



# Downloading and Installing Software Upgrades

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This appendix describes how to locate, download, and install software updates for the switch. Because software updates are stored in the switch file system, this appendix includes a section on browsing the file system. This appendix includes the following sections:

- [Upgrade Process Overview](#)
- [Quickstart Procedures for Software Upgrades](#)
- [Browsing the File System](#)
- [Locating Software Updates](#)
- [Copying Software Files to the Switch](#)
- [Upgrade Procedures for PXM45 and AXSM Cards](#)
- [Upgrade Procedures for RPM-PR Cards](#)
- [Troubleshooting Upgrade Problems](#)

## Upgrade Process Overview

This appendix provides a series of quickstart procedures that describe how to perform graceful and non-graceful upgrades to the switch. To perform a graceful upgrade on a switch card, the card must be operating in redundant mode with another switch card of the same type. When performed properly, graceful upgrades have minimal impact on connections in progress and do not interrupt any established connections.



**Note**

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Graceful upgrades to Release 2.1.60 are supported from Releases 2.0.15 and 2.1.10.

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When a card to be upgraded is not operating in redundant mode, you must do a non-graceful upgrade, which disrupts all traffic that passes through the card. For PXM45 cards, an ungraceful upgrade interrupts all traffic passing through the switch. For all other types of cards, an ungraceful upgrade affects only the traffic that passes through that card.

When you upgrade the software in a switch, you should refer to the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60* for the latest information. Each type of switch card runs boot and runtime software. The recommended sequence for upgrading the software on switch cards is as follows:

1. PXM45 boot software
2. PXM45 runtime software
3. AXSM boot software
4. AXSM runtime software
5. RPM-PR boot software
6. RPM-PR runtime software

**Note**


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If you plan to upgrade PXM45 cards and AXSM cards, upgrade the PXM45 cards first. Wait until the PXM45 cards are operating in active and standby modes with the correct software before upgrading AXSM cards. The software version used by the PXM45/B cards should be equal to or later than the version used on the AXSM, AXSM/B, and AXSM-E cards.

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Typically, the boot software requires less frequent upgrades. Some upgrades might only require updates to one type of switch card. The *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60* should explain which software components require upgrading.

When you upgrade the software on a switch card, proceed as follows:

- Decide whether you are performing a graceful or non-graceful upgrade
- Follow the appropriate quickstart procedure for that type of upgrade
- For additional information on a task within a quickstart procedure, see the appendix section to which the procedure refers

The next section presents the quickstart procedure for switch card software upgrades.

## Quickstart Procedures for Software Upgrades

The following sections provide quickstart procedures for the following upgrades:

- [Graceful PXM45 Boot Upgrades](#)
- [Non-Graceful PXM45 Boot Upgrades](#)
- [Graceful PXM45 and AXSM Runtime Software Upgrades](#)
- [Non-Graceful PXM45 and AXSM Runtime Software Upgrades](#)
- [Graceful AXSM Boot Upgrades](#)
- [Non-Graceful AXSM Boot Upgrades](#)
- [Non-Graceful RPM-PR Boot Software Upgrades](#)
- [Non-Graceful RPM-PR Runtime Software Upgrades](#)

## Graceful PXM45 Boot Upgrades

When performed properly, graceful upgrades have minimal impact on connections in progress and do not interrupt any established connections.

When a boot software upgrade is required, the procedure for upgrading redundant PXM45 cards is as follows:

1. Manually upgrade the boot software on the standby PXM45.
2. Switch cards to make the upgraded standby card active.
3. After the standby card becomes the active card, manually upgrade the non-active card.

This process ensures a smooth transition to the new software and preserves all established calls. During the short period when the roles of the active and standby cards are switched, all calls that are not established are lost.



**Note** Avoid making configuration changes while upgrading PXM45 software. Configuration changes can be lost when the PXM45 is reset during the upgrade.

To upgrade the runtime software, use the following procedure.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch. See <a href="#">“Copying Software Files to the Switch,”</a> which appears later in this appendix.
Step 2	<i>username</i> <i>password</i>	Establish a CLI session with the <i>standby</i> PXM45 card using the CP port on the UI-S3 back card and a user name with CISCO_GP privileges.
Step 3	<b>saveallcnf</b>	This optional step saves the current configuration to the hard disk. Refer to <a href="#">“Saving a Configuration”</a> in <a href="#">Chapter 7, “Switch Operating Procedures.”</a>
Step 4	<b>sh</b> <b>sysBackupBoot</b> <Return> (2.0.11 and earlier)	Change to the PXM45 Backup Boot mode. Note that the software versions 2.0.11 and earlier require you to press <b>Return</b> during the reboot sequence to enter backup boot mode. See <a href="#">“Changing to PXM45 Backup Boot Mode”</a> in <a href="#">Appendix B, “PXM45 Backup Boot Procedures.”</a>
Step 5	<b>sysPxmRemove</b>	At the backup boot prompt, enter the <b>sysPxmRemove</b> command: This step prevents the active card from resetting the standby card while you are working with it.
Step 6	<b>sysFlashBootBurn</b> “Filename” <b>reboot</b> <i>username</i> <i>password</i> <b>dspcd</b>	Burn the boot code. Remember to enter quotation marks before and after the boot software filename. For example: <pre>sysFlashBootBurn "C:FW/pxm45_002.001.000.000_bt.fw"</pre> See <a href="#">“Upgrading PXM45 Boot Software,”</a> which appears later in this appendix.

	Command	Purpose
Step 7	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card (which is the non-upgraded card) using the CP port on the UI-S3 back card and a user name with CISCO_GP privileges.
Step 8	<b>switchcc</b> <b>y</b>	Switch the roles of the active and standby cards so you can upgrade the non-upgraded card in standby mode.
Step 9	<b>sh</b> <b>sysBackupBoot</b> <Return> (2.0.11 and earlier)	Change to the PXM45 Backup Boot mode.  Note that the software versions 2.0.11 and earlier require you to press <b>Return</b> during the reboot sequence to enter backup boot mode.  See “ <a href="#">Changing to PXM45 Backup Boot Mode</a> ” in <a href="#">Appendix B, “PXM45 Backup Boot Procedures.”</a>
Step 10	<b>sysPxmRemove</b>	At the backup boot prompt, enter the <b>sysPxmRemove</b> command: This step prevents the active card from resetting the standby card while you are working with it.
Step 11	<b>sysFlashBootBurn</b> “ <i>Filename</i> ” <b>reboot</b> <i>username</i> <i>password</i> <b>dspcd</b>	Burn the boot code. Remember to enter quotation marks before and after the boot software filename. For example:  <b>sysFlashBootBurn</b> "C:FW/pxm45_002.001.000.000_bt_fw"  See “ <a href="#">Upgrading PXM45 Boot Software</a> ,” which appears later in this appendix.  Both active and standby cards should now be upgraded. The card that was active before the upgrade is now operating in standby mode.

## Non-Graceful PXM45 Boot Upgrades

Ungraceful upgrades disrupt all switch traffic and are usually used in lab installations where the use of standalone cards provides no opportunity for a graceful upgrade. The quickstart procedure is provided as an overview and as a quick reference for those who have already performed ungraceful upgrades on the switch.



**Note** Avoid making configuration changes while upgrading PXM45 software. Configuration changes can be lost when the PXM45 is reset during the upgrade.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch.  See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2	<i>username</i> <i>password</i>	Establish a CLI session with the active PXM45 card using the CP port on the UI-S3 back card and a user name with CISCO_GP privileges.

