User Guide for Cisco Video Assurance Management Solution 1.5

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User Guide for Cisco Video Assurance Management Solution 1.5

CONTENTS

Preface

This preface describes the objectives, audience, organization, and conventions of the *User Guide for Cisco Video Assurance Management Solution 1.5*.

Note Use this document along with the documents listed in the "Related Documentation" section on page ix.

This preface contains:

In this guide, each installation and configuration bases its procedures on Cisco product documentation with corresponding references made to specified product documentation guides (supplied during site installation or available online at cisco.com). Refer to these guides whenever requested. Each reference will call out the required procedure and the section of the guide that you will need.

Document Revision History

The following Document Revision History table records technical changes to this document. The table shows the document revision number for the change, the date of the change, and a brief summary of the change.

Revision	Date	Change Summary
OL-16498-01	December 17, 2008	Initial release.

Objectives

This guide describes the architecture, the components, and the processes necessary for the design and implementation of the Cisco Video Assurance Management Solution (Cisco VAMS), Release 1.5.

Audience

The target audience for the Cisco VAMS guide should have a basic knowledge of network management products, and experience with the installation and acceptance of these products covered by this solution.

In addition, the user should understand the procedures to upgrade and troubleshoot video systems and Ethernet switches.

Note This document addresses Cisco components only. It does not discuss how to implement third-party components optionally supported for video management capabilities.

Document Organization

The major sections of this document are:

Chapter	Title	Description
Chapter 1	Overview	Introduces implementation and scope of the Cisco VAMS, its components, and miscellaneous support topics.
Chapter 2	Preinstallation	Describes the prerequisites required for preinstallation of the Cisco VAMS 1.5 solution components.
Chapter 3	Installing the Cisco Video Assurance Management Solution 1.5	Describes how to install the Cisco VAMS 1.5.
Chapter 4	Uninstalling the Cisco Video Assurance Management Solution 1.5	Describes how to uninstall the Cisco VAMS 1.5.
Chapter 5	Configuring the Components of the Cisco Video Assurance Management Solution 1.5	Describes how to configure the components of the Cisco VAMS 1.5.
Chapter 6	Troubleshooting with the Cisco Video Assurance Management Solution 1.5	Provides information about troubleshooting the Cisco VAMS 1.5.
Appendix A	Trap Definitions	Provides definitions of traps that the Cisco VAMS 1.5 supports.

Related Documentation

For information beyond the scope of this document, or for additional information about the Cisco VAMS product and its third-party documentation, refer to:

- Cisco Product Documentation, page ix
- Video Probe Documentation, page xiv

Cisco Product Documentation

Cisco provides:

- Cisco Active Network Abstraction, page ix
- Cisco Multicast Manager, page xi
- Cisco Routers and Switches, page xii
- Cisco Info Center, page xiii
- Cisco Internet Protocol Television (IPTV) Solutions, page xiii

Cisco Active Network Abstraction

The Cisco Active Network Abstraction (ANA) 3.6 and Service Packs up through Service Pack 3 is the element management platform for the Cisco VAMS.

Cisco ANA Release Notes

- *Release Notes for Cisco Active Network Abstraction, Version 3.6*
- *Release Notes for Cisco Active Network Abstraction, Version 3.6 Service Pack 1*
- *Release Notes for Cisco Active Network Abstraction, Version 3.6 Service Pack 2*
- *Release Notes for Cisco Active Network Abstraction, Version 3.6 Service Pack 3*

Viewable online at:

http://www.cisco.com/en/US/products/ps6776/prod_release_notes_list.html

Cisco ANA User and Reference Guides

- *Cisco Active Network Abstraction EventVision User Guide Version 3.6*
- *Cisco Active Network Abstraction EventVision User Guide Version 3.6 Service Pack 1*
- *Cisco Active Network Abstraction EventVision User Guide Version 3.6 Service Pack 2*
- *Cisco Active Network Abstraction EventVision User Guide Version 3.6 Service Pack 3*
- *Cisco Active Network Abstraction Fault Management User Guide Version 3.6*
- *Cisco Active Network Abstraction Fault Management User Guide Version 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Fault Management User Guide Version 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Fault Management User Guide Version 3.6 Service Pack 3*
- *Cisco Active Network Abstraction Managing MPLS User Guide Version 3.6*
- *Cisco Active Network Abstraction Managing MPLS User Guide Version 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Managing MPLS User Guide 3.6 Service Pack 2*

- *Cisco Active Network Abstraction Managing MPLS User Guide 3.6 Service Pack 3*
- *Cisco Active Network Abstraction NetworkVision User Guide Version 3.6*
- *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 1*
- *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 3*
- *Cisco Active Network Abstraction Technology Support and Information Model Reference Manual, Version 3.6*
- *Cisco Active Network Abstraction Technology Support and Information Model Reference Manual, 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Technology Support and Information Reference Manual 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Technology Support and Information Model Reference Manual, 3.6 Service Pack 3*
- *Cisco Active Network Abstraction 3.6 Virtual Network Element Reference Guide*
- *Cisco Active Network Abstraction Virtual Network Element Reference Guide, Version 3.6 Service Pack 1*
- *Cisco Active Network Abstraction VNE Reference Guide 3.6 Service Pack 2*

Viewable online at:

http://www.cisco.com/en/US/products/ps6776/products_user_guide_list.html

Cisco ANA Configuration Guides

- *Cisco Active Network Abstraction BQL User Guide 3.6*
- *Cisco Active Network Abstraction BQL User Guide 3.6 Service Pack 1*
- *Cisco Active Network Abstraction BQL User Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Command Builder User Guide 3.6*
- *Cisco Active Network Abstraction Command Builder User Guide 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Command Builder User Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Customization User Guide 3.6*
- *Cisco Active Network Abstraction Customization User Guide 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Customization User Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Customization User Guide 3.6 Service Pack 3*
- *Cisco Active Network Abstraction Workflow User Guide 3.6*
- *Cisco Active Network Abstraction Workflow User Guide Version 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Workflow User Guide 3.6 Service Pack 2*

Viewable online at:

http://www.cisco.com/en/US/products/ps6776/products_installation_and_configuration_guides_list.html

Cisco ANA Installation Guides

- *Cisco Active Network Abstraction Installation Guide Version 3.6*
- *Cisco Active Network Abstraction Installation Guide 3.6 Service Pack 1*

- *Cisco Active Network Abstraction Installation Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Installation Guide 3.6 Service Pack 3*

Viewable online at:

http://cisco.com/en/US/products/ps6776/prod_installation_guides_list.html

Cisco ANA Administration Guides

- *Cisco Active Network Abstraction Administrator Guide 3.6*
- *Cisco Active Network Abstraction Administrator Guide 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Administrator Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Administrator Guide 3.6 Service Pack 3*
- *Cisco Active Network Abstraction Error Messages 3.6*
- *Cisco Active Network Abstraction Error Messages 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Error Messages 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Error Messages 3.6 Service Pack 3*
- *Cisco Active Network Abstraction High Availability User Guide 3.6*
- *Cisco Active Network Abstraction High Availability User Guide Version 3.6 Service Pack 1*
- *Cisco Active Network Abstraction High Availability User Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction High Availability User Guide 3.6 Service Pack 3*
- *Cisco Active Network Abstraction Shell User Guide 3.6*
- *Cisco Active Network Abstraction Shell User Guide 3.6 Service Pack 1*
- *Cisco Active Network Abstraction Shell User Guide 3.6 Service Pack 2*
- *Cisco Active Network Abstraction Shell User Guide 3.6 Service Pack 3*

Viewable online at:

http://www.cisco.com/en/US/products/ps6776/prod_maintenance_guides_list.html

Cisco Multicast Manager

Cisco Multicast Manager (CMM) 2.5.4 monitors the multicast control plane and forwards traps from the video transport network to Cisco ANA.

Cisco Multicast Manager Release Notes

Release Notes for Cisco Multicast Manager 2.5

Viewable online at:

http://www.cisco.com/en/US/products/ps6337/prod_release_notes_list.html

Cisco Multicast Manager Installation Guide

Installation Guide for Cisco Multicast Manager, 2.5

Viewable online at:

http://www.cisco.com/en/US/products/ps6337/prod_installation_guides_list.html

Cisco Multicast Manager User Guide

User Guide for Cisco Multicast Manager 2.5

Viewable online at:

http://www.cisco.com/en/US/products/ps6337/products_user_guide_list.html

Cisco Routers and Switches

The Cisco 7600 Series router, the Cisco Catalyst 6500 switch, the CRS-1, and a Catalyst 4948 Series switches form the core of the video transport network.

Cisco 7600 Series Routers

Viewable online at:

http://www.cisco.com/en/US/products/hw/routers/ps368/tsd_products_support_series_home.html

Release notes for the 12.2(33)SRB2, 12.2(33)SRB3, and 12.2(33)SRC1 IOS

Viewable online at:

http://www.cisco.com/en/US/docs/ios/12_2sr/release/notes/122SRrn.html

Cisco Catalyst 6500 Series Switches

Viewable online at:

http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html

Release notes for the 12.2(33)SRB2, 12.2(33)SRB3, and 12.2(33)SRC1 IOS

Viewable online at:

http://www.cisco.com/en/US/docs/ios/12_2sr/release/notes/122SRrn.html

Cisco Carrier Routing System (CRS-1)

Viewable online at:

http://www.cisco.com/en/US/products/ps5763/tsd_products_support_series_home.html

Release notes for the IOS-XR 3.6.1.12

Viewable online at:

http://www.cisco.com/en/US/docs/ios_xr_sw/iosxr_r3.6/general/release/notes/reln_361.html

Cisco Catalyst 4900 Series Switches

Viewable online at:

http://www.cisco.com/en/US/products/ps6021/tsd_products_support_series_home.html

Release notes for the 12.2(25)EWA6 and 12.2(31)SGA IOS

Viewable online at:

http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/release/note/OL_9592.html

Cisco Info Center

The Cisco VAMS 1.5 system architecture includes an interface between the IBM Netcool 7.1 product suite (under the Cisco Info Center or CIC product family) and Cisco ANA.

Documentation Guide and Supplemental License Agreement

- *Cisco Info Center 7.1 Documentation Guide and Supplemental Licence Agreement*

Viewable online at:

http://www.cisco.com/en/US/products/sw/netmgtsw/ps996/products_documentation_roadmap09186a0080805796.html

IBM Tivoli Netcool Product

See the following guides for this product, available on the IBM website.

User Guide

Netcool/OMNIbus 7.1 User Guide

Administration Guide

Netcool/OMNIbus 7.1 Administration Guide

Installation and Deployment

Netcool/OMNIbus 7.1 Installation and Deployment Guide

Release Notes

Netcool/OMNIbus 7.1 Release Notes

Probe and Gateway Guide

Netcool/OMNIbus 7.1 Probe and Gateway Guide

Cisco Internet Protocol Television (IPTV) Solutions

Video solutions that the Cisco VAMS 1.5 solution supports include:

Cisco IPTV Wireline Solutions

- *Cisco Wireline Video/IPTV Solution Design and Implementation Guide, Release 1.1*

Viewable online at:

http://www.cisco.com/en/US/products/ps6902/products_implementation_design_guide_book09186a00806b5b4c.html

Cisco IPTV Cable Solutions

- *Cisco Gigabit-Ethernet Optimized Video Networking Solution for Cable Design and Implementation Guide, Release 3.0*

Viewable online at:

http://www.cisco.com/en/US/products/ps6902/products_implementation_design_guide_book09186a00806470d8.html

Video Probe Documentation

Bridge Technologies

VB120 Broadcast IP-Probe User's Manual v. 4.0

IneoQuest IQMediaMonitor Series M1 Singulus G1-T

- *Hardware User's Guide*
- *IQMediaAnalyzer Application User's Guide*

IneoQuest Cricket

See the IneoQuest website.

Mixed Signals Sentry

Mixed Signals Sentry Digital Content Monitor User Guide

PixelMetrix

DVStation-IP-3 User Manual, Software Version 4.17

Tektronix MTM400

- *MTM400 MPEG Transport Stream Monitor User Manual*
- *MTM400 MPEG Transport Stream Monitor Technical Reference*
- *MTM400 MPEG Transport Stream Monitor Programmer Manual*

Document Conventions

This guide uses the following conventions to convey instructions and information.

Convention	Description
boldface font	Commands and keywords.
italic font	Variables for which you supply values.
[ ]	Keywords or arguments that appear within square brackets are optional.
{x | y | z}	A choice of required keywords appears in braces separated by vertical bars. You must select one.
`screen font`	Examples of information displayed on the screen.
`boldface screen font`	Examples of information you must enter.
< >	Nonprinting characters, for example passwords, appear in angle brackets.
[ ]	Default responses to system prompts appear in square brackets.

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

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

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.

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

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop by using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

CHAPTER 1

Overview

The *User Guide for Cisco Video Assurance Management Solution 1.5* provides a complete overview of the hardware and software products that the Cisco Video Assurance Management Solution (Cisco VAMS) comprises. This guide describes key benefits and advantages, features, and technical specifications for the products that make up the Cisco VAMS 1.5. The guide also describes installation, configuration, and troubleshooting tasks.

You can use the Cisco VAMS 1.5 to diagnose and facilitate the tasks of monitoring the transport section of a multicast video network to:

- Monitor the health and performance of the network.
- Analyze and troubleshoot faults and exceptions.
- Ensure security, accountability and compliance with organizational policies and regulatory requirements.

This chapter contains:

License Information

See Appendix B, “End User License Agreement Supplement.”

Introduction to Cisco VAMS 1.5

Cisco VAMS 1.5 delivers to service providers real-time, centralized monitoring of backbone, regional, and aggregation networks for broadcast video transport. Cisco VAMS 1.5 provides the framework for a flexible end-to-end assurance platform for video. See the "Solution Component Versions" section on page 1-7 for descriptions of the solution components and required software versions.

Cisco VAMS 1.5 provides a modular architecture for monitoring video networks: VAMS 1.5 uses:

- Cisco Multicast Manager (CMM 2.5) with Patch 2.5.4 for multicast monitoring and troubleshooting functions
- The Cisco Info Center (CIC) product suite[1] to monitor events from CMM.

  Cisco has bundled the CIC/Netcool the ObjectServer (central database) and Webtop (web GUI for event list viewing) from the CIC product suite with the VAM solution.

  The CIC product suite includes two additional product components from the IBM Tivoli product suite:

  – IBM Tivoli Business and Services Manager (TBSM), a service dashboard and visualization tool.

  – IBM Tivoli Impact, which supports the definition of service and network correlations.

  This combination of CIC and Netcool functionality accomplishes two key objectives for Cisco VAMS 1.5. It provides:

  – Connectivity between CMM and CIC.

  – A "Single Pane of Glass" toolset[2] for Cisco VAMS 1.5.

  CIC includes rules files that define multicast alerts from various sources like probes and routers. The rules file includes code that extracts the multicast group and source information from these alerts and provides the operator with a CMM Multicast Trace option.

  By integrating CMM with CIC you can now view all the alarm conditions and data for service level correlation and analysis. Additionally, you can launch troubleshooting and diagnostic analysis from one system instead of looking at several systems.
- Cisco ANA 3.6 Service Pack 3 to build an abstracted network model through a set of virtual network elements (VNEs).

  Each VNE represents an element in the managed network. Cisco VAMS 1.5 extends the base functions of the Cisco ANA 3.6.2 VNEs for Cisco 7600 Series routers, Cisco Carrier Routing System (CRS-1) devices, and Cisco Catalyst 4948 and 6500 Series switches. These VNE extensions address the specific requirements of video delivery across the IP network.

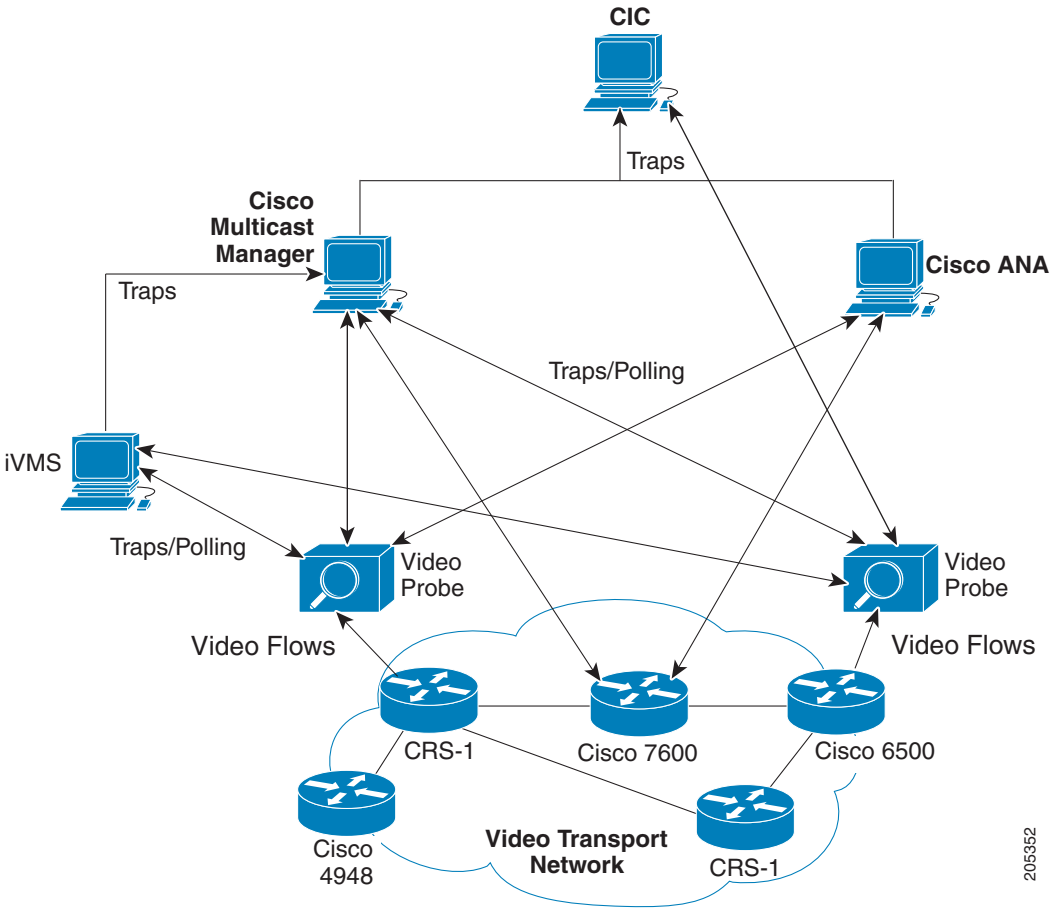
Finally, Cisco VAMS 1.5 includes generic VNEs that support specific video probes; this release includes VNEs for IneoQuest, Mixed Signals, and Tektronix video probes.

Cisco VAMS 1.5 Network Topology

Figure 1-1 shows an example topology of the Cisco VAMS 1.5 components.

1. This is the OEM product of the IBM Tivoli Netcool Suite.
2. Single Pane of Glass—The ability to utilize multiple interconnected tools to monitor, diagnose, and troubleshoot network and video impairments from a single console.

Figure 1-1 Cisco Video Assurance Management Solution 1.5 Components

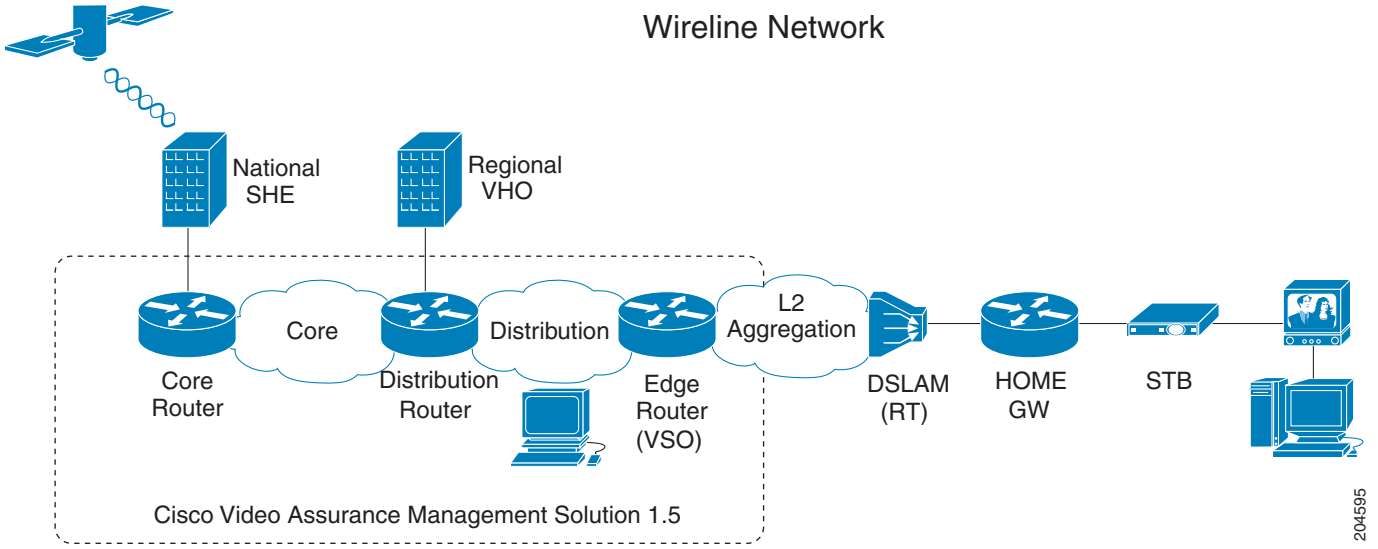


See the "Cisco VAMS Solution Components" section on page 1-6, for descriptions of the Cisco VAMS components shown in Figure 1-1.

Cisco VAMS 1.5 in a Wireline Network

Figure 1-2 shows the Cisco VAMS 1.5 in a wireline network.

Figure 1-2 Cisco Video Assurance Management Solution 1.5 in a Wireline Network



The Super Head End (SHE) is the network location for live feeds for the broadcast video service. This site contains the real-time encoders used for the broadcast video service, along with the asset distribution systems for on-demand services. This site may also contain back-office systems such as the subscriber database.

The Video Hub Office (VHO) is the network location of the video server complex, which includes the video sources for on-demand services and real-time encoders for local television stations.

Cisco VAMS 1.5 covers the video transport network and focuses on the core and distribution networks shown in Figure 1-2. See also Figure 1-1 on page 1-3 for an example of the Cisco devices Cisco VAMS 1.5 manages.

For detailed information about this supported architecture, see the *Cisco Wireline Video/IPTV Solution Design and Implementation Guide, Release 1.1,* viewable online at:

http://www.cisco.com/en/US/products/ps6902/products_implementation_design_guide_book09186a00806b5b4c.html

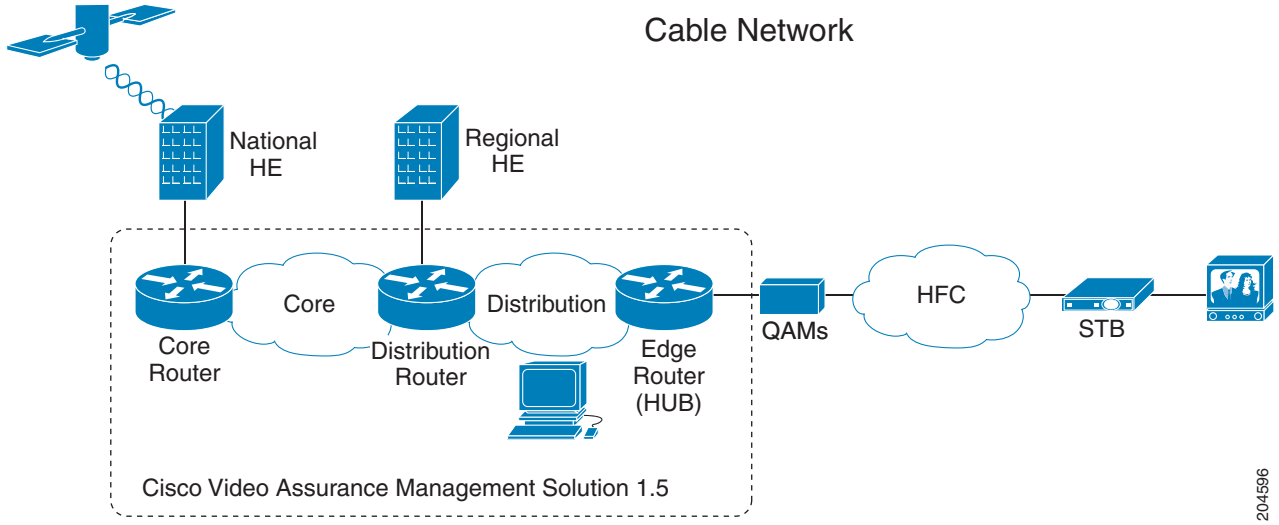
More information about Cisco Internet Protocol Television (IPTV) solutions for wireline carriers is viewable online at:

http://www.cisco.com/en/US/netsol/ns610/networking_solutions_solution_category.html

Cisco VAMS 1.5 in a Cable Network

Figure 1-3 shows the Cisco VAMS 1.5 in a cable network.

Figure 1-3 Cisco Video Assurance Management Solution 1.5 in a Cable Network



Most components of the cable network are the same as those shown in the wireline network (Figure 1-2), except for the home access portion. Hybrid Fiber-Coaxial (HFC) technology provides two-way, high-speed data access to the home by using a combination of fiber optics and traditional coaxial cable.

A national headend (HE) pulls content from different sources and grooms traffic into transport streams for distribution to the regional headends. The national HE aggregates live national content, processes it, encodes it, and distributes it to regional HEs.

Regional headends receive content from the national headend and from other sources, such as satellite and off-air antennas. Multiple converged regional area networks (RANs) are connected to the Internet through peering points provided by an Internet service provider

Cisco VAMS 1.5 covers the video transport network and focuses on the core and distribution networks shown in Figure 1-3. See also Figure 1-1 on page 1-3 for an example of the Cisco devices the Cisco VAMS 1.5 manages.

For detailed information about this supported architecture, see the *Cisco Gigabit-Ethernet Optimized Video Networking Solution for Cable Design and Implementation Guide, Release 3.0,* viewable online at:

http://www.cisco.com/en/US/products/ps6902/products_implementation_design_guide_book09186a00806470d8.html

More information about Cisco cable video solutions is viewable online at:

http://www.cisco.com/en/US/netsol/ns457/networking_solutions_solution_category.html

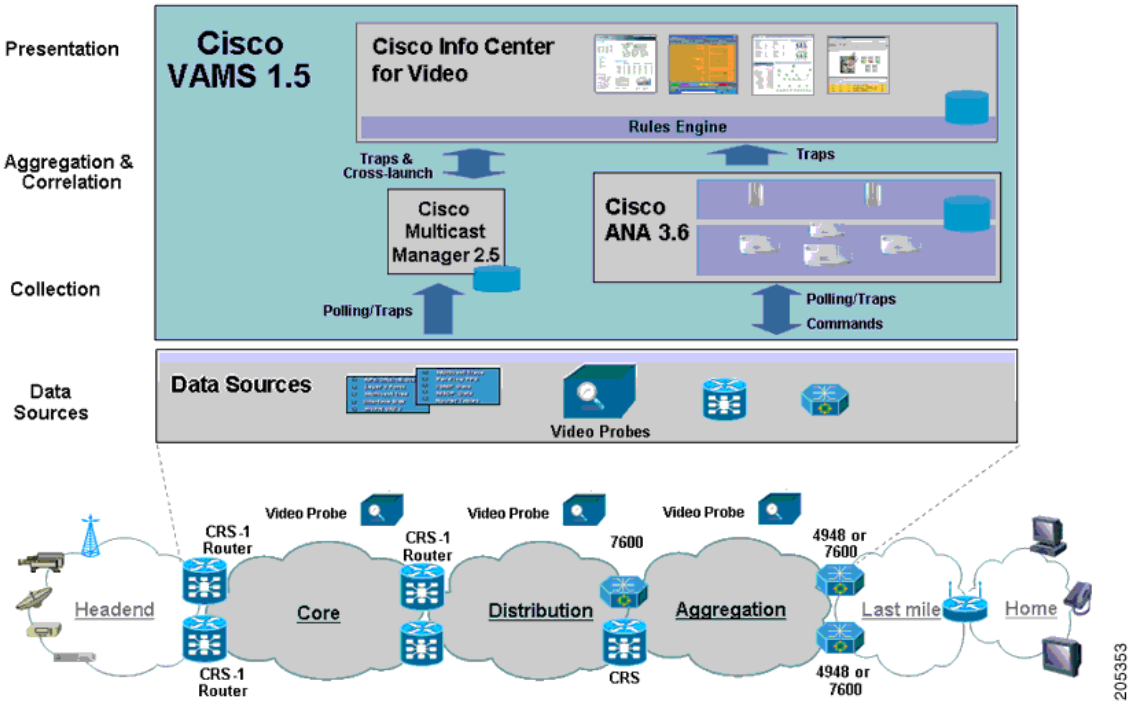
Cisco VAMS Solution Components

The Cisco VAMS 1.5 solution comprises:

- Cisco Multicast Manager 2.5.4, page 1-8
- Cisco Info Center, page 1-12
- Cisco ANA 3.6.3, page 1-17
- Third-Party Video Probes, page 1-26

Figure 1-4 shows the components in the VAMS 1.5 architecture.

