CHAPTER 77

Configuring Logging

This chapter describes how to configure and manage logs for the ASA and includes the following sections:

- Information About Logging, page 77-1
- Licensing Requirements for Logging, page 77-5
- Prerequisites for Logging, page 77-5
- Guidelines and Limitations, page 77-5
- Configuring Logging, page 77-6
- Monitoring the Logs, page 77-19
- Configuration Examples for Logging, page 77-20
- Feature History for Logging, page 77-20

Information About Logging

System logging is a method of collecting messages from devices to a server running a syslog daemon. Logging to a central syslog server helps in aggregation of logs and alerts. Cisco devices can send their log messages to a UNIX-style syslog service. A syslog service accepts messages and stores them in files, or prints them according to a simple configuration file. This form of logging provides protected long-term storage for logs. Logs are useful both in routine troubleshooting and in incident handling.

The ASA system logs provide you with information for monitoring and troubleshooting the ASA. With the logging feature, you can do the following:

- Specify which syslog messages should be logged.
- Disable or change the severity level of a syslog message.
- Specify one or more locations where syslog messages should be sent, including an internal buffer, one or more syslog servers, ASDM, an SNMP management station, specified e-mail addresses, or to Telnet and SSH sessions.
- Configure and manage syslog messages in groups, such as by severity level or class of message.
- Specify whether or not a rate-limit is applied to syslog generation.
- Specify what happens to the contents of the internal log buffer when it becomes full: overwrite the buffer, send the buffer contents to an FTP server, or save the contents to internal flash memory.
- Filter syslog messages by locations, severity level, class, or a custom message list.
This section includes the following topics:

- Logging in Multiple Context Mode, page 77-2
- Analyzing Syslog Messages, page 77-2
- Syslog Message Format, page 77-3
- Severity Levels, page 77-3
- Message Classes and Range of Syslog IDs, page 77-4
- Filtering Syslog Messages, page 77-4
- Using Custom Message Lists, page 77-4

Logging in Multiple Context Mode

Each security context includes its own logging configuration and generates its own messages. If you log in to the system or admin context, and then change to another context, messages you view in your session are only those messages that are related to the current context.

Syslog messages that are generated in the system execution space, including failover messages, are viewed in the admin context along with messages generated in the admin context. You cannot configure logging or view any logging information in the system execution space.

You can configure the ASA to include the context name with each message, which helps you differentiate context messages that are sent to a single syslog server. This feature also helps you to determine which messages are from the admin context and which are from the system; messages that originate in the system execution space use a device ID of system, and messages that originate in the admin context use the name of the admin context as the device ID.

Analyzing Syslog Messages

The following are some examples of the type of information you can obtain from a review of various syslog messages:

- Connections that are allowed by ASA security policies. These messages help you spot holes that remain open in your security policies.
- Connections that are denied by ASA security policies. These messages show what types of activity are being directed toward your secured inside network.
- Using the ACE deny rate logging feature shows attacks that are occurring on your ASA.
- IDS activity messages can show attacks that have occurred.
- User authentication and command usage provide an audit trail of security policy changes.
- Bandwidth usage messages show each connection that was built and torn down as well as the duration and traffic volume used.
- Protocol usage messages show the protocols and port numbers used for each connection.
- Address translation audit trail messages record NAT or PAT connections being built or torn down, which are useful if you receive a report of malicious activity coming from inside your network to the outside world.
**Syslog Message Format**

Syslog messages begin with a percent sign (%) and are structured as follows:

```
%ASA Level Message_number: Message_text
```

Field descriptions are as follows:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA</td>
<td>The syslog message facility code for messages that are generated by the ASA. This value is always ASA.</td>
</tr>
<tr>
<td>Level</td>
<td>1 through 7. The level reflects the severity of the condition described by the syslog message—the lower the number, the more severe the condition. See Table 77-1 for more information.</td>
</tr>
<tr>
<td>Message_number</td>
<td>A unique six-digit number that identifies the syslog message.</td>
</tr>
<tr>
<td>Message_text</td>
<td>A text string that describes the condition. This portion of the syslog message sometimes includes IP addresses, port numbers, or usernames.</td>
</tr>
</tbody>
</table>

**Severity Levels**

Table 77-1 lists the syslog message severity levels. You can assign custom colors to each of the severity levels to make it easier to distinguish them in the ASDM log viewers. To configure syslog message color settings, either choose the Tools > Preferences > Syslog tab or, in the log viewer itself, click Color Settings on the toolbar.

