



Preface

This preface explains the objectives, intended audience, and organization of the *Cisco Gigabit-Ethernet Optimized VoD Solution Design and Implementation Guide, Release 2.0*. The section also defines the conventions used to convey instructions and information, available related documentation, and the process for obtaining Cisco documentation and technical assistance.

This preface presents the following major topics:

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Document Version and Solution Release

This is the first version of this document, which covers Release 2.0 of the Cisco Gigabit-Ethernet Optimized VoD Solution.

Document History

Document Version	Date	Notes
1	09/10/2004	This document was first released. Release 1.0 documentation was released on 07/30/2003. Release 1.1 documentation was released on 03/15/2004.
2	09/17/2004	Incorporates minor changes.

Document Objectives and Scope

This guide describes the architecture, the components, and the processes necessary for the design and implementation of the Cisco Gigabit-Ethernet Optimized VoD Solution, Release 2.0.

This guide supplements the fundamental design and configuration information that is required to establish the various services provided by the Cisco Gigabit-Ethernet Optimized VoD Solution, Release 1.1. MSO (multiple system operator) and service provider networks may have additional requirements that are beyond the scope of this document.

With respect to Release 1.1, the Cisco Gigabit-Ethernet Optimized VoD Solution, Release 2.0 adds major enhancements in the areas of Ethernet switching, optical transport, and Cisco video edge QAM devices, including support for the following:

- Cisco Catalyst 6509 switch and the Cisco 7609 in the headend and Dhub, with 10 Gigabit Ethernet (GE)
- 10-GE external transponders and intelligent optical filters in conjunction with the Cisco ONS 15454 MSTP (Multi-Service Transport Platform)
- Cisco uMG9850 QAM Modules
- Graphical user interface (GUI)-based network management

In addition, the video architecture of Release 2.0 leverages transport and routing designs for fully converged networks that support not only video, but also high-speed data (HSD), voice over IP (VoIP), and other applications.

**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.

Audience

The target audience for this document is assumed to have basic knowledge of and experience with the installation and acceptance of the products covered by this solution. See [Chapter 1, “Solution Overview.”](#)

In addition, it is assumed that the user understands the procedures required to upgrade and troubleshoot optical transport systems and Ethernet switches, with emphasis on Cisco Catalyst series switches).

**Note**

This document addresses Cisco components only. It does not discuss how to implement third-party optical components, VoD servers, or QAM devices, or how to enable service between QAM devices and hybrid fiber coax (HFC) distribution.

Document Organization

The major sections of this document are as follows:

Section	Title	Major Topics
Chapter 1	Solution Overview	Introduces applications, example scenarios, and components.
Chapter 2	Designing the Solution	Provides detailed requirements of various scenarios.
Chapter 3	Implementing and Configuring the Solution	Describes the configuration and implementation of the solution and provides example implementations.
Chapter 4	Providing Redundancy and Reliability	Describes failure scenarios and their remedies.
Chapter 5	Monitoring and Troubleshooting	Provides an introduction to monitoring and troubleshooting the Cisco Ethernet switches used in the solution.
Appendix A	Sample Configuration for a Headend Switch	Provides an example configuration for a headend switch.
Appendix B	Sample Configurations for Dhub Switches	Provides example configurations for Dhub switches.
Appendix C	Sample Configurations for QAM Switches	Provides example configurations for QAM switches.

Related Documentation

Solution Documentation

This document, and *Release Notes for Cisco Gigabit-Ethernet Optimized VoD Solution, Release 2.0*, are available under Cisco Gigabit-Ethernet Optimized VoD Solution, Release 2.0, at the following URL:

http://www.cisco.com/univercd/cc/td/doc/solution/vodsols/geopt2_0/index.htm

Switch Documentation

Documentation resources for the Cisco Catalyst switches and the Cisco 7609 router are available at the following URLs:



Note

The Cisco 7609 router used in this solution functions as a switch, and is considered to be a switch in this documentation.

Cisco Catalyst 4500 Series Switches

For all hardware and software documentation for this series, go to the following URL:

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

Cisco Catalyst 6500 Series Switches

For all hardware and software documentation for this series, go to the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/index.htm>

Cisco 7600 Series Routers

For all hardware and software documentation for this series, go to the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/index.htm>

Optical Component Documentation

Cisco ONS 15454

- Cisco ONS 15454 User Documentation, Release 4.6
<http://www.cisco.com/univercd/cc/td/doc/product/ong/15400/index.htm>

Cisco ONS 15216

- Cisco ONS 15216
<http://www.cisco.com/univercd/cc/td/doc/product/ong/15216/index.htm>
- *Cisco ONS 15216 FlexLayer User Guide, Release 1.0*
<http://www.cisco.com/univercd/cc/td/doc/product/ong/15216/flxlyr10/index.htm>

Cisco DWDM GBICs

- *Cisco DWDM Gigabit Interface Converter Installation Guide*
www.cisco.com/univercd/cc/td/doc/product/gbic_sfp/gbic_doc/78_15574.htm
- *Cisco Dense Wavelength Division Multiplexing GBICs Compatibility Matrix*
www.cisco.com/univercd/cc/td/doc/product/gbic_sfp/gbic_doc/ol_4604.htm

QAM Gateway Documentation

- Cisco uMG9820 QAM Gateway
<http://www.cisco.com/univercd/cc/td/doc/product/cable/vod/umg9820/index.htm>
- Cisco uMG9850 QAM Module
<http://www.cisco.com/univercd/cc/td/doc/product/cable/vod/umg9850/index.htm>



Note

Other references are provided as appropriate throughout this document.

Document Conventions

Command descriptions use the following conventions:

boldface font	Commands and keywords are in boldface .
<i>italic font</i>	Arguments for which you supply values are in <i>italics</i> .
[]	Elements in square brackets are optional.
{ x y z }	Alternate keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use the following conventions:

screen font	Terminal sessions and information the system displays are in screen font.
boldface screen font	Information you must enter is in boldface screen font . ¹
<i>italic screen font</i>	Arguments for which you supply values are in <i>italic screen font</i> .
→	This pointer highlights an important line of text in an example.
^	The symbol ^ represents the key labeled Control. For example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords, are in angle brackets in contexts where italic font is not available.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

1. As this document makes use of annotated configurations, the rigorous use of boldface type to indicate what the user must enter is relaxed.

Notes use the following conventions:



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

Timesavers use the following conventions:

**Timesaver**

Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Cautions use the following conventions:

**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Tips use the following conventions:

**Tip**

Means the following information *will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

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 at this URL:

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

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at 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_inpk/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 send 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, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

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

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

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

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request 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 list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—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.

Severity 2 (S2)—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.

Severity 3 (S3)—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.

Severity 4 (S4)—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. Visit Cisco Marketplace, the company store, at this URL:

<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 at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

<http://www.cisco.com/packet>

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. 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>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

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

