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, page 6-1
- Monitoring ANA, CMM, and Video Probe Events with Netcool/Webtop, page 6-4
- Advanced Troubleshooting with CMM and TBSM, page 6-6
- Monitoring and Troubleshooting in the Wireline Network, page 6-19
- Monitoring and Troubleshooting in the Cable Network, page 6-19
- Troubleshooting with Cisco ANA, page 6-20

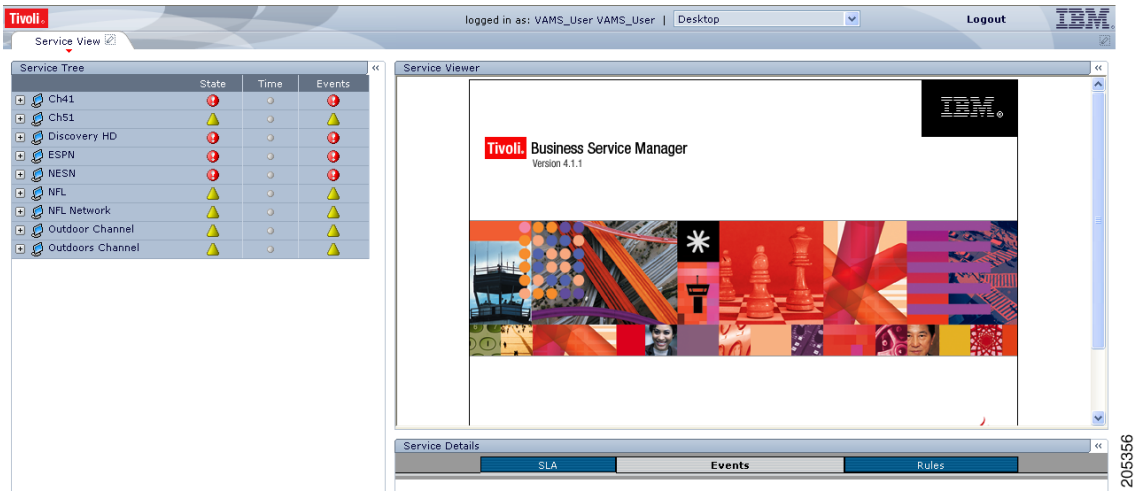
Monitoring ANA, CMM, and Video Probe Events with TBSM

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



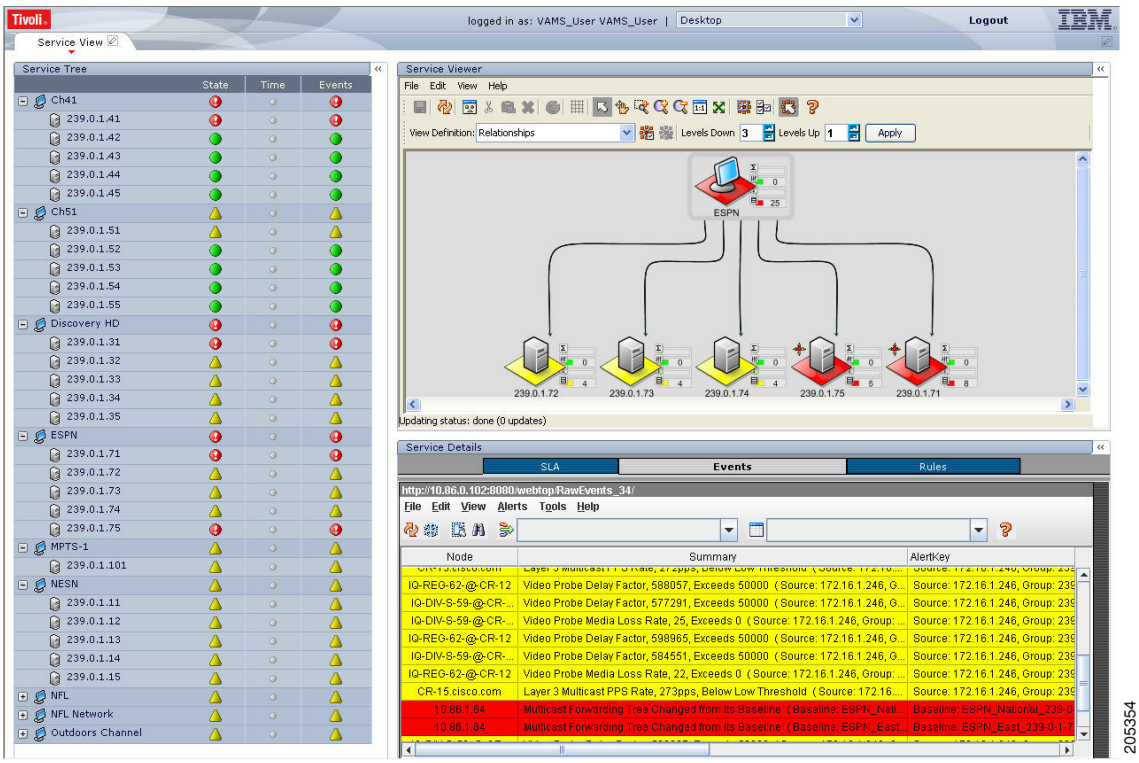
Step 2 From the service tree directory browser at the left of the page, click on a service.

