



MQAM Software Version 2.6.18

Release Notes and Installation Instructions

Please Read

Important

Please read this entire guide. If this guide provides installation or operation instructions, give particular attention to all safety statements included in this guide.

Notices

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About This Guide

Introduction

This document provides the information and procedures for upgrading a Model D9477 Multiple Quadrature Amplitude Modulation (MQAM) Modulator to MQAM software version 2.6.18. This document also includes a description of the change requests (CRs) implemented in this release.

Purpose

This document enables system operators to upgrade the Model D9477 MQAM Modulator with MQAM software version 2.6.18.

Scope

This document provides instructions for upgrading the Model D9477 MQAM Modulator with MQAM software version 2.6.18. It does not provide instructions for installing an MQAM into your headend system.

Note: For instructions on installing an MQAM in your headend or for a complete description of MQAM features, refer to the *MQAM Modulator Models D9477-1, D9477-2, and D9477-3 Installation and Operation Guide* (part number 717866). For the part number for this document, see *Related Publications*.

Audience

System operators or field service engineers who are responsible for installing the MQAM software onto the MQAM should read this publication.

Related Publications

You may find the following publications useful as resources when you implement the procedures in this document.

- *DBDS Utilities Version 6.1 Installation Instructions and DNCS Utilities User Guide* (part number 4020695)
- *DNCS Online Help (PC) 4.2.0.3* (part number 4012121)
- *DNCS Report Writer Version 4.2 User's Guide* (part number 4013430)
- *DNCS Report Writer 4.2.1 User Guide* (part number 4022012)
- *MQAM Modulator Models D9477-1, D9477-2, and D9477-3 Installation and Operation Guide* (part number 717866)
- *Program and System Information Protocol Configuration for System Releases 2.5, 2.7, 3.5, 3.7, 4.0, 4.2, and CV 3.4 Technical Bulletin* (part number 4011319)
- *System Release 2.7/3.7/4.2 Service Pack 2 Release Notes and Installation Instructions* (part number 4019475)
- *System Release 2.7.1 Release Notes and Installation Instructions* (part number 4001524)
- *System Release 3.7.1 Release Notes and Installation Instructions* (part number 4001525)
- *System Release 4.2.1 Release Notes and Installation Instructions* (part number 4002179)

Document Version

This is the second release of this document.

1

Introducing MQAM Software Version 2.6.18

Introduction

This chapter lists the requirements for upgrading the Model D9477 MQAM Modulator (MQAM) with software version 2.6.18, while also describing several feature enhancements and performance improvements over previous releases of MQAM software. For additional details, go to *What's Fixed?* (on page 3).

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Introduction

MQAM software version 2.6.18 is designed to be installed on an MQAM. After the software is installed and the modulator is active, it provides additional support for sites that deploy video-on-demand (VOD), *anything-on-demand* (xOD), and other interactive broadcast services.

Note: For a complete description of an MQAM, refer to the *MQAM Modulator Models D9477-1, D9477-2, and D9477-3 Installation and Operation Guide*.

This section includes the system release and application compatibility requirements, application platform release dependencies, software requirements, and hardware requirements for installing the MQAM software. This chapter also includes the CRs implemented in this release.

What's New?

MQAM software version 2.6.18 provides support for the following new features:

- Support for new RF boards now on MQAMs
- Ability to process corrupt MPEG packets

Support for New RF Boards

We have recently transitioned to a new radio frequency (RF) board on our MQAMs. MQAM software version 2.6.18 provides support for these new RF boards that are now shipping on MQAMs. These RF boards provide system operators with an enhanced performance upgrade to earlier MQAMs and also assist them with bandwidth management in two key areas:

- Bandwidth optimization: the ability to handle content more efficiently to expand the capability of existing bandwidth
- Bandwidth expansion: the ability to move to the next, most financially and operationally practical bandwidth capacity level

The new MQAMs also give system operators access to the extra bandwidth needed to expand their interactive service offerings to customers and to support the increased demand for advanced interactive services and the growing deployment of high-definition (HD) content along with the bundling of services to include the latest voice, video and data technologies, i.e, the triple play.

What's Fixed?

Introduction

This section provides a description of the CRs implemented in MQAM 2.6.18.

CR 71660: Third-Party MUX Devices No Longer Cause MQAM Reboots

Previously, when system operators used a third-party MUX device in conjunction with the MQAM, an issue was identified where the MUX device used the entire reserved bandwidth rate to send the Program Allocation Table (PAT) to the MQAM, which caused multiple MQAM reboots. A PAT filter was added in the field programmable gate array (FPGA) code to limit the extract processing at a low level.

Note: If you use a third-party MUX device, make sure that you limit its reserved bandwidth rate to our recommended bandwidth of 10 to 15 kpbs. You can also configure the MUX device so that it does not use the reserved bandwidth feature.

CR 71660 corrects this issue.

CR 71988: Adaptation Headers No Longer Cause MQAMs to Lose Sessions

Certain content feeds include adaptation field parameters in the Program Map Table (PMT). MQAM software version 2.6.18 includes an enhancement to handle cases found when adaptation field data is included in PMT packets. This fix allows the MQAM to successfully handle the adaptation field parameters and establish the session. **CR 71998** corrects this issue.

CR 76306: MQAMs No Longer Re-Boot When They Receive Bad MPEG Data

Previously, an MQAM could re-boot if it received bad MPEG packets. MQAM software version 2.6.18 was enhanced to detect and drop bad MPEG packets instead of processing them. **CR 76303** corrects this issue.

What Are the Site Requirements?

System Release Compatibility and Prerequisites

This MQAM software can be installed on a DBDS that is running one of the following system releases and DNCS application versions:

- SR 2.7/3.7/4.2 SP2 and later
- SR 2.7.1/3.7.1/4.2.1

For a complete configuration listing, or to upgrade your system, contact Cisco Services.

Software

MQAM 2.6.18 includes the following software code:

- MQAM Host Application code 2.6.18
- MQAM Host Boot code 2.6.18

Hardware Supported

MQAM 2.6.18 supports only the Model D9477 MQAM.

When to Perform the Upgrade

To reduce the impact of service interruptions, perform the upgrade during a scheduled maintenance window.

Application Platform Release Dependencies

The following table shows the set-top and Multi-Stream CableCARD™ (M-Card™) module software application platform release dependencies for this software release.

