

MGX 8220 Upgrade and Downgrade Matrices, Concepts and Definitions

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Introduction

Prerequisites

Requirements

Components Used

Conventions

Identifying Desired Technique

Technique Tables

Upgrades

Downgrades

Concepts and Definitions

One ASC Card Set (no redundancy)

Two ASC Card Set (redundant)

burnbtrev

chkflash

clrallcnf

clrsmcnf

Compatibility

Graceful Upgrades

burntrev

revdn

revup

resetsys

revup and revdn

Ungraceful Upgrades

version

Downgrades

dspfwrevs

dspadrxlat

dsptotals

donotupdatestandby

flashStartAddr and flashEndAddr

Save and Restore ASC Configuration

Save and Restore SM Configuration

Slot-specific and Card-type-specific

dspfwrevs

softswitch

tftp put

File Size

Related Information

Introduction

This document describes Cisco's recommended process for successful MGX 8220 Edge Concentrator bootcode and firmware upgrades and downgrades. AXIS is the legacy product name for the Cisco MGX 8220 Edge Concentrator.

The following techniques for the AXIS Shelf Controller (ASC) and Service Module (SM) are provided.

- Graceful Upgrades
- Ungraceful Upgrades
- Downgrades

See Concepts and Definitions for additional information.

Prerequisites

Requirements

Readers of this document should be knowledgeable of the following:

- MGX 8220 Edge Concentrator



Warning: Use of the procedures discussed in this document assumes that you have a working

knowledge of the MGX 8220 Edge Concentrator. We recommend that you read both documents completely before proceeding with a firmware upgrade.

Components Used

The information in this document is based on the software and hardware versions below.

MGX 8220 upgrades to firmware version 5.0.x are supported only for versions:

- 4.0.x
- 4.1.x
- 5.0.x

For upgrades from version 2.x or 3.x, you must first upgrade devices to the latest generally available firmware version of 4.0.x or 4.1.x and then upgrade them to version 5.0.x. Special considerations apply when upgrading Inverse Multiplexing for ATM Trunk Module (IMATM) and ATM UNI service modules (AUSM) 8-port service modules (SMs) to version 5.0.x.

To see detailed information in the firmware Release Notes, you must be a registered user and you must be logged in.

This document is intended to be used as an aid for conducting successful firmware upgrades but is not a substitute for proper planning with your Cisco Sales Engineer, Systems Engineer, or Account Manager.

Note: For MGX 8220 upgrades from firmware version 2.1.16 or 2.1.18 to 4.0.03, refer to [Upgrading MGX 8220 Firmware 2.1.18/16 to 4.0.03](#).

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

For more information on document conventions, see the [Cisco Technical Tips Conventions](#).

Identifying Desired Technique

Identify a desired technique in one of the technique tables. To use the tables, ask yourself:

- Upgrade or downgrade?
- One ASC card set or two?
- Ungraceful or graceful?
- What pair of firmware versions are involved?

Technique Tables

Upgrades

	Ungraceful Upgrades					Graceful Upgrades			
	One ASC (no redundancy)					Two ASCs (redundant)			
	To 2.x	To 3.x	To 4.x	To 5.x		To 2.x	To 3.x	To 4.x	To 5.x
From version 2.x	1	1	5	via 4.x	From version 2.x	10	3*	11	via 4.x
From version 3.x	-	1	5	via 4.x	From version 3.x	-	10	11	via 4.x
From version 4.x	-	-	8	8	From version 4.x	-	-	12	12
From version 5.x	-	-	-	8	From version 5.x	-	-	-	12

* Procedure is for ungraceful upgrade with a two ASC card set.

Downgrades

	Downgrades					Downgrades			
	One ASC (no redundancy)					Two ASCs (redundant)			
	To 2.x	To 3.x	To 4.x	To 5.x		To 2.x	To 3.x	To 4.x	To 5.x
From version 2.x	2	-	-	-	From version 2.x	4	-	-	-
From version 3.x	2	2	-	-	From version 3.x	4	4	-	-

From version 4.x	6	6	9	-	From version 4.x	7	7	13	-
From version 5.x	via 4.x	via 4.x	9	9	From version 5.x	via 4.x	via 4.x	13	13

Concepts and Definitions

One ASC Card Set (no redundancy)

The one ASC card set includes:

- One MGX 8220 ASC
- One Broadband Network Module (BNM)
- One Service Resource Module (SRM)

The SRM is optional in an ASC card set. A one ASC card set that uses only the ASC and BNM is allowed in the MGX 8220.

