



# CHAPTER 4

## Using the VQE-S AMT

This chapter describes how to use Cisco VQE Server (VQE-S) Application Monitoring Tool (AMT). The tasks that you can perform with the VQE-S AMT are listed in [Table 4-1](#).

**Table 4-1** VQE-S AMT Tasks

VQE-S AMT Task	Section Where Described
Log in to the VQE-S AMT	<a href="#">Logging into and Navigating in the VQE-S AMT, page 4-2</a>
Monitor the health of the VQE-S processes	<a href="#">Monitoring the Health of the VQE-S Processes, page 4-4</a>
View channel configuration details, status, and statistics	<a href="#">Viewing Channel Configuration and Status, page 4-7</a>
Monitor statistics for Unicast Retransmission and RCC <sup>1</sup>	<a href="#">Monitoring Unicast Retransmission and RCC, page 4-16</a>
View configuration details, status, and statistics for CDE110 Ethernet interfaces	<a href="#">Monitoring Interfaces, page 4-26</a>
View configuration details, status, and statistics for the VQE-S RTCP <sup>2</sup> Exporter	<a href="#">Monitoring RTCP Exporter, page 4-28</a>
View STUN Server statistics	<a href="#">Monitoring the STUN Server, page 4-30</a>
Reset VQE-S counters	<a href="#">Resetting VQE-S Counters, page 4-31</a>
Restore VQE-S counters	<a href="#">Restoring VQE-S Counters, page 4-32</a>
Change VQE-S logging levels	<a href="#">Change VQE-S Logging, page 4-33</a>
Change VQE-S debugging levels	<a href="#">Change VQE-S Debugging, page 4-33</a>

1. RCC = rapid channel change.

2. RTCP = Real-Time Transport Control Protocol



**Note**

The VQE-S AMT supports configuration capabilities for logging levels and debugging options. However, the configured values do not persist when the VQE-S AMT is restarted.

# Logging into and Navigating in the VQE-S AMT

Before logging into the VQE-S AMT, you need a valid Linux username and password on the Cisco CDE110 hosting the VQE-S AMT. The username does not have to belong to any special group. Creation of the username is the responsibility of the Cisco CDE110 system administrator.

The VQE-S AMT supports two web browsers: Microsoft Internet Explorer version 6.0 or later, and Mozilla Firefox version 2.0 or later. The minimum screen resolution required for the VQE-S AMT is 1024 x 768 pixels.

The VQE-S AMT uses secure HTTPS. Access by multiple simultaneous browsers is supported.

To display the Channels Status Summary graph of active, inoperative, and inactive channels in the AMT VQE-S Status window, Adobe Flash Player must be installed on the computer that hosts the browser accessing the VQE-S AMT. Adobe Flash Player is free and can be found at this URL:

<http://get.adobe.com/flashplayer/>

To login to the VQE-S AMT, follow these steps:

- 
- Step 1** Point your web browser to the Cisco CDE110 that hosts the VQE-S AMT using an IP address or fully qualified domain name:

`https://ip_address`

or

`https://fully_qualified_domain_name`

The VQE-S AMT login dialog box is displayed.

- Step 2** Enter a Linux username and password.

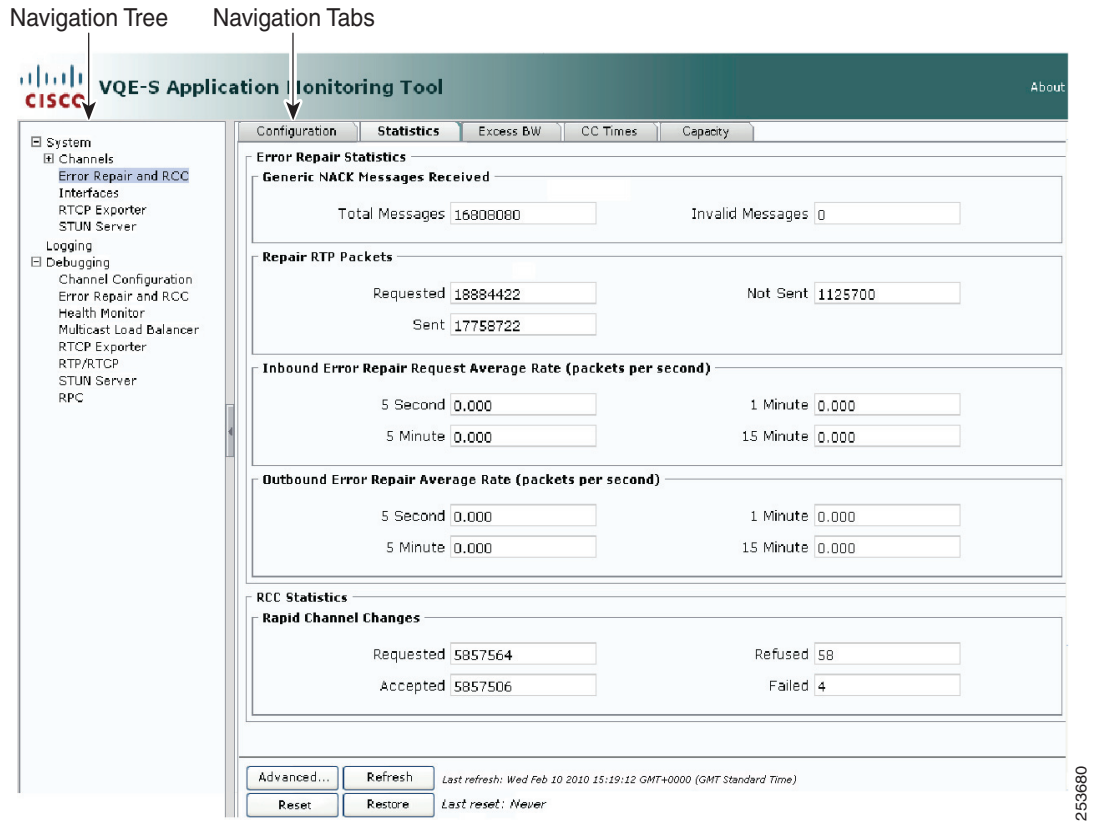
- Step 3** Click **OK**.

If the username and password are valid, the AMT VQE-S Status window is displayed.

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Figure 4-1 shows the VQE-S AMT navigation controls and buttons.

**Figure 4-1 VQE-S AMT Navigation**



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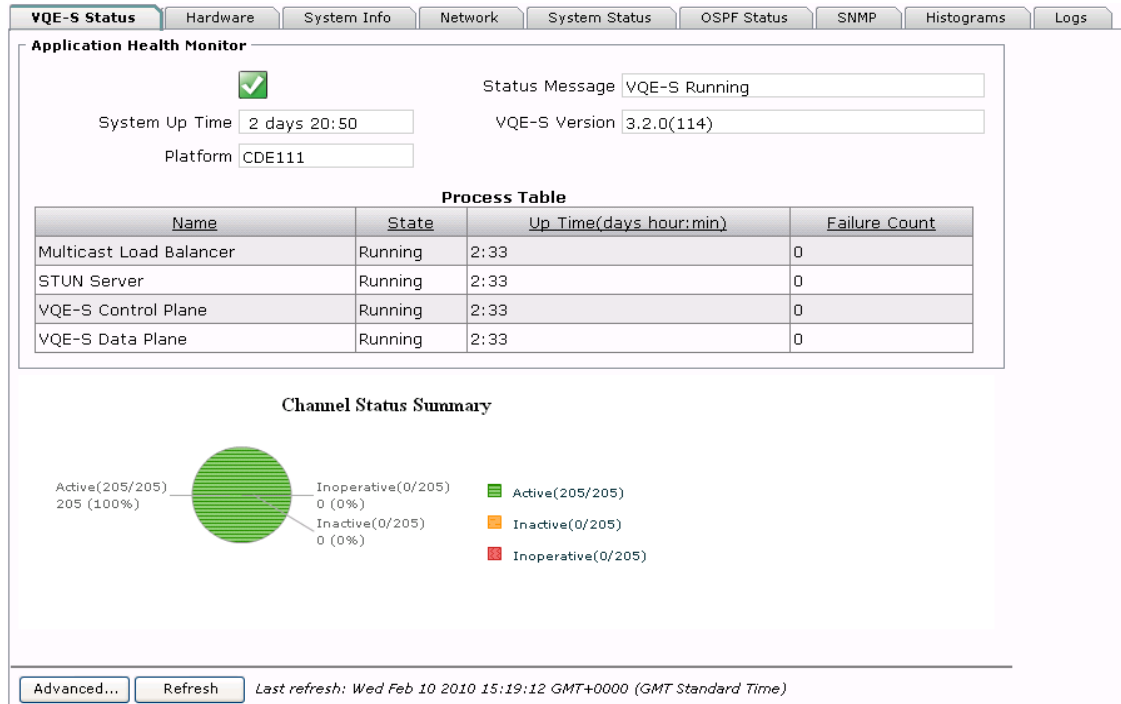
The VQE-S AMT (see [Figure 4-1](#)) provides these controls and buttons for navigating and displaying VQE data:

- **Navigation tree**—Use the collapsible and expandable tree to display the VQE-S AMT items that can be viewed or configured. The navigation tree can be hidden by clicking the < arrow in its right border.
  - Parent node in the tree (such as Channels) usually provides summary data.
  - Child node in the tree (such as an individual channel name) provides data on the specific child node.
- **Navigation Tabs**—Click the tabs to display VQE data for viewing or VQE parameters for configuring in the main window. Some, but not all, VQE items have Configuration and Statistics tabs that display the relevant data or parameters.
- **Advanced**—Click to get additional, detailed information on the current VQE-S AMT items. The advanced data is intended for Cisco Technical Support and are not described in this document.
- **Refresh**—Click to update the displayed data. The VQE-S AMT statistical data are not automatically updated when the VQE-S real-time counters are incremented. The last refresh date-and-time information to the right of the **Refresh** button indicates when the last update of displayed data occurred.
- **Reset**—Click to globally reset counter values displayed on the VQE-S AMT to zero. The results of this action are visible to all AMT users, even those in separate AMT browser sessions. Only a subset of counters can have their display value reset. Resetting the display of counter values is provided for debugging purposes. For example, resetting a counter after you have fixed an issue could allow you to easily see that an error counter no longer occurs. The last reset date-and-time information to the right of the **Reset** button indicates when the last manual reset of counters occurred, and displays *never* if a reset has not occurred.
- **Restore**—Click to globally restore counters to their true value since the last start of the VQE-S service.

## Monitoring the Health of the VQE-S Processes

When you click the **System** node in the navigation tree and the **VQE-S Status** tab, the VQE-S AMT displays the VQE-S Status window (see [Figure 4-2](#)). The Application Health Monitor and a Channel Status Summary are displayed in the VQE-S Status window.

Figure 4-2 VQE-S Status Window



In the Application Health Monitor, a green icon with a check mark indicates that the VQE-S system is running and is healthy. A red icon with an X indicates one or more problems with the VQE-S processes.

Using the Application Health Monitor, you can view the following status information:

- System Up Time—Time that Cisco CDE110 hosting the VQE-S has been running.
- Platform—Cisco CDE110 hardware platform that is hosting this VQE-S. Platform can be one of the following:
  - Cisco CDE110 (models CDE110-1-036TXA-K9 and CDE110-1-036TXD-K9)
  - Cisco CDE111 (models CDE111-2-146TXA-K9 CDE111-2-146TXD-K9)
  - UNKNOWN if the hardware platform cannot be determined.
- Status Message—Current status of the VQE-S software or information on problems (for example, the message “Config File Parsing Failed”).
- VQE-S Version—Current version of the VQE-S software.
- Process Table—Information on these VQE-S processes:
  - Multicast Load Balancer
  - STUN Server
  - Data Plane
  - Control Plane.

In the Process Table, Failure Count is the number of times the process has failed and been restarted by the VQE-S Process Monitor. The VQE-S Process Monitor is responsible for starting and monitoring the preceding processes.

The Channels Status Summary section provides the number of and a graph for active, inoperative, and inactive channels.

In addition to the VQE-S Status tab, you can get information on the VQE-S system on the eight other tabs. Table 4-2 lists the information that is available from each tab accessible from the System node.

**Table 4-2 System Information**

System Node Tab	Information Provided
VQE-S Status	Application Health Monitor and Channel Status Summary.
Hardware	Processor and memory on the Cisco CDE110 that hosts the VQE-S. Each CDE110 has two physical processors and four virtual processors.
System Info	Hostname, operating system version, date and time, Network Time Protocol servers, Domain Name System servers, and <b>iptables</b> information (trusted channel-provisioning servers).
Network	Output from the <b>ifconfig</b> and <b>ip addr show lo</b> commands. <ul style="list-style-type: none"> <li>• Configuration information displayed by <b>ifconfig</b> is for the four CDE110 Ethernet interfaces and the CDE110 loopback addresses.</li> <li>• Loopback addresses displayed by <b>ip addr show lo</b> are the feedback target addresses for the configured channels.</li> </ul>
System Status	Detailed information on host uptime, currently running processes, and file system disk space.
OSPF Status	Output from several commands that show OSPF information, including status, neighbors, interfaces, database, and routes.
SNMP	SNMP <sup>1</sup> information on the VQE-S host taken from the <code>snmpd.conf</code> file.
Histograms	STB IGMP <sup>2</sup> latency data is displayed in graphs and tables.
Logs	Most recent 300 lines from the following VQE-related log files are displayed: <ul style="list-style-type: none"> <li>• VQE-S log (<code>/var/log/vqe/vqe.log</code>)</li> <li>• System messages log (<code>/var/log/messages</code>)</li> <li>• HTTPD error log (<code>/var/log/httpd/error_log</code>)</li> <li>• SSL error log (<code>/var/log/httpd/ssl_error_log</code>)</li> <li>• Tomcat log (<code>/usr/share/tomcat5/logs/catalina.out</code>)</li> </ul>

1. SNMP = simple network management protocol.

2. IGMP = internet group management protocol.

## Viewing Channel Configuration and Status

When you click the **Channels** node in the navigation tree, the VQE-S AMT displays the Channel Lineups window (see [Figure 4-3](#)).

**Figure 4-3** Channel Lineups Window

Channel Lineups Last update: 2008-07-08T14:44:14, Total Channels: 250, Active Channels: 240 Aggregated Bandwidth: 1215000(kbits/sec), Total Receivers: 1040							
Name	Status	Original Multicast	Feedback Target	Bit Rate (Kbps)	Repair Enabled	RCC Enabled	Member Receiver Population
Channel 229.1.1.1	✓	229.1.1.1:53170	11.112.1.1:53171	4000	true	true	400
Channel 229.1.1.10	✓	229.1.1.10:53206	11.112.1.10:53207	13000	true	true	0
Channel 229.1.1.11	✓	229.1.1.11:53210	11.112.1.11:53211	4000	true	true	0
Channel 229.1.1.12	✓	229.1.1.12:53214	11.112.1.12:53215	4000	true	true	0
Channel 229.1.1.13	✓	229.1.1.13:53218	11.112.1.13:53219	4000	true	true	0
Channel 229.1.1.14	✓	229.1.1.14:53222	11.112.1.14:53223	4000	true	true	0
Channel 229.1.1.15	✓	229.1.1.15:53226	11.112.1.15:53227	2000	true	true	0

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Using the Channel Lineups window, you can do the following:

- Click a column heading to reorder the channels in the list. For example, clicking **Feedback Target** orders the entries by feedback target: the combination of an IP address and RTCP port number.
- Double-click any item in a channel's row to display the full details for the channel in a new window.
- Click the **Re-Activate** button to cause the VQE-S to create all channels that are not currently created in the VQE-S software.

In [Figure 4-3](#), the channel-lineup summary data indicates when the lineup was last updated (for example, with the VCPT) and provides totals for all channels and active channels as well as aggregated bandwidth and total receivers:

```
Last update: 2007-08-06T14:15:31, Total Channels: 10, Active Channels: 9
Aggregated Bandwidth: 88000 (kbits/sec), Total Receivers: 0
```

The Channel Lineups window has the same information that is defined for channels using VCPT but has the following additions. For information on the other data that appears in the Channel Lineups table, see [Table 3-3](#).

- Status—Indicates channel status as follows:
  - Green with a checkmark—Channel is active. The VQE-S is receiving the multicast stream.
  - Yellow with exclamation mark (!)—Channel is inactive. The channel is successfully initialized, but the VQE-S is not receiving the multicast stream.
  - Red with an X—Channel is inoperative (for example, the channel is not configured correctly).
- Member Receiver Population—Provides the number of VQE-Cs that are currently receiving this multicast stream.

## Viewing Channel Configuration

When you click a channel name in the navigation tree and then click the **Configuration** tab, the VQE-S AMT displays the Channel Configuration window (see [Figure 4-4](#)).

**Figure 4-4** Channel Configuration Window

The screenshot shows the Channel Configuration window with the following settings:

- Channel Configuration:**
  - Channel Name: Channel 229.1.1.1
  - Mode: Lookaside
  - Feedback Target Address: 11.112.1.1
  - Error Repair: true
  - Rapid Channel Change: true
  - Post Repair Loss RLE Enabled: true
- Original Source Stream:**
  - Multicast IP Address: 229.1.1.1
  - Port: 53170
  - Protocol: RTP
  - RTCP Port: 53171
  - IP Source Filter: 9.3.13.2
  - Bit Rate(Kbps): 4000
  - RTCP XR Enabled: true
  - Reduced size RTCP Enabled: true
- Unicast Retransmission Stream:**
  - Retransmission IP Address: 11.112.1.1
  - RTP Port: 10002
  - RTCP Port: 10003
  - RTCP XR Enabled: true

At the bottom, there is a Refresh button and a timestamp: Last refresh: Wed Feb 10 2010 15:19:12 GMT+0000 (GMT Standard Time).

[Table 4-3](#) lists the information presented in the Channel Configuration window.