Figure 1-4 VAMS 1.5 System Architecture



Network Elements in the Video Transport Network

Cisco VAMS 1.5 monitors these network elements (NEs), which form the core of the video transport network (see Figure 1-1 on page 1-3):

- Cisco 7600 Series router—A carrier-class edge router that offers integrated, high-density Ethernet switching, carrier-class Internet Protocol/Multiprotocol Label Switching (IP/MPLS) routing, and 10-Gb/s interfaces.
- Cisco Catalyst 6500 Series switch—As the premier intelligent, multilayer modular Cisco switch, the Catalyst 6500 Series delivers secure, converged, end-to-end services, from the wiring closet to the core network, the data center, and the WAN edge.
- CRS-1—A carrier routing system that service providers use to deliver data, voice, and video services over a highly available and scalable IP network.
- Cisco Catalyst 4948 Series switch—A low-latency, Layer 2-4, switch that offers performance and reliability for low-density, multilayer aggregation of high-performance servers and workstations.

Note You must equip these NEs with IOS software that enables the NEs to monitor multicast video flows in the network. See the "Solution Component Versions" section on page 1-7, for a list of the required IOS software.

Solution Component Versions

Besides the Cisco VAMS 1.5 software package, the Cisco VAMS 1.5 solution supports these components and software version levels:

Table 1-1 Solution Components and Version Information

Solution Component	Version Information
Active Network Abstraction (ANA)[1]	3.6 Service Pack 3 (3.6.3)
Cisco Multicast Manager	2.5.4
Cisco 7600 Series router and Cisco Catalyst 6500 Series switch (7600-SUP720-3BXL with redundant SUP720-3BXL) Line cards: WS-X6704-10GE, WS-X6708-10GE, WS-X6748-SFP, WS-X6748-GE-TX, WS-X6724-SFP, RSP720-3CXL, 7600-ES20-10G3CXL, 7600-SIP-400, 7600-SIP-600, SPA-1XTENGE-XFP, SPA-2X1GE, and optional WS-F6700-DFC3BXL	12.2(33)SRB2, 12.2(33)SRB3, 12.2(33)SRC1
Cisco CRS-1 Line cards: CRS-MSC, CRS1-SIP-800 (with SPA-8X1GE), 8-10GE	IOS-XR 3.6.1.12
Cisco Catalyst 4948 Series switch (CAT4948-10GE)	12.2(25)EWA6 or 12.2(31)SGA1
CIC (includes IBM Tivoli Netcool products)[2]	7.2 • ObjectServer - 7.2 • Webtop - 2.1 • TBSM - 4.1 • Impact - 4.0
Bridge Technologies video probe	VB Series: Version: 3.1.0-26
IneoQuest video probe	• Singulus G1-T Media Analyzer Firmware Version: TB-2.5s-060608 • Singulus G10 Firmware Version: Denali-1.3a-021808 • iVMS 3.00.00 with Patch 24 • IQ Cricket Firmware Version: Cricket-1.0a-092607

Table 1-1 Solution Components and Version Information (continued)

Solution Component	Version Information
Mixed Signals video probe	Sentry 136 Digital Content Monitor[3] Sentry Engine Version: PDM (build 1460.84) Sentry Database Version: 3.0.31 Sentry Configuration: TRANSPORT
PixelMetrix video probe	DVStation: Version: 4.17.0
Tektronix video probe	MTM400 Application Firmware Version: 3.1.061.000 FPGA Logic Firmware Version: 4 BIOS Version: 2.0.7 SNMP Interface Version: 2.6.0 Hardware Version: 5 QA Build: Alpha 01 Build Timestamp: Dec 19 2007 22:22:42

1. You must purchase base VNEs before installing the VNE extensions. For example, you must acquire the Cisco 7600 series router group VNE license to use the Cisco 7600 VNE extensions.
2. Cisco Info Center is an OEM product that includes the IBM Tivoli Netcool Suite.
3. Cisco VAMS 1.5 does not support carousel-related traps for the Mixed Signals Sentry 136.

Cisco Multicast Manager 2.5.4

This section describes the hardware and software components of CMM 2.5.4.

Cisco Multicast Manager 2.5.4 Hardware Components

CMM 2.5.4 hardware comprises:

- x86 Server, page 1-8
- Sun Microsystems Server, page 1-9

x86 Server

The CMM 2.5.4 x86 server uses one of these processors in a x86-type computer:

- Dual AMD Opteron 250.
- 2.4 GHz 64-bit (recommended for a large enterprise network of more than 500 devices).
- 2.8 GHz Intel Pentium IV.
- 2.8 GHz Intel Xeon processor.
- Dual 2.8 GHz Intel Pentium IV.
- Dual 2.8 GHz Intel Xeon processor (recommended for a large enterprise network of more than 500 devices).

Sun Microsystems Server

The CMM 2.5.4 Sun Microsystems server uses one of these Sun Fire series workstations:

- Sun Fire V440 (up to four 1.593 GHz UltraSPARC IIIi processors for a large enterprise network of more than 500 devices),
- Sun Fire V240 (one 1.34 GHz or two 1.5 GHz UltraSPARC processors).

CMM 2.5.4 Application

Using an x86-type computer running Linux or a Sun Microsystems Sun Fire series workstation running Solaris, the CMM 2.5.4 application (a web-based multicast troubleshooting tool) has two components: Administration and Multicast Manager. CMM 2.5.4 uses SNMP MIB polling to monitor devices and traffic in the network. CMM 2.5.4 also provides metrics and alerts, which it then forwards to the ANA as SNMP traps. Based on the unique requirements of the network environment, the SNMP traps are user-configurable.

The CMM 2.5.4 can monitor multicast-specific data such as:

- Rendezvous points (RP)
- Designated routers (DR)
- Multicast traffic (Layer 2 and Layer 3)
- Multicast bandwidth (Layer 2 and Layer 3)
- Layer 3 multicast trees
- Tree Change events
- PPS/BPS per flow monitoring

The CMM 2.5.4 also provides detailed diagnostics and a health-check capability.

You use CMM 2.5.4 to set thresholds, generate notifications, and forward them to CIC.

See the *User Guide for Cisco Multicast Manager 2.5,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/CMM_25_User_Guide.html

Cisco Multicast Manager 2.5.4 System Requirements

Table 1-2 lists the hardware and software requirements for the CMM 2.5.4.

Table 1-2 Cisco Multicast Manager 2.5.4 System Requirements

Item	Specifications
Hardware Requirements	
Platform type	Linux: • Dual AMD Opteron Processor 250 2.4-GHz 64-Bit (more than 500 devices) • Dual 2.8-GHz Intel Pentium IV or dual 2.8-GHz Intel Xeon processor (more than 500 devices) • 2.8-GHz Intel Pentium IV or 2.8-GHz Intel Xeon processor Solaris: • Sun Fire v440 up to four 1.593-GHz UltraSPARC IIIi processors (more than 500 devices) • Sun Fire v240 One 1.34-GHz or two 1.5-GHz UltraSPARC processors
Memory	Size: • 2 GB • 4 GB (more than 500 devices) • 2 GB or more of free space
Software Requirements	
Operating system	Linux: • Red Hat Enterprise Linux 3 • Red Hat Enterprise Linux 4 Solaris: • Solaris 8 • Solaris 9 • Solaris 10 **Note** Cisco does not support Solaris x86.
Browser	• Firefox 1.5 or higher • Internet Explorer 6 • Netscape 7.0 • Mozilla 1.7 • Safari 2.0

Cisco Multicast Manager 2.5.4 Software Components

As described previously, the CMM 2.5.4 application has an Administration and a Multicast Manager tool. You can select either tool from the menu at the upper left of CMM Web interface. You can perform the following tasks with each tool:

Administration

- Manage domains
- Use administrative utilities
- Configure security
- Manage users
- Perform discovery
- Configure devices
- Configure global polling
- Configure multicast polling
- Manage addresses

Multicast Manager

- View events through the **Home** page.
- View topology through the **Topology** page, such as:
  - Each router and its local interfaces.
  - The interfaces on each of the router's PIM neighbors.
  - The names of the routers and their PIM neighbors.
- Manage report through the **Reporting** page, such as:
  - A record of the latest SNMP traps sent.
  - Historical graphs or trends.
  - Routers in the database IOS versions.
  - Video probe reports.
  - Reports on VPN routing/forwarding instances (VRFs).
- Manage a global view and a router-specific view of your network through the **Diagnostics** page, such as:
  - Showing active sources and groups in the network.
  - Finding sources and receivers in the network.
  - Viewing the status of all devices in the current multicast domain.
  - Viewing all the routers in the database.
  - Viewing all the RPs that CMM is aware of, based on discovery.
  - Seeing the interfaces that have joined onto a particular group.
  - Viewing all the routers running Multicast Source Discovery Protocol (MSDP) and their peering connectivity. You can also view details for a specific router, such as peering information and the SA cache.
  - Viewing Layer 2 Multicast Information and Layer 2 Host IPs.
  - Running preconfigured network tests using the Health Check facility.
  - Enable the CMM to gather accurate packet forwarding statistics and other information in a timely manner.
  - Viewing the top 20 talkers, sorted by long term.

  - Viewing diagnostic information about video probes and the flows that they are monitoring.
  - Viewing a detailed trace about a video flow and a topology tree that shows: RPs, routers, interfaces, and probes.
  - Viewing detailed information about the status of Multicast VPNs, including: VRF table configurations, Provider Edge (PE) device configurations, and the current status of a specified VRF.
  - Viewing specific multicast diagnostics on a router.
- Viewing a PDF version of the *User Guide for the Cisco Multicast Manager 2.5* through the **Help** page.

For complete hardware and software requirements, see the following books:

Installation Guide for the Cisco Multicast Manager 2.5, viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/installation/guide/CMM_25_install_guide.html

User Guide for the Cisco Multicast Manager 2.5, viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/CMM_25_User_Guide.html

Cisco Info Center

CIC/Netcool delivers real-time centralized monitoring and root-cause analysis by integrating the IBM Tivoli Netcool 7.1 components and the CIC with Cisco ANA 3.6.3, CMM 2.5.4, and video probe devices.

CIC alone provides real-time monitoring, management, and event deduplication[3] or pruning, and helps enterprises and service providers proactively manage their IT infrastructures to ensure the continuous uptime of business services and applications.

The CIC/Netcool components comprise:

- IBM Tivoli Netcool/OMNIbus and ObjectServer, page 1-12
- IBM Tivoli Netcool/Webtop, page 1-14
- IBM Tivoli Netcool/Impact, page 1-15
- IBM Tivoli Business Service Manager, page 1-15
- IBM Tivoli Netcool GUI Foundation, page 1-16
- IBM Tivoli Netcool Probes, page 1-16
- Rules Files, page 1-16

IBM Tivoli Netcool/OMNIbus and ObjectServer

The IBM Tivoli Netcool/OMNIbus service level management (SLM) system collects enterprise-wide event information from several different network data sources, and presents a simplified view of this information to operators and administrators.

This information:

- Assigns information to operators.
- Travels to help desk systems.

3. For a detailed definition, see the Glossary.

- Logs in a database.
- Replicates on a remote Netcool/OMNIbus system.
- Triggers automatic responses to certain alerts.

Netcool/OMNIbus can also consolidate information from different domain-limited network management platforms in remote locations. By working in conjunction with existing management systems and applications, Netcool/OMNIbus minimizes deployment time; thus, you can use their network management skills.

Netcool/OMNIbus tracks alert information in a high-performance, in-memory database, and presents information of interest to you through individually configurable filters and views.

Netcool/OMNIbus automation functions can perform intelligent processing on managed alerts.

The ObjectServer is the in-memory database server at the core of Netcool/OMNIbus. The ObjectServer forwards alert information from external programs, such as probes, monitors, and gateways, stored and managed in database tables, and visible in the event list.

See the following books:

- *Netcool/OMNIbus v7 User Guide is* viewable online at:

  http://www.cisco.com/en/US/products/sw/netmgtsw/ps996/products_user_guide_book09186a008047d044.html
- *Netcool/OMNIbus v7 ObjectServer Gateway Guide* is viewable online at:

  http://www.cisco.com/en/US/products/sw/netmgtsw/ps996/products_technical_reference_book09186a008047d049.html

IBM Tivoli Netcool/OMNIbus and ObjectServer Requirements

On Sun Microsystems SPARC-based platforms, Cisco supports:

- Solaris 8
- Solaris 9
- Solaris 10

On Hewlett-Packard PA-RISC-based platforms, Cisco supports:

HP-UX 11i (11.11)

On IBM PowerPC-based platforms:

- AIX 5L (5.2 RS/6000 32-bit)
- AIX 5L (5.3 RS/6000 32-bit)

On Intel x86 processor and chipset-based platforms, Cisco supports:

- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Advanced Server
- Microsoft Windows 2003 Server
- Microsoft Windows 2000 Professional—desktop component only
- Microsoft Windows XP—desktop component only
- Red Hat Enterprise Linux AS, ES, and WS 3
- Red Hat Enterprise Linux AS, ES, and WS 4
- SUSE Linux Enterprise Server 9.2

JRE Requirements

The Netcool/OMNIbus Administrator GUI and the **nco_confpack** utility require the JRE to be installed on your system.

Netcool/OMNIbus supports the following JREs:

- Javasoft JRE 1.5 on Linux, Solaris, and Windows platforms
- IBM JRE 1.4.2 on AIX platforms
- HP JRE 1.5 on HP-UX platforms

User Interface Requirements

Netcool/OMNIbus supports the following user interface environments:

- UNIX/Motif 1.2 or CDE
- Microsoft Windows 2000, 2003, and XP

IBM Tivoli Netcool/Webtop

IBM Tivoli Netcool/Webtop publishes alerts for viewing in a web browser. Users can manipulate them by using an active event list launched from a web browser. The Webtop includes server administration pages to set up users, table views, and other configurable elements.

Webtop includes the Webtop Editor; a tool for creating and editing maps (filters and views). Webtop publishes Netcool alerts and active event list applets over HTTP or HTTPS[4] (HTTP with SSL) protocol to supported web browsers. Launched from a web browser, the active event list offers the functionality of Netcool/Java EventList (JEL) to acknowledge, prioritize, and delete alerts by using the Webtop technology.

Using a client-server architecture, the Webtop server runs inside the IBM Tivoli Netcool GUI Foundation application (see the "IBM Tivoli Netcool GUI Foundation" section on page 1-16 for more information). Clients connect to the IBM Tivoli Netcool GUI Foundation to access Netcool/Webtop.

See the administration guide for this product, available on the IBM website.

You can also launch Netcool/Webtop from the Tivoli Business Service Manager (TBSM) application. For information on launching TBSM and Netcool/Webtop to view VAMS 1.5 alerts, see Monitoring ANA, CMM, and Video Probe Events with TBSM, page 6-1.

IBM Tivoli Netcool/Webtop Requirements

On Sun Microsystems SPARC-based platforms, Cisco supports:

- Solaris 9
- Solaris 10

On Hewlett-Packard PA-RISC-based platforms, Cisco supports:

HP-UX 11i (11.11)

On IBM PowerPC-based platforms:

AIX 5L (5.3 RS/6000 32-bit)

On Intel x86 processor and chipset-based platforms, Cisco supports:

- Microsoft Windows 2003 Server (32 and 64 bit)

4. HTTPS—HTTP with SSL (secure sockets layer) encryption for security.

- Microsoft Windows XP SP2
- Red Hat Enterprise Linux AS, ES, and WS 3
- Red Hat Enterprise Linux AS, ES, and WS 4
- SUSE Linux Enterprise Server 9
- SUSE Linux Enterprise Server 10

Note Ensure that the IBM Tivoli Netcool Security Manager is installed, running, and accessible; and that you know the host, port, and administrative user name and password for the IBM Tivoli Netcool Security Manager before you install IBM Tivoli Netcool/Webtop. For information about how to install and configure the IBM Tivoli Netcool Security Manager, see the security manager installation guide for this product, available on the IBM website.

IBM Tivoli Netcool/Impact

IBM Tivoli Netcool/Impact is the analysis and correlation engine for the Netcool suite of network management products. IBM Tivoli Netcool/Impact allows you to extensively customize and enhance Netcool/OMNIbus and other Netcool products by adding such functionality as advanced event and business data correlation, event enrichment and event notification. In addition, you can use IBM Tivoli Netcool/Impact to integrate IBM Tivoli Netcool/OMNIbus with a wide variety of third-party software, including databases, messaging systems and network inventory applications.

See the administration, user interface, and solutions guides for this product, available on the IBM website.

IBM Tivoli Business Service Manager

IBM Tivoli Business Service Manager (TBSM) delivers technology to visualize and assure the health and performance of critical business services.

TBSM functions:

- Build business service models.
- Integrate business service status from data sources or event sources including the Netcool/OMNIbus ObjectServer.
- Monitor service outages based on service level agreements.
- Build customized business service views, scorecards, and dashboards.
- Tailor views to different users and roles including service manager, operator, or executive.
- Provide dynamic visualization of key performance indicators (KPIs) and other critical business metrics.
- Provide self-management through monitoring of key components by using IBM Tivoli Monitoring (ITM).

The TBSM tools enable a service model that integrates with the Netcool/OMNIbus ObjectServer alerts, or optionally with the data from a structured query language (SQL) data source. TBSM processes the external data based on the service model data you create in the TBSM database and returns a new or updated TBSM service event to the Netcool/OMNIbus ObjectServer.

TBSM provides a console that allows you to logically link services and business requirements in the service model. The service model provides you with a view on the performance of your business services, second by second.

See the installation, quick start, administrator, service configuration, customizing, and troubleshooting guides for this product, available on the IBM website.

JRE Requirements

Netcool/TBSM version 4.1.1 requires the Java Runtime Environment (JRE) to be installed on your system.

Netcool/TBSM supports the following JREs:

- Javasoft JRE 1.5 on Linux, Solaris, and Windows platforms
- IBM JRE 1.4.2 on AIX platforms
- HP JRE 1.5 on HP-UX platforms

Note JRE versions higher than 1.5 in client web browsers result in a failure of the Service Viewer and the Service Details within the TBSM window.

IBM Tivoli Netcool GUI Foundation

The IBM Tivoli Netcool GUI Foundation (NGF) is a server application that delivers web-based Netcool products in a single, unified framework. The IBM Tivoli Netcool GUI Foundation provides single sign-on, consolidated user management, and a single point of access for different IBM Tivoli Netcool applications. The IBM Tivoli Netcool GUI Foundation also provides the ability to create customized pages and administer access to content by user, role, or group.

The IBM Tivoli Netcool GUI Foundation is installed automatically with the first IBM Tivoli Netcool GUI Foundation-enabled product. Subsequent products may install updated versions of the IBM Tivoli Netcool GUI Foundation. The Netcool GUI Foundation is not available separately.

The IBM Tivoli Netcool GUI Foundation uses IBM Tivoli Netcool/Security Manager for authentication and authorization.

See the administration guide for this product, available on the IBM website.

IBM Tivoli Netcool Probes

The IBM Tivoli Netcool Probes connect to an event source, detect and acquire event data, and forward the data to the ObjectServer as alerts. Probes use the logic specified in a rules file to manipulate the event elements before converting them into fields of an alert in the ObjectServer alerts.status table.

Uniquely designed, each probe can acquire event data from a specific source. Probes can also acquire data from any stable data source, including devices, databases, and log files.

Rules Files

Included in CIC/Netcool, the rules files enable streamlined communication between the CMM and Cisco ANA components and the Netcool ObjectServer. This functionality includes the decoding of CMM and Cisco ANA trap information pushed up from CMM or Cisco ANA into the ObjectServer database on the Netcool server.

Cisco ANA 3.6.3

This section describes the hardware and software components of Cisco ANA 3.6.3.

Cisco ANA 3.6.3 Hardware Components

Cisco ANA 3.6.3 hardware comprises:

- Cisco ANA Servers, page 1-17
- Cisco ANA Clients, page 1-20

Note The hardware recommendations assume that the Cisco ANA 3.6.3 software will not share the hardware with additional applications.

Cisco ANA Servers

Cisco ANA uses two server types, each performing different activities:

- Cisco ANA Gateway, page 1-17
- Cisco ANA Unit, page 1-18

Cisco ANA Gateway

The Cisco ANA Gateway uses a Sun Fire V490 running Solaris OS 10. It is the gateway through which all clients, including any operations support systems or business support systems (OSS/BSS) applications as well as the Cisco ANA clients, can access the system. The gateway is an extended Cisco ANA unit (see the "Cisco ANA Unit" section on page 1-18). It enforces access control and security for all connections, and manages client sessions. In addition, it functions as a repository for storing configuration, network and system events, and alarms.

Another important function of the gateway is to map network resources to the business context. As a result, Cisco ANA can contain information not directly in the network (such as virtual private networks [VPNs] and subscribers) and display it to northbound applications.

Cisco ANA Gateway Requirements

Table 1-3 lists the hardware and software requirements for the Cisco ANA 3.6.3 gateway.

Table 1-3 Cisco ANA Gateway Requirements

Item	Specifications
Hardware Requirements	
Sun Fire V490	• 4 x at least 1.35-GHz UltraSPARC IV processors. • Minimum 16 GB of memory. • Swap file must be at least twice the size of the installed RAM. • 2 x 73-GB hard disk drives. • 1 x DVD drive.
Software Requirements	

Table 1-3 Cisco ANA Gateway Requirements

Item	Specifications
Hardware Requirements	
Operating system	• Solaris 10. • Solaris 10 patch cluster release as published by Sun Microsystems on 18 January 2008 or later. • J2SE Solaris 10 patch cluster release as published by Sun Microsystems on 18 January 2008 or later. **Note** For exact patch lists, see the *Cisco ANA Release Notes, Version 3.6.2*, viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/release_notes/rn36_sp2.html
Third-party tools	• Java v1.3.1_08 • Active Perl v5.6
Database	• Customer supplied and installed Oracle 9i Enterprise Edition with partitioning option.

Note Do not use the Cisco ANA 3.6.3 servers (gateway and unit) with any application other than Cisco ANA 3.6.3.

Cisco ANA Unit

The Cisco ANA unit uses a Sun Fire V490 running Solaris OS 10. This unit is a key element of the Cisco ANA system. Networked together, these units create a modular, scalable, and high-performance, distributed knowledge engine. Multiple units cover the entire network as a single complete entity for discovery, assurance, and activation.

Cisco ANA Unit Requirements

Table 1-4 lists the hardware and software requirements for the Cisco ANA 3.6.3 unit.

Table 1-4 Cisco ANA Unit Requirements

Item	Specifications
Hardware Requirements	
Sun Fire V490	• 4 x at least 1.35-GHz UltraSPARC IV processors. • Maximum 16 GB of memory. **Note** CPUs may not use more than 16 GB of memory, even if the hardware has, for example, 32 GB of available memory. All Autonomous Virtual Machine (AVM) and VNE memory must do its calculations as if the unit only has 16 GB of available memory. • 2 x 73-GB hard disk drives. • 1 x DVD drive.
Software Requirements	
Operating system	• Solaris 10. • Solaris 10 patch cluster release as published by Sun Microsystems on 18 January 2008 or later. • J2SE Solaris 10 patch cluster release as published by Sun Microsystems on 18 January 2008 or later. **Note** For the exact patch list, see the *Cisco ANA Release Notes, Version 3.6 Service Pack 2,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/release_notes/rn36_sp2.html
Third-party tools	• Java v1.3.1_08 • Active Perl v5.6

Note Do not use the Cisco ANA 3.6.3 servers (gateway and unit) with any application other than Cisco ANA 3.6.3.

Cisco ANA Clients

The Cisco ANA client uses a Wintel platform running a suite of various GUI applications to manage the network. (See the "Cisco ANA Client Software Tools" section on page 1-24.)

Cisco ANA Client Requirements

Table 1-5 lists the hardware and software requirements for the Cisco ANA 3.6.3 client.

Table 1-5 Cisco ANA Client Requirements

Item	Specifications
Hardware Requirements	
Wintel platform	• Pentium IV, 2.66-GHz processor or better • 1 GB RAM • 2 GB of free disk space • 1 DVD drive • 512 MB of free nonvirtual memory
Monitor	• Minimum screen resolution of 1024 x 768 pixels • True color (32-bit) setting
Software Requirements	
Operating system	Microsoft Windows 2000 or Windows XP
Internet Connection	
	Minimum bandwidth of 1.5 MB

Cisco ANA 3.6.3 Software Components

Cisco ANA 3.6.3 provides mediation and abstraction between NEs and OSS applications, and supports fault collection and root-cause analysis for the transport network. Cisco ANA 3.6.3 manages the NEs listed in the "Network Elements in the Video Transport Network" section on page 1-6. The Cisco ANA 3.6.3 features for the Cisco VAMS 1.5 include:

- Soft properties and command builder scripts to extend VNEs for monitoring multicast and video flows.
- Unique VNEs to support the Cisco NEs in the video transport network (Cisco 7600 Series router, Cisco CRS-1, and Catalyst 4948 Series and Catalyst 6500 Series switches).
- Event-handling and threshold-crossing alerts (TCA) for video-affecting conditions.
- New trap and syslog support through event configuration and customization.

Cisco ANA 3.6.3 automatically detects and manages the NEs in its domain, including their physical and logical inventories.

VNEs

The Cisco ANA 3.6.3 provides a VNE mediation layer between the managed NEs and the network management applications in the Cisco ANA 3.6.3. Generally, a one-to-one correspondence exists between an NE in the managed network and the VNE that depicts it in the Cisco ANA 3.6.3. The VNEs collect information from their corresponding NEs for management purposes.

Cisco VAMS 1.5 uses VNEs to represent the solution components in Table 1-6.

Table 1-6 VNEs for the Cisco VAMS 1.5

Solution Component	VNE Description
Cisco 7600 Series routers	7600 VNE[1]
Cisco Catalyst 6500 Series switch	6500 VNE[1]
Cisco CRS-1	CRS-1 VNE[1]
Cisco Catalyst 4948 Series switches	4948 VNE[1]
Cisco Multicast Manager	Generic Internet Control Message Protocol (ICMP) VNE
IneoQuest Video Probe	Generic Simple Network Management Protocol (SNMP) VNE
Mixed Signals Video Probe	Generic ICMP VNE
Tektronix Video Probe	Generic SNMP VNE

1. Cisco ANA 3.6.3 activation scripts and soft properties created for the Cisco VAMS 1.5 enable the VNE to monitor multicast video flows.

Command Builder Scripts

Cisco VAMS 1.5 introduces command builder scripts (created in the ANA Command Builder tool) that configure managed devices to collect, calculate, and analyze multicast and video data; and notify the Cisco ANA 3.6.3 when preconfigured conditions occur. These command builder scripts use the Event MIB and a rules engine to provide support for multicast alarms in the Cisco ANA 3.6.3.

Cisco VAMS 1.5 provides an Internet Protocol Television (IPTV) command builder script for the Cisco 7600 Series router, CRS-1, and Catalyst 4948 Series switch VNEs. The script runs at installation time and whenever managed devices reload. In addition, you can run the IPTV command builder script on demand. See the "Run the Setup for IPTV Script" section on page 5-15.

Soft Properties and Threshold-Crossing Alerts

Soft properties are attributes that appear in the inventory of managed VNEs but are not kept in the database. You can configure these properties to poll on a regular basis. You can also configure TCAs to raise events based on preset threshold values. You can associate soft properties with a specific VNE, all instances of a VNE type, or all managed elements.

Note Delivered as part of this solution, the Cisco VAMS 1.5 already configures the soft properties and TCAs in the IPTV command builder script. (See the "Command Builder Scripts" section on page 1-21.)