Important: Failure to have the correct application platform software *or later* installed on your system *prior* to installing the software can result in video freezing and black screens when using video-on-demand (VOD) or xOD applications.

Set-Top or M-Card Platform	Operating System (OS)	SARA	PowerKEY Conditional Access Version
Explorer 8300 DVR v. 1.4.3a10 or later v. 1.5.2	OS 6.14.74.1 OS 6.14.79.1	1.88.22.1 1.89.16.2	3.9 3.9
Explorer 8000/8010 DVR v. 1.4.3a10 or later v. 1.5.2	OS 6.12.74.1 OS 6.12.79.1	1.88.21.1 1.89.16.2	3.7.5 3.7.5
Explorer 3250HD MR4 P1 or later	OS 3.24.5.2	1.59.18.1	3.9
Explorer 2xxx, 31xx, 3200, 3100HD	OS 3.13.6.1	1.60.6.2	1.0.6.20 (Explorer 2000s) 1.0.7 (all others)
Explorer 4250HDC Exp. 2.0.0 (0701) or later	OS 6.20.28.1	1.61.5.a100	4.0.1.1
Explorer 8300HDC DVR 1.5.3 (0801) or later	OS 6.20.28.1	1.90.5a101	3.9.7.13
M-Card OS 1.1.10p5 or later	OS 1.1.10p5	Not applicable	Not applicable

Important: If you are not using SARA, contact your resident application provider to verify that you have the most recent version.

Known Issues

This software product currently has no known issues.

CA Descriptor and VOD Sessions

Overview

Versions of MQAM software prior to software version 2.5 inserted the PowerKEY Conditional Access (CA) descriptor into the Program Map Table (PMT) for unencrypted on-demand content. If the Digital Home Communication Terminal (DHCT) operating system (OS) found the CA descriptor in the PMT, the OS started the PowerKEY decryptor.

The PowerKEY scheduler within the DHCT then prioritized entitlement control messages (ECMs) by waiting until an ECM was processed before allowing any other CA messages or requests to be processed.

Background

During this waiting period, when no ECMs were delivered, non-ECM requests (for example, a request for a Multi-Room DVR session) remained in the queue and were not processed until the PowerKEY decryptor was stopped. Therefore, no Multi-Room DVR sessions could be established while the Multi-Room DVR server was streaming unencrypted VOD.

Solution

MQAM 2.6.18 carries forward the modification from MQAM 2.4.10 to insert the CA descriptor only for encrypted sessions, including those that will be encrypted after interactive session key (ISK) setup. Consequently, the OS now correctly detects the encryption status of the stream. Detecting the encryption status enables sessions (including VOD and MR-DVR sessions) to be established correctly on a Multi-Room server.

2

Upgrading the Software

Introduction

This chapter describes how to upgrade the Model D9477 MQAM with software version 2.6.18.

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Upgrade Process Overview

Before You Begin

Before you upgrade to MQAM 2.6.18, be sure that your system meets the criteria specified in *System Release Compatibility and Prerequisites* (on page 4) and *Application Platform Release Dependencies* (on page 5).

If you will not be downloading the MQAM software from our File Transfer Protocol (FTP) site, make sure that you have obtained the CD, **MQAM V2.6.18**, part number 4021953.

Time to Complete

When upgrading MQAMs with the new software, consider the following tasks and the amount of time required for each:

- Completing pre-upgrade tasks takes from 30 to 45 minutes.
- If you are upgrading from an FTP site, allow an additional 10 to 15 minutes to download the software from the FTP site. The speed of the connection and the size of the files will determine the actual download time.
- Downloading new software to the MQAM takes approximately 5 minutes for each modulator.
- For MQAMs that carry broadcast sessions, the DNCS will restart the sessions after the MQAMs load new software.
- For MQAMs that carry VOD sessions, only those sessions that are determined to be active will be restarted. Because subscribers may tune away when the MQAM reboots, the total number of recovered sessions may not match the original number of sessions on the MQAMs.

Note: It is not necessary to rebuild non-VOD sessions on the MQAMs that you upgrade. The non-VOD sessions are rebuilt automatically after the new software is downloaded to the MQAM.

Subscriber Impact

When MQAMs are reset (rebooted) during the upgrade, the services they carry are interrupted. DHCTs will show a frozen picture or black screen until the upgrade is complete and the DNCS has restarted all of the active sessions on the MQAM.

Impact of TVs with QAM Tuners

When upgrading MQAMs to new releases of software, you must reset the MQAMs in order for the devices to download the new software from the DNCS. When the software download is complete, the DNCS then recreates any broadcast sessions that were active on the MQAMs. The DNCS also activates encryption for any secure services that were running on the MQAMs.

An increasing number of TVs are being manufactured and sold with QAM tuners that can access services that are not properly encrypted. Therefore, as a part of the upgrade process, we encourage you to verify that the DNCS re-establishes encryption for *all* secure services on the upgraded MQAMs. This extra step ensures that no MQAM that may be carrying content inappropriate for children can be viewed inadvertently when using a TV that is equipped with a QAM tuner. For additional information, refer to the following procedures:

- *Verifying the Functionality of MQAM Modulators That Carry Broadcast Sessions* (on page 29)
- *Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions* (on page 30)

Process Overview

This section provides an overview of the process required to upgrade to MQAM 2.6.18.

Important: You should only upgrade MQAMs to new releases of software if your network is running in a healthy state (for example, a system can boot and stage set-tops). If your network is not in a healthy state, you should not upgrade to the new release of software unless the new release contains a remedy to your system issue.



CAUTION:

If you are upgrading more than one MQAM, download the new software to one modulator group (for example, all modulators in a single rack or hub) and verify its functionality before attempting to download the software to another modulator group. Verifying the functionality of one modulator group at a time enables you to better isolate any failures that may occur and enables you to minimize service interruptions.

Pre-Upgrade Tasks

Important: Performing the pre-upgrade tasks will not impact system performance.

- 1 Verify that the install tool (install_pkg) exists on the DNCS.
 - Note:** For procedures on how to check for the install_pkg tool, see *Verify the Install Package Exists on the DNCS* (on page 33).
- 2 Determine the configuration (config) files currently in use on your system.
- 3 Verify the software version associated with the configuration files.