**Table 4-3** Channel Configuration

Field	Description
<b>Channel Configuration</b>	
Channel Name	Name of the channel.
Feedback Target Address	Feedback Target IP address assigned on the VQE-S host.
RCC	<ul style="list-style-type: none"> <li>true—RCC is enabled for this channel.</li> <li>false—RCC is not enabled for this channel.</li> </ul>
Mode	Currently only Lookaside mode is supported.
Error Repair	<ul style="list-style-type: none"> <li>true—Unicast Retransmission is enabled for this channel.</li> <li>false—Unicast Retransmission is not enabled for this channel.</li> </ul>
Post Repair Loss RLE Enabled	<ul style="list-style-type: none"> <li>true—RTCP Extended Reports includes the Loss RLE (run-length encoded) report block type.</li> <li>false—RTCP Extended Reports does not include the Loss RLE report block type.</li> </ul>
<b>Original Source Stream</b>	



**Table 4-3 Channel Configuration (continued)**

Field	Description
Multicast IP Address	Multicast IP address for the channel's original source stream.
Protocol	Currently only RTP <sup>1</sup> is supported.
IP Source Filter	Source IP address of the channel's original source stream.
RTCP XR Enabled	<ul style="list-style-type: none"> <li>• true—RTCP Extended Reports are enabled.</li> <li>• false—RTCP Extended Reports are not enabled.</li> </ul>
Port	Number of the port for the original source stream. When the protocol is RTP, this is the RTP port number.
RTCP Port	Number of the RTCP port for the original source stream.
Bit Rate (Kbps)	Bit rate configured for the original source stream.
Reduced size RTCP Enabled	<ul style="list-style-type: none"> <li>• true—Sending reduced-size RTCP NACK compound packets is enabled.</li> <li>• false—Sending reduced-size RTCP NACK compound packets is not enabled.</li> </ul> <p>This field was introduced in Cisco VQE Release 3.5.5.</p>
<b>Unicast Retransmission Stream</b>	
Retransmission IP Address	IP address of the Unicast Retransmission stream.
RTCP Port	Number of the RTCP port for the Unicast Retransmission stream.
RTP Port	Number of the RTP port for the Unicast Retransmission stream.

1. RTP = Real-Time Transport Protocol

## Viewing Channel Statistics

When you click a channel name in the navigation tree and then click the **Statistics** tab, the VQE-S AMT displays the Channel Statistics window (see [Figure 4-5](#)).

**Figure 4-5** Channel Statistics Window

The screenshot shows the 'Status/Statistics' tab of the Channel Statistics window. It contains several sections of data:

- Configuration:** Status: active
- Stream Statistics:** Average Stream Rate (Mbps): 3.81, Received Packets: 2339128, Received Bytes: 3153144544, Lost RTP Packets: 634
- Error Repair Statistics:**
  - Generic NACK Messages Received:** Total Messages: 12544, Invalid Messages: 0
  - Repair Packets:** Requested: 13941, Sent: 13935, Not Sent: 6
  - Error Repair Average Rate (packets per second):** 5 Second: 4.600, 5 Minute: 3.457, 1 Minute: 3.425, 15 Minute: 3.460
- RCC Statistics:**
  - Rapid Channel Changes:** Requested: 1, Accepted: 1, Refused: 0, Failed: 0
- RTCP Packets:** Received: 13053, Sent Downstream: 286, Sent Upstream: 254, Reduced Size RTCP Received: 54

At the bottom, there are buttons for 'Advanced...' and 'Refresh', and a timestamp: 'Last refresh: Wed Feb 10 2010 15:19:12 GMT+0000 (GMT Standard Time)'. A vertical ID '254373' is on the right side.

[Table 4-4](#) lists the information presented in the Channel Statistics window.

**Table 4-4** Channel Statistics

Field	Description
<b>Channel Input Stream</b>	
Status	<ul style="list-style-type: none"> <li>active—VQE-S is receiving the multicast stream.</li> <li>inactive—Channel is successfully initialized, but the VQE-S is not receiving the multicast stream.</li> <li>inoperative—Channel is not operational. For example, it is not configured correctly.</li> </ul>

**Table 4-4 Channel Statistics (continued)**

Field	Description
Received Packets	Number of RTP packets received by the VQE-S for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Lost RTP Packets	Number of RTP packets sent but not received by the VQE-S for this multicast stream. Lost RTP Packets, in general, specifies the number of missing input RTP packets for a channel, as determined by missing sequence numbers. Some lost packets can occur when a channel is first received because a few packets may be dropped internally by the VQE-S in the course of initializing the channel. After the channel has been initialized (typically less than a second delay), further increments in this counter may reflect lost packets in the network between the source of the RTP stream and the VQE-S. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Average Stream Rate (Mbps)	Average megabits per second received by the VQE-S for this multicast stream.
Received Bytes	Number of bytes received by the VQE-S for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
<b>Error Repair Statistics—Generic NACK Messages Received</b>	
Total Messages	Number of NACK messages received by the VQE-S from VQE-C for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Invalid Messages	Number of invalid messages received by the VQE-S from VQE-C for this multicast stream. Invalid messages are received messages that, for example, cannot be parsed. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
<b>Repair Packets</b>	
Requested	Number of RTP packets VQE-Cs have requested for ER <sup>1</sup> for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Sent	Number of RTP packets sent by the VQE-S that have succeeded in repairing an error for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .

Table 4-4 Channel Statistics (continued)

Field	Description
Not Sent	<p>Number of failed RTP packets that were not repaired by the VQE-S for this multicast stream. The VQE-S may not be able to send an ER packet for the following reasons:</p> <ul style="list-style-type: none"> <li>• Most likely cause is that the ER requests were bursty and exceeded the ER rate-policer limit at one point.</li> <li>• Requested RTP packets were not found in the VQE-S memory cache.</li> <li>• VQE-S failed to send the RTP packets because of a socket sendto() failure.</li> </ul> <p>This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a>.</p>
<b>Error Repair Average Rate (packets per second)</b>	
5 second, 5 minute, 1 minute, 15 minute	<p>The average number of packets per second that the VQE-S has sent to VQE-Cs to repair errors for this multicast stream for each time interval. Averages are calculated for ER each time interval over a period of time that is greater than the interval. For example, the 5 second calculation might be an average of 12 five-second intervals over a 1 minute period.</p>
<b>RCC Statistics—RCCs</b>	
Requested	<p>Number of RCC requested for this channel. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a>.</p>
Accepted	<p>Number of RCCs requested for this channel where the VQE-S has accepted the request and sent IPTV packets and other channel data to a VQE-C on the STB. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a>.</p>
Refused	<p>Number of RCCs requested for this channel where the VQE-S refused the request. For example, the VQE-S may refuse an RCC request for the following reasons:</p> <ul style="list-style-type: none"> <li>• If the VQE-S did not find an I-frame that is a suitable starting point for the RCC burst.</li> <li>• If the VQE-S exceeded the output interface bandwidth limit or CPU load limit.</li> <li>• If the CPU load limit is exceeded, the Advanced Channel Debug Stats counter “Refused RCC - no core resources on DP” is displayed when the limit is exceeded.</li> </ul> <p>The Refused RCC counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a>.</p>
Failed	<p>Number of RCCs that have failed. A VQE-C has made an RCC request, and the VQE-S has accepted the request and sent IPTV packets and other channel data to a VQE-C. But the RCC failed. For example, an RCC can fail if the VQE-C stops receiving the packets from the VQE-S earlier than expected. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a>.</p>
<b>RTCP Packets</b>	

**Table 4-4 Channel Statistics (continued)**

Field	Description
Received	Number of RTCP packets received by the VQE-S for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Sent Downstream	Number of RTCP packets that the VQE-S sent downstream for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Sent Upstream	Number of RTCP packets that the VQE-S sent upstream for this multicast stream. This counter is resettable. For information on resetting counters, see the <a href="#">“Resetting VQE-S Counters” section on page 31</a> .
Reduced Size RTCP Received	Number of reduced-size RTCP NACK compound packets sent for this multicast stream.  This field was introduced in Cisco VQE Release 3.5.5.

