CHAPTER 36

Troubleshooting

This chapter describes how to troubleshoot the ASA 1000V and includes the following sections:

Testing Your Configuration

This section describes how to test connectivity, how to ping the ASA 1000V Ethernet interfaces, and how to allow hosts on one interface to ping through to hosts on another interface.

This section includes the following topics:

Pinging ASA 1000V Interfaces

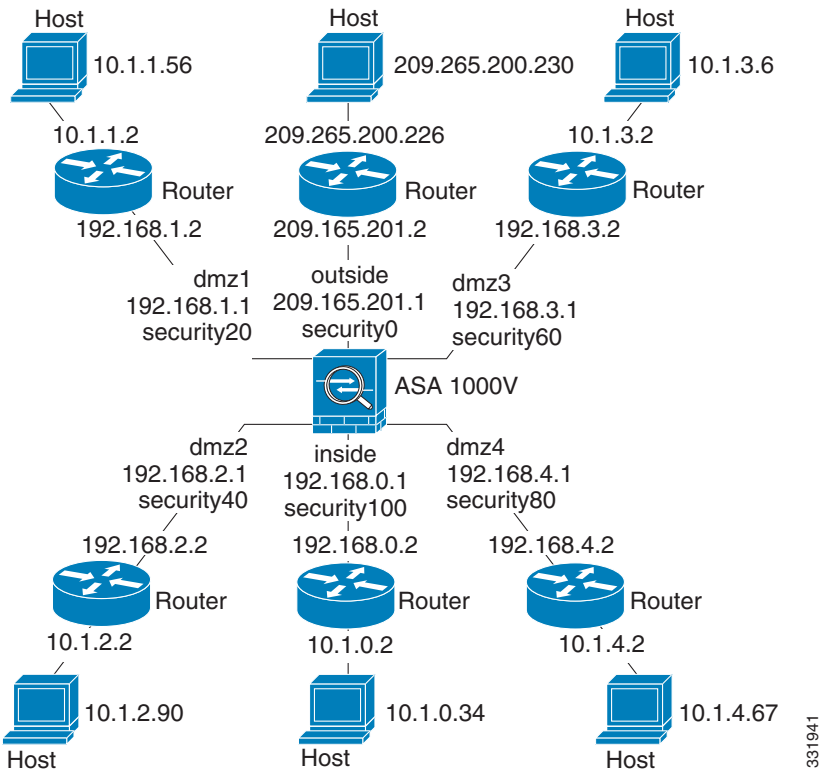
To test whether the ASA 1000V interfaces are up and running and that the ASA 1000V and connected routers are operating correctly, you can ping the ASA 1000V interfaces. To ping the ASA 1000V interfaces, perform the following steps:

Step 1 Draw a diagram of your ASA 1000V that shows the interface names, security levels, and IP addresses.

Note Although this procedure uses IP addresses, the **ping** command also supports DNS names and names that are assigned to a local IP address with the **name** command.

The diagram should also include any directly connected routers and a host on the other side of the router from which you will ping the ASA 1000V. You will use this information in this procedure and in the procedure in the "Passing Traffic Through the ASA 1000V" section on page 36-3. (See Figure 36-1.)

Figure 36-1 Network Diagram with Interfaces, Routers, and Hosts



Step 2 Ping each ASA 1000V interface from the directly connected routers. This test ensures that the ASA 1000V interfaces are active and that the interface configuration is correct.

A ping might fail if the ASA 1000V interface is not active, the interface configuration is incorrect, or if a switch between the ASA 1000V and a router is down (see Figure 36-2). In this case, no debugging messages or syslog messages appear, because the packet never reaches the ASA 1000V.

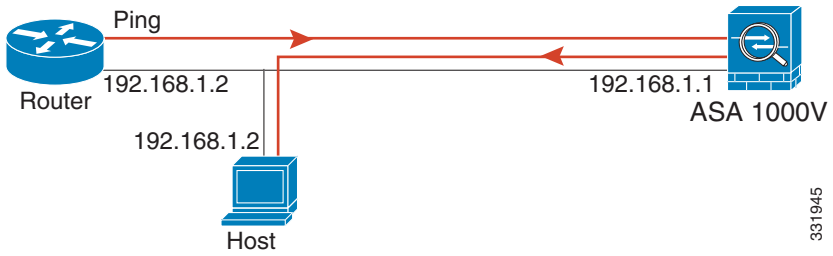
Figure 36-2 Ping Failure at the ASA 1000V Interface

If the ping reaches the ASA 1000V, and it responds, debugging messages similar to the following appear:

```
ICMP echo reply (len 32 id 1 seq 256) 209.165.201.1 > 209.165.201.2
ICMP echo request (len 32 id 1 seq 512) 209.165.201.2 > 209.165.201.1
```

If the ping reply does not return to the router, then a switch loop or redundant IP addresses may exist (see Figure 36-3).

