



# CHAPTER 12

## Monitoring Your Network

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The ACE Appliance Device Manager Monitor function allows you to monitor key areas of system usage. The following functionality is provided under the Monitor tab:

- [Error Monitoring, page 12-2](#)
- [Graphing Data, page 12-3](#)
- [Monitoring Load Balancing, page 12-5](#)
- [Monitoring the CPU, page 12-5](#)
- [Monitoring Application Acceleration and Optimization Statistics, page 12-6](#)
- [Monitoring Interfaces, page 12-7](#)
- [Monitoring Real Servers, page 12-8](#)
- [Setting Up Virtual Contexts Statistics Collection, page 12-10](#)
- [Monitoring Probes, page 12-10](#)
- [Displaying Resource Usage, page 12-11](#)
- [Testing Ping, page 12-14](#)



### Note

To troubleshoot problems related to the ACE appliance, use the **debug** and **show** commands supported in the command line interface (CLI). For a list of the ACE appliance **show** commands, see the *Cisco 4700 Series Application Control Engine Appliance Command Reference*. For more detailed descriptions of hardware and software show commands, see the *Cisco 4700 Series Application Control Engine Appliance Administration Guide*.

### Prerequisite

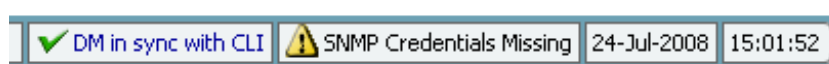
Before using the Monitoring functions, you must:

- Enable monitoring on the virtual contexts or servers (see [Setting Up Virtual Contexts Statistics Collection, page 12-10](#) and [Monitoring Probes, page 12-10](#) or the *Cisco 4700 Series Application Control Engine Appliance Administration Guide*).
- Ensure that you allow the SNMP protocol and enter the v2c community string in the **Config > System > Primary Attributes** page.
- Select the virtual context you want to monitor. This step is reflected in the monitoring procedures as part of selecting your task; such as **Monitor > Virtual Contexts > context > Load Balancing**.

# Error Monitoring

Error monitoring displays virtual context-specific runtime polling state error messages in the bottom right status bar of the DM GUI (see [Figure 12-1](#)). [Table 12-1](#) lists the polling states and actions required to resolve them. DM and CLI synchronization status messages also display in this same location for the active context.

**Figure 12-1** Polling State Message Location



**Table 12-1** Polling Error States

Polling States	Action Required
Polling Started	No action required. Everything is working properly. Polling states will display activity. This state is not displayed in the interface.
SNMP Credentials Missing	SNMP credentials are not configured for this virtual context; therefore, statistics are not collected. Add the SNMP v2c credentials to fix this error.
Polling Timed Out	SNMP polling has timed out. This may occur if the wrong credentials were configured or may be caused by an internal error (such as SNMP protocol configured incorrectly or destination is not reachable). Verify that SNMP credentials are correct. If the problem persists, enable the SNMP collection again.
Polling Failed	SNMP polling failed due to some internal error. Try enabling the SNMP collection again.
Not Polled	SNMP polling has not started. This happens when the virtual context is first created from ACE Appliance Device Manager and the SNMP credentials are not configured. Add the SNMP v2c credentials to fix this error.
Unknown	SNMP polling is not working due to one of the above-mentioned conditions. Check the SNMP v2c credential configuration.

These states are only applicable for the SNMP polling done per virtual context. Statistics collected for the ACE Appliance Device Manager processes (shown under Admin > Device Management) are not collected via SNMP.

## Related Topics

- [Viewing Virtual Context Synchronization Status, page 2-51](#)
- [Monitoring ACE Appliance Statistics, page 13-32](#)

# Graphing Data

Monitor graphs offer many options including graph type, viewing raw data, graph layout, and values to be included. [Table 1-7](#) identifies these options and their associated buttons. When viewing a graph, click the button to select the option. ACE Appliance Device Manager displays graph data in GMT.

[Figure 12-2](#) is an example of a helpful monitor graph that uses the value delta per time option. Use this type of graph to display data points over a specific time period. For example, if ACE Appliance Device Manager has polled data1 at time1, data2 at time2, and data3 at time3, there are two points plotted on the graph, the first point being data2 minus data1 at time2, data3 minus data2 at time3.

