CHAPTER 6

Switch Operating Procedures

This chapter describes procedures you can use to manage the MGX 8850 switch.

Managing the Configuration Files

The following sections describe how to save a switch configuration in a single zipped file, clear or erase a configuration, and restore a configuration from a file.

Saving a Configuration

After configuring your switch or after making configuration updates, it is wise to save the configuration. Restoring a saved configuration is much easier than reentering all the commands used to configure the switch.

To save a configuration, you use the **saveallcnf** command, which saves the configuration to a file in the C:/CNF directory. The file is named using the switch name and the current date as follows:

*Name*_01_*DateTime*.zip.

The date appears in YYYYMMDD (year, month, day) format, and the time appears in HHMM (hour, minute) format. For example, if the configuration for a switch named "mgx8850a" were saved on February 29th, 2000 at 2:31pm, the file would be named C:/CNF/mgx8850a_01_200002291431.zip.

You can save a configuration if both of the following are true:

- No save or restore process is currently running.
- No configuration changes are in progress.

Caution Make sure that no other users are making configuration changes when you save the configuration. The MGX 8850 switch does not check for other CLI or CWM users before saving a configuration. If other users make changes while the file is being saved, the configuration can become corrupt. If you try to restore the configuration from a corrupt file, the switch can fail and you might have to send switch cards back to the factory for re-programming.

To save a switch configuration, use the following procedure.

Step 1 Establish a configuration session using a user name with SERVICE_GP privileges or higher.

Step 2 To save the configuration, enter the **saveallcnf** command:

```
mgx8850a.7.PXM.a > saveallcnf
```

Step 3 Read the prompt that appears. Press **Y** if you want to continue, and press **Enter**.

When the save is complete, the switch prompt reappears, and the new file is stored in the C:/CNF directory. The switch displays the saved filename as shown below:

```
pop20one.7.PXM.a > saveallcnf

The 'saveallcnf' command can be time-consuming. The shelf
must not provision new circuits while this command is running.

Do not run this command unless the shelf configuration is stable
or you risk corrupting the saved configuration file.

Do you want to proceed (Yes/No)? y


saveallcnf: shelf configuration saved in C:/CNF/pop20one_01_200006151550.zip.
```

Note Cisco Systems recommends that you use an FTP client to copy the saved configuration file to a workstation. This ensures that you have a backup copy if the PXM45 Hard Drive card fails.

Clearing a Configuration

There are two commands that allow you to clear the switch configuration: **clrcnf** and **clrallcnf**.

To clear switch provisioning data such as the PNNI controller, AXSM ports, and SPVC connections, enter the **clrcnf** command. This command clears all configuration data except the following:

- IP address configuration
- Node name
- Software version data for each card
- SNMP community string, contact, and location
- Date, time, time zone, and GMT offset

To clear the entire configuration, use the **clrallcnf** command. This command clears all the provisioning data and most of the general switch configuration parameters such as the switch name and SNMP configuration. The **clrallcnf** command clears all IP addresses except the boot IP address.

Restoring a Saved Configuration

You can restore a configuration if all of the following are true:

- No save or restore process is currently running.
- No configuration changes are in progress.
- The switch is not hosting any critical calls.

Caution Make sure that no other users are making configuration changes when you restore the configuration. The MGX 8850 switch does not check for other CLI or CWM users before restoring a configuration. If other users make changes while the file is being restored, the configuration can become corrupt, the switch can fail, and you might have to send switch cards back to the factory for re-programming.

To restore a saved switch configuration, use the following procedure.

Step 1 Establish a configuration session using a user name with SERVICE_GP privileges or higher.

Step 2 Verify that the file from which you want to restore configuration data is located in the C:/CNF directory.

Note The C:/CNF directory is the only location from which you can restore a configuration file. If the file has been moved to another directory or stored on another system, the file must be returned to this directory before the data can be restored.

Tips Use the **cd** command to navigate the C:/CNF directory, and use the **ll** command to display the directory contents. For information on transferring files to and from the switch, refer to Appendix A, "Downloading and Installing Software Upgrades."

Step 3 To restore a saved configuration file, enter the **restoreallcnf** command:

```
mgx8850a.7.PXM.a > restoreallcnf -f filename
```

Caution The **restoreallcnf** command resets all cards in the switch and terminates all calls passing through the switch.

Replace *filename* with the name of the saved configuration file.You do not have to enter the path to the file or the extension. For information on the location and name of the file, see "Saving a Configuration."

Managing ILMI

The following sections describe how to:

- Enable and disable ILMI on a port
- Display ILMI port configuration data
- Display and clear ILMI management statistics
- Delete ILMI prefixes

Enabling and Disabling ILMI on a Port

The MGX 8850 switch provides several commands that you can use to enable or disable ILMI on a port. For instructions on enabling or disabling ILMI from an AXSM card prompt, refer to "Configuring ILMI on a Port," in Chapter 4, "Provisioning AXSM Communication Links." To enable or disable ILMI from the PXM45 prompt, use the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1 privileges or higher.

Step 2 To display a list of ports and view the current ILMI status of each, enter the **dsppnports** command.

To enable or disable ILMI on a port, enter the **cnfilmienable** command as follows:

```
popeye2.1.7pxm.a>cnfilmienable <portid> <no | yes>
```

Replace *portid* using the format *slot*:*bay.line*:*ifNum*. Table 6-1 describes these parameters.

Enter **yes** to enable ILMI on the port, or enter **no** to disable ILMI.

Table 6-1 Port Identification Parameters

Parameter	Description
slot	Enter the slot number for the card that hosts the port you are configuring.
bay	Replace *bay* with **1** if the line is connected to a back card in the upper bay, or replace it with **2** if the line is connected to a back card in the lower bay. Remember that the bay number is always **1** for an AXSM-1-2488.
line	Replace *line* with the number that corresponds to the back card port to which the line is connected.
ifNum	An ATM port is also called an interface. Enter a number from 1 to 60 to identify this interface. The interface number must be unique on the card to which it is assigned. Interface numbers are assigned with the **addport** command.

Step 3 To verify the ILMI status change, reenter the **dsppnports** command.

Displaying the ILMI Port Configuration

The following procedure describes some commands you can use to view the ILMI port configuration.

Step 1 Establish a configuration session using a user name with access privileges at any level.

Step 2 To display the ILMI configuration for all ports on an AXSM card, enter the **dspilmis** command. The following example shows the **dspilmis** command report:

```
pop20two.1.AXSM.a > dspilmis

    Sig. rsrc  Ilmi  Sig  Sig Ilmi  S:Keepalive T:conPoll K:conPoll
    Port Part State  Vpi  Vci Trap  Interval    Interval  InactiveFactor
    ---- ----  ---- ---- ---- --- ------------  ---------- ----------
    1    1   Off     0    16    On          1          5          4
    2    1   Off     0    16    On          1          5          4
    3    1   Off     0    16    On          1          5          4
    4    1   Off     0    16    On          1          5          4
```

The example above shows that all ports are configured for the default ILMI values and that ILMI has not been started on any port. Table 6-2 describes each of the report columns.

Table 6-2 Column Descriptions for dspilmis and dspilmi commands

Column	Description
Sig. Port	Port or logical interface for which ILMI status appears.
rsrc Part	Resource partition assigned to the port.
ILMI State	Configured ILMI state, which appears as either On or Off. The default ILMI state is Off, which indicates that ILMI is disabled on the port. You can enable ILMI signaling on the port by entering the **upilmi** command, which changes the state to On. Note that this column indicates whether ILMI is enabled or disabled. To see the operational state of ILMI, use the **dsppnport**, **dsppnports**, or **dsppnilmi** commands.
Sig Vpi	The VPI for the ILMI signaling VCC.
Sig Vci	The VCI for the ILMI signaling VCC.
Ilmi Trap	Indicates whether ILMI traps are enabled (On) or disabled (Off) for this port.
S:Keepalive Interval	
T:conPoll Interval	
K:conPoll InactiveFactor	

Step 3 To display the ILMI configuration for a single port, enter the **dspilmi** command as follows:

```
pop20one.10.AXSM.a > dspilmi <ifnum> <partitionId>
```

Replace *ifnum* with the interface number of the port, and replace *partitionID* with the partition number assigned to the port. You can view both of these numbers in the **dspilmis** command report. The following is an example report for the **dspilmi** command. Table 6-2 describes each of the columns that appear in the command report.

```
pop20one.10.AXSM.a > dspilmi 1 1

    Sig. rsrc  Ilmi  Sig  Sig Ilmi  S:Keepalive T:conPoll K:conPoll
    Port Part State  Vpi  Vci Trap  Interval    Interval  InactiveFactor
    ---- ----  ---- ---- ---- --- ------------  ---------- ----------
    1    1    On     0    16    On           1          5          4
```

Step 4 To display the operational state of ILMI on all ports, use the **dsppnports** command at the PXM45 prompt as shown in the following example:

```
pop20one.7.PXM.a > dsppnports
Summary of total connections
(p2p=point to point,p2mp=point to multipoint,SpvcD=DAX spvc,SpvcR=Routed spvc)
Type   #Svcc:   #Svpc:   #SpvcD:  #SpvpD:  #SpvcR:  #SpvpR:  #Total:
p2p:   0        0        0        0        0        0        0
p2mp:  0        0        0        0        0        0        0
                                                      Total=0
Summary of total configured SPVC endpoints
Type   #SpvcCfg: #SpvpCfg:
p2p:   0         0
p2mp:  0         0

Per-port status summary

PortId         IF status         Admin status       ILMI state       #Conns

7.35           up                up                 Undefined        0

7.36           up                up                 Undefined        0

7.37           up                up                 Undefined        0

7.38           up                up                 Undefined        0

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

10:1.1:1       up                up                 UpAndNormal      0
```

The ILMI operational state is displayed as one of the following: Disable, EnableNotUp, or UpAndNormal. When ILMI is disabled on the port, the operational status is Disable. When ILMI is enabled on the local port but cannot communicate with ILMI on the remote port, the status is EnableNotUp (This happens when ILMI is disabled on the remote end.). When ILMI is enabled and communicating with ILMI on the remote port, the ILMI state is UpAndNormal.

Step 5 To display ILMI configuration data for a specific port, use the **dsppnilmi** command at the PXM45 prompt as follows:

```
pop20one.7.PXM.a > dsppnilmi <portid>
```

Replace *portid* using the format *slot*:*bay.line*:*ifNum*. Table 6-1 describes these parameters. The following example shows the format of the **dsppnilmi** command report.

```
pop20one.7.PXM.a > dsppnilmi 10:1.1:1

Port:  10:1.1:1            Port Type:  PNNI             Side:  network
Autoconfig:  disable      UCSM: disable
Secure Link Protocol:  enable
Change of Attachment Point Procedures:  enable
Modification of Local Attributes Standard Procedure:  enable
Addressreg:  Permit All
VPI:       0                VCI:      16
Max Prefix:      16      Total Prefix:       0
Max Address:      64     Total Address:      0
Resync State:      0     Node Prefix: yes
Peer Port Id:    16848897   System_Id : 0.80.84.171.226.192
Peer Addressreg:  enable
Peer Ip Address : 0.0.0.0
Peer Interface Name : atmVirtual.01.1.1.01
ILMI Link State : UpAndNormal
ILMI Version : ilmi40

INFO:  No Prefix registered
```

Table 6-3 Descriptions for dsppnilmi Command Display Components

Component	Description
Port	Port or logical interface for which ILMI status appears.
Port Type	Controller type to which this port is assigned.
Side	Side of ATM link, which is either network or user.
Autoconfig	Status of Autoconfig option, which is either enable or disable.
UCSM	Status of UCSM option, which is either enable or disable.
Secure Link Protocol	Status of secure link protocol option, which is either enable or disable. You can change this option with the **cnfilmiproto** command.
Change of Attachment Point Procedures	Status of change-of-attachment-point-procedures option, which is either enable or disable. You can change this option with the **cnfilmiproto** command.
Modification of Local Attributes Standard Procedure	Status of modification-of-local-attributes-standard-procedure option, which is either enable or disable. You can change this option with the **cnfilmiproto** command.
Addressreg	
VPI	ILMI signaling VPI. You can change this option with the **cnfilmi** command.
VCI	ILMI signaling VCI. You can change this option with the **cnfilmi** command.
Max Prefix	
Total Prefix	
Max Address	
Total Address	

Table 6-3 Descriptions for dsppnilmi Command Display Components (continued)

Component	Description
Resync State	
Node Prefix	
Peer Port ID	
System ID	
Peer Address Reg	
Peer IP Address	
Peer Interface Name	
ILMI Link State	The ILMI operational state is displayed as one of the following: Disable, Undefined, or UpAndNormal. When ILMI is disabled on the port, the operational status is Disable. When ILMI is enabled on the local port but cannot communicate with ILMI on the remote port, the status is Undefined (This happens when ILMI is disabled on the remote end.). When ILMI is enabled and communicating with ILMI on the remote port, the ILMI state is UpAndNormal.
ILMI Version	ilmi40
Info	

Displaying and Clearing ILMI Management Statistics

The following procedure describes some commands you can use to view ILMI management statistics.

