

IBM System Storage



# N3220

## Installation and Setup Instructions

*Covering the N3220 model*

## Notices

Mail comments to:  
IBM Corporation  
Attention Department GZW  
9000 South Rita Road  
Tucson, AZ 85744-0001

[www.ibm.com/storage/support/nseries](http://www.ibm.com/storage/support/nseries)

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## Before you begin

Read this information before beginning your installation.

Before you begin your installation, print and complete a Configuration worksheet for your storage system to gather the information that the software setup process requires. The configuration worksheet is provided in the *Data ONTAP Software Setup Guide for 7-Mode* for your version of Data ONTAP, which is available on the IBM® N series support website:

[www.ibm.com/storage/support/nseries/](http://www.ibm.com/storage/support/nseries/)

If you are configuring a storage system as part of a high-availability configuration, some information types must be unique for each storage system mode in the configuration, and some information types must be identical on both storage system nodes. If you have a high-availability configuration, IBM recommends that you print and complete two copies of the configuration worksheet, one for each system node.

### About this document

This document provides installation and setup instructions for the IBM System Storage® N3220 filer storage system.

For additional information about your system and related topics, refer to the following resources.

- *IBM System Storage N3150, N3220, and N3240 Hardware and Service Guide*
- *IBM System Storage N series Introduction and Planning Guide*
- *IBM System Storage N series Safety Notices*
- *IBM Environmental Notices and User Guide*
- IBM System Storage N series support website at [www.ibm.com/storage/support/nseries/](http://www.ibm.com/storage/support/nseries/)

Additional information about the N series storage expansion units you connect to your system can be found in the *Hardware and Service Guides* and the *Installation and Setup Instructions* for your storage expansion units.

### Read the safety notices

Before continuing, make sure that you have reviewed the safety notices, *IBM System Storage N series Safety Notices*, shipped with this product. Do not plug any cables into the system, adapters, or any electrical outlets until you have reviewed the safety information and followed the procedures in this document.

### Need help?

If you encounter any difficulties while setting up your system, contact IBM service and support for assistance. Information can also be found on the IBM N series support website:

[www.ibm.com/storage/support/nseries/](http://www.ibm.com/storage/support/nseries/)

### About the IBM N series support website

The IBM System Storage N series support website requires users to register in order to obtain access to N series support content on the web. To understand how the N series support web content is organized and navigated, and to access the N series support website, go to the following publicly accessible web page:

[www.ibm.com/storage/support/nseries/](http://www.ibm.com/storage/support/nseries/)

This web page also provides links to AutoSupport information as well as other important N series product resources.

## **Items supplied by you for the installation**

You need to supply the following items to complete the installation:

- Ethernet LAN cables
- Fibre Channel (FC) cables
- Console (for example, a PC or notebook)
- #2 Phillips screwdriver and slotted screwdriver

## **Installing in a non-IBM rack**

The rack installation instructions provided in this document apply specifically to the installation of the N series product in an IBM 19-inch rack. IBM service personnel cannot install the N series product in a non-IBM rack.

If the N series product is being installed in a non-IBM rack, the rails shipped with the N series product may or may not work with the non-IBM rack. Physical installation of the N series product in a non-IBM rack is the customer's responsibility.

## Overview of the N3220

Refer to the following figures to familiarize yourself with the N3220.

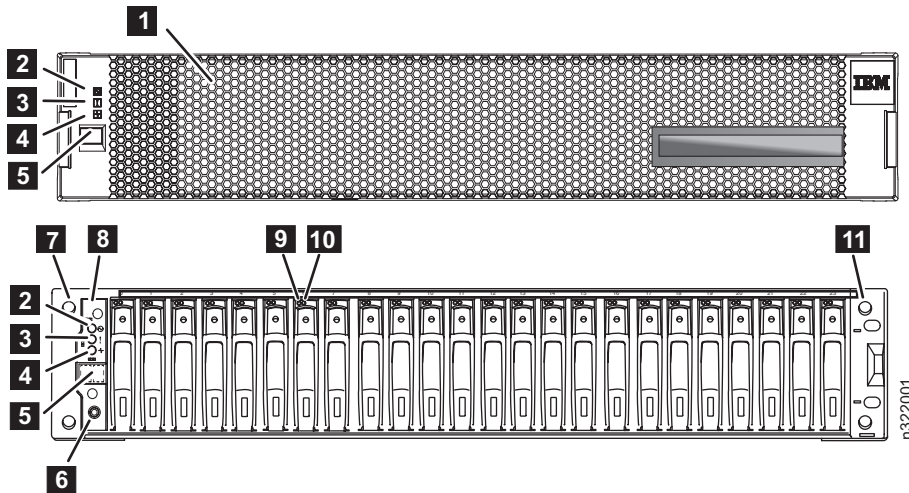


Figure 1. Front view with and without bezel

<b>1</b>	Bezel	<b>7</b>	Left mounting flange
<b>2</b>	Shelf power LED	<b>8</b>	Operator display panel
<b>3</b>	Shelf fault LED	<b>9</b>	Disk drive activity LED
<b>4</b>	Shelf activity LED	<b>10</b>	Disk drive fault LED
<b>5</b>	Two-digit shelf ID digital display	<b>11</b>	Right mounting flange
<b>6</b>	Button for changing the shelf ID		