The value delta per time option is not rate calculation. The significance of this feature is more apparent for large stats values as illustrated using the following graphs. [Figure 12-3](#) is the regular stats graph. Because the value of the statistics is large, and the graph always starts at 0 on the y-axis, the granular of the stats change over time is lost because of the scale of the y-axis. [Figure 12-2](#) is the value delta per time graph for the same values. Because only the difference between the values are considered, the change over time is more dramatic and easier to read. The advantage of the value delta per time graph over the regular stats graph is diminished when the statistics in question are smaller values.

**Note**

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On the ACE, statistics are kept for 7 days or 20,000 hourly records, whichever comes first. The duration it takes to reach 20,000 hourly records is determined by the number of contexts, interfaces and real servers configured. The “All dates” graph provides all available data in the database, up to the above mentioned numbers. An ACE reboot will reset the statistics database.

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Figure 12-2 Value Delta Per Time Graph

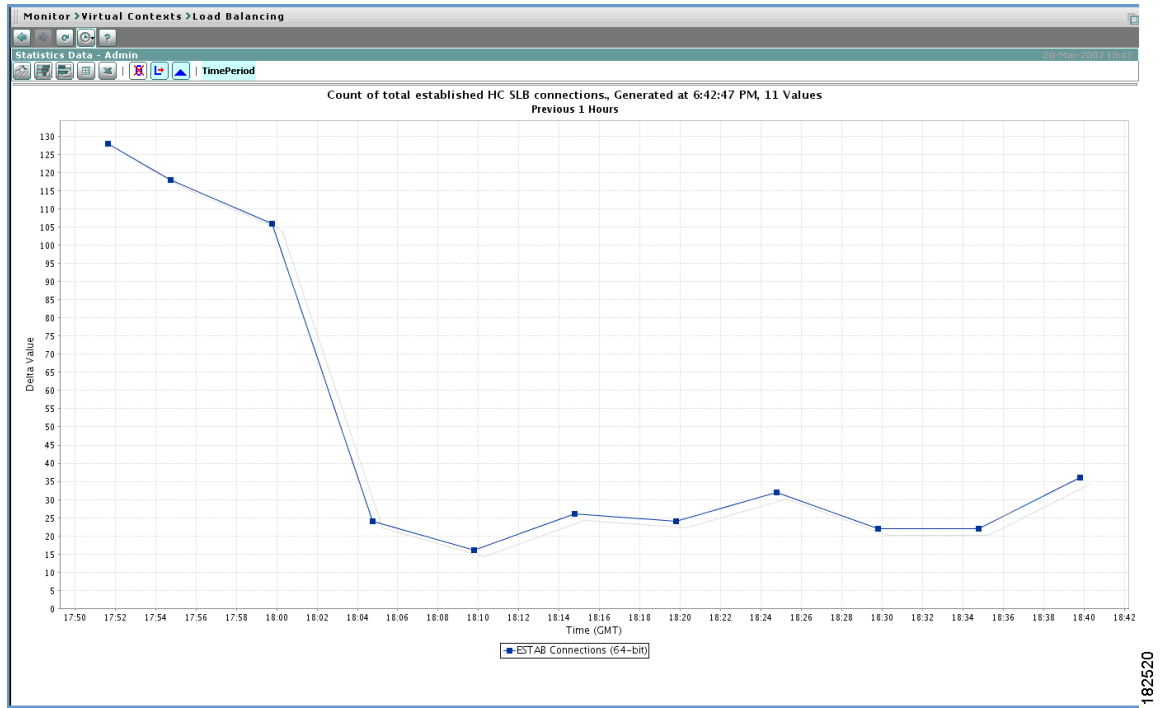
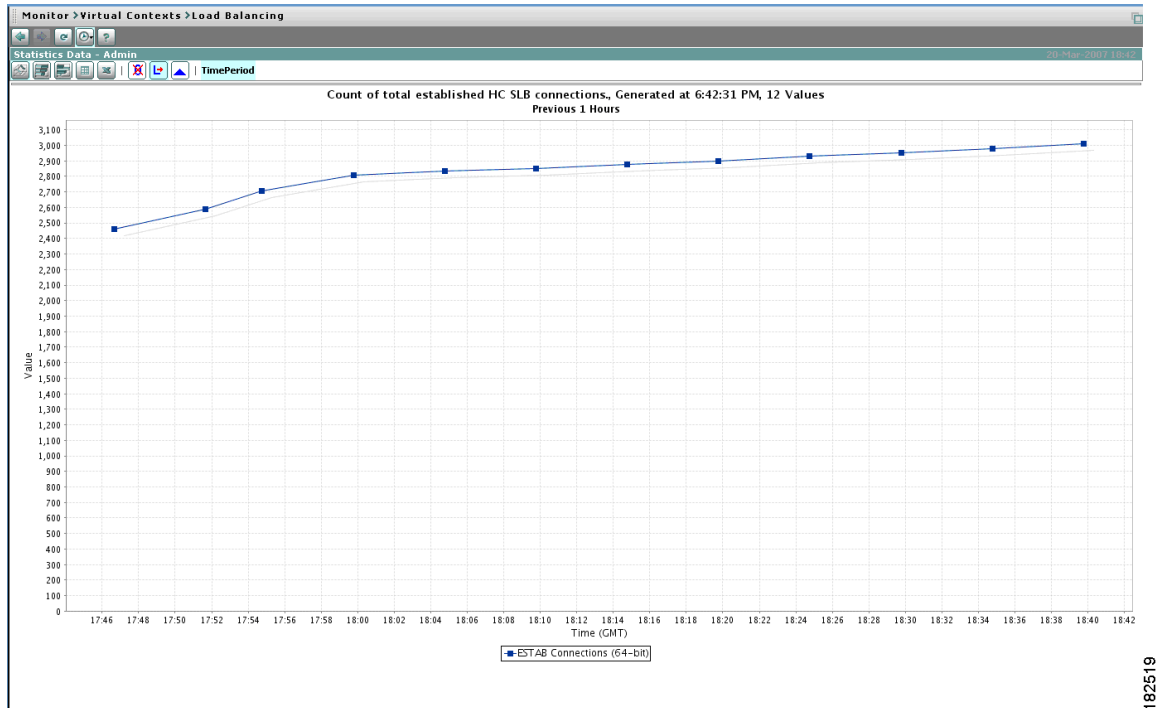


