

gFiler™ Gateway Series

Hardware Installation Guide

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Preface

About this guide

This guide describes how to install, configure, and set up Network Appliance™ gFiler™ gateways that run Data ONTAP™ 6.4 software.

Audience

This guide is for support engineers who are familiar with operating systems, such as UNIX®, Windows® 95, Windows NT®, and Windows 2000, and who will be installing gFiler gateways. This guide doesn't cover basic system or network administration topics, such as IP addressing, routing, and network topology; it emphasizes the characteristics of the NetApp® gFiler.

Terminology

This guide uses the term “type” to mean pressing one or more keys on the keyboard. It uses the term “enter” to mean pressing one or more keys and then pressing the Enter key.

This guide uses the following terms:

- ◆ *Storage subsystem* refers to your disk array.
- ◆ *Node* refers to either the local or partner gFiler gateway.
- ◆ *Cluster* refers to local and partner nodes directly connected to each other.
- ◆ *Channel adapter* refers to the single adapter of ports on your storage subsystem.
- ◆ *LUN* generally refers to the logical devices or logical units of your storage subsystem. LUN also refers to the number that maps to the logical device on the port.

Command conventions

You can enter Data ONTAP commands on either the system console or from any client computer that can access the gFiler through a Telnet session.

In examples that illustrate commands executed on a UNIX workstation, this guide uses the command syntax of SunOS 4.1.x. The command syntax and output might differ, depending on your version of UNIX.

Keyboard conventions

When describing key combinations, this guide uses the hyphen (-) to separate individual keys. For example, “Ctrl-D” means pressing the “Control” and “D” keys simultaneously. Also, this guide uses the term “Enter” to refer to the key that generates a carriage return, although the key is named “Return” on some keyboards.

Typographic conventions

The following table describes typographic conventions used in this guide.

Convention	Type of information
<i>Italic font</i>	Words or characters that require special attention. Placeholders for information you must supply. For example, if the guide says to enter the <code>arp -d hostname</code> command, you enter the characters “arp -d” followed by the actual name of the host. Book titles in cross-references.
Monospaced font	Command and daemon names. Information displayed on the system console or other computer monitors. The contents of files.
Bold monospaced font	Words or characters you type. What you type is always shown in lowercase letters, unless you must type it in uppercase letters.

Special messages

This guide contains special messages that are described as follows:

Note

A note contains important information that helps you install or operate the system efficiently.

Caution

A caution contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.

Safety Information (Sicherheitshinweise)

Safety rules

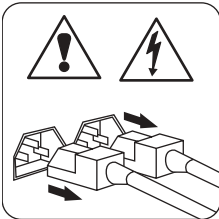
All products are Class 1 laser devices. You must follow these safety rules when working with this equipment:

WARNING

Failure to follow these directions could result in bodily harm or loss of life.

- ◆ **Switzerland only—for FAS900, GF900, R200, and C6200 systems:**
This equipment relies on fuses/circuit breakers in the building installation for overcurrent protection. Each power supply must receive power from a separately dedicated outlet with a 10A fuse/circuit breaker.
- ◆ When installing disk shelves and a storage appliance into a movable cabinet or rack, install from the bottom up for best stability.
- ◆ DC-based systems must be installed in a restricted access location and the two input power terminals for the DC power supply must be connected to separate isolated branch circuits.
- ◆ To reduce the risk of personal injury or equipment damage, allow internal components time to cool before touching them and ensure that the equipment is properly supported or braced when installing options.
- ◆ This equipment is designed for connection to a grounded outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.
- ◆ This equipment has one or more replaceable batteries. There is danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warning for units with multiple power cords



If your storage appliance or disk shelf has multiple power cords and you need to turn the unit off, heed the following warning:

WARNING

This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect all power supply cords before servicing.

Sicherheitsvorgaben

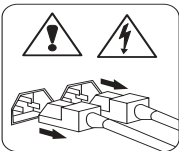
Alle Produkte sind Lasergeräte der Klasse 1. Die folgenden Sicherheitshinweise sind beim Betreiben des Geräts unbedingt zu beachten:

Vorsicht

Nichtbeachtung dieser Anweisungen kann zu schweren Körperschäden führen oder tödlich sein.

- ◆ **Nur für die Schweiz - Systeme FAS900, GF900, R200 und C6200:**
Diese Geräte erfordern den Festeinbau von Sicherungen zum Überstromschutz. Jeder Netzanschluss muss mit Strom aus getrennten, speziell für diesen Zweck vorgesehenen Steckdosen versorgt werden, die jeweils mit einer 10A-Sicherung geschützt sind.
- ◆ Bei der Montage der Diskettenregale und Archivierungsgeräte, des NetCache™ -Geräts oder des NearStore® -Systems in bewegliche Schränke oder Regale sind die Geräte von unten nach oben einzubauen, um optimale Stabilität zu gewährleisten.
- ◆ Gleichstrom-Systeme müssen an Betriebsstätte mit beschränktem Zutritt installiert sein und die beiden Eingangsstromklemmen für das Gleichstrom-Netzteil müssen an separate und isolierte Abzweigleitungen angeschlossen sein.
- ◆ Zum Schutz vor Körperverletzung oder Sachschäden am Gerät lassen Sie die inneren Bauteile stets vor dem Berühren abkühlen. Sorgen Sie dafür, dass das Gerät richtig abgestützt ist oder fest aufrecht steht, bevor Sie neues Zubehör einbauen.
- ◆ Dieses Gerät ist für die Einspeisung aus einer geerdeten Netzverbindung ausgelegt. Der Netzstecker mit Erdungsvorrichtung ist ein wichtiger Sicherheitsschutz. Zum Schutz vor elektrischem Schlag oder Sachschäden am Gerät die Erdung nicht abschalten.
- ◆ Das Gerät ist mit einer oder mehreren auswechselbaren Batterien ausgestattet. Bei unsachgemäßem Auswechseln der Batterie besteht Explosionsgefahr. Batterien nur mit dem vom Hersteller empfohlenen Typ oder entsprechenden Typen ersetzen. Gebrauchte Batterien sind gemäß den Anweisungen des Herstellers zu entsorgen.

Warnhinweis für Geräte mit mehrfachen Netzanschlussleitungen



Sollte Ihr Archiviergerät, NetCache-Gerät, NearStore-System oder Diskettenregal mehrfache Netzanschlussleitungen aufweisen und Sie wollen das Gerät abschalten, bitte folgenden Warnhinweis beachten.

ACHTUNG

Gerät besitzt zwei Netzanschlussleitungen. Vor Wartung alle Anschlüsse vom Netz trennen.

About this chapter This chapter identifies the tools, equipment, manuals, and site requirements you need for first-time installation of a gFiler™ gateway.

Topics in this chapter This chapter discusses the following topics:

- ◆ “[Required tools, equipment, and documentation](#)” on page 2
- ◆ “[Gateway dimensions and environmental parameters](#)” on page 4

Required tools, equipment, and documentation

Equipment you receive with your gateway

In addition to this guide, your shipment should have the following components:

- ◆ A gFiler gateway and bezel
- ◆ A DB-9 to DB-9 straight-through serial cable and a DB-9 to RJ-45 adapter for your ASCII terminal connection, if ordered
- ◆ A disposable antistatic grounding leash
- ◆ The appropriate rack installation kit
- ◆ Rack alignment tool
- ◆ Gateway documentation

Equipment rack installation components

The following table lists the components you receive to install your gateway in a specific type of equipment rack.

Tools or equipment	Front-mounted on a two-post equipment rack	Center-mounted on a two-post equipment rack	Front-mounted on a four-post equipment rack
Four-post rack adjustable supports			X
Rail mounting screws	X	X	X
Two-post rack mounts	X	X	

Required tools

To install your gateway components in an equipment rack, you need the following tools:

- ◆ #2 Phillips screwdriver
- ◆ Marker
- ◆ Hand level
- ◆ Antistatic wrist strap and grounding leash

Caution

The gateway electronic components are sensitive to static electricity. Static discharge from your clothing or other fixtures can damage these components. Always wear an antistatic wrist strap and a grounding leash to prevent static discharge.