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- 4 Make a backup copy of the *current* MQAM configuration file.
- 5 If you are upgrading more than one MQAM, establish an order for upgrading the modulators.
- 6 Install the MQAM software onto the DNCS from either our FTP site or a CD.

Upgrade Tasks

Important: Performing the upgrade tasks will result in a temporary loss of service as MQAMs are reset.

- 1 Download the new software to the MQAMs.
- 2 If the MQAMs you are upgrading currently carry broadcast sessions, determine the sessions that are running on those modulators you plan to upgrade. This will allow you to verify that these sessions are rebuilt after the new software is downloaded to the modulators.
- 3 Verify that the upgraded MQAM is functioning properly.

Important: Read and follow the directives contained in *Impact of TVs with QAM Tuners* (on page 11).

- 4 After the upgrade is complete, generate a Doctor Report using the **-av** option to verify system stability and functionality.
- 5 Perform System Validation Tests for your system release version.

Verify the Current Software Version on the DNCS

Introduction

Before attempting to upgrade to MQAM 2.6.18, verify the number of configuration files in use and what MQAM software version is associated with each configuration file.

On occasion, for testing purposes, the configuration file for a test device or a set of test devices is changed to a non-standard value (for example `mqam111.config` instead of `mqam.config`). If your site has been involved in this type of testing (and you are now ready to use the released code again), you should update the configuration file setting for your test units to reflect the default values.

Note: The default configuration file for the MQAM is `/tftpboot/mqam.config`.

Failure to correct a unit from using a unique configuration will result in the unit remaining in the uniquely-specified configuration. Specifically, it will not load the new code and it will continue to load the code specified in the unique configuration file.

In extremely rare cases, the configuration file may have been specified in or may need to be specified in the `/etc/bootptab` file. In the event that a headend device fails to load the code you intended it to receive, you should check to see if a unique file was specified either through the DNCS GUI or in the `/etc/bootptab` file before contacting Cisco Services for assistance.

Checking for Multiple Config Files

- 1 From the DNCS Administrative Console, click **Utilities** and click **xterm**. The xterm window opens.
- 2 Type `dbaccess dnscsdb <<%` and press **Enter**.
- 3 Type `unload to mqamdata select qam_name, configfile from pdcaqam where modeltype=2;` and press **Enter**.
- 4 Type `%` and press **Enter**. A result, similar to the following output, appears.

```
Database selected.

5 row(s) unloaded.

Database closed.
```

- 5 Type **more mqamdata** and press **Enter**. A result, similar to the following output, appears.

```
> more mqamdata
BCASTQAM1|mqam.config|
VODMQAM1|mqam.config|
BCASTQAM2|mqam.config|
BCASTQAM3|mqam.config|
VODMQAM|mqam.test|
```

Notice that two different config files exist

- 6 Did more than one config file appear?
 - If **yes**, keep the xterm window open and go to step 7.
 - If **no**, go to *Checking the Software Version Associated with the config File* (on page 15).
- 7 Do you need to continue to run different versions of MQAM software on some MQAMs in your network?
 - If **yes**, refer to *Load Multiple Versions of MQAM Code* (on page 35).
 - If **no**, go to step 8.
- 8 Update the MQAMs to use the same config file by performing the following steps:
 - a From the DNCS Administrative Console, click **Element Provisioning** and click **QAM**. The QAM List window opens.
 - b Select the MQAM, click **File** and select **Open**. The Set Up MQAM window opens.
 - c Click **Advanced Parameters** and modify the configuration file, as needed.
- 9 Go to *Checking the Software Version Associated with the config File* (on page 15).

Checking the Software Version Associated with the config File

- 1 From the xterm window, type `cd /tftpboot` and press **Enter**. The tftpboot directory becomes the working directory.
- 2 For each unique config file identified in *Checking for Multiple config Files* (on page 13), type `grep Appl <config file name>` and press **Enter**.

Example: `grep Appl mqam.config`

Result: A result, similar to the following output, appears.

```
flame:/export/home/dnccs$ >cd /tftpboot
flame:/tftpboot$ >grep Appl mqam.config
# if the file path/name in ApplCodePath is different than it was
# ApplCodePath should contain a string indicating the path and
# Example: ApplCodePath = [pathname/filename]
AppCodePath =mqam_app_2_6_15.bin
flame:/tftpboot$ >
```

**Indicates v2.6.15 code is in use
with the mqam.config file**

- 3 Is the proper version of software installed?

Note: See the MQAM Host Application code version listed in *Software* (on page 4) to verify the correct software version.

- If **yes**, type `exit` and press **Enter**.
- If **no**, go to *Back Up the Current MQAM Configuration File* (on page 16).

Back Up the Current MQAM Configuration File

Introduction

Before installing the new MQAM software, make a backup file of the config file currently installed on the DNCS by completing the following steps.



CAUTION:

Do not install new software until you have created a backup of the configuration file currently installed on your system. Having a backup file will enable you to restore the previous version of MQAM software in the unlikely event of a failure.

Restore the previous version of software to your system only when recommended by Cisco Services.

Backing Up the Current MQAM Configuration File

- 1 Complete the following steps to log on to the xterm window as **root** user.
 - a Type **su -** and press **Enter**. The password prompt appears.
 - b Type the root password and press **Enter**.
- 2 Type **cd /tftpboot** and press **Enter** to access the tftpboot directory.
- 3 Type **pwd** and press **Enter**. The /tftpboot directory name appears and indicates that you are in the correct directory.
- 4 Copy the current configuration file to a backup file.

Example: Type **cp -p mqam.config mqam.config.old** and press **Enter**.

Note: If you are using a non-standard config file (for example, mqam.test), substitute that config file name for mqam.config.

Result: A copy of the mqam.config file (or the file name you specified), which contains configuration settings, is saved to a configuration file named mqam.config.old.

- 5 Remain logged in as root user and go to *Install MQAM Software onto the DNCS* (on page 17).

Install MQAM Software onto the DNCS

Introduction

This section describes how to install the new software onto the DNCS. Software is installed from either of the following locations:

- MQAM Software V2.6.18 CD, part number 4021953. Go to *Installing the MQAM Software from a CD* (on page 17).
- Our FTP server. Go to *Installing the MQAM Software from the FTP Server* (on page 18).

