Completing Interface Configuration (Transparent Mode, 8.4 and Later)

This chapter includes tasks to complete the interface configuration for all models in transparent firewall mode.

For Version 8.3 and earlier, see Chapter 15, "Completing Interface Configuration (Transparent Mode, 8.3 and Earlier)."

This chapter includes the following sections:

Note For multiple context mode, complete the tasks in this section in the context execution space. In the Configuration > Device List pane, double-click the context name under the active device IP address.

Information About Completing Interface Configuration in Transparent Mode (8.4 and Later)

This section includes the following topics:

Bridge Groups in Transparent Mode

If you do not want the overhead of security contexts, or want to maximize your use of security contexts, you can group interfaces together in a bridge group, and then configure multiple bridge groups, one for each network. Bridge group traffic is isolated from other bridge groups; traffic is not routed to another bridge group within the ASA, and traffic must exit the ASA before it is routed by an external router back to another bridge group in the ASA. Although the bridging functions are separate for each bridge group, many other functions are shared between all bridge groups. For example, all bridge groups share a syslog server or AAA server configuration. For complete security policy separation, use security contexts with one bridge group in each context. At least one bridge group is required per context or in single mode.

Each bridge group requires a management IP address. For another method of management, see the "Management Interface" section.

Note The ASA does not support traffic on secondary networks; only traffic on the same network as the management IP address is supported.

Security Levels

Each interface must have a security level from 0 (lowest) to 100 (highest). For example, you should assign your most secure network, such as the inside host network, to level 100. While the outside network connected to the Internet can be level 0. Other networks, such as DMZs can be in between. You can assign interfaces to the same security level. See the "Allowing Same Security Level Communication" section on page 14-21 for more information.

The level controls the following behavior:

- Network access—By default, there is an implicit permit from a higher security interface to a lower security interface (outbound). Hosts on the higher security interface can access any host on a lower security interface. You can limit access by applying an ACL to the interface.

  If you enable communication for same security interfaces (see the "Allowing Same Security Level Communication" section on page 14-21), there is an implicit permit for interfaces to access other interfaces on the same security level or lower.

- Inspection engines—Some application inspection engines are dependent on the security level. For same security interfaces, inspection engines apply to traffic in either direction.
  - NetBIOS inspection engine—Applied only for outbound connections.
  - SQL*Net inspection engine—If a control connection for the SQL*Net (formerly OraServ) port exists between a pair of hosts, then only an inbound data connection is permitted through the ASA.

- Filtering—HTTP(S) and FTP filtering applies only for outbound connections (from a higher level to a lower level).

  If you enable communication for same security interfaces, you can filter traffic in either direction.

- **established** command—This command allows return connections from a lower security host to a higher security host if there is already an established connection from the higher level host to the lower level host.

  If you enable communication for same security interfaces, you can configure **established** commands for both directions.

Licensing Requirements for Completing Interface Configuration in Transparent Mode

Model	License Requirement
ASA 5505	VLANs: Routed Mode: Base License: 3 (2 regular zones and 1 restricted zone that can only communicate with 1 other zone) Security Plus License: 20 Transparent Mode: Base License: 2 active VLANs in 1 bridge group. Security Plus License: 3 active VLANs: 2 active VLANs in 1 bridge group, and 1 active VLAN for the failover link. VLAN Trunks: Base License: None. Security Plus License: 8.

Model	License Requirement
ASA 5510	VLANs[1]: Base License: 50 Security Plus License: 100 Interface Speed: Base License—All interfaces Fast Ethernet. Security Plus License—Ethernet 0/0 and 0/1: Gigabit Ethernet; all others Fast Ethernet. Interfaces of all types[2]: Base License: 364 Security Plus License: 564
ASA 5520	VLANs[1]: Base License: 150. Interfaces of all types[2]: Base License: 764
ASA 5540	VLANs[1]: Base License: 200 Interfaces of all types[2]: Base License: 964

Model	License Requirement
ASA 5550	VLANs[1]: Base License: 400 Interfaces of all types[2]: Base License: 1764
ASA 5580	VLANs[1]: Base License: 1024 Interfaces of all types[2]: Base License: 4612
ASA 5512-X	VLANs[1]: Base License: 50 Security Plus License: 100 Interfaces of all types[2]: Base License: 716 Security Plus License: 916
ASA 5515-X	VLANs[1]: Base License: 100 Interfaces of all types[2]: Base License: 916
ASA 5525-X	VLANs[1]: Base License: 200 Interfaces of all types[2]: Base License: 1316
ASA 5545-X	VLANs[1]: Base License: 300 Interfaces of all types[2]: Base License: 1716

Model	License Requirement
ASA 5555-X	VLANs[1]: Base License: 500 Interfaces of all types[2]: Base License: 2516
ASA 5585-X	VLANs[1]: Base and Security Plus License: 1024 Interface Speed for SSP-10 and SSP-20: Base License—1-Gigabit Ethernet for fiber interfaces 10 GE I/O License (Security Plus)—10-Gigabit Ethernet for fiber interfaces (SSP-40 and SSP-60 support 10-Gigabit Ethernet by default.) Interfaces of all types[2]: Base and Security Plus License: 4612

1. For an interface to count against the VLAN limit, you must assign a VLAN to it.
2. The maximum number of combined interfaces; for example, VLANs, physical, redundant, bridge group, and EtherChannel interfaces. Every **interface** defined in the configuration counts against this limit.

Model	License Requirement
ASA SM	VLANs: Base License: 1000

Guidelines and Limitations

This section includes the guidelines and limitations for this feature.

Context Mode Guidelines

- For the ASA 5510 and higher in multiple context mode, configure the physical interfaces in the system execution space according to Chapter 11, "Starting Interface Configuration (ASA 5510 and Higher)." Then, configure the logical interface parameters in the context execution space according to this chapter. For the ASASM in multiple context mode, configure switch ports and VLANs on the switch, and then assign VLANs to the ASASM according to Chapter 2, "Configuring the Switch for Use with the ASA Services Module."

  The ASA 5505 does not support multiple context mode.

- You can only configure context interfaces that you already assigned to the context in the system configuration.

Firewall Mode Guidelines

- You can configure up to 8 bridge groups in single mode or per context in multiple mode. Note that you must use at least 1 bridge group; data interfaces must belong to a bridge group.

Note Although you can configure multiple bridge groups on the ASA 5505, the restriction of 2 data interfaces in transparent mode on the ASA 5505 means you can only effectively use 1 bridge group.

- Each bridge group can include up to 4 interfaces.
- For IPv4, a management IP address is required for each bridge group for both management traffic and for traffic to pass through the ASA.

  Unlike routed mode, which requires an IP address for each interface, a transparent firewall has an IP address assigned to the entire bridge group. The ASA uses this IP address as the source address for packets originating on the ASA, such as system messages or AAA communications. In addition to the bridge group management address, you can optionally configure a management interface for some models; see the "Management Interface" section on page 11-2 for more information.

  The management IP address must be on the same subnet as the connected network. You cannot set the subnet to a host subnet (255.255.255.255). The ASA does not support traffic on secondary networks; only traffic on the same network as the management IP address is supported. See the "Configuring Bridge Groups" section on page 14-8 for more information about management IP subnets.
- For IPv6, at a minimum you need to configure link-local addresses for each interface for through traffic. For full functionality, including the ability to manage the ASA, you need to configure a global IPv6 address for each bridge group.
- For multiple context mode, each context must use different interfaces; you cannot share an interface across contexts.
- For multiple context mode, each context typically uses a different subnet. You can use overlapping subnets, but your network topology requires router and NAT configuration to make it possible from a routing standpoint.

