



QAM Modulator Software Version 2.5.1

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

Trademark Acknowledgments

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of cisco trademarks, go to this URL: www.cisco.com/go/trademarks.

Third party trademarks mentioned are the property of their respective owners.

The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)

Publication Disclaimer

Cisco Systems, Inc. assumes no responsibility for errors or omissions that may appear in this publication. We reserve the right to change this publication at any time without notice. This document is not to be construed as conferring by implication, estoppel, or otherwise any license or right under any copyright or patent, whether or not the use of any information in this document employs an invention claimed in any existing or later issued patent.

Copyright

© 2006, 2012 Cisco and/or its affiliates. All rights reserved. Printed in the United States of America.

Information in this publication is subject to change without notice. No part of this publication may be reproduced or transmitted in any form, by photocopy, microfilm, xerography, or any other means, or incorporated into any information retrieval system, electronic or mechanical, for any purpose, without the express permission of Cisco Systems, Inc.

Contents

About This Guide	v
Chapter 1 Introducing QAM Software Version 2.5.1	1
Why Choose This Release?	2
What Are the Site Requirements?	3
What's Fixed?.....	5
Known Issues.....	6
CA Descriptor and VOD Sessions	7
Chapter 2 Upgrading the Software	9
Upgrade Process Overview	10
Verify the Current Software Version on the DNCS	13
Back Up the Current QAM Configuration File.....	16
Install QAM Software onto the DNCS.....	17
Establish a Download Sequence	20
Download Software to the QAM Modulators	22
Chapter 3 Customer Information	30
Appendix A Verify the Install Package Exists on the DNCS	31
Check for the Install Tool on the DNCS	32
Appendix B Load Multiple Versions of QAM Code	33
Loading Multiple Versions of QAM Code	34
Appendix C Roll Back to the Previous Version of QAM Software	35
Restore the Previous Version of QAM Software	36

About This Guide

Introduction

This document provides information and procedures for upgrading a Model D9476 Quadrature Amplitude Modulation (QAM) Modulator (QAM) to QAM software version 2.5.1. This document also includes a description of the change requests (CRs) implemented in this release.

Scope

This document provides instructions for upgrading the Model D9476 QAM Modulator with QAM software version 2.5.1. It does not provide instructions for installing a QAM in your headend.

Note: For instructions to install a QAM in your headend or for a complete description of QAM features, refer to the *QAM Modulator Model D9476 Installation and Operation Guide*. For the part number of this document, see **Related Publications**, in this Preface.

Audience

System operators or Cisco engineers who are responsible for installing the QAM software onto a QAM should read this publication.

Related Publications

You may find the following publications useful as resources when you implement the procedures in this document. Check the copyright date on your resources to assure that you have the most current version. The publish dates for the following documents are valid as of this printing. However, some of these documents may have since been revised:

- *Provisioning the DNCS to Support SDV Services* (part number 4012948, expected publish date: late 2006)
- *SARA Application Server 3.4.1 Release Notes and Installation Instructions* (part number 4012158, expected publish date: late 2006)
- *SARA Application Server 3.4.1 User's Guide* (part number 4012159, expected publish date: late 2006)
- *SoftMux Common Download Solution* (part number 4017307, expected published date: late 2006)
- *SR 2.7/3.7/4.2 Online Help (PC Version)* (part number 4012121, expected publish date: late 2006) *

About This Guide

- *Switched Digital Video Architecture Guide* (part number 4012490, expected publish date: late 2006)
- *System Release 2.7 Release Notes* (part number 4012155, expected publish date: December 2006)
- *System Release 3.7 Release Notes* (part number 4012156, expected publish date: December 2006)
- *System Release 4.2 Release Notes* (part number 4012157, expected publish date: December 2006)
- *DBDS Utilities Version 6.1 Installation Instructions and DNCS Utilities User's Guide* (part number 740020, [revision expected date: late 2006])
- *Configuring the DBDS System for Using the Common Download Process With OpenCable™ Hosts Application Guide* (part number 4011041, published January 2006)
- *OCAP Architecture Guide* (part number 738184, published January 2006)
- *Model D9476 QAM Modulator Installation and Operation Guide* (part number 568251, [revision expected date: late 2006])

* The SR 2.7/3.7/4.2 *Online Help (UNIX Version)* should already be installed on your Digital Network Control System (DNCS). The PC version is a separate CD that allows you to view the same online Help on a PC separate from the DNCS workstation.