**Required
configuration
equipment**

To configure your system, you need the following equipment on site:

- ◆ ASCII terminal (also referred to as an ANSI terminal)
- ◆ Serial console

**Required
documentation**

See your Documentation Roadmap for a list and description of required documentation.

Gateway dimensions and environmental parameters

Installation considerations

You need to consider the following elements:

- ◆ Physical characteristics, such as height and weight
- ◆ Space requirements
- ◆ Environmental requirements, such as temperature and humidity
- ◆ Electrical requirements

Physical characteristics

GF900 series physical characteristics: The following table lists the physical characteristics of your gateway.

Characteristic	U.S.	Metric
Height	10.3 in. (5.9 U)	26.12 cm
Width	17 in.	43.18 cm
Depth without cable management tray	22 in.	55.88 cm
Depth with cable management tray	25 in.	63.5 cm
Weight (without power supplies)	77.8 lbs	35.36 kg
Weight (with power supplies inserted)	105 lbs	47.72 kg

GF825 physical characteristics: The following table lists the physical characteristics of your gateway.

Characteristic	U.S.	Metric
Height	8.75 in. (5U)	22.23 cm
Width	17 in.	43.18 cm
Depth	25.25 in.	64.14 cm
Weight	66 lbs.	29.94 kg

GF270c physical characteristics: The following table lists the physical characteristics of your gateway.

Characteristic	U.S.	Metric
Height	5.25 in. (3U)	13.3 cm
Width	17.6 in.	44.8 cm
Depth	20 in.	50.9 cm
Weight	55 lbs	25 kg

Space requirements The following table lists the recommended minimum clearances for your gateway.

Recommended minimum clearance	U.S.	Metric
Front clearance for cooling		
Two-post equipment rack	6 in.	15.2 cm
Four-post equipment rack	6 in.	15.2 cm
Rear clearance for cooling		
Two-post equipment rack	19 in.	48.3 cm
Four-post equipment rack	12 in.	30.5 cm
Front clearance for maintenance		

Recommended minimum clearance	U.S.	Metric
Two-post equipment rack	45 in.	114.3 cm
Four-post equipment rack	32 in.	81.28 cm
Rear clearance for maintenance		
Two-post equipment rack	30 in.	76.2 cm
Four-post equipment rack	12 in.	30.5 cm
Clearance in vertical rack space above gateway for rear vents	0.5 in.	3.81 cm

Operating acoustic noise

The operating acoustic noise level for your gateway is 49.5 dBA at 23° C.

Environmental requirements

The following table lists the environmental ranges for operation and storage temperatures and humidity.

Environmental condition	Operating range	Storage range
Temperature	10° C to 40° C 50° F to 104° F	0° C to 60° C 32° F to 140° F
Relative humidity	20% to 80%	8% to 80%

Environmental stress specifications

The following table lists the environmental stress specifications for your gateway.

Condition	Requirement
Operating shock	5g 10 ms 1/2 sine
Operating vibration	.21 grms 5–500 Hz random
Altitude	0 to 7,000 ft (2,133m)

Electrical ratings

GF900 series electrical ratings: The following table lists the AC power ratings for your gateway.

Condition	Requirement
Voltage range	100–240V AC
Frequency	50/60 Hz
Rated input current, amperage	12–6A
Actual input current, amperage	3.8–2A
Inrush current	30A at 264V

GF825 electrical ratings: The following table lists the AC power ratings for your gateway.

Condition	Requirement
Voltage range	100–240V AC single phase
Frequency	50–60 Hz
Rated input current, amperage	5–3A
Actual input current, amperage	1.8–0.9A
Inrush current	25A at 110V AC 30A at 220V AC

GF270c electrical ratings: The following table lists the AC power ratings for your gateway.

Condition	Requirement
Voltage range	100–127V AC single phase 200–240V AC single phase
Rated input current, amperage	7–3.5A
Actual input current, amperage	3.95–1.9A
Inrush current	20A at 220V AC

Power consumption ratings

GF900 series power consumption ratings: The following table lists the power consumption rating for your gateway.

Power	Rating
Watts	330W
Heat dissipation BTU/hr.	1,126 BTU

GF825 power consumption ratings: The following table lists the power consumption rating for your gateway.

Power	Rating
Watts	170W
Heat dissipation BTU/hr.	580 BTU

GF270c power consumption ratings: The following table lists the power consumption rating for your gateway.

Power	Rating
Watts	356W
Heat dissipation BTU/hr.	1,215 BTU

About this chapter

This chapter discusses how to install your gateway in a four-post or two-post equipment rack.

Topics in this chapter

This chapter describes the following topics:

- ◆ “[Before you begin your installation](#)” on page 10
- ◆ “[Installing in a four-post equipment rack](#)” on page 11
- ◆ “[Installing in a two-post equipment rack](#)” on page 13

Note

If you ordered your gateway in a system cabinet, the gateway is shipped preinstalled in the cabinet.

Before you begin your installation

Rules for installing the gateway in a rack

You need to observe the following rules and restrictions when installing your gateway in a standard 19-inch (48.26 cm) telco equipment rack with mounting rails:

- ◆ You must work with another person.

WARNING

The gateway is extremely heavy. To avoid injuring yourself or damaging the gateway, you must work with at least one other person when you install the gateway in the rack.

- ◆ Install the gateways in the lowest available slots in the rack.

WARNING

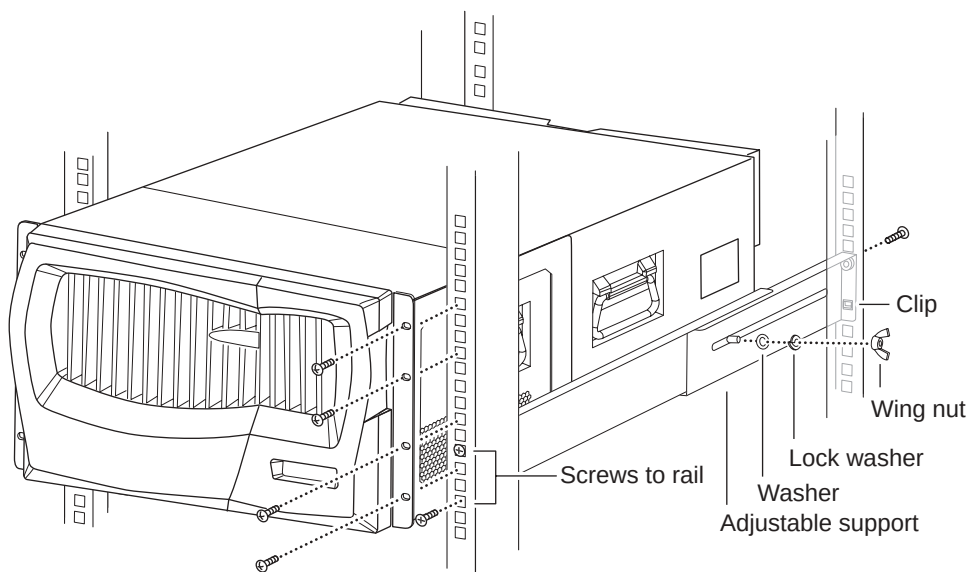
Install the equipment from the bottom up when installing it in a movable rack. This helps prevent the rack from tipping over and seriously injuring you or someone else.

- ◆ Because the GF270c has empty disk drive bays, the proper slot over must be installed over the empty slot to ensure proper air flow and cooling.

Installing in a four-post equipment rack

Installing your gateway

To install your gateway in a four-post equipment rack, complete the following steps, using the figure for reference.



Step	Action
1	Attach the clip of each adjustable support to the appropriate slot of each rear post in the equipment rack.
2	Using the wing nut to adjust the length of the support, align the adjustable supports so that they fit between the front and back posts of the rack.
3	Secure each adjustable support to the front post of the rack using two of the supplied #2 Phillips screws, then tighten the wing nut. Use a level to ensure that the adjustable supports are secured in the correct, level holes in the rack.
4	Secure each support rail to the back post of the rack using the supplied #2 Phillips screws.

