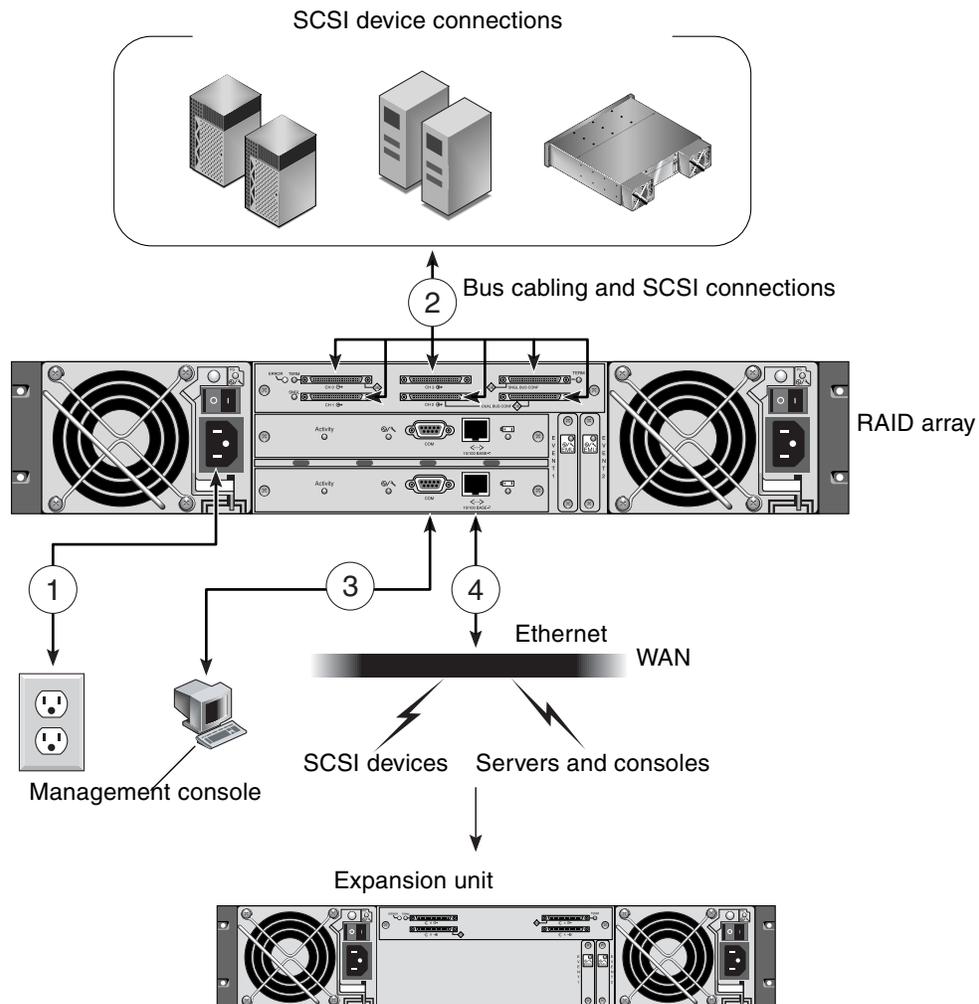
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**Note** – To convert your bezel locks back so that the keys can be removed, repeat this procedure.

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## 2.2 Hardware Connections

Figure 2-3 identifies a typical series of hardware connections used when you install an array. These procedures are designed for a redundant SANnet II U320 SCSI configuration.



**Figure 2-3** Typical Sequence of Installation Steps for the SANnet II U320 SCSI Array

## 2.3 Connecting the Chassis to an AC Power Outlet

When you connect the AC power cords, you should install the provided two cord locks at the same time. The provided AC cord locks are used to securely fasten the AC cable connectors.



**Caution** – For AC power: If the array is connected to AC power sources not within the designated 90–135, 180–265 VAC PFC range, damage might occur to the unit.

**Note** – To ensure power redundancy, be sure to connect the two power supply modules to two separate circuits (for example, one commercial circuit and one UPS).

To connect the AC power cords, perform the following procedure:

1. Obtain an appropriate AC power cable.

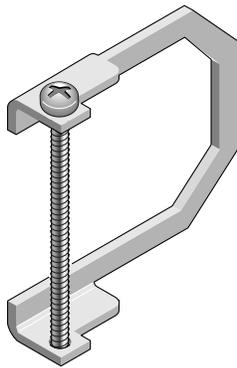


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**Caution** – The power cables for SANnet II products are designed only for SANnet II products and should not be used with other equipment.

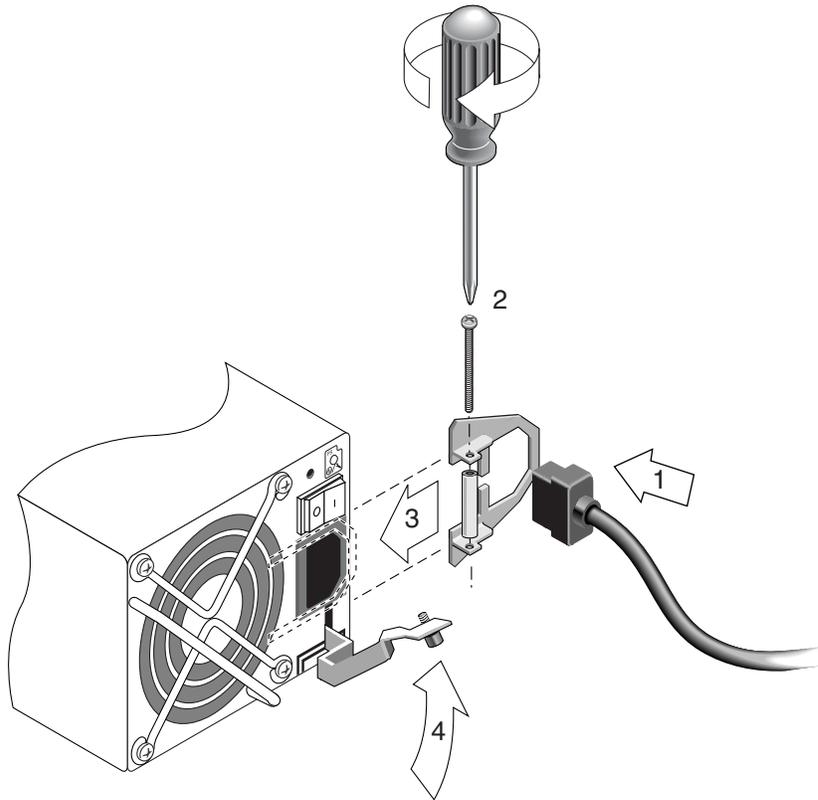
---

2. Use a screwdriver to remove the screw and cylindrical standoff from one of the two cord locks provided and set them aside for reassembly later.



**Figure 2-4** AC Cord Lock

3. Slide the cord lock over the AC power connector.
4. Hold the cylindrical standoff between the two screw-holes on the flanges of the cord lock.
5. Insert the screw into the first screw-hole, through the standoff, and then into the threaded screw-hole on the other flange.
6. Tighten the screw with a screwdriver until the flanges bottom out on the cylindrical standoff.
7. Push the power cord into the power supply receptacle until it is firmly seated.
8. Push the green ejector handle forward until it is seated against the power supply.
9. Turn the thumbscrew of the green ejector handle clockwise until it is finger-tight to secure the handle and the cord lock.



**Figure 2-5** Inserting the Cord Lock

10. Repeat this procedure for the second cord lock and second power cable.

## 2.4 Connecting the Chassis to DC Power Outlets

Two DC power cords are packaged with each DC array. To connect the DC power cords, perform the following procedure.

1. Connect a DC power cable to the first power supply and to a power outlet.




---

**Caution** – Use only the DC power cables provided with the array. The power cables for SANnet II products are designed only for SANnet II products and should not be used with other equipment.

---

2. Check the DC cable part number and wire labels carefully before connecting the cable to the source.

**Table 2-1** DC Cable Wiring for Cable 35-00000191

Pin Number	Voltage	Color
A3	Return	Red
A2	GND (Chassis Ground)	Green/Yellow
A1	-48 VDC	Black



**Caution** – If the array is connected to DC power sources not within the designated -48V DC (-36 VDC to -72 VDC) range, damage might occur to the unit.

**Note** – To ensure power redundancy, be sure to connect the two power supply modules to two separate circuits (for example, one commercial circuit and one UPS).

**Note** – To extend the length of the DC power cable as needed, strip the last 1/4 inch of the cable, insert the stripped end into a provided *Panduit* tube, and crimp the tube.

3. Tighten the cable locking screws to attach the cable securely to the power supply power outlet.
  4. Connect the second power cable to the second power supply and to a second power outlet. Tighten the cable locking screws.
- If one power supply fails, the second power supply automatically takes the full load.

## 2.5 Powering Up and Checking LEDs

Perform the initial check of the array according to the following procedure.

1. Connect two AC (or DC) power cables to the power and fan modules on the back of the array.



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**Caution** – The power cables for SANnet II products are designed only for SANnet II products and should not be used with other equipment.