Configuration Management and Inventory

Cisco ANA 3.6.3 automatically detects managed NEs in the video transport network along with their physical and logical inventories. Cisco ANA 3.6.3 also detects changes in the NEs and automatically synchronizes its archived physical and logical inventories with those changes. Support for traps, syslogs, and polling (SNMP and Telnet) enables this functionality.

Cisco ANA 3.6.3 also supports discovery of the network topology (automatically and manually).

Cisco ANA 3.6.3 monitors and reports interface and operational status for these Cisco NEs in the video transport network:

- Cisco 7600 Series router
- Cisco Catalyst 6500 Series switch

- CRS-1
- Cisco Catalyst 4948 Series switch

This support includes:

- Logical inventory (for example, subinterfaces, VLANs, and routing tables)
- Physical inventory (for example, chassis, cards, and serial numbers)

See the "Network Elements in the Video Transport Network" section on page 1-6, for details about the Cisco NEs.

Fault Management

The Cisco ANA 3.6.3 provides fault management for the video transport network:

See the *Cisco ANA Fault Management User Guide 3.6 Service Pack 2* for a description of the Cisco ANA fault management system, viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/fault/user/guide/chp1.html

Event and Alarm Management

The Cisco ANA 3.6.3 also provides the following event-related features:

- A log of the events.
- Rules-based event processing (for example, to support changing event severities or customize problem descriptions).
- Correlation of events and removal of duplicated events.
- Suppression of events from a particular device or interface.
- Viewing and sorting events (by time and date, severity, or device), switching between multiple event views, and viewing detailed event data.
- Viewing syslog events.
- Changing severity of alarms in the Cisco VAMS 1.5.

Polling and CPU Utilization

Cisco ANA 3.6.3 monitors CPU utilization of the supported NEs in the Cisco VAMS 1.5. You can define polling groups and designate polling intervals for the ANA-managed NEs. The ANA uses an adaptive polling mechanism to ensure that the NEs are not overpolled.

For more information about ANA polling and its interaction with the CPU utilization of managed NEs, see the *Cisco ANA Administrator User Guide 3.6 Service Pack 2,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/administrator/administration/guide/global.html#wp1041531

Cisco ANA 3.6.3 also supports ICMP to verify that supported NEs are reachable. The ANA VNEs send the ICMP packets to the NEs at a designated rate. You specify the polling rate when you define the VNEs for the Cisco VAMS 1.5.

For more information about ICMP polling, see the *Cisco ANA Administrator User Guide 3.6 Service Pack 2,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/administrator/administration/guide/manavm.html#wp1041967

Cisco ANA 3.6.3 also provides dynamic, on-demand polling of specific object identifiers (OIDs) by using the ANA Command Builder, a tool which you use to create and run activation scripts.

See the *Cisco ANA Command Builder User Guide 3.6 Service Pack 2,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/command_builder/developer/guide/cmdbuild-Book-Wrapper.html

GUIs for Fault Management

Cisco ANA 3.6.3 provides GUIs that show NE:

- Status information on the components that this solution supports. (See the "Network Elements in the Video Transport Network" section on page 1-6, for descriptions of the supported NEs.)
- Events, including severity levels and timestamps.

Note Cisco ANA NetworkVision, page 1-25 and Cisco ANA EventVision, page 1-26 are the software tools that provide these GUIs.

Security Management

Cisco ANA 3.6.3 provides user identification and authentication for accessing the Cisco ANA 3.6.3 to perform configuration and fault management tasks on the supported NEs. For more information about security information in Cisco ANA 3.6.3, view the information online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6/administrator/mansec.html

Multicast and Video Management

Cisco ANA 3.6.3 provides these multicast and video metrics:

- PIM Alarms, page 1-23
- Multicast Routes, page 1-24
- Non-RPF Drops, page 1-24

PIM Alarms

Cisco ANA creates alarms for events related to Protocol Independent Multicast:(PIM) status changes. The video transport network uses PIM to build a video-specific multicast topology. Therefore, PIM alarms are important for monitoring the status of the solution.

You can view PIM alarms in the ANA EventVision tool. Cisco ANA creates alarms for the following multicast-related SNMP traps:

- pimNeighborLoss—Signifies the loss of an adjacency with a neighbor. The router generates the trap when the neighbor timer expires, and the router has no other neighbors on the same interface with a lower IP address than itself.
- ciscoPimInterfaceUp—Signifies the restoration of a PIM interface.
- ciscoPimInterfaceDown—Signifies the loss of a PIM interface.

Multicast Routes

Cisco ANA uses a VNE soft property to display the number of multicast routes in the device (Cisco 7600 Series router, Cisco CRS-1, or Cisco Catalyst 4948 Series switch). Cisco ANA NetworkVision displays the number of multicast routes on the selected device.

Cisco ANA uses the Event MIB to monitor changes in the number of multicast routes. When the number of multicast routes changes, indicating a possible problem in the video flow, the Event MIB sends an SNMP trap. Cisco ANA receives the trap and creates an event in the Cisco ANA EventVision.

Cisco VAMS 1.5 creates soft properties on VNEs to support viewing:

- Multicast (whether you are enabling an NE for multicast).
- PIM configurations on an interface (whether you are enabling the PIM, the PIM mode, and the designated router (DR) address for the PIM interface).
- IGMP configurations on an interface for a Cisco 7600 router or Catalyst 4948 switch (whether you are enabling the IGMP leave, the IGMP protocol version, or the number of IGMP interface groups).

Note The current Cisco VAMS 1.5 release does not support viewing IGMP status on Cisco CRS-1 NEs.

Non-RPF Drops

Cisco ANA monitors non-Reverse Path Forwarding (non-RPF) drops on each multicast stream. Non-RPF packets, also called RPF failure packets, are RPF packets transmitted backwards, against the flow from the source. Multicast streams include video and non-video streams. If the number of non-RPF drops on a multicast stream exceeds five drops during a polling period, the device sends an SNMP notification. The Cisco ANA 3.6.3 receives the notification and generates an alarm. The Cisco ANA 3.6.3 correlates subsequent alarms and generates subalarms.

Troubleshooting

You perform most fault management tasks through the Cisco ANA 3.6.3 software tools. You perform advanced troubleshooting of the multicast video network by using the CMM 2.5.4. See Chapter 6, “Troubleshooting with the Cisco Video Assurance Management Solution 1.5.”

Cisco ANA Client Software Tools

Cisco ANA 3.6.3 includes several applications built on top of the virtual network as the mediation layer.

Cisco ANA 3.6.3 applications include:

- Cisco ANA Manage, page 1-24
- Cisco ANA NetworkVision, page 1-25
- Cisco ANA EventVision, page 1-26

Cisco ANA Manage

You use the Cisco ANA Manage tool to add, delete, or modify the Cisco NEs in the Layer 2 transport sections of multicast video networks. The administrator configures and controls the Cisco ANA with this GUI tool. The Cisco ANA Manage tool interacts with the Cisco ANA Registry to query and modify configuration information.

Specifically, you use the Cisco ANA Manage tool to perform system administration activities including:

- Adding and removing Cisco ANA units, Autonomous Virtual Machines (AVMs), and VNEs.
- Starting and stopping VNEs.

- Setting polling information per VNE.
- Customizing polling groups and protection groups.
- Managing static and persistent topology links.
- Installing and managing Cisco ANA client licenses.
- Defining and managing user accounts.

See the *Cisco ANA Administrators Guide 3.6 Service Pack 2,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/administrator/administration/guide/Admin-Book-Wrapper.html

Cisco ANA NetworkVision

You use the Cisco ANA NetworkVision tool (the main GUI for Cisco ANA 3.6.3) to view the network inventory and topology. Cisco ANA NetworkVision displays events, while the mediation layer collects information from the NEs and displays the objects in a topology map. Cisco ANA NetworkVision also displays status and event information (including severities and timestamps) for these supported NEs.

You use the Cisco ANA NetworkVision to:

- View network inventory and multilayer connectivity.
- Troubleshoot, monitor, and manage NEs.
- Model and view network maps maintaining up-to-date topological information on device connections, traffic, and routes.

Network administrators and anyone else responsible for the management, fulfillment, planning, and assurance of the integrity of network resources can use the Cisco NetworkVision tool. See the *Cisco ANA NetworkVision User Guide 3.6 Service Pack 2,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/networkvision/user/guide/nvug.html

Cisco ANA EventVision

You use the Cisco ANA EventVision tool (a GUI for browsing the events in the system) to view and manage alarms, traps, syslogs, provisioning, and system and security events. Monitoring the Cisco ANA EventVision helps predict and identify the sources of network problems, which may prevent future problems.

You can configure Cisco ANA EventVision to display:

- Number of events per page
- Number of events to export to a file
- Filter options
- Information that appears in EventVision tabs

Administrators periodically review and manage the events list by using the Cisco ANA EventVision tool. In addition, when an event occurs in the Cisco ANA 3.6.3 system, Cisco ANA EventVision displays specific details.

See the *Cisco ANA EventVision User Guide 3.6 Service Pack 2,* viewable online at:

http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/eventvision/user/guide/Event-Book-Wrapper.html

Third-Party Video Probes

Cisco VAMS 1.5 supports several third-party probes including the Bridge Technologies, IneoQuest, Mixed Signals, PixelMetrix, and Tektronix video probes. You can add these video quality monitoring probes to key points in the transport network. Functionally, these probes detect impairments and validate the integrity of the Moving Pictures Expert Group (MPEG) transport stream, which carries video.

The video probes communicate with the Cisco VAMS components as follows:

- The video probes communicate traps directly to CIC. When you are viewing a video probe event forwarded by these probes, you can launch CMM diagnostics directly from the CIC interface.
- Certain video probes, such as the IneoQuest probe and the iVMS NMS, communicate traps directly to CMM—CMM can then be configured to forward the traps to CIC.

Cisco VAMS 1.5 receives events from the probes based on thresholds that you configure in the video probes. The Cisco VAMS 1.5 associates probe events with a severity level in Cisco CIC.

Generic VNEs in the Cisco ANA 3.6.3 support the video-monitoring probes. Generic SNMP VNEs handle the IneoQuest and Tektronix probes. A Generic ICMP VNE (no inventory support) handles the Mixed Signals probe.

The video probe VNEs enable the Cisco ANA 3.6.3 to receive SNMP traps from the video probes. (See Appendix A, “Trap Definitions.”)

Note IneoQuest probes are polled directly by the CMM 2.5.4 application.

See the appropriate video probe guides for this product listed in the "Related Documentation" section on page ix.

Cisco VAMS 1.5 Solution Software Description

Table 1-7 lists the software product information and Cisco part numbers for the Cisco VAMS 1.5 release.

Table 1-7 Software Products with Cisco Part Number

Description	Cisco Part Number
Cisco Video Assurance Management Solution 1.5 (top level part number)	VAMS-1-SOFTWARE
Video Extension to 4948 (G2) VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNE4948
Video Extension to 7600 (G3) VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNE7600
Video Extension to CRS-1 (G5) VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNEG5
Video Extension to CRS-1 (G6) VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNEG6
Video Extension Cisco Multicast Manager (CMM) VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNECMM
IneoQuest Video Probe VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNEIQ
Mixed Signals Video Probe VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNEMS
Tektronix Video Probe VNE—Software (optional, qty 0-1)	VAMS-1.0-3.6VNETK
IneoQuest Video Probe RTU—Right-to-use for one IQ probe (optional, qty 0-1)	VAMS-1.0-3.6IQRTU
Mixed Signals Video Probe RTU—Right-to-use for one MS probe (optional, qty 0-1)	VAMS-1.0-3.6MSRTU
Tektronix Video Probe RTU—Right-to-use for one TK probe (optional, qty 0-1)	VAMS-1.0-3.6TKRTU
CMM 2.5.4	
VAMS 1.5 ANA Extensions	
VAMS 1, Extensions to ANA 3.6 (top level part number)	VAMS1-ANA3.6-SW
VAMS 1, Extension to 4948 (G2) VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNE4948
VAMS 1, Extension to 7600 (G3) VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNE7600
VAMS 1, Extension to CRS-1(G5) VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNEG5
VAMS 1, Extension to CRS-1(G6) VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNEG6
VAMS 1, Cisco Multicast Manager VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNECMM
VAMS 1, IneoQuest Video Probe VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNEIQ
VAMS 1, Mixed Signals Video Probe VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNEMS
VAMS 1, Tektronix Video Probe VNE - ANA 3.6 (optional, qty 0-1)	VAMS1-ANA36VNETK
VAMS 1, IneoQuest Video Probe RTU - ANA 3.6—Right-to-use for one IQ probe (optional, no limit on qty)	VAMS1-ANA36IQRTU
VAMS 1, Mixed Signals Video Probe RTU - ANA 3.6—Right-to-use for one MS probe (optional, no limit on qty)	VAMS1-ANA36MSRTU
VAMS 1, Tektronix Video Probe RTU - ANA 3.6—Right-to-use for one TK probe (optional, no limit on qty)	VAMS1-ANA36TKRTU

Table 1-7 Software Products with Cisco Part Number (continued)

Description	Cisco Part Number
VAMS 1.5 CIC Extensions	
VAMS 1, Extensions to CIC (top level part number)	VAMS1-CIC-SW
VAMS 1, Extensions to CIC 7.2 ObjectServer/Webtop (optional, qty 0-1)	VAMS-CICMOM72-K9
VAMS 1, Extensions to CIC 7.2 ObjectServer/Webtop - Failover (optional, qty 0-1)	VAMS-CICMOM72F-K9
VAMS 1, Extensions to CIC 7.2 ObjectServer/Webtop - Non Prod (optional, qty 0-1)	VAMS-CICMOM72N-K9
VAMS 1, Extensions to CIC 7.2 TBSM 4.1 (optional, qty 0-1)	VAMS-CICTBSM41-K9
VAMS 1, Extensions to CIC 7.2 TBSM 4.1 - Failover (optional, qty 0-1)	VAMS-CICTBSM41F-K9
VAMS 1, Extensions to CIC 7.2 TBSM 4.1 - Non Prod (optional, qty 0-1)	VAMS-CICTBSM41N-K9
VAMS 1, Extensions to CIC 7.2 Impact 4.0 (optional, qty 0-1)	VAMS-CICIMPT40-K9
VAMS 1, Extensions to CIC 7.2 Impact 4.0 - Non Prod (optional, qty 0-1)	VAMS-CICIMPT40N-K9

Cisco Advanced Services Support for VAMS

Cisco Advanced Services provides services such as technical application support, network application integration Support and network optimization support for the VAMS solution.

Using the Cisco Lifecycle Services approach, Cisco and its partners provide a broad portfolio of services that address all aspects of deploying, operating, and optimizing your network to help increase business value and return on investment.

This section describes:

- Cisco Lifecycle Approach, page 1-28
- Prepare Phase, page 1-29
- Plan Phase, page 1-30
- Design Phase, page 1-30
- Implement Phase, page 1-30

For detailed information on Cisco Advanced Services support for video services, go to the following URL:

http://www.cisco.com/en/US/products/ps9908/serv_group_home.html

For detailed information on Advanced Services support for network management, go to the following URL:

http://www.cisco.com/en/US/products/ps6835/serv_group_home.html

For a detailed description of Cisco Advanced Services support for VAMS 1.5, see the *Video Assurance Monitoring Delivery Cisco Advanced Services* document at the following URL (TBD):

Cisco Lifecycle Approach

Cisco takes a lifecycle approach to deploying and operating network management systems. This approach helps companies to accelerate their success with advanced technologies and to improve their network's business value and return on investment.

Table 1-1 lists each phase in the product lifecycle and describes the type of support that Advanced Services and other consulting groups at Cisco provide.

Table 1-8 Cisco Lifecycle Mapping

Lifecycle Stage	Services	Organization
Prepare	Establishing a technology vision and high-level conceptual architecture	Presales/Advisory/ Advanced Services
Plan	Properly assessing the existing environment to determine whether it can support the new technologies and services	Advanced Services
Design	Designing a system that meets business and technical requirements	Advanced Services
Implement	Integrating the new solution without disrupting the network or creating points of vulnerability	Advanced Services
Operate	Maintaining network health through day-to-day operations	Advanced Services Technical Services
Optimize	Achieving operational excellence by adapting the architecture, operation, and performance of the network to ever changing business goals	Technical Services

Prepare Phase

In the prepare phase of the VAMS lifecycle, a company establishes business requirements and a corresponding management technology vision. The company develops a technology strategy and identifies the technologies that can best support its growth plans. After the financial and business value of migrating to a particular advanced technology solution has been assessed, the company establishes a high-level, conceptual architecture for the proposed system and validates features and functionality documented in the high-level design through proof-of-concept testing. The customer can choose to perform all or some of the activities in house or use Cisco Services.

Cisco Advanced Services can provide services to deploy a turnkey VAMS solution, ranging from a base probeless solution with CMM only to a full solution with probes with both ANA and CIC integration. The solution complexity scales based on the number of multicast streams (channels), ad-zones, multicast-enabled routes. Addition of probes, ANA and CIC will increase the complexity of the integration. Probes can be added to any offering whether base or a fully integration with ANA and CIC.

Additional features can also be added on in later phases.

Services Provided

- Customer requirements document (CRD) and CRD response
- Current Video Service Operations Assessment document
- High Level Design Document
- Proof of concept (POC) of the solution, and POC lab execution report
- Statement of work (SOW) and quotation

Plan Phase

In the plan phase of the lifecycle, the organization tries to make sure that adequate resources are available to manage the technology deployment project from planning through design and implementation. A project plan is created to help manage the tasks, risk, problems, responsibilities, critical milestones, and resources required to implement VAMS solution into the production network.

Services Provided

- Data collection of channel-lineup, ad-zone, and multicast addresses for the video flows (Base offering, CMM only). A spreadsheet summarizing the collected data.
- Data collection regarding MPEG probes parameters and associated alarm thresholds. (probes only).
- Data collection regarding ANA managed nodes and alarm thresholds (ANA only).
- Data collection regarding VAMS CIC-specific data. (CIC).
- Gaps and recommendation to gaps document.
- VAMS program and project management: Aligns with the scope, cost, and resource parameters in the original business requirements established during the prepare phase.
- An overall project management plan (PMP).
- VAMS site readiness report.

Design Phase

During the design phase of the VAM lifecycle, Cisco validates the proposed high level design and develops a low level design to the specified customer requirements and data. During the design phase, Cisco Network Consulting Engineers create a variety of plans and documents to guide activities such as configuring, deploying, and commissioning the proposed system.

Services Provided

- VAMS design development (CMM, probes, ANA and/or CIC) and associated Low-Level Design (LLD) documents.
- VAMS test plan development (CMM, probes, ANA, and/or CIC.
- VAMS implementation plan.
- VAMS design validation and review.
- Probes placement methodology.
- Network management for probes.
- Probe configuration.
- Probe network management plan.
- ANA-plug in configuration for VAMS (ANA).
- Specific configuration for CIC.

Implement Phase

In the implementation phase, Cisco Advanced Services integrates systems without disrupting the existing network or creating points of vulnerability. Cisco configures and integrates system components, and installs,

configures, tests, and commissions the VAMS system. After installation, Cisco validates that its operational network is working as intended, validates system operations, and works to close gaps in staff skills

Services Provided

- Site readiness review.
- CMM installation and configuration.
- Discovery of the multicast devices.
- Configuration, testing, and adjustment of critical flows and multicast thresholds.
- Configuration, testing, and adjustment of MPEG thresholds (probes only). Customer performs physical installation of probes.
- Implementation and configuration of the ANA VAMS plug-in (ANA only)
- Implementation of CIC plug-in (CIC only).
- Test plan execution.
- CMM cases.
- Probes cases.
- ANA VAMS-plug in cases.
- CIC-plug in cases.
- AS build documents and support for on-site knowledge transfer.

CHAPTER 2

Preinstallation

Prerequisites

Your system must have the following hardware and software before installing the Cisco VAMS 1.5 software package:

Note See the "Install and Configure Prerequisite Hardware and Software Solution Components" section on page 2-2 for detailed installation procedures.

Hardware Installation

- The core network elements of the video transport network:
  - Cisco 7600 Series router
  - Cisco Catalyst 6500 Series switch
  - Cisco CRS-1
  - Cisco Catalyst 4948 Series switch
- Management servers for Cisco Active Network Abstraction (ANA) 3.6.3 (includes gateway, unit, and client installation).
- Management servers for Cisco Multicast Manager (CMM) 2.5.4.
- Third-party video probes:
  - Bridge Technologies VB Series
  - IneoQuest Singulus G1-T and IQ Cricket
  - Mixed Signals Sentry Digital Content Monitor
  - Pixelmetrix DVStation
  - Tektronix MTM400
- Management servers for Cisco Info Center/Netcool 7.2 Suite.

Software Installation

- The IPTV-enabled IOS software versions:
  - 12.2(33)SRB2, 12.2(33)SRB3, 12.2(33)SRC, or 12.2(33)SRC1on the Cisco 7600 Series router
  - 12.2(33)SRB2, 12.2(33)SRB3, 12.2(33)SRC, or 12.2(33)SRC1on the Cisco Catalyst 6500 Series switch

  - IOS-XR 3.6.1.12 on the Cisco CRS-1
  - 12.2(31)SGA1 on the Cisco Catalyst 4948 Series switch
- Cisco ANA 3.6.3 (includes gateway, unit, and client installation).
- Cisco Multicast Manager (CMM) 2.5.4 software on dedicated server.
- Management software for the Cisco Info Center/Netcool 7.2 suite:
  - ObjectServer 7.2
  - Webtop 2.1
  - Impact 4.0
  - TBSM 4.1

Install and Configure Prerequisite Hardware and Software Solution Components

Before installing the Cisco VAMS 1.5 software package:

Note Perform these tasks in the sequence shown.

Step 1 Install the Cisco 7600 Series routers, Cisco Catalyst 6500 switches, Cisco CRS-1, and Cisco Catalyst 4948 Series switches for the supported cable or wireline architecture.

See the following installation guides for more information:

- Cisco 7600 Series installation guides, viewable online at: http://www.cisco.com/en/US/products/hw/routers/ps368/prod_installation_guides_list.html
- Cisco Catalyst 6500 Series installation guides, viewable online at: http://www.cisco.com/en/US/products/hw/switches/ps708/prod_installation_guides_list.html
- Cisco CRS-1 installation guides, viewable online at: http://www.cisco.com/en/US/products/ps5763/prod_installation_guides_list.html
- Cisco Catalyst 4948 installation guides, viewable online at: http://www.cisco.com/en/US/docs/switches/lan/catalyst4900/4948-10ge/4948_10.html

Step 2 Configure the Cisco 7600 Series routers, Cisco Catalyst 6500 Series switches, Cisco CRS-1, and Cisco Catalyst 4948 Series switches for the supported cable or wireline architecture.

See the following configuration guides for more information:

- Cisco 7600 Series configuration guides, viewable online at: http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_and_configuration_guides_list.html
- Cisco Catalyst 6500 Series configuration guides, viewable online at: http://www.cisco.com/en/US/products/hw/switches/ps708/products_installation_and_configuration_guides_list.html
- Cisco CRS-1 configuration guides, viewable online at: http://www.cisco.com/en/US/products/ps5763/products_installation_and_configuration_guides_list.html

- Cisco Catalyst 4948 configuration guides, viewable online at:
  http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/12.2/25ewa/configuration/guide/conf.html

  http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/12.2/31sg/configuration/guide/conf.html
- Also, consult configuration tasks documented in the "Cisco Internet Protocol Television (IPTV) Solutions" section on page xiii.

Step 3 Install the following multicast-enabled IOS images[1]:

- Cisco 7600 Series routers with 12.2(33)SRB2, 12.2(33)SRB3, or 12.2(33)SRC1 image
- Cisco Catalyst 6500 Series switches with 12.2(33)SRB2, 12.2(33)SRB3, or 12.2(33)SRC1 image
- Cisco CRS-1 with IOS-XR 3.6.1.12 image
- Cisco Catalyst 4948 Series switches with 12.2(31)SGA1 image

See the following release notes for more information:

- Cisco 7600 release notes, viewable online at:
  http://www.cisco.com/en/US/products/ps6922/prod_release_note09186a00806c096f.html
- Cisco Catalyst 6500 release notes, viewable online at:
  http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html
- Cisco CRS-1 release notes, viewable online at:
  http://www.cisco.com/en/US/docs/ios_xr_sw/iosxr_r3.4/general/release/notes/reln_342.html
- Cisco Catalyst 4948 release notes, viewable online at:
  http://www.cisco.com/en/US/docs/switches/lan/catalyst4500/release/note/OL_9592.html

Step 4 Install the Active Network Abstraction (ANA) hardware and software on dedicated servers (includes gateway, unit, and client installation and ANA 3.6.1, 3.6.2, and 3.6.3 updates):

See the following installation guides for more information:

- *Cisco Active Network Abstraction Installation Guide 3.6*, viewable online at:
  http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6/installation/install_1.html
- *Cisco Active Network Abstraction Installation Guide 3.6 Service Pack 1*, viewable online at:
  http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp1/installation/guide/Install-Book-Wrapper.html).
- *Cisco Active Network Abstraction Installation Guide 3.6 Service Pack 2*[2], viewable online at:
  http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/installation/guide/Install-Book-Wrapper.html
- *Cisco Active Network Abstraction Installation Guide 3.6 Service Pack 3,* viewable online at:
  http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp3/installation/guide/Install-Book-Wrapper.html

Step 5 Install the Cisco Multicast Manager (CMM) 2.5.4 hardware and software on dedicated servers:

See the following installation guide for more information:

Cisco Multicast Manager Installation Guide 2.5, viewable online at:
http://www.cisco.com/en/US/products/ps6337/prod_installation_guides_list.html

1. Download the Cisco IOS software from http://www.cisco.com/public/sw-center/index.shtml.
2. If you encounter an error during installation of ANA 3.6.2, follow the workaround described here:
   http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/release_notes/rn36_sp2.htm#wp82640

Step 6 Install the third-party video probes for Bridge Technologies, IneoQuest, Mixed Signals, PixelMetrix and Tektronix:

See the following video probe guides for more information:

Bridge Technologies

VB120 Broadcast IP-Probe User's Manual v. 4.0.

IneoQuest Singulus G1-T

- *IQMedia QuickStart Guide*
- *IQ MediaMonitor Series M1 Singulus G1-T Network Monitoring and Analysis Systems Hardware User's Guide*
- *IQMediaAnalyzer Application User's Guide*

IneoQuest Cricket

See the IneoQuest website for more information.

Mixed Signals Sentry

Mixed Signals Sentry Digital Content Monitor User Guide

PixelMetrix

DVStation-IP-3 User Manual, Software Version 4.17

Tektronix MTM400

- *MTM400 MPEG Transport Stream Monitor User Manual*
- *MTM400 MPEG Transport Stream Monitor Technical Reference*
- *MTM400 MPEG Transport Stream Monitor Programmer Manual*

Step 7 Install the hardware and software for the Cisco Info Center/Netcool 7.2 on dedicated servers:

See the following books for more information:

Documentation Guide and Supplemental License Agreement

Cisco Info Center 7.1 Documentation Guide and Supplemental Licence Agreement

Viewable online at:

http://www.cisco.com/en/US/products/sw/netmgtsw/ps996/products_documentation_roadmap09186a0080805796.html

IBM Tivoli Netcool/OMNIbus

IBM Tivoli Netcool/OMNIbus Installation and Dployment Guide

IBM Tivoli Netcool/Webtop

- *IBM Tivoli Netcool/Webtop QuickStart Guide*
- *IBM Tivoli Netcool/Webtop Administration Guide*

IBM Tivoli Netcool/Impact

- *IBM Tivoli Netcool/Impact Administration Guide*
- *IBM Tivoli Netcool/Impact User Interface Guide*
- *IBM Tivoli Netcool/Impact Solutions Guide*

IBM Tivoli Business Service Manager

- *IBM Tivoli Business Service Manager Installation Guide*
- *IBM Tivoli Business Service Manager Quick Start*
- *IBM Tivoli Business Service Manager Administrator's Guide*
- *IBM Tivoli Business Service Manager Service Configuration Guide*
- *IBM Tivoli Business Service Manager Customization Guide*

IBM Netcool GUI Foundation

Netcool GUI Foundation Version 1.1 Administration Guide

CHAPTER 3

Installing the Cisco Video Assurance Management Solution 1.5

Before You Install

Note You must meet all preinstallation tasks listed in Chapter 2, "Preinstallation" before continuing. Complete these tasks before installing the Cisco VAMS 1.5 software package.

Release Notes

Before you install the Cisco VAMS 1.5, refer to the latest release notes for this solution, available online at Cisco.com. The release notes contain additional information that became available after the initial release of the solution.