	Command	Purpose
Step 3	<b>saveallcnf</b>	This optional step saves the current configuration to the hard disk. Refer to “ <a href="#">Saving a Configuration</a> ” in Chapter 7, “ <a href="#">Switch Operating Procedures</a> .”
Step 4	<b>sh</b> <b>sysBackupBoot</b> <Return> (2.0.11 and earlier)	Change to the PXM45 Backup Boot mode.  Note that the software versions 2.0.11 and earlier require you to press <b>Return</b> during the reboot sequence to enter backup boot mode.  See “ <a href="#">Changing to PXM45 Backup Boot Mode</a> ” in Appendix B, “ <a href="#">PXM45 Backup Boot Procedures</a> .”
Step 5	<b>sysPxmRemove</b>	If the switch has two PXM45 cards installed in it, enter the <b>sysPxmRemove</b> command, which prevents the active card from resetting the standby card while you are working with it.
Step 6	<b>sysFlashBootBurn</b> “ <i>Filename</i> ” <b>reboot</b> <i>username</i> <i>password</i> <b>dspcd</b>	Burn the boot code. Remember to enter quotation marks before and after the boot software filename. For example:  <code>sysFlashBootBurn "C:FW/pxm45_002.001.000.000_bt.fw"</code>  See “ <a href="#">Upgrading PXM45 Boot Software</a> ,” which appears later in this appendix.

## Graceful PXM45 and AXSM Runtime Software Upgrades

When performed properly, graceful upgrades have minimal impact on connections in progress and do not interrupt any established connections.

This quickstart procedure applies to both PXM45 and AXSM cards and does the following:

1. Loads the new software on the standby PXM45 or AXSM card
2. Makes the standby card active
3. Loads the new software on the formerly active (now standby) card



### Note

If you plan to upgrade PXM45 cards and AXSM cards, upgrade the PXM45 cards first. Wait until the PXM45 cards are operating in active and standby modes with the correct software before upgrading AXSM cards. The software version used by the PXM45/B cards should be equal to or later than the version used on the AXSM, AXSM/B, and AXSM-E cards. When AXSM boot software is to be upgraded, it should be upgraded before upgrading the runtime software.



### Caution

Avoid making configuration changes while upgrading PXM45 software. Configuration changes can be lost when the PXM45 is reset during the upgrade. While graceful upgrades can be aborted with the **abortrev** command, the **abortrev** command does reset both active and standby cards, so reverting back to an earlier software release is non-graceful.



### Note

Cisco Systems recommends that you upgrade software on one AXSM card at a time within a switch. Wait until each AXSM card upgrade is complete before starting an upgrade on another AXSM card.

To upgrade the runtime software, use the following procedure.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch. See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2		If the <i>Release Notes for Cisco MGX 8850 Software Version 2.1.60</i> or the <i>Release Notes for Cisco MGX 8950 Software Version 2.1.60</i> call for a boot software upgrade, upgrade the boot software for the card you are upgrading.  PXM45 cards should be upgraded first. See “ <a href="#">Graceful PXM45 Boot Upgrades</a> ,” which appears earlier in this appendix.  For instructions on upgrading AXSM boot software, see “ <a href="#">Graceful AXSM Boot Upgrades</a> ,” which appears later in this appendix.
Step 3	<i>username</i> <i>password</i>	Establish a CLI session with the active PXM45 card using a user name with SERVICE_GP privileges.
Step 4	<b>saveallcnf</b>	This optional step saves the current configuration to the hard disk. Refer to “ <a href="#">Saving a Configuration</a> ” in Chapter 7, “ <a href="#">Switch Operating Procedures</a> .”
Step 5	<b>dspcd</b> <b>commitrev</b> <slot> <revision>	Verify that all previous upgrades have been committed. If a previous upgrade has not been committed, commit to the new upgrade. See “ <a href="#">Committing to a Runtime Software Upgrade</a> ,” which appears later in this appendix.
Step 6	<b>loadrev</b> <slot> <revision> <b>dspcd</b>	Load the new runtime software on the standby PXM45.
Step 7	<b>runrev</b> <slot> <revision> <b>dspcd</b> <b>dspcd</b> <slot>	Switch over to the standby PXM45 card and load the new runtime software on the new standby (non-upgraded) PXM45.
Step 8	<b>commitrev</b> <slot> <revision>	This command prevents an accidental switch back to a previous software revision if someone enters the <b>abortrev</b> command. Enter the <b>commitrev</b> command after the former active PXM45 comes up in the standby-U state. Cisco Systems recommends that you avoid configuration changes until after you have run the <b>commitrev</b> or <b>abortrev</b> commands.  See “ <a href="#">Aborting a Runtime Software Upgrade</a> ” and “ <a href="#">Committing to a Runtime Software Upgrade</a> ,” both of which appear later in this appendix.

## Non-Graceful PXM45 and AXSM Runtime Software Upgrades

Ungraceful upgrades disrupt all switch traffic and are usually used in lab installations where the use of standalone cards provides no opportunity for a graceful upgrade. The quickstart procedure is provided as an overview and as a quick reference for those who have already performed ungraceful upgrades on the switch.



**Note** If you plan to upgrade PXM45 cards and AXSM cards, upgrade the PXM45 cards first. Wait until the PXM45 cards are operating in active and standby modes with the correct software before upgrading AXSM cards. The software version used by the PXM45/B cards should be equal to or later than the version used on the AXSM, AXSM/B, and AXSM-E cards. When AXSM boot software is to be upgraded, it should be upgraded before upgrading the runtime software.



**Note** Avoid making configuration changes while upgrading PXM45 software. Configuration changes can be lost when the PXM45 is reset during the upgrade.



**Note** Cisco Systems recommends that you upgrade software on one AXSM card at a time within a switch. Wait until each AXSM card upgrade is complete before starting an upgrade on another AXSM card.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch. See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2		If the <i>Release Notes for Cisco MGX 8850 Software Version 2.1.60</i> or the <i>Release Notes for Cisco MGX 8950 Software Version 2.1.60</i> call for a boot software upgrade, upgrade the boot software as described in “ <a href="#">Non-Graceful PXM45 Boot Upgrades</a> ,” which appears earlier in this appendix or “ <a href="#">Non-Graceful AXSM Boot Upgrades</a> ,” which appears later in this appendix.
Step 3	<i>username</i> <i>password</i>	Establish a CLI session with the active PXM45 card using a user name with SERVICE_GP privileges.
Step 4	<b>saveallcnf</b>	This optional step saves the current configuration to the hard disk. Refer to “ <a href="#">Saving a Configuration</a> ” in <a href="#">Chapter 7, “Switch Operating Procedures.”</a>
Step 5	<b>dspcd</b> <b>commitrev</b> <slot> <revision>	Verify that all previous upgrades have been committed. If a previous upgrade has not been committed, commit to the new upgrade. See “ <a href="#">Committing to a Runtime Software Upgrade</a> ,” which appears later in this appendix.
Step 6	<b>loadrev</b> <slot> <revision> <b>dspcd</b>	Define the new software version to be used.

	Command	Purpose
Step 7	<b>runrev</b> <slot> <revision> <b>dspcd</b>	Reset the card and run the new software version.
Step 8	<b>commitrev</b> <slot> <revision>	This command prevents an accidental switch back to a previous software revision if someone enters the <b>abortrev</b> command. Enter the <b>commitrev</b> command after the former active PXM45 comes up in the standby-U state. Cisco Systems recommends that you avoid configuration changes until after you have run the <b>commitrev</b> or <b>abortrev</b> commands.  See “ <a href="#">Aborting a Runtime Software Upgrade</a> ” and “ <a href="#">Committing to a Runtime Software Upgrade</a> ,” both of which appear later in this appendix.

## Graceful AXSM Boot Upgrades

When performed properly, graceful upgrades have minimal impact on connections in progress and do not interrupt any established connections. The quickstart procedure is provided as an overview and as a quick reference for those who have already performed ungraceful upgrades on the switch.



### Note

If you plan to upgrade PXM45 cards and AXSM cards, upgrade the PXM45 cards first. Wait until the PXM45/B cards are operating in active and standby modes with the correct software before upgrading AXSM cards. The software version used by the PXM45/B cards should be equal to or later than the version used on the AXSM, AXSM/B, and AXSM-E cards.