<table>
<thead>
<tr>
<th>Level Number</th>
<th>Severity Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>emergencies</td>
<td>System is unusable.</td>
</tr>
<tr>
<td>1</td>
<td>alert</td>
<td>Immediate action is needed.</td>
</tr>
<tr>
<td>2</td>
<td>critical</td>
<td>Critical conditions.</td>
</tr>
<tr>
<td>3</td>
<td>error</td>
<td>Error conditions.</td>
</tr>
<tr>
<td>4</td>
<td>warning</td>
<td>Warning conditions.</td>
</tr>
<tr>
<td>5</td>
<td>notification</td>
<td>Normal but significant conditions.</td>
</tr>
<tr>
<td>6</td>
<td>informational</td>
<td>Informational messages only.</td>
</tr>
<tr>
<td>7</td>
<td>debugging</td>
<td>Debugging messages only.</td>
</tr>
</tbody>
</table>

**Note**

The ASA does not generate syslog messages with a severity level of zero (emergencies). This level is provided in the logging command for compatibility with the UNIX syslog feature but is not used by the ASA.
Message Classes and Range of Syslog IDs

For a list of syslog message classes and the ranges of syslog message IDs that are associated with each class, see the syslog message guide.

Filtering Syslog Messages

You can filter generated syslog messages so that only certain syslog messages are sent to a particular output destination. For example, you could configure the ASA to send all syslog messages to one output destination and to send a subset of those syslog messages to a different output destination.

Specifically, you can configure the ASA so that syslog messages are directed to an output destination according to the following criteria:

- Syslog message ID number
- Syslog message severity level
- Syslog message class (equivalent to a functional area of the ASA)

You customize these criteria by creating a message list that you can specify when you set the output destination. Alternatively, you can configure the ASA to send a particular message class to each type of output destination independently of the message list.

You can use syslog message classes in two ways:

- Specify an output location for an entire category of syslog messages using the `logging class` command.
- Create a message list that specifies the message class using the `logging list` command.

The syslog message class provides a method of categorizing syslog messages by type, equivalent to a feature or function of the ASA. For example, the vpnc class denotes the VPN client.

All syslog messages in a particular class share the same initial three digits in their syslog message ID numbers. For example, all syslog message IDs that begin with the digits 611 are associated with the vpnc (VPN client) class. Syslog messages associated with the VPN client feature range from 611101 to 611323.

In addition, most of the ISAKMP syslog messages have a common set of prepended objects to help identify the tunnel. These objects precede the descriptive text of a syslog message when available. If the object is not known at the time that the syslog message is generated, the specific `heading = value` combination does not appear.

The objects are prefixed as follows:

- Group = `groupname`
- Username = `user`
- IP = `IP_address`

Where the group is the tunnel-group, the username is the username from the local database or AAA server, and the IP address is the public IP address of the remote access client or L2L peer.

Using Custom Message Lists

Creating a custom message list is a flexible way to exercise control over which syslog messages are sent to which output destination. In a custom syslog message list, you specify groups of syslog messages using any or all of the following criteria: severity level, message IDs, ranges of syslog message IDs, or message class.

For example, you can use message lists to do the following:
• Select syslog messages with the severity levels of 1 and 2 and send them to one or more e-mail addresses.
• Select all syslog messages associated with a message class (such as ha) and save them to the internal buffer.

A message list can include multiple criteria for selecting messages. However, you must add each message selection criterion with a new command entry. It is possible to create a message list that includes overlapping message selection criteria. If two criteria in a message list select the same message, the message is logged only once.

Licensing Requirements for Logging

The following table shows the licensing requirements for this feature:

<table>
<thead>
<tr>
<th>Model</th>
<th>License Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>All models</td>
<td>Base License.</td>
</tr>
</tbody>
</table>

Prerequisites for Logging

Logging has the following prerequisites:

• The syslog server must run a server program called syslogd. Windows (except for Windows 95 and Windows 98) provides a syslog server as part of its operating system. For Windows 95 and Windows 98, you must obtain a syslogd server from another vendor.