1. ER = error repair

## Viewing Channel Histograms

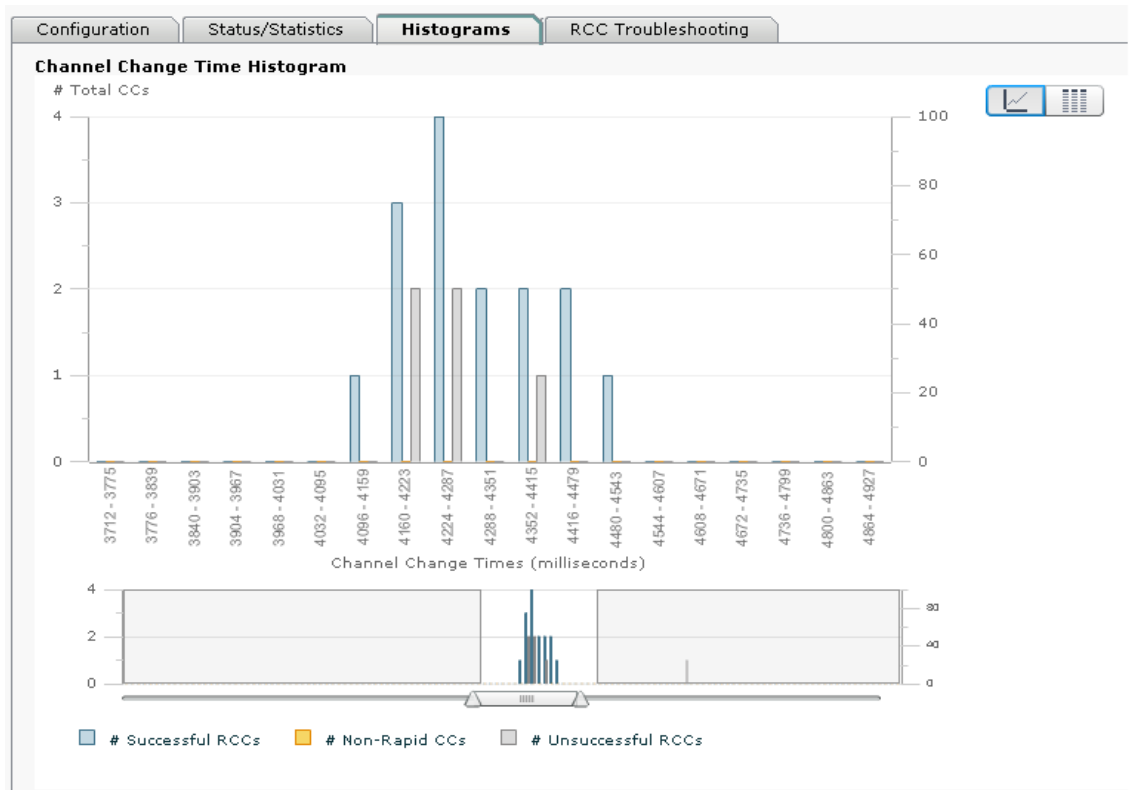
When you click a channel name in the navigation tree and then click the **Histograms** tab, the VQE-S AMT displays the Channel Histograms window (see [Figure 4-6](#)).



### Note

The VQE-S AMT Channel Channel Time histogram is only supported for VQE-C integrations that have implemented the RCC instrumentation as described in the VQE-C System Integration Guide.

**Figure 4-6** Channel Histograms Window



In the Channel Histogram window, the Channel Change Time histogram and table are displayed. The data displayed in the histogram and table include the following:

- Total number of channel changes (CCs) per time bucket.
- Number of successful RCCs for the selected time bucket.
- Number of unsuccessful RCCs for the selected time bucket.
- Number of non-rapid CCs (that is, channel changes where RCC was not requested) for the selected time bucket.

Each time bucket in this histogram represents a subset of channel change times from 0 to 7000 ms. Any channel change times that take longer than 7000 ms are collected in the uppermost bucket.

Move the slider below the histogram to change the way in which the histogram is displayed.

**Note**

The histogram is displayed and populated, regardless of whether RCC is enabled at the VQE-S. If no Multicast Acquisition (MA) XR report (a RTCP XR report block type) is received for a repair session, the histogram is unchanged.

## Viewing RCC Troubleshooting

When you click a channel name in the navigation tree and then click the **RCC Troubleshooting** tab, the VQE-S AMT displays the RCC Troubleshooting window (see [Figure 4-7](#)).

**Figure 4-7** RCC Troubleshooting Window

The screenshot shows the VQE-S Application Monitoring Tool interface. The 'RCC Troubleshooting' tab is selected. The main content area is titled 'Rapid Channel Change Status' and contains a table of 'Rapid Channel Change Errors'. The table has four columns: Client CNAME, Timestamp, Failure Reason, and Failure Detail. There are four rows of data, all showing a failure reason of 'No RCC: no RAP from stream' and a failure detail of 'There are no TSRAPs available for this stream.' A 'Refresh' button is located at the bottom left of the table area.

Client CNAME	Timestamp	Failure Reason	Failure Detail
00-14-f8-e2-d2-11	2009-07-21 11:17:25.957014	No RCC: no RAP from stream	There are no TSRAPs available for this stream.
00-14-f8-e2-d2-11	2009-07-21 11:14:09.599941	No RCC: no RAP from stream	There are no TSRAPs available for this stream.
00-14-f8-e2-d2-11	2009-07-21 11:10:49.403925	No RCC: no RAP from stream	There are no TSRAPs available for this stream.
00-14-f8-e2-d2-11	2009-07-21 11:07:25.486600	No RCC: no RAP from stream	There are no TSRAPs available for this stream.

The RCC Status window has the information listed in [Table 4-5](#).

**Table 4-5** RCC Status

Field	Description
Client CNAME	Identifier for the STB for which the RCC was requested but failed. Typically, the CNAME is the MAC address of the STB.
Timestamp	Time of the event. For example, 2009-07-21 08:42:03.05.
Failure Reason	Specific reason for the failure on either the VQE-S or the VQE-C.
Failure Detail	Additional information about the failure that may be used for debugging purposes.

The table presents the last 20 RCC failures on this channel. To reorder the list of RCC failures, click a column heading. For example, clicking **Timestamp** orders the RCC failures by date and time.

# Monitoring Unicast Retransmission and RCC


**Note**

In VQE-S AMT, Error Repair is the term used for Unicast Retransmission.

Use the VQE-S AMT to view Error Repair and RCC statistics.

## Viewing Error Repair and RCC Configuration

When you click **Error Repair and RCC** in the navigation tree and click the **Configuration** tab, the VQE-S AMT displays the Error Repair and RCC Configuration window (see [Figure 4-8](#)).

**Figure 4-8 Error Repair and RCC Configuration Window**

[Table 4-6](#) lists the information in the Error Repair and RCC Configuration window. Each of the parameters listed in the table can be configured with the VQE Configuration Management System. For information on configuring the VQE-S, see [Chapter 7, “Configuring VQE Server and VQE Tools.”](#)

**Table 4-6 Error Repair and RCC Configuration**

Field	Description
<b>Error Repair/RCC Configuration</b>	
RCC Mode	RCC mode can be aggressive or conservative. This value is configured with the <code>vqe.vqes.rcc_mode</code> parameter in VCDB. For information on this parameter, see <a href="#">Table A-3 on page A-6</a> .
IGMP Join Variability (msec)	Amount of variability (in milliseconds) between the fastest and slowest IGMP joins for RCC. This value is configured with the <code>vqe.vqes.igmp_join_variability</code> parameter. For information on this parameter, see <a href="#">Table A-3 on page A-6</a> .
Excess Bandwidth Fraction	Percent of channel bandwidth that is available on the access link for Unicast Retransmission and RCC. This value is configured with the <code>vqe.vqes.excess_bw_fraction</code> parameter. For information on this parameter, see <a href="#">Table A-4 on page A-9</a> .



**Table 4-6 Error Repair and RCC Configuration (continued)**

Field	Description
Maximum Interval between MPEG RAPs (msec)	Maximum time interval (in milliseconds) between MPEG RAPs <sup>1</sup> for the entire channel lineup. This value is configured with the <code>vqe.vqes.rap_interval</code> parameter in VCDB. For information on this parameter, see <a href="#">Table A-3 on page A-6</a> .
<b>Differentiated Services Code Point Configuration</b>	
RTCP Packets	DCSP value for RTCP packets that the VQE-S sends. This value is configured with the <code>vqe.vqes.rtcp_dscp</code> parameter in VCDB. For information on this parameter, see <a href="#">Table A-1 on page A-2</a> .
Retransmitted RTP Packets	DCSP value for RTP packets that the VQE-S sends. This value is configured with the <code>vqe.vqes.rtp_trans_dscp</code> parameter in VCDB. For information on this parameter, see <a href="#">Table A-1 on page A-2</a> .

1. RAP = random access point.

## Viewing Error Repair and RCC Statistics

When you click **Error Repair and RCC** in the navigation tree and click the **Statistics** tab, the VQE-S AMT displays the Error Repair and RCC Statistics tab (see [Figure 4-9](#)). The statistics are similar to the Error Repair and RCC statistics displayed for individual channels but are for all channels in the current channel lineup.

The ER and RCC statistics are reset to 0 when the VQE-S service restarts or when the channel lineup changes.

Figure 4-9 Error Repair and RCC Statistics Tab

Configuration	Statistics	Excess BW	CC Times	Capacity
<b>Error Repair Statistics</b>				
<b>Generic NACK Messages Received</b>				
Total Messages	464130	Invalid Messages	0	
<b>Repair RTP Packets</b>				
Requested	6310539	Not Sent	3530290	
Sent	2780249			
<b>Inbound Error Repair Request Average Rate (packets per second)</b>				
5 Second	0.000	1 Minute	0.000	
5 Minute	0.000	15 Minute	0.000	
<b>Outbound Error Repair Average Rate (packets per second)</b>				
5 Second	0.000	1 Minute	0.000	
5 Minute	0.000	15 Minute	0.000	
<b>RCC Statistics</b>				
<b>Rapid Channel Changes</b>				
Requested	1	Refused	0	
Accepted	1	Failed	0	
Advanced...	Refresh	Last refresh: Wed Feb 10 2010 15:19:12 GMT+0000 (GMT Standard Time)		
Reset	Restore	Last reset: Never		

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Table 4-7 lists the information in the Error Repair and RCC Statistics window.