Step 1 To display ILMI management statistics for a port, enter the **dspilmicnt** command as follows:

```
pop20one.10.AXSM.a > dspilmicnt <ifnum> <partitionId>
```

Replace *ifnum* with the interface number of the port, and replace *partitionID* with the partition number assigned to the port. You can view both of these numbers in the **dspilmis** command report. The following is an example report for the **dspilmicnt** command.

```
pop20one.10.AXSM.a > dspilmicnt 1 1
If Number                : 1
Partition Id             : 1
SNMP Pdu Received        : 36914
GetRequest Received      : 18467
GetNext Request Received : 0
SetRequest Received      : 0
Trap Received            : 1
GetResponse Received     : 18446
GetResponse Transmitted  : 18467
GetRequest Transmitted   : 18446
Trap Transmitted         : 4
Unknown Type Received    : 0
ASN1 Pdu Parse Error     : 0
No Such Name Error       : 0
Pdu Too Big Error        : 0
```

Step 2 To clear the ILMI management statistics for a port, enter the **clrilmicnt** command as follows:

```
pop20one.10.AXSM.a > clrilmicnt <ifnum> <partitionId>
```

Replace *ifnum* with the interface number of the port, and replace *partitionID* with the partition number assigned to the port. The following example shows the switch response to this command.

```
pop20one.10.AXSM.a > clrilmicnt 1 1
ilmi stats for ifNum 1, partId 1 cleared
```

Step 3 To verify that the statistics have been cleared, re-enter the **dspilmicnt** command.

Deleting ILMI Prefixes

The procedure for adding ILMI prefixes is described in "Configuring ILMI Dynamic Addressing" in Chapter 4, "Provisioning AXSM Communication Links." The following procedure describes how to delete an ILMI address prefix from a port.

Step 1 Establish a configuration session using a user name with GROUP1 privileges or higher.

Step 2 To view the ILMI prefixes assigned to a port, enter the **dspprfx** command as follows:

```
pop20one.7.PXM.a > dspprfx <portid>
```

Replace *portid* with the port address using the format *slot*:*bay.line*:*ifnum*. These parameters are described in Table 6-1. For example:

```
pop20one.7.PXM.a > dspprfx 10:2.2:4

INFO:  No Prefix registered
```

In the example above, no ILMI prefixes have been assigned to the port, so the port will use the prefix configured for the SPVC prefix.

Step 3 To prepare for deleting an ILMI prefix, down the port to be configured with the **dnpnport** command. For example:

```
pop20one.7.PXM.a > dnpnport 10:2.2:4
```

Step 4 Use the following command to delete an ATM prefix for a port:

```
popeye2.7.PXM.a > delprfx <portid> atm-prefix
```

Replace *portid* using the format *slot*:*bay.line*:*ifNum*. Table 6-1 describes these parameters.

Replace *atm-prefix* with the 13-byte ATM address prefix in use.

Step 5 Up the port you configured with the **uppnport** command. For example:

```
pop20one.7.PXM.a > uppnport 10:2.2:4
```

Step 6 To verify the proper ATM prefix configuration for a port, re-enter the **dspprfx** command.

Determining the Software Version Number from Filenames

The following version management commands require a version number to be entered in a specific format:

- **abortrev**
- **burnboot**
- **commitrev**
- **loadrev**
- **runrev**
- **setrev**

In most cases, you will find the correct firmware version numbers in the *2.0.12 Version Software Release Notes, Cisco WAN MGX 8850 Software*. If the release notes are not available, you can use the firmware filename to determine the version number as described below.

Step 1 Establish a configuration session at any access level.

Step 2 To view the files on the switch hard drive, you can enter UNIX-like commands at the switch prompt. To change directories to the firmware directory (FW), enter the **cd** command as follows:

```
mgx8850a.7.PXM.a > cd C:/FW
```

Note Remember that UNIX directory and filenames are case sensitive.

Step 3 To list the contents of the directory, enter the **ll** command:

```
mgx8850a.7.PXM.a > ll
```

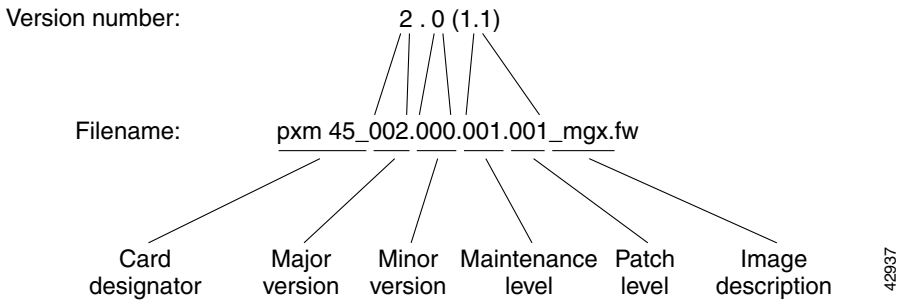
The display shows:

```
pop20one.7.PXM.a > ll
  size          date       time       name
--------       ------     ------    --------
     512    APR-19-2000  01:24:16   .                 <DIR>
     512    APR-19-2000  01:24:16   ..                <DIR>
 2248536    MAY-17-2000  15:12:16   axsm_002.000.000.000.fw
  591008    MAY-15-2000  21:37:28   axsm_002.000.000.000_bt.fw
  839392    MAY-15-2000  21:37:36   pxm45_002.000.000.000_bt.fw
 3450888    MAY-15-2000  21:37:48   pxm45_002.000.000.000_mgx.fw
 2260984    JUN-06-2000  07:18:40   axsm_002.000.001.000.fw
  592288    JUN-06-2000  07:09:02   axsm_002.000.001.000_bt.fw
  844720    JUN-06-2000  07:09:26   pxm45_002.000.001.000_bt.fw
 3481816    JUN-06-2000  07:11:00   pxm45_002.000.001.000_mgx.fw

In the file system :
    total space :  819200 K bytes
    free  space :  786279 K bytes
```

Figure 6-1 shows the information contained in filenames for released software.

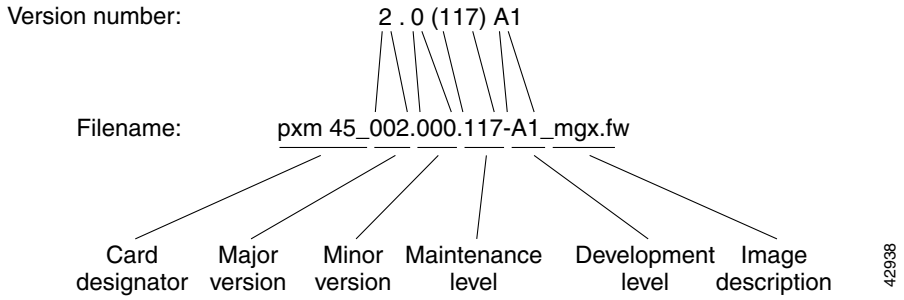
Figure 6-1 Filename Format for Released Software



Filenames that include "_mgx" are for runtime PXM45 firmware, and filenames that include "_bt" are for boot firmware. AXSM runtime firmware images do not have an image description after the version number. When you first receive the switch from Cisco, there will be single versions of each file. If you download updates to any files, there will be multiple versions of those files.

Figure 6-2 shows the information contained in filenames for prereleased firmware. If you are evaluating nonreleased firmware, the filename format shows that the firmware is pre-released and indicates the development level of the prerelease firmware.

Figure 6-2 Filename Format for Prereleased Firmware



Step 4 Translate the filenames to version numbers, and write the numbers down so you can set the revision levels for the software.

Write the version number down in the format required by the revision management commands. The following example shows the required format. If you are logged in as a user with SERVICE_GP access privileges, you can display this example by entering any of the revision management commands without parameters.

```
pop20one.7.PXM.a > runrev
ERR: Syntax: runrev <slot> <revision>
           revision - revision number. E.g.,
                      2.0(1)
                      2.0(1.248)
                      2.0(0)B1 or 2.0(0)B2
                      2.0(0)A1 or 2.0(0)A2
                      2.0(0)I1 or 2.0(0)I2
                      2.0(0)D
```

The first example above, 2.0(1), is for released firmware version 2.0, maintenance release 1. The second example, 2.0(1.248), is for patch 248 to version 2.0, maintenance release 1. The other examples are for prerelease firmware. Prerelease firmware does not include patches; the maintenance release number is increased for each software change.

Table 6-4 shows some example filenames and the correct version numbers to use with the revision management commands.

Table 6-4 Determining Firmware Version Numbers from Filenames

Filename	Version Number for Revision Management Commands
pxm45_002.000.000.000_bt.fw	2.0(0)
pxm45_002.000.001.000_bt.fw	2.0(1)
axsm_002.000.001.001.fw	2.0(1.1)
pxm45_002.000.001-D_mgx.fw	2.0(1)D
pxm45_002.000.014-A1_bt.fw	2.0(14)A1
axsm_002.000.016-D.fw	2.0(16)D

Displaying Software Revisions in Use

The following sections describe:

- Displaying Software Revisions for All Cards
- Displaying Software Revisions for a Single Card

Displaying Software Revisions for All Cards

To display the boot and runtime software version in use on every card in the switch, enter the **dsprevs** command as shown in the following example:

```
pop20one.7.PXM.a > dsprevs
pop20one                          System Rev: 02.00   Jan. 24, 2001 18:32:57 PST
MGX8850                                               Node Alarm: NONE
Physical  Logical   Inserted       Cur Sw              Boot FW
Slot      Slot      Card           Revision            Revision
--------  -------   --------       --------            --------

01        01        AXSM_4OC12     2.0(12)             2.0(12)
02        02        AXSM_4OC12     2.0(12)             2.0(12)
03        03        ---            ---                 ---
04        04        ---            ---                 ---
05        05        ---            ---                 ---
06        06        ---            ---                 ---
07        07        PXM45          2.0(12)             2.0(12)
08        07        PXM45          2.0(12)             2.0(12)
09        09        ---            ---                 ---
10        10        ---            ---                 ---
11        11        ---            ---                 ---
12        12        ---            ---                 ---
13        13        ---            ---                 ---
14        14        ---            ---                 ---
15        15        ---            ---                 ---
16        16        ---            ---                 ---

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

To display the upgrades status of the runtime software on all switch cards, enter the **dsprevs -status** command as shown in the following example:

```
pop20one.7.PXM.a > dsprevs -status
pop20one                          System Rev: 02.00   Jan. 24, 2001 18:37:16 PST
MGX8850                                               Node Alarm: NONE
Phy. Log. Cur Sw           Prim Sw          Sec Sw           Rev Chg
Slot Slot Revision         Revision         Revision         Status
---- ---- --------         --------         --------         -------

01   01   2.0(12)          2.0(12)          2.0(12)          ---
02   02   2.0(12)          2.0(12)          2.0(12)          ---
03   03   39.164(233.78)   ---              ---              ---
04   04   251.219(56.207)  ---              ---              ---
05   05   254.11(150.37)   ---              ---              ---
06   06   190.169(6.88)    ---              ---              ---
07   07   2.0(12)          2.0(12)          2.0(12)          ---
08   07   2.0(12)          2.0(12)          2.0(12)          ---
09   09   142.40(140.117)  ---              ---              ---
10   10   42.208(73.15)    ---              ---              ---
11   11   63.152(10.87)    ---              ---              ---
12   12   125.5(211.9)     ---              ---              ---
13   13   219.244(64.165)  ---              ---              ---
14   14   152.117(161.21)  ---              ---              ---
15   15   233.108(172.149) ---              ---              ---
16   16   146.171(183.191) ---              ---              ---

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

Displaying Software Revisions for a Single Card

To display the boot and runtime software revisions in use on a single card, enter the **dspcd** <*slot*> command as shown in the following example:

```
pop20one.7.PXM.a > dspcd 7
pop20one                          System Rev: 02.00   Jan. 24, 2001 18:39:00 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(12)             ---                 ---
Sec SW Rev:         2.0(12)             ---                 ---
Cur SW Rev:         2.0(12)             ---                 ---
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:
```

Managing Redundant Cards

The MGX 8850 switch supports redundancy between two cards of the same type. For PXM45 cards, this redundancy is preconfigured on the switch. To establish redundancy between two AXSM cards, you can use the **addred** command as described in "Establishing Redundancy Between Two AXSM Cards," in Chapter 3, "Preparing AXSM Cards and Lines for Communication."

The following sections describe how to

- Display the redundancy configuration
- Switch operation from one card to the other
- Remove the redundancy between two AXSM cards

Displaying Redundancy Status

To display the redundancy configuration for the switch, use the following procedure.

Step 1 Establish a configuration session at any access level.

Step 2 To view the redundancy status, enter the following command:

```
mgx8850a.7.PXM.a > dspred
```

After you enter the command, the switch displays a report similar to the following:

```
pop2one.7.PXM.a > dspred
pop2one                          System Rev: 02.00   Feb. 23, 2000 10:59:10 PST
MGX8850                                              Shelf Alarm: NONE
Primary  Primary  Primary  Secondary  Secondary  Secondary  Redundancy
SlotNum   Type     State    SlotNum     Type       State       Type
-------  -------  -------  ---------  ---------  ---------  ----------
  7      PXM45     Active      8        PXM45      Empty Resvd  1-1
```

Switching Between Redundant PXM Cards

When the switch has two PXM45 cards running in active and standby mode, you can use the **swtichcc** command to swap the roles of the two cards. Typically, you use this command to switch roles so you can upgrade the hardware or software on one of the cards.

Note The **switchcc** command is executed only when all cards are operating in active or standby roles. For example, if the non-active PXM45 is not in standby state, or if an AXSM card is being upgraded, the **swtichcc** command is not executed.

To switch operation from one redundant PXM card to another, use the following procedure.

Step 1 Establish a configuration session using a user name with SUPER_GP privileges or higher.

Step 2 Check the status of the active and standby cards by entering the **dspcds** command.

The **dspcds** command should list one card as *active* and one card as *standby*. If the cards are not in their proper states, the switchover cannot take place.

Step 3 To switch cards, enter the following command after the switch prompt:

```
mgx8850a.7.PXM.a > switchcc
```

Switching Between Redundant AXSM Cards

To switch operation from an active redundant AXSM card to the standby card, use the following procedure.

Step 1 Establish a configuration session using a user name with SERVICE_GP privileges or higher.

Step 2 Check the status of the active and standby cards by entering the **dspcds** command.

The **dspcds** command should list one card as *active* and one card as *standby*. If the cards are not in their proper states, the switchover cannot take place.

Step 3 To switch cards, enter the following command after the switch prompt:

```
mgx8850a.7.PXM.a > switchredcd <fromSlot> <toSlot>
```

Replace *fromSlot* with the card number of the active card, and replace *toSlot* with the card number to which you want to switch control.

Removing Redundancy between Two Cards

To remove the redundant relationship between two AXSM cards, use the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1_GP privileges or higher.

Step 2 To remove card redundancy, enter the following command after the switch prompt:

```
mgx8850a.7.PXM.a > delred <primarySlot>
```

Replace *primarySlot* with the number of the primary card. You can view the primary and secondary status of cards by entering the **dspred** command.

Managing Redundant APS Lines

The MGX 8850 switch supports APS line redundancy. To establish redundancy between two lines, you can use the **addapsln** command as described in "Establishing Redundancy Between Two Lines with APS," in Chapter 3, "Preparing AXSM Cards and Lines for Communication."

The following sections describe how to

- Display APS line information
- Configure APS lines
- Switch APS lines
- Remove the redundancy between two lines

Displaying APS Line Information

To display the APS line redundancy configuration for an AXSM card, use the **dspapsln** command as described below.

Step 1 Establish a configuration session at any access level.

Step 2 To view the redundancy status, enter the following command after the switch prompt:

```
pop20one.9.AXSM.a > dspapsln
```

After you enter the command, the switch displays a report similar to the following:

```
pop20one.9.AXSM.a > dspapsln
Working Prot.  Conf    Oper    Active SFBer SDBer WTR   Revt Dir LastUser
Index   Index  Arch    Arch    Line   10^-n 10^-n (min)          SwitchReq
------- -----  ----    -----   ------ ----- ----- ----- ---- --- ----------
  9.1.1  9.1.2  1+1     1+1    working     3     5     5   No uni No Request
  9.2.1  9.2.2  1+1     1+1    working     3     5     5   No uni No Request
```

Configuring APS Lines

To change the configuration for an APS line, use the **cnfapsln** command as described in the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1_GP privileges or higher.

Step 2 Enter the **cnfapsln** command as follows:

```
pop20one.9.AXSM.a > cnfapsln -w <workingIndex> -sf <SignalFaultBER>
-sd <SignalDegradeBER> -wtr <Wait To Restore> -dr <direction> -rv <revertive>
```

Select the working line to configure by replacing *workingIndex* with the with the location of the working line using the format “slot.bay.line.” For example, to specify the line on card 9, bay 1, line 2, enter 9.1.2.

Table 6-5 describes the **cnfapsln** command options.

Table 6-5 Options for cnfapsln Command

Option	Description
-sf	The signal failure Bit Error Rate (BER) threshold. Replace *SignalFaultBER* with a number in the range of 3 to 5. 5 = signal failure BER threshold = 10 ^^ -5.
-sd	The Signal degrade BER threshold. Replace *SignalDegradeBER* with a number in the range of 5 to 9. 5 = signal degrade BER threshold = 10 ^^ -5.
-wtr	The number of minutes to wait before attempting to switch back to the working line. Replace *Wait To Restore* with a number in the range of 1 to 12 minutes. Note that this option is applicable only when the **-rv** option is set to 2, enabling revertive operation.

Table 6-5 Options for cnfapsln Command (continued)

Option	Description
-dr	The direction option, which specifies the communication paths to be switched when a failure occurs. The options are unidirectional or bidirectional. When the unidirectional option is selected, only the affected path, either transmit or receive, is switched. When the bidirectional option is selected, both paths are switched. To set this option, replace the *direction* variable with **1** for unidirectional operation or **2** for bidirectional operation.
-rv	The revertive option, which defines how the switch should operate when a failed line recovers. The options are revertive and non-revertive. When the -rv option is configured for revertive operation and the working line recovers, the switch will switch back to the working line after the period specified by the -wtr option. If the line is configured for non-revertive operation, a failure on the working line will cause the switch to use the protect line until a manual switchover is initiated as described in "Switching APS Lines." To set this option, replace the *revertive* variable with **1** for non-revertive operation or **2** for revertive operation.

Switching APS Lines

To switch between two APS lines, use the **switchapsln** command as described in the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1_GP privileges or higher.

Step 2 Enter the **switchapsln** command as follows:

```
pop20one.9.AXSM.a > switchapsln <bay> <line> <switchOption> <serviceSwitch>
```

Select the working line to switch by replacing *bay* with the bay number of the working line, and replacing *line* with the line number for the working line.

Table 6-6 describes the other options you can use with this command.

Table 6-6 Options for switchapsln Command

Option	Value	Description
switchOption	1	Clear
	2	Lockout of protection
	3	Forced working->protection
	4	Forced protection->working
	5	Manual working->protection
	6	Manual protection->working; applies only to 1+1 mode
serviceSwitch	0 or 1	Zero switches specified line. One switches all lines.

Removing APS Redundancy between Two Lines

To remove the redundant APS line relationship between two lines, use the **delapsln** command as described in the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1_GP privileges or higher.

Step 2 To remove redundancy between the two lines, enter the following command after the switch prompt:

```
mgx8850a.7.PXM.a > delapsln <workingIndex>
```

Select the working line to delete by replacing *workingIndex* with the location of the working line using the format "*slot.bay.line*." In the following example, the **delapsln** command removes the APS redundancy between the working line at Card 9, Bay 2, Line 1 and the protection line associated with it.

```
pop20one.9.AXSM.a > delapsln 9.2.1
```

Managing Network Clock Sources

The following sections describe how to do the following:

- View the configured clock sources
- Reconfiguring network clock sources
- Delete clock sources
- Restoring clock the clock source after failure

Viewing the Configured Clock Sources

One command allows you to view the configured clock sources and determine which clock source is active. To view the configured clock sources, use the following procedure.

Step 1 Establish a configuration session at any access level.

Step 2 Enter the **dspclksrcs** command:

```
mgx8850a.7.PXM.a > dspclksrcs
```

The following example shows a display with neither primary nor secondary clocks configured. This is the default configuration of a switch, which uses the internal clock as the network clock source. Whenever the active clock is listed as null, the switch is using the internal clock.

```
pop20two.7.PXM.a > dspclksrcs
Primary clock type:     null
Primary clock source:   0.0
Primary clock status:   not configured
Primary clock reason:   okay
Secondary clock type:   null
Secondary clock source: 0.0
Secondary clock status:   not configured
Secondary clock reason:   okay
Active clock:           internal clock
source switchover mode: non-revertive
```

In the following example, the display shows that both the primary and secondary clocks are configured for network clock sources. The primary clock source is coming from port 4 on the AXSM card in slot 10. The primary clock source is active. The secondary clock source is coming from port 1 on the AXSM card in slot 9.

```
pop20one.7.PXM.a > dspclksrcs
Primary clock type:     generic
Primary clock source:   10:2.2:4
Primary clock status:   ok
Primary clock reason:   okay
Secondary clock type:   generic
Secondary clock source: 9:1.1:1
Secondary clock status:   ok
Secondary clock reason:   okay
Active clock:           primary
source switchover mode: non-revertive
```

Reconfiguring Clock Sources

The procedure you use to reconfigure a clock source depends on whether or not you need to change the role of the clock source. If the clock source keeps it role as either primary or secondary, just enter a new **cnfclksrc** command as described in the following locations:

- To reconfigure a clock source for a BITS clock, see "Configuring BITS Clock Sources," in Chapter 2, "Configuring General Switch Features."
- To reconfigure a clock source to use an AXSM line, see "Configuring AXSM Line Clock Sources," in Chapter 4, "Provisioning AXSM Communication Links."