Each release note contains:

- Upgrade notes—additional information and considerations for upgrading.
- Uninstalling software—detailed instructions for removing previous installations of software.
- Patch releases and enhancements—describes any enhancements provided by patches.
- Open and resolved caveats—describes any expected behavior that may or may not require a workaround.
- Other configuration requirements.

Install the Cisco VAMS 1.5 Software

To install the Cisco VAMS 1.5:

Step 1 Log in to the server as the root user.

Step 2 Insert the Cisco VAMS 1.5 installation DVD into the DVD drive on your system.

Step 3 Check the system prerequisites such as required disk space. See Chapter 1, "Overview."

Step 4 If an older version of the Cisco VAMS exists, uninstall it. See Chapter 4, "Uninstalling the Cisco Video Assurance Management Solution 1.5."

Step 5 Change the directory to the root directory on the DVD.

For example:

```
cd /cdrom/cdrom0/
```

Step 6 Start the installation script.

For example:

```
./install.sh -o
```

The installation script prompts you to enter site-specific values for the installation.

Step 7 When prompted to enter login information for the Cisco ANA, you must enter an administrative-level user ID and password. If necessary, obtain this information from your administrator.

Step 8 If your login information does not authenticate, retry by entering **r**, or bypass the Cisco ANA authentication by entering **y**.

```
The specified login and password do not authenticate.
Do you wish to continue with the installation? [Y(es)/N(o)/R(etry)]:
```

Caution If you enter **y** to bypass authentication, you must run the setCimsCredentials.sh script later. That script is in the iptv/scripts/ directory. The Cisco VAMS 1.5 will not operate correctly if you do not run the setCimsCredentials.sh script after a failed authentication.

Step 9 After successful installation, continue to Chapter 5, "Configuring the Components of the Cisco Video Assurance Management Solution 1.5."

A message similar to this one should appear on your screen:

```
Installation of <CSCOcims> was successful.
Modifying configuration files
preparing client configuration..
updating client configuration..
Restarting ANA Gateway
...
Installation completed.
```

CHAPTER 4

Uninstalling the Cisco Video Assurance Management Solution 1.5

Uninstall Cisco VAMS 1.5

Note You can also use this procedure to uninstall a previous version of the Cisco VAMS software.

To uninstall Cisco VAMS 1.5:

Step 1 Log in to the server as the root user.

Step 2 Insert the Cisco VAMS 1.5 installation DVD into the DVD drive on your system.

Step 3 Change the directory to the uninstallation directory.

For example:

```
cd $ANAROOT/iptv/scripts
```

where $ANAROOT is the ANA installation directory.

Step 4 Start the uninstall script.

```
./uninstall.sh

Do you want to remove this package? [y,n,?,q] ?
```

Step 5 Enter **y** to continue. A message similar to this one should appear on your screen:

```
## Removing installed package instance <CSCOcims>
## Verifying package <CSCOcims> dependencies in global zone
## Processing package information.
## Executing preremove script.
Restoring configuration file
...

Restarting ANA Gateway
...

Removal of <CSCOcims> was successful.
```

CHAPTER 5

Configuring the Components of the Cisco Video Assurance Management Solution 1.5

After completing the installation of Cisco VAMS 1.5, you are ready to configure the components of the solution for operation.

The following summary procedure describes how to configure all the components of the Cisco VAMS 1.5. References to more detailed procedures and documentation are provided.

To configure the components of the Cisco VAMS 1.5:

Step 1 Ensure that you have met all prerequisites. (See Chapter 2, "Preinstallation." and the "Before You Install" section on page 3-1.)

Note As an important prerequisite, load all the Cisco devices in the video transport network with IOS software that supports the Cisco VAMS 1.5.

Step 2 In Cisco ANA, create new virtual network elements (VNEs) for the Cisco VAMS 1.5 components. See the "Create VNEs" section on page 5-2.

Step 3 Add the Cisco VAMS 1.5 devices to the Cisco ANA network map. See the "Add Solution Components to the Cisco ANA Network Map" section on page 5-4.

Step 4 Configure the CMM to set thresholds and forward notifications to the CIC Object Server. Configure the following types of monitoring:

- PPS/BPS Threshold Polling
- Tree Polling
- Health Checks
- IP Multicast Heartbeat Monitoring

See the "Configure the CMM" section on page 5-5.

Step 5 Configure the video probes to set thresholds and send events to Cisco ANA. See the "Configure Video Probes" section on page 5-14.

Note All components of the Cisco VAMS 1.5 are now operational. The Cisco devices in the video transport network forward notifications to the CMM, which then forwards them to the Cisco ANA. The video probes also forward notifications to the Cisco ANA. The remaining steps of this procedure are optional.

Step 6 (Optional) To manually run the Setup for IPTV activation script, see Run the Setup for IPTV Script, page 5-15.

Note The Setup for IPTV activation script runs automatically at installation time, hourly, and whenever a managed device reloads.

Step 7 (Optional) To manually run the Cleanup from IPTV activation script, see the "Run the Cleanup from IPTV Script" section on page 5-16.

Note Do Step 7 when you want to remove a device from the Cisco VAMS 1.5. The Cleanup from IPTV activation script removes the IPTV extensions.

Create VNEs

Use this procedure to create a VNE for each component of the Cisco VAMS 1.5. Table 5-1 lists important values for the VNEs of the Cisco VAMS 1.5. You will need this information when you create the VNEs for the Cisco VAMS.

Table 5-1 VNE Information for Cisco VAMS 1.5[1]

Name	Type	Scheme
Cisco 7600	Auto Detect	Product
Cisco Catalyst 6500	Auto Detect	Product
Cisco CRS-1	Auto Detect	Product
Cisco Catalyst 4948	Auto Detect	Product
Cisco Multicast Manager	ICMP	Product
Tektronix video probe	Auto Detect	Product
IneoQuest video probe	Auto Detect	Product
Mixed Signals video probe	ICMP	Product

1. Column headings in this table are the names of the fields in the New VNE window, under the General tab.

To create VNEs for the Cisco VAMS 1.5:

Step 1 Log in to ANA Manage.

Step 2 Click the **ANA Servers** item in the navigation tree (left pane).

Step 3 Click and expand the **ANA Gateway** item in the navigation tree.

Step 4 Create an Autonomous Virtual Machine (AVM) to contain the VNE objects for the Cisco VAMS 1.5:

a. Right-click the ANA Gateway in the left pane.

b. Choose **New AVM** from the drop-down menu.

c. Enter an ID number and key.

d. Check the **Activate on creation** check box and click **OK**.

Note You may create more than one AVM. For example, you could create one AVM for the Cisco devices and a different AVM for the video probes.

Step 5 Right-click the AVM that contains the IPTV devices, then, choose the **New VNE**.

Step 6 Complete these fields in the New VNE window under the General tab:

- Name (as ANA identifies it)
- IP Address
- Type (see Table 5-1 on page 5-2)
- Scheme (see Table 5-1 on page 5-2)
- Initial State (Stop or Start)

Step 7 Under the SNMP tab, in the SNMP V1/V2 Settings pane, complete these fields:

- Community Read
- Community Write

Step 8 Enable Telnet or SSH under the Telnet/SSH tab. This information enables discovery of the device.

Step 9 If the VNE type is ICMP (see Table 5-1 on page 5-2), enter a polling rate under the ICMP tab.

Step 10 If required, add the VNE to a polling group under the Polling tab.

Note The IPTV extensions of the Cisco VAMS 1.5 provide two new polling groups: *30-minute config* and *60-minute config*. Depending on your polling requirements, choose one of these groups to obtain status, configuration, and system information.

Step 11 Enter any other required information in the remaining tabs of the New VNE window and click **OK**.

Step 12 Verify that the new VNE appears in the VNEs table in the right pane of the ANA Manage window.

Step 13 To start the new VNE, right-click it in the table and choose **Actions > Start**.

Step 14 To continue to add new VNEs, repeat this procedure from Step 5.

Add Solution Components to the Cisco ANA Network Map

Use this procedure to add these components to the Cisco ANA Network Map:

- Cisco 7600 Series router
- Cisco Catalyst 6500 switch
- Cisco CRS-1
- Cisco Catalyst 4948 Series switch
- Video probes:
  - Bridge Technologies
  - IneoQuest
  - Mixed Signals
  - PixelMetrix
  - Tektronix
- Cisco Multicast Manager

To add the previous components:

Step 1 Log in to ANA NetworkVision.

Step 2 If you have not already, create a new network map:

File > New Map

Step 3 To open the device list, choose **File > Add Device**.

Step 4 Choose the device that you want to add to the network map.

Step 5 Click **Add Device**.

Step 6 Verify that the device appears in the network map and links appear between connected devices.

Note If links do not appear and the devices are connected, you can manually create the links as described in the *Release Notes for Cisco Active Network Abstraction 3.6 Service Pack 2*: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/release_notes/rn36_sp2.html

(see defect CSCsi50166).

Step 7 To add other solution components to the network map, repeat this procedure from Step 3.

Configure the CMM

To enable notifications and set thresholds for multicast conditions, you must configure the CMM.

This section covers two areas of CMM Configuration:

- General CMM Configuration, page 5-5—This section covers general configuration of CMM.
- Setting Up Troubleshooting Configuration for IP Multicast, page 5-6—This section describes configuration of CMM for specific types of monitoring:
  - Configuring BPS/PPS Threshold Monitoring, page 5-6.
  - Configuring Tree Polling, page 5-8.
  - Configuring Health Checks, page 5-11
  - Configuring IP Multicast Heartbeat Monitoring, page 5-13

General CMM Configuration

General Configuration tasks for CMM include:

- Discovery of multicast-capable devices in the domain.
- Global configuration of polling intervals and run times for Layer 2 polling, Designated Router (DR) polling, and polling of Rendezvous Point (RP) status.
- Configuration of video probes.
- Configuration of the Channel Mapping database.

Note A summary procedure of configuration tasks follows. For complete details about these, and other configuration tasks, see the *User Guide for the Cisco Multicast Manager 2.5*:

http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/CMM_25_User_Guide.html

To configure the CMM for the Cisco VAMS 1.5:

Step 1 In a browser window, open and log in to the CMM.

Step 2 In the Tool drop-down menu, click **Administration**.

Step 3 To add a domain, choose **Domain Management**.

Step 4 Choose **add a new domain**. The System Configuration page appears.

Step 5 To discover the devices, choose **Discovery > Multicast**.

Step 6 To add Video probes, choose **Discovery > Add Video Probe**.

Step 7 To configure multicast thresholds, choose **Multicast Polling Configuration**. To activate your changes, click the **Start** button.

Step 8 To configure polling intervals and run times, choose **Global Polling Configuration**. To activate your changes, click the **Start** button.

Step 9 To configure the Channel Mapping databases, choose **Address Management** and configure the Channel Map database, the Multiplex Table Database, the Ad Zone database, and the Address database.

Step 10 Forward notifications to CIC:

a. Choose **Global Polling Configuration > Domain Trap/Email**.

b. In the right pane, enter the IP address of the CIC Object Server in the Add Trap Receiver field.

c. Click the **Add Trap Receiver** button. This action adds the CIC Object Server IP address to the Configured Trap Receivers drop-down list.

d. Choose a trap receiver from the Configured Trap Receivers drop-down list.

e. To activate your changes, click the **Start** button.

The CMM forwards notifications to CIC, the designated trap receiver.

Step 11 To add users, choose **User Management > Manage Users**.

Setting Up Troubleshooting Configuration for IP Multicast

Configuring IP multicast configuration settings in CMM for VAMS 1.5 includes the following tasks:

- Configuring BPS/PPS Threshold Monitoring, page 5-6
- Configuring Tree Polling, page 5-8
- Configuring Health Checks, page 5-11
- Configuring IP Multicast Heartbeat Monitoring, page 5-13

Configuring BPS/PPS Threshold Monitoring

Cisco VAMS 1.5, which includes CMM 2.5.4. enables polling of flows from Cisco 7600 routers and Cisco 6500 devices without the use of video probes. This is referred to as probeless monitoring.

To configure probeless monitoring, in the domain configuration for the monitored device, specify Telnet as the CLI threshold polling method. Then, on the main SG Polling Configuration page, set up the thresholds that you want to configure for each device.

To set up BPS/PPS Threshold Monitoring:

Step 1 In the CMM application, from the Multicast Manager home page, select the **Administration** tool.

Step 2 Select **Domain Management**.

Step 3 Select **add a new domain**. The System Configuration page appears.

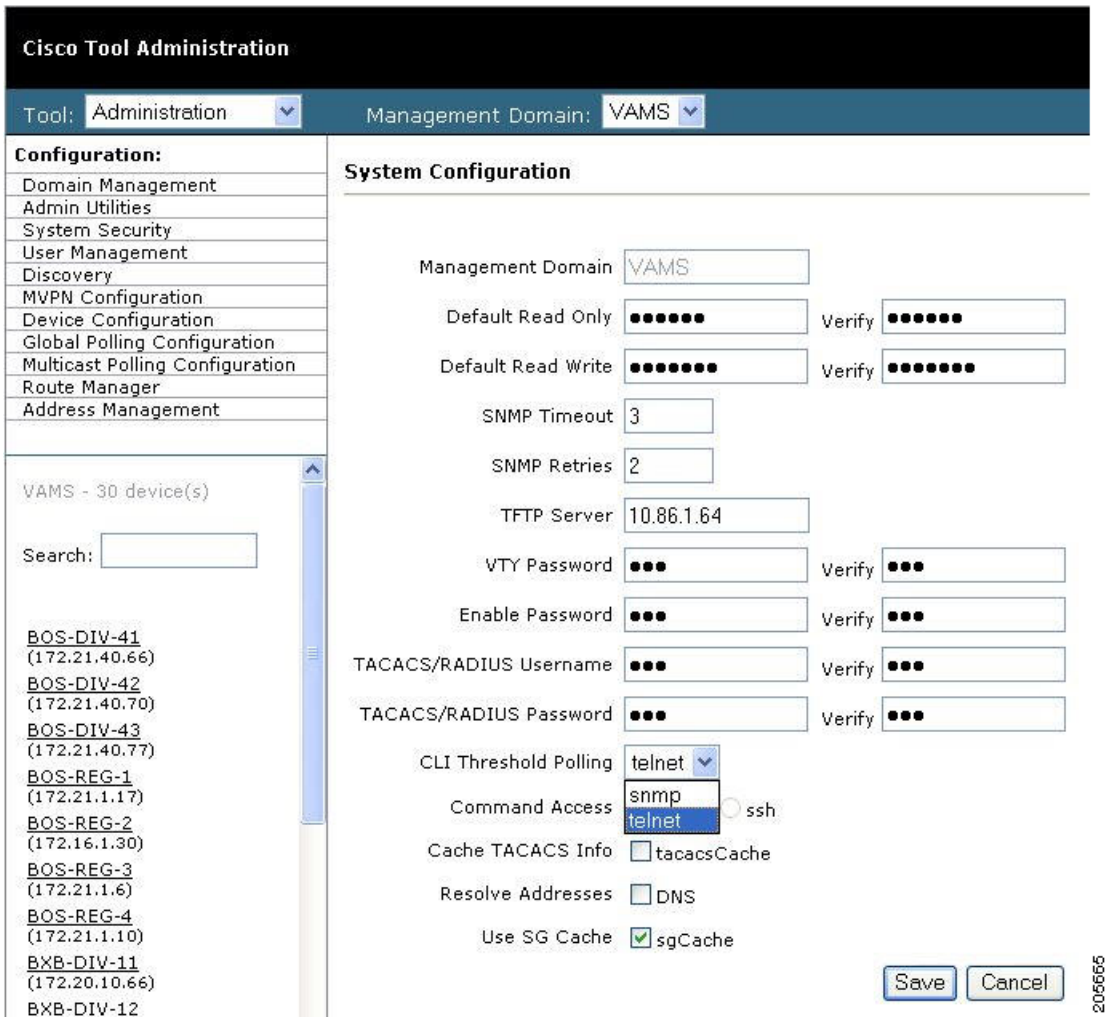
Note To edit an existing domain, select **edit** next to the desired domain listing.

Step 4 Specify the domain settings as described in “Creating a Domain” the *User Guide for Cisco Multicast Manager 2.5* at the following location:

http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/cmm_gs.html

Step 5 On the System Configuration page, from the drop-down list for **CLI Threshold Polling** method, select **telnet**, as shown in Figure 5-1.

Figure 5-1 Configuring the CLI Threshold Polling Method

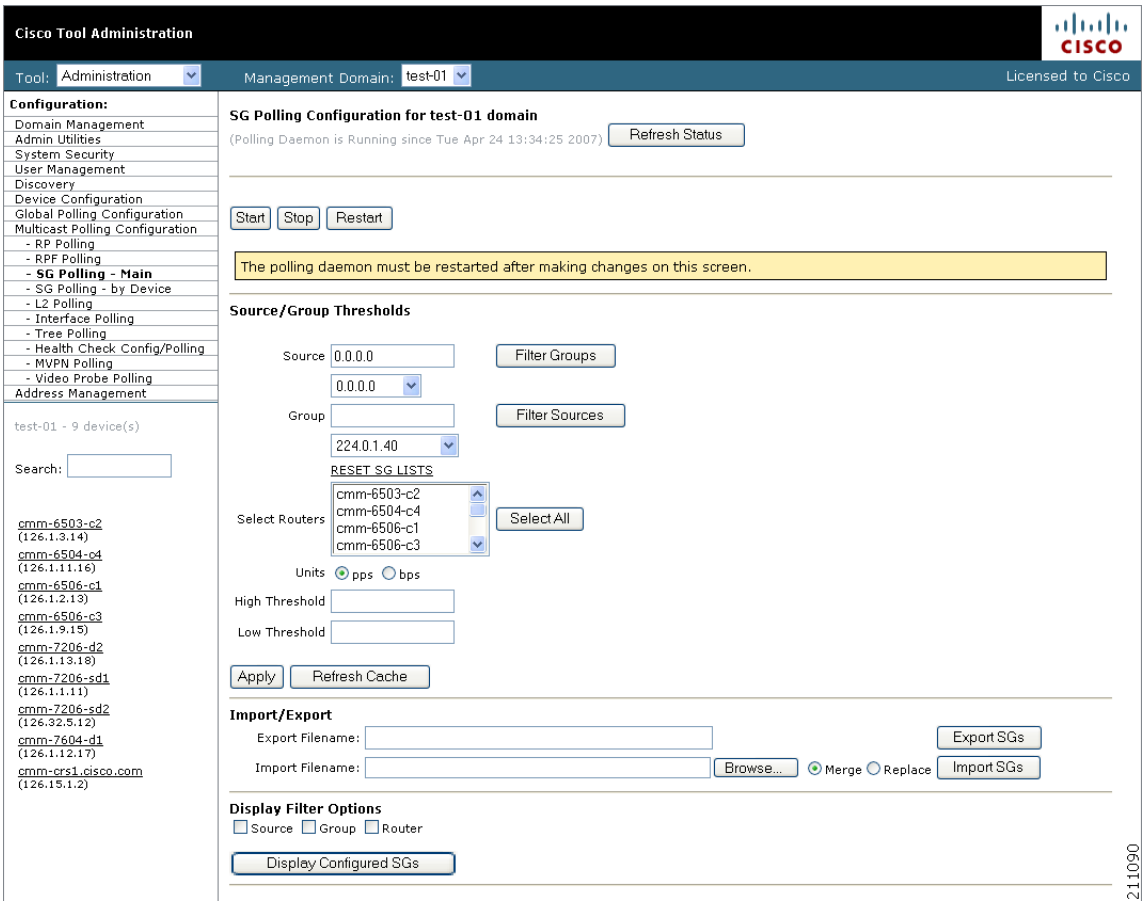


Step 6 Click **Save** to save the domain configuration.

Step 7 To configure SG polling and set up PPS/BPS thresholds, select **Multicast Polling Configuration > SG Polling - Main.**

The main SG Polling Configuration page opens, as shown in Figure 5-2.

Figure 5-2 SG Polling Configuration Page



Step 8 Configure PPS/BPS thresholds as described in the "SG Polling - Main" section of the *User Guide for Cisco Multicast Manager 2.5* at the following location:

http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/cmm_cf.html#wp1271295

Configuring Tree Polling

Multicast trees can change due to network outages or in response to establishment of more optimal flow paths. Because tree changes might impact video quality immediately or in the future, it is important for network operators to be notified of changes in multicast trees.

To configure tree polling, you must first create a trace file by drawing a multicast tree and saving it. You can then use the saved tree as a baseline for configuring tree polling.

The trace file name that you specify must have this format:

<channel_name>_<ad_zone>_<Mcast-Group>_<source-IP>

where *channel_name* is the name of the channel, *ad_zone* is the name of the Ad zone, *Mcast-Group* is the address of the multicast group, and *source-IP* is the IP address of the source. For example:

`PBS_National_232-0-1-32_12-101-2-18`

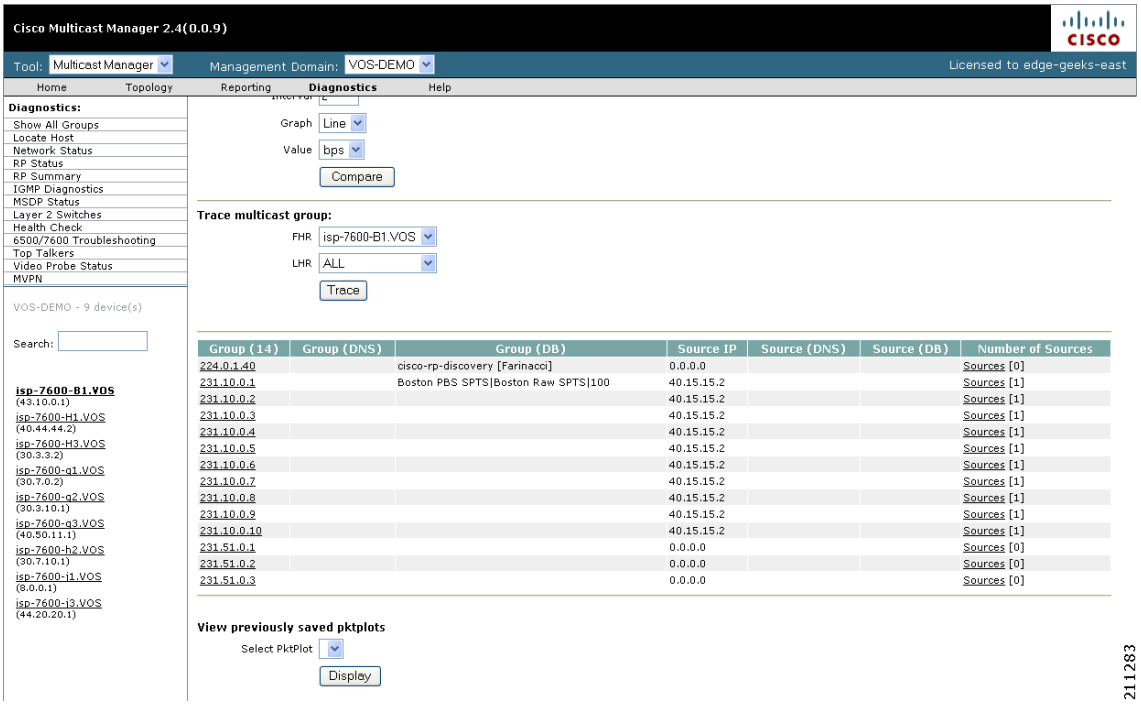
To configure tree polling:

Step 1 Start the Diagnostics tool.

Step 2 Click **Show All Groups**.

The Multicast Diagnostics page appears, as shown in Figure 5-3.

Figure 5-3 Multicast Diagnostics Page



Step 3 From the drop-down list below the **Source** field in the Set Source and Group to Work On pane, select a source to work on.

Step 4 From the drop-down list below the **Group** field in the Set Source and Group to Work On pane, select a group to work on.

The Multicast Diagnostics page appears with the source and group selected.

Step 5 For additional details, see the "Show All Groups" section in the *User Guide for Cisco Multicast Manager 2.5* at this location:

http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/cmm_dt.html

CMM draws a tree diagram of the tree.

Step 6 To save the trace to use as a baseline for tree polling, in the Trace File field, enter a name the trace file, and then click **Save As**.

Note The trace file name that you specify must have this format:

<*channel_name*>_<*ad_zone*>_<Mcast-Group>_<*source-IP*>

where *channel_name* is the name of the channel, *ad_zone* is the name of the Ad zone, *Mcast-Group* is the address of the multicast group, and *source-IP* is the IP address of the source. For example:

PBS_National_232-0-1-32_12-101-2-18

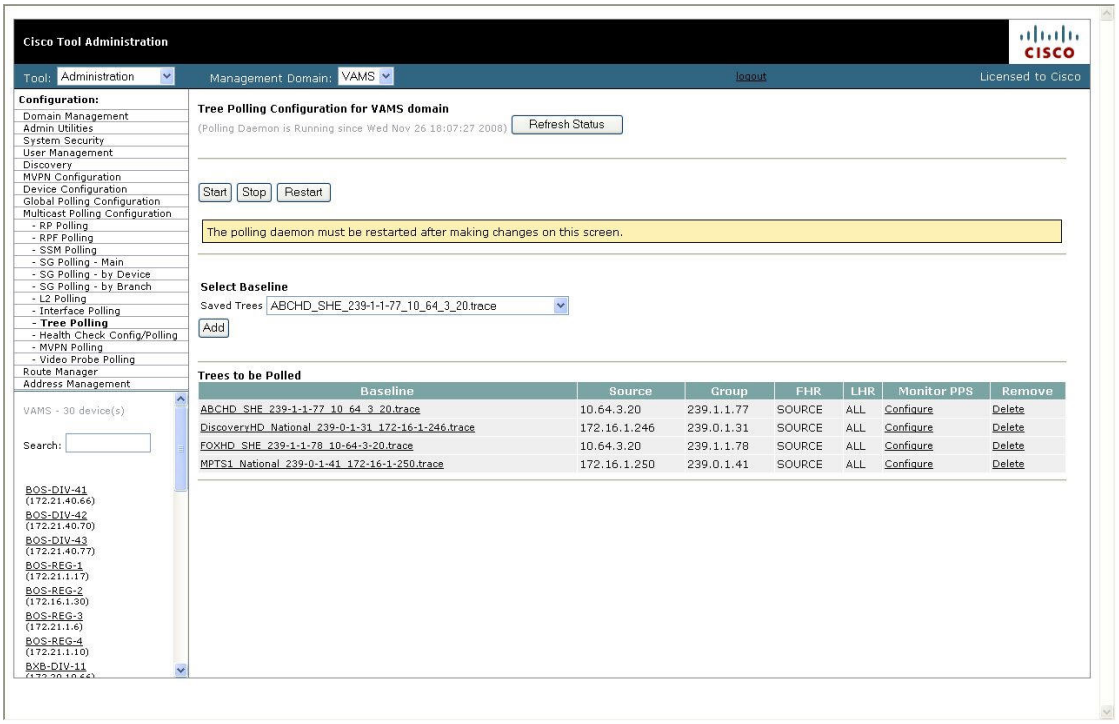
Step 7 To set up tree polling for the saved baseline, complete these steps:

a. Select the **Administration** tool.

b. Select **Multicast Polling Configuration > Tree Polling.**

The Tree Polling Configuration page opens, as shown in Figure 5-4.

Figure 5-4 Tree Polling Configuration Page



The Tree Polling Configuration page contains the following fields and buttons:

Fields and Buttons	Description
Refresh Status	The status line indicates how long the polling daemon has been running and how it was started. Click **Refresh Status** to update the status information.
Start	Starts the polling daemon globally.

Fields and Buttons	Description
Stop	Stops the polling daemon globally.
Restart	Restarts the polling daemon globally. Each time you change a polling interval, click **Restart**.
Saved Trees	Lists all the multicast tree baselines that have been saved.
Add	Adds the selected tree for monitoring.

c. To monitor a tree, from the drop-down menu in the **Saved Trees field,** select the tree name, and click **Add**.

d. To specify how often the tree is polled:

- Click **Global Polling Configuration.**

  The Global Polling Configuration Page appears.

- Click **Tree Polling Interval,** and on the dialog that appears, specify the time interval for tree polling.
- Save your changes.
- Click **Set** to save your global polling configuration.

The tree is drawn in the background for every interval that you set up for tree polling. This tree is compared with the tree saved in the database. If it is different, a trap is sent, and a report is generated.

Configuring Health Checks

The CMM application provides the ability to set up health checks that check and report on the status of critical components of your IP multicast network. Health checks can check the status of RPs, MSDP peering, the presence of sources and groups, and the status of multicast trees.