Table 4-7 Error Repair and RCC Statistics

Field	Description
<b>Generic NACK Messages Received</b>	
Total Messages	Number of NACK messages received by this VQE-S from the VQE-Cs. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
Invalid Messages	Number of invalid messages received by this VQE-S from VQE-Cs. Invalid messages are received messages that, for example, cannot be parsed. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
<b>Repaired RTP Packets</b>	
Requested	Number of RTP packets VQE-Cs have requested for ER from this VQE-S. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.

**Table 4-7 Error Repair and RCC Statistics (continued)**

<b>Field</b>	<b>Description</b>
Sent	Number of RTP packets sent by this VQE-S that have succeeded in repairing an error. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
Not Sent	Number of failed RTP packets that were not repaired by the VQE-S. The VQE-S may not be able to send an ER packet for several reasons, among them: <ul style="list-style-type: none"> <li>• Most likely cause is that the ER requests were bursty and exceeded the ER rate-policer limit at one point.</li> <li>• Requested RTP packets were not found in the VQE-S memory cache.</li> <li>• VQE-S failed to send the RTP packets because of a socket sendto() failure.</li> </ul> The Repaired RTP Packets Not Sent counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
<b>Inbound and Outbound Error Repair Average Rate (packets per second)</b>	
5 second, 5 minute, 1 minute, 15 minute	For each time period, the average number of packets per second that the VQE-S has received (inbound) or sent (outbound) to VQE-Cs to repair errors (Unicast Retransmission).
<b>RCC Statistics—Rapid Channel Changes</b>	
Requested	Number of RCCs requested for this channel. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
Accepted	Number of RCCs requested for this channel where the VQE-S has accepted the request and sent IPTV packets and other channel data to a VQE-C on the STB. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.

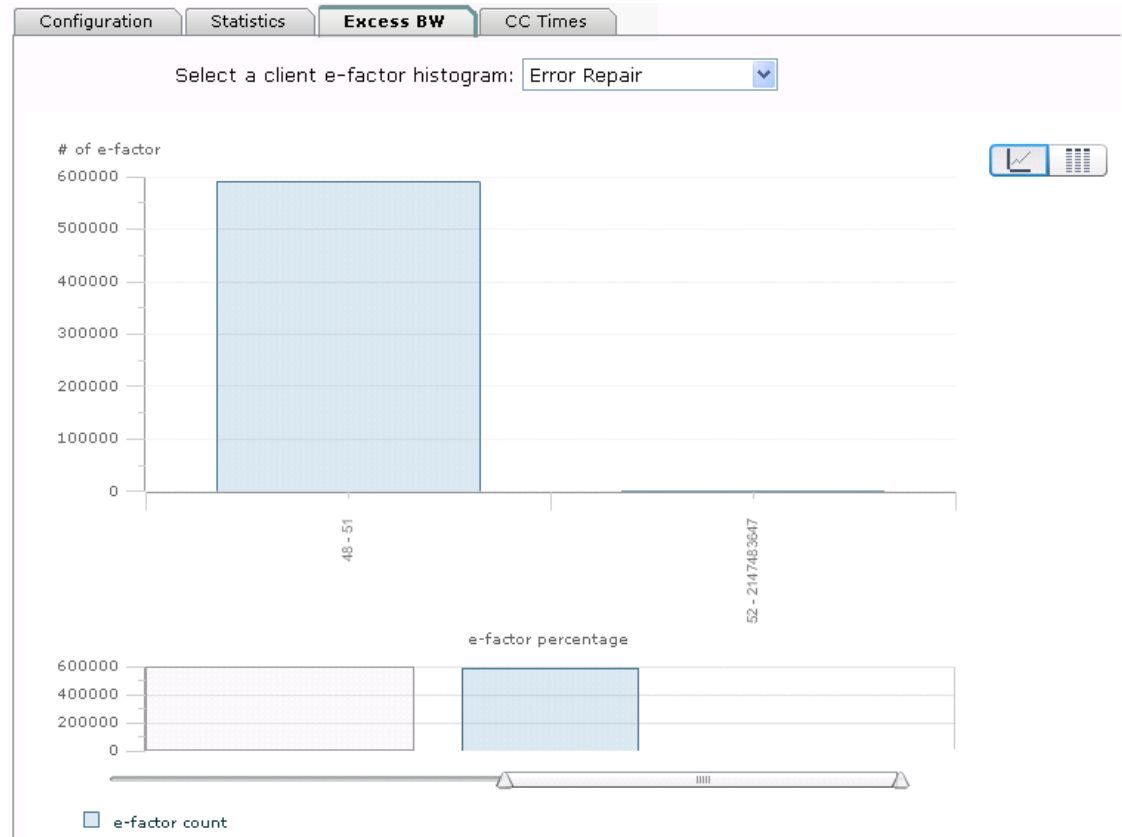
**Table 4-7 Error Repair and RCC Statistics (continued)**

<b>Field</b>	<b>Description</b>
Refused	<p>Number of RCCs requested for this channel where the VQE-S has refused the request. For example, the VQE-S may refuse an RCC request for the following reasons:</p> <ul style="list-style-type: none"> <li>• VQE-S did not find an I-frame that is a suitable starting point for the RCC burst.</li> <li>• VQE-S exceeded the output interface bandwidth limit or CPU load limit.</li> <li>• CPU load limit is exceeded, the Advanced Channel Debug Stats counter “Refused RCC - no core resources on DP” shows when the limit is exceeded.</li> </ul> <p>This RCCs Refused counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.</p>
Failed	<p>Number of RCCs that have failed. A VQE-C has made an RCC request, and the VQE-S has accepted the request and sent IPTV packets and other channel data to a VQE-C but the RCC failed. For example, an RCC can fail if the VQE-C stopped receiving RCC packets from the VQE-S earlier than was expected.</p> <p>This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.</p>

## Viewing Excess Bandwidth

When you click **Error Repair and RCC** in the navigation tree and click the **Excess BW** tab, the VQE-S AMT displays the Excess BW window (see [Figure 4-10](#)).

**Figure 4-10** Excess BW Window



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If Error Repair or RCC is enabled and active, you can choose to display a client e-factor histogram or table by clicking the icons in the upper right corner of the window. Use the Select a client e-factor histogram drop-down menu to select Error Repair or RCC histograms.

An e-factor is an excess bandwidth fraction that determines the rate at which packets are sent during Error Repair and RCC. The data displayed in the histograms and tables include the following:

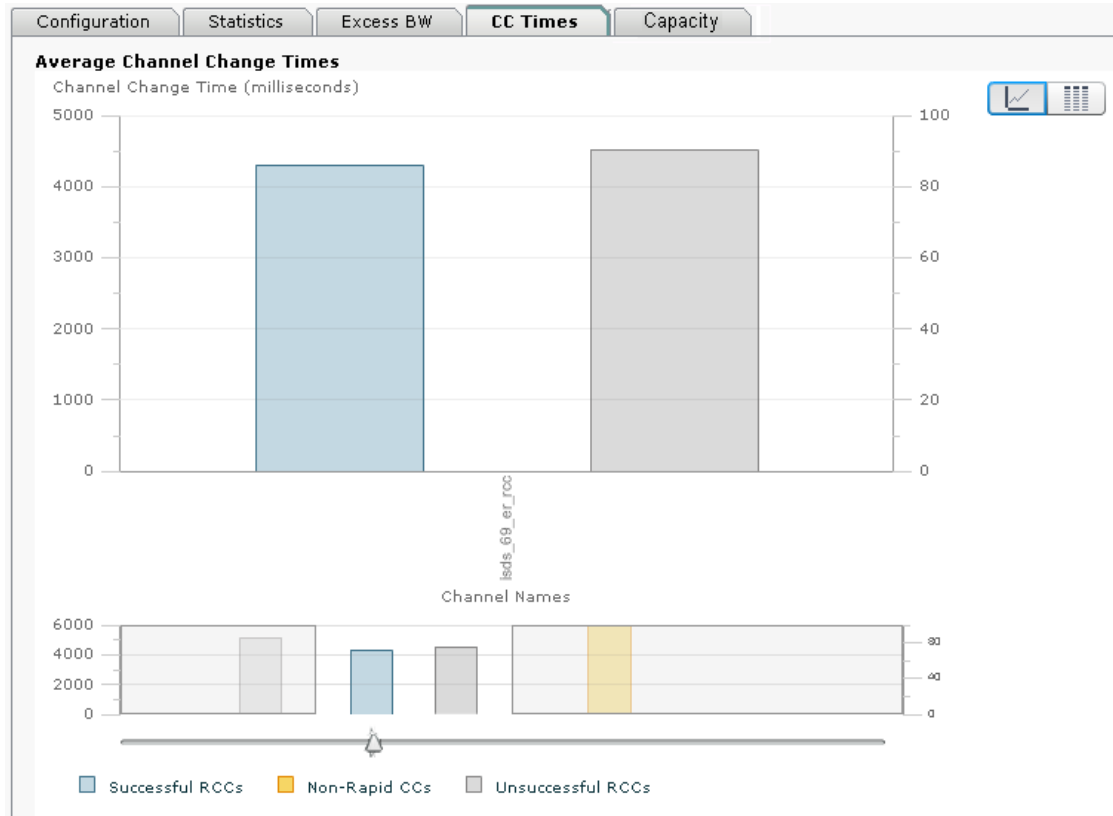
- E-factor count with the number of times a client e-factor has been calculated. This appears on the vertical axis in the histograms.
- E-factor distribution of the client e-factor percentages that have been used. This appears on the horizontal axis in the histograms. If the distribution is widely dispersed, there can be more than one grouping of percentages.

