

Interface Overview

The Firewall Threat Defense device includes data interfaces that you can configure in different modes, as well as a management/diagnostic interface.

- Management/Diagnostic interface, on page 1
- Interface Mode and Types, on page 3
- Security zones and interface groups, on page 3
- Auto-MDI/MDIX feature, on page 4
- Redundant interfaces (deprecated), on page 5
- Default settings for interfaces, on page 5
- Create security zone and interface group objects, on page 6
- Enable the physical interface and configure Ethernet settings, on page 6
- Configure EtherChannel interfaces, on page 9
- Sync Interface Changes with the Firewall Management Center, on page 18
- Network module management for Secure Firewall 3100, on page 21
- History for interfaces, on page 36

Management/Diagnostic interface

A management/diagnostic interface is a shared physical interface that enables communication between the diagnostic logical interface and the management logical interface on security appliances.

Interface configuration details

The physical management interface is shared between the Diagnostic logical interface and the Management logical interface.

Management interface

The Management interface is separate from the other interfaces on the device. It is used to set up and register the device to the Firewall Management Center. It uses its own IP address and static routing.

Management interface configuration and monitoring

You can configure its settings at the CLI using the **configure network** command. If you change the IP address at the CLI after you add it to the Firewall Management Center, you can match the IP address in the Secure Firewall Management Center in the **Devices** > **Device Management** area.

You can alternatively manage the Firewall Threat Defense using a data interface instead of the management interface.

Diagnostic interface

Diagnostic interface shares a physical port with the Management interface but requires different IP addresses on the same network. A diagnostic interface allows only management traffic.

Legacy diagnostic interface support

- A data interface named "management"—This name is reserved for use with the merged Management interface.
- IP Address on Diagnostic
- DNS enabled on Diagnostic
- Syslog, SNMP, RADIUS or AD (for remote access VPN) source interface is Diagnostic
- RADIUS or AD (for remote access VPN) with no source interface specified, and there is at least one interface configured as management-only (including Diagnostic)—The default route lookup for these services has changed from the management-only routing table to the data routing table, with no fallback to management. Therefore, you cannot use a management-only interface other than Management.
- Static routes on Diagnostic
- Dynamic routing on Diagnostic
- HTTP server on Diagnostic
- ICMP on Diagnostic
- DDNS for Diagnostic
- FlexConfig using Diagnostic

The Diagnostic logical interface can be configured along with the rest of the data interfaces on the **Devices** > **Device Management** window by clicking the device name and then **Interfaces** tab. Using the Diagnostic interface is optional (see the routed and transparent mode deployments for scenarios). The Diagnostic interface only allows management traffic, and does not allow through traffic. It does not support SSH; you can SSH to data interfaces or to the Management interface only. The Diagnostic interface is useful for SNMP or syslog monitoring.



Note Although the Diagnostic and Management interfaces share a physical port, you must assign different IP addresses to each interface on the same network.

Interface Mode and Types

You can deploy Firewall Threat Defense interfaces in two modes: Regular firewall mode and IPS-only mode. You can include both firewall and IPS-only interfaces on the same device.

Regular Firewall Mode

Firewall mode interfaces subject traffic to firewall functions such as maintaining flows, tracking flow states at both IP and TCP layers, IP defragmentation, and TCP normalization. You can also optionally configure IPS functions for this traffic according to your security policy.

The types of firewall interfaces you can configure depends on the firewall mode set for the device: routed or transparent mode. See Transparent or Routed Firewall Mode for more information.

- Routed mode interfaces (routed firewall mode only)—Each interface that you want to route between is on a different subnet.
- Bridge group interfaces (routed and transparent firewall mode)—You can group together multiple interfaces on a network, and the Firewall Threat Defense device uses bridging techniques to pass traffic between the interfaces. Each bridge group includes a Bridge Virtual Interface (BVI) to which you assign an IP address on the network. In routed mode, the Firewall Threat Defense device routes between BVIs and regular routed interfaces. In transparent mode, each bridge group is separate and cannot communicate with each other.

IPS-Only Mode

You can configure your device in either a passive or inline IPS deployment. In a passive deployment, you deploy the system out-of-band from the flow of network traffic. In an inline deployment, you configure the system transparently on a network segment by binding two interfaces together.

Security zones and interface groups

You can assign each interface to a security zone, an interface group, or both. You then apply your security policy based on zones or groups. For example, you can assign the "inside" interface on one or more devices to the "inside" zone, and the "outside" interfaces to the "outside" zone. You can then configure your access control policy to enable traffic to go from the inside zone to the outside zone for every device using the same zones.

Security zones and interface groups functionality

To view the interfaces that belong to each object, choose **Objects** > **Object Management** and click **Interface**. This page lists the security zones and interface groups configured on your managed devices. You can expand each interface object to view the type of interfaces in each interface object.



Note Policies that apply to **any** zone (a global policy) apply to interfaces in zones as well as any interfaces that are not assigned to a zone.

Note The Diagnostic/Management interface does not belong to a zone or interface group.

Security zones and interface groups have different membership and usage characteristics:

- Security zones—An interface can belong to only one security zone.
- Interface groups—An interface can belong to multiple interface groups (and to one security zone).

  You can use interface groups in NAT policies, prefilter policies, and QoS policies, as well as features that let you specify the interface name directly, such as Syslog servers or DNS servers.

Some policies only support security zones, while other policies support zones and groups. Unless you need the functionality an interface group provides, you should default to using security zones because security zones are supported for all features.

You cannot change an existing security zone to an interface group or vice-versa. Instead, you must create a new interface object.

Note Although tunnel zones are not interface objects, you can use them in place of security zones in certain configurations; see Using tunnel zones to apply access control at the tunnel level.

Interface objects are categorized by these types:

- Passive—For IPS-only passive or ERSPAN interfaces.
- Inline—For IPS-only inline set interfaces.
- Switched—For regular firewall bridge group interfaces.
- Routed—For regular firewall routed interfaces.
- ASA—(Security zones only) For legacy ASA FirePOWER device interfaces.

All interfaces in an interface object must be of the same type. After you create an interface object, you cannot change the type of interfaces it contains.

The interface (or zone name) itself does not provide any default behavior in regarding the security policy. We recommend using names that are self-describing to avoid mistakes in future configuration. A good name signifies a logical segment or traffic specification, for example:

- Names of internal interfaces—InsideV110, InsideV160, InsideV195
- Names of DMZ interfaces—DMZV11, DMZV12, DMZV-TEST
- Names of external interfaces—Outside-ASN78, Outside-ASN91

Auto-MDI/MDIX feature

Auto-MDI/MDIX is a feature that eliminates the need for crossover cabling by performing an internal crossover when a straight cable is detected during the auto-negotiation phase. The feature is enabled by default with

auto-negotiation on RJ-45 interfaces and requires either speed or duplex to be set to auto-negotiate. If you explicitly set both the speed and duplex to a fixed value, thus disabling auto-negotiation for both settings, then Auto-MDI/MDIX is also disabled. For Gigabit Ethernet, when the speed and duplex are set to 1000 and full, then the interface always auto-negotiates; therefore Auto-MDI/MDIX is always enabled and you cannot disable it.

Redundant interfaces (deprecated)

Redundant interfaces were supported for the ASA 5500-X platforms only. We don't recommend configuring them for other platforms.

Default settings for interfaces

This section lists default settings for interfaces.

Default state of interfaces

The default state of an interface depends on the type.

- Physical interfaces—Disabled. The exception is the Management interface that is enabled for initial setup. Physical interfaces includes switch ports.
- VLAN subinterfaces—Enabled. However, for traffic to pass through the subinterface, the physical interface must also be enabled.
- EtherChannel port-channel interfaces (ISA 3000)—Enabled. However, for traffic to pass through the EtherChannel, the channel group physical interfaces must also be enabled.
- EtherChannel port-channel interfaces (Firepower and Secure Firewall models)—Disabled.



Note For the Firepower 4100/9300, you can administratively enable and disable interfaces in both the chassis and in the Firewall Management Center. For an interface to be operational, the interface must be enabled in both operating systems. Because the interface state is controlled independently, you may have a mismatch between the chassis and Firewall Management Center.

Default speed and duplex

By default, the speed and duplex for copper (RJ-45) interfaces are set to auto-negotiate.

By default, the speed and duplex for fiber (SFP) interfaces are set to the maximum speed, with auto-negotiation enabled. If a peer switch connecting to the port over a 50G cable does not support auto-negotiation, ensure to disable auto-negotiation on the switch and the Threat Defense interface as well. For example, N9K-C93400LD-H1 does not support auto-negotiation on a 50G cable. Hence, you must disable the default auto-negotiation on the platform and the switch for the port to be connected.

For the Secure Firewall 3100 the speed is set to detect the installed SFP speed.

Create security zone and interface group objects

Create empty interface objects that can be populated with interfaces later, or create security zones while configuring interfaces to provide logical grouping and management of device interfaces.

Add security zones and interface groups to which you can assign device interfaces.

Tip You can create empty interface objects and add interfaces to them later. To add an interface, the interface must have a name. You can also create security zones (but not interface groups) while configuring interfaces.

Before you begin

Understand the usage requirements and restrictions for each type of interface object. See Security zones and interface groups, on page 3.

Procedure

Step 1 Choose **Objects** > **Object Management** > **Interface**.

Step 2 Click **Add > Security Zone** or **Add > Interface Group**.

Step 3 Enter a **Name**.

Do not use the same name as a network or port object. These object names are deployed to the device, and duplicate names result in a failed deployment.

Step 4 Choose an **Interface Type**.

Step 5 (Optional) From the **Device** > **Interfaces** drop-down list, choose a device that contains interfaces you want to add.

You do not need to assign interfaces on this screen; you can instead assign interfaces to the zone or group when you configure the interface.

Step 6 Click **Save**.

What to do next

- If an active policy references your object, deploy configuration changes; see Deploy configuration changes.

Enable the physical interface and configure Ethernet settings

Before you begin

If you changed the physical interfaces on the device after you added it to the Firewall Management Center , you need to refresh the interface listing by clicking **Sync Interfaces from device** on the top left of **Interfaces**

. For the 3100 , which supports hot swapping, see Network module management for Secure Firewall 3100, on page 21 before you change interfaces on a device.

This section describes how to:

- Enable the physical interface. By default, physical interfaces are disabled (with the exception of the Diagnostic interface).
- Set a specific speed and duplex. By default, speed and duplex are set to Auto.

This procedure only covers a small subset of interface settings. Refrain from setting other parameters at this point. For example, you cannot name an interface that you want to use as part of an EtherChannel interface. The exact interface options vary depending on your model and interface type.

Note For the Firepower 4100/9300 , you configure basic interface settings in FXOS. See Configure a physical interface for more information.

Note For switch ports, see Configure switch ports .

Procedure

Step 1 Select **Devices** > **Device Management** and click **Edit** (✎) for your Firewall Threat Defense device. The **Interfaces** page is selected by default.

Step 2 Click **Edit** (✎) for the interface you want to edit.

Step 3 Enable the interface by checking the **Enabled** check box.

a) (Optional) Add a description in the **Description** field.

The description can be up to 200 characters on a single line, without carriage returns.

Step 4 (Optional) Set the duplex and speed by clicking **Hardware Configuration** > **Speed** .

- **Duplex** —Choose **Full** or **Half** . SFP interfaces only support **Full** duplex.
- **Speed** —Choose a speed (varies depending on the model). For SFPs, choose **Detect SFP** to detect the speed of the installed SFP module and use the appropriate speed. Duplex is always full, autonegotiation is enabled, and FEC is set to auto. For dual-speed transceivers, the lower speed is used. This option is useful if you later change the network module to a different model, and want the speed to update automatically. Some switches and transceivers don't support autonegotiation, especially for higher speed interfaces. In this case, set the interface on the Firewall Threat Defense to a manual speed and also disable **Auto-negotiation** so the link can come up.