• To view logs generated by the ASA, you must specify a logging output destination. If you enable logging without specifying a logging output destination, the ASA generates messages but does not save them to a location from which you can view them. You must specify each different logging output destination separately. For example, to designate more than one syslog server as an output destination, enter a new command for each syslog server.

Guidelines and Limitations

This section includes the guidelines and limitations for this feature.

Context Mode Guidelines
Supported in single and multiple context modes.

Firewall Mode Guidelines
Supported in routed and transparent firewall modes.

IPv6 Guidelines
Does not support IPv6.

Additional Guidelines
• Sending syslogs over TCP is not supported on a standby ASA.
**The ASA supports the configuration of 16 syslog servers with the logging host command in single context mode. In multiple context mode, the limitation is 4 servers per context.**

**When you use a custom message list to match only access list hits, the access list logs are not generated for access lists that have had their logging severity level increased to debugging (level 7). The default logging severity level is set to 6 for the logging list command. This default behavior is by design. When you explicitly change the logging severity level of the access list configuration to debugging, you must also change the logging configuration itself.**

The following is sample output from the `show running-config logging` command that will not include access list hits, because their logging severity level has been changed to debugging:

```
hostname# show running-config logging
logging enable
logging timestamp
logging list test message 106100
logging buffered test
```

The following is sample output from the `show running-config logging` command that will include access list hits:

```
hostname# show running-config logging
logging enable
logging timestamp
logging buffered debugging
```

In this case, the access list configuration does not change and the number of access list hits appears, as shown in the following example:

```
hostname(config)# access-list global line 1 extended permit icmp any host 4.2.2.2 log debugging interval 1 (hitcnt=7) 0xf36b5386
hostname(config)# access-list global line 2 extended permit tcp host 10.1.1.2 any eq www log informational interval 1 (hitcnt=18) 0xe7e7c3b8
hostname(config)# access-list global line 3 extended permit ip any any (hitcnt=543) 0x25f9e609
```

---

**Configuring Logging**

This section describes how to configure logging and includes the following topics:

- **Enabling Logging, page 77-7**
- **Configuring an Output Destination, page 77-7**

---

**Note** The minimum configuration depends on what you want to do and what your requirements are for handling syslog messages in the ASA.
Enabling Logging

To enable logging, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging enable</td>
<td>Enables logging. To disable logging, enter the <code>no logging enable</code> command.</td>
</tr>
</tbody>
</table>

Example:

```
hostname(config)# logging enable
```

What to Do Next

See the “Configuring an Output Destination” section on page 77-7.

Configuring an Output Destination

To optimize syslog message usage for troubleshooting and performance monitoring, we recommend that you specify one or more locations where syslog messages should be sent, including an internal log buffer, one or more external syslog servers, ASDM, an SNMP management station, the console port, specified e-mail addresses, or Telnet and SSH sessions.

This section includes the following topics:

- Sending Syslog Messages to an External Syslog Server, page 77-8
- Sending Syslog Messages to the Internal Log Buffer, page 77-9
- Sending Syslog Messages to an E-mail Address, page 77-10
- Sending Syslog Messages to ASDM, page 77-11
- Sending Syslog Messages to the Console Port, page 77-11
- Sending Syslog Messages to an SNMP Server, page 77-11
- Sending Syslog Messages to a Telnet or SSH Session, page 77-12
- Creating a Custom Event List, page 77-13
- Generating Syslog Messages in EMBLEM Format to a Syslog Server, page 77-14
- Generating Syslog Messages in EMBLEM Format to Other Output Destinations, page 77-14
- Changing the Amount of Internal Flash Memory Available for Logs, page 77-15
- Configuring the Logging Queue, page 77-15
- Sending All Syslog Messages in a Class to a Specified Output Destination, page 77-16
- Enabling Secure Logging, page 77-16
- Including the Device ID in Non-EMBLEM Format Syslog Messages, page 77-17
- Including the Date and Time in Syslog Messages, page 77-18
- Disabling a Syslog Message, page 77-18
- Changing the Severity Level of a Syslog Message, page 77-18
- Limiting the Rate of Syslog Message Generation, page 77-19
# Configuring Logging

## Sending Syslog Messages to an External Syslog Server

You can archive messages according to the available disk space on the external syslog server, and manipulate logging data after it is saved. For example, you could specify actions to be executed when certain types of syslog messages are logged, extract data from the log and save the records to another file for reporting, or track statistics using a site-specific script.