**Note:** Disk drive bays are numbered horizontally starting from 0 to 23 (left to right).

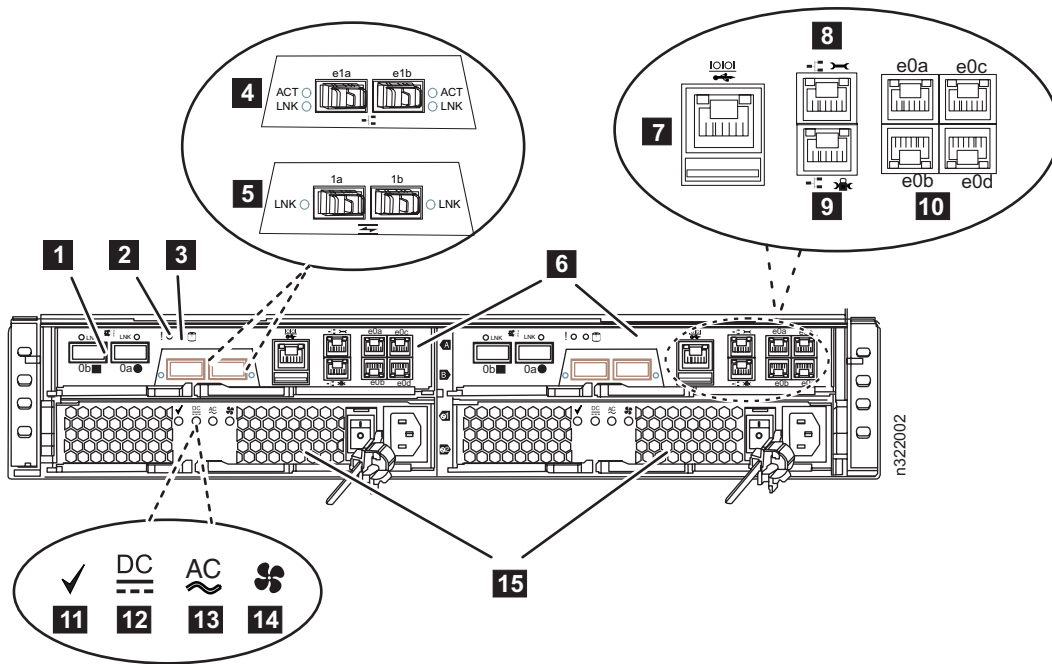


Figure 2. Rear view

<b>1</b>	SAS ports (2)	<b>9</b>	ACP port (locked wrench icon)
<b>2</b>	PCM fault LED	<b>10</b>	Gigabit Ethernet ports (4)
<b>3</b>	NVMEM LED	<b>11</b>	PSU OK LED
<b>4</b>	Mezzanine card ports 10 Gb option	<b>12</b>	DC fault LED
<b>5</b>	Mezzanine card ports 8 Gb Fibre Channel option	<b>13</b>	AC fault LED
<b>6</b>	Controller modules (1 or 2 depending on the model)	<b>14</b>	Fan fault LED
<b>7</b>	Serial console port	<b>15</b>	Power supplies (2, each with integrated fans)
<b>8</b>	Remote Management port (wrench icon)		



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## Installation and setup instructions

Use these instructions to install and set up your N3220 filer.

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### Unpacking the N3220 filer

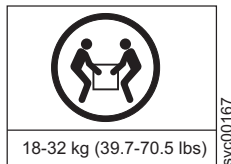
Use these instructions to unpack the N3220.

**Important:** If your system was shipped already assembled and cabled in a rack, go directly to “Setting up and booting the system” on page 9.

Each N3220 system enclosure ships with an accessories kit and set-up kit containing documentation and hardware parts for installing your system. The quantity of hardware parts is determined by your system configuration and requirements.

Each shipment container includes the following contents:

- N3220 system enclosure
- N3220 system bezel
- *IBM System Storage N3220 Installation and Setup Instructions*
- General information kit, containing warranty, safety, and environmental information
- Software license



**CAUTION:**

The weight of this part or unit is 25.4 kg (56.0 lb). It takes specially trained persons, a lifting device, or both to safely lift this part or unit.

1. Remove the foam hardware protectors and the plastic surrounding the system.
2. Place the storage system on a table.

### Contents for each N3220 model

The N3220 is a single-enclosure high availability (HA) capable system. Each N3220 model also ships with at least one envelope with the software End User License Agreement (EULA) and license keys. The following list describes the contents of the shipping packages included with the N3220 model:

- Console adapters, RJ-45 to DB-9 (one per controller module)
- Cable management arms (two per controller module)
- 2 power cords
- Serial null modem cables (one per controller module)
- 2U IBM rail kit
- 1 ESD wrist strap
- 1 set of IBM publications

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## Installing the rails in an IBM 19-inch rack

Use these instructions to install the rails on which you will mount the N3220 filer.

