Release Notes for Cisco Gigabit-Ethernet Optimized VoD Solution, Release 1.1

March 5, 2004

These release notes include the following topics:

Tip Use this document online. This document provides hyperlinks to related documents and websites, including release notes for solution components and Cisco IOS images.

Note This document is primarily for Cisco products. To establish and maintain the third-party products and applications that may be a part of the Cisco Gigabit-Ethernet Optimized VoD Solution, refer to the documentation provided by the vendors of those products.
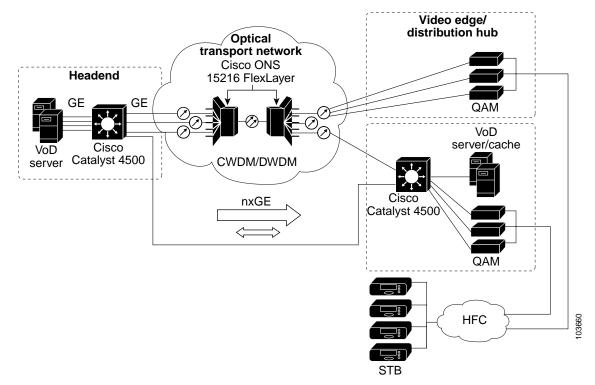
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Document History

Document Version	Date	Notes
1	07/30/2003	This document was first published as *Release Notes for Cisco Gigabit-Ethernet Optimized VoD Solution, Release 1.0*
1.1	03/15/2004	Revised to include additions for Release 1.1

Solution Description

The Cisco Gigabit-Ethernet Optimized VoD Solution enables multiple system operators (MSOs) to offer Video on Demand (VoD) services to consumer customers over their existing hybrid fiber-coaxial (HFC) plant, with existing next-generation digital set-top boxes. The solution leverages a Gigabit Ethernet transport network between the headend, where the video servers reside, to the distribution hub (Dhub), where the HFC network terminates. Cisco Catalyst switches are used in the headend and optionally in the Dhub.

Figure 1   Cisco Gigabit-Ethernet Optimized VoD Solution Architecture

MPEG-2 video is (1) unicast from the video server to the switch; (2) transported from the switch through Gigabit Ethernet Interface Converters (GBICs) over an optical transport Ethernet network between Cisco ONS 15216 FlexLayer DWDM 100-GHz terminal filters at each end; (3) delivered to Gigabit Ethernet quadrature amplitude modulation (QAM) devices; (4) and then modulated onto the HFC plant for viewing by the authorized user through a set-top box. This release of the solution uses both third-party QAM devices and the Cisco uMG9820 QAM Gateway.

For additional information, see Related Documentation, page 7.

Solution Components

Release 1.1 of the Cisco Gigabit-Ethernet Optimized VoD Solution features both Cisco and third-party components. Cisco components are listed in the following sections:

- Cisco Components
- Cisco Software Matrix

Third-Party Components are listed in Important Notes, page 5.

Cisco Components

Table 1 describes the Cisco components tested for Release 1.1 of the Cisco Gigabit-Ethernet Optimized VoD Solution. Software releases that were tested for the solution are listed in Table 2 on page 4.

> **Note** Different applications of this solution may use different subsets of the following components.

> **Tip** When viewing this document online, the components in the Hardware column of Table 1 serve as links to the platform-specific release notes (where applicable). Refer to the release notes for each platform and software image that you use in this solution.

Table 1   Cisco Components for the Cisco Gigabit-Ethernet Optimized VoD Solution

Hardware	Purpose
Cisco uMG9820 QAM Gateway	Video edge QAM device
Cisco Catalyst 4500 series switches	Headend and distribution hub switches
Cisco ONS 15216 FlexLayer DWDM filters	Optical transport network
Cisco DWDM GBICs	Optical transport network

See also Related Documentation, page 7.

Cisco Software Matrix

Table 2 on page 4 is a matrix that describes the tested Cisco IOS and other software releases for Release 1.1 of the Cisco Gigabit-Ethernet Optimized VoD Solution. If you are implementing this solution for the first time, we recommend that you use the most recent software releases in Table 2. If you have already implemented the solution in your network, use the entries in Table 2 as options for upgrading your solution components.

Table 2 also provides hyperlinks to release notes and the Cisco IOS Upgrade Planner from which you can download Cisco IOS images for Cisco components of the solution. See How to Use the Cisco Upgrade Planner, page 4.

Before you select a Cisco IOS image, do the following:

- Select a feature set. Consult with your Cisco account representative to determine the Cisco IOS features that are required for your installation.

- Check the release notes for the platform and software release for Flash and DRAM memory requirements.