  Note
  You cannot modify the speed of a high availability or a cluster control link interface.

- **Auto-negotiation** —Set the interface to negotiate the link status and flow control.

Except for the 1100 and 2100 , autonegotiation is set separately from the speed. Some switches don't support autonegotiation, especially for higher speed interfaces. In this case, set the interface on the Firewall Threat Defense to a manual speed and also disable **Auto-negotiation** so the link can come up.

- **Forward Error Correction Mode** —For 25Gbps and higher interfaces, enable Forward Error Correction (FEC).

  For an EtherChannel member interface, configure FEC before adding it to the EtherChannel. If you remove the interface from EtherChannel and then reboot, reconfigure the FEC for the interface.

  Some switches don't support auto mode for FEC, especially for larger interfaces. Be sure to manually configure the setting, depending on the switch support. We don't recommend disabling FEC because the EtherChannel may not function correctly.

  The setting chosen when you use **auto** depends on the transceiver type and whether the interface is fixed (built-in) or on a network module.

Table 1: Default FEC for Auto Setting

Transceiver Type	Fixed Port Default FEC (Ethernet 1/9 through 1/16)	Network Module Default FEC
25G-SR	Clause 108 RS-FEC	Clause 108 RS-FEC
25G-LR	Clause 108 RS-FEC	Clause 108 RS-FEC
10/25G-CSR	Clause 108 RS-FEC	Clause 74 FC-FEC
25G-AOC *x* M	Clause 74 FC-FEC	Clause 74 FC-FEC
25G-CU2.5/3M	Auto-Negotiate	Auto-Negotiate
25G-CU4/5M	Auto-Negotiate	Auto-Negotiate

Note
From Version 7.4.2, Firewall Threat Defense supports the SFP 10G_25G_CSR_S module. To avoid link-down issues after a reboot, Forward Error Correction (FEC) must be enabled on these interfaces.

Step 5 (Optional) Enable Link Layer Discovery Protocol (LLDP) by clicking **Hardware Configuration** > **Network Connectivity** .

- **Enable LLDP Receive** —Enables the firewall to receive LLDP packets from its peers.
- **Enable LLDP Transmit** —Enables the firewall to send LLDP packets to its peers.

Step 6 (Optional) Enable pause (XOFF) frames for flow control by clicking **Hardware Configuration** > **Network Connectivity** , and checking **Flow Control Send** .

Flow control enables connected Ethernet ports to control traffic rates during congestion by allowing congested nodes to pause link operation at the other end. If the threat defense port experiences congestion (exhaustion of queuing resources on the internal switch) and cannot receive any more traffic, it notifies the other port by sending a pause frame to stop sending until the condition clears. Upon receipt of a pause frame, the sending device stops sending any data packets, which prevents any loss of data packets during the congestion period.

Note

The Firewall Threat Defense supports transmitting pause frames so that the remote peer can rate-control the traffic.

However, receiving of pause frames is not supported.

The internal switch has a global pool of 8000 buffers of 250 bytes each, and the switch allocates buffers dynamically to each port. A pause frame is sent out every interface with flowcontrol enabled when the buffer usage exceeds the global high-water mark (2 MB (8000 buffers)); and a pause frame is sent out of a particular interface when its buffer exceeds the port high-water mark (.3125 MB (1250 buffers)). After a pause is sent, an XON frame can be sent when the buffer usage is reduced below the low-water mark (1.25 MB globally (5000 buffers); .25 MB per port (1000 buffers)). The link partner can resume traffic after receiving an XON frame.

Only flow control frames defined in 802.3x are supported. Priority-based flow control is not supported.

Step 7 In the **Mode** drop-down list, choose one of the following:

- **None** —Choose this setting for regular firewall interfaces and inline sets. The mode will automatically be changed to Routed, Switched, or Inline based on further configuration.
- **Passive** —Choose this setting for passive IPS-only interfaces.
- **Erspan** —Choose this setting for ERSPAN passive IPS-only interfaces.

Step 8 In the **Priority** field, enter a number ranging from 0–65535.

This value is used in the policy based routing configuration. The priority is used to determine how you want to distribute the traffic across multiple egress interfaces.

Step 9 Click **OK** .

Click **Save**.

Go to **Deploy** > **Deploy** and deploy the policy to assigned devices. The changes are not active until you deploy them.

What to do next

Continue configuring interfaces.

- Regular Firewall Interfaces
- Inline Sets and Passive Interfaces

Configure EtherChannel interfaces

This section tells how to configure EtherChannel interfaces.

Note For the Firepower 4100/9300, you configure EtherChannels in FXOS. Refer to Add an EtherChannel (port channel) for more information.

About EtherChannels

This section describes EtherChannels.

EtherChannels

An 802.3ad EtherChannel is a logical interface, called a port-channel interface) that consists of a bundle of individual Ethernet links, known as a channel group. This approach increases the bandwidth for a single network. A port channel interface is used in the same way as a physical interface when you configure interface-related features.

You can configure up to 48 EtherChannels, depending on how many interfaces your model supports.

Channel group interfaces

Channel group interfaces enable EtherChannel aggregation with specific capacity and configuration requirements. Understanding these interface specifications ensures proper EtherChannel deployment and performance.

Each channel group can have up to 8 active interfaces, except for the ISA 3000, which support 16 active interfaces. On switches that support only 8 active interfaces, you can assign up to 16 interfaces to a channel group. Only 8 interfaces can be active, the remaining interfaces can act as standby links in case of interface failure.

All interfaces in the channel group must be the same type and speed. The first interface added to the channel group determines the correct type and speed.

The EtherChannel aggregates traffic across all the available active interfaces in the channel. A proprietary hash algorithm selects the interface, using criteria such as source or destination MAC addresses, IP addresses, TCP and UDP port numbers, and VLAN numbers.

EtherChannel connection to other devices

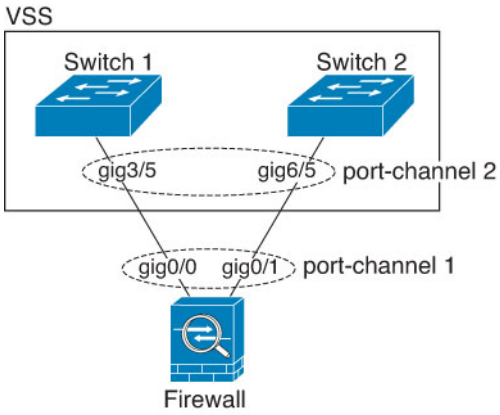
An EtherChannel connection to other devices requires the connected device to support 802.3ad EtherChannels for compatibility.

EtherChannel connection requirements and configurations

The device to which you connect the Firewall Threat Defense EtherChannel must also support 802.3ad EtherChannels. For example, you can connect to the Catalyst 6500 switch or the Cisco Nexus 7000.

When the switch is part of a Virtual Switching System (VSS) or Virtual Port Channel (vPC), you can connect Firewall Threat Defense interfaces within the same EtherChannel to separate switches in the VSS/vPC. The switch interfaces are members of the same EtherChannel port-channel interface because the separate switches act like a single switch.

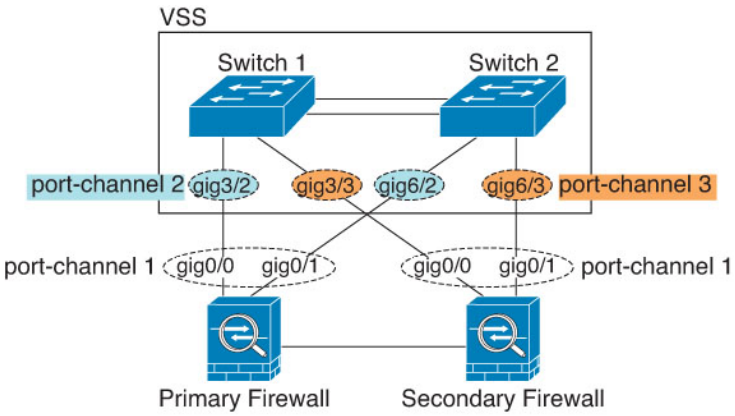
Figure 1: Connecting to a VSS/vPC



Note If the Firewall Threat Defense device is in transparent firewall mode, and you place the Firewall Threat Defense device between two sets of VSS/vPC switches, then be sure to disable Unidirectional Link Detection (UDLD) on any switch ports connected to the Firewall Threat Defense device with an EtherChannel. If you enable UDLD, then a switch port may receive UDLD packets sourced from both switches in the other VSS/vPC pair. The receiving switch will place the receiving interface in a down state with the reason "UDLD Neighbor mismatch".

If you use the Firewall Threat Defense device in an Active/Standby failover deployment, you need to create separate EtherChannels on the switches in the VSS/vPC, one for each Firewall Threat Defense device. On each Firewall Threat Defense device, a single EtherChannel connects to both switches. Even if you could group all switch interfaces into a single EtherChannel connecting to both Firewall Threat Defense devices,the EtherChannel would not be established because of the separate Firewall Threat Defense system IDs. Also, using a single EtherChannel would not be desirable because you do not want traffic sent to the standby Firewall Threat Defense device.

Figure 2: Active/Standby failover and VSS/vPC



Link aggregation control protocol

The Link Aggregation Control Protocol (LACP) is a network protocol that aggregates interfaces by exchanging the Link Aggregation Control Protocol Data Units (LACPDUs) between two network devices.

LACP interface configuration modes

You can configure each physical interface in an EtherChannel to be:

- Active—Sends and receives LACP updates. An active EtherChannel can establish connectivity with either an active or a passive EtherChannel. You should use the active mode unless you need to minimize the amount of LACP traffic.
- Passive—Receives LACP updates. A passive EtherChannel can only establish connectivity with an active EtherChannel. Not supported on hardware models.
- On—The EtherChannel is always on, and LACP is not used. An "on" EtherChannel can only establish a connection with another "on" EtherChannel.

LACP coordinates the automatic addition and deletion of links to the EtherChannel without user intervention. It also handles misconfigurations and checks that both ends of member interfaces are connected to the correct channel group. "On" mode cannot use standby interfaces in the channel group when an interface goes down, and the connectivity and configurations are not checked.

Load balancing

Load balancing is a distribution mechanism that distributes packets to interfaces in the EtherChannel and ensures transparent failover when active interfaces go down by rebalancing traffic between remaining links.

Load balancing operation details

The Firewall Threat Defense device distributes packets to the interfaces in the EtherChannel by hashing the source and destination IP address of the packet (this criteria is configurable). The resulting hash is divided by the number of active links in a modulo operation where the resulting remainder determines which interface owns the flow. All packets with a *hash_value* **mod** *active_links* result of 0 go to the first interface in the EtherChannel, packets with a result of 1 go to the second interface, packets with a result of 2 go to the third interface, and so on. For example, if you have 15 active links, then the modulo operation provides values from 0 to 14. For 6 active links, the values are 0 to 5, and so on.

If an active interface goes down and is not replaced by a standby interface, then traffic is rebalanced between the remaining links. The failure is masked from both Spanning Tree at Layer 2 and the routing table at Layer 3, so the switchover is transparent to other network devices.

EtherChannel MAC address

An EtherChannel MAC address is a network identifier that is shared by all interfaces in the EtherChannel group. This makes the EtherChannel transparent to network applications and users by presenting one logical connection.

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.