Failover Guidelines

Do not finish configuring failover interfaces with the procedures in this chapter. See Chapter 9, "Configuring Failover," to configure the failover and state links. In multiple context mode, failover interfaces are configured in the system configuration.

IPv6 Guidelines

- Supports IPv6.
- No support for IPv6 anycast addresses in transparent mode.

VLAN ID Guidelines for the ASASM

You can add any VLAN ID to the configuration, but only VLANs that are assigned to the ASA by the switch can pass traffic. To view all VLANs assigned to the ASA, use the **show vlan** command.

If you add an interface for a VLAN that is not yet assigned to the ASA by the switch, the interface will be in the down state. When you assign the VLAN to the ASA, the interface changes to an up state. See the **show interface** command for more information about interface states.

Default Settings

This section lists default settings for interfaces if you do not have a factory default configuration. For information about the factory default configurations, see the "Factory Default Configurations" section on page 3-19.

Default Security Level

The default security level is 0. If you name an interface "inside" and you do not set the security level explicitly, then the ASA sets the security level to 100.

Note If you change the security level of an interface, and you do not want to wait for existing connections to time out before the new security information is used, you can clear the connections using the **clear local-host** command.

Default State of Interfaces for the ASASM

- In single mode or in the system execution space, VLAN interfaces are enabled by default.
- In multiple context mode, all allocated interfaces are enabled by default, no matter what the state of the interface is in the system execution space. However, for traffic to pass through the interface, the interface also has to be enabled in the system execution space. If you shut down an interface in the system execution space, then that interface is down in all contexts that share it.

Jumbo Frame Support

By default, the ASASM supports jumbo frames. Just configure the MTU for the desired packet size according to the "Configuring the MAC Address, MTU, and TCP MSS" section on page 14-15.

Completing Interface Configuration in Transparent Mode (8.4 and Later)

This section includes the following topics:

Task Flow for Completing Interface Configuration

Step 1 Set up your interfaces depending on your model:

- ASA 5510 and higher—Chapter 11, "Starting Interface Configuration (ASA 5510 and Higher)."
- ASA 5505—Chapter 12, "Starting Interface Configuration (ASA 5505)."
- ASASM—Chapter 2, "Configuring the Switch for Use with the ASA Services Module."

Step 2 (Multiple context mode) Allocate interfaces to the context according to the "Configuring Multiple Contexts" section on page 8-15.

Step 3 (Multiple context mode) In the Configuration > Device List pane, double-click the context name under the active device IP address.

Step 4 Configure one or more bridge groups, including the IPv4 address. See the "Configuring Bridge Groups" section on page 14-8.

Step 5 Configure general interface parameters, including the bridge group it belongs to, the interface name, and security level. See the "Configuring General Interface Parameters" section on page 14-9.

Step 6 (Optional; not supported for the ASA 5505) Configure a management interface. See the "Configuring a Management Interface (ASA 5510 and Higher)" section on page 14-12.

Step 7 (Optional) Configure the MAC address and the MTU. See the "Configuring the MAC Address, MTU, and TCP MSS" section on page 14-15.

Step 8 (Optional) Configure IPv6 addressing. See the "Configuring IPv6 Addressing" section on page 14-17.

Step 9 (Optional) Allow same security level communication, either by allowing communication between two interfaces or by allowing traffic to enter and exit the same interface. See the "Allowing Same Security Level Communication" section on page 14-21.

Configuring Bridge Groups

Each bridge group requires a management IP address. The ASA uses this IP address as the source address for packets originating from the bridge group. The management IP address must be on the same subnet as the connected network. For IPv4 traffic, the management IP address is required to pass any traffic. For IPv6 traffic, you must, at a minimum, configure the link-local addresses to pass traffic, but a global management address is recommended for full functionality, including remote management and other management operations.

Guidelines and Limitations

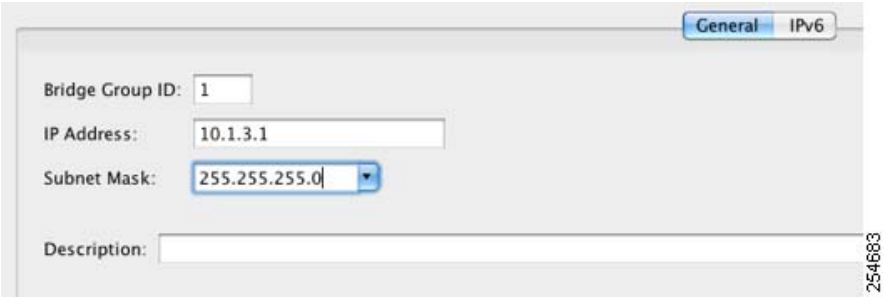
You can configure up to 8 bridge groups in single mode or per context in multiple mode. Note that you must use at least one bridge group; data interfaces must belong to a bridge group.

Note For a separate management interface (for supported models), a non-configurable bridge group (ID 101) is automatically added to your configuration. This bridge group is not included in the bridge group limit.

Detailed Steps

Step 1 Choose the **Configuration > Interfaces** pane, and choose **Add > Bridge Group Interface**.

The Add Bridge Group dialog box appears.



Step 2 In the Bridge Group ID field, enter the bridge group ID between 1 and 100.

Step 3 In the IP Address field, enter the management IPv4 address.

The ASA does not support traffic on secondary networks; only traffic on the same network as the management IP address is supported.

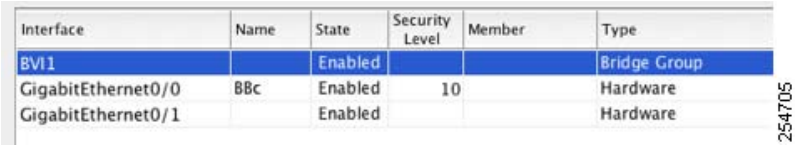
Step 4 In the Subnet Mask field, enter the subnet mask or choose one from the menu.

Do not assign a host address (/32 or 255.255.255.255) to the transparent firewall. Also, do not use other subnets that contain fewer than 3 host addresses (one each for the upstream router, downstream router, and transparent firewall) such as a /30 subnet (255.255.255.252). The ASA drops all ARP packets to or from the first and last addresses in a subnet. For example, if you use a /30 subnet and assign a reserved address from that subnet to the upstream router, then the ASA drops the ARP request from the downstream router to the upstream router.

Step 5 (Optional) In the Description field, enter a description for this bridge group.

Step 6 Click **OK**.

Step 7 A Bridge Group Virtual Interface (BVI) is added to the interface table, along with the physical and subinterfaces.



What to Do Next

Configure general interface parameters. See the "Configuring General Interface Parameters" section on page 14-9.

Configuring General Interface Parameters

This procedure describes how to set the name, security level, and bridge group for each transparent interface.

To configure a separate management interface, see the "Configuring a Management Interface (ASA 5510 and Higher)" section on page 14-12.

For the ASA 5510 and higher, you must configure interface parameters for the following interface types:

- Physical interfaces
- VLAN subinterfaces
- Redundant interfaces
- EtherChannel interfaces

For the ASA 5505 and the ASASM, you must configure interface parameters for the following interface types:

- VLAN interfaces

Guidelines and Limitations

- You can configure up to four interfaces per bridge group.
- For the ASA 5550, for maximum throughput, be sure to balance your traffic over the two interface slots; for example, assign the inside interface to slot 1 and the outside interface to slot 0.
- For information about security levels, see the "Security Levels" section on page 14-2.
- If you are using failover, do not use this procedure to name interfaces that you are reserving for failover and Stateful Failover communications. See Chapter 9, "Configuring Failover," to configure the failover and state links.