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**.

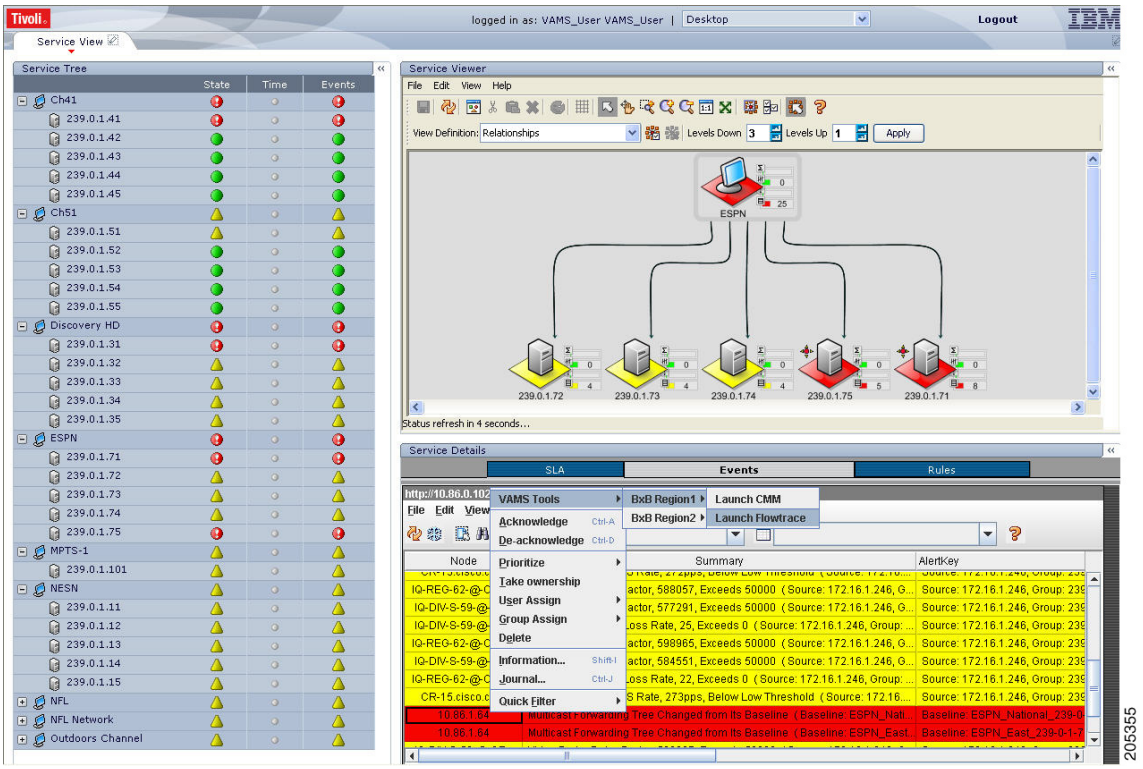
Note The Region Name value is configurable from TBSM. For information on configuring the Region Name, see the IBM Tivoli TBSM documentation at the following URL:

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:

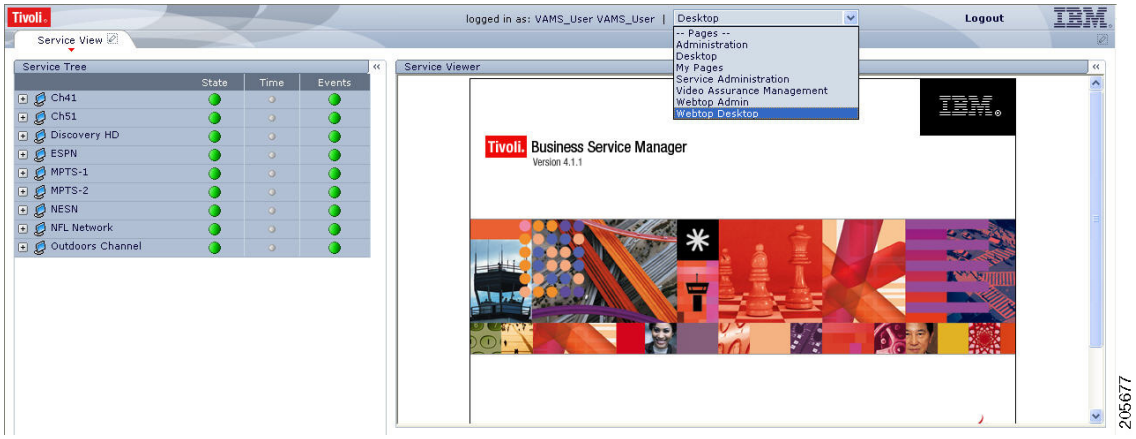
http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.tivoli.itbsm.doc/tbsm42custom.pdf