Document Version

This is the second release of this document.

1

Introducing QAM Software Version 2.5.1

Introduction

This chapter lists the requirements for upgrading the Model D9476 QAM Modulator with QAM software version 2.5.1 and includes several feature enhancements and performance improvements over previous releases of QAM software. These enhancements and improvements are described in the change requests (CRs) implemented in this release. For additional details, go to *What's Fixed?* (on page 5).

In This Chapter

- Why Choose This Release? 2
- What Are the Site Requirements? 3
- What's Fixed? 5
- Known Issues 6
- CA Descriptor and VOD Sessions 7

Why Choose This Release?

Overview

QAM software version 2.5.1 is designed to be installed on a QAM. After the software is installed and the QAM is active, it provides additional support for sites that deploy video-on-demand (VOD), *anything-On-Demand* (xOD), and other standard or interactive broadcast services.

Note: For a complete description of the QAM, refer to the *QAM Modulator Model D9476 Installation and Operation Guide*.

This section includes the features supported in QAM software version 2.5.1.

New Feature

Introduction

This section provides a description of a new feature supported in QAM software version 2.5.1.

Improved Passthru Mode

QAM software version 2.5.1 features a new Passthru command called "pidmode." This feature allows the DNCS to insert packets while in pass-through mode. By utilizing the new command, you can turn the packet/program identifier (PID) pass-through mode on or off for up to three separate PID blocks. The setting you define is stored in non-volatile random access memory (NVRAM) and is automatically restored from NVRAM after a power cycle.

For additional details on configuring pass-through mode on a QAM, refer to the **Preparing the DNCS for a SoftMux Common Download** chapter in the *SoftMux Common Download Solution*.

What Are the Site Requirements?

System Release Compatibility and Prerequisites

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

- SR 2.2/SR 3.2 with Service Pack 3 (or later)
- SR 2.5/SR 3.5/4.0 and associated Service Packs
- SR 2.7/SR 3.7/SR 4.2

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

Cisco Application Platform Release Dependencies

The following table shows the application platform release dependencies for the QAM software.

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

Set-Top Platform	Operating System (OS)	SARA*	PowerKEY Version
Explorer 8300 DVR v. 1.3.1a17 (or later)	OS 6.14.10.1	1.87.14.1	3.7.5
Explorer 8000/8010 DVR v. 1.3.1a17 (or later)	OS 6.12.7.1	1.87.13.1	3.7.5
Explorer 3250HD MR4 P1 (or later)	OS 3.12.8.1	1.57.8.1	3.7.5
Explorer 2xxx, 31xx, 3200, 3100HD	OS 3.10.9	1.54.23.1	1.0.6.20 (Explorer 2000s) 1.0.7 (all others)

* Cisco Resident Application

Important! If you are not using the Cisco Resident Application, contact your resident application provider to verify that you have the most recent version.

Software Components

QAM software version 2.5.1 includes the following codes:

- QAM Host Application code 2.5.1
- QAM Host Boot code 2.1.0

Hardware Supported

QAM 2.5.1 supports only the Model D9476 QAM.

When to Perform the Upgrade

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

What's Fixed?

Implemented CRs

This section provides a description of the CRs implemented in QAM 2.5.1 for issues found in QAM 2.4 and earlier.

QAMs No Longer Insert a CA Descriptor on a Clear Session During a PMT Update

Previously, QAMs inserted the conditional access (CA) descriptor into the program map table (PMT), whether the stream was encrypted or not. Now the CA descriptor is inserted only into encrypted video streams. **CR 54993-03** corrected this issue.

QAMs Perform Insertion ID Re-Use Properly

Previously, the QAMs would occasionally re-use an insertion ID value. This often caused the packet insertion process to fail. Now QAMs will not immediately use deleted insertion ID values and will select a new value. **CR 60424** corrects this issue.

Known Issues

There are no known issues at the time of this release.