To send syslog messages to an external syslog server, perform the following steps:

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>logging host interface_name syslog_ip [tcp[/port]</td>
<td>Configures the ASA to send messages to a syslog server.</td>
</tr>
<tr>
<td></td>
<td>udp[/port] [format emblem]]</td>
<td>The <code>format emblem</code> keyword enables EMBLEM format logging for the syslog server with UDP only. The <code>interface_name</code> argument specifies the interface through which you access the syslog server. The <code>syslog_ip</code> argument specifies the IP address of the syslog server. The <code>tcp[/port]</code> or <code>udp[/port]</code> keyword and argument pair specify that the ASA and ASASM should use TCP or UDP to send syslog messages to the syslog server.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td>You can configure the ASA to send data to a syslog server using either UDP or TCP, but not both. The default protocol is UDP if you do not specify a protocol.</td>
</tr>
<tr>
<td></td>
<td>hostname(config)# logging host dmz1 192.168.1.5 udp 1026 format emblem</td>
<td>If you specify TCP, the ASA discover when the syslog server fails and as a security protection, new connections through the ASA are blocked. To allow new connections regardless of connectivity to a TCP syslog server, see Step 3. If you specify UDP, the ASA continue to allow new connections whether or not the syslog server is operational. Valid port values for either protocol are 1025 through 65535. The default UDP port is 514. The default TCP port is 1470.</td>
</tr>
<tr>
<td>2</td>
<td>logging trap {severity_level</td>
<td>message_list}</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td>(Optional) Disables the feature to block new connections when a TCP-connected syslog server is down. If the ASA is configured to send syslog messages to a TCP-based syslog server, and if either the syslog server is down or the log queue is full, then new connections are blocked. New connections are allowed again after the syslog server is back up and the log queue is no longer full. For more information about the log queue, see the “Configuring the Logging Queue” section on page 77-15.</td>
</tr>
<tr>
<td></td>
<td>hostname(config)# logging trap errors</td>
<td>hostname(config)# logging permit-hostdown</td>
</tr>
<tr>
<td>3</td>
<td>logging permit-hostdown</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hostname(config)# logging permit-hostdown</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>logging facility number</td>
<td>(Optional) Sets the logging facility to a value other than 20, which is what most UNIX systems expect.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hostname(config)# logging facility 21</td>
<td></td>
</tr>
</tbody>
</table>

---

Cisco ASA 5500 Series Configuration Guide using the CLI
### Sending Syslog Messages to the Internal Log Buffer

To send syslog messages to the internal log buffer, perform the following steps:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>logging buffered</strong> *(severity_level</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>hostname(config)# logging buffered critical</td>
</tr>
<tr>
<td></td>
<td>hostname(config)# logging buffered level 2</td>
</tr>
<tr>
<td></td>
<td>hostname(config)# logging buffered notif-list</td>
</tr>
</tbody>
</table>

**Step 2** **logging buffer-size** *bytes*  
**Example:** hostname(config)# logging buffer-size 16384

**Step 3** Choose one of the following options:  
**logging flash-bufferwrap**  
**Example:** hostname(config)# logging flash-bufferwrap

**logging ftp-bufferwrap**  
**Example:** hostname(config)# logging ftp-bufferwrap

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <strong>logging buffered</strong> *(severity_level</td>
<td>message_list)*</td>
</tr>
<tr>
<td><strong>Step 2</strong> <strong>logging buffer-size</strong> <em>bytes</em></td>
<td>Changes the size of the internal log buffer. The buffer size is 4 KB.</td>
</tr>
</tbody>
</table>
| **Step 3** Choose one of the following options:  
**logging flash-bufferwrap** | When saving the buffer content to another location, the ASA create log files with names that use the following time-stamp format:  

`LOG-YYYY-MM-DD-HHMMSS.TXT`

where `YYYY` is the year, `MM` is the month, `DD` is the day of the month, and `HHMMSS` is the time in hours, minutes, and seconds.

The ASA continues to save new messages to the internal log buffer and saves the full log buffer content to the internal flash memory. |
| **logging ftp-bufferwrap** | When saving the buffer content to another location, the ASA creates log files with names that use the following time-stamp format:  

`LOG-YYYY-MM-DD-HHMMSS.TXT`

where `YYYY` is the year, `MM` is the month, `DD` is the day of the month, and `HHMMSS` is the time in hours, minutes, and seconds.

