



GQAM Modulator
Software Version 4.0.17
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 information and procedures for upgrading a Model D9479 Gigabit Quadrature Amplitude Modulation (GQAM) modulator to GQAM software version 4.0.17.

Audience

System operators or engineers who are responsible for installing the software onto the GQAM should read this document.

Purpose

This document enables system operators to upgrade the Model D9479 GQAM Modulator with GQAM software version 4.0.17.

Scope

This document provides instructions for upgrading the Model D9479 GQAM Modulator with GQAM software version 4.0.17.

Note: The instructions in this document for the Model D9479 GQAM Modulator includes both the 9479-1 (single GigE port) and 9479-12 (dual GigE port) models of the GQAM.

This document does not provide instructions for installing a GQAM into your headend system.

Note: For instructions to install a GQAM in your headend or for a complete description of GQAM features, refer to the *Gigabit QAM Modulator Model D9479 Hardware Installation and Operation Guide* (part number 745431) or the *Dual SFP Gigabit QAM Modulator Installation and Operation Guide* (part number 4014102).

About This Guide

Document Version

This is the third release of this document.

1

Introducing GQAM Software Version 4.0.17

Introduction

This chapter lists the requirements for upgrading the Model D9479 GQAM Modulator (GQAM) with software version 4.0.17, while also describing several feature enhancements and performance improvements over previous releases of GQAM software. For additional details, go to *What's Fixed?* (on page 5).

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Why Choose This Release?

Overview

GQAM software version 4.0.17 is designed to be installed on a GQAM. 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 or broadcast services.

Note: For a complete description of the GQAM modulator, refer to the *Gigabit QAM Modulator Model D9479 Hardware Installation and Operation Guide* (part number 745431) or the *Dual SFP Gigabit QAM Modulator Installation and Operation Guide* (part number 4014102).

This section includes the features supported in GQAM software version 4.0.17.

What Are the Site Requirements?

System Release Compatibility and Prerequisites

This GQAM software can be installed on a DBDS that is running System Release (SR) 2.5/3.5 or SR 4.0 SP3 (or later) or SR 2.7/3.7/4.2 SP0.2 (or later).

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

Software

GQAM 4.0.17 includes the following software code:

- GQAM Host Application code 4.0.17
- GQAM Host Boot code 4.0.17
- GQAM RF 2.5
- GQAM Input App code 4.0.17
- GQAM Input Boot code 4.0.17
- GQAM Output App code 4.0.17
- GQAM Output Boot code 4.0.17

Hardware

GQAM 4.0.17 supports only the Model D9479 GQAM (both the single GigE port and dual GigE port models).

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	OS 6.14.74.1	1.88.22.1	3.9
v. 1.5.2	OS 6.14.79.1	1.89.16.2	3.9
Explorer 8000/8010 DVR			
v. 1.4.3a10 or later	OS 6.12.74.1	1.88.21.1	3.7.5
v. 1.5.2	OS 6.12.79.1	1.89.16.2	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

* Cisco Resident Application

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

What's Fixed?

Introduction

This section provides a description of the CRs implemented in GQAM 4.0.17.

CR 69051: GQAMs with Encrypted Sessions Could Potentially Become Unresponsive to Session Creations and Deletions

In GQAM 4.0.11, GQAMs with encrypted sessions could potentially become unresponsive to session creations and deletions. This issue has not been detected on the GQAM device, but was corrected in other QAM devices and was included in GQAM 4.0.17 for completeness.

CR 70572: Incorrect SDV Session Count on GQAM Front Panel Has Been Corrected

In GQAM 4.0.11, the Switched Digital Video (SDV) session count on the GQAM front panel became inaccurate when no programming content was available on the SDV channel line-up.

CR 70572 corrects this issue.

CR 70751: GQAM No Longer Passes Stale Upstream PowerKEY ECMs when Session Is Encrypted on GQAM

In GQAM 4.0.11, encrypted sessions on a GQAM exhibited macroblocking when content was being sourced from the SA PowerVu® Model D9850 program receiver.

CR 70751 corrects this issue.

