



Release Notes for Cisco MGX Route Processor Module (RPM-PR) IOS Release 12.3(11)T9 for MGX Releases 1.3.14 and 5.2.10

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About This Release

These maintenance release notes describe the system requirements, new features, and limitations that apply to the Cisco MGX Route Processor Module (RPM-PR) IOS Release 12.3(11)T9 for MGX Releases 1.3.14 and 5.2.10.

These notes also contain Cisco support information. For more information on the RPM-PR with MGX Release 5.2, refer to the *Cisco MGX Route Processor Module (RPM-PR) Installation and Configuration Guide, Release 5.2*.

For MGX Release 1.3.14, the user documentation (command reference, overview, and installation and configuration guides) were not updated. Use the Release 1.1.3 and 1.2.10 documents in addition to this release note.

For product documentation about Cisco MGX 8850 switches, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8850/12/index.htm>

For product documentation about Cisco MGX 8250 switches, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8250/12/index.htm>

For product documentation about Cisco MGX 8230 switches, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8230/12/index.htm>

For product documentation about VISM Version 3.0(0), go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8850/>

For product documentation about RPM-PR Release 2.1 and these release notes, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8850/12/rpm/index.htm>

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8250/12/rpm/index.htm>

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8230/12/rpm/index.htm>

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New Features in MGX Release 1.3.14 or Earlier

This section lists new features introduced by release for the Cisco MGX Route Processor Module (RPM-PR) IOS Release 12.3(11)T9 for MGX Releases 1.3.14 and 5.2.10 or earlier releases.

Features Introduced in Cisco IOS Release 12.3(11)T9 for MGX Release 1.3.14

No new features were introduced in Cisco IOS Release 12.3(11)T9.

Features Introduced in Cisco IOS Release 12.3(11)T7 for MGX Release 1.3.12

No new features are introduced with this release.

Features Introduced in Cisco IOS Release 12.3(11)T6 for MGX Release 1.3.12

No new features are introduced with this release.

Features Introduced in Cisco IOS Release 12.3(11)T3 for MGX 1.3.12

No new features are introduced with this release.

Features Introduced in Cisco MGX 8800 Release 1.2.21

The RPM-PR in Cisco MGX 8800 Release 1.2.21 supports all new and existing features introduced in the Release 1.2.x baseline. The following four new features were introduced for RPM-PR implementations using Cisco IOS Release 12.2(15)T5:

1. Multiprotocol Label Switching (MPLS) CoS Transparency—This feature allows the service provider to set the MPLS experimental field instead of overwriting the value in the customer's IP precedence field. The IP header remains available for customer use; the IP packet's CoS is not changed as the packet travels through the MPLS network.
For configuration information, go to:
<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t13/ftdmode.htm>
2. cRTP with MQC—Modular Quality of Service (QoS) Command-Line Interface (CLI). An RPM-PR in Cisco MGX 8800 Release 1.2.21 supports using the MQC to configure the compressed Real-Time Protocol (cRTP) header. The CLI commands introduced to support this feature include:
 - **ip rtp header-compression**—Enables RTP header compression for a particular interface.
 - **no ip rtp header-compression**—Disables RTP header compression for a particular interface.
 - **clear ip rtp header-compression <interface>**—Resets all statistics for the interface to 0.

- **show ip rtp header-compression** <interface> [detail]—Shows all statistics for an interface.
- **show policy-map int sw1.x**—Shows the number of packets which are compressed because of a match in policy map.

For configuration information, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t13/fthdrcmp.htm>

3. Label Switch Controller (LSC) Redundancy

For configuration information, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/8850px1e/rel4/scg/rpm.htm>

4. MVPN—The frame-based Multicast Virtual Private Network (MVPN) feature enables the RPM-PR in Cisco MGX 8800 Release 1.2.21 to pass frame-based multicast traffic to VPNs across the ATM core.

For configuration information, go to:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122s/122snwft/release/122s14/fs_mvpn.htm

Previously Released Features

This section lists previously released features for Cisco IOS Release 12.3(11)T7 for MGX Release 1.3.12 or earlier releases.

Automatic Cell Bus Clocking

To implement automatic cell bus clocking, an *-autoClkMode* option was added to the **xcnfbclk** command. The default is disabled for backward compatibility. To enable this feature, enter the **xcnfbclk -autoClkMode enable** command. The PXM scans the entire shelf to verify if two RPMs reside on the same cell bus, and then changes that cell bus to run at a 42 MHz clock rate. The clock rate for the remaining cell buses is not changed. The active PXM updates the disk DB and sends the update to the standby PXM.

When you enable this feature, you cannot manually configure the cell bus clock rate for any of the cell buses. When you disable this feature using the **xcnfbclk -autoClkMode disable** command, the PXM does not change the clock rate for any of the cell buses, but still updates the disk DB and sends the update to the standby PXM.



Note

The command to enable or disable the feature is on a per shelf basis.



Note

The clock is automatically changed to 21 MHz if one of the two RPM-PRs residing on the same cell bus is removed from the shelf.



Note

After disabling the automatic cell bus clocking, you can manually configure the cell bus clock.

The output from the **dspcbclk** command changes to reflect this new feature. A column indicates whether the feature is enabled or disabled on the cell buses. When the feature is enabled and an RPM-PR card is inserted, the PXM checks whether the card that resides next to it on the same cell bus is also an RPM-PR card. If both cards are RPM-PR cards and neither of them is in failed, reserved, unknown, self-test-fail, or no-card state, the cell bus clock rate is automatically set to 42 MHz.

Conversely, when the feature is enabled, and an RPM-PR card with a cell bus clock rate of 42 MHz is removed or fails, the PXM sets the cell bus to 21 MHz, as shown in the following example:

```
mgx574.1.7.PXM.a > dspcbclk
```

CellBus	Rate (MHz)	Slot	AutoClkMode
CB1	21	1, 2	disable
CB2	21	3, 4	disable
CB3	21	5, 6	disable
CB4	21	17 - 22	disable
CB5	21	9, 10	disable
CB6	21	11, 12	disable
CB7	21	13, 14	disable
CB8	21	25 - 30	disable

```
mgx574.1.7.PXM.a > cnfcbclk 1 42
```

WARNING: Certain Service Modules will not operate at the clock rate you specified.

Please check the Service Modules in the slots where the Cell Bus clock rate is effected by this command.

```
mgx574.1.7.PXM.a > cnfcbclk 5 42
```

WARNING: Certain Service Modules will not operate at the clock rate you specified.

Please check the Service Modules in the slots where the Cell Bus clock rate is effected by this command.

```
mgx574.1.7.PXM.a > dspcbclk
```

CellBus	Rate (MHz)	Slot	AutoClkMode
CB1	42	1, 2	disable
CB2	21	3, 4	disable
CB3	21	5, 6	disable
CB4	21	17 - 22	disable
CB5	42	9, 10	disable
CB6	21	11, 12	disable
CB7	21	13, 14	disable
CB8	21	25 - 30	disable

```
mgx574.1.7.PXM.a > xcncbclk
```

Not enough arguments (?)

```
xcncbclk "-cb <cellBus> -rate <clockRate> -autoClkMode <autoClkEnable>"
```

```
-cb <cellBus>, where cellBus is a string CB1..CB8
```

```
-rate <clockRate>, where clockRate is 21 or 42 (MHz)
```

```
-autoClkMode <autoClkEnable>, where autoClkEnable is enable or disable
```

```
mgx574.1.7.PXM.a > xcncbclk -autoClkMode enable
```

```
mgx574.1.7.PXM.a > dspcbclk
```

CellBus	Rate (MHz)	Slot	AutoClkMode
CB1	42	1, 2	enable
CB2	21	3, 4	enable
CB3	21	5, 6	enable
CB4	21	17 - 22	enable
CB5	21	9, 10	enable
CB6	42	11, 12	enable
CB7	21	13, 14	enable
CB8	21	25 - 30	enable

VISM-PR to RPM-PR Connectivity

VISM Release 3.0 introduces VISM-PR front cards for Cisco MGX Release 1.2.21 and Cisco IOS Release 12.2(15)T.

The new VISM-PR-8E1 and VISM-PR-8T1 cards work in Cisco MGX 8230, MGX 8250, and MGX 8850 PXM1-based switches, in combination with the PXM1 Processor Module card. The VISM-PR card supports 144 channels when used with the G.723.1 codec, whereas the VISM card supports 64 channels with the G.723.1 codec.

Setting connections between a VISM-PR card and an RPM-PR card in your Cisco MGX 8230, MGX 8250, or MGX 8850 PXM1-based switch chassis requires that you use the new VBR (NRT) 3 connection type. For more information, refer to the *Cisco VISM Installation and Configuration Guide*.

Configuring the Cell Bus Clock Rate

As of Cisco MGX Release 1.2.10 and Cisco IOS Release 12.2(8)T4, when two RPM-PR cards are on the same cell bus occupying adjacent slots (for example, slots 1 and 2 or slots 3 and 4), set the cell bus clock (CBC) rate to 42 MHz. Correspondingly, if only one RPM-PR exists on the cell bus, set the clock to the default value of 21 MHz.

If one of the adjacent RPM-PRs goes to failed or empty state, the CBC for that cell bus must be reconfigured for traffic shaping to work correctly on the active RPM-PR. On Cisco MGX 1 switches with Release 1.2.10, you must use the **cnfcbclk** command to change the CBC from 42 MHz to 21 MHz. Use the **dspcbclk** command from the PXM1 to confirm the CBC rate.

The following output displays the use of the **cnfcbclk** and **dspcbclk** commands used to change the clock on cell bus 1 (for slots 1 and 2) from 21 MHz to 42 MHz and confirm the change:

```
PXM> dspcbclk
```

CellBus	Rate (MHz)	Slot
CB1	21	1, 2
CB2	21	3, 4
CB3	21	5, 6
CB4	21	17 - 22
CB5	21	9, 10
CB6	21	11, 12
CB7	21	13, 14
CB8	21	25 - 30

PXM> **cnfcbclk CB1 42**

WARNING: Certain Service Modules will not operate at the clock rate you specified.

Please check the Service Modules in the slots where the Cell Bus clock rate is effected by this command

```
mgx3.1.7.PXM.a > dspcbclk
  CellBus   Rate (MHz)   Slot
-----
   CB1      42          1, 2
   CB2      21          3, 4
   CB3      21          5, 6
   CB4      21         17 - 22
   CB5      21          9, 10
   CB6      21         11, 12
   CB7      21         13, 14
   CB8      21         25 - 30
```

The RPM-PR makes use of idle cells for traffic shaping and scheduling. If two RPM-PRs exist in adjacent slots on the same cell bus and one of the RPM-PRs is put into a failed state by the PXM while that card is alive, then the failed RPM-PR must stop sending idle cells to avoid having an impact on traffic shaping on the adjacent functional RPM-PRs. The **rpm-auto-cbclk-change** command implements the RPM-PR support for this feature. This command instructs the RPM-PR to stop sending idle cells if the RPM-PR is put into a failed state by the PXM and thus prevents an impact on traffic shaping on an adjacent functional RPM-PR.

This command may be used if traffic shaping is not required.

The following output displays an example of the **rpm-auto-cbclk-change** command:

```
RPM-11#config terminal
  Enter configuration commands, one per line. End with CNTL/Z.
RPM-11(config)#int sw1
RPM-11(config-if)#rpm-auto-cbclk-change
RPM-11(config-if)#end
RPM-11#write mem
Building configuration...
[OK]
RPM-11#show run int sw1
Building configuration...

Current configuration:142 bytes
!
interface Switch1
 no ip address
 no atm ilmi-keepalive
 rpm-auto-cbclk-change
 switch autoSynch off
end
! rpm_tag_id Apr 04 2002 02:49:04
```

If traffic shaping is *not* a requirement, enter the **no rpm-cbclk-change** command, either manually or during card configuration. The following output displays an example of the **no rpm-auto-cbclk-change** command:

```
RPM-11#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
RPM-11(config)#int sw1
RPM-11(config-if)#no rpm-auto-cbclk-change
RPM-11(config-if)#end
RPM-11#write mem
Building configuration...
[OK]
RPM-11#show run int sw1
Building configuration...

Current configuration:145 bytes
!
interface Switch1
no ip address
no atm ilmi-keepalive
no rpm-auto-cbclk-change
switch autoSynch off
end
! rpm_tag_id Apr 04 2002 02:49:57
```

**Note**

The CBC feature is enabled by default on the RPM-PR.

LDP on RPM-PR Running MGX Release 1.2.02 and Cisco IOS Release 12.2(8)T1

The MPLS label distribution protocol (LDP), as standardized by the Internet Engineering Task Force (IETF) and as enabled by Cisco IOS software, allows the construction of highly scalable and flexible IP Virtual Private Networks (VPNs) that support multiple levels of services.

1. LDP provides a standard methodology for hop-by-hop or dynamic label distribution in an MPLS network by assigning labels to routes that have been chosen by the underlying Interior Gateway Protocol (IGP) routing protocols.
2. The resulting labeled paths, called label switch paths (LSPs), forward label traffic across an MPLS backbone to particular destinations.

These capabilities enable service providers to implement Cisco MPLS-based IP VPNs and IP+ATM services across multivendor MPLS networks.

From an historical and functional standpoint, LDP is a superset of the Cisco pre-standard Tag Distribution Protocol (TDP), which also supports MPLS forwarding along normally routed paths. For those features that LDP and TDP share in common, the pattern of protocol exchanges between network routing platforms is identical. The differences between LDP and TDP for those features supported by both protocols are embedded in their implementation details, such as the encoding of protocol messages.

This software release of LDP provides the means for transitioning an existing network from a TDP operating environment to an LDP operating environment. Thus, you can run LDP and TDP simultaneously on any given router platform. The routing protocol that you select can be configured on both:

- A per-interface basis for directly-connected neighbors and
- A per-session basis for non-directly-connected (targeted) neighbors

In addition, a label switch path (LSP) across an MPLS network can be supported by LDP on some hops and by TDP on other hops.

MPLS LDP offers the following features:

- IETF Standards-based label distribution protocol
- Multivendor interoperability
- TDP to LDP migration and interoperability

Multi-LVC on RPM-PR Running MGX Release 1.2.02 and Cisco IOS Release 12.2(8)T1

This feature enables support for initiation of multiple LSPs per destination on the RPM-PR. Different label switched paths are established for different classes of service (CoS). This feature enables interface level queuing rather than per-vc level on the RPM-PR based on MPLS CoS policy. With Multilabel switched controlled virtual circuits (Multi-LVC) support, customers can deploy IP VPN services with CoS Service Level Agreements (SLAs).

Bypass Feature for RPM-PR in Cisco IOS Release 12.2(4)T



Note

Information about the bypass feature and its Cisco IOS commands was not available at publish time; therefore, it is included in these release notes.

RPM-PR cards have a maximum storage of 128 KB for the nonvolatile RAM (NVRAM). This size limitation creates a problem for customers with large configurations who find it impossible to store the complete configuration in the NVRAM, even with compression enabled.

To allow customers to store large configuration files, a bypass feature was added. With the bypass feature enabled, users execute the enhanced **write memory** command to bypass NVRAM and save the configuration in the following location:

For MGX Release 1, the file `auto_config_slot##` is located in the `C:/RPM` directory on the PXM1.

Where `##` represents the zero-padded slot number in which the RPM-PR card is seated in the MGX chassis.

To enable the bypass feature, enter the **rpmnvbypass** command from the Cisco IOS run-time image (*not* in the Cisco IOS boot image).

To disable the bypass feature, enter the **no rpmnvbypass** command.

To verify the bypass feature is either enabled or disabled, enter the **show running-configuration** command. If the bypass feature is enabled, **rpmnvbypass** appears in the window. If it does not appear, the feature is not enabled.



Note

Because the bypass feature bypasses NVRAM, it is not necessary to compress the configuration file using the **service compress-config** command.

Table 1 lists the cautions that are important to successfully use the bypass feature.

Table 1 **Boot Cautions**

Caution	Description
<p>When using the bypass feature, you can load the run-time Cisco IOS image from the PXM hard drive or from the bootflash.</p>	<p>You can load the Cisco IOS image in one of three ways:</p> <ol style="list-style-type: none"> 3. From the PXM hard drive. 4. From the bootflash. 5. From the network (for example, through TFTP) from the RPM-PR back card (Ethernet or Fast Ethernet). <p>When the bypass feature is enabled, the boot config statement (c:auto_config_slot##) is automatically generated. The NVRAM configuration is cleared upon executing a write memory command. To load from the network, the RPM-PR must have an IP address for its back card. This information is part of the NVRAM configuration, which was just cleared by enabling the bypass feature. Hence, it is not possible to load the Cisco IOS image from the network upon a reload of the RPM-PR after you execute the rpmnvbypass and write memory commands.</p>
<p>Do not execute the no boot config command.</p> <p>Doing so may prevent the bypass feature from working properly.</p>	<p>When you enable the bypass feature, the following boot config statement is automatically generated, and the NVRAM configuration is cleared:</p> <pre>c:auto_config_slot##</pre> <p>Any writes are subsequently directed to the <i>boot config</i> file. This is essential, as a write memory command expects the boot config statement to be present.</p> <p>If the boot config statement is not present, and you enter the write memory command, this writes the configuration into the NVRAM, which is not desirable when the objective is to save a complete configuration that is large and requires more space.</p>
<p>If the command write memory is issued with the bypass feature enabled, and is consequently followed by an RPM-PR card reset, previous versions of the boot image trigger the RPM-PR card to enter boot mode (unable to load run-time Cisco IOS software).</p>	<p>For safety purposes, the location of the system image is stored in a special area called the ROM monitor (ROMmon) area in the NVRAM. The ROMmon is always intact.</p> <p>The Release 12.2(4)T boot image accesses and reads ROMmon to load the Cisco IOS image. Boot images earlier than Release 12.2(4)T do not read the ROMmon area.</p> <p>Generally, Cisco IOS boot and run-time images are the same versions. However, if you change the boot image to one earlier than Release 12.2(4)T on a reload, the boot image sees that the NVRAM configuration is empty [which is normal when the bypass feature is enabled]. But because boot images earlier than Release 12.2(4)T cannot access the ROMmon area, the boot image cannot read the location of the Cisco IOS image. Because it cannot see the Cisco IOS image, it loads itself.</p>

Example 1 through Example 5 illustrate how to enable and disable the bypass feature, and how to validate each of these actions from the configuration display.

Example 1 Running Configuration—No Bypass Feature Enabled

```
rpm_slot02#show running-config
Building configuration...

Current configuration : 470 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rpm_slot02
!
boot system c:rpm-js-mz.<new_rel>
enable password cisco
!
ip subnet-zero
!
!
!
!
interface Switch1
  no ip address
  no atm ilmi-keepalive
  switch autoSynch off
!
ip classless
no ip http server
ip pim bidir-enable
!
!
snmp-server community public RO
snmp-server community private RW
!
!
line con 0
line aux 0
line vty 0 4
  no login
!
end
```

Example 2 Enabling the Bypass Feature—rpmnvbypass

```
rpm_slot02#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
rpm_slot02(config)#rpmnvbypass
The "boot config" statement has been (re)added to your
running configuration. Do not remove it else risk not
using the nvbypass feature

rpm_slot02(config)#end
rpm_slot02#
```

Example 3 *Running Configuration with Bypass Feature Enabled—rpmnvbypass at End of Output*

```
rpm_slot02#show running-config
Building configuration...

Current configuration: 515 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rpm_slot02
!
boot system c:rpm-js-mz.<new_rel>
boot config c:auto_config_slot02    <==== Line added as per output above
enable password cisco
!
ip subnet-zero
!
!
interface Switch1
  no ip address
  no atm ilmi-keepalive
  switch autoSynch off
!
ip classless
no ip http server
ip pim bidir-enable
!
!
snmp-server community public RO
snmp-server community private RW
!
!
line con 0
line aux 0
line vty 0 4
  no login
!
rpmnvbypass
end
```

Example 4 *Disabling Bypass Feature—no rpmnvbypass*

```
rpm_slot02#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
rpm_slot02(config)#no rpmnvbypass
rpm_slot02(config)#end
rpm_slot02#
```


Example 5 *Running the Configuration After Disabling the Bypass Feature*

```

rpm_slot02#show running-config
Building configuration...

Current configuration: 503 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rpm_slot02
!
boot system c:rpm-js-mz.<new_rel>
boot config c:auto_config_slot02
enable password cisco
!
ip subnet-zero
!
!
!
!
interface Switch1
 no ip address
 no atm ilmi-keepalive
 switch autoSynch off
!
ip classless
no ip http server
ip pim bidir-enable
!
!
snmp-server community public RO
snmp-server community private RW
!
!
line con 0
line aux 0
line vty 0 4
 no login
!
end

rpm_slot02#

```

Features Not Supported in This Release

The following features are not supported on the RPM-PR:

- MPLS inter AS
- MPLS TE

RPM-PR Redundancy Support

Use RPM 1:N redundancy to switch configuration and traffic from one RPM-PR card to another. The main benefits are:

- Route processing continues even if an RPM-PR fails and there is no operator or direct access to swap the failed card or fix the problem.
- An RPM-PR card with hardware problems can be fixed while the redundant standby card takes over its functionality.
- Software upgrades are easy and are performed with less downtime.

SNMP MIB

SNMP MIB files for RPM-PR are provided with MGX Release 1.3.14. These files can be compiled with most standards-based MIB compilers. The tar file contains the MGX MIB files and the MIB release notes.

Cisco IOS MIBs are not part of the MGX Release 1.3.14 SNMP MIB bundle; they are part of Cisco IOS Release 12.3(11)T9.



Note

As of this release, the `old_mib_Format` is discontinued.

Notes and Cautions

Before using this release, review the following notes and cautions.