Platform-specific MAC address behavior

MAC address assignment for EtherChannel interface varies by hardware platform.

Firepower and Secure Firewall Hardware

The port-channel interface uses the MAC address of the internal interface Internal-Data 0/1. You can manually configure a MAC address for the port-channel interface if needed. All EtherChannel interfaces on a chassis use the same MAC address, so be aware that if you use SNMP polling, for example, multiple interfaces will have the same MAC address.



Note Member interfaces only use the Internal-Data 0/1 MAC address after a reboot. Prior to rebooting, the member interface uses its own MAC address. If you add a new member interface after a reboot, you will have to perform another reboot to update its MAC address.

Guidelines for EtherChannels and redundant interfaces

Provides essential configuration rules and limitations for implementing EtherChannels and redundant interfaces to maintain network stability and high availability.

Bridge Group

In routed mode, Firewall Management Center -defined EtherChannels are not supported as bridge group members. EtherChannels on the Firepower 4100/9300 can be bridge group members.

High availability

- When you use an EtherChannel interface as a High availability link, it must be pre-configured on both units in the High availability pair; you cannot configure it on the primary unit and expect it to replicate to the secondary unit because the High availability link itself is required for replication .
- If you use an EtherChannel interface for the state link, no special configuration is required; the configuration can replicate from the primary unit as normal. For the Firepower 4100/9300 chassis , all interfaces, including EtherChannels, need to be pre-configured on both units.
- You can monitor EtherChannel interfaces for High availability . When an active member interface fails over to a standby interface, this activity does not cause the EtherChannel interface to appear to be failed when being monitored for device-level High availability . Only when all physical interfaces fail does the EtherChannel interface appear to be failed (for an EtherChannel interface, the number of member interfaces allowed to fail is configurable) .
- If you use an EtherChannel interface for a High availability or state link, then to prevent out-of-order packets, only one interface in the EtherChannel is used. If that interface fails, then the next interface in the EtherChannel is used. You cannot alter the EtherChannel configuration while it is in use as a High availability link. To alter the configuration, you need to temporarily disable High availability , which prevents High availability from occurring for the duration.

Model Support

- You cannot add EtherChannels in the Firewall Management Center for the Firepower 4100/9300 or the Firewall Threat Defense Virtual . The Firepower 4100/9300 supports EtherChannels, but you must perform all hardware configuration of EtherChannels in FXOS on the chassis.

- You cannot use Firepower 1010 or Secure Firewall 1210/1220 switch ports or VLAN interfaces in EtherChannels.

Clustering

- To configure a spanned EtherChannel or an individual cluster interface, see the clustering chapter.

General Redundant Interface Guidelines

- You can configure up to 8 redundant interface pairs.
- All the Firewall Threat Defense configuration refers to the logical redundant interface instead of the member physical interfaces.
- You cannot use a redundant interface as part of an EtherChannel, nor can you use an EtherChannel as part of a redundant interface. You cannot use the same physical interfaces in a redundant interface and an EtherChannel interface. You can, however, configure both types on the Firewall Threat Defense device if they do not use the same physical interfaces.
- If you shut down the active interface, then the standby interface becomes active.
- Redundant interfaces do not support the Diagnostic *slot* / *port* interfaces as members. You can, however, set a redundant interface comprised of non- Diagnostic interfaces as management-only.

General EtherChannel Guidelines

- You can configure up to 48 EtherChannels, depending on how many interfaces are available on your model.
- Each channel group can have up to 8 active interfaces, except for ASA models and the ISA 3000, which supports 16 active interfaces. For switches that support only 8 active interfaces, you can assign up to 16 interfaces to a channel group: while only 8 interfaces can be active, the remaining interfaces can act as standby links in case of interface failure.
- When you add the first member interface, it sets the required hardware properties of all member interfaces.
    - The media type of member interfaces can be either RJ-45 or SFP; SFPs of different types (copper and fiber) can be mixed. You cannot mix RJ-45 and SFP interfaces.
    - All interfaces must be set to the same speed and duplex.
    - The first interface sets the speed *capacity* , which cannot be changed later.
- The device to which you connect the Firewall Threat Defense EtherChannel must also support 802.3ad EtherChannels.
- The Firewall Threat Defense device does not support LACPDUs that are VLAN-tagged. If you enable native VLAN tagging on the neighboring switch using the Cisco IOS **vlan dot1Q tag native** command, then the Firewall Threat Defense device will drop the tagged LACPDUs.
- The LACP rate depends on the model. When you set the rate (normal or fast), the device requests that rate from the connecting switch.

- In Cisco IOS software versions earlier than 15.1(1)S2, Firewall Threat Defense does not support connecting an EtherChannel to a switch stack. To improve compatibility, set the **stack-mac persistent timer** command to a large enough value to account for reload time.
- Match the speed, duplex, and auto-negotiation settings on every EtherChannel member interface and its corresponding peer port. For a 10/100-Mbps member link, use auto-negotiation at both ends, or use the same fixed speed and duplex settings at both ends. If one end is fixed at full duplex while the other end uses auto-negotiation, the auto-negotiating side defaults to half duplex, resulting in a duplex mismatch.
- All the Firewall Threat Defense configuration refers to the logical EtherChannel interface instead of the member physical interfaces.

Configure an EtherChannel

Create an EtherChannel port-channel interface to aggregate multiple physical interfaces into a single logical interface for increased bandwidth and redundancy.

This section describes how to create an EtherChannel port-channel interface, assign interfaces to the EtherChannel, and customize the EtherChannel.

Note For the Firepower 4100/9300, you configure EtherChannels in FXOS. See Add an EtherChannel (port channel) for more information.

Before you begin

- When you add the first member interface, it sets the required hardware properties of all member interfaces. See Guidelines for EtherChannels and redundant interfaces, on page 13 for more details about member interface requirements.
- You cannot add a physical interface to the channel group if you configured a name for it. You must first remove the name.

Note If you are using a physical interface already in your configuration, removing the name will clear any configuration that refers to the interface.

Follow these steps to configure an EtherChannel:

Procedure

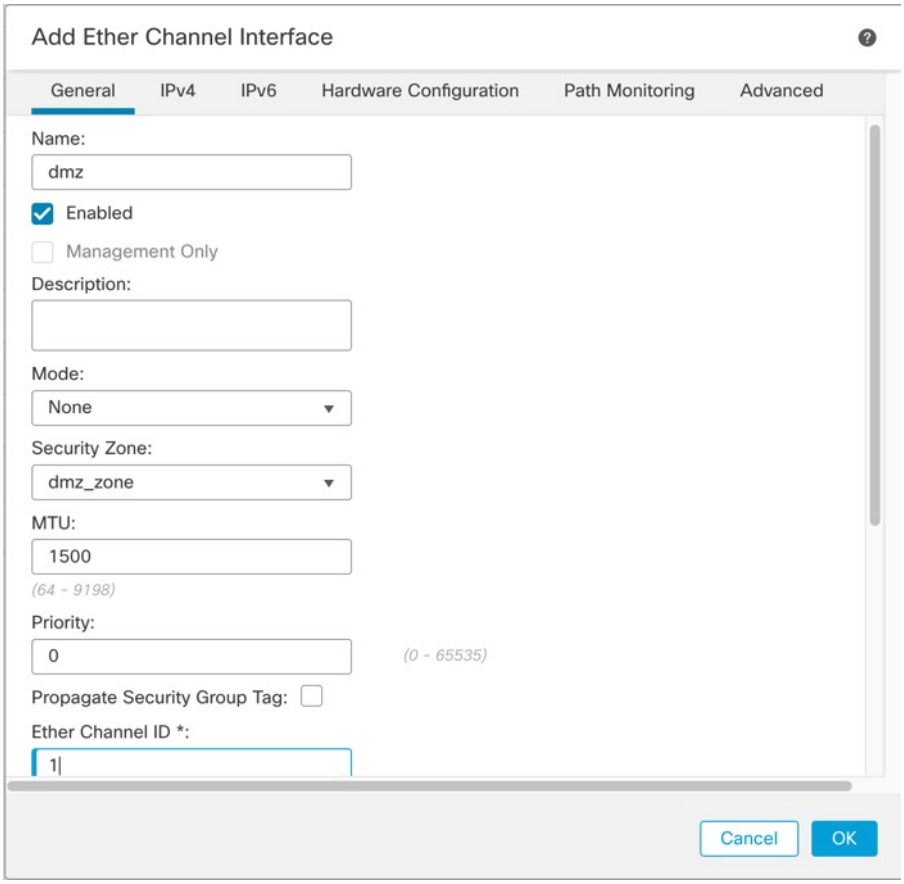
Step 1 Select **Devices** > **Device Management** and click **Edit** ( ) for your Firewall Threat Defense device. The **Interfaces** page is selected by default.

Step 2 Enable the member interfaces according to Enable the physical interface and configure Ethernet settings, on page 6.

Step 3 Click **Add Interfaces** > **Ether Channel Interface**.

Step 4 On the **General** tab, set the **Ether Channel ID** to a number between 1 and 48 (1 and 8 for the Firepower 1010).

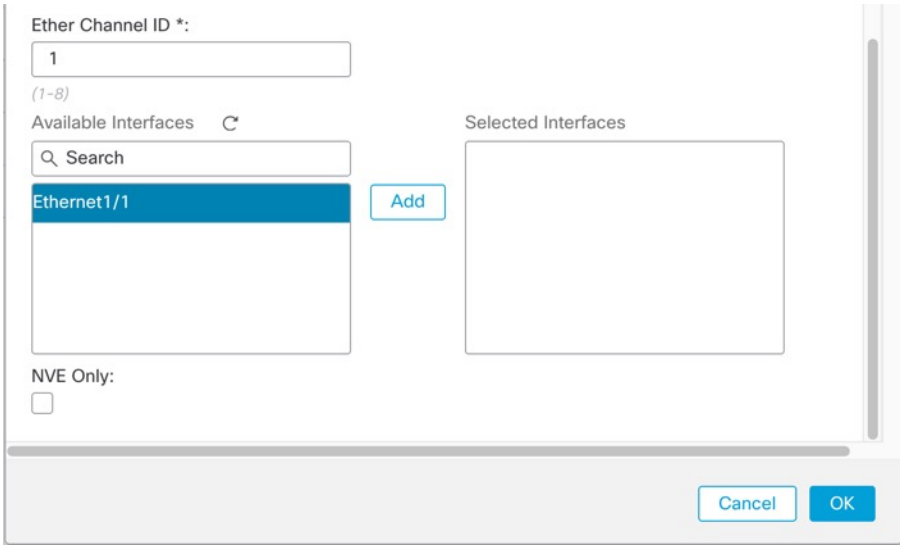
Figure 3: Add EtherChannel interface



Step 5 In the **Available Interfaces** area, click an interface and then click **Add** to move it to the **Selected Interfaces** area. Repeat for all interfaces that you want to make members.

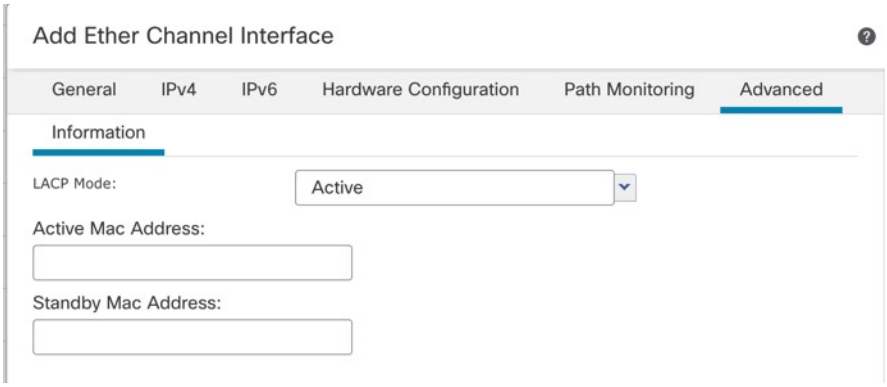
Make sure all interfaces are the same type and speed capability.