CR 71208: GQAM 1024-Byte Buffer Leak Has Been Corrected

When a corrupted content (input) stream was present, it could result in a slow 1024-byte buffer leak on the GQAM modulator. After a period of days to weeks, the leak could exhaust the entire 1024-byte buffer pool. When this occurred, the GQAM was unable to create new sessions or handle program specific information (PSI) updates on existing sessions, resulting in a loss of service and a GQAM reboot to clear this condition.

CR 71208 corrects this issue.

CR 71523: Statmux Dejitter Group Setup Needs a Way to Ignore Active Session Conflicts

A GQAM craft port command has been added that works in conjunction with SR 2.7/3.7/4.2 SP2 to provide a workaround for adding statmux dejitter group (SMDG) provisioning without deleting active sessions.

Workaround: After 4.0.17 is installed on the GQAM, use the following instructions to enable SMDGs on the GQAM even after the sessions are created. Perform these instructions on one GQAM at a time.

- 1 Run the following command from the craft port of the GQAM that you wish to add SMDGs after the initial CF sessions are created.

GQAM> statmux_rpc_errors 1

- 2 Create the SMDGs on the various ports of the GQAM.

Important: Be careful to enter the information correctly because there is no way to delete an SMDG without deleting all the CF sessions.

- 3 Reboot the GQAM to have the SMDGs take effect.

CR 71901: Allow GQAM to Tune to Frequencies Up to 1 GHz

Previously, the GQAM did not allow tuning above 870 MHz. CR 71901 corrects this issue so that operators can now tune to frequencies up to 1 GHz on GQAM devices that support this enhancement. If the label on the top lid of the GQAM device contains the text "sub-assembly 4005986," then the device supports 1 GHz tuning.

CR 71901 allows GQAM devices that support the 1 GHz frequency range to tune up to 1 GHz.

CR 72200: Macroblocking No Longer Occurs when SDV Mixed with Broadcast or VOD on Same Output Channel

In GQAM 4.0.11, when SDV and either video-on-demand (VOD) or standard broadcasting were on a common RF output, severe macroblocking was occasionally present. This condition also may have occurred with only standard broadcasting if a single RF output carried a program number greater than 255.

CR 72200 corrects this issue.

CR 73037: Single Stream Data Rates Above 20 Mbps No Longer Cause Macroblocking

Previously, a condition existed in GQAMs where macroblocking could possibly occur when a single stream data rate exceeded 20 Mbps. For example, a high-definition program encoded at rates above 20 Mbps could occasionally cause macroblocking on subscribers' TVs.

CR 73037 corrects this issue.

CR 74333: Stranded Packets in Dejitter Buffers No Long Cause GQAM Macroblocking

Previously, when a session was torn down during the startup phase of the dejitter algorithm, a potential race condition could cause packets to become stranded in the dejitter buffers. The next stream that tried to use these resources failed to properly free the buffers. This loss of available buffers degraded the dejitter algorithm for the entire QAM channel and could cause severe packet loss for all streams carried on this QAM channel. A GQAM reboot was required to clear this condition.

CR 74333 corrects this issue.

CR 75344: Unplugging the GigE Cable No Longer Affects Video Quality

Previously, if the GigE cable was unplugged while multicast sessions were provisioned on the GQAM, GigE buffers would be lost. If enough buffers were lost, video quality would drop.

CR 75344 corrects this issue.

CR 75941: GQAMs No Longer Reject New Session Setup Requests

Previously, the GQAM would reject new session setup requests following intermittent link disruptions on the GQAM management Ethernet interface. A reboot of the GQAM was necessary to clear this condition.

CR 75941 corrects this issue.

CR 79277: Reduced the Number of Minor Intermittent Tiling Events on Broadcast Channels Caused by MPEG Payload Data Corruption

CR 79279: Reduced the Number of Minor Intermittent Tiling Events Caused by Misrouted MPEG Packets

Previously, minor intermittent tiling events were reported at a rate of 5 or 6 per hour from sites using the GQAM in a broadcast application. This issue was more pronounced on frequencies with a mix of video and music sessions when the music sessions were provisioned below 250 kbps.

CR 79277 and **CR 79279** corrected these issues.

Known Issues

Introduction

This section lists the CRs that were found while testing this software product. Efforts to address these issues are ongoing in our laboratories.