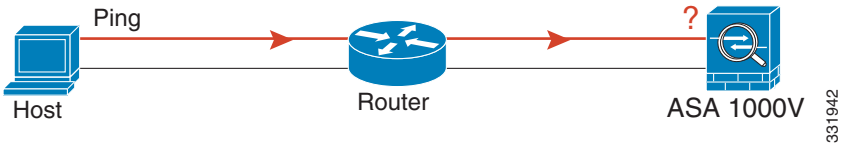
Figure 36-3 Ping Failure Because of IP Addressing Problems



Step 3 Ping each ASA 1000V interface from a remote host. This test checks whether the directly connected router can route the packet between the host and the ASA 1000V, and whether the ASA 1000V can correctly route the packet back to the host.

A ping might fail if the ASA 1000V does not have a return route to the host through the intermediate router (see Figure 36-4). In this case, the debugging messages show that the ping was successful, but syslog message 110001 appears, indicating a routing failure.

Figure 36-4 Ping Failure Because the ASA 1000V has No Return Route



Passing Traffic Through the ASA 1000V

After you successfully ping the ASA 1000V interfaces, make sure that traffic can pass successfully through the ASA 1000V. This test shows that NAT is operating correctly, if configured.

Verifying ASA 1000V Configuration and Operation, and Testing Interfaces Using Ping

The Ping tool is useful for verifying the configuration and operation of the ASA 1000V and surrounding communications links, as well as for testing other network devices.

This section includes the following topics:

A ping is sent to an IP address and it returns a reply. This process enables network devices to discover, identify, and test each other.

The Ping tool uses ICMP (as described in RFC 777 and RFC 792) to define an echo request-and-reply transaction between two network devices. The echo request packet is sent to the IP address of a network device. The receiving device reverses the source and destination address and sends the packet back as the echo reply.

Administrators can use the ASDM Ping interactive diagnostic tool in these ways:

- Loopback testing of two interfaces—A ping may be initiated from one interface to another on the same ASA 1000V, as an external loopback test to verify basic "up" status and operation of each interface.
- Pinging to an ASA 1000V—The Ping tool can ping an interface on another ASA 1000V to verify that it is up and responding.
- Pinging through an ASA 1000V—Ping packets originating from the Ping tool may pass through an intermediate ASA 1000V on their way to a device. The echo packets will also pass through two of its interfaces as they return. This procedure can be used to perform a basic test of the interfaces, operation, and response time of the intermediate unit.
- Pinging to test questionable operation of a network device—A ping may be initiated from an ASA 1000V interface to a network device that is suspected of functioning incorrectly. If the interface is configured correctly and an echo is not received, there may be problems with the device.
- Pinging to test intermediate communications—A ping may be initiated from an ASA 1000V interface to a network device that is known to be functioning correctly and returning echo requests. If the echo is received, the correct operation of any intermediate devices and physical connectivity is confirmed.

Pinging From an ASA 1000V Interface

For basic testing of an interface, you can initiate a ping from an ASA 1000V interface to a network device that you know is functioning correctly and returning replies through the intermediate communications path. For basic testing, make sure you do the following:

- Verify receipt of the ping from the ASA 1000V interface by the "known good" device. If the ping is not received, a problem with the transmitting hardware or interface configuration may exist.
- If the ASA 1000V interface is configured correctly and it does not receive an echo reply from the "known good" device, problems with the interface hardware receiving function may exist. If a different interface with "known good" receiving capability can receive an echo after pinging the same "known good" device, the hardware receiving problem of the first interface is confirmed.