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



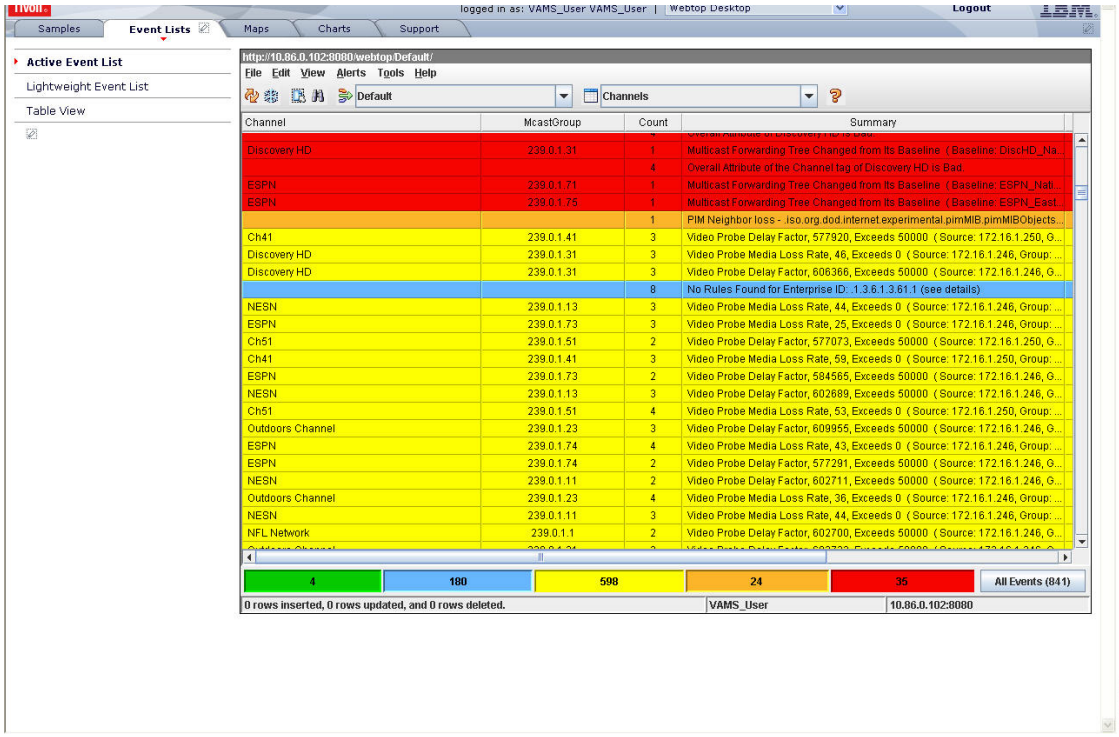
Step 2 From the pull-down menu at the top of the TBSM start page, select **Webtop Desktop**.

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.

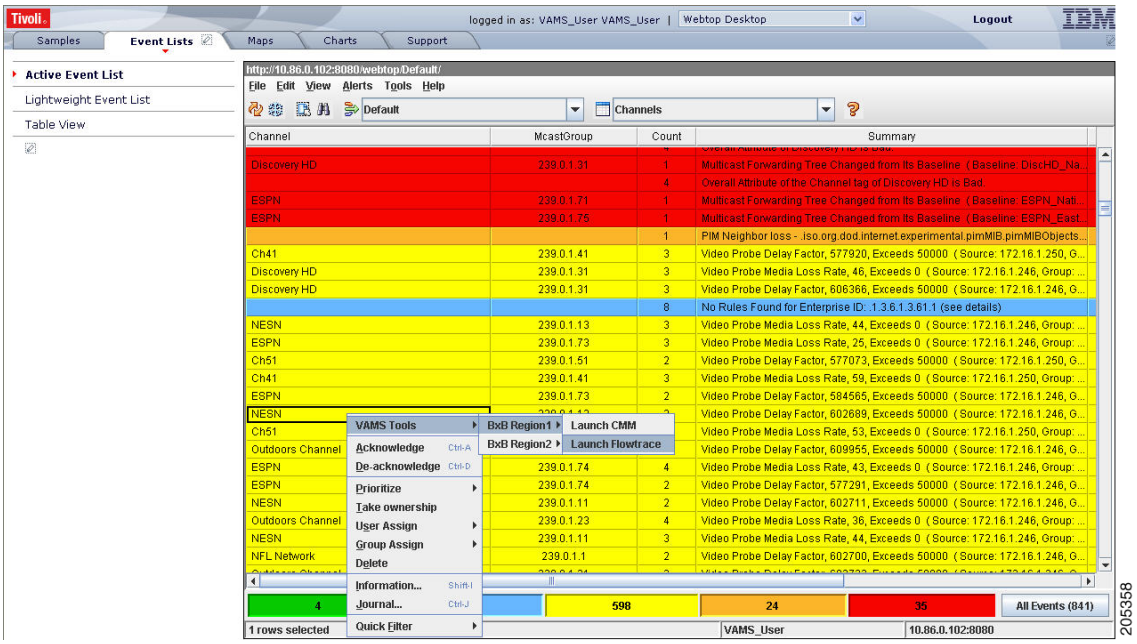
Note The Region Name value is configurable. For information on configuring the Region Name in TBSM, see the IBM Tivoli TBSM documentation at the following URL:

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.