Figure 12-3 Stats Graph



# Monitoring Load Balancing

Use the following steps to monitor load balancing on your real servers.

## Procedure

- Step 1** Select **Monitor > Virtual Contexts > context > Load Balancing**. The Statistic Viewer displays the information described in [Table 12-2](#).

**Table 12-2** Load Balancing Statistic Viewer Information

Field	Description
Statistic	Name of the load balancing statistic.
Value	Value of the statistic.
Description	Describes what information the statistic gathered.



### Tip

If an error message appears stating that polling is not functioning, you can verify that SNMP is allowed by the ACE Appliance Device Manager and that the SNMP v2c community string is entered by checking the Primary Attributes page (Select **Config > Virtual Contexts > context > System > Primary Attributes**).

- Step 2** Select a statistic, then click **Graph**. You can select more than one statistic. ACE Appliance Device Manager queries the current values from the devices and graphically displays the information.
- Step 3** To modify the information shown in the graph, you can click on any of the buttons described in [Table 1-7 on page 1-14](#).

## Related Topics

- [Monitoring the CPU, page 12-5](#)
- [Monitoring Real Servers, page 12-8](#)
- [Monitoring Probes, page 12-10](#)

# Monitoring the CPU

You can use this procedure to monitor CPU categorized statistics for a single Admin virtual context and select your choice of graphs to display the data.



### Note

Your user role and context determines whether you can use this option.

**Procedure**

- Step 1** Select **Monitor > Virtual Contexts > admin\_context > CPU**. The Statistic Viewer displays the information described in [Table 12-3](#).

**Table 12-3 CPU Statistic Viewer Information**

Field	Description
CPU	Number assigned the virtual context that is being monitored.
Statistic	Name of the CPU statistic (usage in 5 minute or 1 minute intervals)
Value	Value of the statistic.
Description	Describes what information the statistic gathered.