Special Upgrade Procedure for Cisco IOS Release 12.1(5.3)T_XT

Use the following procedure when upgrading from your current RPM Cisco IOS Release 12.1(5.3)T_XT run-time image and MGX version for MGX Releases 1.2.02 and 1.2.10:

-
- Step 1** Upgrade the RPM-PR/IOS boot and run-time images first. Follow the RPM/IOS image upgrade procedure as specified in the [“Upgrading RPM-PR Cards in MGX PXM1 Switches”](#) section on page 35.
- Step 2** Upgrade the MGX software by entering the following commands:
- ```
install <image-name>
newrev <image-name>
commit <image-name>
```
- 

For more information on the MGX upgrade procedures, refer to the *Release Notes for Cisco MGX 8230, MGX 8250, and MGX 8850 (PXM1), Software Version 1.2.10*.

## UPC Connection Parameters

In Release 1.1.40 and later, the default peak cell rate (PCR) is 50 cps, and the default for policing is enabled. These settings are insufficient for running RPM-PR Intermediate System-to-Intermediate System (IS-IS) protocol over the connection, and with such settings, the IS-IS protocol fails.



### Note

You must increase the PCR value depending upon the number of interfaces configured for IS-IS on the RPM-PR.

Depending upon your connection type, you can use the following CLI commands to modify the PCR parameter:

- **cnfupccbr**
- **cnfupcvbr**
- **cnfupcabr**
- **cnfupcubr**

## Booting the RPM-PR

See [Chapter 5, “Configuring the MGX RPM”](#) in the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1*, (DOC-7812278=) for complete details on configuring an RPM-PR. (See the [“Obtaining Documentation”](#) section on [page 88](#) for information on ordering a printed copy of this guide, or to locate it online.)

When the RPM-PR boots, the boot image must be the first file in the bootflash. If the bootflash does not have a valid boot image as a first file, the card may not be able to boot. You can reboot the RPM-PR from the PXM by entering the **resetcd** *<card\_number>* command from the switch CLI, where *card\_number* is the slot number of the RPM-PR that is being rebooted.



### Note

Omitting the card number resets the entire system.

Also, you can reboot the RPM-PR from the RPM-PR using the console port and then entering the **reload** command.

Each time you turn on power to the RPM-PR by inserting the RPM-PR into the Cisco MGX 8850 switch, the RPM-PR goes through the following boot sequence:

1. The RPM-PR runs diagnostics on the CPU, memory and interfaces.
2. The system boot software (which is the boot image) executes and searches for a valid Cisco IOS image (which is the RPM-PR run-time software). If the configuration register:
  - Is **0x01** (default setting)—The RPM-PR comes up and stays in boot mode.
  - Is **0x2**—The RPM-PR looks for the run-time image either in bootflash or on the PXM1 C:/RPM drive.

The source of the Cisco IOS image is determined by the configuration register setting. To verify this setting, you can either enter the **show version** or the **show bootvar** command. See the [“Viewing the Hardware Configuration”](#) section of the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1* (DOC-7812278=).

3. The search for run-time image is determined by one of the following boot system commands that you enter:
  - Enter the **boot system c:<runtime\_image\_name>** command to search for a run-time image in the C:/RPM directory on the PXM1 hard disk.
  - Enter the **boot system bootflash:<runtime\_image\_name>** to search for a run-time image in the bootflash.
  - If the **boot system bootflash:<runtime\_image\_name>** is not entered, it loads the first available Cisco IOS image from C:/RPM, if an image is present.
4. After three attempts, if the run-time software is not found, the RPM-PR reverts to boot mode.
5. If a valid Cisco IOS image is found, the RPM-PR searches for a valid configuration. The configuration can reside in NVRAM or as a configuration file either on the PXM hard disk C:/RPM drive or in bootflash.

To load from a specific configuration file, enter either the **boot config bootflash:<config\_file>** command or the **boot config c:<config\_file>** command.

6. For normal RPM-PR operation, a valid Cisco IOS image must be present on the PXM-1 C:/RPM drive or in bootflash, and a configuration file must be present in NVRAM, or in the bootflash or on the PXM hard disk.

The first time you boot the RPM-PR, configure the RPM-PR interfaces and save the configuration to a file in NVRAM. Then follow the procedure described in “[Initializing the RPM-PR Card](#)” in the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1* (DOC-7812278=). For more information, refer to Appendix C, “[IOS and Configuration Basics](#)” of the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 2.1* (DOC-7812510=).

## RPM-PR Bootflash Precautions

The RPM-PR bootflash is used to store the boot image, configuration, and run-time files. The flash memory stores and accesses data sequentially, and the RPM-PR boot image must be the first file stored to successfully boot the card. If you erase the boot image or move it from the first position on the flash, the card will not boot.

The RPM-PR boot image, which is shipped loaded on the flash, works for all RPM-PR Cisco IOS images. Therefore, there is no reason to ever delete or move the factory-installed boot image.



### Caution

---

Erasing or moving the boot image can cause RPM-PR boot failure. When this happens, the RPM-PR card must be returned to Cisco and reflashed.

---

To avoid this unnecessary failure, requiring card servicing, remember the following:

- Never erase the boot file from the RPM-PR flash.
- Never change the position of the boot file on the RPM-PR flash.
- Use care when using **squeeze flash:** command to clean up the flash.

If the boot file remains intact in the first position on the flash, the RPM-PR successfully boots.

## Solving the RPM-PR Bandwidth Issue When Adding a 12th VISM Card

If you add more than 11 VISM cards to an MGX chassis with RPM-PR cards, you must enable the expanded memory option on the PXM45/B using the **cnfndparms** command (option 4). This expanded memory option does not have an impact on chassis performance, and allows more connections.

## Limitations and Restrictions

This section lists the limitations and restrictions for Cisco IOS Release 12.3(11)T9 for MGX Release 1.3.14 and earlier releases.

## CWM Recognition of RPM-PR and MGX-RPM-128M/B Back Cards

Cisco WAN Manager (CWM) does not distinguish between the Ethernet back card versions installed with the MGX-RPM-128M/B or RPM-PR. There is no functionality difference.

## RPM/B and RPM-PR Front Card Resets on the Back Card Removal

When you remove or insert an Ethernet back card, the RPM-PR front card may reset on Cisco MGX 8250 and MGX 8850 switches with PXM1 controller cards. To avoid this reset problem, execute a **shut** command before removing the back card.

## RPM/B and RPM-PR Back Ethernet Card Support

For Ethernet connectivity with the RPM-PR, you must have the model /B 4-port Ethernet back card (part number: MGX-RJ45-4E/B).

## MGX-RPM-128M/B Ethernet Back Card Support

You can use the model /B 4-port Ethernet back card with the MGX-RPM-128M/B module only in combination with Cisco IOS Release 12.2(2)T2 or later. The model /B back card does not work on the MGX-RPM-128M/B with earlier versions of Cisco IOS (part number: MGX-RJ45-4E/B).

You can use earlier back cards with any Cisco IOS release.

| 4-port Ethernet Back Card Used with MGX-RPM-128M/B | Required Cisco IOS Release                                                 |
|----------------------------------------------------|----------------------------------------------------------------------------|
| Model /B back card                                 | 12.2(2)T2                                                                  |
| Earlier back card models                           | Minimum Cisco IOS release for MGX-RPM-128M/B on MGX 8250 is Release .0(7)T |

## RPM/B and RPM-PR Limitations and Restrictions for MGX Release 1.3.14

The following RPM/B and RPM-PR limitations and restrictions apply to this release:

- The MGX-RPM-128M/B is a NPE-150-based router card capable of sustaining 150,000 pps. The RPM-PR is an NPE-400-based router card capable of sustaining over 350,000 pps. The RPM-PR only operates with Cisco IOS Release 12.1(5.3)T\_XT or later. In the following section, RPM refers to both the MGX-RPM-128M/B and the RPM-PR, (unless specifically stated). Some software versions and limitations are not applicable to the RPM-PR because it does not support any releases earlier than Cisco IOS Release 12.1(5.3)T\_XT.
- With MGX-RPM-128M/B versions earlier than 12.0.7T1, some limitations in Inter-Process Communication when the MGX-RPM-128M/B is at high loads can cause the PXM to declare that the MGX-RPM-128M/B has failed. To avoid this with MGX-RPM-128M/B, software releases earlier than 12.0.7T1, throughput is limited to 62,000 pps, and we recommend that MPLS configurations are limited to 100 interfaces. With RPM software releases from 12.0.7T1, those limitations are removed. In a separate limitation, the number of directly-connected open shortest path first (OSPF) networks supported by an RPM is currently limited to 27. This means that any or all of the subinterfaces supported by the RPM can run OSPF, but the number of distinct OSPF networks supported is limited to 27. (A workaround is available; see below.) The limit of 27 is because of the overhead of supporting separate link-state databases for separate networks.
- In an application in which the RPM is a PE router in an MPLS Virtual Private Network service, the solution is to use a distance-vector routing protocol between the customer routers and the RPM. A distance-vector routing protocol provides the information for this application: reachability information, and not link-state information. The distance-vector routing protocols supported by the RPM are Border Gateway Protocol (BGP), RIP v1 and RIP v2, and static routing. With RPM software from Release 12.0.7T1 and later, distance-vector routing protocols can be used with as many different networks as subinterfaces.
- If the RPM is acting as a PE router in an MPLS VPN service, and even if OSPF is running in a customer network, it is not necessary to run OSPF between the customer router and the RPM. If the customer edge devices run Cisco IOS, they can redistribute OSPF routing information into RIP using Cisco IOS commands, redistribute RIP in the OSPF configuration, and redistribute OSPF in the RIP configuration. Similar configurations are possible for BGP. (For more information, see the “Configuring IP Routing Protocol-Independent Features” chapter in the *Cisco IOS Release 12.0 Network Protocols Configuration Guide, Part 1*). Redistribution is not unique to Cisco CPEs, and other vendor equipment also supports redistribution.
- Each time two RPM cards on adjacent slots are driven by the same CBC, use the **cnfcbclk** command to set the clock rate to 42 MHz for traffic shaping. This configuration is lost if the node rebuilds due to **resetsys** or a power cycle. After a rebuild using the **cnfcbclk** command, you must manually reconfigure the CBC rate.
- On a Cisco MGX 8850 switch, when the chassis is loaded with six or more RPM-PR cards, and if each card is configured to download the Cisco IOS run-time image from the PXM-1 hard disk, occasionally, upon entering a **resetsys** command or after a power cycle, some of the RPM-PR cards may go into the failed state. To reset failed RPM-PR cards, enter the **resetcd <slot #>** command for each failed card.
- One RPM-PR can only function as either an edge Label Switch Router (eLSR) or as an LSC, but not as both.
- Supports a total of (OC-12 minus T3) Mbps intrashelf traffic for cell bus-based modules.
- To configure redundancy, the primary and secondary RPM-PR cards need to be in the active state and the secondary card should not have any configuration.

- Removing a back card does not cause an RPM-PR switchover.
- After establishing redundancy between two RPM-PR cards with the **addred** command, you must enter the **copy run start** command on the primary RPM-PR card to save the configuration change.
- If a secondary RPM-PR card is redundant to primary cards x and y, you cannot delete redundancy for only card x.
- If you must enter the **switchredcd** and **switchcc** commands, we recommend that you wait at least 5 seconds after issuing the **switchredcd** command, and then enter the **switchcc** command.
- Cisco IOS software images on primary and secondary RPM-PR cards do not have to be compatible, but the Cisco IOS software on a secondary card should be at the same level as the primary card or higher.
- Each time the RPM-PR configuration is changed and you want to store that configuration, you must enter the **copy run start** command on the RPM-PR. If you do not, the changed configuration is lost on RPM-PR card reboot or RPM-PR switchover in case of redundancy.
- Even though an RPM-PR can have 1999 subinterfaces, you must plan the use of subinterfaces to prevent the crossing of a safe limit of 1985. This is because each subinterface takes one interface descriptor block (IDB) and the number of IDBs available in the card is 2000. Further, a user might need some IDBs for the RPM-PR back card and its ports.
- For RPM/B and RPM-PR PVC dax connections, the slave end must be deleted before the master endpoint.

## Open Caveats

This section contains the lists of open caveats in Cisco IOS Releases 12.3.x.

### Open Caveats in Release 12.3(11)T9 for MGX 1.3.14

No open bugs are listed for this release.

### Open Caveats in Release 12.3(11)T7 for MGX 1.3.12

No open bugs are listed for this release.

## Open Caveats in Release 12.3(11)T6 for MGX 1.3.12

Table 2 lists open caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 1.3.12 as of June 20, 2005.

**Table 2** Open Caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 1.3.12

| Caveat Number | Symptom                                                     | Conditions                                                                                                                                                                                                                                           | Workaround |
|---------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| CSCef79260    | A Cisco RPM-PR card stops responding at atmdx_rx_interrupt. | Observed in a configuration in which two LSCs are configured for hot redundancy with a large MPLS VPN configuration on a PE router, and LDP flapping was performed for a long time. Observed on an RPM router running Cisco IOS Release 12.2(15)T4e. | Unknown    |

## Open Caveats in Release 12.3(11)T3 for MGX 1.3.12

Table 3 lists open caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 1.3.12 as of January 2005.

**Table 3** Open Caveats in Cisco IOS Release 12.3(11)T3 for MGX 1.3.12

| Caveat Number | Symptom                                                                                                                                                                  | Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Workaround                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| CSCec68542    | In a large-scale network and under a stressful condition, segmentation and reassembly (SAR) may not reassemble properly for large packets, causing the protocol to fail. | Observed on an RPM-PR that runs Cisco IOS Release 12.2(15)T4B that functions as a Label Edge Router (LER), and that is configured with two LSCs under the following conditions: <ul style="list-style-type: none"> <li>• With a script running, disable and re-enable the multi-virtual-circuit (Multi-VC) mode on the RPM-PR.</li> <li>• 1000 soft permanent virtual circuits (SPVCs) that have VPN routing/forwarding (VRF) enabled exist.</li> <li>• 500 external Border Gateway Protocol (eBGP) sessions exist.</li> <li>• 80-Mbps input traffic and 6-Mbps output IP traffic is in place.</li> </ul> | To clear the issue, enter the <b>clear int switch1</b> command. L3 protocols come up. |



**Table 3**      **Open Caveats in Cisco IOS Release 12.3(11)T3 for MGX 1.3.12 (continued)**

| Caveat Number | Symptom                                                                                                                                                                 | Condition                                                                                                                                                                                                                                                                                                                                                  | Workaround                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCee21093    | On a Cisco MGX 8850 switch with a PXM1 controller card platform, TFTP of the config file by the CWM NMS application from the RPM-PR card takes a long time to complete. | The CWM application attempts to sync up with the Cisco MGX 8850 switch. This process invokes an SNMP <b>get route</b> command to collect information from the switch cards. The RPM-PR config file cannot be collected as the SNMP get routine gets timed out. As the timeout happens in this condition, CWM cannot sync up with the RPM-PR configuration. | Remove the running configuration of the RPM-PR card by executing the <b>clrsmcnf</b> command from the PXM1 controller card. Reload the original configuration (which must be saved in a temporary file before executing the <b>clrsmcnf</b> command) on the RPM-PR card. This allows the card to resync properly with CWM. |
| CSCef07711    | A Cisco MGX-RPM-PR stops responding with a crashinfo file, indicating that it failed to reset the ATMizer (SAR) chip.                                                   | Observed when a Cisco MGX 8850 switch in which an MGX-RPM-PR-512 is running Cisco IOS Release 12.2(15)T4e.                                                                                                                                                                                                                                                 | None                                                                                                                                                                                                                                                                                                                       |
| CSCef47494    | RPM-PR does not respond to console commands.                                                                                                                            | After a node is powered on.                                                                                                                                                                                                                                                                                                                                | Reset the card slot from PXM.                                                                                                                                                                                                                                                                                              |
| CSCef79260    | An RPM-PR card may stop responding upon entering <code>atmdx_rx_interrupt</code> .                                                                                      | Observed in a configuration in which two LSCs are configured for hot redundancy with a large MPLS VPN configuration on a PE router, and LDP flapping was performed for a long time.                                                                                                                                                                        | Unknown                                                                                                                                                                                                                                                                                                                    |
| CSCeg11001    | RPM-PR interface update to PXM failed.                                                                                                                                  | Adding IP address on an RPM-PR subinterface.                                                                                                                                                                                                                                                                                                               | Unknown                                                                                                                                                                                                                                                                                                                    |
| CSCin75680    | On an RPM-PR card, ingress and egress parameters in resource-partition are decremented automatically when the max/min virtual circuit identifier (VCI) is changed.      | Change the max/min VCI values in resource partition details and enter the <b>snmpget</b> command on ingress and egress bandwidth parameters after you change VCI.                                                                                                                                                                                          | Unknown                                                                                                                                                                                                                                                                                                                    |

## Open Caveats in Release 12.3(7)T3 for MGX 1.3.10

Table 4 lists open caveats in Cisco IOS Release 12.3(7)T3 for MGX Release 1.3.10 as of August 2004.

**Table 4** Open Caveats in Cisco IOS Release 12.3(7)T3 for MGX Release 1.3.10

| Caveat Number | Symptom                                                                                                                                                                                                             | Condition                                                                                                                                                                                                                                  | Workaround                                                                                                                                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCdv24154    | If you set the maximum transmission unit (MTU) size in the XtagATM interface in LSC, the system defaults to 4470.                                                                                                   | Observed when you set the MTU size in the XtagATM interface in LSC.                                                                                                                                                                        | None                                                                                                                                                                                                                               |
| CSCea84387    | A user session may pause indefinitely, causing a Cisco router to become unresponsive.                                                                                                                               | Observed when multiple simultaneous users enter modular QoS CLI (MQC) commands on the same router through separate virtual terminal type (vty) sessions.                                                                                   | Allow only one user at a time to enter MQC commands                                                                                                                                                                                |
| CSCea85160    | snmpwalk on ifDescr responds to aal5 mib variable.                                                                                                                                                                  | Observed when you query for the ifDescr.                                                                                                                                                                                                   | None                                                                                                                                                                                                                               |
| CSCec02155    | All Virtual Switch Interface (VSI) sessions go down and XTag interfaces go to the down/down state on an LSC.                                                                                                        | Observed on an RPM-PR that acts as an LSC.                                                                                                                                                                                                 | None                                                                                                                                                                                                                               |
| CSCec16481    | A Cisco device running Cisco IOS and enabled for OSPF protocol is vulnerable to a Denial of Service (DoS) attack from a malformed OSPF packet. The OSPF protocol is not enabled by default. Further details and the | Present in Cisco IOS Releases based on 12.0S, 12.2, and 12.3. Releases based on 12.0, 12.1 mainlines, and all Cisco IOS images before Release 12.0 are not affected. Refer to the Security Advisory for a list of affected release trains. | Workarounds to mitigate the effects are explained in the Security Advisory at: <a href="http://www.cisco.com/warp/public/707/cisco-s-a-20040818-ospf.shtml">http://www.cisco.com/warp/public/707/cisco-s-a-20040818-ospf.shtml</a> |
| CSCec26512    | After switchover, 22 LVCs entered Bwait state.                                                                                                                                                                      | After switchover.                                                                                                                                                                                                                          | None                                                                                                                                                                                                                               |
| CSCed83799    | The following error message appeared on an RPM-PR terminal, followed by a traceback.<br><br>*Feb 24 14:36:35.140:<br>%ATMPA-3-BADPARTICLE: Switch1: bad rx particle 0x61DE1540 flags 0x00000000 index 19000         | Appears on an RPM-PR terminal when there is heavy incoming and outgoing traffic through the RPM-PR card.                                                                                                                                   | None                                                                                                                                                                                                                               |
| CSCed85540    | An RPM-PR acting as LSC resets due to a <b>software forced reload</b> command.                                                                                                                                      | This problem might be seen on the RPM-PR in the following conditions: <ul style="list-style-type: none"> <li>• Acts as LSC in cell-based MPLS network.</li> <li>• Frequent Multi-VC flaps back to back.</li> </ul>                         | None                                                                                                                                                                                                                               |
| CSCee37192    | Upstream RPM to RPM flow corrupted with connection identifiers (CIDs).                                                                                                                                              | —                                                                                                                                                                                                                                          | —                                                                                                                                                                                                                                  |
| CSCee74057    | RPM-PR throughput performance degradation.                                                                                                                                                                          | —                                                                                                                                                                                                                                          | —                                                                                                                                                                                                                                  |

## Resolved Caveats

This section contains the lists of resolved caveats in Cisco IOS Releases 12.3.x.

### Resolved Caveats in Release 12.3(11)T9 for MGX 1.3.14

No caveats are resolved in this release.

### Resolved Caveat in Release 12.3.(11)T7 for MGX 1.3.12

[Table 5](#) lists the resolved caveat in Cisco IOS Release 12.3(11)T7 for MGX Release 1.3.12 as of September 26, 2005.

**Table 5** Resolved Caveat in Cisco IOS Release 12.3.(11)T7 for MGX Release 1.3.12

| Caveat Number | Description                                           |
|---------------|-------------------------------------------------------|
| CSCeh86365    | IPC-ERR: Back card line update to PXM failed/timeout. |

### Resolved Caveats in Release 12.3(11)T6 for MGX 1.3.12

[Table 6](#) lists resolved caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 1.3.12 as of June 20, 2005.