Tip When viewing this document online, some of the components in the first column of Table 2 serve as links to the platform-specific release notes. The software release names in the rest of the table serve as links to the Cisco IOS Upgrade Planner from which you can download the Cisco IOS images.

Table 2   Cisco Gigabit-Ethernet Optimized VoD Solution Software Matrix

Component	Cisco Release Tested for This Solution
Cisco uMG9820 QAM Gateway	Release 1.0, Software Version 1.1.9
Cisco Catalyst 4500 series switches	Cisco IOS Release 12.1(19)EW
Cisco ONS 15216 FlexLayer DWDM filters	—
Cisco DWDM GBICs	Cisco IOS Release 12.1(19)EW

How to Use the Cisco Upgrade Planner

Note You need a cisco.com password and user ID to access the Cisco IOS Upgrade Planner.

Step 1 To access the Cisco IOS Upgrade Planner, complete one of the following steps:

a. Within the online version of these release notes, click the release version in Table 2, and launch the IOS Upgrade Planner.

b. Go to http://www.cisco.com/cgi-bin/Software/Iosplanner/Planner-tool/iosplanner.cgi?, and launch the IOS Upgrade Planner.

Step 2 Select the platform name from the Select Platform column in the Choose Options window.

Step 3 Go to the Select Release column and find the heading Early Development Updates.

Step 4 Search for the release name that corresponds with the name in the Cisco Releases Tested for This Solution column in Table 2.

Step 5 Click the link for that release. The Cisco IOS Upgrade Planner is refreshed.

Step 6 Read all instructions on the page, then click the appropriate software feature in the Select Software Feature column. The IOS Upgrade Planner is refreshed.

Step 7 Read the information on that page. If you agree with the requirements, click **I Agree**. The Cisco IOS Upgrade Planner is refreshed.

Caution Make sure that you have enough memory on your system for the file. Note the values in the Minimum Memory and Minimum Flash columns in the File Download Information table.

Step 8 Read all instructions on that page, then click the filename of the binary image in the Download: line.

Step 9 Continue as prompted.

Important Notes

Third-Party Components

> **Note** While third-party servers and QAM devices are not supported as part of this solution, configurations relevant to the transport network are documented in the *Cisco Gigabit-Ethernet Optimized VoD Solution Design and Implementation Guide*.

Table 3 lists third-party components of the solution.

> **Note** For the most current information, contact your Cisco account representative, visit the manufacturer's website, or contact the manufacturer's representative.

Table 3   Third-Party Components

Component	Manufacturer	Product and Version	Website
VoD Server	Concurrent Computer Corporation	MediaHawk	www.ccur.com
	nCube	n4x On-Demand Server	www.ncube.com
	SeaChange International	ITV Media Cluster	www.schange.com
QAM Device	Harmonic Inc.	NSG	www.harmonicinc.com

SeaChange VoD Server Hardware and Software

For this solution, the SeaChange VoD server requires the following hardware and software components:

- Hardware:
  - EVL-0068-02

Software:

  - Vstream version 2.0
  - Mylex firmware version AMI 79P
  - NT advanced server 4.0 OEM service pack 114

Asymmetric EtherChannel

The load balancing behavior of an EtherChannel with both bidirectional and send-only links is as follows:

- If a bidirectional link is lost, the flows on that link are rebalanced to the other links. If this link is the only bidirectional link in the EtherChannel, then it is possible that Open Shortest Path First (OSPF) will lose this route and force the traffic to a new route.

- If a send-only link is lost, the flows on that link are not rebalanced to the other links.

Adding Send-Only Gigabit-Ethernet Links to Operational EtherChannels

When adding send-only links to EtherChannels that are carrying video traffic, be sure to configure the receive-side switch and all physical connections before the send-side switch. If the send-side switch is configured first, then the send-only link is forced up (even though the receive side is not ready to receive) and traffic will be load-balanced onto that link—subsequently causing that traffic to be lost.

Limitations and Restrictions

Load-Balancing Limitations

Limitations in the load-balancing architecture and its implementation on Cisco Catalyst 4500 series switches force restrictions on how load balancing can be used for this solution. The restrictions—and strategies to deal with them—can be found in Load Balancing Strategies in Chapter 2, "Designing the Solution," in the following document:

Cisco Gigabit-Ethernet Optimized VoD Solution Design and Implementation Guide

www.cisco.com/univercd/cc/td/doc/solution/vodsols/goept1/voddig/index.htm

ARP and MAC Address Table Timeouts

Because the data flow in VoD is unidirectional, the MAC address table for each Gigabit-Ethernet port connected to an edge QAM device eventually times out and causes data bound for that device to get flooded to all ports. To get around this, set the Address Resolution Protocol (ARP) timeout for that port (or VLAN) to a value less than the value for **mac-address-table aging-time**. Because the default value of **aging-time** is 300 (seconds), the ARP timeout can be set to 150, as follows: **arp timeout 150**.