Move the slider below the histograms to change the way in which the histograms are displayed. The e-factor percentages cannot be negative values.

## Viewing Channel Change Times

When you click **Error Repair and RCC** in the navigation tree and click the **CC Times** tab, the VQE-S AMT displays the CC Times window (see [Figure 4-11](#)).

**Figure 4-11** Channel Change Times Window



In this window, the Average Channel Change Time histogram and table are displayed. The data displayed in the histogram and table includes the following:

- Average channel change time in milliseconds for each channel on the VQE-S for the following three categories:
  - Successful RCCs
  - Unsuccessful RCCs
  - Non-rapid CC (that is, channel changes where RCC was not requested).

The data displayed is based on the last 100 successful channel changes where RCC was enabled, the last 100 unsuccessful change changes where RCC was enabled, and the last 100 channel changes where RCC was disabled.

Move the slider below the histogram to change the way in which the histogram is displayed.

## Viewing Error Repair and RCC Capacity Statistics

When you click **Error Repair and RCC** in the navigation tree and click the **Capacity** tab, the VQE-S AMT displays the Error Repair and RCC Capacity tab (Figure 4-12). The VQE-S provides capacity statistics to indicate when Unicast Retransmission and RCC capacity limits have been exceeded.

The ER and RCC capacity counters and statistics are reset to 0 when the VQE-S service restarts or when the channel lineup changes.

**Figure 4-12** Error Repair and RCC Capacity Tab

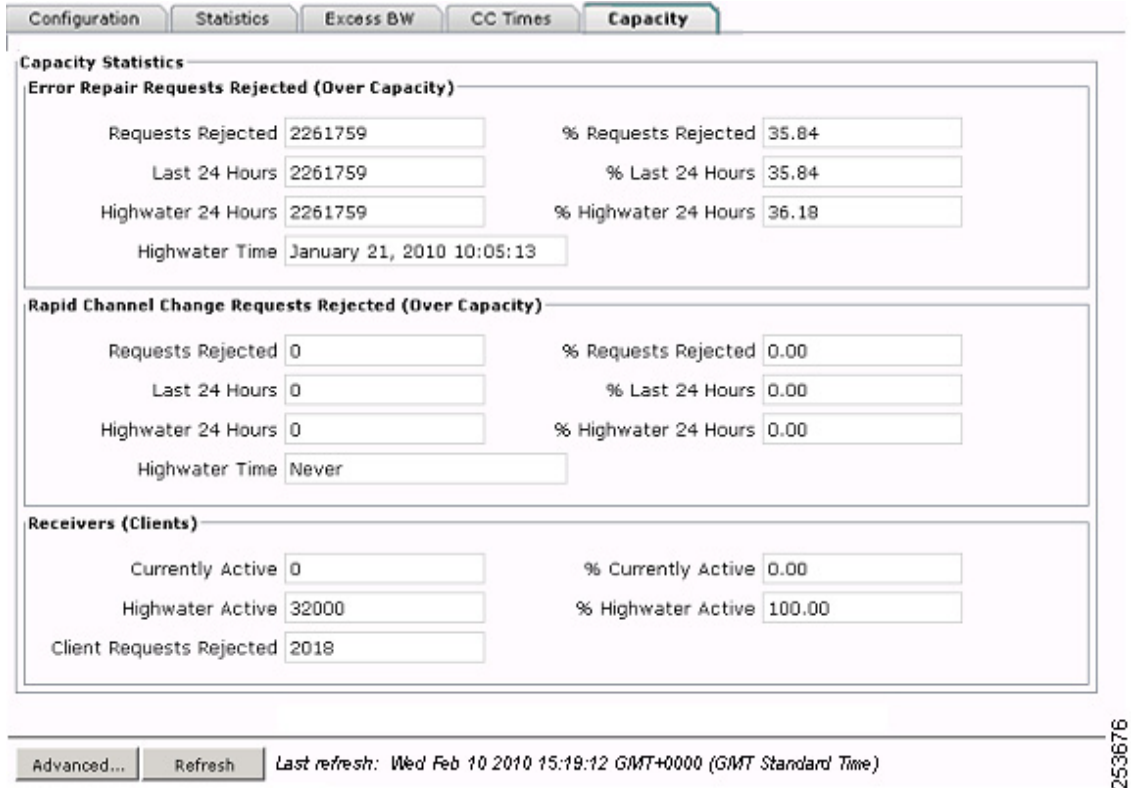


Table 4-8 lists the information presented in the Error Repair and RCC Capacity tab.

**Table 4-8** Error Repair and RCC Capacity Statistics

Field	Description
<b>Error Repair Requests Rejected (Over Capacity)</b>	
Requests Rejected	Number of ER requests rejected due to ER capacity limits being exceeded since the VQE-S service was last started. For information on the maximum number of ER requests and the maximum number of output ER packets, see <a href="#">Table H-3 on page H-2</a> . This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.

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**Table 4-8 Error Repair and RCC Capacity Statistics (continued)**

Field	Description
% Requests Rejected	Percentage of ER requests rejected due to ER capacity limits being exceeded out of the total number of ER requests received. For information on the maximum number of ER requests and the maximum number of output ER packets, see <a href="#">Table H-3 on page H-2</a> . This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
Last 24 Hours	Number of ER requests rejected in the last 24 hours due to ER capacity limits being exceeded. For information on the maximum number of ER requests and the maximum number of output ER packets, see <a href="#">Table H-3 on page H-2</a> .
% Last 24 Hours	Percentage of ER requests rejected in the last 24 hours due to ER capacity limits being exceeded out of the total number of ER requests received during that same 24 hour period. For information on the maximum number of ER requests and the maximum number of output ER packets, see <a href="#">Table H-3 on page H-2</a> .
Highwater 24 Hours	Highest number of ER requests rejected during any 24 hour period due to ER capacity limits being exceeded. For information on the maximum number of ER requests and the maximum number of output ER packets, see <a href="#">Table H-3 on page H-2</a> .
% Highwater 24 Hours	Percentage of ER requests rejected during the highest 24 hour period due to ER capacity limits being exceeded out of the total number of ER requests received during that same 24 hour period. For information on the maximum number of ER requests and the maximum number of output ER packets, see <a href="#">Table H-3 on page H-2</a> .
Highwater Time	Date and time when the highwater mark was reached.
<b>RCC Requests Rejected (Over Capacity)</b>	
Requests Rejected	Number of RCC requests rejected due to RCC capacity limits being exceeded since the VQE-S service was last started. For information on the allocation of egress bandwidth to servicing RCC requests, see the <a href="#">“Scaling and Performance Summary”</a> section on page H-2. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
% Requests Rejected	Percentage of RCC requests rejected due to RCC capacity limits being exceeded out of the total number of RCC requests received. For information on the allocation of egress bandwidth to servicing RCC requests, see the <a href="#">“Scaling and Performance Summary”</a> section on page H-2. This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.
Last 24 Hours	Number of RCC requests rejected in the last 24 hours due to RCC capacity limits being exceeded. For information on the allocation of egress bandwidth to servicing RCC requests, see the <a href="#">“Scaling and Performance Summary”</a> section on page H-2.
% Last 24 Hours	Percentage of RCC requests rejected in the last 24 hours due to RCC capacity limits being exceeded out of the total number of RCC requests received during that same 24 hour period. For information on the allocation of egress bandwidth to servicing RCC requests, see the <a href="#">“Scaling and Performance Summary”</a> section on page H-2.



**Table 4-8 Error Repair and RCC Capacity Statistics (continued)**

Field	Description
Highwater 24 Hours	Highest number of RCC requests rejected during any 24 hour period due to RCC capacity limits being exceeded. For information on the allocation of egress bandwidth to servicing RCC requests, see the <a href="#">“Scaling and Performance Summary”</a> section on page H-2.
% Highwater 24 Hours	Percentage of RCC requests rejected during the highest 24 hour period due to RCC capacity limits being exceeded out of the total number of RCC requests received during that same 24 hour period. For information on the allocation of egress bandwidth to servicing RCC requests, see the <a href="#">“Scaling and Performance Summary”</a> section on page H-2.
Highwater Time	Date and time when the highwater mark was reached.
<b>Receivers (Clients)</b>	
Currently Active	Number of receivers currently active on the VQE-S.
% Currently Active	Percentage of receivers currently active on the VQE-S out of the total number of allowed receivers. For information on the maximum number of simultaneous receivers, see <a href="#">Table H-3 on page H-2</a> .
Highwater Active	Highest number of receivers simultaneously active on the VQE-S.
% Highwater Active	Percentage of receivers simultaneously active at the highwater mark out of the total number of allowed receivers. For information on the maximum number of simultaneous receivers, see <a href="#">Table H-3 on page H-2</a> .
Client Requests Rejected	Number of client requests rejected due to the maximum number of simultaneous receivers being exceeded. For information on the maximum number of simultaneous receivers, see <a href="#">Table H-3 on page H-2</a> . This counter is resettable. For information on resetting counters, see the <a href="#">Resetting VQE-S Counters</a> section.

