Cisco 12016, Cisco 12416, and Cisco 12816 Router Blower Module and Air Filter Replacement Instructions

Cisco Product Numbers: GSR16-BLOWER=, 12000/10/16-BLWER=, ACS-GSR16-FLTR=

This publication contains removal and replacement procedures for the blower module and chassis air filter in Cisco 12016, Cisco 12416, and Cisco 12816 routers. Unless otherwise noted, all information in this publication applies to all router models.

Note The illustrations in this guide represent both the original and newer enhanced capacity blower modules, and air filters for the Cisco 12016, Cisco 12416, and Cisco 12816 routers. Depending on your system, these components may not look *exactly* like those in your chassis, but the removal and replacement procedures are essentially the same. For clarity, most chassis covers are not shown in the illustrations.

Blower Module Compatibility

There are currently two types of blower modules in use for the Cisco 12016, Cisco 12416, and Cisco 12816 routers; blowers that shipped with original systems, and enhanced capacity blowers that ship with current systems.

If you are replacing an:

- Original blower module (GSR16-BLOWER=)—Use an original blower module *or* enhanced capacity blower modules as replacements.

Caution You cannot mix original and enhanced capacity blower modules in the same chassis. Both the upper and lower blower modules must be identical.

- Enhanced capacity blower module (12000/10/16-BLWER=)—Use an enhanced capacity blower module as a replacement.

CISCO SYSTEMS

Contents

The following sections are included in this publication:

Prerequisites and Preparation

Before you perform any of the procedures in this guide, we recommend that you:

- Read the safety and ESD-prevention guidelines in this section.
- Ensure that you have all of the necessary tools and equipment before beginning the installation (see the "Installation Guidelines" section on page 4).
- Have access to the following documents during the installation:
  - *Regulatory Compliance and Safety Information for the Cisco 12016, Cisco 12416, and Cisco 12816 Series Router* publication that shipped with the router (PN 78-4347-xx)
  - *Cisco 12016, Cisco 12416, and Cisco 12816 Router Installation and Configuration Guide*

For additional information about obtaining documentation see the "Obtaining Documentation" section on page 14.

Safety Guidelines

Before you perform any procedure in this publication, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, may harm you. A warning symbol precedes each warning statement. The following warning is an example of a safety warning. It identifies the warning symbol and associates it with a bodily injury hazard.

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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 standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the Regulatory Compliance and Safety Information document that accompanied this device.**