Prerequisites

- Set up your interfaces depending on your model:
  - ASA 5510 and higher—Chapter 11, "Starting Interface Configuration (ASA 5510 and Higher)."
  - ASA 5505—Chapter 12, "Starting Interface Configuration (ASA 5505)."
  - ASASM—Chapter 2, "Configuring the Switch for Use with the ASA Services Module."
- In multiple context mode, you can only configure context interfaces that you already assigned to the context in the system configuration according to the "Configuring Multiple Contexts" section on page 8-15.
- In multiple context mode, complete this procedure in the context execution space. To change from the system to a context configuration, in the Configuration > Device List pane, double-click the context name under the active device IP address.

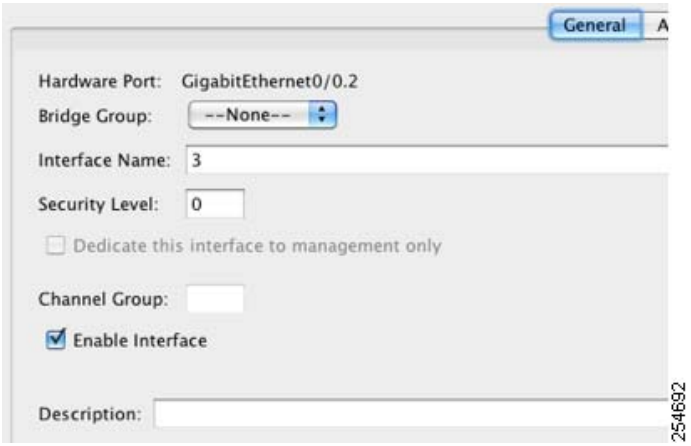
Detailed Steps

Step 1 Choose the **Configuration > Device Setup > Interfaces** pane.

BVIs appear in the table alongside physical interfaces, subinterfaces, redundant interfaces, and EtherChannel port-channel interfaces. In multiple context mode, only interfaces that were assigned to the context in the System execution space appear in the table.

Step 2 Choose the row for a non-BVI interface, and click **Edit**.

The Edit Interface dialog box appears with the General tab selected.



Do not use this procedure for Management interfaces; see the "Configuring a Management Interface (ASA 5510 and Higher)" section on page 14-12 to configure the Management interface.

Step 3 In the Bridge Group drop-down menu, choose the bridge group to which you want to assign this interface.

Step 4 In the Interface Name field, enter a name up to 48 characters in length.

Step 5 In the Security level field, enter a level between 0 (lowest) and 100 (highest).

See the "Security Levels" section on page 14-2 for more information.

Note Do not click the **Dedicate this interface to management only** check box; see the "Configuring a Management Interface (ASA 5510 and Higher)" section on page 14-12 for this option.

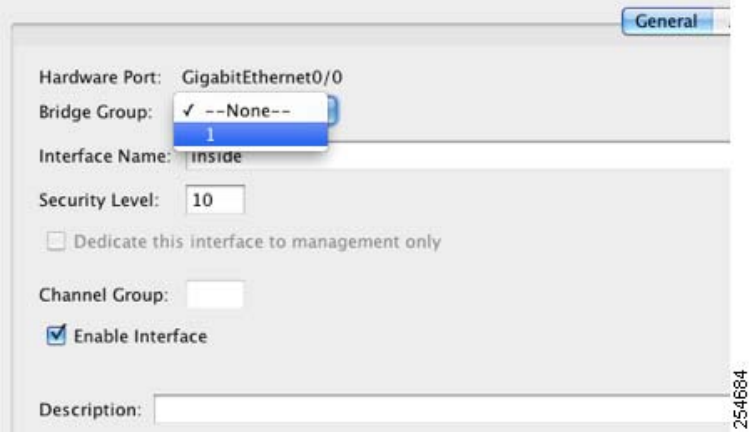
Step 6 If the interface is not already enabled, check the **Enable Interface** check box.

Note The Channel Group field is read-only and indicates if the interface is part of an EtherChannel.

Step 7 (Optional) In the Description field, enter a description for this interface.

The description can be up to 240 characters on a single line, without carriage returns. In the case of a failover or state link, the description is fixed as "LAN Failover Interface," "STATE Failover Interface," or "LAN/STATE Failover Interface," for example. You cannot edit this description. The fixed description overwrites any description you enter here if you make this interface a failover or state link.

Note (ASA 5510 and higher, single mode) For information about the Configure Hardware Properties button, see the "Enabling the Physical Interface and Configuring Ethernet Parameters" section on page 11-25.



Step 8 Click **OK**.

What to Do Next

- (Optional) Configure a management interface. See the "Configuring a Management Interface (ASA 5510 and Higher)" section on page 14-12.
- (Optional) Configure the MAC address and the MTU. See the "Configuring the MAC Address, MTU, and TCP MSS" section on page 14-15.
- (Optional) Configure IPv6 addressing. See the "Configuring IPv6 Addressing" section on page 14-17.

Configuring a Management Interface (ASA 5510 and Higher)

You can configure one management interface separate from the bridge group interfaces in single mode or per context. For more information, see the "Management Interface" section on page 11-2.

Restrictions

- See the "Management Interface" section on page 11-2.
- Do not assign this interface to a bridge group; a non-configurable bridge group (ID 101) is automatically added to your configuration. This bridge group is not included in the bridge group limit.
- If your model does not include a Management interface, you must manage the transparent firewall from a data interface; skip this procedure. (For example, on the ASA 5505.)
- In multiple context mode, you cannot share any interfaces, including the Management interface, across contexts. To provide management per context, you can create subinterfaces of the Management interface and allocate a Management subinterface to each context. Note that the ASA 5512-X through ASA 5555-X do not allow subinterfaces on the Management interface, so for per-context management, you must connect to a data interface.

Prerequisites

- Complete the procedures in Chapter 11, "Starting Interface Configuration (ASA 5510 and Higher)."

- In multiple context mode, you can only configure context interfaces that you already assigned to the context in the system configuration according to the "Configuring Multiple Contexts" section on page 8-15.
- In multiple context mode, complete this procedure in the context execution space. To change from the system to a context configuration, in the Configuration > Device List pane, double-click the context name under the active device IP address.

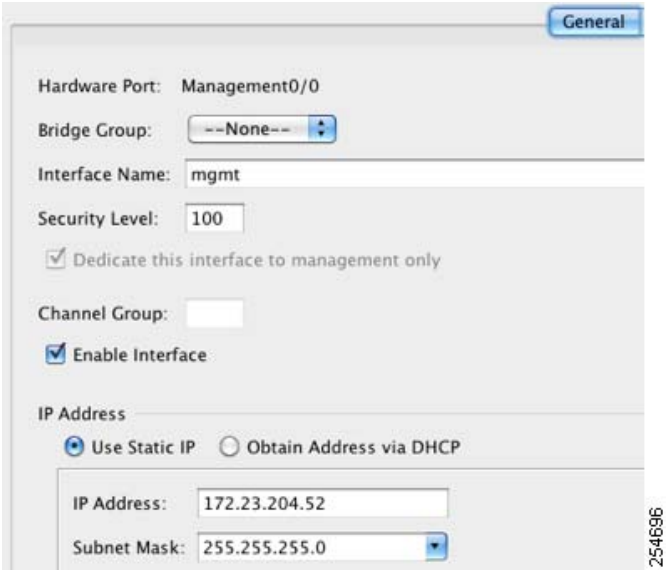
Detailed Steps

Step 1 Choose the **Configuration > Device Setup > Interfaces** pane.

BVIs appear in the table alongside physical interfaces, subinterfaces, redundant interfaces, and EtherChannel port-channel interfaces. In multiple context mode, only interfaces that were assigned to the context in the System execution space appear in the table.

