



Catalyst GigaStack Gigabit Interface Converter Hardware Installation Guide

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Cisco Limited Lifetime Hardware Warranty Terms ix

Preface xiii

Audience **xiii**

Purpose **xiii**

Organization **xiv**

Notes, Cautions, and Warnings **xiv**

Related Publications **xvii**

Obtaining Documentation **xviii**

World Wide Web **xviii**

Documentation CD-ROM **xix**

Ordering Documentation **xix**

Documentation Feedback **xix**

Obtaining Technical Assistance **xx**

Cisco.com **xx**

Technical Assistance Center **xxi**

Contacting TAC through the Website **xxi**

Contacting TAC by Telephone **xxii**

CHAPTER 1

Overview 1-1

Features **1-1**

GigaStack GBIC LEDs **1-2**

GBIC Module Slot LEDs **1-3**

Cabling Guidelines **1-5**

Switches Supporting the GBIC **1-6**

Minimum IOS Release for Redundant Loop Configurations 1-7

Deployment Examples 1-9

 Example 1: Cascaded Stack Connection 1-9

 Example 2: Point-to-Point Connection 1-10

CHAPTER 2

Installation 2-1

Inspecting the Packing List 2-1

EMC Regulatory Statements 2-2

 U.S.A. 2-2

 Taiwan 2-2

 Japan 2-2

 Korea 2-3

 Hungary 2-3

Avoiding Electrostatic Discharge 2-4

Installing a GigaStack GBIC 2-4

Attaching the GBIC Clip 2-6

Recommended Configuration 2-7

Connecting to GigaStack GBIC Ports 2-7

Creating Connections 2-8

 Point-to-Point Connections 2-10

 Cascaded Stack Connections 2-11

 Cascaded Stack Connections with a Redundant Link 2-12

Removing a GigaStack GBIC 2-13

Power-On Self-Test 2-14

CHAPTER 3

Troubleshooting 3-1

APPENDIX A

Technical Specifications A-1

APPENDIX B

Connectors and Cables B-1

GigaStack GBIC Cabling **B-1**

APPENDIX C

Translated Safety Warnings C-1

Product Disposal **C-1**

INDEX



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1. Launch your browser and go to the following URL:
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The Warranties and License Agreement page appears.
2. To view the *Cisco Information Packet*, perform these steps:
 - a. Click the **Information Packet Number** field and make sure that the part number 78-5235-02C0 is highlighted.
 - b. Select the language to view the document.
 - c. Click **Go**. The Information Packet page appears.
 - d. From this page you can review the document online or click the **PDF** icon to download and print the document in Adobe Portable Data File (PDF) format.

**Note**

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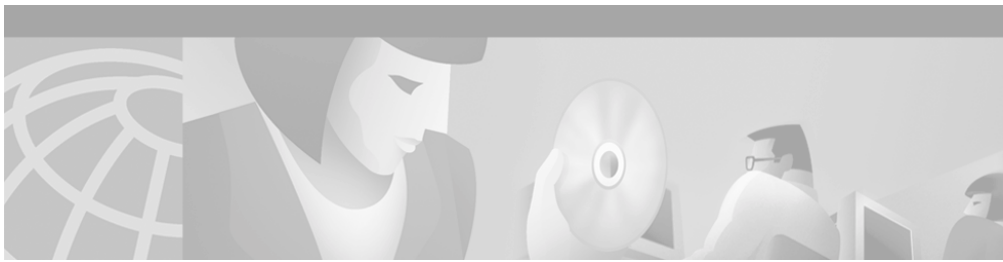
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Complete the information below and keep for ready reference.

Product purchased from:	
Their telephone number:	
Product Model and Serial number:	
Maintenance Contract number:	



Preface

Audience

This guide is for the technician installing the GigaStack Gigabit Interface Converter (GBIC), hereafter referred to as the GigaStack GBIC. Before using this guide, make sure that you are familiar with the concepts and terminology of Ethernet and local-area networking.

Purpose

This guide describes how to install the GigaStack GBIC and troubleshoot problems associated with its installation.



Note

The GigaStack GBICs and their ports are managed through one of the management interfaces of a Gigabit-capable switch. For more information about managing GigaStack GBICs, refer to the software configuration guides for the Catalyst 2900 series XL, the Catalyst 2950, the Catalyst 3500 series XL, and the Catalyst 3550 multilayer switches.

Organization

This guide is organized into the following chapters:

Chapter 1, “Overview,” describes the key features, provides a physical description, and shows how the GigaStack GBICs can be deployed in real networks.

Chapter 2, “Installation,” explains how to install the GigaStack GBIC.

Chapter 3, “Troubleshooting,” describes how to identify and resolve common installation and cabling problems.

Appendix A, “Technical Specifications,” lists the physical and environmental specifications and the regulatory agency approvals.

Appendix B, “Connectors and Cables,” describes the cables and connectors that can connect to the GigaStack GBIC ports.

Appendix C, “Translated Safety Warnings,” contains translations of the warnings in this guide.

Notes, Cautions, and Warnings

Notes, cautions, and warnings use the following conventions and symbols:



Note

Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.



Caution

Means reader be careful. In this situation, you might do something that could result in equipment damage or loss of data.

**Warning**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with the standard practices for preventing accidents. The warning symbol also means that you can see the warning in multiple languages in "Appendix C, "Translated Safety Warnings."

Waarschuwing

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Het waarschuwingssymbool betekent ook dat u de waarschuwing in meerdere talen in Appendix C, "Translated Safety Warnings" kunt vinden.

Varoitus

Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Varoitusmerkki tarkoittaa myös sitä, että varoitus esiintyy useilla kielillä osassa Appendix C, "Translated Safety Warnings."

Attention

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Le symbole d'avertissement signifie également que cet avis se trouve traduit dans plusieurs langues dans la section «Appendix C, "Translated Safety Warnings"».

- Warnung** Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Das Warnsymbol bedeutet auch, daß Sie die Warnung in verschiedenen Sprachen unter Appendix C, "Translated Safety Warnings" lesen können.
- Avvertenza** Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. Il simbolo di avvertenza indica inoltre che l'avvertenza viene presentata in diverse lingue in Appendix C, "Translated Safety Warnings."
- Advarsel** Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Dette varselsymbolet betyr også at du kan lese advarselen på flere språk i «Appendix C, "Translated Safety Warnings"».
- Aviso** Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Este símbolo serve também para indicar que poderá ler este tipo de aviso em várias línguas na secção: "Appendix C, "Translated Safety Warnings."

- ¡Atención!** Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Este símbolo de aviso también significa que la misma advertencia aparece en varios idiomas bajo el título “Appendix C, “Translated Safety Warnings.”
- Varning!** Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Denna varningssymbol innebär också att du kan se varningsmeddelandet på flera språk i “Appendix C, “Translated Safety Warnings.”
-

Related Publications

You can order printed copies of documents with a DOC-xxxxxx= number. For more information, see the “Ordering Documentation” section on page xix.

