



Overview: PA-FC-1G

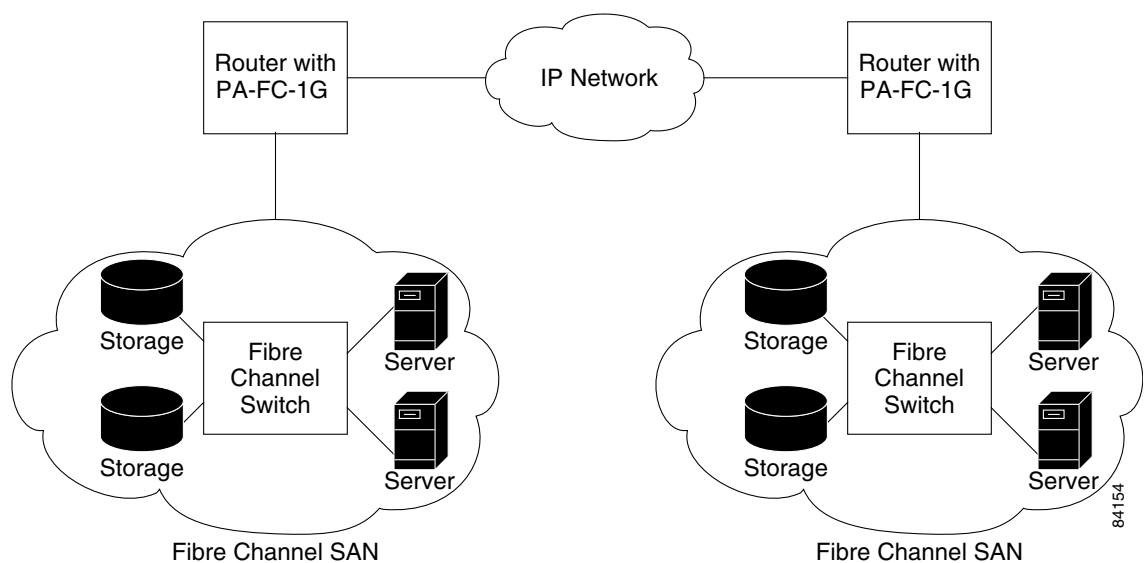
This chapter describes the PA-FC-1G and contains the following sections:

- [Fibre Channel Overview, page 1-1](#)
- [PA-FC-1G Fibre Channel Port Adapter Overview, page 1-2](#)
- [LEDs, page 1-2](#)
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Fibre Channel Overview

The Fibre Channel over TCP/IP (FCIP) is a tunneling protocol that connects geographically distributed fibre channel storage area networks (SANs) transparently over local area networks (LANs), metropolitan area networks (MANs), and wide area networks (WANs). (See [Figure 1-1](#).)

Figure 1-1 FC SAN Traffic Over an IP Network



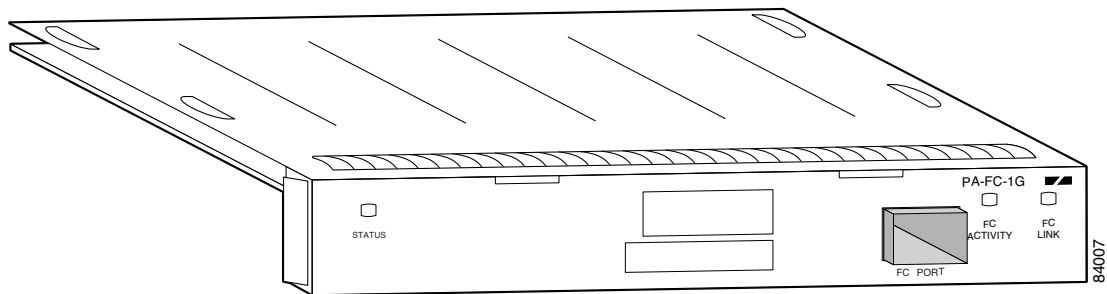
The Transmission Control Protocol (TCP) handles congestion control and congestion management, and data error recovery and data loss recovery for FCIP. TCP/IP handles transportation for FCIP, while maintaining fibre channel (FC) services.

PA-FC-1G Fibre Channel Port Adapter Overview

The PA-FC-1G is a single-width, Peripheral Component Interconnect (PCI) port adapter designed to tunnel fibre channel frames through TCP connections, guaranteeing reliable transport of SAN traffic over IP-based WANs.