Step 2 Choose the row for a Management interface, subinterface, or EtherChannel port-channel interface comprised of Management interfaces, and click **Edit**.

The Edit Interface dialog box appears with the General tab selected.



Step 3 In the Bridge Group drop-down menu, leave the default **--None--**. You cannot assign a management interface to a bridge group.

Step 4 In the Interface Name field, enter a name up to 48 characters in length.

Step 5 In the Security level field, enter a level between 0 (lowest) and 100 (highest).

See the "Security Levels" section on page 14-2 for more information.

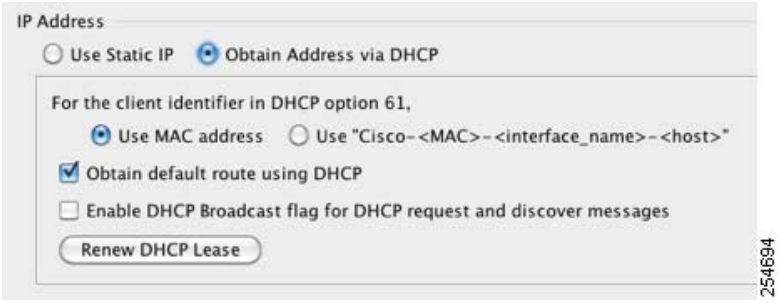
Note The **Dedicate this interface to management only** check box is enabled by default and is non-configurable.

Step 6 If the interface is not already enabled, check the **Enable Interface** check box.

Step 7 To set the IP address, use one of the following options.

Note For use with failover, you must set the IP address and standby address manually; DHCP is not supported. Set the standby IP addresses on the Configuration > Device Management > High Availability > Failover > Interfaces tab.

- To set the IP address manually, click the **Use Static IP** radio button and enter the IP address and mask.
- To obtain an IP address from a DHCP server, click the **Obtain Address via DHCP** radio button.



a. To force a MAC address to be stored inside a DHCP request packet for option 61, click the **Use MAC Address** radio button.

   Some ISPs expect option 61 to be the interface MAC address. If the MAC address is not included in the DHCP request packet, then an IP address will not be assigned.

b. To use a generated string for option 61, click **Use "Cisco-<MAC>-<interface_name>-<host>"**.

c. (Optional) To obtain the default route from the DHCP server, check **Obtain Default Route Using DHCP**.

d. (Optional) To set the broadcast flag to 1 in the DHCP packet header when the DHCP client sends a discover requesting an IP address, check **Enable DHCP Broadcast flag for DHCP request and discover messages**.

   The DHCP server listens to this broadcast flag and broadcasts the reply packet if the flag is set to 1.

e. (Optional) To renew the lease, click **Renew DHCP Lease**.

Step 8 (Optional) In the Description field, enter a description for this interface.

The description can be up to 240 characters on a single line, without carriage returns.

Note (ASA 5510 and higher, single mode) For information about the Configure Hardware Properties button, see the "Enabling the Physical Interface and Configuring Ethernet Parameters" section on page 11-25.

Step 9 Click **OK**.

What to Do Next

- (Optional) Configure the MAC address and the MTU. See the "Configuring the MAC Address, MTU, and TCP MSS" section on page 14-15.
- (Optional) Configure IPv6 addressing. See the "Configuring IPv6 Addressing" section on page 14-17.

Configuring the MAC Address, MTU, and TCP MSS

This section describes how to configure MAC addresses for interfaces, how to set the MTU, and set the TCP MSS.

Information About MAC Addresses

By default, the physical interface uses the burned-in MAC address, and all subinterfaces of a physical interface use the same burned-in MAC address.

For the ASASM, all VLANs use the same MAC address provided by the backplane.

A redundant interface uses the MAC address of the first physical interface that you add. If you change the order of the member interfaces in the configuration, then the MAC address changes to match the MAC address of the interface that is now listed first. If you assign a MAC address to the redundant interface using this command, then it is used regardless of the member interface MAC addresses.

For an EtherChannel, all interfaces that are part of the channel group share the same MAC address. This feature makes the EtherChannel transparent to network applications and users, because they only see the one logical connection; they have no knowledge of the individual links. The port-channel interface uses the lowest numbered channel group interface MAC address as the port-channel MAC address. Alternatively you can manually configure a MAC address for the port-channel interface. In multiple context mode, you can automatically assign unique MAC addresses to interfaces, including an EtherChannel port interface. We recommend manually, or in multiple context mode, automatically configuring a unique MAC address in case the group channel interface membership changes. If you remove the interface that was providing the port-channel MAC address, then the port-channel MAC address changes to the next lowest numbered interface, thus causing traffic disruption.

In multiple context mode, if you share an interface between contexts, you can assign a unique MAC address to the interface in each context. This feature lets the ASA easily classify packets into the appropriate context. Using a shared interface without unique MAC addresses is possible, but has some limitations. See the "How the ASA Classifies Packets" section on page 8-3 for more information. You can assign each MAC address manually, or you can automatically generate MAC addresses for shared interfaces in contexts. See the "Automatically Assigning MAC Addresses to Context Interfaces" section on page 8-24 to automatically generate MAC addresses. If you automatically generate MAC addresses, you can use this procedure to override the generated address.

For single context mode, or for interfaces that are not shared in multiple context mode, you might want to assign unique MAC addresses to subinterfaces. For example, your service provider might perform access control based on the MAC address.

Information About the MTU and TCP MSS

See the "Controlling Fragmentation with the Maximum Transmission Unit and TCP Maximum Segment Size" section on page 11-8.

Prerequisites

- Set up your interfaces depending on your model:
  - ASA 5510 and higher—Chapter 11, "Starting Interface Configuration (ASA 5510 and Higher)."
  - ASA 5505—Chapter 12, "Starting Interface Configuration (ASA 5505)."
  - ASASM—Chapter 2, "Configuring the Switch for Use with the ASA Services Module."
- In multiple context mode, you can only configure context interfaces that you already assigned to the context in the system configuration according to the "Configuring Multiple Contexts" section on page 8-15.
- In multiple context mode, complete this procedure in the context execution space. To change from the system to a context configuration, in the Configuration > Device List pane, double-click the context name under the active device IP address.

Detailed Steps

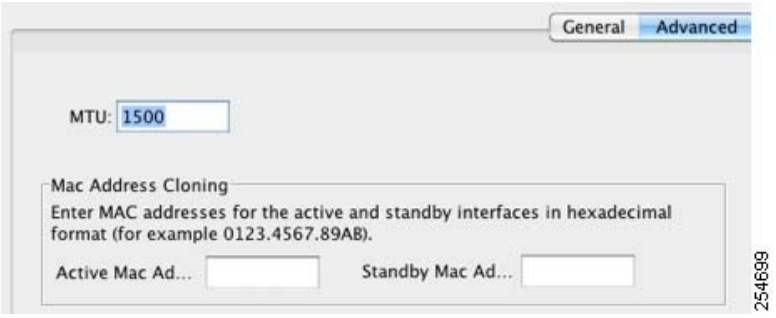
Step 1 Choose the **Configuration > Device Setup > Interfaces** pane.

For the ASA 5505, the Interfaces tab shows by default.

Step 2 Choose the interface row, and click **Edit**.

The Edit Interface dialog box appears with the General tab selected.

Step 3 Click the **Advanced** tab.



Step 4 To set the MTU or to enable jumbo frame support (supported models only), enter the value in the MTU field, between 300 and 65,535 bytes.

The default is 1500 bytes.

Note When you set the MTU for a redundant or port-channel interface, the ASA applies the setting to all member interfaces.

- For models that support jumbo frames in single mode—If you enter a value for any interface that is greater than 1500, then you enable jumbo frame support automatically for all interfaces. If you set the MTU for all interfaces back to a value under 1500, then jumbo frame support is disabled.