- Step 2** Select a statistic, then click **Graph**.  
ACE Appliance Device Manager queries the current values from the devices and graphically displays the information.
- Step 3** To modify the information shown in the graph, you can click on any of the buttons described in [Table 1-7 on page 1-14](#).

**Related Topics**

- [Monitoring Load Balancing, page 12-5](#)
- [Monitoring Real Servers, page 12-8](#)
- [Monitoring Probes, page 12-10](#)

## Monitoring Application Acceleration and Optimization Statistics

Use this procedure to monitor application acceleration and optimization statistics for any virtual context and select your choice of graphs to display the data.

**Procedure**

- Step 1** Select **Monitor > Virtual Contexts > context > Application Acceleration**. The Application Acceleration and Optimization Statistic Viewer displays the information described in [Table 12-4](#).

**Table 12-4 Application Acceleration and Optimization Statistic Viewer Information**

Field	Description
Index	Number assigned the virtual context that is being monitored.
Statistic	Name of the statistic.
Value	Value of the statistic.
Description	Describes what information the statistic gathered.

- Step 2** Select a statistic, then click **Graph**.  
ACE Appliance Device Manager queries the current values from the devices and graphically displays the information.
- Step 3** To modify the information shown in the graph, you can click on any of the buttons described in [Table 1-7 on page 1-14](#).

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#### Related Topics

- [Monitoring Load Balancing, page 12-5](#)
- [Monitoring Real Servers, page 12-8](#)
- [Monitoring Probes, page 12-10](#)

## Monitoring Interfaces

Use this procedure to view information about network interfaces.

#### Procedure

- Step 1** Select **Monitor > Virtual Contexts > context > Interfaces**. The Statistic Viewer appears displaying the information described in [Table 12-5](#).

**Table 12-5** *Interface Statistic Viewer Details*

Field	Description
Interface	Name of the interface.
Statistic	Name of statistic.
Value	Value of statistic.
Description	Describes what information the statistic gathered.

- Step 2** Select an interface statistic, then click **Graph**. You can select more than one item by holding down Shift (to select items in a row) or Control (to select individual interfaces) while clicking on additional items.  
ACE Appliance Device Manager queries the current values from the devices and graphically displays the information.
- Step 3** To modify the information shown in the graph, you can click on any of the buttons described in [Table 1-7 on page 1-14](#).

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#### Related Topics

- [Monitoring Probes, page 12-10](#)
- [Monitoring Real Servers, page 12-8](#)

# Monitoring Real Servers

ACE Appliance Device Manager uses real-time, on-demand polling to collect statistics for real servers. This is the only polling that is completed on demand. Other polling is based on long-term data collection. You can graph data for a single real server.

## Procedure

- Step 1** Select **Monitor > Virtual Contexts > context > Real Servers**. The Real Servers table displays the information shown in table [Table 12-6](#).

**Table 12-6 Real Server Monitoring Details**

Field	Description
Owner	Virtual context to which the real server is associated.
Server Farm	Name of the server farm to which the real server is associated.
Name	Name of the real server.
IP Address	IP address of the real server. This field appears only for real servers specified as hosts.
Port	Port number used for the server port address translation (PAT).
Current Connections	Number of current connections.
Total Conns	Number of total connections, including current, failed, and dropped connections.
Failed Conns	Number of failed connections.
Current Weight	Weight assigned to the real server.

**Table 12-6 Real Server Monitoring Details (continued)**

Field	Description
Admin Status	<p>The specified state of the server retrieved from collected statistics instead of on demand, which can be:</p> <ul style="list-style-type: none"> <li>• In Service—Indicates that the server is in service.</li> <li>• Out of Service—Indicates that the server is out of service.</li> <li>• In Service Standby—Indicates that the server is a backup server and remains inactive unless the primary server fails. If the primary server fails, the backup server becomes active and starts accepting connections.</li> <li>• N/A—The real server is suspended or the stats polling fails because polling is not configured.</li> </ul>
State	<p>The current state of the server, which can be:</p> <ul style="list-style-type: none"> <li>• Failed</li> <li>• In-band probe failed</li> <li>• In service</li> <li>• N/A</li> <li>• Operation wait</li> <li>• Out of service</li> <li>• Probe failed</li> <li>• Probe testing</li> <li>• Ready to test</li> <li>• Return code failed</li> <li>• Test wait</li> <li>• Testing</li> <li>• Throttle (DFP, max clients, max connections)</li> <li>• Unknown</li> </ul> <p>For server state descriptions, see <a href="#">Table 4-2</a>.</p>

**Step 2** To graph data, select a real server, then click **Graph**. ACE Appliance Device Manager queries the current values from the device and graphically displays the information.