Installing the MQAM Software from a CD

- 1 Insert the **MQAM V2.6.18** CD into the CD-ROM drive of the DNCS.
- 2 Did the File Manager window display?
 - If **yes**, the CD mounted successfully. Go to step 4.
 - If **no**, type **df -k** to determine where the CD is mounted and then go to step 3.
- 3 Is `/cdrom` listed in the output?
 - If **yes**, go to step 4.
 - If **no**, contact Cisco Services.
- 4 From an xterm window where you are logged in as root, type **cd /cdrom/cdrom0** and press **Enter** to access the `cdrom0` directory.
- 5 Type **/usr/sbin/install_pkg** and press **Enter**.

Results:

- The system lists the packages that will be installed.
 - A confirmation message appears asking you to confirm that you want to proceed with the installation.
- 6 Type **y** and press **Enter** to start the installation. When the installation is complete, the system displays a message stating that the installation was successful and a prompt for the root user appears.

Note: The installation should take less than 30 seconds.
 - 7 Was the installation successful?
 - If **yes**, go to step 8.
 - If **no**, contact Cisco Services.
 - 8 From the xterm window where you are logged in as root, type **exit** and press **Enter**. You are logged out as root user.

- 9 Complete one of the following options:
 - **If the File Manager is present:** From the File Manager window, click **File** and select **Eject**. The CD is ejected from the CD drive and the File Manager window closes.
 - **If the File Manager is not present:** From an xterm window, type the following command: **cd /; eject; exit**. The CD is ejected from the CD drive.
- 10 Type **exit** and press **Enter** to close the xterm window.
- 11 Go to *Establish a Download Sequence* (on page 21).

Installing the MQAM Software from the FTP Server

Creating the Directory

- 1 From the xterm window where you are logged in as root, type **cd /export/home/dnscs/download** and press **Enter**. The `/export/home/dnscs/download` directory becomes the working directory.
Important: If this directory does *not* exist, use the **mkdir** command to create it. Then, repeat step 1.
- 2 Type **mkdir MQAM2618** and press **Enter**. The system creates a subdirectory called MQAM2618 in the `/export/home/dnscs/download` directory.
- 3 Type **cd MQAM2618** and press **Enter** to access the MQAM2618 directory.
- 4 Go to *Obtaining the MQAM Software File* (on page 18).

Obtaining the MQAM Software File

Access to the FTP server requires current FTP server site access information. Because many sites do not allow an open Internet connection to the DNCS for security reasons, the following procedure provides generic instructions to access the FTP server and download the software.

This procedure also assumes the software is in a TAR file format. The TAR file is a compressed image format that is the typical format of a software image released on CD. If you have any questions about this process, contact Cisco Services.

- 1 Log on to the FTP server.

Notes:

- The address of the server is **ftp.sciatl.com** or **192.133.243.133**.
Note: The address for the FTP server is subject to change. If you are unable to reach the FTP server, please contact Cisco Services for the latest address.
- The username is **anonymous**.
- The password is the e-mail address of the person logging in.

- 2 Choose one of the following options to navigate to the directory in which the file is located:
 - If you are *outside* our firewall, type **cd /pub/scicare/RELEASED/MQAM**
 - If you are *inside* our firewall, type **cd /external_pub/scicare/RELEASED/MQAM**
- 3 Type **bin** and press **Enter**. The system sets the ftp transfer mode to binary.
- 4 Type **hash** and press **Enter**. The system configures itself to display hash marks that show file-transfer progress.
- 5 Type **prompt** and press **Enter**. The system indicates that interactive mode is off.
- 6 Type **get MQAM_2.6.18.tar.gz** and press **Enter**. The system begins copying the file (or files) from the FTP site to the current directory on your DNCS.
- 7 Type **bye** and press **Enter** to log out of the FTP server.
- 8 Go to *Decompressing and Extracting the File* (on page 19).

Decompressing and Extracting the File

- 1 From the xterm window, type **gzip -d MQAM_2.6.18.tar.gz** and press **Enter**. The system decompresses the MQAM software file.
- 2 Type **tar xvf MQAM_2.6.18.tar** and press **Enter**. The system extracts the individual files.
- 3 Go to *Installing MQAM Software* (on page 19).

Installing MQAM Software

- 1 From the xterm window where you are logged in as root, type **/usr/sbin/install_pkg** and press **Enter**.

Results:

- The system lists the packages that will be installed.
 - A confirmation message appears asking you to confirm that you want to proceed with the installation.
- 2 Type **y** and press **Enter** to start the installation.
Note: The installation should take less than 30 seconds.
 - 3 Did a message appear indicating that the installation was successful?
 - If **yes**, go to step 4.
 - If **no**, contact Cisco Services.
 - 4 Use the UNIX **rm -rfi** command to remove the following file and directory:
 - MQAM2618.tar (file)
 - SAIMQAM (directory)

Example: Type **rm -rf SAIMqam MQAM2618.tar** and press **Enter**.

Result: A confirmation question message appears asking you to confirm the removal.

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- 5 Type **exit** and press **Enter** to log out as root user.
- 6 Type **exit** and press **Enter** to close the xterm window.
- 7 Go to *Establish a Download Sequence* (on page 21).

Establish a Download Sequence

Establishing a Sequence for Downloading Software onto Each MQAM

The order in which you download new software onto MQAMs allows you to verify that the download is successful before proceeding. Follow these guidelines to establish an order in which to download the new software to MQAMs. The method that you follow depends on the type of sessions that the modulator carries (xOD/VOD sessions or broadcast sessions).



CAUTION:

If you are downloading new software to more than one MQAM modulator group, download the software to one modulator group (for example, all modulators in a single rack or hub) and verify its functionality before attempting to download software to another modulator group. Verifying the functionality of one modulator group at a time enables you to better isolate any failures that may occur.

xOD/VOD Sessions

When upgrading MQAMs that carry xOD or VOD sessions, we suggest that you upgrade all modulators in one hub and verify the functionality of those modulators before upgrading modulators in another hub.

Use the following guidelines to determine the order in which to upgrade modulators within a hub:

- 1 If any MQAMs act as spares, download the software on these modulators first.
- 2 If your system does not have a spare MQAM, download the software on the modulator carrying the fewest number of sessions.
- 3 Continue downloading the software to modulators by working your way up to the modulator carrying the most sessions.

Broadcast Sessions

When upgrading MQAMs that carry broadcast sessions, upgrade the modulators in one hub, four modulators at a time, and verify their functionality before proceeding to other MQAMs in the hub.