Two ASC Card Set (redundant)

The two ASC card set includes:

- Two ASC cards
- Two BNMs
- Two SRMs

The SRM is optional in an ASC card set but must match for primary and secondary ASC card sets. A two ASC card set configuration that uses only one SRM is not allowed in the MGX 8220.

burnbtrev

This active ASC command-line interface (CLI) command is used instead of **flashStartAddr** and **flashEndAddr** commands for ASC and SM bootcode upgrades. Use the following commands to rename bootcode file extensions from .BT to .BOOT for graceful upgrades

- **burnbtrev** **AXIS_SM_1_slot#.BOOT**. Replace the slot# with the number of the SM slot.
- **burnbtrev** **AXIS_ASC_ACTIVE.BOOT**
- **burnbtrev** **AXIS_ASC_STANDBY.BOOT**

The **burnbtrev** command is available in firmware version 4.0.x, 4.1.x, 5.0.x, and later.

chkflash

This active ASC and SM CLI command checks a file's stored checksum with a recalculated checksum. It only checks files stored in Flash memory on a card. For more information about the **chkflash** command, refer to the MGX 8220 **chkflash** Command to Verify Downloads to Service Modules.

ASC Example

```
mgx8220.1.4.ASC.a > chkflash
```

```
Program length = 495176
Calculated checksum = 338e98b9 stored checksum = 338e98b9
Flash checksum passed
```

SM Example

```
mgx8220.1.10.FRSM.a > chkflash
Program length = 287622
Calculated checksum = 742c5240 stored checksum = 742c5240
Flash checksum passed
```

clrallcnf

This active ASC CLI command is used in place of the **resetsys** command as part of an ungraceful upgrade or downgrade. All downgrades require the **clrallcnf** command.

The **clrallcnf** command terminates all telnet sessions to the MGX 8220. You have to reinitiate a Telnet session after an ASC card returns to the active state.

clrsmcnf

This active ASC CLI command is used as part of an ungraceful upgrade or downgrade.

Compatibility

Compatibility is critical for all upgrades and downgrades. You can downgrade a firmware version to another one, but you will lose all configuration information. Hardware incompatibilities may prevent some downgrades. For example, firmware version 2.x and 3.x SMs require two flash chips. Firmware version 4.x and 5.x SMs are shipped with a single flash chip. An MGX 8220 with firmware version 4.x containing BNM-E1 cards or SRM-3T3 cards cannot be downgraded to firmware version 2.x or 3.x.

Graceful Upgrades

Graceful upgrade minimizes traffic disruption at the expense of added complexity.

To gracefully upgrade an MGX 8220 with a 9:1 redundancy group from firmware version 3.x to 3.y requires 18 **resetcd** operations and may take 20 minutes. The average traffic loss per connection is approximately 20 seconds. The SM ungraceful upgrade from firmware version 3.x to 3.y requires only a single **resetsys** command and may take 60 seconds, but the average traffic loss per connection may be more than a minute.

Graceful upgrades are greatly improved in firmware versions 4.0.x, 4.1.x, and 5.0.x so that there is virtually no disruption to network traffic. The upgrades were improved as a result of the difficulty in executing graceful upgrades from version 3.x to version 4.x. For example, if version 4.x bootcode is loaded onto an ASC or SM before the upgrade and the ASC or SM are reset, the new version of bootcode is activated and the cards request firmware from the ASC. If the version 4.x firmware is already loaded onto the ASC, the ASC and SM may come up using the version 4.x bootcode and firmware. If version 4.x firmware is not loaded onto the ASC, then the ASC or SM stays in boot mode until appropriate firmware is loaded onto the ASC.

Use the following commands to load, stage, and execute bootcode and firmware upgrades with little or no impact to network traffic.

burntrev

Use this command to stage bootcode immediately before executing an upgrade. ASC and SM bootcode is loaded onto the MGX 8220 as a *file*.BT file. Because the MGX 8220 only uses bootcode files with the .BOOT extension, the .BT extension ensures that even if the ASC or SM is reset, the new bootcode is not be used. Once all desired bootcode and firmware files are loaded on the MGX 8220, the bootcode is staged or loaded onto the ASC and SMs using the **burnbtrev** command. Issue the **version** command to verify that the **burnbtrev** command has loaded the bootcode onto the respective ASCs and SMs. The desired bootcode is not be used until the ASC or SM is reset.

