



# Configuring Attack Response Controller for Blocking and Rate Limiting



## Note

ARC is formerly known as Network Access Controller. Although the name has been changed, IDM, IME, and the CLI contain references to Network Access Controller, **nac**, and **network-access**.

This chapter provides information for setting up ARC to perform blocking and rate limiting on the sensor. It contains the following sections:

- [Understanding Blocking, page 14-1](#)
- [Understanding Rate Limiting, page 14-4](#)
- [Understanding Service Policies for Rate Limiting, page 14-5](#)
- [Before Configuring ARC, page 14-5](#)
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- [Configuring Blocking Properties, page 14-7](#)
- [Configuring User Profiles, page 14-20](#)
- [Configuring Blocking and Rate Limiting Devices, page 14-21](#)
- [Configuring the Sensor to be a Master Blocking Sensor, page 14-29](#)
- [Configuring Host Blocking, page 14-32](#)
- [Configuring Network Blocking, page 14-33](#)
- [Configuring Connection Blocking, page 14-33](#)
- [Obtaining a List of Blocked Hosts and Connections, page 14-34](#)

## Understanding Blocking

ARC is responsible for managing network devices in response to suspicious events by blocking access from attacking hosts and networks. ARC blocks the IP address on the devices it is managing. It sends the same block to all the devices it is managing, including any other master blocking sensors. ARC monitors the time for the block and removes the block after the time has expired.



## Caution

Blocking is not supported on the FWSM in multiple mode admin context.

**Note**

ARC completes the action response for a new block in no more than 7 seconds. In most cases, it completes the action response in less time. To meet this performance goal, you should not configure the sensor to perform blocks at too high a rate or to manage too many blocking devices and interfaces. We recommend that the maximum number of blocks not exceed 250 and the maximum number of blocking items not exceed 10. To calculate the maximum number of blocking items, a security appliance counts as one blocking item per blocking context. A router counts as one blocking item per blocking interface/direction. A switch running Catalyst software counts as one blocking item per blocking VLAN. If the recommended limits are exceeded, ARC may not apply blocks in a timely manner or may not be able to apply blocks at all.

For security appliances configured in multi-mode, Cisco IPS does not include VLAN information in the block request. Therefore you must make sure the IP addresses being blocked are correct for each security appliance. For example, the sensor is monitoring packets on a security appliance customer context that is configured for VLAN A, but is blocking on a different security appliance customer context that is configured for VLAN B. Addresses that trigger blocks on VLAN A may refer to a different host on VLAN B.

There are three types of blocks:

- Host block—Blocks all traffic from a given IP address.
- Connection block—Blocks traffic from a given source IP address to a given destination IP address and destination port.

Multiple connection blocks from the same source IP address to either a different destination IP address or destination port automatically switch the block from a connection block to a host block.

- Network block—Blocks all traffic from a given network.

You can initiate host and connection blocks manually or automatically when a signature is triggered. You can only initiate network blocks manually.

**Note**

Connection blocks and network blocks are not supported on security appliances. Security appliances only support host blocks with additional connection information.

**Caution**

Do not confuse blocking with the ability of the sensor to drop packets. The sensor can drop packets when the following actions are configured for a sensor in inline mode: deny packet inline, deny connection inline, and deny attacker inline.

For automatic blocks, you must check the Request Block Host or Request Block Connection check boxes as the event action for particular signatures, and add them to any event action overrides you have configured, so that SensorApp sends a block request to ARC when the signature is triggered. When ARC receives the block request from SensorApp, it updates the device configurations to block the host or connection.

On Cisco routers and Catalyst 6500 series switches, ARC creates blocks by applying ACLs or VACLs. ACLs and VACLs permit or deny passage of data packets through interface directions or VLANs. Each ACL or VACL contains permit and deny conditions that apply to IP addresses. The security appliances do not use ACLs or VACLs. The built-in **shun** and **no shun** command is used.

**Caution**

The ACLs that ARC makes should never be modified by you or any other system. These ACLs are temporary and new ACLs are constantly being created by the sensor. The only modifications that you can make are to the Pre- and Post-Block ACLs.

You need the following information for ARC to manage a device:

- Login user ID (if the device is configured with AAA)
- Login password
- Enable password (not needed if the user has enable privileges)
- Interfaces to be managed (for example, ethernet0, vlan100)
- Any existing ACL or VACL information you want applied at the beginning (Pre-Block ACL or VACL) or end (Post-Block ACL or VACL) of the ACL or VACL that will be created  
This does not apply to the security appliances because they do not use ACLs to block.
- Whether you are using Telnet or SSH to communicate with the device
- IP addresses (host or range of hosts) you never want blocked
- How long you want the blocks to last.

**Note**

ARC is formerly known as Network Access Controller. Although the name has been changed, IDM, IME, and the CLI contain references to Network Access Controller, **nac**, and **network-access**.

**Tip**

To check the status of ARC, type **show statistics network-access** at the `sensor#`. The output shows the devices you are managing, any active blocks and rate limits, and the status of all devices.

**Note**

Rate limiting and blocking are not supported for IPv6 traffic. If a signature is configured with a block or rate limit event action and is triggered by IPv6 traffic, an alert is generated but the action is not carried out.

**For More Information**

- For the procedure to add request-block-host or request-block-connection event actions to a signature, see [Assigning Actions to Signatures, page 8-15](#).
- For the procedure for configuring overrides that add the request-block-host or request-block-connection event actions to alerts of a specific risk rating, see [Adding, Editing, Enabling, and Disabling Event Action Overrides, page 7-17](#).
- For more information on Pre- and Post-Block ACLs, see [How the Sensor Manages Devices, page 14-22](#).

# Understanding Rate Limiting

ARC is responsible for rate limiting traffic in protected networks. Rate limiting lets sensors restrict the rate of specified traffic classes on network devices. Rate limit responses are supported for the Host Flood and Net Flood engines, and the TCP half-open SYN signature. ARC can configure rate limits on network devices running Cisco IOS 12.3 or later. Master blocking sensors can also forward rate limit requests to blocking forwarding sensors.