These publications provide more information about the switches that support the GigaStack GBIC:

- *Catalyst 2900 Series XL Hardware Installation Guide* (order number DOC-786461=)
- *Catalyst 2900 Series XL and Catalyst 3500 Series XL Software Configuration Guide* (order number DOC-786511=) (previously titled *Cisco IOS Desktop Switching Software Configuration Guide*)
- *Catalyst 2900 Series XL and Catalyst 3500 Series XL Command Reference* (order number DOC-7812155=) (previously titled *Cisco IOS Desktop Switching Command Reference*)
- *Catalyst 2950 Desktop Switch Hardware Installation Guide* (order number DOC-7811157=)
- *Catalyst 2950 Desktop Switch Software Configuration Guide* (order number DOC-78111380=)

- *Catalyst 2950 Desktop Switch Command Reference* (order number DOC-78111381=)
- *Catalyst 3500 Series XL Hardware Installation Guide* (order number DOC-786456=)
- *Catalyst 3550 Multilayer Switch Hardware Installation Guide* (order number DOC-7811358=)
- *Catalyst 3550 Multilayer Switch Software Configuration Guide* (order number DOC-7811194=)
- *Catalyst 3550 Multilayer Switch Command Reference* (order number DOC-7811195=)
- *Catalyst 3550 Multilayer Switch System Message Guide* (order number DOC-7811196=)
- *Release Notes for the Catalyst 2900 Series XL and Catalyst 3500 Series XL Switches Cisco IOS Release 12.0(5.1)WC(1)* or later
- *Release Notes for the Catalyst 2950 Cisco IOS Release 12.1(6)EA2* or later
- *Release Notes for the Catalyst 3550 Multilayer Switches Cisco IOS Release 12.1(4)EA1* or later

Refer to the online *Catalyst GigaStack Gigabit Interface Converter Switch Compatibility Matrix* listed with the GigaStack GBIC documentation on www.cisco.com for the list of switching products supporting the GBIC.

Obtaining Documentation

These sections provide sources for obtaining documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

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http://www.cisco.com/cgi-bin/order/order_root.pl
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We appreciate your comments.

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Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC through the Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

<http://www.cisco.com/tac>

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

<http://www.cisco.com/register/>

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

<http://www.cisco.com/tac/caseopen>

Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.



Overview

The GigaStack GBIC (model WS-X3500-XL) adds port density and high-performance connectivity to supporting switches. When installed in a supporting switch, the GigaStack GBIC supports Gigabit connections in a cascaded stack or point-to-point configuration. The GigaStack GBIC autonegotiates the duplex setting of each port to maximize the bandwidth for your configuration.

Features

This section describes the GigaStack GBIC features:

- Half-duplex stacking using only one GBIC slot for each switch

Stack up to nine switches to form an independent backbone that can be managed with a single IP address. This stack gives the appearance of a single large switch for network management purposes. For this kind of connectivity, see the “Example 1: Cascaded Stack Connection” section on page 1-9.

- Full-duplex connectivity between two switches

You can also form a point-to-point link between two switches. The GigaStack GBIC supports one full-duplex link (in a point-to-point configuration) or up to eight half-duplex links (in a stack configuration) to other Gigabit Ethernet devices. For this kind of connectivity, see the “Example 2: Point-to-Point Connection” section on page 1-10.

- Support for redundant loop configurations in a GigaStack GBIC stack
For more information, see the “Minimum IOS Release for Redundant Loop Configurations” section on page 1-7 and the “Cascaded Stack Connections with a Redundant Link” section on page 2-12
- Support for IOS Release 12.0(5)XU or later for Catalyst 2900 XL and 3500 XL switches, support for Release 12.1(6)EA2 or later for Catalyst 2950 switches, and support for Release 12.1(4)EA1 or later for Catalyst 3550 multilayer switches
- Management through the Cisco IOS command-line interface (CLI) or the web-based Cluster Management Suite (CMS)
- Field-replaceable

GigaStack GBIC LEDs

Figure 1-1 shows the LED locations on the GigaStack GBIC, and Table 1-1 describes the LED colors and their meanings.

Figure 1-1 GigaStack GBIC LEDs and Ports

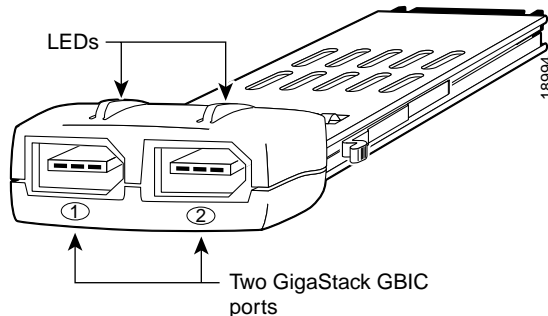


Table 1-1 GigaStack GBIC LEDs

Color	Meaning
Off	No link.
Green	Link present. This link occurs if there is connectivity with another network device and the GigaStack GBIC port.
Amber	Power-on self-test (POST) failure or use of an incorrect cable.
Flashing amber	Loop detection activated.

GBIC Module Slot LEDs

Figure 1-2 shows the GBIC module slot LED on the front of a supporting switch, and Figure 1-3 shows the GBIC LED location when the GigaStack GBIC is installed in the 1000BASE-X module.

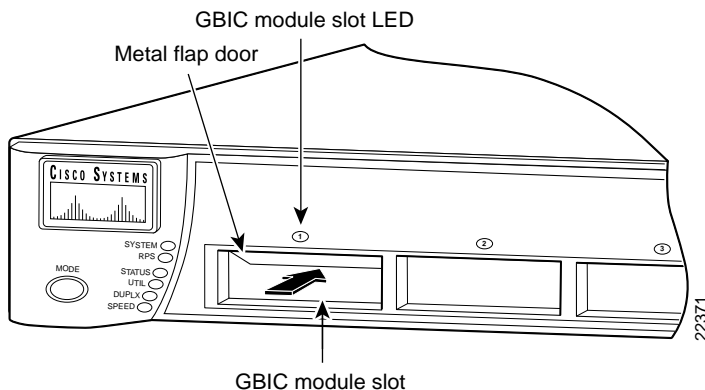
Figure 1-2 GBIC Module Slot LED Location on a Switch

Figure 1-3 GBIC LED Location on a 1000BASE-X Module

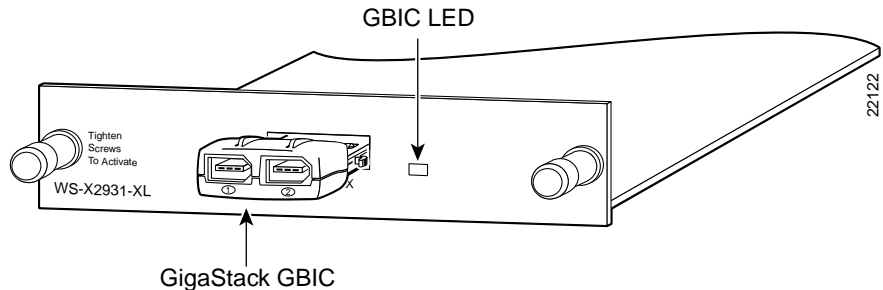


Table 1-2 describes the switch and 1000BASE-X module GBIC slot LED colors and port status.