Pinging to an ASA 1000V Interface

When you try to ping to an ASA 1000V interface, verify that the pinging response (ICMP echo reply*)* is enabled for that interface by choosing **Tools > Ping**. When pinging is disabled, the ASA 1000V cannot be detected by other devices or software applications, and does not respond to the ASDM Ping tool.

Pinging Through the ASA 1000V Interface

To verify that other types of network traffic from "known good" sources are being passed through the ASA 1000V, choose **Monitoring > Interfaces > Interface Graphs** or an SNMP management station.

To enable internal hosts to ping external hosts, configure ICMP access correctly for both the inside and outside interfaces by choosing **Configuration > Firewall > Objects > IP Names**.

Troubleshooting the Ping Tool

When pings fail to receive an echo, it may be the result of a configuration or operational error in an ASA 1000V, and not necessarily because of no response from the IP address being pinged. Before using the Ping tool to ping from, to, or through an ASA 1000V interface, perform the following basic checks:

- Verify that interfaces are configured by choosing **Configuration > Device Setup > Interfaces**.
- Verify that devices in the intermediate communications path, such as switches or routers, are correctly delivering other types of network traffic.
- Make sure that traffic of other types from "known good" sources is being passed by choosing **Monitoring > Interfaces > Interface Graphs**.

Using the Ping Tool

To use the Ping tool, perform the following steps:

Step 1 In the main ASDM application window, choose **Tools > Ping**.

The Ping dialog box appears.

Step 2 Enter the destination IP address for the ICMP echo request packets in the IP Address field.

Note If a hostname has been assigned in the Configuration > Firewall > Objects > IP Names pane, you can use the hostname in place of the IP address.

Step 3 (Optional) Choose the ASA 1000V interface that transmits the echo request packets from the drop-down list. If it is not specified, the ASA 1000V checks the routing table to find the destination address and uses the required interface.

Step 4 Click **Ping** to send an ICMP echo request packet from the specified or default interface to the specified IP address and start the response timer.

The response appears in the Ping Output area. Three attempts are made to ping the IP address, and results display the following fields:

- The IP address of the device pinged or a device name, if available. The name of the device, if assigned Hosts/Networks, may be displayed, even if NO response is the result.
- When the ping is transmitted, a millisecond timer starts with a specified maximum, or timeout value. This timer is useful for testing the relative response times of different routes or activity levels.
- Example Ping output:

```
Sending 5, 100-byte ICMP Echos to out-pc, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
If the ping fails, the output is as follows:
Sending 5, 100-byte ICMP Echos to 10.132.80.101, timeout is 2 seconds:
?????
Success rate is 0 percent (0/5)
```

Step 5 To enter a new IP address, click **Clear Screen** to remove the previous response from the Ping output area.

Determining Packet Routing with Traceroute

The Traceroute tool helps you to determine the route that packets will take to their destination. The tool prints the result of each probe sent. Every line of output corresponds to a TTL value in increasing order. The following table lists the output symbols printed by this tool.

Output Symbol	Description
*	No response was received for the probe within the timeout period.
nn msec	For each node, the round-trip time (in milliseconds) for the specified number of probes.
!N.	ICMP network unreachable.
!H	ICMP host unreachable.
!P	ICMP unreachable.
!A	ICMP administratively prohibited.
?	Unknown ICMP error.

To use the Traceroute tool, perform the following steps:

Step 1 In the main ASDM application window, choose **Tools > Traceroute**.

The Traceroute dialog box appears.

Step 2 Enter the name of the host to which the route is traced. If the hostname is specified, define it by choosing **Configuration > Firewall > Objects > IP Names**, or configure a DNS server to enable this tool to resolve the hostname to an IP address.

Step 3 Enter the amount of time in seconds to wait for a response before the connection times out. The default is three seconds.

Step 4 Type the destination port used by the UDP probe messages. The default is 33434.

Step 5 Enter the number of probes to be sent at each TTL level. The default is three.

Step 6 Specify the minimum and maximum TTL values for the first probes. The minimum default is one, but it can be set to a higher value to suppress the display of known hops. The maximum default is 30. The traceroute terminates when the packet reaches the destination or when the maximum value is reached.

Step 7 Check the **Specify source interface or IP address** check box. Choose the source interface or IP address for the packet trace from the drop-down list. This IP address must be the IP address of one of the interfaces.

Step 8 Check the **Reverse Resolve** check box to have the output display the names of hops encountered if name resolution is configured. Leave this check box unchecked to have the output display IP addresses.