## Tip

To check the status of ARC, type **show statistics network-access** at the `sensor#`. The output shows the devices you are managing, any active blocks and rate limits, and the status of all devices.

To add a rate limit, you specify the following:

- Source address and/or destination address for any rate limit
- Source port and/or destination port for rate limits with TCP or UDP protocol

You can also tune rate limiting signatures. You must also set the action to Request Rate Limit and set the percentage for these signatures.



## Note

Rate limiting and blocking are not supported for IPv6 traffic. If a signature is configured with a block or rate limit event action and is triggered by IPv6 traffic, an alert is generated but the action is not carried out.

Table 14-1 lists the supported rate limiting signatures and parameters.

**Table 14-1** Rate Limiting Signatures

Signature ID	Signature Name	Protocol	Destination IP Address Allowed	Data
2152	ICMP Flood Host	ICMP	Yes	echo-request
2153	ICMP Smurf Attack	ICMP	Yes	echo-reply
4002	UDP Flood Host	UDP	Yes	none
6901	Net Flood ICMP Reply	ICMP	No	echo-reply
6902	Net Flood ICMP Request	ICMP	No	echo-request
6903	Net Flood ICMP Any	ICMP	No	None
6910	Net Flood UDP	UDP	No	None
6920	Net Flood TCP	TCP	No	None
3050	TCP HalfOpenSyn	TCP	No	halfOpenSyn

### For More Information

- For the procedure for configuring rate limiting on a router, see [Configuring Blocking and Rate Limiting Devices, page 14-21](#).
- For the procedure for configuring a sensor to be a master blocking sensor, see [Configuring the Sensor to be a Master Blocking Sensor, page 14-29](#).

# Understanding Service Policies for Rate Limiting

You must not apply a service policy to an interface/direction that is configured for rate limiting. If you do so, the rate limit action will fail. Before configuring rate limits, confirm that there is no service policy on the interface/direction, and remove it if one exists. ARC does not remove the existing rate limit unless it is one that ARC had previously added.

Rate limits use ACLs, but not in the same way as blocks. Rate limits use **acls** and **class-map** entries to identify traffic, and **policy-map** and **service-policy** entries to police the traffic.

## Before Configuring ARC



### Caution

Two sensors cannot control blocking or rate limiting on the same device. If this situation is needed, configure one sensor as the master blocking sensor to manage the devices and the other sensors can forward their requests to the master blocking sensor.



### Note

When you add a master blocking sensor, you reduce the number of blocking devices per sensor. For example, if you want to block on 10 security appliances and 10 routers with one blocking interface/direction each, you can assign 10 to the sensor and assign the other 10 to a master blocking sensor.

Before you configure ARC for blocking or rate limiting, make sure you do the following:

- Analyze your network topology to understand which devices should be blocked by which sensor, and which addresses should never be blocked.
- Gather the usernames, device passwords, enable passwords, and connections types (Telnet or SSH) needed to log in to each device.
- Know the interface names on the devices.
- Know the names of the Pre-Block ACL or VACL and the Post-Block ACL or VACL if needed.
- Understand which interfaces should and should not be blocked and in which direction (in or out). You do not want to accidentally shut down an entire network.

### For More Information

For the procedure for configuring the master blocking sensor, see [Configuring the Sensor to be a Master Blocking Sensor, page 14-29](#).

# Supported Devices



## Caution

If the recommended limits are exceeded, ARC may not apply blocks in a timely manner or may not be able to apply blocks at all.

By default, ARC supports up to 250 devices in any combination. The following devices are supported for blocking by ARC:

- Cisco series routers using Cisco IOS 11.2 or later (ACLs):
  - Cisco 1600 series router
  - Cisco 1700 series router
  - Cisco 2500 series router
  - Cisco 2600 series router
  - Cisco 2800 series router
  - Cisco 3600 series router
  - Cisco 3800 series router
  - Cisco 7200 series router
  - Cisco 7500 series router
- Catalyst 5000 switches with RSM with IOS 11.2(9)P or later (ACLs)
- Catalyst 6500 switches and 7600 routers with IOS 12.1(13)E or later (ACLs)
- Catalyst 6500 switches 7600 routers with Catalyst software version 7.5(1) or later (VACLs)
  - Supervisor Engine 1A with PFC
  - Supervisor Engine 1A with MSFC1
  - Supervisor Engine 1A with MFSC2
  - Supervisor Engine 2 with MSFC2
  - Supervisor Engine 720 with MSFC3



## Note

We support VACL blocking on the Supervisor Engine and ACL blocking on the MSFC.

- PIX Firewall with version 6.0 or later (**shun** command)
  - 501
  - 506E
  - 515E
  - 525
  - 535

- ASA with version 7.0 or later (**shun** command)
  - ASA-5510
  - ASA-5520
  - ASA-5540
- FWSM 1.1 or later (**shun** command)

You configure blocking using either ACLs, VACLs, or the **shun** command. All firewall and ASA models support the **shun** command.

The following devices are supported for rate limiting by ARC:

- Cisco series routers using Cisco IOS 12.3 or later:
  - Cisco 1700 series router
  - Cisco 2500 series router
  - Cisco 2600 series router
  - Cisco 2800 series router
  - Cisco 3600 series router
  - Cisco 3800 series router
  - Cisco 7200 series router
  - Cisco 7500 series router

**Caution**

ARC cannot perform rate limits on 7500 routers with VIP. ARC reports the error but cannot rate limit.

## Configuring Blocking Properties

You can change the default blocking properties. It is best to use the default properties, but if you need to change them, use the following procedures:

- [Allowing the Sensor to Block Itself, page 14-8](#)
- [Disabling Blocking, page 14-9](#)
- [Specifying Maximum Block Entries, page 14-11](#)
- [Specifying the Block Time, page 14-13](#)
- [Enabling ACL Logging, page 14-14](#)
- [Enabling Writing to NVRAM, page 14-15](#)
- [Logging All Blocking Events and Errors, page 14-16](#)
- [Configuring the Maximum Number of Blocking Interfaces, page 14-17](#)
- [Configuring Addresses Never to Block, page 14-19](#)

## Allowing the Sensor to Block Itself



### Caution

We recommend that you do not permit the sensor to block itself, because it may stop communicating with the blocking device. You can configure this option if you can ensure that if the sensor creates a rule to block its own IP address, it will not prevent the sensor from accessing the blocking device.