You should create a health check for every important source and group in your multicast network.

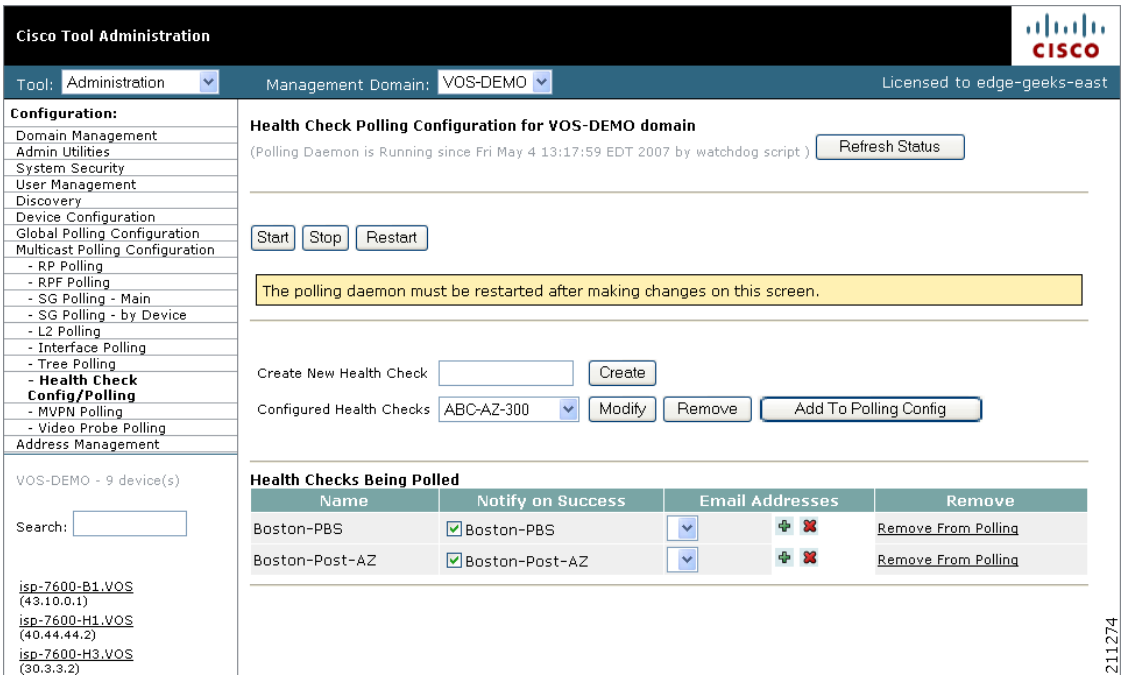
To configure health check polling:

Step 1 Select the **Administration** tool.

Step 2 Select **Multicast Polling Configuration > Health Check Config/Polling.**

The Health Check Config/Polling page opens, as shown in Figure 5-5.

Figure 5-5 Health Check Polling Configuration Page



The Health Check Config/Polling page contains the following fields and buttons:

Fields and Buttons	Description
Create New Health Check	Type a name for the health check.
Create	Creates the new health check.
Configured Health Checks	Select the health check you want to modify.
Modify	To update a health check, select a health check from the drop-down list of health checks in the Configured Health checks field and then click **Modify**. A summary of the currently configured health checks appears.
Remove	Removes the existing health check.
Add To Polling Config	Schedules this health check to run automatically.
Name	Name of the health check.
Notify on Success	Generates an email report if the health check completes successfully.
Email Addresses	Enter the email addresses to be notified. Click **+** to add an email address. Click **-** to remove an email address.
Remove	Click **Remove From Polling** to stop the health check from running at scheduled intervals.

Configuring IP Multicast Heartbeat Monitoring

The CMM application can monitor the heartbeat of the routers that are forwarding a video flow. This is useful to confirm that the traffic stream is active.

To set up heartbeat monitoring requires that a downstream router or host has joined a multicast group or a static IGMP has been set; a data path must be established through the router that is configured for heartbeat monitoring.

Configuring heartbeat monitoring consists of two steps:

1. Configuring IP multicast on a router.
2. Enabling monitoring for the router.

Configuring IP Multicast Heartbeat on the Router

To configure IP multicast heartbeat on a router for which you want to enable IP multicast heartbeat, enter the following commands:

```
snmp-server enable traps ipmulticast
ip multicast heartbeat <ip_address> <minimum_number> <intervals> <interval_length>
```

where *ip_address* is the IP address of the router, *minimum_number* is the minimum number of intervals, *intervals* is the number of intervals, and *interval_length* is the length of the intervals in seconds.

The following is an example configuration of the ip multicast heartbeat command:

```
snmp-server enable traps ipmulticast-heartbeat
ip multicast heartbeat 224.0.1.53 1 1 10
```

Enabling Monitoring for the Router

To enable CMM monitoring for the router heartbeat, complete these steps to set the multicast group to monitor and specify the minimum number of packets that the router must process in an interval:

Step 1 Select **Multicast Polling Configuration > SG Polling - Main.**

The main SG Polling Configuration page opens.

Step 2 In the Group field, enter the IP address for the group to monitor.

Step 3 In the Select Routers list, select the router that you want to monitor.

Step 4 Scroll down to the bottom of the SG Polling configuration page and click **Time-based thresholds** (in the Time Threshold column).

Step 5 Set the number of intervals to monitor and the length of the intervals in seconds.

Step 6 Click the **Set Thresholds** button to save your changes.

Step 7 On the SG Polling Configuration page, click **Apply**.

Configure Video Probes

Each video probe in Cisco VAMS 1.5 monitors various parameters of the video flow through the network. For example, you might configure a video probe to monitor the amount of jitter or delay in a video stream.

For each video probe deployed in the network, you must configure the thresholds for the conditions that you want to monitor. You must also configure the video probes to forward traps to CIC. (Refer to the probe documentation for information on adding the CIC IP addresses and related SNMP information to the video probe settings.)

Once you configure the video probe, if a monitored condition exceeds a configured threshold, the probe sends a corresponding trap to CIC, which shows the event in the TBSM GUI and the Webtop GUI.

Note CMM 2.5.4 will poll the IneoQuest probes even though the probes may also be sending traps to the Cisco ANA.

Bridge Technologies Video Probe

To configure the Bridge Technologies video probe for operation in the video transport network, refer to the documentation that comes with the product. These documents assist the network planner when integrating the Bridge Technologies video probes with the Cisco VAMS 1.5:

VB120 Broadcast IP-Probe User's Manual v. 4.0

IneoQuest Video Probe

To configure the IneoQuest video probe for operation in the video transport network, refer to the documentation that comes with the product. These documents assist the network planner when integrating the IneoQuest video probes with the Cisco VAMS 1.5:

- *Hardware User's Guide*
- *IQMediaAnalyzer Application User's Guide*

Mixed Signals Video Probe

To configure the Mixed Signals video probe for operation in the video transport network, refer to the documentation that comes with the product. These documents assist the network planner when integrating the Mixed Signals video probes with the Cisco VAMS 1.5:

The *Mixed Signals Sentry Digital Content Monitor User Guide*

PixelMetrix Video Probe

To configure the PixelMetrix video probe for operation in the video transport network, refer to the documentation that comes with the product. These documents assist the network planner when integrating the PixelMetrix video probes with the Cisco VAMS 1.5:

DVStation-IP-3 User Manual, Software Version 4.17

Tektronix Video Probe

To configure the Tektronix video probe for operation in the video transport network, refer to the documentation that comes with the product. These documents assist the network planner when integrating the Tektronix video probes with the Cisco VAMS 1.5.

- *MTM400 MPEG Transport Stream Monitor User Manual*
- *MTM400 MPEG Transport Stream Monitor Technical Reference*
- *MTM400 MPEG Transport Stream Monitor Programmer Manual*

Run the Setup for IPTV Script

The Setup for IPTV activation script sets up network configuration parameters for the Cisco devices in the Cisco VAMS 1.5.

The script runs:

- ANA startup.
- Every two hours.
- Whenever the managed device reloads.
- When you activate it in ANA NetworkVision (see procedure).

The hourly run checks the IPTV configuration of the managed VNEs. If a VNE does not have the expected IPTV configuration, the script applies the IPTV configuration parameters to the device.

Note Configure the supported devices and load them with IPTV-enabled IOS images. The IPTV script does not recognize the devices without IPTV-enabled IOS images. (See the "Before You Install" section on page 3-1.)

To manually run the IPTV activation script for setup:

Step 1 Log in to ANA NetworkVision.

Step 2 Right-click a VNE in the network map.

Step 3 In the right-click menu, choose **Management > Setup for IPTV**.

Step 4 In the Setup for IPTV window, click the **Execute** button.

The result of the script appears in the same window under the Result tab.

Note If the selected VNE already has its IPTV configuration, the result indicates *ALREADY CREATED*, and the script does not run.

Run the Cleanup from IPTV Script

You run the Cleanup from IPTV activation script when you want to remove the IPTV extensions from a VNE that is in the Cisco VAMS 1.5. When you remove the extensions, the VNE will not be able to process the IPTV requests.

To run the Cleanup from IPTV script:

Step 1 Log in to ANA NetworkVision.

Step 2 Right-click the VNE in the network map.

Step 3 In the right-click menu, choose **Management > Cleanup from IPTV**.

The Cleanup from IPTV script runs and removes the IPTV extensions from the selected VNE.

CIC Configuration

The CIC configuration includes:

- Prerequisites, page 5-16
- Installation of Cisco ANA to Netcool Adapter, page 5-17
- Installing the IBM Tivoli Netcool Rules Files, page 5-19
- Installing IBM Tivoli Netcool View For ANA, page 5-21
- Configuring of Channel Mapping databases
- Configuration of the VAMS Cross-Launch menu

Prerequisites

Verify that the following patches are in Cisco ANA 3.6 Service Pack 1:

- CSCsj08845—Gateway sends duplicate alarms to the Netcool server.
- CSCsj16298—ANA2CIC—alarm notification sent to the drool misses properties.

Note Back up existing post.drl file, under the main/data directory. If the directory contains a new drools rules[1] file, merge them with the post.drl file that will be added to the directory once the next step is complete.

Installation of Cisco ANA to Netcool Adapter

To install the Cisco ANA to the Netcool Adapter:

Step 1 Go to the release site and FTP the ps-Netcool-adapter-1.1-src.zip file:

http://wwwin-nmbu.cisco.com/Patches/patch-publisher/listbyproduct.cfm?searchbug=CSCsk84768 to the /export/home/sheer4 directory

Step 2 Unzip the file under the /export/home/sheer4 directory.

Note This procedure will override any existing post.drl files.

Step 3 Back up.

Step 4 If you are installing an AVM80 on the ANA gateway, skip this step.

To install the avm80.xml file on an ANA unit:

Copy the avm80.xml from directory ~Main/ registry/ConfigurationFiles/127.0.0.1 to an appropriate directory:

```
cp SHEERHOME/Main/registry/ConfigurationFiles/127.0.0.1/avm80.xml $SHEERHOME/Main/
registry/ConfigurationFiles/<unit_IP>
```

Step 5 In the drool installation, the JAR file contains the post.drl file. After unzipping and extracting the file, the file will override the existing data/post.drl file.

All relevant rules should have a condition tag set to *true* as follows:

```
java:condition>true</java:condition>
```

Set the following rules to *true*:

- sendAlarmNotification: Handles alarm and ticket notifications.
- sendAlarmNotificationOnProvisioningEvents: Handles provisioning events.

Step 6 Change the IP address 0.0.0.0 to the unit IP address if installed on the Cisco ANA unit. Then, run the following ANA gateway commands:

```
./runRegTool.sh -gs 127.0.0.1 add 0.0.0.0 avm99/services/bsm/avm80
./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 avm99/services/bsm/avm80/maxmem 512
./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 avm99/services/bsm/avm80/id 80
./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 avm99/services/bsm/avm80/enable false
./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 avm99/services/bsm/avm80/reqavm 0
./runRegTool.sh -gs 127.0.0.1 set 0.0.0.0 avm99/services/bsm/avm80/classesjar
"classes.jar:ANA-Netcool-Adapter-1.1.jar"
```

Step 7 Verify that AVM80 has been updated correctly. If it has not, repeat the process.

1. For a detailed definition, see the Glossary.

Step 8 Edit the avm80.xml file containing the correct destination IP address and port number.

On the ANA gateway:

```
./runRegTool.sh -gs 127.0.0.1 set 127.0.0.1
avm80/services/trap-forwarder/destination-list/<Destination IP> 162
```

On the ANA unit:

```
./runRegTool.sh -gs 127.0.0.1 set <Unit_IP>
avm80/services/trap-forwarder/destination-list/<Destination IP> 162
```

Step 9 To change the AVM80 trap type for the ANA gateway, run one of the following commands:

```
./runRegTool.sh -gs 127.0.0.1 set 127.0.0.1 avm80/services/trap-forwarder/snmp-version v1

./runRegTool.sh -gs 127.0.0.1 set 127.0.0.1 avm80/services/trap-forwarder/snmp-version v2
```

To change the AVM80 trap type for the ANA unit, run one of the following commands:

```
./runRegTool.sh -gs 127.0.0.1 set <Unit_IP>  avm80/services/trap-forwarder/snmp-version v1

./runRegTool.sh -gs 127.0.0.1 set <Unit_IP> avm80/services/trap-forwarder/snmp-version v2
```

Step 10 From the ~/Main directory, run the **mvm** command.

```
~/Main]% ./mvm.csh
```

Step 11 Open the ANA Manage application and start the AVM80.

Log Level Configuration

To configure the log level for log monitoring:

Step 1 Run the following ANA gateway commands from the ~/Main directory:

Note Replace the IP address 127.0.0.1 with the ANA unit server IP address if the AVM80 does not reside in the Cisco ANA gateway.

```
./runRegTool.sh -gs 127.0.0.1 set 127.0.0.1
avm80/services/logger/log4j.category.com.cisco.integrations.cic DEBUG

./runRegTool.sh -gs 127.0.0.1 set 127.0.0.1
avm80/services/logger/log4j.category.Netcool-adapter DEBUG
```

Step 2 Use Cisco ANA Manage to stop and start the AVM80.

Step 3 To change the log level for log monitoring:

a. Go to the machine where the AVM80 is running.

b. Log in as user sheer.

c. Telnet to 0 2080.

d. Change the directory to logger.

e. Change the log level to DEBUG/ERROR/FATAL.

After changing the previous value to the desired level, the logs will appear in the 80.out directory.

Installing the IBM Tivoli Netcool Rules Files

Configure the IBM Tivoli Netcool with a specific rules file created to identify the information that the Cisco ANA sends.

To install the IBM Tivoli Netcool rules files:

Step 1 First FTP the NCKL-1.2.3-CFM.tar.gz file to Netcool server.

Step 2 Put it in the directory $OMNIHOME/probes/linux2x86.

Step 3 Unzip the file:

```
gunzip NCKL-1.2.3-CFM.tar.gz
```

Step 4 Untar the file:

```
tar -vxf  NCKL-1.2.3-CFM.tar
```

This should create a new directory called *rules* in the $OMNIHOME/probes/linux2x86 directory.

Step 5 Edit the .cshrc file as root and add the following environment variable at the end of the file after all the environment variables:

```
$NC_RULES_HOME=$OMNIHOME/probes/linux2x86/rules
```

Note Be sure to use the correct path.

Step 6 Exit the session and open a new session as root.

Step 7 FTP the Cisco EPM rules files to the $NC_RULES_HOME/include-snmptrap directory.

The rule files names are:

- cisco-CISCO-EPM-NOTIFICATION-MIB.adv.include.snmptrap.rules
- cisco-CISCO-EPM-NOTIFICATION-MIB.include.snmptrap.lookup
- cisco-CISCO-EPM-NOTIFICATION-MIB.include.snmptrap.rules
- cisco-CISCO-EPM-NOTIFICATION-MIB.sev.snmptrap.lookup

Step 8 FTP the ANA-New Probe.txt file from the caveat CSCsk84768 to the $NC_RULES_HOME/include-snmptrap directory and rename it by replacing the original cisco-EPM file:

```
mv ANA-New Probe.txt cisco-CISCO-EPM-NOTIFICATION-MIB.include.snmptrap.rules
```

Step 9 Edit the snmptrap.rules file located in directory $OMNIHOME/probes/linux2x86/rules to contain the following new lines:

Lookup files

a. include:

```
"$NC_RULES_HOME/include-snmptrap/cisco-CISCO-EPM-NOTIFICATION-MIB.include.snmptrap.lookup"
```

Severity files

```
table cisco-CISCO-EPM-NOTIFICATION-MIB_sev =
"$NC_RULES_HOME/include-snmptrap/cisco-CISCO-EPM-NOTIFICATION-MIB.sev.snmptrap.lookup"
default = {"Unknown","Unknown","Unknown"}
```

Rules files

a. include

```
"$NC_RULES_HOME/include-snmptrap/cisco-CISCO-EPM-NOTIFICATION-MIB.include.snmptrap.rules"
```

Step 10 Edit your snmptrap.rules file, located in directory $NC_RULES_HOME.

At the end you will see the following section:

```
##########
# The following include statement is required by Netcool's advanced correlation
# logic.
##########

if(nmatch(@Agent, "Cisco-IOS"))
{
include "$NC_RULES_HOME/include-syslog/CorrScore.include.syslog.rules"
include "$NC_RULES_HOME/include-syslog/PreClass.include.syslog.rules"
}
else
{
include "$NC_RULES_HOME/include-snmptrap/CorrScore.include.snmptrap.rules"
include "$NC_RULES_HOME/include-snmptrap/PreClass.include.snmptrap.rules"
}

##########
# End of advanced correlation include files.
##########

##########
# Enter "compatibility" includes below with the following syntax:
#
# include "<$NCHOME>/etc/rules/include-compat/<rulesfile>.include.compat.rules"
##########

include "$NC_RULES_HOME/include-compat/omnibus36.include.compat.rules"
include "$NC_RULES_HOME/include-compat/AdvCorr36.include.compat.rules"
#include "$NC_RULES_HOME/include-compat/neusecure-gw-snmptrap.include.compat.rules"
#include "$NC_RULES_HOME/include-compat/neusecure-gw.include.compat.rules"

##########
# End of "compatibility" includes.
##########
```

Comment the entire section out, and then try again.

Step 11 From the directory $OMNIHOME/probes/linux2x86, run the following command:

```
nco_p_mttrapd -rulesfile ./rules/snmptrap.rules &
```

Step 12 If you get the following error:

```
"ld.so.1: nco_p_mttrapd: fatal: libOpl_r.so.1: open failed: No such file or directory"
```

Run the probe from a different location such as:

```
/opt/Netcool/omnibus/probes]#./nco_p_mttrapd -rulesfile ./linux2x86/rules/snmptrap.rules &
```

Installing IBM Tivoli Netcool View For ANA

To install IBM Tivoli Netcool View for ANA:

Step 1 FTP the Cisco ANA AdapterView.elc file from caveat CSCsk84768 to the Netcool server.

Step 2 Put it in the $OMNIHOME/utils directory.

Step 3 Open **Netcool View**, choose **File > Open**.

Step 4 Browse and select the $OMNIHOME/utils/Cisco ANA.elc file.

CHAPTER 6

Troubleshooting with the Cisco Video Assurance Management Solution 1.5

Troubleshooting with the Cisco VAMS 1.5 involves the use of:

- Monitoring Service Trees and Events using IBM Tivoli TBSM
- Monitoring ANA and CMM events using Netcool/Webtop
- CMM for advanced troubleshooting.
- Cisco ANA for basic troubleshooting.

This chapter contains:

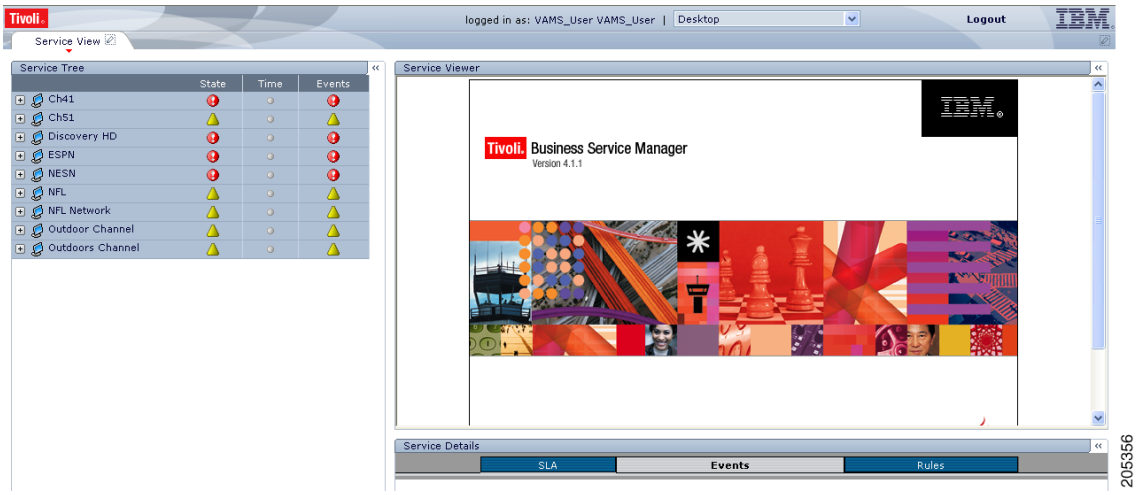
Monitoring ANA, CMM, and Video Probe Events with TBSM

Step 1 Log in to IBM Tivoli Business and Services Manager (TBSM).

The main TBSM page appears, as shown in Figure 6-4.

The highest severity alarm status is shown in the Service Tree at the left of the page.

Figure 6-1 TBSM Main Window



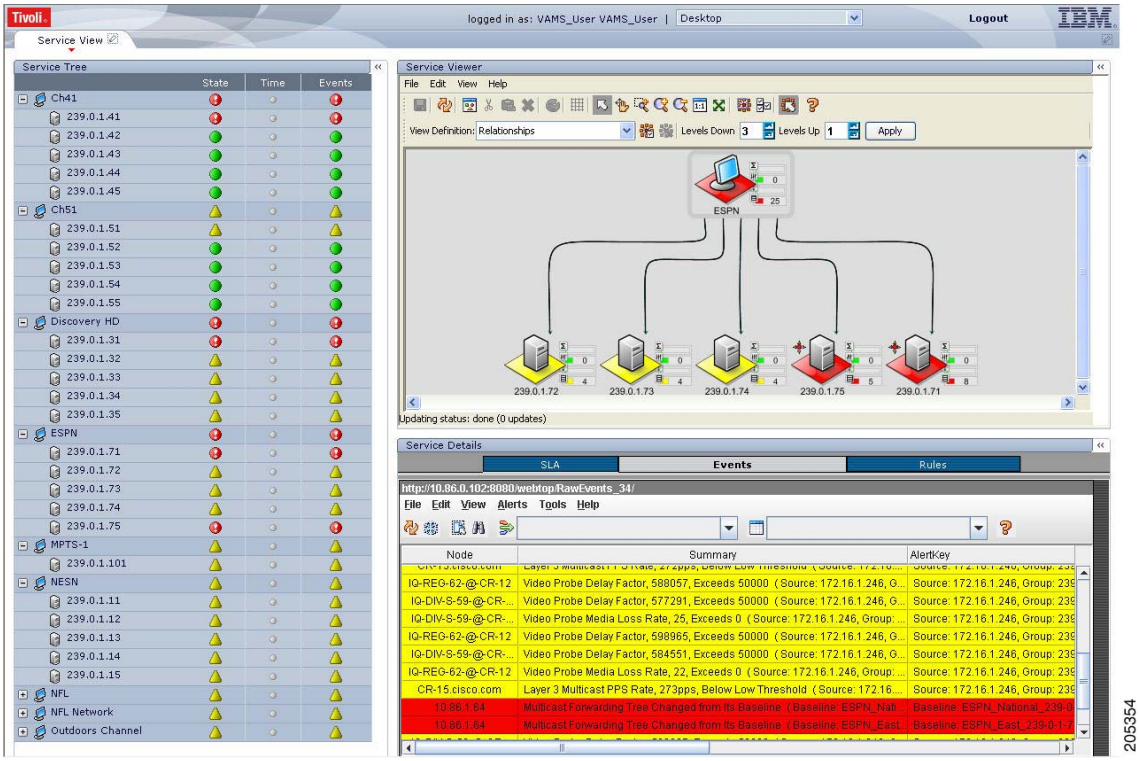
Step 2 From the service tree directory browser at the left of the page, click on a service.

The service tree for the selected service appears.

Step 3 Click on a specific device address.

The Service Viewer displays the service relationships and the Service Details window shows an event list for the service, as shown in Figure 6-2.

Figure 6-2 Service Viewer and Service Details Window



Step 4 To view the details of an event, double-click on the row for the event.

A table giving detailed field information for the event appears.

Step 5 To launch the CMM application, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

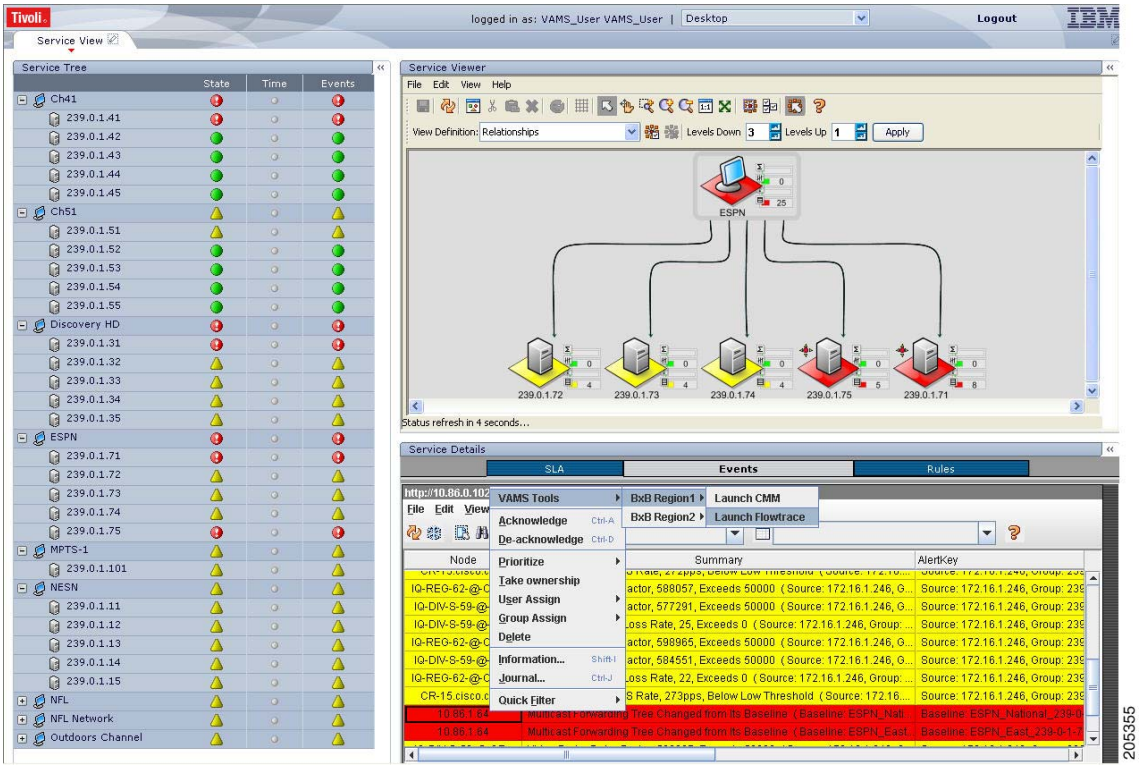
Note The Region Name value is configurable from TBSM. For information on configuring the Region Name, see the IBM Tivoli TBSM documentation at the following URL:

http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.tivoli.itbsm.doc/tbsm42custom.pdf

Note You can launch a real-time CMM flow trace or launch the CMM Latest Events page for further troubleshooting. it is possible to have one or more CMM servers available to launch to. The example in Figure 6-3 shows two regional CMM servers reporting events to a single CIC server.

Figure 6-3 shows the menu selections for starting CMM.

Figure 6-3 Launching CMM from a TBSM Event List



The CMM application starts.