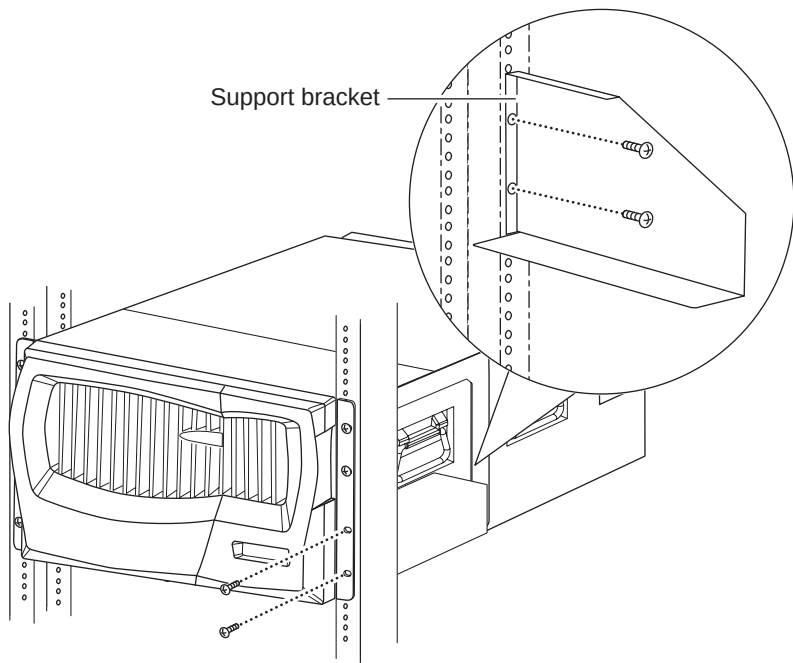
Step	Action
5	Slide your gateway onto the adjustable supports and secure it to the four-post rack by inserting the appropriate screws through the mounting holes on each side of the bezel and into the front posts of the rack.
6	If desired, apply the ear covers over the heads of the mounting screws by peeling the adhesive strip from the back of the ear covers and applying the ear covers to each mounting flange on your gateway.
7	Go to “ Connecting Your Gateway ” on page 35, for instructions about connecting your gateway to your network and connecting an ASCII terminal.

Installing in a two-post equipment rack

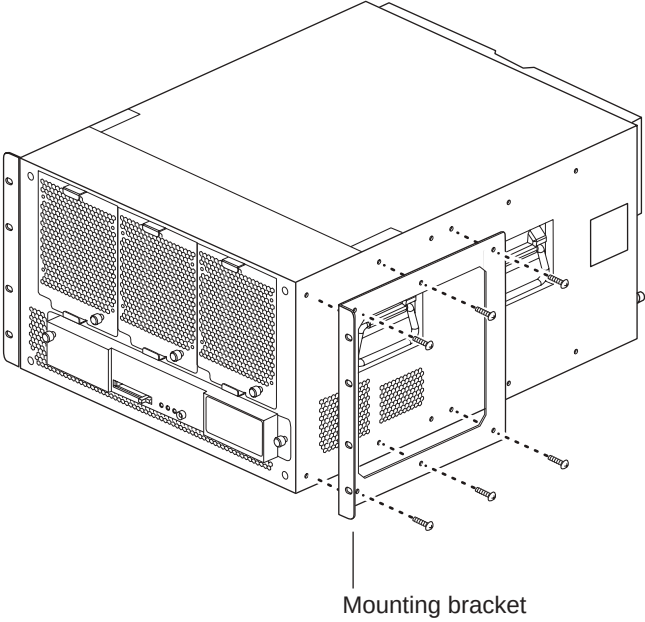
Installing your gateway

To install your gateway in a two-post equipment rack as either a flush-mount or mid-mount installation, complete the following steps, using the figure for reference.

WARNING — You must install your gateways with either the two-post telco tray kit, the mid-mount bracket kit, or the four-post rail kit that came in your shipment package. Do not flush-mount the gateway using only the front ear-mounts; the gateway will collapse from the rack under its own weight.



Step	Action
1	Attach the small support bracket to the equipment rack, using the appropriate screws from the mounting kit. Do not tighten the screws completely. The bracket should wiggle a little.

Step	Action
2	If you are mounting the gateway as a... Then...
	Mid-mount Complete the following substeps, using the figure for reference: 1. Unscrew the mounting brackets from the side of your gateway. 2. Set the mounting bracket to the furthest position back on the side of your gateway. 3. Repeat Steps 1 and 2 for the other side of your gateway.  Mounting bracket
	Flush-mount Go to Step 3.

Step	Action
3	Attach the support rack mounts to each post in the rack. Align the mounting brackets with the small brackets attached to the equipment rack, then carefully slide your gateway into place.
4	Secure your gateway to the two-post equipment rack by inserting the appropriate screws from the mounting kit through the mounting holes on each side of the bezel and into the front posts of the rack.
5	If desired, apply the ear covers over the heads of the mounting screws by peeling the adhesive strip from the back of the ear covers and applying the ear covers to each mounting flange on your gateway.
6	Go to Chapter 5, “ Connecting Your Gateway ,” on page 35, for instructions about connecting your gateway to your network and connecting an ASCII terminal.

About this chapter

This chapter describes the processes for connecting to your storage subsystem. It assumes that you already chose a configuration from the Getting Started Guide.

Topics in this chapter

This chapter discusses the following topics:

- ◆ [“Connecting to your storage subsystem”](#) on page 18
- ◆ [“Connecting your gateway HBAs”](#) on page 22
- ◆ [“Connecting your gateway to another gateway in a cluster”](#) on page 24
- ◆ [“Connecting to a switch”](#) on page 25
- ◆ [“Connecting your gateway MetroCluster interconnects”](#) on page 28

Connecting to your storage subsystem

About connecting to your storage subsystem

You connect your gateway to your storage subsystem when you want to allocate space on the storage subsystem for the gateway. This space is segmented into Logical Unit Numbers (LUNs). For more information, see your Getting Started guide.

Guidelines for cabling

Review the following list of guidelines, which apply for all configurations, before you cable your system:

- ◆ The ports on the gateway HBAs are labeled 1 and 2. However, the software refers to them as a and b. You see these labels in the user interface and system messages displayed on the console.
- ◆ Use a loopback plug for any unused Fibre Channel ports.
- ◆ All configurations should be cabled for redundancy. Redundant connections are needed for maximum performance.
- ◆ Each connection in a redundant pair must be attached to a different HBA on your gateway and to a port on a different channel adapter on the storage subsystem.

Connection process

The connection process occurs before you create LUNs on your storage subsystem. This process requires the following stages:

1. Planning a configuration for your storage subsystem.
2. Devising the port-to-port connectivity scheme between your gateway and storage subsystem for the configuration you have chosen.
3. Verifying that you have the correct number and types of cables you need for your configuration.
4. Using the following process tables with your port-to-port connectivity schemes to connect your storage system to your gateway.

Caution

You must plan your configuration before you allocate space on your storage subsystem. See your Getting Started guide for more information.

Direct-attached stand-alone configuration

If you are connecting your storage subsystem in a direct-attached stand-alone configuration, complete the following connections.

Stage	Process
1	Cable the gateway to the storage subsystem through your gateway HBAs, as described in “ Connecting your gateway HBAs ” on page 22.
2	When you complete cabling your gateway to your storage subsystem, go to the Getting Started guide for rules about configuring LUNs and ports on your storage subsystem.

Direct-attached cluster configuration

If you are connecting your storage subsystem in a direct-attached cluster configuration, complete the following connections.

Stage	Process
1	Cable the gateway to the storage subsystem through your gateway HBAs, as described in “ Connecting your gateway HBAs ” on page 22.
2	Cable gateway 1 to gateway 2 using the cluster interconnect cables, as described in “ Connecting your gateway to another gateway in a cluster ” on page 24. For redundancy, you must cable both ports on your cluster adapters.
3	When you finish connecting your gateway to your storage subsystem, go to the Getting Started guide for rules about configuring LUNs and ports on your storage subsystem.