revdn

Use this command to revert to the original version of firmware during an aborted upgrade. The **revdn** command renames original ASC and SM firmware that is indicated by the .DN extension to .FW.

revup

This command stages firmware immediately before executing an upgrade. ASC and SM firmware is loaded onto the MGX 8220 as a *file*.UP file. The .UP extension ensures that even if the ASC or SM is reset, the new firmware is not used. Once all desired bootcode and firmware files are loaded on the MGX 8220, the firmware is staged on the ASC using the **revup** command. The **dspfwrevs** command is used to verify that the **revup** command has renamed the existing firmware files with the .DN extension and the desired firmware files with the .FW extension on the ASC. The desired firmware is not used until the ASC or SM is reset.

resetsys

Use this active ASC CLI command to reset all the cards in the MGX 8220.

```
mgx8220.1.3/4.ASC.a > resetsys
```

The **resetsys** command terminates all telnet sessions. You have to reinitiate a Telnet session after an ASC card returns to the active state.

revup and revdn

Use the commands on the active ASC rename firmware file extensions from .UP to .FW for graceful upgrades. The **revup** and **revdn** commands are available in firmware version 4.0.x, 4.1.x, 5.0.x and later.

Ungraceful Upgrades

This is the fastest technique for upgrading or downgrading from one firmware and bootcode version to another. Ungraceful upgrades cause service disruption and are required when upgrading:

- An incompatible firmware version
- An incompatible database structure
- A nonredundant MGX 8220; a single ASC card set

version

This active ASC and SM CLI command displays the bootcode version that is stored in Flash and the firmware version that is being executed. The bootcode version that is stored in Flash is not necessarily the version of bootcode being executed.

ASC Example

```
mgx8220.1.4.ASC.a > version
***** Cisco Systems, Inc. AXIS ASC Card *****
  Firmware Version           = 5.0.15
  Backup Boot version       = ASC_BT_1.0.03
  ASCFRSM Xilinx file      = asc025.h
  ASC2 Xilinx file         = ASC2_Xilinx.h
  ASCBNM Xilinx file       = A:bnm_a E:bnm_e
  ASCBNM Altera file       = bnm155_2
  SRM-T1E1 Xilinx file     = A:srm038.h, E:srmE038.h
  SRM-3T3 Xilinx file      = srm038.h
  SRM-3T3 Encoder file     = encoder42_004.ttf
  SRM-3T3 Encoder-2 file  = encoder80_001.ttf
  SRM-3T3 Decoder file    = decoder42_004.ttf
  SRM-3T3 Clock file      = clkctrl_40.ttf
  SRM-3T3 I-Cube file     = ic320.h

VxWorks (for Cisco Systems, Inc.) version 5.1.1-R3000.
Kernel: WIND version 2.4.
Made on Fri Oct 6 23:48:03 PDT 2000.
Boot line:
ln(0,0)
```

SM Example

```
mgx8220.1.10.FRSM.a > version
***** Cisco Systems, Inc. AXIS FRSM Card *****
  Firmware Version           = 5.0.12
  Backup Boot version       = BT_4.0.00
  Cell Bus Slave Xilinx file = cbslave.h
  Test Loop Xilinx file (X.21) = tstloop3.h
  GRAM Controller FPGA      = gramctrl9.ttf
  SRAM controller FPGA      = shram4.ttf
VxWorks (for STRATACOM) version 5.2 Rev B.

Kernel: WIND version 2.4.
Made on Wed Jun 21 16:29:10 PDT 2000.
Boot line:
```

Downgrades

Downgrades always are ungraceful and result in the loss of configuration. Attempt downgrades only after consulting a Cisco Systems Engineer or TAC engineer.

dspfwrevs

This active ASC CLI command was introduced in firmware versions 2.1.25 and 4.0.02. ASC and SM firmware is stored on the ASC hard disk. ASC and SM bootcode is stored on a respective card. When ASC or SM firmware is put onto the ASC, use the **dspfwrevs** command to ensure that the image was successfully TFTP-put to the disk.

