APPENDIX A

Downloading and Installing Software Upgrades

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
- Quickstart Procedures for Software Downgrades
- Browsing the File System
- Locating Software Updates
- Copying Software Files to the Switch
- Upgrade Procedures for PXM45 and AXSM 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.

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 2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software 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:

- PXM45 boot software
- PXM45 runtime software
- AXSM boot software
- AXSM runtime software

Typically, the boot software requires less frequent upgrades. Some upgrades might only require updates to one type of switch card. The 2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software 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

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 updates the standby card and then makes that card active. This method ensures a smooth transition to the new software and preserves all established calls. Any calls that are not established are lost.

A graceful upgrade of the boot software does the following:

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

To upgrade the runtime software, use the following procedure.

	Command	Purpose
Step 1	`ftp`	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2	*`username`* *`password`*	Establish a CLI session with the *standby* PXM45 card using the CP port on the UI-S3 back card and a user name with CISCO_GP privileges.

	Command	Purpose
Step 3	**saveallcnf**	This optional step saves the current configuration to the hard disk. Refer to "Saving a Configuration" in Chapter 6, "Switch Operating Procedures."
Step 4	**sh** **sysBackupBoot** **Return**	Change to the PXM45 Backup Boot mode. See "Changing to PXM45 Backup Boot Mode" in Appendix B, "PXM45 Backup Boot Procedures."
Step 5	**sysPxm45Remove**	At the backup boot prompt, enter the **sysPxm45Remove** command: This step prevents the active card from resetting the standby card while you are working with it.
Step 6	**sysFlashBootBurn** *"Filename"* **reboot** *username* *password* **dspcd**	Burn the boot code. Remember to enter quotation marks before and after the boot software filename. For example: **sysFlashBootBurn** "C:FW/pxm45_002.000.012.000_bt.fw" See "Upgrading PXM45 Boot Software," which appears later in this appendix.
Step 7	*username* *password*	Establish a CLI session with the new *active* 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	**switchcc** ***y***	Switch the roles of the active and standby cards so you can upgrade the non-upgraded card in standby mode.
Step 9	**sh** **sysBackupBoot** **Return**	Change to the PXM45 Backup Boot mode. See "Changing to PXM45 Backup Boot Mode" in Appendix B, "PXM45 Backup Boot Procedures.".
Step 10	**sysPxmRemove**	At the backup boot prompt, enter the **sysPxmRemove** command: This step prevents the active card from resetting the standby card while you are working with it.
Step 11	**sysFlashBootBurn** *"Filename"* **reboot** *username* *password* **dspcd**	Burn the boot code. Remember to enter quotation marks before and after the boot software filename. For example: **sysFlashBootBurn** "C:FW/pxm45_002.000.012.000_bt.fw" See "Upgrading PXM45 Boot Software," 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.

	Command	Purpose
Step 1	**ftp**	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2	*username* *password*	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.
Step 3	**saveallcnf**	This optional step saves the current configuration to the hard disk. Refer to "Saving a Configuration" in Chapter 6, "Switch Operating Procedures."
Step 4	**sh** **sysBackupBoot** **Return**	Change to the PXM45 Backup Boot mode. See "Changing to PXM45 Backup Boot Mode" in Appendix B, "PXM45 Backup Boot Procedures.".
Step 5	**sysFlashBootBurn** *"Filename"* **reboot** *username* *password* **dspcd**	Burn the boot code. Remember to enter quotation marks before and after the boot software filename. For example: **sysFlashBootBurn** "C:FW/pxm45_002.000.012.000_bt.fw" See "Upgrading PXM45 Boot Software," 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

To upgrade the runtime software, use the following procedure.

	Command	Purpose
Step 1	**ftp**	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2		If the 2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software call for a boot software upgrade, upgrade the boot software for the card you are upgrading. PXM45 cards should be upgraded first. See "Graceful PXM45 Boot Upgrades," which appears earlier in this appendix. For instructions on upgrading AXSM boot software, see "Graceful AXSM Boot Upgrades," which appears later in this appendix.
Step 3	*username* *password*	Establish a CLI session with the active PXM45 card using a user name with SERVICE_GP privileges.
Step 4	**saveallcnf**	This optional step saves the current configuration to the hard disk. Refer to "Saving a Configuration" in Chapter 6, "Switch Operating Procedures."
Step 5	**dspcd** **commitrev** <*slot*> <*revision*>	Verify that all previous upgrades have been committed. If a previous upgrade has not been committed, commit to the new upgrade. See "Committing to a Runtime Software Upgrade," which appears later in this appendix.
Step 6	**loadrev** <*slot*> <*revision*> **dspcd**	Load the new runtime software on the standby PXM45.
Step 7	**runrev** <*slot*> <*revision*> **dspcd** **dspcd** <*slot*>	Switch over to the standby PXM45 card and load the new runtime software on the new standby (non-upgraded) PXM45.