**Step 3** To modify the information shown in the graph, you can select the following and then click **Update**:

- Click on any of the buttons described in [Table 1-7 on page 1-14](#).
- Select or deselect any of the following options:
  - Operation Status
  - Current Connections
  - Weight
  - Total Load Balanced Connections
  - Failed Connections
  - Current Admin Status

- Alter the rows per page

#### Related Topics

- [Monitoring Probes, page 12-10](#)
- [Monitoring Application Acceleration and Optimization Statistics, page 12-6](#)
- [Monitoring Load Balancing, page 12-5](#)

## Setting Up Virtual Contexts Statistics Collection

Use the procedure to enable data collection for the virtual contexts you select. Configuration changes are not saved after an appliance reboot; default settings are restored.

For more information about ACE appliance hardware statistics such as CPU, disk, and memory usage, see [Monitoring ACE Appliance Statistics, page 13-32](#).

#### Procedure

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- Step 1** Select **Monitor > Virtual Contexts > context > Statistics Collection**. The Statistics Collection screen appears.
- Step 2** In the Polling Stats field, select **Enable** to start background polling or **Disable** to stop background polling.
- Step 3** In the Background Polling Interval field, select the polling interval appropriate for your networking environment. The interval range is from one minute to six hours.
- Step 4** Click **Deploy Now** to save your entries.



**Note** These settings are not saved if you reboot your appliance. The system defaults will be restored.

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#### Related Topics

- [Monitoring the CPU, page 12-5](#)
- [Monitoring Real Servers, page 12-8](#)
- [Monitoring Probes, page 12-10](#)

## Monitoring Probes

To check the health and availability of a real server, the ACE periodically sends a probe to the real server. You can monitor the probes as shown in the following procedure:

#### Procedure

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- Step 1** Select **Monitor > Virtual Contexts > context > Probes**. The probes are listed with the details described in [Table 12-7](#).

**Table 12-7**      **Monitoring Probe Details**

Field	Description
Name	Name of the probe.
Probe Type	Type of probe. For a complete list of probe types and their descriptions, see <a href="#">Table 4-7</a> .
Interval	Probe interval in seconds.
IP Address	IP address the probe is polling.
Port	Port the probe is polling.

**Step 2** Select a probe, then click **Details** to see additional details about the probe. You can select more than one item by holding down Shift (to select items in a row) or Control (to select individual interfaces) while clicking on additional items.

The following is an example of the probe results information that displays:

```

probe : d2
type : DNS, state :ACTIVE
description :
-----
port : 80 address : 0.0.0.0 addr type : -
interval : 120 pass intvl : 300 pass count : 3
fail count: 3 recv timeout: 10

dns domain : www.cisco.com
----- probe results -----
probe association probed-address probes failed passed health
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
track : avcd
3.2.1.3 88 88 0 FAILED

Socket state : CLOSED
No. Passed states : 0 No. Failed states : 1
No. Probes skipped : 0 Last status code : 0
No. Out of Sockets : 0 No. Internal error: 0
Last disconnect err : Server reply timeout (no reply)
Last probe time : Thu Jan 18 15:18:14 2007
Last fail time : Thu Jan 18 08:06:27 2007
Last active time : Never

```

**Step 3** Click **Back** to return to the Probes list.

#### Related Topics

- [Monitoring Load Balancing, page 12-5](#)
- [Monitoring the CPU, page 12-5](#)

## Displaying Resource Usage

Use the following steps to display resource usage for virtual contexts.

**Procedure**

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**Step 1** Select **Monitor > Virtual Contexts > context > Resource Usage**.