Use the **allow-sensor-block {true | false}** command in the service network access submode to configure the sensor to block itself.

To allow the sensor to block itself, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
```

**Step 3** Enter general submode.

```
sensor(config-net)# general
```

**Step 4** Configure the sensor to block itself.

```
sensor(config-net-gen)# allow-sensor-block true
```

By default, this value is **false**.

**Step 5** Verify the settings.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false <defaulted>
allow-sensor-block: true default: false
block-enable: true default: true
block-max-entries: 100 default: 250
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
never-block-hosts (min: 0, max: 250, current: 1)
-----
ip-address: 11.11.11.11
-----
never-block-networks (min: 0, max: 250, current: 1)
-----
ip-address: 12.12.0.0/16
-----
block-hosts (min: 0, max: 250, current: 0)
-----
--MORE--
```

**Step 6** Configure the sensor not to block itself.

```
sensor(config-net-gen)# allow-sensor-block false
```



**Step 7** Verify the setting.

```

sensor(config-net-gen)# show settings
  general
  -----
  log-all-block-events-and-errors: true <defaulted>
  enable-nvram-write: false <defaulted>
  enable-acl-logging: false <defaulted>
  allow-sensor-block: false default: false
  block-enable: true default: true
  block-max-entries: 100 default: 250
  max-interfaces: 250 <defaulted>
  master-blocking-sensors (min: 0, max: 100, current: 0)
  -----
  never-block-hosts (min: 0, max: 250, current: 1)
  -----
  ip-address: 11.11.11.11
  -----
  never-block-networks (min: 0, max: 250, current: 1)
  -----
  ip-address: 12.12.0.0/16
  -----
  block-hosts (min: 0, max: 250, current: 0)
  -----
--MORE--

```

**Step 8** Exit network access submode.

```

sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:[yes]:

```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

## Disabling Blocking

Use the **block-enable {true | false}** command in the service network access submode to enable or disable blocking on the sensor. By default, blocking is enabled on the sensor. If ARC is managing a device and you need to manually configure something on that device, you should disable blocking first. You want to avoid a situation in which both you and ARC could be making a change at the same time on the same device. This could cause the device and/or ARC to crash.

**Note**

For blocking to operate, you must set up devices to do the blocking.

**Caution**

If you disable blocking for maintenance on the devices, make sure you enable it after the maintenance is complete or the network will be vulnerable to attacks that would otherwise be blocked

**Note**

While blocking is disabled, ARC continues to receive blocks and track the time on active blocks, but will not apply new blocks or remove blocks from the managed devices. After blocking is reenabled, the blocks on the devices are updated.

To disable blocking or rate limiting, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Enter general submode.

```
sensor(config-net)# general
```

**Step 4** Disable blocking on the sensor.

```
sensor(config-net-gen)# block-enable false
```

By default, this value is **true**.

**Step 5** Verify the settings.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false <defaulted>
allow-sensor-block: false default: false
block-enable: false default: true
block-max-entries: 100 default: 250
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
never-block-hosts (min: 0, max: 250, current: 1)
-----
ip-address: 11.11.11.11
-----
never-block-networks (min: 0, max: 250, current: 1)
-----
ip-address: 12.12.0.0/16
-----
block-hosts (min: 0, max: 250, current: 0)
-----
--MORE--
```

**Step 6** Enable blocking on the sensor.

```
sensor(config-net-gen)# block-enable true
```

**Step 7** Verify that the setting has been returned to the default.

```
sensor(config-net-gen)# show settings
general
-----
```

```

log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false <defaulted>
allow-sensor-block: false default: false
block-enable: true default: true
block-max-entries: 100 default: 250
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
never-block-hosts (min: 0, max: 250, current: 1)
-----
    ip-address: 11.11.11.11
-----
never-block-networks (min: 0, max: 250, current: 1)
-----
    ip-address: 12.12.0.0/16
-----
block-hosts (min: 0, max: 250, current: 0)
-----
--MORE--

```

**Step 8** Exit network access submode.

```

sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:[yes]:

```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

#### For More Information

- For the procedure for configuring the sensor to manage Cisco routers, see [Configuring the Sensor to Manage Cisco Routers](#), page 14-23.
- For the procedure for configuring the sensor to manage Cisco routers and switches, see [Configuring the Sensor to Manage Catalyst 6500 Series Switches and Cisco 7600 Series Routers](#), page 14-26.

## Specifying Maximum Block Entries

Use the **block-max-entries** command in the service network access submode to configure the maximum block entries. You can set how many blocks are to be maintained simultaneously (1 to 65535). The default value is 250.



#### Caution

We do not recommend setting the maximum block entries higher than 250. Some devices have problems with larger numbers of ACL or shun entries. Refer to the documentation for each device to determine its limits before increasing this number.



#### Note

The number of blocks will not exceed the maximum block entries. If the maximum is reached, new blocks will not occur until existing blocks time out and are removed.

To change the maximum number of block entries, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Enter general submode.

```
sensor(config-net)# general
```

**Step 4** Change the maximum number of block entries.

```
sensor(config-net-gen)# block-max-entries 100
```

**Step 5** Verify the setting.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false <defaulted>
allow-sensor-block: false default: false
block-enable: true <defaulted>
block-max-entries: 100 default: 250
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
never-block-hosts (min: 0, max: 250, current: 1)
-----
    ip-address: 11.11.11.11
    -----
never-block-networks (min: 0, max: 250, current: 1)
-----
    ip-address: 12.12.0.0/16
    -----
block-hosts (min: 0, max: 250, current: 0)
-----
--MORE--
```

**Step 6** To return to the default value of 250 blocks:

```
sensor(config-net-gen)# default block-max-entries
```

**Step 7** Verify the setting.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false <defaulted>
allow-sensor-block: false default: false
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

```

-----
never-block-hosts (min: 0, max: 250, current: 1)
-----
    ip-address: 11.11.11.11
-----
never-block-networks (min: 0, max: 250, current: 1)
-----
    ip-address: 12.12.0.0/16
-----
block-hosts (min: 0, max: 250, current: 0)
-----
--MORE--

```

**Step 8** Exit network access submode.

```

sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes?[yes]:

```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

## Specifying the Block Time

Use the **global-block-timeout** command in the service event action rules submode to change the amount of time an automatic block lasts. The default is 30 minutes.