Step 9 Check the **Use ICMP** check box to specify the use of ICMP probe packets instead of UDP probe packets.

Step 10 Click **Trace Route** to start the traceroute.

The Traceroute Output area displays detailed messages about the traceroute results.

Step 11 Click **Clear Output** to start a new traceroute.

Tracing Packets with Packet Tracer

The packet tracer tool provides packet tracing for packet sniffing and network fault isolation, as well as detailed information about the packets and how they are processed by the ASA 1000V. If a configuration command did not cause the packet to drop, the packet tracer tool provides information about the cause in an easily readable manner.

In addition, you can trace the lifespan of a packet through the ASA 1000V to see whether the packet is operating correctly with the packet tracer tool. This tool enables you to do the following:

- Debug all packet drops in a production network.
- Verify the configuration is working as intended.
- Show all rules applicable to a packet, along with the CLI commands that caused the rule addition.
- Show a time line of packet changes in a data path.
- Inject tracer packets into the data path.
- Search for an IP address based on the user identity and the FQDN.

To use the packet tracer, perform the following steps:

Step 1 In the main ASDM application window, choose **Tools > Packet Tracer**.

The Cisco ASDM Packet Tracer dialog box appears.

Step 2 Choose the source interface for the packet trace from the drop-down list.

Step 3 Specify the protocol type for the packet trace. Available protocol types include ICMP, IP, TCP, and UDP.

Step 4 Enter the source IP address for the packet trace in the Source IP Address field.

Step 5 For TCP and UDP only, choose the source port for the packet trace from the drop-down list.

Step 6 Enter the destination IP address for the packet trace in the Destination IP Address field.

Step 7 For TCP and UDP only, choose the destination port for the packet trace from the drop-down list.

Step 8 For ICMP only, choose the type of packet trace from the Type drop-down list. Then enter the trace code and trace ID in the appropriate fields.

Step 9 For IP only, enter the protocol number in the Protocol field. Valid values range from 0 to 255.

Step 10 Click **Start** to trace the packet.

The Information Display Area shows detailed messages about the results of the packet trace.

Note To display a graphical representation of the packet trace, check the **Show animation** check box.

Step 11 Click **Clear** to start a new packet trace.

Handling TCP Packet Loss

To troubleshoot TCP packet loss, see the "Customizing the TCP Normalizer with a TCP Map" section on page 27-6 for more information.

Other Troubleshooting Tools

The ASA 1000V provides other troubleshooting tools that you can use. This section includes the following topics:

Configuring and Running Captures with the Packet Capture Wizard

You can use the Packet Capture Wizard to configure and run captures for troubleshooting errors. The captures can use access lists to limit the type of traffic captured, the source and destination addresses and ports, and one or more interfaces. The wizard runs one capture on each of the ingress and egress interfaces. You can save the captures on your PC to examine them in a packet analyzer.

To configure and run captures, perform the following steps:

Step 1 In the main ASDM application window, choose **Wizards > Packet Capture Wizard**.

The Overview of Packet Capture screen appears, with a list of the tasks through which the wizard will guide you to complete.

Step 2 Click **Next** to display the Ingress Traffic Selector screen.

Step 3 Choose the ingress interface from the drop-down list.

Step 4 In the Packet Match Criteria area, do one of the following:

- To specify the access list to use for matching packets, click the **Specify access-list** radio button, and then choose the access list from the Select access list drop-down list. To add a previously configured access list to the current drop-down list, click **Manage** to display the ACL Manager pane. Choose an access list, and click **OK**.
- To specify packets parameters, click the **Specify Packet Parameters** radio button.

Step 5 Click **Next** to display the Ingress Traffic Selector screen. For more information, see the "Ingress Traffic Selector" section on page 36-10.

Step 6 Enter the source host IP address and choose the network IP address from the drop-down list.

Step 7 Enter the destination host IP address and choose the network IP address from the drop-down list.

Step 8 Choose the protocol type to capture from the drop-down list. Available protocol types to capture are ah, eigrp, esp, gre, icmp, icmp6, igmp, igrp, ip, ipinip, nos, ospf, pcp, pim, snp, tcp, or udp.

Step 9 Click **Next** to display the Egress Traffic Selector screen. For more information, see the "Egress Traffic Selector" section on page 36-10.