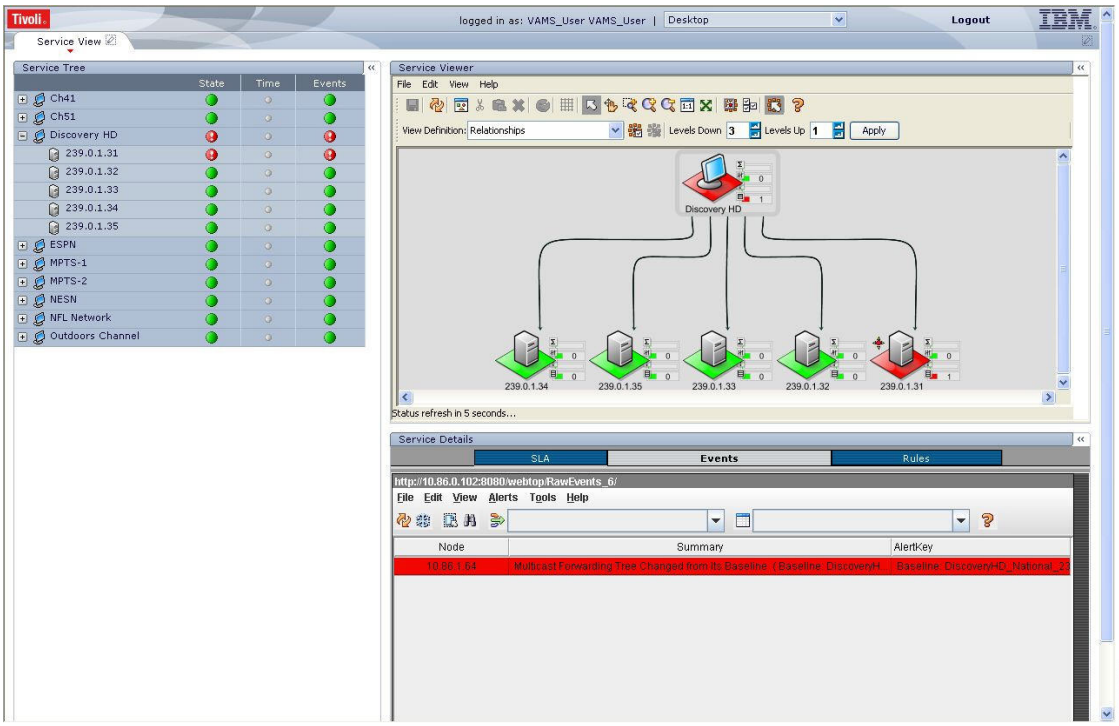
The service tree for the selected service appears.

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.

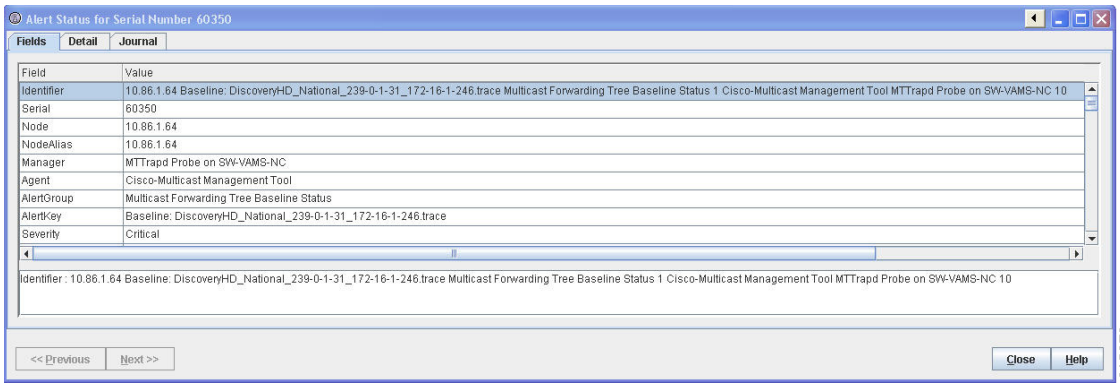
Figure 6-7 Viewing a Tree Change Event in TBSM/Webtop



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.