**Note**

If you change the default block time, you are changing a signature parameter, which affects all signatures.



**Note**

The time for manual blocks is set when you request the block.

To change the default block time, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter event action rules submode.

```

sensor# configure terminal
sensor(config)# service event-action-rules rules0
sensor(config-rul)#

```

**Step 3** Enter general submode.

```

sensor(config-rul)# general

```

**Step 4** Specify the block time.

```

sensor(config-rul-gen)# global-block-timeout 60

```

The value is the time duration of the block event in minutes (0 to 10000000).

**Step 5** Verify the setting.

```

sensor(config-rul-gen)# show settings

```

```

general
-----
global-overrides-status: Enabled <defaulted>
global-filters-status: Enabled <defaulted>
global-summarization-status: Enabled <defaulted>
global-metaevent-status: Enabled <defaulted>
global-deny-timeout: 3600 <defaulted>
global-block-timeout: 60 default: 30
max-denied-attackers: 10000 <defaulted>
-----
sensor(config-rul-gen)#

```

**Step 6** Exit event action rules submode.

```

sensor(config-rul-gen)# exit
sensor(config-rul)# exit
Apply Changes:[yes]:

```

**Step 7** Press **Enter** to apply the changes or enter **no** to discard them.




---

**Note** There is a time delay while the signatures are updated.

---

## Enabling ACL Logging

Use the **enable-acl-logging {true | false}** command in the service network access submode to enable ACL logging, which causes ARC to append the log parameter to block entries in the ACL or VACL. This causes the device to generate syslog events when packets are filtered. Enable ACL logging only applies to routers and switches. The default is disabled.

To enable ACL logging, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode:

```

sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#

```

**Step 3** Enter general submode.

```

sensor(config-net)# general

```

**Step 4** Enable ACL logging.

```

sensor(config-net-gen)# enable-acl-logging true

```

**Step 5** Verify that ACL logging is enabled.

```

sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: true default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>

```

```

block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----

```

**Step 6** Disable ACL logging, use the **false** keyword.

```
sensor(config-net-gen)# enable-acl-logging false
```

**Step 7** Verify that ACL logging is disabled.

```

sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----

```

**Step 8** Exit network access mode.

```

sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:[yes]:

```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

## Enabling Writing to NVRAM

Use the **enable-nvram-write {true | false}** command to configure the sensor to have the router write to NVRAM when ARC first connects. If **enable-nvram-write** is enabled, NVRAM is written each time the ACLs are updated. The default is disabled.

Enabling NVRAM writing ensures that all changes for blocking are written to NVRAM. If the router is rebooted, the correct blocks will still be active. If NVRAM writing is disabled, a short time without blocking occurs after a router reboot. And not enabling NVRAM writing increases the life of the NVRAM and decreases the time for new blocks to be configured.

To enable writing to NVRAM, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```

sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#

```

**Step 3** Enter general submode.

```
sensor(config-net)# general
```

**Step 4** Enable writing to NVRAM.

```
sensor(config-net-gen)# enable-nvram-write true
```

**Step 5** Verify that writing to NVRAM is enabled.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: true default: false
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

**Step 6** Disable writing to NVRAM.

```
sensor(config-net-gen)# enable-nvram-write false
```

**Step 7** Verify that writing to NVRAM is disabled.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false default: false
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

**Step 8** Exit network access submode.

```
sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes?[yes]:
```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

---

## Logging All Blocking Events and Errors

Use the **log-all-block-events-and-errors {true | false}** command in the service network access submode to configure the sensor to log events that follow blocks from start to finish. For example, when a block is added to or removed from a device, an event is logged. You may not want all these events and errors to be logged. Disabling **log-all-block-events-and-errors** suppresses the new events and errors. The default is enabled.

To disable blocking event and error logging, follow these steps:

---

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access mode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```



**Step 3** Enter general submenu.

```
sensor(config-net)# general
```

**Step 4** Disable blocking event and error logging.

```
sensor(config-net-gen)# log-all-block-events-and-errors false
```

**Step 5** Verify that logging is disabled.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: false default: true
enable-nvram-write: false default: false
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

**Step 6** Enable blocking event and error logging.

```
sensor(config-net-gen)# log-all-block-events-and-errors true
```

**Step 7** Verify that logging is enabled.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true default: true
enable-nvram-write: false default: false
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

**Step 8** Exit network access mode.

```
sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:?[yes]:
```

**Step 9** Press **Enter** to apply the changes or type **no** to discard them.

## Configuring the Maximum Number of Blocking Interfaces

Use the **max-interfaces** command to configure the maximum number of interfaces for performing blocks. For example, a PIX Firewall counts as one interface. A router with one interface counts as one, but a router with two interfaces counts as two. At most you can configure 250 blocking interfaces on a router, switch, or firewall. You can configure up to 250 Catalyst 6K switches, 250 routers, and 250 firewalls.

The **max-interfaces** command configures the limit of the sum total of all interfaces and devices. In addition to configuring the limit on the sum total of interfaces and devices, there is a fixed limit on the number of blocking interfaces you can configure per device. Use the **show settings** command in network access mode to view the specific maximum limits per device.

To configure the maximum number of blocking interfaces, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access mode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Enter general submodule.

```
sensor(config-net)# general
```

**Step 4** Specify the maximum number of interfaces.

```
sensor(config-net-gen)# max-interfaces 50
```

**Step 5** Verify the number of maximum interfaces.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true default: true
enable-nvram-write: false default: false
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 50 default: 250
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

**Step 6** To return the setting to the default of 250:

```
sensor(config-net-gen)# default max-interfaces
```

**Step 7** Verify the default setting.