Step 10 Choose the egress interface from the drop-down list.

Step 11 Enter the source host IP address and choose the network IP address from the drop-down list.

Step 12 Enter the destination host IP address and choose the network IP address from the drop-down list.

Note The source port services, destination port services, and ICMP type are read-only and are based on the choices that you made in the Ingress Traffic Selector screen.

Step 13 Click **Next** to display the Buffers & Captures screen. For more information, see the "Buffers" section on page 36-10.

Step 14 In the Capture Parameters area, to obtain the latest capture every 10 seconds automatically, check the **Get capture every 10 seconds** check box. By default, this capture uses the circular buffer.

Step 15 In the Buffer Parameters area, you specify the buffer size and packet size. The buffer size is the maximum amount of memory that the capture can use to store packets. The packet size is the longest packet that the capture can hold. We recommend that you use the longest packet size to capture as much information as possible.

a. Enter the packet size. The valid size ranges from 14 - 1522 bytes.

b. Enter the buffer size. The valid size ranges from 1534 - 33554432 bytes.

c. Check the **Use circular buffer** check box to store captured packets.

Note When you choose this setting, if all the buffer storage is used, the capture starts overwriting the oldest packets.

Step 16 Click **Next** to display the Summary screen, which shows the traffic selectors and buffer parameters that you have entered. For more information, see the "Summary" section on page 36-11.

Step 17 Click **Next** to display the Run Captures screen, and then click **Start** to begin capturing packets. Click **Stop** to end the capture. For more information, see the "Run Captures" section on page 36-11.

Step 18 Click **Get Capture Buffer** to determine how much buffer space you have remaining. Click **Clear Buffer on Device** to remove the current content and allow room in the buffer to capture more packets.

Step 19 Click **Save captures** to display the Save Capture dialog box. Choose the format in which you want to include the captures: **ASCII** or **PCAP**. You have the option of saving either the ingress capture, the egress capture, or both.

Step 20 To save the ingress packet capture, click **Save Ingress Capture** to display the Save capture file dialog box. Specify the storage location on your PC, and click **Save**.

Step 21 Click **Launch Network Sniffer Application** to start the packet analysis application specified in Tools > Preferences for analyzing the ingress capture.

Step 22 To save the egress packet capture, click **Save Egress Capture** to display the Save capture file dialog box. Specify the storage location on your PC, and click **Save**.

Step 23 Click **Launch Network Sniffer Application** to start the packet analysis application specified in Tools > Preferences for analyzing the egress capture.

Step 24 Click **Close,** and then click **Finish** to exit the wizard.

Ingress Traffic Selector

To configure the ingress interface, source and destination hosts/networks, and the protocol for packet capture, perform the following steps:

Step 1 Enter the ingress interface name.

Step 2 Enter the ingress source host and network.

Step 3 Enter the ingress destination host and network.

Step 4 Enter the protocol type to capture. Available protocols are ah, eigrp, esp, gre, icmp, icmp6, igmp, igrp, ip, ipinip, nos, ospf, pcp, pim, snp, tcp, or udp.

a. Enter the ICMP type for ICMP only. Available types include all, alternate address, conversion-error, echo, echo-reply, information-reply, information-request, mask-reply, mask-request, mobile-redirect, parameter-problem, redirect, router-advertisement, router-solicitation, source-quench, time-exceeded, timestamp-reply, timestamp-request, traceroute, or unreachable.

b. Specify the source and destination port services for the TCP and UDP protocols only. Available options include the following:

- To include all services, choose All Services.
- To include a service group, choose Service Groups.
- To include a specific service, choose one of the following: aol, bgp, chargen, cifx, citrix-ica, ctiqbe, daytime, discard, domain, echo, exec, finger, ftp, ftp-data, gopher, h323, hostname, http, https, ident, imap4, irc, kerberos, klogin, kshell, ldap, ldaps, login, lotusnotes, lpd, netbios-ssn, nntp, pcanywhere-data, pim-auto-rp, pop2, pop3, pptp, rsh, rtsp, sip, smtp, sqlnet, ssh, sunrpc, tacacs, talk, telnet, uucp, or whois.

Egress Traffic Selector

To configure the egress interface, source and destination hosts/networks, and source and destination port services for packet capture, perform the following steps:

Step 1 Enter the egress interface name.