CA Descriptor and VOD Sessions

Overview

Versions of QAM software prior to software version 2.3.5 inserted the PowerKEY Conditional Access (CA) descriptor into the PMT for unencrypted on-demand content. If the Digital Home Communications 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

QAM software version 2.5.1 carries forward the modification from QAM software version 2.3.5 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 Multi-Room DVR sessions) to be established correctly on a Multi-Room server.

2

Upgrading the Software

Introduction

This chapter describes how to upgrade the Model D9479 QAM Modulator with QAM software version 2.5.1.

In This Chapter

- Upgrade Process Overview 10
- Verify the Current Software Version on the DNCS 13
- Back Up the Current QAM Configuration File 16
- Install QAM Software onto the DNCS 17
- Establish a Download Sequence 20
- Download Software to the QAM Modulators 22

Upgrade Process Overview

Before You Begin

Before you upgrade to QAM 2.5.1, be sure that your system meets the criteria specified in *System Release Compatibility and Prerequisites* (on page 3) and *Cisco Application Platform Release Dependencies* (on page 3).

If you will not be downloading the QAM software from the Cisco File Transfer Protocol (FTP) site, make sure that you have obtained the CD, **QAM Software V2.5.1**, part number 4016663.

Time to Complete

When upgrading QAMs 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 QAM takes approximately 5 minutes for each modulator.
- For QAMs that carry broadcast sessions, the DNCS will restart the sessions after the QAMs load new software.
- For QAMs that carry VOD sessions, only those sessions that are determined to be active will be restarted. Because subscribers may tune away when the QAM reboots, the total number of recovered sessions may not match the original number of sessions on the QAMs.

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

Subscriber Impact

When QAMs 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 QAM.

Impact of TVs with QAM Tuners

When upgrading QAMs to new releases of software, you must reset the QAMs 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 QAMs. The DNCS also activates encryption for any secure services that were running on the QAMs.

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 QAMs. This extra step ensures that no QAM 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 QAM Modulators That Carry Broadcast Sessions* (on page 27)
- *Verifying the Functionality of QAM Modulators That Carry xOD or VOD Sessions* (on page 29)

Process Overview

This section provides an overview of the process required to upgrade to QAM 2.5.1.

Important! You should only upgrade QAMs 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 QAM, 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 That the Install Package Exists on the DNCS* (on page 31).
- 2 Determine the configuration (config) files currently in use on your system.
- 3 Verify the software version associated with the configuration files.
- 4 Make a backup copy of the *current* QAM configuration file.

Chapter 2 Upgrading the Software

- 5 If you are upgrading more than one QAM, establish an order for upgrading the modulators.
- 6 Install the QAM software onto the DNCS from either the Cisco FTP site or a CD.

Upgrade Tasks

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

- 1 Download the new software to the QAMs.
- 2 If the QAMs 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 QAM 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 QAM 2.5.1, verify the number of configuration files in use and what QAM 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 qam111.config instead of qam.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 QAM is `/tftpboot/qam.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.

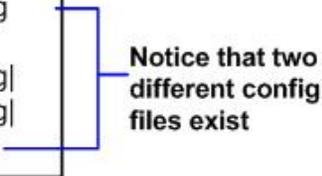
Checking for Multiple Config Files

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

```
> more qamdata
BCASTQAM1|qam.config
VODQAM1|qam.config
BCASTQAM2|qam.config
BCASTQAM3|qam.config
VODQAM|qam.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 QAM software on some QAMs in your network?
 - If **yes**, refer to *Load Multiple Versions of QAM Code* (on page 33).
 - If **no**, go to step 8.
- 8 Update the QAMs 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 QAM, click **File** and select **Open**. The Set Up QAM 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 qam.config`

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