Figure 4: Available interfaces



Step 6 (Optional) Click the **Advanced** tab to customize the EtherChannel. Set the following parameters on the **Information** sub-tab:

Figure 5: Advanced



- (ISA 3000 only) **Load Balancing**—Select the criteria used to load balance the packets across the group channel interfaces. By default, the Firewall Threat Defense device balances the packet load on interfaces according to the source and destination IP address of the packet. If you want to change the properties on which the packet is categorized, choose a different set of criteria. For example, if your traffic is biased heavily towards the same source and destination IP addresses, then the traffic assignment to interfaces in the EtherChannel will be unbalanced. Changing to a different algorithm can result in more evenly distributed traffic. For more information about load balancing, see Load balancing, on page 12.
- **LACP Mode**—Choose Active, Passive, or On. We recommend using Active mode (the default). Passive mode is only available for the ISA 3000 only.
- (Secure Firewall 3100 only) **LACP Rate**—Choose Default, Normal, or Fast. The defualt is Normal (also known as slow). Sets the LACP data unit receive rate for a physical interface in the channel group. We recommend that you set the same rate on both sides.

- (ISA 3000 only) **Active Physical Interface: Range**—From the left drop-down list, choose the minimum number of active interfaces required for the EtherChannel to be active, between 1 and 16. The default is 1. From the right drop-down list, choose the maximum number of active interfaces allowed in the EtherChannel, between 1 and 16. The default is 16. If your switch does not support 16 active interfaces, be sure to set this command to 8 or fewer.
- **Active MAC Address**—Set a manual MAC address if desired. The mac_address is in H.H.H format, where H is a 16-bit hexadecimal digit. For example, the MAC address 00-0C-F1-42-4C-DE is entered as 000C.F142.4CDE.

Step 7 Click the **Hardware Configuration** tab and set the Duplex and Speed for all member interfaces.

Step 8 Click **OK**.

Step 9 Click **Save**.

You can now go to **Deploy** > **Deploy** and deploy the policy to assigned devices. The changes are not active until you deploy them.

What to do next

For regular firewall interfaces:

- Add a VLAN subinterface. See Add a subinterface.
- Configure the routed or transparent mode interface parameters: Configure routed mode interfaces or Bridge group interfaces. For IPS-only interfaces, see Inline Sets and Passive Interfaces.

Sync Interface Changes with the Firewall Management Center

Synchronize interface changes to ensure the Firewall Management Center and device configurations remain aligned when physical interfaces are added or removed.

Interface changes on the device can cause the Firewall Management Center and the device to get out of sync. The Firewall Management Center can detect interface changes by one of these methods:

- Event sent from the device
- Synchronize when you deploy from the Firewall Management Center

  If the Firewall Management Center detects interface changes when it attempts to deploy, the deployment will fail. You must first accept the interface changes.
- Manual synchronization

There are two types of interface changes performed outside of Firewall Management Center that need to be synchronized:

- Addition or deletion of physical interfaces—Adding a new interface, or deleting an unused interface has minimal impact on the Firewall Threat Defense configuration. However, deleting an interface that is used in your security policy will impact the configuration. Interfaces can be referenced directly in many places in the Firewall Threat Defense configuration, including access rules, NAT, SSL, identity rules, VPN, DHCP server, and so on. Deleting an interface will delete any configuration associated with that

interface. Policies that refer to security zones are not affected. You can also edit the membership of an allocated EtherChannel without affecting the logical device or requiring a sync on the Firewall Management Center.

When the Firewall Management Center detects changes, the **Interface** page shows status (removed, changed, or added) to the left of each interface.

- Firewall Management Center access interface changes—If you configure a data interface for managing management center using the **configure network management-data-interface** command, you must manually make matching configuration changes in management center and then acknowledge the changes. These interface changes cannot be made automatically.

This procedure describes how to manually sync interface changes if required and how to acknowledge the detected changes. If interface changes are temporary, you should not save the changes in the Firewall Management Center; you should wait until the device is stable, and then re-sync.

Before you begin

- User roles:
  - Admin
  - Access Admin
  - Network Admin

Follow these steps to sync interface changes with the Firewall Management Center:

Procedure

Step 1 Select **Devices** > **Device Management** and click **Edit** (✎) for your Firewall Threat Defense device. The **Interfaces** page is selected by default.

Step 2 If required, click **Sync Device** on the top left of **Interfaces**.

Step 3 After the changes are detected, see these steps.

Addition or Deletion of Physical Interfaces

a) You will see a red banner on **Interfaces** indicating that the interface configuration has changed. Click the **Click to know more** link to view the interface changes.

b) Click **Validate Changes** to make sure your policy will still work with the interface changes.

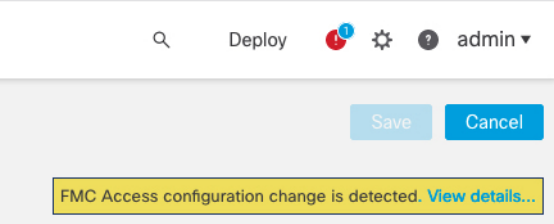
If there are any errors, you need to change your policy and rerun the validation.

c) Click **Save**.

You can now go to **Deploy** > **Deployment** and deploy the policy to assigned devices.

FMC Access Interface Changes

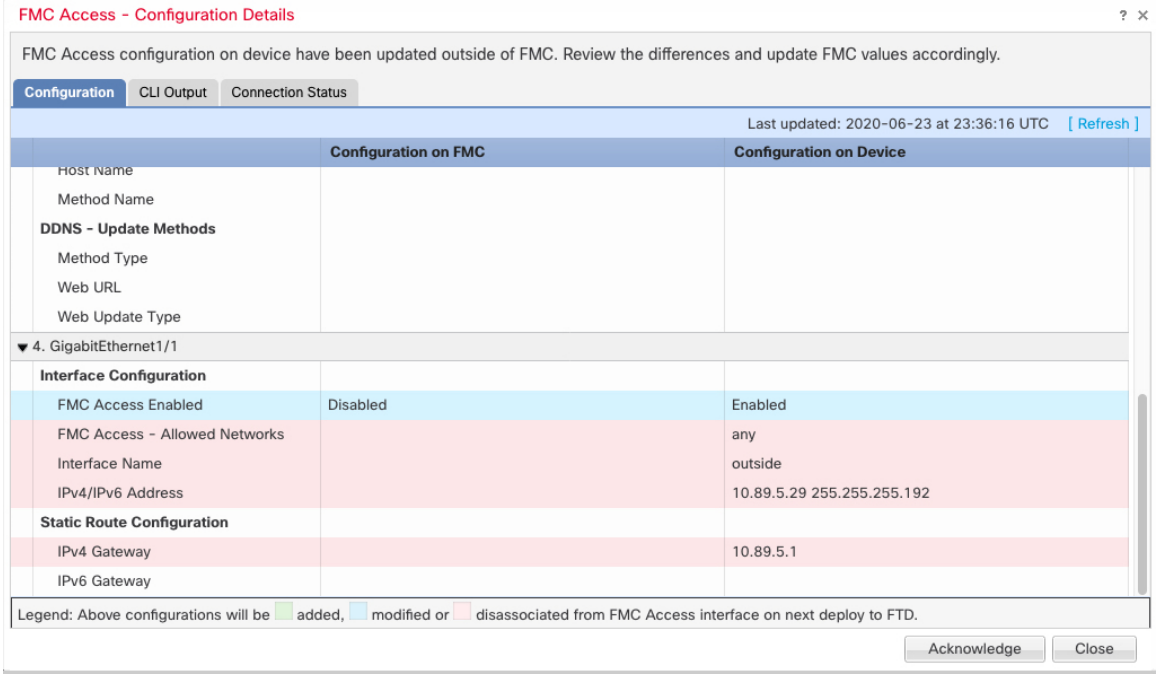
a) You will see a yellow banner in the top right of the **Device** page indicating that the Firewall Management Center access configuration has changed. Click the **View details** link to view the interface changes.



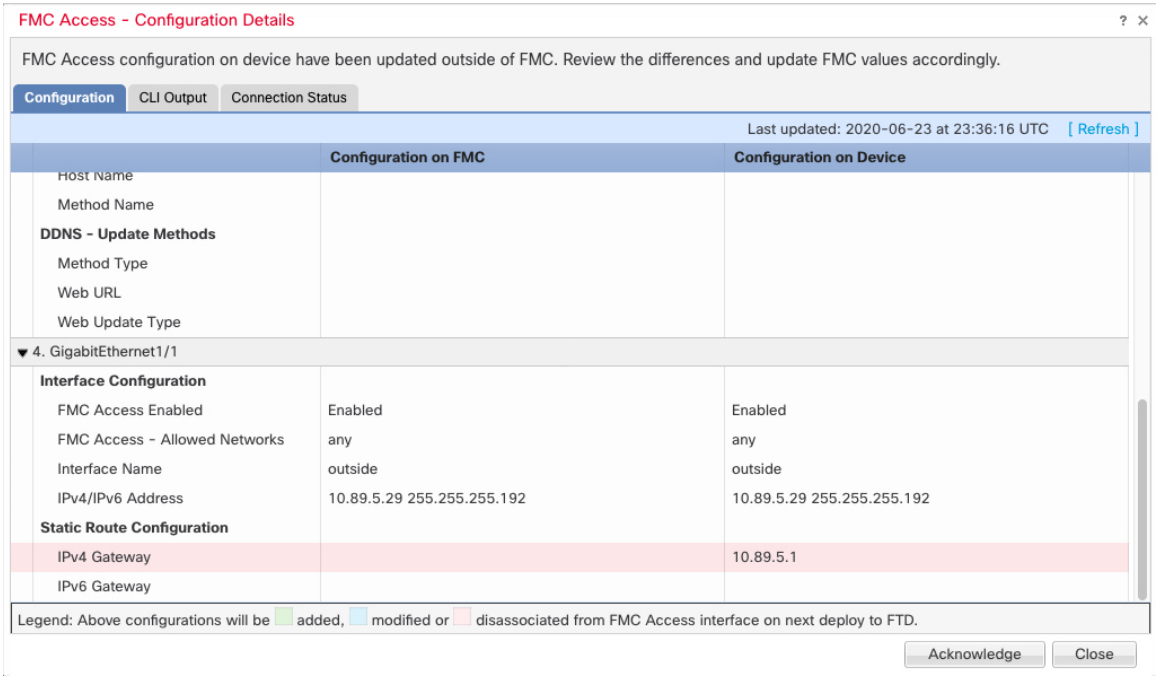
The **FMC Access - Configuration Details** dialog box opens.

b) Take note of all highlighted configurations, especially the pink highlighted ones. You need to match any values on the Firewall Threat Defense by manually configuring them on the Firewall Management Center.

For example, the pink highlights show configuration that exists on the Firewall Threat Defense but not yet on the Firewall Management Center.



This example shows this page after configuring the interface in Firewall Management Center; the interface settings match, and the pink highlight was removed.



c) Click **Acknowledge**.