Example

```
mgx8220.1.4.ASC.a > dspfwrevs
```

Cfg	Size	Date	Time	File Name	Card Type	Version
n/a	1860892	01/30/2000	12:11:26	asc.fw	ASC	5.0.15
Yes	1109480	12/31/1999	17:56:12	sm50.fw	AUSM-8T1E1	5.0.10
Yes	729868	12/31/1999	17:56:12	sm35.fw	FRSM-8T1E1	5.0.10

Yes	1087240	10/24/2000	02:30:24	sm70.fw	IMA-8T1E1	5.0.12
Yes	690340	12/02/2000	05:16:48	sm34.fw	FRSM-HS1	5.0.12
No	733132	12/29/1998	03:14:02	sm40.fw	AUSM-4T1E1	4.0.11
Yes	609848	05/10/2000	09:57:32	sm60.fw	CESM-4T1E1	4.0.11
n/a	264404	12/31/1999	17:56:12	sm30.bt	FRSM-4T1E1	BT_4.0.00
n/a	264592	12/31/1999	17:56:12	sm90.bt	CESM-8T1E1	CE8_BT_1.0.01
n/a	377604	12/31/1999	17:56:12	sm50.bt	AUSM-8T1E1	AU8_BT_1.0.01
No	569200	12/31/1999	17:56:12	sm90.fw	CESM-8T1E1	4.1.05
n/a	300268	12/31/1999	17:56:12	sm35.bt	FRSM-8T1E1	FR8_BT_1.0.01
Yes	762660	12/31/1999	20:26:14	sm30.fw	FRSM-4T1E1	4.0.19
n/a	267104	05/10/2000	09:46:48	sm60.bt	CESM-4T1E1	BT_4.0.00
Yes	264404	08/31/2000	03:16:16	sm30_14.fw	FRSM-4T1E1	BT_4.0.00
Yes	405800	08/31/2000	06:42:34	sm70_10.fw	IMA-8T1E1	IMA_BT_1.0.02

dspadrxlat

Use this active ASC CLI command to compare the number of connections before and after an upgrade or downgrade.

```
mgx8220.1.4.ASC.a > dspadrxlat
```

Chan	ConnectionType	VPI
-----	-----	----
1.8.100	vcConnection	
1.10.16	vcConnection	
1.10.17	vcConnection	
1.10.18	vcConnection	
1.10.19	vcConnection	
1.10.20	vcConnection	
1.10.21	vcConnection	

```
ConnNumOfValidEntries: 7
```

The only information of interest to you is:

```
ConnNumOfValidEntries: <value>
```

Note: Do not make configuration changes to the MGX 8220 while an upgrade or downgrade is in progress because all or part of the configuration changes can be lost.

dsptotals

An upgrade or downgrade that involves resetting or clearing the configuration of a stand-alone or primary service module should compare the total number of lines, ports, and channels before and after the upgrade or downgrade. You can do this by executing an active SM CLI command:

```
mgx8220.1.10.FRSM.a > dsptotals
```

```
total active lines = 4/4
total active ports = 4/4
total active chans = 6/1000
```

```
Port Channel Table : # of channel assigned per port
```

0	1	2	3	4	5	6	7	8	9	<-- least significant digit
0	3	1	1	1						

The only information you are interested in is:

```
total active lines = value/maximumlines
total active ports = value/maximumports
```

`total active chans = value/maximumchannels`

Do not make configuration changes to the MGX 8220 while an upgrade or downgrade is in progress because all or part of the configuration changes can be lost.

donotupdatestandby

This active ASC CLI command is used as part of an ASC graceful firmware upgrade to prevent the active ASC card from downloading firmware or configuration information to a reset standby ASC. Some ASC firmware versions include the active ASC CLI command, **updatestandby**, which you can use to undo the effects of the **donotupdatestandby** command.

```
mgx8220.1.4.ASC.a > donotupdatestandby
```

flashStartAddr and flashEndAddr

Variables determine where a file is written in Flash memory.

The ASC bootcode **flashStartAddr** defaults to 0xbfc00000. You do not need to change the bootcode. ASC firmware resides on the hard disk in firmware versions 2.x, 3.x, 4.x, and 5.x. The ASC bootcode **flashEndAddr** defaults to 0xbfc80000.

- For firmware versions 2.x and 3.x, the SM bootcode **flashStartAddr** defaults to 0xbfc00000 after the SM is reset. The SM bootcode **flashEndAddr** defaults to 0xbfc40000.

Firmware version 2.x and 3.x SM bootcode:

```
mgx8220.1.Slot.type.a/sshellConn  
mgx8220.1.Slot.type.a/sflashStartAddr = 0xbfc00000  
mgx8220.1.Slot.type.a/sflashEndAddr = 0xbfc40000
```

- For firmware versions 2.x and 3.x, the SM firmware **flashStartAddr** defaults to 0xbfc40000 after the SM is reset. The SM firmware **flashEndAddr** defaults to 0xbfd00000.