The information in [Table 12-8](#) is displayed.



**Note** There might be a slight delay because the resource usage information is gathered real-time from the ACE appliance.

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**Table 12-8** Resource Usage Fields

Field	Description
Resource	<p>List of resources which can be:</p> <ul style="list-style-type: none"> <li>• acc-connections—Number of acceleration connections</li> <li>• acl-memory—Memory space allocated for ACLs</li> <li>• bandwidth—Context throughput in bytes per second. The total bandwidth rate of a context consists of the following two resource usage fields: <ul style="list-style-type: none"> <li>– throughput—Displays through-the-ACE traffic. This is a derived value (you cannot configure it directly) and it is equal to the bandwidth rate minus the mgmt-traffic rate for the 1-Gbps and 2-Gbps licenses.</li> <li>– mgmt-traffic—Displays management (to-the-ACE) traffic in bytes per second. To guarantee a minimum amount of management traffic bandwidth, you must explicitly allocate a minimum percentage to management traffic using the rate mgmt-traffic parameter. When you allocate a minimum percentage of bandwidth to management traffic, the ACE subtracts that value from the maximum available management traffic bandwidth for all contexts in the ACE.</li> </ul> </li> <li>• conc-connections—Number of simultaneous connections</li> <li>• connection rate—Number of connections of any kind per second</li> <li>• http-comp rate—Compression rate for HTTP-based traffic in connections per second</li> <li>• inspect-conn rate—Number of application protocol inspection connections per second for FTP and RTSP only</li> <li>• mac-miss rate—To-the-ACE traffic sent to the control plane when the encapsulation is not correct in bytes per second</li> <li>• mgmt-connections—Number of management (to-the-ACE) connections</li> <li>• mgmt-traffic rate—Management to-the-ACE traffic in bytes per second</li> <li>• proxy-connections—Number of proxy connections</li> <li>• regexp—Amount of regular expression memory</li> <li>• ssl-connections rate—Number of SSL connections per second</li> <li>• sticky—Displays the resource usage for the sticky entries.</li> </ul> <p><b>Note</b> If a context has fewer sticky resources than the configured Allocation Minimum, the ACE displays the Actual Minimum value that you can assign to the context.</p> <ul style="list-style-type: none"> <li>• syslog buffer—Number of syslog buffers</li> <li>• syslog rate—Number of syslog messages per second</li> <li>• xlates—Number of network and port address translations entries</li> </ul>
Current	Displays the current resource usage.
Peak	Displays the highest value of resource usage.
Min (Allocation)	Indicates resource units that are guaranteed to be available to each context.

**Table 12-8** Resource Usage Fields

Field	Description
Max	Indicates number of resource units that might be available to each context and are shared among all contexts from the oversubscription pool.
Denied	Number of denied resources because of oversubscription or resource depletion.

**Related Topics**

- [Setting Up Virtual Contexts Statistics Collection, page 12-10](#)
- [Monitoring Real Servers, page 12-8](#)
- [Monitoring Probes, page 12-10](#)

## Testing Ping

Use the following steps to verify the **ping** command on a device.

**Procedure**

**Step 1** Select **Monitor > Virtual Contexts > context > Ping**.

**Step 2** Enter the information shown in [Table 12-9](#).

**Table 12-9** Ping Fields

Field	Description
IP Address	Enter the IP address of the real server to which you want to ping.
Elapsed Time	Elapsed time before the ping request is declared a failure.
Repeat	Enter how many times to repeat the test.
Datagram Size	Enter a value for the argument size (size of the packet) of the ping command. Range is between 36 and 452.

**Step 3** Click **Start** to run the connectivity test.

If ping fails, it may take up to 30 seconds before an error is returned. A future release will have a Cancel button.

**Step 4** After the test completes, the results are displayed. Click:

- **New** to enter new parameters and create a new ping test. After selecting New, the Start New Test page displays. You may click Results if you want to review the results of the test you just performed.
- **Restart** to rerun the connectivity test.

**Related Topics**

- [Setting Up Virtual Contexts Statistics Collection, page 12-10](#)

- [Monitoring Real Servers, page 12-8](#)
- [Monitoring Probes, page 12-10](#)