For additional information on the Tivoli TBSM application, and information on how to adjust and customize the TBSM window, see the IBM Tivoli TBSM documentation at the following URL:

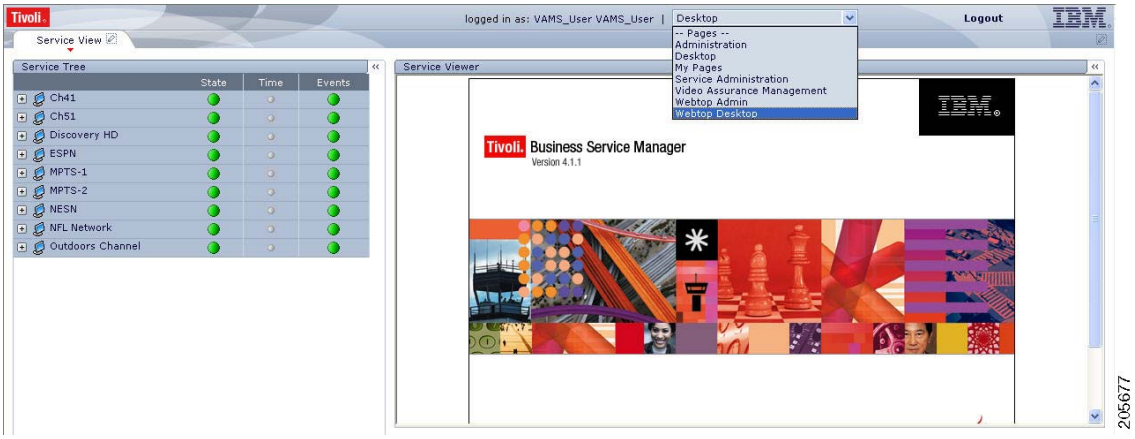
http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.tivoli.itbsm.doc/tbsm42custom.pdf

Monitoring ANA, CMM, and Video Probe Events with Netcool/Webtop

Step 1 Log in to IBM Tivoli Business and Services Manager (TBSM).

The main TBSM window appears, as shown in Figure 6-4.

Figure 6-4 TBSM Main Window



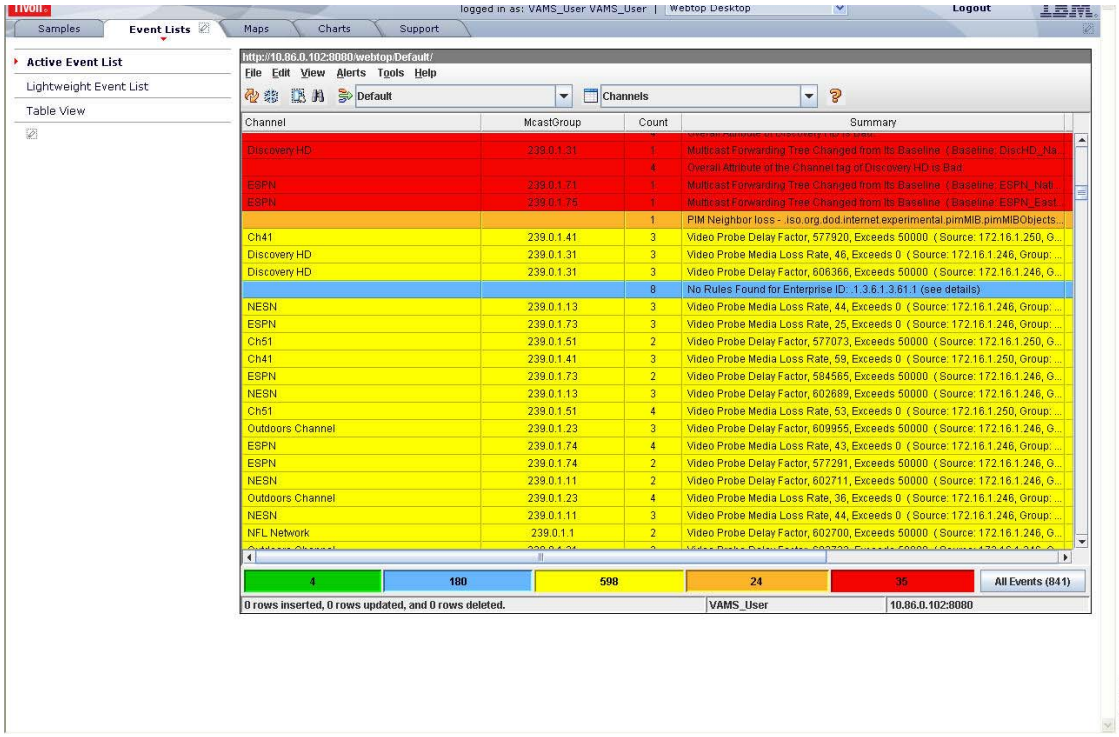
Step 2 From the pull-down menu at the top of the TBSM start page, select **Webtop Desktop**.

The Webtop Desktop User page appears.

Step 3 Click the **Event Lists** tab.

The Active Event List appears, as shown in Figure 6-5.

Figure 6-5 Webtop Active Event List



The Active Event List shows ANA events and CMM events. These events are sent from the CMM video probes by means of the MTTrapd probe. The Active Event List also shows events from the IneoQuest, Bridge Tech, Mixed Signals, and Pixelmetrix video probes.

Step 4 To view the details of an event, double-click on the row for the event.

A table giving detailed field information for the event appears.

Step 5 To launch the CMM application, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

Note You can launch a real-time CMM flow trace or you can launch the CMM Latest Events page for further troubleshooting.

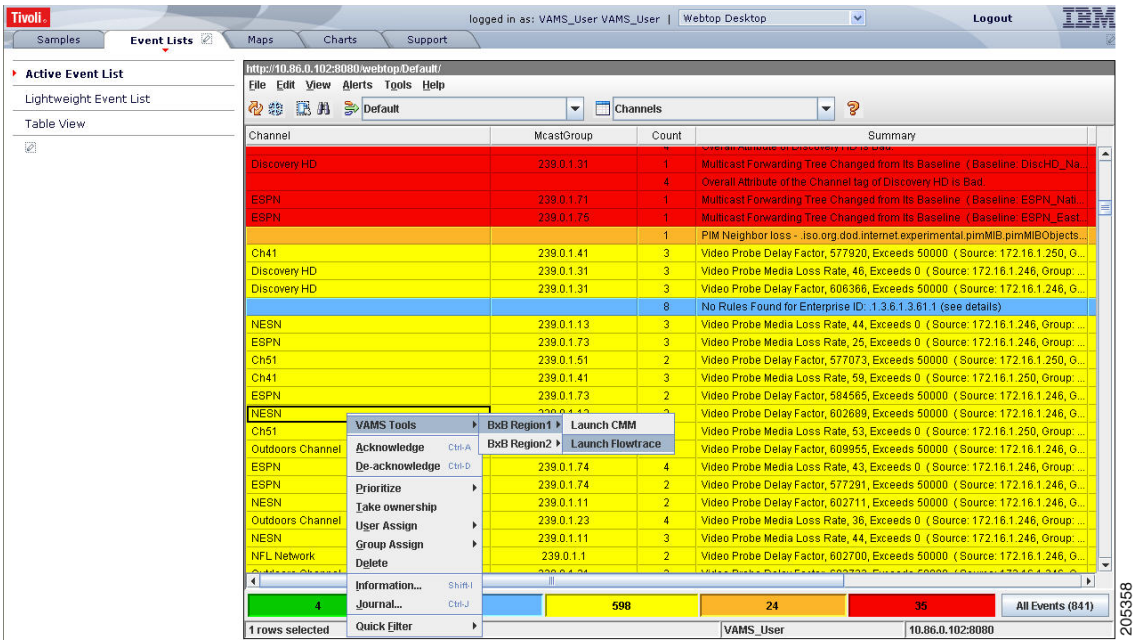
Note The Region Name value is configurable. For information on configuring the Region Name in TBSM, see the IBM Tivoli TBSM documentation at the following URL:

http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.tivoli.itbsm.doc/tbsm42custom.pdf

Note It is possible to have one or more CMM servers available to launch to. The example in Figure 6-6 shows two regional CMM servers reporting events to a single CIC server.

Figure 6-6 shows the menu selections for starting CMM.

Figure 6-6 Launching CMM from Webtop



For detailed information on the Netcool/Webtop tool, see the following IBM Netcool/Webtop documents on the IBM Tivoli Netcool web site:

- *IBM Tivoli Netcool/Webtop QuickStart Guide*
- *IBM Tivoli Netcool/Webtop Administration Guide*

Advanced Troubleshooting with CMM and TBSM

CMM provides a diagnostics tool that gives you a multicast global view and a router-specific view of your network. Webtop events that you can view using TBSM allow you to see additional details about the network.

Table 6-1 lists important areas of the CMM that you can use to troubleshoot a multicast video distribution network using Cisco VAMS:

Table 6-1 Cisco Multicast Manager

Troubleshooting Area	Task and Reference
Viewing network status	View the status of all devices in the current multicast domain. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83.html
Viewing RP status	View all routers in the database, their RPs, and the active groups. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83.html
IGMP diagnostics	View the interfaces that have joined a particular group. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83.html

Table 6-1 Cisco Multicast Manager

Troubleshooting Area	Task and Reference
Layer 2 switches	View Layer 2 multicast information and host IPs. The table shows, from a Layer 2 perspective, which multicast groups are being forwarded out which interfaces. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83.html
Cisco 6500/7600 troubleshooting	Gather accurate packet-forwarding statistics and other information. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83
Top-20 video flows	View the top-20 video flows. The top-20 video flows are dynamically updated at every polling interval. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83.html
Video probe status[1]	View diagnostic information about video probes and the flows that they are monitoring. See: http://www.cisco.com/en/US/products/ps6337/products_user_guide_chapter09186a0080834d83.html
Video Flow Tracing	Video flows can be traced through the network. All routers participating in the transport of the multicast flow are listed. A graphical representation of the flow path is provided which includes IneoQuest probes and their status for a given flow.
PPS/BPS Threshold Monitoring	PPS/BPS threshold monitoring allows you to set and monitor thresholds on Cisco routers and switches for high or low BPS or PPS rates on a per flow basis. See Monitoring Multicast Tree Changes (Tree Polling), page 6-7 for details on PPS/BPS threshold monitoring.
Monitoring Multicast Tree Changes (Tree Polling)	View changes to multicast trees, which might affect video quality immediately, or at some time in the future. Tree polling allows you to monitor the multicast distribution tree of a video service and receive an alert when changes to the distribution tree occur. See: • Monitoring Multicast Tree Changes (Tree Polling), page 6-7 • "Monitoring with the Multicast Monitoring Tool" in the *User Guide for Cisco Multicast Manager 2.5* at the following location: http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/cmm_mon.html
Health Checks	You can perform health checks to check and report on the critical components of your network. For example, you can check on the status of Rendezvous Points (RPs), Multicast Source Discovery Protocol (MSDP) peering, the presence of sources and groups, and the status of multicast trees. See: • Performing Health Checks, page 6-14 • The "Health Check" section in the *User Guide for Cisco Multicast Manager 2.5* at the following location: http://www.cisco.com/en/US/docs/net_mgmt/cisco_multicast_manager/2.5/user/guide/cmm_dt.html
Monitoring IP Multicast Heartbeat	You can monitor IP multicast heartbeat to confirm that the devices forwarding a traffic stream are functioning correctly. See Monitoring IP Multicast Heartbeat, page 6-11.

1. Cisco Multicast Manager 2.5.4 supports only the IneoQuest video probe.

Monitoring Multicast Tree Changes (Tree Polling)

You can monitor multicast tree changes with CIC, and from CIC, launch CMM for advanced troubleshooting of the tree changes.

Monitoring Multicast Tree Changes with CIC

To monitor multicast tree changes with CIC, bring up a Webtop event list using CIC/TBSM:

Step 1 From the service tree directory browser at the left of the CIC/TBSM display, click on a service.

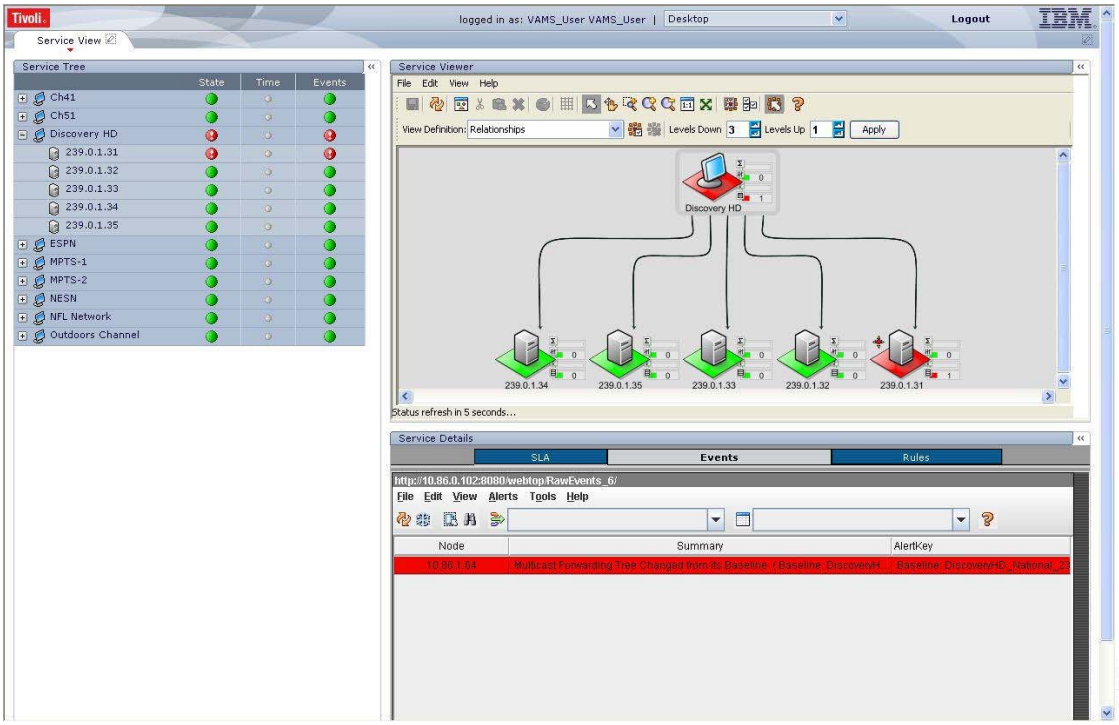
The service tree for the selected service appears.

Step 2 Click on a specific device address.

The Service Viewer displays the network topology an the Service Details window shows an event list for the service.

Figure 6-7 shows a CIC/TBSM display and a Webtop event indicating that a Multicast Forwarding Tree has changed from its baseline.

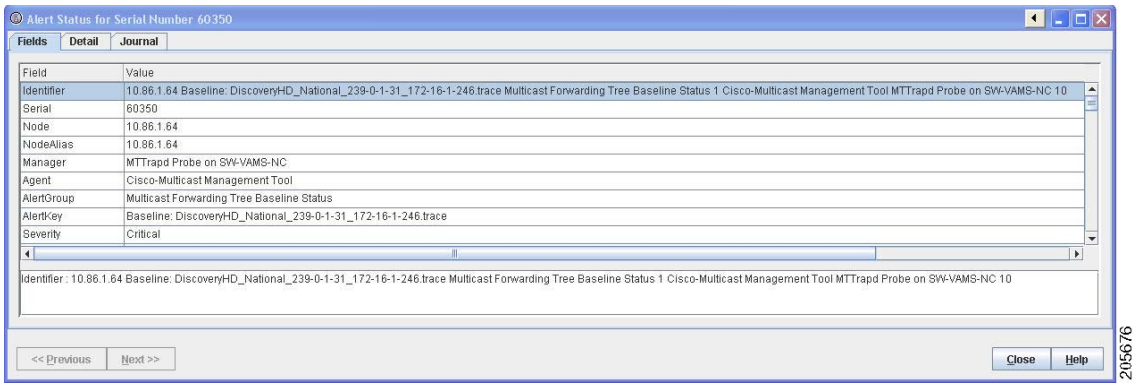
Figure 6-7 Viewing a Tree Change Event in TBSM/Webtop



Step 3 To view the details of an event, double-click on the row for the event.

A table giving detailed field information for the tree change event appears. Figure 6-8 shows a sample Alerts Status page with tree change event details.

Figure 6-8 Detailed Tree Change Event Information



Step 4 To launch the CMM application and monitor additional information about the tree change event, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

Step 5 Go to the Monitoring Multicast Tree Changes with CMM, page 6-9 for information on monitoring tree change events with CMM.

Monitoring Multicast Tree Changes with CMM

Using CMM, you can:

- View the latest tree change events.
- View a Tree Changed Report that shows details about the changes in the tree

When you launch CMM from TBSM/CIC, the CMM Latest Events list appears. Figure 6-9 shows a Latest Events list from CMM that includes tree change events.

Figure 6-9 CMM Tree Change Events

The event list in the figure shows two events:

- The first event to come in is a Tree Changed event indicating that a tree has been changed.

  The Tree Changed event indicates the name of the trace file that was used as the baseline to compare the current distribution tree against. The format of the trace file name shown in the event is the same format that you use to specify the trace file name when during Tree Polling configuration for the domain.

  The trace file name has this format:

  ```
  <channel name>_<ad zone>_<Mcast-Group>_<source-IP>
  ```

  where *channel_name* is the name of the channel, *ad_zone* is the name of the Ad zone, *Mcast-Group* is the address of the multicast group, and source-IP is the IP address of the source. For example:

  ```
  PBS_National_232-0-1-32_12-101-2-18
  ```

- The second event to come in is a Tree Reverted event that indicates that the tree reverted back to its previous state. This trap has the same format as the Tree Changed event (indicates the filename of the trace file was used as the baseline to compare against).

Viewing a Tree Changed Report

To view a Tree Changed Report:

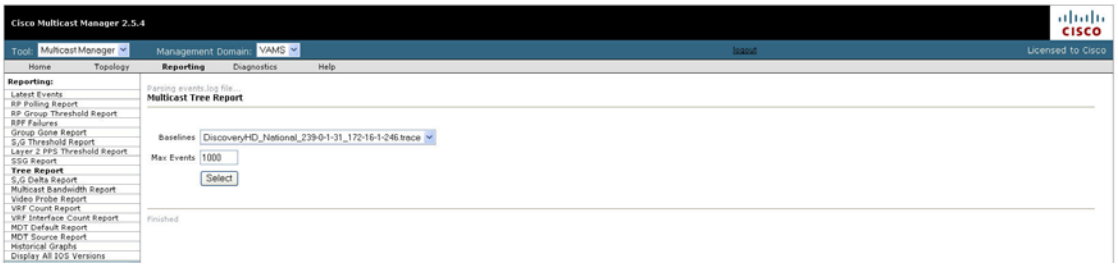
Step 1 If you are in the TBSM/CIC interface, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

The CMM Latest Events page appears.

Step 2 From the CMM Home Page, select **Reporting > Tree Report**.

The Multicast Tree Report page appears, as shown in Figure 6-10.

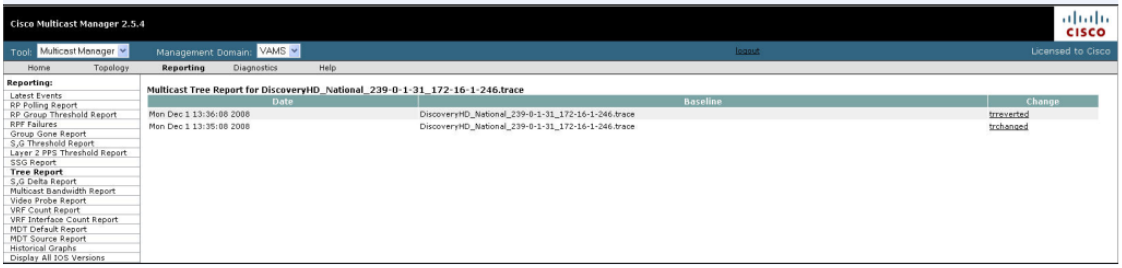
Figure 6-10 Selecting a Tree Change Report



Step 3 Select the baseline trace file that matches the Tree Changed event.

A list of Multicast Tree Change reports for the baseline appears, as shown in Figure 6-11.

Figure 6-11 Multicast Tree Change Report



Step 4 Click the **trchange** link to view the Tree Changed Report.

The selected Tree Changed Report appears. The report shows:

- A table containing detailed information about the routers and interfaces in the tree
- The baseline tree.
- The current tree (changed tree).

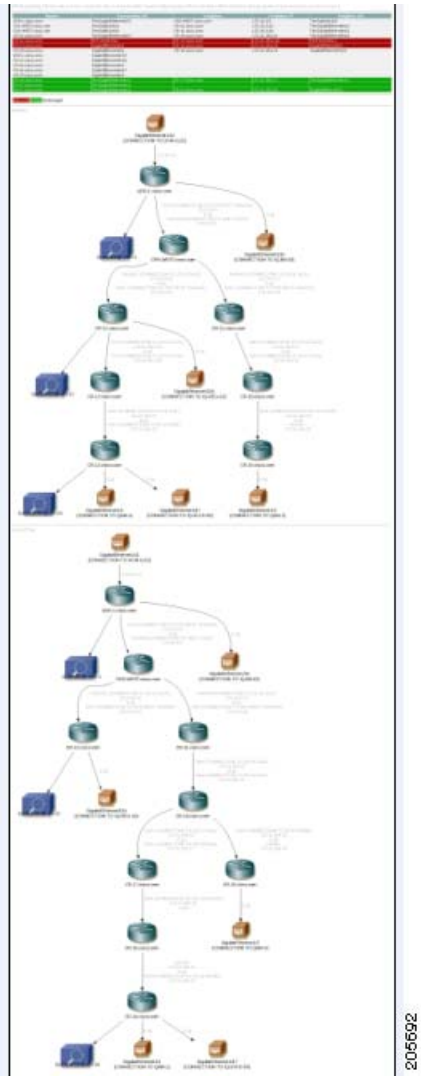
Routers and interfaces that are no longer part of the multicast tree are highlighted in red. Routers and interfaces that have been added to the distribution tree are highlighted in green.

Step 5 If you want to view a Tree Reverted report, click the **trreverted** link next to a report name.

A Tree Reverted report shows the baseline distribution tree in tabular and in graphical format.

Figure 6-12 shows a sample Tree Changed Report.

Figure 6-12 Tree Changed Report



Monitoring IP Multicast Heartbeat

You can monitor the multicast data plane of multicast video flows on Cisco routers and switches that utilize the IP Multicast Heartbeat feature to confirm that the routers and switches are receiving the monitored multicast video flows. You can view heartbeat events with CIC, and from CIC, launch CMM for advanced troubleshooting of the heartbeat events.

Monitoring Heartbeat Events with CIC/TBSM

To view heartbeat events in TBSM/Webtop:

Step 1 From the service tree directory browser at the left of the TBSM display, click on a service.

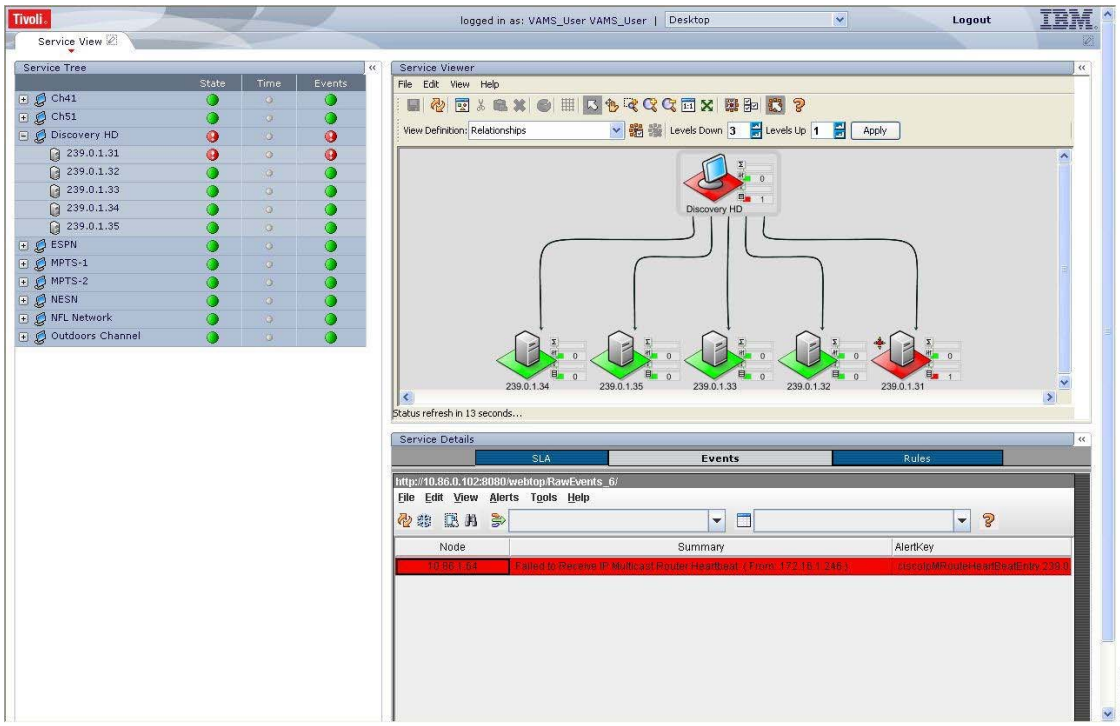
The service tree for the selected service appears.

Step 2 Click on a specific device address.

The Service Viewer displays the network topology and the Service Details window shows an event list for the service.

Figure 6-13 shows a Webtop/TBSM display with a heartbeat event indicating that a a heartbeat threshold has been violated on a router.

Figure 6-13 Viewing a Heartbeat Event in TBSM/Webtop

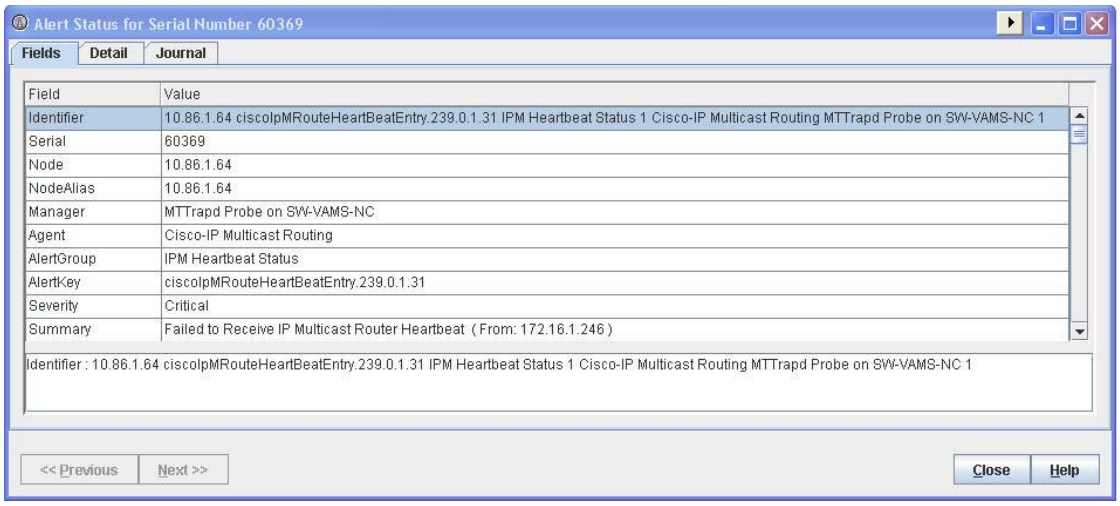


The Summary column shows the IP address of the router that generated the heartbeat event.

Step 3 To view additional details about the event, double click on the event in the Webtop display.

Figure 6-14 shows a sample Alerts Status page with heartbeat event details.

Figure 6-14 TBSM/Webtop: Viewing Heartbeat Event Details



The event summary for the service details includes the baseline trace file name, which includes the Service Name, Ad Zone, Multicast Group, and Source Address.

Step 4 To launch the CMM application and monitor additional information about the heartbeat event, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

Step 5 Go to the Monitoring Heartbeat Events with CMM, page 6-13 for information on monitoring heartbeat events with CMM.

Monitoring Heartbeat Events with CMM

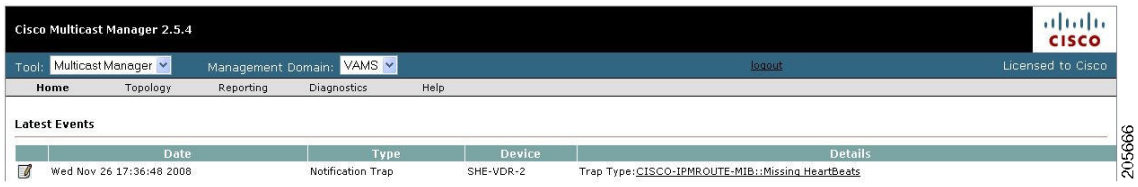
To view IP Multicast heartbeat events with CMM:

Step 1 If you are in the TBSM/CIC interface, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

The CMM home page shows the Latest Events list, which includes any heartbeat events that have come in.