We recommend that you do not click **Acknowledge** until you have finished the Firewall Management Center configuration, and are ready to deploy. Clicking **Acknowledge** removes the block on deployment. The next time you deploy, the Firewall Management Center configuration will overwrite any remaining conflicting settings on the Firewall Threat Defense. It is your responsibility to manually fix the configuration in the Firewall Management Center before you re-deploy.

d) You can now go to **Deploy** > **Deployment** and deploy the policy to assigned devices.

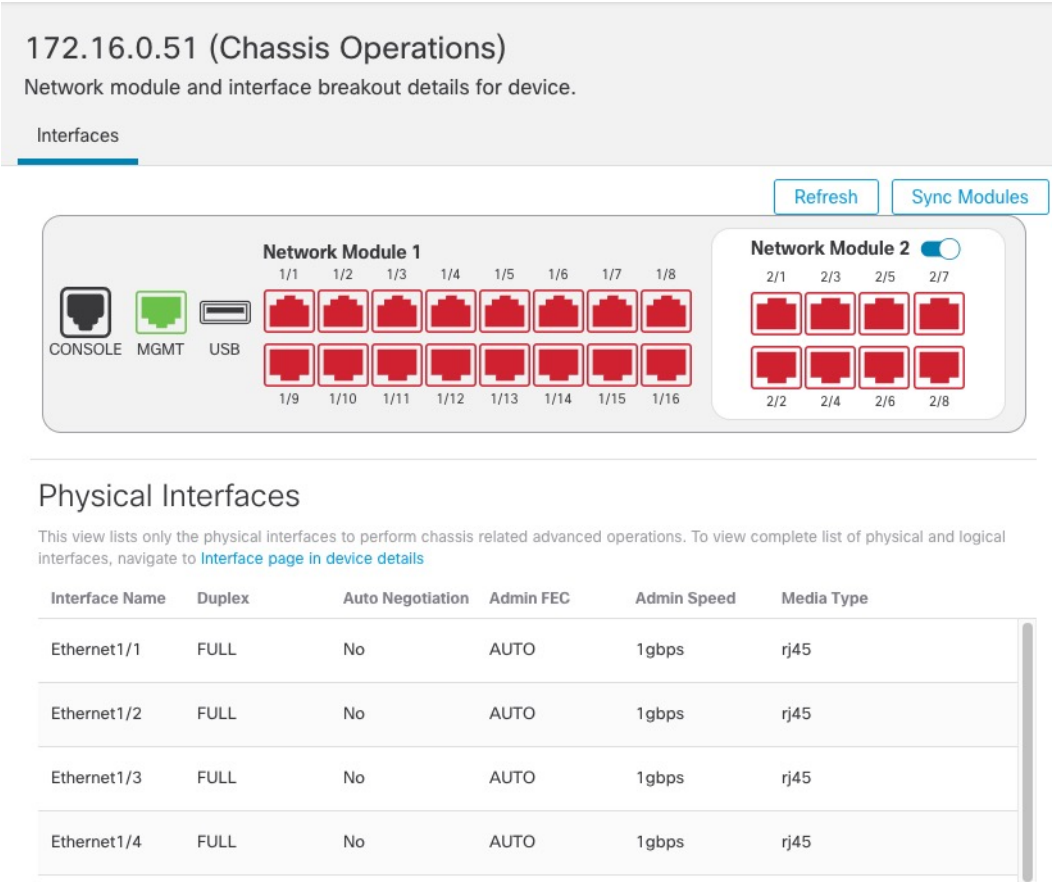
Network module management for Secure Firewall 3100

If you install a network module before powering on the device, the network module becomes enabled and ready for use automatically.

Network module management operations

To view physical interface details for the device, and to manage the network module, open the **Chassis Operations** page. From **Devices** > **Device Management**, click **Manage** in the **Chassis** column. For clustering or High Availability, this option is only available for the control node/active unit. The **Chassis Operations** page opens for the device.

Figure 6: Chassis operations



Click **Refresh** to refresh interface status. Click **Sync Modules** if you made a hardware change on the device that you need to detect.

If you need to make changes to your network module installation after initial bootup, then see the following procedures.

Configure breakout ports

This task configures breakout ports to create smaller ports from 40GB or higher interfaces, allowing you to split a single high-capacity interface into multiple physical Ethernet ports that can be used like any other physical Ethernet port, including being added to EtherChannels.

You can configure smaller breakout ports for each 40GB or higher interface. This procedure tells you how to break out and rejoin the ports. The breakout ports can be used just like any other physical Ethernet port, including being added to EtherChannels. For example, you can break out four 10GB ports from a 40GB interface. The exact size and number of ports depends on your model.

Changes are immediate; you do not need to deploy to the device. After you break or rejoin, you cannot roll back to the previous interface state.

Before you begin

- You must use a supported breakout cable. See the hardware installation guide for more information.

- The interface cannot be in use for the following before breaking or rejoining:
  - Failover link
  - Cluster control link
  - Have a subinterface
  - EtherChannel member
  - BVI member
  - Manager access interface
- Breaking or rejoining an interface that is used directly in your security policy can impact the configuration; however, the action is not blocked.

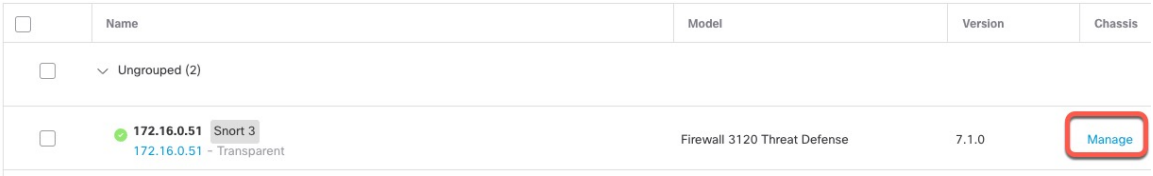
Follow these steps to configure breakout ports:

Procedure

Step 1 From **Devices** > **Device Management**, click **Manage** in the **Chassis** column.

For clustering or High Availability, this option is only available for the control node/active unit; network module changes are replicated to all nodes.

Figure 7: Manage chassis



The **Chassis Operations** page opens for the device. This page shows physical interface details for the device.

Step 2 Break out ports from a 40GB or higher interface.

a) Click **Break** (⇝) to the right of the interface.

Click **Yes** on the confirmation dialog box. If the interface is in use, you will see an error message. You must resolve any use cases before you can retry the breakout.

For example, to break out the Ethernet2/1 40GB interface, the resulting child interfaces will be identified as Ethernet2/1/1, Ethernet2/1/2, Ethernet2/1/3, and Ethernet2/1/4.

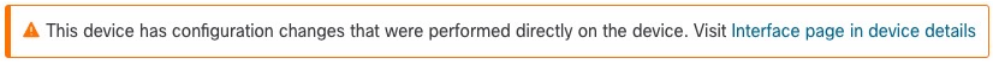
On the interfaces graphic, a port that is broken out has this appearance:

Figure 8: Breakout ports



b) Click the link in the message at the top of the screen to go to the **Interfaces** page to save the interface changes.

Figure 9: Go to interface page



c) At the top of the **Interfaces** page, click **Click to know more**.

The **Interface Changes** dialog box opens.

Figure 10: View interface changes

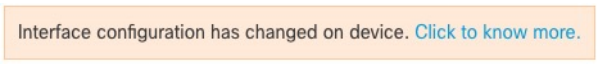
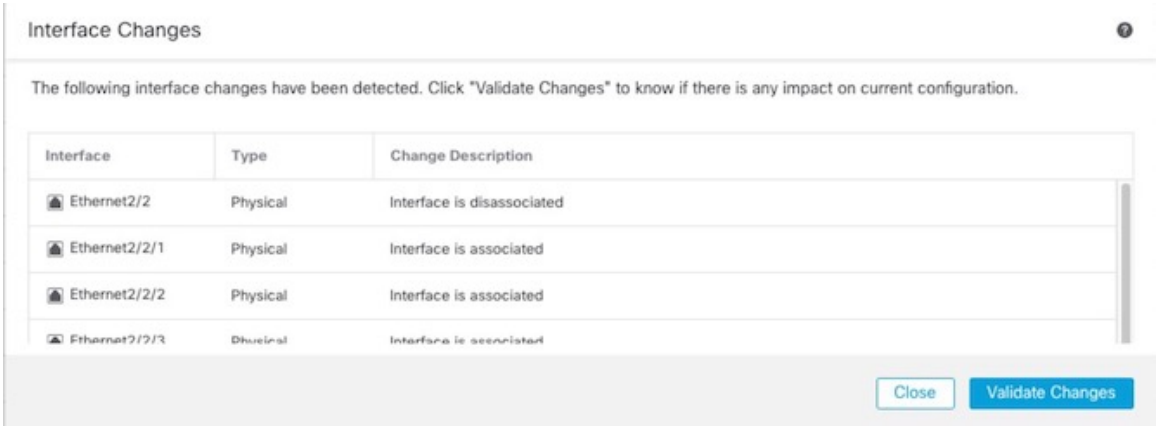


Figure 11: Interface changes



d) Click **Validate Changes** to make sure your policy will still work with the interface changes.

If there are any errors, change your policy and rerun the validation.

Replacing the parent interface that is used in your security policy can impact the configuration. Interfaces can be referenced directly in many places in the configuration, including access rules, NAT, SSL, identity rules, VPN, DHCP server, and so on. Deleting an interface will delete any configuration associated with that interface. Policies that refer to security zones are not affected.

e) Click **Close** to return to the **Interfaces** page.

f) Click **Save** to save the interface changes to the firewall.

g) If you had to change any configuration, go to **Deploy** > **Deployment** and deploy the policy.

You do not need to deploy just to save the breakout port changes.

Step 3 Rejoin breakout ports.

You must rejoin all child ports for the interface.

a) Click **Join** ( ) to the right of the interface.

Click **Yes** on the confirmation dialog box. If any child ports are in use, you will see an error message. You must resolve any use cases before you can retry the rejoin.

b) Click the link in the message at the top of the screen to go to the **Interfaces** page to save the interface changes.

Figure 12: Go to interface page



c) At the top of the **Interfaces** page, click **Click to know more**.

The **Interface Changes** dialog box opens.

Figure 13: View interface changes

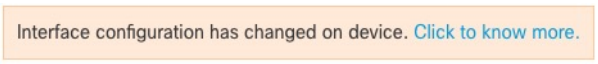
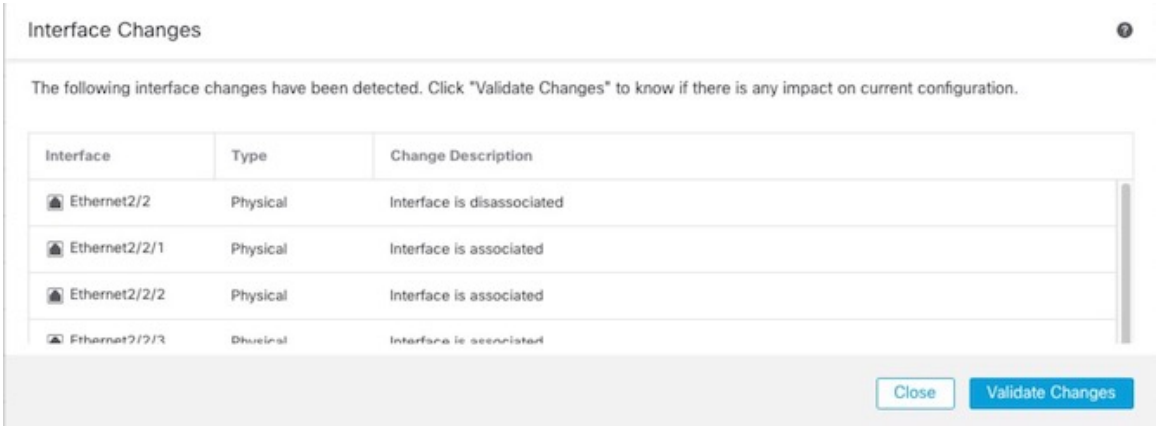


Figure 14: Interface changes



d) Click **Validate Changes** to make sure your policy will still work with the interface changes.