**Table 6** Resolved Caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 1.3.12

| Caveat Number | Description                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------|
| CSCef07711    | A Cisco MGX-RPM-PR stopped responding with a crashinfo file, indicating that it failed to reset the ATMizer (SAR) chip. |
| CSCef60537    | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                 |
| CSCeg87969    | RPM-PR dropped unmuxed packets sent by far router.                                                                      |
| CSCeg11001    | Interface update to PXM failed when you added an ip addr.                                                               |
| CSCeg15067    | Upon reload, the RPM-PR sent redundant traps about the presence of the card.                                            |
| CSCeg17630    | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                 |
| CSCeg17638    | When 1FE_CP Fast Ethernet coprocessor back card failed, it did not trigger a front card switchover.                     |
| CSCeg25439    | RPM-PR sent incorrect values in the trap varbind.                                                                       |
| CSCeh00712    | Inconsistency on RPM FECF_RJ45 back card type.                                                                          |
| CSCeh02016    | RPM-PR router was reloaded abnormally when its back card underwent OIR.                                                 |
| CSCeh06751    | RPM_PR Front card switchover did not occur by default when 1FECF back card underwent OIR.                               |
| CSCeh27915    | RPM-PR switchover.                                                                                                      |

**Table 6** *Resolved Caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 1.3.12 (continued)*

| <b>Caveat Number</b> | <b>Description</b>                                                                                                                                                                        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCeh54867           | %RPM_VIRTUAL_PORT-3-IPCERR: switch_vport_send_pxm_with_reply: Vport request rejected by PXM. Error String = enErr:Input parameters are InCorrect. Error Code = 1869756999.                |
| CSCeh78358           | SAR failure caused the RPM-PR to reset because of watchdog timer expiry.                                                                                                                  |
| CSCsa55292           | The LVCs under a subinterface became stuck, causing OutPktDrops on an RPM-PR card.                                                                                                        |
| CSCsa81379           | NetFlow Feature Acceleration is deprecated and removed from Cisco IOS. The global command <b>ip flow-cache feature-accelerate</b> is no longer recognized in any Cisco IOS configuration. |

## Resolved Caveats in Release 12.3(11)T3 for MGX 1.3.12

Table 7 lists resolved caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 1.3.12 as of January 25, 2005.

**Table 7** *Resolved Caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 1.3.12*

| <b>Caveat Number</b> | <b>Description</b>                                                                                                                                                           |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCed94598           | An RPM-PR over-shaped the traffic by 0.3 to 0.5 percent above the sustainable cell rate (SCR).                                                                               |
| CSCee12392           | An RPM-PR did not boot up due to continuous hardware watchdog resets.                                                                                                        |
| CSCee33948           | Intermittent diagnostic loopback failure.                                                                                                                                    |
| CSCee38626           | Unexpected reload of an RPM-PR acting as an LSR in an MPLS domain.                                                                                                           |
| CSCee53246           | The standby (secondary) RPM-PR did not release the config_file boot variable after the primary redundant RPM-PR card takes over when a card switchover command was executed. |
| CSCee59256           | You could not execute the <b>write memory</b> or the <b>dir filesystem</b> command.                                                                                          |
| CSCef34052           | IP connectivity between the PE and the LSC was lost, causing the LDP session to flap.                                                                                        |
| CSCef53761           | RPM-PR reloaded when the SAR auto recovery mechanism began.                                                                                                                  |
| CSCef60537           | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                                                                      |
| CSCeg17630           | The MGX-RPM-1FE-CP RPM-PR back card SNMP traps are not sent to the PXM.                                                                                                      |

## Resolved Caveats in Release 12.3(7)T3 for MGX 1.3.10

Table 8 lists resolved caveats in Cisco IOS Release 12.3(7)T3 for MGX Release 1.3.10 as of August 18, 2004.

**Table 8** Resolved Caveats in Cisco IOS Release 12.3(7)T3 for MGX Release 1.3.10

| Caveat Number | Description                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------|
| CSCea62571    | %UTIL-3-TREE: Data structure error with traceback logged on LSC.                                    |
| CSCea85395    | BGP suppressed prefixes not reinstated after condition removed.                                     |
| CSCed41381    | Input drops on framed PVC i/f causing an LDP session flap.                                          |
| CSCed74835    | When copying big files from an RPM-PR to a Cisco MGX 8850 switch hard drive, it silently failed.    |
| CSCee54524    | During SCR provisioning (changing the bandwidth) on the ePVCs, the RPM-PR PE occasionally reloaded. |

## Resolved Caveats in Release 12.3(2)T6 for MGX 1.3.00

Table 9 lists resolved caveats in Cisco IOS Release 12.3(2)T6 for MGX Release 1.3.00 as of June 4, 2004.

**Table 9** Resolved Caveats in Cisco IOS Release 12.3(2)T6 for MGX Release 1.3.00

| Caveat Number | Description                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCec76875    | A PE router was unable to ping other PE routers or an LSC, nor could other platforms ping the PE router.                                                                                                                                                                                |
| CSCed82475    | An LSC reloaded unexpectedly when an Address Error (load or instruction fetch) exception occurred.                                                                                                                                                                                      |
| CSCed85438    | A Fast Ethernet 100BASE-TX port adapter on an RPM-PR card stopped receiving burst traffic packets.                                                                                                                                                                                      |
| CSCee03384    | When an LC-ATM switch subinterface was created and then deleted on an RPM-PR, the index for the subinterface for the LVC stuck detection and recovery mechanism changed in such a way that the LVC stuck information for an existing LC-ATM was overwritten when a new LC-ATM is added. |

## Resolved Caveats in Release 12.3(2)T5 for MGX 1.3.00

Table 10 lists resolved caveats in Cisco IOS Release 12.3(2)T5 for MGX Release 1.3.00 as of April 14, 2004.

**Table 10** Resolved Caveats in Cisco IOS Release 12.3(2)T5 for MGX Release 1.3.00

| Caveat Number | Description                                                                        |
|---------------|------------------------------------------------------------------------------------|
| CSCdz79827    | SNMP loop occurred at cipPrecedenceEntry on the switch subinterface of the RPM-PR. |
| CSCea26869    | Kept sending an IPC message header cache below traceback.                          |

**Table 10** Resolved Caveats in Cisco IOS Release 12.3(2)T5 for MGX Release 1.3.00 (continued)

| Caveat Number | Description                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| CSCea44854    | Error Messages from the RPM-PR card for SNMP requests are wrong.                                                                       |
| CSCea74335    | On reloading an RPM-PR card using the <b>reload</b> command, it prompts for saving the configuration even if it has not been modified. |
| CSCeb10082    | No indication in the log that <b>clear int sw1</b> was executed through the CLI.                                                       |
| CSCeb11734    | Traceback messages were received on slot 14 after an upgrade was performed.                                                            |
| CSCeb22233    | The RPM-PR failed after Fast Ethernet back card OIR.                                                                                   |
| CSCeb41501    | Traceback on RPM-PR with only virtual channel connection (VCC) virtual path connection (VPC) switch partition configured.              |
| CSCeb61872    | <b>sw rev varbind</b> command is not available when trap 60056 is sent for an RPM-PR.                                                  |
| CSCeb63762    | RPM-SAR remote access server (RAS) enhancement. Ability to reset SAR after failure.                                                    |
| CSCeb65685    | <b>ip cef load-sharing algorithm tunnel</b> command lost upon resetting an RPM-PR.                                                     |
| CSCeb78535    | Received multiple alignment errors when adding switch connection.                                                                      |
| CSCeb78905    | Incorrect configuration generation for RPM-PR commands.                                                                                |
| CSCeb81588    | Set PCI retry timer to nonzero value for the RPM-PR platform.                                                                          |
| CSCeb74637    | During the RPM-PR upgrade to 12.2(8)MC2d, the startup config disappeared.                                                              |
| CSCec14559    | The PXM spontaneously failed over during 1:N RPM redundancy testing.                                                                   |
| CSCed05581    | The switch connection configuration in switch subinterfaces is lost after reloading in RPM-PR.                                         |
| CSCed25513    | Watchdog timeout occurred when malloc fails while resynching.                                                                          |
| CSCed26565    | RPM-PR-512 reset multiple times due to a SAR APU stall.                                                                                |
| CSCed40082    | Duplicate <b>ping atm</b> command in the RPM-PR.                                                                                       |
| CSCed46492    | Ethernet 2/1 on RPM-PR stayed in shutdown state after a <b>switchredcd</b> command was used.                                           |

## Compatibility Notes

This section contains compatibility information for the RPM-PR card.

All Cisco IOS firmware can be downloaded from Cisco.com at:

<http://www.cisco.com/kobayashi/sw-center/sw-ios.shtml>

## RPM-PR Boot File and Firmware File Names and Sizes

Table 11 displays RPM-PR boot and firmware file names and sizes for this release.

**Table 11** *RPM-PR Boot and Firmware File Names and Sizes*

|                      | File Name             | File Size (in Bytes) |
|----------------------|-----------------------|----------------------|
| <b>Boot File</b>     | rpm-boot-mz.123-11.T9 | 3933600              |
| <b>Firmware File</b> | rpm-js-mz.123-11.T9   | 12053028             |

## RPM-PR Compatibility Matrix

Table 12 contains the compatibility matrix for the RPM-PR card.

**Table 12** *RPM-PR Compatibility Matrix*

| MGX Software Release | Cisco IOS Release      | CWM             |
|----------------------|------------------------|-----------------|
| 1.3.14               | 12.3(11)T9             | 15.1.50         |
|                      | 12.3(11)T7             |                 |
| 1.3.12               | 12.3(11)T7             | 15.1.50         |
|                      | 12.3(11)T6             | 15.1.00         |
|                      | 12.3(11)T3             | 15.1.00         |
| 1.3.10               | 12.3(7)T3              | 15.0.00 P2      |
| 1.3.00               | 12.3(2)T6              | 15.0.00         |
|                      | 12.3(2)T5              | 15.0.00         |
| 1.2.21               | 12.3(2)T4              | 12.0.00.2       |
|                      | 12.2(15)T5             | 12.0.00.1       |
| 1.2.20               | 12.2(15)T4a            | 11.0.11         |
| 1.2.13/3.0.20        | 12.2(11)T2             | 11.0.10 Patch 1 |
| 1.2.11/3.0.10        | 12.2(11)T1             | 11.0.10         |
| 1.2.10/3.0.00        | 12.2(8)T4              | 11.0.00         |
| 1.2.02/2.1.76        | 12.2(8)T1 <sup>1</sup> | 10.5.10 Patch 1 |
| 1.2.00/2.1.70        | 12.2(4)T1              | 10.5.10         |
| 1.1.40               | 12.2(4)T               | 10.5            |
| 1.1.34               | 12.2(2)T2              | 10.4.01 Patch 1 |
| 1.1.32               | 12.1(5.3)T_XT          | 10.4.01         |

1. MGX 1.2.02 has also been certified with Cisco IOS 12.2(4)T3.

# MGX RPM/B and RPM-PR Hardware

Table 13 shows the front and back card compatibility for the RPM/B and RPM-PR hardware supported in this release. The table lists the card model, name, part numbers, minimum version, and minimum revisions of each card supported. More than one 800-level part number for the same front cards may exist. The minimum version is identified by the last 2 digits of the 800-level numbers.

**Table 13** Hardware Compatibility Matrix

| Front Cards    | Part Number/<br>Min. Version | Rev. | Back Cards      | Part Number/<br>Min. Version | Rev. |
|----------------|------------------------------|------|-----------------|------------------------------|------|
| MGX-RPM-128M/B | 800-05743-01                 | A0   | MGX-RJ45-FE     | 800-02735-02                 | A0   |
|                |                              |      | MGX-MMF-FE      | 800-03202-02                 | A0   |
|                |                              |      | MGX-RJ45-4E     | 800-02737-02                 | A0   |
|                |                              |      | MGX-MMF-FDDI    | 800-02857-01                 | A0   |
|                |                              |      | MGX-MMF-FDDI/FD | 800-03820-01                 | A0   |
|                |                              |      | MGX-SMF-FDDI    | 800-02736-01                 | A0   |
|                |                              |      | MGX-SMF-FDDI/FD | 800-03822-01                 | A0   |
| MGX-RPM-PR-256 | 800-07178-02                 | A0   | MGX-RJ45-FE     | 800-02735-02                 | A0   |
|                |                              |      | MGX-MMF-FE      | 800-03202-02                 | A0   |
|                |                              |      | MGX-RJ45-4E/B   | 800-12134-01                 | A0   |
| MGX-RPM-PR-512 | 800-07656-02                 | A0   | MGX-RJ45-FE     | 800-02735-02                 | A0   |
|                |                              |      | MGX-MMF-FE      | 800-03202-02                 | A0   |
|                |                              |      | MGX-RJ45-4E/B   | 800-12134-01                 | A0   |

## Previous Cisco IOS Release Compatibility Information

This section describes the compatibility information for RPM-PR modules with Cisco IOS Releases prior to 12.3.x.

### About Cisco IOS Release 12.2(15)T5

Cisco IOS Release 12.2(15)T5 supports existing features on the MGX-RPM-PR and MGX-RPM-128M/B cards.

### About Cisco IOS Release 12.2(11)T1

Cisco IOS Release 12.2(11)T1 supports existing features on the MGX-RPM-PR and MGX-RPM-128M/B cards.



## About Cisco IOS Release 12.2(8)T4

Cisco IOS Release 12.2(8)T4 supports existing features on the MGX-RPM-PR and MGX-RPM-128M/B cards.

## About Cisco IOS Release 12.2(8)T1

Cisco IOS Release 12.2(8)T1 supports existing features on the MGX-RPM-PR and MGX-RPM-128M/B cards and the CBC clock rate configuration feature described in [“Features Not Supported in This Release”](#) section on page 17.

## About Cisco IOS Release 12.2(4)T3

Cisco IOS Release 12.2(4)T3 supports existing features on the MGX-RPM-PR and MGX-RPM-128M/B cards.

## About Cisco IOS Release 12.2(4)T1

Cisco IOS Release 12.2(4)T1 or later is used with MGX Release 1.2.00. This Cisco IOS release supports new RPM-PR features and continues to support existing features on the RPM-PR and MGX-RPM-128M/B cards.

**Note**

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The MPLS inter AS and MPLS TE are not supported features on RPM-PR for this release.

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## About Cisco IOS Release 12.2(4)T

Cisco IOS Release 12.2(4)T or later is used with MGX Release 1.1.40. This Cisco IOS release supports new RPM-PR features and continues to support existing features on the RPM-PR and MGX-RPM-128M/B cards.

**Note**

---

The MPLS inter AS and MPLS TE are not supported features on RPM-PR for this release.

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## About Cisco IOS Releases 12.2(2)T2 and 12.2(2)T3

Cisco IOS Releases 12.2(2)T2 and 12.2(2)T3 are used with MGX Releases 1.1.34 and 1.1.40. This Cisco IOS release does not support new RPM-PR features, but was tested with Release 1.1.34 and continues to support existing features on the RPM-PR and MGX-RPM-128M/B cards. Note the following anomaly in Cisco IOS Release 12.2(2)T2:

- **Description**—Customers upgrading to Release 12.2(2)T2 with RPMs might not see some external Border Gateway Protocol (eBGP) sessions coming up when the customer edge (CE) router is running an earlier Cisco IOS release (12.0 and 12.0.xT). This issue was encountered with a CE running a Release 12.0(7)T image. In such cases, the CEs running earlier Cisco IOS releases were not able to create BGP sessions to PEs with the later image (Release 12.2(2)T2). The issue is fixed in 12.2(2)T3. Customers who face the problems described with the 12.2(2)T2 image, may upgrade to 12.2(2)T3 image.
- **Symptom**—MPLS PE does not advertise BGP network to CE router running an older Cisco IOS image.
- **Condition**—A Cisco router that is running Cisco IOS Release 12.2(3.1)T or 12.2(2)T and is configured as a PE router may not support LDP. This defect might cause the PE router not to advertise any BGP routes to a Cisco 2600 series CE router that is running Cisco IOS Release 12.0(18). However, the CE router advertises routes to the PE router. Entering the neighbor **ce-ipaddress don-capability-negotiate** command on the PE router does not correct this defect.
- **Workaround**—Upgrade the CE router from Cisco IOS Release 12.0(18) to Cisco IOS Release 12.2(2)T3.

## About Cisco IOS Release 12.1(5.3)T\_XT

Cisco IOS Release 12.1(5.3)T\_XT and later is used with MGX Release 1.1.32 and provides support for:

- RPM-PR in any MGX chassis




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**Note** RPM-PR is FCS with Release 1.1.32; and General Availability with Release 1.1.34.

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- MGX-RPM-128M/Bs in a Cisco MGX 8230 chassis
- Multiple RPM-PR card types
- Cisco IOS Release 12.1(5.3)T\_XT offers no other software features for the RPM-PR




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**Note** To locate Cisco IOS-related anomalies or problems fixed, please refer to Cisco IOS release notes.

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## Caveats Fixed with Cisco IOS Release 12.1(5.3)T\_XT

Refer to the Release Notes for Cisco IOS Release 12.1 at:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121relnt/index.htm>

# Special Installation and Upgrade Requirements

Existing customers must use the upgrade procedures located in the “[Upgrading RPM-PR Cards in MGX PXM1 Switches](#)” section on page 35. For new customers, the image is pre-installed and they should use the PXM installation procedure in the PXM documentation to upgrade to future maintenance releases.

## Upgrading from an MGX-RPM-128M/B Card to an RPM-PR Card

To replace an MGX-RPM-128M/B card with an RPM-PR card, the PXM must be running MGX Release 1.1.34 or later, and the RPM-PR must be running IOS Release 12.2(4)T or later. Then perform the following procedure.

- 
- Step 1** Insert the RPM-PR in a test node.
- Step 2** Copy the new RPM-PR boot image to the Flash. Verify that the boot image is the first file in the Flash.
- Step 3** Modify the configuration of the file to use the latest IOS image on the c: drive by entering the **boot system c:<IOS\_filename>** command.
- Step 4** Enter the **write memory** command to save the configuration file in NVRAM.
- Step 5** Enter the **show bootvar** command to check the Boot variable and to verify that the card is configured to boot from the latest image.
- Now the RPM-PR card is ready to replace an MGX-RPM-128M/B card.
- Step 6** Before you insert the RPM-PR in the node, verify the following:
- PXM is running Release 1.1.34 or later
  - PXM disk contains the latest Cisco IOS image specified for the RPM-PR
- 



**Caution**

After an MGX-RPM-128M/B card is replaced with a RPM-PR card, the MGX-RPM-128M/B card cannot be re-installed. If you attempt to re-install the MGX-RPM-128M/B, the module is placed in a mismatch state.

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**Caution**

After installing the RPM-PR card, do not mix card redundancy.

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## Upgrading RPM-PR Cards in MGX PXM1 Switches

The following sections describe how to upgrade boot and run-time software on RPM-PR cards in detail.

### Upgrading RPM-PR Boot Software

A boot file is installed in the bootflash on the RPM-PR card and is used to boot the card. The run-time software is updated more frequently than the boot software. However, the boot software is updated occasionally. When you are updating run-time software, check [Table 11](#) to see if a boot software upgrade is required.

The boot software is stored in bootflash memory on the RPM-PR card. To manage the software in bootflash, you access it as if it were a hard disk. For example, in **copy** and **delete file** commands, files are identified as `bootflash:filename` (which is similar to `c:filename`).

The following example shows a directory of bootflash contents:

```
Router (boot)#show flash:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .D config D4F7352A 40330 18 686 Jan 30 2001 18:18:41 auto_config_slot09
2 .D config CBF007C1 40660 9 688 Feb 22 2001 15:33:11 slot9.cnf
3 .. image F596869A 2973E8 27 2452744 Feb 28 2001 03:16:05
rpm-boot-mz_002.001.070.202
```


**Note**

Although you can display directory contents with the **dir bootflash:** command, the **show flash:** command provides more detail. Also, although bootflash and Flash are separate entities on other Cisco Systems Routers, both terms refer to the same entity on the RPM-PR.

In the example above, the numbers in the left column indicate the order in which the RPM-PR card tries to load software. The second column shows that the first two files are marked for deletion (D). The last column lists the names of the files stored in bootflash.

When managing the bootflash, you need to consider the following:

- When the RPM-PR card is reset, it tries to load the first undeleted bootable image in bootflash.
- Files are not removed from bootflash until the **squeeze flash:** command is entered.


**Caution**

If all bootable images are deleted from bootflash, try to reinstall the bootflash file using the Xmodem download procedure found in [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 46](#). If this does not work, return the card to the factory to be reprogrammed.

## Upgrading RPM-PR Run-Time Software

You can load the run-time software on the RPM-PR from the following sources:

- The C:\RPM directory on the PXM1 hard disk
- Bootflash
- A TFTP server on a LAN to which an RPM-PR back card is connected

We recommend that you configure the RPM-PR card to load from the C:\RPM directory on the PXM1 hard disk. Note that images load much faster from bootflash, but if you are using multiple RPM-PR cards, it takes longer to complete an upgrade because the run-time software must be copied to each RPM-PR card's bootflash instead of to a single location.

At startup, the RPM-PR card attempts to load the software in the order listed in the startup-config file. The following example shows an excerpt from a startup-config file:

```
!
boot system c:rpm-js-mz.122-4.T
boot system bootflash:rpm-js-mz.122-4.T
boot config c:auto_config_slot09
logging rate-limit console 10 except errors
enable password cisco
!
```

In the startup-config file example, the RPM-PR card attempts to load the run-time software from the PXM1 card (C:rpm-js-mz.122-4.T) first, and if that fails, it attempts to load the image copy stored in bootflash. This configuration takes longer to upgrade, but it assures the card can reboot if someone accidentally removes the file on the PXM1 hard disk.

**Note**

The convention is lowercase *c* for RPM-PR commands and uppercase *C* for switch commands.

To configure the RPM-PR to load upgraded run-time software from the PXM1 hard disk, you must do the following:

- Copy the upgraded file to the PXM1 hard disk.
- Update the boot system variable in the router startup-config file to load the new file.
- Reset the RPM-PR card so that it loads the new file.