```
flame:/export/home/dnscs$ >cd /tftpboot
flame:/tftpboot$ >grep Appl qam.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 = caqam_app250.bin
flame:/tftpboot$ >
```

Indicates v2.5.0 code is in use
with the qam.config file

- 3 Is the proper version of software installed?
 - If **yes**, type `exit` and press **Enter**.
 - If **no**, go to *Back Up the Current QAM Configuration File* (on page 16).

Back Up the Current QAM Configuration File

Introduction

Before installing the new QAM 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 QAM 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 QAM Configuration File

- 1 Follow these instructions 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 qam.config qam.config.old** and press **Enter**.

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

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

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

Install QAM 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:

- QAM Software V2.5.1 CD, part number 4016663. Go to *Installing the QAM Software from a CD* (on page 17).
- Cisco's FTP server. Go to *Installing the QAM Software from the Cisco FTP Server* (on page 18).

Installing the QAM Software from a CD

- 1 Insert the **QAM Software V2.5.1** CD into the CD-ROM drive of the DNCS.
- 2 Did the File Manager window display?
 - If **yes**, the CD mounted successfully.
 - 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 the 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 steps:
 - a **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.
 - b **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 20).

Installing the QAM Software from the Cisco 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 QAM25** and press **Enter**. The system creates a subdirectory called QAM25 in the /export/home/dnscs/download directory.
- 3 Type **cd QAM25** and press **Enter** to access the QAM25 directory.
- 4 Go to *Obtaining the QAM Software File* (on page 18).

Obtaining the QAM Software File

- 1 Log on to the Cisco FTP server.
Notes:
 - The address of the server is **ftp.sciatl.com** or **192.133.243.133**.
Note: The address for the Cisco 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.
- 2 Choose one of the following options to navigate to the directory in which the file is located:
 - If you are *outside* of Cisco's firewall, type **cd /pub/scicare/RELEASED/CAQAM**
 - If you are *inside* of Cisco's firewall, type **cd /external_pub/scicare/RELEASED/CAQAM**
- 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 **mget *** 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 Cisco 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 QAM25.tar.gz** and press **Enter**. The system decompresses the QAM software file.
- 2 Type **tar xvf QAM25.tar** and press **Enter**. The system extracts the individual files.
- 3 Go to *Installing QAM Software* (on page 19).

Installing QAM 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:

- QAM25 (file)
- SAIQAM (directory)

Example: Type **rm -rf SAIqam QAM25** and press **Enter**.

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

- 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 20).

Establish a Download Sequence

Establishing a Sequence for Downloading Software onto Each QAM

The order in which you download new software onto QAMs 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 QAMs. 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 QAM 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 QAMs 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 QAMs act as spares, download the software on these modulators first.
- 2 If your system does not have a spare QAM, 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 QAMs that carry broadcast sessions, upgrade the modulators in one hub, four modulators at a time, and verify their functionality before proceeding to other QAMs in the hub.

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

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

- 3 If you have QAMs that carry BFS sessions, download the software to the BFS QAM 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 QAMs carry xOD or VOD sessions, you are ready to begin downloading the new software to the QAMs. Go to *Download Software to the QAM Modulators* (on page 22).

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 QAMs that carry broadcast sessions, use Cisco's 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 QAMs).

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

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 3.5 User's Guide* or the *DNCS Online Help* for your system for further assistance.

Download Software to the QAM Modulators

Introduction

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

- DNCS GUI
- auditQam utility
- Back panel of the QAM



CAUTION:

All active sessions on the QAM 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 QAM Resets* (on page 22) when resetting QAMs from the DNCS GUI or when using an auditQam script to reset multiple QAMs.

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 QAMs:

- To reset modulators through the DNCS GUI, go to *Preparing to Monitor Remote QAM Resets* (on page 22).
- To reset modulators using the auditQam utility, go to *Preparing to Monitor Remote QAM Resets* (on page 22).
- To reset modulators through the back panel, go to *Physically Resetting the QAM Modulator* (on page 26).

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

Preparing to Monitor Remote QAM Resets

- 1 From the xterm window, type `cd /dvs/dnCS/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 '/QAM/'** to show the last QAM to reboot.
- 5 As you reset QAMs (in the QAM List window or using the auditqam utility), monitor the bootpd file to verify that each QAM 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 QAM Modulator Through the DNCS GUI* (on page 23)
 - *Resetting QAM Modulators Through the auditQam Utility* (on page 25)

Resetting the QAM Modulator Through the DNCS GUI

This section describes how to reset QAMs in order to load new software. Use the *Preparing to Monitor Remote QAM Resets* (on page 22) procedure before resetting QAMs through the DNCS GUI.



CAUTION:

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

- 1 If you have not already done so, provision the QAM on the DNCS.
Note: For instructions to provision the QAM, refer to the *QAM Modulator Model D9476 Installation and Operation Guide*.
- 2 From the DNCS Administrative Console, click the **DNCS** tab, click the **Element Provisioning** tab, and then click **QAM**. The QAM List window opens.
- 3 Based on the order you determined earlier, select the QAM that you want to reset by highlighting it in the QAM List window.
Important! Although each QAM that has been provisioned is listed multiple times, select only up to four of the modulators listed.

Example: The following diagram shows an example of a QAM selected in the QAM List window.

Headend Name	QAM Type	QAM Name	Port	Transport Stream ID	Channel Center Frequency (MHz)	IP Address	Admin State
oliveoil	MQAM	MQAM1x1	RF OUT 2	121	627.00	172.16.4.5	Online
oliveoil	MQAM	MQAM1x1	RF OUT 3	122	633.00	172.16.4.5	Online
oliveoil	MQAM	MQAM1x1	RF OUT 4	123	639.00	172.16.4.5	Online
bluto	QAM	MikesQam	RF OUT	1235	99.00	12.12.12.12	Offline
oliveoil	QAM	QAM1x1	RF OUT	3	609.00	172.16.4.3	Online
oliveoil	MQAM	VOD1MQAM1	RF OUT 1	31	555.00	172.16.4.31	Offline
oliveoil	MQAM	VOD1MQAM1	RF OUT 2	32	561.00	172.16.4.31	Offline
oliveoil	MQAM	VOD1MQAM1	RF OUT 3	33	567.00	172.16.4.31	Offline
oliveoil	MQAM	VOD1MQAM1	RF OUT 4	34	573.00	172.16.4.31	Offline
oliveoil	QAM	VODqam	RF OUT	7	615.00	172.16.4.4	Online

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

Notes:

- The <Name of QAM> 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 QAM 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 QAM Resets* (on page 22).

- 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 QAMs to have to retry downloads due to traffic congestion on the network.
- 8 Choose one of the following options and then go to step 9 of this procedure.
 - For QAMs that carry broadcast sessions, go to *Verifying the Functionality of QAM Modulators That Carry Broadcast Sessions* (on page 27).
 - For QAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of QAM Modulators That Carry xOD or VOD Sessions* (on page 29).
 - 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 QAM Modulators Through the auditQam Utility

The *reset* option of the auditQam utility allows you to reset the QAM 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 QAM using auditQam:

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

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

Resetting One QAM

- 1 If necessary, open an xterm window on the DNCS.
- 2 Type the following command and press **Enter**:

auditQam -reset [QAM 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 QAM 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 QAMs that carry broadcast sessions, go to *Verifying the Functionality of QAM Modulators That Carry Broadcast Sessions* (on page 27).
 - For QAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of QAM Modulators That Carry xOD or VOD Sessions* (on page 29).

Resetting More Than One QAM

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 QAMs. Refer to the following example for a sample script.

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

This sample script will execute the following functions:

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

Important! Use the procedure for *Preparing to Monitor Remote QAM Resets* (on page 22) when using an auditQam script to reset multiple QAMs.

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