**Note:** Read this document in its entirety before proceeding.

1. Loosen (but do not remove) the four rail adjustment screws on each rail, as shown in Figure 3.

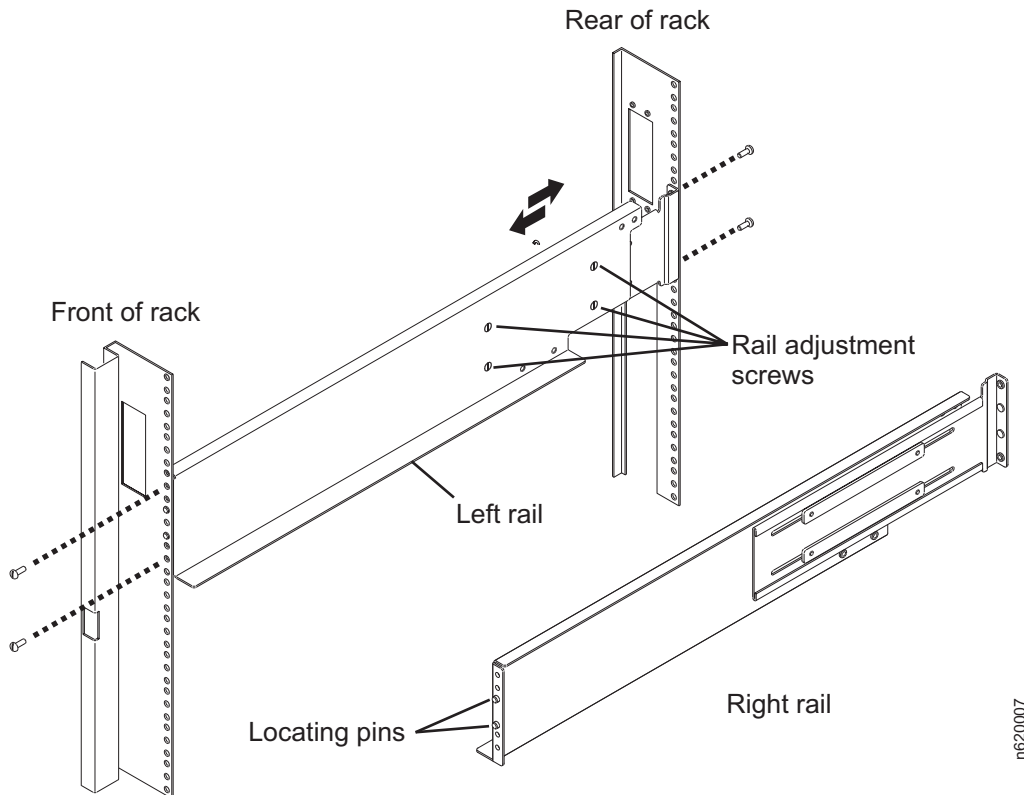


Figure 3. Installing the rails in the rack

2. Refer to Figure 4 on page 3. At the front of the rack, position the right-hand rail in the rack at the appropriate EIA location. Make sure that the two locating pins seat properly in holes H3 and H4. The bottom of the rail should line up with the bottom EIA boundary.

**Note:** When installed, each N3220 will occupy a 2U space.

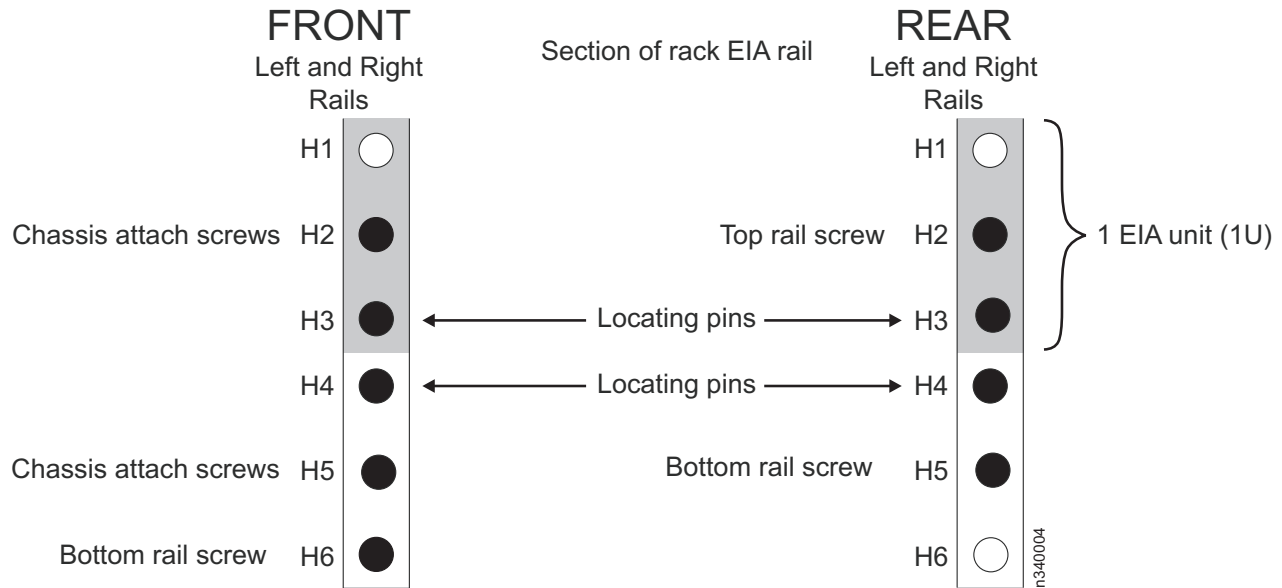


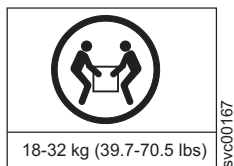
Figure 4. N3220 rail mounting template

Using one silver pan head M5 screw, attach the rail to the front of the rack using hole H6. Tighten this screw with a screwdriver.