Figure 6-15 shows a Latest Events list with a heartbeat event.

Figure 6-15 Viewing a Heartbeat Event in CMM

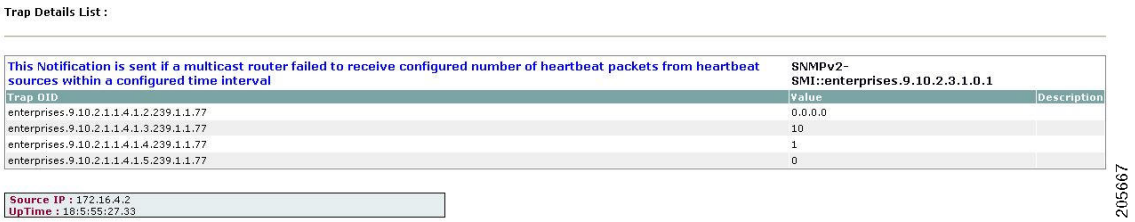


The heartbeat event includes the name of the SNMP MIB used to forward the event and the name of the event; however, CMM 2.5.4 does not indicate the name of the Multicast Group or the Channel Name on the Latest Events page for heartbeat events.

Step 2 To view additional information about the heartbeat event click the URL link in the Details column.

A Trap Details list appears for the heartbeat event, as shown in Figure 6-16.

Figure 6-16 Trap Details List for a Heartbeat Event



The Trap Details list displays the full description of the heartbeat event, the SNMP version used to generate the event, and the OIDs from the reporting router.

The last four octets of the OID indicate the Multicast Group. The Source IP address at the bottom of the Trap Details page is the IP address of the reporting router.

Step 3 To determine the video service affected by the event, select **Diagnostics > Show All Groups** and find the corresponding Multicast Group in the list that matches the heartbeat event. Note that CIC/TBSM parses the heartbeat event to and matches the Multicast Group to the corresponding video service directly.

Performing Health Checks

Using the Health Check page, you can run a health check on a multicast domain.

To run a health check:

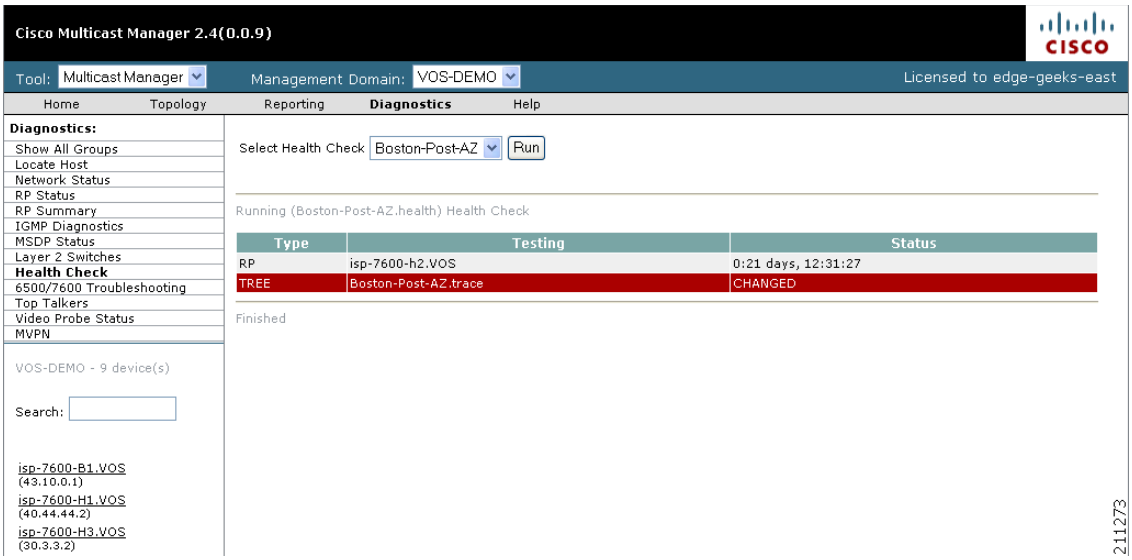
Step 1 On the Multicast Manager tool, select **Diagnostics > Health Check**.

The Select Health Check page appears.

Step 2 Select a health check from the list of health checks and click **Run**.

Figure 6-17 shows a sample health check display.

Figure 6-17 Health Check



The color of the displayed text on the Health Check display indicates the status of the monitored condition:

- Gray = normal
- White = normal
- Red = error condition

Monitoring PPS/BPS Thresholds

When a PPS/BPS threshold is exceeded or fails to reach a minimum value, an event is generated and the event is displayed in CIC, in the TBSM/Webtop. From the TBSM/Webtop event list, you can launch CMM to view enhanced monitoring information about the threshold event.

Monitoring PPS/BPS Thresholds in CIC TBSM/Webtop

To view heartbeat events in TBSM/Webtop:

Step 1 From the service tree directory browser at the left of the TBSM display, click on a service.

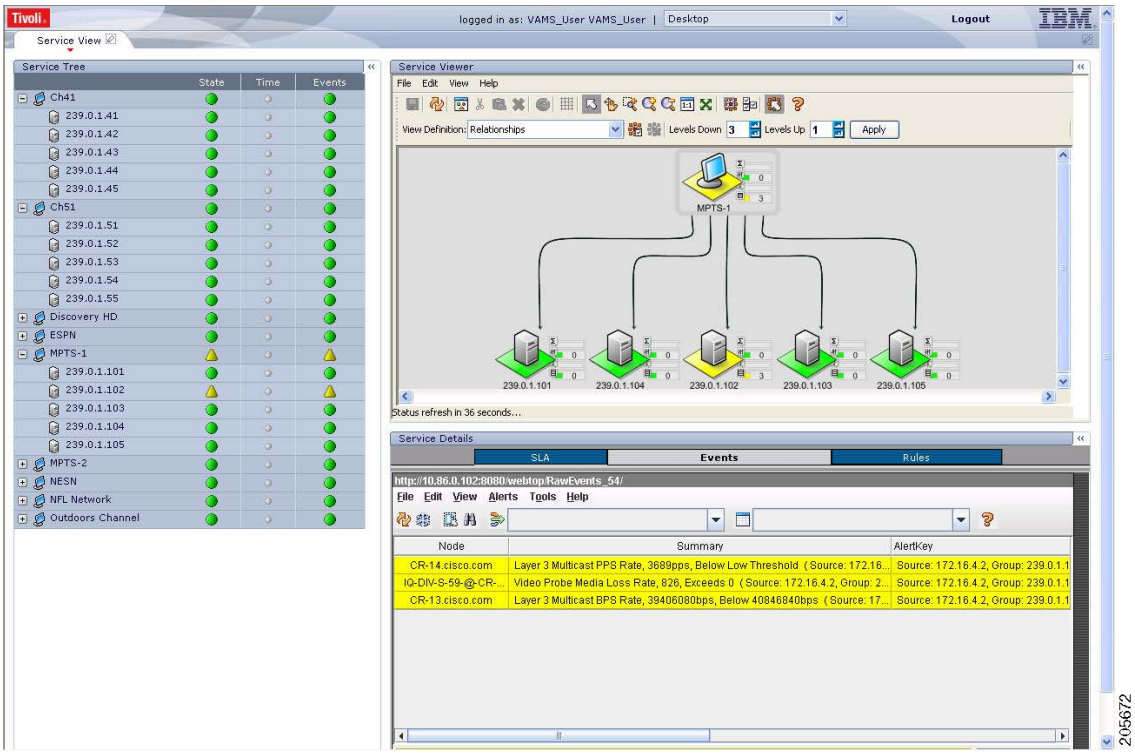
The service tree for the selected service appears.

Step 2 Click on a specific device address.

The Service Viewer displays the network topology and the Service Details window shows an event list for the service.

Figure 6-18 shows a Webtop/TBSM display with a threshold event indicating that high and low threshold limits have been exceeded.

Figure 6-18 Viewing a Threshold Event in TBSM/Webtop



The event summary for threshold events includes the measured value and the configured threshold.

Step 3 To view additional details about the event, double-click on the event in the event list.

Step 4 To launch the CMM application and monitor additional information about the threshold events, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

Step 5 Go to the Monitoring Threshold Events with CMM, page 6-16 for information on monitoring heartbeat events with CMM.

Monitoring Threshold Events with CMM

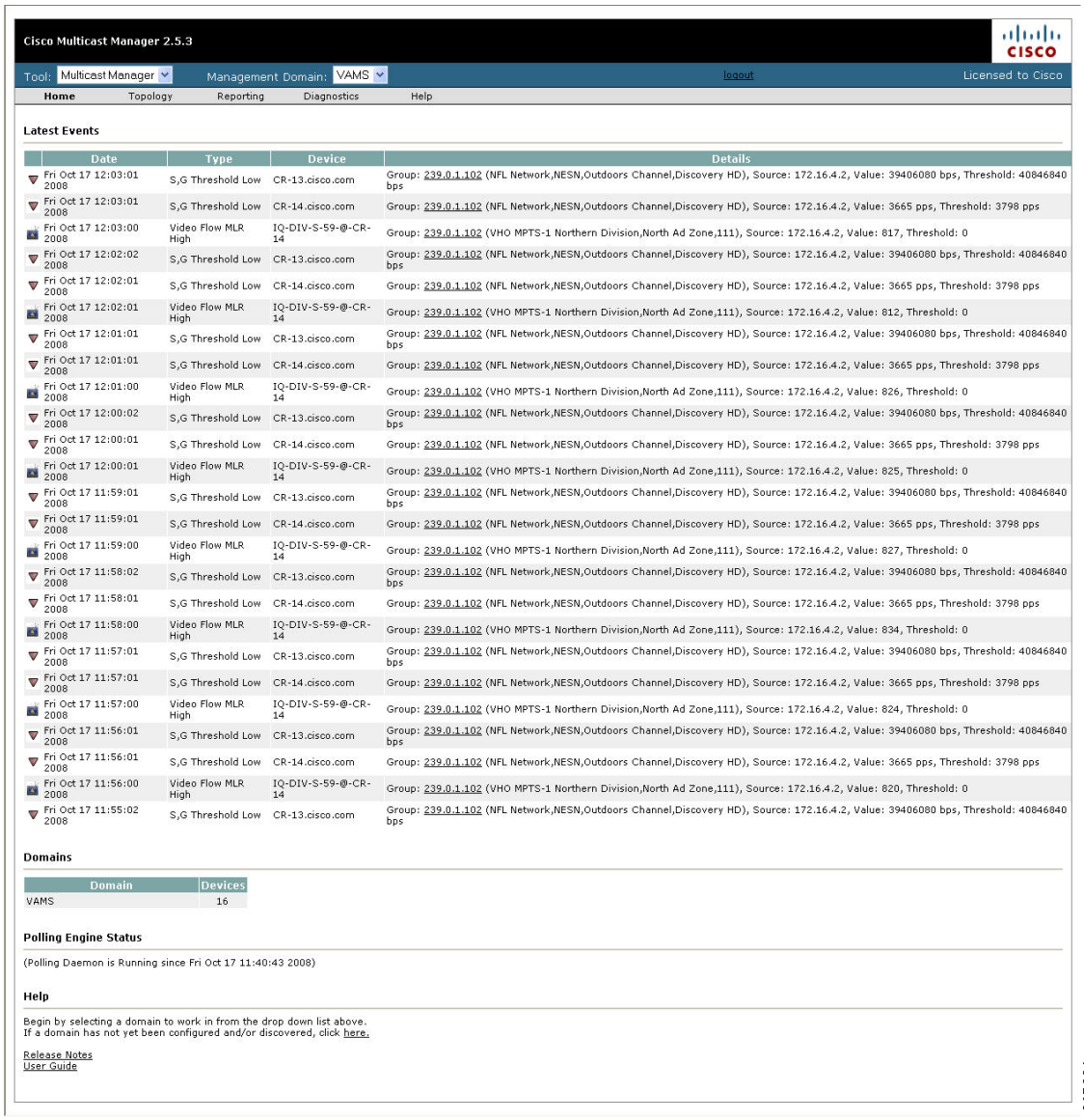
To view threshold events with CMM:

Step 1 If you are in the TBSM/CIC interface, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

The CMM home page shows the Latest Events list, which includes any BPS/PPS threshold events that have come in.

Figure 6-19 shows a Latest Events list with a BPS/PPS threshold events.

Figure 6-19 Viewing BPS/PPS Threshold Events in CMM



The Details column for BPS/PPS threshold events includes the measured value and the configured threshold.

Note CMM 2.5.4 does not reflect the BPS/PPS flow status on CMM flow traces, as it does for video probe status. Therefore, you will have to manually correlate the devices reporting BPS/PPS events from either CIC/TBSM or the CMM Latest Events page, to the CMM flow trace, to isolate where in the distribution tree the problem is occurring.

Running Threshold Reports

CMM provides two threshold reports that you can use to monitor threshold events:

- S, G Threshold Report—Shows threshold events for a specified source and group.
- Layer 2 PPS Threshold Report—Shows threshold events for a specified port on a specified switch.

To run an S, G Threshold report:

Step 1 In the CMM Multicast Manager tool, click **Reporting**.

Step 2 Select **S, G Threshold Report**.

A list of groups appears.

Step 3 Select a group from the list and then click **Report**.

CMM displays an S,G Threshold Report listing any events that have occurred in the last 24 hours.

To run a Layer 2 PPS Threshold report:

Step 1 In the CMM Multicast Manager tool, click **Reporting**.

Step 2 Select **Layer 2 PPS Threshold Report**.

A list of groups appears.

Step 3 Select a group from the list and then click **Report**.

CMM displays a Layer 2 PPS Threshold Report listing any events that have occurred in the last 24 hours.

Monitoring and Troubleshooting in the Wireline Network

The *Cisco Wireline Video/IPTV Solution Design and Implementation Guide, Release 1.1*, provides an introduction to monitoring and troubleshooting the Cisco Ethernet switches in the Cisco wireline-based IPTV solution. Troubleshooting areas include:

- Network Time Protocol (NTP)
- Syslog
- Quality of Service (QoS)
- Multicast

Monitoring and troubleshooting information is viewable online at:

http://www.cisco.com/en/US/products/ps6902/products_implementation_design_guide_chapter09186a00806ac2e0.html

Monitoring and Troubleshooting in the Cable Network

The *Cisco Gigabit-Ethernet Optimized Video Networking Solution for Cable Design and Implementation Guide, Release 3.0*, provides an introduction to monitoring and troubleshooting the Cisco Ethernet switches in the Cisco cable-based IPTV solution. Troubleshooting areas include:

- Troubleshooting multicast.
- Show commands.
- Debug commands.
- Viewing hardware rate limiter (HWRL) counters.

Monitoring and troubleshooting information is viewable online at:

http://www.cisco.com/en/US/products/ps6902/products_implementation_design_guide_chapter09186a0080645ae0.html

Troubleshooting with Cisco ANA

Troubleshooting with Cisco ANA requires an understanding of the Cisco ANA fault-management system. You should also understand how to use ANA NetworkVision and ANA EventVision.

This section contains:

Fault Management

Table 6-2 highlights important aspects of the fault management system in Cisco ANA.

Table 6-2 Cisco ANA Fault Management

Troubleshooting Area	Description and Reference
Fault detection and isolation	Describes: • How the various VNEs use reachability to check connectivity with the NEs. • Basic alarm sources that indicate problems in the network. • What happens when a VNE with associated open alarms shuts down. • The integrity service tests that run on the gateway and the units. For detailed information about working with fault detection and isolation, see the *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 2,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/fault/user/guide/chp1.html
Casualty correlation and root-cause analysis	Describes: • Enabling or disabling port-down, port-up, link-down, and link-up alarms. • The root-cause correlation concept. • The root-cause alarm and weights concepts. • Correlation by flow and correlation by key. For detailed information about working with casualty correlation and root-cause analysis, see the *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 2,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/fault/user/guide/chp2.html
Advanced correlation scenarios	Describes alarms that use advanced correlation logic on top of the root cause analysis flow. For detailed information about working with advanced correlation scenarios, see the *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 2,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/fault/user/guide/chp4.html

ANA NetworkVision

Network administrators use Cisco ANA NetworkVision to manage, fulfill, plan, and assure the integrity of network resources. Table 6-3 lists important aspects of using Cisco ANA NetworkVision for troubleshooting.

Table 6-3 Cisco ANA NetworkVision

Troubleshooting Area	Description and Reference
Working with ANA tickets	Cisco ANA NetworkVision: • Correlates alarms, and enables you to view tickets and ticket properties, including correlated alarms, active alarms, and alarm history. • Describes ticket management and the different ways in which a ticket displays in the ticket pane, depending on the status or severity of the alarm. For detailed information about working with tickets, see the *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 2,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/networkvision/user/guide/8tickets.html
Working with ANA PathTracer	You use the Cisco ANA PathTracer to view a network path between two network objects in packet-switched networks such as Ethernet and IP. For detailed information about working with the Cisco ANA PathTracer, see the *Cisco Active Network Abstraction NetworkVision User Guide 3.6 Service Pack 1,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/networkvision/user/guide/9ptracer.html

ANA EventVision

You use Cisco ANA EventVision to view, filter, and display the properties of specific events. Table 6-4 lists important aspects of using Cisco ANA EventVision for troubleshooting.

Table 6-4 Cisco ANA EventVision

Troubleshooting Area	Description and Reference
Viewing events	Events appear in different event categories in the ANA EventVision. For detailed information about displaying events, see the *Cisco Active Network Abstraction EventVision User Guide 3.6 Service Pack 2, viewable online at*: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/eventvision/user/guide/3viewevn.html
Working with EventVision	For detailed information about working with EventVision, see the *Cisco Active Network Abstraction EventVision User Guide 3.6 Service Pack 2,* viewable online at: http://www.cisco.com/en/US/docs/net_mgmt/active_network_abstraction/3.6_sp2/eventvision/user/guide/4workev.html

APPENDIX A

Trap Definitions

Cisco VAMS 1.5 supports traps (alarms) for:

CMM

Alarm Message Text[1]	Severity
The Layer 3 multicast bandwidth percentage on an interface has exceeded the percentage threshold.	Minor
The designated router for an interface has been detected.	Warning
One or more parameters of a multicast route entry has changed.	Warning
The rendezvous point did not respond to a *sysUpTime* poll.	Information
The Layer 3 multicast b/s rate for a (source, group) has exceeded the high b/s rate threshold.	Minor
The application has rediscovered a router.	Information
The rendezvous point responded to a *sysUpTime* poll.	Information
The designated router for an interface has been removed.	Major
That a health check has detected one or more failures.	Minor
The Layer 3 multicast bandwidth percentage on an interface has exceeded the percentage threshold.	Information
The Layer 3 multicast Reverse Path Forwarding (RPF) failures for a (source, group) that is now being measured at a value above the low threshold.	Minor
The unicast or multicast routing table has changed compared to the initial baseline.	Information

Alarm Message Text[1] (continued)	Severity
The video probe media loss rate (MLR) for a video flow has exceeded the configured threshold.	Major
The multicast group limit exceeded the configured threshold on the rendezvous point.	Minor
A Layer 2 port multicast p/s low threshold is exceeded.	Minor
The Layer 3 multicast b/s rate for a (source, group) has exceeded the low b/s rate threshold.	Minor
A rendezvous point that did not respond to a poll.	Information
The Layer 3 multicast p/s rate for a (source, group) has exceeded the set threshold when measured between the routers on a multicast forwarding tree.	Warning
A (source, group) no longer exists on the router.	Major
One or more parameters of a unicast route entry has changed.	Information
A multicast forwarding tree that has reverted to its baseline.	Warning
The Layer 3 multicast b/s rate for a (source, group) has exceeded the high b/s rate threshold.	Cleared
The multicast p/s rate for the aggregate multicast traffic on a Layer 2 port, which is now being measured at a value between the high and low p/s rate thresholds.	Cleared
A (source, group) has been removed from the rendezvous point since the poll.	Major
Notification that the video probe delay factor (DF) for a video flow has exceeded the configured threshold.	Major
A (source, group) has been added to the rendezvous point since the last poll.	Information
A Layer 2 port multicast p/s high threshold is exceeded.	Minor
The multicast bandwidth percentage for the aggregate multicast traffic on an interface is now at a value lower than the high threshold.	Cleared
The Layer 3 multicast p/s rate for a (source, group) that is now being measured at a value between the high and low p/s rate thresholds.	Cleared
A multicast group that has more than a single source sending to it.	Major
A multicast forwarding tree that has changed from its baseline.	Critical
The Layer 3 multicast p/s rate for a (source, group) has exceeded the high p/s rate threshold.	Minor
The Layer 3 multicast p/s rate for a (source, group) has exceeded the low p/s rate threshold.	Minor
The designated router for an interface has changed.	Warning
A multicast sender on the default multicast distribution tree (MDT) for a particular VPN routing/forwarding (VRF) instance has been removed.	Warning
A VRF on a multicast VPN (MVPN) Provider Edge (PE) router has been removed.	Warning
A default MDT address for a VRF has been configured on a PE that does not match the configuration on the rest of the PEs.	Warning
The number interfaces associated with a VRF on an MVPN PE has changed.	Warning
A VRF on an MVPN PE has been added.	Warning

Alarm Message Text[1] (continued)	Severity
A new multicast sender on the default MDT for a particular VRF has been detected.	Warning
The number of VRFs configured on an MVPN PE has changed.	Warning

1. See the Glossary for abbreviations used in alarm message text.

Cisco 7600, Catalyst 6500, CRS-1, and Catalyst 4948 Devices

Alarm Text Message [1]	Severity
PIM Neighbor loss	Major
PIM Interface down	Major
PIM Interface up	Clear
The number of multicast routes changed.	Information
The number of non-RPF drops exceeded threshold.	Minor

1. See the Glossary for abbreviations used in alarm message text.

Bridge Technologies Video Probe

Ethernet Alarms

Alarm Message Text [1]	Severity
No signal: There has been no UDP packet for the predefined period of time (default 1 second)	Major
RTP duplicates: Number of duplicate IP packets (only if RTP)	Warning
RTP packet drop: Number of dropped IP packets (only if RTP headers are present)	Error
RTP out of order: Out-of-order IP-packet detections (requires RTP)	Warning
CC skips: Number of lost Transport Stream packets	Warning
MDI-DF >= err-thresh: The MDI Delay Factor exceeds the error-threshold	Error
MDI-DF >= warn-thresh: The MDI Delay Factor exceeds the warning-threshold	Warning
MDI-MLR>= err-thresh: The MDI Media Loss Rate exceeds the error-threshold	Error
MDI-MLR>= warn-thresh: The MDI Media Loss Rate exceeds the warning-threshold	Warning
TTL changed: The Time-to-Live field is changing	Error
TOS changed: The Type-Of-Service field is changing	Error
Multiple mcast sources: There are multiple multicast sources	Error

1. See Glossaryfor abbreviations used in alarm message text.

ETR (290) Alarms

Alarm Message Text [1]	Severity
TS Sync: No TS Sync	Major
Sync byte: Sync byte error	Major
PAT: Program Allocation Table error	Major
Continuity: Continuity counter error	Major
PMT: Program Map Table error	Major
PID: Pid is missing	Major
Transport: Transport stream error indicator is set	Major
CRC: Table checksum error	Major
PCR: Program Map table error	Major
PCR accuracy	Major
PTS: Presentation Time Stamp error	Major
CAT: Conditional Access Table error	Major
NIT: Network Information Table error	Major
SI Rep Rate: Wrong repetition rate for SI table	Major
Buffer: Buffer error	Major
Unref PID: Pid is unreferenced	Major
SDT: Service Description Table error	Major
EIT: Event Information Table error	Major
RST: Running Status Table error	Major
TDT: Time Data Table error	Major
CA System: CA System error	Major
Pid checks: Pid check error	Major
Service checks: Service check error	Major
Interface checks: Input interface error	Major

1. See Glossary for abbreviations used in alarm message text.

SYS (System) Events

Alarm Message Text [1]	Severity
Critical system errors: Enable this to view all critical system errors	Fatal
System errors: Enable this to view all system errors	Major
System info: Enable this to view system information messages	OK

1. See Glossary for abbreviations used in alarm message text.

IneoQuest Video Probe

Alarm Message Text [1]	Severity
The network utilization on the primary port exceeds the threshold value.	Minor
User feedback event.	Information
The delay factor threshold crossover is detected.	Minor
A stream was lost for a period defined in the outage.	Major
A 15-minute monitored metric threshold crossover is detected.	Information
The Bit-Rate for a stream exceeds the threshold value.	Warning
The maximum RTP media loss period threshold crossover is detected.	Minor
A system fault condition occurred.	Minor
Software or config download.	Information
This trap is sent when link is lost.	Major
This event is sent every 15-Min to indicate the completion of an interval of system statistics.	Information
The PID bitrate threshold is crossed for a PID selected from the video characteristic template.	Minor
This trap is sent when the media loss threshold crossover is detected.	Minor
The minimum loss distance threshold crossover is detected.	Minor
The media loss threshold crossover is detected.	Minor
The multicast IGMP join time threshold crossover is detected.	Information
The stream alarms limit is reached for a 15-Minute period.	Information
The media link is established.	Information
A new flow has been detected by the system.	Information
The bit rate for a stream exceeds the threshold value.	Minor
A stream was lost for a period defined in the outage.	Major
The Minimum Bit-Rate threshold is crossed.	Warning
The ZAP time threshold crossover is detected.	Information

1. See Glossary for abbreviations used in alarm message text.

Mixed Signals Video Probe

Alarm Message Text [1]	Severity
Table bit rate	Warning
Table detect	Warning
Table cycle time	Warning
PID bit rate	Warning

Alarm Message Text [1] (continued)	Severity
PID detect	Warning
PID discontinuity	Minor
PID audio silence	Minor
PID video freeze	Minor
PID table bit rate	Warning
PID table detect	Warning
PID table cycle time	Warning
Program bit rate	Warning
Program detect	Warning
Program discontinuity	Warning
Program audio silence	Warning
Program video freeze	Warning
Program PCR interval	Warning
Program PCR jitter	Warning
Program table PMT bit rate	Warning
Program table PMT detect	Warning
Program table PMT cycle time	Warning
DSM-CC DII bit rate	Warning
DSM-CC DII detect	Warning
DSM-CC DII cycle time	Warning
DSM-CC DC bit rate	Warning
DSM-CC DC detect	Warning
DSM-CC DC cycle time	Warning
Carousel bit rate	Warning
Carousel source file add-delete	Warning
Carousel source DSM-CC DII bit rate	Warning
Carousel source DSM-CC DII detect	Warning
Carousel source DSM-CC DII cycle time	Warning
Carousel source DSM-CC DC bit rate	Warning
Carousel source DSM-CC DC detect	Warning
Carousel source DSM-CC DC cycle time	Warning
Carousel file bit rate	Warning
Carousel file detect	Warning
Carousel file cycle time	Warning
Carousel file change	Warning
Port IP arrival interval	Warning
Port delay factor	Warning

1. See Glossary for abbreviations used in alarm message text.

PixelMetrix Video Probe

Alarm Message Text[1]	Severity
TS Synchronization Loss	Critical
TS Synchronization Byte Error	Critical
PAT Error	Critical
PMT Error	Critical
Continuity Count Error	Critical
PID Error	Critical
Frame Error Ratio	Major
Transport Error	Major
CRC Error	Major
CAT Error	Major
SI Table Repetition Error for NIT	Minor
SI Table Repetition Error for SDT	Minor
SI Table Repetition Error for BAT	Minor
SI Table Repetition Error for EIT	Minor
SI Table Repetition Error for RST	Minor
SI Table Repetition Error for TDT	Minor
SI Table Repetition Error for TOT	Minor
SI Table Repetition Error for ST	Minor
Undefined PID Error	Minor

1. See Glossary for abbreviations used in alarm message text.

Tektronix Video Probe

Alarm Message Text[1]	Severity
Number of packet received out of order exceeds Warning threshold	Warning
Inter packet delay exceeds Warning threshold	Warning
IP Packets lost exceeds Warning threshold	Warning
IP Packets in error exceeds Warning threshold	Warning
Number of packet received out of order exceeds threshold	Minor
Inter packet delay exceeds threshold	Minor
IP Packets lost exceeds threshold	Minor

Alarm Message Text[1] (continued)	Severity
IP Packets in error exceed threshold	Minor
1.5a PMT	Major
2.5 PTS	Minor
1.5 Ind PMT Error Timer	Major
2.3b PCR Discontinuity Indicator - The difference between two consecutive PCR values (PCRi + 1 - PCRi) is outside the range of 0 ms to 100 ms without the discontinuity_indicator set.	Minor
2.3a PCR Repetition - Error Timer	Minor
1.4 Continuity	Major
2.3b PCR Discontinuity Indicator - This test applies only to PIDs that are indicated as PCR_PID in the current PMT.	Minor
2.3a PCR EVID_INDIVIDUAL_PCR_ERR_TIMER	Minor
1.5 PMT Error Scrambling	Major
1.5 PMT Error Timer	Major
1.3 PAT Error Scrambling	Major
1.3 PAT Error Table Id	Major
1.3 PAT Error Timer	Major
2.4 PCR Accuracy	Minor
CAT (DVB test 2.6)	Minor
PTS (DVB test 2.5)	Minor
PCR Accuracy (DVB test 2.4)	Minor
CRC (DVB test 2.2)	Minor
Transport (DVB test 2.1)	Minor
PMT (DVB test 1.5)	Major
PAT Table (DVB test 1.3)	Major
1.6 PID	Major
PID (DVB test 1.6)	Major
Continuity Error (DVB test 1.4)	Major
Sync Byte (DVB test 1.2)	Major
Sync Loss (DVB test 1.1)	Major

1. See the Glossary abbreviations used in alarm message text.

Performance Metrics

For the Cisco VAMS 1.5, the Cisco ANA supports a:

- Sustained trap rate of 35 traps per second.
- Cut-off rate of 5 traps per second per VNE.