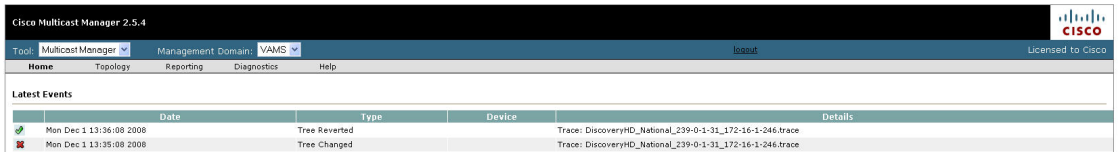
Monitoring Multicast Tree Changes with CMM

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:

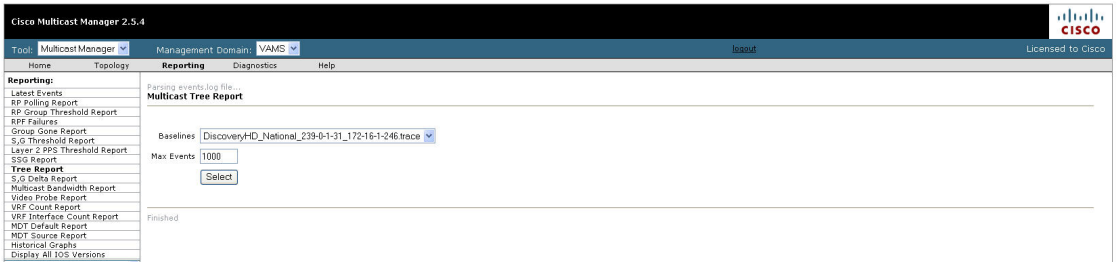
Step 1 If you are in the TBSM/CIC interface, highlight an event, and then from the Alerts Menu, choose **VAMS Tools > *Region Name* > Launch CMM**.

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.

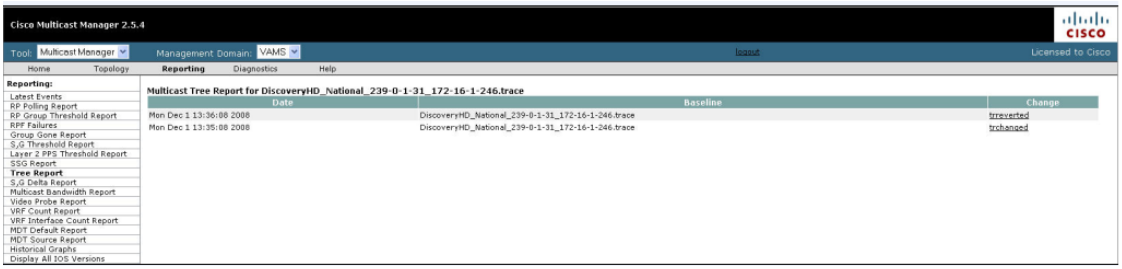
Figure 6-10 Selecting a Tree Change Report



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).

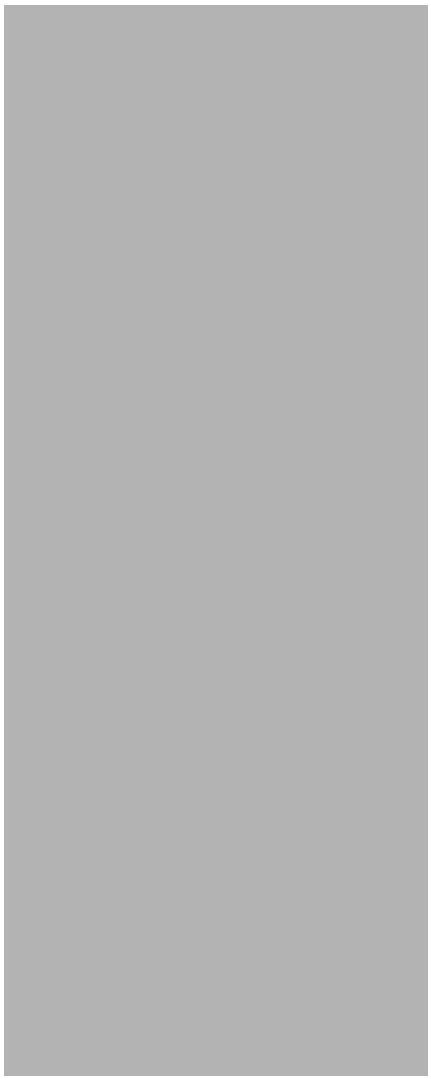
Routers and interfaces that are no longer part of the multicast tree are highlighted in red. Routers and interfaces that have been added to the distribution tree are highlighted in green.

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.

