



Cisco uBR10012 Universal Broadband Router Performance Routing Engine Module

Document Revision History

Date	Revision	Reason
7/11/2012	OL-5096-04	Added upgrading the FPGA Image on PRE4 modules.
11/29/2010	OL-5096-03	This document was updated with the PRE4 module information for Cisco IOS Release 12.2(33)SCE.
12/15/2008	OL-5096-02	The document is updated with the PRE4 information and the OBFL feature.
12/18/2004	OL-5096-01	Moved document to online only, update with PRE2 information.
11/31/2001	78-11489-02	Original publication. This document is obsolete.

Contents

This document explains the objectives, intended audience, and scope of this publication and provides instructions and other information on installation, removal and troubleshooting of Performance Routing Engine (PRE) on Cisco universal broadband router.

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Purpose

The purpose of this document is to provide installation, removal, and troubleshooting information for the Performance Routing Engine (PRE) module installed in the Cisco uBR10012 universal broadband router.

Audience

This document is intended for use by a field service engineer who is familiar with Cisco products and headend cable installation procedures.



Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030.

Scope

This document includes procedures for installing and removing the Cisco uBR10012 Performance Routing Engine (PRE) module installed in the Cisco uBR10012 universal broadband router. This document also includes technical specifications and troubleshooting information.



Note

Unless otherwise indicated, all references to PRE in this document refer to the PRE, PRE2, and PRE4 modules.

Overview

The PRE module is a single-slot module used with the Cisco uBR10012 universal broadband routers. The PRE performs all Layer 2 and Layer 3 packet routing and forwarding by using an advanced parallel processing architecture called Parallel eXpress Forwarding (PXF). This process separates the control plane from the data plane. The PXF architecture supports high-performance throughput with IP services enabled on every port.

A general-purpose RISC processor supports high-performance Layer 3 forwarding of traffic. The combination of a general purpose RISC processor with advanced programmable PXF network processors provide the capacity to support the aggregation of thousands of active connections in a single Cisco uBR10012 chassis, even when supporting IP applications, such as access policy filtering, rate-based queuing, and quality of service (QoS).

PRE Module Models

There are three models of PRE modules:

- PRE1 module—Began shipping with Cisco IOS Release 12.2(4)XF
- PRE2 module—Began shipping with Cisco IOS Release 12.3(9a)BC
- PRE4 module—Began shipping with Cisco IOS Release 12.2(33)SCB



Note

Use the **show version** command to determine which PRE module (PRE1, PRE2, or PRE4) is installed on your router, and which PRE module is the active processor module.

PRE1 Modules

The PRE1 module supports error checking and correction (ECC) for all onboard memory, replacing the simpler parity error algorithm.

Because parity error detection can only detect errors, the ECC feature helps protect against processor downtime by correcting errors and detecting them. The PRE1 module can automatically correct single-bit errors as small as one bit per nibble, protecting the PRE1 module from memory corruption due to transient memory problems.

The ECC feature is also more sensitive and precise in detecting errors. The PRE1 module can detect an error in only one bit out of each 64-bit block. It can also detect errors in two, three, or four bits in each 64-bit block.

The Cisco IOS Release 12.2(4)XF automatically enables the ECC feature on PRE1 modules. Two command-line interface (CLI) commands are enhanced to provide information about ECC operation:

- **show hardware pxf xcm**—Adds a display for the ECC counters for each PRE1 module. For the older PRE modules, this command shows the message “ECC is not supported for this revision.”
- **clear pxf xcm counters**—Adds support for clearing the ECC counters.

PRE2 Module

PRE2 modules are designed to address Internet service provider (ISP) requirements. The PRE2 has four PFX network processors (containing 64 individual processors) with two independent 32-MB SDRAM control memories on each processor set. The PRE2 provides 6.2 Mpps¹ of processing power and has a 500-MHz RM7000 Mpps processor with integrated 16-KB data and 16-KB instruction Level 1 caches, an integrated 256-KB Level 2 cache, and a 4-MB Level 3 cache. Cisco IOS Release 12.3(9)BC automatically enables the following features:

- Route Processor Redundancy Plus (RPR+)
- The PRE2 has a higher packet per second (PPS) forwarding—6.2 Mpps processing power
- Software features available with PRE2 and Cisco IOS Release 12.3(9)BC:

1. Mpps—Million packets per second.

- EtherChannel
- TLS 802.1q
- NetFlow

**Note**

Cisco IOS Release 12.2(15)BC2 and later releases change the **show hardware pxf xcm** command to **show pxf xcm**. Cisco uBR10012 PRE2 modules do not support the older command.

Refer to the *Cisco IOS CMTS Cable Command Reference* for additional information:

http://www.cisco.com/en/US/docs/ios/cable/command/reference/cbl_book.html

PRE4 Module

The Performance Routing Engine 4 (PRE4) is the fifth-generation Parallel eXpress Forwarding (PXF) packet processing and scheduling engine. The PRE4 performs all Layer 2 and Layer 3 packet manipulation related to routing and forwarding. The advanced application-specific integrated circuit (ASIC) technology of PRE4 supports high performance throughput with IP services enabled on each port.

The PRE4 runs Cisco IOS Release 12.2(33)SCB and later releases. Benefits of the PRE4 include:

- 800 MHz dual processor
- 64 PXF network processors arranged as 8 columns and 8 rows
- 512 MB packet buffer (17 Gbps bi-directional throughput) and 128 MB control memory with error checking and correction (ECC)
- 4 GB ECC-protected Route Processor (RP) memory
- 10 Mpps forwarding performance through the PXF complex
- 5.6 Gbps backplane bandwidth for each full-height backplane slot
- 2.8 Gbps backplane bandwidth for each half-height backplane slot
- 11.2 Gbps backplane bandwidth for each SPA interface processor (SIP)
- 12.8 Gbps backplane interconnect bandwidth for each set of 4 full-height backplane slots
- Maximum transmission unit (MTU) support of 9216 bytes
- An external CompactFlash Disk slot
- A 100 Mb/s Ethernet interface for communication between redundant PRE4s
- Increased port density (supports 10 Gigabit Ethernet line cards over the Cisco SIP-600)
- Hierarchical Queueing Framework (HQF) that provides up to three levels of service granularity

PRE Redundant Operation

In Cisco IOS Release 12.2(4)XF and later Cisco IOS releases, the PRE module supports redundant operation when installing two PRE modules in a Cisco uBR10012 chassis. If the primary PRE fails, the secondary PRE automatically takes over operation of the chassis. Because all Cisco uBR10012 line cards are physically connected to both the primary and secondary PRE modules, switchover of PRE

modules does not require human intervention to reset the line cards as they automatically fail over to the redundant PRE. This also means that the PRE module is hot-swappable (assuming the availability of the redundant PRE).

Physical Description

Figure 1 Cisco PRE1 Faceplate

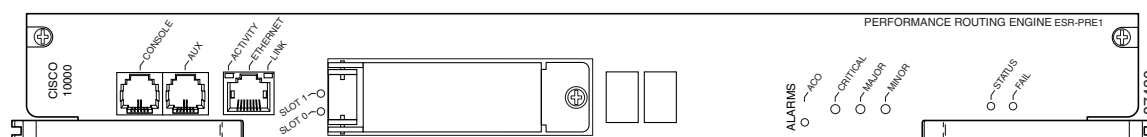


Figure 2 Cisco PRE2 Faceplate

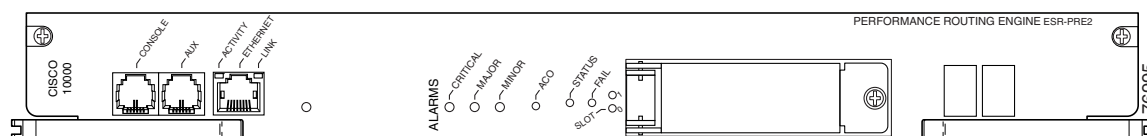
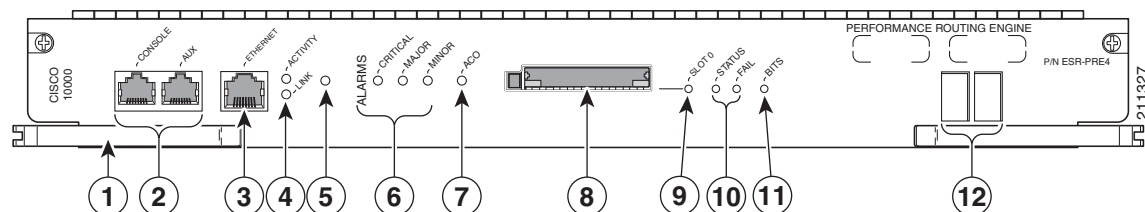


Figure 3 Cisco PRE4 Faceplate



1	Ejector levers	7	ACO (Alarm Cut-Off button)
2	Console and Auxiliary ports	8	CompactFlash Disk slot
3	Network Management Ethernet (NME) port	9	Slot 0 (disk0) LED
4	NME Activity and Link LEDs	10	STATUS, FAIL LEDs
5	Reset button	11	Building Internal Timing Source (BITS) LED
6	Alarms: CRITICAL, MAJOR, MINOR LEDs	12	Alphanumeric display

Connector Ports

The front panel on the PRE contains three ports with RJ-45 connectors (see [Figure 1](#)):

- Console port—This asynchronous EIA/TIA-232 serial port is used to connect a terminal to the PRE for local administrative access.
- Auxiliary port (AUX)—This asynchronous EIA/TIA-232 serial port is used to connect a modem to the PRE for remote administrative access.
- Fast Ethernet port—This Fast Ethernet port is used to connect the PRE to a 10/100BASE-T network management LAN.