Please visit <http://www.scientificatlanta.com/dsnexplorer> to view a list of change requests. After logging on to this site, click **General Clarify Reports** in the left pane to display the list of open issues for released software.

Note: This website is password protected. Contact the representative who handles your account for instructions, if necessary.

CA Descriptor and VOD Sessions

Overview

Versions of GQAM 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

GQAM software version 4.0.17 carries forward the modification from GQAM software version 1.0.6 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.

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Upgrading the Software

Introduction

This chapter describes how to upgrade the Model D9479 GQAM with software version 4.0.17.

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Upgrade Process Overview

Before You Begin

Before you upgrade to GQAM 4.0.17, be sure that your system meets the criteria specified in *System Release Compatibility and Prerequisites* (on page 3) and *Application Platform Release Dependencies* (on page 4).

If you will not be downloading the GQAM software from our File Transfer Protocol (FTP) site, make sure that you have obtained the CD, **GQAM V4.0.17**, part number 4022917.

Time to Complete

When upgrading GQAMs 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 GQAM takes approximately 10 minutes for each modulator.
- For GQAMs that carry broadcast sessions, the DNCS will restart the sessions after the GQAMs load new software.
- For GQAMs that carry VOD sessions, only those sessions that are determined to be active will be restarted. Because subscribers may tune away when the GQAM reboots, the total number of recovered sessions may not match the original number of sessions on the GQAMs.

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

Subscriber Impact

When GQAMs 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 GQAM.

Impact of TVs with QAM Tuners

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

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 GQAMs. This extra step ensures that no GQAM 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 GQAM Modulators That Carry Broadcast Sessions* (on page 31)
- *Verifying the Functionality of GQAM Modulators That Carry xOD or VOD Sessions* (on page 32)

Process Overview

This section provides an overview of the process required to upgrade to GQAM 4.0.17.

Important: You should only upgrade GQAMs 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 GQAM, 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 35).
- 2 Determine the configuration (config) files currently in use on your system.
- 3 Verify the software version associated with the configuration files.

Chapter 2 Upgrading the Software

- 4 Make a backup copy of the *current* GQAM configuration file.
- 5 If you are upgrading more than one GQAM, establish an order for upgrading the modulators.
- 6 Install the GQAM 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 GQAMs are reset.

- 1 Download the new software to the GQAMs.
- 2 If the GQAMs 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 GQAM is functioning properly.

Important: Read and follow the directives contained in *Impact of TVs with QAM Tuners* (on page 13).

- 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 GQAM 4.0.17, verify the number of configuration files in use and what GQAM 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 `gqam111.config` instead of `gqam.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 GQAM is `/tftpboot/gqam.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.

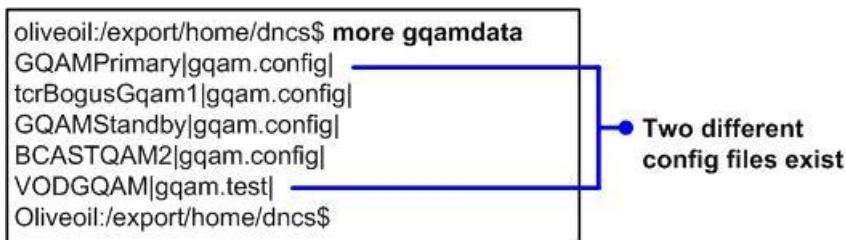
In extremely rare cases, the configuration file may have been specified in or may need to be specified in the `/etc/bootptab` file. In the event that a headend device fails to load the code you intended it to receive, you should check to see if a unique file was specified either through the DNCS GUI 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 gqamdata select qam_name, configfile from pdcaqam where modeltype=3;` 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 qqamdata** and press **Enter**. A result, similar to the following output, appears.



```
oliveoil:/export/home/dnCS$ more qqamdata
GQAMPrimary|qqam.config|
tcrBogusGqam1|qqam.config|
GQAMStandby|qqam.config|
BCASTQAM2|qqam.config|
VODGQAM|qqam.test|
Oliveoil:/export/home/dnCS$
```

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 17).
- 7 Do you need to continue to run different versions of GQAM software on some GQAMs in your network?
- If **yes**, refer to *Load Multiple Versions of GQAM Code* (on page 37).
 - If **no**, go to step 8.
- 8 Update the GQAMs to use the same config file by performing the following steps:
- a From the DNCS Administrative Console, click **Network Element Provisioning** and click **QAM**. The QAM List window opens.
 - b Select the GQAM, click **File** and select **Open**. The Set Up GQAM 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 17).