```
sensor(config-net-gen)# show settings
general
-----
log-all-block-events-and-errors: true default: true
enable-nvram-write: false default: false
enable-acl-logging: false default: false
allow-sensor-block: false <defaulted>
block-enable: true <defaulted>
block-max-entries: 250 <defaulted>
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
```

**Step 8** Exit network access mode.

```
sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:[yes]:
```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

---

## Configuring Addresses Never to Block

Use the **never-block-hosts** and the **never-block-networks** commands in the service network access submode to configure hosts and network that should never be blocked.

The following options apply:

- *ip\_address*—IP address of the device that should never be blocked.
- *ip\_address/netmask*— IP address of the network that should never be blocked. The format is A.B.C.D/nn.

You must tune your sensor to identify hosts and networks that should never be blocked, not even manually, because you may have a trusted network device whose normal, expected behavior appears to be an attack. Such a device should never be blocked, and trusted, internal networks should never be blocked.

You can specify a single host or an entire network.



### Note

The **never-block-hosts** and the **never-block-networks** commands apply only to the Request Block Host and Request Block Connection event actions. It does not apply to the Deny Attacker Inline, Deny Connection Inline, or Deny Packet Inline event actions. Use event action rules to filter out the hosts that you do not want blocked, denied, or dropped.

---

To set up addresses never to be blocked by blocking devices, follow these steps:

---

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Enter general submode.

```
sensor(config-net)# general
```

**Step 4** Specify the address that should never be blocked:

- Single host

```
sensor(config-net-gen)# never-block-hosts 10.16.0.0
```

- Network

```
sensor(config-net-gen)# never-block-networks 10.0.0.0/8
```

**Step 5** Verify the settings.

```
sensor(config-net-gen)# show settings
```

```

general
-----
log-all-block-events-and-errors: true <defaulted>
enable-nvram-write: false <defaulted>
enable-acl-logging: false <defaulted>
allow-sensor-block: false default: false
block-enable: true default: true
block-max-entries: 100 default: 250
max-interfaces: 250 <defaulted>
master-blocking-sensors (min: 0, max: 100, current: 0)
-----
never-block-hosts (min: 0, max: 250, current: 2)
-----
ip-address: 10.16.0.0
-----
ip-address: 11.11.11.11
-----
never-block-networks (min: 0, max: 250, current: 2)
-----
ip-address: 10.0.0.0/8
-----
ip-address: 12.12.0.0/16
--MORE--

```

**Step 6** Exit network access submode.

```

sensor(config-net-gen)# exit
sensor(config-net)# exit
Apply Changes:[yes]:

```

**Step 7** Press **Enter** to apply the changes or enter **no** to discard them.

#### For More Information

For the procedure for configuring event action filters, see [Configuring Event Action Filters, page 7-21](#).

## Configuring User Profiles

Use the **user-profiles** *profile\_name* command in the service network access submode to set up user profiles for the other devices that the sensor will manage. The user profiles contain userid, password, and enable password information. For example, routers that all share the same passwords and usernames can be under one user profile.



#### Note

If the username or password is not needed to log in to the device, do not set a value for it.



#### Note

You **MUST** create a user profile before configuring the blocking device.

To set up user profiles, follow these steps:

---

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access mode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Create the user profile name.

```
sensor(config-net)# user-profiles PROFILE1
```

**Step 4** Type the username for that user profile.

```
sensor(config-net-use)# username username
```

**Step 5** Specify the password for the user.

```
sensor(config-net-use)# password
Enter password[]: *****
Re-enter password *****
```

**Step 6** Specify the enable password for the user.

```
sensor(config-net-use)# enable-password
Enter enable-password[]: *****
Re-enter enable-password *****
```

**Step 7** Verify the settings.

```
sensor(config-net-use)# show settings
  profile-name: PROFILE1
  -----
  enable-password: <hidden>
  password: <hidden>
  username: jsmith default:
  -----
sensor(config-net-use)#
```

**Step 8** Exit network access submode.