Table 1-2 Switch and 1000BASE-X Module GBIC Slot LEDs

Color	Meaning
Off	No link, or port was administratively shut down.
Green	Link present.
Flashing green	Activity. Port is transmitting or receiving data.
Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, cyclic redundancy check (CRC) errors, and alignment and jabber errors are monitored for a link-fault indication.
Solid amber	Port is blocked by Spanning Tree Protocol (STP) and is not forwarding data. Note After a port is reconfigured, the port LED can remain amber for up to 30 seconds as STP checks the switch for possible loops.
Flashing amber	Port is blocked by STP and is sending or receiving packets.

Cabling Guidelines

The GigaStack GBIC uses the following Cisco proprietary cables. See Figure 1-4 and Table 1-3 for more information.

The maximum distance for a GBIC-to-GBIC connection is 1 meter. The GigaStack GBIC requires Cisco proprietary signaling and cabling. For more information about cabling, see Appendix B, “Connectors and Cables.”

Figure 1-4 GigaStack GBIC Cables

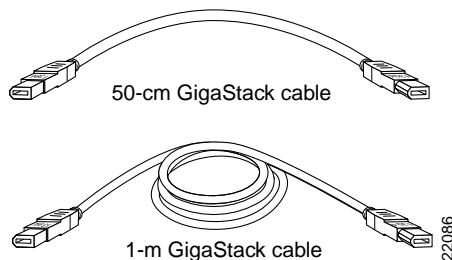


Table 1-3 GigaStack GBIC Cable Part Numbers

Part Number	Cable Length
CAB-GS-50CM	50 cm
CAB-GS-1M	1 m

The 50-cm cable comes with the GigaStack GBIC. You can order additional cables.



Caution

Do not use standard IEEE 1394 cables with the GigaStack GBIC. You must use one of the Cisco proprietary cables (CAB-GS-50CM or CAB-GS-1M). If you use any other cable, you will not have connectivity.



Caution

Do not use the GigaStack GBIC with standard IEEE 1394 equipment. You might damage the equipment or lose data.

Switches Supporting the GBIC

Refer to the online *GigaStack Gigabit Interface Converter Switch Compatibility Matrix* listed with the GBIC documentation on www.cisco.com for the most current list of products supporting the GBIC.



Caution

Installing the GBIC in or connecting it to an unauthorized device might cause damage to the GBIC, the other device, or both.

Table 1-4 lists the switches and the module supporting the GigaStack GBIC.

Table 1-4 Switches and Module Supporting the GigaStack GBIC

Switch Series or Module	Model Number	Description
WS-X2931-XL module for Catalyst 2900 series XL switches	WS-X2931-XL	1 1000BASE-X port ¹
Catalyst 2900 XL switches	Catalyst 2912MF XL	12 100BASE-FX ports and 2 module slots
	Catalyst 2924M XL	24 autosensing 10/100 Ethernet ports and 2 module slots
Catalyst 2950 switches	Catalyst 2950G-12-EI	12 autosensing 10/100 Ethernet ports and 2 GBIC module slots
	Catalyst 2950G-24-EI	24 autosensing 10/100 Ethernet ports and 2 GBIC module slots
	Catalyst 2950G-24-EI-DC	24 autosensing 10/100 Ethernet ports and 2 GBIC module slots with DC-input power
	Catalyst 2950G-48-EI	48 autosensing 10/100 Ethernet ports and 2 GBIC module slots

Switch Series or Module	Model Number	Description
Catalyst 3500 XL switches	Catalyst 3508G XL	8 GBIC module slots
	Catalyst 3512 XL	12 autosensing 10/100 Ethernet ports and 2 GBIC module slots
	Catalyst 3524 XL	24 autosensing 10/100 Ethernet ports and 2 GBIC module slots
	Catalyst 3524 PWR XL	24 autosensing 10/100 inline-power Ethernet ports and 2 GBIC module slots
	Catalyst 3548 XL	48 autosensing 10/100 Ethernet ports and 2 GBIC module slots
Catalyst 3550 switches	Catalyst 3550-12G	2 autosensing 10/100/1000 Ethernet ports and 10 GBIC module slots
	Catalyst 3550-12T	10 autosensing 10/100/1000 Ethernet ports and 2 GBIC module slots
	Catalyst 3550-24-SMI Catalyst 3550-24-EMI	24 autosensing 10/100 Ethernet ports and 2 GBIC module slots
	Catalyst 3550-48-SMI Catalyst 3550-48-EMI	48 autosensing 10/100 Ethernet ports and 2 GBIC module slots

1. The 1000BASE-X module provides one switched 1000-Mbps port in half-duplex, full-duplex, or autonegotiation mode for a GigaStack GBIC. The port supports the IEEE 802.3Z 1000BASE-X standard.

Minimum IOS Release for Redundant Loop Configurations

To ensure support for redundant loop configurations when using the GigaStack GBIC in a cascaded stack configuration, make sure that every switch in the stack is running at least the minimum IOS Release listed in Table 1-5.

Table 1-5 *Minimum IOS Release for Redundant Loop Configurations*

Supported Switch	Minimum IOS Release
Modular 2900 XL switches	12.0(5)XU (April 2000)
2950 switches	12.1(6)EA2 (December 2000)
3500 XL switches	12.0(5)XU (April 2000)
3550 multilayer switches	12.1(4)EA1 (May 2001)

**Note**

All switches in a series must run the same software version. For example, if the stack includes only Catalyst 2900 series XL and 3500 series XL switches, they must run Release 12.0(5)XU or later. If the stack includes a mixture of Catalyst 2900 series XL, 3500 series XL, 2950, and 3550 switches, all the 2900 XL and 3500 XL switches must run Release 12.0(5)XW or later, all the Catalyst 2950 switches must run Release 12.1(6)EA2 or later, and all the Catalyst 3550 switches must run Release 12.1(4)EA1 or later.

For more information, see the “Cascaded Stack Connections with a Redundant Link” section on page 2-12. For switch software upgrade information, refer to the release notes for your switch.