Step 2 Enter the egress source host and network.

Step 3 Enter the egress destination host and network.

The protocol type selected during the ingress configuration is already listed.

Buffers

To configure the packet size, buffer size, and use of the circular buffer for packet capture, perform the following steps.

Step 1 Enter the longest packet that the capture can hold. Use the longest size available to capture as much information as possible.

Step 2 Enter the maximum amount of memory that the capture can use to store packets.

Step 3 Use the circular buffer to store packets. When the circular buffer has used all of the buffer storage, the capture will overwrite the oldest packets first.

Summary

The Summary screen shows the traffic selectors and the buffer parameters for the packet capture selected in the previous wizard screens.

Run Captures

To start and stop the capture session, view the capture buffer, launch a network analyzer application, save packet captures, and clear the buffer, perform the following steps:

Step 1 To begin the packet capture session on a selected interface, click **Start**.

Step 2 To stop the packet capture session on a selected interface, click **Stop**.

Step 3 To obtain a snapshot of the captured packets on the interface, click **Get Capture Buffer**.

Step 4 To show the capture buffer on the ingress interface, click **Ingress**.

Step 5 To show the capture buffer on the egress interface, click **Egress**.

Step 6 To clear the buffer on the device, click **Clear Buffer on Device**.

Step 7 To start the packet analysis application for analyzing the ingress capture or the egress capture specified in Tools > Preferences, click **Launch Network Sniffer Application**.

Step 8 To save the ingress and egress captures in either ASCII or PCAP format, click **Save Captures**.

Save Captures

To save the ingress and egress packet captures to ASCII or PCAP file format for further packet analysis, perform the following steps:

Step 1 To save the capture buffer in ASCII format, click **ASCII**.

Step 2 To save the capture buffer in PCAP format, click **PCAP**.

Step 3 To specify a file in which to save the ingress packet capture, click **Save ingress capture**.

Step 4 To specify a file in which to save the egress packet capture, click **Save egress capture**.

Saving an Internal Log Buffer to Flash

To save the internal log buffer to flash memory, perform the following steps:

Step 1 In the main ASDM application window, choose **File > Save Internal Log Buffer to Flash**.

The Enter Log File Name dialog box appears.

Step 2 Choose the first option to save the log buffer with the default filename, LOG-YYYY-MM-DD-hhmmss.txt.

Step 3 Choose the second option to specify a filename for the log buffer.

Step 4 Enter the filename for the log buffer, and then click **OK**.

Viewing and Copying Logged Entries with the ASDM Java Console

You can use the ASDM Java console to view and copy logged entries in a text format, which can help you troubleshoot ASDM errors.

To access the ASDM Java Console, perform the following steps:

Step 1 In the main ASDM application window, choose **Tools > ASDM Java Console**.

Step 2 To show the virtual machine memory statistics, enter **m** in the console.

Step 3 To perform garbage collection, enter **g** in the console.

Step 4 To monitor memory usage, open the Windows Task Manager and double-click the **asdm_launcher.exe** file.

Note The maximum memory allocation allowed is 256 MB.

Monitoring Performance

To view ASA 1000V performance information in a graphical or tabular format, perform the following steps:

Step 1 In the ASDM main window, choose **Monitoring > Properties > Connection Graphs > Perfmon**.

Step 2 Select one or more entries from the Available Graphs list, then click **Add** to move them to the Selected Graphs list. To remove an entry from the Selected Graphs list, click **Remove**. The available options are the following:

- AAA Perfmon—Displays the ASA 1000V AAA performance information.
- Inspection Perfmon—Displays the ASA 1000V inspection performance information.
- Web Perfmon—Displays the ASA 1000V web performance information, including URL access and URL server requests.
- Connections Perfmon—Displays the ASA 1000V connections performance information.
- Xlate Perfmon—Displays the ASA 1000V NAT performance information.

You can choose up to four types of statistics to show in one graph window. You can open multiple graph windows at the same time.

Step 3 To use an existing window title, select one from the drop-down list. To display graphs in a new window, enter a new window title in the Graph Window Title field.

Step 4 Click **Show Graphs** to view performance statistics in a new or updated graph window.

Step 5 Click the **Table** tab to view the same performance statistics in a tabular format.