### Note

Cisco Systems recommends that you upgrade software on one AXSM card at a time within a switch. Wait until each AXSM card upgrade is complete before starting an upgrade on another AXSM card.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch.  See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card using a user name with SERVICE_GP privileges or higher.
Step 3	<b>saveallcnf</b>	This optional step saves the current configuration to the hard disk.  Refer to “ <a href="#">Saving a Configuration</a> ” in <a href="#">Chapter 7, “Switch Operating Procedures.”</a>
Step 4	<b>burnboot</b> <slot> <revision> <b>dspcd</b> <slot>	Burn the boot software on the standby AXSM card by specifying the slot number of the standby card. For example:  M8850_LA.7.PXM.a > burnboot 1 2.1(60)  See “ <a href="#">Upgrading Boot Software on an AXSM Card</a> ,” which appears later in this appendix.

	Command	Purpose
Step 5	<b>switchredcd</b> <fromSlot> <toSlot>	Activate the upgraded card and place the non-upgraded card in standby mode.
Step 6	<b>burnboot</b> <slot> <revision> <b>dspcd</b> <slot>	Burn the boot software on the non-upgraded, standby AXSM card by specifying the slot number of the standby card.  See <a href="#">“Upgrading Boot Software on an AXSM Card,”</a> which appears later in this appendix.

## Non-Graceful AXSM Boot Upgrades

Ungraceful upgrades disrupt all switch traffic and are usually used in lab installations where the use of standalone cards provides no opportunity for a graceful upgrade. The quickstart procedure is provided as an overview and as a quick reference for those who have already performed ungraceful upgrades on the switch.



**Note** If you plan to upgrade PXM45 cards and AXSM cards, upgrade the PXM45 cards first. Wait until the PXM45 cards are operating in active and standby modes with the correct software before upgrading AXSM cards. The software version used by the PXM45/B cards should be equal to or later than the version used on the AXSM, AXSM/B, and AXSM-E cards.



**Note** Cisco Systems recommends that you upgrade software on one AXSM card at a time within a switch. Wait until each AXSM card upgrade is complete before starting an upgrade on another AXSM card.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch.  See <a href="#">“Copying Software Files to the Switch,”</a> which appears later in this appendix.
Step 2	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card using a user name with SERVICE_GP privileges or higher.
Step 3	<b>saveallcnf</b>	This optional step saves the current configuration to the hard disk.  Refer to <a href="#">“Saving a Configuration”</a> in <a href="#">Chapter 7, “Switch Operating Procedures.”</a>
Step 4	<b>burnboot</b> <slot> <revision> <b>dspcd</b> <slot>	Burn the boot software on the standby AXSM card by specifying the slot number of the standby card. For example:  M8850_LA.7.PXM.a > burnboot 1 2.1(60)  See <a href="#">“Upgrading Boot Software on an AXSM Card,”</a> which appears later in this appendix.


## Graceful RPM-PR Boot Software Upgrades

The RPM-PR card supports graceful boot software upgrades when 1:n redundancy is established in the switch between RPM-PR cards. Boot software is generally upgraded less often than runtime software, so be sure to compare the recommended boot software version with the boot software running on your RPMs before starting an upgrade. The correct boot software might already be installed.

The following quickstart procedure describes how to upgrade redundant RPM-PR cards.



**Note** Redundancy must be established before you use this procedure. If redundancy has not been configured between two RPM-PR cards, upgrade each RPM-PR card using the procedure in “[Non-Graceful RPM-PR Boot Software Upgrades](#),” which appears later in this chapter. To add redundancy to an RPM-PR card, refer to “[Establishing Redundancy Between Two RPM-PR Cards](#)” in [Chapter 4, “Preparing RPM-PR Cards for Operation.”](#)”

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch (E:RPM).  See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card using a user name at any access level.
Step 3	<b>cc</b> <i>&lt;primarySlot&gt;</i>	Select the slot in which the primary RPM-PR card is installed.
Step 4	<b>enable</b> <i>password</i>	Enter Enable mode for the router.
Step 5	<b>dir e:</b>	Verify router access to the PXM45 hard disk and the boot upgrade software.
Step 6	<b>show flash:</b>	Display current contents of bootflash.
Step 7S	<b>copy filename bootflash:</b> <b>dir bootflash:</b>	Copy the upgrade boot software to flash. For example:  <code>copy e:rpm-boot-mz_002.001.060.000 bootflash:</code>
Step 8	<b>del bootflash:</b>	Delete older boot files from the bootflash. The switch always attempts to load the first bootable file in bootflash. If the upgraded file has a higher file number than another bootable file, it will not be used when the card is reset.  <b>Note</b> This step marks files to be deleted, but it does not delete them.
Step 9	<b>show flash:</b>	 <b>Caution</b> Verify that at least one valid boot or runtime image will not be deleted. If all boot and runtime images are deleted from bootflash, the RPM card must be returned to the factory for repair.
Step 10	<b>squeeze flash:</b>	This step deletes all files that have been marked for deletion.

	Command	Purpose
Step 11	<b>softswitch</b> <primarySlot> <secondarySlot>	This step makes the secondary card active and resets the primary RPM-PR card. When the primary card resets, it loads the upgraded boot software from bootflash.
Step 12	<b>cc</b> <secondarySlot>	Select the slot in which the secondary RPM-PR card is installed.
Step 13	<b>enable</b> <i>password</i> <b>dir e:</b> <b>show flash:</b> <b>copy filename bootflash:</b> <b>dir bootflash:</b> <b>show flash:</b> <b>squeeze flash:</b>	Repeat Steps 4 through 10 to move the upgraded boot software into bootflash.
Step 14	<b>softswitch</b> <secondarySlot> <primarySlot>	This step makes the upgraded primary card active and resets the secondary RPM-PR card. When the secondary card resets, it loads the upgraded boot software from bootflash. Both primary and secondary cards should now be using upgraded boot software.
Step 15		If there are other primary RPM-PR cards that need upgrading, repeat the part of this procedure that upgrades the primary card, then execute the <b>softswitch</b> command once to reload the primary card. Finally, execute the <b>softswitch</b> command a second time to make the upgraded primary card active.

## Graceful RPM-PR Runtime Software Upgrades

The RPM-PR card supports graceful upgrades when 1:n redundancy is established in the switch between RPM-PR cards.

The following quickstart procedure describes how to gracefully upgrade redundant RPM-PR cards.



### Note

Redundancy must be established before you use this procedure. If redundancy has not been configured between two RPM-PR cards, upgrade each RPM-PR card as described in “[Non-Graceful RPM-PR Runtime Software Upgrades](#),” which appears later in this chapter. To add redundancy to an RPM-PR card, refer to “[Establishing Redundancy Between Two RPM-PR Cards](#)” in [Chapter 4](#), “[Preparing RPM-PR Cards for Operation](#).”