Switch-attached stand-alone configuration

If you are connecting your storage subsystem in a switch-attached stand-alone configuration, complete the following connections.

Stage	Process
1	Cable the gateway to the storage subsystem through your gateway HBAs, as described in “ Connecting your gateway HBAs ” on page 22.
2	Cable your storage subsystem to your switch.
3	Cable your gateway to your switch, as described in “ Connecting to a switch ” on page 25.
4	When you finish connecting your gateway to your storage subsystem, go to the Getting Started guide for rules about configuring LUNs and ports on your storage subsystem.

Switch-attached cluster

If you are connecting your storage subsystem in a switch-attached cluster configuration, complete the following connections.

Stage	Process
1	Cable gateway 1 to gateway 2 using the cluster interconnect cables, as described in “ Connecting your gateway to another gateway in a cluster ” on page 24. For redundancy, you must cable the cluster adapters so that port 1 is cabled to port 1 and port 2 is cabled to port 2.
2	Cable your storage subsystem to your switch.
3	Cable your gateway to your switch, as described in “ Connecting to a switch ” on page 25.
4	When you finish connecting your gateway to your storage subsystem, go to the Getting Started guide for rules about configuring LUNs and ports on your storage subsystem.

MetroCluster cluster

If you are connecting your storage subsystem in a MetroCluster configuration, complete the following connections.

Note

The MetroCluster configuration requires switch port zoning. For more details, see your Getting Started guide.

Stage	Process
1	Cable the storage subsystem to your gateway, as described in “Connecting your gateway HBAs” on page 22.
2	Cable gateway 1 to switch 1 and switch 2 using the Virtual Interface-MetroCluster (VI-MC) cluster interconnect cables, as described in “Connecting your gateway MetroCluster interconnects” on page 28.
3	Cable gateway 2 to switch 3 and switch 4 using the cluster interconnect cables, as described in “Connecting your gateway MetroCluster interconnects” on page 28.
4	If applicable, cable gateway 3 to switch 1 and switch 2, as described in “Connecting your gateway MetroCluster interconnects” on page 28.
5	If applicable, cable gateway 4 to switch 3 and switch 4, as described in “Connecting your gateway MetroCluster interconnects” on page 28.
6	Cable storage subsystem 1 to switch 1 and switch 2.
7	Cable storage subsystem 2 to switch 3 and switch 4.
8	Using Inter Switch Links, cable switch 1 to switch 3, then cable switch 2 to switch 4.
9	When you finish connecting your gateway to your storage subsystem, go to the Getting Started guide for rules about configuring LUNs and ports on your storage subsystem.

Connecting your gateway HBAs

HBA cabling requirements

The following types of cables and connectors are required for connecting a gateway HBA:

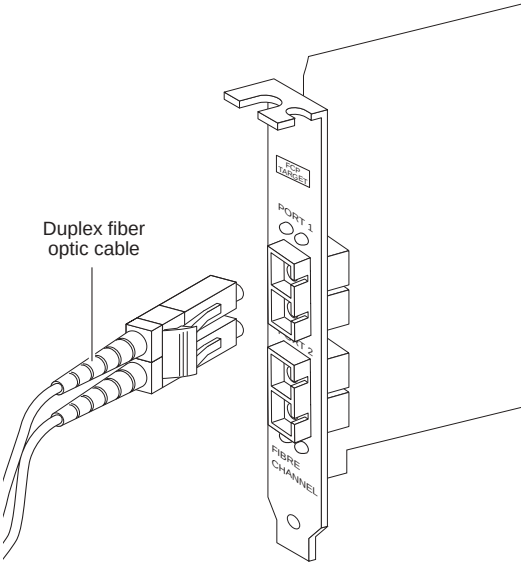
- ◆ 50 micron multimode fiber optic cable with LC-to-LC connectors
- ◆ 62.5 micron multimode fiber optic cable with LC-to-LC connectors

Connecting a gateway HBA

To connect a gateway HBA, complete the following steps.

Note_____

The GF270c has onboard Fibre Channel HBA ports.

Step	Action
1	Connect the cable into an appropriate port on your storage subsystem.
2	Push the cable with the duplex LC connector into the appropriate port on the dual-channel HBA, until it clicks and locks into place. 

Step	Action
3	Repeat Steps 1 and 2 for the second port on your gateway HBA. Note_____ If the second port of your HBA is not used, add a loopback, as described in Step 4 of the procedure “Connecting to a switch” on page 25.

Connecting your gateway to another gateway in a cluster

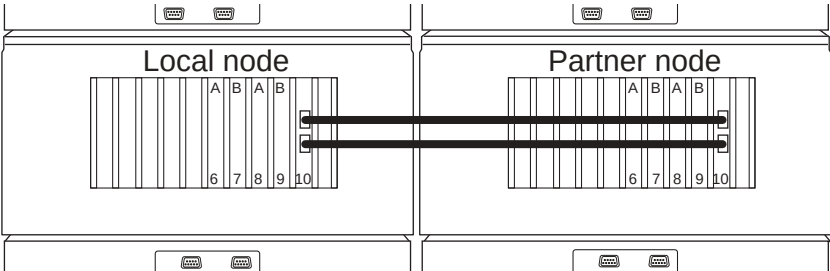
Connecting the GF900 series or GF825 in a cluster

To connect the GF900 series or GF825 in a cluster, complete the following steps, using the figure for reference.

Note—
The GF270c is a self-contained clustered unit only supported in a cluster-attached configuration. See “[Connecting a clustered GF270c](#)” on page 46 for more information.

The following figure shows a GF825 gateway in a clustered configuration with only one cable connected.

Note—
You must always verify the correct slot assignment for your cluster adapter in your gateway. For slot assignment information, see the System Configuration Guide at <http://now.netapp.com>.



Step	Action
1	Verify that you have the correct cable for your cluster adapter.
2	For redundancy, cable both ports on each cluster adapter. Cable the cluster adapters by connecting port 1 with port 1, then port 2 with port 2.
3	Gently pull on the cable ends to ensure that they are properly seated.