**Tip**

The FastEthernet interface on the PRE module is intended for network management access and should not be used for WAN connectivity purposes. For WAN connections, use the appropriate network uplink cards, which take full advantage of the system's high-performance PXF processing subsystem.

**Note**

The PRE module also contains an internal Ethernet interface (**ethernet0/0/0**) that it uses for inter-module communications. Do not confuse this internal interface, which is not user-accessible or user-configurable, with the PRE module's external Fast Ethernet interface (**fastethernet0/0/0**).

PC Media Card Slots

The two PC media card slots on the PRE1 and PRE2 can store the Cisco IOS image or system configuration file. The single CompactFlash Disk on the PRE4 can store the Cisco IOS image or system configuration file. The system can also boot from the software stored on the PC media card or CompactFlash Disk. For more information about inserting and removing PC media cards from the PRE, see the “[Removing and Installing a PC Media Card](#)” section on page 30. The PC media card slots support Type I or Type II cards.

PRE LED Indicators and Buttons

LEDs on the front panel of the PRE provide a visual indication showing the status of PRE operation (see [Figure 1 on page 5](#)). The LEDs are separated into three categories:

- Alarms
- Status
- Failure

Alarm relay contacts on the Cisco uBR10012 router connect the router to a site alarm maintenance system. This allows critical, major, and minor alarms generated by the Cisco uBR10012 router to be displayed on both the PRE front panel and to external visual or audible alarms connected to the system. For more information, refer to the *Cisco uBR10012 Universal Broadband Router Hardware Installation Guide* at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/guide/hig.html>

Pressing the ACO button on the (primary) PRE during an alarm condition shuts off the external alarm, but does not deactivate the alarm LEDs on the PRE front panel. Alarm LEDs on the front panel are deactivated only after the condition that caused the alarm is corrected.

[Table 1](#) describes the LEDs and buttons on the PRE front panel. The slot and some of the LEDs are specific to the PRE4 front panel.

Table 1 LED Status and Button Descriptions

LEDs and Button	Status	Description
ACTIVITY	Green	Packets are being transmitted and received.
	Off	No packet activity
LINK	Green	Carrier detected; the port is able to pass traffic.
	Off	No carrier detected; the port is not able to pass traffic.
ALARMS—CRITICAL, MAJOR, and MINOR LEDs	Off	No alarm.
	Yellow	Indicates an alarm condition.
Alarm cutoff (ACO) switch	—	Pressing this switch disables an audible alarm.
CompactFlash Disk0	Green	Disk0 is active. This slot is present only on the PRE4.
STATUS	Flashing Yellow	System is booting.
	Green	PRE is ready.
	Off	No power to the PRE, or the PRE is acting as the secondary PRE.
FAIL	Off	The PRE is operating properly.
	Yellow	A major failure has disabled the PRE.
BITS	Green	This LED is specific to the PRE4. BITS input to the PRE is configured and functioning normally.
	Yellow	BITS input to the PRE is configured, but not functional. For example, the framer may have detected a Loss of Signal (LOS).
	Off	BITS input to the PRE4 is not configured.
PC media card slot 0	Green	Media card in Slot 0 is active.
PC media card slot 1	Green	Media card in Slot 1 is active.

Alphanumeric Display

The alphanumeric display on the PRE front panel provides information on the state of the PRE. The display consists of two 4-character LED panels. [Table 2](#) describes the most common messages. If you report a problem to Cisco, it is helpful to include the message on the PRE alphanumeric display in your problem report.

Table 2 Messages on PRE Alphanumeric Display

Message	PRE4 Status
1111, 2222, 3333, 4444, 5555, 6666, 7777	The PRE4 has just been powered on and is running its power-on self-test.
ROM DONE	The PRE4 has loaded the ROM monitor. This message appears briefly if the system is configured to boot a Cisco IOS software image. If the system is not configured to boot Cisco IOS, this message remains on the display and the rommon> prompt appears on the terminal window.
AUTO BOOT	The ROM monitor is preparing to boot a Cisco IOS image.
BOOT IMGE	A Cisco IOS image is starting to boot.
AUTO BOOT	The ROM monitor is preparing to boot a Cisco IOS image.
BOOT IMGE	A Cisco IOS image is starting to boot.
IOS STRT, IOS EXC, IOS FPGA, IOS FPOK, IOS FILE, IOS STBY, IOS INTF, IOS MEM, IOS DRVR, IOS LIB, IOS MGMT, IOS PROT, IOS CONF	These messages appear in quick succession during the boot process.
IOS RUN	[On the primary PRE4] The PRE4 has finished booting and is running Cisco IOS. This is the normal operating status for the primary PRE.
IOS STBY	[On the secondary PRE4] The PRE4 is in standby mode and ready to take over if the primary PRE4 fails. This is the normal operating status for the secondary PRE4.

PRE Disposal

The PRE contains a small lithium battery. Some jurisdictions restrict the ways in which you can dispose of items containing lithium batteries. In particular, never dispose of lithium batteries or products containing lithium batteries in an unregulated fire. Other restrictions may apply in your area.



Warning

Ultimate disposal of this product should be handled according to all national laws and regulations.
Statement 1040

Part Numbers and Technical Specifications

Table 3 lists the specifications for the PRE modules.

Table 3 PRE Specifications

Description	Specifications
Product order numbers	PRE1 modules: <ul style="list-style-type: none"> • ESR-PRE1 (Primary and redundant) • ESR-PRE1= (Spare) PRE2 modules <ul style="list-style-type: none"> • ESR-PRE2/R (Primary and redundant) • ESR-PRE2= (Spare) PRE4 module <ul style="list-style-type: none"> • ESR-PRE4 • ESR-PRE4= (Spare) Blank PRE cover <ul style="list-style-type: none"> • ESR-PRE-COVER • ESR-PRE-COVER= (Spare) CompactFlash Disk <ul style="list-style-type: none"> • ESR-PRE-CF-512MB • ESR-PRE-CF-512MB= (Spare)
Per chassis	2 per chassis
Dimensions	Height: 3.46 in. (87.9 cm) Width: 19 in. (482.26 cm) Depth: 10.78 in. (273.8 cm)
Weight	PRE1: 7.5 lb (3.41 kg) PRE2: 8.45 lb (3.84 kg) PRE4: 9.0 lb (4.09 kg)
Three interface ports	RJ-45 IEE 802.3 Ethernet 100BASE-T RJ-45 auxiliary (AUX) port for modem access RJ-45 console (CON) port for terminal access
PC media card	10000-PREMEMFD64= ESR-PRE-MEM-FD128=
CompactFlash Disk	PRE4: 128 MB
Packet buffer	PRE1: 128 MB PRE2: 256 MB PRE4: 512 MB

Table 3 **PRE Specifications (continued)**

Description	Specifications
NVRAM	PRE1: 512 KB PRE2: 2 MB PRE4: 14 MB
SDRAM	PRE1: 512 MB PRE2: 1 GB PRE4: 4 GB
Power consumption	PRE1: 80 Watts (273 btu ¹ per hour) PRE2: 200 Watts (682.4 btu ¹ per hour) PRE4: 210 Watts (716.52 btu ¹ per hour)
Mean Time Between Failures (MTBF)	PRE1: 116,904 hours PRE2: 122,426 hours PRE4: 106,574 hours
Facility temperature range ²	Operating: 41 to 104° F (5 to 40° C) Storage: -38 to 158° F (-40 to 70° C)
Relative humidity	Operating: 5 to 95% Storage: 5 to 85%
Operating altitude	-197 to 13,123 ft (-60 to 4000 m)

1. British thermal units

2. This temperature range is for outside or facility temperatures, not for PRE operating temperatures. For the default alarm temperatures that trigger the inlet and core alarms, see the [“Alarm Temperature Ranges for the PRE Modules”](#) section on page 30.

EMC Compliance Notices

The PRE complies with the worldwide requirements specified by the notices in the following subsections.

USA—Class B Notices

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

Class B Notice

This product meets the requirements for a Class B digital device when STP (shielded twisted pair) cables are used.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Europe, Australia, and New Zealand Notices

- CISPR 22 Requirements:
 - EN55022:1998—European requirements.
 - AS/NZS 3548:1995—Australia and New Zealand requirements.
- General requirements:
 - All blank faceplates must be installed.
 - Shielded cables must be used.