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch (E:RPM). See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2	<b>copy</b>	Optional: Copy and rename the runtime file to a generic name for easy updates. See “ <a href="#">Non-Graceful RPM-PR Runtime Software Upgrades</a> ,” which appears later in this chapter. <b>Note</b> If you have already configured the RPM to use a generic name, you can skip to Step 12.
Step 3	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card using a user name at any access level.
Step 4	<b>cc</b> <primarySlot>	Select the slot in which the primary RPM-PR card is installed.
Step 5	<b>enable</b> <i>password</i>	Enter Enable mode for the router.
Step 6	<b>show bootvar</b>	Display the current runtime software filename.
Step 7	<b>config terminal</b>	Enter the router global configuration mode.
Step 8	<b>no boot system</b>	Remove the entire boot list. To remove a single file from the boot list, include a filename. For example: <pre>Router(config)# no boot system c:rpm-js-mz_122-4.T</pre>
Step 9	<b>boot system c:filename</b>	Add the new router runtime image to the boot list. For example: <pre>Router(config)# boot system c:rpm-js-mz_122-4.T</pre>
Step 10	<b>boot config</b> <b>e:auto_config_RPM-PR_slot#</b>	Configure the RPM-PR card to store its configuration on the PXM45 hard disk. <b>Note</b> This step only needs to be performed once. If this command is already in the startup configuration file, you do not need to enter it again.
Step 11	<b>^Z</b>	Exit global configuration mode.
Step 12	<b>copy run start</b>	Save the new configuration. <b>Note</b> If you omit this step, the RPM-PR card will continue to use the previous version of software.
Step 13	<b>show bootvar</b>	Verify the change in the runtime software filename.
Step 14	<b>softswitch</b> <primarySlot> <secondarySlot>	This step makes the secondary card active and resets the primary RPM-PR card. When the primary card resets, it loads the upgraded boot software from bootflash.

	Command	Purpose
Step 15	<b>softswitch</b> <secondarySlot> <primarySlot>	This step makes the upgraded primary card active and resets the secondary RPM-PR card. When the secondary card resets, it loads the upgraded boot software from bootflash. Both primary and secondary cards should now be using upgraded runtime software.
Step 16		If there are other primary RPM-PR cards that need upgrading, repeat the part of this procedure that upgrades the primary card, then execute the <b>softswitch</b> command once to reload the primary card. Finally, execute the <b>softswitch</b> command a second time to make the upgraded primary card active.

## Non-Graceful RPM-PR Boot Software Upgrades


Use the non-graceful upgrade procedure in this section when you need to upgrade RPM-PR boot software and the RPM-PR is operating in standalone mode. Non-graceful upgrades terminate all connections and disrupt service until the upgrade procedure is complete.



**Note** If the RPM-PR is operating in 1:N redundancy mode with another RPM-PR, upgrade the cards as described in “[Graceful RPM-PR Boot Software Upgrades](#),” which appears earlier in this chapter.

The following quickstart procedure is provided as an overview and as a quick reference for those who have already performed RPM-PR upgrades on the switch. For detailed instructions, see “[Upgrade Procedures for RPM-PR Cards](#),” which appears later in this appendix.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch (E:RPM).  See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card using a user name at any access level.
Step 3	<b>cc</b> <RPM-PR_Slot>	Select the slot in which the RPM-PR card is installed.
Step 4	<b>enable</b> <i>password</i>	Enter Enable mode for the router.
Step 5	<b>dir e:</b>	Verify router access to the PXM45 hard disk and the boot upgrade software.
Step 6	<b>show flash:</b>	Display current contents of bootflash.
Step 7	<b>copy filename bootflash:</b> <b>dir bootflash:</b>	Copy the upgrade boot software to flash. For example: <code>copy e:rpm-boot-mz_002.001.000.000 bootflash:</code>
Step 8	<b>del bootflash:</b>	Optional. Delete older boot files from the bootflash. This step marks files to be deleted, but it does not delete them.

	Command	Purpose
Step 9	<b>show flash:</b>	 <b>Caution</b> Verify that at least one valid boot or runtime image will not be deleted. If all boot and runtime images are deleted from bootflash, the RPM card must be returned to the factory for repair.
Step 10	<b>squeeze flash:</b>	This step deletes all files that have been marked for deletion.
Step 11	<b>cc &lt;active_PXM45_slot&gt;</b> <b>resetcd &lt;RPM-PR_Slot&gt;</b>	This command sequence restarts the RPM card with the new boot image.

## Non-Graceful RPM-PR Runtime Software Upgrades

Use the non-graceful upgrade procedure in this section when you need to upgrade RPM-PR runtime software and the RPM-PR is operating in standalone mode. Non-graceful upgrades terminate all connections and disrupt service until the upgrade procedure is complete.



### Note

If the RPM-PR is operating in 1:N redundancy mode with another RPM-PR, upgrade the cards as described in “[Graceful RPM-PR Runtime Software Upgrades](#),” which appears earlier in this chapter.

The following quickstart procedure is provided as an overview and as a quick reference for those who have already performed RPM-PR upgrades on the switch. For detailed instructions, see “[Upgrade Procedures for RPM-PR Cards](#),” which appears later in this appendix.

	Command	Purpose
Step 1	<b>ftp</b>	Copy the boot and runtime files you want to use to the switch (E:RPM).  See “ <a href="#">Copying Software Files to the Switch</a> ,” which appears later in this appendix.
Step 2	<b>copy</b>	Copy and rename the runtime file to a generic name for easy updates.  See “ <a href="#">Non-Graceful RPM-PR Runtime Software Upgrades</a> ,” which appears later in this chapter.  <b>Note</b> If you have already configured the RPM to use a generic name, you can skip to Step 12.
Step 3	<i>username</i> <i>password</i>	Establish a CLI session with the <i>active</i> PXM45 card using a user name at any access level.
Step 4	<b>cc &lt;RPM-PR_Slot&gt;</b>	Select the slot in which the RPM-PR card is installed.
Step 5	<b>enable</b> <i>password</i>	Enter Enable mode for the router.
Step 6	<b>show bootvar</b>	Display the current runtime software filename.
Step 7	<b>config terminal</b>	Enter the router global configuration mode.

	Command	Purpose
Step 8	<b>no boot system</b>	Remove the entire boot list. To remove a single file from the boot list, include a filename. For example:  Router(config)# no boot system c:rpm-js-mz_122-4.T
Step 9	<b>boot system e:filename</b>	Add the new router runtime image to the boot list. For example:  Router(config)# boot system e:rpm-js-mz.122-4.T
Step 10	<b>boot config</b> <b>e:auto_config_RPM-PR_slot#</b>	Configure the RPM-PR card to store its configuration on the PXM45 hard disk.  <b>Note</b> This step only needs to be performed once. If this command is already in the startup configuration file, you do not need to enter it again.
Step 11	<b>^Z</b> <b>copy run start</b>	Exit global configuration mode and save the new configuration.
Step 12	<b>show bootvar</b>	Verify the change in the runtime software filename.
Step 13	<b>cc &lt;active_PXM45_slot&gt;</b> <b>resetcd &lt;RPM-PR_Slot&gt;</b>	This command sequence selects the active PXM card and restarts the RPM card with the new runtime image.
Step 14	<b>dspcds</b> <b>dspcd &lt;RPM-PR_Slot&gt;</b> <b>cc &lt;RPM-PR_Slot&gt;</b>	Verify router reboot is complete.

## Browsing the File System

The PXM45 hard disk stores log files, configuration files, and boot and runtime software. The switch operating system supports a set of UNIX-like commands that you can use to locate log files or manage software updates. [Table A-1](#) lists commands that you can use to browse the file system.



### Note

File and directory names in the switch file system are case sensitive. Also, some of the commands listed in [Table A-1](#) are not available at all administrator access levels.

**Table A-1 File System Commands at Switch Prompt**

Command	Description
<b>cd</b>	Change directories. Access level required: ANYUSER or above.
<b>copy</b>	Copies a file from one location to another. Syntax: <b>copy</b> <source file name> <destination file name> Access level required: GROUP1 or above.
<b>del</b>	Deletes a file. Syntax: <b>del</b> <file name> Access level required: GROUP1 or above.

Table A-1 File System Commands at Switch Prompt (continued)

Command	Description
<b>ll</b>	List directory contents using long format, which includes the name, size, modification date, and modification time for each file. This command also displays the total disk space and free disk space.  Syntax: <b>ll</b> Access level required: ANYUSER or above.
<b>ls</b>	List directory contents using the short format, which displays filenames, total disk space, and free disk space.  Syntax: <b>ls</b> Access level required: ANYUSER or above.
<b>pwd</b>	Display the present working directory.  Syntax: <b>pwd</b> Access level required: ANYUSER or above.
<b>rename</b>	Renames a file.  Syntax: <b>rename</b> <old file name> <new file name> Access level required: GROUP1 or above.
<b>whoami</b>	Lists the login name for the current session.  Syntax: <b>whoami</b> Access level required: ANYUSER or above.