Use the following guidelines to determine the order in which to upgrade modulators:

- 1 If any MQAMs act as spares, download the software on these modulators first.
- 2 If your system does not have a spare MQAM, download the software on the modulator carrying sessions that are least viewed.

- 3 If you have MQAMs that carry BFS sessions, download the software to the BFS MQAM first.
- 4 Continue downloading the software to modulators in this hub by working your way up to the modulator carrying sessions that are most frequently viewed.

What's Next?

xOD/VOD Sessions

If all of your MQAMs carry xOD or VOD sessions, you are ready to begin downloading the new software to the MQAMs. Go to *Download Software to the MQAM Modulators* (on page 23).

Note: Because xOD and VOD sessions are not pre-configured, but are set up as needed when a subscriber requests them, generating a list of existing sessions is not necessary.

Broadcast Sessions

If you have MQAMs that carry broadcast sessions, use our DNCS Report Writer to view the Channels, Sources & Sessions Report. This report lists the existing broadcast sessions in your system along with the channels and sources in your system that each modulator currently carries.

The Channels, Sources & Sessions Report lists each *display channel* (channel number) in the system. The report also displays information about the *carriage* of each channel (how the channel is transmitted on the DBDS). The report maps each source to the transport device used to deliver the source (analog frequency on MQAMs).

Generating this report helps you to determine which sessions/services are carried by each MQAM. This report also helps you to verify that these sessions are successfully rebuilt after the new software is downloaded to the MQAM.

You can also use the DNCS Session List to determine the existing broadcast sessions in your system.

Important: Refer to the *DNCS Report Writer Version 4.2 User's Guide* (part number 4013430), the *DNCS Report Writer 4.2.1 User Guide* (part number 4022012), or the *DNCS Online Help* for your system for further assistance.

Download Software to the MQAM Modulators

Introduction

To download the new software to MQAMs, you must first reset (reboot) the modulators using one of the following methods:

- DNCS GUI
- auditQam utility
- Front panel of the MQAM



CAUTION:

All active sessions on the MQAM will be interrupted when the modulator is reset. DHCTs downstream of the modulator will lose their ability to display services until sessions are reestablished.

Important: Use the procedure for *Preparing to Monitor Remote MQAM Resets* (on page 24) when resetting MQAMs from the DNCS GUI or when using an auditQam script to reset multiple MQAMs.

After the modulators reset, the software is downloaded from the DNCS to the modulators and existing sessions are reestablished.

Choose a Reset Method

Choose one of the following methods to reset your MQAMs:

- To reset modulators through the DNCS GUI, go to *Preparing to Monitor Remote MQAM Resets* (on page 24).
- To reset modulators using the auditQam utility, go to *Preparing to Monitor Remote MQAM Resets* (on page 24).
- To reset modulators through the front panel, go to *Physically Resetting the MQAM Modulator* (on page 28).

Note: Resetting MQAMs from the DNCS GUI or from the front panel can be time-consuming. If you have a number of modulators to reset, consider using the auditQam utility.

Preparing to Monitor Remote MQAM Resets

- 1 From the xterm window, type `cd /dvs/dnacs/tmp` and press **Enter** to access the TMP directory.
- 2 Type `ls -ltr boot*` and press **Enter**. A list of files starting with "boot" appears in the xterm window.
- 3 Locate the current bootpd.xxx file name.
Note: This will be the bootpd.xxx file with the highest number and/or the most recent date.
- 4 Type `tail -f bootpd.xxx | awk '/'` to show the last MQAM to reboot.
- 5 As you reset MQAMs (in the QAM List window or using the auditqam utility), monitor the bootpd file to verify that each MQAM reset.
Note: The bootpd file will roll over to the next log as it grows. If logging stops, repeat steps 2 through 4 to see if a new log file is being used.
- 6 Go to one of the following sections, as desired:
 - *Resetting the MQAM Modulator Through the DNCS GUI* (on page 24)
 - *Resetting MQAM Modulators Through the auditQam Utility* (on page 26)

Resetting the MQAM Modulator Through the DNCS GUI

This section describes how to reset MQAMs in order to load new software. Use the *Preparing to Monitor Remote MQAM Resets* (on page 24) procedure before resetting MQAMs through the DNCS GUI.



CAUTION:

All active sessions on the MQAM will be interrupted when the modulator is reset. DHCTs downstream of the modulator will lose their ability to display services until sessions are re-established.

- 1 If you have not already done so, provision the modulator on the DNCS.
Note: For instructions on provisioning the MQAM modulator, refer to the *MQAM Modulator Models D9477-1, D9477-2, and D9477-3 Installation and Operation Guide*.
- 2 From the DNCS Administrative Console, click the **DNCS** tab, click the **Network Element Provisioning** tab, and then click **QAM**. The QAM List window opens.
- 3 Based on the order you determined earlier, select the MQAM that you want to reset.

Note: In the following QAM List window, MQAM1 would be reset once even though it is listed four times.

Headend Name	QAM Type	QAM Name	Port	Transport Stream ID	Channel Center Frequency (MHz)	IP Address	Admin State
Headend1	GOQAM	GOQAMx2	RF OUT 1	1177	663.00	172.16.4.10	Online
Headend1	GOQAM	GOQAMx2	RF OUT 2	1178	675.00	172.16.4.10	Online
Headend1	IFGOQAM	IFGOQAMx1	IF Out 1	188	44	172.16.4.100	Online
Headend1	IFGOQAM	IFGOQAMx1	IF Out 2	189	44	172.16.4.100	Online
Headend1	QAM	IrtQam	RF OUT	600	639.00	172.16.4.25	Online
Headend1	MQAM	MQAM1	RF OUT 1	777	705.00	172.16.4.4	Offline
Headend1	MQAM	MQAM1	RF OUT 2	224	711.00	172.16.4.4	Offline
Headend1	MQAM	MQAM1	RF OUT 3	234	717.00	172.16.4.4	Offline
Headend1	MQAM	MQAM1	RF OUT 4	244	723.00	172.16.4.4	Offline
Headend1	MQAM	MQAM2	RF OUT 1	216	729.00	172.16.4.6	Online

- 4 Click **File** and select **Reset**. The Question window opens and asks you to confirm the reset of the MQAM.
- 5 Click **Yes**. The QAM List window displays the following message:
The reset request has been received by QAM modulator <Name of MQAM>

Notes:

- The <Name of MQAM> represents the name of the modulator you just reset.
 - It may take up to 5 minutes for each modulator to reset.
- 6 Do you see the IP address for the MQAM you reset in the bootpd log file?
 - If **yes**, continue with this procedure.
 - If **no**, call Cisco Services.