```
sensor(config-net-use)# exit
sensor(config-net)# exit
Apply Changes:[yes]:
```

**Step 9** Press **Enter** to apply the changes or enter **no** to discard them.

---

## Configuring Blocking and Rate Limiting Devices

This section describes how to configure devices that the sensor uses to perform blocking or rate limiting. It contains the following topics:

- [How the Sensor Manages Devices, page 14-22](#)
- [Configuring the Sensor to Manage Cisco Routers, page 14-23](#)

- [Configuring the Sensor to Manage Catalyst 6500 Series Switches and Cisco 7600 Series Routers, page 14-26](#)
- [Configuring the Sensor to Manage Cisco Firewalls, page 14-28](#)

## How the Sensor Manages Devices


**Note**

ACLs do not apply to rate limiting devices.

ARC uses ACLs on Cisco routers and switches to manage those devices. These ACLs are built as follows:

1. A **permit** line with the sensor IP address or, if specified, the NAT address of the sensor


**Note**

If you permit the sensor to be blocked, this line does not appear in the ACL.

2. Pre-Block ACL (if specified)

This ACL must already exist on the device.


**Note**

ARC reads the lines in the ACL and copies these lines to the beginning of the ACL.

3. Any active blocks

4. Either:

- Post-Block ACL (if specified)

This ACL must already exist on the device.


**Note**

ARC reads the lines in the ACL and copies these lines to the end of the ACL.


**Note**

Make sure the last line in the ACL is **permit ip any any** if you want all unmatched packets to be permitted.

- **permit ip any any** (not used if a Post-Block ACL is specified)

ARC uses two ACLs to manage devices. Only one is active at any one time. It uses the offline ACL name to build the new ACL, then applies it to the interface. ARC then reverses the process on the next cycle.


**Caution**

The ACLs that ARC makes should never be modified by you or any other system. These ACLs are temporary and new ACLs are constantly being created by the sensor. The only modifications that you can make are to the Pre- and Post-Block ACLs.

If you need to modify the Pre-Block or Post-Block ACL, do the following:

1. Disable blocking on the sensor.
2. Make the changes to the configuration of the device.
3. Reenable blocking on the sensor.

When blocking is reenabled, the sensor reads the new device configuration.

**Caution**

A single sensor can manage multiple devices, but you cannot use multiple sensors to control a single device. In this case, use a master blocking sensor.

**For More Information**

- For the procedure for enabling blocking, see [Configuring Blocking Properties, page 14-7](#).
- For the procedure for configuring the sensor to be a master blocking sensor, see [Configuring the Sensor to be a Master Blocking Sensor, page 14-29](#).

## Configuring the Sensor to Manage Cisco Routers

This section describes how to configure the sensor to manage Cisco routers. It contains the following topics:

- [Routers and ACLs, page 14-23](#)
- [Configuring the Sensor to Manage Cisco Routers, page 14-24](#)

## Routers and ACLs

**Note**

Pre-Block and Post-Block ACLS do not apply to rate limiting.

You create and save Pre-Block and Post-Block ACLs in your router configuration. These ACLs must be extended IP ACLs, either named or numbered. See your router documentation for more information on creating ACLs. Enter the names of these ACLs that are already configured on your router in the Pre-Block ACL and Post-Block ACL fields.

The Pre-Block ACL is mainly used for permitting what you do not want the sensor to ever block. When a packet is checked against the ACL, the first line that gets matched determines the action. If the first line matched is a permit line from the Pre-Block ACL, the packet is permitted even though there may be a deny line (from an automatic block) listed later in the ACL. The Pre-Block ACL can override the deny lines resulting from the blocks.

The Post-Block ACL is best used for additional blocking or permitting that you want to occur on the same interface or direction. If you have an existing ACL on the interface or direction that the sensor will manage, that existing ACL can be used as a Post-Block ACL. If you do not have a Post-Block ACL, the sensor inserts **permit ip any any** at the end of the new ACL.

When the sensor starts up, it reads the contents of the two ACLs. It creates a third ACL with the following entries:

- A **permit** line for the sensor IP address
- Copies of all configuration lines of the Pre-Block ACL

- A **deny** line for each address being blocked by the sensor
- Copies of all configuration lines of the Post-Block ACL

The sensor applies the new ACL to the interface and direction that you designate.

**Note**

When the new ACL is applied to an interface or direction of the router, it removes the application of any other ACL to that interface or direction.

## Configuring the Sensor to Manage Cisco Routers

To configure a sensor to manage a Cisco router to perform blocking and rate limiting, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Specify the IP address for the router controlled by ARC.

```
sensor(config-net)# router-devices ip_address
```

**Step 4** Enter the logical device name that you created when you configured the user profile.

```
sensor(config-net-rou)# profile-name user_profile_name
```

ARC accepts anything you enter. It does not check to see if the user profile exists.

**Step 5** Specify the method used to access the sensor.

```
sensor(config-net-rou)# communication {telnet | ssh-des | ssh-3des}
```

If unspecified, SSH 3DES is used.

**Note**

If you are using DES or 3DES, you must use the command **ssh host-key ip\_address** to accept the key or ARC cannot connect to the device.

**Step 6** Specify the sensor NAT address.

```
sensor(config-net-rou)# nat-address nat_address
```

**Note**

This changes the IP address in the first line of the ACL from the sensor's address to the NAT address. This is not a NAT address configured on the device being managed. It is the address the sensor is translated to by an intermediate device, one that is between the sensor and the device being managed.



**Step 7** Specify whether the router will perform blocking, rate limiting, or both:



**Note** The default is blocking. You do not have to configure response capabilities if you want the router to perform blocking only.

a. Rate limiting only

```
sensor(config-net-rou)# response-capabilities rate-limit
```

b. Both blocking and rate limiting

```
sensor(config-net-rou)# response-capabilities block|rate-limit
```

**Step 8** Specify the interface name and direction.

```
sensor(config-net-rou)# block-interfaces interface_name {in | out}
```



**Caution**

The name of the interface must either be the complete name of the interface or an abbreviation that the router recognizes with the **interface** command.

**Step 9** (Optional) Add the pre-ACL name (blocking only).

```
sensor(config-net-rou-blo)# pre-acl-name pre_acl_name
```

**Step 10** (Optional) Add the post-ACL name (blocking only).

```
sensor(config-net-rou-blo)# post-acl-name post_acl_name
```

**Step 11** Verify the settings.

```
sensor(config-net-rou-blo)# exit
sensor(config-net-rou)# show settings
ip-address: 10.89.127.97
-----
communication: ssh-3des default: ssh-3des
nat-address: 19.89.149.219 default: 0.0.0.0
profile-name: PROFILE1
block-interfaces (min: 0, max: 100, current: 1)
-----
interface-name: GigabitEthernet0/1
direction: in
-----
pre-acl-name: <defaulted>
post-acl-name: <defaulted>
-----
response-capabilities: block|rate-limit default: block
-----
sensor(config-net-rou)#
```

**Step 12** Exit network access submode.