## Locating Software Updates

For information on locating software updates, refer to the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60*.

## Copying Software Files to the Switch

This section describes how to copy software files to an MGX 8850 or MGX 8950 switch. The switch cards use boot software and runtime software. Each PXM45 and AXSM card uses the boot software to define communications between the card components and to enable cards to start up. The runtime software defines how the card operates after startup. RPM-PR cards function on the runtime software and use the boot software only when they cannot load the runtime software.



### Note

The boot and runtime software are installed on the switch at the factory. Before you copy new files to the switch, verify that you need to update them by comparing the file versions on the disk to those recommended in the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60*.

MGX 8850 and MGX 8950 switches provide a File Transfer Protocol (FTP) service to support file transfers to the switch. If you have FTP client software and network connectivity to both the switch and the server where the software files are stored, you can use FTP to transfer files directly from the server to the switch.

**Note**

The following procedure describes how to copy files to the switch when the runtime software is up and running (showing the node name switch prompt). When the runtime software cannot load, copy the software files to the switch as described in “[Transferring Software Files to and from the Switch](#)” in [Appendix B, “PXM45 Backup Boot Procedures.”](#)

**Step 1** Refer to the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60* to locate a server from which you can download the files.

**Step 2** Using a workstation with FTP client software, transfer PXM45 and AXSM files from the server to the switch directory C:/FW.

The procedure you use for transferring the files depends on the FTP client software you are using. When initiating the FTP connection, remember the following:

- Select the switch by entering its IP address.
- When prompted for a username and password, enter the username and password you use when managing the switch.
- When configuring file transfer options, select binary mode for the file transfer.

**Step 3** To verify that the new PXM45 and AXSM files have been transferred to the switch, log into the switch and display the contents of the C:/FW directory.

**Step 4** Using a workstation with FTP client software, transfer RPM-PR files from the server to the switch directory E:/RPM.

**Note**

You must use a capital E when referencing the E drive in switch commands.

**Step 5** To verify that the new RPM-PR files have been transferred to the switch, log into the switch and display the contents of the E:/RPM directory.

For more information on browsing the switch file system, see “[Browsing the File System,](#)” which appears earlier in this appendix.

## Upgrade Procedures for PXM45 and AXSM Cards

The following sections describe procedures that support upgrades to PXM45 and AXSM cards. For complete upgrade procedures, see “[Quickstart Procedures for Software Upgrades,](#)” which appears earlier in this appendix. The procedures in this section detail some of the tasks listed in the quickstart procedures.

## Upgrading PXM45 Boot Software

This section describes how to upgrade the PXM45 boot software on a single PXM45 card. If you are performing a graceful upgrade, use the quickstart procedure described in [“Graceful PXM45 Boot Upgrades,”](#) which appears earlier in this appendix. The following procedure provides detailed information on the upgrade task within the quickstart procedure.

- 
- Step 1** If you have not done so already, establish a CLI session with the PXM45 card using the CP port on the UI-S3 back card and a user name with CISCO\_GP privileges.
- Step 2** If you have not done so already, change to PXM45 Backup Boot mode as described in [“Changing to PXM45 Backup Boot Mode”](#) in [Appendix B, “PXM45 Backup Boot Procedures.”](#)
- Step 3** To burn the boot software on the PXM45, enter the **sysFlashBootBurn** command as follows:
- ```
pxm45bkup> sysFlashBootBurn "filename"
```
- Replace *filename* with the complete path to the boot file on the PXM45 hard drive. For example:
- ```
pxm45bkup> sysFlashBootBurn "C:FW/pxm45_002.001.000.000_bt.fw"
```
- Step 4** When the switch prompts you to confirm this action, type **y** and press **Return**.
- When the boot code burning process is complete, the switch displays a message similar to the following:
- ```
Flash download completed ...
value = 0 = 0x0
```
- Step 5** When the boot code has been burned, reset the card with the **reboot** command. For example:
- ```
pxm45bkup> reboot
```
- Be patient and wait for Login prompt to appear.
- Step 6** When the Login prompt appears, log in to the switch as you do at the beginning of a CLI session. The switch prompt should appear.
- Step 7** To confirm that the PXM45 card is now using the correct boot code, enter the **dspcd** command.

The Boot FW Rev row in the display should show the new revision as shown in the following example:

```

8850_NY.7.PXM.a > dspcd
8850_NY                      System Rev: 02.01      Mar. 04, 2001 22:47:23 PST
MGX8850                      Node Alarm: NONE
Slot Number      7      Redundant Slot:  8

                          Front Card      Upper Card      Lower Card
                          -----
Inserted Card:      PXM45              UI Stratum3     PXM HardDiskDrive
Reserved Card:      PXM45              UI Stratum3     PXM HardDiskDrive
State:              Active             Active          Active
Serial Number:      SBK050302AF          SBK045203PJ     SBK044602HJ
Prim SW Rev:        2.0(13)            ---             ---
Sec SW Rev:         2.0(13)            ---             ---
Cur SW Rev:        2.0(13)            ---             ---
Boot FW Rev:        2.1(0)             ---             ---
800-level Rev:      A0                  A0              A0
800-level Part#:    800-06147-08          800-05787-02    800-05052-04
CLEI Code:          BAA670YCAA          BA7IBCLAAA      BA7IADNAAA
Reset Reason:       On Power up
Card Alarm:         NONE
Failed Reason:      None
Miscellaneous Information:

```

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

After you confirm the upgrade to the first PXM45 card, the boot software upgrade for that card is complete.

## Loading the Runtime Upgrade Software

This section describes how to load the runtime upgrade software in preparation for running it. Production switches should have redundant cards installed, so that upgrades can occur without interrupting traffic. For graceful upgrades, the upgrade software is loaded on the standby card first, and then the control is switched to upgraded card so that the other card can be upgraded. The best way to assess the upgrade status of a card is to enter the **dspcd** <slot> command. For example:

```
8850_NY.7.PXM.a > dspcd
8850_NY                      System Rev: 02.01   Mar. 04, 2001 22:47:23 PST
MGX8850                      Node Alarm: NONE
Slot Number      7      Redundant Slot:  8

                          Front Card      Upper Card      Lower Card
                          -----
Inserted Card:      PXM45              UI Stratum3     PXM HardDiskDrive
Reserved Card:      PXM45              UI Stratum3     PXM HardDiskDrive
State:              Active              Active          Active
Serial Number:      SBK050302AF      SBK045203PJ    SBK044602HJ
Prim SW Rev:        2.0(13)          ---            ---
Sec SW Rev:         2.0(13)          ---            ---
Cur SW Rev:        2.0(13)          ---            ---
Boot FW Rev:        2.1(0)          ---            ---
800-level Rev:     A0              A0             A0
800-level Part#:   800-06147-08      800-05787-02  800-05052-04
CLEI Code:         BAA670YCAA      BA7IBCLAAA     BA7IADNAAA
Reset Reason:      On Power up
Card Alarm:        NONE
Failed Reason:     None
Miscellaneous Information:
```

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

The primary (Prim SW Rev), secondary (Sec SW Rev), and current (Cur SW Rev) software revision labels indicate the status of an upgrade. In this example, these numbers match because the runtime software upgrade has not started. (Note that the boot software has been upgraded as indicated by the Boot FW Rev label.)

The primary software revision indicates which revision a card will run if it becomes active, and the secondary revision indicates an alternate revision that the card will use if the `abortrev` command is entered. (For more information on aborting an upgrade, see [“Aborting a Runtime Software Upgrade,”](#) which appears later in this appendix.) The current software revision represents the software the active card is using.