When reconfiguring a clock source from primary to secondary or from secondary to primary, you must delete both existing clock sources and define new clock sources. The switch will not allow you to create two primary or two secondary clock sources, and the switch will not allow you to configure the same line as both primary and secondary clock sources. After you have deleted the old clock source, you can use the appropriate procedure referenced above to define a new clock source.

To delete a clock source, use the **delclksrc** command as described in the next section.

Deleting Clock Sources

Deleting a clock source deletes the definition of the clock source, not the clock source itself. You might want to delete a primary or secondary clock source definition so that you can reassign the clock source to another line.

To delete a clock source, use the following procedure.

Step 1 Establish a configuration session using a user name with SUPER_GP privileges or higher.

Step 2 Display the clock source information by entering the **dspclksrcs** command.

You will need the information in this display to delete the clock source.

Step 3 To delete a clock source, enter the **delclksrc** command:

```
mgx8850a.7.PXM.a > delclksrc <priority>
```

The following example deletes a primary clock source:

```
mgx8850a.7.PXM.a > delclksrc primary
```

Step 4 To verify that a clock source has been deleted, enter the **dspclksrcs** command. When the primary or secondary clock source is deleted, the clock type is set to `null`.

Restoring a Clock Source After Failure

The revertive option for clock sources connected to the PXM45 allows a primary clock source to resume operation as the primary clock source after a failure and restoration of the clock signal. However, if you have the revertive option disabled, or if your primary clock source is connected to an AXSM line, you will have to reconfigure the primary clock source after it is restored. To reconfigure the clock source as a BITS clock source, see "Configuring BITS Clock Sources," in Chapter 2, "Configuring General Switch Features." To reconfigure the clock source as a AXSM line clock source, see "Configuring AXSM Line Clock Sources," in Chapter 4, "Provisioning AXSM Communication Links."

Tips Use the **dspclksrcs** command to display the current configuration settings for the primary clock source. Having this information available makes it easier to re-enter the **cnfclksrc** command.

Note To change a clock source on the PXM45 from nonrevertive to revertive, enter the **cnfclksrc** with the option **–revertive enable**.

When the primary clock source is restored on the master clock node, you may have to reconfigure the primary clock source at each remote node where the node has switched from the primary source to the secondary source. This reconfiguration is necessary only if the local node has detected a change in the master clock source.

To determine if you need to reconfigure the primary clock at a non-master node, enter the **dspclksrcs** command. If the Active clock has changed to either secondary or **internal clock**, you must use the **cnfclksrc** command to reconfigure the primary clock source for that node.

Managing Feeder Connections

The procedure for defining feeder connections is described in Chapter 4, "Provisioning AXSM Communication Links." Table 6-7 lists commands that you can use to manage feeder connections.

Table 6-7 Feeder Management Commands

Command	Description
dspfdrs	Display the feeders configured on an AXSM card.
dspfdr <*ifnum*>	Display the feeder configuration for a specific interface. Replace *ifnum* with the interface number.
dspfdrstat <*ifnum*>	Display statistics on a feeder interface. Replace *ifnum* with the interface number.

Table 6-7 Feeder Management Commands (continued)

Command	Description
clrfdrstat <*ifnum*>	Clear statistics counters for a feeder interface. Replace *ifnum* with the interface number.
delfdr <*ifnum*>	Remove the feeder configuration from an interface. Replace *ifnum* with the interface number.

Displaying SVCs

To display active SVCs, use the following procedure.

Step 1 Establish a CLI management session at any user access level.

Step 2 Enter the following command:

```
popeye2.7.PXM.a > dsppncons
```

The following is an example report for the **dsppncons** command.

```
popeye2.7.PXM.a > dsppncons
           Port   VPI   VCI CallRef       X-Port    VPI   VCI  CallRef Type OAM-Type
        9:1.1:1     0    32       1       9:1.2:2      0    36       5   PTP    No
    Calling-Addr:47.666666666666666666666666.666666666666.00
    Called-Addr: 47.111111111111111111111111.111111111111.64
        9:1.2:2     0    36       5       9:1.1:1      0    32       1   PTP    No
    Calling-Addr:47.666666666666666666666666.666666666666.00
    Called-Addr: 47.111111111111111111111111.111111111111.64
```

Managing Service Class Templates (SCTs)

The Service Class Template (SCT) provides the ability to automatically set numerous standard ATM parameters by simply installing the SCT.

The SCT provides the settings for two types of parameters:

- Connection parameters
- Class of Service Buffer (CoSB) configuration parameters

Connection parameters control establishing and maintaining virtual connections (VCs), and may include policing action thresholds and bandwidth configurations.

Class of Service Buffer (CoSB) configuration parameters control Quality of Service (QoS) settings.

Cisco provides two SCTs that are recommended for use.

- SCT 2
- SCT 3

SCT 2 provides policing action settings.

SCT 3 does not provide policing action settings and should be used if you do not require policing.

SCTs 2 and 3 can be copied from the PXM45 card to an AXSM card. The path for SCTs on an AXSM card is /SCT/AXSM

Individual SCT settings cannot be modified using the CLI. If you want to modify specific SCT parameter settings and then save the SCT, you must use Cisco Wan Manager (CWM).

If you want to create your own SCT, you can do so by modifying the parameters in SCT 2 or 3 and then saving the SCT with a different name after you have modified the parameters. You can save up to 250 SCTs with names such as SCT 4 or SCT 100.

If you just want to modify ATM parameters after the SCT is loaded, but you do not want to save the settings as an SCT, you can use the CLI commands: **cnfabr**, **cnfcon**, or **cnfabrtparmdft**.

Note If you use your own SCTs you must make sure that your connecting endpoints have compatible SCTs; that is, endpoints cannot have ATM parameters with conflicting settings.

The following sections describe how to:

- Display the SCT assigned to a port
- Display the SCT assigned to a card
- Display the SCT settings in use on a port
- Display the SCT settings in use on a card

Displaying the SCT Assigned to a Port

To display the SCT assigned to a port, use the following procedure.

Step 1 Establish a configuration session at any user access level.

Step 2 Enter the following command:

```
pop20two.9.AXSM.a > dspports
```

The **dspports** report displays a column labeled “Port SCT Id,” which identifies the SCT assigned to each port:

```
pop20two.1.AXSM.a > dspports
ifNum Line Admin Oper. Guaranteed Maximum     Port SCT Id     ifType  VPI
           State State Rate       Rate                              (VNNI only)
----- ---- ----- ----- ---------- --------- ----------------- ------ ----------
    1  1.1    Up    Up    1412830   1412830   2                   NNI    0
    2  1.2    Up    Up    1412830   1412830   2                   NNI    0
    3  2.1    Up    Up    1412830   1412830   2                   NNI    0
    4  2.2    Up    Up    1412830   1412830   2                   UNI    0
```

Displaying the SCT Assigned to a Card

To display the SCT assigned to a card, use the following procedure.

Step 1 Establish a configuration session at any user access level.

Step 2 Enter the following command:

```
pop20two.9.AXSM.a > dspcd
```

The **dspcd** report displays a row labeled "Card SCT Id," which identifies the SCT assigned to the card.

```
pop20two.1.AXSM.a > dspcd
                    Front Card          Upper Card          Lower Card
                    ----------          ----------        ------------
Card Type:          AXSM-4-622          SMFIR-2-622         SMFIR-2-622
State:              Active              Present             Present
Serial Number:      SAK03500088         SBK0406002V         SAK0346003F
Boot FW Rev:        2.0(252)A1          ---                 ---
SW Rev:             2.0(252)A1          ---                 ---
800-level Rev:      M6                  14                  13
Orderable Part#:    800-5774-5          800-5383-1          800-5383-1
PCA Part#:          73-4504-2           73-4125-1           73-4125-1
Reset Reason:On Power up
Card SCT Id: 2

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

Displaying Port SCT Settings

To view the port SCT settings, use the following procedure.

Step 1 Establish a CLI management session at any user access level.

Step 2 Enter the following command:

```
pop20two.9.AXSM.a > dspportsct <bw|gen|cosb|vcThr|cosThr> <ifNum>
```

Select one of the options to display one of the five SCT configuration reports, and replace *ifNum* with the number of the port you want to view. Table 6-8 describes the reports for each of these options.

Note The option names are case sensitive. The switch does not recognize the **vcthr** option. You must enter **vcThr**.

Table 6-8 Options for dspcdsct Command

Option	Description
bw	Displays bandwidth and policing parameters.
gen	Displays general SCT parameters.

Table 6-8 Options for dspcdsct Command (continued)

cosb	Displays COSB parameters.
vcThr	Displays virtual circuit threshold parameters.
cosThr	Displays COSB threshold parameters.

The following sections display the reports for each of the **dspportsct** command options.

Port SCT Bandwidth and Policing Parameters (bw)

The following report appears when you enter the **dspportsct bw** command:

```
pop20two.10.AXSM.a > dspportsct bw 1
+-------------------------------------------------------------------------------+
Service Class Template [2] : Bw and Policing Parameters
+-------------------------------------------------------------------------------+
| SERV-TYPE |    PCR    |    SCR    |    MCR    |    MBS    |    CDVT   |    ICR    |
+-------------------------------------------------------------------------------+
| CBR.1     | 00001000 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| VBR-RT.1  | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-RT.2  | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-RT.3  | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-nRT.1 | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-nRT.2 | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-nRT.3 | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| UBR.1     | 00000010 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| UBR.2     | 00000010 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| ABR       | 00000010 | 00000000 | 01000000 | 00000001 | 00250000 | 00000000 |
| CBR.2     | 00001000 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| CBR.3     | 00001000 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
+-------------------------------------------------------------------------------+
```

Table 6-9 describes the service types shown in the example, and Table 6-10 explains the SCT bandwidth and policing parameters.

Table 6-9 Service Class Template: ATM Service Types

Label	Description
CBR.1, CBR.2, & CBR.3	Constant Bit Rate. Used for connections that require a high QoS and strict CDV. The numbers .1, .2 and .3 indicate the type of ATM traffic management parameters used in policing for this service type.
VBR-RT.1, VBR-RT.2, & VBR-RT.3	Variable Bit Rate - Real Time. Used for connections that have bursty traffic and that require a strict CDV. The numbers .1, .2 and .3 indicate the type of ATM traffic management parameters used in policing for this service type.
VBR-nRT.1, VBR-nRT.2, & VBR-nRT.3	Variable Bit Rate - non-Real Time. Used for connections that do not require end to end timing. The numbers .1, .2 and .3 indicate the type of ATM traffic management parameters used in policing for this service type.

Table 6-9 Service Class Template: ATM Service Types (continued)

Label	Description
UBR.1& UBR.2	Unspecified Bit Rate. Used for connections that can allow any amount of data, up to a specified maximum, to be transmitted, but with no guarantees in terms of cell loss rate and delay. The numbers .1, .2 and .3 indicate the type of ATM traffic management parameters used in policing for this service type.
ABR	Available Bit Rate. Used for connections that do not require timing relationships between source and destination endpoints. ABR provides no guarantees in terms of cell loss or delay, and provides only a best-effort service. Cell rates are adjusted in response to the state or condition of the network and its ability to successfully deliver data.

Table 6-10 Service Class Template: SCT Bw and Policing Parameters

Parameter	Range and Units	Description
SERV-TYPE	N.A.	The service type (i.e. CBR, VBR, ABR) to which the parameters (i.e. PCR, SCR, MCR) in this table apply.
PCR	0 to 1000000	Peak Cell Rate. The peak (maximum) cell rate for a connection using the service type. This value is a percentage of the maximum cell rate for the logical interface. 1000000 is equal to 100%.
SCR	0 to 1000000	Sustained Cell Rate. The sustained cell rate for a connection using this service type. This value is a percentage of the maximum cell rate for the logical interface. 1000000 is equal to 100%.
MCR	0 to 1000000	Minimum Cell Rate. The minimum cell rate for a connection using the service type. This value is a percentage of the maximum cell rate for the logical interface. 1000000 is equal to 100%.
MBS	1 to 5000000	Maximum Burst Size. Used for policing.
CDVT	0 to 5 microseconds	Cell Delay Variation Tolerance. Used for policing. For PNNI, the CDVT default value from the SCT is not used. Use **dspcdvtdft**.
ICR	0 to 1000000	Initial Cell Rate. The cell rate used to begin a transmission on a connection that has been idle for a configured period of time. This value is a percentage of the PCR for the logical interface. 1000000 is equal to 100%. (Used only on ABR service type connections.)

Port SCT General Parameters (gen)

The following report appears when you enter the **dspportsct gen** command:

```
pop20two.10.AXSM.a > dspportsct gen 1
+-------------------------------------------------------------------------------------------------------+
Service Class Template [2] : General Parameters
+-------------------------------------------------------------------------------------------------------+
| SERV-TYPE | COSB_NUM | CAC_TYPE | UPC_ENB   | CLP-SELEC |    GCRA-1     |    GCRA-2     | CI-CNTRL |
+-------------------------------------------------------------------------------------------------------+
| CBR.1     | 00000003 |    B-CAC |GCRA1-ENB | 000000003 |       DISCARD |       DISCARD | DISABLED |
| VBR-RT.1  | 00000004 |    B-CAC |GCRA 1 & 2| 000000002 |       DISCARD |       DISCARD | DISABLED |
| VBR-RT.2  | 00000004 |    B-CAC |GCRA 1 & 2| 000000001 |       DISCARD |       DISCARD | DISABLED |
| VBR-RT.3  | 00000004 |    B-CAC |GCRA 1 & 2| 000000001 |       DISCARD |       SET-CLP | DISABLED |
| VBR-nRT.1 | 00000005 |    B-CAC |GCRA 1 & 2| 000000002 |       DISCARD |       DISCARD | DISABLED |
| VBR-nRT.2 | 00000005 |    B-CAC |GCRA 1 & 2| 000000001 |       DISCARD |       DISCARD | DISABLED |
| VBR-nRT.3 | 00000005 |    B-CAC |GCRA 1 & 2| 000000001 |       DISCARD |       SET-CLP | DISABLED |
| UBR.1     | 00000006 |  LCN_CAC |GCRA1-ENB | 000000003 |       DISCARD |       DISCARD | DISABLED |
| UBR.2     | 00000006 |  LCN_CAC |GCRA1-ENB | 000000003 | DSCD/SET-CLP  |       DISCARD | DISABLED |
| ABR       | 00000001 |    B-CAC |GCRA1-ENB | 000000003 |       DISCARD |       DISCARD | DISABLED |
| CBR.2     | 00000003 |    B-CAC |GCRA 1 & 2| 000000001 |       DISCARD |       DISCARD | DISABLED |
| CBR.3     | 00000003 |    B-CAC |GCRA 1 & 2| 000000001 |       DISCARD |       SET-CLP | DISABLED |
+-------------------------------------------------------------------------------------------------------+
```

Table 6-11 describes the SCT General Parameters shown in the example.

Table 6-11 Service Class Template: SCT General Parameters

Parameter	Range	Description
SERV-TYPE		The service type (i.e. CBR, VBR, ABR) to which the parameters (i.e. COSB_NUM, CAC_TYPE, UPC_ENB) in this table apply.
COSB_NUM	1 to 16	Class of Service Buffer Number. The number that identifies one of the sixteen CoS buffers. A CoS buffer is a buffer that services connections with similar QoS requirements.
CAC_TYPE		Connection Admission Control. Used by an ATM switch during setup to determine if a connection's requested QoS conforms to the guaranteed QoS standards for ATM connections. LCN_CAC: Logical Connection Number CAC B_CAC: Basic - CAC E_CAC: Enhanced - CAC
UPC_ENB		Usage Parameter Control Enable. Enables or disables GCRA policing functions on the connection. GCRA1-ENB: Enables GCRA1 only. GCRA 1 & 2: Enables both GCRA1 and GCRA2.
CLP-SELEC	1 to 4	Cell Loss Priority Select. Specifies whether a bucket will police for CLP (0+1) or CLP (0) in the dual leaky bucket policing action. 1 - Bucket 1: CLP (0+1) - Bucket 2: CLP (0) 2 - Bucket 1: CLP (0+1) - Bucket 2: CLP (0+1) 3 - Bucket 1: CLP (0+1) - Bucket 2: Disabled 4 - Bucket 1: CLP (0+1) with Maximum Frame Size (MFS)

Table 6-11 Service Class Template: SCT General Parameters (continued)

Parameter	Range	Description
GCRA-1		Generic Cell Rate Algorithm – Bucket 1. In ATM, an algorithm that defines conformance with respect to the traffic contract of the connection. For each cell arrival, the GCRA determines whether the cell conforms to the traffic contract.
GCRA-2		Generic Cell Rate Algorithm – Bucket 2. In ATM, an algorithm that defines conformance with respect to the traffic contract of the connection. For each cell arrival, the GCRA determines whether the cell conforms to the traffic contract.
CI-CNTRL	1 - Enabled 2 - Disabled	Congestion Indication Control. Indicates whether the EFCI Threshold has been exceeded.

Port SCT COSB Parameters (cosb)

The following report appears when you enter the **dspportsct cosb** command:

```
pop20two.10.AXSM.a > dspportsct cosb
+-------------------------------------------------------------------------------------+
|Service Class Template [02] : COSB Parameters
+-------------------------------------------------------------------------------------+
| COSB | MIN-RATE | MAX-RATE | MIN-PRIORITY | EXCESS-PRIORITY | ERS ENABLE |  CLR   |
+-------------------------------------------------------------------------------------+
| 0001 | 00000000 | 00000100 |          000 |             002 |     ENABLE | 10^-01 |
| 0002 | 00000000 | 00000100 |          000 |             002 |     ENABLE | 10^-01 |
| 0003 | 00000000 | 00000100 |          000 |             000 |    DISABLE | 10^-05 |
| 0004 | 00000000 | 00000100 |          000 |             001 |    DISABLE | 10^-03 |
| 0005 | 00000000 | 00000100 |          000 |             001 |    DISABLE | 10^-01 |
| 0006 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0007 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0008 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0009 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0010 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0011 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0012 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0013 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0014 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0015 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0016 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
+-------------------------------------------------------------------------------------+
```

Table 6-12 describes the SCT COSB parameters shown in the example.

Table 6-12 Service Class Template: SCT COSB Parameters

Label	Range and Units	Description
COSB	N.A.	Class of Service Buffer. A buffer or queue which serves connections with similar QoS requirements.
MIN-RATE	1 to 1000000	This field is no longer used and is currently always set to its default value (0) and will be removed in future releases.

Table 6-12 Service Class Template: SCT COSB Parameters (continued)

Label	Range and Units	Description
MAX-RATE	1 to 1000000	This field is no longer used and is currently always set to its default value (100) and will be removed in future releases.
MIN-PRIORITY	0 to 15	The priority at which this COSB will be serviced to guarantee its minimum and maximum bandwidth requirements. • 0 is highest priority • 15 is lowest priority
EXCESS-PRIORITY	0 to 15	The priority at which this COSB will be given access to excess bandwidth. • 0 is highest priority • 15 is lowest priority
ERS ENABLE	1 - Enabled 2 - Disabled	Indicates whether Explicit Rate Stamping (ERS) is enabled or disabled.
CLR	1 to 15	Cell Loss Ratio for this COSB. The minimum supported CLR is 10^{-6} and maximum supported CLR is 10^{-10}

Port SCT Virtual Circuit Threshold Parameters (vcThr)

The following report appears when you enter the **dspportsct vcThr** command:

```
pop20two.10.AXSM.a > dspportsct vcThr 1
+-------------------------------------------------------------------------------------------------------------+
Service Class Template [2] : VC Threshold Parameters
+-------------------------------------------------------------------------------------------------------------+
| SERV-TYPE | VC THRESH | PACKET |  MAX_CELL  |  EFCI   | CLP_HI  |  EPD0   | CLP_LO  | SCALING | SCALING |
|           | TBL IDX   |  MODE  |   THRESH   |         |         |         |  EPD1   |  COSB   |  Log-If |
+-------------------------------------------------------------------------------------------------------------+
| CBR.1     |     002   |   DSB  | 0000002500 | 1000000 | 0800000 | 0600000 | 0800000 | 0000001 | 0000001 |
| VBR-RT.1  |     003   |   DSB  | 0000005000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-RT.2  |     004   |   DSB  | 0000005000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-RT.3  |     005   |   DSB  | 0000005000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-nRT.1 |     006   |   DSB  | 0000025000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-nRT.2 |     007   |   DSB  | 0000025000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-nRT.3 |     008   |   DSB  | 0000025000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| UBR.1     |     009   |   DSB  | 0000050000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000004 | 0000004 |
| UBR.2     |     010   |   DSB  | 0000050000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000004 | 0000004 |
| ABR       |     011   |   DSB  | 0000050000 | 0200000 | 0800000 | 0600000 | 0800000 | 0000003 | 0000003 |
| CBR.2     |     012   |   DSB  | 0000002500 | 1000000 | 0800000 | 0600000 | 0800000 | 0000001 | 0000001 |
| CBR.3     |     013   |   DSB  | 0000002500 | 1000000 | 0800000 | 0600000 | 0800000 | 0000001 | 0000001 |
+-------------------------------------------------------------------------------------------------------------+
```

Table 6-13 describes the SCT VC Threshold parameters shown in the example.

Table 6-13 Service Class Template: SCT VC Threshold Parameters

Label	Range and Units	Description
SERV-TYPE	N.A.	The service type (i.e. CBR, VBR, ABR) to which the parameters (i.e. EFCI, CLP_HI, EPD0) in this table apply.
VC THRESH TBL IDX	N.A.	An index number into the queue engine's VC threshold table.
PACKET MODE	1 - Enabled 2 - Disabled	Enables or disables Packet Discard Mode on the connection.
MAX_CELL THRESH	0 to 5000000 microseconds	The VcMax threshold for CLP (0+1) cells in microseconds.
EFCI	0 to 1000000	Explicit Forward Congestion Indication. The VC EFCI discard threshold. This value is a percentage of MAX_CELL THRESH. 1000000 is equal to 100%.
CLP_HI	0 to 1000000	Cells Loss Priority - High. The high hysteresis threshold at which CLP (1) cells will be discarded. The cells will continue to be discarded until the CLP_LO threshold is reached. This value is a percentage of MAX_CELL THRESH. 1000000 is equal to 100%.
EPD0	0 to 1000000	Early Packet Discard 0. The maximum threshold for CLP(0+1) cells. This value is a percentage of the MAX_CELL THRESH for the connection. 1000000 is equal to 100%.
CLP_LO /EPD1	0 to 1000000	Cells Loss Priority Low / Early Packet Discard 1. The low hysteresis threshold at which CLP (1) cells will stop being discarded. If packet mode is enable, EPD1 executes.

Table 6-13 Service Class Template: SCT VC Threshold Parameters (continued)

Label	Range and Units	Description
SCALING COSB	1 to 4	Class of Service Scaling Class. Indicates which of the four Scaling Class Tables (1 to 4, see Table 6-14) to use for a connection. Each table is for a specific service category and has an index of 16 entries. Each index entry contains a percentage by which to scale traffic on a connection to reduce CoS buffer congestion. The hardware generates the index and selects the entries as needed. Each entry is the ratio of the COSB cell count to the COSB maximum threshold. CoS scaling occurs when the CoSB cell count is approximately 50% of the CoSB max threshold.
SCALING Log-If	1 to 4	Logical Port Scaling Class. Indicates which of the four Scaling Class Tables (1 to 4, see Table 6-15) to use on a logical port. Each table is for a specific service category and has an index of 16 entries. Each index entry contains a percentage by which to scale traffic on a connection on a logical port to reduce congestion. The hardware generates the index and selects the entries as needed. Each entry is the ratio of the interface cell count to the interface maximum threshold. Interface scaling occurs when the interface cell count is approximately 50% of the interface max threshold.

Table 6-14 Class of Service (CoS) Scaling Table

Index	Scaling Class Table #1 (CBR)	Scaling Class Table #2 (VBR)	Scaling Class Table #3 (ABR)	Scaling Class Table #4 (UBR)
0	100.00%	100.00%	100.00%	100.00%
1	100.00%	100.00%	100.00%	100.00%
2	100.00%	100.00%	100.00%	100.00%
3	100.00%	100.00%	100.00%	100.00%
4	100.00%	100.00%	100.00%	100.00%
5	100.00%	100.00%	100.00%	100.00%
6	100.00%	100.00%	100.00%	67.00%
7	100.00%	100.00%	100.00%	34.00%
8	100.00%	100.00%	50.00%	20.00%
9	100.00%	50.00%	25.00%	12.00%
10	100.00%	25.00%	12.00%	8.00%
11	100.00%	12.00%	6.00%	4.00%

Table 6-14 Class of Service (CoS) Scaling Table (continued)

Index	Scaling Class Table #1 (CBR)	Scaling Class Table #2 (VBR)	Scaling Class Table #3 (ABR)	Scaling Class Table #4 (UBR)
12	100.00%	6.00%	3.00%	2.50%
13	100.00%	3.00%	1.30%	1.40%
14	100.00%	1.30%	0.75%	1.00%
15	100.00%	0.50%	0.50%	0.50%

Table 6-15 Logical Interface Scaling Table

Index	Scaling Class Table #1 (CBR)	Scaling Class Table #2 (VBR)	Scaling Class Table #3 (ABR)	Scaling Class Table #4 (UBR)
0	100.00%	100.00%	100.00%	100.00%
1	100.00%	100.00%	100.00%	100.00%
2	100.00%	100.00%	100.00%	100.00%
3	100.00%	100.00%	100.00%	100.00%
4	100.00%	100.00%	100.00%	100.00%
5	100.00%	100.00%	100.00%	100.00%
6	100.00%	100.00%	100.00%	67.00%
7	100.00%	100.00%	100.00%	34.00%
8	100.00%	100.00%	50.00%	20.00%
9	100.00%	50.00%	25.00%	12.00%
10	100.00%	25.00%	12.00%	8.00%
11	100.00%	12.00%	6.00%	4.00%
12	50.00%	6.00%	3.00%	2.50%
13	25.00%	3.00%	1.30%	1.40%
14	6.00%	1.30%	0.75%	1.00%
15	0.50%	0.50%	0.50%	0.50%

Port SCT COSB Threshold Parameters (cosThr)

The following report appears when you enter the **dspportsct cosThr** command:

```
pop20two.10.AXSM.a > dspportsct cosThr 1
+-------------------------------------------------------------------------------------------------+
Service Class Template [00002] : COSB Threshold Parameters
+-------------------------------------------------------------------------------------------------+
| COSB |COSB THRESH|  MAX_CELL  |  EFCI   | CLP_HI  |  EPD0   | CLP_LO  |   RED   | RED PROB  |
|      | TBL IDX   |   THRESH   |         |         |         |  EPD1   |         |  FACTOR   |
+-------------------------------------------------------------------------------------------------+
| 0001 |  0000002  |  1000000   | 0200000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0002 |  0000003  |  1000000   | 0200000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0003 |  0000004  |     5000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0004 |  0000005  |    10000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0005 |  0000006  |    50000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0006 |  0000007  |   100000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0007 |  0000008  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0008 |  0000009  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0009 |  0000010  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0010 |  0000011  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0011 |  0000012  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0012 |  0000013  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0013 |  0000014  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0014 |  0000015  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0015 |  0000016  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0016 |  0000017  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
+-------------------------------------------------------------------------------------------------+
```

Table 6-16 describes the SCT COSB parameters shown in the example.

Table 6-16 Service Class Template: SCT COSB Threshold Parameters

Label	Range and Units	Description
SERV-TYPE	N.A.	The service type (i.e. CBR, VBR, ABR) to which the parameters (i.e. EFCI, CLP_HI, EPD0) in this table apply.
COSB THRESH TBL IDX	N.A.	An index number into Queue Engine's COSB threshold table.
MAX_CELL THRESH	0 to 5000000 microseconds	The maximum threshold, in microseconds, beyond which all CLP (0+1) cells must be dropped.
EFCI	0 to 1000000	Explicit Forward Congestion Indication. The threshold level for congestion indication for ABR traffic using CI control. This threshold is a percentage of the MAX_CELL THRESH for the connection. 1000000 is equal to 100%.
CLP_HI	0 to 1000000	Cells Loss Priority High. The maximum number of cells that can be queued in the buffer. CLP(1) cells that exceed this threshold are discarded. This threshold is a percentage of the MAX_CELL THRESH for the connection. 1000000 is equal to 100%.

Table 6-16 Service Class Template: SCT COSB Threshold Parameters (continued)

Label	Range and Units	Description
EPD0	0 - 1000000	Early Packet Discard 0. The maximum number of cells that can be queued in the buffer in packet mode. Any CLP(0+1) cells that exceed this threshold, will be discarded. This threshold is a percentage of the MAX_CELL THRESH for the connection. 1000000 is equal to 100%.
CLP_LO /EPD1	0 to 1000000	Cell Loss Priority Low/ Early Packet Discard 1. The threshold at which CLP (0+1) cells that exceed this threshold are discarded. This threshold is a percentage of the MAX_CELL THRESH for the connection. 1000000 is equal to 100%.
RED	0 - 1000000	Random Early Discard. The threshold at which the COSB Random Early Discard is activated. This threshold is a percentage of the MAX_CELL THRESH for the connection. 1000000 is equal to 100%.
RED PROB FACTOR	0 to 15	RED Probability Factor. The mantissa value of probability for maximum discard when RED is activated. Determined as 1/2^<value>.

Displaying Card SCT Settings

To view the card SCT settings, use the following procedure.

Step 1 Establish a CLI management session at any user access level.

Step 2 Enter the following command:

```
pop20two.9.AXSM.a > dspcdsct <bw|gen|cosb|vcThr|cosThr>
```

Select one of the options to display one of the five SCT configuration reports. Table 6-17 describes the reports for each of these options. The following section lists sample reports for each of these options.

Note The option names are case sensitive. For example, the switch does not recognize the **vcthr** option. You must enter **vcThr**.

Table 6-17 Options for dspcdsct Command

Option	Description
bw	Displays bandwidth and policing parameters.
gen	Displays general SCT parameters.
cosb	Displays COSB parameters.
vcThr	Displays virtual circuit threshold parameters.
cosThr	Displays COSB threshold parameters.

The following sections display the reports for each of the **dspcdsct** command options.

Note For descriptions of the Card SCT parameters refer to Service Class Template Tables 6-6 through 6-11 in the "Displaying Port SCT Settings" section on page 6-24.

Card SCT Bandwidth and Policing Parameters (bw)

The following report appears when you enter the **dspcdsct bw** command:

```
pop20two.10.AXSM.a > dspcdsct bw
+-------------------------------------------------------------------------------+
Service Class Template [2] : Bw and Policing Parameters
+-------------------------------------------------------------------------------+
| SERV-TYPE |    PCR    |    SCR    |    MCR    |    MBS    |    CDVT   |    ICR    |
+-------------------------------------------------------------------------------+
| CBR.1     | 00001000 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| VBR-RT.1  | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-RT.2  | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-RT.3  | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-nRT.1 | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-nRT.2 | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| VBR-nRT.3 | 00001000 | 01000000 | 00000000 | 00000050 | 00250000 | 00000000 |
| UBR.1     | 00000010 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| UBR.2     | 00000010 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| ABR       | 00000010 | 00000000 | 01000000 | 00000001 | 00250000 | 00000000 |
| CBR.2     | 00001000 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
| CBR.3     | 00001000 | 00000000 | 00000000 | 00000001 | 00250000 | 00000000 |
+-------------------------------------------------------------------------------+
```

Card SCT General SCT Parameters (gen)

The following report appears when you enter the **dspcdsct gen** command:

```
pop20two.10.AXSM.a > dspcdsct gen
+-------------------------------------------------------------------------------------------------+
Service Class Template [2] : General Parameters
+-------------------------------------------------------------------------------------------------+
| SERV-TYPE | COSB_NUM | CAC_TYPE | UPC_ENB   | CLP-SELEC |    GCRA-1     |    GCRA-2     | CI-CNTRL |
+-------------------------------------------------------------------------------------------------+
| CBR.1     | 00000003 |    B-CAC |GCRA1-ENB  | 000000003 |      DISCARD  |      DISCARD  | DISABLED |
| VBR-RT.1  | 00000004 |    B-CAC |GCRA 1 & 2 | 000000002 |      DISCARD  |      DISCARD  | DISABLED |
| VBR-RT.2  | 00000004 |    B-CAC |GCRA 1 & 2 | 000000001 |      DISCARD  |      DISCARD  | DISABLED |
| VBR-RT.3  | 00000004 |    B-CAC |GCRA 1 & 2 | 000000001 |      DISCARD  |      SET-CLP  | DISABLED |
| VBR-nRT.1 | 00000005 |    B-CAC |GCRA 1 & 2 | 000000002 |      DISCARD  |      DISCARD  | DISABLED |
| VBR-nRT.2 | 00000005 |    B-CAC |GCRA 1 & 2 | 000000001 |      DISCARD  |      DISCARD  | DISABLED |
| VBR-nRT.3 | 00000005 |    B-CAC |GCRA 1 & 2 | 000000001 |      DISCARD  |      SET-CLP  | DISABLED |
| UBR.1     | 00000006 |  LCN_CAC |GCRA1-ENB  | 000000003 |      DISCARD  |      DISCARD  | DISABLED |
| UBR.2     | 00000006 |  LCN_CAC |GCRA1-ENB  | 000000003 | DSCD/SET-CLP  |      DISCARD  | DISABLED |
| ABR       | 00000001 |    B-CAC |GCRA1-ENB  | 000000003 |      DISCARD  |      DISCARD  | DISABLED |
| CBR.2     | 00000003 |    B-CAC |GCRA 1 & 2 | 000000001 |      DISCARD  |      DISCARD  | DISABLED |
| CBR.3     | 00000003 |    B-CAC |GCRA 1 & 2 | 000000001 |      DISCARD  |      SET-CLP  | DISABLED |
+-------------------------------------------------------------------------------------------------+
```

Card SCT COSB Parameters (cosb)

The following report appears when you enter the **dspcdsct cosb** command:

```
pop20two.10.AXSM.a > dspcdsct cosb
+-------------------------------------------------------------------------------+
|Service Class Template [02] : COSB Parameters
+-------------------------------------------------------------------------------+
| COSB | MIN-RATE | MAX-RATE | MIN-PRIORITY | EXCESS-PRIORITY | ERS ENABLE |  CLR   |
+-------------------------------------------------------------------------------+
| 0001 | 00000000 | 00000100 |          000 |             002 |     ENABLE | 10^-01 |
| 0002 | 00000000 | 00000100 |          000 |             002 |     ENABLE | 10^-01 |
| 0003 | 00000000 | 00000100 |          000 |             000 |    DISABLE | 10^-05 |
| 0004 | 00000000 | 00000100 |          000 |             001 |    DISABLE | 10^-03 |
| 0005 | 00000000 | 00000100 |          000 |             001 |    DISABLE | 10^-01 |
| 0006 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0007 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0008 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0009 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0010 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0011 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0012 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0013 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0014 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0015 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
| 0016 | 00000000 | 00000100 |          000 |             002 |    DISABLE | 10^-01 |
+-------------------------------------------------------------------------------+
```

Card SCT Virtual Circuit Threshold Parameters (vcThr)

The following report appears when you enter the **dspcdsct vcThr** command:

```
pop20two.10.AXSM.a > dspcdsct vcThr
+-------------------------------------------------------------------------------------------------------------+
Service Class Template [2] : VC Threshold Parameters
+-------------------------------------------------------------------------------------------------------------+
| SERV-TYPE | VC THRESH | PACKET |  MAX_CELL  |  EFCI   | CLP_HI  |  EPD0   | CLP_LO  | SCALING | SCALING |
|           | TBL IDX   |  MODE  |   THRESH   |         |         |         |  EPD1   |  COSB   |  Log-If |
+-------------------------------------------------------------------------------------------------------------+
| CBR.1     |     225   |   DSB  | 0000002500 | 1000000 | 0800000 | 0600000 | 0800000 | 0000001 | 0000001 |
| VBR-RT.1  |     226   |   DSB  | 0000005000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-RT.2  |     227   |   DSB  | 0000005000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-RT.3  |     228   |   DSB  | 0000005000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-nRT.1 |     229   |   DSB  | 0000025000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-nRT.2 |     230   |   DSB  | 0000025000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| VBR-nRT.3 |     231   |   DSB  | 0000025000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000002 | 0000002 |
| UBR.1     |     232   |   DSB  | 0000050000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000004 | 0000004 |
| UBR.2     |     233   |   DSB  | 0000050000 | 1000000 | 0800000 | 0600000 | 0800000 | 0000004 | 0000004 |
| ABR       |     234   |   DSB  | 0000050000 | 0200000 | 0800000 | 0600000 | 0800000 | 0000003 | 0000003 |
| CBR.2     |     235   |   DSB  | 0000002500 | 1000000 | 0800000 | 0600000 | 0800000 | 0000001 | 0000001 |
| CBR.3     |     236   |   DSB  | 0000002500 | 1000000 | 0800000 | 0600000 | 0800000 | 0000001 | 0000001 |
+-------------------------------------------------------------------------------------------------------------+
```

Card SCT COSB Threshold Parameters (cosThr)

The following report appears when you enter the **dspcdsct cosThr** command:

```
pop20two.10.AXSM.a > dspcdsct cosThr
+-----------------------------------------------------------------------------------------------+
Service Class Template [00002] : COSB Threshold Parameters
+-----------------------------------------------------------------------------------------------+
| COSB |COSB THRESH|  MAX_CELL  |  EFCI   | CLP_HI  |  EPD0   | CLP_LO  |   RED   | RED PROB  |
|      | TBL IDX   |   THRESH   |         |         |         |  EPD1   |         |  FACTOR   |
+-----------------------------------------------------------------------------------------------+
| 0001 |  0000114  |  1000000   | 0200000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0002 |  0000115  |  1000000   | 0200000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0003 |  0000116  |     5000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0004 |  0000117  |    10000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0005 |  0000118  |    50000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0006 |  0000119  |   100000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0007 |  0000120  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0008 |  0000121  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0009 |  0000122  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0010 |  0000123  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0011 |  0000124  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0012 |  0000125  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0013 |  0000126  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0014 |  0000127  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0015 |  0000128  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
| 0016 |  0000129  |  1000000   | 1000000 | 0800000 | 0600000 | 0800000 | 1000000 | 000000015 |
+-----------------------------------------------------------------------------------------------+
```

Viewing an ATM Port Configuration

To view the configuration of an ATM line or trunk port, use the following procedure.

Step 1 Establish a CLI management session at any user access level.

Step 2 To display a list of the ports already configured on the AXSM card, enter the following command:

```
mgx8850a.10.AXSM.a > dspports
```

This command displays all configured ports on the AXSM card. Port numbers are listed in the ifNum (interface number) column. The interfaces listed include UNI and NNI ports. Note the number of the port for which you want to view the configuration.

Step 3 To display the port configuration, enter the following command:

```
mgx8850a.10.AXSM.a > dspport <ifNum>
```

Replace *ifNum* with the number assigned to the port during configuration. The following example shows the report for this command:

```
pop20two.9.AXSM.a > dspport 2
  Interface Number               : 2
  Line Number                    : 2.1
  Admin State                    : Up        Operational State   : Down
  Guaranteed bandwidth(cells/sec): 100000    Number of partitions: 1
  Maximum bandwidth(cells/sec)   : 100000    Number of SPVC      : 0
  ifType                         : NNI       Number of SVC       : 0
  SCT Id                         : 6
  VPI number(VNNI only)          : 0
```

Managing Partitions

The following sections describe how to display, change, and delete a resource partition.

Displaying a Resource Partition Configuration

To display a list of resource partitions or a resource partition configuration, use the following procedure.

Step 1 Establish a CLI management session at any user access level.

Step 2 To display a list showing the resource partitions on this card, enter the following command:

```
mgx8850a.10.AXSM.a > dspparts
```

The switch displays a report similar to the following:

```
pop20one.10.AXSM.a > dspparts
if  part Ctlr egr     egr     ingr    ingr    min max   min   max  min   max
Num ID   ID   GuarBw  MaxBw   GuarBw  MaxBw   vpi vpi   vci   vci  conn  conn
             (.0001%)(.0001%)(.0001%)(.0001%)
--------------------------------------------------------------------------------
 1   1    2 1000000 1000000 1000000 1000000    0 4095    32 65535  10000  10000
 2   1    2 1000000 1000000 1000000 1000000    0  255    32 65535   5000   5000
```

Step 3 To display the configuration of a resource partition, note the interface and partition numbers and enter the following command:

```
mgx8850a.10.AXSM.a > dsppart <ifNum> <partId>
```

Replace *ifnum* with the interface number of the port, and replace *partitionID* with the partition number assigned to the port. The following example shows the report provided by the **dsppart** command.

```
pop20one.10.AXSM.a > dsppart 1 1
  Interface Number               : 1
  Partition Id                   : 1        Number of SPVC: 0
  Controller Id                  : 2        Number of SPVP: 0
  egr Guaranteed bw(.0001percent): 1000000  Number of SVC : 2
  egr Maximum bw(.0001percent)   : 1000000
  ing Guaranteed bw(.0001percent): 1000000
  ing Maximum bw(.0001percent)   : 1000000
  min vpi                        : 0
  max vpi                        : 4095
  min vci                        : 32
  max vci                        : 65535
  guaranteed connections         : 10000
  maximum connections            : 10000
```

Changing a Resource Partition Configuration

To change the configuration of a resource partition, use the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1 privileges or higher.

Step 2 To display a list showing the partitions for this card, enter the **dspparts** command.

Step 3 To create a resource partition, enter the following command:

```
mgx8850a.10.AXSM.a > cnfpart -if <ifNum> -id <partId> -emin <egrminbw> -emax <egrmaxbw>
-imin <ingminbw> -imax <ingmaxbw> -vpmin <minVpi> -vpmax <maxVpi> -vcmin <minVci> -vcmax
<maxVci> -mincon <minConns> -maxcon <maxConns>
```

Table 6-18 describes the parameters for this command.

Table 6-18 Parameters for the cnfpart Command

Parameter	Description
ifNum	Interface number or port number. This number identifies the port this resource partition configures. Enter the interface number that was assigned to the port when it was configured (See "Adding ATM Ports," in Chapter 4, "Provisioning AXSM Communication Links.").
partId	Partition identification number. Enter a number in the range of 1 to 20. On an AXSM card, this number must be the same for all ports that use the PNNI controller.
egrminbw	Egress minimum bandwidth. Enter the minimum percentage of the outgoing port bandwidth that you want assigned to the PNNI controller. One percent is equal to 0.00001 units. For example, an *egrminbw* of 1000000 = 100%.

Table 6-18 Parameters for the cnfpart Command (continued)

Parameter	Description
egrmaxbw	Egress maximum bandwidth. Enter the maximum percentage of the outgoing port bandwidth that you want assigned to the PNNI controller. One percent is equal to 0.00001 units. For example, an *egrminbw* of 250000 = 25%.
ingminbw	Ingress minimum bandwidth. Enter the minimum percentage of the incoming port bandwidth that you want assigned to the PNNI controller. One percent is equal to 0.00001 units. For example, an *egrminbw* of 500000 = 50%.
ingmaxbw	Ingress maximum bandwidth. Enter the maximum percentage of the incoming port bandwidth that you want assigned to the PNNI controller. One percent is equal to 0.00001 units. For example, an *egrminbw* of 750000 = 75%.
minVpi	Minimum VPI number for this port. For UNI ports, enter a value in the range from 0 to 255. For NNI ports, enter a value in the range from 0 to 4095.
maxVpi	Maximum VPI number for this port. For UNI ports, enter a value in the range from 0 to 255. For NNI ports, enter a value in the range from 0 to 4095. The value for *maxVpi* cannot be less than for *minVpi.*
minVci	Minimum VCI number for this port. For OC-48 AXSM cards, enter a number in the range from 32 to 131072. For all other cards, enter a number in the range from 32 to 65535. To support features planned for the future, Cisco recommends setting the minimum VCI to 35 or higher.
maxVci	Maximum VCI number for this port. For OC-48 AXSM cards, enter a number in the range from 32 to 131072. For all other cards, enter a number in the range from 32 to 65535.
minConns	Minimum number of simultaneous connections allowed on this port. The minimum number of connections is 0. The type of back card and line determine the maximum number of connections as follows: T3/E3 lines: 65535 per line to a total of 65535 per back card OC3 lines: 32767 per line to a total of 65535 per back card OC12 lines: 32767 per line to a total of 65535 per back card OC48 lines: 131071 per line to a total of 131071 per back card Note that the maximum number of connections is 128K (131,071) for the AXSM front card and the OC48 back card. For the other AXSM back cards, which are used in pairs (upper and lower bays), the maximum number of connections is 64K (65535), which totals 128K for the front card.
maxConns	Maximum number of simultaneous connections allowed on this port. The range is the same as described for the *minConns* parameter, and this parameter must be set to number that is greater than the number defined for *minConns*.

Step 4 To display the changed partition configuration, use the **dsppart** command as described in the previous section.

Deleting a Resource Partition

To delete a resource partition, you must do the following:

- Delete any connections that are using the affected port
- Down the affected port

The following procedure explains how to delete a resource partition.

Step 1 Establish a configuration session using a user name with CISCO_GP privileges.

Step 2 To display a list showing the partitions for this card, enter the **dspparts** command.

Step 3 Note the interface number and partition number for the resource partition you want to delete.

Step 4 To display the active connections, enter the following command:

```
mgx8850a.10.AXSM.a > dspcons
```

The following is a sample **dspcons** display.