Japan—Class B Notice

This equipment complies with the Class B equipment specified by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI).



Warning

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual. Statement 157

Korea—Class B Notice



Warning

This is a Class B Device and is registered for EMC requirements for residential use. This device can be used not only in residential areas but in all other areas. Statement 295

Safety Warnings

Before working on the equipment, be aware of the hazards involved with electrical circuitry, and follow standard safety practices to prevent accidents. For more information on warnings, see [Regulatory Compliance and Safety Information for the Cisco uBR10012 Universal Broadband Router](#).



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. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

Statement 1071

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which occurs when electronic cards or components are improperly handled, can result in complete or intermittent failures.

Following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact. Before removing a card from the chassis, connect the equipment end of the strap to a bare metal, unpainted surface on the chassis or rack-mount.
- Handle components by the carrier edges only; avoid touching the card components or any connector pins.
- When removing a module, place it on an antistatic surface or in a static-shielding bag. If the module will be returned to the factory, immediately place it in a static-shielding bag.
- Avoid contact between the modules and clothing. The wrist strap protects the card from ESD voltages on the body only; ESD voltages on clothing can still cause damage.



Caution

For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms.

Software Compatibility

The ESR-PRE1, ESR-PRE2, and ESR-PRE4 have specific Cisco IOS software requirements. For more information about Cisco IOS software releases for cable, go to the following URL:

http://www.cisco.com/en/US/products/hw/cable/ps2209/prod_release_notes_list.html

Table 4 shows the minimum required Cisco IOS software for each PRE.

Table 4 PRE Software Compatibility

PRE Product Number	Cisco IOS Software Train	Minimum Cisco IOS Software Release
ESR-PRE1	12.2(4)XF	12.2(4)XF
ESR-PRE2	12.3(9)BC	12.3(9a)BC
ESR-PRE2	12.2(33)SCB	12.2(33)SCB

Use the **show version** command to display the system software version that is currently loaded and running on the router, and to determine the type of PRE module (PRE1, PRE2, or PRE4) installed in your system.

If the output of the **show version** command indicates that the Cisco IOS software is a version earlier than the version identified in Table 4 as the minimum Cisco IOS software release, check the contents of the PC media card memory to determine if the required images are available on your system.

The output of the **show flash** command provides a list of all files. The files are stored in the PC media card memory for PRE2 modules and in the Compact Flash card for PRE4 modules. Table 5 lists the flash format for the PRE modules.

Table 5 Flash Output Format

PRE Product Number	Flash Format
ESR-PRE2	ESR-PRE-MEM-FDxxx[G]
ESR-PRE4	ESR-PRE-CF-xxx[MB GB]

If the correct software version is not installed, contact Cisco Customer Service (see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page 35).

Before You Begin

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

- Read the safety guidelines and review the electrical safety and ESD-preventive guidelines.
- Ensure that the software configuration meets the minimum requirement for installation.
- Ensure that you have all the necessary tools and equipment.
- Have a terminal console available for configuring the PRE module.
- Save your configuration information to the PC media card or TFTP server.
- Have access to online documentation for configuring the PRE module.

Removing and Replacing the PRE Module

If you are upgrading from an earlier version of PRE to PRE2 or PRE4, review the upgrade procedures in the [“Upgrading to a Cisco ESR-PRE2 or Cisco ESR-PRE4”](#) section on page 21 before continuing with this procedure.



Note

The PRE4 module has a single CompactFlash Disk slot instead of the PC media card slot.

Equipment

You need the following tools and parts to remove and replace the PRE module. If you need additional equipment, contact a service representative for ordering information:

- Replacement PRE module
- Your own ESD-prevention equipment or the disposable grounding wrist strap included with all upgrade kits, FRUs, and spares
- Antistatic mat or surface



Caution

When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the PRE module. Some platforms have an ESD connector for attaching the wrist strap.

Unpacking the PRE Module

To unpack the PRE module, complete the following steps:

- Step 1** Make sure that you are properly grounded with an ESD-preventive ground strap.
- Step 2** Open the shipping box.
- Step 3** Remove the PRE module from the box and place it on an antistatic surface.

Removing the PRE from the Chassis



Note

Modules can be hot-swapped. However, removing a PRE module terminates all traffic. We recommend that you power down the router to ensure a successful installation.



Warning

Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing. Statement 1034

To remove an existing PRE module, perform the following steps:

-
- Step 1** Attach an antistatic wrist strap to your wrist and to a bare metal surface on the chassis or frame.
 - Step 2** Save the startup configuration and running configuration to the primary PC media card or CompactFlash Disk and the redundant PC media card or the TFTP server or CompactFlash Disk.
 - Step 3** Power off the router.
 - Step 4** Disconnect the cables from the PRE.
 - Step 5** Remove the PC media card from the PRE. Remove the CompactFlash Disk in the case of the PRE4.
 - Step 6** Unscrew the top and bottom captive screws on the PRE. (See [Figure 4](#).)
 - Step 7** Simultaneously pivot both ejector levers away from each other to disengage the PRE from the backplane. (See [Figure 5](#).)
 - Step 8** Slide the PRE out of the slot ([Figure 6](#)) and place it on an antistatic surface or in an antistatic bag.
 - Step 9** If you are installing a replacement PRE, proceed to the [“Installing the PRE in the Chassis”](#) section on [page 18](#). Otherwise, install a blank PRE cover over the slot and screw down the captive screws to conclude this procedure.

**Warning**

Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.