3. At the rear of the rack, position the rail at the same EIA location used in step 2. Make sure that the locating pins seat properly in holes H3 and H4. Using two silver pan head M5 screws, attach the rail to the rack using holes H2 and H5. Tighten these screws with a screwdriver.
4. Tighten the four rail adjustment screws on the installed rail.
5. Repeat steps 2 through 4 for the left-hand rail.
6. Repeat steps 1 through 5 for each additional N3220 that you are installing in the rack, making sure to allow 2U of space for each N3220 filer.

## Installing the N3220 filer in the rack

Use these instructions to install the N3220 filer in the rack.



### CAUTION:

The weight of this part or unit is 25.4 kg (56.0 lb). Use two people to lift an N3220 filer into a rack.

1. If the N3220 filer front bezel is attached to the expansion unit, carefully remove the bezel by pulling out on the rectangular openings (marked by blue stripes) on either side of the bezel.
2. From the front of the rack, set the N3220 filer onto the rails and slide it into the rack until the front mounting flange is a few inches from the rack frame. As shown in Figure 5 on page 4, position the spacer plates **1** over the locating pins (holes H3 and H4) on the front left and right rails. Slowly slide the chassis into the rack until the front mounting flange of the N3220 filer is flush against the spacer plates.

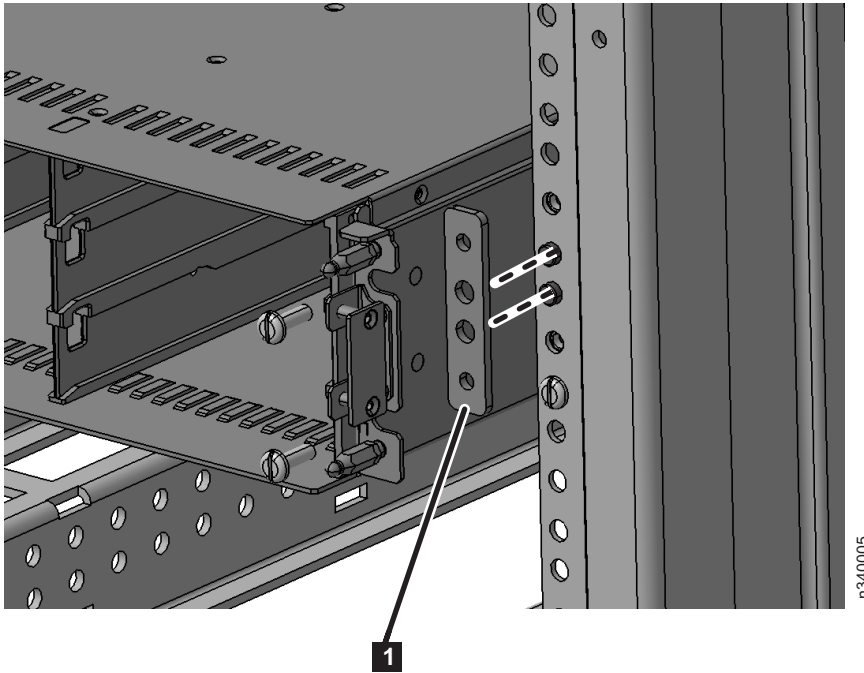


Figure 5. Mounting the N3220 filer in the rack

3. Using Figure 5 for reference, attach the N3220 filer to the front of the rack using four silver pan head screws (two for each rail) in the H2 and H5 holes. Thread the screws through the front flange, the spacer plate, and the rack frame rail into the threaded rail nuts. Tighten the screws using a screwdriver.
4. Replace the front bezel of the N3220 filer.
5. From the back of the rack, attach a rear tie-down plate **1** to the left and right rails using four M5 pan head screws (two for each rail) **2**, as shown in Figure 6.