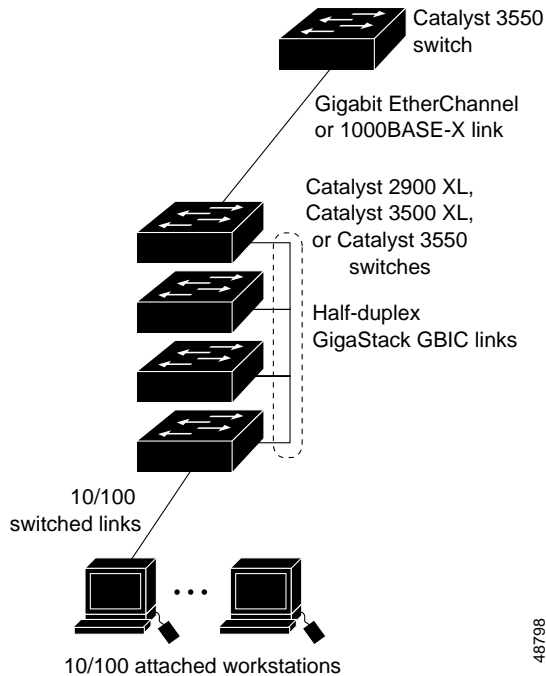
Deployment Examples

This section contains examples that use the GigaStack GBIC as a Gigabit uplink to aggregate traffic in a switched and shared network.

Example 1: Cascaded Stack Connection

Figure 1-5 shows the GigaStack GBIC cascaded in a half-duplex stack configuration.

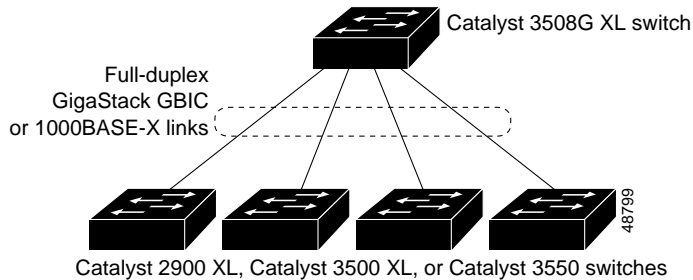
Figure 1-5 *Cascaded Stack Connection*



Example 2: Point-to-Point Connection

Figure 1-6 shows the 3500 XL switch aggregating traffic by using a GigaStack GBIC as a full-duplex, point-to-point uplink connection.

Figure 1-6 Point-to-Point Connection





Installation

This chapter describes how to unpack, install, cable, and run the power-on self-test (POST) on the GigaStack GBIC. After power on, you can manage GBIC ports as you would manage fixed ports on the switch, through the web-based Cluster Management Suite (CMS), or through the console port or a Telnet connection to access the IOS command-line interface.

Inspecting the Packing List

Before you install a GigaStack GBIC, ensure that these items are included in the package:

- GigaStack GBIC
- 50-cm cable
- GBIC clip

If anything is missing, contact your Cisco Systems customer service representative.



Note

You can order a 1-m cable separately.

EMC Regulatory Statements

This section lists international regulatory information for the GigaStack GBIC.

U.S.A.

U.S. regulatory information for this product is in the front matter of this manual.

Taiwan

This is a Class A Information product. When used in a residential environment, it may cause radio frequency interference. Under such circumstances, the user may be requested to take appropriate countermeasures.

這是甲類資訊產品，在居住環境中使用時，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。

Japan

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. When such trouble occurs, the user may be required to take corrective actions.

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。

467464

Korea



Warning

This is a Class A Device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this type was sold or purchased by mistake, it should be replaced with a residential-use type.

주의 A급 기기 이 기기는 업무용으로 전자파 적합 등록을 한 기기이
오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약
잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Hungary

This equipment is a Class A product and should be used and installed properly according to the Hungarian EMC Class A requirements (MSZEN55022). Class A equipment is designed for typical commercial establishments for which special conditions of installation and protection distance are used.

Figyelmeztetés a felhasználói kézikönyv számára:

Ez a berendezés "A" osztályú termék, felhasználására és üzembe helyezésére a magyar EMC "A" osztályú követelményeknek (MSZ EN 55022) megfelelően kerülhet sor, illetve ezen "A" osztályú berendezések csak megfelelő kereskedelmi forrásból származhatnak, amelyek biztosítják a megfelelő speciális üzembe helyezési körülményeket és biztonságos üzemelési távolságok alkalmazását.

Avoiding Electrostatic Discharge

Before you install the GigaStack GBIC, ground yourself by touching the metal part of the chassis to avoid electrostatic discharge (ESD). You should also keep the GigaStack GBIC in its antistatic shielded bag until you are ready for installation.

Installing a GigaStack GBIC

Gigabit Ethernet switches are shipped without the GigaStack GBIC. However, you can install the GBIC into GigaStack GBIC slots, as shown in Figure 2-1.

Install a GigaStack GBIC as follows:

-
- Step 1** Remove the GigaStack GBIC from its protective packaging.
 - Step 2** If you want to use the GigaStack cable connector (hereafter referred to as the clip), see the “Attaching the GBIC Clip” section on page 2-6.
 - Step 3** Grip the sides of the GBIC with your thumb and forefinger, and insert it into the GBIC slot on a switch front panel, as shown in Figure 2-1, or the Catalyst 2900 XL 1000BASE-X module slot, as shown in Figure 2-2.
The GigaStack GBIC is keyed to prevent incorrect insertion.
 - Step 4** Slide the GigaStack GBIC through the flap covering the opening into the slot until you hear a click. The click means the GigaStack GBIC is locked into the slot.

Figure 2-1 Inserting the GigaStack GBIC into a Switch Module Slot

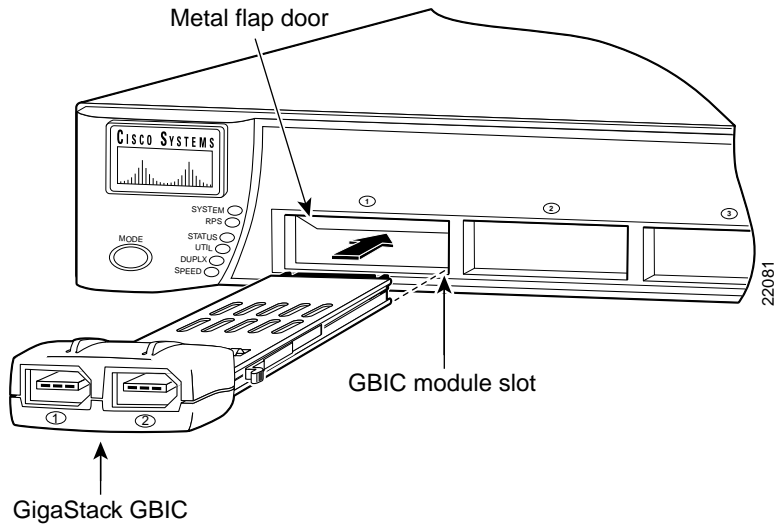
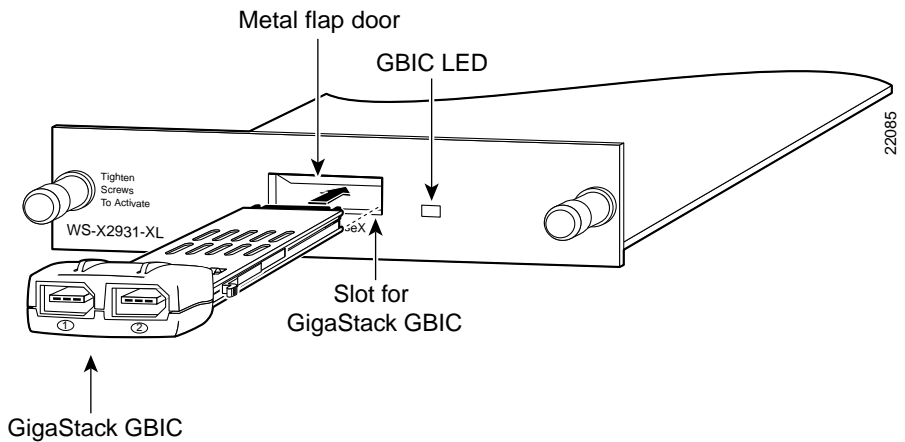