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 15), type **grep Appl <config file name>** and press **Enter**.

Example: `grep Appl gqam.config`

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

```
oliveoil:/export/home/dncs$ cd /tftpboot
oliveoil:/tftpboot$ grep Appl gqam.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]
ApplCodePath = gqam_host_app_4_0_11.bin
oliveoil:/tftpboot$
```

Indicates v4.0.11 code is in
use with the gqam.config file

- 3 Is the proper version of software installed?

Note: See the GQAM Host Application code version listed in *Software* (on page 3) to verify the correct software version.

- If **yes**, type **exit** and press **Enter**.
- If **no**, go to *Back Up the Current GQAM Configuration File* (on page 18).

Back Up the Current GQAM Configuration File

Introduction

Before installing the new GQAM 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 GQAM 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 GQAM 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 gqam.config gqam.config.old** and press **Enter**.

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

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

- 5 Remain logged in as root user and go to *Install GQAM Software onto the DNCS* (on page 19).

Install GQAM 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:

- GQAM Software V4.0.17 CD, part number 4022917. Go to *Installing the GQAM Software from a CD* (on page 19).
- Our FTP server. Go to *Installing the GQAM Software from the FTP Server* (on page 20).

Installing the GQAM Software from a CD

- 1 Insert the **GQAM V4.0.17** 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 23).

Installing the GQAM 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 GQAM4017** and press **Enter**. The system creates a subdirectory called GQAM4017 in the /export/home/dnscs/download directory.
- 3 Type **cd GQAM4017** and press **Enter** to access the GQAM4017 directory.
- 4 Go to *Obtaining the GQAM Software File* (on page 20).

Obtaining the GQAM 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/GQAM**
 - If you are *inside* our firewall, type **cd /external_pub/scicare/RELEASED/GQAM**
- 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 GQAM4017.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 21).

Decompressing and Extracting the File

- 1 From the xterm window, type **gzip -d GQAM4017.tar.gz** and press **Enter**. The system decompresses the GQAM software file.
- 2 Type **tar xvf GQAM4017.tar** and press **Enter**. The system extracts the individual files.
- 3 Go to *Installing GQAM Software* (on page 21).

Installing GQAM 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:
 - GQAM4017.tar (file)
 - SAIGQAM (directory)

Example: Type **rm -rf SAIgqam GQAM4017.tar** and press **Enter**.

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

Chapter 2 Upgrading the Software

- 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 23).

Establish a Download Sequence

Establishing a Sequence for Downloading Software onto Each GQAM

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

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

- 1 If any GQAMs act as spares, download the software on these modulators first.
- 2 If your system does not have a spare GQAM, download the software on the modulator carrying sessions that are least viewed.
- 3 If you have GQAMs that carry BFS sessions, download the software to the BFS GQAM 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 GQAMs carry xOD or VOD sessions, you are ready to begin downloading the new software to the GQAMs. Go to *Download Software to the GQAM Modulators* (on page 25).

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 GQAMs 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 GQAMs).

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

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

Important: Refer to the *DNCS Report Writer 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 GQAM Modulators

Introduction

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

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



CAUTION:

All active sessions on the GQAM 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 GQAM Resets* (on page 25) when resetting GQAMs from the DNCS GUI or when using an auditQam script to reset multiple GQAMs.

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 GQAMs:

- To reset modulators through the DNCS GUI, go to *Preparing to Monitor Remote GQAM Resets* (on page 25).
- To reset modulators using the auditQam utility, go to *Preparing to Monitor Remote GQAM Resets* (on page 25).
- To reset modulators through the front panel, go to *Physically Resetting the GQAM Modulator* (on page 30).