If there are any errors, you need to change your policy and rerun the validation.

Replacing the child interfaces that are used in your security policy can impact the configuration. Interfaces can be referenced directly in many places in the configuration, including access rules, NAT, SSL, identity rules, VPN, DHCP server, and so on. Deleting an interface will delete any configuration associated with that interface. Policies that refer to security zones are not affected.

e) Click **Close** to return to the **Interfaces** page.
f) Click **Save** to save the interface changes to the firewall.
g) If you had to change any configuration, go to **Deploy** > **Deployment** and deploy the policy.

You do not need to deploy just to save the breakout port changes.

Add a network module

This task enables you to add network module functionality to a firewall that is already operational, expanding its interface capabilities.

Adding a new module requires a reboot of the firewall system.

Procedure

Step 1 Install the network module according to the hardware installation guide.

For clustering or High Availability, install the network module on all nodes.

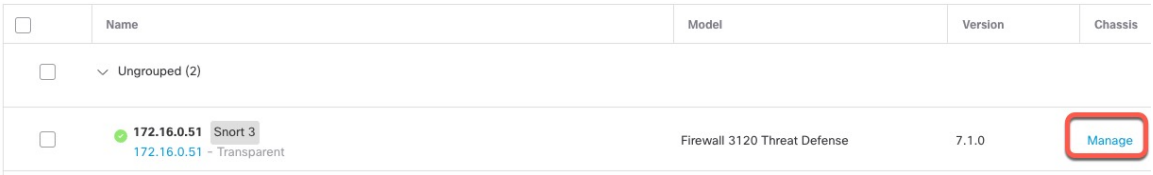
Step 2 Reboot the firewall; see Shut down or restart the device.

For clustering or High Availability, reboot the data nodes/standby unit first, and wait for them to come back up. Then you can change the control node or active unit (see Switch the Active Peer in the Firewall Threat Defense High Availability Pair), and reboot the former control node/active unit.

Step 3 From **Devices** > **Device Management**, click **Manage** in the **Chassis** column.

For clustering or High Availability, this option is only available for the control node/active unit; network module changes are replicated to all nodes.

Figure 15: Manage chassis

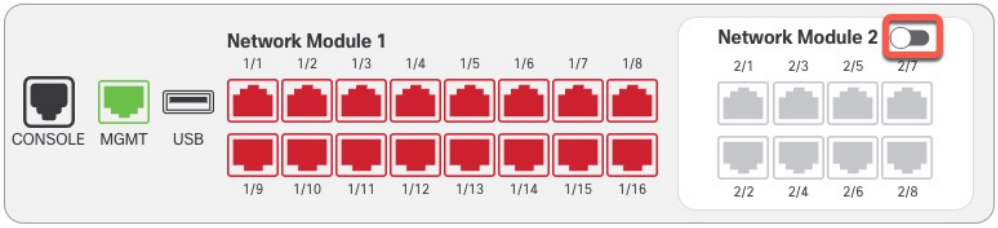


The **Chassis Operations** page opens for the device. This page shows physical interface details for the device.

Step 4 Click **Sync Modules** to update the page with the new network module details.

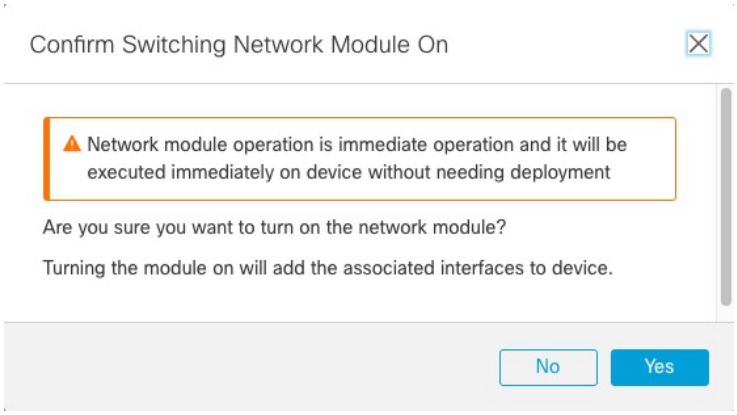
Step 5 On the interfaces graphic, click the slider ( ) to enable the network module.

Figure 16: Enable the network module



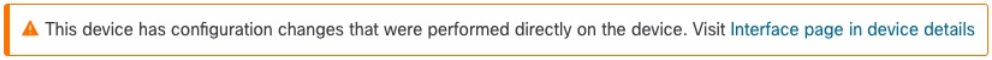
Step 6 You are prompted to confirm that you want to turn the network module on. Click **Yes**.

Figure 17: Confirm enable



Step 7 You see a message at the top of the screen; click the link to go to the **Interfaces** page to save the interface changes.

Figure 18: Go to interface page



Step 8 (Optional) At the top of the **Interfaces** page, you see a message that the interface configuration has changed. You can click **Click to know more** to open the **Interface Changes** dialog box to view the changes.

Figure 19: View interface changes

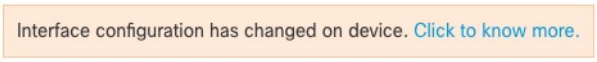
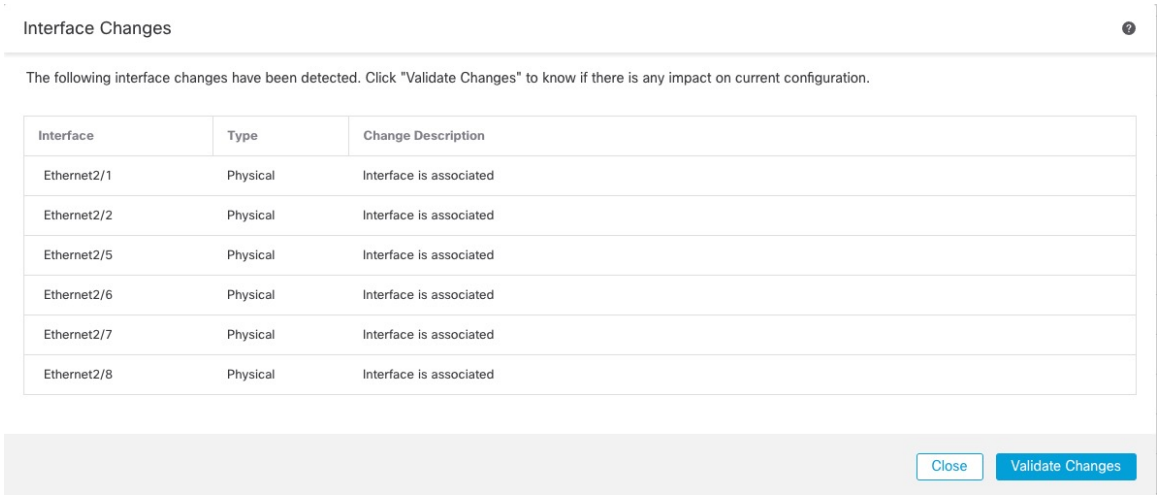


Figure 20: Interface changes



Click **Close** to return to the **Interfaces** page. (Because you are adding a new module, there shouldn't be any configuration impact, so you do not need to click **Validate Changes**.)

Step 9 Click **Save** to save the interface changes to the firewall.

Hot swap the network module

You can hot swap a network module for a new module of the same type without having to reboot.

You must shut down the current module to remove it safely. This procedure describes how to shut down the old module, install a new module, and enable it.

For clustering or High Availability, you can only perform chassis operations on the control node/active unit. You cannot disable a network module if the cluster control link/failover link is on the module.

Procedure

Step 1 For clustering or High Availability, perform the following steps.

- **Clustering**—Ensure the unit you want to perform the hot swap on is a data node; then break the node so it is no longer in the cluster.

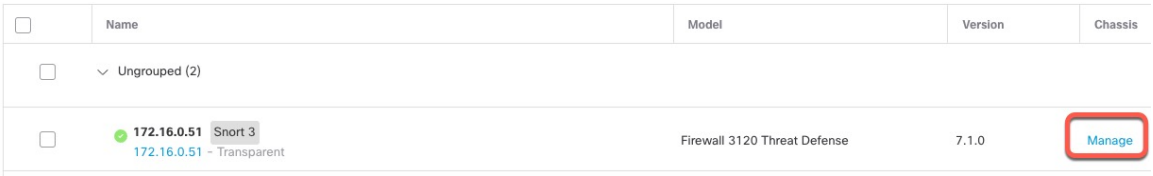
  You will add the node back to the cluster after you perform the hot swap. Alternatively, you can perform all operations on the control node, and the network module changes will sync to all data nodes. However, you will lose use of those interfaces on all nodes during the hot swap.

- **High Availability**—To avoid failing over when you disable the network module:
  - If the failover link is on the network module, you must break High Availability. See Break a high availability pair. Disabling the network module with an active failover link is not allowed.
  - Disable interface monitoring for interfaces on the network module. See Configure standby IP addresses and interface monitoring.

Step 2 From **Devices** > **Device Management**, click **Manage** in the **Chassis** column.

For clustering or High Availability, this option is only available for the control node/active unit; network module changes are replicated to all nodes.

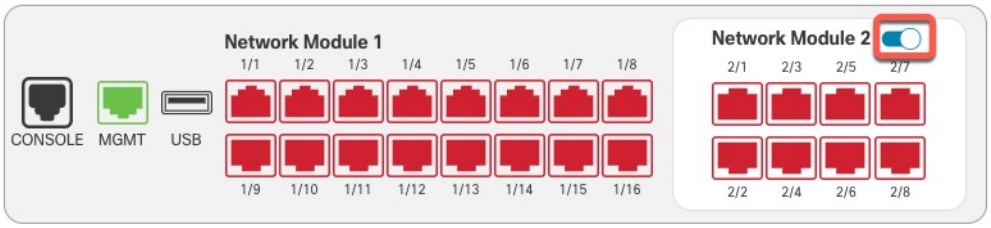
Figure 21: Manage chassis



The **Chassis Operations** page opens for the device. This page shows physical interface details for the device.

Step 3 On the interfaces graphic, click the slider ( ) to disable the network module.

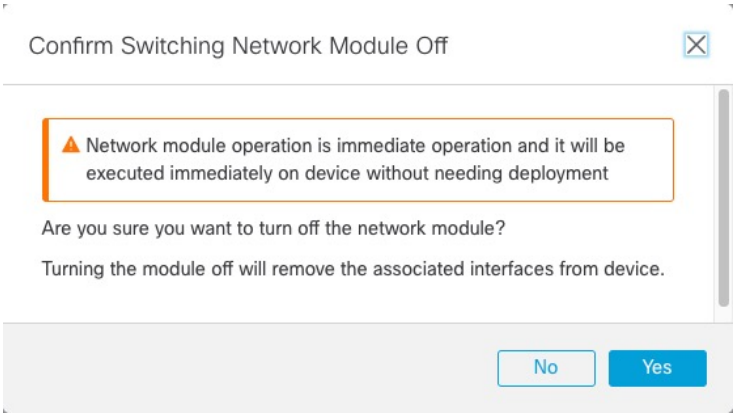
Figure 22: Disable the network module



Do not save any changes on the **Interfaces** page. Because you are replacing the network module, you do not want to disrupt any existing configuration.