The ASA continues saving new messages to the internal log buffer and saves the full log buffer content to an FTP server. |
### Sending Syslog Messages to an E-mail Address

To send syslog messages to an e-mail address, perform the following steps:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Specifying which syslog messages should be sent to an e-mail address. When sent by e-mail, the device name appears in the subject line of the e-mail message and the syslog message appears in the body of the e-mail message. For this reason, we recommend configuring this option to notify administrators of syslog messages with high severity levels, such as critical, alert, and emergency.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Specifying the source e-mail address to be used when sending syslog messages to an e-mail address.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Specifying the recipient e-mail address to be used when sending syslog messages to an e-mail address.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>Specifying the SMTP server to be used when sending syslog messages to an e-mail address.</td>
</tr>
</tbody>
</table>

#### Command Explanation

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>logging mail</strong></td>
<td>Specifies which syslog messages should be sent to an e-mail address.</td>
</tr>
<tr>
<td><strong>logging from-address</strong></td>
<td>Specifies the source e-mail address to be used when sending syslog messages to an e-mail address.</td>
</tr>
<tr>
<td><strong>logging recipient-address</strong></td>
<td>Specifies the recipient e-mail address to be used when sending syslog messages to an e-mail address.</td>
</tr>
<tr>
<td><strong>smtp-server</strong></td>
<td>Specifies the SMTP server to be used when sending syslog messages to an e-mail address.</td>
</tr>
</tbody>
</table>

#### Example Configurations

- **Step 1 Example**
  
  ```
  hostname(config)# logging mail high-priority
  ```

- **Step 2 Example**
  
  ```
  hostname(config)# logging from-address xxx-001@example.com
  ```

- **Step 3 Example**
  
  ```
  hostname(config)# logging recipient-address admin@example.com
  ```

- **Step 4 Example**
  
  ```
  hostname(config)# smtp-server 10.1.1.1
  ```
Sending Syslog Messages to ASDM

To send syslog messages to ASDM, perform the following steps:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>logging asdm</strong> *(severity_level</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>hostname(config)# logging asdm 2</td>
</tr>
</tbody>
</table>

Specifies which syslog messages should be sent to ASDM. The ASA sets aside a buffer area for syslog messages waiting to be sent to ASDM and saves messages in the buffer as they occur. The ASDM log buffer is a different buffer than the internal log buffer. When the ASDM log buffer is full, the ASA deletes the oldest syslog message to make room in the buffer for new ones. Deletion of the oldest syslog message to make room for new ones is the default setting in ASDM. To control the number of syslog messages retained in the ASDM log buffer, you can change the size of the buffer.

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 2</strong></td>
<td><strong>logging asdm-buffer-size</strong> <em>num_of_msgs</em></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>hostname(config)# logging asdm-buffer-size 200</td>
</tr>
</tbody>
</table>

Specifies the number of syslog messages to be retained in the ASDM log buffer. To empty the current content of the ASDM log buffer, enter the clear logging asdm command.

Sending Syslog Messages to the Console Port

To send syslog messages to the console port, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>logging console</strong> *(severity_level</td>
<td>message_list)*</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>hostname(config)# logging console errors</td>
</tr>
</tbody>
</table>

Sending Syslog Messages to an SNMP Server

To enable logging to an SNMP server, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>logging history</strong> *(logging_list</td>
<td>level)*</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>hostname(config)# logging history errors</td>
</tr>
</tbody>
</table>
Sending Syslog Messages to a Telnet or SSH Session

To send syslog messages to a Telnet or SSH session, perform the following steps:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1**
logging monitor \{severity_level | Specifies which syslog messages should be sent to a Telnet or
| message_list\}                | SSH session.                                                     |
| Example:
hostname(config)# logging  | Enables logging to the current session only. If you log
monitor 6                        | out and then log in again, you need to reenter this command. To
disable logging to the current session, enter the **terminal no
monitor** command. |
| **Step 2**
terminal monitor                |                                                                  |
| Example:
hostname(config)# terminal    |                                                                  |
monitor