---

2. Power on the array by turning on each power switch.

See “Power-On Sequence” on page 2-32 for the power-up sequence to use when operating RAID arrays and expansion units. Refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual* for the power-up sequence to use when operating standalone SANnet II U320 SCSI JBODs directly attached to hosts.

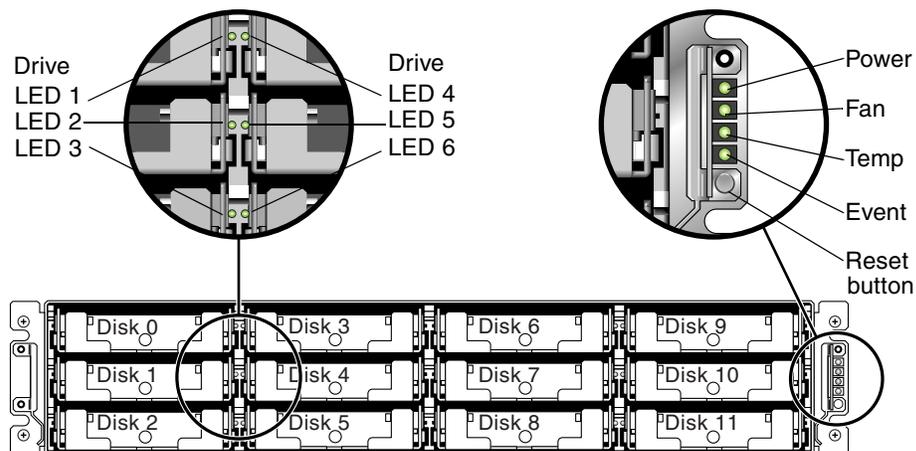
3. Check for the following LED activity:

All front-panel LEDs turn solid green to indicate good operation.

---

**Note** – Whenever media scan is running on a drive, its front-panel LED flashes green and continues to flash as long as media scan is running. Media scan must be started from the firmware application. If the host is restarted, then media scan must be manually restarted. For more information, refer to the *SANnet II Family RAID Firmware User’s Guide*.

---



**Figure 2-6** Front Panel of the SANnet II U320 SCSI Array With LEDs Displayed

Refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual* for more information about the array’s LEDs.

## 2.6 Single-Bus and Split-Bus Configurations

The drive-bus configuration determines how drives and drive IDs are assigned to drive channels on the controller.

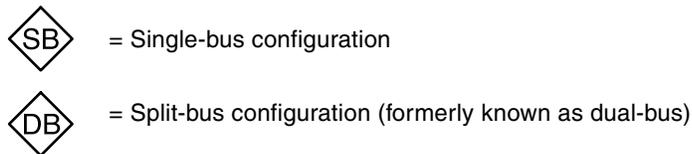
A single-bus configuration assigns all disk drive IDs in a controller to one channel (typically CH 0 for the RAID array and CH 2 for an expansion unit).

A split-bus configuration assigns half the disk drive IDs to CH 0 and the other half to CH 2 in the RAID array, and then typically adds more disk drive IDs to both CH 0 and CH 2 when it is connected to an expansion unit.

Each drive channel can have up to 16 IDs (0 to 15); ID 6 and ID 7 are reserved for internal connections.

On the back panel of each RAID array on the I/O module, the SB icon is displayed next to the CH 0 port and the SCSI SNGL BUS CONF port to indicate where to connect the SCSI jumper cable for a single-bus configuration.

Similarly, the DB icon is displayed next to the CH 2 port and the split-bus CONF port to indicate where to connect the SCSI jumper cable for a split-bus configuration.



**Figure 2-7** Single-Bus and Split-Bus Icons

On the back panel of each expansion unit, the SB icon indicates where to connect the jumper cable for a single-bus configuration.

The physical drive IDs are also displayed on the lower inside-front edge of the chassis. These IDs are automatically assigned and appear in the RAID controller status tables.

DUAL/SNGL	DUAL/SNGL	DUAL/SNGL	DUAL/SNGL
CH2-ID0 CH0-ID0	CH2-ID3 CH0-ID3	CH0-ID0 CH0-ID8	CH0-ID3 CH0-ID11
CH2-ID1 CH0-ID1	CH2-ID4 CH0-ID4	CH0-ID1 CH0-ID9	CH0-ID4 CH0-ID12
CH2-ID2 CH0-ID2	CH2-ID5 CH0-ID5	CH0-ID2 CH0-ID10	CH0-ID5 CH0-ID13

**Figure 2-8** Disk Drive IDs Displayed Inside the Lower Edge of the Chassis

## 2.6.1 Default Channel Settings

SANnet II U320 SCSI arrays are preconfigured with the default channel settings shown in Figure 2-9. The most common reason to change a host channel to a drive channel is to attach expansion units to a RAID array.

When configuring an array:

- Channel 0 must be a drive channel.
- Channel 1, 2, or 3 can be host or drive channels.



Chl	Mode	PID	SID	DefSynClk	DefWid	S	Term	CurSynClk	CurWid
0	Drive	6	7	160.0MHz	Wide	L	Off	160.0MHz	Wide
1	Host	0	NA	160.0MHz	Wide	L	Off	160.0MHz	Wide
2	Drive	6	7	160.0MHz	Wide	L	Off	160.0MHz	Wide
3	Host	2	3	160.0MHz	Wide	L	Off	160.0MHz	Wide
4<C>	RCCOM	NA	NA	AUTO	Serial	F	NA	2 GHz	Serial
5<D>	RCCOM	NA	NA	AUTO	Serial	F	NA		

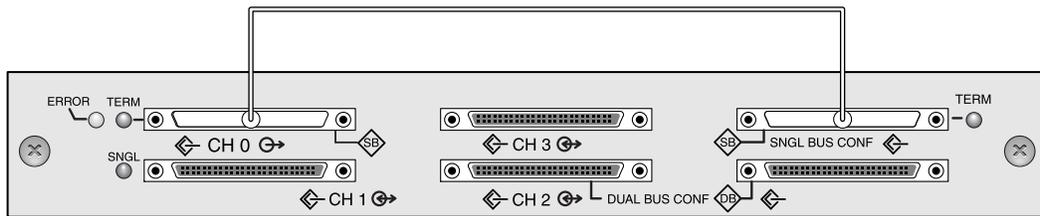
**Figure 2-9** SANnet II U320 SCSI Array Default Channel Settings

After you cable the array, modify the host or drive channels as needed using the firmware application. For information about how to change channel settings, refer to the *SANnet II Family RAID Firmware User's Guide*.

## 2.7 Connecting Cables for a Single-Bus Configuration

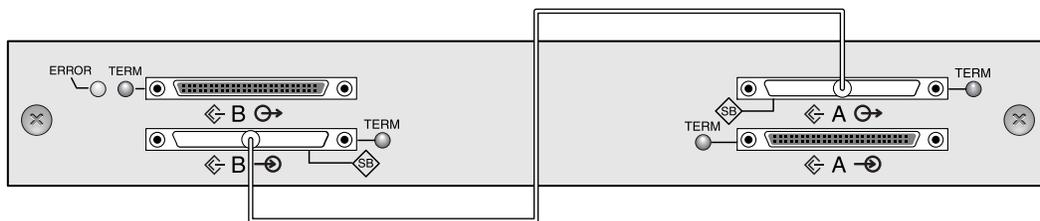
A single-bus I/O configuration assigns all disk drive IDs in a chassis (RAID or expansion unit) to one channel. This configuration is convenient administratively if you want to assign all RAID array drive IDs to channel 0, and assign all expansion unit drive IDs to channel 2.

1. To configure a RAID array as a single-bus configuration, connect the SCSI jumper cable between the SCSI ports labeled “CH 0” and “SNGL BUS CONF” as shown in Figure 2-10. Tighten the cable jack screws with six full clockwise turns to ensure proper connection and operation.



**Figure 2-10** Single-Bus Connection: All Drives are Assigned to a Single Channel (CH 0)

2. To configure an expansion unit as a single-bus configuration, connect the SCSI jumper cable between SCSI ports (lower left and upper right ports), as shown in Figure 2-11. Tighten the cable jack screws with six full clockwise turns to ensure proper connection and operation.



**Figure 2-11** Required Jumper Cabling for a Single-Bus Expansion Unit




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**Caution** – A maximum of 16 drive IDs is allowed per channel. Therefore, with a 12-drive array, do not connect a split-bus channel 0 or channel 2 (6 IDs) to a single-bus expansion unit (12 IDs).