Firmware version 2.x and 3.x SM firmware:

```
mgx8220.1.Slot.type.a/sshellConn  
mgx8220.1.Slot.type.a/sflashStartAddr = 0xbfc40000  
mgx8220.1.Slot.type.a/sflashEndAddr = 0xbfd00000
```

- For firmware version upgrades from 2.1.23 to 4.x, the SM bootcode **flashStartAddr** defaults to 0xbfc00000 after the SM is reset. The SM bootcode **flashEndAddr** defaults to 0xbfc80000.

Firmware version upgrades from 2.1.23 to 4.x SM bootcode:

```
mgx8220.1.Slot.type.a/sshellConn  
mgx8220.1.Slot.type.a/sflashStartAddr = 0xbfc00000  
mgx8220.1.Slot.type.a/sflashEndAddr = 0xbfc80000
```

Save and Restore ASC Configuration

The ASC card stores ASC configuration information in Battery-backed Random Access Memory (BRAM). The BRAM contains a revision that identifies the format of the configuration information. For version 4.0.x and later, the configuration information includes:

- Passwords
- IP addresses
- SRM bulk distribution links
- Redundancy table

The format can change between firmware versions. The newer version of firmware always provides conversion routines that automatically reformat the configuration information as part of an upgrade. There are no conversion routines for reformatting the configuration information as part of a downgrade.

Save the active and standby ASC BRAM information before upgrading or downgrading:

```
tftp MGX_8220_IP_address
tftp> bin
tftp> get AXIS_ASC_ACTIVE.BR
tftp> quit
```

```
tftp MGX_8220_IP_address
tftp> bin
tftp> get AXIS_ASC_STANDBY.BR
tftp> quit
```

Restore the active and standby ASC BRAM information after a downgrade.

```
tftp MGX_8220_IP_address
tftp> bin
tftp> put AXIS_ASC_ACTIVE.BR
tftp> quit
```

```
tftp MGX_8220_IP_address
tftp> bin
tftp> put AXIS_ASC_ACTIVE.BR AXIS_ASC_STANDBY.BR
tftp> quit
```

Restore the active and standby ASC cards to execute the saved configuration.

Save and Restore SM Configuration

The ASC stores SM configuration information on the disk in a configuration (PRI) file. The file contains a revision that identifies the format of the configuration information. The format can change between firmware versions. The newer version of firmware always provides conversion routines that automatically reformat the configuration information as part of an upgrade. There are no conversion routines to reformat the configuration information as part of a downgrade.

1. Save the configuration file for each primary and stand-alone SM before upgrading or downgrading.

```
tftp MGX_8220_IP_address
tftp> bin
tftp> get AXIS_SM_1_slot.PRI.Service_login_password
tftp> quit
```

2. Restore the SM configuration file after a downgrade for each primary and stand-alone SM.

```
tftp MGX_8220_IP_address
tftp> bin
tftp> put AXIS_SM_1_slot.PRI.Service_login_password
tftp> quit
```

3. Reset the standby ASC card to download the SM configuration files from the active ASC card.
4. Reset each primary and stand-alone SM to execute the saved configuration.
5. Preserve the SM configuration if the SM configuration file revision is the same between the firmware

revisions involved in an upgrade.

A configuration restore is not required.

Slot-specific and Card-type-specific

SM firmware refers to how firmware is stored on the ASC hard disk. Active ASC cards executing firmware versions 2.x or 3.x support TFTP-putting slot-specific SM firmware. This means that firmware is TFTP-put to each SM slot individually. The SM firmware is written directly to the SM flash. For upgrade and downgrade techniques, this is denoted as:

```
tftp put SM_FW_file AXIS_SM_1_$(slot).FW
```

Active ASCs executing firmware version 4.0.x, 4.1.x, 5.0.x and later support TFTP-putting card-type-specific SM firmware, in addition to slot-specific SM firmware. The SM firmware is written to the ASC disk instead of the SM flash as in firmware versions 2.x and 3.x. A single SM firmware file can be TFTP put to the ASC disk for all SMs of a particular card type. This is denoted as:

```
tftp put SM_FW_file AXIS_SM_1_0.FW
```

Zero is used in place of a specific slot number. Each time an SM is reset, it downloads the SM firmware stored on the active ASC file based on its card type.

Active ASCs executing firmware version 4.0.x, 4.1.x, 5.0.x and later also support TFTP-putting slot-type-specific SM firmware. The SM firmware is still written to the ASC disk. Slot-specific SM firmware takes precedence over card-type-specific firmware. That is, for an SM of a particular card type in a particular slot, if both card-type-specific and slot-specific firmware files exist, the slot-specific firmware is downloaded to the SM.