You can configure RPM-PR cards for 1:N redundancy as well as for non-redundant configurations. The procedures for both types of configuration are in the sections that follow.

**Tip**

To simplify run-time software updates, copy the run-time file in the C:RPM directory and rename it to a generic name such as rpm-js-mz. The production run-time filenames have version numbers appended to them, but you can change this. This approach allows you to perform future upgrades by copying the file to the hard disk, renaming a copy of the file to your generic name, and resetting each card. The approach eliminates the need to reconfigure the Cisco IOS on each card to recognize the new filename.

## Upgrading Boot Software and Run-Time Software for Non-Redundant Cards

To upgrade boot software and run-time software.

**Note**

The first part of this procedure describes boot software upgrade and the second part describes run-time software upgrade. RPM-PR boot software can be upgraded either in boot mode or in run-time mode. The procedure described here shows an example for run-time mode. The same commands are applicable for upgrading boot software in boot mode.

**Step 1** Copy the new boot software file for the RPM-PR card to the switch (C:RPM).

**Step 2** Establish a configuration session using any valid user name.

**Step 3** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
8850_LA.7.PXM.a > cc 9
(session redirected)
Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.



**Note** This procedure assumes that you are familiar with Cisco IOS, which is a topic that is beyond the scope of this book. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples are given to show how to complete the task.

**Step 4** Enter Enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

**Step 5** To verify router access to the PXM1 hard disk and display the boot file name, enter the following command:

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

65539 -rw- 815 Sep 13 2001 23:51:10 auto_config_slot09
65540 -rw- 2588780 Mar 22 2001 19:06:54 rpm-boot-mz_002.001.070.201
84611 -rw- 2452768 Apr 05 2001 05:34:44 rpm-boot-mz.122-4.T
66805 -rw- 8529104 Mar 22 2001 19:09:00 rpm-js-mz_002.001.070.201
85809 -rw- 7936012 Apr 05 2001 06:28:54 rpm-js-mz.122-4.T
```

104857600 bytes total (83068928 bytes free)

**Step 6** To display the files in the bootflash, enter the following command:

```
Router#show flash:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image F596869A 296D88 27 2452744 Feb 28 2001 03:16:05
rpm-boot-mz_002.001.070.201
```

30315128 bytes available (2452872 bytes used)

**Step 7** To copy new boot software to the bootflash, use the **copy** command as shown in the following example:

```
Router#copy c:rpm-boot-mz.122-4.T bootflash:
Destination filename [rpm-boot-mz.122-4.T]?
CC
CCCCCCCCCCCCCCCCCCCC
2334044 bytes copied in 35.768 secs (66686 bytes/sec)
```



**Tip** When prompted for the destination filename, press **<Enter>** to use the source filename shown in the prompt. To change the destination filename, enter a new filename after the prompt.

**Step 8** To verify that the file was copied, enter the **show flash:** command.

**Step 9** To mark an older boot file for deletion from the bootflash, enter the following command:

```
Router#del bootflash:
Delete filename []? rpm-js-mz
Delete bootflash:rpm-js-mz? [confirm]
Router#
```

**Tip**

To unmark a bootflash file so that it is not deleted when running the **squeeze flash:** command, enter the **undelete <number>** command, where *number* is the file number displayed in the left-most column of the **show flash:** command display.

**Step 10** To delete all files that are marked for deletion from bootflash, enter the following command:

```
Router#squeeze flash:
All deleted files will be removed. Continue? [confirm]y
Squeeze operation may take a while. Continue? [confirm]

Squeeze of bootflash complete
```

**Step 11** Enter the **show flash:** command to verify that the bootflash files are as you want them.

**Caution**

If all bootable images are deleted from bootflash, try to reinstall the bootflash file using the Xmodem download procedure found in [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 46](#) and restart the RPM-PR card. If this does not work, return the card to the factory to be reprogrammed. When you are done managing the bootflash, the **show flash:** command should display at least one bootable image, and the image you want the card to boot from must be the first bootable image in the list.

**Tip**

If the **show flash:** command does not display a bootable image, copy a bootable image to bootflash as described earlier in this procedure. You can continue to manage the bootflash, even when there are no files in bootflash, until the router is restarted.

**Tip**

If the bootflash contains bootable images and the sequence is such that the card does not start, you can enter rommon mode and load the bootable image. To get into rommon mode, establish a console connection to the RPM-PR card, reset the RPM-PR card using the **resetcd <slot>** command from the active PXM1 card, then quickly enter the **CTRL-[, Break** sequence at the RPM-PR console. The command to send a Break depends on the computer platform and software you are using. It may take a couple of attempts to successfully get into rommon mode. When you are in rommon mode, the RPM-PR card displays the *rommon 1 >* prompt.

After you enter rommon mode, you can enter the **dir bootflash:** command to display the images in bootflash. To boot one of the images, enter a **boot** command the following format: **boot bootflash:filename.**

See the [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 46](#).

This ends the boot software upgrade procedure. The following steps are for upgrading the run-time software. If you do not want to upgrade the run-time software, you need to restart the RPM-PR card by entering the reload command.

**Step 12** Copy the new run-time software file for the RPM-PR card to the switch (C:RPM).

**Step 13** Establish a configuration session using any valid user name.

**Step 14** If you are using a generic filename for your run-time images, copy the file on the PXM1 hard disk and rename the copied file. For example:

```
8850_LA.8.PXM.a > copy rpm-js-mz.122-4.T rpm-js-mz
```

**Step 15** If your RPM-PR is already configured to use a file with a generic name, skip to Step 24.

**Step 16** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
pop20two.7.PXM.a > cc 9
```

```
(session redirected)
```

```
Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.



**Note** This procedure assumes that you are familiar with Cisco IOS software. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples appear to show how to complete the task.

**Step 17** Enter the enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

**Step 18** Configure the RPM-PR card to store its configuration on the PXM1 hard disk by entering the following command:

```
Router> boot config c:auto_config_slot#
```

**Step 19** Display the startup run-time software filename by entering the following command:

```
Router#show bootvar
BOOT variable = c:rpm-js-mz.122-4.T,12;
CONFIG_FILE variable = c:auto_config_slot09
BOOTLDR variable does not exist
Configuration register is 0x2
```

In the example above, the startup run-time software file is C:rpm-js-mz.122-4.T, and it has a version number attached to it. Another way to view the boot list is to enter the **show startup-config** command and look for the **boot system** commands.

**Step 20** Enter the router global configuration mode by entering the following command:

```
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

**Step 21** If you need to change the boot system filenames, remove the existing boot list by entering the following command:

```
Router(config)# no boot system
```

**Step 22** Create a new boot list by entering one or more **boot system** commands as follows:

```
Router(config)# boot system c:filename
```

Replace the filename variable with the name of the new run-time file that was previously transferred to the C:RPM directory on the switch as follows:



```
Router(config)# boot system c:rpm-js-mz
```

If you want to enter additional boot system commands, enter them in the order in which you want the RPM-PR card to use them. The following example adds a statement to load from bootflash if the run-time file is not found on the PXM1 hard disk:

```
Router(config)# boot system bootflash:rpm-js-mz.122-4.T
```



**Note** Before the RPM-PR card can load run-time software from the bootflash, you must copy the run-time software to the bootflash. The procedure for copying files from the PXM1 hard disk to bootflash is described earlier.

**Step 23** Exit global configuration mode and save the new configuration by entering the following command:

```
Router(config)#^Z
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

**Step 24** To verify the change, enter the **show bootvar** or **show run** commands.

**Step 25** Switch to the active PXM1 card and reset the RPM-PR card by entering the following command:

```
Router#cc 8

(session redirected)

8850_LA.8.PXM.a > resetcd 9
The card in slot number 9, will be reset. Please confirm action
resetcd: Do you want to proceed (Yes/No)? y
```

## Upgrading RPM-PR Boot Software and Run-Time Software for 1:N Redundancy

You must establish redundancy before you use the procedure in this section. To upgrade the RPM-PR run-time software for 1:N redundancy, use the following procedure.



**Note** The directory on the PXM1 card uses (C:) and the directory within the router card uses (c:).

The following procedure describes how to upgrade boot software and run-time software.



**Note** The first part of this procedure describes boot software upgrade and the second part describes run-time software upgrade. RPM-PR boot software can be upgraded either in boot mode or in run-time mode. The procedure described here shows an example for run-time mode. The same commands are applicable for upgrading boot software in boot mode.

**Step 1** Copy the new boot software file for the RPM-PR card to the switch (C:RPM).

**Step 2** Establish a configuration session using any valid user name.

**Step 3** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
8850_LA.7.PXM.a > cc 9

(session redirected)

Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.




---

**Note** This procedure assumes that you are familiar with Cisco IOS. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples appear to show how to complete the task.

---

**Step 4** Enter enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

**Step 5** To verify router access to the PXM1 hard disk and display the boot file name, enter the following command.

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

65539 -rw- 815 Sep 13 2001 23:51:10 auto_config_slot09
65540 -rw- 2588780 Mar 22 2001 19:06:54 rpm-boot-mz_002.001.070.201
84611 -rw- 2452768 Apr 05 2001 05:34:44 rpm-boot-mz.122-4.T
66805 -rw- 8529104 Mar 22 2001 19:09:00 rpm-js-mz_002.001.070.201
85809 -rw- 7936012 Apr 05 2001 06:28:54 rpm-js-mz.122-4.T

104857600 bytes total (83068928 bytes free)
```

**Step 6** To display the files in the bootflash, enter the following command:

```
Router#show flash:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image F596869A 296D88 27 2452744 Feb 28 2001 03:16:05
rpm-boot-mz_002.001.070.201

30315128 bytes available (2452872 bytes used)
```

**Step 7** To copy new boot software to the bootflash, enter the following command:

```
Router#copy c:rpm-boot-mz.122-4.T bootflash:
Destination filename [rpm-boot-mz.122-4.T]?
CC
CCCCCCCCCCCCCCCCCCCC
2334044 bytes copied in 35.768 secs (66686 bytes/sec)
```




---

**Tip** When prompted for the destination filename, press **<Enter>** to use the source filename shown in the prompt. To change the destination filename, enter a new filename after the prompt.

---

**Step 8** To verify that the file was copied, enter the **show flash:** command.

- Step 9** To mark an older boot file for deletion from the bootflash, use the **del bootflash:** command as shown in the following example:

```
Router#del bootflash:
Delete filename []? rpm-js-mz
Delete bootflash:rpm-js-mz? [confirm]
Router#
```

**Tip**

To unmark a bootflash file so that it is not deleted when running the **squeeze flash:** command, enter the **undelete <number>** command, where *number* is the file number displayed in the left-most column of the **show flash:** command display.

- Step 10** To delete all files that are marked for deletion from bootflash, enter the following command:

```
Router(boot)#squeeze flash:
All deleted files will be removed. Continue? [confirm]y
Squeeze operation may take a while. Continue? [confirm]
```

```
Squeeze of bootflash complete
```

- Step 11** Enter the **show flash:** command to verify that the bootflash files are as you want them.

**Caution**

If all bootable images are deleted from bootflash, try to reinstall the bootflash file using the Xmodem download procedure found in [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 46](#) and restart the RPM-PR card. If this does not work, return the card to the factory to be reprogrammed. When you are done managing the bootflash, the **show flash:** command should display at least one bootable image, and the image you want the card to boot from must be the first bootable image in the list.

**Tip**

If the **show flash:** command does not display a bootable image, copy a bootable image to bootflash as described earlier in this procedure. You can continue to manage the bootflash, even when there are no files in bootflash, until the router is restarted.

**Tip**

If the bootflash contains bootable images and the sequence is such that the card does not start, you can enter rommon mode and load the bootable image. To get into rommon mode, establish a console connection to the RPM-PR card, reset the RPM-PR card using the **resetcd <slot>** command from the active PXM1 card, then quickly enter the **CTRL-[, Break** sequence at the RPM-PR console. The command to send a Break depends on the computer platform and software you are using. It may take a couple of attempts to successfully get into rommon mode. When you are in rommon mode, the RPM-PR card displays the *rommon 1 >* prompt.

After you enter rommon mode, you can enter the **dir bootflash:** command to display the images in the bootflash. To boot one of the images, enter a **boot** command the following format: **boot bootflash:filename**. See the [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 46](#).

This ends the boot software upgrade procedure for the primary card. The following steps are for upgrading the run-time software. If you do not want to upgrade the run-time software for the primary card, skip steps 12 through 24 and go to step 25 to upgrade the boot software on the secondary card.

- Step 12** Copy the new run-time software file for the RPM-PR card to the switch (C:RPM).

**Step 13** If you are using a generic filename for your run-time images, copy the file on the PXM1 hard disk and rename the copied file as shown in the following example:

```
8850_LA.8.PXM.a > copy rpm-js-mz.122-4.T rpm-js-mz
```

**Step 14** Establish a configuration session using any valid user name.

**Step 15** If your RPM-PR is already configured to use a file with a generic name, skip to Step 25.

**Step 16** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
pop20two.7.PXM.a > cc 9
```

```
(session redirected)
```

```
Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.




---

**Note** This procedure assumes that you are familiar with Cisco IOS, which is a topic that is beyond the scope of this book. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples are given to show how to complete the task.

---

**Step 17** Enter enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

**Step 18** Configure the RPM-PR card to store its configuration on the PXM1 hard disk by entering the following command:

```
Router> boot config c:auto_config_slot#
```

**Step 19** Display the startup run-time software filename by entering the following command:

```
Router#show bootvar
BOOT variable = c:rpm-js-mz.122-4.T,12;
CONFIG_FILE variable = c:auto_config_slot09
BOOTLDR variable does not exist
Configuration register is 0x2
```

In the example above, the startup run-time software file is `c:rpm-js-mz.122-4.T`, and it has a version number attached to it. Another way to view the boot list is to enter the **show startup-config** command and look for the **boot system** commands.

**Step 20** Enter the router global configuration mode by entering the following command:

```
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

**Step 21** If you must change the boot system filenames, remove the existing boot list using the **boot system** command as follows:

```
Router(config)# no boot system
```

**Step 22** Create a new boot list by entering one or more **boot system** commands as follows:

```
Router(config)# boot system c:filename
```

Replace the filename variable with the name of the new run-time file that was previously transferred to the C:RPM directory on the switch as follows:

```
Router(config)# boot system c:rpm-js-mz
```

To enter additional boot system commands, enter them in the order in which you want the RPM-PR card to use them. The following example adds a statement to load from the bootflash if the run-time file is not found on the PXM1 hard disk:

```
Router(config)# boot system bootflash:rpm-js-mz.122-4.T
```




---

**Note** Before the RPM-PR card can load run-time software from the bootflash, you must copy the run-time software to the bootflash. The procedure for copying files from the PXM1 hard disk to bootflash is described in a previous section.

---

**Step 23** Exit global configuration mode and save the new configuration by entering the following command:

```
Router(config)#^Z
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

**Step 24** To verify the change, enter the **show bootvar** or **show run** commands.

**Step 25** Switch to the active PXM1 card by entering the following command:

```
Router#cc 8

(session redirected)
```

**Step 26** Switch to the secondary card by entering the **switchredcd** command as follows:

```
8850_LA.8.PXM.a > switchredcd <fromSlot> <toSlot>
```

Replace <fromSlot> with the slot number of the primary card. Replace <toSlot> with the slot number of the secondary card.

This step makes the secondary card active and resets the primary RPM-PR card. When the Primary card resets, it loads the upgraded software.

**Step 27** **cc** to the secondary slot.

**Step 28** Repeat steps 1 through 11.

This ends the boot software upgrade on the secondary card. If you do not want to upgrade the run-time software, go to step 30.

The following steps are for upgrading run-time software on the secondary card.

**Step 29** Repeat steps 12 through 24.

**Step 30** Switch to the primary card using the **switchredcd** command as follows:

```
8850_LA.8.PXM.a > switchredcd <fromSlot> <toSlot>
```

Replace <fromSlot> with the slot number of the secondary card. Replace <toSlot> with the slot number of the primary card.

This step makes the primary card active and resets the secondary RPM-PR card. When the reset is complete, the secondary card is ready to run the upgraded software.

**Step 31** To verify that the router reboot is complete, enter the **dspecds** or **dspecd <slot>** commands. The reboot is complete when the card state displays as Active. Another way to verify router operation is to use the **cc** slot command. If you can access the router from the switch prompt, the router reboot is complete.

**Step 32** If there are other primary cards with redundant (secondary) cards, repeat this procedure for each primary card.

## Using XModem to Download Flash to RPM-PR Cards

Use the xmodem feature to download flash memory to an RPM/B or RPM-PR card. During this process, connect the card to a target machine through HyperTerminal with settings of 9600, n, 8, and 1.



**Note**

This feature is only available for ROMmon image version 12.2(4r)T1 or greater. Use the **show version** command to verify the ROMmon version installed on an RPM-PR card.

**Step 1** Place the node in monitor mode by entering the **priv** command to gain access to the privileged commands as shown in the following example:

```
rommon 1> priv
You now have access to the full set of monitor commands. Warning:
some commands will allow you to destroy your configuration and/or
system images and could render the machine unbootable.
```

**Step 2** The **xmodem** command becomes available and the general syntax of this command and availability of this can be checked by giving xmodem command without any parameters on the CLI, shown in the following example:

```
rommon 2 > xmodem
usage: xmodem [-cys]
-c CRC-16
-y ymodem-batch protocol
-s<speed> Set speed of download, where speed may be
 1200|2400|4800|9600|19200|38400
rommon 3 >
```

The command line options for xmodem are as follows:

| Option | Definition                                                                                          |
|--------|-----------------------------------------------------------------------------------------------------|
| -c     | xmodem performs the download using CRC-16 error checking to validate packets. Default is 8-bit CRC. |
| -y     | xmodem uses Ymodem-batch protocol for downloading, which uses CRC-16 error checking.                |
| -s     | Specifies the download speed. Default is 9600 bps.                                                  |



**Note** If you do not find the xmodem commands, then the xmodem feature is not available on this ROM Monitor (ROMmon) version. In that case, you must return the card to Cisco Systems.



**Note** The rommon xmodem/ymodem transfer only works on the console port. You can only download files to the router. You cannot use xmodem/ymodem to get files from the router.

For example:

```
rommon 4> xmodem -cys 38400
Do not start sending the image yet...
Invoke this application for disaster recovery. Do you wish to continue? y/n [n]: y
Note, if the console port is attached to a modem, both the console port and the modem
must be operating at the same baud rate. Use console speed 38400 bps for download
[confirm]
```

**Step 3** At this point, change the preferences in HyperTerminal and adjust the speed from 9600 to 38400.

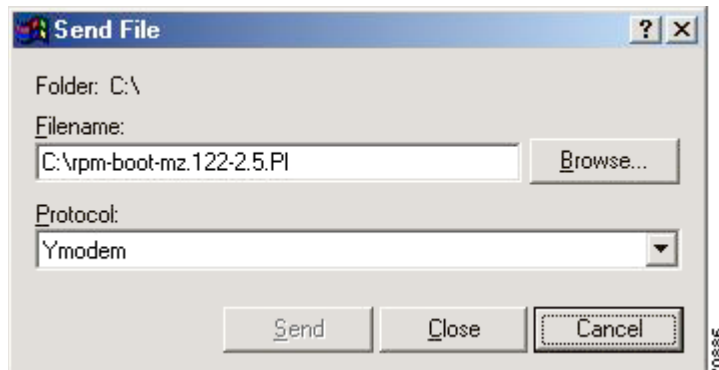


**Note** You can continue at the speed of 9600 as well by either not specifying the `-s` option in the command, or by specifying 9600 explicitly, but it takes longer.

The following message appears:

```
Download will be performed at 38400. Make sure your terminal emulator is set to this
speed before sending file. Ready to receive file ...
```

**Step 4** To start the image transfer, use the **Transfer > Send File** option in HyperTerminal.



In the Filename box, browse and choose the image file to be downloaded. Also because you used the `-y` option while invoking the xmodem, set the transfer protocol to ymodem or use Xmodem protocol by not specifying the `-y` option on the command line.

The transfer window appears and transfer starts. (The transfer may not start immediately; wait for a few moments and it should start.) After the transfer is completed (it typically takes about 10-15 minutes), the following messages are displayed on HyperTerminal console:

```
Returning console speed to 9600.
Please reset your terminal emulator to this speed...
```

- Step 5** Return the console speed to 9600 baud through the HyperTerminal's Preferences menu option. Because of the time lag between changing HyperTerminal speed to 9600 baud, you might see a some unrecognizable text. To avoid this, disconnect and reconnect the HyperTerminal to get the console back again.
- The system resets and boots with new software image.
- 

## New Features in MGX Release 5.2.10 or Earlier

This section lists new features introduced by release for Cisco IOS Release 12.3(11)T9 for MGX 5.2.10 or earlier releases.

### Features Introduced in Cisco IOS Release 12.3(11)T9 for MGX Release 5.2.10

No new features are introduced with this release.

### Features Introduced in Cisco IOS Release 12.3(11)T7 for MGX Release 5.2.00

No new features are introduced with this release.

### Features Introduced in Cisco IOS Release 12.3(11)T6 for MGX Release 5.1.20

No new features are introduced with this release.

### Features Introduced in Cisco IOS Release 12.3(11)T4 for MGX Release 5

This section contains the new features introduced with this release.