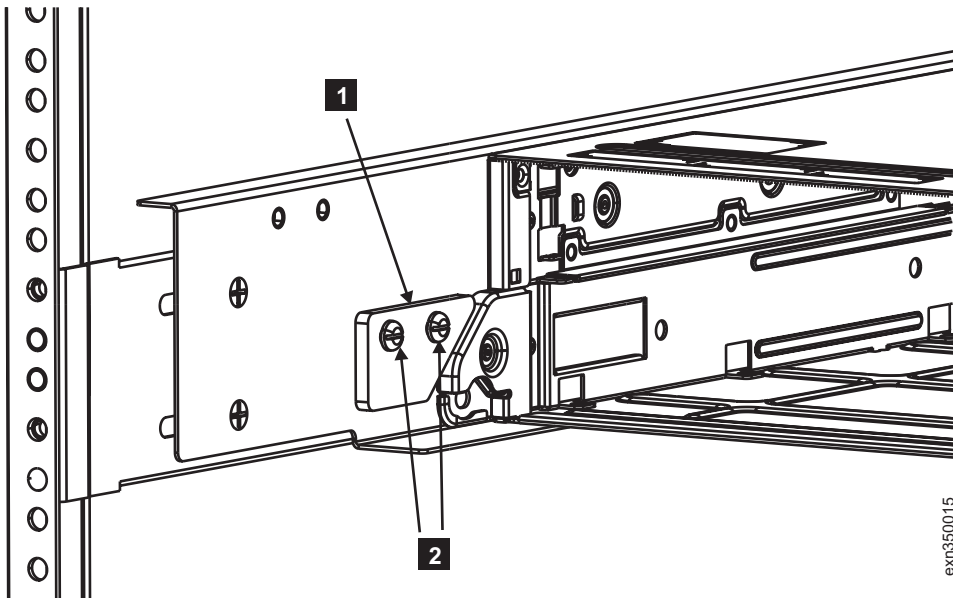


Figure 6. Attaching the rear tie-down plate

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## Setting storage expansion unit shelf IDs

Use these instructions to set the storage expansion unit shelf IDs.

### Setting SAS expansion unit shelf IDs

A unique shelf ID (from 00 to 98) is required for each SAS storage expansion unit in a SAS stack. ID 00 is used by default for the controller's internal disks.

If your storage system has SAS and FC storage expansion units, the shelf IDs do not need to be unique between the SAS and FC expansion units. (FC expansion unit shelf IDs continue to be unique within each FC loop. SAS expansion unit shelf IDs continue to be unique to all other SAS expansion units in the storage system.)

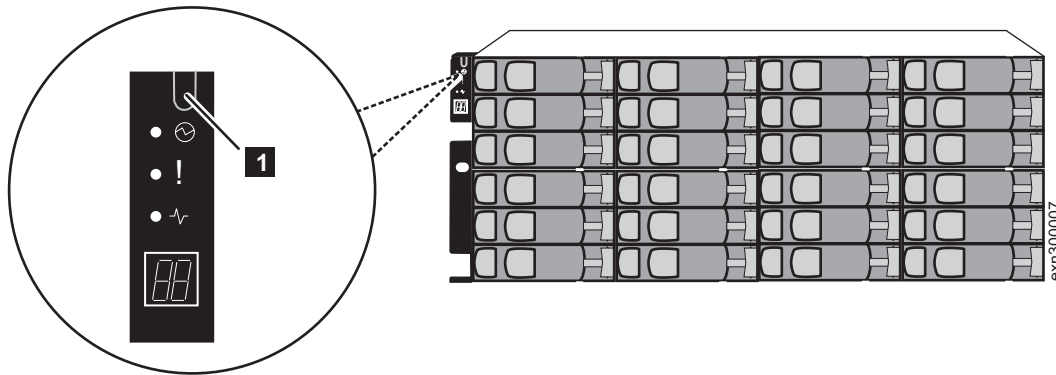


Figure 7. Shelf ID tab on the EXN3000

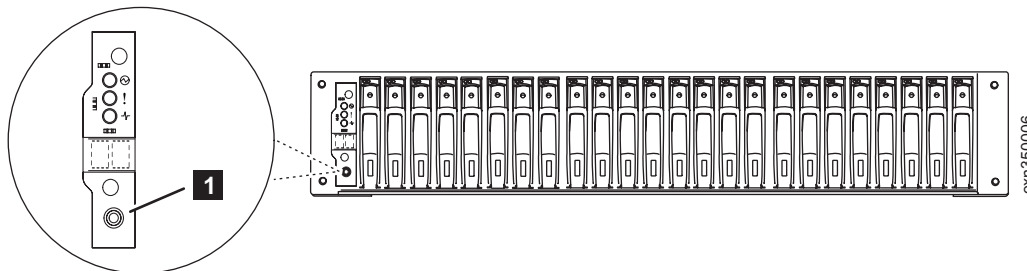


Figure 8. Shelf ID button on the EXN3500

Visually verify that the shelf ID for each SAS storage expansion unit is unique. If an ID is not unique, set the ID:

1. Remove the front bezel if you have not already removed it.
2. Press and hold the shelf ID U-shaped tab (for EXN3000s) or button (for EXN3500s) **1** until the first digit flashes.
3. Press the tab until the correct number is displayed.
4. Repeat steps 2 and 3 for the second digit.
5. Press and hold the tab until the second number stops flashing. **Result:** Both numbers start flashing and the Fault LED on the operations panel illuminates after about five seconds.
6. Power-cycle the SAS storage expansion unit to make the new expansion unit ID take effect.
7. Replace the front bezel.