Harmonic NSG Issues

Versions of Harmonic NSG earlier than V2.1 do not support Gigabit-Ethernet link redundancy and ARP responses are unreliable.

Caveats

Following are the key caveats for the components in this solution. Workarounds are provided where applicable.

Note For additional caveats that may affect this solution, refer to the release notes for each platform and software release that you use as a solution component. If you view this document online, the software release numbers in Table 2 serve as links to the platform-specific release notes.

If you have an account with Cisco.com, you can use the Bug Toolkit to find to find caveats of any severity for any release. To find the open caveats for Cisco components used in this solution, you must query the system for each of the component and software releases used or being planned for your network. To reach the Bug Toolkit, go to http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

Open Caveats—Release 1.1

There are no solution-specific open caveats in Release 1.1.

Related Documentation

Solution Documentation

This document, and *Cisco Gigabit-Ethernet Optimized VoD Solution Design and Implementation Guide* are available under Cisco Gigabit-Ethernet Optimized VoD Solution, Release 1.1, at the following URL:

http://www.cisco.com/univercd/cc/td/doc/solution/vodsols/geopt1_1/index.htm

Switch Documentation

Documentation resources for the Cisco Catalyst 4500 series switches are available at the following URLs:

http://www.cisco.com/en/US/products/hw/switches/ps4324/index.html

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat4000/index.htm

For the Cisco IOS software used in this release, refer to the following:

- Switch Documentation, Cisco IOS Software Release 12.1(19)EW

    http://www.cisco.com/univercd/cc/td/doc/product/lan/cat4000/12_1_19/index.htm

- Cisco IOS Software Release 12.1(19)EW for Sup II-Plus, III, IV

    http://www.cisco.com/en/US/products/hw/modules/ps2797/prod_bulletin09186a008019741d.html

- Release Notes for the Catalyst 4500 Series Switch, Cisco IOS Release 12.1(19)EW

    http://www.cisco.com/univercd/cc/td/doc/product/lan/cat4000/relnotes/ol_2170.htm

QAM Gateway Documentation

- *Cisco uMG9820 QAM Gateway*

  http://www.cisco.com/univercd/cc/td/doc/product/cable/vod/umg9820/index.htm

Optical Component Documentation

Cisco ONS 15216 DWDM Filters

- *Cisco ONS 15216 FlexLayer User Guide*

  http://www.cisco.com/univercd/cc/td/doc/product/ong/15216/flxlyr10/index.htm

Cisco DWDM GBICs

- *Cisco DWDM Gigabit Interface Converter Installation Guide*

  http://www.cisco.com/univercd/cc/td/doc/product/gbic_sfp/gbic_doc/78_15574.htm
- *Cisco Dense Wavelength Division Multiplexing GBICs Compatibility Matrix*

  http://www.cisco.com/univercd/cc/td/doc/product/gbic_sfp/gbic_doc/ol_4604.htm

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

International Cisco websites can be accessed from this URL:

http://www.cisco.com/public/countries_languages.shtml

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/index.shtml

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit e-mail comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, the Cisco Technical Assistance Center (TAC) provides 24-hour-a-day, award-winning technical support services, online and over the phone. Cisco.com features the Cisco TAC website as an online starting point for technical assistance. If you do not hold a valid Cisco service contract, please contact your reseller.

Cisco TAC Website

The Cisco TAC website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The Cisco TAC website is available 24 hours a day, 365 days a year. The Cisco TAC website is located at this URL:

http://www.cisco.com/tac

Accessing all the tools on the Cisco TAC website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

http://tools.cisco.com/RPF/register/register.do

Opening a TAC Case

Using the online TAC Case Open Tool is the fastest way to open P3 and P4 cases. (P3 and P4 cases are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using the recommended resources, your case will be assigned to a Cisco TAC engineer. The online TAC Case Open Tool is located at this URL:

http://www.cisco.com/tac/caseopen

For P1 or P2 cases (P1 and P2 cases are those in which your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

TAC Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is "down" or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Priority 4 (P4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

• Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Go to this URL to visit the company store:

http://www.cisco.com/go/marketplace/

• The Cisco *Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:

http://cisco.com/univercd/cc/td/doc/pcat/

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- *iQ Magazine* is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/ipj

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

  http://www.cisco.com/en/US/learning/index.html

This document is to be used in conjunction with the documents listed in Related Documentation, page 7.