Preventing Electrostatic Discharge Damage

Many router components can be damaged by static electricity. Not exercising the proper electrostatic discharge (ESD) precautions can result in intermittent or complete component failures. To minimize the potential for ESD damage, always use an ESD-preventive antistatic wrist strap (or ankle strap) and ensure that it makes good skin contact.
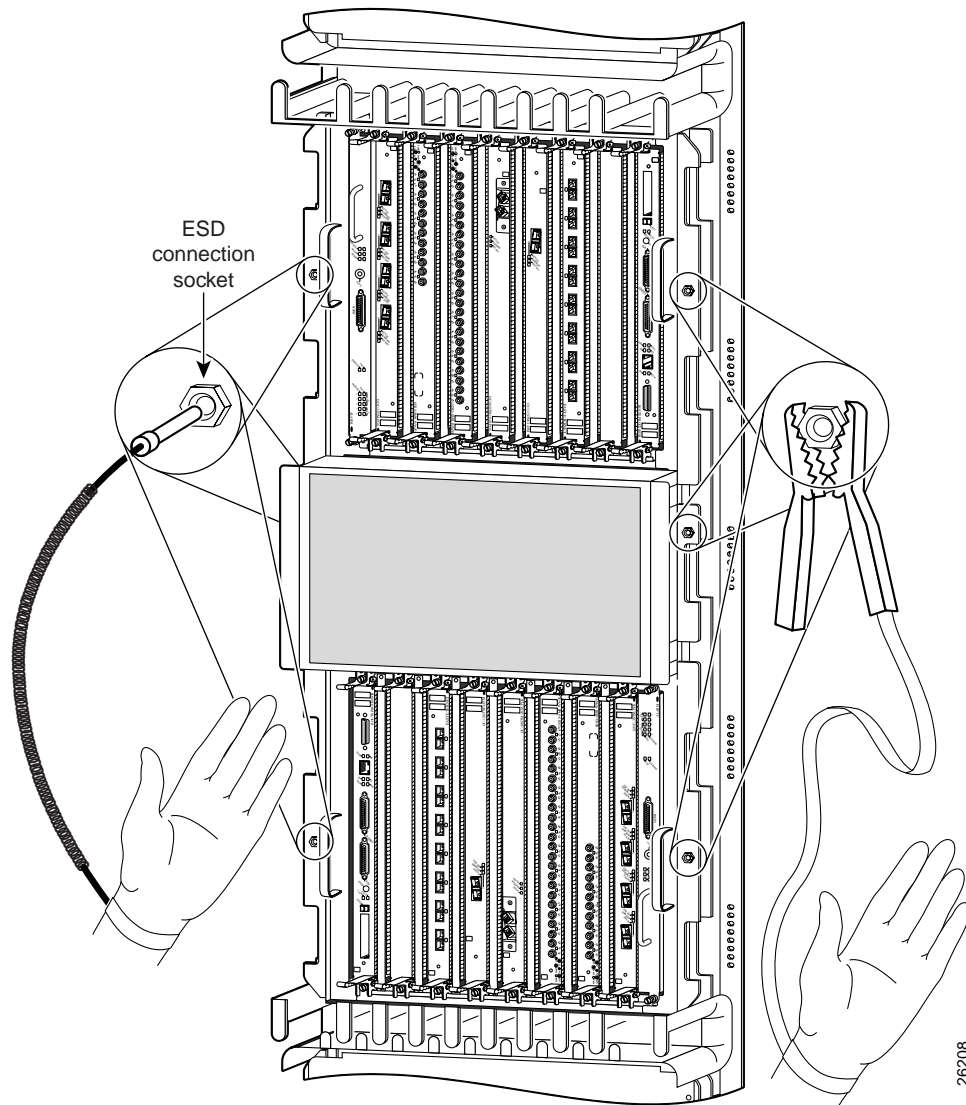
Note You should periodically check the resistance value of the ESD-preventive strap. Ensure the measurement is between 1 and 10 megohms.

Before performing the procedures in this guide, attach an ESD-preventive strap to your wrist and connect the leash to the chassis or to another grounded, bare metal surface as shown in Figure 1.

Figure 1   Connecting an ESD-Preventive Wrist Strap to the Chassis

ESD connection socket

26208

Installation Guidelines

The blower modules support online insertion and removal (OIR), so you can remove and install a blower module while the system remains powered on without presenting an electrical hazard or damage to the system. You can replace a blower module while the system maintains all routing information and ensures session preservation.

⚠ **Caution**   Although the blower module supports OIR and can be replaced without interruption to system operation, the system should not operate without a blower module for more than 3 minutes to prevent overheating.

⚠ **Caution**   You cannot mix blower types within the chassis. If you are replacing a blower module from an old system (GSR16-BLOWER=), you must replace both upper and lower blower modules with new, higher capacity replacement blowers (12000/10/16-BLWER=). Although the blower modules can be replaced without interruption to system operation, the system should not operate with mixed blower modules in the router for more than 5 minutes.

Required Tools and Equipment

You need the following tools and equipment to install the blower module:

- Number 2 Phillips screwdriver
- 3/16-inch flat-blade screwdriver
- An electrostatic discharge (ESD) preventive wrist or ankle strap with connection cord
- Vacuum cleaner (to clean the air filters)

Removing and Replacing the Blower Modules

This section contains the procedure to remove and replace the upper or lower blower modules from the chassis. *Before* beginning either of these procedures, be sure to read the "Installation Guidelines" section on page 4.

Upper and Lower Blower Module Orientation

Illustrations in this procedure show the removal and replacement of the upper blower module. The procedure to replace the lower blower module is the same *except for the orientation of the blower module*.