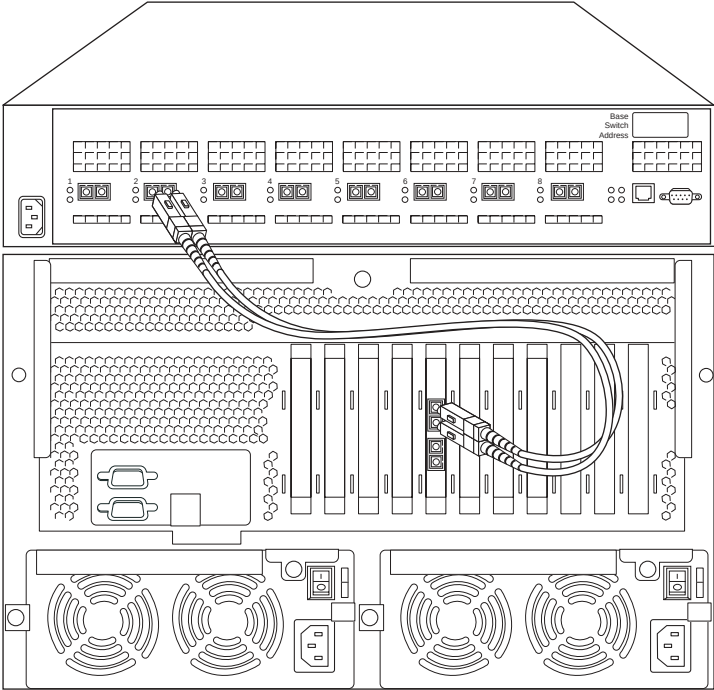
Connecting to a switch

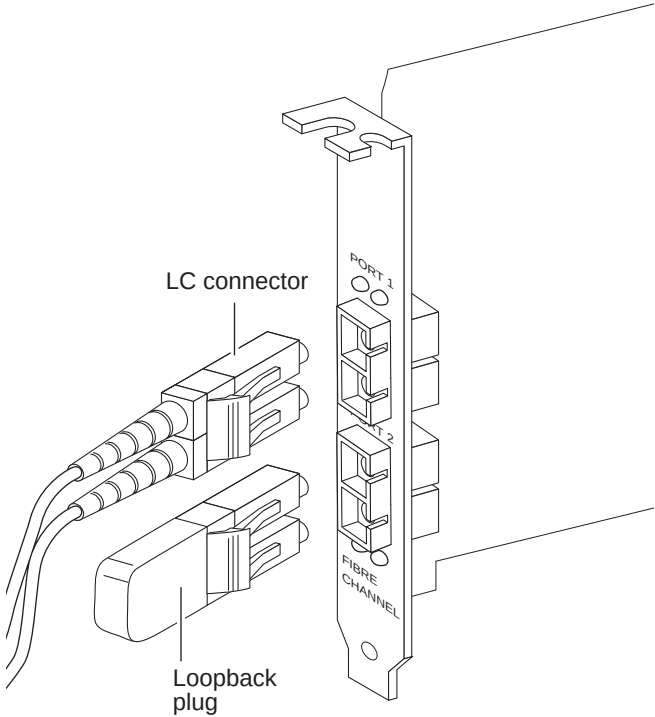
Connecting to a switch

To connect your gateway to a third-party switch, complete the following steps. If you have a GF270c, go to “[Connecting a GF270c gateway](#)” on page 46.

Caution—
Some configurations require switch port zoning. See your Getting Started guide for more details.

Step	Action
1	If your gateway is running, shut it down by entering the following command at the console: halt Caution— Always use the halt command to perform a clean shutdown.
2	If applicable, set the ID on your Fibre Channel switch. See the documentation for the Fibre Channel switch.

Step	Action
3	Connect the cable provided with the Fibre Channel switch to the following points of connection: ◆ The appropriate HBA port on the back panel of your gateway ◆ An available port on the Fibre Channel switch The following figure shows a Fibre Channel switch connecting to a GF900 series gateway.  The diagram illustrates the physical connection between a Fibre Channel switch and a GF900 series gateway. The switch is positioned at the top of the assembly, featuring a control panel with multiple status LEDs and a 'Base Switch Address' label. Below the switch is the GF900 series gateway, which has a large array of ports. A cable is shown connecting a specific port on the switch to an HBA port on the gateway. The gateway also features cooling fans and power connectors at the bottom.

Step	Action
4	If you are leaving one of the ports unused on your HBA, insert an LC loopback plug into Port 2, until it clicks and locks into place.  The diagram illustrates the process of inserting an LC loopback plug into Port 2 of an HBA. On the left, two LC connectors are shown: one with a cable attached and another labeled 'Loopback plug'. On the right, a vertical HBA module is shown with two ports labeled 'PORT 1' and 'PORT 2'. Below the ports is a label 'FIBRE CHANNEL'. A line points from the text in the action step to Port 2, indicating where the loopback plug should be inserted.

Connecting your gateway MetroCluster interconnects

About MetroClusters

The MetroCluster configuration is a disaster recovery solution. Each node in a MetroCluster can be separated by 300 to 500 meters.

For connecting up to a distance of 30 km, you must obtain an SVP from your switch vendor.

Required hardware

You need the following hardware for setting up your MetroCluster:

- ◆ VI-MC adapter
- ◆ ISL

Cabling the VI-MC adapters

To cable the VI-MC adapters, complete the following steps.

Step	Action
1	Cable each port of the local node’s VI-MC adapter to a pair of different switches.
2	Cable each port of the partner node’s VI-MC adapter to a pair of different switches.
3	Gently pull on the cable ends to ensure that they are properly seated.
4	Cable one pair of switches to each other with an ISL, then cable the second pair of switches to each other with another ISL. You must zone the ports on your switches that each ISL connects. Note_____ For more information about zoning, see your third-party switch documentation. _____

About this chapter

This chapter describes how to connect to an ASCII terminal and how to collect WWNs for your HBAs.

About preparing your gateway for connectivity

After you finish connecting your gateway to your storage subsystem, you must connect your gateway to an ASCII terminal and obtain the World Wide Names (WWNs) for the HBA ports on your gFiler gateway. This is necessary for creating LUNs for your gateway on the storage subsystem.

This chapter discusses the following topics:

- ◆ [“Connecting to an ASCII terminal console”](#) on page 30
- ◆ [“Obtaining World Wide Names”](#) on page 32

Connecting to an ASCII terminal console

About the ASCII terminal console

The ASCII terminal console enables you to monitor the boot process and helps you configure your gateway after it boots. You can attach an ASCII terminal console through the serial port on the back of your gateway if you want to do local system administration.

ASCII terminal console cable wiring

The ASCII terminal console is connected to your gateway with a DB-9 serial adapter, attached to an RJ-45 converter cable. The DB-9 adapter connects into the DB-9 serial port on the back of your gateway.

The following table lists how the DB-9 serial cable is wired. Input indicates data flow from the ASCII terminal to your gateway and output indicates data flow from your gateway to the ASCII terminal.

Pin number	Signal	Data flow direction	Description
1	DCD	Input	Data carrier detect
2	SIN	Input	Serial input
3	SOUT	Output	Serial output
4	DTR	Output	Data terminal ready
5	GND	N/A	Signal ground
6	DSR	Input	Data set ready
7	RTS	Output	Request to send
8	CTS	Input	Clear to send
9	RI	Input	Ring indicator

Connecting to an ASCII terminal console

To connect an ASCII terminal console to your gateway, complete the following steps.

Step	Action	
1	Set the following communications parameters to the same values for both your gateway and the ASCII terminal.	
	Parameter	Setting
	Baud	9600
	Data bit	8
	Parity	None
	Stop bits	1
	Flow control	None
	Note _____	
See your terminal documentation for information about changing your ASCII console terminal settings.		
2	Using an RJ-45 cable with DB-9 connectors on each end, insert one end of the cable into the ASCII terminal console port and the other end into the serial port on the back of your gateway.	
3	Go to “ Obtaining World Wide Names ” on page 32.	

Obtaining World Wide Names

Getting the WWNs from your gateway

If the storage subsystem does not recognize your gateway WWNS automatically after connecting the gateway to the storage subsystem, you must obtain them from your gateway before configuring LUNs on the storage subsystem.

To obtain the WWNs from your gateway, complete the following steps.

Step	Action
1	Power on your gateway. Result: The gateway begins booting by going through a system check.
2	Interrupt the boot process by pressing Ctrl-C when you see the following message on the console: Starting Press CTRL-C for floppy boot menu Result: The following boot options menu appears, if there are no LUNs assigned: (1) Normal boot. (2) Boot without /etc/rc. (3) Change password. (4) No disks assigned (use 'disk assign' in maintenance mode). (5) Maintenance mode boot. If LUNs have already been assigned to your gateway, option 4 reads: (4) Initialize owned disks. (1 disk is owned by this gFiler). Note_____ The number 1 represents the number of LUNs assigned. It could be any number. _____
3	Select option 5, "Maintenance mode boot."

Step	Action
4	To list the WWNs, enter the following command: storage show adapter Result: The gateway lists gateway HBAs.
5	From the list, record the Fibre Channel node name for each HBA. The Fibre Channel node name is what the user interface calls the WWN.
6	Enter the following command: halt Result: The ok prompt appears. This prepares your gateway for input when you begin to configure your gateway.
7	Using the WWNs, you can begin mapping LUNs on your storage subsystem to your gateway. See your storage subsystem documentation for more information.

Verifying Fibre Channel paths

You verify Fibre Channel paths to ensure that your HBA connection is valid. This might be necessary if your storage subsystem does not recognize gateway WWNs after connecting your gateway to the storage subsystem.

To verify Fibre Channel paths, complete the following steps.

Step	Action
1	Power on your gateway. Result: The gateway begins booting by going through a system check.