Note: For details about IP addresses in the bootpd log file, go to *Preparing to Monitor Remote MQAM Resets* (on page 24).

- 7 Repeat steps 3 through 6 for up to three additional modulators and then go to step 8.

Important: Never reset more than four modulators at once or you may cause MQAMs to have to retry downloads due to traffic congestion on the network.

- 8 Choose one of the following options and then come back to step 9 of this procedure.
 - For MQAM modulators that carry broadcast sessions, go to *Verifying the Functionality of MQAM Modulators That Carry Broadcast Sessions* (on page 29).
 - For MQAM modulators that carry xOD or VOD sessions, go to *Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions* (on page 30).

- 9 Do you have additional modulators to reset?
 - If **yes**, repeat steps 3 through 8.
 - If **no**, go to step 10.
- 10 Click **File** and select **Close** to close the QAM List window.

Resetting MQAM Modulators Through the auditQam Utility

The *reset* option of the auditQam utility allows you to reset the MQAM from the command line of the DNCS, a process that is usually quicker than resetting the modulator through the DNCS GUI or modulator panel.

You can use one of the following two methods to reset the MQAM using auditQam:

- Reset a single MQAM by typing the IP address of the modulator as an argument to the **auditQam -reset** command
- Reset more than one MQAM by creating a script that includes a reset command for each modulator. The script includes a delay value that resets each MQAM over a period of time.

Note: Instructions and guidelines for both situations are provided in this section.

Resetting One MQAM

- 1 If necessary, open an xterm window on the DNCS.
- 2 Type the following command and press **Enter**:
auditQam -reset [MQAM ip address]
Result: The system shuts down and reinitializes the modulator.
Note: The system also performs an audit to ensure that the session list for the modulator matches the session list from the DNCS.
- 3 Do you see the IP address for the MQAM you reset in the bootpd log file?
 - If **yes**, continue with this procedure.
 - If **no**, call Cisco Services.
- 4 Select one of the following options:
 - For MQAMs that carry broadcast sessions, go to *Verifying the Functionality of MQAM Modulators That Carry Broadcast Sessions* (on page 29).
 - For MQAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions* (on page 30).

Resetting More Than One MQAM

When performing an upgrade, you may not want to manually reset hundreds of modulators from the DNCS GUI. To save time, you can create a script that resets the MQAMs. Refer to the following example for a sample script.

Important: Resetting the MQAM interrupts all active sessions on the MQAM for up to 10 minutes. Complete this task during a maintenance period whenever possible.

This sample script will execute the following functions:

- Reset four MQAMs
- After 5 minutes (300 seconds), reset another set of four MQAMs

Important: Use the procedure for *Preparing to Monitor Remote MQAM Resets* (on page 24) when using an auditQam script to reset multiple MQAMs.

Note: You can save and re-use this script each time you need to reboot your MQAMs.

```
auditQam -reset 123.123.123.123
sleep 1
auditQam -reset 123.123.123.124
sleep 1
auditQam -reset 123.123.123.125
sleep 1
auditQam -reset 123.123.123.126
sleep 300
# end of first set
auditQam -reset 123.123.123.127
sleep 1
auditQam -reset 123.123.123.128
sleep 1
auditQam -reset 123.123.123.129
sleep 1
auditQam -reset 123.123.123.130
sleep 300
# end of second set
```

After resetting the MQAMs, select one of the following options:

- For MQAMs that carry broadcast sessions, go to *Verifying the Functionality of MQAM Modulators That Carry Broadcast Sessions* (on page 29).
- For MQAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions* (on page 30).

Physically Resetting the MQAM Modulator

- 1 Record the Session Count and the Program Count for your MQAMs by completing the following steps:
 - Note:** Skip this step for any MQAM that is used for video-on-demand (VOD).
 - a Press the **Options** button on the front panel until the **Session Count** total appears.
 - b Record the Session Count on a piece of paper.
 - Note:** Press the **RF Select** button to access each component of the MQAM.
 - c Press the **Options** button on the front panel until the **Program Count** total appears.
 - d Record the Program Count on a piece of paper.
 - Note:** Press the **RF Select** button to access each component of the MQAM.
 - e Repeat steps a) through d) for each MQAM in your system.
- 2 Reset the MQAM by turning off and then back on the power switch located on the back panel.
 - Note:** If it is difficult to reach the power switch, you can reset the modulators by pressing the **Options** button on the front panel until the Reset option appears.
- 3 Repeat steps 1 and 2 for up to three additional modulators.
 - Important:** Never reset more than four modulators at once, or you may overload the DNCS.
- 4 Repeat step 1 to record the current Session and Program Count totals for each modulator that you reset. Then, go to step 5.
- 5 Does the Session Count and Program Count recorded in step 1 and step 4 match?
 - Note:** Skip this step for any MQAM that is used for video-on-demand (VOD).
 - If **yes**, go to *Verifying the Functionality of MQAM Modulators That Carry Broadcast Sessions* (on page 29). Then, go to step 6 of this procedure.
 - If **no**, contact Cisco Services.
- 6 Do you have additional modulators to reset?
 - If **yes**, repeat steps 2 through 5 until each modulator has been reset, and then go to *Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions* (on page 30).
 - If **no**, go to *Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions* (on page 30).