- Heads-up orientation—Install the blower module in the upper bay in the "heads-up" orientation with the three fan air intake openings face down.
- Heads-down orientation—Install the blower module in the lower blower module bay in the "heads-down" orientation with the three fan air intake openings face up.
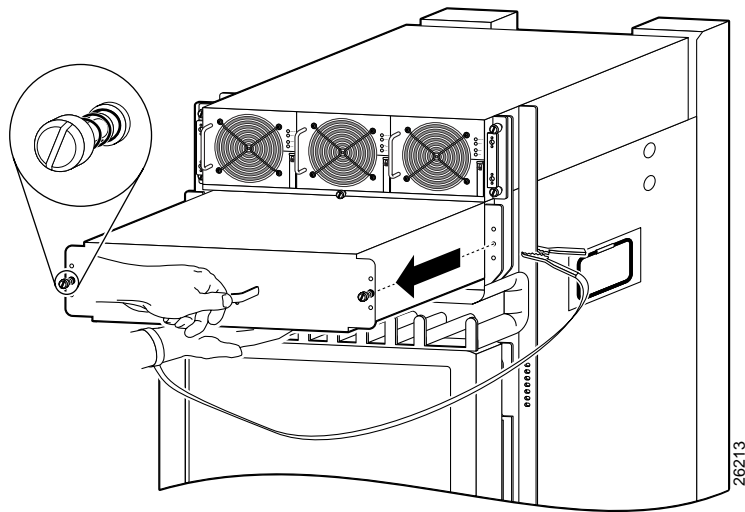
Use the following procedure to remove and replace the blower modules.

Step 1 Remove the blower module from the chassis (Figure 2):

   a. Loosen the captive screw on each side of the blower module.

   b. Pull out the blower module halfway from the module bay.

   c. Slide out the blower module completely from the module bay while supporting it with your other hand.

Warning **The blower module weighs approximately 20 pounds (9 kg). Use two hands when handling the blower module.**

Figure 2   *Removing the Upper Blower Module*

Step 2 Install the new blower module into the chassis (Figure 3):

    a. Lift the blower module (with two hands) and slide it halfway into the module bay.

    b. Slowly push the blower module into the chassis until it mates with the backplane connector at the back of the module bay.
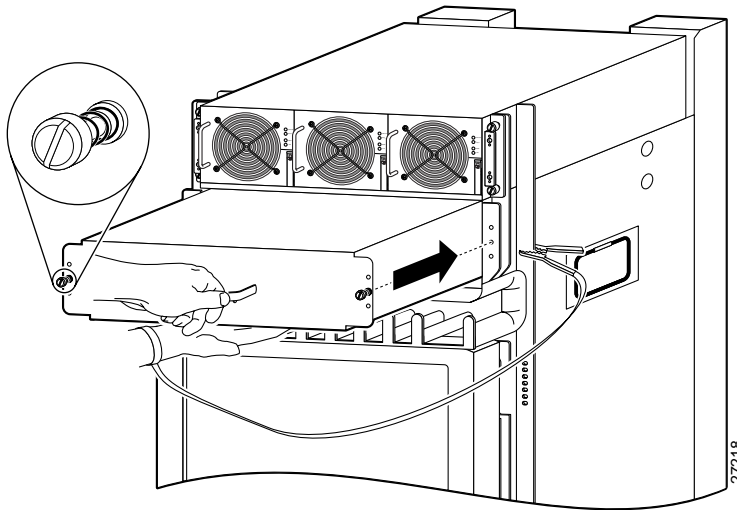
⚠

Caution   To prevent damage to the connectors, do not use excessive force when inserting the blower module into the chassis.

    c. Tighten the captive screws on the blower module to secure it to the chassis.

    • The (green) OK status indicator on the front of the blower module should light. If the OK indicator does not light, see the "Troubleshooting the Installation" section on page 7.

Figure 3   *Installing the Upper Blower Module*

Troubleshooting the Installation

Use the following procedure to troubleshoot a blower module if it is not operating properly after installation.

Step 1   Be sure the router is powered on and that all power cords are connected properly.

Step 2   Loosen the captive screws and reseat the blower module to the chassis.

- Retighten the captive screws to ensure the blower module is properly seated to the backplane connector.

Step 3   Check the blower module status indicators:

- OK (green)—Indicates that the blower module is operating normally. This indicator should light as soon as the blower module is installed and receives power from the backplane connector.

  - If this indicator remains on, and the blower module fans fail to operate after several attempts to reseat the blower module, replace it with a spare.

  - If the spare blower module also fails, power off the router and contact a Cisco service representative for assistance.

- FAIL (red)—This indicator remains off during normal operation. If this indicator is on, the system has detected a fan failure or other fault in the blower module.