#### 1FECP Back Card Support

The RPM-PR in a Cisco MGX 8850 switch now supports 1FECP back cards. This feature includes the following back card functions:

- The **dspecd** *<rpm-slot>* command correctly displays the back card type.
- SNMP Traps are sent for the following events:
  - Interface up/down (for Admin and Line status)
  - Interface Removal
  - Interface insertion
- Back card failure or OIR triggers front card switchover if redundancy is configured. This feature is enabled by default. This feature can be disabled by entering the following command:

```
slot12(config)#no hw-module rpm fecp-fail fc-xover
```



## OIR Commands

When a user inserts a back card during graceful OIR, it causes the RPM-PR to crash. To avoid this, the following new commands were added. Users can enter either set of commands (Exec mode or Conf mode).

- Exec mode commands:

```
hw-module slot <slot> stop
hw-module slot <slot> start
```

- Conf mode commands:

```
hw-module slot <slot> shutdown powered
hw-module slot <slot> shutdown unpowered
```

Two sequences exist for safely initiating OIR. Perform the following steps for sequence 1:

---

**Step 1** Enter the following command:

```
hw-module slot <slot> stop
```

**Step 2** Insert or remove the RPM-PR from the Cisco MGX 8850 switch.

**Step 3** Enter the following command:

```
hw-module slot <slot> start
```

---

Perform the following steps for sequence 2:

---

**Step 1** Enter the following command:

```
hw-module slot <slot> shutdown powered/unpowered
```

**Step 2** Insert or remove the RPM-PR from the Cisco MGX 8850 switch.

**Step 3** Enter the following command:

```
no hw-module slot <slot> shutdown powered/unpowered
```

---

## Features Introduced in Cisco MGX 8800 Release 4.0.10

The RPM-PR in Cisco MGX 8800 Release 4.0.10 supports all new and existing features introduced in the Release 1.2.x baseline. The following four new features were introduced for RPM-PR implementations using Cisco IOS Release 12.2(15)T5:

1. Multiprotocol Label Switching (MPLS) CoS Transparency—This feature allows the service provider to set the MPLS experimental field instead of overwriting the value in the customer's IP precedence field. The IP header remains available for customer use; the IP packet's CoS is not changed as the packet travels through the MPLS network.

For configuration information, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t13/ftdtmode.htm>

2. cRTP with MQC—Modular Quality of Service (QoS) Command-Line Interface (CLI). An RPM-PR in Cisco MGX 8800 Release 4.0.10 supports using the MQC to configure the compressed Real-Time Protocol (cRTP) header. The CLI commands introduced to support this feature include:
  - **ip rtp header-compression**—Enables RTP header compression for a particular interface.
  - **no ip rtp header-compression**—Disables RTP header compression for a particular interface.
  - **clear ip rtp header-compression <interface>**—Resets all statistics for the interface to 0.
  - **show ip rtp header-compression <interface> [detail]**—Shows all statistics for an interface.
  - **show policy-map int sw1.x**—Shows the number of packets which are compressed because of a match in policy map.

For configuration information, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t13/fthdrcmp.htm>

3. Label Switch Controller (LSC) Redundancy

For configuration information, go to:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/8850px1e/rel4/scg/rpm.htm>

4. MVPN—The frame-based Multicast Virtual Private Network (MVPN) feature enables the RPM-PR in Cisco MGX 8800 Release 4.0.10 to pass frame-based multicast traffic to VPNs across the ATM core.

For configuration information, go to:

[http://www.cisco.com/univercd/cc/td/doc/product/software/ios122s/122snwft/release/122s14/fs\\_mvpn.htm](http://www.cisco.com/univercd/cc/td/doc/product/software/ios122s/122snwft/release/122s14/fs_mvpn.htm)

## Previously Released Features

This section describes features that were introduced in releases prior to Cisco IOS Release 12.3(11)T9 for MGX 5.2.10.

### RPM-PR Image Directory Change From E:RPM to C:/FW

Until this release, all files used by RPM-PR were stored in E:RPM. All other service modules, including PXM, store their firmware files in C:/FW. You can now use the C:/FW (or x: from RPM-PR card) directory to download the RPM-PR images. As with all other service modules, by storing all the firmware files, including the RPM-PR files in C:/FW, the router blades can more easily integrate with the shelf architecture.



#### Note

This change is backward compatible. That is, you can still use E:RPM or (e:from the RPM-PR card) to access and configure RPM-PR images.

Due to the large number and size of RPM-PR images in the E:RPM directory, the **saveallcnf** command would timeout. By moving these large image files to the C:/FW directory and leaving only the configuration files in the E:RPM directory, no timeouts occurred when executing the **saveallcnf** command.

## Automatic Cell Bus Clocking

If you are installing a combination of RPM-PR and MPSM-155 on slots covered by the same cellbus (for example, slots 5 and 6 or 3 and 4), you must enable the Auto Clock Setting feature using the **cnfndparms** command.

For more information on the **cnfndparms** command, see the appropriate section in the *Cisco MGX 8850 (PXM1E/PXM45), MGX 8950, MGX 8830, and MGX 8880 Command Reference, Release 5*, at this URL:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/8850px45/re15/cmdref/3cnf.htm#wp1681477>

The CLI commands **dspeblk** and **cnfcbclk** allow for manual setting of the cellbus clock rates, as shown in the following listing:

```
unknown.7.PXM.a > dspeblk
```

| CellBus | Rate (MHz) | Slots   | Allowable Rates (MHz) |
|---------|------------|---------|-----------------------|
| CB1     | 21         | 1, 2    | 21, 42                |
| CB2     | 21         | 3, 4    | 21, 42                |
| CB3     | 21         | 5, 6    | 21, 42                |
| CB4     | 21         | 17 - 22 | 21                    |
| CB5     | 21         | 9, 10   | 21, 42                |
| CB6     | 21         | 11, 12  | 21, 42                |
| CB7     | 21         | 13, 14  | 21, 42                |
| CB8     | 21         | 25 - 30 | 21                    |

To enable automatic setting of cellbus clock rates, a node parameter must be turned on. The CLI commands **dspsndparms** and **cnfndparms** manipulate the node parameters, as shown in the following listing:

```
unknown.7.PXM.a > dspsndparms
```

```
unknown System Rev: 03.00 Oct. 02, 2002 13:42:53 PST
MGX8850 Node Alarm: MINOR
```

```
NODE CONFIGURATION OPTIONS
```

| Opt# | Value  | Type          | Description                                   |
|------|--------|---------------|-----------------------------------------------|
| 1    | 3600   | 16bit Decimal | SHM Card Reset Sliding Window (secs)          |
| 2    | 3      | 8bit Decimal  | SHM Max Card Resets Per Window (0 = infinite) |
| 3    | Yes    | Boolean       | Core Redundancy Enabled                       |
| 4    | No     | Boolean       | Expanded Memory on PXM45B Enabled             |
| 5    | 0x0    | 8bit Hex      | Required Power Supply Module Bitmap           |
| 6    | 0x0    | 8bit Hex      | Required Fan Tray Unit Bitmap                 |
| 7    | 0      | 8bit Decimal  | Trap Manager Aging timeout value(Hour(s))     |
| 8    | atm0   | 8bit Decimal  | Primary IP interface for Netmgmt              |
| 9    | lnPci0 | 8bit Decimal  | Secondary IP interface for Netmgmt            |
| 10   | No     | Boolean       | Auto Setting of Cellbus Clock Rate Enabled    |
| 11   | Yes    | Boolean       | Inband Node-to-Node IP Connectivity Enabled   |

Turning on node parameter 10 allows for automatic setting of cellbus clock rates. After it is enabled, the software immediately determines if any cellbus rates need to be changed. If, for example, two RPM-PR cards exist in one cellbus, that cellbus rate is changed to 42 MHz, as shown in the following listing:

```
unknown.7.PXM.a > cnfndparm 10 yes
```

```
NODE CONFIGURATION OPTIONS
```

| Opt# | Value | Type    | Description                                |
|------|-------|---------|--------------------------------------------|
| 10   | Yes   | Boolean | Auto Setting of Cellbus Clock Rate Enabled |

After enabled, the **dspcbclk** command shows that you cannot manually configure the cellbus clock rate, as displayed in the following listing:

```
unknown.7.PXM.a > dspcbclk
```

| CellBus | Rate (MHz) | Slots   | Allowable Rates (MHz)         |
|---------|------------|---------|-------------------------------|
| CB1     | 21         | 1, 2    | 21, 42 (Auto Setting Enabled) |
| CB2     | 21         | 3, 4    | 21, 42 (Auto Setting Enabled) |
| CB3     | 21         | 5, 6    | 21, 42 (Auto Setting Enabled) |
| CB4     | 21         | 17 - 22 | 21                            |
| CB5     | 21         | 9, 10   | 21, 42 (Auto Setting Enabled) |
| CB6     | 21         | 11, 12  | 21, 42 (Auto Setting Enabled) |
| CB7     | 21         | 13, 14  | 21, 42 (Auto Setting Enabled) |
| CB8     | 21         | 25 - 30 | 21                            |

If you attempt to manually configure the cellbus clock rate while automatic cellbus rate changes are enabled, you receive an error message similar to the following:

```
unknown.7.PXM.a > cnfcbclk 1 42
Err: Illegal value for option -rate
 -cb <cellBus>, where cellBus is a string CB1..CB8
 -rate <clockRate>, where clockRate is 21 or 42 (MHz)

unknown.7.PXM.a >
```

## dspcd Command—New Fields

The **dspcd** CLI command on the PXM displays the following front and back card information:

- Serial number
- 800 part number
- 73 part number
- CLEI code

Before this release, the following information appeared when you entered the **dspcd** command:

```
rswzen2.8.PXM.a > dspcd 3
rswzen2 System Rev:03.00 Aug. 26, 2002 19:25:49 PDT
MGX8850 Node Alarm:MAJOR
Slot Number: 3 Redundant Slot:NONE

 Front Card Upper Card Lower Card
 ----- -
Inserted Card: RPM_PR FE_RJ45 ---
Reserved Card: UnReserved UnReserved UnReserved
State: Active Active Empty
Serial Number: ---
Prim SW Rev: ---
Sec SW Rev: ---
Cur SW Rev: ---
Boot FW Rev: ---
800-level Rev: ---
800-level Part#: 000-00000-00 000-00000-00 ---
CLEI Code: ---
Reset Reason: On Reset From Shell
Card Alarm: NONE
Failed Reason: None
Miscellaneous Information:
```

As of Release 3.0.10, the following information appears when you enter the **dspsd** command:

```

rswzen2.8.PXM.a > dspsd 1
rswzen2 System Rev:03.00 Aug. 26, 2002 19:24:24 PDT
MGX8850 Node Alarm:MAJOR
Slot Number: 1 Redundant Slot:NONE

 Front Card Upper Card Lower Card
 ----- ----- -----
Inserted Card: RPM_PR FE_RJ45 ---
Reserved Card: UnReserved UnReserved UnReserved
State: Active Active Empty
Serial Number: SAG06041R16 SAG053355UV ---
Prim SW Rev: --- --- ---
Sec SW Rev: --- --- ---
Cur SW Rev: 12.2(11)T1 --- ---
Boot FW Rev: 12.2(11)T1 --- ---
800-level Rev: A0 B2 ---
800-level Part#: 800-07424-00 800-02560-00 ---
CLEI Code: BA3AY30CAA BAETAAAAAA ---
Reset Reason: On Reset From Shell
Card Alarm: NONE
Failed Reason: None
Miscellaneous Information:

Type <CR> to continue, Q<CR> to stop:q

```

## Switching from Active to Standby—switchredcd Command with RPM-PR Cards

The MGX RPM-PR uses the **switchredcd** command to manually change the active card to the standby card as of Cisco MGX Release 3.0 and Cisco IOS Release 12.2(8)T4), similar to other Cisco MGX service modules. The **switchredcd** command replaces the **softswitch** command that was previously used and is now obsolete.

Be sure to execute the **switchredcd** command before removing an active RPM-PR card from the Cisco MGX 8000 series switch shelf.

See the [“Upgrading RPM-PR Cards in MGX 8000 Releases 2.1 and 3 \(PXM45 and PXM1E\) Switches” section on page 75](#) and the [“Upgrading RPM-PR Cards in MGX PXM1 Switches” section on page 35](#).

For more information on the **switchredcd** command, refer to the *Cisco MGX 8850, MGX 8950, and MGX 8830 Command Reference (PXM45/B and PXM1E), Release 3*.

## VISM-PR to RPM-PR Connectivity

The VISM-PR card supports 144 channels when used with the G.723.1 codec, whereas the current VISM card supports 64 channels with the G.723.1 codec.

The following VISM Release 3.0 features require either the PXM1E or PXM45 card in your Cisco MGX 8000 Series switch chassis:

- Expanded Clock Source Selection
- Private Network-to-Network Interface (PNNI) Priority Routing

- Specifying a Connection Up or Down
- AAL1 and AAL2 Switched Virtual Circuits

As of Cisco MGX Release 3.0 and Cisco IOS Release 12.2(8)T4, setting connections between a VISM-PR card and an RPM-PR card in your Cisco MGX 8000 Series switch chassis requires that you use the new VBR (NRT) 3 connection type.

If you are using a VISM-PR card in combination with either a PXM1E or PXM45 card, you must use the VBR (NRT) 3 selection when adding a connection. Use the modified **addcon** or **cnfcon** commands to configure this connection type.

For more information, refer to the *Cisco VISM Installation and Configuration Guide, Release 3*.

## Configuring the Cell Bus Clock Rate

As of Cisco MGX Release 3.0 and Cisco IOS Release 12.2(8)T4, when two RPM-PR cards are on the same cell bus, that is, they occupy adjacent slots (for example, slots 1 and 2, slots 3 and 4), the cell bus clock (CBC) rate is automatically set to 42 MHz. Correspondingly, if there is only one RPM-PR on the cell bus, the clock should be at the default value of 21 MHz.

If one of the adjacent RPM-PRs goes to failed or empty state, you must reconfigure the CBC for that cell bus for the traffic shaping to work correctly on the active RPM-PR. On MGX Release 3, reconfiguration of CBC rate from 42 MHz to 21 MHz is done *automatically*.

RPM-PR makes use of idle cells for Traffic Shaping and Scheduling. If there are two RPMs in adjacent slots on the same cell bus and one of the RPMs is put into a failed state by the PXM, while that card is alive, then the failed RPM-PR must stop sending idle cells to avoid impacting the Traffic Shaping on the adjacent functional RPM-PR. The command that implements the RPM-PR support for this feature is **rpm-auto-cbclk-change**.

**rpm-auto-cbclk-change** instructs the RPM-PR to stop sending idle cells in the event of being put into a failed state by the PXM and thus prevent an impact on the traffic shaping on an adjacent functional RPM-PR.

**no rpm-auto-cbclk-change** disables the feature to stop sending idle cells if the RPM-PR is put into a failed state. You may use this command if Traffic Shaping is not required.

The following output is an example of the **rpm-auto-cbclk-change** command:

```
RPM-11#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
RPM-11(config)#int sw1
RPM-11(config-if)#rpm-auto-cbclk-change
RPM-11(config-if)#end
RPM-11#write mem
Building configuration...
[OK]
RPM-11#show run int sw1
Building configuration...

Current configuration :142 bytes
!
interface Switch1
no ip address
no atm ilmi-keepalive
rpm-auto-cbclk-change
switch autoSynch off
end
! rpm_tag_id Apr 04 2002 02:49:04
```

If traffic shaping is *not* a requirement, enter the **no rpm-cbclk-change** command, either manually or during card configuration. The following output is an example of the **no rpm-auto-cbclk-change** command:

```
RPM-11#config terminal
 Enter configuration commands, one per line. End with CNTL/Z.
RPM-11(config)#int sw1
RPM-11(config-if)#no rpm-auto-cbclk-change
RPM-11(config-if)#end
RPM-11#write mem
Building configuration...
[OK]
RPM-11#show run int sw1
Building configuration...

Current configuration :145 bytes
!
interface Switch1
 no ip address
 no atm ilmi-keepalive
 no rpm-auto-cbclk-change
 switch autoSynch off
end
! rpm_tag_id Apr 04 2002 02:49:57
```

**Note**

This feature is enabled by default on the RPM-PR.

## Enabling LDP on RPM-PR in Cisco MGX 8850 and MGX 8950 Switches

The MPLS LDP, as standardized by the Internet Engineering Task Force (IETF) and as enabled by Cisco IOS software, allows the construction of highly scalable and flexible IP VPNs that support multiple levels of services.

LDP provides a standard methodology for hop-by-hop, or dynamic label, distribution in an MPLS network by assigning labels to routes that have been chosen by the underlying Interior Gateway Protocol (IGP) routing protocols. The resulting labeled paths, called label switch paths or LSPs, forward label traffic across an MPLS backbone to particular destinations. These capabilities enable service providers to implement Cisco's MPLS-based IP VPNs and IP+ATM services across multivendor MPLS networks.

From an historical and functional standpoint, LDP is a superset of Cisco's pre-standard TDP, which also supports MPLS forwarding along normally routed paths. For those features that LDP and TDP share in common, the pattern of protocol exchanges between network routing platforms is identical. The differences between LDP and TDP for those features supported by both protocols are largely embedded in their respective implementation details, such as the encoding of protocol messages, for example.

This software release of LDP provides the means for transitioning an existing network from a TDP operating environment to an LDP operating environment. Thus, you can run LDP and TDP simultaneously on any given router platform. You can configure the routing protocol that you select on a per-interface basis for directly connected neighbors and on a per-session basis for non directly-connected (targeted) neighbors. In addition, an LSP across an MPLS network can be supported by LDP on some hops and by TDP on other hops.

MPLS LDP offers the following features:

- IETF Standards-based Label distribution protocol
- Multi-Vendor Interoperability
- TDP to LDP migration and interoperability

## Multi-LVC on RPM-PR in Cisco MGX 8850 and MGX 8950 Release 2.1.76 Running Cisco IOS Release 12.2(8)T1

This feature supports initiation of Multiple LSPs per destination on the RPM-PR. Different LSPs are established for different CoS. This feature enables interface level queueing rather than per-vc level on the RPM-PR based on MPLS CoS policy. With Multi-LVC support, customers can deploy IP VPN services with CoS SLAs.

## MPLS over ATM using VC Merge in Cisco MGX 8850 and MGX 8950 Release 2.1.76 Running Cisco IOS Release 12.2(8)T

The virtual circuit (VC) merge facility allows a switch to aggregate multiple incoming flows with the same destination address into one outgoing flow. Wherever VC merge occurs, several incoming labels are mapped to one single outgoing label. Cells from different virtual circuit identifiers (VCIs) going to the same destination are transmitted to the same outgoing VC using multipoint-to-point connections. This sharing of labels reduces the total number of VCs required for label switching.

Without VC merge, each path consumes one label VC on each interface along the path. VC merge reduces the label space shortage by sharing labels for different flows with the same destination. Therefore, VC-Merge connections are unidirectional, and furthermore, all merged connections must be of the same service type.



### Note

To support VC-merge, the ATM switch requires that AXSM cards allow multiple VC frames to be merged into a single VC without interleaving cells inside AAL5 frames. The RPM-PR is the control point, where LSC resides.

VC Merge is enabled by default when the MPLS over ATM network is configured and is only used when the RPM-PR functions as an LSC. Because it is enabled by default, the only commands necessary are the following:

**no tag-switching atm vc-merge** to disable VC Merge

and

**tag-switching atm vc-merge** to enable VC Merge

For more information, see MPLS Label Switch Controller and Enhancements at this URL:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t8/ftlsc.htm#xtocid15>

## Bypass Feature for RPM-PR in Cisco IOS Release 12.2(4)T



### Note

Information about the bypass feature and related Cisco IOS commands was not available at publish time; therefore, it is included in the these release notes.

RPM-PR cards have a maximum storage of 128 KB for the nonvolatile RAM (NVRAM). This size limitation creates a problem for customers with large configurations who find it impossible to store the complete configuration in the NVRAM, even with compression enabled.



So customers can store large configuration files, a new bypass feature has been added. With the bypass feature enabled, users execute the enhanced **write memory** command to bypass the NVRAM and save the configuration in the following location:

For MGX Release 1, the file `auto_config_slot##` located in the `C:/RPM` directory on the PXM1.

Where `##` represents the zero-padded slot number in which the RPM-PR card is seated in the MGX chassis.

To enable the bypass feature, users enter the **rpmnvbypass** command from the Cisco IOS run-time image (*not* in the Cisco IOS boot image).

To disable the bypass feature, users enter the **no rpmnvbypass** command.

To verify the bypass feature is either enabled or disabled, users enter the **show running-configuration** command. If the bypass feature is enabled, **rpmnvbypass** displays in the window. If it does not display, the feature is not enabled.

**Note**

Because the bypass feature bypasses NVRAM, it is not necessary to compress the configuration file using the **service compress-config** command.

[Table 14](#) lists important cautions for successfully using the bypass feature.