Figure 2-2 Inserting the GigaStack GBIC into a 1000BASE-X Module



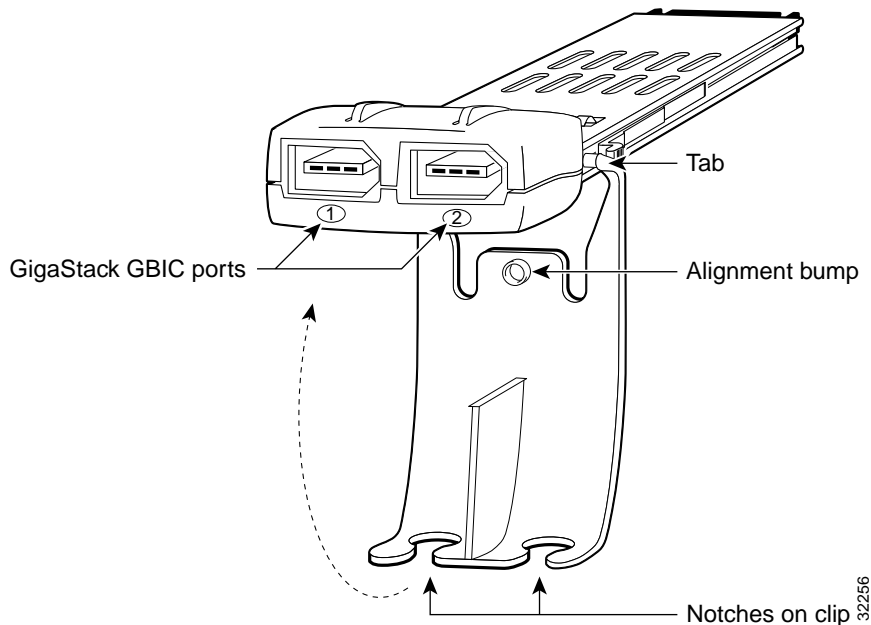
Attaching the GBIC Clip

Each GigaStack GBIC ships with a removable clip that can be attached to provide extra security against accidental cable removal. If you use the clip, you must attach it before inserting the GBIC into the slot.

Attach the clip as follows:

- Step 1** Attach the clip to the GBIC by carefully inserting the clip tabs into the slots on either side of the GBIC, in the orientation shown in Figure 2-3. Slide the clip toward the port side of the GBIC.

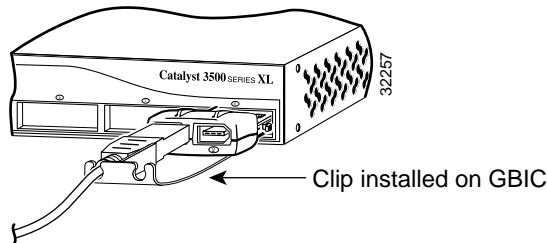
Figure 2-3 Attaching the GBIC Clip



- Step 2** Insert the cable connector into the GBIC port according to your configuration.
- Step 3** Swing the GBIC clip up toward the GBIC so that the alignment bump in the clip seats in the indentation on the GBIC bottom.

Step 4 Secure the cable in a clip notch as shown in Figure 2-4.

Figure 2-4 *Securing the Cables in the GBIC Clip*



Step 5 Insert the GBIC into the slot. Follow the steps in the “Installing a GigaStack GBIC” section on page 2-4.

Recommended Configuration

All ports are set to autonegotiate the duplex mode for your GigaStack GBIC. You must keep this default setting; autonegotiation must not be disabled.

For information about the supporting switches and software, see the “Switches Supporting the GBIC” section on page 1-6 and the “Minimum IOS Release for Redundant Loop Configurations” section on page 1-7.

Connecting to GigaStack GBIC Ports

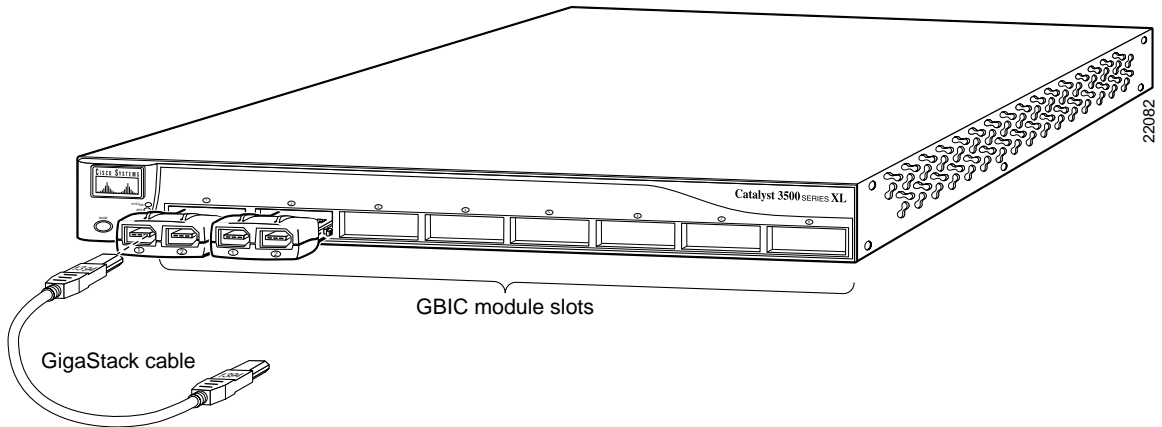
Insert the GigaStack cable connector into the GigaStack GBIC port, as shown in Figure 2-5.



Note

The GBIC module slot LED is amber while the Spanning Tree Protocol discovers the topology and searches for loops. This takes about 30 seconds. The port status LED then turns green.