# Creating a Custom Event List

To create a custom event list, perform the following steps:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Specifies criteria for selecting messages to be saved in the internal log buffer. For example, if you set the severity level to 3, then the ASA sends syslog messages for severity levels 3, 2, and 1. <strong>The name argument</strong> specifies the name of the list. The <strong>level</strong> keyword and argument pair specify the severity level. The <strong>class message_class</strong> keyword and argument pair specify a particular message class. The <strong>message start_id[-end_id]</strong> keyword and argument pair specify an individual syslog message number or a range of numbers. <strong>Note</strong> Do not use the names of severity levels as the name of a syslog message list. Prohibited names include emergencies, alert, critical, error, warning, notification, informational, and debugging. Similarly, do not use the first three characters of these words at the beginning of an event list name. For example, do not use an event list name that starts with the characters err.</td>
</tr>
<tr>
<td>`logging list name {level level [class message_class]</td>
<td>message start_id[-end_id]}`</td>
</tr>
</tbody>
</table>

| **Step 2** | (Optional) Adds more criteria for message selection to the list. Enter the same command as in the previous step, specifying the name of the existing message list and the additional criterion. Enter a new command for each criterion that you want to add to the list. For example, you can specify criteria for syslog messages to be included in the list as the following: **Note** A syslog message is logged if it satisfies any of these conditions. If a syslog message satisfies more than one of the conditions, the message is logged only once. |
| `logging list name {level level [class message_class] | message start_id[-end_id]}` | **Example:** hostoname(config)# logging list notif-list message 104024-105999 hostoname(config)# logging list notif-list level critical hostoname(config)# logging list notif-list level warning class ha |

| **Step 2** | |
| `logging list name {level level [class message_class] | message start_id[-end_id]}` | |
Generating Syslog Messages in EMBLEM Format to a Syslog Server

To generate syslog messages in EMBLEM format to a syslog server, enter the following command:

```
logging host interface_name ip_address
{tcp[/port] | udp[/port]} [format emblem]
```

**Example:**
```
hostname(config)# logging host interface_1 127.0.0.1 udp format emblem
```

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging host interface_name ip_address {tcp[/port]</td>
<td>udp[/port]} [format emblem]</td>
</tr>
</tbody>
</table>

**Note** Sending syslogs over TCP is not supported on a standby ASA.

Generating Syslog Messages in EMBLEM Format to Other Output Destinations

To generate syslog messages in EMBLEM format to other output destinations, enter the following command:

```
logging emblem
```

**Example:**
```
hostname(config)# logging emblem
```

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging emblem</td>
<td>Sends syslog messages in EMBLEM format to output destinations other than a syslog server, such as Telnet or SSH sessions.</td>
</tr>
</tbody>
</table>
### Changing the Amount of Internal Flash Memory Available for Logs

To change the amount of internal flash memory available for logs, perform the following steps:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Specifying the maximum amount of internal flash memory available for saving log files. By default, the ASA can use up to 1 MB of internal flash memory for log data. The minimum amount of internal flash memory that must be free for the ASA to save log data is 3 MB.</td>
</tr>
</tbody>
</table>
| **logging flash-maximum-allocation kbytes** | **Example:**  
hostname(config)# logging flash-maximum-allocation 1200  
If a log file being saved to internal flash memory would cause the amount of free internal flash memory to fall below the configured minimum limit, the ASA deletes the oldest log files to ensure that the minimum amount of memory remains free after saving the new log file. If there are no files to delete or if, after all old files have been deleted, free memory is still below the limit, the ASA fails to save the new log file. |
| **Step 2**                     | Specifying the minimum amount of internal flash memory that must be free for the ASA to save a log file.                                                                                               |
| **logging flash-minimum-free kbytes** | **Example:**  
hostname(config)# logging flash-minimum-free 4000                                                                                           |

### Configuring the Logging Queue

To configure the logging queue, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **logging queue message_count** | Specifies the number of syslog messages that the ASA can hold in its queue before sending them to the configured output destination. The ASA has a fixed number of blocks in memory that can be allocated for buffering syslog messages while they are waiting to be sent to the configured output destination. The number of blocks required depends on the length of the syslog message queue and the number of syslog servers specified. The default queue size is 512 syslog messages. The queue size is limited only by block memory availability. Valid values are from 0 to 8192 messages, depending on the platform. If the logging queue is set to zero, the queue is the maximum configurable size (8192 messages), depending on the platform. The maximum queue size by platform is as follows:  
  • ASA-5505—1024  
  • ASA-5510—2048  
  • On all other platforms—8192 |
| **Example:**              |  
hostname(config)# logging queue 300                                                                                                                                                                    |
## Sending All Syslog Messages in a Class to a Specified Output Destination