```
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 QAMs, select one of the following options:

- For QAMs that carry broadcast sessions, go to *Verifying the Functionality of QAM Modulators That Carry Broadcast Sessions* (on page 27).
- For QAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of QAM Modulators That Carry xOD or VOD Sessions* (on page 29).

Physically Resetting the QAM Modulator

- 1 Record the Session Count and the Program Count for your QAMs by completing the following steps:

Note: Skip this step for any QAM 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 QAM.
- 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 QAM.
- e Repeat steps a) through d) for each QAM in your system.

- 2 Reset the QAM by turning off and then back on the power switch located on the back panel.
- 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 QAM that is used for video-on-demand (VOD).

 - If **yes**, go to *Verifying the Functionality of QAM Modulators That Carry Broadcast Sessions* (on page 27). 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 QAM Modulators That Carry xOD or VOD Sessions* (on page 29).
 - If **no**, go to *Verifying the Functionality of QAM Modulators That Carry xOD or VOD Sessions* (on page 29).

Verifying the Functionality of QAM Modulators That Carry Broadcast Sessions

- 1 Access a DHCT that is connected downstream to one QAM.
- 2 Refer to the Channels, Sources & Sessions Report that you generated and saved in *Broadcast Sessions* (on page 21) to verify restored QAM channels and sessions.
- 3 Tune the DHCT to each channel listed in the report for each QAM that you reset and upgraded.
- 4 Are all channels listed for the QAMs 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 QAM. Call Cisco Services.
- 5 For those QAMs that carry content inappropriate for children, Cisco recommends 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 QAMs that carry inappropriate content is correct 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 QAMs?
 - If **yes**, go to step 8.
 - If **no**, return to the procedure you are using to reset your QAMs.
- 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 Installation Instructions and DNCS Utilities User's Guide*.
- 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 QAM Modulators That Carry xOD or VOD Sessions

Sessions that exist on xOD or VOD QAMs 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 QAMs 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

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 the Cisco FTP site.

In This Appendix

- Check for the Install Tool on the DNCS 32

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 Cisco's FTP server.

Notes:

 - The address of the server is **ftp.sciatl.com** or **192.133.243.133**.
Note: The address for the Cisco 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* of Cisco's firewall, type **cd /external_pub/scicare/RELEASED/SR2.2Patches**.
 - If you are *outside* of Cisco's 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 Cisco 's FTP server.
- 11 Continue with the installation procedures.

B

Load Multiple Versions of QAM Code

The recommended upgrade process for QAMs 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 QAMs over time or may desire to load a unique version of code onto a single QAM for extended testing. This appendix describes how to accomplish either of these goals.

In This Appendix

- Loading Multiple Versions of QAM Code 34

Loading Multiple Versions of QAM Code

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

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

C

Roll Back to the Previous Version of QAM Software

This appendix contains instructions for restoring the previous version of QAM software should you encounter problems after upgrading to QAM 2.5.1. Follow the instructions in this appendix only after Cisco Services directs you to restore the previous version of software.

Important! If after downloading QAM 2.5.1 you encounter problems, contact Cisco Services at for assistance. In the event that Cisco Services directs you to download the previous version of software to QAMs, follow the procedures in this appendix while working with Cisco Services.

In This Appendix

- Restore the Previous Version of QAM Software 36

Restore the Previous Version of QAM Software

Introduction

Contact Cisco Services if you notice that the system is reacting adversely after installing or upgrading to QAM 2.5.1. If Cisco Services recommends restoring the previous QAM software version, use the instructions in this section to assist you.



CAUTION:

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

Restoring the Previous QAM Software Version

Note: To restore the previous QAM executable files, restore the configuration backup file that you saved in *Backing Up the Current QAM 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 qam.config qam.config.yyy** and press **Enter**. The configuration file named `qam.config`, which contains QAM version 2.5.1 configuration settings, is saved to a file named `qam.config.yyy`.

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

- 5 Type **cp -p qam.config.old qam.config** and press **Enter**. The configuration file named `qam.config.old`, which contains the previous list of QAM configuration files, is copied to a configuration file named `qam.config`.
- 6 Type **ls -l** and press **Enter**. A list of files displays. The files **qam.config.old**, **qam.config**, and **qam.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 **qam.config** matches those of **qam.config.old**.
- 8 Type **exit** and press **Enter**.
- 9 Download the previous version of software to QAMs by rebooting the modulators. For detailed procedures, go to *Download Software to the QAM Modulators* (on page 22).



Cisco Systems, Inc.
5030 Sugarloaf Parkway, Box 465447
Lawrenceville, GA 30042

678 277-1120
800 722-2009
www.cisco.com

This document includes various trademarks of Cisco Systems, Inc. Please see the Notices section of this document for a list of the Cisco Systems, Inc. trademarks used in this document.

Product and service availability are subject to change without notice.

© 2006, 2012 Cisco and/or its affiliates.

All rights reserved.

October 2012 Printed in USA

Part Number 78-740242-01 Rev B