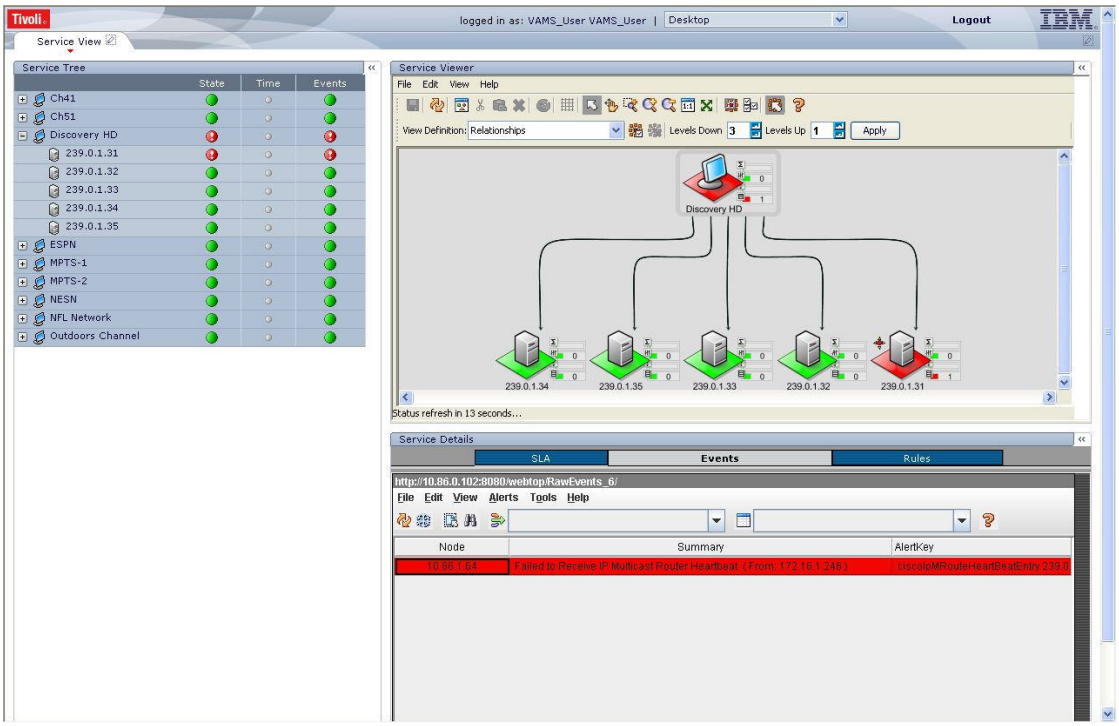
The service tree for the selected service appears.

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

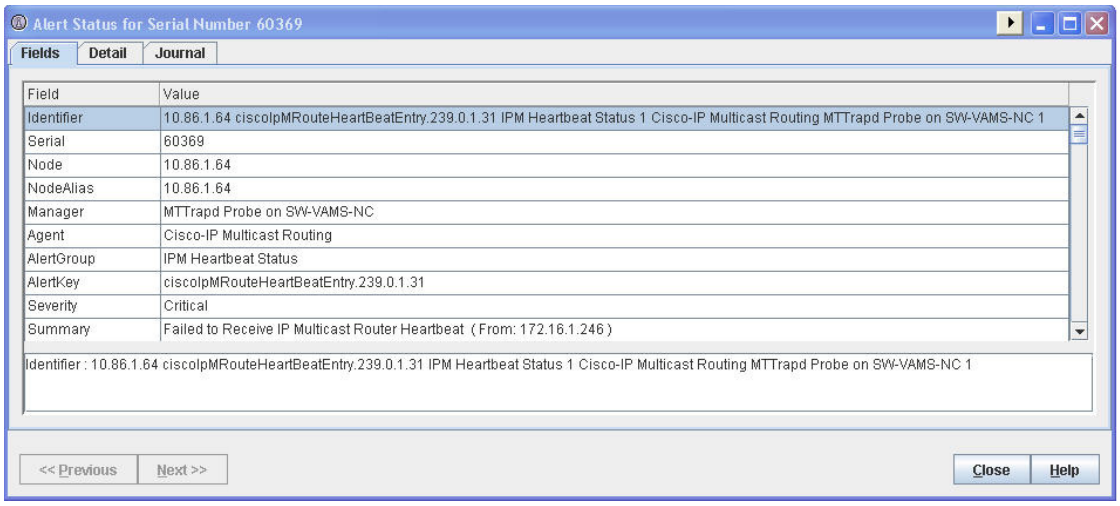


The Summary column shows the IP address of the router that generated the heartbeat event.

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

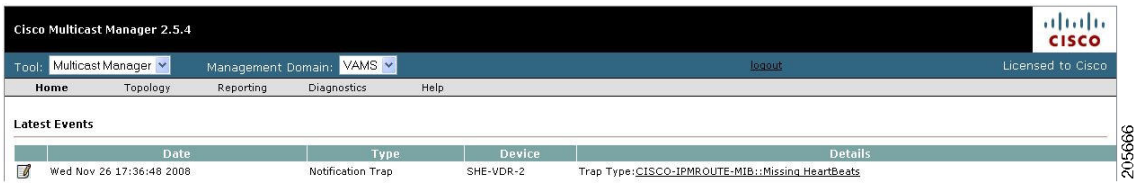
To view IP Multicast heartbeat events with CMM:

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

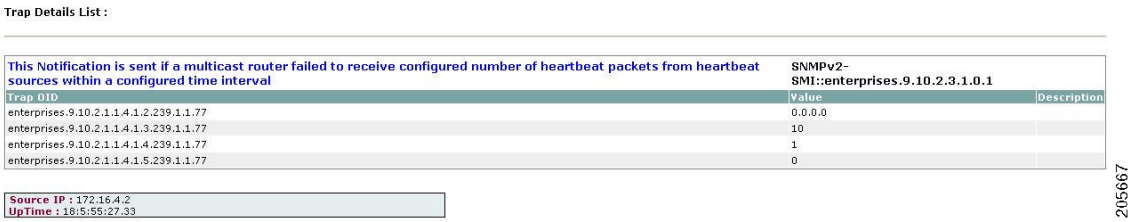


The heartbeat event includes the name of the SNMP MIB used to forward the event and the name of the event; however, CMM 2.5.4 does not indicate the name of the Multicast Group or the Channel Name on the Latest Events page for heartbeat events.

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:

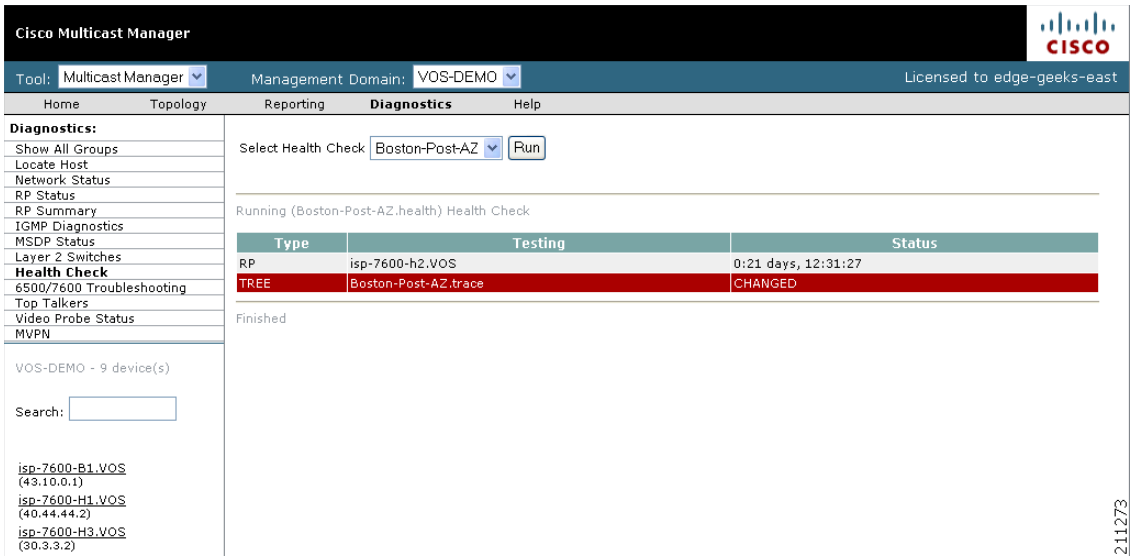
Step 1 On the Multicast Manager tool, select **Diagnostics > Health Check**.

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.

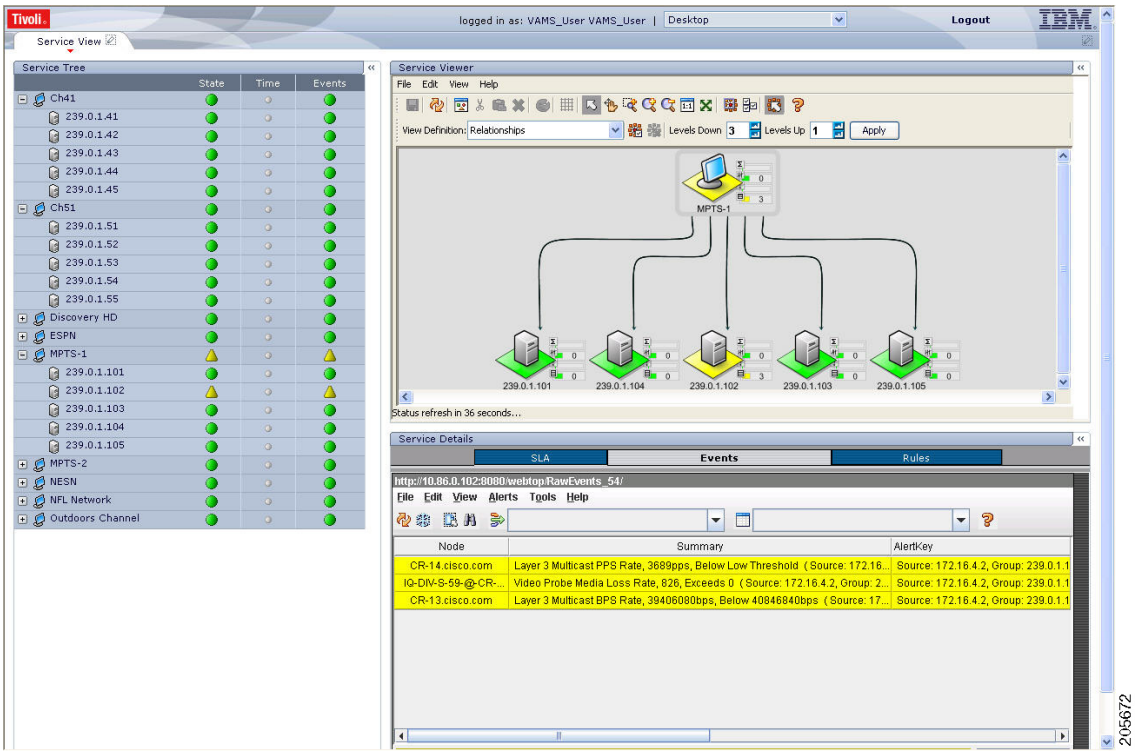
The service tree for the selected service appears.