- For models that support jumbo frames in multiple mode—If you enter a value for any interface that is greater than 1500, then be sure to enable jumbo frame support in the system configuration. See the "Enabling Jumbo Frame Support (Supported Models)" section on page 11-39.

Note Enabling or disabling jumbo frame support requires you to reload the ASA.

Step 5 To manually assign a MAC address to this interface, enter a MAC address in the Active Mac Address field in H.H.H format, where H is a 16-bit hexadecimal digit.

For example, the MAC address 00-0C-F1-42-4C-DE would be entered as 000C.F142.4CDE. The first two bytes of a manual MAC address cannot be A2 if you also want to use auto-generated MAC addresses.

Step 6 If you use failover, enter the standby MAC address in the Standby Mac Address field. If the active unit fails over and the standby unit becomes active, the new active unit starts using the active MAC addresses to minimize network disruption, while the old active unit uses the standby address.

Step 7 To set the TCP MSS, choose **Configuration > Firewall > Advanced > TCP Options**. Set the following options:

- Force Maximum Segment Size for TCP—Sets the maximum TCP segment size in bytes, between 48 and any maximum number. The default value is 1380 bytes. You can disable this feature by setting the bytes to 0.
- Force Minimum Segment Size for TCP—Overrides the maximum segment size to be no less than the number of bytes you set, between 48 and any maximum number. This feature is disabled by default (set to 0).

What to Do Next

(Optional) Configure IPv6 addressing. See the "Configuring IPv6 Addressing" section on page 14-17.

Configuring IPv6 Addressing

This section describes how to configure IPv6 addressing. For more information about IPv6, see the "IPv6 Addresses" section on page 48-5.

This section includes the following topics:

Information About IPv6

This section includes information about how to configure IPv6, and includes the following topics:

IPv6 Addressing

You can configure two types of unicast addresses for IPv6:

- Global—The global address is a public address that you can use on the public network. This address needs to be configured for each bridge group, and not per-interface. You can also configure a global IPv6 address for the management interface.
- Link-local—The link-local address is a private address that you can only use on the directly-connected network. Routers do not forward packets using link-local addresses; they are only for communication on a particular physical network segment. They can be used for address configuration or for the ND functions such as address resolution and neighbor discovery. Because the link-local address is only available on a segment, and is tied to the interface MAC address, you need to configure the link-local address per interface.

At a minimum, you need to configure a link-local address for IPv6 to operate. If you configure a global address, a link-local addresses is automatically configured on each interface, so you do not also need to specifically configure a link-local address. If you do not configure a global address, then you need to configure the link-local address, either automatically or manually.

Modified EUI-64 Interface IDs

RFC 3513: Internet Protocol Version 6 (IPv6) Addressing Architecture requires that the interface identifier portion of all unicast IPv6 addresses, except those that start with binary value 000, be 64 bits long and be constructed in Modified EUI-64 format. The ASA can enforce this requirement for hosts attached to the local link.

When this feature is enabled on an interface, the source addresses of IPv6 packets received on that interface are verified against the source MAC addresses to ensure that the interface identifiers use the Modified EUI-64 format. If the IPv6 packets do not use the Modified EUI-64 format for the interface identifier, the packets are dropped and the following system log message is generated:

```
%ASA-3-325003: EUI-64 source address check failed.
```

The address format verification is only performed when a flow is created. Packets from an existing flow are not checked. Additionally, the address verification can only be performed for hosts on the local link. Packets received from hosts behind a router will fail the address format verification, and be dropped, because their source MAC address will be the router MAC address and not the host MAC address.

Unsupported Commands

The following IPv6 commands are not supported in transparent firewall mode, because they require router capabilities:

- **ipv6 address autoconfig**
- **ipv6 nd prefix**
- **ipv6 nd ra-interval**
- **ipv6 nd ra-lifetime**
- **ipv6 nd suppress-ra**

Configuring a Global IPv6 Address

To configure a global IPv6 address for a bridge group or management interface, perform the following steps.

Note Configuring the global address automatically configures the link-local address, so you do not need to configure it separately.

Restrictions

The ASA does not support IPv6 anycast addresses.

Prerequisites

- Set up your interfaces depending on your model:
  - ASA 5510 and higher—Chapter 11, "Starting Interface Configuration (ASA 5510 and Higher)."
  - ASA 5505—Chapter 12, "Starting Interface Configuration (ASA 5505)."
  - ASASM—Chapter 2, "Configuring the Switch for Use with the ASA Services Module."
- In multiple context mode, you can only configure context interfaces that you already assigned to the context in the system configuration according to the "Configuring Multiple Contexts" section on page 8-15.
- In multiple context mode, complete this procedure in the context execution space. To change from the system to a context configuration, in the Configuration > Device List pane, double-click the context name under the active device IP address.

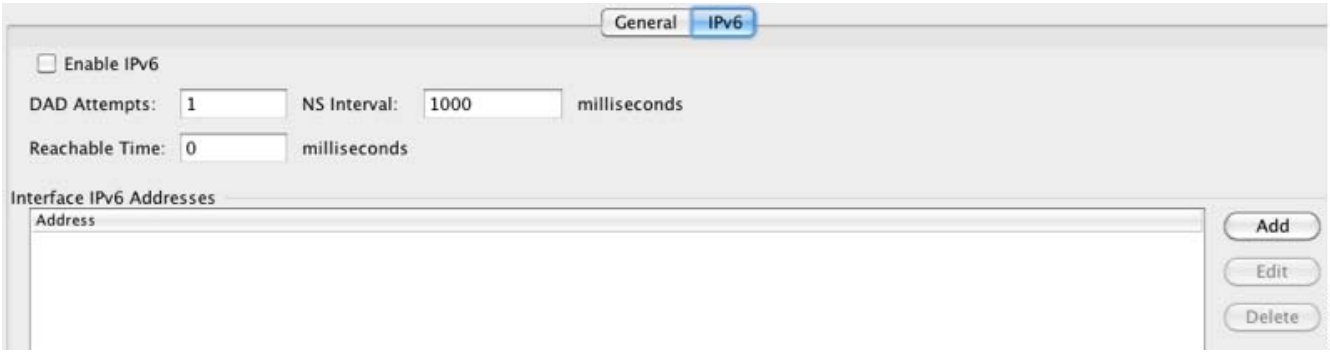
Detailed Steps

Step 1 Choose the **Configuration > Device Setup > Interfaces** pane.

Step 2 Choose a BVI or management interface, and click **Edit**.

The Edit Interface dialog box appears with the General tab selected.

Step 3 Click the **IPv6** tab.



Step 4 Check the **Enable IPv6** check box.

Step 5 (Optional) To enforce the use of Modified EUI-64 format interface identifiers in IPv6 addresses on a local link, check the **Enforce EUI-64** check box.

See the "Modified EUI-64 Interface IDs" section on page 14-18 for more information.

Step 6 (Optional) In the top area, customize the IPv6 configuration by referring to Chapter 31, "Configuring IPv6 Neighbor Discovery."

Step 7 To configure the global IPv6 address:

a. In the Interface IPv6 Addresses area, click **Add**.

The Add IPv6 Address for Interface dialog box appears.

b. In the Address/Prefix Length field, enter the global IPv6 address and the IPv6 prefix length. For example, 2001:0DB8::BA98:0:3210/48. See the "IPv6 Addresses" section on page 48-5 for more information about IPv6 addressing.

c. Click **OK**.

Step 8 Click **OK**.

You return to the Configuration > Device Setup > Interfaces pane.

Configuring IPv6 Neighbor Discovery

See Chapter 31, "Configuring IPv6 Neighbor Discovery," to configure IPv6 neighbor discovery.