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.

	Command	Purpose
Step 1	**ftp**	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2		If the 2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software call for a boot software upgrade, upgrade the boot software as described in "Non-Graceful PXM45 Boot Upgrades," which appears earlier in this appendix or "Non-Graceful AXSM Boot Upgrades," which appears later in this appendix.

	Command	Purpose
Step 3	*username* *password*	Establish a CLI session with the active PXM45 card using a user name with SERVICE_GP privileges.
Step 4	**saveallcnf**	This optional step saves the current configuration to the hard disk. Refer to "Saving a Configuration" in Chapter 6, "Switch Operating Procedures."
Step 5	**dspcd** **commitrev <*slot*> <*revision*>**	Verify that all previous upgrades have been committed. If a previous upgrade has not been committed, commit to the new upgrade. See "Committing to a Runtime Software Upgrade," which appears later in this appendix.
Step 6	**loadrev <*slot*> <*revision*>** **dspcd**	Define the new software version to be used.
Step 7	**runrev <*slot*> <*revision*>** **dspcd**	Run the new software version.

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.

	Command	Purpose
Step 1	**ftp**	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2	*username* *password*	Establish a CLI session with the *active* PXM45 card using a user name with SERVICE_GP privileges or higher.
Step 3	**saveallcnf**	This optional step saves the current configuration to the hard disk. Refer to "Saving a Configuration" in Chapter 6, "Switch Operating Procedures."
Step 4	**burnboot <*slot*> <*revision*>** **dspcd <*slot*>**	Burn the boot software on the standby AXSM card by specifying the slot number of the standby card. See "Upgrading Boot Software on an AXSM Card," which appears later in this appendix.
Step 5	**switchredcd** *<fromSlot>* *<toSlot>*	Activate the upgraded card and place the non-upgraded card in standby mode.
Step 6	**burnboot <*slot*> <*revision*>** **dspcd <*slot*>**	Burn the boot software on the non-upgraded, standby AXSM card by specifying the slot number of the standby card. See "Upgrading Boot Software on an AXSM Card," 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.

	Command	Purpose
Step 1	**ftp**	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2	*username* *password*	Establish a CLI session with the *active* PXM45 card using a user name with SERVICE_GP privileges or higher.
Step 3	**saveallcnf**	This optional step saves the current configuration to the hard disk. Refer to "Saving a Configuration" in Chapter 6, "Switch Operating Procedures."
Step 4	**burnboot** <*slot*> <*revision*> **dspcd** <*slot*>	Burn the boot software on the standby AXSM card by specifying the slot number of the standby card. See "Upgrading Boot Software on an AXSM Card," which appears later in this appendix.

Quickstart Procedures for Software Downgrades

Cisco Systems, Inc., recommends that you avoid software downgrades, which replace a current software release with another that has a lower version number. However, there are some situations in which you might want to downgrade the software. For example, if you have been testing pre-release software in a lab, the software version number can be higher than a later official software release. Any time the software version number to which you are changing is lower than the current software version, the change is a downgrade, regardless of when the software versions are released.

The following sections provide quickstart procedures for the following downgrades:

- PXM45 and AXSM Boot Downgrades
- Non-Graceful PXM45 Runtime Software Downgrades
- Non-Graceful AXSM Runtime Software Downgrades

PXM45 and AXSM Boot Downgrades

When redundant cards are used and the downgrade software is compatible with the existing runtime software, boot software downgrades can be graceful. To perform a graceful downgrade of boot software, follow the instructions for the appropriate graceful software upgrade:

- Graceful PXM45 Boot Upgrades
- Graceful AXSM Boot Upgrades

Caution Cisco Systems, Inc., does not guarantee that any software downgrade is graceful, so assume that the downgrade is non-graceful and time the downgrade accordingly. The advantage to following the graceful upgrade procedures listed above is that you might be able to delay traffic interruption until the runtime software is downgraded.

When upgrading a standalone card, the downgrade is non-graceful, and you should follow one of the following software upgrade procedures:

- Non-Graceful PXM45 Boot Upgrades
- Non-Graceful AXSM Boot Upgrades

Non-Graceful PXM45 Runtime Software Downgrades

To downgrade PXM45 runtime software, you must clear the entire switch configuration.All traffic is disrupted until the switch downgrade is complete and the configuration has been re-entered. The following quickstart procedure is provided as an overview for PXM45 runtime software downgrades.