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

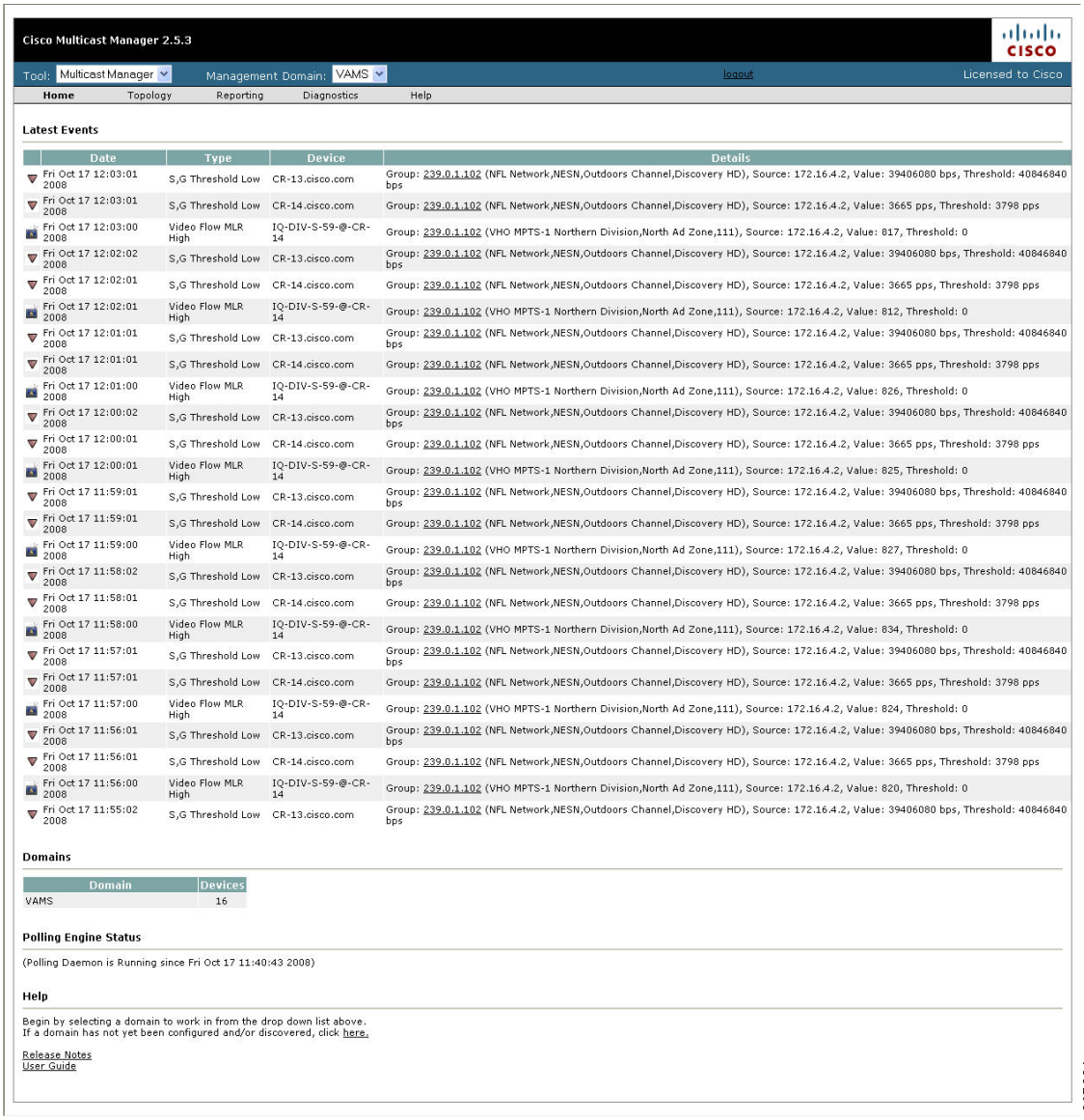
To view threshold events with CMM:

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, page 6-20
- ANA NetworkVision, page 6-21
- ANA EventVision, page 6-21

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