Statement 1029

Figure 4 Loosening the Captive Screws

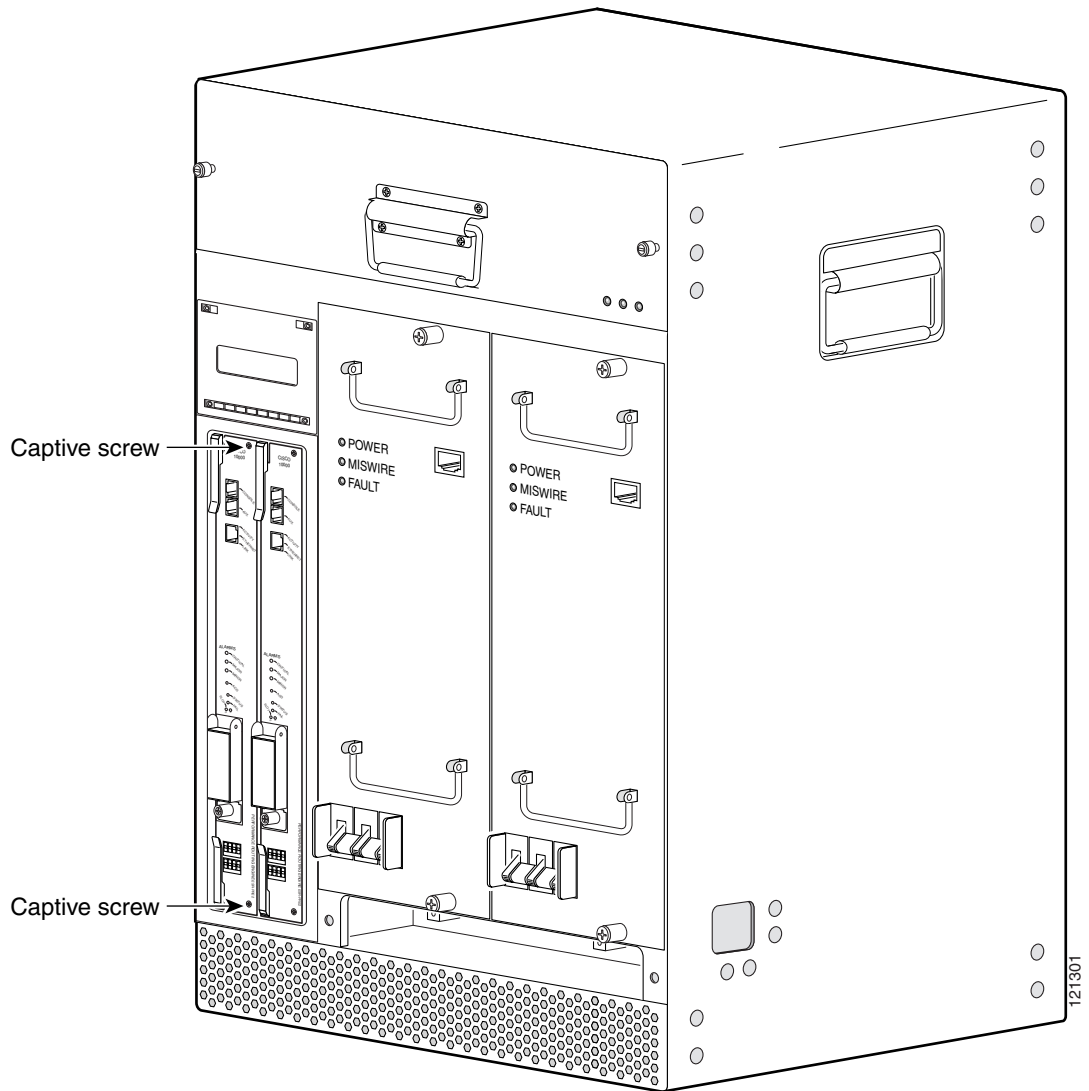


Figure 5 Opening the Ejector Levers

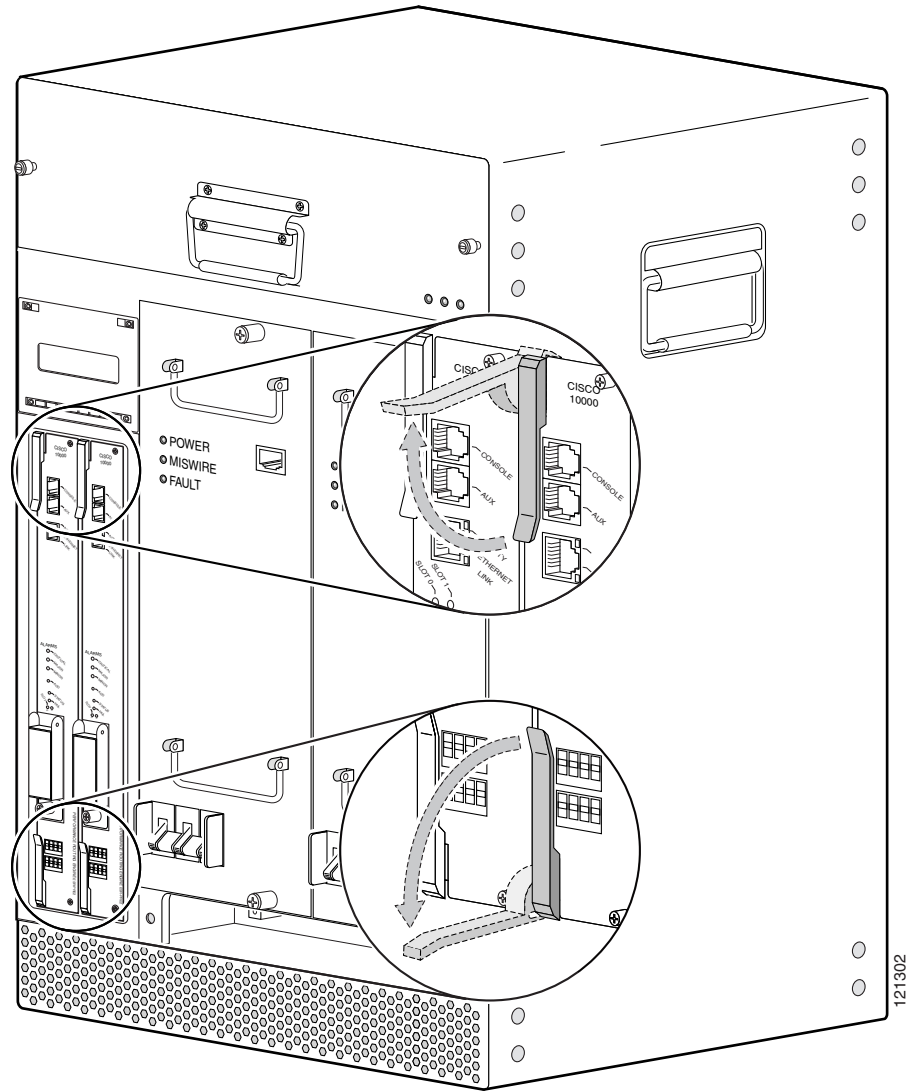
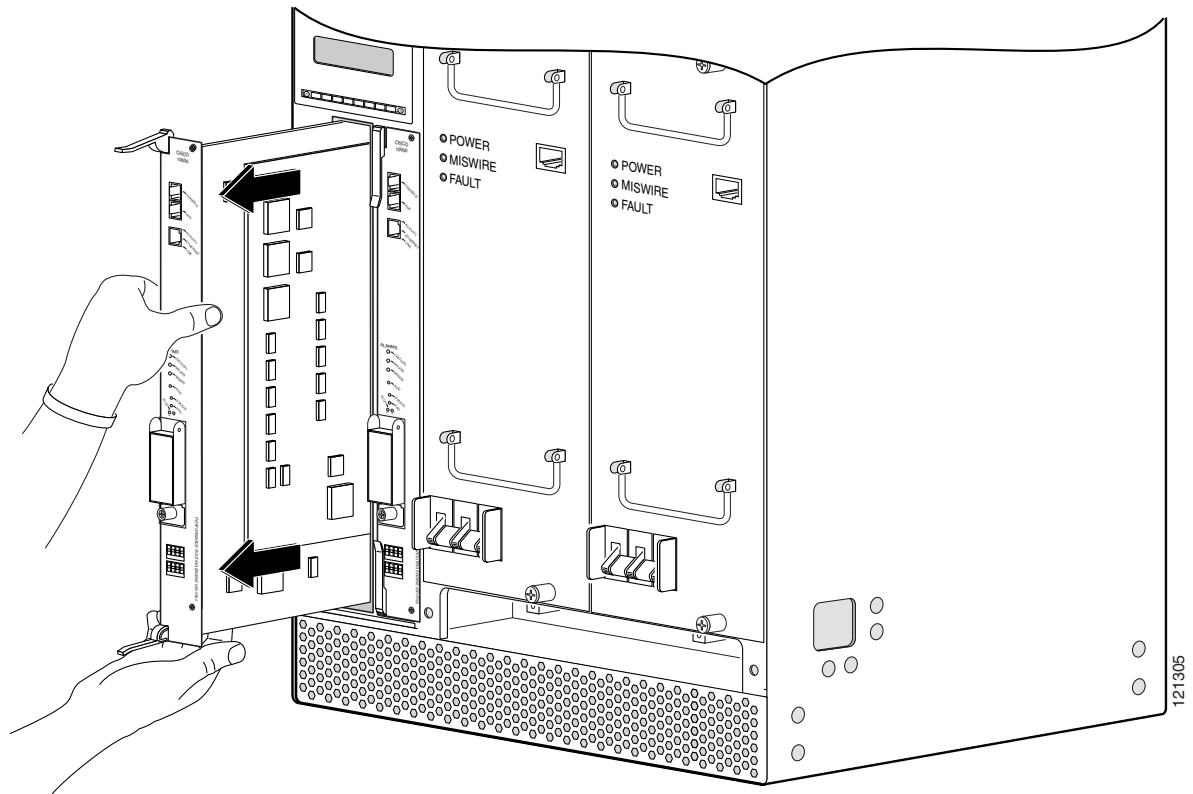


Figure 6 Removing the PRE from the Chassis



Installing the PRE in the Chassis

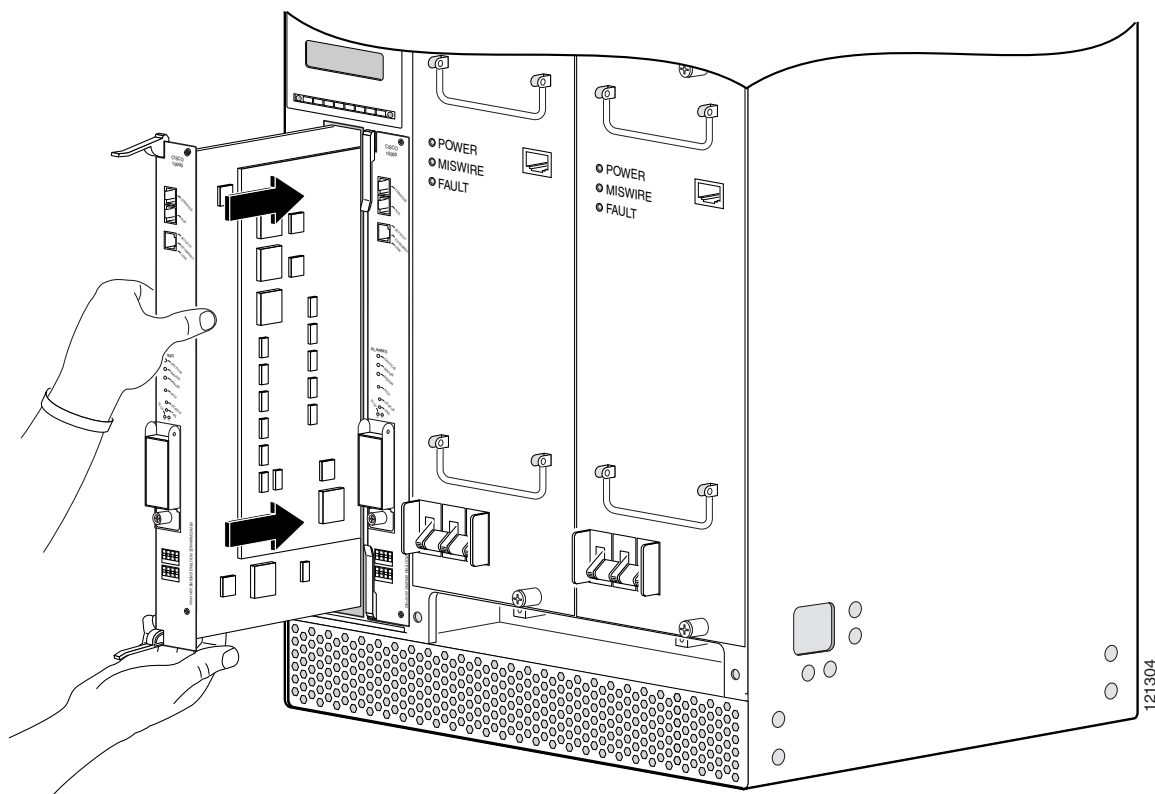
To install a new PRE module or replace an existing PRE module, perform the following steps:

- Step 1** Make sure that you are properly grounded with an ESD-preventive wrist strap.
- Step 2** Inspect the connectors for any bent or broken pins. Bent or broken pins can cause a system malfunction.
- Step 3** Grasp the faceplate of the new PRE with one hand and place your other hand under the module (to support the weight of the module) and position the module in front of the card cage slot.
- Step 4** Carefully align the upper and lower edges of the PRE with the upper and lower guides in the slot.
- Step 5** Slide the module into the slot until you can feel it begin to seat in the backplane connectors. (See [Figure 7](#).)
- Step 6** Simultaneously pivot both ejector levers toward each other (until they are parallel to the faceplate) to firmly seat the PRE in the backplane. (See [Figure 8](#).)
- Step 7** Secure the PRE in the chassis by tightening the top and bottom captive screws.

**Caution**

Always tighten the captive screws on each newly installed PRE to prevent accidental removal and provide proper grounding for electromagnetic interference (EMI) shielding.

Figure 7 Inserting the PRE in the Chassis



When fully inserted, the PRE cycles through its power-on self-test. The FAIL LED comes on briefly (about 5 to 6 seconds) and then goes off. If the Fail LED remains on or is flashing, go to the “[Troubleshooting the PRE Module Installation](#)” section on page 28.

- Step 8** Install the old PC media card in the PRE. See the “[Removing and Installing a PC Media Card](#)” section on page 30. PRE2 uses the PC media card while PRE4 uses the CompactFlash Disk.

If you are not installing the old PC media card or if you are upgrading your system, refer to the “[Upgrading to a Cisco ESR-PRE2 or Cisco ESR-PRE4](#)” section on page 21.

- Step 9** Reconnect the cables.

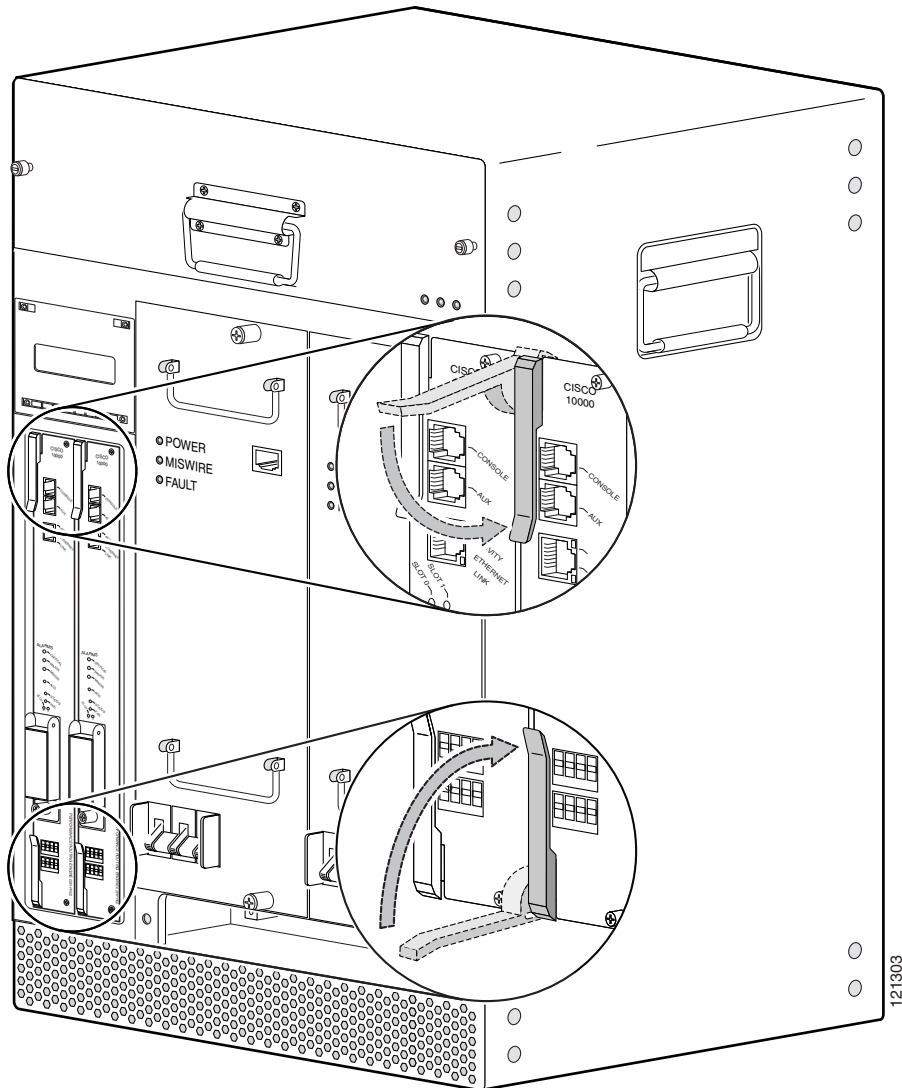
For information about configuring the PRE, refer to the *Cisco uBR10012 Universal Broadband Router Software Configuration Guide* at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/configuration/guide/scg.html>

 **Note**

It is not necessary to reconfigure the PRE if you are installing or replacing the redundant PRE. The system downloads the necessary configuration information from the primary PRE when you set the configuration to boot the full image and reload. Refer to the [“Upgrading the Secondary PRE of a Redundant Pair of PREs to a PRE2”](#) section on page 26.

Figure 8 Closing the Ejector Levers



Upgrading to a Cisco ESR-PRE2 or Cisco ESR-PRE4

This section describes the procedures for upgrading the PRE or PRE1 to a Cisco ESR-PRE2 or Cisco ESR-PRE4. Procedures for downgrading from a Cisco ESR-PRE2 to a Cisco ESR-PRE1 are also described.

- [Prerequisites, page 21](#)
- [Upgrade Considerations, page 21](#)
- [Saving the Startup and Running Configuration Information, page 22](#)
- [Upgrade Procedures, page 23](#)

Prerequisites



Caution

Before upgrading to a PRE2 or PRE4, you must install the Cisco EMI kit in the Cisco uBR10012 chassis. Refer to the *Installing EMI Gaskets and RF Absorber Material on the Cisco uBR10012 Universal Broadband Router* document at the following URL:

http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/field_replaceable_units/pre2gkit.html

To ensure that all the software features supported by your current PRE1 image function correctly, they must be supported by the PRE2 or the PRE4 image. Check with your Cisco technical support representative to verify the correct upgrade path before initiating the upgrade.

The upgrade should be performed by a qualified engineer. This person must be familiar with the Cisco router console interface and be able to perform basic router operations, such as configuration loading and router reload functions.

Upgrade Considerations

- This is a service-impacting hardware upgrade. The router will not be available for user traffic during the upgrade, and traffic cannot resume until the upgrade is complete.
- The new PRE2 or the PRE4 image must exist on the TFTP server.
- The same type of PRE should be used for primary and secondary PRE. PREs can operate with the same PRE type only. Different PRE types should never be installed in a chassis together.
- PRE2 and PRE4 modules must have the helper image (eboot) stored in the onboard boot flash, must have no configuration, and must be set to boot into ROMMON mode. Individual PRE2 and PRE4 modules ship in this state.
- If the existing PRE1 has a removable media card, you can copy your startup configuration and running configuration to the media card, and you can use it on the PRE2 after the upgrade.
- If the existing PRE4 has a CompactFlash Disk, you can copy your startup configuration and running configuration to the CompactFlash Disk, and you can use it on the PRE4 after the upgrade.
- If the PC media card has enough space, the new PRE2 image can also be copied there, which will save considerable time. If you desire to do this, download the latest PRE2 image from the TFTP server to the removable PC media card in disk0/1 or slot0/1.

- Configure the desired "facility-alarm outlet-temperature critical exceed-action" value on the PRE4 to the desired setting when upgrading from a PRE2 module to a PRE4 module.

**Note**

If you have redundant PREs installed in the Cisco uBR10012 chassis, and you intend to save the startup configuration, the running configuration, and the new PRE2 image to the media card, be sure that you save them to the media cards on both the primary and the redundant PRE.