---

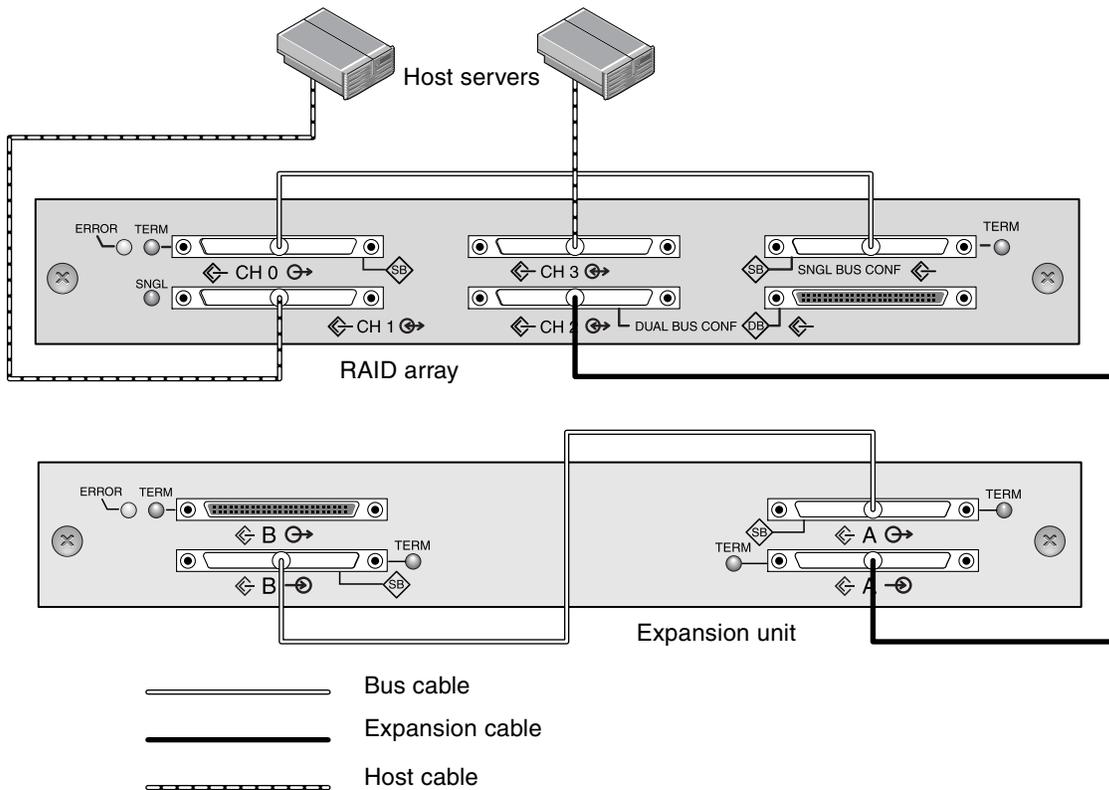
3. (Optional) Use a SCSI cable to connect a RAID array (channel 2 port) to an expansion unit (lower right port). Tighten the cable jack screws with six full clockwise turns to ensure proper connection and operation.

The configuration in Figure 2-12 shows a RAID array with all its drive IDs assigned to channel 0, and an expansion unit with all its drive IDs assigned to channel 2.

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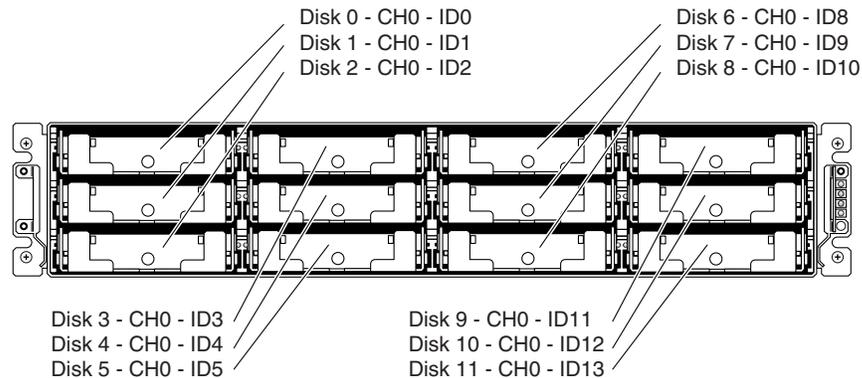
**Note** – In a single-bus configuration with an expansion unit, the jumper cable must be attached to the lower left and upper right ports. The host connection must be connected to the lower right port of the expansion unit.

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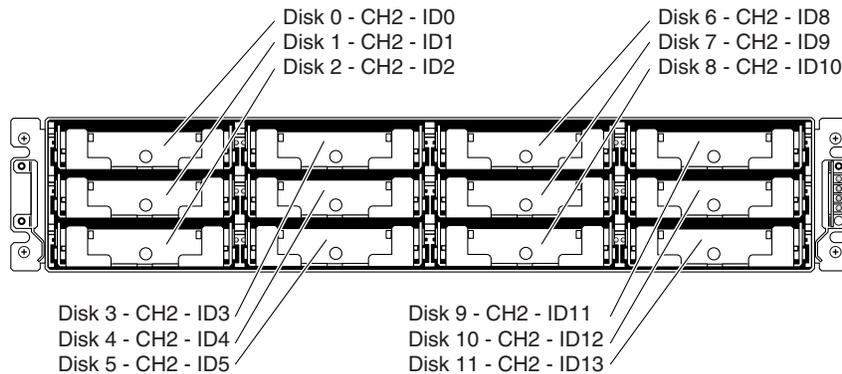


**Figure 2-12** Required Single-Bus Expansion Unit Configuration When Connected to a RAID Array

Based on the configuration in Figure 2-12, the default drive IDs for a 12-drive single-bus configuration are shown in Figure 2-13 and Figure 2-14. (ID6 and ID7 are reserved for host HBAs.)



**Figure 2-13** RAID Array: Single-Bus Configuration, Default IDs



**Figure 2-14** Expansion Unit: Single-Bus Configuration, Default IDs

The IDs are also displayed on the lower inside-front edge of the chassis. These IDs are automatically assigned and appear in RAID controller status tables.

4. Connect your RAID array (SCSI channel 1 and 3 ports) to one or two host servers with SCSI cables.

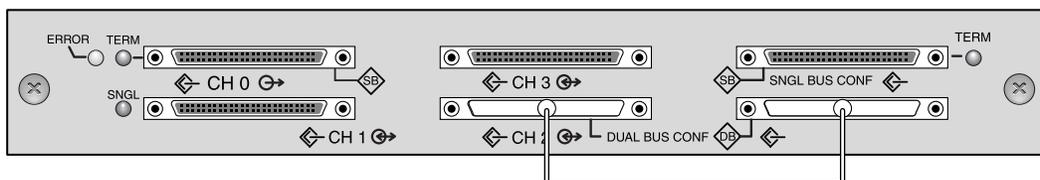
SCSI ports for channels 1 and 3 are assigned as host channels by default.

## 2.8 Connecting Cables for a Split-Bus Configuration

A split-bus configuration assigns half the disk drives to one channel and the other to the second channel. This configuration can be helpful when you want to use one set of drives to mirror the second set with drives configured as RAID 1 drives.

1. To create a split-bus configuration on a RAID array, use the SCSI jumper cable to connect the CH 2 port to the split-bus (formerly known as the dual-bus) CONF port. Tighten the cable jack screws with six full clockwise turns to ensure proper connection and operation.

Six IDs are assigned to CH 0, and six IDs are assigned to CH 2 in a 12-drive array.



**Figure 2-15** RAID Split-Bus Configuration

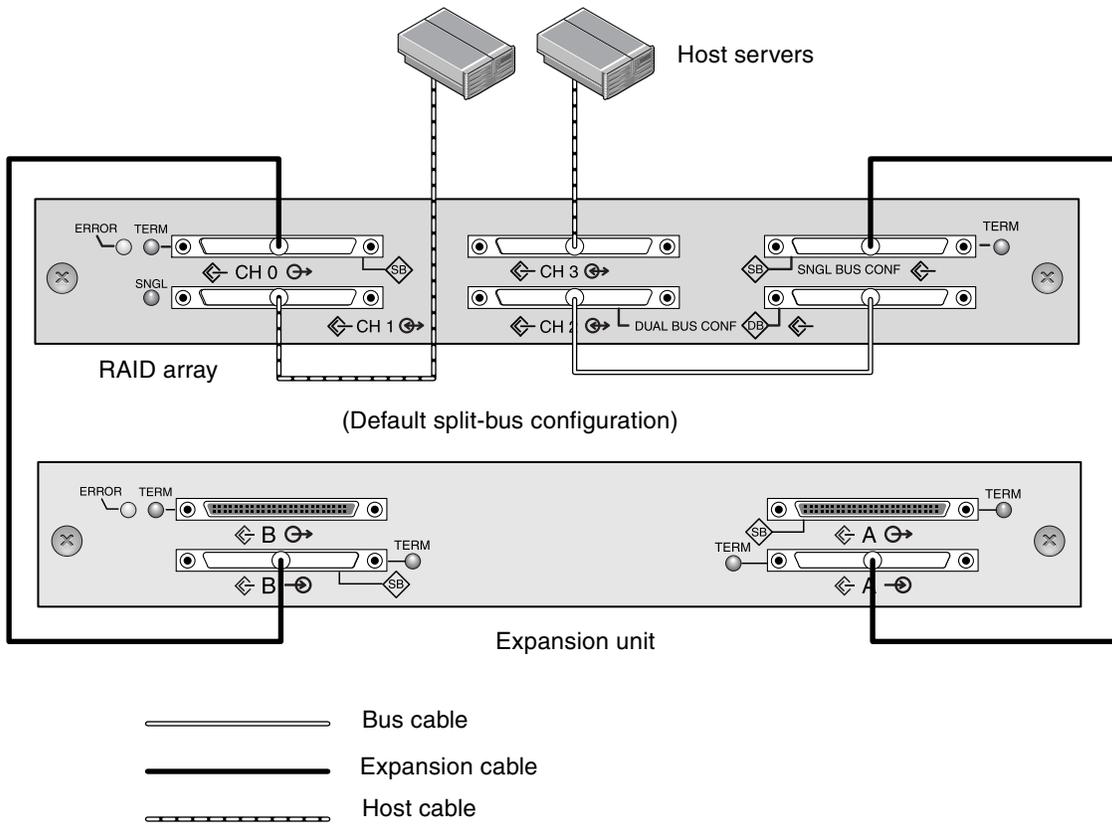
In the split-bus expansion unit configuration, no jumper cable is required.