The normal sequence of commands for a runtime software upgrade is **loadrev**, **runrev**, and **commitrev**. [Table A-2](#) shows how the software revision levels change during a graceful runtime software upgrade. [Software Versions Reported During Graceful Upgrades](#)

**Table A-2** Software Versions Reported During Graceful Upgrades

Software Revision	Before Upgrade		After loadrev		After runrev		After commitrev	
	Slot 7	Slot 8	Slot 7	Slot 8	Slot 7	Slot 8	Slot 7	Slot 8
	Active	Standby	Active	Standby	Standby	Active	Active	Standby
Primary	2.0(13)	2.0(13)	2.0(13)	2.0(13)	2.1(0)	2.1(0)	2.1(0)	2.1(0)
Secondary	2.0(13)	2.0(13)	2.1(0)	2.1(0)	2.0(13)	2.0(13)	2.1(0)	2.1(0)
Current	2.0(13)	2.0(13)	2.0(13)	2.1(0)	2.1(0)	2.1(0)	2.1(0)	2.1(0)

For non-graceful upgrades, the load process defines the software version to which the switch is about to be upgraded. [Table A-3](#) shows how the revision levels change during a non-graceful upgrade.

**Table A-3 Software Versions Reported During Non-Graceful Upgrades**

Software Revision	Before Upgrade	After loadrev	After runrev	After commitrev
Primary	2.0(13)	2.0(13)	2.1(0)	2.1(0)
Secondary	2.0(13)	2.1(0)	2.0(13)	2.1(0)
Current	2.0(13)	2.0(13)	2.1(0)	2.1(0)

If you are performing a graceful upgrade, use the quickstart procedure described in “[Graceful PXM45 and AXSM Runtime Software Upgrades](#),” which appears earlier in this appendix. The following procedure provides detailed information on the load task within the quickstart procedure.

**Step 1** To load the upgrade runtime software version on a PXM45 or AXSM card, enter the following command:

```
mgx8850a.7.PXM.a > loadrev <slot> <revision>
```

Replace *<slot>* with the card slot number for the card to be upgraded, and replace *<revision>* with the software version number for the update. For graceful upgrades, you can specify either the active or the standby card. The switch software will automatically load the upgrade software on the standby card when it is installed. The following example shows how to enter this command:

```
mgx8850a.7.PXM.a > loadrev 7 2.1(0)
```

After you enter the loadrev command, the standby card comes up in the standby-U state.

You can find the software version number in the *Release Notes for Cisco MGX 8850 Software Version 2.1.60* or the *Release Notes for Cisco MGX 8950 Software Version 2.1.60*. You can also determine the version number from the runtime software filename as described in “[Determining the Software Version Number from Filenames](#),” which appears in [Chapter 7, “Switch Operating Procedures.”](#)

**Step 2** When prompted to confirm the command, type **y** and press **Return** to continue.

**Step 3** To verify that the load command was processed correctly, enter the **dspecd <slot>** command and check the status of the software revision levels. You can also view the revision levels with the **dsprevs** command.



**Note** In a standalone configuration, the switch does not start the upgraded software until the **runrev** command is entered. In a redundant configuration, the switch starts the upgraded software on the standby card. The standby card does not become active until the **runrev** command is entered.

## Starting the Upgrade Software

After you load the runtime upgrade software for a PXM45 or AXSM card, enter the **runrev** command to start using the software. The version levels for graceful and non-graceful upgrades change as shown earlier in [Table A-2](#) and [Table A-3](#). The following procedure describes how to start the upgrade software.

- 
- Step 1** To start using the new runtime software version on a PXM45 or AXSM card, enter the following command:

```
mgx8850a.7.PXM.a > runrev <slot> <revision>
```

Replace *<slot>* with the card slot number, and replace *<revision>* with the software version number specified with the **loadrev** command. For graceful upgrades, you can specify either the active or the standby card. The switch software will automatically run the upgrade software on the standby card when it is installed. The following example shows how to enter this command:

```
mgx8850a.7.PXM.a > runrev 7 2.1(0)
```

The active card is reset, and the former standby card comes up in the active-U state.

- Step 2** When prompted to confirm the command, type **y** and press **Return** to continue.
- Step 3** To verify that the load command was processed correctly, enter the **dspcd <slot>** command and check the status of the software revision levels. You can also view the revision levels with the **dsprevs** command.
- Step 4** When the former active PXM45 come sup in the standby-U state, enter the **commitrev** command to commit to that software version. This step is optional.

After the **runrev** command is entered, the switch starts running the new software revision. The secondary software revision shows that a previous revision is still available. Whenever the secondary software revision is different from the primary and current software revisions, you can revert back to the secondary software revision as described in “[Aborting a Runtime Software Upgrade](#),” which appears later in this appendix.

---

## Upgrading Boot Software on an AXSM Card

The upgrade procedure for the boot software on a single AXSM card is the same for graceful and non-graceful upgrades. The difference between the graceful and non-graceful upgrades is the sequence of commands before and after the upgrade on a single card. For information on the proper sequence see “[Graceful AXSM Boot Upgrades](#)” or “[Non-Graceful AXSM Boot Upgrades](#),” both of which appear earlier in this appendix.

To upgrade the boot software, use the following procedure.

- 
- Step 1** Copy the new boot software files for the AXSM card to the switch as described in “[Copying Software Files to the Switch](#),” which appears earlier in this appendix.
- Step 2** Establish a CLI session with the switch using a user name with SERVICE\_GP privileges or higher.
- Step 3** To burn the new AXSM boot code, enter the burnboot command as follows:

```
pop20one.7.PXM.a > burnboot <slot> <revision>
```

Replace *<slot>* with the slot number of a standalone AXSM card or an AXSM card operating in standby mode. Replace *<revision>* with the software revision number to which you are upgrading. For example:

```
pop20one.7.PXM.a > burnboot 1 2.1(0)
```

- Step 4** When prompted to confirm the upgrade, type **y** and press **Return**.

After you confirm the upgrade, the new boot code is burned into the AXSM card and the card is reset. Be patient, the card reset takes some time. You can use the **dspcds** command to display the status of the AXSM card. At first, the status may show that the card slot is empty or the card is rebooting. Reenter the command periodically to see the current status of the card. When the card status returns to active or standby, you are ready to continue.

- Step 5** To confirm that the AXSM card is now using the correct boot code, enter the **dspcd <slot>** command. The Boot FW Rev row in the display should show the new revision as shown in the following example:

```
8850_NY.7.PXM.a > dspcd 1
8850_NY                      System Rev: 02.01   Mar. 04, 2001 22:58:22 PST
MGX8850                      Node Alarm: NONE
Slot Number: 1      Redundant Slot: NONE

                Front Card          Upper Card          Lower Card
                -----
Inserted Card:  AXSM_40C12          SMFIR_2_OC12       SMFIR_2_OC12
Reserved Card:  AXSM_40C12          SMFIR_2_OC12       UnReserved
State:          Active              Active              Active
Serial Number:  SAK0344001V         SBK0406002K        SAK032800Q6
Prim SW Rev:    2.0(13)              ---
Sec SW Rev:    2.0(13)              ---
Cur SW Rev:   2.0(13)              ---
Boot FW Rev:   2.1(0)               ---
800-level Rev:
800-level Part#: 800-05774-05        800-05383-01       800-05383-01
CLEI Code:      1234567890          BAI9ADTAAA         0
Reset Reason:   On Power up
Card Alarm:     NONE
Failed Reason:  None
Miscellaneous Information:
```

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

After you confirm the upgrade to the AXSM card, the boot software upgrade for that card is complete.

## Aborting a Runtime Software Upgrade

After upgrading PXM45 or AXSM runtime software, you can revert to the previously used version of software at any time, as long as you have not committed to the new software version with the **commitrev** command (which is described in the next section).