```
sensor(config-net-rou)# exit
sensor(config-net)# exit
sensor(config)# exit
Apply Changes:[yes]:
```

**Step 13** Press **Enter** to apply the changes or enter **no** to discard them.

**For More Information**

- For the procedure for configuring user profiles, see [Configuring User Profiles, page 14-20](#).
- For the procedure for adding a device to the known hosts list, see [Adding Hosts to the SSH Known Hosts List, page 4-41](#).

## Configuring the Sensor to Manage Catalyst 6500 Series Switches and Cisco 7600 Series Routers

This section describes how to configure the sensor to manage Cisco switches. It contains the following topics:

- [Switches and VACLs, page 14-26](#)
- [Configuring the Sensor to Manage Catalyst 6500 Series Switches and Cisco 7600 Series Routers, page 14-27](#)

### Switches and VACLs

You can configure ARC to block using VACLs on the switch itself when running Cisco Catalyst software, or to block using router ACLs on the MSFC or on the switch itself when running Cisco IOS software. You cannot configure switches that use VACLs to perform rate limiting.

You must configure the blocking interfaces on the Catalyst 6500 series switch and specify the VLAN of traffic you want blocked.

You create and save Pre-Block and Post-Block VACLs in your switch configuration. These VACLs must be extended IP VACLs, either named or numbered. See your switch documentation for more information on creating VACLs. Enter the names of these VACLs that are already configured on your switch in the Pre-Block VACL and Post-Block VACL fields.

The Pre-Block VACL is used mainly for permitting what you do not want the sensor to ever block. When a packet is checked against the VACL, the first line that gets matched determines the action. If the first line matched is a permit line from the Pre-Block VACL, the packet is permitted even though there may be a deny line (from an automatic block) listed later in the VACL. The Pre-Block VACL can override the deny lines resulting from the blocks.

The Post-Block VACL is best used for additional blocking or permitting that you want to occur on the same VLAN. If you have an existing VACL on the VLAN that the sensor will manage, the existing VACL can be used as a Post-Block VACL. If you do not have a Post-Block VACL, the sensor inserts **permit ip any any** at the end of the new VACL.

**Note**


---

The IDSM2 inserts **permit ip any any capture** at the end of the new VACL.

---

When the sensor starts up, it reads the contents of the two VACLs. It creates a third VACL with the following entries:

- A **permit** line for the sensor IP address
- Copies of all configuration lines of the Pre-Block VACL
- A **deny** line for each address being blocked by the sensor
- Copies of all configuration lines of the Post-Block VACL

The sensor applies the new VACL to the VLAN that you designate.

**Note**

When the new VACL is applied to a VLAN of the switch, it removes the application of any other VACL to that VLAN.

**For More Information**

For the procedure for configuring blocking using router ACLs, see [Configuring Blocking and Rate Limiting Devices, page 14-21](#).

## Configuring the Sensor to Manage Catalyst 6500 Series Switches and Cisco 7600 Series Routers

To configure the sensor to manage Catalyst 6500 series switches and Cisco 7600 series routers, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Specify the IP address for the router controlled by ARC.

```
sensor(config-net)# cat6k-devices ip_address
```

**Step 4** Enter the user profile name that you created when you configured the user profile.

```
sensor(config-net-cat)# profile-name user_profile_name
```

**Note**

ARC accepts anything you type. It does not check to see if the logical device exists.

**Step 5** Specify the method used to access the sensor.

```
sensor(config-net-cat)# communication {telnet | ssh-des | ssh-3des}
```

If unspecified, SSH 3DES is used.

**Note**

If you are using DES or 3DES, you must use the command **ssh host-key ip\_address** to accept the key or ARC cannot connect to the device.

**Step 6** Specify the sensor NAT address.

```
sensor(config-net-cat)# nat-address nat_address
```

**Note**

This changes the IP address in the first line of the ACL from the IP address of the sensor to the NAT address. This is not a NAT address configured on the device being managed. It is the address the sensor is translated to by an intermediate device, one that is between the sensor and the device being managed.

**Step 7** Specify the VLAN number.

```
sensor(config-net-cat)# block-vlans vlan_number
```

**Step 8** (Optional) Add the pre-VACL name.

```
sensor(config-net-cat-blo)# pre-vacl-name pre_vacl_name
```

**Step 9** (Optional) Add the post-VACL name.

```
sensor(config-net-cat-blo)# post-vacl-name post_vacl_name
```

**Step 10** Exit network access submode.

```
sensor(config-net-cat-blo)# exit
sensor(config-net-cat)# exit
sensor(config-net)# exit
sensor(config)# exit
Apply Changes:[yes]:
```

**Step 11** Press **Enter** to apply the changes or enter **no** to discard them.

---

#### For More Information

- For the procedure for configuring user profiles, see [Configuring User Profiles, page 14-20](#).
- For the procedure for adding a device to the known hosts list, see [Adding Hosts to the SSH Known Hosts List, page 4-41](#).

## Configuring the Sensor to Manage Cisco Firewalls

To configure the sensor to manage Cisco firewalls, follow these steps:

---

**Step 1** Log in to the CLI using an account with administrator privileges.

**Step 2** Enter network access submode.

```
sensor# configure terminal
sensor(config)# service network-access
sensor(config-net)#
```

**Step 3** Specify the IP address for the firewall controlled by ARC.

```
sensor(config-net)# firewall-devices ip_address
```

**Step 4** Enter the user profile name that you created when you configured the user profile.

```
sensor(config-net-fir)# profile-name user_profile_name
```

ARC accepts anything you type. It does not check to see if the logical device exists.

**Step 5** Specify the method used to access the sensor.

```
sensor(config-net-fir)# communication {telnet | ssh-des | ssh-3des}
```

If unspecified, SSH 3DES is used.




---

**Note** If you are using DES or 3DES, you must use the command **ssh host-key ip\_address** to accept the key or ARC cannot connect to the device.

---

**Step 6** Specify the sensor NAT address.

```
sensor(config-net-fir)# nat-address nat_address
```



**Note** This changes the IP address in the first line of the ACL from the IP address of the sensor to the NAT address. This is not a NAT address configured on the device being managed. It is the address the sensor is translated to by an intermediate device, one that is between the sensor and the device being managed.

**Step 7** Exit network access submode.