  - If this indicator remains on, and the blower module fans fail to operate after several attempts to reseat the blower module, replace it with a spare.

  - If the spare blower module also fails, power off the router and contact a Cisco service representative for assistance.

Cleaning or Replacing the Chassis Air Filter

The Cisco 12016, Cisco 12416, and Cisco 12816 routers are equipped a user-serviceable air filter that removes dust drawn into the router. One time per month (or more often in dusty environments), examine the air filter for damage and cleanliness.

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Caution   Damage to the air filter can restrict the airflow, cause overheating in the router, and degrade EMI performance. Be careful when cleaning and replacing the filter.

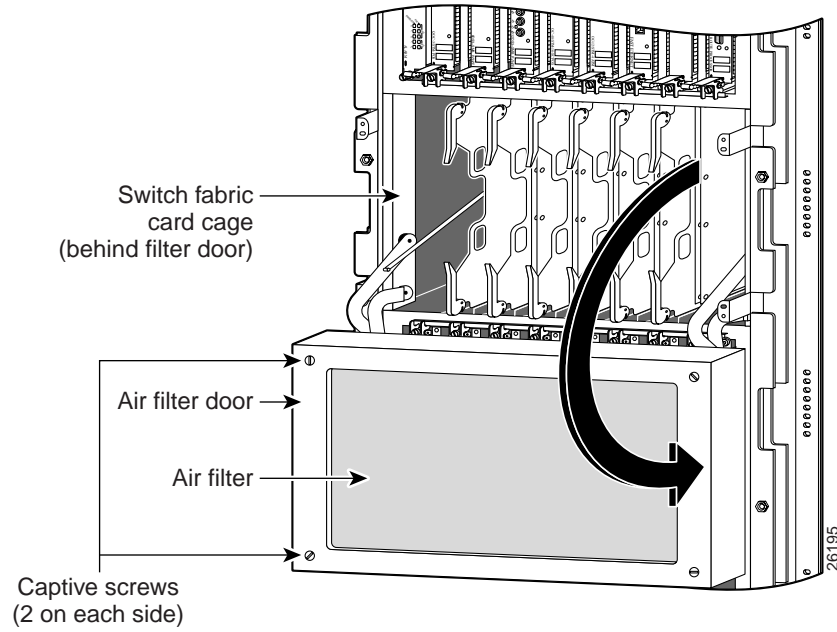Use the following procedure to clean or replace the air filter.

Step 1   Loosen the captive screws on the air filter door and pivot the door open (Figure 4).

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Caution   If the router uses an extended front cover bezel, the air filter door does not have enough space to open completely. Before you open the air filter door, you must remove the extended front cover.

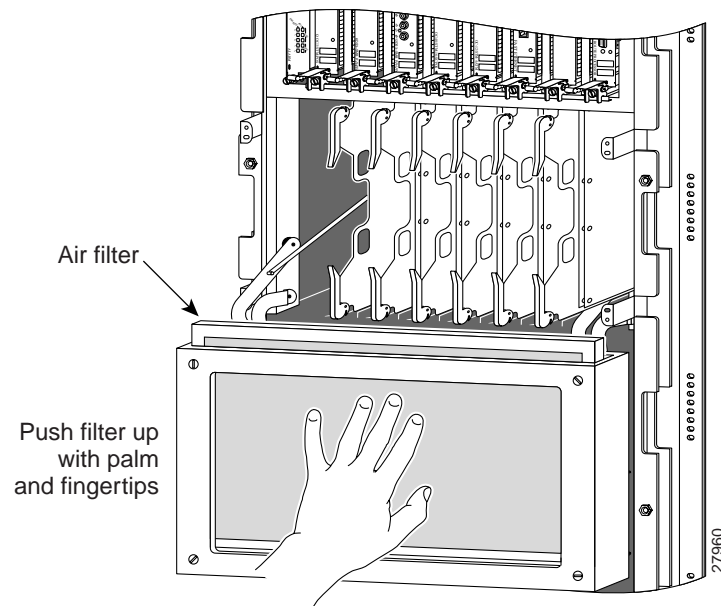*Figure 4   Opening the Chassis Air Filter Door*

Switch fabric card cage (behind filter door)

Air filter door

Air filter

Captive screws (2 on each side)

26195

Step 2 Lift up the air filter and carefully slide it out the door (Figure 5).