# Monitoring Interfaces

When you click **Interfaces** in the navigation tree, the VQE-S AMT displays three tables associated with the CDE110 Ethernet and bond interfaces: the Interface Summary Table, the Input Bandwidth Table, and the Multicast Group Table. [Figure 4-13](#) shows these tables. (In [Figure 4-13](#), some channels in the Multicast Group Table have been omitted.)

**Figure 4-13** Interface-related Tables

The screenshot shows the VQE-S Application Monitoring Tool interface. It contains three tables:

Interface Summary Table				
I/F Name	IP Address	Status	Role	Max BW (Mbps)
bond1	18.17.1.2	up	Ingest, Management	2000
bond2	18.18.1.2	up	Service, Management	2000
eth1	18.86.61.26	up	Management	1000
eth2	(bond1)	up	(bond1)	1000
eth3	(bond1)	up	(bond1)	1000
eth4	(bond2)	up	(bond2)	1000
eth5	(bond2)	up	(bond2)	1000
eth6	13.3.20.2	up	Service	1000

Input Bandwidth Table				
I/F Name	Max Input BW (Mbps)	Reserved Input BW	Available Input BW (Mbps)	Multicast Group Count
bond1	2000	20%	508	202

Multicast Group Table				
Multicast Address	I/F Name	Source Filter	Used Input BW (Mbps)	
229.1.1.1	bond1	9.3.13.2	4.0	
229.1.1.2	bond1	9.3.13.2	4.0	
229.1.1.3	bond1	9.3.13.2	4.0	
229.1.1.4	bond1	9.3.13.2	4.0	
229.1.1.5	bond1	9.3.13.2	2.0	

[Table 4-9](#) lists the information presented in the Interface Summary Table (shown in [Figure 4-13](#)). The information is about the Ethernet and bond interfaces on the Cisco CDE110 that are currently configured for the VQE-S ingest and services traffic.

**Table 4-9** Interface Summary Table

Column	Description
I/F Name	Name that is assigned to the Ethernet interface or bond interface by Linux. For information on these names, see <a href="#">“Configuring the Linux Operating System for the VQE-S”</a> section on page D-3.
IP Address	IP address of one of the following interfaces: <ul style="list-style-type: none"> <li>If this interface is an Ethernet interface and it does not belong to a bond interface, the IP address assigned to the Ethernet interface is displayed.</li> <li>If this interface is an Ethernet interface and it belongs to a bond interface, the bond interface name is displayed.</li> <li>If this interface is a bond interface, the IP address assigned to the bond interface is displayed.</li> </ul>
Status	Interface is either up or down.

**Table 4-9** *Interface Summary Table (continued)*

Column	Description
Role	One or more of the following: <ul style="list-style-type: none"> <li>• Ingest—Used for traffic for multicast streams from the upstream video sources.</li> <li>• Service—Used for the VQE-S services traffic (Unicast Retransmission and RCC) to the downstream VQE-Cs on the STBs.</li> <li>• Management—Used for the VQE-S management traffic to the management network.</li> <li>• Bond interface name—Used for Ethernet interfaces that are members of a bond interface. Displays the bond interface name.</li> </ul>
Max BW (Mbps)	Maximum speed of the interface.

Table 4-10 lists information about the Input Bandwidth Table shown in Figure 4-13. The table provides information on the Ethernet interfaces or bond interfaces currently being used for VQE-S ingest traffic. The interfaces listed in this table are currently under the control of the VQE-S Multicast Load Balancer.

Multicast Load Balancer distributes traffic for incoming multicast streams over the Ethernet interfaces that are configured for ingest. If a bond interface is used for ingest traffic, the Multicast Load Balancer distributes traffic over the Ethernet interfaces that are members of the bond interface. The interfaces must be correctly configured and operational (up) to participate in this load balancing. The Multicast Load Balancer determines the best interface on which to join or leave the multicast group, distributing the joins across available interfaces to avoid oversubscription. It also monitors the status of these interfaces, moving the streams to other interfaces in case of interface failure.

**Table 4-10** *Input Bandwidth Table*

Column	Description
I/F Name	Name of the interface that is being used for receiving multicast streams.
Max Input BW (Mbps)	Maximum speed of the interface.
Reserved Input BW	Percentage of maximum input bandwidth that has been reserved for all non-ingest traffic and is not be used for receiving multicast streams. The VCDB parameter <code>vqe.vqes.unicast_reservation</code> specifies this percent. <ul style="list-style-type: none"> <li>• If the interface is used for both VQE-S ingest and VQE-S services, the reservation should include sufficient bandwidth for receiving Unicast Retransmission and RCC requests, RTCP reports from the STBs, and control traffic, such as IGMP and RTCP.</li> <li>• If the interface is used for ingest only, the reservation should include sufficient bandwidth for incoming control traffic, such as IGMP and RTCP.</li> </ul>

**Table 4-10** *Input Bandwidth Table (continued)*

Column	Description
Available Input BW (Mbps)	Interface bandwidth that is available for ingest of multicast streams but that is not currently being used. Initially, when no multicast streams are being received by this interface, this value is equal to Max Input BW minus Reserved Input BW.
Multicast Group Count	Number of multicast streams that are currently being received by the interface.

[Table 4-11](#) lists the information about the Multicast Group Table shown in [Figure 4-13](#). The table provides information about the multicast streams currently being received by this VQE-S.

**Table 4-11** *Multicast Group Table*

Column	Description
Multicast Address	Destination IP address for this multicast group.
I/F Name	Name of the interface that is being used for receiving this multicast stream.
Source Filter	Source IP address of the multicast group's sender.
Used Input Bandwidth (Mbps)	Receive bandwidth consumed on this interface by receiving this multicast steam. This bandwidth is specified in the channel definition (for example, in the Bit Rate field of the VCPT).

## Monitoring RTCP Exporter

When you click **RTCP Exporter** in the navigation tree and click the **Configuration** tab, the VQE-S AMT displays the VQE-S RTCP Exporter parameters. RTCP Exporter currently has no parameters that can be configured with the VQE-S AMT, and the parameters are for viewing only. For information on configuring RTCP Exporter, see the [“Configuring the VQE-S RTCP Exporter”](#) section on page 2-42.

When you click **RTCP Exporter** in the navigation tree and click the **Statistics** tab, the VQE-S AMT displays the RTCP Exporter Statistics window (see [Figure 4-14](#)).

**Figure 4-14** RTCP Exporter Statistics Window

[Table 4-12](#) lists the information presented in the RTCP Exporter Statistics window.

**Table 4-12** RTCP Exporter Statistics

Field	Description
<b>VQM Application Configuration</b>	
VQM Host	IP address of the host on which the video-quality monitoring (VQM) application resides.
VQM TCP Port	TCP port number on which the VQM application listens for video quality data from RTCP Exporter.
Enabled	Either true (enabled) or false (not enabled).
Filtering NACKs	Either true (enabled) or false (not enabled). If enabled, RTCP NACK compound packets are not sent to the VQM application. This field was introduced in Cisco VQE Release 3.5.5.
Configuration Status	Either enabled or not enabled. It is possible for the value in the Enabled field to be true, and the value in the Configuration Status field to be not enabled (for example, if the host IP address or TCP port are not valid).
Operational Status	Message providing information on the operational status of RTCP Exporter.
<b>RTCP Exporter Stats</b>	
Packets Exported	Number of RTCP compound packets that have been exported to a VQM host.

**Table 4-12** RTCP Exporter Statistics

Field	Description
Packets Dropped	Number of RTCP compound packets that have been dropped rather than exported to a VQM host. In heavy load situations, RTCP Exporter may intentionally drop RTCP packets.  Details on dropped packets (number of dropped packets and the position and time where this loss occurred) is contained in the collection of reports exported by this VQE-S.
NACKs Filtered	Number of RTCP NACK compound packets omitted from the RTCP data sent to the VQM application.  This field was introduced in Cisco VQE Release 3.5.5.

For information on RTCP Exporter and the video-quality monitoring application, see the “[VQE-S RTCP Exporter for Video-Quality Monitoring](#)” section on page 1-23.

## Monitoring the STUN Server

When you click **STUN Server** in the navigation tree, the VQE-S AMT displays the STUN Server Statistics window (see [Figure 4-15](#)).

**Figure 4-15** STUN Server Statistics Window

The screenshot shows the 'STUN Server Statistics' window with the following data:

Total Requested	0	Response Failed	0
Successfully Sent	0	Sent Failed	0

Buttons: Advanced..., Refresh

Last refresh: Wed Feb 10 2010 15:19:12 GMT+0000 (GMT Standard Time)

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[Table 4-13](#) lists information displayed in the STUN Server Statistics window.