The PA-FC-1G provides a one gigabit (1Gb) fibre channel interface to the external networks and a single PCI interface into 7200 VXR and 7401ASR routers. (See [Figure 1-2](#).) It offers an alternative technology to carry SAN traffic over long distances without requiring a dedicated fibre channel network.

Figure 1-2 PA-FC-1G—Faceplate View



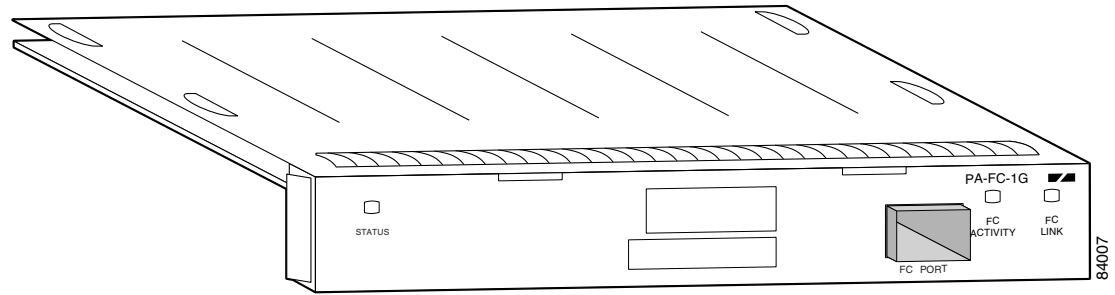
The PA-FC-1G complies with the environmental specifications listed in [Table 1-1](#).

Table 1-1 PA-FC-1G Port Adapter Specifications

Environmental Specification	Description
Operating temperature	50 to 104°F (10 to 40°C)
Humidity	0 to 90%, noncondensing

LEDs

The PA-FC-1G has three LEDs to indicate port adapter status, fibre channel activity, and the status of the fibre channel link. (See [Figure 1-3](#).)

Figure 1-3 LEDs on the PA-FC-1G

After system initialization, the Status LED goes on to indicate that the PA-FC-1G has been recognized by the system.

The following conditions must be met before the PA-FC-1G is enabled:

- The PA-FC-1G is correctly connected and is receiving power.
- A valid system software image for the PA-FC-1G has been downloaded successfully.
- The system recognizes the installed PA-FC-1G.

If any of these conditions are not met, or if the initialization fails for other reasons, the PA-FC-1G will not be operational.

Table 1-2 lists LED colors and indications.

Table 1-2 PA-FC-1G LEDs

LED Label	Color	State	Meaning
Status	Green	On	PA-FC-1G is recognized by the system.
		Off	PA-FC-1G is not recognized by the system.
FC Activity		Off	Indicates no activity on the port.
	Green	Blinking	Indicates activity on the port.
FC Link		Off	No connection, no signals are being received. Possible causes: No SFP module is present, or the fibre is not plugged in.
	Green	On	Optical signal is running through the interface, FC Link is up, and the B_port is up.
	Amber	On	Indicates that the B_port is initializing. Possible causes: SFP module is present and the fibre is connected to the port of another switch, but the FC Link is not up; the B_port is offline; fabric parameters are incompatible with the switch to which the B_port is connected.

Cables and Connectors

A small form-factor pluggable (SFP) module plugs into the FC port on the PA-FC-1G. The FC port is a 1000-Mbps optical interface in the form of an LC-type duplex port that supports IEEE 802.3z interfaces. The SFP is compliant with the 1000BASEX standard and the IEEE *Fibre Channel 2nd Generation Physical Interface* standard. The SFP (product ID SFP-FCPA-LC-1G=) ships installed in the PA-FC-1G and can be ordered as a spare.

An appropriate fibre-optic cable with an LC connector must be plugged into an SFP on the PA-FC-1G. If the SAN switch to which the PA-FC-1G is being connected has an SFP module installed, an LC-to-LC fibre-optic cable is recommended. If the SAN switch has a GBIC module, use an LC-to-SC fibre-optic cable.

Table 1-3 describes the features and operating distances of the SFP.