**Table 14**      **Boot Cautions**

| Caution                                                                                                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| When using the bypass feature, you can load the run-time Cisco IOS image from the PXM hard drive or from the bootflash. | <p>Cisco IOS software can be loaded in one of three ways:</p> <ol style="list-style-type: none"> <li>1. From the PXM hard drive.</li> <li>2. From the bootflash.</li> <li>3. From the network (for example, through TFTP) from the RPM-PR back card (Ethernet or Fast Ethernet).</li> </ol> <p>When the bypass feature is enabled, the <b>boot config</b> statement (<code>c:auto_config_slot##</code>) is automatically generated. The NVRAM configuration is cleared upon entering a <b>write memory</b> command. To load from the network, the RPM-PR must have an IP address for its back card. This information is part of the NVRAM configuration, which was just cleared by enabling the bypass feature. Hence, it is not possible to load the Cisco IOS image from the network upon a reload of the RPM-PR after executing the <b>rpmnvbypass</b> and <b>write memory</b> commands.</p> |

**Table 14**      **Boot Cautions (continued)**

| Caution                                                                                                                                                                                                                                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Do not execute the <b>no boot config</b> command.</p> <p>Doing so may prevent the bypass feature from working properly.</p>                                                                                                                                             | <p>When you enable the bypass feature, the following <b>boot config</b> statement is automatically generated, and the NVRAM configuration is cleared:</p> <pre>c:auto_config_slot##</pre> <p>Any writes are subsequently directed to the <i>boot config</i> file. This is essential, as a <b>write memory</b> command expects the <b>boot config</b> statement to be present.</p> <p>If the <b>boot config</b> statement is not present, entering the <b>write memory</b> command would write the configuration into the NVRAM, which is not desirable when the objective is to save a complete configuration that is large and requires more space.</p>                                                                                                                                                                                         |
| <p>If the command <b>write memory</b> is issued with the bypass feature enabled, and is consequently followed by an RPM-PR card reset, previous versions of the boot image triggers the RPM-PR card to go into boot mode (unable to load run-time Cisco IOS software).</p> | <p>For safety purposes, the location of the system image is stored in a special area called the ROM monitor (ROMmon) area in the NVRAM. The ROMmon is always intact.</p> <p>The Cisco Release 12.2(4)T boot image accesses and reads ROMmon to load the Cisco IOS image. Boot images earlier than Release 12.2(4)T do not read the ROMmon area.</p> <p>Generally, the Cisco IOS boot and run-time images are the same versions. However, if you change the boot image to one earlier than Release 12.2(4)T, on a reload, the boot image sees that the NVRAM configuration is empty, which is normal when the bypass feature is enabled. But because boot images earlier than Release 12.2(4)T cannot access the ROMmon area, it cannot read the location of the Cisco IOS image. Because it cannot see the Cisco IOS image, it loads itself.</p> |

[Example 6](#) through [Example 10](#) illustrate how to enable and disable the bypass feature, and how to validate each of these actions from the configuration display.

**Example 6**      **Running Configuration—Bypass Feature Disabled**

```
rpm_slot02#show running-config
Building configuration...

Current configuration : 470 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rpm_slot02
!
boot system c:rpm-js-mz.<new_rel>
enable password cisco
!
ip subnet-zero
!
!
```

```

!
interface Switch1
 no ip address
 no atm ilmi-keepalive
 switch autoSynch off
!
ip classless
no ip http server
ip pim bidir-enable
!
!
snmp-server community public RO
snmp-server community private RW
!
!
line con 0
line aux 0
line vty 0 4
 no login
!
end

```

**Example 7 Enabling the Bypass Feature—rpmnvbypass**

```

rpm_slot02#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
rpm_slot02(config)#rpmnvbypass
The "boot config" statement has been (re)added to your
running configuration. Do not remove it else risk not
using the nvbypass feature

rpm_slot02(config)#end
rpm_slot02#

```

**Example 8 Running Configuration with Bypass Feature Enabled—rpmnvbypass at End of Output**

```

rpm_slot02#show running-config
Building configuration...

Current configuration: 515 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rpm_slot02
!
boot system c:rpm-js-mz.<new_rel>
boot config c:auto_config_slot02 <==== Line added as per output above
enable password cisco
!
ip subnet-zero
!
!
!
interface Switch1
 no ip address
 no atm ilmi-keepalive
 switch autoSynch off
!
ip classless

```

```

no ip http server
ip pim bidir-enable
!
!
snmp-server community public RO
snmp-server community private RW
!
!
line con 0
line aux 0
line vty 0 4
 no login
!
rpmnvbypass
end

```

### **Example 9**    *Disabling the Bypass Feature—no rpmnvbypass*

```

rpm_slot02#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
rpm_slot02(config)#no rpmnvbypass
rpm_slot02(config)#end
rpm_slot02#

```

### **Example 10**    *Running the Configuration After Disabling the Bypass Feature*

```

rpm_slot02#show running-config
Building configuration...

Current configuration: 503 bytes
!
version 12.2
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname rpm_slot02
!
boot system c:rpm-js-mz.<new_rel>
boot config c:auto_config_slot02
enable password cisco
!
ip subnet-zero
!
!
!
!
interface Switch1
 no ip address
 no atm ilmi-keepalive
 switch autoSynch off
!
ip classless
no ip http server
ip pim bidir-enable
!
!
snmp-server community public RO
snmp-server community private RW
!
!
line con 0

```

```

line aux 0
line vty 0 4
 no login
!
end

rpm_slot02#

```

## Features Not Supported in This Release

The following features are not supported in this release:

- MPLS inter AS
- MPLS TE

## RPM-PR Redundancy Support

Use RPM 1:N redundancy to switch configuration and traffic from one RPM-PR card to another. The main benefits are as follows:

- Route processing continues even if an RPM-PR fails and there is no operator or direct access to swap the failed card or fix the problem.
- An RPM-PR card with hardware problems can be fixed while the redundant standby card takes over its functionality.
- Software upgrades are easier and can be done with less downtime.

## SNMP MIB

SNMP MIB files for RPM-PR are provided with MGX Release 5.2.10. These files can be compiled with most standards-based MIB compilers. The tar file contains the MGX MIB files and the MIB release notes.

Cisco IOS MIBs are not part of the MGX Release 5.2.10 SNMP MIB bundle; they are part of Cisco IOS Release 12.3(11)T9.



### Note

---

The old\_mib\_Format is discontinued as of this release.

---

## Notes and Cautions

Review the following notes and cautions before using this release.

## UPC Connection Parameters

In Release 2.1.60 and higher, the default PCR is 50 cps, and the default for policing is **enabled**. These settings are insufficient for running RPM-PR IS-IS protocol over the connection, and with such settings, the IS-IS protocol fails. The PCR value must be increased, depending on the number of interfaces configured for IS-IS on the RPM-PR.

Depending upon your connection type, you can use the following CLIs to modify the PCR parameter.

- **cnfupccbr**
- **cnfupcvbr**
- **cnfupcabr**
- **cnfupcubr**

## Booting the RPM-PR

Refer to the *Cisco MGX 8800/8900 Hardware Installation Guide, Releases 2 - 5.2* and the *Cisco MGX 8800/8900 Series Command Reference, Release 5.2* for complete details on configuring the RPM-PR cards. (See the “[Obtaining Documentation](#)” section on page 88 for information on how to order a printed copy of this manual or locate the manual online.) A summary of the booting and upgrading procedures is presented here for your convenience.

When the RPM-PR is booted, the boot image must be the first file in the bootflash. If the bootflash does not have a valid boot image as a first file, the card may not be able to boot and can result in bootflash corruption. If the bootflash is corrupt, you must send the card back for an external burn with a valid boot image.

You can reboot the RPM-PR from the PXM by entering the command **resetcd** *<card\_number>* from the switch CLI, where *card\_number* is the slot number of the RPM-PR that is being rebooted.



### Note

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Omitting the card number resets the entire system.

---

Also, you can reboot the RPM-PR from the RPM-PR using the RPM-PR console port and entering the **reload** command.

Each time you turn on power to the RPM-PR by inserting the RPM-PR into a Cisco MGX 8850 or MGX 8950 switch, it goes through the following boot sequence:

1. The RPM-PR runs diagnostics on the CPU, memory and interfaces.
2. The system boot software, which is the boot image, executes and searches for a valid Cisco IOS image, which is the RPM-PR run-time software.
  - If the configuration register is set to the factory-default setting of **0x01**, the RPM-PR comes up and stays in boot mode.
  - If the configuration register is **0x2**, the RPM-PR looks for the run-time image either in bootflash or on the PXM1 C:/RPM drive.

The source of the Cisco IOS image is determined by the configuration register setting. To verify this setting, you can enter either the **show version** or **show bootvar** command. See the “[Viewing the Hardware Configuration](#)” section of the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1* (DOC-7812278=).

3. The search for run-time image is determined by which of the following boot system command you enter:
  - Enter the **boot system c:<runtime\_image\_name>** command to search for a run-time image in the C:/RPM directory on the PXM1 hard disk.
  - Enter the **boot system bootflash:<runtime\_image\_name>** to search for a run-time image in the bootflash.
  - If the **boot system bootflash:<runtime\_image\_name>** is not entered, it loads the first available Cisco IOS image from C:/RPM, if an image is present.
4. If the run-time software is not found after three attempts, the RPM-PR reverts to the boot mode.
5. If a valid Cisco IOS image is found, the RPM-PR searches for a valid configuration, which can reside in NVRAM or as a configuration file either on the PXM hard disk C:/RPM drive or in bootflash.

If you want to load from a specific configuration file, enter either the **boot config bootflash:<config\_file>** command or the **boot config c:<config\_file>** command.

6. For normal RPM-PR operation, a valid Cisco IOS image must be present on the PXM-1 C:/RPM drive or in bootflash, and a configuration file must be present in NVRAM, in the bootflash, or on the PXM hard disk.

The first time you boot the RPM-PR, configure the RPM-PR interfaces and save the configuration to a file in NVRAM. Then follow the procedure described in “[Initializing the RPM-PR Card](#)” in the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1* (DOC-7812278=). For information on the Cisco IOS instructions, refer to Appendix C, “[IOS and Configuration Basics](#)” of the *Cisco MGX Route Processor Module Installation and Configuration Guide, Release 2.1* (DOC-7812510=).

## RPM-PR Bootflash Precautions

The RPM-PR bootflash is used to store the boot image, configuration and run-time files. The Flash stores and accesses data sequentially, and the RPM-PR boot image must be the first file stored to successfully boot the card. Erasing the boot image or moving it from the first position on the Flash causes the card to not boot.

The RPM-PR boot image, which comes loaded on the Flash, works for all RPM-PR Cisco IOS images. Therefore, there is no reason to ever delete or move the factory installed boot image.



### Caution

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Erasing or moving the boot image can cause RPM-PR boot failure. When this happens, the RPM-PR card must be returned to Cisco and reflashed.

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To avoid this unnecessary failure, requiring card servicing, remember the following:

- Never erase the boot file from the RPM-PR Flash.
- Never change the position of the boot file on the RPM-PR Flash.
- Use care when using **squeeze flash:** command to clean it up the Flash.

If the boot file remains intact in the first position on the Flash, the RPM-PR successfully boots.

## CLI Modifications in MGX Release 5.1.00

There are no new or modified RPM-PR CLI commands in Release 5.1.00.

## Limitations and Restrictions

This section lists the limitations and restrictions for Cisco IOS Release 12.3(11)T9 for MGX 5.2.10 or earlier releases.

### CWM Recognition of RPM-PR Back Card

CWM does not distinguish between the Ethernet back card versions installed with the RPM-PR. There is no functionality difference.

### RPM-PR Front Card Resets on the Back Card Removal

The RPM-PR front card may reset on a Cisco MGX 8850 or MGX 8950 switch when the Ethernet back card is removed or inserted. You can easily avoid this reset problem if you execute a **shut** interface command before removing the back card.

### RPM-PR Back Ethernet Card Support

For Ethernet connectivity with the RPM-PR, the model “/B” four-port Ethernet back card is required (order number: MGX-RJ45-4E/B).

### RPM-PR Limitations and Restrictions for PXM45 and PXM1E

The RPM-PR and MPLS limitations and restrictions that apply to this release are as follows:

- Removing a back card does not cause RPM-PR switchover. If the back card is a FECP and redundancy is configured, then a switchover occurs.
- In an application where the RPM-PR is a PE router in an MPLS VPN service, a much better solution is to use a distance-vector routing protocol between the customer routers and the RPM-PR. A distance-vector routing protocol provides the exact information required for this application: reachability information, and not link-state information. The distance-vector routing protocols supported by the RPM-PR are BGP, RIP v1 and RIP v2, as well as static routing. With RPM-PR software releases from 12.0.7T1, distance-vector routing protocols can be used with as many different networks as subinterfaces.
- If the RPM-PR is acting as a PE router in an MPLS VPN service, and even if OSPF is running in a customer network, it is not necessary to run OSPF between the customer router and the RPM-PR. If the customer edge devices run Cisco IOS, they can redistribute OSPF routing information into RIP using the Cisco IOS commands, redistribute RIP in the OSPF configuration, and redistribute OSPF in the RIP configuration. Similar configurations are possible for BGP. (For more information on re advertisement, see the “Configuring IP Routing Protocol-Independent Features” chapter in the *Cisco IOS Release 12.0 Network Protocols Configuration Guide, Part 1*). Redistribution is not unique to Cisco CPE, and other vendors’ equipment also supports redistribution.
- Each time two RPM-PR cards exist on adjacent slots, driven by the same cell bus clock, set the clock rate to 42 MHz for traffic shaping, using the **cnfcbclk** command. This configuration is lost if the node rebuilds due to **resetsys** or a power cycle. The user must manually reconfigure the cell bus clock rate after the rebuild using the **cnfcbclk** command.



- On PXM45-based switches, when the chassis is loaded with six or more RPM-PR cards, and if every card is configured to download the Cisco IOS run-time image from the PXM45 hard disk, occasionally, upon entering a **resetsys** command or after a power cycle, some of the RPM-PR cards may go into the failed state. To reset the failed RPM-PR cards, enter the **resetcd <slot #>** command for each failed card.
- RPM-PR cannot be configured as eLSR with PXM1E as controller card.
- **Saveallcnf** (issued on the PXM45/B card) captures configuration data saved by the RPM-PR card (as well as AXSM and PXM45 cards), and saves it on the active PXM45/B card's hard disk. Users must have configured the RPM-PR to store its configuration on the PXM45/B hard disk (E:/RPM). That is, on RPM, a user should have this line in its running configuration (**boot config e:auto\_config\_slot#**). To ensure that the saved file contains the latest RPM-PR configuration, the user must execute the **copy run start** command on each RPM-PR card before executing the **saveallcnf** command. This way, the RPM-PR files on the active PXM45 hard disk contains the latest configuration to be saved.
- One RPM-PR can only function as either an eLSR or as an LSC, but not as both.
- Supports a total of (OC-12 minus T3) Mbps intrashelf traffic for cell bus-based modules.
- To configure redundancy, the primary and secondary RPM-PR cards need to be in the active state and the secondary card should not have any configuration.
- Removing a back card does not cause RPM-PR switchover.
- After establishing redundancy between two RPM-PR cards with the **addred** command, you must enter the **copy run start** command on the primary RPM-PR card to save the configuration change.
- If a secondary RPM-PR card is redundant to primary cards x and y, you cannot delete redundancy for only card x.
- If you must enter the **switchredcd** (formerly **softswitch**) and **switchcc** commands, we recommend that you wait at least 5 seconds after issuing the **switchredcd** command, and then enter the **switchcc** command.
- Cisco IOS software images on primary and secondary RPM-PR cards are not required to be compatible, but the Cisco IOS software on a secondary card should be at the same level or higher as the primary card.
- For eLSR to LSC connectivity, default control vc used is 32. If a PNNI partition exists with VCI 32 as part of its partition range, then when you add an MPLS partition, there are two options to handle the situation:
  - Add an MPLS controller and define its partition with available range. On eLSR, define control VC from any VCI value within the range defined in partition. The same VC should be defined on LSC on Xtag interface.
  - Reconfigure the PNNI partition to spare the control VC usage both on RPM-PR and AXSM, AXSM/B or AXSM-E APS Management Information.
- Whenever the RPM-PR configuration is changed and you want to store that configuration, you must enter the **copy run start** command on the RPM-PR. If you do not do this, the changed configuration is lost on RPM-PR card reboot or RPM-PR switchover in case of redundancy.
- Even though RPM-PR can have 1999 subinterfaces, the usage of subinterfaces should be planned in such a way that it does not cross a safe limit of 1985. This is because each subinterface takes one IDB and the number of IDBs available in the card is 2000. Further, you might need some IDBs for the RPM-PR back card and its ports.

# Open Caveats

This section contains the lists of open caveats in Cisco IOS Releases 12.3.x.

## Open Caveats in Release 12.3(11)T9 for MGX Release 5.2.10

No open caveats are listed for this release.

## Open Caveats in Release 12.3(11)T7 for MGX Release 5.2.00

No open caveats are listed for this release.

## Open Caveats in Release 12.3(11)T6 for MGX Release 5.1.20

Table 15 lists open caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 5.1.20 as of June 20, 2005.

**Table 15** Open Caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 5.1.20

| Caveat Number | Symptom                                                                                                                                                                                                                                             | Conditions                                                                                                                                                                                                                                           | Workaround |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| CSCef79260    | A Cisco RPM-PR card stops responding at atmdx_rx_interrupt.                                                                                                                                                                                         | Observed in a configuration in which two LSCs are configured for hot redundancy with a large MPLS VPN configuration on a PE router, and LDP flapping was performed for a long time. Observed on an RPM router running Cisco IOS Release 12.2(15)T4e. | Unknown    |
| CSCeh86365    | The user sees an error for each of the following events if the PXM does not have the support: <ul style="list-style-type: none"> <li>• Interface up/down (Admin/Line status)</li> <li>• Interface removal</li> <li>• Interface insertion</li> </ul> | The user sees this error when performing this action during a steady state condition.                                                                                                                                                                | None.      |

## Open Caveats in Release 12.3(11)T3 for MGX Release 5.1.00

Table 16 lists open caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 5.1.00 as of January 25, 2005.

**Table 16** Open Caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 5.1.00

| Caveat Number | Symptom                                                                                                                                                                  | Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Workaround                                                                                                                                                                                                                                                                                                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCec68542    | In a large-scale network and under a stressful condition, segmentation and reassembly (SAR) may not reassemble properly for large packets, causing the protocol to fail. | Observed on an RPM-PR that runs Cisco IOS Release 12.2(15)T4B that functions as a Label Edge Router (LER), and that is configured with two LSCs under the following conditions: <ul style="list-style-type: none"> <li>• With a script running, disable and re-enable the multi-virtual-circuit (Multi-VC) mode on the RPM-PR.</li> <li>• 1000 soft permanent virtual circuits (SPVCs) that have VPN routing/forwarding (VRF) enabled exist.</li> <li>• 500 external Border Gateway Protocol (eBGP) sessions exist.</li> <li>• 80-Mbps input traffic and 6-Mbps output IP traffic is in place.</li> </ul> | To clear the issue, enter the <b>clear int switch1</b> command. L3 protocols come up.                                                                                                                                                                                                                                      |
| CSCee21093    | On a Cisco MGX 8850 switch with a PXM1 controller card platform, TFTP of the config file by the CWM NMS application from the RPM-PR card takes a long time to complete.  | The CWM application attempts to sync up with the Cisco MGX 8850 switch. This process invokes an SNMP <b>get route</b> command to collect information from the switch cards. The RPM-PR config file cannot be collected as the SNMP get routine gets timed out. As the timeout happens in this condition, CWM cannot sync up with the RPM-PR configuration.                                                                                                                                                                                                                                                | Remove the running configuration of the RPM-PR card by executing the <b>clrmscnf</b> command from the PXM1 controller card. Reload the original configuration (which must be saved in a temporary file before executing the <b>clrmscnf</b> command) on the RPM-PR card. This allows the card to resync properly with CWM. |
| CSCef07711    | A Cisco MGX-RPM-PR stops responding with a crashinfo file, indicating that it failed to reset the ATMizer (SAR) chip.                                                    | Observed when a Cisco MGX 8850 switch in which an MGX-RPM-PR-512 is running Cisco IOS Release 12.2(15)T4e.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | None                                                                                                                                                                                                                                                                                                                       |

**Table 16** Open Caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 5.1.00 (continued)

| Caveat Number | Symptom                                                                                                                                                            | Condition                                                                                                                                                                           | Workaround                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| CSCef47494    | RPM-PR does not respond to console commands.                                                                                                                       | After a node is powered on.                                                                                                                                                         | Reset the card slot from PXM. |
| CSCef79260    | An RPM-PR card may stop responding upon entering atmdx_rx_interrupt.                                                                                               | Observed in a configuration in which two LSCs are configured for hot redundancy with a large MPLS VPN configuration on a PE router, and LDP flapping was performed for a long time. | Unknown                       |
| CSCeg11001    | RPM-PR interface update to PXM failed.                                                                                                                             | Adding IP address on an RPM-PR subinterface.                                                                                                                                        | Unknown                       |
| CSCin75680    | On an RPM-PR card, ingress and egress parameters in resource-partition are decremented automatically when the max/min virtual circuit identifier (VCI) is changed. | Change the max/min VCI values in resource partition details and enter the <b>snmpget</b> command on ingress and egress bandwidth parameters after you change VCI.                   | Unknown                       |

## Open Caveats in Release 12.3(7)T3 for MGX Release 5.0.10

Table 17 lists open caveats in Cisco IOS Release 12.3(7)T3 for MGX Release 5.0.10 as of August 18, 2004.