**Figure 2-16** Expansion Unit Split-Bus Configuration

2. (Optional) Use a SCSI cable to connect a RAID array (channel 2 port) to an expansion unit lower input port. Tighten the cable jack screws with six full clockwise turns to ensure proper connection and operation.

In Figure 2-17, RAID channels 0 and 2 are expanded into the expansion unit, in a split-bus configuration set up on the RAID array and kept by default for the expansion unit.



**Figure 2-17** Split-Bus Configuration With One RAID Array and One Expansion Unit



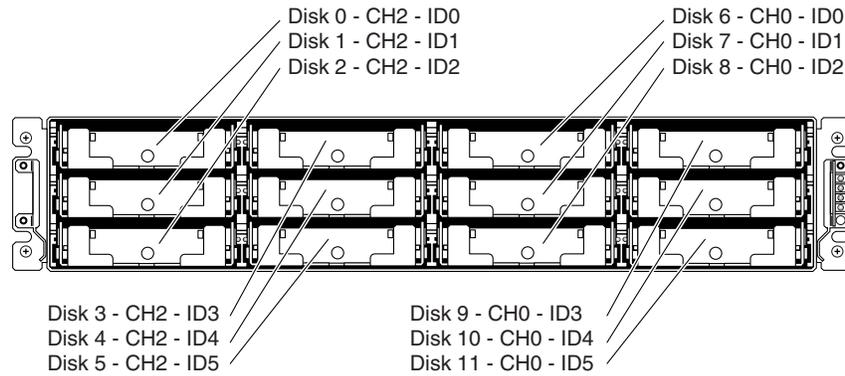
**Caution** – A maximum of 16 drive IDs is allowed per channel. Therefore, with a 12-drive array, do not connect a split-bus channel 0 or channel 2 (6 IDs) to a single-bus expansion unit (12 IDs).

The split-bus configuration shown in the preceding figure assigns half the IDs from the RAID and the expansion unit to channel 0, and the other half to channel 2. The “SINGLE-BUS CONF” port is a channel 2 expansion port in a split-bus configuration.

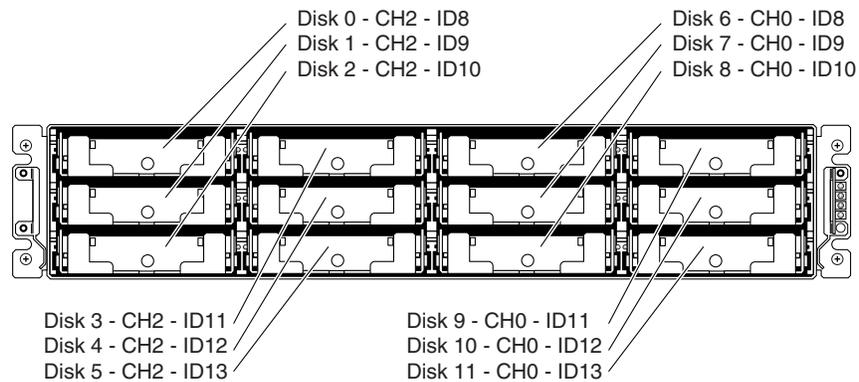
3. Based on the configuration shown in Figure 2-17, the default drive IDs for a split-bus configuration are shown in the following figures.

ID6 and ID7 are reserved and are not available for drive IDs.

The IDs are also displayed on the lower inside edge of the chassis. These IDs are automatically assigned and appear in RAID controller status tables.



**Figure 2-18** RAID Array: Split-Bus Configuration, Default IDs



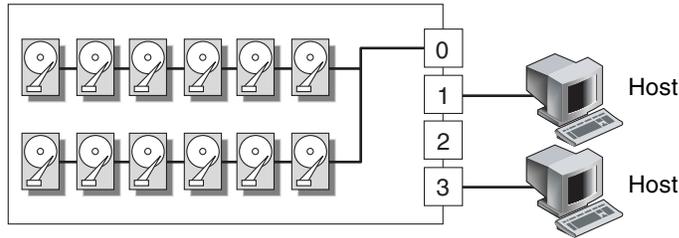
**Figure 2-19** Expansion Unit: Split-Bus Configuration, Default IDs

4. Connect your RAID array (SCSI channel 1 and 3 ports) to two host servers with SCSI cables.

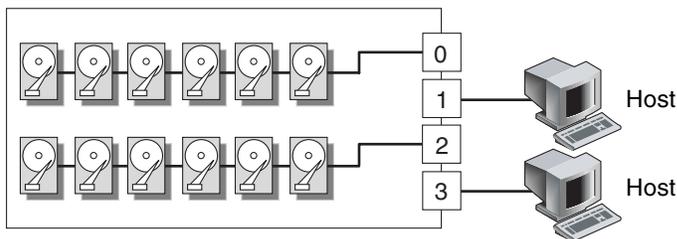
SCSI ports for channels 1 and 3 are assigned as host channels by default.

## 2.8.1 Standard Cabling Scenarios

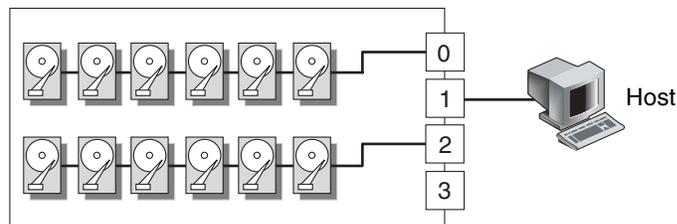
The following figures illustrate the standard cabling scenarios for a 12-drive array:



**Figure 2-20** Configuration #1: Single-Bus Configuration With Two Hosts



**Figure 2-21** Configuration #2: Split-Bus Configuration With Two Hosts



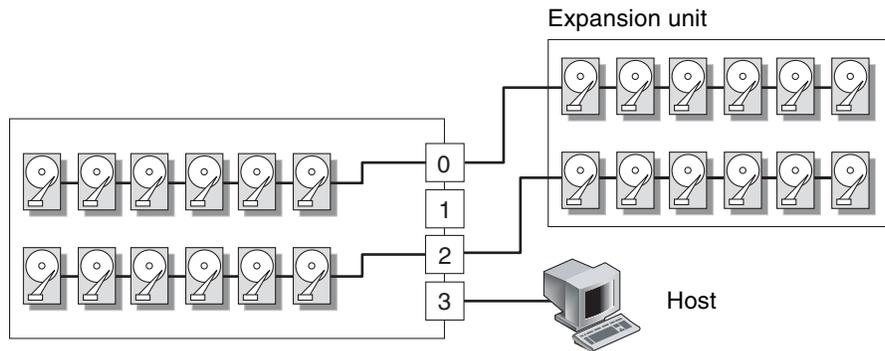
**Figure 2-22** Configuration #3: Split-Bus Configuration With One Host



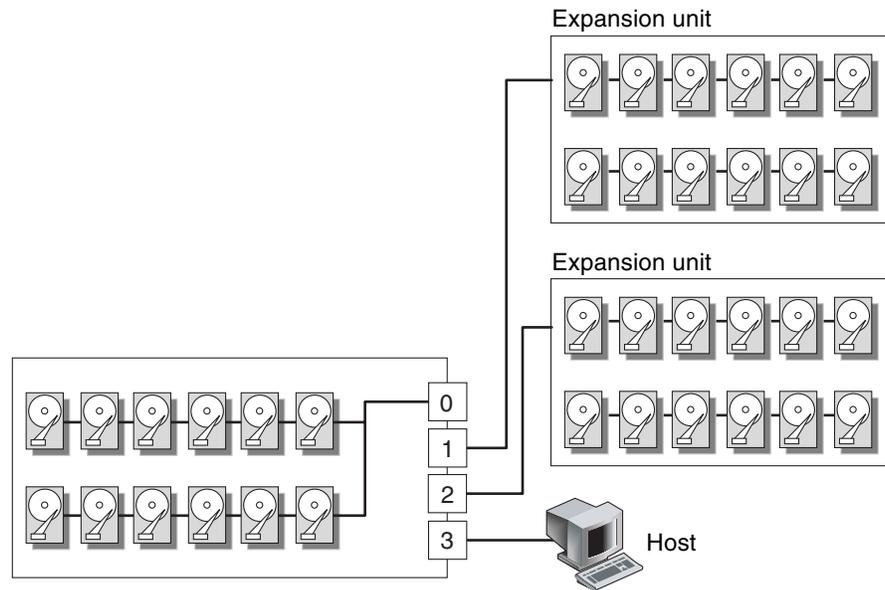
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**Caution** – A maximum of 16 drive IDs is allowed per channel. Therefore, with a 12-drive array, do not connect a split-bus channel 0 or channel 2 (6 IDs) to a single-bus expansion unit (12 IDs).