Saving the Startup and Running Configuration Information

When the PRE1 or PRE2 is removed from the chassis, any local configuration is lost. You must save your configuration information to the TFTP server or PC media card before removing the module.

If you plan to use the PC media card from your current PRE1, you can save your startup configuration, running configuration, and the latest PRE2 image (from the TFTP server) to the PC media card.

If you plan to use the CompactFlash Disk from your current PRE4, you can save your startup configuration and running configuration from PRE2 (or PRE1) to a TFTP server and then retrieve it after the PRE4 is installed. The configurations can be copied to disk0 if desired.

Saving to the TFTP Server

-
- Step 1** Connect to the primary PRE1 or PRE2 console.
 - Step 2** Save the startup configuration and running configuration to the TFTP server.
-

Saving to the CompactFlash Disk (Specific to PRE4)

-
- Step 1** Connect to the PRE4 console.
 - Step 2** Copy the startup configuration and running configuration to the existing CompactFlash Disk.
 - Step 3** Download the full PRE4 image from the TFTP server to the CompactFlash Disk using the Network Management Ethernet (NME) port.
 - Step 4** Remove the CompactFlash Disk from the slot and set it aside.
-

Saving to a PC Media Card

-
- Step 1** Connect to the primary PRE1 or PRE2 console.
 - Step 2** Copy the startup configuration and running configuration to the existing PC media card.
 - Step 3** Download the full PRE2 image from the TFTP server to the PC media card. If you have redundant PREs or PRE1s, save this information on both PC media cards.
 - Step 4** Remove the PC media cards from the modules and set them aside.
-

Upgrade Procedures




This section contains these upgrade procedures:

- [Upgrading the Primary PRE1 to a PRE2 or PRE4, page 23](#)
- [Upgrading the Secondary PRE of a Redundant Pair of PREs to a PRE2, page 26](#)
- [Reversing an Upgrade to a PRE2, page 26](#)

Upgrading the Primary PRE1 to a PRE2 or PRE4

This procedure is used for the primary PRE2 in a chassis with a redundant PRE2 installed and for a chassis with a single PRE2 installed (no redundant PRE2).

To upgrade from a PRE1 to a PRE2 or PRE4:

-
- Step 1** Connect a terminal to the primary PRE.
- Step 2** If you have not already done so, save the startup configuration and running configuration to a location on a TFTP server, or to the PC media card on the PRE1, or to the CompactFlash Disk on the PRE4. See the [Saving the Startup and Running Configuration Information, page 22](#).
- If you save to the PC media card, and you have a redundant PRE1 installed in the chassis, ensure that you save the startup configuration and the running configuration to the PC media card on the redundant PRE1 as well.
- If you save to the CompactFlash Disk, and you have a redundant PRE2 installed in the chassis, ensure that you save the startup configuration and running configuration from PRE2 to a TFTP server and then retrieve it after the PRE4 is installed.
-
-  **Caution** When the PRE is removed from the chassis, any local configuration is lost. You must save your configuration before removing the PRE.
-
- Step 3** Power down the router. All the traffic on the router is terminated.
-  **Note** PREs can be hot-swapped. However, because removing a PRE terminates all traffic, we recommend that you power down the router to ensure a successful installation.
-
- Step 4** Remove the PRE (or all PREs in a redundant configuration) from the chassis by following the procedure in the [“Removing the PRE from the Chassis” section on page 14](#).
- Step 5** Insert the new PRE into slot A of the chassis by following the procedure in the [“Installing the PRE in the Chassis” section on page 18](#)”. If you have a second redundant PRE to install, set it aside until the primary PRE is installed and configured.
-  **Note** Although a PRE can be installed in slot B, to ensure proper operation, we recommend that you install a single PRE in slot A.
-
- Step 6** If you saved the startup configuration and running configuration to the PC media card, remove the PC media card from the old PRE and install the PC media card in the other PRE.
- Step 7** Power up the router. The router boots up in read-only memory (ROMMON) monitor mode.



Note The config-register of a new PRE2 or PRE4 (shipped from the factory) is set to 0x0. If your PRE2 is not new from the factory, and the config-register is not set to 0x0, it may behave differently while booting up.

Step 8 From the console in ROMMON mode, enter the appropriate **boot** command. Depending on whether the other PRE image is on a TFTP server, the PC media card or the CompactFlash Disk, or you are booting from the helper image, see the following information:

Booting from a TFTP Server

If you saved the PRE2 image on a TFTP server that is reachable from the router (for example, if the router and server are on the same LAN or there is a default proxy server), boot the router from the TFTP server.



Note These are examples. Your IP address may be different and the image name may change.

In the following example, the router boots the PRE2 image from a network server with the IP address 172.16.15.112:

```
> boot tftp://172.16.15.112/ubr10k2-k8p6-mz
```

The configuration dialog appears.

Proceed to [Step 9](#).

Booting from a PC Media Card

If the image was saved to the media card, boot that image.

In the following examples, The **boot** command loads the PRE2 image from the PC media card:

```
> boot system flash disk0:ubr10k2-k8p6-mz
```

The configuration dialog appears.

Proceed to [Step 9](#).

Booting from the Helper Image

If you did not save the PRE2 image to either a TFTP server or a PC media card, boot the helper image, which is shipped with the PRE2 on the PC media card.

In the following example, the router boots from the helper image:

```
> boot ubr10k-eboot-mz
```

The configuration dialog appears.

Proceed to the [“Did Not Save the Configuration”](#) section.

Booting from disk0 or the CompactFlash Disk

If the image exists on disk0 or the CompactFlash Disk, and if the config-register is set to 0x0, boot the helper image, which is shipped with the PRE4 on the CompactFlash Disk using the **boot** command:

```
> boot disk0: image name
```

Step 9 Restore the startup configuration and running configuration of the router, depending on whether you saved the PRE2 image to a TFTP server or a PC media card, or you did not save the PRE2 image.

Saved the Configuration on a CompactFlash Disk

If you booted the PRE4 image and saved the previous configuration to a CompactFlash Disk:

- a. Exit the configuration dialog and restore the previously saved startup and running configuration from the CompactFlash Disk.
- b. Update any **boot** commands to use the new PRE4 image.

The router is available for normal operations and the upgrade is complete.

Saved the Configuration on a PC Media Card

If you booted the image, and you saved the previous configuration to a PC media card:

- a. Exit the configuration dialog and restore the previously saved startup configuration and running configuration from the PC media card.
- b. Update any **boot** commands to use the new PRE2 image.

The router is available for normal operations and the upgrade is complete.

Saved the Configuration on a TFTP Server

If you booted the image, and you saved the previous configuration to a TFTP server:

- a. Enter the initial configuration dialog, and enter all required information to allow access to the TFTP server.
- b. Assign the correct IP address for the Fast Ethernet interface to become active and for the TFTP server to become reachable. This may require adding an IP route for the server even after the initial dialog finishes.
- c. Restore the previous configuration from the TFTP server to the startup configuration and running configuration on the router.
- d. Restore the startup configuration and running configuration and update any **boot** commands to use the new PRE2 or PRE4 image.

The router is available for normal operations and the upgrade is complete.

Did Not Save the Configuration

If you did not save the configuration to either a TFTP server or a PC media card or the CompactFlash Disk, and you booted the router using the helper image:

- a. Enter the initial configuration dialog, and enter all required information. Be sure to assign the correct IP address for the Fast Ethernet interface to become active and for the TFTP server to become reachable.
- b. The TFTP server should be reachable. If you want to boot the PRE2 or PRE4 image from a local media device, download the PRE2 or the PRE4 image from the TFTP server to the local media device (bootflash, disk0/1, or slot0/0, or disk0 in the case of the CompactFlash Disk). If you want to boot directly from the TFTP server, you can skip the image download.
- c. Restore the previously saved configuration by downloading it from the TFTP server. Update any **boot** commands from the previous configuration to point to the new PRE2 or PRE4 image. Otherwise, update the **boot** command to point to the desired PRE2 or PRE4 image.
- d. Reload the router. After reload, the router is available to resume normal operations and the upgrade is complete.

Upgrading the Secondary PRE of a Redundant Pair of PREs to a PRE2

If you have a secondary or redundant PRE2 to install in the chassis, use the following procedure:

-
- Step 1** Insert the redundant PRE2 into chassis slot B.
 - Step 2** Connect the terminal to the console port of the PRE2 in slot B. The console displays the ROMMON mode prompt (>).
 - Step 3** If you have a PC media card that contains the startup configuration and running configuration and the PRE2 image:
 - a. Remove the PC media card from that PRE2 and insert it into the PRE2 in slot B.
 - b. Boot the image from the PC media card in the PRE2 in slot B. The redundant PRE2 in slot B comes up as the secondary PRE, and the configuration synchronizes automatically between the two PREs.

If you do not have any PC media devices, then you upgrade this redundant PRE2 as if it were a single PRE2:

- a. Remove the PRE2 from slot A and go to [Step 8](#) of the “[Upgrading the Primary PRE1 to a PRE2 or PRE4](#)” section on page 23. Follow the upgrade procedures for the PRE2 in slot B.
- b. Insert the PRE2 back into slot A. This redundant PRE2 in slot A now comes up as the secondary PRE, and the configuration is synchronized automatically between the PREs.