Step	Action
2	Interrupt the boot process by pressing Ctrl-C when you see the following message on the console: Starting Press CTRL-C for floppy boot menu Result: The following boot options menu appears: (1) Normal boot. (2) Boot without /etc/rc. (3) Change password. (4) No disks assigned (use 'disk assign' in maintenance mode). (5) Maintenance mode boot.
3	Select option 5, "Maintenance mode boot."
4	To verify Fibre Channel paths, enter the following command: disktest This test takes about 5 minutes to complete. Result: The screen gives you output on the Fibre Channel paths.
5	Enter the following command: halt Result: The ok prompt appears. This prepares your gateway for input when you begin to configure your gateway.

About this chapter

This chapter discusses the following topics:

- ◆ [“Connecting a GF900 series and GF825 gateway”](#) on page 36
- ◆ [“Connecting a GF270c gateway”](#) on page 46
- ◆ [“Connecting your gateway to an AC source and powering on”](#) on page 49

Connecting a GF900 series and GF825 gateway

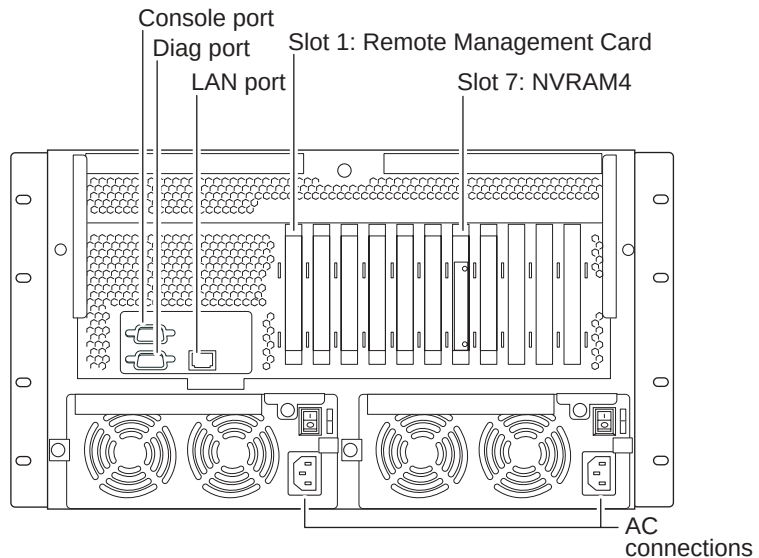
Topics in this section

This section discusses how to connect your GF900 series and GF825 gateway to the network and any third-party devices.

Connection locations

You connect your gateway to a network and to power through the back of the chassis.

The following illustration gives an overview of onboard ports, PCI slots, and AC connections of a GF920, GF940, and GF960.



For detailed information

For details about connecting your GF900 series and GF825 gateway, see the following topics:

- ◆ [“Connecting to an Ethernet network”](#) on page 37
- ◆ [“Connecting your remote management card”](#) on page 43
- ◆ [“Connecting to a third-party tape backup device”](#) on page 45

Connecting to an Ethernet network

Supported Ethernet NICs

Your gateway has one onboard 10Base-T/100Base-TX Ethernet port. It also supports the following Ethernet NICs in the PCI slots of your gateway motherboard:

- ◆ Copper Gigabit Ethernet (GbE) NIC (with an RJ-45 connection)
- ◆ Fiber optic GbE NIC

Note

See the slot assignments for your system before installing NICs into your gateway.

Supported Ethernet connections

Use the following table to determine the Ethernet connection and cabling requirements of your Ethernet NICs.

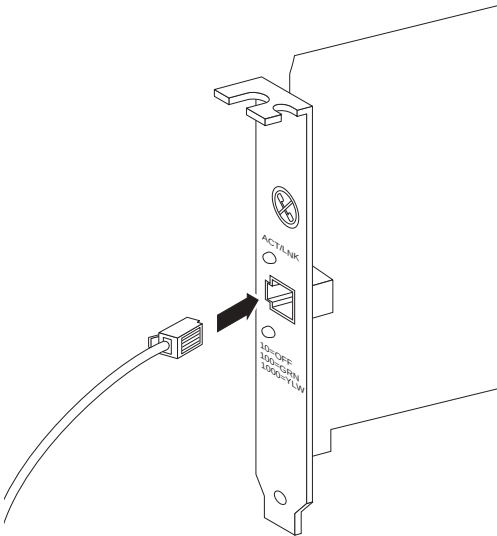
Caution

Do not exceed the maximum cable length specification.

Ethernet type	Supported ports	Cabling requirements	Distance
10Base-T 100Base-TX (copper)	◆ Onboard ◆ Single (GF825 only)	Category 3 (10Base-T only) or 5 (10Base-T/100Base-TX) unshielded twisted-pair (UTP) copper cable with RJ-45 connectors Note The onboard Ethernet port on the GF900 series requires a cable of 1m length minimum.	100m max.
10Base-T/ 100Base-TX/ 1000Base-TX (copper)	◆ Single ◆ Dual ◆ Quad (GF900 series only)	Category 5 unshielded twisted-pair (UTP) copper cable with RJ-45 connectors	100m max.
1000Base-SX (fiber)	◆ Single ◆ Dual	50 micron multimode fiber optic cable with SC or LC connector	550m max.
		62.5 micron multimode fiber optic cable with SC or LC connector	220m max.

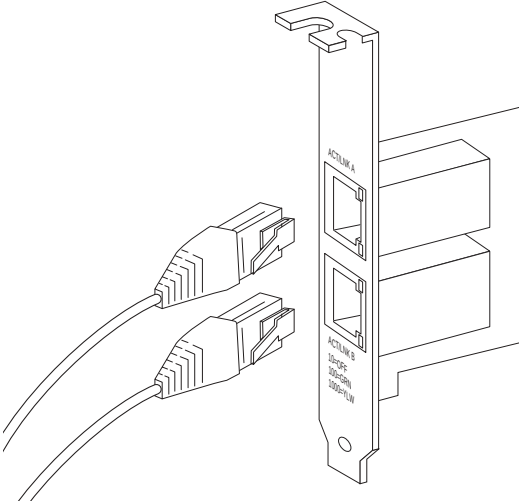
Connecting to a single-port GbE NIC using copper cabling

To connect to the onboard Ethernet port or to a single-port GbE NIC using copper cabling, complete the following step, using the figure for reference.

Step	Action
1	Push the RJ-45 connector into the Ethernet port, until it clicks and locks into place. Caution————— If you use a single-port copper GbE NIC, you must place a ferrite on your cable approximately four inches from the NIC port. ————— The following figure shows a UTP cable with an RJ-45 connector connecting to a single-port copper GbE NIC. 

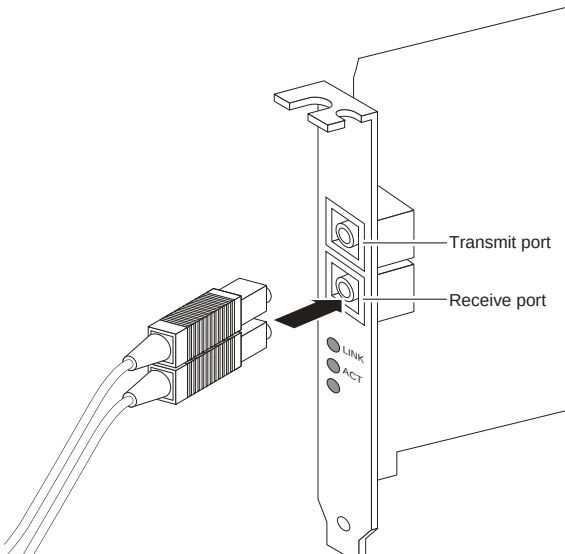
Connecting to a multiport GbE NIC using copper cabling

To connect to a multiport GbE NIC using copper cabling, complete the following step, using the figure for reference.

Step	Action
1	Push the RJ-45 connector into the Ethernet port until it clicks and locks into place. Repeat this step to connect another network to the remaining ports. The following figure shows two UTP cables with RJ-45 connectors connecting to a dual-port copper GbE NIC. 