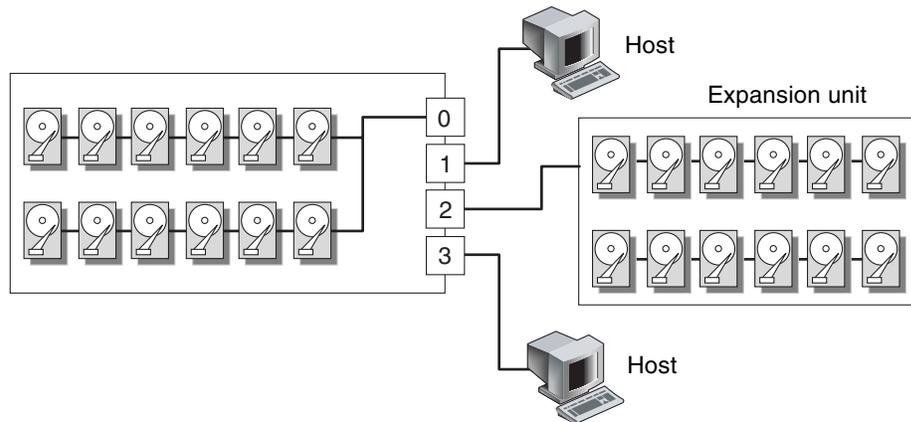
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**Figure 2-23** Configuration #4: Split-Bus Configuration With One Split-Bus Expansion Unit



**Figure 2-24** Configuration #5: Single-Bus Configuration With Two Single-Bus Expansion Units



**Figure 2-25** Configuration #6: Single-Bus RAID Connected to One Single-Bus Expansion Unit

## 2.9 Connecting Ports to Hosts

By default, channels 1 and 3 (the upper middle SCSI port and lower left SCSI port on the I/O module) are host channels. The array can be connected to a host in one of the following ways:

- By means of an Ultra320 LVD-compliant HBA installed in a host
- By means of a qualified and supported onboard single-ended server-embedded SCSI controller

Connect the array to one or two hosts with SCSI cables. Refer to the *SANnet II U320 SCSI Array Release Notes* for a list of the supported cables.

### 2.9.1 Connecting a SANnet II U320 SCSI RAID Array

The SCSI specification states that the maximum bus length for Ultra3 SCSI is 25 meters (82 feet) for point-to-point connections. The SANnet II U320 RAID array uses a point-to-point implementation. Each channel connector is on a separate physical SCSI bus.

Taking into account the internal bus length of .5 meters (1.64 feet) and the internal SCSI bus length of the host, the maximum SCSI cable length to each channel connector could conceivably be around 24 meters (72.8 feet) when connected to an Ultra3 host adapter. However, the longest Ultra3 cable qualified by Dot Hill is 10 meters (32.8 feet) in length.

When connected to single-ended host adapters, the longest support bus length per connector is 1.5 meters (4.9 feet).

---

**Note** – When connecting to Ultra3 host adapters, all SCSI cables must be Ultra3-qualified.

---

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**Note** – If you connect two hosts to the same channel on a RAID array, you do not need to change the scsi-initiator-id of one host adapter.

---

## 2.9.2 Connecting a SANnet II U320 SCSI JBOD Array

The SCSI specification states that the maximum bus length for Ultra3 SCSI is 12 meters (39.4 feet) for multidrop connections. The SANnet II U320 SCSI JBOD arrays use a multidrop implementation. The ports on each channel are connected to the same physical SCSI bus.

Taking into account the internal bus length of .5 meters (1.6 feet), and the internal SCSI bus length of the host, the maximum SCSI bus length for each channel is 12 meters (39.4 feet) when connected to an LVD host adapter.

You must ensure that the length of all cables to any connected nodes, as well as the internal bus length of .5 meters (1.6 feet) internal to the SANnet II U320 SCSI JBOD array and the internal bus length of the host, is less than 12 meters (39.4 feet) in total. Also include the jumper cable length of .3 meters (.98 feet) if the JBOD is being used in a single-bus configuration.

The longest Ultra3 cable qualified by Dot Hill is 10 meters (32.8 feet) in length.

When connected to single-ended host adapters, the longest supported bus length per channel is 1.5 meters (4.9 feet).

---

**Note** – If you connect two hosts to the same channel, you must change the scsi-initiator-id of one host adapter as described in the host adapter documentation. When either of these hosts is subsequently booted, SCSI reset warnings are displayed on the other host.

---

For information about supported JBOD configurations, refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual*.

## 2.10 Cabling to Expansion Units

Designed for a fully redundant configuration, a standard RAID array has channels 0 and 2 assigned as drive channels, and channels 1 and 3 assigned as host channels.

You can attach up to two expansion units to a RAID array if channel 1 or channel 3 is configured as a drive channel. When you configure a host channel as a drive channel, the primary ID (PID) is set to 8 and the secondary ID (SID) is set to 9. To avoid SCSI ID conflicts, change the newly assigned drive channel PID to 6 and the SID to 7 using the firmware application. For details, refer to the *SANnet II Family RAID Firmware User's Guide*.

This section describes:

- “Cabling to One Expansion Unit” on page 2-21
- “Cabling to Two Expansion Units” on page 2-23
- “Adding an Expansion Unit to an Existing RAID Array” on page 2-25

### 2.10.1 Cabling to One Expansion Unit

The following figures are examples of configurations that have a RAID array connected to one expansion unit.

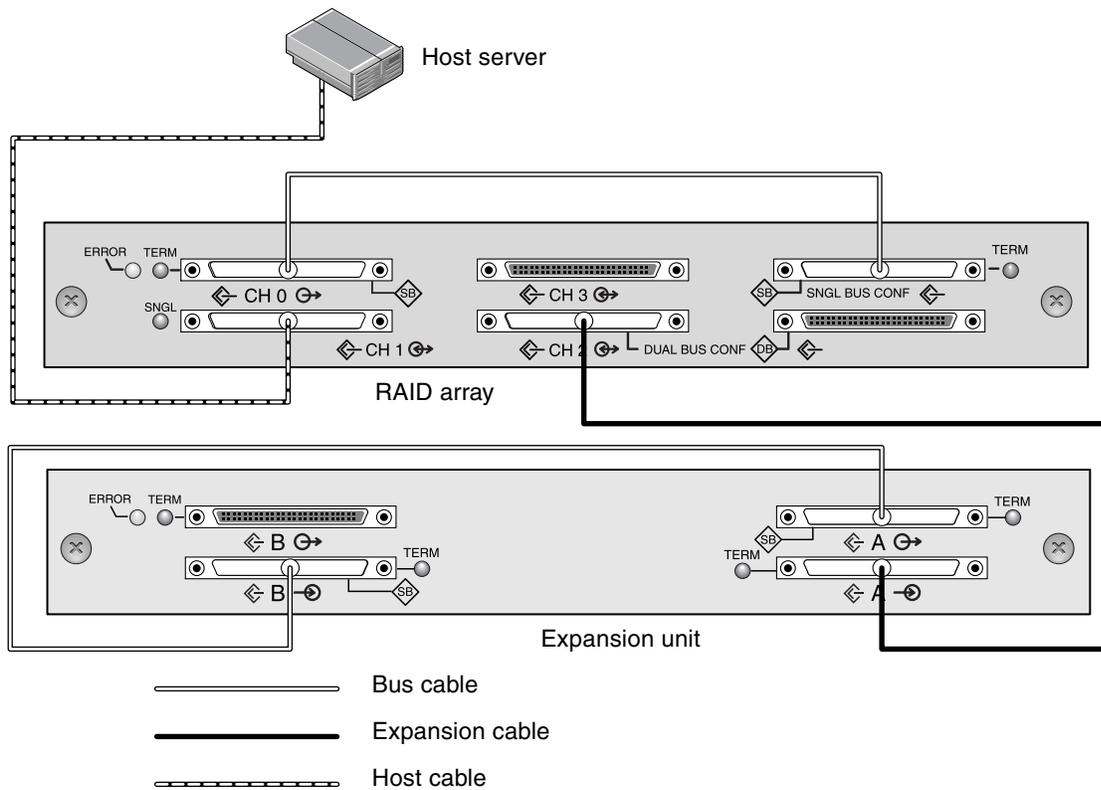


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**Caution** – A maximum of 16 drive IDs is allowed per channel. Therefore, in a 12-drive array, do not connect a split-bus channel 0 or channel 2 (6 IDs) to a single-bus expansion unit (12 IDs).