**Table 4-13** STUN Server Statistics

Field	Description
Total Requested	Number of STUN binding requests that the VQE-C STUN Client sent to the STUN Server.
Successfully Sent	Number of responses to STUN binding requests that the STUN Server successfully sent to the VQE-C STUN Client.
Response Failed	Number of instances in which the STUN Server fails to generate a binding response because of an internal error.
Sent Failed	Number of instances in which the STUN Server successfully generates a binding response but fails to send it to the VQE-C STUN Client (for example, because of a socket error).

## Resetting VQE-S Counters

The VQE-S maintains a set of counters for debugging purposes. A subset of counters can be manually reset from the VQE-S AMT GUI. The results of this action are visible to all AMT users, even those in separate AMT browser sessions. The **Reset** button is located on the **Statistics** tab of the **Error Repair and RCC** window, and resets all counters displayed in [Table 4-14](#) to zero.

**Table 4-14**     *Resettable VQE-S AMT counters*

Category	Counter
<b><i>Error Repair and RCC counters on Statistics tab</i></b>	
Generic NACK Messages Received	<ul style="list-style-type: none"> <li>• Total Messages</li> <li>• Invalid Messages</li> </ul>
Repaired RTP Packets	<ul style="list-style-type: none"> <li>• Requested</li> <li>• Sent</li> <li>• Not Sent</li> </ul>
RCC	<ul style="list-style-type: none"> <li>• Requested</li> <li>• Accepted</li> <li>• Refused</li> <li>• Failed</li> </ul>
<b><i>Capacity counters on Capacity tab</i></b>	
Capacity Statistics	<ul style="list-style-type: none"> <li>• Error Repair Requests Rejected (Over Capacity)—Requests Rejected</li> <li>• Error Repair Requests Rejected (Over Capacity)—% Requests Rejected</li> <li>• RCC Requests Rejected (Over Capacity)—Requests Rejected</li> <li>• RCC Requests Rejected (Over Capacity)—% Requests Rejected</li> <li>• Receivers (Clients)—Client Requests Rejected</li> </ul>
<b><i>Channel counters on Statistics/Status tab</i></b>	
Channel Input Stream	<ul style="list-style-type: none"> <li>• Received packets</li> <li>• Received bytes</li> <li>• Lost RTP Packets</li> </ul>
Error Repair—Generic NACK Messages Received	<ul style="list-style-type: none"> <li>• Total Messages</li> <li>• Invalid Messages</li> </ul>
Error Repair—Repaired RTP Packets	<ul style="list-style-type: none"> <li>• Requested</li> <li>• Sent</li> <li>• Not Sent</li> </ul>

**Table 4-14** *Resettable VQE-S AMT counters (continued)*

Category	Counter
RCC	<ul style="list-style-type: none"> <li>• Requested</li> <li>• Accepted</li> <li>• Refused</li> <li>• Failed</li> </ul>
RTCP Packets	<ul style="list-style-type: none"> <li>• Received</li> <li>• Sent Downstream</li> <li>• Sent Upstream</li> </ul>



**Note** When one user resets the subset of counters displayed in [Table 4-13](#), this change is reflected for all other users on performing a refresh of the VQE-S AMT GUI.

To reset counters, do the following:

- 
- Step 1** In the VQE-S AMT navigation tree, click the **Error Repair and RCC** node.  
The **Configuration** tab is displayed on the **Error Repair and RCC** window.
- Step 2** On the Error Repair and RCC window, click the Statistics tab.  
The **Reset** button is displayed on the Statistics tab.
- Step 3** Click **Reset**.  
The values of all counters listed in [Table 4-13](#) are reset to zero. The last reset timestamp is updated to display the current time.
- 

## Restoring VQE-S Counters

Following a reset of the subset of counters listed in [Table 4-14](#), you can restore counters from the VQE-S AMT GUI to display their cumulative value since the last start of the VQE-S service.



**Note** When one user restores the subset of counters displayed in [Table 4-14](#) to their cumulative value, this change is reflected for all users on performing a refresh of the VQE-S AMT GUI.

To reset counters, do the following:

- 
- Step 1** In the VQE-S AMT navigation tree, click the **Error Repair and RCC** node.  
The Configuration tab is displayed on the Error Repair and RCC window.
- Step 2** On the Error Repair and RCC window, click the **Statistics** tab.  
The Restore button is displayed on the Statistics tab.
- Step 3** Click **Restore**.



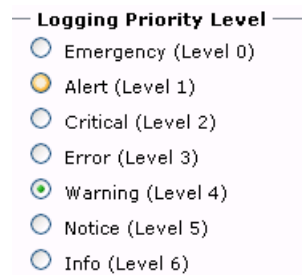
All counters that were reset now display their cumulative value. The last reset timestamp is updated to display the text *never*.

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## Change VQE-S Logging

When you click **Logging** in the navigation tree, the VQE-S AMT displays the logging priority levels (Figure 4-16) for the VQE-S. The priority levels allow you to control the logging level for system messages for all VQE-S processes (Process Monitor, Control Plane, Data Plane, and Multicast Load Balancer). By default, all VQE-S system messages are written to the file `/var/log/vqe/vqe.log`. In addition, you can send system messages to remote servers for centralized logging. For information on configuring remote syslog servers, see the “[Remote Syslog Hosts](#)” section on page 2-28.

**Figure 4-16** Logging Priority Levels



To change a VQE-S logging priority level, click the button next to the appropriate level and click **Apply**.

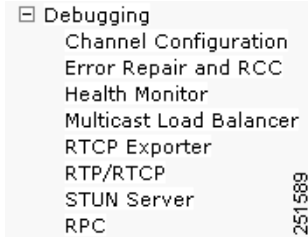
In VQE-S AMT, the logging priority levels are listed from least verbose to most verbose. The Emergency level generates the smallest number of messages, and the Info level generates the greatest number of messages. The default value is Warning.

When you select a logging level, log messages are generated for the levels below that level. For example, when the level is set to Error, messages are generated for Emergency, Alert, Critical, and Error.

The selected logging priority level does not persist when the VQE-S is stopped. When the VQE-S restarts, the logging priority level goes back to the default (Warning). To set a logging priority level that does persist, use the VQE-S parameter `vqe.vqes.log_priority`. For information on this parameter, see [Table A-1 on page A-2](#).

## Change VQE-S Debugging

When you click **Debugging** in the navigation tree and click a debug component, the debugging options for that component are displayed. [Figure 4-17](#) shows the debug components. The options allow you to control the types of debugging messages that are written to the syslog file. By default, debug messages are written to the file `/var/log/vqe/vqe.log`.

**Figure 4-17** Debug Components

To change VQE-S debugging, follow these steps:

- Step 1** In the VQE-S AMT navigation tree, click the + sign next to **Debugging** and click the component for which you want to configure debug messages.

The debug flags and filters for that component are displayed.

For example, [Figure 4-18](#) shows the flags and filters for the RTP/RTCP category.

**Figure 4-18** RTP/RTCP Flags and Filters

A screenshot of the 'Debug Flags' configuration page for RTP/RTCP. The page has a title 'Debug Flags' and a table with three columns: 'Debug Flag Name', 'On/Off', and 'Filter Status'. Below the table is a 'Debug Filters' section with radio buttons for 'None', 'Multicast IP', and 'Client IP'. The 'None' option is selected. There are input fields for IP addresses and a 'Port' field. At the bottom, there are 'Apply' and 'Refresh' buttons, and a timestamp 'Last refresh: Thu Aug 09 14:54:59 2007'. A vertical number '208272' is visible on the right side.

Debug Flag Name	On/Off	Filter Status
RTP_DEBUG_VERBOSE	<input type="checkbox"/>	<input type="checkbox"/>
RTP_DEBUG_ERRORS	<input type="checkbox"/>	<input type="checkbox"/>
RTP_DEBUG_EVENTS	<input type="checkbox"/>	<input type="checkbox"/>
RTP_DEBUG_PACKETS	<input type="checkbox"/>	<input type="checkbox"/>

Debug Filters

None

Multicast IP:  .  .  .  Port:

Client IP:  .  .  .

Apply Refresh Last refresh: Thu Aug 09 14:54:59 2007

**Note**

In the debug filters for the STUN Server, only the Client IP filter is supported. The Multicast IP filter is not supported because the STUN Server has no knowledge of channels. Filtering on the Client IP address provides debug messages for the specified client.

- Step 2** To enable a debugging flag, click the check box in the On/Off column. To disable an enabled flag, click the check box in the On/Off column to uncheck it.

**Note**

For the next step, be aware that not all debug flags support debug filters (in the Filter Status column). If debug filters are not supported, the check box next to the flag is grayed out.

- Step 3** To filter debugging messages by a specific channel or VQE-C for an enabled debugging flag, do the following:

- a. In the Filter Status column, click the check box for the option.
- b. In the Debug Filters section, click either **Multicast IP** or **Client IP**:
  - For Multicast IP, enter the channel source stream IP address and (RTP/UDP) port number.
  - For Client IP, enter the VQE-C IP address.

**Step 4** Click **Apply**.

The selected debugging options are enabled.

The selected debugging options do not persist when the VQE-S is stopped. When the VQE-S restarts, debugging goes back to the default—no options are enabled.

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