



GQAM Software Version 4.0.6

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 Dual Gigabit Quadrature Amplitude Modulation (GQAM) modulator to GQAM software version 4.0.6.

Audience

System operators or Cisco engineers who are responsible for installing the GQAM 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 4.0.6.

Scope

This document provides instructions for upgrading the Model D9479 GQAM Modulator with GQAM software version 4.0.6.

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 an 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*. For the part number for this document, see **Related Publications**.

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:

- *DBDS Utilities Version 6.1 Installation Instructions and DNCS Utilities User's Guide* (part number 740020, expected publish date: late 2006)
- *SR 2.7/3.7/4.2 Online Help (PC Version)* (part number 4012121, expected publish date: late 2006)
- *SR 2.7/3.7/4.2 Online Help (UNIX Version)* (part number 4012122, expected publish date: late 2006)
- *System Release 4.2 Release Notes* (part number 4012157, expected publish date: late 2006)
- *Gigabit QAM Modulator Model D9479 Hardware Installation and Operation Guide* (part number 745431, published January 2005)
- *Tearing Down Sessions Before Deleting a QAM or an MQAM Modulator Technical Bulletin* (part number 749641, published March 2002)

* The *SR 2.7/3.7/4.2 Online Help (UNIX Version)* should already be installed on your DNCS. The *SR 2.7/3.7/4.2 Online Help (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 GQAM Software Version 4.0.6

Introduction

This chapter lists the requirements for upgrading the Model D9479 GQAM Modulator (GQAM) with software version 4.0.6, 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 7).

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Why Choose This Release?

Overview

GQAM software version 4.0.6 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*.

This section includes the features supported in GQAM software version 4.0.6.

New Features Supported in GQAM Software Version 4.0.6

Introduction

This section provides descriptions of the major new features supported in GQAM software version 4.0.6.

Dual GbE Port Support

GQAM software version 4.0.6 provides for a second GbE port to be used as an automatically or manually switched redundant port when a loss of signal is detected by the GQAM. The second GbE port can also be used as an additional active program source.

When you use the secondary GbE port as a redundant port, the following types of loss detection are used:

- Loss of link – Loss of signal (LOS) or loss of frame (LOF) activity. With either port active, the GQAM switches to the other GbE port when the time of the loss exceeds the Loss threshold time.
- Loss of MPEG program content (LOP) – Ethernet frames are received, but there are no incoming programs (no SPTS [Single Program Transport Streams] or MPTS [Multiple Program Transport Streams]) detected. With either port active, the GQAM switches to the other GbE port when the time of the loss exceeds the Loss threshold time.

The Loss threshold time (Los) is the time interval that must be exceeded to trigger an automatic switch to the inactive port. The default value is 100 milliseconds. Valid threshold times are in the range from 30 milliseconds to 60,000 milliseconds (1 minute).

You can set the GQAM to one of the following switching modes:

- Disabled – One GbE port is used along with the ASI inputs. This is the default provisioned state.
- Automatic Redundancy – Automatically switches to the other GbE port when the loss parameters are exceeded. Setting the GQAM to this switching mode disables the ASI inputs.
- Manual Redundancy – Allows you to switch to the other GbE port manually. Setting the GQAM to this switching mode disables the ASI inputs.

There is a new alarm associated with using dual GbE ports set to automatic or manual redundancy. The alarm displays that the GbE port was switched, and also includes the following parameters:

- Cause of switch—Loss type or manual command
- Previous switching mode—Auto or Manual
- Previous port value
- Current port value

Important:

- This feature requires a system that is running SR 2.7/3.7 or SR 4.2 or later.
- You cannot use the ASI inputs on the GQAM if you use both GbE ports either as failsafe ports or as program source ports.

Note: For assistance using the DNCS to provision and activate the dual GbE ports, refer to the *DNCS Online Help* for your system.

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 2.7/3.7 or SR 4.2.

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

Software

GQAM 4.0.6 includes the following software code:

- GQAM Host Application code 4.0.6
- GQAM Host Boot code 4.0.6

Hardware

GQAM 4.0.6 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.

Cisco Application Platform Release Dependencies

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

Important! Failure to have the correct application platform software *or later* installed on your system *prior* to installing the GQAM 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.

What's Fixed?

Implemented CRs

This section provides a description of the CRs implemented in GQAM 4.0.6.