(Optional) Configuring the Link-Local Addresses Automatically

If you do not want to configure a global address, and only need to configure a link-local address, you have the option of generating the link-local addresses based on the interface MAC addresses (Modified EUI-64 format. Because MAC addresses use 48 bits, additional bits must be inserted to fill the 64 bits required for the interface ID.)

To manually assign the link-local address (not recommended), see the "(Optional) Configuring the Link-Local Addresses Manually" section on page 14-21.

For other IPv6 options, including enforcing the Modified EUI-64 format, and DAD settings, see the "Configuring a Global IPv6 Address" section on page 14-18.

To automatically configure the link-local addresses for a management interface or bridge group member interfaces, perform the following steps:

Step 1 Choose the **Configuration > Device Setup > Interfaces** pane.

Step 2 Select a BVI or management interface, and click **Edit**.

The Edit Interface dialog box appears with the General tab selected.

Step 3 Click the **IPv6** tab.

Step 4 In the IPv6 configuration area, check **Enable IPv6**.

This option enables IPv6 and automatically generates the link-local addresses for member interfaces using the Modified EUI-64 interface ID based on the interface MAC address.

Step 5 Click **OK**.

(Optional) Configuring the Link-Local Addresses Manually

If you do not want to configure a global address, and only need to configure a link-local address on the physical interfaces or subinterfaces, you have the option of manually defining the link-local address. Note that we recommend automatically assigning the link-local address based on the Modified EUI-64 format. For example, if other devices enforce the use of the Modified EUI-64 format, then a manually-assigned link-local address may cause packets to be dropped.

To automatically assign the link-local address (recommended), see the "(Optional) Configuring the Link-Local Addresses Automatically" section on page 14-20.

For other IPv6 options, including enforcing the Modified EUI-64 format, and DAD settings, see the "Configuring a Global IPv6 Address" section on page 14-18.

To assign a link-local address to a physical interface or subinterface, including the management interface, perform the following steps:

Step 1 Choose the **Configuration > Device Setup > Interfaces** pane.

Step 2 Select an interface, and click **Edit**.

The Edit Interface dialog box appears with the General tab selected.

Step 3 Click the **IPv6** tab.

Step 4 To set the link-local address, enter an address in the Link-local address field.

A link-local address should start with FE8, FE9, FEA, or FEB, for example fe80::20d:88ff:feee:6a82. See the "IPv6 Addresses" section on page 48-5 for more information about IPv6 addressing.

Step 5 Click **OK**.

Allowing Same Security Level Communication

By default, interfaces on the same security level cannot communicate with each other, and packets cannot enter and exit the same interface. This section describes how to enable inter-interface communication when interfaces are on the same security level.

Information About Inter-Interface Communication

Allowing interfaces on the same security level to communicate with each other is useful if you want traffic to flow freely between all same security interfaces without ACLs.

If you enable same security interface communication, you can still configure interfaces at different security levels as usual.

Detailed Steps

To enable interfaces on the same security level to communicate with each other, from the Configuration > Interfaces pane, check **Enable traffic between two or more interfaces which are configured with same security level**.

Turning Off and Turning On Interfaces

This section describes how to turn off and on an interface.

All interfaces are enabled by default. In multiple context mode, if you disable or reenable the interface within a context, only that context interface is affected. But if you disable or reenable the interface in the system execution space, then you affect that interface for all contexts.

Detailed Steps

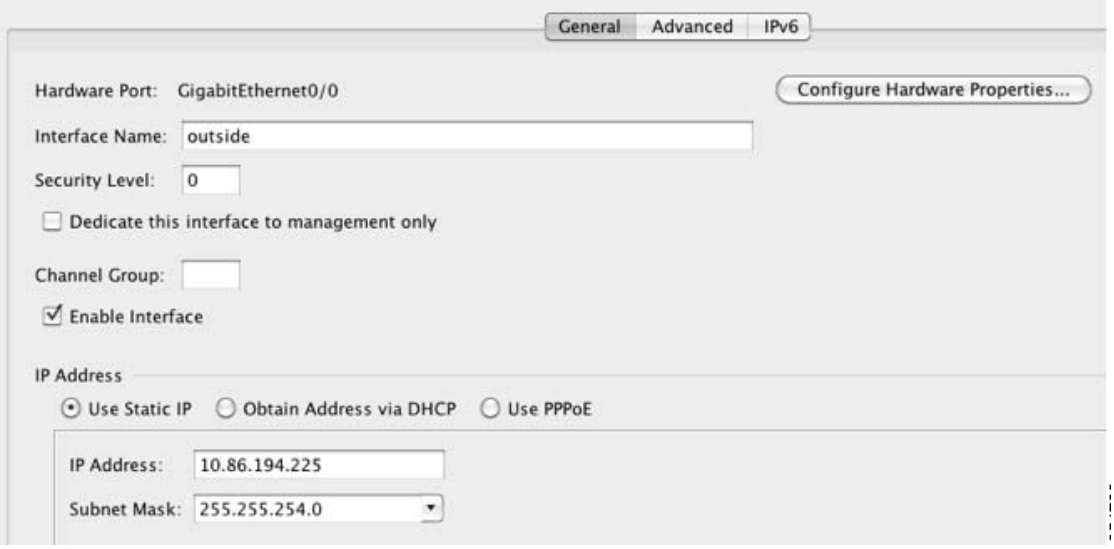
Step 1 Depending on your context mode:

- For single mode, choose the **Configuration > Device Setup > Interfaces** pane.
- For multiple mode in the System execution space, choose the **Configuration > Context Management > Interfaces** pane.

By default, all physical interfaces are listed.

Step 2 Click a VLAN interface that you want to configure, and click **Edit**.

The Edit Interface dialog box appears.



Step 3 To enable or disable the interface, check or uncheck the **Enable Interface** check box.

Monitoring Interfaces

This section includes the following topics:

ARP Table

The Monitoring > Interfaces > ARP Table pane displays the ARP table, including static and dynamic entries. The ARP table includes entries that map a MAC address to an IP address for a given interface.

Fields

- Interface—Lists the interface name associated with the mapping.
- IP Address—Shows the IP address.
- MAC Address—Shows the MAC address.
- Proxy ARP—Displays Yes if proxy ARP is enabled on the interface. Displays No if proxy ARP is not enabled on the interface.
- Clear—Clears the dynamic ARP table entries. Static entries are not cleared.
- Refresh—Refreshes the table with current information from the ASA and updates Last Updated date and time.
- Last Updated—*Display only.* Shows the date and time the display was updated.

DHCP

The ASA lets you monitor DHCP status, including the addresses assigned to clients, the lease information for a ASA interface, and DHCP statistics.

DHCP Server Table

The Monitoring > Interfaces > DHCP > DHCP Server Table lists the IP addresses assigned to DHCP clients.

Fields

- IP Address—Shows the IP address assigned to the client.
- Client-ID—Shows the client MAC address or ID.
- Lease Expiration—Shows the date that the DHCP lease expires. The lease indicates how long the client can use the assigned IP address. Remaining time is also specified in the number of seconds and is based on the timestamp in the Last Updated display-only field.
- Number of Active Leases—Shows the total number of DHCP leases.
- Refresh—Refreshes the information from the ASA.
- Last Updated—Shows when the data in the table was last updated.

DHCP Client Lease Information

If you obtain the ASA interface IP address from a DHCP server, the Monitoring > Interfaces > DHCP > DHCP Server Table > DHCP Client Lease Information pane shows information about the DHCP lease.