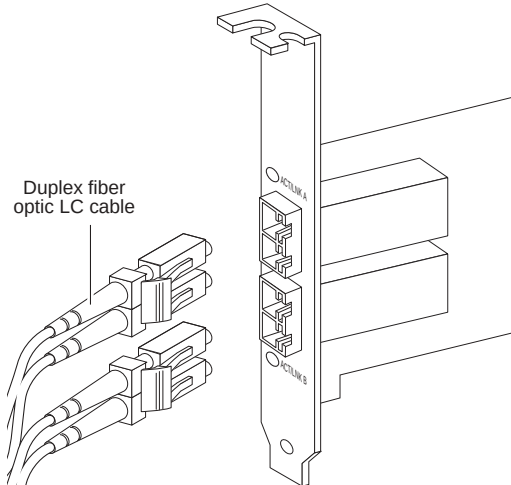
Connecting to a single-port GbE NIC using fiber optic cabling

To connect to a single-port GbE NIC using fiber optic cabling, complete the following step, using the figure for reference.

Step	Action
1	Push the SC connector into the Ethernet port until it clicks and locks into place. The following illustration shows a fiber cable with an SC connector connecting to a single-port fiber GbE NIC. Note _____ Your single-port fiber NIC might have an LC connector. _____ 

Connecting to a dual-port GbE NIC using fiber optic cabling

To connect to a dual-port GbE NIC using fiber optic cabling, complete the following step.

Step	Action
1	Push the LC connector into the Ethernet port NIC, until it clicks and locks into place. Repeat this step for the second port. The following figure shows two fiber cables with LC connectors connecting to a dual-port fiber GbE NIC. 

Connecting your remote management card

What your remote management card does

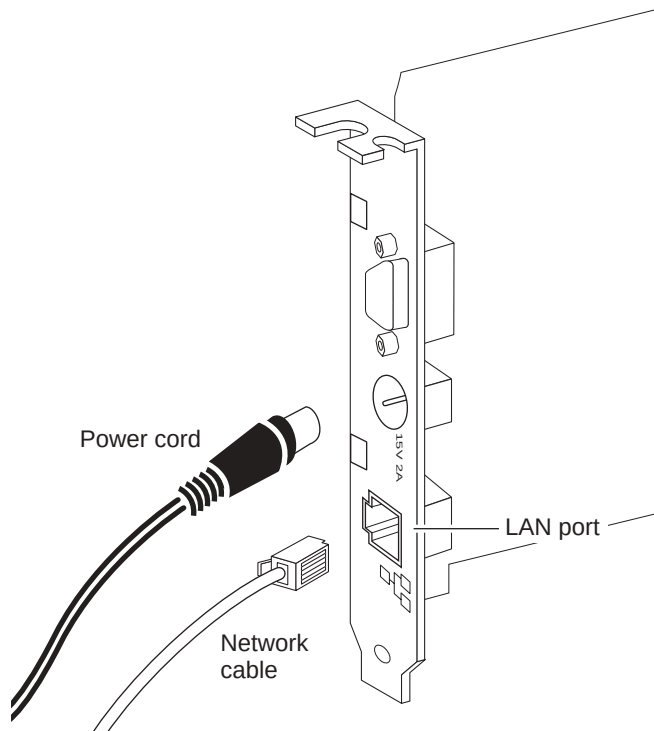
The remote management card optionally sends a message to configured autosupport recipients, including Customer Support, when your gateway needs support.

Note

The remote management card is supported only on the GF900 series gateway. It is an optional feature in the GF920 and is not supported in the GF825.

Connecting your remote management card

To connect your remote management card to a LAN network and to power, complete the following steps, using the figure for reference.



Step	Action
1	Connect your remote management card to the LAN network through the LAN port.
2	Connect the remote management card power supply cord into the socket on the back of the card. Note_____ The remote management card comes with a power cord for connection to its own external power source. NetApp recommends that you connect the remote management card to an uninterruptible power supply in case of a power outage. _____
3	When you install your equipment into a two-post or four-post rack, use the velcro strips to attach the remote management card power supply to an appropriate space on your rack.
4	Connect the power cord from the remote management power supply into a separate power source than what your gateway uses.

Connecting a GF900 series and GF825 gateway

Connecting to a third-party tape backup device

Modes for connecting to a tape backup device

You can connect to a tape backup device through the following modes:

- ◆ Your gateway
- ◆ Fibre Channel switch
- ◆ Backup server host

Preparing the tape backup device

To prepare the tape backup device, complete the following steps.

Step	Action
1	See the <i>Data Protection Guide</i> for choosing the mode most suitable to your system.
2	See the documentation for the tape backup device.
3	Set the appropriate ID on the tape backup device. Note _____ See the third-party documentation about connecting a tape backup device to the Fibre Channel switch. _____

Rules for connecting the tape backup device

Observe the following rules for connecting the tape backup device:

- ◆ Use a cable that is
 - ❖ Appropriate to the tape expansion adapter installed in your gateway
 - ❖ Of an approved length for the tape backup device

Note _____
See the documentation for the tape backup device.

- ◆ Check your configuration to verify the expansion slots assigned for tape adapters and the type of tape adapters installed in your gateway.
- ◆ Check the configuration to verify support for your tape backup device. An unsupported tape backup device might cause your gateway to halt.

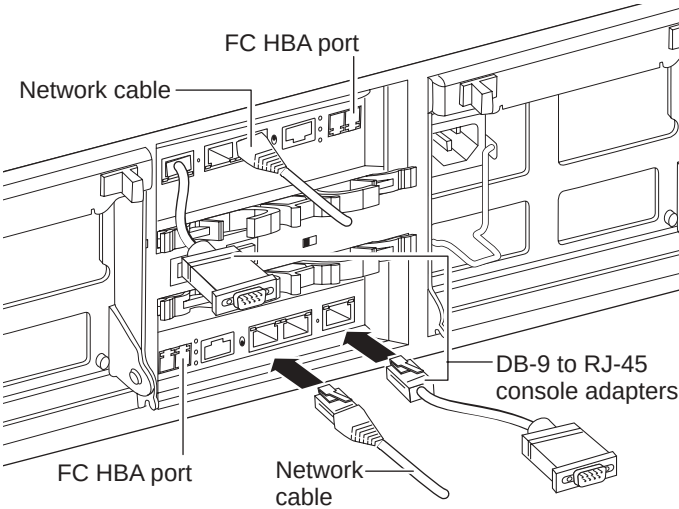
Connecting a GF270c gateway

Topics in this section

This section discusses how to connect your GF270c gateway to a network and any third-party devices

Connection locations

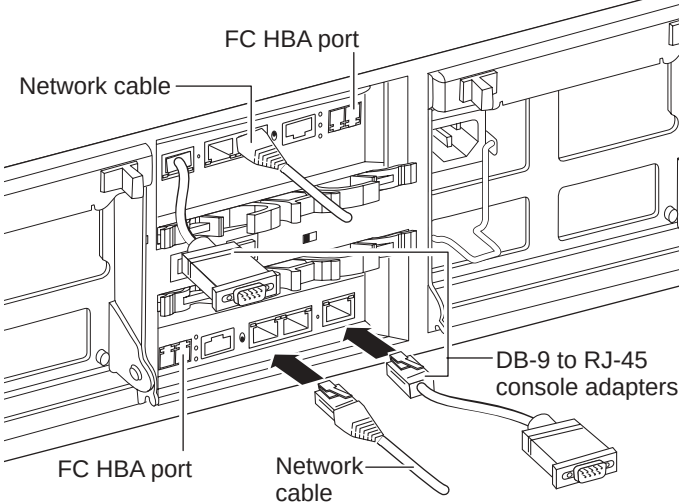
The following illustration gives an overview of onboard ports and AC connections of a GF270c.



Connecting a clustered GF270c

To connect your clustered GF270c, complete the following steps.

Step	Action
1	Put on the antistatic wrist strap and grounding leash.
2	Make sure that your gateway is turned off.