Step 4 You are prompted to confirm that you want to turn the network module off. Click **Yes**.

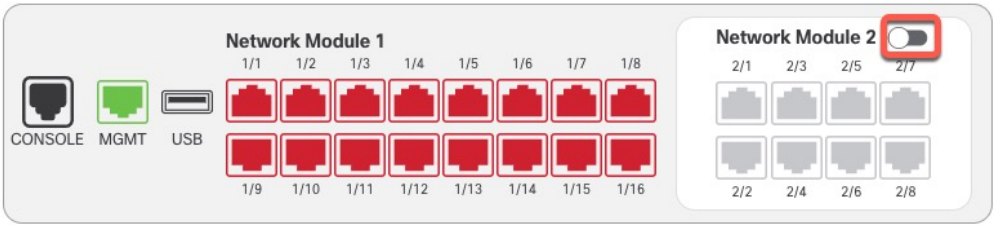
Figure 23: Confirm disable



Step 5 On the device, remove the old network module and replace it with the new network module according to the hardware installation guide.

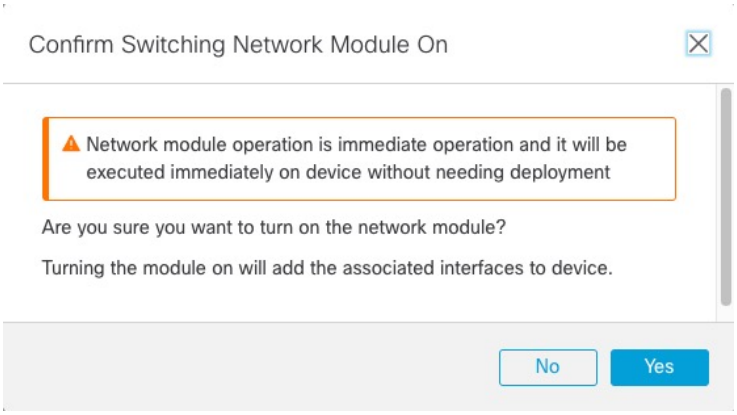
Step 6 In the Firewall Management Center, enable the new module by clicking the slider ().

Figure 24: Enable the network module



Step 7 You are prompted to confirm that you want to turn the network module on. Click **Yes**.

Figure 25: Confirm enable



Step 8 For clustering or High Availability, perform the following steps.

- **Clustering**—Add the node back to the cluster.
- **High Availability**—
  - If you broke High Availability, then reform High Availability. See Add a high availability pair.
  - Reenable interface monitoring for interfaces on the network module. See Configure standby IP addresses and interface monitoring.

Replace the network module with a different type

Replace an existing network module with a different type to accommodate new interface requirements or hardware upgrades.

If you replace a network module with a different type, then a reboot is required. If the new module has fewer interfaces than the old module, you will have to manually remove any configuration related to interfaces that will no longer be present.

For clustering or High Availability, you can only perform chassis operations on the control node or active unit.

Before you begin

For High Availability, you cannot disable a network module if the failover link is on the module. You will have to break the high availability pair (see Break a high availability pair), which means you will have downtime when you reboot the active unit. After the units finish rebooting, you can reform High Availability.

Follow these steps to replace the network module with a different type:

Procedure

Step 1 For clustering or High Availability, perform the following steps.

- **Clustering**—To avoid downtime, you can break each node one at a time so it is no longer in the cluster when you perform the network module replacement.

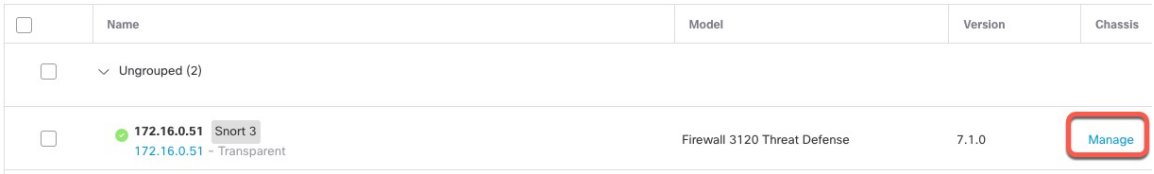
  Add the node back to the cluster after the replacement.

- **High Availability**—To avoid failing over when you replace the network module, disable interface monitoring for interfaces on the network module. See Configure standby IP addresses and interface monitoring.

Step 2 From **Devices** > **Device Management**, click **Manage** in the **Chassis** column.

For clustering or High Availability, this option is only available for the control node/active unit; network module changes are replicated to all nodes.

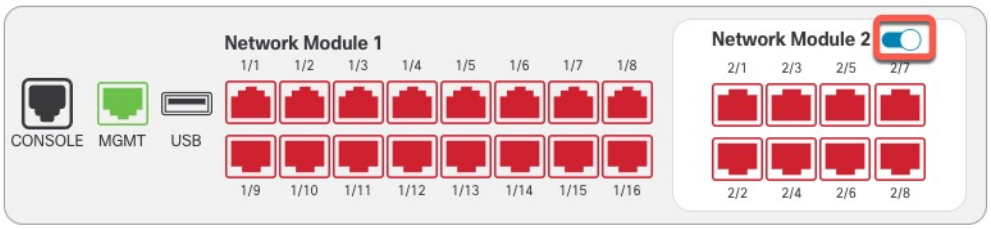
Figure 26: Manage chassis



The **Chassis Operations** page opens for the device. This page shows physical interface details for the device.

Step 3 On the interfaces graphic, click the slider ( ) to disable the network module.

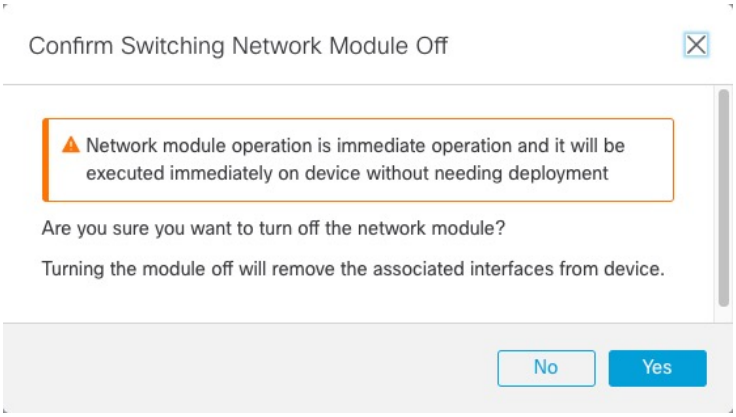
Figure 27: Disable the network module



Do not save any changes on the **Interfaces** page. Because you are replacing the network module, you do not want to disrupt any existing configuration.

a) You are prompted to confirm that you want to turn the network module off. Click **Yes**.

Figure 28: Confirm disable



Step 4 On the device, remove the old network module and replace it with the new network module according to the hardware installation guide.

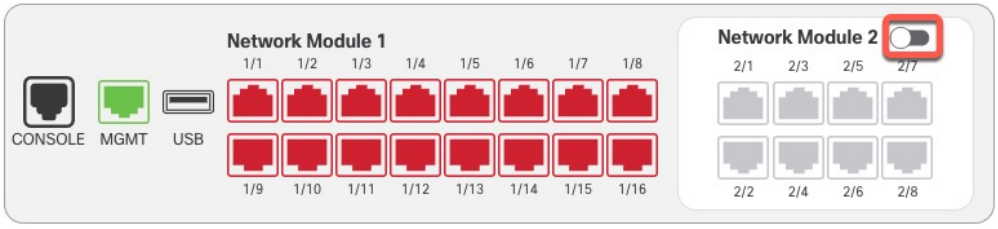
Reboot the firewall. Refer to Shut down or restart the device for guidance.

For clustering or High Availability, reboot the data nodes/standby unit first, and wait for them to come back up. Then you can change the control node or active unit (see Switch the Active Peer in the Firewall Threat Defense High Availability Pair), and reboot the former control node/active unit.

Step 5 In the Firewall Management Center, click **Sync Modules** to update the page with the new network module details.

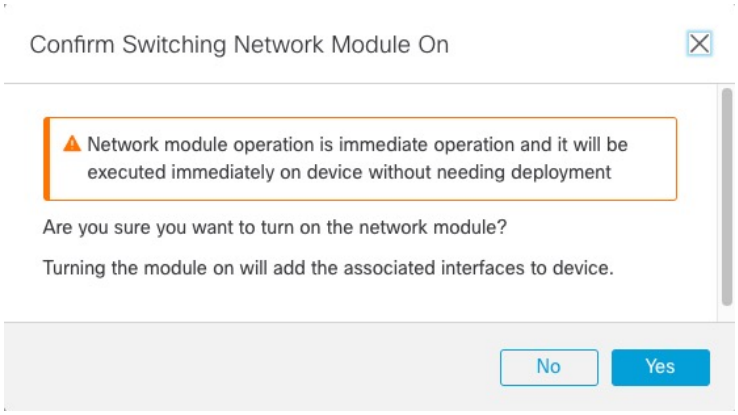
Step 6 Enable the new module by clicking the slider ( ).

Figure 29: Enable the network module



a) Click **Yes** when prompted to confirm that you want to turn the network module on.

Figure 30: Confirm enable



Step 7 Click the link in the message at the top of the screen to go to the **Interfaces** page to save the interface changes.

Figure 31: Go to interface page



Step 8 If the network module has *fewer* interfaces:

a) At the top of the **Interfaces** page, click **Click to know more**.

The **Interface Changes** dialog box opens.

Figure 32: View interface changes

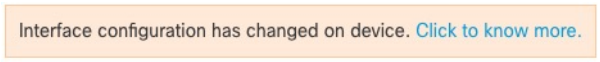
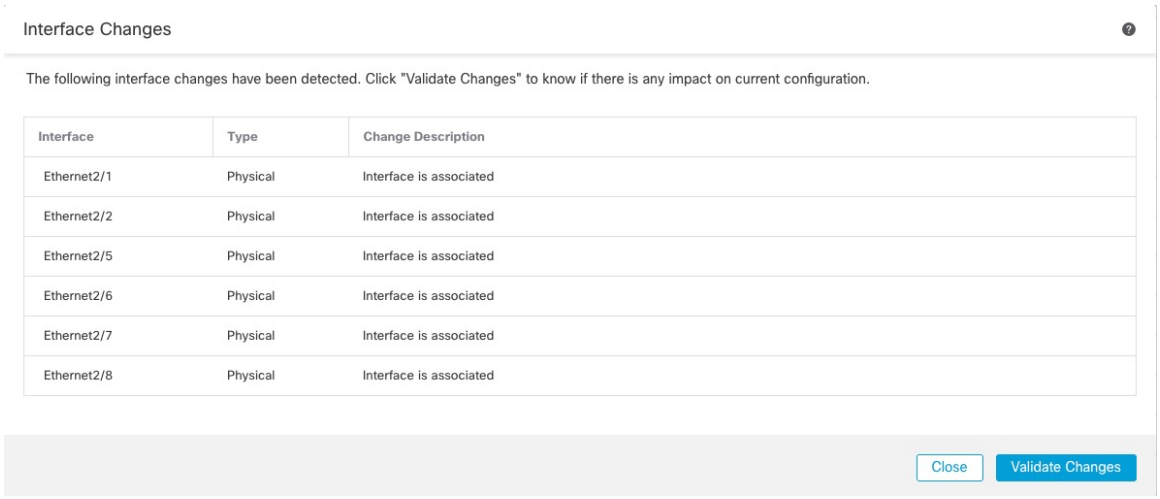


Figure 33: Interface changes



b) Click **Validate Changes** to make sure your policy will still work with the interface changes.