Note: Slot-specific firmware may directly conflict with the SM in the slot if SMs are moved to different slots in the MGX 8220 or if multiple versions of SM firmware exist on the ASC hard disk. Where possible, download firmware using the card-type-specific method.

A CONFIG.SYS file on the ASC disk tracks which SM firmware files are available for downloading to an SM. If an SM firmware file (slot-specific or card-type-specific) is not contained within the CONFIG.SYS file, it is not downloaded to an SM.

An SM firmware file is automatically added to the CONFIG.SYS file when it is TFTP-put to the active ASC disk and when the active ASC disk downloads the SM firmware file to the standby ASC disk. An SM firmware file can be removed from the CONFIG.SYS file by using the **delcfgsys** command.

dspfwrevs

Use the **dspfwrevs** command to list all SM firmware files on active and standby ASC disks and identify which SM firmware files are contained within a CONFIG.SYS file.

Standby ASC Example

```
mgx8220.1.3.ASC.a > cc 4
```

```
mgx8220.1.4.ASC.s > dspfwrevs
```

Cfg	Size	Date	Time	File Name	Card Type	Version
n/a	1860892	01/30/2000	12:11:26	asc.fw	ASC	5.0.15

Yes	1109480	12/31/1999	17:56:12	sm50.fw	AUSM-8T1E1	5.0.10
Yes	729868	12/31/1999	17:56:12	sm35.fw	FRSM-8T1E1	5.0.10
Yes	1087240	10/24/2000	02:30:24	sm70.fw	IMA-8T1E1	5.0.12
Yes	690340	12/02/2000	05:16:48	sm34.fw	FRSM-HS1	5.0.12
No	733132	12/29/1998	03:14:02	sm40.fw	AUSM-4T1E1	4.0.11
Yes	609848	05/10/2000	09:57:32	sm60.fw	CESM-4T1E1	4.0.11
n/a	264404	12/31/1999	17:56:12	sm30.bt	FRSM-4T1E1	BT_4.0.00
n/a	264592	12/31/1999	17:56:12	sm90.bt	CESM-8T1E1	CE8_BT_1.0.01
n/a	377604	12/31/1999	17:56:12	sm50.bt	AUSM-8T1E1	AU8_BT_1.0.01
No	569200	12/31/1999	17:56:12	sm90.fw	CESM-8T1E1	4.1.05
n/a	300268	12/31/1999	17:56:12	sm35.bt	FRSM-8T1E1	FR8_BT_1.0.01
Yes	762660	12/31/1999	20:26:14	sm30.fw	FRSM-4T1E1	4.0.19
n/a	267104	05/10/2000	09:46:48	sm60.bt	CESM-4T1E1	BT_4.0.00
Yes	264404	08/31/2000	03:16:16	sm30_14.fw	FRSM-4T1E1	BT_4.0.00
Yes	405800	08/31/2000	06:42:34	sm70_10.fw	IMA-8T1E1	IMA_BT_1.0.02

value = 0 = 0x0

softswitch

This active ASC CLI command transfers traffic between a primary and secondary SM and minimizes traffic loss during a graceful upgrade. The **softswitch** command is available in firmware version 4.0.x, 4.1.x, 5.0.x and later.

```
mgx8220.1.3/4.ASC.a > softswitch primary,secondary
mgx8220.1.3/4.ASC.a > softswitch secondary,primary
```

tftp put

This command writes firmware and bootcode to the ASC flash or disk and to the SM flash.

Example

```
tftp> MGX_8220_IP_address
tftp> bin
tftp> put file AXIS_FILE.EXTENSION
tftp> quit
```

Compare the number of sent bytes reported by the TFTP routine to the size of the firmware or bootcode file to verify a successful TFTP-put.

Example

```
ls -l file
-rw-rw-rw- size file

tftp> put file AXIS_FILE.EXTENSION
Sent size bytes in secondsseconds
```

File Size

The firmware file size tends to be unique. Comparing the file size between the originating device and the ASC firmware directory is a method to verify that the firmware file was successfully TFTP-put to the ASC disk.

Related Information

- **MGX 8220 Upgrade and Downgrade Techniques**
 - **Product Information for Cisco Multiservice Switching Solutions**
 - **Cisco WAN Switching Solutions – Cisco Documentation**
 - **Guide to New Names and Colors for WAN Switching Products**
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