Note If you want the primary PRE2 to be in slot A, you can perform a switchover from the console at this point.

Reversing an Upgrade to a PRE2

To reinstall a Cisco ESR-PRE1 (or redundant PREs) after upgrading to an Cisco ESR-PRE2:

-
- Step 1** Power down the router.
 - Step 2** Remove the PRE2 or the PRE4 (or both PRE2s in a redundant configuration) from the chassis.
 - Step 3** Insert the PRE1 back into the chassis. (Use the media cards with the original PRE1 image.)



Note You cannot use a PRE2 image with the PRE1 modules.

- Step 4** Power on the router. The router loads as it originally did before the upgrade.
-

Upgrading the FPGA Image on ESR-PRE4 Module

There are two types of Field-Programmable Gate Array (FPGA) image upgrades available on the Cisco ESR-PRE4 module:

- Manual PRE4 upgrade—Supported in Cisco IOS Release 12.2(33)SCB and later releases on the Cisco uBR10012 router. For more information, see “[Upgrading the PRE4 Module manually](#)” section on page 27.
- Automatic upgrade of PRE4—Supported in Cisco IOS Release 12.2(33)SCG and later releases on the Cisco uBR10012 router. For more information, see “[Upgrading the PRE4 Module Automatically](#)” section on page 28

Upgrading the PRE4 Module manually

Step 1 Cold-boot the active PRE4 module.

Step 2 Copy the hw-programmable upgrade package to your hard disk drive as follows:

```
copy tftp://iofpga/pre4_iofpga.bin disk0:
```

To download this package from Cisco.com, log in with your Cisco.com password to:
<http://www.cisco.com/cisco/software/navigator.html?mdfid=268437899&i=rp>.

Step 3 Upgrade the active PRE4 module using the **upgrade fpga {alt | def} file {url}** command.



Note Use the **upgrade fpga {alt | def} file {url} {version}** command, if you are running Cisco IOS Release 12.2(33)SCG.
If you are using a PRE4 VE board and running Cisco IOS Release 12.2(33)SCG, use the **upgrade fpga {alt | def} file {url}** command to upgrade the PRE4 module.

```
Router# upgrade fpga alt file disk0:pre4_iofpga.bin 0x0A0A0D01
```

Step 4 Perform [Step 1](#) to [Step 3](#) to upgrade the FPGA on the standby PRE4 module.

Step 5 Power cycle the chassis.

After the power cycle, the active RP reboots with the latest FPGA programmable firmware and comes online.

Upgrading the PRE4 Module Automatically

The FPGA Auto Upgrade feature enables automatic upgrade of the FPGA image on the PRE4 module. This feature is supported in Cisco IOS Release 12.2(33)SCG and later releases.



Note

Automatic upgrade is enabled by default on the Cisco uBR10012 router.

Automatic upgrade occurs only if the following conditions are met:

- Two PRE4 modules are available on the Cisco uBR10012 router.
- First automatic upgrade on the standby module is successful.

The auto upgrade occurs only on the standby PRE4. The approximate time for the upgrade is 11 seconds. The upgrade occurs on bootup of the Cisco uBR10012 router. If the upgrade is successful on the standby PRE4 module, a message is displayed on the console, and a reload occurs to set the upgraded PRE4 module to active. After the upgraded PRE4 module becomes active, the auto upgrade resumes on the second PRE4 module and moves it the standby state.

To disable auto upgrade, use the **upgrade fpga auto-upgrade** command in global configuration mode. The **upgrade fpga auto-upgrade show** command displays information on the FPGA upgrade.

For more information on the commands, see *Cisco IOS CMTS Cable Command Reference*.

Troubleshooting the PRE Module Installation

The processor subsystem on the Cisco uBR10012 router consists of the PRE modules and the Timing, Communication, and Control Plus (TCC+) cards. At system startup, the following sequence should appear on the primary PRE:

1. The FAIL LED should briefly come on (yellow) and go off, and the STATUS LED should start flashing (yellow).

A series of messages should appear on the PRE alphanumeric display, indicating the progress of the boot sequence.

2. On successful completion of the boot sequence, the message IOS RUN should appear on the alphanumeric display.
3. The STATUS LED should be on (green) to indicate that this is the primary PRE.

The sequence on the redundant PRE is similar, except that the STATUS LED remains OFF and the messages on the alphanumeric display are slightly different. The final message upon a successful boot sequence should be IOS STBY to indicate that the PRE is in the standby state.

Check the following if a problem appears on one of the PRE modules:

- Is the STATUS LED on the primary PRE green at the end of the boot sequence?
 - If no, check the other LEDs on other modules in the chassis. If no other LEDs are on, check for a problem in the power subsystem, as described in the “Troubleshooting the Power Subsystem” section in the *Cisco uBR10012 Universal Broadband Router Hardware Installation Guide* at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/guide/hig.html>

- If no, and no other LEDs on the PRE are on but LEDs on other modules are on, remove the PRE from the slot, check for any bent or broken pins on the backplane connectors, and reinsert it. Ensure that it makes solid contact with the backplane and is securely locked in by firmly closing both locking levers.
- If no, but the FAIL LED is on (yellow), remove the PRE and reinsert it. If that fails, insert a new PRE. If that fails, contact Cisco Technical Assistance for assistance.
- Repeat the above steps for the redundant PRE, except that its STATUS LED should remain OFF and its alphanumeric display should read IOS STBY, if it is operating correctly.
- If other LEDs on the PRE modules are on, check the *Cisco uBR10012 Universal Broadband Router Troubleshooting Guide* for additional instructions.
- If both PRE modules are operating correctly, check the Power LEDs on each TCC+ card. Are the Power LEDs on each TCC+ card on (green)?
 - If no, remove the TCC+ card and reinsert it, making sure that it firmly connects to the backplane and that both captive screws are tightly connected.
 - If yes, proceed to the next step.
- Is the STATUS LED on the primary TCC+ on (green) to indicate that it is the primary card? Is the STATUS LED on the secondary TCC+ flashing (green) to indicate that it is the redundant card?
 - If no, check that the version of Cisco IOS software that you have loaded on the router supports the TCC+ card.
- Verify the status of the internal Ethernet interface (**ethernet0/0/0**) of the PRE module, which is used for intermodule communications. If this internal interface is down, it could indicate that the PRE module is not fully seated in its slot or that a hardware failure has occurred.

```
Router# show interfaces ethernet 0/0/0

Ethernet0/0/0 is up, line protocol is up
  Hardware is Amqp2, address is 0200.0000.00a0 (bia 0200.0000.00a0)
  Internet address is 127.0.0.254/8
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 2/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/8000/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/8000 (size/max)
  5 minute input rate 94000 bits/sec, 74 packets/sec
  5 minute output rate 58000 bits/sec, 72 packets/sec
    2001292 packets input, 538117935 bytes, 0 no buffer
    Received 121 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 input packets with dribble condition detected
    1838055 packets output, 221698260 bytes, 0 underruns
    5 output errors, 191417 collisions, 2 interface resets
    0 babbles, 2 late collision, 44893 deferred
    3 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
Router#
```

**Note**

Do not confuse the internal Ethernet interface (**ethernet0/0/0**) of the PRE module with the external Fast Ethernet interface (**fastethernet0/0/0**) of the PRE module, which is used for network management and remote access.

Alarm Temperature Ranges for the PRE Modules

A new keyword— **critical exceed-action shutdown** from the **facility-alarm** command allows you to enable or disable the auto-shutdown feature on the Cisco uBR10012 router. Previously, auto-shutdown was enabled by default. When auto-shutdown is enabled, the router shuts down automatically when its core or intake temperature exceeds the critical temperature threshold for 2 minutes.

Default alarm temperatures for the PRE modules:

- Inlet minor warning temperature: - 45° C or -49° F
- Inlet major warning temperature: - 54° C or -65° F
- Inlet critical warning temperature: - 72° C or -98° F
- Core minor warning temperature: - 50° C or -58° F
- Core major warning temperature: - 58° C or -72° F
- Core critical warning temperature: - 85° C or -121° F

Setting the Automatic Shutdown Command

The Cisco uBR10012 router with PRE modules has a CLI configuration command that controls the automatic shutdown action when the critical temperature is exceeded. The default command is **auto-shutdown disabled**.

The command that enables or disables the auto-shutdown when the critical temperature threshold exceeded for 2 minutes is:

facility-alarm [*core-temperature* | *inlet-temperature*] **critical exceed-action shutdown**

You can also use this command to set the temperature thresholds at which the Cisco uBR100012 router generates a major or minor alarm, or to disable those alarms.

The command format is as follows:

[no] facility-alarm { *intake-temperature* | *core-temperature* } { *major* [##] | *minor* [##] | **critical exceed-action shutdown** }

To turn off the automatic shutdown action, use the **no** form of the command.