Verifying the Functionality of MQAM Modulators That Carry Broadcast Sessions

- 1 Access a DHCT that is connected downstream to one MQAM.
- 2 Refer to the Channels, Sources & Sessions Report that you generated and saved in *Broadcast Sessions* (on page 22) to verify restored MQAM channels and sessions.
- 3 Tune the DHCT to each channel listed in the report for each MQAM that you reset and upgraded.
- 4 Are all channels listed for the MQAMs that you reset accessible from the DHCT?
 - If **yes**, go to step 5.
 - If **no**, do *not* attempt to upgrade the software for any additional MQAM. Call Cisco Services.
- 5 For those MQAMs that carry content inappropriate for children, we recommend that you verify encryption using one of the following methods:
 - Using a set-top that is authorized for all services, tune one by one to each service and check the PowerKEY Information diagnostic screen (page 6). If the Prog Stat and Prog Entitle fields are zero (0x00), then the program is in the clear. If these fields are non-zero, then the program is encrypted.
 - Verify that the program count is correct on the MQAMs that carry inappropriate content before and after the reset.
 - Using a QAM tuner television, tune to the respective channels and verify that inappropriate content is not viewable.
- 6 Is the content viewable?
 - If **yes**, stop and then restart (bounce) the qamManager process on the DNCS, and repeat step 5. If the content continues to be viewable, contact Cisco Services. Then, go to step 7.
 - If **no**, go to step 7.
- 7 Have you completed resetting your MQAMs?
 - If **yes**, go to step 8.
 - If **no**, return to the procedure you are using to reset your MQAMs.
- 8 Generate a Doctor Report using the **-av** option to verify system stability and functionality.

Note: For further instructions on running the Doctor Report, refer to the chapter titled **Analyze System Configuration With the Doctor Report** in the *DBDS Utilities Version 6.1 Installation Instructions and DNCS Utilities User Guide* (part number 4020695).
- 9 Do new or unexpected errors appear in the Doctor Report?
 - If **yes**, contact Cisco Services.
 - If **no**, go to step 10.

- 10 Perform the System Validation Tests found in the installation and upgrade documentation for your system release version to verify the functionality and performance of the set-tops in your system.
- 11 Over the next few days, check the individual modulators to verify that they received the new code.

Verifying the Functionality of MQAM Modulators That Carry xOD or VOD Sessions

Sessions that exist on xOD or VOD MQAMs that were upgraded will be interrupted and, in most cases, will recover. If the sessions do not recover, choose one of the following options:

- Exit the xOD or VOD application (stop the xOD or VOD program), and then restart the application and the xOD or VOD stream by resuming the playback of the “in progress” purchase.
- Change to a different channel, and then back to the previous channel. Restart the application and the xOD or VOD stream by resuming the playback of the “in progress” purchase.

Note: This procedure will vary depending on the application you are using.

Important: Due to load balancing and traffic, it is difficult to determine if all MQAMs are functioning properly. For this reason, you should monitor these modulators for a few days following this upgrade to verify that Session and Program Counts are increasing and/or decreasing (whichever is applicable) as new xOD or VOD sessions are created.

Note: After the upgrade is complete, perform the System Validation Tests found in the installation and upgrade documentation for your system release version to verify the functionality and performance of the set-tops in your system. If new or unexpected errors occur, contact Cisco Services.

3

Customer Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.

A

Verify the Install Package Exists on the DNCS

Introduction

For system releases that do not include the pre-packaged install tool, we recommend that you verify whether or not the tool exists on your DNCS; because, the tool is required to load new software onto the DNCS. This appendix provides procedures for checking for the install tool, as well as procedures for retrieving it from our FTP site.

In This Appendix

- Check for the Install Tool on the DNCS 34

Check for the Install Tool on the DNCS

Checking for install_pkg on the DNCS

- 1 From an xterm window, type **cd /usr/sbin** and press **Enter**.
- 2 Type **ls** and press **Enter**.
- 3 Is the `install_pkg` file present on the DNCS?
 - If **yes**, resume your installation procedures.
 - If **no**, go to step 4.
- 4 Log on to our FTP server.

Notes:

 - The address of the server is **ftp.sciatl.com** or **192.133.243.133**.

Note: The address for the FTP server is subject to change. If you are unable to reach the FTP server, please contact Cisco Services for the latest address.
 - The username is **anonymous**.
 - The password is the email address of the person logging in.
- 5 Choose one of the following options to navigate to the directory in which the file is located:
 - If you are *inside* our firewall, type **cd /external_pub/scicare/RELEASED/SR2.2Patches**.
 - If you are *outside* our firewall, type **cd /pub/scicare/RELEASED/SR2.2Patches**.
- 6 Type **bin** and press **Enter**. The system sets the ftp transfer mode to binary.
- 7 Type **hash** and press **Enter**. The system configures itself to display hash marks that show file-transfer progress.
- 8 Type **get install_pkg** and press **Enter**. The system begins copying files into the `/export/home/dnCS/download/` directory on your DNCS.
- 9 Type **get install_pkg README_3.0.1.3p2EP1.txt**. The system begins copying files into the `/export/home/dnCS/download/` directory on your DNCS.
- 10 Type **bye** and press **Enter** to log out of our FTP server.
- 11 Continue with the installation procedures.

B

Load Multiple Versions of MQAM Code

Introduction

The recommended upgrade process for MQAMs is based on a goal of getting all the units upgraded within a short period of time (typically one day). In some cases a site may choose to upgrade the MQAMs over time or may desire to load a unique version of code onto a single MQAM for extended testing. This appendix describes how to accomplish either of these goals.

In This Appendix

- Loading Multiple Versions of MQAM Code 36

Loading Multiple Versions of MQAM Code

Note: If you need to determine which config files are being used by each MQAM, refer to *Checking for Multiple Config Files* (on page 13) for details. For this procedure, we will assume that `mqam.config` is the current configuration file.

- 1 Go to the `/tftpboot` directory on the DNCS and rename the current `mqam.config` file as **mqam.current**.
 - 2 Install the new version of MQAM software that you intend to use using *Install MQAM Software onto the DNCS* (on page 17).
 - 3 From the `/tftpboot` directory on the DNCS, rename the new `mqam.config` file as **mqam.new**.
 - 4 From the `/tftpboot` directory on the DNCS, rename the original backup file (for example, rename `mqam.current` to `mqam.config`).
 - 5 From the QAM List window on the DNCS, open the entry for the MQAM that should download the new code.
 - 6 Click the **Advanced Parameters** tab, and change the configuration file name from `mqam.config` to **mqam.new**.
 - 7 Click **Apply**.
 - 8 From the QAM List window on the DNCS, reset the MQAM to which you want to download the new code.
 - 9 Repeat steps 6 through 8 for each MQAM to which you want to download the new code.
 - 10 When you are ready to load code to all of your MQAMs, perform one of the following approaches:
 - **Preferred Approach**
 - a Go to the `/tftpboot` directory and rename `mqam.new` as **mqam.config**.
 - b From the QAM List window on the DNCS, reset all the MQAMs that are using the `mqam.config` file.
 - c From the QAM List window on the DNCS, change the configuration file value for all MQAMs that currently use `mqam.new` to **mqam.config**. These units do not need to be reset.
 - **Alternative Approach**
 - a From the QAM List window, change the configuration file value for all modulators using `mqam.config` to use **mqam.new**.
 - b Reset the changed MQAMs.
- Note:** Units that were already using `mqam.new` as their configuration file do not need to be reset.