If there are any errors, you need to change your policy and rerun the validation.

Deleting an interface that is used in your security policy can impact the configuration. Interfaces can be referenced directly in many places in the configuration, including access rules, NAT, SSL, identity rules, VPN, DHCP server, and so on. Deleting an interface will delete any configuration associated with that interface. Policies that refer to security zones are not affected.

c) Click **Close** to return to the **Interfaces** page.

Step 9 To change the interface speed, see Enable the physical interface and configure Ethernet settings, on page 6.

The default speed is set to Detect SFP, which detects the correct speed from the SFP installed. You only need to fix the speed if you manually set the speed to a particular value and you now need a new speed.

Click **Save** to save the interface changes to the firewall.

What to do next

- If you had to change any configuration, go to **Deploy** > **Deployment** and deploy the policy.
- For clustering, add the node back to the cluster.
- For high availability, reenable interface monitoring for interfaces on the network module. See Configure standby IP addresses and interface monitoring.

Remove the network module

Remove a network module permanently from the chassis when it is no longer needed or requires replacement.

If you want to permanently remove the network module, follow these steps. Removing a network module requires a reboot.

For clustering or High Availability, you can only perform chassis operations on the control node or active unit.

Before you begin

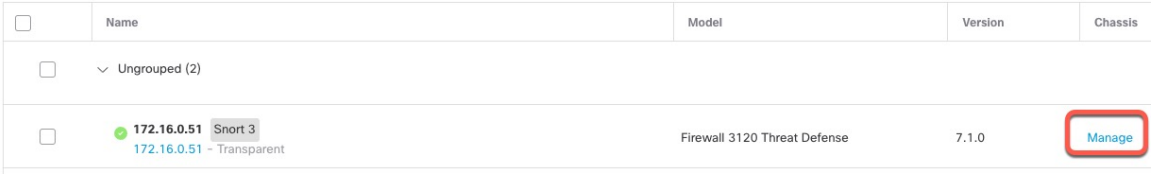
For clustering or High Availability, make sure the cluster or failover link is not on the network module.

Procedure

Step 1 From **Devices** > **Device Management**, click **Manage** in the **Chassis** column.

For clustering or High Availability, this option is only available for the control node/active unit; network module changes are replicated to all nodes.

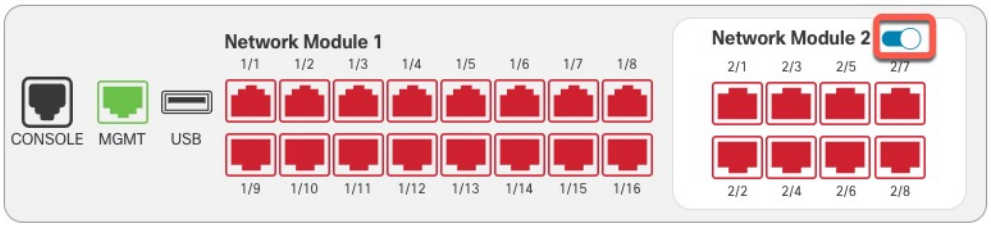
Figure 34: Manage chassis



The **Chassis Operations** page opens for the device. This page shows physical interface details for the device.

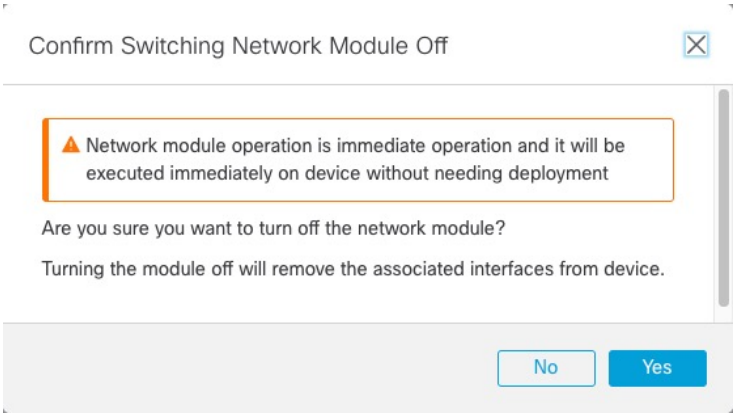
Step 2 On the interfaces graphic, click the slider ( ) to disable the network module.

Figure 35: Disable the network module



Step 3 You are prompted to confirm that you want to turn the network module off. Click **Yes**.

Figure 36: Confirm disable



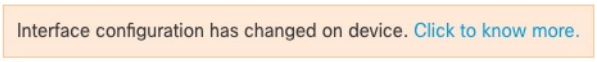
Step 4 You see a message at the top of the screen; click the link to go to the **Interfaces** page to save the interface changes.

Figure 37: Go to interface page



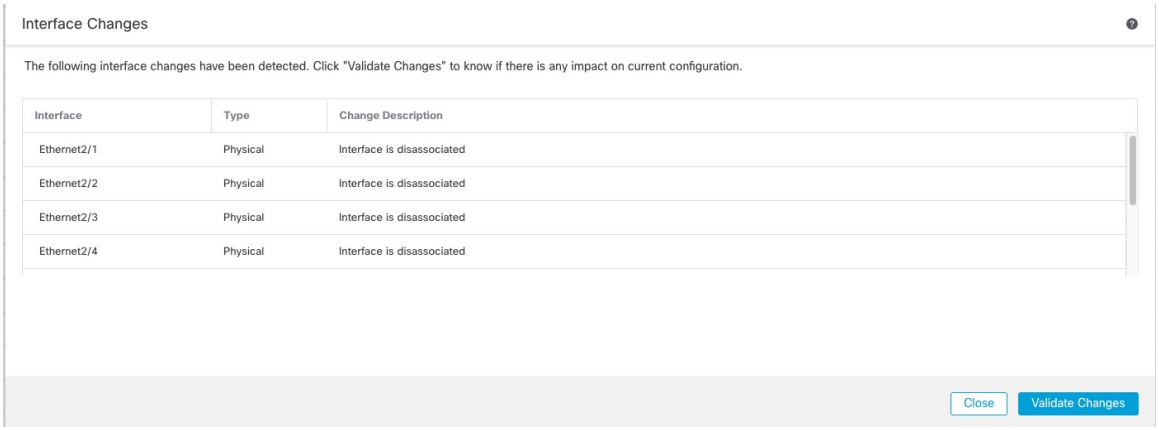
Step 5 At the top of the **Interfaces** page, you see a message that the interface configuration has changed.

Figure 38: View interface changes



a) Click **Click to know more** to open the **Interface Changes** dialog box to view the changes.

Figure 39: Interface changes



b) Click **Validate Changes** to make sure your policy will still work with the interface changes.

If there are any errors, you need to change your policy and rerun the validation.

Deleting an interface that is used in your security policy can impact the configuration. Interfaces can be referenced directly in many places in the configuration, including access rules, NAT, SSL, identity rules, VPN, DHCP server, and so on. Deleting an interface will delete any configuration associated with that interface. Policies that refer to security zones are not affected.

c) Click **Close** to return to the **Interfaces** page.

Step 6 Click **Save** to save the interface changes to the firewall.

Step 7 If you had to change any configuration, go to **Deploy** > **Deployment** and deploy the policy.

Step 8 Reboot the firewall; see Shut down or restart the device.

For clustering or High Availability, reboot the data nodes/standby unit first, and wait for them to come back up. Then you can change the control node or active unit (see Switch the Active Peer in the Firewall Threat Defense High Availability Pair), and reboot the former control node/active unit.

History for interfaces

This reference provides the complete version history for interface-related features, enhancements, and changes across different versions of the Secure Firewall system.

Feature	Minimum Firewall Management Center	Minimum Firewall Threat Defense	Details
Default Forward Error Correction (FEC) on Secure Firewall 3100 fixed ports changed to Clause 108 RS-FEC from Clause 74 FC-FEC for 25 GB+ SR, CSR, and LR transceivers	7.2.4	7.2.4	When you set the FEC to Auto on the Secure Firewall 3100 fixed ports, the default type is now set to Clause 108 RS-FEC instead of Clause 74 FC-FEC for 25 GB+ SR, CSR, and LR transceivers.
LLDP support for the Firepower 2100, Secure Firewall 3100	7.2.0	7.2.0	You can enable Link Layer Discovery Protocol (LLDP) for Firepower 2100 and Secure Firewall 3100 interfaces. New/Modified screens: **Devices** > **Device Management** > **Interfaces** > **Hardware Configuration** > **Network Connectivity** New/Modified commands: **show LLDP status**, **show LLDP neighbors**, **show LLDP statistics**
Pause Frames for Flow Control for the Secure Firewall 3100	7.2.0	7.2.0	If you have a traffic burst, dropped packets can occur if the burst exceeds the buffering capacity of the FIFO buffer on the NIC and the receive ring buffers. Enabling pause frames for flow control can alleviate this issue. New/Modified screens: **Devices** > **Device Management** > **Interfaces** > **Hardware Configuration** > **Network Connectivity**
Support for hot swapping the network module for the Secure Firewall 3100	7.1.0	7.1.0	You can add or remove the network module on the Secure Firewall 3100 while the firewall is powered up. To replace a module with another module of the same type, you do not need to reboot. After initial bootup, adding a module, permanently removing a module, or replacing a module with a new type requires a reboot. New/Modified screens: **Devices** > **Device Management** > **Chassis Operations**
Support for Forward Error Correction for the Secure Firewall 3100	7.1.0	7.1.0	Secure Firewall 3100 25 Gbps interfaces support Forward Error Correction (FEC). FEC is enabled by default and set to Auto. New/Modified screens: **Devices** > **Device Management** > **Interfaces** > **Edit Physical Interface** > **Hardware Configuration**
Support for setting the speed based on the SFP for the Secure Firewall 3100	7.1.0	7.1.0	The Secure Firewall 3100 supports speed detection for interfaces based on the SFP installed. Detect SFP is enabled by default. This option is useful if you later change the network module to a different model, and want the speed to update automatically. New/Modified screens: **Devices** > **Device Management** > **Interfaces** > **Edit Physical Interface** > **Hardware Configuration**

Feature	Minimum Firewall Management Center	Minimum Firewall Threat Defense	Details
LLDP support for the Firepower 1100.	7.1.0	7.1.0	You can enable Link Layer Discovery Protocol (LLDP) for Firepower 1100 interfaces. New/Modified screens: **Devices** > **Device Management** > **Interfaces** > **Hardware Configuration** > **LLDP** New/Modified commands: **show LLDP status**, **show LLDP neighbors**, **show LLDP statistics**
Interface auto-negotiation is now set independently from speed and duplex, interface sync improved.	7.1.0	7.1.0	Interface auto-negotiation is now set independently from speed and duplex. Also, when you sync the interfaces in Firewall Management Center, hardware changes are detected more effectively. New/Modified screens: **Devices** > **Device Management** > **Interfaces** > **Hardware Configuration** > **Speed** Supported platforms: Firepower 1000, 2100, Secure Firewall 3100
Firepower 1100/2100 series fiber interfaces now support disabling auto-negotiation.	6.7.0	6.7.0	You can now configure a Firepower 1100/2100 series fiber interface to disable flow control and link status negotiation. Previously, when you set the fiber interface speed (1000 or 10000 Mbps) on these devices, flow control and link status negotiation was automatically enabled. You could not disable it. Now, you can deselect **Auto-negotiation** and set the speed to 1000 to disable flow control and link status negotiation. You cannot disable negotiation at 10000 Mbps. New/modified screens: **Devices** > **Device Management** > **Interfaces** > **Hardware Configuration** > **Speed**