**Note**

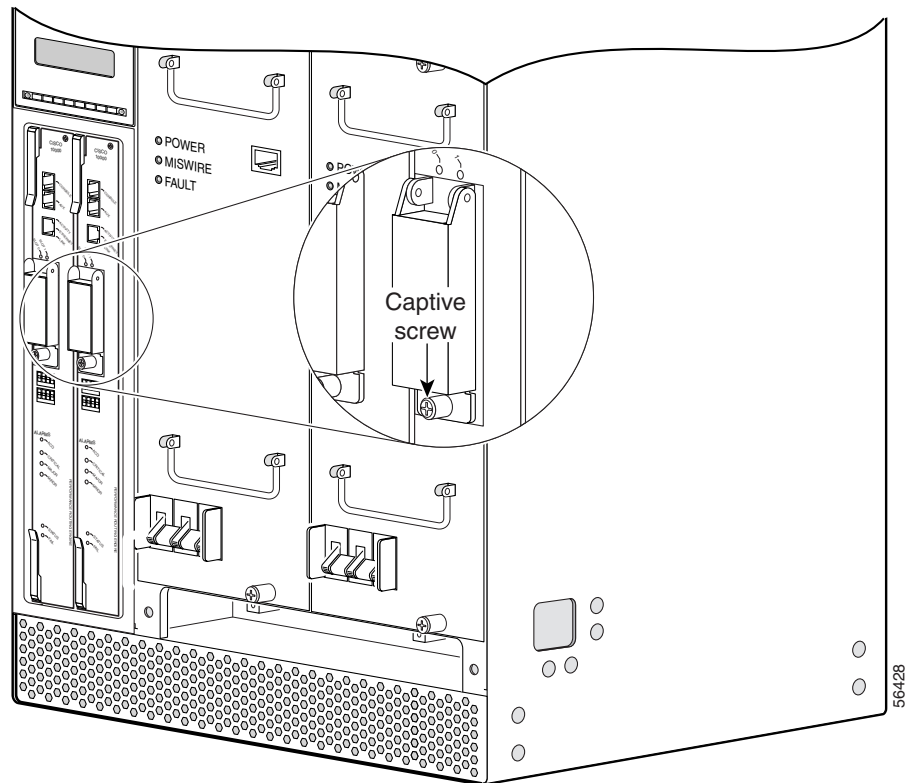
Configure the desired "facility-alarm outlet-temperature critical exceed-action" value on the PRE4 to the desired setting when upgrading from a PRE2 module to a PRE4 module.

Removing and Installing a PC Media Card

To remove and install a PC media card, use the following procedure:

- Step 1** Loosen the captive screw on the PC media card cover on the PRE (Figure 9).

Figure 9 PC Media Card Cover Captive Screws



- Step 2** Lift the cover, push the proper eject button, and pull the media card out of its slot (Figure 10).
- Step 3** Insert the new PC media card into one of the card slots on the PRE (Figure 11).
- Step 4** Close the cover and tighten the captive screw to maintain proper EMI emissions levels. (Figure 9).

Figure 10 *Removing the PC Media Card*

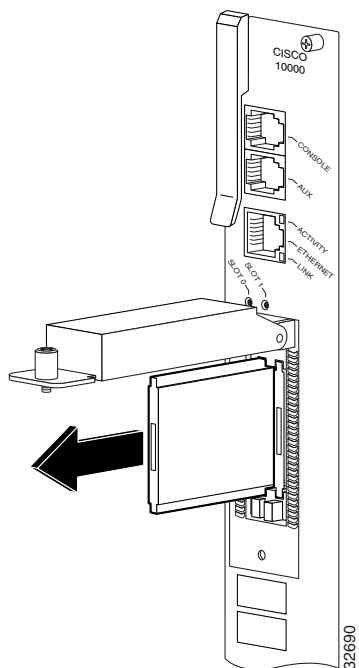
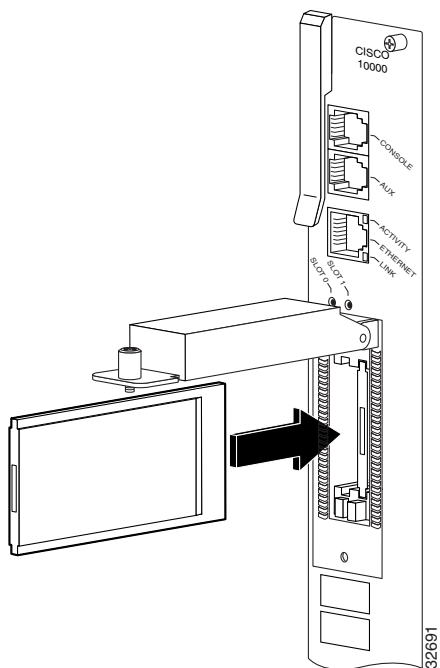


Figure 11 *Inserting the PC Media Card*



Onboard Failure Logging

The On-Board Failure Logging (OBFL) feature enables storage and collection of critical failure information in the nonvolatile memory of an FRU (Field Replaceable Unit), like a Route Processor (RP) or Line Card. The Cisco uBR 10000 series router supports OBFL on PRE4 and the Cisco SIP-600 jacket card.

The OBFL stored data assists in understanding and debugging field failures upon RMA (Return Material Authorization) of a RP or Line Card at repair and failure analysis sites.

OBFL records operating temperatures, hardware uptime, interrupts and any other important events that assist board diagnosis in case of hardware failures.

For more information on the feature, see the *Onboard Failure Logging* feature guide located at the following URL:

http://www.cisco.com/en/US/docs/ios/12_2sx/12_2sxh/feature/guide/sxhobfl.html#wp1053048



Note

The output from the CMTS router may vary slightly compared to the output samples shown in the URL mentioned above.

Logging details for OBFL

The logging details for the OBFL feature are described below:

- OBFL is enabled by default. You need to enable the feature if it has been disabled previously.
- On the Route Processor (RP), logging begins after the system starts up.
- On the jacket card, logging begins two minutes after the card Online Insertion and Removal (OIR) to complete initialization.
- OBFL updates RP and jacket card temperatures and voltage sensors every five minutes.
- Temperature and voltage data is stored only when it is different from the last stored record.
- The maximum logging time is two hours, hence, a new record is stored every two hours, regardless of data variation.
- Logs are organized as current (continuous) and historical (summarized) data records.
- OBFL logging has no impact on performance.

Storing OBFL Data

The RP logs are recorded in the bootflash, where other system images, configuration information and crash dumps are stored. OBFL logs are identified by the extension (*_hist or *_cont). The maximum memory used on the flash disk for OBFL storage is 2 MB.



Note

OBFL log files must not be modified, overwritten or deleted from the bootflash, as this information is used for failure analysis.

The **dir bootflash** command displays a list of log files (including OBFL logs). Given below is a sample output of the additional filenames in use by OBFL.

```
Router# dir bootflash:
Directory of bootflash:/

 4 -rw- 202752 Jan 4 2008 16:13:10 -05:00 env_cont
 5 -rw- 69120 Jan 4 2008 16:13:12 -05:00 temp_hist
13 -rw- 69120 Jan 4 2008 16:13:12 -05:00 volt_hist
14 -rw- 33792 Jan 4 2008 16:13:12 -05:00 uptime_cont
15 -rw- 201216 Jan 4 2008 16:13:18 -05:00 errmsg_cont
16 -rw- 67584 Jan 4 2008 16:13:16 -05:00 env_hist
17 -rw- 135168 Jan 4 2008 16:13:18 -05:00 temp_cont
18 -rw- 135168 Jan 4 2008 20:17:28 -05:00 volt_cont
19 -rw- 6144 Jan 4 2008 16:13:14 -05:00 uptime_exthist
20 -rw- 4096 Jan 4 2008 16:13:16 -05:00 uptime_hist
```

Displaying OBFL Data

The **show logging onboard [status] <module> <slotnumber/subslotnumber/module number>** command displays the logs from the OBFL data.

For information on OBFL commands, see the "Configuration Tasks" chapter in the *Onboard Failure Logging* feature guide located at the following URL:

http://www.cisco.com/en/US/partner/docs/ios/12_0s/feature/guide/12sobfl.html#wp1025118

Related Documentation

Cisco uBR10012 Universal Broadband Router Hardware Installation Guide at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/guide/hig.html>

Cisco uBR10012 Universal Broadband Router Software Configuration Guide at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/configuration/guide/scg.html>

Cisco CMTS Feature Guide at the following URL:

<http://www.cisco.com/en/US/docs/cable/cmts/feature/guide/cmtsfg.html>

Cisco uBR10012 Universal Broadband Router Release Notes

http://www.cisco.com/en/US/products/hw/cable/ps2209/prod_release_notes_list.html

Installing EMI Gaskets and RF Absorber Material on the Cisco uBR10012 Universal Broadband Router

http://www.cisco.com/en/US/docs/cable/cmts/ubr10012/installation/field_replaceable_units/pre2gkit.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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