Step 6 From the View drop-down list on either tab, choose to display updates to information in the following time periods: Real-time, data every 10 sec; Last 10 minutes, data every 10 sec; Last 60 minutes, data every 1 min; Last 12 hours, data every 12 minutes; or Last 5 days, data every two hours.

Step 7 (Optional) Click **Export** to display the Export Graph Data dialog box. The selected performance statistics to export are already checked.

Step 8 (Optional) Click **Export** again to display the Save dialog box.

Step 9 (Optional) Click **Save** to save the performance statistics to a text file (.txt) on your local drive for future reference.

Step 10 (Optional) Click **Print** to display the Print Graph dialog box.

Step 11 (Optional) Choose the graph or table name from the drop-down list, then click **Print** to display the Print dialog box.

Step 12 (Optional) Click **OK** to print the selected performance statistics.

Monitoring System Resources

This section includes the following topics:

Blocks

To view the free and used memory blocks, perform the following steps:

Step 1 In the ASDM main window, choose **Monitoring > Properties > System Resources Graphs > Blocks**.

Step 2 Select one or more entries from the Available Graphs list, then click **Add** to move them to the Selected Graphs list. To remove an entry from the Selected Graphs list, click **Remove**. The available options are the following:

- Blocks Used—Displays the ASA 1000V used memory blocks.
- Blocks Free—Displays the ASA 1000V free memory blocks.

You can choose up to four types of statistics to show in one graph window. You can open multiple graph windows at the same time.

Step 3 To use an existing window title, select one from the drop-down list. To display graphs in a new window, enter a new window title in the Graph Window Title field.

Step 4 Click **Show Graphs** to view system resource statistics in a new or updated graph window.

Step 5 Click the **Table** tab to view the same performance statistics in a tabular format.

Step 6 From the View drop-down list on either tab, choose to display updates to information in the following time periods: Real-time, data every 10 sec; Last 10 minutes, data every 10 sec; Last 60 minutes, data every 1 min; Last 12 hours, data every 12 minutes; or Last 5 days, data every two hours.

Step 7 (Optional) Click **Export** to display the Export Graph Data dialog box. The selected memory block statistics to export are already checked.

Step 8 (Optional) Click **Export** again to display the Save dialog box.

Step 9 (Optional) Click **Save** to save the memory block statistics to a text file (.txt) on your local drive for future reference.

Step 10 (Optional) Click **Print** to display the Print Graph dialog box.

Step 11 (Optional) Choose the graph or table name from the drop-down list, then click **Print** to display the Print dialog box.

Step 12 (Optional) Click **OK** to print the selected memory block statistics.

CPU

To view the CPU utilization, perform the following steps:

Step 1 In the ASDM main window, choose **Monitoring > Properties > System Resources Graphs > CPU**.

Step 2 Select one or more entries from the Available Graphs list, then click **Add** to move them to the Selected Graphs list. To remove an entry from the Selected Graphs list, click **Remove**.

You can choose up to four types of statistics to show in one graph window. You can open multiple graph windows at the same time.

Step 3 To use an existing window title, select one from the drop-down list. To display graphs in a new window, enter a new window title in the Graph Window Title field.

Step 4 Click **Show Graphs** to view system resource statistics in a new or updated graph window.

Step 5 Click the **Table** tab to view the same performance statistics in a tabular format.

Step 6 From the View drop-down list on either tab, choose to display updates to information in the following time periods: Real-time, data every 10 sec; Last 10 minutes, data every 10 sec; Last 60 minutes, data every 1 min; Last 12 hours, data every 12 minutes; or Last 5 days, data every two hours.

Step 7 (Optional) Click **Export** to display the Export Graph Data dialog box. The selected CPU utilization statistics to export are already checked.

Step 8 (Optional) Click **Export** again to display the Save dialog box.

Step 9 (Optional) Click **Save** to save the CPU utilization statistics to a text file (.txt) on your local drive for future reference.

Step 10 (Optional) Click **Print** to display the Print Graph dialog box.

Step 11 (Optional) Choose the graph or table name from the drop-down list, then click **Print** to display the Print dialog box.

Step 12 (Optional) Click **OK** to print the selected CPU utilization statistics.

Memory

To view the memory utilization, perform the following steps:

Step 1 In the ASDM main window, choose **Monitoring > Properties > System Resources Graphs > Blocks**.