Fields

- Select an interface—Lists the ASA interfaces. Choose the interface for which you want to view the DHCP lease. If an interface has multiple DHCP leases, then choose the interface and IP address pair you want to view.
- Attribute and Value—Lists the attributes and values of the interface DHCP lease.
  - Temp IP addr—*Display only.* The IP address assigned to the interface.
  - Temp sub net mask—*Display only.* The subnet mask assigned to the interface.
  - DHCP lease server—*Display only.* The DHCP server address.
  - state—*Display only.* The state of the DHCP lease, as follows:

    Initial—The initialization state, where the ASA begins the process of acquiring a lease. This state is also shown when a lease ends or when a lease negotiation fails.

    Selecting—The ASA is waiting to receive DHCPOFFER messages from one or more DHCP servers, so it can choose one.

    Requesting—The ASA is waiting to hear back from the server to which it sent its request.

    Purging—The ASA is removing the lease because of an error.

    Bound—The ASA has a valid lease and is operating normally.

    Renewing—The ASA is trying to renew the lease. It regularly sends DHCPREQUEST messages to the current DHCP server, and waits for a reply.

    Rebinding—The ASA failed to renew the lease with the original server, and now sends DHCPREQUEST messages until it gets a reply from any server or the lease ends.

    Holddown—The ASA started the process to remove the lease.

    Releasing—The ASA sends release messages to the server indicating that the IP address is no longer needed.
  - Lease—*Display only.* The length of time, specified by the DHCP server, that the interface can use this IP address.
  - Renewal—*Display only.* The length of time until the interface automatically attempts to renew this lease.
  - Rebind—*Display only.* The length of time until the ASA attempts to rebind to a DHCP server. Rebinding occurs if the ASA cannot communicate with the original DHCP server, and 87.5 percent of the lease time has expired. The ASA then attempts to contact any available DHCP server by broadcasting DHCP requests.
  - Next timer fires after—*Display only.* The number of seconds until the internal timer triggers.
  - Retry count—*Display only.* If the ASA is attempting to establish a lease, this field shows the number of times the ASA tried sending a DHCP message. For example, if the ASA is in the Selecting state, this value shows the number of times the ASA sent discover messages. If the ASA is in the Requesting state, this value shows the number of times the ASA sent request messages.
  - Client-ID—*Display only.* The client ID used in all communication with the server.

  - Proxy—*Display only.* Specifies if this interface is a proxy DHCP client for VPN clients, True or False.
  - Hostname—*Display only.* The client hostname.

DHCP Statistics

The Monitoring > Interfaces > DHCP > DHCP Statistics pane shows statistics for the DHCP server feature.

Fields

- Message Type—Lists the DHCP message types sent or received:
  - BOOTREQUEST
  - DHCPDISCOVER
  - DHCPREQUEST
  - DHCPDECLINE
  - DHCPRELEASE
  - DHCPINFORM
  - BOOTREPLY
  - DHCPOFFER
  - DHCPACK
  - DHCPNAK
- Count—Shows the number of times a specific message was processed.
- Direction—Shows if the message type is Sent or Received.
- Total Messages Received—Shows the total number of messages received by the ASA.
- Total Messages Sent—Shows the total number of messages sent by the ASA.
- Counter—Shows general statistical DHCP data, including the following:
  - DHCP UDP Unreachable Errors
  - DHCP Other UDP Errors
  - Address Pools
  - Automatic Bindings
  - Expired Bindings
  - Malformed Messages
- Value—Shows the number of each counter item.
- Refresh—Updates the DHCP table listings.
- Last Updated—Shows when the data in the tables was last updated.

MAC Address Table

The Monitoring > Interfaces > MAC Address Table pane shows the static and dynamic MAC address entries. See the "MAC Address Table" section on page 14-26 for more information about the MAC address table and adding static entries.

Fields

- Interface—Shows the interface name associated with the entry.
- MAC Address—Shows the MAC address.
- Type—Shows if the entry is static or dynamic.
- Age—Shows the age of the entry, in minutes. To set the timeout, see the "MAC Address Table" section on page 14-26.
- Refresh—Refreshes the table with current information from the ASA.

Dynamic ACLs

The Monitoring > Interfaces > Dynamic ACLs pane shows a table of the Dynamic ACLs, which are functionally identical to the user-configured ACLs except that they are created, activated and deleted automatically by the ASA. These ACLs do not show up in the configuration and are only visible in this table. They are identified by the "(dynamic)" keyword in the ACL header.

When you choose an ACL in this table, the contents of the ACL are shown in the bottom text field.

Fields

- ACL—Shows the name of the dynamic ACL.
- Element Count—Shows the number of elements in the ACL
- Hit Count—Shows the total hit count for all of the elements in the ACL.

Interface Graphs

The Monitoring > Interfaces > Interface Graphs pane lets you view interface statistics in graph or table form. If an interface is shared among contexts, the ASA shows only statistics for the current context. The number of statistics shown for a subinterface is a subset of the number of statistics shown for a physical interface.

Fields

- Available Graphs for—Lists the types of statistics available for monitoring. 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.
  - Byte Counts—Shows the number of bytes input and output on the interface.
  - Packet Counts—Shows the number of packets input and output on the interface.
  - Packet Rates—Shows the rate of packets input and output on the interface.
  - Bit Rates—Shows the bit rate for the input and output of the interface.
  - Drop Packet Count—Shows the number of packets dropped on the interface.

  These additional statistics display for physical interfaces:

- Buffer Resources—Shows the following statistics:

  Overruns—The number of times that the ASA was incapable of handing received data to a hardware buffer because the input rate exceeded the ASA capability to handle the data.

  Underruns—The number of times that the transmitter ran faster than the ASA could handle.

  No Buffer—The number of received packets discarded because there was no buffer space in the main system. Compare this with the ignored count. Broadcast storms on Ethernet networks are often responsible for no input buffer events.

- Packet Errors—Shows the following statistics:

  CRC—The number of Cyclical Redundancy Check errors. When a station sends a frame, it appends a CRC to the end of the frame. This CRC is generated from an algorithm based on the data in the frame. If the frame is altered between the source and destination, the ASA notes that the CRC does not match. A high number of CRCs is usually the result of collisions or a station transmitting bad data.

  Frame—The number of frame errors. Bad frames include packets with an incorrect length or bad frame checksums. This error is usually the result of collisions or a malfunctioning Ethernet device.

  Input Errors—The number of total input errors, including the other types listed here. Other input-related errors can also cause the input error count to increase, and some datagrams might have more than one error; therefore, this sum might exceed the number of errors listed for the other types.

  Runts—The number of packets that are discarded because they are smaller than the minimum packet size, which is 64 bytes. Runts are usually caused by collisions. They might also be caused by poor wiring and electrical interference.

  Giants—The number of packets that are discarded because they exceed the maximum packet size. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.

  Deferred—For FastEthernet interfaces only. The number of frames that were deferred before transmission due to activity on the link.

- Miscellaneous—Shows statistics for received broadcasts.

- Collision Counts—For FastEthernet interfaces only. Shows the following statistics:

  Output Errors—The number of frames not transmitted because the configured maximum number of collisions was exceeded. This counter should only increment during heavy network traffic.

  Collisions—The number of messages retransmitted due to an Ethernet collision (single and multiple collisions). This usually occurs on an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once by the output packets.

  Late Collisions—The number of frames that were not transmitted because a collision occurred outside the normal collision window. A late collision is a collision that is detected late in the transmission of the packet. Normally, these should never happen. When two Ethernet hosts try to talk at once, they should collide early in the packet and both back off, or the second host should see that the first one is talking and wait. If you get a late collision, a device is jumping in and trying to send the packet on the Ethernet while the ASA is partly finished sending the packet. The ASA does not resend the packet, because it may have freed the buffers that held the first part of the packet. This is not a real problem because networking protocols are designed to cope with collisions by resending packets. However, late collisions indicate a problem exists in your network. Common problems are large repeated networks and Ethernet networks running beyond the specification.