Cisco ANA drops traps that exceed the cut-off rate. For example, if a VNE receives six traps per second, the ANA drops the sixth trap. Also, the cut-off rate is cumulative. For example, for two VNEs, the cut-off rate is 10 traps per second.

APPENDIX **B**

End User License Agreement Supplement

END USER LICENSE AGREEMENT SUPPLEMENT FOR CISCO SYSTEMS NETWORK MANAGEMENT SOFTWARE: Cisco Video Assurance Management Solution Software

Dear Customer,

This End User License Agreement Supplement ("Supplement") contains additional terms and conditions for the Software Product licensed under the End User License Agreement ("EULA") between you and Cisco (collectively, the "Agreement"). Capitalized terms used in this Supplement but not defined will have the meanings assigned to them in the EULA. To the extent that there is a conflict between the terms and conditions of the EULA and this Supplement, the terms and conditions of this Supplement will take precedence.

In addition to the limitations set forth in the EULA on your access and use of the Software, you agree to comply at all times with the terms and conditions provided in this Supplement, including any restrictions on access and use of the Software. BY DOWNLOADING, INSTALLING, OR USING THE SOFTWARE, YOU ARE BINDING YOURSELF AND THE BUSINESS ENTITY THAT YOU REPRESENT (COLLECTIVELY, "CUSTOMER") TO THE AGREEMENT. IF YOU DO NOT AGREE TO ALL OF THE TERMS OF THE AGREEMENT, THEN CISCO IS UNWILLING TO LICENSE THE SOFTWARE TO YOU AND (A) YOU MAY NOT DOWNLOAD, INSTALL OR USE THE SOFTWARE, AND (B) YOU MAY RETURN THE SOFTWARE (INCLUDING ANY UNOPENED CD PACKAGE AND ANY WRITTEN MATERIALS) FOR A FULL REFUND, OR, IF THE SOFTWARE AND WRITTEN MATERIALS ARE SUPPLIED AS PART OF ANOTHER PRODUCT, YOU MAY RETURN THE ENTIRE PRODUCT FOR A FULL REFUND. YOUR RIGHT TO RETURN AND REFUND EXPIRES 30 DAYS AFTER PURCHASE FROM CISCO OR AN AUTHORIZED CISCO RESELLER, AND APPLIES ONLY IF YOU ARE THE ORIGINAL END USER PURCHASER.

For purposes of the SEULA, the Product name and the Product description you have ordered is one or more of:

Cisco Video Assurance Management Solution 1.5

- VAMS1.0-3.6VNE4948—Video Assurance 1.0, Extension to 4948 (G2) VNE - ANA 3.6.3
- VAMS1.0-3.6VNE7600—Video Assurance 1.0, Extension to 7600 (G3) VNE - ANA 3.6.3
- VAMS1.0-3.6VNEG5—Video Assurance 1.0, Extension to CRS-1 (G5) VNE - ANA 3.6.3
- VAMS1.0-3.6VNEG6—Video Assurance 1.0, Extension to CRS-1 (G6) VNE - ANA 3.6.3
- VAMS1.0-3.6VNECMM—Video Assurance 1.0, Cisco Multicast Manager VNE - ANA 3.6.3
- VAMS1.0-3.6VNEIQ—IneoQuest Video Probe VNE - ANA 3.6.3
- VAMS1.0-3.6VNEMS—Mixed Signals Video Probe VNE - ANA 3.6.3
- VAMS1.0-3.6VNETK—Tektronix Video Probe VNE - ANA 3.6.3

- VAMS1.0-3.6IQRTU—IneoQuest Video Probe RTU - Right to Use for one IQ probe
- VAMS1.0-3.6MSRTU—Mixed Signals Video Probe RTU - Right to Use for one MS probe
- VAMS1.0-3.6TKRTU—Tektronix Video Probe VNE RTU - Right to Use for one TK probe

VAMS 1.5 ANA Extensions:

- VAMS-ANA36VNE4948—VAMS 1, Extension to 4948 (G2) VNE - ANA 3.6
- VAMS-ANA36VNE7600—VAMS 1, Extension to 7600(G3) VNE - ANA 3.6
- VAMS-ANA36VNEG5—VAMS 1, Extension to CRS-1 (G5) VNE - ANA 3.6
- VAMS-ANA36VNEG6—VAMS 1, Extension to CRS-1 (G6) VNE - ANA 3.6
- VAMS-ANA36VNECMM—VAMS 1, Cisco Multicast Manager VNE - ANA 3.6
- VAMS-ANA36VNEIQ—VAMS 1, IneoQuest Video Probe VNE - ANA 3.6
- VAMS-ANA36VNETK—VAMS 1, Tektronix Video Probe VNE - ANA 3.6
- VAMS-ANA36QRTU—VAMS 1, IneoQuest Video Probe RTU - ANA 3.6
- VAMS-ANA36MSRTU—VAMS 1, Mixed Signals Video Probe RTU - ANA 3.6
- VAMS-ANA36VTKRTU—VAMS 1, Tektronix Video Probe RTU - ANA 3.6

VAMS 1.5 CIC Extensions

- VAMS1-CICMOM72-K9—VAMS 1, Extensions to CIC 7.2 ObjectServer/Webtop
- VAMS1-CICMOM72F-K9—VAMS 1, Extensions to CIC 7.2 ObjectServer/Webtop - Failover
- VAMS1-CICMOM72N-K9—VAMS 1, Extensions to CIC 7.2 ObjectServer/Webtop - Non Prod
- VAMS1-CICTBSM41-K9—VAMS 1, Extensions to CIC 7.2 TBSM 4.1
- VAMS1-CICTBSM41F-K9—VAMS 1, Extensions to CIC 7.2 TBSM 4.1 - Failover
- VAMS1-CICTBSM41N-K9—VAMS 1, Extensions to CIC 7.2 TBSM 4.1 - Non Prod
- VAMS1-CICIMPT40-K9—VAMS 1, Extensions to CIC 7.2 Impact 4.0
- VAMS1-CICIMPT40N-K9—VAMS 1, Extensions to CIC 7.2 Impact 4.0 - Non Prod

AMS 1.0

- AMS-1.0-MOM-K9—Assurance Management System 1.0 MoM Software and Probe RTU
- AMS-1.0-MOMP-K9—Assurance Management System 1.0 MoM Probe RTU
- AMS-1.0-MOMF-K9—Assurance Management System 1.0 MoM Software, Probe, BIGW Failover RTU
- AMS-1.0-MOMPF-K9—Assurance Management System 1.0 MoM Probe and Failover RTU
- AMS-1.0-MOMN-K9—Assurance Management System 1.0 MoM Software, Probe, BIGW, and Non Prod RTU
- AMS-1.0-MOMPN-K9—Assurance Management System 1.0 MoM Probe and Non Prod RTU

For purposes of this Supplement, the following definitions will apply:

“Cisco Video Assurance Management Solution” is software licensed to manage the assurance of video in a network environment. The Software is licensed per device managed.

ADDITIONAL LICENCE RESTRICTIONS

- Installation and Use. The Software components are provided to Customer solely to install, update, supplement, or replace existing functionality of the applicable Network Management Software product.

  Cisco Video Assurance Management Software is licensed and deployed such that it may be loaded on multiple processors. Customers must purchase software licenses for each device family to be managed in the Customer's environment.

- Customer may install and use following Software components:
  - Cisco Video Assurance Management Solution - Video extensions to 4948 (G2) VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment, subject to a limitation on the number of 4948 devices managed that equals the number of ANA Group 2 licenses purchased from Cisco and in effect.
  - Cisco Video Assurance Management Solution - Video extensions to 7600 (G3) VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment subject to a limitation on the number of 7600 devices managed that equals the number of ANA Group 3 licenses purchased from Cisco and in effect.
  - Cisco Video Assurance Management Solution - Video extensions to CRS-1 (G5) VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment, subject to a limitation on the number CRS-1(G5) devices managed that equals the number of ANA Group 5 licenses purchased from Cisco and in effect.
  - Cisco Video Assurance Management Solution - Video extensions to CRS-1 (G6) VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment, subject to a limitation on the number of CRS-1(G6) devices managed that equals the number of ANA Group 6 licenses purchased from Cisco and in effect.
  - Cisco Video Assurance Management Solution - Cisco Multicast Manager VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment to enable ANA to interface with Cisco Multicast Manager installations in the Customer's network environment.
  - Cisco Video Assurance Management Solution - IneoQuest Video Probe VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment, subject to a limitation on the number of IneoQuest probe devices managed that equals the number of IneoQuest licenses purchased from Cisco and in effect.
  - Cisco Video Assurance Management Solution - Mixed Signals Video Probe VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment, subject to a limitation on the number of Mixed Signals probe devices managed that equals the number of Mixed Signals licenses purchased from Cisco and in effect.
  - Cisco Video Assurance Management Solution - Tektronix Video Probe VNE license: Customer may install and run the Software on unlimited number of processors in the Customer's network environment, subject to a limitation on the number Tektronix probe devices managed that equals the number of Tektronix Video Probe licenses purchased from Cisco and in effect.
- Other license restrictions on software:
  - Cisco Video Assurance Management Solution - IneoQuest Video Probe license: Each license permits the Customer to manage one IneoQuest probe device.
  - Cisco Video Assurance Management Solution - Mixed Signals Video Probe RTU license: Each license permits the Customer to manage one Mixed Signals probe device.

- Cisco Video Assurance Management Solution - Tektronix Video Probe license: Each license permits the Customer to manage one Tektronix probe device.
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Please refer to the Cisco Systems, Inc. End User License Agreement

GLOSSARY

A

Access privilege In computer security, the process of ensuring that only authorized users can access the resources of a computer system in authorized ways.

Activation script A command script that Cisco ANA applies to one or more VNEs to extend their configurations. You use Cisco ANA Command Builder to create activation scripts. The Cisco Video Assurance Management Solution runs an IPTV activation script on its VNEs.

Alarm An audible or visual signal at a device, such as a display station or printer, that is used to notify the user that a predefined condition exists.

Alarm Thresholding A mechanism by which Cisco ANA constantly monitors selected soft properties and generates an alarm every time they cross a user-defined threshold or violate a condition. See also Soft Properties.

ANA Active Network Abstraction. A Cisco resource management solution designed with a fully distributed OSS mediation platform which abstracts the network, its topology and its capabilities from the physical elements.

ANA EventVision ANA EventVision is a GUI application that serves as a browser for viewing and retrieving detailed information about the different types of system events and tickets that are generated within the Cisco ANA system. Monitoring EventVision helps predict and identify the sources of system problems, which assists in preventing future problems.

ANA Manage ANA Manage is a GUI tool in Cisco ANA that performs various system administration activities for simple system control.

Active Network Abstraction See ANA.

ANA NetworkVision ANA NetworkVision is the primary GUI for Cisco ANA. It is a surveillance tool providing total visibility for multi-vendor, multi-tier, multi-technology networks. It also supports fault and configuration functionality.

ANA NetworkVision supports the creation of multiple network maps to represent specific network views. Views can cover specific network segments, customer networks, or any other mix of network elements desired. Once the maps have been created, they are available for all connecting clients (with support for fine grained access privileges).

Authentication In computer security, (1) verification of the identity of a user or the user's eligibility to access an object; (2) verification that a message has not been altered or corrupted; (3) a process that is used to verify the user of an information system or of protected resources.

Authorization In computer security, (1) the right granted to a user to communicate with or make use of a computer system; (2) the process of granting a user either complete or restricted access to an object, resource, or function.

Automation In IBM Tivoli/OMNIbus, the ObjectServer can respond automatically to specified alerts.

Autonomous Virtual Machine See AVM.

AVM Autonomous Virtual Machine. Java processes that provide the necessary distribution support platform for executing and monitoring multiple VNEs.

B

back-office The internal operations of an organization that are not accessible or visible to the general public.

back up To copy information to another location to ensure against loss of data. Contrast with restore.

C

Carrier Routing System-1 See CRS-1

Cisco Multicast Manager A Web-based network management application that simplifies the holistic discovery, visualization, monitoring, and troubleshooting of multicast networks. CMM is applicable to multiple system operators that use multicast to transport video over IP.

Configuration The machines, devices, and programs that make up a system, subsystem, or network.

CPU Central Processing Unit.

CRC Cyclic Redundancy Check. Error-checking technique in which the frame recipient calculates a remainder by dividing frame contents by a prime binary divisor and compares the calculated remainder to a value stored in the frame by the sending node.

CRS-1 Carrier Routing System-1. A Cisco large-scale core router for carrier networks.

Cyclic Redundancy Check See CRC.

D

Deduplication Deduplication (also known as record linkage) is a task of finding the same (duplicate) entry in multiple files. You use deduplication when merging two or more data sets. Deduplication is a useful tool when performing data mining tasks, where the data originated from different sources or different organizations.

Delay Factor See DF.

Deploy To place files or install software into an operational environment.

Desginated Router See DR.

Device Any non-client, non-server part of a network managed by Tivoli software, including, but not limited to, cable set-top boxes and other pervasive devices.

DF Delay Factor. A time value indicating the amount of data that buffers must contain to eliminate jitter.

Digital Storage Media - Command and Control See DSM-CC.

Digital Subscriber Line Access Multiplexer See DSLAM.

Digital Video Broadcast See DVB.

Discovery The automatic detection of a topology change, such as finding new and deleted nodes or links within a network topology, or such as finding storage resources and devices within a network that are not yet being monitored.

Domain A logical grouping of resources in a network for the purpose of common management and administration.

Domain name In the Internet suite of protocols, a name of a host system. A domain name consists of a sequence of subnames that are separated by a delimiter character. For example, Cisco.com.

DR Designated Router. A router in a multiaccess network that designates the originate network link advertisements and establishes adjacencies with all routers in the network.

Drools rules engine Drools rules engine is a general-purpose expert-system generator and combines rule-based techniques and object-oriented programming. It also provides a customizable mechanism to add decision support and data flow control functions to business applications.

Drools rules engine is based on an object-oriented paradigm and uses user-defined rules to perform pattern matching on different conditions. The rules are written in a Java-like syntax, and are organized into source files (known as a rule files), which are plain ASCII files.

DSLAM Digital Subscriber Line Access Multiplexer. A device that connects many digital subscriber lines to a network by multiplexing the DSL traffic onto one or more network trunk lines.

DSM-CC Digital Storage Media - Command and Control. A toolkit for developing control channels associated with MPEG-1 and MPEG-2 streams.

DVB Digital Video Broadcast. A European standard for digital television.

E

EMS Element Management System. A system that manages a network of elements.

Element Management System See EMS.

Event Any significant change in the state of a system resource, network resource, or network application. An event can be generated for a problem, for the resolution of a problem, or for the successful completion of a task.

F

Field The building block of which objects are composed. A field is characterized by a field name, a data type (integer, Boolean, character string, or enumerated value), and a set of flags that describe how the field is treated. A field can contain data only when it is associated with an object.

G

Gateway In the IP community, an older term referring to a routing device. Today, the term *router* is used to describe nodes that perform this function, and *gateway* refers to a special-purpose device that performs an application layer conversion of information from one protocol stack to another.

H

HDD Hard disk drive.

Health check A report that shows the values over time of one or more metrics, which can be selected from one or more schemas, for one or more components. Typically, a health check shows time-delineated, diagnostic data that shows the fluctuation of key indicators.

Host A computer that is connected to a network (such as the Internet or an Systems Network Architecture [SNA] network) and provides an access point to the network. Also, depending on the environment, the host may provide centralized control of the network. The host can be a client, a server, or both a client and a server simultaneously.

HFC Hybrid Fiber-Coaxial. Technology being developed by the cable TV industry to provide two-way, high-speed data access to the home by using a combination of fiber optics and traditional coaxial cable.

Hybrid Fiber-Coaxial See HFC.

I

iVMS IP Video Management System (iVMS) from Ineoquest Technologies has been added to CMM 2.5 to provide real-time alerts to allow for rapid fault isolation of customer impacting video events.

ICMP Internet Control Message Protocol. Network layer Internet protocol that reports errors and provides other information relevant to IP packet processing. Documented in RFC 792.

IGMP Internet Group Management Protocol. Used by IP hosts to report their multicast group memberships to an adjacent multicast router.

Internet Control Message Protocol See ICMP.

Internet Group Management Protocol See IGMP.

Internet Protocol Television See IPT.

Internet Service Monitors See ISM.

IPTV Internet Protocol Television. Video transport over IP.

IPTV extensions Configurations that extend the capabilities of the VNEs to include functions that are unique to the Cisco Video Assurance Management Solution. These extensions are applied to supported VNEs with an activation script.

IP Video Management System See iVMS.

ISM Internet Service Monitors. A collection of software components that monitors the status and performance of Internet services such as e-mail, Dynamic Host Configuration Protocol (DHCP), Domain Name Service (DNS), and Remote Authentication Dial-In User Service (RADIUS). To assist CIC users in integrating CIC with ISM, CIC includes utilities you can run after installing CIC and ISM. These utilities customize the ISM installation to function more smoothly with CIC.

J

Java EventLists See JEL.

JEL Java EventLists. Java EventLists use passive software probes to collect network events from a wide variety of management environments. Then, JEL distributes color-coded views (output from the Netcool/OMNIbus ObjectServer memory-resident SQL data repository) of networked services to operators who monitor service levels. When combined, the topology displays and Java EventLists are updated in real time, giving managers a collaborative network management environment.

M

Management Information Base See MIB.

Map A named collection of objects, symbols, submaps, and their relationships, all of which represent the network topology. See topology.

MDT Multicast Distribution Tree. A distribution tree that controls the path that IP multicast traffic takes through the network to deliver traffic to all receivers. The two basic types of multicast distribution trees are source trees and shared trees.

Media Loss Rate See MLR.

MIB Management Information Base. Network management protocol, such as SNMP, uses and maintains a database of network management information. The value of a MIB object can be changed or retrieved by using SNMP commands, usually through a GUI network management system.

MLR Media Loss Rate. The number of lost or out-of-order media packets per second.

Motion Picture Experts Group See MPEG.

MPEG Motion Picture Experts Group. Standard for compressing video. MPEG1 is a bit stream standard for compressed video and audio optimized to fit into a bandwidth of 1.5 Mb/s. Intended for higher quality video-on-demand applications, MPEG2 runs at data rates between 4 and 9 Mb/s. Intended for 64-kb/s connections, MPEG4 is a low-bit-rate compression algorithm.

MPLS Multiprotocol Label Switching. Switching method that forwards IP traffic by using a label. This label instructs the routers and the switches in the network where to forward the packets based on preestablished IP routing information.

MVPN Multicast VPN.

Multicast Distribution Tree See MDT.

Multicast VPN See MVPN.

Multiprotocol Label Switching See MPLS.

N

NE Network Element. A user-named physical component or device existing in the network.

Netcool/Tivoli An application that integrates the CIC server product with the Tivoli network management application and allows Tivoli to manage a CIC sever installation.

Network Element See NE.

Network Time Protocol See NTP.

NTP Network Time Protocol. Protocol built on top of TCP that ensures accurate local time-keeping with reference to radio and atomic clocks located on the Internet. This protocol is capable of synchronizing distributed clocks in milliseconds over long time periods.

O

Object Identifier See OID.

OID Object Identifier. Values are defined in specific MIB modules. The Event MIB allows a user or an NMS to watch over specified objects and to set event triggers based on existence, threshold, and boolean tests. An event occurs when a trigger is fired; this means that a specified test on an object returns a value of true. To create a trigger, a user or an NMS configures a trigger entry in the mteTriggerTable of the Event MIB. This trigger entry specifies the OID of the object to be watched. For each trigger entry type, corresponding tables (existence, threshold, and boolean tables) are populated with the information required for carrying out the test. The MIB can be configured so that when triggers are activated (fired) either an SNMP Set is performed, a notification is sent out to the interested host, or both.

Operations Support Systems/Business Support Systems See OSS/BSS.

OSS/BSS Operations Support Systems/Business Support Systems. Operations support systems (OSS) and business support systems are a set of programs that help a communications service provider monitor, control, analyze, and manage a telephone or computer network.

P

Packet ID See PID.

Packets per second See PPS.

PAT Program Association Table. A table that lists the PIDs that are associated with the PMTs in the transport stream.

PCR Program Clock Reference. A clock reference on a program PID that helps to present programs on time and at the right speed.

PE Provider Edge. A router at the edge of a network service provider area.

PID Packet ID. The ID of a packet in a transport stream.

PIM Protocol Independent Multicast. Multicast routing architecture that allows the addition of IP multicast routing on existing IP networks. PIM is a unicast routing protocol which is independent and can be operated in two modes: dense and sparse.

PMT Program Map Table. A table that provides information about a program on a video transport stream. The PMT lists the PIDs of the streams associated with the program.

Polling (1) The process whereby stations are invited, one at a time, to transmit. The polling process usually involves the sequential interrogation of several data stations. (2) In network management, the process by which a manager interrogates one or more managed nodes at regular intervals. (3) The process by which databases are interrogated at regular intervals to determine if data needs to be transmitted.

PPS Packets per second.

Presentation Time Stamp See PTS.

Program Association Table See PAT.

Program Clock Reference See PCR.

Program Map Table See PMT.

Protocol Independent Multicast See PIM.

Provider Edge See PE.

Provision To provide, deploy, and track a service or component.

Provisioning The process of setting up and maintaining a user's access to a system.

PTS Presentation Time Stamp. The time stamp when a video or audio frame must be presented to the user.

Q

QAM Quadratrue Amplitude Modulation. Method for encoding digital data in an analog signal in which each combination of phase and amplitude represents one of sixteen four-bit patterns. Also refers to devices that encode digital cable channels for transmission over cable.

Quadrature Amplitude Modulation See QAM.

QoS Quality of Service. Measure of performance for a transmission system that reflects its transmission quality and service availability.

Quality of Service See QoS.

R

RDBMS Relational Database Management System. A collection of hardware and software that organizes and provides access to a relational database.

Realtime Transport Protocol See RTP.

Registry The data store that contains access and configuration information for users, systems, and software.

Relational database A database that can be perceived as a set of tables and manipulated in accordance with the relational model of data.

Relational database management system See RDBMS.

Rendezvous Point See RP.

Reverse Path Forwarding See RPF.

Root-cause analysis The process of determining the actual cause of a network problem. For example, when a device on a network cannot be reached, it might be because of a problem with the device or a problem with a network component that is used to reach that device.

RP Rendezvous Point. Router specified in PIM sparse mode implementations to track membership in multicast groups and to forward messages to known multicast group addresses.

RPF Reverse Path Forwarding. Multicasting technique in which a multicast datagram is forwarded out of all but the receiving interface if the receiving interface is the one used to forward unicast datagrams to the source of the multicast datagram. Non-RPF packets, also called RPF failure packets, are RPF packets that have been transmitted backwards, against the flow from the source.

RTP Realtime Transport Protocol. IP transport protocol that provides media-specific time stamp data for real-time flows.

Rule A set of logical statements that enable the event server to recognize relationships among events and to execute automated responses accordingly. See also event.

Run time The time period during which a computer program is executing. A run-time environment is an execution environment.

S

Schema The set of statements, expressed in a data definition language, that completely describe the structure of a database. In a relational database, the schema defines the tables, the fields in each table, and the relationships between fields and tables.

Secure sockets layer See SSL.

Service provider Any company that provides services for a fee to its customers, such as telecommunication companies, application service providers, enterprise IT, and Internet service providers (ISPs). These fee services include application provisioning, application hosting, service level agreement management, and others.

Set-top box See STB.

SHE Super Head End. Network location for live feeds for the broadcast video service. This site contains the real-time encoders used for the broadcast video service, along with the asset distribution systems for on-demand services. This site may also contain back-office systems such as the subscriber database. The SHE typically resides in the core of the transport network.

Simple Network Management Protocol See SNMP.

SNMP Simple Network Management Protocol. Network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security.

Soft Properties Cisco ANA offers the soft properties mechanism to enable user-configurable extensions of device modeling, which can cover any unsupported MIB variable. This mechanism enables adding new monitored NE properties in runtime to the default set of supported properties.

Every soft property is implemented through a set of definitions that determine how to retrieve, parse and display a certain MIB variable from the NE. The definition process is done through a simple GUI utility, and does not require system restart. Soft properties are retrieved from the NE by using SNMP, or Telnet/SSH.

See also Alarm Thresholding.

SSL Secure sockets layer. A security protocol that provides communication privacy. SSL enables client/server applications to communicate in a way that is designed to prevent eavesdropping, tampering, and message forgery.

STB Set-top box. A set-top box (STB) or set-top unit (STU) is a device that connects to a television and an external source of signal, turning the signal into content which is then displayed on the television screen.

Structured Query Language See SQL.

SQL Structured Query Language. A database computer language designed for the retrieval and management of data in relational database management systems (RDBMS), database schema creation and modification, and database object access control management.

SQL is a standard interactive and programming language for querying and modifying data and managing databases. Although SQL is both an ANSI and an ISO standard, many database products support SQL with proprietary extensions to the standard language. The core of SQL is formed by a command language that allows the retrieval, insertion, updating, and deletion of data, and performing management and administrative functions.

Super Head End See SHE.

T

TCA Threshold Crossing Alert. A system message that alerts the operator when a provisionable threshold has been crossed.

Threshold A customizable value for defining the acceptable tolerance limits (maximum, minimum, or reference limit) for an application resource or system resource. When the measured value of the resource is greater than the maximum value, less than the minimum value, or equal to the reference value, an exception is raised.

Threshold Crossing Alert See TCA.

Topology Physical arrangement of network nodes and media within an enterprise networking structure.

V

VHO Video Hub Office. Network location of the video server complex, which includes the video sources for on-demand services and real-time encoders for local television stations. A VHO typically serves a metropolitan area of between 100,000 and 1,000,000 homes.

Video Hub Office See VHO.

Video Switching Office See VSO.

Virtual Network Element See VNE.

Virtual Private Network See VPN.

VNE Virtual Network Element. A virtual representation of a single network element as a modeled component. VNEs all communicate with each other to present ANA-based applications with a single, common device abstraction for network element discovery, configuration, status collection, fault analysis and other basic network functions. VNEs can be extended to support new application functionality.

VPN Virtual Private Network. Enables IP traffic to travel securely over a public TCP/IP network by encrypting all traffic from one network to another. A VPN uses tunneling to encrypt all information at the IP level.

VPN routing/forwarding See VRF.

VRF VPN routing/forwarding. A VRF consists of an IP routing table, a derived forwarding table, a set of interfaces that use the forwarding table, and a set of rules and routing protocols that determine what goes into the forwarding table.

VSO Video Switching Office. VSOs house aggregation routers that aggregate traffic from subscriber homes.

Z

ZAP Zone Announcement Protocol. A multicast protocol for discovering the multicast administrative scope zones that are relevant at a particular location. See RFC 2776.

Zone Announcement Protocol See ZAP.

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