Step 2 Select one or more entries from the Available Graphs list, then click **Add** to move them to the Selected Graphs list. To remove an entry from the Selected Graphs list, click **Remove**. The available options are the following:

- Free Memory—Displays the ASA 1000V free memory.
- Used Memory—Displays the ASA 1000V used memory.

You can choose up to four types of statistics to show in one graph window. You can open multiple graph windows at the same time.

Step 3 To use an existing window title, select one from the drop-down list. To display graphs in a new window, enter a new window title in the Graph Window Title field.

Step 4 Click **Show Graphs** to view system resource statistics in a new or updated graph window.

Step 5 Click the **Table** tab to view the same performance statistics in a tabular format.

Step 6 From the View drop-down list on either tab, choose to display updates to information in the following time periods: Real-time, data every 10 sec; Last 10 minutes, data every 10 sec; Last 60 minutes, data every 1 min; Last 12 hours, data every 12 minutes; or Last 5 days, data every two hours.

Step 7 (Optional) Click **Export** to display the Export Graph Data dialog box. The selected memory utilization statistics to export are already checked.

Step 8 (Optional) Click **Export** again to display the Save dialog box.

Step 9 (Optional) Click **Save** to save the memory utilization statistics to a text file (.txt) on your local drive for future reference.

Step 10 (Optional) Click **Print** to display the Print Graph dialog box.

Step 11 (Optional) Choose the graph or table name from the drop-down list, then click **Print** to display the Print dialog box.

Step 12 (Optional) Click **OK** to print the selected memory utilization statistics.

Monitoring Connections

To view current connections in a tabular format, in the ASDM main window, choose **Monitoring > Properties > Connections**. Each connection is identified by the following parameters:

- Protocol
- Source IP address
- Source port
- Destination IP address
- Destination port
- Idle time since the last packet was sent or received
- Amount of sent and received traffic on the connection

Monitoring Per-Process CPU Usage

You can monitor the processes that run on the CPU. You can obtain information about the percentage of CPU that is used by a certain process. CPU usage statistics are sorted in descending order to display the highest consumer at the top. Also included is information about the load on the CPU per process, at 5 seconds, 1 minute, and 5 minutes before the log time. This information is updated automatically every 5 seconds to provide real-time statistics.

In ASDM, this information is updated every 30 seconds.

To view CPU usage on a per-process basis, perform the following steps:

Step 1 In the ASDM main window, choose **Monitoring > Properties > Per-Process CPU Usage**.

Step 2 To pause the auto-refresh of the screen, click **Stop auto-refresh**.

Step 3 To save the information on the screen to a local text file, click **Save log to local file**.

The Save dialog box appears.

Step 4 Enter the name of the text file, then click **Save**.

To color code processes according to their CPU usage range, click **Configure CPU usage**.

The Color Settings dialog box appears.

Step 5 Choose one of the following range options: 49% and below, 50% to 79%, and 80% and above.

Step 6 Click the foreground or background cell to display the Pick a Color dialog box, and select the foreground and background colors for the given ranges.

Step 7 Click one of the following tabs to pick the color palette: **Swatches**, **HSB**, or **RGB**. When you are done, click **OK**.

Step 8 Click **OK** to view the color-coded entries.

Step 9 Click **Refresh** to refresh the data manually at any time.

Increasing Heap Memory Size

ASDM supports a maximum configuration size of 512 KB. If you exceed this amount, you may experience performance issues. For example, when you load the configuration, the status dialog box shows the percentage of the configuration that is complete, yet with large configurations it stops incrementing and appears to suspend operation, even though ASDM might still be processing the configuration. If this situation occurs, we recommend that you consider increasing the ASDM system heap memory.

To increase the ASDM heap memory size, modify the launcher shortcut by performing the following steps:

Step 1 Right-click the shortcut for the ASDM-IDM Launcher, and choose **Properties**.

Step 2 Choose the **Shortcut** tab.

Step 3 In the Target field, change the argument prefixed with "-Xmx" to specify your desired heap size. For example, change it to -Xmx768m for 768 MB or -Xmx1g for 1 GB. For more information about this parameter, see the Oracle document at the following URL:
http://docs.oracle.com/javase/1.5.0/docs/tooldocs/windows/java.html