Step	Action
3	Connect your gateway to the network by plugging the network cable into either the left or right network input connections (green ports) at the center of both CPU modules at the rear of the gateway. The following illustration shows the connections made to both CPU modules.  The diagram shows the rear panel of a gateway with two CPU modules. Each module has a green network port and a purple console port. Network cables are plugged into the green ports. Console cables, using DB-9 to RJ-45 adapters, are plugged into the purple ports. Labels indicate 'FC HBA port', 'Network cable', and 'DB-9 to RJ-45 console adapters'. Note Do not make any connections to the copper ports (blue ports). These ports are not used on the GF270c.
4	Connect console cables to the console connection port (purple port) on both CPU modules, using the DB-9 to RJ-45 console adapter. For information about connecting a console cable, see “Connecting to an ASCII terminal console” on page 30.

Step	Action	
5	If...	Then...
	You are not attaching a third-party device	Got to Step 6
	You are attaching a a tape backup	Your tape backup device must support an Ethernet connection. Connect your tape backup device through one of your Ethernet ports, and see “Connecting your gateway to an AC source and powering on” on page 49.
6	Use the Fibre Channel HBA ports to connect to the storage subsystem directly or through a Fibre Channel Switch. You must use both Fibre Channel HBA ports.	
7	Make sure that the gateway power switches are turned off.	

Connecting your gateway to an AC source and powering on

What the power-on sequence does

The power-on sequence for a new installation automatically

- ◆ Checks all connections to the gateway
- ◆ Runs the setup command

Grounding your gateway

To ground your gateway, complete the following steps.

Step	Action
1	Choose one of the grounding holes on the rear of your gateway chassis. The grounding hole is designated by the following symbol: 
2	Using the grounding cable and screw that came with your gateway grounding kit, insert the screw through the ring terminal of the grounding cable, and then tighten the screw into the grounding hole on the chassis.
3	Insert a screw through the ring terminal at the other end of the grounding cable into a properly grounded object.
4	After you are finished grounding your gateway, go to “Connecting and powering on an AC system” on page 50.

Connecting and powering on an AC system

To connect your gateway to an AC power source and power it on, complete the following steps.

Step	Action
1	Verify that your storage subsystem is configured and connected properly. For details, go to your Getting Started guide. Caution—— Your configured and connected storage subsystem must be powered on before you power on your gateway. See your storage subsystem documentation for how to power on the storage subsystem. The gateway expects these units to be ready for input/output when it powers on and performs its reset and self-test.
2	Turn on any switches and tape backup devices, if applicable.
3	Make sure that the power switch on each power supply on your gateway is in the Off (O) position.
4	Connect the socket end of the supplied power cord to the recessed power plug on the power supply.
5	If you are turning on a GF900 series gateway, secure the power cord with the retaining adjustable clip on the power supply.
6	Plug the other end of the power cord into a grounded electrical outlet.
7	Repeat Steps 1 through 6 for the second power supply, if needed. Caution—— To obtain power supply redundancy, you must connect the second power supply to a separate AC circuit.
8	Verify that your CompactFlash™ unit is completely inserted in its slot.
9	Turn the power switch on the gateway power supplies to the On (I) position. Result: The system verifies the hardware and loads the operating system.

Step	Action
10	Make sure that the following LEDs illuminate: ◆ Front panel LEDs ◆ Power supply LEDs ◆ Network port LEDs The LED responses are described in your <i>gFiler Series Hardware Maintenance Guide</i>. Note_____ If the LEDs do not illuminate, contact your authorized reseller. _____
11	Check the startup messages as they appear on the console or LCD. The system messages are described in your <i>gFiler Series Gateway Hardware Maintenance Guide</i>. Note_____ If the startup messages do not appear, contact your authorized reseller. _____
12	Go to the <i>gFiler Series Software Setup, Installation, and Management Guide</i> when the following default host name prompt appears on the console screen: toaster>

About this appendix This appendix lists the regulatory notices you need to be aware of when installing and operating your NetApp equipment.

Regulatory notices

FCC notices (U.S. only)

Network Appliance devices are designed for a CFR 47 (Code Federal Regulations) Part 15 Class A environment.

The FCC and Network Appliance guarantee the user's rights to operate this equipment only if the user complies with the following rules and regulations:

- ◆ Install and operate this equipment in accordance with the specifications and instructions in this guide.
- ◆ Modify this equipment only in the ways specified by Network Appliance.
- ◆ Use shielded cables with metallic RFI/EMI connector hoods to maintain compliance with applicable emissions standards.
- ◆ If the system has nine or more fibre channel disk shelves, install the system in two or three NetApp System Cabinets to maintain performance within Part 15 of CFR 47 regulations.

Compliance with Part 15 of CFR 47

This equipment has been tested and found compliant with Part 15 of the CFR 47 rules for Class A digital devices. These rules are designed to provide reasonable protection from interference to electronics equipment operated in a commercial environment.

Operation of this device is subject to the following two conditions:

- ◆ This device cannot cause harmful interference.
- ◆ This device must accept any interference received, including interference that may cause undesired operation.

Compliance with ICES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A conforme à la norme NMB-003 du Canada.

Compliance with EN regulations

Marking by the symbol  indicates compliance of this Network Appliance device to the EMC Directive and the Low Voltage Directive of the European Union. Such marking is indicative that this Network Appliance device meets the technical standards listed in “Declaration of Conformity,” later in this appendix.

Caution

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Bureau of Standards, Metrology, and Inspections notice (BSMI, Taiwan only)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Translation of the BSMI notice:

Warning: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Voluntary Control Council for Interference by Information Technology Equipment (VCCI, Japan)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Translation of the VCCI-A notice:

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. If such trouble occurs, the user may be required to take corrective actions.

Declaration of Conformity

**Network Appliance, Inc.,
495 East Java Drive
Sunnyvale, California, 94089, U.S.A.,**

declare under our sole responsibility that the products

Type of equipment	Description	Model number	Year of manufacture
Gateway	NetApp gFiler series	GF940	2003
		GF960	
		GF825	
		GF920	2004
		GF270c	

to which this declaration relates conform to the following standards:

EN 60950:2000, with A1-A4, A11, Information Technology Equipment (Safety)

EN 55022:1998, Emissions Requirements for Information Technology Equipment

EN 50024:1998, Immunity Requirements for Information Technology Equipment

EN 60825-1, 1994+A11, Safety of Laser/LED Equipment

EN 61000-3-2:2000, Limits for Harmonic Current Emissions

EN 61000-3-3:1995/A1:2001, Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems

following the provisions of the directives listed below:

73/23/EEC, Low Voltage Directive (Product Safety)

89/336/EEC, Electromagnetic Compatibility Directive

Part number: 210-00678

About this appendix The information in this appendix discusses how to determine the power line lengths running from your gateway to the power source.

Recommended AC power line sizes

About AC power feeds

Longer AC power feeds need to be properly designed to preserve voltage levels to the equipment. The wiring from the breaker panel to the power strip, which supplies power to your gateway, can often exceed 50 feet.

Note

Total AC wire length = breaker to wall or ceiling outlet + extension cable or ceiling drop.

Recommended conductor size

The following table lists the recommended conductor size for a 2% voltage drop for a particular distance in feet (taken from the *Radio Engineer's Handbook*).

110V, single-phase	20A circuit	30A circuit	40A circuit	50A circuit
25 ft	12 AWG	10 AWG	8 AWG	8 AWG
50 ft	8 AWG	6 AWG	6 AWG	4 AWG
75 ft	6 AWG	4 AWG	4 AWG	2 AWG

220V, single-phase	20A circuit	30A circuit	40A circuit	50A circuit
25 ft	14 AWG	12 AWG	12 AWG	10 AWG
50 ft	12 AWG	10 AWG	8 AWG	8 AWG
75 ft	10 AWG	8 AWG	6 AWG	6 AWG

Wire gauge approximates

The following table lists the approximate equivalent of American Wire Gauge (AWG) to Harmonized Cordage.

AWG	8	10	12
Harmonized, mm-mm	4.0	2.5	1.5

Feature update history

The following table lists and describes the history of changes made to this manual. When a change is implemented, it applies to the release in which it was implemented and all subsequent releases, unless otherwise specified.

Feature updates	Feature first implemented in	Feature release date
◆ Initial release of this manual	Data ONTAP 6.5	January 2004
◆ Updates for GF920 and GF270c	Data ONTAP 6.5.1	April 2004

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