Note: Resetting GQAMs 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 GQAM 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 '/'** to show the last GQAM to reboot.
- 5 As you reset GQAMs (in the QAM List window or using the auditqam utility), monitor the bootpd file to verify that each GQAM 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 GQAM Modulator Through the DNCS GUI* (on page 26)
 - *Resetting GQAM Modulators Through the auditQam Utility* (on page 28)

Resetting the GQAM Modulator Through the DNCS GUI

This section describes how to reset GQAMs in order to load new software. Use the *Preparing to Monitor Remote GQAM Resets* (on page 25) procedure before resetting GQAMs through the DNCS GUI.



CAUTION:

All active sessions on the GQAM 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 GQAM modulator, refer to *Gigabit QAM Modulator Model D9479 Hardware Installation and Operation Guide* (part number 745431).
- 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 GQAM modulator that you want to reset by highlighting it in the QAM List window.

Important: Although each GQAM modulator that has been provisioned is listed 16 times, select only 1 of the 16 modulators listed.

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

Headend Name	QAM Type	QAM Name	RF Port	Transport Stream ID	Channel Center Frequency (MHz)	IP Address	Admin State
BillyHE1	QAM	EmulGQAM77	RF OUT 1 (4)	23231	621.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 1 (3)	22231	615.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 4 (16)	23234	621.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 4 (15)	22234	615.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 4 (13)	20234	603.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 1 (2)	21231	609.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 1 (1)	20231	603.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 4 (14)	21234	609.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 2 (5)	20232	603.00	172.16.4.77	Online
BillyHE1	QAM	EmulGQAM77	RF OUT 2 (6)	21232	609.00	172.16.4.77	Online

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

Notes:

- The <Name of GQAM> represents the name of the modulator you just reset.
- It may take up to 10 minutes for each modulator to reset.

- 6 Do you see the IP address for the GQAM 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 GQAM Resets* (on page 25).

- 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 GQAMs 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 GQAM modulators that carry broadcast sessions, go to *Verifying the Functionality of GQAM Modulators That Carry Broadcast Sessions* (on page 31).
- For GQAM modulators that carry xOD or VOD sessions, go to *Verifying the Functionality of GQAM Modulators That Carry xOD or VOD Sessions* (on page 32).

- 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 GQAM Modulators Through the auditQam Utility

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

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

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

Resetting One GQAM

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

auditQam -reset [GQAM 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 GQAM 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 GQAMs that carry broadcast sessions, go to *Verifying the Functionality of GQAM Modulators That Carry Broadcast Sessions* (on page 31).
 - For GQAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of GQAM Modulators That Carry xOD or VOD Sessions* (on page 32).

Resetting More Than One GQAM

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

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

This sample script will execute the following functions:

- Reset four GQAMs
- After 10 minutes (600 seconds), reset another set of four GQAMs

Important: Use the procedure for *Preparing to Monitor Remote GQAM Resets* (on page 25) when using an auditQam script to reset multiple GQAMs.

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

```
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 600
# 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 600
# end of second set
```

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

- For GQAMs that carry broadcast sessions, go to *Verifying the Functionality of GQAM Modulators That Carry Broadcast Sessions* (on page 31).
- For GQAMs that carry xOD or VOD sessions, go to *Verifying the Functionality of GQAM Modulators That Carry xOD or VOD Sessions* (on page 32).

Physically Resetting the GQAM Modulator

- 1 Record the Session Count and the Program Count for your GQAMs by completing the following steps:
 - Note:** Skip this step for any GQAM 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 GQAM.
 - 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 GQAM.
 - e Repeat steps a) through d) for each GQAM in your system.
- 2 Reset the GQAM 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 GQAM that is used for video-on-demand (VOD).
 - If **yes**, go to *Verifying the Functionality of GQAM Modulators That Carry Broadcast Sessions* (on page 31). 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 GQAM Modulators That Carry xOD or VOD Sessions* (on page 32).
 - If **no**, go to *Verifying the Functionality of GQAM Modulators That Carry xOD or VOD Sessions* (on page 32).