To send all syslog messages in a class to a specified output destination, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging class message_class [buffered</td>
<td>console</td>
</tr>
</tbody>
</table>

Example:

```
hostname(config)# logging class ha buffered alerts
```

## Enabling Secure Logging

To enable secure logging, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>logging host interface_name syslog_ip [tcp/port</td>
<td>udp/port] [format emblem] [secure]</td>
</tr>
</tbody>
</table>

Example:

```
hostname(config)# logging host inside 10.0.0.1 TCP/1500 secure
```

Note: Secure logging does not support UDP; an error occurs if you try to use this protocol.
Including the Device ID in Non-EMBLEM Format Syslog Messages

To include the device ID in non-EMBLEM format syslog messages, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| logging device-id [context-name | hostname | ipaddress interface_name | string text] | Configures the ASA to include a device ID in non-EMBLEM-format syslog messages. You can specify only one type of device ID for syslog messages. The `context-name` keyword indicates that the name of the current context should be used as the device ID (applies to multiple context mode only). If you enable the logging device ID for the admin context in multiple context mode, messages that originate in the system execution space use a device ID of `system`, and messages that originate in the admin context use the name of the admin context as the device ID. The `hostname` keyword specifies that the hostname of the ASA should be used as the device ID. The `ipaddress interface_name` keyword and argument pair specify that the interface IP address specified as `interface_name` should be used as the device ID. If you use the `ipaddress` keyword, the device ID becomes the specified ASA interface IP address, regardless of the interface from which the syslog message is sent. This keyword provides a single, consistent device ID for all syslog messages that are sent from the device. The `string text` keyword and argument pair specify that the text string should be used as the device ID. The string can include as many as 16 characters. You cannot use blank spaces or any of the following characters:
  - `&` (ampersand)
  - `‘` (single quote)
  - `“` (double quote)
  - `<` (less than)
  - `>` (greater than)
  - `?` (question mark)
| Note  | If enabled, the device ID does not appear in EMBLEM-formatted syslog messages nor in SNMP traps. |
Including the Date and Time in Syslog Messages

To include the date and time in syslog messages, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>logging timestamp</code></td>
<td>Specifies that syslog messages should include the date and time that they were generated. To remove the date and time from syslog messages, enter the <code>no logging timestamp</code> command.</td>
</tr>
</tbody>
</table>

Example:

```
hostname(config)# logging timestamp
LOG-2008-10-24-081856.TXT
```

Disabling a Syslog Message

To disable a specified syslog message, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>no logging message message_number</code></td>
<td>Prevents the ASA from generating a particular syslog message. To reenable a disabled syslog message, enter the <code>logging message message_number</code> command (for example, <code>logging message 113019</code>). To reenable logging of all disabled syslog messages, enter the <code>clear config logging disabled</code> command.</td>
</tr>
</tbody>
</table>

Example:

```
hostname(config)# no logging message 113019
```

Changing the Severity Level of a Syslog Message

To change the severity level of a syslog message, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>logging message message_ID level severity_level</code></td>
<td>Specifies the severity level of a syslog message. To reset the severity level of a syslog message to its setting, enter the <code>no logging message message_ID level current_severity_level</code> command (for example, <code>no logging message 113019 level 5</code>). To reset the severity level of all modified syslog messages to their settings, enter the <code>clear configure logging level</code> command.</td>
</tr>
</tbody>
</table>

Example:

```
hostname(config)# logging message 113019 level 5
```
### Limiting the Rate of Syslog Message Generation

To limit the rate of syslog message generation, enter the following command:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>`logging rate-limit {unlimited</td>
<td>{num [interval]}messages syslog_id</td>
</tr>
</tbody>
</table>