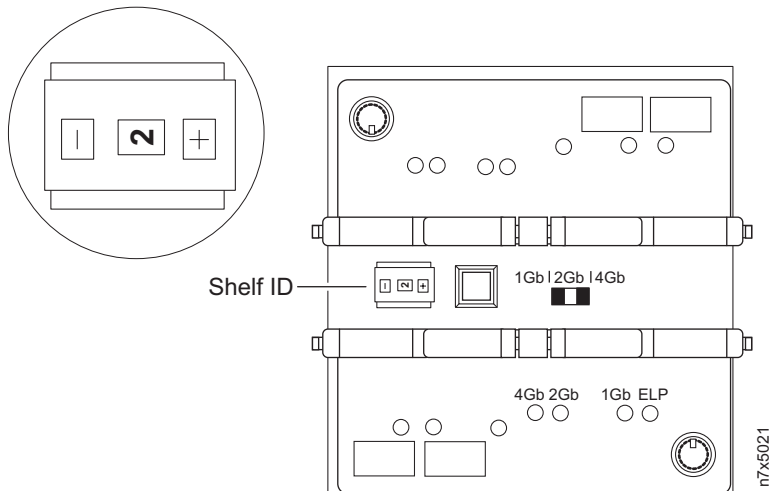
## Setting EXN4000 or EXN1000 storage expansion unit shelf IDs

A unique shelf ID (from 1 to 7) is required for each EXN4000 or EXN1000 storage expansion unit in a loop.

Shelf ID 1 is used for the first EXN4000 or EXN1000 storage expansion unit in a new loop. Shelf IDs for additional storage expansion units are incremented sequentially from the number of the first unit.

To adjust the storage expansion unit shelf ID, press the - or + buttons.

Shelf ID - close-up view



**Note:** This illustration shows a detailed view of the EXN4000. The Shelf ID buttons on the EXN1000 are in the same relative position. For N3220, the Shelf ID button should be in 4 GB mode.

## Attaching the cable management arms

Using the following instructions, attach cable management arms to each N3220 controller module.

1. As shown in Figure 9, align the cable management arm with the controller.

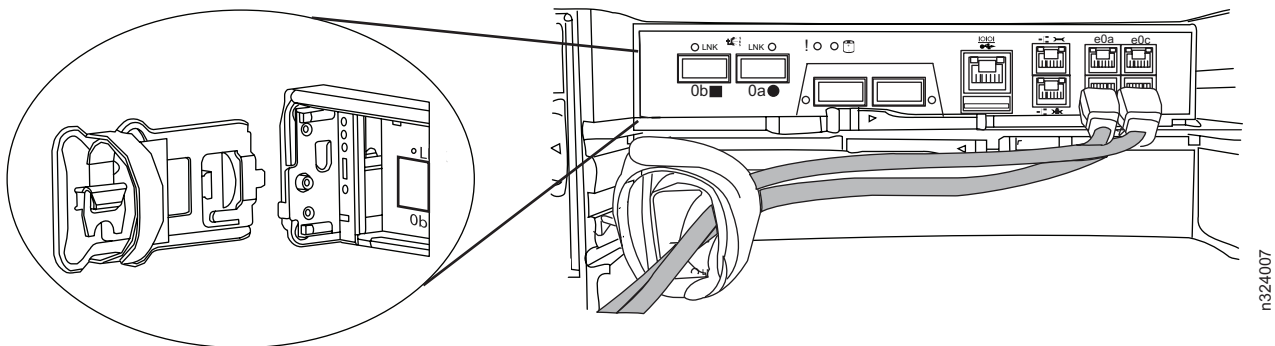


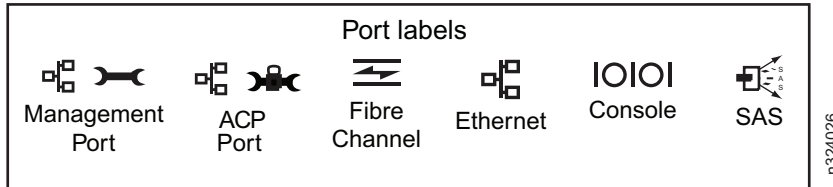
Figure 9. Attaching the cable management arm

2. Slide the cable management arm onto the controller module until it clicks into place.
3. Repeat these steps for the remaining cable management arms. Attach two (left and right) cable management arms to each controller.

## Connecting the N3220 filer to a network

Use these instructions to connect the N3220 filer to a network. Perform the steps in this section for each N3220 controller node.

**Note:** Use the cable management arms and hook-and-loop fasteners to organize your cabling.



1. Connect the RJ-45 to DB-9 adapter (as shown in Figure 10) from the adapter kit to the console port on the system.
2. Connect one end of the serial null modem cable to your console, and then connect the other end to the DB-9 end of the adapter (as shown in Figure 10).

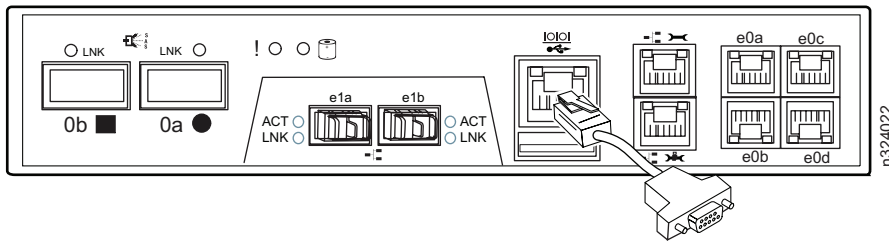


Figure 10. Cabling the console port

3. Connect your system to the network by plugging the network cables (as shown in Figure 11) into the networking ports, labeled e0a, e0b, e0c, and e0d.