```
pop20one.7.PXM.a > dspcons

Local Port          Vpi.Vci   Remote Port         Vpi.Vci    State   Owner
--------------------------+-----------------------------+-------+------
10:2.2:2           100 100    Routed             100 100     FAIL        MASTER
Local  Addr: 47.00918100000000107b65f33c.0000010a1802.00
Remote Addr: 47.009181000000002a123f213f.000001011802.00\\
```

Step 5 Review the **dspcons** command display to see if the interface to which the partition is assigned is being used by a connection. The Identifier column identifies the interface, VPI, and VCI for the connection in the format: *if.VPI.VCI*. If the interface is in use, note the VPI and VCI values of all connections that use the interface, as you will need these to delete the connections.

Step 6 Delete each connection that uses the interface by entering the following command:

```
mgx8850a.10.AXSM.a > delcon <ifNum> <VPI> <VCI>
```

Step 7 Bring down the interface by entering the following command:

```
mgx8850a.10.AXSM.a > dnport <ifNum>
```

Step 8 Delete the resource partition by entering the following command:

```
mgx8850a.10.AXSM.a > delpart <ifNum> <partId>
```

Replace *ifnum* with the interface number of the port, and replace *partitionID* with the partition number assigned to the port.

Step 9 To verify that the partition has been deleted, enter the **dspparts** command to display a list of partitions for the card.

Removing Static ATM Addresses

If you create a static ATM address and later want to remove that address, use the following procedure to delete it.

Step 1 Establish a configuration session using a user name with GROUP1 privileges or higher.

Step 2 To locate the port for which you want to delete an address, enter the **dsppnports** command.

Step 3 Use the following command to delete the static address:

```
popeye2.7.PXM.a > deladdr <portid> <atm-address> <length> [-plan {e164|nsap}]
```

The command parameters are described in Table 6-19.

Table 6-19 ATM Address Configuration Parameters

Parameter	Description
portid	Port identifier in the format *slot*:*bay.line*:*ifnum*. These parameters are described in Table 6-1.
atm-address	Enter the ATM address using up to 40 nibbles. The ATM address can include up to 20 bytes, which is 40 nibbles or 160 bits.
length	Enter the length, in bits, of the address you specified with the *atm-address* parameter. Each nibble is equal to 4 bits. The acceptable range for the parameter is from 0 to 160 bits.
-plan	Enter the address plan, which is either **e164** (E.164) or **nsap** (NSAP). For an NSAP address, the first byte of the address automatically implies one of the three NSAP address plans: NSAP E.164, NSAP DCC, or NSAP ICD. Default = **nsap**.

Step 4 To verify that the static address has been deleted, enter the following command:

popeye2.7.PXM.a > **dspaddr** *<portid>*

Replace *portid* with the port address using the format *slot*:*bay.line*:*ifnum* These parameters are described in Table 6-1.

Configuring VPI and VCI Ranges for SVCs and SPVCs

When you add a partition to a port, you define the minimum and maximum VPIs and VCIs for that port. These VPIs and VCIs become available for all services unless you make additional configuration changes. If this configuration is acceptable for your installation, you can skip this section. You are not required to configure VPI and VCI ranges for SVCs and SPVCs.

The MGX 8850 switch allows you to define the minimum and maximum values for the following:

- SVCC VPIs
- SVCC VCIs
- SPVC VPIs

To configure VPI and VCI usage for connections on a specific port, use the following procedure.

Step 1 Establish a configuration session using a user name with GROUP1 privileges or higher.

Step 2 To display a list of PNNI ports, enter the **dsppnports** command.

Step 3 Use the following command to bring down the PNNI port you want to configure:

popeye2.7.PXM.a > **dnpnport** *<portid>*

A PNNI port is automatically brought up when you add it. You must down the port before you can change the port range. Replace *portid* using the format *slot*:*bay.line*:*ifNum*. Table 6-1 describes these parameters.

Step 4 To configure the port range, enter the following command:

popeye2.7.PXM.a > **cnfpnportrange** *<portid>* [**-minsvccvpi** *<min-svcc-vpi>*] [**-maxsvccvpi** *<max-svcc-vpi>*]] [**-minsvccvci** *<min-svcc-vci>*] [**-maxsvccvci** *<max-svcc-vci>*]] [**-minsvpcvpi** *<min-svpc-vpi>*] [**-maxsvpcvpi** *<max-svpc-vpi>*]]

The only required parameter for this command is the *portid* parameter, but the command serves no purpose if you enter it without options. If you include some options with the command and omit others, the omitted options remains set to the last configured values. Table 6-20 lists and describes the options and parameters for this command.

Table 6-20 Parameters for the cnfpnportrange Command

Parameter	Description
portid	Port identifier in the format *slot*:*bay.line*:*ifnum*. Table 6-1 describes these parameters.
min-svcc-vpi	Minimum VPI value for SVCC. Range: 0 to 4095. Default = 0.
max-svcc-vpi	Maximum VPI value for SVCC. Range: 0 to 4095. Default = 4095.
min-svcc-vci	Minimum VCI value for SVCC. Range: 32 to 65535. Default = 35.
max-svcc-vci	Maximum VCI value for SVCC. Range: 32 to 65535. Default = 65535.
min-svpc-vpi	Minimum VPI value for SVPC. Range: 1 to 4095. Default = 1.
max-svpc-vpi	Maximum VPI value for SVPC. Range: 1 to 4095. Default = 4095.

Step 5 Use the following command to bring up the PNNI port you just configured:

```
popeye2.7.PXM.a > uppnport <portid>
```

Replace *portid* using the format *slot*:*bay.line*:*ifNum*. Table 6-1 describes these parameters.

Step 6 To display the PNNI port range for a port, enter the following command:

```
popeye2.7.PXM.a > dsppnportrange <portid>
```

After you enter this command, the switch displays a report similar to the following:

```
pop20two.7.PXM.a > dsppnportrange 1:2.1:2

minSvccVpi:          0              maxSvccVpi:       4095
minSvccVci:         32              maxSvccVci:      65535
minSvpcVpi:          1              maxSvpcVpi:       4095
```

Managing Load Sharing

When redundant PXM45 cards are used, load sharing enables traffic routing through the switch fabric on both PXM45 cards, doubling the capacity of the switch. Load sharing is enabled by default and should only be disabled for testing or debugging purposes.

The switch provides two options for load sharing management: Auto Shutdown and Plane Alarm Threshold. The switch fabric on each PXM45 is made up of 3 switch planes that each contain links to 14 slots within the switch chassis. When the Auto Shutdown feature is enabled and one of these internal links fails, that link is automatically shut down and the card in the affected slot must use a link to another switch plane. If Auto Shutdown is not enabled and a link goes bad, the affected card slot can still attempt to use that link.

The Plane Alarm Threshold option defines the threshold at which a switch plane is declared bad and reported as such. When a switch plane is reported bad, the PXM45 on which the switch plan resides should be replaced.

The following procedures describe how to view the load sharing option settings and how to change them.

Displaying Load Sharing Status

To display whether the status of the load sharing options, enter the **dspxbarmgmt** command. The following example shows the display for this command.

```
pop20two.7.PXM.a > dspxbarmgmt
pop20two                          System Rev: 02.01   Dec. 07, 2000 18:36:47 GMT
MGX8850                                               Node Alarm: MAJOR
Load Sharing: Enable
Auto Shutdown: Disable
Plane Alarm Threshold: 3
```

The Load Sharing and Auto Shutdown lines shows the option status as Enable or Disable. The Plane Alarm Threshold line displays a number between 1 and 32. On PXM45 cards, the maximum number of slots to which each plane can connect is 14.

Changing Load Sharing Options

To change the load sharing options, enter the **cnfxbarmgmt** command as described in the following procedure.

Step 1 Establish a configuration session using a user name with SUPER_GP privileges or higher.

Step 2 Display the current configuration setting by entering the **dspxbarmgmt** command.

Step 3 Set the load sharing options by entering the **cnfxbarmgmt** command as follows:

```
pop20two.7.PXM.a > cnfxbarmgmt <loadSharing> <autoShutdown> <planeAlarmThresh>
```

Note You must enter values for all command parameters, even if you want to only change one of them.

Table 6-21 describes the parameters for this command.

Table 6-21 Command Parameters for cnfxbarmgmt

Parameter	Description
loadSharing	Enables or disables load sharing. Enter -1, 0, or 1. These values control load sharing as follows: • -1 unconditionally disables load sharing, regardless of switch plane status • 0 disables load sharing only when there are no switch plane alarms • 1 enables load sharing If you don't want to change the setting, enter the value that corresponds to the current setting displayed with the **dspxbarmgmt** command.
autoShutdown	Enables or disables the Auto Shutdown feature. Enter 0 to disable this feature, or enter 1 to automatically shut down a failed link between a switch plane and a card slot. If you don't want to change the setting, enter the value that corresponds to the current setting displayed with the **dspxbarmgmt** command.
planeAlarmThresh	Defines when a switch plane should be reported as bad. Set the threshold to the number of failed links (between a switch plane and the card slots it services) that exceeds your acceptable limit. The default threshold is three. The PXM45 card supports up to 14 links. If you don't want to change the setting, enter the value that appears when you enter the **dspxbarmgmt** command.

Step 4 To verify your configuration change, enter the **dspxbarmgmt** command.

Starting and Managing Telnet Sessions to Other Switches

The MGX 8850 switch supports Telnet sessions between switches. For example, you can start a CLI session with one switch, Telnet to a second switch to view configuration information, then switch back to the first switch and continue that CLI session. Each switch supports up to 15 simultaneous Telnet sessions, and you can Telnet across multiple switches. For example, you can establish a CLI session on switch A, Telnet to switch B, and then Telnet from switch B to switch C. The following sections describe:

Starting a Telnet Session

To start a Telnet session, enter the **telnet** command as follows:

```
pop20one.7.PXM.a > telnet [-E<escapeCharacter>] [-R<traceroutecharacter>] <ipAddress>
[[0x|X|x]<tcpPort>]
```

You must enter an IP address with the **telnet** command as shown in the following example:

```
pop20one.7.PXM.a > telnet 172.29.52.88
Trying 172.29.52.88...
Connected to 172.29.52.88

Login: cisco
password:
```

The -E option allows you to specify an escape character that takes you back to the previous session. For example, if you have Telnetted from Switch A to Switch B to Switch C, you can use this escape character to return to Switch B. The default escape character is Q. To change this, specify an alternate escape character withe the -E option when you start a Telnet session. There should be no space character between the -E and the escape character.

The -R option allows you to specify an escape character that displays a trace of your Telnet activity. For example, if you have Telnetted from Switch A to Switch B to Switch C, you can use this escape character to display the Telnet routes from A to B and from B to C. The default escape character is g. To change this, specify an alternate escape character withe the -R option when you start a Telnet session. There should be no space character between the -R and the escape character.

The tcpPort option allows you to specify a destination port for the Telnet session. If you omit this option, the Telnet session uses the default Telnet port.

Returning to a Previous Session

After you Telnet from one switch to another, enter the **bye** command or the **exit** command to close the current session and return to the previous session. For example, if you have Telnetted from Switch A to Switch B to Switch C, the **bye** command will terminate the session on Switch C and display the session on Switch B.

Returning to the Original CLI Session

After you Telnet from switch to switch, enter the escape character to close all Telnet sessions and return to the original CLI session. The default escape sequence is **Escape, Q** (uppercase Q). Press the **Escape** key first, then press **Shift-Q**. If you specified an alternate escape character when opening Telnet sessions, enter that character in place of Q.

For example, if you Telnet from Switch A to Switch B to Switch C, the escape character sequence closes the Telnet sessions on Switches B and C, and displays the CLI session on Switch A.

Displaying a Telnet Trace

After you Telnet from switch to switch, enter the trace escape character to display a list of connections you have established between switches. The default escape sequence is **Escape, g** (lowercase g). Press the **Escape** key first, then press **g**. If you specified an alternate escape character when opening Telnet sessions, enter that character in place of g.

The following example shows a sequence of Telnet sessions and the trace that documents the sequence:

```
pop20one.7.PXM.a > telnet 172.29.52.88
Trying 172.29.52.88...
Connected to 172.29.52.88

Login: cisco
password:

pop20two.7.PXM.a > telnet 172.29.52.56
Trying 172.29.52.56...

Connected to 172.29.52.56

Login:
password:

pop20one.7.PXM.a >
-> local IP 172.29.52.56, next hop at 172.29.52.88

-> local IP 172.29.52.88, connected to server at 172.29.52.56

pop20two.7.PXM.a >
```