Figure 2-5 Inserting the Cable in a GigaStack GBIC

**Note**

Always use a GigaStack cable to connect a GigaStack GBIC to any device. For more information, see the “GigaStack GBIC Cabling” section on page B-1.

Creating Connections

You can create these configurations:

- Point-to-point
- Cascaded stack
- Cascaded stack with a redundant link

In a point-to-point configuration or cascaded stack configuration, the GigaStack GBIC can use the ports listed in Table 2-1 to connect to other devices.

Table 2-1 Available GBIC Ports in a Point-to-Point Configuration

Device	Available GigaStack GBIC Ports
1000BASE-X module (for modular 2900 XL switches)	2
3500 XL switches	2
2950 switches	2
3550 multilayer switches	2

**Note**

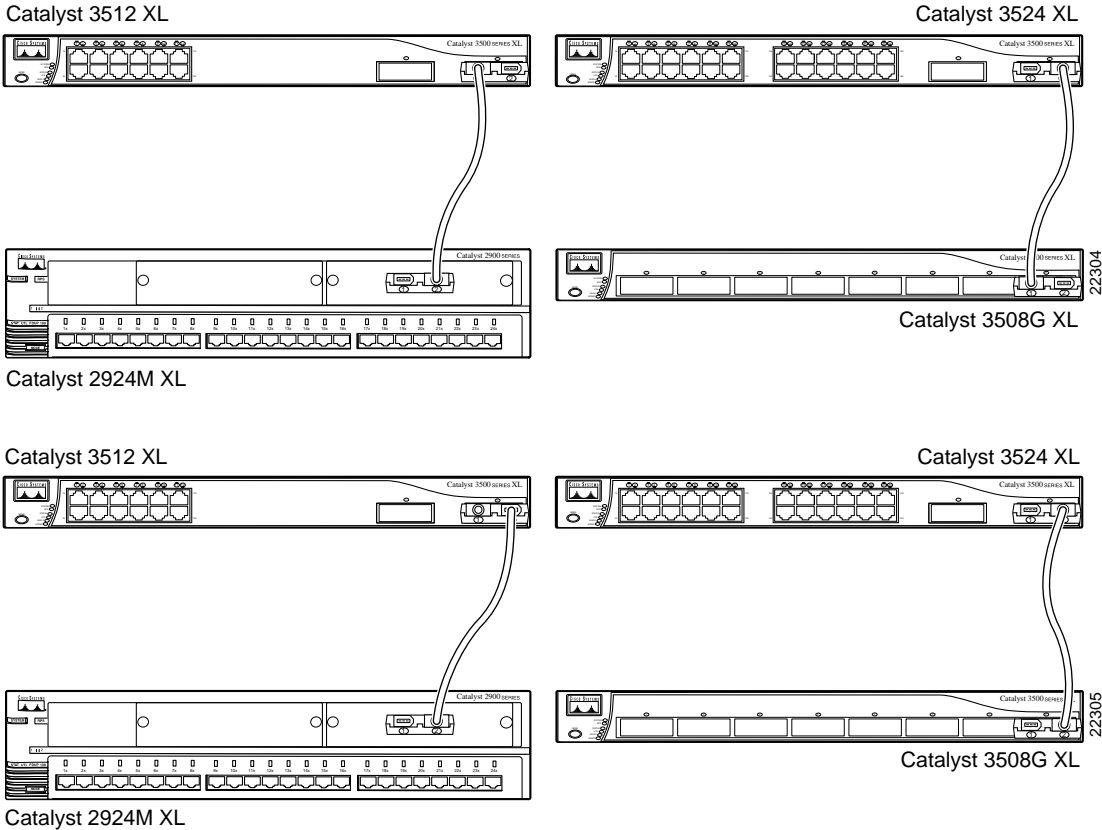
The GigaStack GBIC supports setting a trunk to IEEE 802.1Q or Inter-Switch Link (ISL) encapsulation. All GigaStack GBIC interfaces in the cascaded stack should be configured as trunk interfaces (**switchport mode trunk** interface configuration command) and to use the same encapsulation method (**switchport trunk encapsulation {isl | dot1q}** interface configuration command). For more information on these commands, refer to the command reference for your switch.

For more information, see the “Point-to-Point Connections” section on page 2-10, the “Cascaded Stack Connections” section on page 2-11, and the “Cascaded Stack Connections with a Redundant Link” section on page 2-12.

Point-to-Point Connections

A point-to-point connection operates in full-duplex mode. Figure 2-6 shows an example of supporting switches with point-to-point connections.

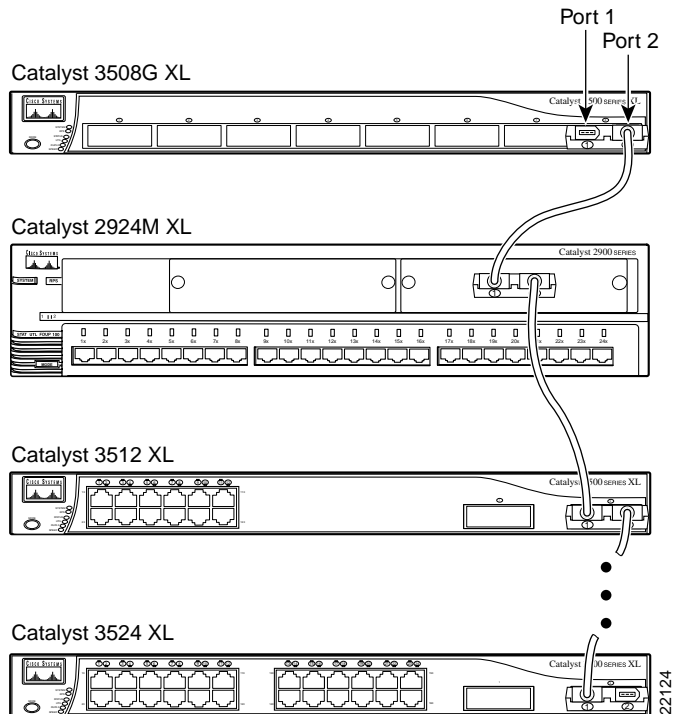
Figure 2-6 Point-to-Point Connections



Cascaded Stack Connections

You can connect from three to nine switches in a cascaded stack configuration. The cascaded stack operates in half-duplex mode. Figure 2-7 shows the connections on some supporting switches.