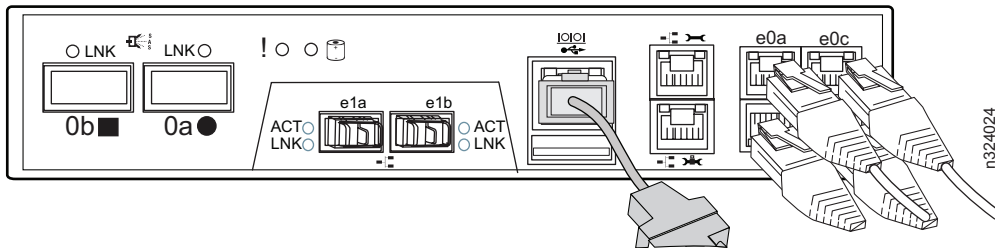


Figure 11. Cabling the networking and management ports

4. Connect the management port from the system to the network, using an Ethernet cable (as shown in Figure 12 on page 8).

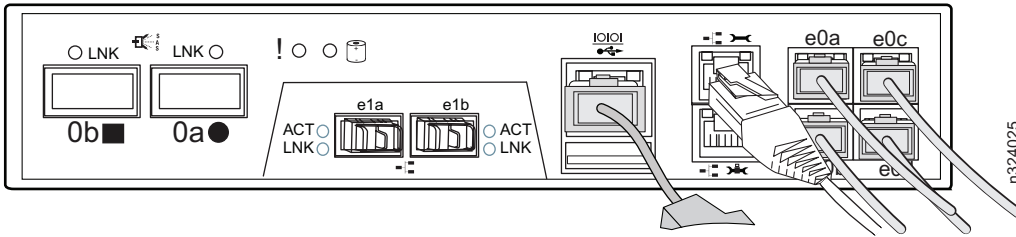



Figure 12. Cabling the management port from the system to the network

**Important:** The network for the management port must negotiate down to 10/100 or auto-negotiate.

## Connecting the system to expansion units

Multipath storage for high availability configurations provides redundancy for the path from each controller to every storage expansion unit in the configuration.

For detailed information about cabling N series SAS storage expansion units, such as the EXN3000 or EXN3500, refer to the *IBM System Storage N series Universal SAS and ACP Cabling Guide*. The SAS ports and ACP ports on the SAS storage expansion unit IOMs are designated by square and circle symbols. All cabling is done in reference to connecting to either square or circle ports. SAS connectivity does not use the concept of In and Out ports.

- If you are making SAS connections to N series storage expansion units and you plan to use Alternate Control Path (ACP) cabling, connect the N3220 system private management port (with the  icon) to an ACP port on the SAS stack using a CAT6 Ethernet cable (Figure 11 on page 7).
- If you are making Fibre Channel connections to N series mezzanine card, connect Fibre Channel cables from the Fibre Channel ports (1a and 1b) to your storage expansion unit loop or Fibre Channel switch. Make sure that SFPs are installed and firmly seated in the Fibre Channel ports (1a and 1b) of the controller node and the In port of the first storage expansion unit in the loop before attaching a Fibre Channel cable.

**Note:** When you order an N3220 storage system without external storage expansion units, two QSFP SAS cables and an ACP cable are required to enable the multipath high availability configuration. These cables can be ordered as FC9563. If you order the storage system with external storage expansion units, the cables come with storage expansion units.

### **Important: If you are connecting to EXN1000 or EXN4000 storage expansion units:**

- When using the optional 8 GB FC Mezzanine (FC2030) adapter Fibre Channel ports to connect to EXN1000 or EXN4000 storage expansion units, the onboard ports must be set to initiator mode. For more information, see the *IBM System Storage N3150, N3220, and N3240 Hardware and Service Guide*.
- SFPs *must* be used when connecting fiber cables.

### **Notes:**

1. For SAN systems with quad-port host bus adapters (HBAs), see the *Multipath and Dual-Path Cabling Information* document on the IBM N series support website:  
[www.ibm.com/storage/support/nseries/](http://www.ibm.com/storage/support/nseries/)
2. For required port usage and specifications for optional Mezzanine adapters supported by your N3220 system, refer to the *IBM System Storage N Series Introduction and Planning Guide*.



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## Installing the power cables

Use these instructions to install the power cables for the N3220 filer.

1. Make sure all power supply switches on the N3220 filer and any attached expansion units are in the Off position.
2. For all storage systems that are being installed, connect the power cords to all power supply unit (PSU) power receptacles using power cord retainer clips, making sure to slide the clip all the way forward on the plug.
3. Connect the power cords to the power sources, making sure that the two power supplies are connected to separate AC sources. This ensures redundant power.

**Attention:** Do not power on the system at this time.

**Note:** The N3220 storage system has no requirement or provision for grounding.

For proper grounding of expansion units, see the *Installation and Setup Instructions* for the expansion unit.

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## Setting up and booting the system

Use these instructions to set up and boot the N3220 filer.