Table 1-3 SFP-FCPA-LC-1G Description and Operating Distance

Product ID	SFP Type	Description	Operating Distance
SFP-FCPA-LC-1G=	Short wavelength (1000BASESX)	Contains a Class 1 laser of 850 nm for 1000BASESX (short-wavelength) applications.	Operates on standard multimode fiber-optic link spans of up to 328 ft (300 m).

Table 1-4 shows the port cabling specifications of the SN-SFP-FCGEMM-LC.

Table 1-4 SFP-FCPA-LC-1G Port Cabling Specifications

Wave-length(nm)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Maximum Cable Distance
850	MMF ¹	62.5	160	722 ft (220 m)
		62.5	200	902 ft (275 m)
		50.0	400	1640 ft (500 m)
		50.0	500	1804 ft (550 m)

1. Multimode fiber (MMF) only.

PA-FC-1G Slot Locations on the Supported Platforms

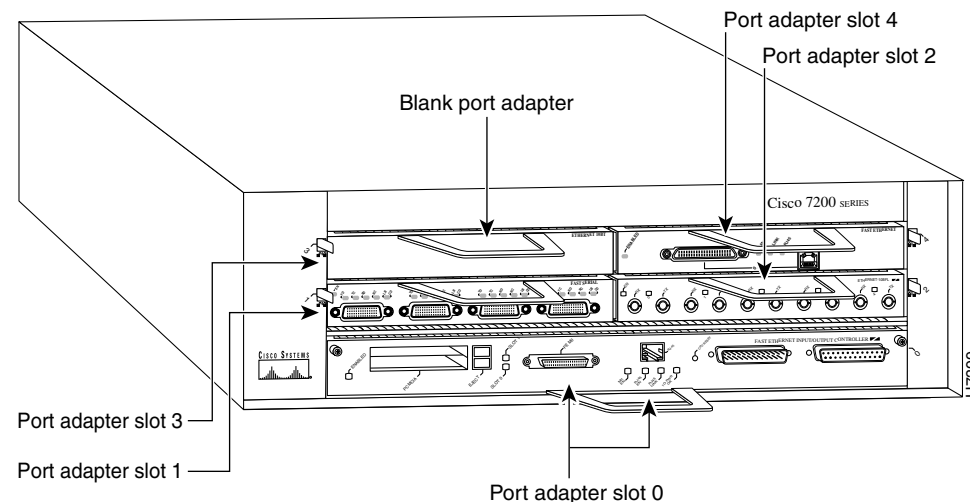
This section discusses the PA-FC-1G slot locations on the supported platforms. The illustrations that follow summarize slot location conventions on each platform:

- [Cisco 7200 VXR Routers Slot Numbering, page 1-5](#)
- [Cisco 7401ASR Router Slot Numbering, page 1-6](#)

Cisco 7200 VXR Routers Slot Numbering

The Cisco 7204VXR has four slots (slot 1 through slot 4) for port adapters. Port adapter slot 0 is reserved for an I/O controller. You can place the port adapters in any of the four available port adapter slots. (See [Figure 1-4](#).)

Figure 1-4 Port Adapter Slots in the Cisco 7204VXR



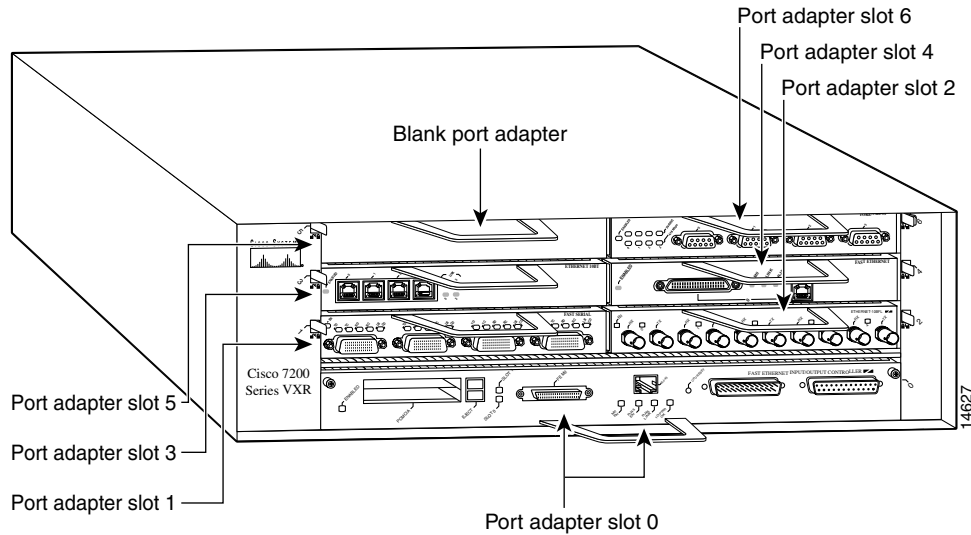
The Cisco 7206VXR has six slots (slot 1 through slot 6) for port adapters. Port adapter slot 0 is reserved for an I/O controller. You can place the port adapters in any of the six available port adapter slots. (See [Figure 1-5](#).)