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Caution Be careful not to damage the honeycomb screens on the back of the air filter door and in the fabric card cage. Damage to the honeycomb screens can restrict airflow, cause overheating, and affect EMI performance.

Figure 5   Removing the Chassis Air Filter

Air filter

Push filter up
with palm
and fingertips

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Step 3 Visually check the condition of the air filter to determine whether to clean or install a new replacement.
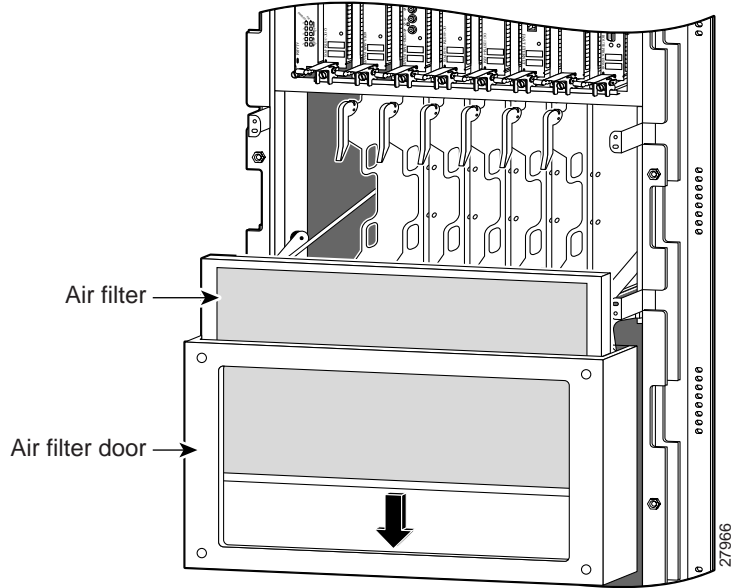
- Dirty—You can vacuum or replace the filter.

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Caution Do not vacuum the air filter while it is installed in the chassis. You must remove the air filter completely before you clean it to prevent contaminants from being drawn into the bays or cage.

- Worn or torn—If the filter appears worn or torn, dispose of it in a responsible manner and install a replacement air filter (ACS-GSR16-FLTR=).

Step 4   Position the metal braces on the back of the air filter to face toward the switch fabric and alarm card cage. Slide the new or cleaned air filter into the air filter door (Figure 6).

Figure 6   Installing the Chassis Air Filter
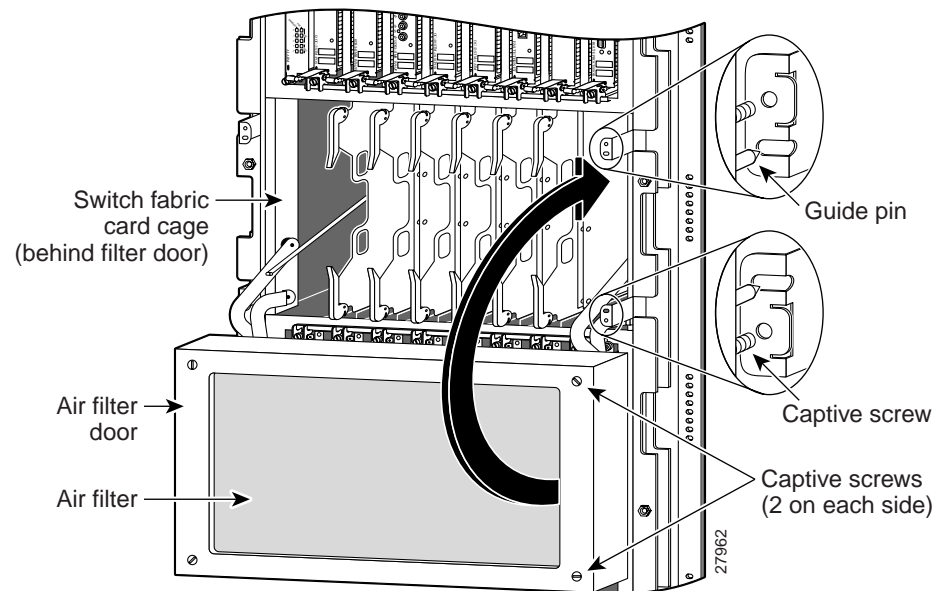

Air filter

Air filter door

Step 5   Lift up the air filter door so that the four guide pins are inserted in the corresponding holes on each side of the switch fabric card cage (Figure 7).