GQAMs No Longer Display Stale Alarms in SDV Application

Previously, with the GQAM in a Switched Digital Video application, alarms were being held after the session was no longer active, possibly leading to false alarms and memory problems. **CR 60608** corrected this issue.

Muted Output Channels No Longer Unmute During Reboot

Previously, muted output channels could unmute during the reboot period of a soft reset. The channel then muted after the application loaded. This behavior could have affected other GQAMs if they were set to the same frequency output. **CR 60817-04** corrected this issue.

GQAMs No Longer Use NVM Values for Muted RF Frequencies

Previously, GQAMs used the RF frequency values in non-volatile memory (NVM) when the GQAMs were rebooted. This could cause the GQAMs to momentarily activate a newly muted RF frequency when the GQAMs were rebooted. **CR 60963-02** prevents the GQAMs from using the NVM values for muted RF frequencies unless they are in boot mode 0 (zero). When the GQAMs are in boot modes 1 or 2, they now wait for one of the following actions before activating a newly muted RF frequency:

- DNCS provisioning
- Front-panel selection is made
- Craft port selection is issued

GQAM Tracks PID Changes Regardless of PMT

Previously, if a session was created with a program number of 0 (zero), the GQAM assumed it was a single-program transport stream and picked the first (or only) program in the incoming Program Access Table (PAT). If the program number in the PAT changed at a later time, the GQAM tracked the change only if the program map table (PMT) PID changed. This process could cause subscribers to experience "black screens." **CR 62320-02** allows the GQAM to track the program number change regardless of whether the PMT PID changes.

GQAM Display Now Shows Information About Backup GigE Port

Previously, the GQAM front panel only displayed the main GigE port information. With the introduction of dual-GigE port GQAMs, this information was not sufficient and is addressed with **CR 62717**. The GQAM front panel now displays the following information in addition to the main GigE port information:

- Backup GigE port MAC address
- Backup GigE port IP address
- Active port (main or backup)

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 4.0.6 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.

2

Upgrading the Software

Introduction

This chapter describes how to upgrade the Model D9479 GQAM with software version 4.0.6.

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Upgrade Process Overview

Before You Begin

Before you upgrade to GQAM 4.0.6, be sure that your system meets the criteria specified in *System Release Compatibility and Prerequisites* (on page 5) and *Cisco Application Platform Release Dependencies* (on page 6).

If you will not be downloading the GQAM software from the Cisco File Transfer Protocol (FTP) site, make sure that you have obtained the CD, **GQAM Software V4.0.6**, part number 4011046.

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 4.0.6.

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 That the Install Package Exists on the DNCS* (on page **Error! Bookmark not defined.**).
- 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* 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 the Cisco 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 4.0.6, 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 gqamdata** and press **Enter**. A result, similar to the following output, appears.

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

Notice that two different config files exist

- 6 Did more than one config file appear?
 - If **yes**, keep the xterm window open and go to step 7.
 - If **no**, go to *Checking the Software Version Associated with the config File* (on page 18).
- 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 **Error! Bookmark not defined.**).
 - 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 **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 18).

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

Example: `grep Appl gqam.config`

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

```
flame:/export/home/dnccs$ >cd /tftpboot
flame:/tftpboot$ >grep Appl mqam.config
# if the file path/name in ApplCodePath is different than it was
# ApplCodePath should contain a string indicating the path and
# Example: ApplCodePath = [pathname/filename]
ApplCodePath =mqam_app_2_5_0.bin
flame:/tftpboot$ >
```

Indicates v2.5.0 code is in use
with the mqam.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 GQAM Configuration File* (on page 19).

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**.

Result: A copy of the configuration file gqam.config, which contains GQAM 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 20).

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 V4.0.6 CD, part number 4011046. Go to *Installing the GQAM Software from a CD* (on page 20).
- Cisco's FTP server. Go to *Installing the GQAM Software from the Cisco FTP Server* (on page 21).

Installing the GQAM Software from a CD

- 1 Insert the **GQAM Software V4.0.6** 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 23).

Installing the GQAM 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/dncs/download** and press **Enter**. The /export/home/dncs/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 GQAM40** and press **Enter**. The system creates a subdirectory called GQAM40 in the /export/home/dncs/download directory.
- 3 Type **cd GQAM40** and press **Enter** to access the GQAM40 directory.
- 4 Go to *Obtaining the GQAM Software File* (on page 21).