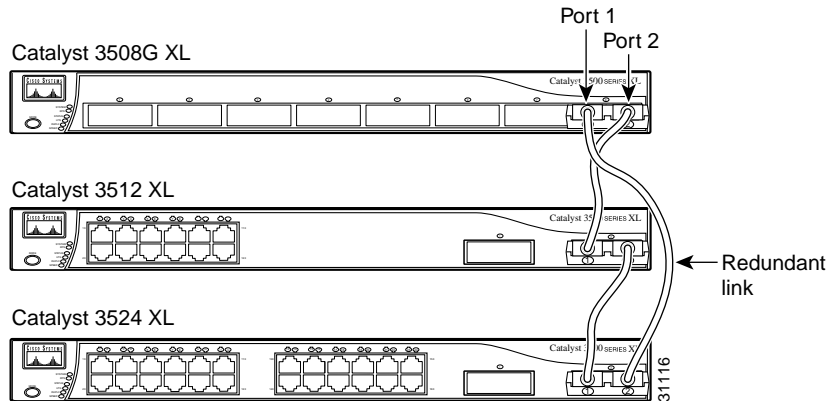
Figure 2-7 Cascaded Stack Connections



Cascaded Stack Connections with a Redundant Link

You can form a redundant link by connecting the open ports on the top and bottom GigaStack GBICs within the same stack, as shown in Figure 2-8.

Figure 2-8 Cascaded Stack Connections with a Redundant Link



The GigaStack GBIC software detects the loop configuration by the way the cables are connected and the number of switches used in the stack. The software uses one of the GigaStack GBIC links as the redundant link, which is disabled for data transmission while all the other links in the stack are up. When any other link in the stack is down, the redundant link is automatically enabled for data transmission. To ensure continued connectivity, the software periodically checks for changes in the stack and invokes the loop detection algorithm if a new link is added to the cascaded stack or if a link is removed from the cascaded stack.

GigaStack GBICs installed in a stack support a loop configuration only if *every* Catalyst 2900 XL and 3500 XL switch in the stack is running IOS software Release 12.0(5)XU or later, Release 12.1(6)EA2 or later for Catalyst 2950 switches, and Release 12.1(4)EA1 or later for Catalyst 3550 switches.

For Catalyst 2900 XL and 3500 XL switches running IOS software earlier than Release 12.0(5)XU, an illegal loop is created under these conditions:

- A GigaStack GBIC is connected to two other GBIC ports in the same stack.
- A single GigaStack GBIC cable is inserted in port 1 and port 2 of the same GBIC.

**Caution**

A loop causes excessive collision errors on the port and can cause the link to become unstable. This instability decreases performance on the links, and communication between the switches in the stack is adversely affected.

If a Catalyst switch is connected through its GigaStack GBIC to another switch's GigaStack GBIC that does not support loop detection, the GBIC LEDs turn these colors:

- The GigaStack GBIC LED on the switch *without* loop detection turns green almost immediately.
- The GigaStack GBIC LED on the switch *with* loop detection flashes green for 15 seconds and then turns green.

As a result, all GBIC links are enabled if no loop is created. If a loop is present, the software does not detect it, excessive collisions occur on these ports, no traffic passes through the stack, and the GigaStack GBIC LEDs remain green.

To avoid problems with loop configurations, make sure that all switches in your stack are running the appropriate IOS release as shown in Table 1-5 on page 1-8. For more information, see the “Minimum IOS Release for Redundant Loop Configurations” section on page 1-7. For switch software upgrade information, refer to the release notes for your switch.

Removing a GigaStack GBIC

Remove a GigaStack GBIC as follows:

-
- Step 1** Release the GigaStack GBIC from the slot by simultaneously squeezing the two plastic tabs (one on each side of the GigaStack GBIC).
- Step 2** To remove, slide the GigaStack GBIC out of the slot. A flap drops down to protect the internal connector.

- Step 3** If you are using the GBIC clip to secure the GBIC cables, remove the clip from the GigaStack GBIC by pulling the tabs from the slots on the GBIC. Remove the cables from the notches in the clip.
- Step 4** Disconnect the cable from the GigaStack GBIC port.
-

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations.

Power-On Self-Test

All supporting switches perform a power-on self-test (POST) on the GigaStack GBIC. When you insert the GigaStack GBIC into the switch or module slot, the port LED on the switch or module turns amber while STP checks for possible loops and then turns green. When you insert a GigaStack GBIC cable into the GBIC port, the GigaStack GBIC port turns green if there is network connectivity; no additional configuration is needed. For more information about the LED meanings, see the “GigaStack GBIC LEDs” section on page 1-2 and the “GBIC Module Slot LEDs” section on page 1-3.



Troubleshooting

Table 3-1 describes how to identify problems with the switch and GigaStack GBIC and how to resolve them.

Table 3-1 Common Problems and Their Solutions

Symptom	Possible Causes	Corrective Action
GBIC module slot LED is amber.	Spanning Tree Protocol (STP) is checking for loops. Port is initializing, it was disabled by management or an address violation, or it was blocked by STP.	Wait for STP to complete its search. The LED turns green when STP completes its check. Use the Cluster Management Suite or the IOS command-line interface to check the status of the port and to enable it.
GBIC module slot LED is flashing green and amber.	Port is experiencing error frames. This could be due to a duplex mismatch caused by autonegotiation, collisions, cyclic redundancy check (CRC) errors, or alignment errors.	Remove and reinsert the GigaStack GBIC.
GBIC module slot LED is off.	Device has no power. No link or port was shut down administratively. Bad cable.	Ensure that the switch and the target device have power. Verify that the GBIC cable is connected to another active network device and that the port is not shut down. Replace with a known good cable.

Table 3-1 Common Problems and Their Solutions (continued)

Symptom	Possible Causes	Corrective Action
GigaStack GBIC LED blinks any color for more than 1 minute.	Link flap (the link keeps going up and down).	<p>Remove and reinsert the GigaStack GBIC.</p> <p>Upgrade all the switches in a series to the same software version; otherwise, the loop-breaking algorithm might never resolve itself. For example, if the stack includes only Catalyst 2900 series XL and 3500 series XL switches, they must run Release 12.0(5)XU or later. If the stack includes a mixture of Catalyst 2900 series XL, 3500 series XL, 2950, and 3550 switches, all the 2900 XL and 3500 XL switches must run Release 12.0(5)XW or later, all Catalyst 2950 switches must run Release 12.1(6)EA2 or later, and all Catalyst 3550 switches must run Release 12.1(4)EA1 or later.</p> <p>If no loop exists in the GigaStack GBIC stack, you can disable the loop-breaking algorithm by using the no gigastack loop-breaking <i>[interface-id]</i> global configuration command.</p>
GigaStack GBIC LED color is incorrect (for example, the GBIC is not connected to another device, but the LED is green).	The GigaStack GBIC is in an indeterminate state.	Remove and reinsert the GigaStack GBIC.



Technical Specifications

Table A-1 lists the technical specifications and regulatory agency approvals for the GigaStack GBIC.