### Caution

Reverting to the previously used version of runtime software resets both PXM45 cards and terminates all calls in progress.

To revert to the previously used runtime software version, use the following procedure.

- Step 1** Establish a configuration session using a user name with SERVICE\_GP privileges or higher.
- Step 2** To display the software revisions known to the switch, enter the **dspcd <slot>** command. (You can also view the revision levels with the **dsprevs** command.)

Replace *slot* with the slot number of the active PXM45 or AXSM card. To complete the next step, you need to know the secondary software revision shown in the display.




---

**Note** If the primary and secondary software revisions are the same, there is no other revision level to revert back to.

---

**Step 3** To abort use of the primary software revision and revert back to the secondary software revision, enter the following command:

```
mgx8850a.7.PXM.a > abortrev <slot> <revision>
```

Replace *<slot>* with the card slot number for the active PXM45 or AXSM card, and replace *<revision>* with the software version number for the secondary software revision.

**Step 4** To verify that the standby card is running the previously used software version, enter the **dspcd** *<slot>* command to view the software version in use. You can also view the revision levels with the **dsprevs** command.

---

## Committing to a Runtime Software Upgrade

Committing to an upgrade does the following:

- Disables use of the **abortrev** command to revert back to the previously used version of software
- Enables upgrading of the current version of software

Once you are sure that an upgrade is stable, you can use the **commitrev** command commit to that software version. This prevents other administrators from inadvertently reverting to the previous version. You must also commit to the current software version before you can upgrade to another software version.

To commit to the currently running runtime software version, use the following procedure.

---

**Step 1** Establish a configuration session using a user name with SERVICE\_GP privileges or higher.

**Step 2** Determine if there is an unfinished upgrade by doing the following:

- If necessary, use the **cc** command to select the active PXM45 card.
- Enter the **dspcd** *<slot>* command.
- Check the **dspcd** command report to see if the same software revision is listed for the Primary Software Revision (Prim SW Rev), Secondary Software Revision (Sec SW Rev), and Current Software Revision (Curr SW Rev).

If all version numbers are identical, the runtime software can be upgraded. There is no need to commit to the current software revision.

**Step 3** To commit to the software version, enter the following command:

```
mgx8850a.7.PXM.a > commitrev <slot> <revision>
```

Replace *<slot>* with the card slot number for the active PXM45 or AXSM card, and replace *<revision>* with the software version number for the currently used software version. To display the software version number, use the **dspcd** *<slot>* command to view the software version in use. You can also view the revision levels with the **dsprevs** command.

**Note**

Cisco Systems recommends that you avoid configuration changes until after you have run the **commitrev** or **abortrev** commands.

## Upgrade Procedures for RPM-PR Cards

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

### Upgrading RPM 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 runtime software is updated more frequently than the boot software. However, the boot software is updated occasionally. When you are updating runtime software, check the Release Notes that accompany the runtime software to see if a boot software upgrade is required.

The boot software is stored in bootflash memory on the RPM 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_002.001.000.000
```

**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.

In the example above, the numbers in the left column indicate the order in which the RPM will try 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 keep in mind the following:

- When the RPM card is reset, it tries to load the first bootable image in bootflash.
- The RPM card will not attempt to boot from automatic configuration files, which are named using the format `auto_config_slotnn`, where `nn` represents a slot in which an RPM card is installed.
- If the image that RPM tries to load does not load, you can reset the RPM from the active PXM45 card using the **resetcd <slot>** command.
- Files are not removed from bootflash until the **squeeze flash:** command is entered. If you delete a file and do not enter **squeeze flash:**, the RPM card will still attempt to boot from the first image it finds, whether it is marked for deletion or not.

**Caution**

If all bootable images are deleted from bootflash, the card must be returned to the factory to be reprogrammed.

If you do need to upgrade the boot software, you can copy the new boot file to the PXM45 disk, and then copy it to the bootflash. The following procedure describes how to do this.

**Step 1** Copy the new boot software file for the RPM-PR card to the switch (E:RPM) as described in “[Copying Software Files to the Switch](#),” which appears earlier in this appendix.

**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.

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

```
(session redirected)
```

```
Router>
```

The switch displays the 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.

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

**Step 5** To verify router access to the PXM45 hard disk and display the boot file name, enter **dir e:** command.

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

65539  -rw-          815   Sep 13 2001 23:51:10  auto_config_slot09
65540  -rw-       2588780  May 22 2001 19:06:54  rpm-boot-mz_002.001.000.000
84611  -rw-       2452768  Apr 05 2001 05:34:44  rpm-boot-mz.122-4.T
66805  -rw-       8529104  May 22 2001 19:09:00  rpm-js-mz_002.001.000.000
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 **show flash:** 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_122-4.T

30315128 bytes available (2452872 bytes used)
```



**Tips**

If the bootflash contains bootable images and the sequence is such that the card will not start, you can enter rommon mode and load the bootable image. To get into rommon mode, establish a console connection to the RPM card, reset the RPM card using the **resetcd <slot>** command from the active PXM45 card, then quickly enter the **CTRL-[, Break** sequence at the RPM 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 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.**

## Upgrading RPM Runtime Software

The runtime software on the RPM can be loaded from the following sources:

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

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

At startup, the RPM 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 *****
!
```

In the startup-config file example, the RPM card attempts to load the runtime 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.

To configure the RPM to load upgraded runtime software from the PXM45 hard disk, you need to 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 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 sections that follow.

**Tips**

To simplify runtime software updates, copy the runtime file in the E:RPM directory and rename it to a generic name such as rpm-js-mz. The production runtime 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 IOS on each card to recognize the new filename.

## Upgrading RPM-PR Runtime Software for 1:N Redundancy

Redundancy must be established before you use the procedure in this section. If redundancy has not been established, upgrade each RPM-PR card using the procedure in the next section, “Upgrading Without Redundancy”.

To upgrade the RPM-PR runtime software for 1:N redundancy, use the following procedure.

- 
- Step 1** Copy the new runtime software file for the RPM-PR card to the switch (E:RPM) as described in “[Copying Software Files to the Switch](#),” which appears earlier in this appendix.
- Step 2** If you are using a generic filename for your runtime images, copy the file on the PXM45 hard disk and rename the copy. For example:

```
8850_LA.8.PXM.a > copy rpm-js-mz_122-4.T rpm-js-mz
```

- Step 3** Establish a configuration session using any valid user name.
- Step 4** If your RPM is already configured to use a file with a generic name, skip to Step 13.
- Step 5** Use the **cc** command to select the RPM-PR card to update.

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

```
(session redirected)
```

```
Router>
```

The switch displays the 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 6** Enter Enable mode for the router.
- Step 7** Display the startup runtime software filename by entering the **show bootvar** command.

```
Router>enable
Password:
Router#
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 runtime 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 8** Enter the router global configuration mode.

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

**Step 9** 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 10** Create a new boot list by entering one or more **boot system** commands as follows:

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

Replace the filename variable with the name of the new runtime file that was previously transferred to the E:RPM directory on the switch. For example:

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

If you want to enter additional boot system commands, enter them in the order in which you want the RPM card to use them. The following example adds a statement to load from bootflash if the runtime file is not found on the PXM45 hard disk:

```
Router(config)# boot system bootflash:rpm-js-mz_122-4.T
```




---

**Note** Before the RPM card can load runtime software from bootflash, you must copy the runtime software to the bootflash. The procedure for copying files from the PXM45 hard disk to bootflash is described in the previous section.

---

**Step 11** Exit global configuration mode and save the new configuration.

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

**Step 12** To verify the change, enter the **show bootvar** or **show run** commands.

**Step 13** Switch to the active PXM45 card and reset the RPM card. For example:

```
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
```

**Step 14** Switch to the secondary card using the **softswitch** command as follows:

```
8850_LA.8.PXM.a > softswitch <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 15** Switch back to the primary card using the **softswitch** command as follows:

```
8850_LA.8.PXM.a > softswitch <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 16** 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 17** If there are other primary cards with redundant (secondary) cards, repeat this procedure for each primary card.