Verifying the Functionality of GQAM Modulators That Carry Broadcast Sessions

- 1 Access a DHCT that is connected downstream to one GQAM.
- 2 Refer to the Channels, Sources & Sessions Report that you generated and saved in *Broadcast Sessions* (on page 24) to verify restored GQAM channels and sessions.
- 3 Tune the DHCT to each channel listed in the report for each GQAM that you reset and upgraded.
- 4 Are all channels listed for the GQAMs 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 GQAM. Call Cisco Services.
- 5 For those GQAMs 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 GQAMs 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 GQAMs?
 - If **yes**, go to step 8.
 - If **no**, return to the procedure you are using to reset your GQAMs.
- 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 GQAM Modulators That Carry xOD or VOD Sessions

Sessions that exist on xOD or VOD GQAMs 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 GQAMs 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.

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- Checking for the Install Tool on the DNCS..... 36

Checking for the Install Tool 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 our 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 GQAM Code

Introduction

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

In This Appendix

- Loading Multiple Versions of GQAM Code 38

Loading Multiple Versions of GQAM Code

Note: If you need to determine which config files are being used by each GQAM, refer to *Checking for Multiple Config Files* (on page 15) for details. For this procedure, we will assume that `gqam.config` is the current configuration file.

- 1 Go to the `/tftpboot` directory on the DNCS and rename the current `gqam.config` file as **`gqam.current`**.
 - 2 Install the new version of GQAM software that you intend to use using *Install GQAM Software onto the DNCS* (on page 19).
 - 3 From the `/tftpboot` directory on the DNCS, rename the new `gqam.config` file as **`gqam.new`**.
 - 4 From the `/tftpboot` directory on the DNCS, rename the original backup file (for example, rename `gqam.current` to `gqam.config`).
 - 5 From the QAM List window on the DNCS, open the entry for the GQAM that should download the new code.
 - 6 Click the **Advanced Parameters** tab, and change the configuration file name from `gqam.config` to **`gqam.new`**.
 - 7 Click **Apply**.
 - 8 From the QAM List window on the DNCS, reset the GQAM to which you want to download the new code.
 - 9 Repeat steps 6 through 8 for each GQAM to which you want to download the new code.
 - 10 When you are ready to load code to all of your GQAMs, perform one of the following approaches:
 - **Preferred Approach**
 - a Go to the `/tftpboot` directory and rename `gqam.new` as **`gqam.config`**.
 - b From the QAM List window on the DNCS, reset all the GQAMs that are using the `gqam.config` file.
 - c From the QAM List window on the DNCS, change the configuration file value for all GQAMs that currently use `gqam.new` to **`gqam.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 `gqam.config` to use **`gqam.new`**.
 - b Reset the changed GQAMs.
- Note:** Units that were already using `gqam.new` as their configuration file do not need to be reset.



Roll Back to the Previous Version of GQAM Software

Introduction

This appendix contains instructions for restoring the previous version of GQAM software should you encounter problems after upgrading to GQAM 4.0.17. Follow the instructions in this appendix only after Cisco Services directs you to restore the previous version of software.

Important: If after downloading GQAM 4.0.17 you encounter problems, contact Cisco Services. In the event that Cisco Services directs you to download the previous version of software to GQAMs, follow the procedures in this appendix while working with Cisco Services.

In This Appendix

- Restoring the Previous Version of GQAM Software 40

Restoring the Previous Version of GQAM Software

Introduction

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



CAUTION:

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

Note: To restore the previous GQAM executable files, restore the configuration backup file that you saved in *Backing Up the Current GQAM Configuration File* (on page 18).

- 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 gqam.config gqam.config.yyy** and press **Enter**. The configuration file named **gqam.config**, which contains GQAM version 4.0.17 configuration settings, is saved to a file named **gqam.config.yyy**.

Note: The **yyy** represents the GQAM software version number you just installed.

- 5 Type **cp -p gqam.config.old gqam.config** and press **Enter**. The configuration file named **gqam.config.old**, which contains the previous list of GQAM configuration files, is copied to a configuration file named **gqam.config**.
- 6 Type **ls -l** and press **Enter**. A list of files displays. The files **gqam.config.old**, **gqam.config**, and **gqam.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 **gqam.config** matches those of **gqam.config.old**.
- 8 Type **exit** and press **Enter**.
- 9 Download the previous version of software to GQAMs by rebooting the modulators. For detailed procedures, go to *Download Software to the GQAM Modulators* (on page 25)



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