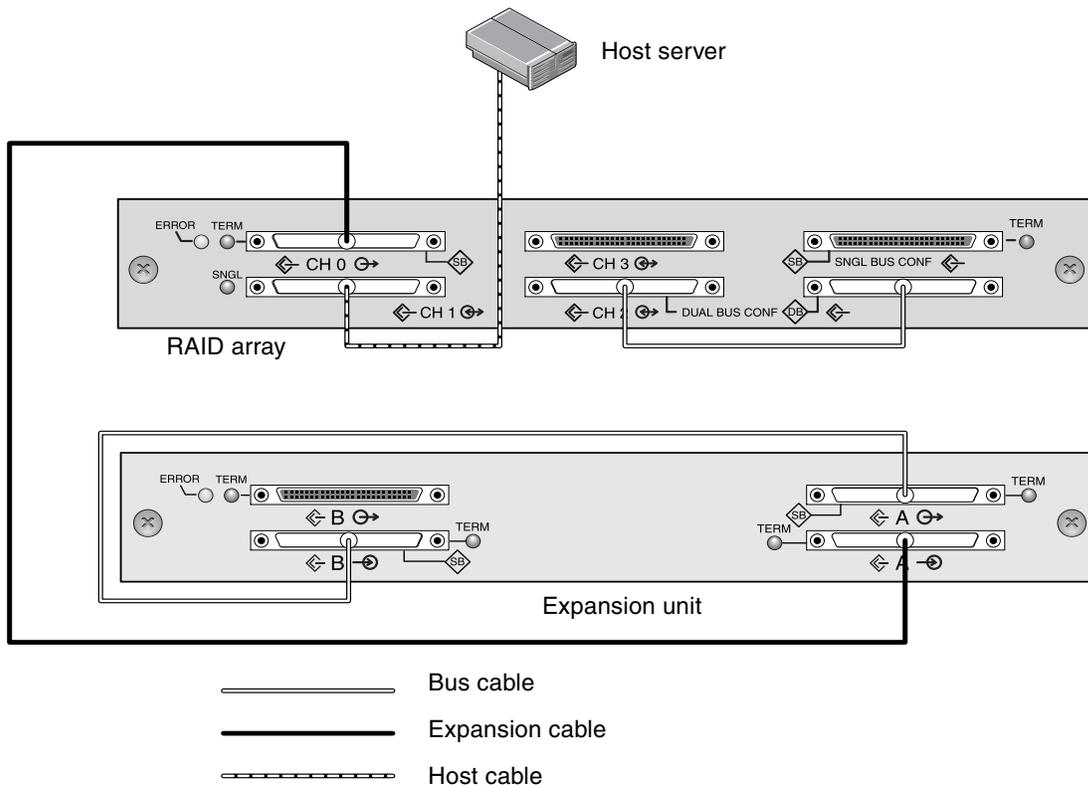
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In Figure 2-26, the RAID array and one expansion unit have been set up for single-bus configuration; Channel 2, a drive channel, is connected to the expansion unit.



**Figure 2-26** Single-Bus Configuration With One Host and One Expansion Unit

In Figure 2-27, the RAID array and one expansion unit have been set up for a split-bus configuration; Channel 0, a drive channel, is connected to the expansion unit and Channel 2, a drive channel, is connected to the RAID unit.



**Figure 2-27** Split-Bus Configuration With One Host and One Expansion Unit

## 2.10.2 Cabling to Two Expansion Units

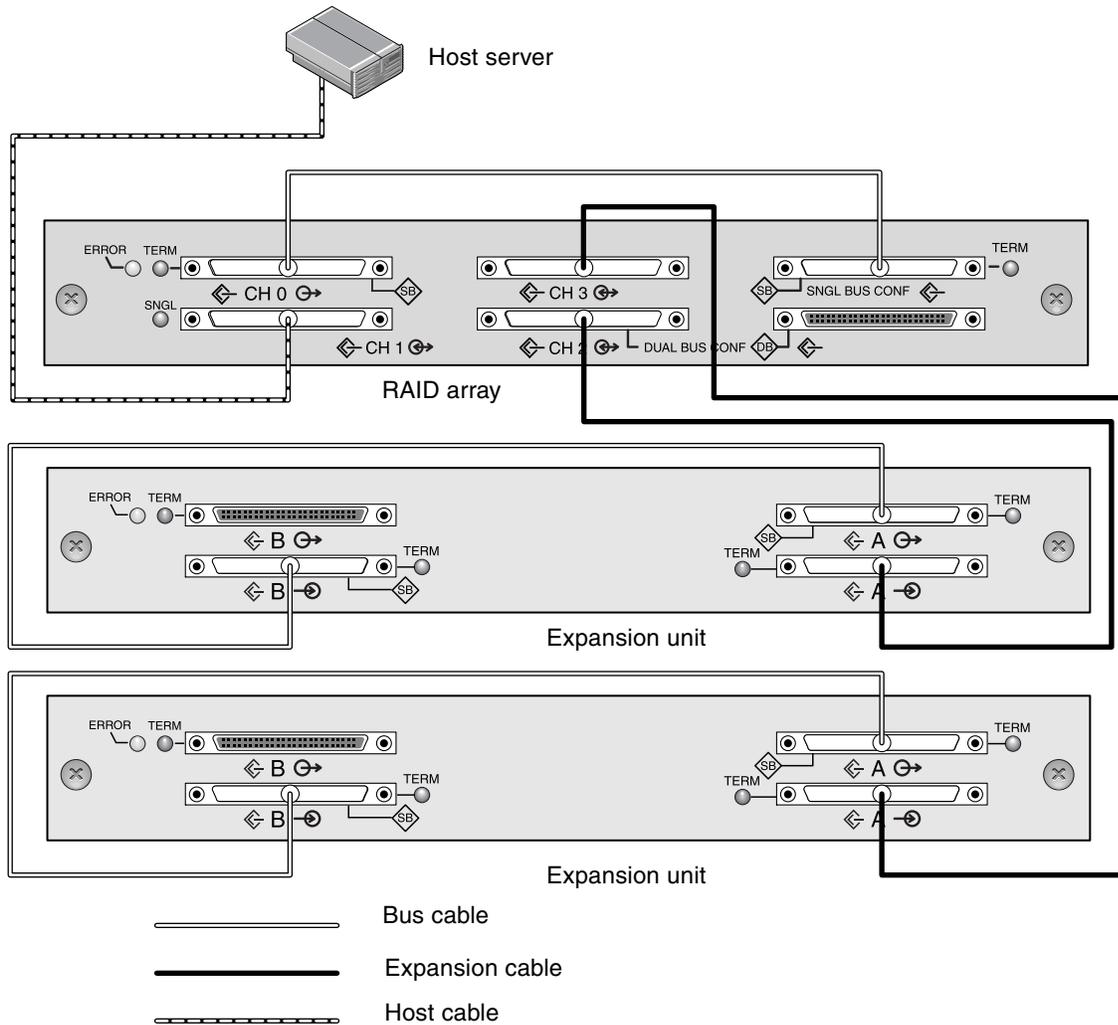
The following figures are examples of configurations that have a RAID array connected to two expansion units.



**Caution** – A maximum of 16 drive IDs is allowed per channel. Therefore, in a 12-drive array, do not connect a split-bus channel 0 or channel 2 (6 IDs) to a single-bus expansion unit (12 IDs).