Obtaining the GQAM 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/GQAM**
 - If you are *inside* of Cisco's 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 **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 22).

Decompressing and Extracting the File

- 1 From the xterm window, type **gzip -d GQAM40.tar.gz** and press **Enter**. The system decompresses the GQAM software file.
- 2 Type **tar xvf GQAM40.tar** and press **Enter**. The system extracts the individual files.
- 3 Go to *Installing GQAM Software* (on page 22).

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:
 - GQAM40.tar (file)
 - SAIGQAM (directory)

Example: Type **rm -rf SAIgqam GQAM40.tar** 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 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 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 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 Version 3.5 User's Guide* 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 re-established.

Important! Use the procedure for *Preparing to Monitor Remote GQAM Resets* (on page 26) 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 26).
- To reset modulators using the auditQam utility, go to *Preparing to Monitor Remote GQAM Resets* (on page 26).
- 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/dnscs/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 '/GQAM/'` 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 26) procedure before resetting GQAMs through the DNCS GUI.



CAUTION:

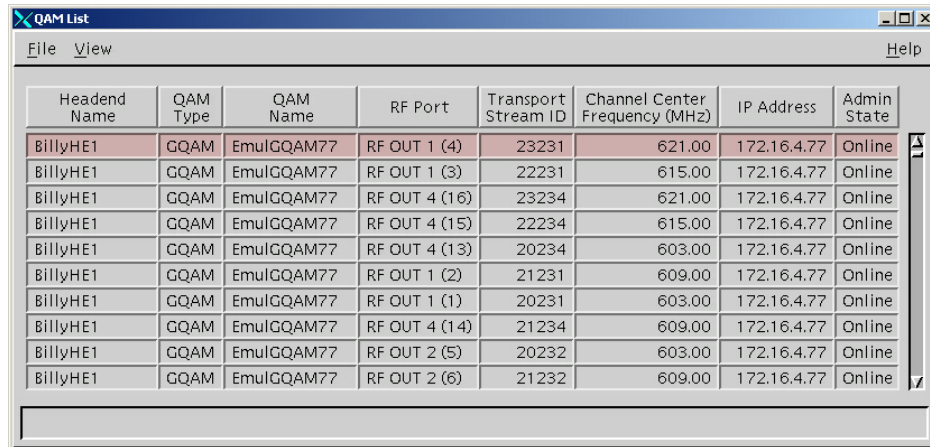
All active sessions on the GQAM will be interrupted when the modulator is reset. DHCTs downstream of the modulator will lose their ability to display services until sessions are re-established.

- 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*.
- 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 | GQAM | EmulGQAM77 | RF OUT 1 (4) | 23231 | 621.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 1 (3) | 22231 | 615.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 4 (16) | 23234 | 621.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 4 (15) | 22234 | 615.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 4 (13) | 20234 | 603.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 1 (2) | 21231 | 609.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 1 (1) | 20231 | 603.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 4 (14) | 21234 | 609.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | EmulGQAM77 | RF OUT 2 (5) | 20232 | 603.00 | 172.16.4.77 | Online |
| BillyHE1 | GQAM | 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 26).

- 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 26) 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 rear 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, 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 GQAMs 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 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 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 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 the Cisco FTP site.

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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 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 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 17) 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.
 - 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**
 - i Go to the `/tftpboot` directory and rename `gqam.new` as **gqam.config**.
 - ii From the QAM List window on the DNCS, reset all the GQAMs that are using the `gqam.config` file.
 - iii 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**
 - i From the QAM List window, change the configuration file value for all modulators using `gqam.config` to use **gqam.new**.
 - ii Reset the changed GQAMs.
- Note:** Units that were already using `gqam.new` as their configuration file do not need to be reset.



Introduction

This appendix contains instructions for restoring the previous version of GQAM software should you encounter problems after upgrading to GQAM 4.0.6. Follow the instructions in this appendix only after Cisco Services directs you to restore the previous version of software.

Important! If after downloading GQAM 4.0.6 you encounter problems, contact Cisco Services at 1-800-283-2636 for assistance. 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.

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Before You Begin

Contact Cisco Services if you notice that the system is reacting adversely after installing or upgrading to GQAM 4.0.6. 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.

Restoring the Previous Version of GQAM Software

Note: To restore the previous GQAM executable files, restore the configuration backup file that you saved in Backing Up the Current GQAM Configuration File.

- 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 4.0.6 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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