Load-Balancing Considerations

There are two PCI buses in a 7200 VXR router. Even-numbered slots are on one PCI bus and odd-numbered slots are on the other PCI bus.

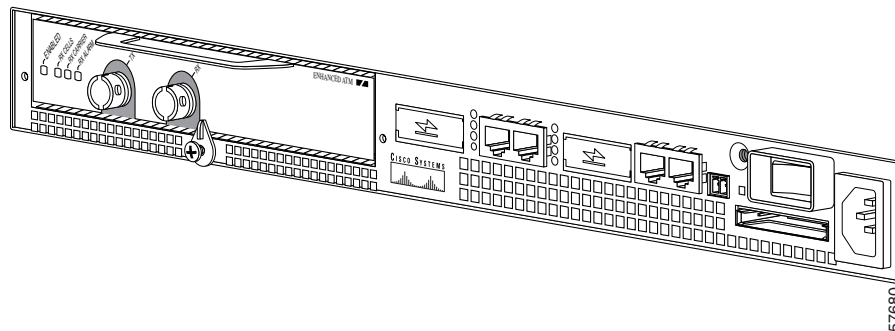
If the IP connection is established using an Ethernet interface on the I/O controller, this interface shares the PCI bus of odd-numbered slots. In this case, the PA-FC-1G achieves best performance when it is installed in an even-numbered slot.

If the IP connection is established using an interface in one of the available port adapter slots, the PA-FC-1G achieves best performance when it is installed on a different PCI bus from the port adapter through which an IP connection is established. For example, if an Ethernet port adapter is installed in slot 2 (IP connection), it is best to install the PA-FC-1G in slot 1, 3, or 5 (fibre channel connection).

Figure 1-5 Port Adapter Slots in the Cisco 7206VXR

Cisco 7401ASR Router Slot Numbering

Figure 1-6 shows the front view of the Cisco 7401ASR router with a port adapter installed. The single slot in a 7401ASR router is located on the left side of the router.

Figure 1-6 Cisco 7401ASR Router with a Port Adapter Installed

Identifying Interface Addresses

This section describes how to identify the interface addresses for port adapters in supported platforms. Interface addresses specify the actual physical location of each interface on a router or switch.

Interfaces on the port adapter installed in a router maintain the same address regardless of whether other port adapters are installed or removed. However, when you move a port adapter to a different slot, the first number in the interface address changes to reflect the new port adapter slot number.

The following subsections describe the interface address formats for specific platforms:

- [Interface Addresses of Cisco 7200 VXR Routers, page 1-7](#)
- [Interface Addresses of Cisco 7401ASR Router, page 1-7](#)

Interface Addresses of Cisco 7200 VXR Routers

In Cisco 7200 VXR routers, slots are numbered from the lower left to the upper right, beginning with slot 1 and continuing through slot 4 for the Cisco 7204VXR, and slot 6 for the Cisco 7206VXR. (Slot 0 is reserved for the I/O controller.)

The interface address is composed of a two-part number in the format *slot/port-number*. The interface addresses of a 4-port port adapter installed in slot 1 would be 1/0 through 1/3 (slot 1 and port 0 through port 3). If the 4-port port adapter were installed in slot 4, these same interfaces would be numbered 4/0 through 4/3 (slot 4 and port 0 through port 3).

Interface Addresses of Cisco 7401ASR Router

There is only one slot on the Cisco 7401ASR router that accepts port adapters and it is numbered as slot 1. The interface address is composed of a two-part number in the format *slot/port-number*. For example, if a single-port port adapter is installed on a Cisco 7401ASR router, the interface address would be 1/0.