C

Roll Back to the Previous Version of MQAM Software

Introduction

This appendix contains instructions for restoring the previous version of MQAM software should you encounter problems after upgrading to MQAM 2.6.18. Follow the instructions in this appendix only after Cisco Services directs you to restore the previous version of software.

Important: If after downloading MQAM 2.6.18 you encounter problems, contact Cisco Services for assistance. In the event that Cisco Services directs you to download the previous version of software to MQAMs, follow the procedures in this appendix while working with Cisco Services.

In This Appendix

- Restore the Previous Version of MQAM Software 38

Restore the Previous Version of MQAM Software

Introduction

Contact Cisco Services if you notice that the system is reacting adversely after installing or upgrading the MQAM software. If Cisco Services recommends restoring the previous MQAM software version, use the instructions in this section to assist you.



CAUTION:

Contact Cisco Services before attempting to restore the previous MQAM software version.

Restoring the Previous MQAM Software Version

Note: To restore the previous MQAM executable files, restore the configuration backup file that you saved in *Backing Up the Current MQAM Configuration File* (on page 16).

- 1 Open an xterm window on the DNCS and log on as the **root** user. The root prompt appears.
- 2 Type **cd /tftpboot** and press **Enter**. The root prompt appears.
- 3 Type **pwd** and press **Enter**. The text `/tftpboot` appears at the prompt. This text indicates you are in the correct directory.
- 4 Type **cp -p mqam.config mqam.config.yyy** and press **Enter**. The configuration file named `mqam.config`, which contains MQAM version 2.6.18 configuration settings, is saved to a file named `mqam.config.yyy`.

Note: The `yyy` represents the MQAM software version number you just installed.

- 5 Type **cp -p mqam.config.old mqam.config** and press **Enter**. The configuration file named `mqam.config.old`, which contains the previous list of MQAM configuration files, is copied to a configuration file named `mqam.config`.
- 6 Type **ls -l** and press **Enter**. A list of files displays. The files **`mqam.config.old`**, **`mqam.config`**, and **`mqam.config.bakyyy`** appear in the list.

Note: The "l" used in `ls` and `-l` is a lowercase letter L.

- 7 Confirm that the date and size of **`mqam.config`** matches those of **`mqam.config.old`**.
- 8 Type **exit** and press **Enter**.
- 9 Download the previous version of software to MQAMs by rebooting the modulators. For detailed procedures, go to *Download Software to the MQAM Modulators* (on page 23).

D

Provision the Passthrough MQAM

Introduction

This appendix provides the procedure to provision an MQAM to process an unencrypted, "passthrough" signal to subscribers.

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Overview

The FCC mandates that any high-definition signal that is available over-the-air to a subscriber must be passed through to the subscriber without being encrypted. Typically, system operators use QAMs to provide this passthrough signal; however, system operators need the option of using MQAMs to provide the passthrough signal.

The procedure in this appendix provides the information you need to set up an MQAM to provide a passthrough signal to subscribers.

Note: You can only provision ASI port 1 and RF output port 1 on an MQAM for passthrough functionality. When using passthrough functionality on an MQAM, you cannot use the other three ports on the MQAM.

What You Need

This procedure requires that you first provide the following:

- An upgrade to the MQAM to version 2.6.18. See *Upgrading the Software* (on page 9) for more information.
- A PC or laptop to connect to the serial port of the MQAM with a terminal emulation software package using the following modem connection settings:
 - 9600 baud
 - 1 stop bit
 - No parity
 - 8 data bits
 - No flow control
- The hexadecimal number of any program ID (PID) that you do **not** want to automatically pass through the MQAM. See *Optional Commands for the Passthrough MQAM* (on page 42) for more information.

Provisioning the Passthrough MQAM

Note: You can only provision ASI port 1 and RF output port 1 on an MQAM for passthrough functionality. When using passthrough functionality on an MQAM, you cannot use the other three ports on the MQAM.

- 1 Upgrade the MQAM to version 2.6.18, following the instructions in *Upgrading the Software* (on page 9).
- 2 Reboot the MQAM.
- 3 Connect a PC to the serial port of the MQAM and open a terminal emulation program such as Procomm Plus or Hyperterm. You will receive an MQAM prompt similar to the following:

D476 MQAM>

- 4 Turn on the passthrough functionality by typing the following command and pressing **Enter**:

pidmode 1 0x0 999

Note: This command allows port 1 on the MQAM to pass 999 PIDs starting with the number 0x0 without encryption. The MQAM stores the information in non-volatile random-access memory (NVRAM) so that the setting is preserved if the MQAM is rebooted.

- 5 Reboot the MQAM by typing the following command and pressing **Enter**:

boot

Result: Port 1 on the MQAM is now in passthrough mode and passes all PIDs without encryption.

Optional Commands for the Passthrough MQAM

If you want to encrypt a block of specific PIDs through the passthrough MQAM port, you can use optional parameters to specify exceptions to the passthrough mode. The PIDs must be in a consecutive numerical block and you must provide the hexadecimal numerical equivalent of the first PID in the block.

To set up a PID block range in the passthrough port that the MQAM will encrypt, type the following command at the MQAM prompt in your terminal emulation program and press **Enter**:

pidmode 1 [hexadecimal starting PID] [decimal number of PID range]

Example:

Typing **pidmode 1 0x1FF0 15** gives you the following results:

- The MQAM is setup for passthrough mode, passing through PIDs with values from 0x0 to 0x1FEF.
- The MQAM does not pass through 15 consecutive PIDs with values starting at 0x1FF0 (0x1FF0 to 0x1FFE). These PIDs can be used for DNCS-inserted packets.

Note: You can specify up to three blocks that identify exceptions to the passthrough mode. Be sure that you know the exact hexadecimal PID values for each block. MQAM software version 2.6.18 will not allow you to overlap block values.



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