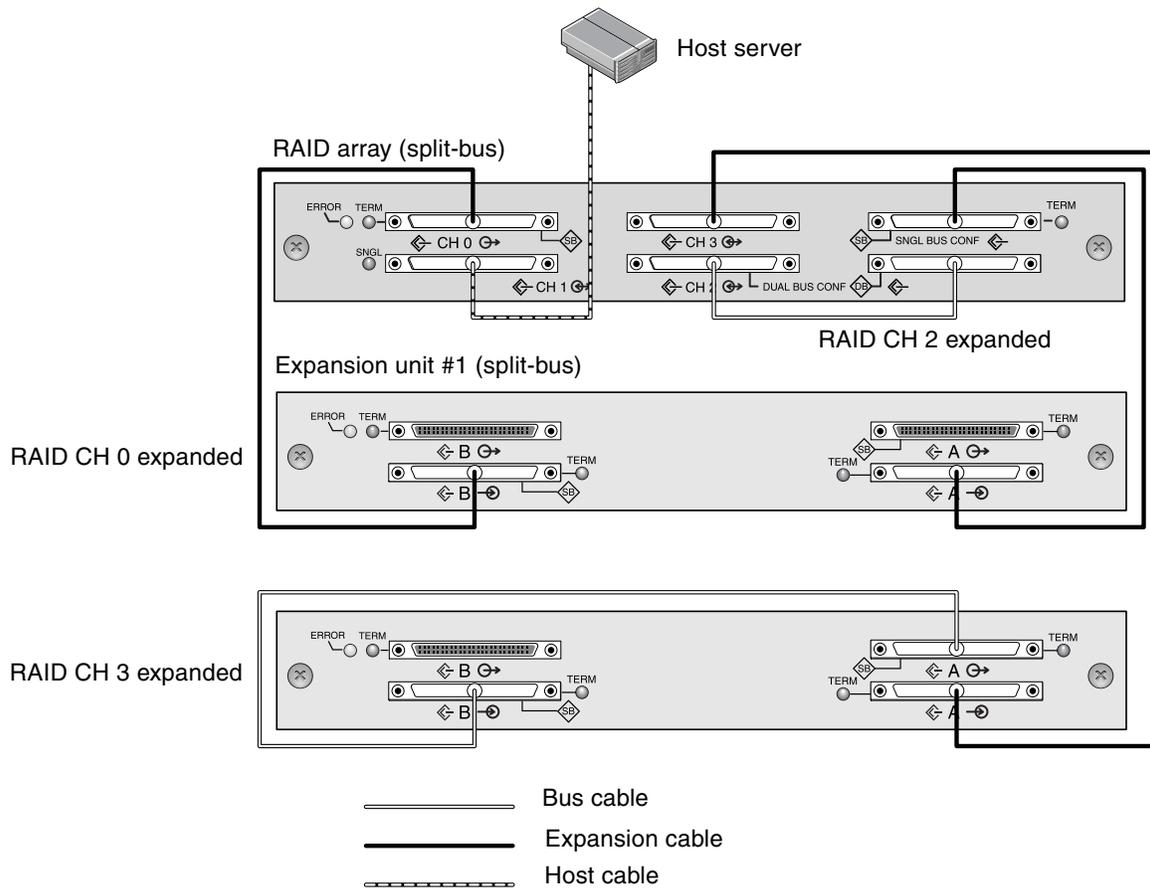
**Note** – When you configure a host channel as a drive channel, the primary ID (PID) is set to 8 and the secondary ID (SID) is set to 9. To avoid SCSI ID conflicts, change the newly assigned drive channel PID to 6 and the SID to 7 using the firmware application. For details, refer to the *SANnet II Family RAID Firmware User's Guide*.

In Figure 2-28, the RAID array and the two expansion units have been set up for single-bus configuration; Channel 3 has been reassigned as a drive channel and connected to the second expansion unit.



**Figure 2-28** Single-Bus Configuration With One Host and Two Expansion Units

In Figure 2-29, the RAID array and one expansion unit #1 have been configured for split-bus configuration and expansion unit #2 is set for single-bus configuration; Channel 3 has been reassigned as a drive channel and connected to the second expansion unit. The RAID channels 0 and 2 are connected and expanded into the split-bus expansion unit #1, and RAID channel 3 is connected and expanded into a single-bus expansion unit #2.



**Figure 2-29** Split-Bus/Single-Bus Configuration With One Host and Two Expansion Units

### 2.10.3 Adding an Expansion Unit to an Existing RAID Array

To install an expansion unit to an existing, configured RAID array, perform the following steps.

1. Stop I/O and shutdown the controller to ensure that all data in the cache is written to disk.  
For details on shutting down, see “Power-Off Procedure” on page 2-33.
2. Physically cable the new expansion unit to the array using a valid cabling configuration.  
See “Cabling to One Expansion Unit” on page 2-21 and “Cabling to Two Expansion Units” on page 2-23 for more information on expansion unit cabling configurations.
3. Power on the expansion units.  
For details on the power on sequence, see “Power-On Sequence” on page 2-32.

#### 4. Power on the RAID array.

---

**Note** – You can attach up to two expansion units to a RAID array if channel 1 or channel 3 is configured as a drive channel. When you configure a host channel as a drive channel, the primary ID (PID) is set to 8 and the secondary ID (SID) is set to 9. To avoid SCSI ID conflicts, change the newly assigned drive channel PID to 6 and the SID to 7 using the firmware application. For details, refer to the *SANnet II Family RAID Firmware User's Guide*.

---

## 2.11 Establishing Communications With An Array

Before you can configure an array, you must establish one or more communication links between at least one host and an array. You can use any combination of the array's RS-232 COM (serial) port, the Ethernet port, and the in-band data connection between the host and the array.

- A direct RS-232 COM port connection guarantees that a host can communicate with a RAID array even if the array's IP address changes or is unknown, or if the TCP/IP network suffers a temporary outage. See “Configuring the RS-232 Serial Port Connection” on page 2-28 for more information. For pinout information, refer to the *SANnet II Installation, Operation, and Service Manual* for your array.

When you connect via the serial port, you immediately access the controller firmware application, a management program embedded in the firmware.

---

**Note** – If you are connected through a serial port connection (including a Solaris tip session) rather than through a telnet session, it is possible that when a controller is inserted, deasserted, or failed over, unwanted “garbage” characters can be displayed or the firmware application can appear to be frozen. This is due to the controller negotiation that occurs during a power-up or restart cycle. In most cases using the Ctrl-L keyboard shortcut corrects this problem. If this fails, the workaround is to close the tip session and start another, or use a telnet session instead.

---

- SANnet II Family arrays ship with the Dynamic Host Configuration Protocol (DHCP) TCP/IP network support protocol enabled. If your network uses a DHCP server to automatically allocate IP addresses to attached devices, as soon as the RAID array is powered up, an IP address is assigned to it.

You can use this IP address to monitor and manage the array's firmware through telnet sessions. See “Setting Up Out-of-Band Management Over Ethernet” on page 2-30 for information about setting up a telnet session.

The out-of-band management tools are:

- The host-based SANscape software.
- The host-based SANscape Command-Line Interface (CLI).
- The firmware application you access when you use the telnet command to connect to the IP address of the controller.

---

**Note** – By default, the CLI and the SANscape console automatically access in-band all arrays connected to the host server where the software is installed.

---

- A static IP address enables you to use telnet or other out-of-band management sessions to manage the array with no risk of a DHCP server changing its IP address. See “Manually Setting a Static IP Address” on page 2-29 for information.

## 2.11.1 Determining the Default IP Address

When the array is first powered up, the default IP address setting uses the IP address assigned by a DHCP server.

---

**Note** – If you do not use a DHCP server with the array, you will not have an IP address and will need to use the serial port connection to create an IP address. See “Configuring the RS-232 Serial Port Connection” on page 2-28.

---

If the RAID array is connected to a network with an active DHCP server, you can determine the IP address assigned to the array in several ways:

- Access the firmware and follow the procedure “Configuring the RS-232 Serial Port Connection” on page 2-28.

When you connect via the serial port, you immediately access the controller firmware application, a management program embedded in the firmware.

- If you already installed the SANscape CLI program, use the **show network-parameters** CLI command.

If the RAID controller is not on a network connected to an active DHCP server, an IP address of 0.0.0.0 is displayed. Refer to the *SANscape CLI User's Guide* for more information.

- If you already installed the SANscape program, use the Change Network Settings window to display the IP address of the array. Refer to the “Updating the Configuration” chapter in the *SANscape User's Guide* for more information.

Event messages sent as SNMP traps to the email address you specify also contain the IP address of the array from which they are sent. Refer to the “Configuration Parameters” chapter in the *SANnet II Family RAID Firmware User's Guide* for more information.

Once you have determined the RAID controller's IP address using one of these methods, you can establish a telnet session to that IP address.



---

**Caution** – Because of the dynamic nature of DHCP-assigned IP addresses, the RAID array’s IP address might change in the event of a controller reset, a network outage, or if the DHCP server is rebooted. If this happens, telnet sessions to the previous IP address can no longer communicate with the array, and it is necessary to use one of the methods described above to determine the new IP address.

---

If you do not have an active DHCP server on the same network as the RAID array, or if you prefer to have a static IP address, use the procedures in “Manually Setting a Static IP Address” on page 2-29.

## 2.11.2 Configuring the RS-232 Serial Port Connection

The RS-232 COM (serial) port on either controller module can be used to configure and monitor the RAID array using the controller firmware. It can be connected to a VT100 terminal, terminal emulation program, terminal server, or the serial port of a server.

1. Use a null modem serial cable to connect the COM port of the RAID array to the serial port on a host workstation.

A null modem serial cable is included in your package.

2. Set the serial port parameters on the workstation as follows:
  - 38,400 baud
  - 8 bit
  - 1 stop bit
  - No parity

For additional information on how to set serial port parameters on a specific server, refer to the *SANnet II U320 SCSI Array Installation, Operation, and Service Manual*.

3. Access the array through the COM port and select the VT100 terminal emulation to access the Main Menu.
4. Check the DHCP IP address and confirm that it is valid.

From the firmware Main Menu choose **Configuration Parameters** → **Communication Parameters** → **Internet Protocol (TCP/IP)**.