1. Make sure the Configuration worksheet from the *Data ONTAP Software Setup Guide for 7-Mode* is completed and available for use.

**Note:** IBM recommends that you print a copy of this worksheet from the *Data ONTAP Software Setup Guide for 7-Mode*.

2. Check that your system is properly set up. Make sure that the expansion unit IDs and speed switches are properly set, and that the cabling is correct for your configuration.
3. Start a console session for each controller module.
4. Turn on the power to only the expansion units, making sure you turn them on within 5 minutes of each other.
5. After you have powered on the storage expansion units, turn on the N3220 filers.

**Note:** It takes the LEDs on the system power supplies a few seconds to illuminate.

The system begins to boot, and then it stops at the first installation question, which is displayed on the console window.

6. Use the console interface to answer the setup questions for each controller module in your system. Use the data you collected with the Configuration worksheet.
7. After you complete the setup, check the licenses on the N3220 filer controller modules by entering the following command:

```
license
```

Add any missing licenses by entering the following command for each missing license:

```
license add <license_code>
```

where <license\_code> is the license code for the product.

**Note:** Clustering must be licensed on both nodes in an N3220 HA pair.

8. Reboot the nodes by entering the following command:  

```
reboot
```
9. Enable clustering by entering the following command on one node's console:  

```
cf enable
```
10. Check each node's status by entering the following command:  

```
cf status
```

Initial setup is now complete for a high availability N3220 filer.

Refer to the *Data ONTAP High Availability and MetroCluster Configuration Guide for 7-Mode* to verify that the system is set up correctly and ready to operate.

11. IBM recommends that you enable AutoSupport and then use the AutoSupport feature to view the health of the system.

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## Appendix. Troubleshooting and additional resources

In this section you can find troubleshooting tips and a list of additional resources for the N3220 filer.

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### Troubleshooting tips

Use these instructions if your N3220 system does not boot when you power it on.

Follow these troubleshooting tips in the order shown here.

1. Look for a description on the console. Follow the instructions, if provided, on the console.
2. Check all cables and connections, making sure that they are secure.
3. Ensure that power is supplied and is reaching your system from the power source.
4. Check the power supplies on your system and attached storage expansion units. If the LEDs on a power supply are not illuminated, remove the power supply and reinstall it, making sure that it connects with the backplane.
5. Verify disk compatibility and check the disk shelf IDs for your storage expansion units:
  - For Fibre Channel storage expansion units:  
Within each loop, the storage expansion unit with disk shelf ID 1 must be directly connected to your system. All other storage expansion units within each loop must have unique IDs (between 2 and 7) and must be placed in consecutive order.
  - For SAS storage expansion units:  
All storage expansion units must have unique shelf IDs between 00 and 98.

For more information about shelf ID requirements, see the *Hardware and Service Guide* for your N series IBM N series storage expansion unit.
6. Ensure that the storage expansion unit speeds are set correctly:
  - EXN1000, set to 2 Gb
  - EXN4000, set to 4 Gb

**Note:** SAS storage expansion units do not have speed switches.
7. Turn off your system and storage expansion units, and then turn on the storage expansion units. Check the *Platform Monitoring Guide* for your N series storage expansion units for information about LED responses.
8. Use the system-level diagnostics to check the disks. For more information, see the *IBM System Storage N series System-Level Diagnostics Guide*.
9. If your system does not boot successfully, it might not have the boot image downloaded on the boot device. Call IBM Service and Support at 1-800-IBM-SERV (1-800-426-7378).

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### Additional resources

Here you can find sources for additional information about the N3220 filer.

<b>For more information about...</b>	<b>Refer to...</b>
New features, enhancements, known issues, and late-breaking news for your version of Data ONTAP software	The <i>Release Notes</i> for your version of Data ONTAP 7-Mode
Setting up and verifying software configuration	<i>Data ONTAP Software Setup Guide For 7-Mode</i>
Configuring and managing the iSCSI or FCP protocol, and creating and managing LUNs and initiator groups with the iSCSI or FCP service	<i>Data ONTAP SAN Administration Guide For 7-Mode</i>
Cabling, configuring, and disk ownership	<i>Data ONTAP High-Availability and MetroCluster Configuration Guide for 7-Mode</i> <i>Data ONTAP System Administration Guide For 7-Mode</i> <i>Data ONTAP Data Protection Tape Backup and Recovery Guide For 7-Mode</i> <i>Data ONTAP Data Protection Online Backup and Recovery Guide for 7-Mode</i>
Hardware configuration options for your system	<i>N series Introduction and Planning Guide</i> <i>IBM System Storage N3150, N3220, and N3240 Hardware and Service Guide</i>
Troubleshooting the system	<i>N series Platform Monitoring Guide</i> <i>N series System-Level Diagnostics Guide</i>
Configuring your Service Processor (SP) after initial setup	<i>Data ONTAP System Administration Guide For 7-Mode</i>
Replacing components	<i>IBM System Storage N3150, N3220, and N3240 Hardware and Service Guide</i>
Safety information	<i>IBM System Storage N series Safety Notices</i>

The IBM N series support site contains additional information about N series hardware and software products:

[www.ibm.com/storage/support/nseries](http://www.ibm.com/storage/support/nseries)





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