Table A-1 *Technical Specifications*

Environmental Ranges	
Operating temperature	32 to 113°F (0 to 45°C)
Storage temperature	-4 to 149°F (-20 to 65°C)
Operating humidity	10 to 85% (noncondensing)
Storage humidity	5 to 95% (noncondensing)
Operating altitude	Up to 10,000 ft (3000 m)
Storage altitude	Up to 15,000 ft (4570 m)
Power Consumption	2W
Physical Dimensions (H x W x D)	0.75 x 1.54 x 3.5 in. (1.90 x 3.91 x 8.89 cm)
Weight	0.11 lb (0.05 kg)

Table A-1 *Technical Specifications (continued)*

Agency Approvals	
Safety	EMI
AS/NZS 3260, TS001	FCC Part 15 Class A
UL 1950/CSA 22.2 No. 950	EN 55022A Class A (CISPR 22 Class A)
IEC 950/EN 60950	VCCI Class A
CE	AS/NRZ 3548 Class A
	BCIQ
	CE



Connectors and Cables

This appendix describes the Cisco proprietary cables and connectors for the GigaStack GBIC.

GigaStack GBIC Cabling

The GigaStack GBIC uses proprietary connectors as shown in Figure B-1.

Figure B-1 GigaStack GBIC Connector



The GigaStack GBIC cables are proprietary, high-data-rate cables with enhanced signal integrity and EMI performance.



Caution

Do not use standard IEEE 1394 cables with the GigaStack GBIC. You must use one of the Cisco proprietary cables (CAB-GS-50CM or CAB-GS-1M). If you use any other cable, you will not have connectivity.



Caution

Do not use the GigaStack GBIC with standard IEEE 1394 equipment. You might damage the equipment or lose data.



Translated Safety Warnings

This appendix repeats the warnings in this guide in multiple languages.

Product Disposal



Warning

Ultimate disposal of this product should be handled according to all national laws and regulations.

Waarschuwing

Het uiteindelijke wegruimen van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

Varoitus

Tämä tuote on hävitettävä kansallisten lakien ja määräysten mukaisesti.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

Warnung

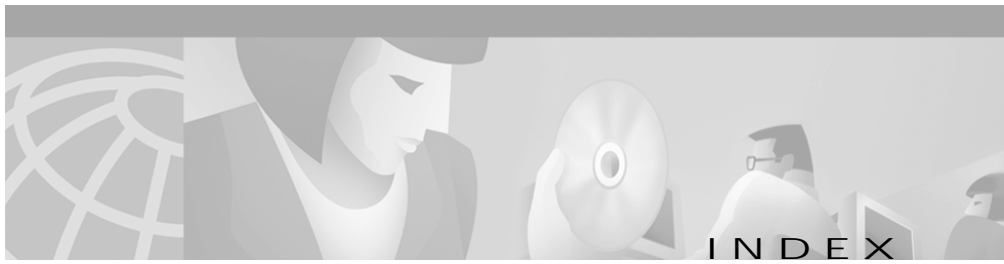
Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

Avvertenza

Lo smaltimento di questo prodotto deve essere eseguito secondo le leggi e regolazioni locali.

Product Disposal

- Advarsel** Endelig kassering av dette produktet skal være i henhold til alle relevante nasjonale lover og bestemmelser.
- Aviso** Deitar fora este produto em conformidade com todas as leis e regulamentos nacionais.
- ¡Advertencia!** Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.
- Varning!** Vid deponering hanteras produkten enligt gällande lagar och bestämmelser.
-



Numerics

- 1000BASE-X module
 - description 1-7
 - IEEE standards 1-7

A

- agency approvals A-2
- alignment errors 1-4
- autonegotiation 2-7

C

- cable
 - 1-m cable availability 2-1
 - description and cautions B-1
 - guidelines 1-5, B-1
 - lengths 1-5
 - part numbers 1-5, B-1
 - proprietary requirements 1-5
 - standard IEEE 1394 cable caution 1-5, B-1
- Cisco IOS command-line interface, (CLI) 1-2
- Cisco Technical Assistance Center xxi
- clip, attaching 2-6 to 2-7

- Cluster Management Suite (CMS) 1-2
- collision errors 2-13
- CRC errors 1-4

D

- definitions, notes, cautions, warnings xiv
- deployment examples 1-9 to 1-10
- disabled port 1-4
- distance limitations 1-5
- documentation
 - feedback xix
 - obtaining
 - CD-ROM xix
 - world wide web xviii
 - ordering xix
 - related xvii
- duplex mode, recommended 2-7

E

- electrostatic discharge (ESD) 2-4
- EMC regulatory statements 2-2
- EMI agency approvals A-2

error frames

- detecting 3-1
- LED indication 1-4
- Spanning Tree Protocol 3-1

F

- features 1-1 to 1-2
- feedback to Cisco Systems, web xix

G

- GigaStack cable connector, *see* clip
- GigaStack GBIC
 - cabling guidelines 1-5
 - connecting ports 2-7
 - definition xiii
 - deployment examples
 - cascaded connection 1-9
 - point-to-point connection 1-10
 - installing 2-4
 - keyed insertion protection 2-4
 - LED descriptions 1-3
 - minimum IOS Release 1-7
 - part number 1-1
 - recommended duplex mode 2-7
 - redundant loop support 1-7, 2-12
 - removing 2-13
 - specifications A-1 to A-2

- supported switches 1-6

GigaStack Gigabit Interface Converter,
see GigaStack GBIC

I

- IEEE 1394 (standard) cable caution 1-5
- IEEE standards
 - 802.1Q 2-9
 - 802.3Z 1-7
- installation procedure 2-4 to 2-7
- Inter-Switch Link (ISL) mode, support 2-9
- IOS software
 - illegal loops with 2-12
 - support 1-2, 1-7
- IP address, managing a stack 1-1

L

- LEDs
 - color meanings 1-2 to 1-4
 - during Spanning Tree Protocol 2-7
 - POST failure 1-3
 - troubleshooting 3-1 to 3-2
- link, point-to-point 1-1
- link flap 3-2
- loop detection 2-12

N

network examples 1-9
note definition xiv

P

packing list 2-1
POST
 conditional limitations 2-14
 LED indicator 1-3
power-on self-test, *see* POST
product disposal C-1

R

redundant links
 configuration example 2-12
 supported IOS Release 1-7, 2-12
regulatory statements 2-2
related publications xvii
removing a GigaStack GBIC 2-13

S

safety
 agency approvals A-2
 warnings, translated C-1

Spanning Tree Protocol

 LED state during 2-7
 port blocking 1-4
specifications A-1
stacking
 full-duplex cascaded example 1-10
 half-duplex cascaded example 1-9
 redundant link example 2-12
switches, supported
 IOS release requirements 1-7
 support for GigaStack GBIC 1-6

T

TAC

 described xxi
 toll-free telephone numbers xxii
technical assistance
 Cisco.com xx
 TAC website xxi
technical specifications A-1
topology
 cascaded 1-9
 point-to-point 1-10
 redundant link 2-12
troubleshooting 3-1 to 3-2
trunking 2-9

U

URLs, Cisco xviii

W

warnings, Product Disposal C-1

World Wide Web, documentation from xviii

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