## Upgrading RPM Runtime Software for Non-Redundant Cards

To upgrade the RPM-PR runtime software for non- redundant cards, use the following procedure.

- Step 1** Copy the new runtime software file for the RPM-PR card to the switch (E:RPM) as described in “[Copying Software Files to the Switch](#),” which appears earlier in this appendix.
- Step 2** If you are using a generic filename for your runtime images, copy the file on the PXM45 hard disk and rename the copy. For example:

```
8850_LA.8.PXM.a > copy rpm-js-mz_122-4.T rpm-js-mz
```

- Step 3** Establish a configuration session using any valid user name.
- Step 4** If your RPM is already configured to use a file with a generic name, skip to Step 13.
- Step 5** Use the **cc** command to select the RPM-PR card to update.

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

```
(session redirected)
```

```
Router>
```

The switch displays the 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 6** Configure the RPM card to store its configuration on the PXM45 hard disk by entering the following command:

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

- Step 7** Enter Enable mode for the router.

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

- Step 8** Display the startup runtime software filename by entering the **show bootvar** 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 runtime 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 9** Enter the router global configuration mode.

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

- Step 10** 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 11** Create a new boot list by entering one or more **boot system** commands as follows:

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

Replace the filename variable with the name of the new runtime file that was previously transferred to the E:RPM directory on the switch. For example:

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

If you want to enter additional boot system commands, enter them in the order in which you want the RPM card to use them. The following example adds a statement to load from bootflash if the runtime file is not found on the PXM45 hard disk:

```
Router(config)# boot system bootflash:rpm-js-mz_122-4.T
```




---

**Note** Before the RPM card can load runtime software from bootflash, you must copy the runtime software to the bootflash. The procedure for copying files from the PXM45 hard disk to bootflash is described in the previous section.

---

- Step 12** Exit global configuration mode and save the new configuration.

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

- Step 13** To verify the change, enter the **show bootvar** or **show run** commands.

**Step 14** Switch to the active PXM45 card and reset the RPM card. For example:

```
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
```

## Troubleshooting Upgrade Problems

Table A-4 lists symptoms of upgrade problems and suggestion on how to correct them.



### Tips

When troubleshooting problems on standby PXM45 cards or cards that do not start up to the active state, establish communications through the boot IP address or through the console port.

**Table A-4** Troubleshooting Upgrade Problems

Primary Symptom	Secondary Symptom	Suggested Action
<b>loadrev</b> or <b>runrev</b> command fails		<p>The <b>loadrev</b> command is blocked when a previous upgrade has not been completed with the <b>commitrev</b> command. Use the <b>dsprevs</b> command to locate the cards that are still being upgraded.</p> <p>For more information on a particular card, enter the <b>dspcd &lt;slot&gt;</b> command and verify that the Current, Primary, and Secondary software revision numbers are identical. If the numbers are not identical, issue the <b>commitrev &lt;slot&gt;</b> command.</p> <p>Enter the <b>dspcds</b> and verify that the standby card is in standby state. Also look for a -U or -D in the <b>dspcds</b> command display, which indicates that the card is in the process of being upgraded (-U) or downgraded (-D). The <b>loadrev</b> and <b>runrev</b> commands are blocked whenever the standby card is not in standby state or an upgrade or downgrade is in progress.</p>
After restart, the switch stops displaying messages and does not display a prompt.		Press <b>Return</b> to display the prompt.

Table A-4 Troubleshooting Upgrade Problems (continued)

Primary Symptom	Secondary Symptom	Suggested Action
After restart, switch stops at backup boot prompt: pxm45bkup>.	The switch displays the message: <i>Can not open file C:/version.</i>	The version file is probably missing. Create the version file as described in “ <a href="#">Initializing the Switch</a> ” in <a href="#">Chapter 2</a> , “ <a href="#">Configuring General Switch Features</a> .”
(Use a console port connection to see this. If you missed the startup messages, enter the <b>reboot</b> command.)	The switch displays the message: <i>Unable to determine size of C:/FW/filename.</i>	<p>The version recorded in the version file doesn’t match software installed in the C:FW directory.</p> <p>Enter the <b>sysVersionShow</b> command to see which file the PXM45 is trying to load.</p> <p>Verify that the correct software is installed on the switch using the commands described in “<a href="#">Browsing the File System in Backup Boot Mode</a>” in <a href="#">Appendix B</a>, “<a href="#">PXM45 Backup Boot Procedures</a>.”</p> <p>If the runtime software is not on the hard disk, copy it to the hard disk as described in “<a href="#">Transferring Software Files to and from the Switch</a>” in <a href="#">Appendix B</a>, “<a href="#">PXM45 Backup Boot Procedures</a>.”</p> <p>If a typo is entered when initializing the switch, re-enter the <b>sysVersionSet</b> command, enter the <b>sysVersionShow</b> command to verify the correct setting, and then reboot the switch with the <b>reboot</b> command.</p>
	The switch displays the message: <i>Please run sysDiskCfgCreate.</i>	The hard disk is formatted, but not ready for operation. Enter the <b>sysDiskCfgCreate</b> command. For more information, refer to “ <a href="#">Initializing the PXM45 Hard Disk</a> ” in <a href="#">Appendix B</a> , “ <a href="#">PXM45 Backup Boot Procedures</a> .”
Standby PXM45 continually reboots.  You can view the rebooting process through the console port.		<p>The active PXM45 card cannot bring up the standby card. The following procedure assumes that this card has just been installed in the switch and that you have given the standby card sufficient time to synchronize with the Active card.</p> <p>Interrupt the boot cycle by pressing <b>Return</b>. Timing is important, so you might have to press <b>Return</b> multiple times. When the pxm45bkup prompt appears, immediately enter the <b>sysPxmRemove</b> command to prevent the Active card from rebooting the standby card while you are working on it.</p> <p>Enter the <b>sysChangeEnet</b> command and verify that the <i>inet on ethernet (e)</i> and <i>gateway inet (g)</i> values are set to the boot and gateway IP address set with the <b>bootChange</b> command on the active card. Also, verify that the <i>boot device</i> is set to <i>lnPci</i>. The <b>sysChangeEnet</b> command works like the <b>bootChange</b> command, which is described in “<a href="#">Setting the Boot IP Address</a>” in <a href="#">Chapter 2</a>, “<a href="#">Configuring General Switch Features</a>.”</p> <p>Enter the <b>sysClrallcnf</b> command to clear any configuration data on the standby card set. This command does not clear the boot IP address set with the <b>sysChangeEnet</b> command.</p>

Table A-4 Troubleshooting Upgrade Problems (continued)

Primary Symptom	Secondary Symptom	Suggested Action
After restart, the switch stops at backup shell prompt: pxm45>.		If the <b>Return</b> key is pressed at one of the auto-boot prompts during start up, the switch stops in shell mode. Enter the <b>reboot</b> command to restart the switch and avoid pressing the <b>Return</b> key.
The non-active PXM45 will not transition out of the active init state.	One or more non-standby AXSM cards are in a transitional state.	<p>A non-standby AXSM card is a standalone AXSM card or the card within a redundant AXSM pair that is trying to go active. When a non-standby AXSM card is in a transitional state, such as the init state, the PXM45 cannot transition to the standby state. When all non-standby cards have reached a steady (non-transitional) state, the PXM45 will transition to a steady state. Steady states include the following: active ready, failed, mismatch, empty, empty reserved, and standby ready.</p> <p><b>Note</b> When either card in a redundant AXSM pair is active, that AXSM pair is not preventing the standby PXM45 from transitioning to a steady state. The standby PXM45 is only affected when both cards in a redundant pair are in a transitional state.</p>