**Table 17** Open Caveats in Cisco IOS Release 12.3(7)T3 for MGX 5.0.10

| Caveat Number | Symptom                                                                                                                                                                                                             | Condition                                                                                                                                                                                                                                  | Workaround                                                                                                                                                                                                                         |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCdv24154    | If you set the maximum transmission unit (MTU) size in the XtagATM interface in LSC, the system defaults to 4470.                                                                                                   | Observed when you set the MTU size in the XtagATM interface in LSC.                                                                                                                                                                        | None                                                                                                                                                                                                                               |
| CSCea84387    | A user session may pause indefinitely, causing a Cisco router to become unresponsive.                                                                                                                               | Observed when multiple simultaneous users enter modular QoS CLI (MQC) commands on the same router through separate virtual terminal type (vty) sessions.                                                                                   | Allow only one user at a time to enter MQC commands                                                                                                                                                                                |
| CSCea85160    | snmpwalk on ifDescr responds to aal5 mib variable.                                                                                                                                                                  | Observed when you query for the ifDescr.                                                                                                                                                                                                   | None                                                                                                                                                                                                                               |
| CSCec02155    | All Virtual Switch Interface (VSI) sessions go down and XTag interfaces go to the down/down state on an LSC.                                                                                                        | Observed on an RPM-PR that acts as an LSC.                                                                                                                                                                                                 | None                                                                                                                                                                                                                               |
| CSCec16481    | A Cisco device running Cisco IOS and enabled for OSPF protocol is vulnerable to a Denial of Service (DoS) attack from a malformed OSPF packet. The OSPF protocol is not enabled by default. Further details and the | Present in Cisco IOS Releases based on 12.0S, 12.2, and 12.3. Releases based on 12.0, 12.1 mainlines, and all Cisco IOS images before Release 12.0 are not affected. Refer to the Security Advisory for a list of affected release trains. | Workarounds to mitigate the effects are explained in the Security Advisory at: <a href="http://www.cisco.com/warp/public/707/cisco-s-a-20040818-ospf.shtml">http://www.cisco.com/warp/public/707/cisco-s-a-20040818-ospf.shtml</a> |

**Table 17** Open Caveats in Cisco IOS Release 12.3(7)T3 for MGX 5.0.10 (continued)

| Caveat Number | Symptom                                                                                                                                                                                                           | Condition                                                                                                                                                                                                      | Workaround |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| CSCec26512    | After switchover, 22 LVCs entered Bwait state.                                                                                                                                                                    | After switchover.                                                                                                                                                                                              | None       |
| CSCed83799    | The following error message appeared on an RPM-PR terminal, followed by a traceback.<br><br>*Feb 24 14:36:35.140:<br>%ATMPA-3-BADPARTICLE: Switch1: bad<br>rx particle 0x61DE1540 flags<br>0x00000000 index 19000 | Appears on an RPM-PR terminal when there is heavy incoming and outgoing traffic through the RPM-PR card.                                                                                                       | None       |
| CSCed85540    | An RPM-PR acting as LSC resets due to a <b>software forced reload</b> command.                                                                                                                                    | This problem might be seen on the RPM-PR in the following conditions: <ul style="list-style-type: none"> <li>Acts as LSC in cell-based MPLS network.</li> <li>Frequent Multi-VC flaps back to back.</li> </ul> | None       |
| CSCee37192    | Upstream RPM to RPM flow corrupted with connection identifiers (CIDs).                                                                                                                                            | —                                                                                                                                                                                                              | —          |
| CSCee74057    | RPM-PR throughput performance degradation.                                                                                                                                                                        | —                                                                                                                                                                                                              | —          |

## Resolved Caveats

This section contains the list of resolved caveats in Cisco IOS Releases 12.3.x.

### Resolved Caveats in Release 12.3(11)T9 for MGX Release 5.2.10

No caveats are resolved in this release.

### Resolved Caveat in Release 12.3(11)T7 for MGX Release 5.2.00

[Table 18](#) lists resolved caveats in Cisco IOS Release 12.3(11)T7 for MGX 5.2.00 as of September 26, 2005.

**Table 18** Resolved Caveats in Cisco IOS Release 12.3(11)T7 for MGX Release 5.2.00

| Caveat Number | Description                                           |
|---------------|-------------------------------------------------------|
| CSCeh86365    | IPC-ERR: Back card line update to PXM failed/timeout. |

## Resolved Caveats in Release 12.3(11)T6 for MGX Release 5.1.20

Table 19 lists resolved caveats in Cisco IOS Release 12.3(11)T6 for MGX 5.1.20 as of June 20, 2005.

**Table 19** Resolved Caveats in Cisco IOS Release 12.3(11)T6 for MGX Release 5.1.20

| Caveat Number | Description                                                                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCef07711    | A Cisco MGX-RPM-PR stopped responding with a crashinfo file, indicating that it failed to reset the ATMizer (SAR) chip.                                                                   |
| CSCef60537    | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                                                                                   |
| CSCeg87969    | RPM-PR dropped unmuxed packets sent by far router.                                                                                                                                        |
| CSCeg11001    | Interface update to PXM failed when you added an ip addr.                                                                                                                                 |
| CSCeg15067    | Upon reload, the RPM-PR sent redundant traps about the presence of the card.                                                                                                              |
| CSCeg17630    | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                                                                                   |
| CSCeg17638    | When 1FE_CP Fast Ethernet coprocessor back card failed, it did not trigger a front card switchover.                                                                                       |
| CSCeg25439    | RPM-PR sent incorrect values in the trap varbind.                                                                                                                                         |
| CSCeh00712    | Inconsistency on RPM FECF_RJ45 back card type.                                                                                                                                            |
| CSCeh02016    | RPM-PR router was reloaded abnormally when its back card underwent OIR.                                                                                                                   |
| CSCeh06751    | RPM_PR Front card switchover did not occur by default when 1FECP back card underwent OIR.                                                                                                 |
| CSCeh27915    | RPM-PR switchover.                                                                                                                                                                        |
| CSCeh54867    | %RPM_VIRTUAL_PORT-3-IPCERR: switch_vport_send_pxm_with_reply: Vport request rejected by PXM. Error String = enErr:Input parameters are InCorrect. Error Code = 1869756999.                |
| CSCeh78358    | SAR failure caused the RPM-PR to reset because of watchdog timer expiry.                                                                                                                  |
| CSCsa55292    | The LVCs under a subinterface became stuck, causing OutPktDrops on an RPM-PR card.                                                                                                        |
| CSCsa81379    | NetFlow Feature Acceleration is deprecated and removed from Cisco IOS. The global command <b>ip flow-cache feature-accelerate</b> is no longer recognized in any Cisco IOS configuration. |

## Resolved Caveats in Release 12.3(11)T3 for MGX Release 5.1.00

Table 20 lists resolved caveats in Cisco IOS Release 12.3(11)T3 for MGX Release 5.1.00 as of January 25, 2005.

**Table 20** Resolved Caveats in Cisco IOS Release 12.3(11)T3 for MGX 5.1.00

| Caveat Number | Description                                                                                    |
|---------------|------------------------------------------------------------------------------------------------|
| CSCed94598    | An RPM-PR over-shaped the traffic by 0.3 to 0.5 percent above the sustainable cell rate (SCR). |
| CSCee12392    | An RPM-PR did not boot up due to continuous hardware watchdog resets.                          |
| CSCee33948    | Intermittent diagnostic loopback failure.                                                      |

**Table 20** *Resolved Caveats in Cisco IOS Release 12.3(11)T3 for MGX 5.1.00 (continued)*

| Caveat Number | Description                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCee38626    | Unexpected reload of an RPM-PR acting as an LSR in an MPLS domain.                                                                                                           |
| CSCee53246    | The standby (secondary) RPM-PR did not release the config_file boot variable after the primary redundant RPM-PR card takes over when a card switchover command was executed. |
| CSCee59256    | You could not execute the <b>write memory</b> or the <b>dir filesystem</b> command.                                                                                          |
| CSCef34052    | IP connectivity between the PE and the LSC was lost, causing the LDP session to flap.                                                                                        |
| CSCef53761    | RPM-PR reloaded when the SAR auto recovery mechanism began.                                                                                                                  |
| CSCef60537    | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                                                                      |
| CSCeg17630    | The MGX-RPM-1FE-CP RPM-PR back card was not recognized.                                                                                                                      |

## Resolved Caveats in Release 12.3(7)T3 for MGX Release 5.0.10

Table 21 lists resolved caveats in Cisco IOS Release 12.3(7)T3 for MGX Release 5.0.10 as of August 18, 2004.

**Table 21** *Resolved Caveats in Cisco IOS Release 12.3(7)T3 for MGX 5.0.10*

| Caveat Number | Description                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------|
| CSCea62571    | %UTIL-3-TREE: Data structure error with traceback logged on LSC.                                    |
| CSCea85395    | BGP suppressed prefixes not reinstated after condition removed.                                     |
| CSCed41381    | Input drops on framed PVC i/f causing an LDP session flap.                                          |
| CSCed74835    | When copying big files from an RPM-PR to a Cisco MGX 8850 switch hard drive, it silently failed.    |
| CSCee54524    | During SCR provisioning (changing the bandwidth) on the ePVCs, the RPM-PR PE occasionally reloaded. |

## Resolved Caveats in Release 12.3(2)T6 for MGX Release 5.0.00

Table 22 lists resolved caveats in Cisco IOS Release 12.3(2)T6 for MGX Release 5.0.00 as of June 4, 2004.

**Table 22** *Resolved Caveats in Cisco IOS Release 12.3(2)T6 for MGX Release 5.0.00*

| Caveat Number | Description                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------|
| CSCec76875    | A PE router was unable to ping other PE routers or an LSC, nor could other platforms ping the PE router. |
| CSCed82475    | An LSC reloaded unexpectedly when an Address Error (load or instruction fetch) exception occurred.       |

**Table 22** Resolved Caveats in Cisco IOS Release 12.3(2)T6 for MGX Release 5.0.00 (continued)

| Caveat Number | Description                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSCed85438    | A Fast Ethernet 100BASE-TX port adapter on an RPM-PR card stopped receiving burst traffic packets.                                                                                                                                                                                      |
| CSCee03384    | When an LC-ATM switch subinterface was created and then deleted on an RPM-PR, the index for the subinterface for the LVC stuck detection and recovery mechanism changed in such a way that the LVC stuck information for an existing LC-ATM was overwritten when a new LC-ATM is added. |

## Resolved Caveats in Release 12.3(2)T5 for MGX 5.0.00

Table 23 lists the resolved caveats in Cisco IOS Release 12.3(2)T5 for MGX 5.0.00 as of April 14, 2004.

**Table 23** Resolved Caveats in Cisco IOS Release 12.3(2)T5 for MGX 5.0.00

| Caveat Number | Description                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| CSCeb63762    | RPM-SAR RAS enhancement. Ability to reset SAR after crash.                                                                             |
| CSCec14559    | PXM spontaneously fails over during 1:N RPM-PR redundancy testing.                                                                     |
| CSCed26565    | RPM-PR-512 reset multiple times due to SAR APU stall.                                                                                  |
| CSCeb22233    | RPM-PR crash after Fast Ethernet back card OIR.                                                                                        |
| CSCeb61872    | <b>sw rev varbind</b> not available when trap 60056 sent for RPM-PR.                                                                   |
| CSCed40082    | Duplicate <b>ping atm</b> command in RPM-PR.                                                                                           |
| CSCed46492    | Ethernet 2/1 on RPM-PR stays in shutdown state after entering <b>switchredcd</b> command.                                              |
| CSCeb74637    | During the RPM-PR upgrade to 12.2(8)MC2d, startup config disappeared.                                                                  |
| CSCed05581    | The switch connection configuration in switch subinterfaces is lost after reload in RPM-PR.                                            |
| CSCdz79827    | SNMP loop at cipPrecedenceEntry on switch subinterface of RPM-PR.                                                                      |
| CSCea26869    | IPC message header cache below traceback kept coming.                                                                                  |
| CSCea44854    | Error Messages from RPM-PR module for SNMP requests are wrong.                                                                         |
| CSCea74335    | On reloading an RPM-PR card using the <b>reload</b> command, it prompts for saving the configuration even if it has not been modified. |
| CSCeb10082    | No indication in the log that <b>clear int sw1</b> was executed through CLI.                                                           |
| CSCeb11734    | Traceback messages on slot 14 after upgrade.                                                                                           |
| CSCeb41501    | Traceback on RPM-PR with only VCC VPC switch partition configured.                                                                     |
| CSCeb65685    | <b>ip cef load-sharing algorithm tunnel</b> command lost upon resetting an RPM-PR.                                                     |
| CSCeb78535    | Multiple alignment errors adding switch connection.                                                                                    |
| CSCeb78905    | Incorrect configuration generation for RPM-PR commands.                                                                                |
| CSCeb81588    | Set PCI retry timer to non-zero value for RPM-PR platform.                                                                             |
| CSCed25513    | Watchdog timeout occurred when malloc fails while resynching.                                                                          |



# Compatibility Notes

This section contains compatibility information for RPM-PR cards.

All Cisco IOS firmware can be downloaded from Cisco.com at this URL:

<http://www.cisco.com/kobayashi/sw-center/sw-ios.shtml>

## RPM-PR Boot File and Firmware File Names and Sizes

Table 24 displays the RPM-PR boot and firmware file names and sizes for this release.

**Table 24** *RPM-PR Boot and Firmware File Names and Sizes*

|                      | File Name             | File Size (in Bytes) |
|----------------------|-----------------------|----------------------|
| <b>Boot File</b>     | rpm-boot-mz.123-11.T9 | 3933600              |
| <b>Firmware File</b> | rpm-js-mz.123-11.T9   | 12053028             |

## RPM-PR Compatibility Matrix

Table 25 lists the RPM-PR compatibility matrix for RPM-PR.

**Table 25** *RPM-PR Compatibility Matrix*

| MGX Software Release | Cisco IOS Release      | CWM             |
|----------------------|------------------------|-----------------|
| 1.3.14/5.2.10        | 12.3(11)T9             | 15.1.50         |
|                      | 12.3(11)T7             |                 |
| 1.3.12/5.2.00        | 12.3(11)T7             | 15.1.50         |
| 1.3.12/5.1.20        | 12.3(11)T6             | 15.1.00         |
| 1.3.12/5.1.00        | 12.3(11)T3             | 15.1.00         |
| 1.3.10/5.0.10        | 12.3(7)T3              | 15.0.00 P2      |
| 1.3.00/5.0.00        | 12.3(2)T6              | 15.0.00         |
|                      | 12.3(2)T5              |                 |
| 1.2.21/4.0.15        | 12.3(2)T4              | 12.0.00.2       |
| 1.2.21/4.0.12        | 12.3(2)T2              | 12.0.00.2       |
| 1.2.21/4.0.10        | 12.2(15)T5             | 12.0.00.1       |
| 1.2.20/4.0.00        | 12.2(15)T4a            | 11.0.11         |
| 1.2.13/3.0.20        | 12.2(11)T2             | 11.0.10 Patch 1 |
| 1.2.11/3.0.10        | 12.2(11)T1             | 11.0.10         |
| 1.2.10/3.0.00        | 12.2(8)T4              | 11.0.00         |
| 1.2.02/2.1.76        | 12.2(8)T1 <sup>1</sup> | 10.5.10 Patch 1 |
| 1.2.00/2.1.70        | 12.2(4)T1              | 10.5.10         |

**Table 25 RPM-PR Compatibility Matrix (continued)**

| MGX Software Release | Cisco IOS Release | CWM             |
|----------------------|-------------------|-----------------|
| 1.1.40               | 12.2(4)T          | 10.5            |
| 1.1.34               | 12.2(2)T2         | 10.4.01 Patch 1 |
| 1.1.32               | 12.1(5.3)T_XT     | 10.4.01         |

1. MGX 1.2.02 has also been certified with Cisco IOS 12.2(4)T3.

## MGX RPM-PR Hardware

Table 26 shows the front card and back card compatibility for RPM-PR hardware supported in this release. The table lists the card model, name, part numbers, minimum version, and minimum revisions of each card supported. Note that there may be more than one 800 level part numbers for the same front cards. The minimum version is identified by the last two digits of the 800 level numbers.

**Table 26 Hardware Compatibility Matrix**

| Front Cards    | Part Number/<br>Min. Version | Rev. | Back Cards    | Part Number/<br>Min. Version | Rev. |
|----------------|------------------------------|------|---------------|------------------------------|------|
| MGX-RPM-PR-256 | 800-07178-02                 | A0   | MGX-RJ45-FE   | 800-02735-02                 | A0   |
|                |                              |      | MGX-MMF-FE    | 800-03202-02                 | A0   |
|                |                              |      | MGX-RJ45-4E/B | 800-12134-01                 | A0   |
| MGX-RPM-PR-512 | 800-07656-02                 | A0   | MGX-RJ45-FE   | 800-02735-02                 | A0   |
|                |                              |      | MGX-MMF-FE    | 800-03202-02                 | A0   |
|                |                              |      | MGX-RJ45-4E/B | 800-12134-01                 | A0   |

## Previous Cisco IOS Release Compatibility Information

This section describes the compatibility information for RPM-PR modules with Cisco IOS Releases prior to 12.3.x.

### About Cisco IOS Release 12.2(11)T1

The Cisco IOS 12.2(11)T1 supports existing features on the MGX-RPM-PR card.

### About Cisco IOS Release 12.2(8)T4

The Cisco IOS 12.2(8)T4 supports existing features on the MGX-RPM-PR card.

## About Cisco IOS Release 12.2(8)T1

The Cisco IOS 12.2(8)T1 supports existing features on the MGX-RPM-PR card and the CBC clock rate configuration feature described in [“Features Not Supported in This Release”](#) section on page 61.

## About Cisco IOS Release 12.2(4)T3

The Cisco IOS 12.2(4)T3 supports existing features on the MGX-RPM-PR card.

## About the Cisco IOS Release 12.2(4)T1

The Cisco IOS 12.2(4)T1 or higher is used with MGX Release 21.70. This Cisco IOS release supports new RPM-PR features and continues to support existing features on the RPM-PR card.



**Note**

---

The MPLS inter-AS and MPLS TE are not supported features on RPM-PR for this release.

---

## About the Cisco IOS Release 12.2(4)T

The Cisco IOS 12.2(4)T or higher is used with MGX Release 2.1.60. This IOS release supports new RPM-PR features and continues to support existing features on the RPM-PR card.



**Note**

---

The MPLS inter-AS and MPLS TE are not supported features on RPM-PR for this release.

---

# Special Installation and Upgrade Requirements

Existing customers should use the upgrade procedures [“Upgrading RPM-PR Cards in MGX 8000 Releases 2.1 and 3 \(PXM45 and PXM1E\) Switches”](#) section on page 75 to upgrade. A graceful upgrade from any release previous to the current release is supported. For new customers, the image is pre-installed and they should use the PXM installation procedure to upgrade to future maintenance releases.

## Upgrading RPM-PR Cards in MGX 8000 Releases 2.1 and 3 (PXM45 and PXM1E) Switches

The following sections describe how to upgrade boot and run-time software on RPM-PR cards.

### Upgrading RPM-PR Boot Software

At the factory, a boot file is installed in the bootflash on the RPM-PR card and is used to boot the card. The run-time software is updated more frequently than the boot software. However, the boot software is updated occasionally. When you are updating run-time software, check [Table 24](#) to see if a boot software upgrade is required.

The boot software is stored in bootflash memory on the RPM-PR card. To manage the software in bootflash, you access it as if it were a hard disk. For example, in copy and delete file commands, files are identified as `bootflash:filename` (which is similar to `e:filename`).

The following example shows a directory of bootflash contents:

```
Router (boot) #show flash:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .D config D4F7352A 40330 18 686 Jan 30 2001 18:18:41 auto_config_slot09
2 .D config CBF007C1 40660 9 688 Feb 22 2001 15:33:11 slot9.cnf
3 .. image F596869A 2973E8 27 2452744 Feb 28 2001 03:16:05
rpm-boot-mz_002.001.070.202
```



#### Note

Although you can display directory contents with the **dir bootflash:** command, the **show flash:** command provides more detail. Also, although bootflash and Flash are separate entities on other Cisco routers, both terms refer to the same entity on the RPM-PR.

In the example above, the numbers in the left column indicate the order in which the RPM-PR card tries to load software. The second column shows that the first two files are marked for deletion (D). The last column lists the names of the files stored in bootflash.

When managing the bootflash, you must consider the following:

- When the RPM-PR card is reset, it tries to load the first bootable image in bootflash.
- Files are not removed from bootflash until the **squeeze flash:** command is entered.



#### Caution

If all bootable images are deleted from bootflash, try to reinstall the bootflash file using the Xmodem download procedure found in [Using XModem to Download Flash to RPM-PR Cards, page 86](#). If this does not work, return the card to the factory to be reprogrammed.

## Upgrading RPM-PR Run-Time Software

You can load the run-time software on the RPM-PR from the following sources:

- The E:RPM directory on the PXM45 hard disk
- Bootflash
- A TFTP server on a LAN to which an RPM-PR back card is connected.

We recommend that you configure the RPM-PR card to load from the E:RPM directory on the PXM45 hard disk. Note that images load much faster from bootflash, but if you are using multiple RPM-PR cards, it takes longer to complete an upgrade because the run-time software must be copied to each RPM-PR card's bootflash instead of to a single location.

At startup, the RPM-PR card attempts to load the software in the order listed in the startup-config file. The following example shows an excerpt from a startup-config file:

```
!
boot system e:rpm-js-mz.122-4.T
boot system bootflash:rpm-js-mz.122-4.T
boot config c:auto_config_slot09
logging rate-limit console 10 except errors
enable password cisco
!
```

In the startup-config file example, the RPM-PR card attempts to load the run-time software from the PXM45 card (E:rpm-js-mz.122-4.T) first, and if that fails, it attempts to load the image copy stored in bootflash. This configuration takes longer to upgrade, but it assures the card can reboot if someone accidentally removes the file on the PXM45 hard disk.

**Note**


---

The convention is lowercase *e* for RPM-PR commands and uppercase *E* for switch commands.

---

To configure the RPM-PR to load upgraded run-time software from the PXM45 hard disk, you must do the following:

- Copy the upgraded file to the PXM45 hard disk.
- Update the boot system variable in the router startup-config file to load the new file.
- Reset the RPM-PR card so that it loads the new file.

RPM-PR cards can be configured for 1:N redundancy as well as for non-redundant configurations. The procedures for both types of configuration are in the following sections.

**Tip**


---

To simplify run-time software updates, copy the run-time file in the E:RPM directory and rename it to a generic name such as rpm-js-mz. The production run-time filenames have version numbers appended to them, but you can change this. This approach allows you to perform future upgrades by copying the file to the hard disk, renaming a copy of the file to your generic name, and resetting each card. The approach eliminates the need to reconfigure Cisco IOS on each card to recognize the new filename.