If the RAID controller is not on a network connected to an active DHCP server, “DHCP Client” is displayed rather than a DHCP-assigned IP address. Refer to the “Configuration Parameters” chapter in the *SANnet II Family RAID Firmware User’s Guide* for more information.

5. If you need to reset the IP address or make a fixed IP address, refer to “Manually Setting a Static IP Address” on page 2-29.
6. Configure the array.
  - To configure the array through the firmware application, refer to the *SANnet II Family RAID Firmware User’s Guide*.

- To configure the array through out-of-band management, refer to “Setting Up Out-of-Band Management Over Ethernet” on page 2-30.

### 2.11.3 Manually Setting a Static IP Address

You can manually set an array’s IP address using the controller’s firmware by typing values for the IP address, the subnet mask, and IP address of the gateway. If your network uses a Reverse Address Resolution Protocol (RARP) server or a Dynamic Host Configuration Protocol (DHCP) server to automatically configure IP information for devices on the network, you can specify the appropriate protocol instead of typing the information manually.

---

**Note** – If you assign an IP address to an array to manage it out-of-band, for security reasons consider using an IP address on a private network rather than a publicly routable network. Using the controller firmware to set a password for the controller limits unauthorized access to the array. Changing the firmware’s Network Protocol Support settings can provide further security by disabling the ability to remotely connect to the array using individual protocols such as HTTP, HTTPS, telnet, FTP, and SSH. Refer to the “Communication Parameters” section of the *SANnet II Family RAID Firmware User’s Guide* for more information.

---

To set the IP address, subnet mask, and gateway address of the RAID controller, perform the following steps:

1. Access the array through the RS-232 COM port on the I/O controller module or through a telnet session to the existing IP address.
2. From the controller firmware’s Main Menu, choose **view and edit Configuration parameters** → **Communication Parameters** → **Internet Protocol (TCP/IP)**.
3. Select the chip hardware address and MAC address that is displayed.
4. Choose **Set IP Address** → **Address**.
5. Type the desired IP address, subnet mask (if it is not automatically supplied), and gateway address, choosing each menu option in turn, backspacing over any existing entries.

If your network sets IP addresses using a RARP server and you prefer using it to using a fixed IP address, type **RARP** rather than an IP address and do not type a subnet mask or gateway address. If your network sets IP addresses using a DHCP server and you prefer using it to using a fixed IP address, type **DHCP** rather than an IP address and do not type a subnet mask or gateway address.

6. Press **Esc** to continue.

A confirmation prompt is displayed.

```
Change/Set IP Address ?
```

7. Click **Yes** to continue.

---

**Note** – You must reset the controller for the configuration to take effect.

---

You are prompted to reset the controller.

8. Click **Yes** to reset the controller.

The controller takes a few minutes to reset.

## 2.12 Setting Up Out-of-Band Management Over Ethernet

The controller Ethernet port offers interactive out-of-band management through several interfaces:

- The host-based **SANscape** application.  
Refer to the *SANscape User's Guide* for details.
- The host-based **SANscape Command-Line Interface (CLI)**.  
Refer to the *SANscape CLI User's Guide* for details.
- The **firmware application** you access when you use the **telnet** command to connect to the IP address of the controller.

---

**Note** – A login password can be set from the firmware application or the CLI.

---

Using an Ethernet connection, you can configure and monitor RAID arrays and expansion units remotely by using the **telnet** command to access the firmware application on the array and by using the SANscape or SANscape CLI software.

---

**Note** – If you assign an IP address to an array to manage it out-of-band, for security reasons consider using an IP address on a private network rather than a publicly routable network. Using the controller firmware to set a password for the controller limits unauthorized access to the array. Changing the firmware's Network Protocol Support settings can provide further security by disabling the ability to remotely connect to the array using individual protocols such as HTTP, HTTPS, telnet, FTP, and SSH. Refer to the "Communication Parameters" section of the *SANnet II Family RAID Firmware User's Guide* for more information.

---

1. To access the RAID array over an Ethernet connection, first connect the RAID array's Ethernet port on each controller to the network.

---

**Note** – SANnet II family arrays require at least CAT-5 Ethernet cable.

---

---

**Note** – In a dual-controller RAID array, be sure to connect both Ethernet ports to the network. This provides failover if one controller fails.

---

2. Establish the IP address of the RAID array, as described in “Establishing Communications With An Array” on page 2-26.
3. To use the firmware application program from the host server, connect to the IP address of the RAID array controller with the following command:

```
# telnet IP-address
```

---

**Note** – Alternatively, you can use the Solaris operating system **tip** command or a terminal emulation program to access the firmware application program. See “Configuring the RS-232 Serial Port Connection” on page 2-28 for more information.

---

4. Press **Ctrl-L** to refresh the screen and view the Main Menu.

---

**Note** – If you reset the controller during a **telnet** session, you are disconnected from the RAID array. Use the **telnet** command to login to the array again.

---

To connect the SANscape program (on a host server) to a RAID array that has an IP address, refer to the out-of-band management instructions in the *SANscape User's Guide*.

The same document's “Email and SNMP” appendix provides information about configuring SANscape software to use Simple Network Management Protocol (SNMP) traps and Management Information Bases (MIBs) to provide information to other out-of-band enterprise management software. The “Monitoring the Array” chapter explains the use of SANscape agents to redirect event messages into host system logs.

You can also enable the controller firmware to send event messages using SNMP. Refer to the “Configuration Parameters” chapter in the *SANnet II Family RAID Firmware User's Guide* for more information.

## 2.13 Remaining Steps

SANnet II U320 SCSI arrays are preconfigured with a single RAID 0 logical drive mapped to LUN 0, and no spare drives. This is not a usable configuration, but it enables in-band connections with management software. You must delete this logical drive and create new logical drives.

All configuration procedures can be performed by using the COM port. You can also perform all procedures except the assignment of an IP address through an Ethernet port connection to a management console.

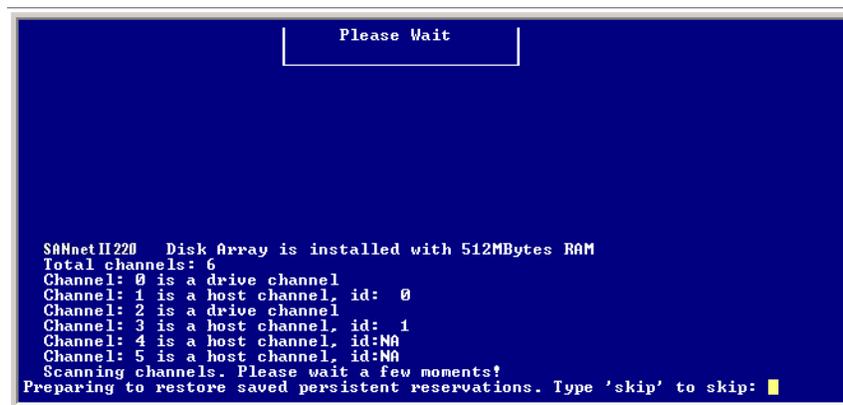
Some of the cabling configurations require accessing the firmware application to further configure the array. For example, the single-bus array with one host and two expansion units (see Figure 2-28) configuration requires changing one of the channels from a host to a drive channel. In order to do this, you must change the drive channel using the firmware application. For details about drive channels as well as other configuration commands that need to be performed, refer to the *SANnet II Family RAID Firmware User's Guide*.

## 2.14 Power-On Sequence

Power on the equipment in the following order so the host computer discovers all connected arrays:

- a. Expansion units
- b. RAID array
- c. Host computers

If an array is connected to a host using a serial port connection and powered on, the host terminal window displays a series of messages, as shown in the following example.



```

Please Wait

SANnetII220  Disk Array is installed with 512MBytes RAM
Total channels: 6
Channel: 0 is a drive channel
Channel: 1 is a host channel, id: 0
Channel: 2 is a drive channel
Channel: 3 is a host channel, id: 1
Channel: 4 is a host channel, id:NA
Channel: 5 is a host channel, id:NA
Scanning channels. Please wait a few moments!
Preparing to restore saved persistent reservations. Type 'skip' to skip: █
```

**Figure 2-30** Host Terminal Window

Do not use the `skip` option shown at the bottom of the example. This option is reserved for support personnel performing testing.

## 2.15 Power-Off Procedure

You might need to power off the array (both power supplies) if you relocate the array or perform certain maintenance procedures with associated servers. Always shut down the array's controller before powering off the array.



---

**Caution** – If controllers are not shut down from the firmware application or the CLI before an array is powered off, data that is written to cache and that has not been completely written to the disks will be lost.

---

To power off an array, perform the following steps:

1. Stop all I/O activity to the array.
2. Shut down the controller with one of the following commands:
  - Firmware application **Shutdown Controller** command (**system Functions** → **Shutdown controller**)
  - SANscape CLI `shutdown controller` command

These commands first halt all I/O activity, and then write the contents of cache to the drives.

3. Power off both power supply/fan modules.
4. See “Power-On Sequence” on page 2-32 for information about turning the array on again.