  - Input Queue—Shows the number of packets in the input queue, the current and the maximum, including the following statistics:

    Hardware Input Queue—The number of packets in the hardware queue.

    Software Input Queue—The number of packets in the software queue.

  - Output Queue—Shows the number of packets in the output queue, the current and the maximum, including the following statistics:

    Hardware Output Queue—The number of packets in the hardware queue.

    Software Output Queue—The number of packets in the software queue.

- Add—Adds the selected statistic type to the selected graph window.
- Remove—Removes the selected statistic type from the selected graph window. This button name changes to Delete if the item you are removing was added from another panel, and is not being returned to the Available Graphs pane.
- Show Graphs—Shows the graph window name to which you want to add a statistic type. If you have a graph window already open, a new graph window is listed by default. If you want to add a statistic type to an already open graph, choose the open graph window name. The statistics already included on the graph are shown in the Selected Graphs pane, to which you can add additional types. Graph windows are named for ASDM followed by the interface IP address and the name "Graph". Subsequent graphs are named "Graph (2)" and so on.
- Selected Graphs—Shows the statistic types you want to show in the selected graph window. You an include up to four types.
  - Show Graphs—Shows the graph window or updates the graph with additional statistic types if added.

Graph/Table

The Monitoring > Interfaces > Interface Graphs > Graph/Table window shows a graph for the selected statistics. The Graph window can show up to four graphs and tables at a time. By default, the graph or table displays the real-time statistics. If you enable History Metrics (see the "Enabling History Metrics" section on page 4-34), you can view statistics for past time periods.

Fields

- View—Sets the time period for the graph or table. To view any time period other than real-time, enable History Metrics (see the "Enabling History Metrics" section on page 4-34). The data is updated according to the specification of the following options:
  - 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 min
  - Last 5 days, data every 2 hours
- Export—Exports the graph in comma-separated value format. If there is more than one graph or table on the Graph window, the Export Graph Data dialog box appears. Choose one or more of the graphs and tables listed by checking the box next to the name.
- Print—Prints the graph or table. If there is more than one graph or table on the Graph window, the Print Graph dialog box appears. Choose the graph or table you want to print from the Graph/Table Name list.

- Bookmark—Opens a browser window with a single link for all graphs and tables on the Graphs window, as well as individual links for each graph or table. You can then copy these URLs as bookmarks in your browser. ASDM does not have to be running when you open the URL for a graph; the browser launches ASDM and then displays the graph.

PPPoE Client

The Monitoring > Interfaces > PPPoE Client > PPPoE Client Lease Information pane displays information about current PPPoE connections.

Fields

Select a PPPoE interface—Select an interface that you want to view PPPoE client lease information.

Refresh—loads the latest PPPoE connection information from the ASA for display.

Interface Connection

The Monitoring > Interfaces > *interface* connection node in the Monitoring > Interfaces tree only appears if static route tracking is configured. If you have several routes tracked, there will be a node for each interface that contains a tracked route.

See the following for more information about the route tracking information available:

- Track Status for, page 14-29
- Monitoring Statistics for, page 14-29

Track Status for

The Monitoring > Interfaces > interface connection > Track Status for pane displays information about the tracked object.

Fields

- Tracked Route—*Display only.* Displays the route associated with the tracking process.
- Route Statistics—*Display only.* Displays the reachability of the object, when the last change in reachability occurred, the operation return code, and the process that is performing the tracking.

Monitoring Statistics for

The Monitoring > Interfaces > interface connection > Monitoring Statistics for pane displays statistics for the SLA monitoring process.

Fields

- SLA Monitor ID—*Display only.* Displays the ID of the SLA monitoring process.
- SLA statistics—*Display only.* Displays SLA monitoring statistics, such as the last time the process was modified, the number of operations attempted, the number of operations skipped, and so on.

Feature History for Interfaces in Transparent Mode

Table 14-1 lists each feature change and the platform release in which it was implemented. ASDM is backwards-compatible with multiple platform releases, so the specific ASDM release in which support was added is not listed.

Table 14-1 Feature History for Interfaces in Transparent Mode

Feature Name	Platform Releases	Feature Information
Increased VLANs	7.0(5)	Increased the following limits: • ASA5510 Base license VLANs from 0 to 10. • ASA5510 Security Plus license VLANs from 10 to 25. • ASA5520 VLANs from 25 to 100. • ASA5540 VLANs from 100 to 200.
Increased VLANs	7.2(2)	The maximum number of VLANs for the Security Plus license on the ASA 5505 was increased from 5 (3 fully functional; 1 failover; one restricted to a backup interface) to 20 fully functional interfaces. In addition, the number of trunk ports was increased from 1 to 8. Now there are 20 fully functional interfaces, you do not need to use the backup interface command to cripple a backup ISP interface; you can use a fully-functional interface for it. The backup interface command is still useful for an Easy VPN configuration. VLAN limits were also increased for the ASA 5510 (from 10 to 50 for the Base license, and from 25 to 100 for the Security Plus license), the ASA 5520 (from 100 to 150), the ASA 5550 (from 200 to 250).
Gigabit Ethernet Support for the ASA 5510 Security Plus License	7.2(3)	The ASA 5510 now supports GE (Gigabit Ethernet) for port 0 and 1 with the Security Plus license. If you upgrade the license from Base to Security Plus, the capacity of the external Ethernet0/0 and Ethernet0/1 ports increases from the original FE (Fast Ethernet) (100 Mbps) to GE (1000 Mbps). The interface names will remain Ethernet 0/0 and Ethernet 0/1.
Native VLAN support for the ASA 5505	7.2(4)/8.0(4)	You can now include the native VLAN in an ASA 5505 trunk port. We modified the following screen: Configuration > Device Setup > Interfaces > Switch Ports > Edit Switch Port.

Table 14-1 Feature History for Interfaces in Transparent Mode (continued)

Feature Name	Platform Releases	Feature Information
Jumbo packet support for the ASA 5580	8.1(1)	The Cisco ASA 5580 supports jumbo frames. A jumbo frame is an Ethernet packet larger than the standard maximum of 1518 bytes (including Layer 2 header and FCS), up to 9216 bytes. You can enable support for jumbo frames for all interfaces by increasing the amount of memory to process Ethernet frames. Assigning more memory for jumbo frames might limit the maximum use of other features, such as ACLs. We modified the following screen: Configuration > Device Setup > Interfaces > Add/Edit Interface > Advanced.
Increased VLANs for the ASA 5580	8.1(2)	The number of VLANs supported on the ASA 5580 are increased from 100 to 250.
IPv6 support for transparent mode	8.2(1)	IPv6 support was introduced for transparent firewall mode.
Support for Pause Frames for Flow Control on the ASA 5580 10-Gigabit Ethernet Interfaces	8.2(2)	You can now enable pause (XOFF) frames for flow control. We modified the following screens: (Single Mode) Configuration > Device Setup > Interfaces > Add/Edit Interface > General (Multiple Mode, System) Configuration > Interfaces > Add/Edit Interface.
Bridge groups for transparent mode	8.4(1)	If you do not want the overhead of security contexts, or want to maximize your use of security contexts, you can group interfaces together in a bridge group, and then configure multiple bridge groups, one for each network. Bridge group traffic is isolated from other bridge groups. You can configure up to eight bridge groups of four interfaces each in single mode or per context. We modified or introduced the following screens: Configuration > Device Setup > Interfaces Configuration > Device Setup > Interfaces > Add/Edit Bridge Group Interface Configuration > Device Setup > Interfaces > Add/Edit Interface