Note The switch does not support a configuration restore to a downgraded software version. When you downgrade the PXM45 runtime software, you must re-enter the configuration.

	Command	Purpose
Step 1	*username* *password*	Establish a CLI session with the active PXM45 card using a user name with SERVICE_GP privileges.
Step 2	**saveallcnf** **y**	Save the current switch configuration. See "Saving a Configuration" in Chapter 6, "Switch Operating Procedures." This step gives you the option to upgrade to the software version from which you are downgrading and use the former configuration.
Step 3	**ftp**	Copy the boot and runtime files you want to use to the switch. Also copy the saved configuration file from the C:CNF directory to a remote workstation so you have a backup file if something happens to the hard disk. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 4	**clrallcnf** **y**	Clear the current configuration. See "Clearing a Configuration" in Chapter 6, "Switch Operating Procedures."

	Command	Purpose
Step 5	**sysVersionSet** *"version"* **reboot**	Select the runtime firmware version the switch will use on the PXM45 card and restart the switch with that firmware. For example: `sysVersionSet "002.000.012.000"` Note that these commands must be entered at the PXM45 backup boot prompt: pxm45bkup>. Refer to "Initializing the Switch" in Chapter 2, "Configuring General Switch Features.".
Step 6		Reconfigure the PXM45 cards as described in "Configuration Quickstart" in Chapter 2, "Configuring General Switch Features."

Non-Graceful AXSM Runtime Software Downgrades

AXSM runtime software downgrades are always non-graceful when the PXM45 runtime software is also downgraded (because the PXM45 downgrade requires a clearing of the configuration). The quickstart procedure is provided as an overview of how to downgrade the AXSM software after the PXM45 runtime software has been downgraded.

	Command	Purpose
Step 1	**ftp**	Copy the boot and runtime files you want to use to the switch. See "Copying Software Files to the Switch," which appears later in this appendix.
Step 2		Refer to "Configuration Quickstart" Chapter 3, "Preparing AXSM Cards and Lines for Communication." The **setrev** command in the quickstart procedure clears the card configuration and assigns the downgrade software version to the card.

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

Command	Description
cd	Change directories. Access level required: ANYUSER or above.
copy	Copies a file from one location to another. Syntax: **copy** <*source file name*> <*destination file name*> Access level required: GROUP1 or above.
del	Deletes a file. Syntax: **del** <*file name*> Access level required: GROUP1 or above.
ll	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: **ll** Access level required: ANYUSER or above.
ls	List directory contents using the short format, which displays filenames, total disk space, and free disk space. Syntax: **ls** Access level required: ANYUSER or above.
pwd	Display the present working directory. Syntax: **pwd** Access level required: ANYUSER or above.
rename	Renames a file. Syntax: **rename** <*old file name*> <*new file name*> Access level required: GROUP1 or above.
whoami	Lists the login name for the current session. Syntax: **whoami** Access level required: ANYUSER or above.

Locating Software Updates

For information on locating software updates, refer to the *2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software.*

Copying Software Files to the Switch

This section describes how to copy software files to the MGX 8850 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 *2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software*.

The MGX 8850 switch provides 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 FTP 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 "Copying Software Files to the Switch" in Appendix B, "PXM45 Backup Boot Procedures."

Step 1 Refer to the *2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software* 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_002.000.012.000_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:

```
pop20one.7.PXM.a > dspcd
pop20one                          System Rev: 02.00   Jan. 25, 2001 17:06:33 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:      SAK03260058         SAK0332009P         SAK0325007Q
Prim SW Rev:        2.0(11)             ---                 ---
Sec SW Rev:         2.0(11)             ---                 ---
Cur SW Rev:         2.0(11)             ---                 ---
Boot FW Rev:        2.0(12)             ---                 ---
800-level Rev:      06                  04                  03
Orderable Part#:    800-05306-01        800-05787-01        800-05052-02
CLEI Code:                        h
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:

```
pop20one.7.PXM.a > dspcd
pop20one                          System Rev: 02.00   Jan. 25, 2001 17:06:33 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:      SAK03260058         SAK0332009P         SAK03325007Q
Prim SW Rev:        2.0(11)             ---                 ---
Sec SW Rev:         2.0(11)             ---                 ---
Cur SW Rev:         2.0(11)             ---                 ---
Boot FW Rev:        2.0(12)             ---                 ---
800-level Rev:      06                  04                  03
Orderable Part#:    800-05306-01        800-05787-01        800-05052-02
CLEI Code:                        h
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 "Reverting Back from 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(11)	2.0(11)	2.0(11)	2.0(12)	2.0(12)	2.0(12)	2.0(12)	2.0(12)
Secondary	2.0(11)	2.0(11)	2.0(12)	2.0(11)	2.0(11)	2.0(11)	2.0(12)	2.0(12)
Current	2.0(11)	2.0(11)	2.0(11)	2.0(11)	2.0(12)	2.0(12)	2.0(12)	2.0(12)

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(11)	2.0(11)	2.0(12)	2.0(12)
Secondary	2.0(11)	2.0(12)	2.0(11)	2.0(12)
Current	2.0(11)	2.0(11)	2.0(12)	2.0(12)

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 2.0(12)
```

You can find the software version number in the *2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software.* 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 6, "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 **dspcd** <*slot*> command and check the status of the software revision levels.

Note The switch does not start the upgraded software 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(0.1)
```

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.

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 "Reverting Back from 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 11 2.0(12)
```

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:

```
pop20one.7.PXM.a > dspcd 1
pop20one                          System Rev: 02.00   Jan. 25, 2001 17:09:45 PST
MGX8850                                               Node Alarm: NONE
Slot Number:   1    Redundant Slot:

                    Front Card          Upper Card          Lower Card
                    ----------          ----------          ----------

Inserted Card:      AXSM_4OC12          SMFIR_2_OC12        SMFIR_2_OC12
Reserved Card:      AXSM_4OC12          SMFIR_2_OC12        SMFIR_2_OC12
State:              Active              Active              Active
Serial Number:      SAK0344001V         SBK0406002K         SAK032800Q6
Prim SW Rev:        2.0(11)             ---                 ---
Sec SW Rev:         2.0(11)             ---                 ---
Cur SW Rev:         2.0(11)             ---                 ---
Boot FW Rev:        2.0(12)             ---                 ---
800-level Rev:
Orderable 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.

Reverting Back from 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).

Note Reverting to the previously used version of runtime software 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.

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.

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:

a. If necessary, use the **cc** command to select the active PXM45 card.

b. Enter the **dspcd** <*slot*> command.

c. 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.

Troubleshooting Upgrade Problems

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

Table A-4 Troubleshooting Upgrade Problems

Primary Symptom	Secondary Symptom	Suggested Action
loadrev or **runrev** command fails		The **loadrev** command is blocked when a previous upgrade has not been completed with the **commitrev** command. Enter the **dspcd** <*slot*> command and verify that the Current, Primary, and Secondary software revision numbers are identical. If the numbers are not identical, issue the **commitrev** <*slot*> command. Enter the **dspcds** and verify that the standby card is in standby state. Also look for a -U or -D in the **dspcds** command display, which indicates that the card is in the process of being upgraded (-U) or downgraded (-D). The **loadrev** and **runrev** commands are blocked whenever the standby card is not in standby state or an upgrade or downgrade is in progress.
After restart, the switch stops displaying messages and does not display a prompt.		Press **Return** to display the prompt.
After restart, switch stops at backup boot prompt: pxm45bkup>. (Use a console port connection to see this. If you missed the startup messages, enter the **reboot** command.)	The switch displays the message: *Can not open file C:/version.*	The version file is probably missing. Create the version file as described in "Initializing the Switch" in Chapter 2, "Configuring General Switch Features."
	The switch displays the message: *Unable to determine size of C:/FW/filename.*	The version recorded in the version file doesn't match software installed in the C:FW directory. Verify that the correct software is installed on the switch using the commands described in "Browsing the File System in Backup Boot Mode" in Appendix B, "PXM45 Backup Boot Procedures." If the runtime software is not on the hard disk, copy it to the hard disk as described in "Copying Software Files to the Switch" in Appendix B, "PXM45 Backup Boot Procedures." If a typo is entered when initializing the switch, delete the version file with the **rm "C:/version"** command, re-enter the **sysVersionSet** command, then reboot the switch with the **reboot** command.
	The switch displays the message: *Please run sysDiskCfgCreate.*	The hard disk is formatted, but not ready for operation. Enter the sysDiskCfgCreate command. For more information, refer to "Initializing the PXM45 Hard Disk" in Appendix B, "PXM45 Backup Boot Procedures."
After restart, the switch stops at backup shell prompt: pxm45>.		If the **Return** key is pressed at one of the auto-boot prompts during start up, the switch stops in shell mode. Enter the **reboot** command to restart the switch and avoid pressing the **Return** key.