---

## Upgrading Boot Software and Run-Time Software for Non-Redundant Cards

The following procedure describes how to upgrade boot software and run-time software.

**Note**


---

The first part of this procedure describes boot software upgrade and the second part describes run-time software upgrade. RPM-PR boot software can be upgraded either in boot mode or in run-time mode. The procedure described here shows an example for run-time mode. The same commands are applicable for upgrading boot software in boot mode.

---

**Step 1** Copy the new boot software file for the RPM-PR card to the switch (C:RPM).

**Step 2** Establish a configuration session using any valid user name.

**Step 3** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
8850_LA.7.PXM.a > cc 9
(session redirected)
Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.



**Note** This procedure assumes that you are familiar with Cisco IOS, which is a topic that is beyond the scope of this book. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples are given to show how to complete the task.

**Step 4** Enter Enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

**Step 5** To verify router access to the PXM1 hard disk and display the boot file name, enter the following command:

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

65539 -rw- 815 Sep 13 2001 23:51:10 auto_config_slot09
65540 -rw- 2588780 Mar 22 2001 19:06:54 rpm-boot-mz_002.001.070.201
84611 -rw- 2452768 Apr 05 2001 05:34:44 rpm-boot-mz.122-4.T
66805 -rw- 8529104 Mar 22 2001 19:09:00 rpm-js-mz_002.001.070.201
85809 -rw- 7936012 Apr 05 2001 06:28:54 rpm-js-mz.122-4.T

104857600 bytes total (83068928 bytes free)
```

**Step 6** To display the files in the bootflash, enter the following command:

```
Router#show flash:
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time----- name
1 .. image F596869A 296D88 27 2452744 Feb 28 2001 03:16:05
rpm-boot-mz_002.001.070.201

30315128 bytes available (2452872 bytes used)
```

**Step 7** To copy new boot software to the bootflash, use the **copy** command as shown in the following example:

```
Router#copy c:rpm-boot-mz.122-4.T bootflash:
Destination filename [rpm-boot-mz.122-4.T]?
CC
CCCCCCCCCCCCCCCCCCCC
2334044 bytes copied in 35.768 secs (66686 bytes/sec)
```



**Tip** When prompted for the destination filename, press **<Enter>** to use the source filename shown in the prompt. To change the destination filename, enter a new filename after the prompt.

**Step 8** To verify that the file was copied, enter the **show flash:** command.

**Step 9** To mark an older boot file for deletion from the bootflash, enter the following command:

```
Router#del bootflash:
Delete filename []? rpm-js-mz
Delete bootflash:rpm-js-mz? [confirm]
Router#
```

**Tip**

To unmark a bootflash file so that it is not deleted when running the **squeeze flash:** command, enter the **undelete <number>** command, where *number* is the file number displayed in the left-most column of the **show flash:** command display.

**Step 10** To delete all files that are marked for deletion from bootflash, enter the following command:

```
Router#squeeze flash:
All deleted files will be removed. Continue? [confirm]y
Squeeze operation may take a while. Continue? [confirm]

Squeeze of bootflash complete
```

**Step 11** Enter the **show flash:** command to verify that the bootflash files are as you want them.

**Caution**

If all bootable images are deleted from bootflash, try to reinstall the bootflash file using the Xmodem download procedure found in [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 86](#) and restart the RPM-PR card. If this does not work, return the card to the factory to be reprogrammed. When you are done managing the bootflash, the **show flash:** command should display at least one bootable image, and the image you want the card to boot from must be the first bootable image in the list.

**Tip**

If the **show flash:** command does not display a bootable image, copy a bootable image to bootflash as described earlier in this procedure. You can continue to manage the bootflash, even when there are no files in bootflash, until the router is restarted.

**Tip**

If the bootflash contains bootable images and the sequence is such that the card does not start, you can enter rommon mode and load the bootable image. To get into rommon mode, establish a console connection to the RPM-PR card, reset the RPM-PR card using the **resetcd <slot>** command from the active PXM1 card, then quickly enter the **CTRL-[, Break** sequence at the RPM-PR console. The command to send a Break depends on the computer platform and software you are using. It may take a couple of attempts to successfully get into rommon mode. When you are in rommon mode, the RPM-PR card displays the *rommon 1 >* prompt.

Once in rommon mode, you can enter the **dir bootflash:** command to display the images in bootflash. To boot one of the images, enter a **boot** command the following format: **boot bootflash:filename.**

See [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 86](#).

This ends the boot software upgrade procedure. The following steps are for upgrading the run-time software. If you do not want to upgrade the run-time software, you need to restart the RPM-PR card by entering the reload command.

**Step 12** Copy the new run-time software file for the RPM-PR card to the switch (C:RPM).

**Step 13** Establish a configuration session using any valid user name.

**Step 14** If you are using a generic filename for your run-time images, copy the file on the PXM1 hard disk and rename the copied file. For example:

```
8850_LA.8.PXM.a > copy rpm-js-mz.122-4.T rpm-js-mz
```

**Step 15** If your RPM-PR is already configured to use a file with a generic name, skip to Step 24.

**Step 16** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
pop20two.7.PXM.a > cc 9
```

```
(session redirected)
```

```
Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.




---

**Note** This procedure assumes that you are familiar with Cisco IOS. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples appear to show how to complete the task.

---

**Step 17** Enter the enable mode for the router by entering the following command:

```
Router>enable
```

```
Password:
```

```
Router#
```

**Step 18** Configure the RPM-PR card to store its configuration on the PXM1 hard disk by entering the following command:

```
Router> boot config c:auto_config_slot#
```

**Step 19** Display the startup run-time software filename by entering the following command:

```
Router#show bootvar
BOOT variable = c:rpm-js-mz.122-4.T,12;
CONFIG_FILE variable = c:auto_config_slot09
BOOTLDR variable does not exist
Configuration register is 0x2
```

In the example above, the startup run-time software file is C:rpm-js-mz.122-4.T, and it has a version number attached to it. Another way to view the boot list is to enter the **show startup-config** command and look for the **boot system** commands.

**Step 20** Enter the router global configuration mode by entering the following command:

```
Router#config terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

**Step 21** If you need to change the boot system filenames, remove the existing boot list by entering the following command:

```
Router(config)# no boot system
```

**Step 22** Create a new boot list by entering one or more **boot system** commands as follows:

```
Router(config)# boot system c:filename
```

Replace the filename variable with the name of the new run-time file that was previously transferred to the C:RPM directory on the switch as follows:

```
Router(config)# boot system c:rpm-js-mz
```



If you want to enter additional boot system commands, enter them in the order in which you want the RPM-PR card to use them. The following example adds a statement to load from bootflash if the run-time file is not found on the PXM1 hard disk:

```
Router(config)# boot system bootflash:rpm-js-mz.122-4.T
```



**Note** Before the RPM-PR card can load run-time software from the bootflash, you must copy the run-time software to the bootflash. The procedure for copying files from the PXM1 hard disk to bootflash is described earlier.

**Step 23** Exit global configuration mode and save the new configuration by entering the following command:

```
Router(config)#^Z
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

**Step 24** To verify the change, enter the **show bootvar** or **show run** commands.

**Step 25** Switch to the active PXM1 card and reset the RPM-PR card by entering the following command:

```
Router#cc 8

(session redirected)

8850_LA.8.PXM.a > resetcd 9
The card in slot number 9, will be reset. Please confirm action
resetcd: Do you want to proceed (Yes/No)? y
```

## Upgrading RPM-PR Cards in MGX 8000 Series Release 4 (PXM45 and PXM1E) Switches

You must establish redundancy before you use the procedure in this section. To upgrade the RPM-PR run-time software for 1:N redundancy, use the following procedure.



**Note** The directory on the PXM1 card uses (C:) and the directory within the router card uses (c:).

The following procedure describes how to upgrade boot software and run-time software.



**Note** The first part of this procedure describes boot software upgrade and the second part describes run-time software upgrade. RPM-PR boot software can be upgraded either in boot mode or in run-time mode. The procedure described here shows an example for run-time mode. The same commands are applicable for upgrading boot software in boot mode.

**Step 1** Copy the new boot software file for the RPM-PR card to the switch (C:RPM).

**Step 2** Establish a configuration session using any valid user name.

**Step 3** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
8850_LA.7.PXM.a > cc 9

(session redirected)

Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.




---

**Note** This procedure assumes that you are familiar with Cisco IOS. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples appear to show how to complete the task.

---

**Step 4** Enter Enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

**Step 5** To verify router access to the PXM1 hard disk and display the boot file name, enter the following command.

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

65539 -rw- 815 Sep 13 2001 23:51:10 auto_config_slot09
65540 -rw- 2588780 Mar 22 2001 19:06:54 rpm-boot-mz_002.001.070.201
84611 -rw- 2452768 Apr 05 2001 05:34:44 rpm-boot-mz.122-4.T
66805 -rw- 8529104 Mar 22 2001 19:09:00 rpm-js-mz_002.001.070.201
85809 -rw- 7936012 Apr 05 2001 06:28:54 rpm-js-mz.122-4.T

104857600 bytes total (83068928 bytes free)
```

**Step 6** To display the files in the bootflash, enter the following command:

```
Router#show flash:
-#- ED --type-- --crc--- -seek-- nlen -length- ----date/time----- name
1 .. image F596869A 296D88 27 2452744 Feb 28 2001 03:16:05
rpm-boot-mz_002.001.070.201

30315128 bytes available (2452872 bytes used)
```

**Step 7** To copy new boot software to the bootflash, enter the following command:

```
Router#copy c:rpm-boot-mz.122-4.T bootflash:
Destination filename [rpm-boot-mz.122-4.T]?
CC
CCCCCCCCCCCCCCCCCCCC
2334044 bytes copied in 35.768 secs (66686 bytes/sec)
```




---

**Tip** When prompted for the destination filename, press **<Enter>** to use the source filename shown in the prompt. To change the destination filename, enter a new filename after the prompt.

---

**Step 8** To verify that the file was copied, enter the **show flash:** command.

- Step 9** To mark an older boot file for deletion from the bootflash, use the **del bootflash:** command as shown in the following example:

```
Router#del bootflash:
Delete filename []? rpm-js-mz
Delete bootflash:rpm-js-mz? [confirm]
Router#
```

**Tip**

To unmark a bootflash file so that it is not deleted when running the **squeeze flash:** command, enter the **undelete <number>** command, where *number* is the file number displayed in the left-most column of the **show flash:** command display.

- Step 10** To delete all files that are marked for deletion from bootflash, enter the following command:

```
Router(boot)#squeeze flash:
All deleted files will be removed. Continue? [confirm]y
Squeeze operation may take a while. Continue? [confirm]
```

```
Squeeze of bootflash complete
```

- Step 11** Enter the **show flash:** command to verify that the bootflash files are as you want them.

**Caution**

If all bootable images are deleted from bootflash, try to reinstall the bootflash file using the Xmodem download procedure found in [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 86](#) and restart the RPM-PR card. If this does not work, return the card to the factory to be reprogrammed. When you are done managing the bootflash, the **show flash:** command should display at least one bootable image, and the image you want the card to boot from must be the first bootable image in the list.

**Tip**

If the **show flash:** command does not display a bootable image, copy a bootable image to bootflash as described earlier in this procedure. You can continue to manage the bootflash, even when there are no files in bootflash, until the router is restarted.

**Tip**

If the bootflash contains bootable images and the sequence is such that the card does not start, you can enter rommon mode and load the bootable image. To get into rommon mode, establish a console connection to the RPM-PR card, reset the RPM-PR card using the **resetcd <slot>** command from the active PXM1 card, then quickly enter the **CTRL-[, Break** sequence at the RPM-PR console. The command to send a **Break** depends on the computer platform and software you are using. It may take a couple of attempts to successfully get into rommon mode. When you are in rommon mode, the RPM-PR card displays the *rommon 1 >* prompt.

Once in rommon mode, you can enter the **dir bootflash:** command to display the images in bootflash. To boot one of the images, enter a **boot** command the following format: **boot bootflash:filename.**

See [“Using XModem to Download Flash to RPM-PR Cards”](#) section on [page 86](#).

This ends the boot software upgrade procedure for the primary card. The following steps are for upgrading the run-time software. If you do not want to upgrade the run-time software for the primary card, skip steps 12 through 24 and go to step 25 to upgrade the boot software on the secondary card.

- Step 12** Copy the new run-time software file for the RPM-PR card to the switch (C:RPM).
- Step 13** If you are using a generic filename for your run-time images, copy the file on the PXM1 hard disk and rename the copied file. For example:

```
8850_LA.8.PXM.a > copy rpm-js-mz.122-4.T rpm-js-mz
```

- Step 14** Establish a configuration session using any valid user name.
- Step 15** If your RPM-PR is already configured to use a file with a generic name, skip to Step 25.
- Step 16** Use the **cc** command to select the RPM-PR card to update as shown in the following example:

```
pop20two.7.PXM.a > cc 9
```

```
(session redirected)
```

```
Router>
```

The switch displays the Cisco IOS prompt for the router on the RPM-PR card. From this point on, all commands are Cisco IOS commands.




---

**Note** This procedure assumes that you are familiar with Cisco IOS. This procedure details only those commands that are unique to setting up RPM-PR on the switch. For general Cisco IOS commands, examples appear to show how to complete the task.

---

- Step 17** Enter Enable mode for the router by entering the following command:

```
Router>enable
Password:
Router#
```

- Step 18** Configure the RPM-PR card to store its configuration on the PXM1 hard disk by entering the following command:

```
Router> boot config c:auto_config_slot#
```

- Step 19** Display the startup run-time software filename by entering the following command:

```
Router#show bootvar
BOOT variable = c:rpm-js-mz.122-4.T,12;
CONFIG_FILE variable = c:auto_config_slot09
BOOTLDR variable does not exist
Configuration register is 0x2
```

In the example above, the startup run-time software file is c:rpm-js-mz.122-4.T, and it has a version number attached to it. Another way to view the boot list is to enter the **show startup-config** command and look for the **boot system** commands.

- Step 20** Enter the router global configuration mode by entering the following command:

```
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

- Step 21** If you need to change the boot system filenames, remove the existing boot list using the **boot system** command as follows:

```
Router(config)# no boot system
```

- Step 22** Create a new boot list by entering one or more **boot system** commands as follows:

```
Router(config)# boot system c:filename
```

Replace the filename variable with the name of the new run-time file that was previously transferred to the C:RPM directory on the switch as follows:

```
Router(config)# boot system c:rpm-js-mz
```

If you want to enter additional boot system commands, enter them in the order in which you want the RPM-PR card to use them. The following example adds a statement to load from bootflash if the run-time file is not found on the PXM1 hard disk:

```
Router(config)# boot system bootflash:rpm-js-mz.122-4.T
```




---

**Note** Before the RPM-PR card can load run-time software from bootflash, you must copy the run-time software to the bootflash. The procedure for copying files from the PXM1 hard disk to bootflash is described in a previous section.

---

**Step 23** Exit global configuration mode and save the new configuration by entering the following command:

```
Router(config)#^Z
Router#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

**Step 24** To verify the change, enter the **show bootvar** or **show run** commands.

**Step 25** Switch to the active PXM1 card by entering the following command:

```
Router#cc 8

(session redirected)
```

**Step 26** Switch to the secondary card entering the **switchredcd** command as follows:

```
8850_LA.8.PXM.a > switchredcd <fromSlot> <toSlot>
```

Replace *<fromSlot>* with the slot number of the primary card. Replace *<toSlot>* with the slot number of the secondary card.

This step makes the secondary card active and resets the primary RPM-PR card. When the Primary card resets, it loads the upgraded software.

**Step 27** **cc** to the secondary slot.

**Step 28** Repeat steps 1 through 11.

This ends the boot software upgrade on the secondary card. If you do not want to upgrade the run-time software, go to step 30.

The following steps are for upgrading run-time software on the secondary card.

**Step 29** Repeat steps 12 through 24.

**Step 30** Switch back to the primary card using the **switchredcd** command as follows:

```
8850_LA.8.PXM.a > switchredcd <fromSlot> <toSlot>
```

Replace *<fromSlot>* with the slot number of the secondary card. Replace *<toSlot>* with the slot number of the primary card.

This step makes the primary card active and resets the secondary RPM-PR card. When the reset is complete, the secondary card is ready to run the upgraded software.

- Step 31** To verify that the router reboot is complete, enter the **dspecs** or **dspecd <slot>** commands. The reboot is complete when the card state displays as *Active*. Another way to verify router operation is to use the **cc slot** command. If you can access the router from the switch prompt, the router reboot is complete.
- Step 32** If there are other primary cards with redundant (secondary) cards, repeat this procedure for each primary card.

## Using XModem to Download Flash to RPM-PR Cards

Use the xmodem feature to download the flash memory to an RPM/B or RPM-PR card. During this process, ensure the card is connected to a target machine through HyperTerminal with settings of 9600, n, 8, and 1.



**Note**

This feature is only available for ROMmon image version 12.2(4r)T1 or greater. Use the **show version** command to verify the ROMmon version installed on an RPM-PR card.

- Step 1** Put the node in monitor mode by entering the **priv** command to gain access to the privileged commands as shown in the following example:

```
rommon 1> priv
You now have access to the full set of monitor commands. Warning:
some commands will allow you to destroy your configuration and/or
system images and could render the machine unbootable.
```

- Step 2** The xmodem command becomes available and the general syntax of this command and availability of this can be checked by giving xmodem command without any parameters on the CLI, shown in the following example:

```
rommon 2 > xmodem
usage: xmodem [-cys]
-c CRC-16
-y ymodem-batch protocol
-s<speed> Set speed of download, where speed may be
 1200|2400|4800|9600|19200|38400
rommon 3 >
```

The command line options for xmodem are as follows:

| Option | Definition                                                                                          |
|--------|-----------------------------------------------------------------------------------------------------|
| -c     | xmodem performs the download using CRC-16 error checking to validate packets. Default is 8-bit CRC. |
| -y     | xmodem uses Ymodem-batch protocol for downloading, which uses CRC-16 error checking.                |
| -s     | Specifies the download speed. Default is 9600 bps.                                                  |



**Note**

If you do not find the xmodem commands, then the xmodem feature is not available on this ROM Monitor (ROMmon) version. In that case, you must return the card to Cisco Systems.



**Note** The rommon xmodem/ymodem transfer only works on the console port. You can only download files to the router. You cannot use xmodem/ymodem to get files from the router.

For example:

```
rommon 4> xmodem -cys 38400
Do not start sending the image yet...
Invoke this application for disaster recovery. Do you wish to continue? y/n [n]: y
Note, if the console port is attached to a modem, both the console port and the modem
must be operating at the same baud rate. Use console speed 38400 bps for download
[confirm]
```

**Step 3** Change the preferences in HyperTerminal and adjust the speed from 9600 to 38400.

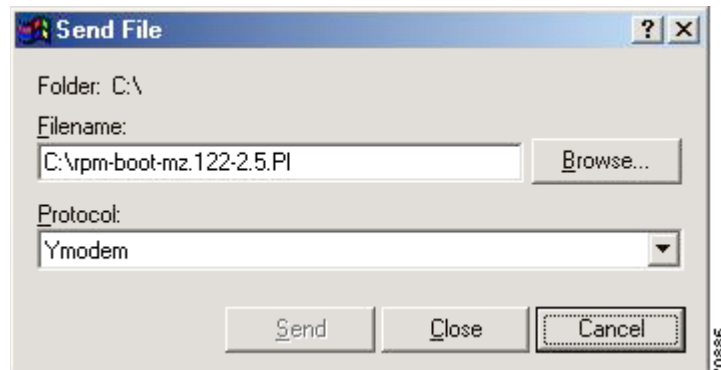


**Note** You can also continue at the speed of 9600 by either not specifying the `-s` option in the command, or by specifying 9600 explicitly. This takes more time.

The following message appears:

```
Download will be performed at 38400. Make sure your terminal emulator is set to this
speed before sending file. Ready to receive file ...
```

**Step 4** To start the image transfer, use the **Transfer > Send File** option in HyperTerminal.



In the Filename box, browse and choose the image file to be downloaded. Also because you used the `y` option while invoking the `xmodem`, set the transfer protocol to `ymodem` or use `Xmodem` protocol by not specifying the `-y` option on the command line.

The transfer window appears and transfer starts. (The transfer may not start immediately; wait for a few moments and it should start.) After the transfer is completed (it typically takes about 10-15 minutes), the following messages are displayed on HyperTerminal console:

```
Returning console speed to 9600.
Please reset your terminal emulator to this speed...
```

**Step 5** Return the console speed to 9600 baud through HyperTerminal's Preferences menu option.

Because of the time lag between changing HyperTerminal speed to 9600 baud, you might see a some unrecognizable text. To avoid this, disconnect and reconnect the HyperTerminal to get the console back again.

The system resets itself from here and boots with new software image.

---

## Related Documentation

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription.

Note that for this release, in addition to the RPM-PR user documentation (RPM-PR Configuration/Command Reference Guide, Release 5.2) at this URL:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/8850px45/re152/rpm/rpmpr/index.htm>

Use the Cisco MGX Release 5.2 or MGX Release 1.3.14 and Cisco IOS documents as well as this release note.

Product documentation for the Cisco MGX 8850 switch is available at this URL:

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/8850px45/re152/index.htm>

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/mgx8850/1300/index.htm>

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- For Nonemergencies—[psirt@cisco.com](mailto:psirt@cisco.com)

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- 1 877 228-7302
- 1 408 525-6532



Tip

We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.x through 9.x.

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[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

The link on this page has the current PGP key ID in use.

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EMEA: +32 2 704 55 55

USA: 1 800 553-2447

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