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Caution   Align and seat the door carefully to avoid damaging the EMI-preventive gasket contacts on the door.

Figure 7   *Closing the Chassis Air Filter Door*

Step 6   Tighten the captive screws to secure the door to the chassis.

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Caution   The air filter door must be closed and secured at all times to maintain correct EMI performance.

Regulatory, Compliance, and Safety Information

This section includes regulatory, compliance, and safety information.

Translated Safety Warnings and Agency Approvals

The complete list of translated safety warnings and agency approvals is available in the *Regulatory Compliance and Safety Information for Cisco 12016, Cisco 12416, and Cisco 12816 Series routerss* publication (PN 78-4347-xx).

Electromagnetic Compatibility Regulatory Statements

FCC Class A Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

Modifying the equipment without Cisco authorization may result in the equipment no longer complying with FCC requirements for Class A digital devices. In that event, your right to use the equipment may be limited by FCC regulation and you may be required to correct any interference to radio or television communication at your own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.

- Move the equipment to one side or the other of the television or radio.

- Move the equipment farther away from the television or radio.

- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

CISPR 22

This apparatus complies with CISPR 22/EN55022 Class B radiated and conducted emissions requirements.

Canada

English Statement of Compliance

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

French Statement of Compliance

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

Europe—EU

This apparatus complies with EN55022 Class B and EN55024 standards when used as ITE/TTE equipment, and EN300386 for Telecommunications Network Equipment (TNE) in both installation environments, telecommunication centers and other indoor locations.

VCCI Class A Notice for Japan

Warning
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. Statement 191

警告 これは、情報処理装置等電波障害自主規制協議会（VCCI）の規定に基づくクラスＡ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取るように要求されることがあります。

Class A Notice for Hungary

Warning
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. Statement 256

Figyelem
Figyelmeztetés a felhasználói kézikönyv számára: Ez a berendezés "A" osztályú termék, felhasználására és üzembe helyezésére a magyar EMC "A" osztályú követelményeknek (MSZ EN 55022) megfeleloen kerülhet sor, illetve ezen "A" osztályú berendezések csak megfelelo kereskedelmi forrásból származhatnak, amelyek biztosítják a megfelelo speciális üzembe helyezési körülményeket és biztonságos üzemelési távolságok alkalmazását.

Class A Notice for Taiwan and Other Traditional Chinese Markets

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Warning   **This is a Class A Information Product, when used in residential environment, it may cause radio frequency interference, under such circumstances, the user may be requested to take appropriate countermeasures.** Statement 257

警告   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。

Class A Notice for Korea

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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.** Statement 294

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잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

    http://www.cisco.com/en/US/partner/ordering/index.shtml

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

You can send your comments in e-mail to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, the Cisco Technical Assistance Center (TAC) provides 24-hour, award-winning technical support services, online and over the phone. Cisco.com features the Cisco TAC website as an online starting point for technical assistance.

Cisco TAC Website

The Cisco TAC website (http://www.cisco.com/tac) provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The Cisco TAC website is available 24 hours a day, 365 days a year.

Accessing all the tools on the Cisco TAC website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

http://tools.cisco.com/RPF/register/register.do

Opening a TAC Case

The online TAC Case Open Tool (http://www.cisco.com/tac/caseopen) is the fastest way to open P3 and P4 cases. (Your network is minimally impaired or you require product information). After you describe your situation, the TAC Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using these recommendations, your case will be assigned to a Cisco TAC engineer.

For P1 or P2 cases (your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

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

TAC Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is "down" or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Priority 4 (P4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:

    http://www.cisco.com/en/US/products/products_catalog_links_launch.html

- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

    http://www.ciscopress.com

- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access *Packet* magazine at this URL:

  http://www.cisco.com/go/packet

- *iQ Magazine* is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access *iQ Magazine* at this URL:

  http://www.cisco.com/go/iqmagazine

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:

  http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

  http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html

This document is to be used in conjunction with the *Cisco 12016, Cisco 12416, and Cisco 12816 Router Installation and Configuration Guide*.