**Example:**

`hostname(config)# logging rate-limit 1000 600 level 6`

### Monitoring the Logs

To monitor the logs and assist in monitoring the system performance, enter one of the following commands:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show logging</code></td>
<td>Shows syslog messages, including the severity level. <strong>Note</strong> The maximum number of syslog messages that are available to view is 1000, which is the default setting. The maximum number of syslog messages that are available to view is 2000.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show logging message</code></td>
<td>Shows a list of syslog messages with modified severity levels and disabled syslog messages.</td>
</tr>
<tr>
<td><code>show logging message message_ID</code></td>
<td>Shows the severity level of a specific syslog message.</td>
</tr>
<tr>
<td><code>show logging queue</code></td>
<td>Shows the logging queue and queue statistics.</td>
</tr>
<tr>
<td><code>show logging rate-limit</code></td>
<td>Shows the disallowed syslog messages.</td>
</tr>
<tr>
<td><code>show running-config logging rate-limit</code></td>
<td>Shows the current logging rate-limit setting.</td>
</tr>
</tbody>
</table>

**Examples**

The following example shows the logging information that displays for the `show logging` command:

```bash
hostname(config)# show logging
Syslog logging: enabled
   Facility: 16
   Timestamp logging: disabled
   Standby logging: disabled
   Deny Conn when Queue Full: disabled
   Console logging: disabled
   Monitor logging: disabled
   Buffer logging: disabled
   Trap logging: level errors, facility 16, 3607 messages logged
   Logging to infrastructure 10.1.2.3
```
Configuration Examples for Logging

The following examples show how to control both whether a syslog message is enabled and the severity level of the specified syslog message:

hostname(config)# show logging message 403503
syslog 403503: -level errors (enabled)

hostname(config)# logging message 403503 level 1
hostname(config)# show logging message 403503
syslog 403503: -level errors, current-level alerts (enabled)

hostname(config)# no logging message 403503
hostname(config)# show logging message 403503
syslog 403503: -level errors, current-level alerts (disabled)

hostname(config)# logging message 403503
hostname(config)# show logging message 403503
syslog 403503: -level errors, current-level alerts (enabled)

hostname(config)# no logging message 403503 level 3
hostname(config)# show logging message 403503
syslog 403503: -level errors (enabled)

Feature History for Logging

Table 77-2 lists each feature change and the platform release in which it was implemented.

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Platform Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logging</td>
<td>7.0(1)</td>
<td>Provides ASA network logging information through various output destinations, and includes the option to view and save log files.</td>
</tr>
<tr>
<td>Rate limit</td>
<td>7.0(4)</td>
<td>Limits the rate at which syslog messages are generated. We introduced the following command: <code>logging rate-limit</code>.</td>
</tr>
<tr>
<td>Logging list</td>
<td>7.2(1)</td>
<td>Creates a logging list to use in other commands to specify messages by various criteria (logging level, event class, and message IDs). We introduced the following command: <code>logging list</code>.</td>
</tr>
</tbody>
</table>
Table 77-2 Feature History for Logging (continued)

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Platform Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure logging</td>
<td>8.0(2)</td>
<td>Specifies that the connection to the remote logging host should use SSL/TLS. This option is valid only if the protocol selected is TCP. We modified the following command: <code>logging host</code>.</td>
</tr>
<tr>
<td>Logging class</td>
<td>8.0(4), 8.1(1)</td>
<td>Added support for the ipaa event class of logging messages. We modified the following command: <code>logging class</code>.</td>
</tr>
<tr>
<td>Logging class and saved logging buffers</td>
<td>8.2(1)</td>
<td>Added support for the dap event class of logging messages. We modified the following command: <code>logging class</code>. Added support to clear the saved logging buffers (ASDM, internal, FTP, and flash). We introduced the following command: <code>clear logging queue bufferwrap</code>.</td>
</tr>
<tr>
<td>Password encryption</td>
<td>8.3(1)</td>
<td>Added support for password encryption. We modified the following command: <code>logging ftp server</code>.</td>
</tr>
</tbody>
</table>
| Enhanced logging and connection blocking  | 8.3(2)            | When you configure a syslog server to use TCP, and the syslog server is unavailable, the ASA blocks new connections that generate syslog messages until the server becomes available again (for example, VPN, firewall, and cut-through-proxy connections). This feature has been enhanced to also block new connections when the logging queue on the ASA is full; connections resume when the logging queue is cleared.
This feature was added for compliance with Common Criteria EAL4+. Unless required, we recommended allowing connections when syslog messages cannot be sent or received. To allow connections, continue to use the `logging permit-hostdown` command.
We modified the following command: `show logging`.
We introduced the following syslog messages: 414005, 414006, 414007, and 414008. |