```
sensor(config-net-fir)# exit
sensor(config-net)# exit
sensor(config)# exit
Apply Changes:[yes]:
```

**Step 8** Press **Enter** to apply the changes or enter **no** to discard them.

#### For More Information

- For the procedure for configuring user profiles, see [Configuring User Profiles, page 14-20](#).
- For the procedure for adding a device to the known hosts list, see [Adding Hosts to the SSH Known Hosts List, page 4-41](#).

## Configuring the Sensor to be a Master Blocking Sensor



#### Caution

Two sensors cannot control blocking or rate limiting on the same device. If this situation is needed, configure one sensor as the master blocking sensor to manage the devices and the other sensors can forward their requests to the master blocking sensor.

Multiple sensors (blocking forwarding sensors) can forward blocking requests to a specified master blocking sensor, which controls one or more devices. The master blocking sensor is the ARC running on a sensor that controls blocking on one or more devices on behalf of one or more other sensors. The ARC on a master blocking sensor controls blocking on devices at the request of the ARCs running on other sensors. Master blocking sensors can also forward rate limits.



#### Note

When you add a master blocking sensor, you reduce the number of blocking devices per sensor. For example, if you want to block on 10 firewalls and 10 routers with one blocking interface/direction each, you can assign 10 to the sensor and assign the other 10 to a master blocking sensor.

On the blocking forwarding sensor, identify which remote host serves as the master blocking sensor; on the master blocking sensor you must add the blocking forwarding sensors to its access list.

If the master blocking sensor requires TLS for web connections, you must configure the ARC of the blocking forwarding sensor to accept the X.509 certificate of the master blocking sensor remote host. Sensors by default have TLS enabled, but you can change this option.



#### Note

Typically the master blocking sensor is configured to manage the network devices. Blocking forwarding sensors are not normally configured to manage other network devices, although doing so is permissible.

Even if you have no devices configured for blocking or rate limiting, a sensor that is configured for blocking or rate limiting can forward blocking and rate limiting requests to a master blocking sensor. When a signature fires that has blocking or rate limit requests configured as event actions, the sensor forwards the block or rate limit request to the master blocking sensor, which then performs the block or rate limit.

**Caution**

Only one sensor should control all blocking interfaces on a device.

Use the **master-blocking-sensors** *mbs\_ip\_address* command in the service network access submode to configure a master blocking sensor.

The following options apply:

- *mbs\_ip\_address*—IP address of sensor for forward block requests.
- **password**—Account password of sensor for forward block requests.
- **port**—Port of sensor for forward block requests.
- **tls {true | false}** —Set to true if the remote sensor requires TLS; otherwise set to false.
- **username**—Account name of sensor for forward block requests.

To configure ARC on a sensor to forward blocks to a master blocking sensor, follow these steps:

**Step 1** Log in to the CLI using an account with administrator privileges on both the master blocking sensor and the blocking forwarding sensor.

**Step 2** Enter configuration mode on both sensors.

```
sensor# configure terminal
```

**Step 3** Configure TLS if necessary:

- a.** On the master blocking sensor, check to see if it requires TLS and what port number is used.

```
sensor(config)# service web-server
sensor(config-web)# show settings
  enable-tls: true <defaulted>
  port: 443 <defaulted>
  server-id: HTTP/1.1 compliant <defaulted>
sensor(config-web)#
```

If *enable-tls* is true, go to Step b.

- b.** On the blocking forwarding sensor, configure it to accept the X.509 certificate of the master blocking sensor.

```
sensor(config-web)# exit
sensor(config)# tls trusted-host ip-address mbs_ip_address port port_number
```

**Example**

```
sensor(config)# tls trusted-host ip-address 10.0.0.0 port 8080
Certificate MD5 fingerprint is
F4:4A:14:BA:84:F4:51:D0:A4:E2:15:38:7E:77:96:D8Certificate SHA1 fingerprint is
84:09:B6:85:C5:43:60:5B:37:1E:6D:31:6A:30:5F:7E:4D:4D:E8:B2
Would you like to add this to the trusted certificate table for this host?[yes]:
```



**Note** You are prompted to accept the certificate based on the certificate fingerprint. Sensors provide only self-signed certificates (instead of certificates signed by a recognized certificate authority). You can verify the master blocking sensor host sensor certificate by logging in to the host sensor and typing the **show tls fingerprint** command to see that the host certificate's fingerprints match.

**Step 4** Enter **yes** to accept the certificate from the master blocking sensor.

**Step 5** Enter network access mode.

```
sensor(config)# service network-access
```

**Step 6** Enter general submode.

```
sensor(config-net)# general
```

**Step 7** Add a master blocking sensor entry.

```
sensor(config-net-gen)# master-blocking-sensors mbs_ip_address
```

**Step 8** Specify the username for an administrative account on the master blocking sensor host.

```
sensor(config-net-gen-mas)# username username
```

**Step 9** Specify the password for the user.

```
sensor(config-net-gen-mas)# password  
Enter password []: *****  
Re-enter mbs-password []: *****  
sensor(config-net-gen-mas)#
```

**Step 10** Specify the port number for the host HTTP communications.

```
sensor(config-net-gen-mas)# port port_number
```

The default is 80/443 if not specified.

**Step 11** Specify whether or not the host uses TLS/SSL.

```
sensor(config-net-gen-mas)# tls {true | false}  
sensor(config-net-gen-mas)
```



**Note** If you set the value to true, you need to use the command **tls trusted-host ip-address mbs\_ip\_address**.

**Step 12** Exit network access submode.

```
sensor(config-net-gen-mas)# exit  
sensor(config-net-gen)# exit  
sensor(config-net)# exit  
sensor(config)# exit  
Apply Changes:[yes]:
```

**Step 13** Press **Enter** to apply the changes or enter **no** to discard them.

**Step 14** On the master blocking sensor, add the block forwarding sensor IP address to the access list.

**For More Information**

For the procedure for adding the blocking forward sensor IP address to the access list, see [Changing the Access List](#), page 4-5.

## Configuring Host Blocking

**Note**

Connection blocks and network blocks are not supported on security appliances. Security appliances only support host blocks with additional connection information.

Use the **block host** *ip-address* [**timeout** *minutes*] command in privileged EXEC mode to block a host. Use the **no** form of the command to remove a block on a host. You must have blocking configured before you can set up host blocks. You can also view a list of hosts that are being blocked.

**Note**

If you do not configure the amount of time for the host block, it is permanent.

The following options apply:

- *ip-address*—IP address of the host to be blocked.
- *minutes*—(Optional) Duration of the host block in minutes. The valid range is 0 to 70560 minutes.

To block a host, follow these steps:

**Step 1** Log in to the CLI using an account with administrator or operator privileges.

**Step 2** Configure the host block for 15 minutes, for example.

```
sensor# block host 10.2.3.1 timeout 15
```

The host block ends in 15 minutes.

**Step 3** Start a host block.

```
sensor# block host 10.2.3.1
```

The host block lasts until you remove it.

**Step 4** End the host block.

```
sensor# no block host 10.2.3.1
sensor#
```



# Configuring Network Blocking

**Note**

Connection blocks and network blocks are not supported on security appliances. Security appliances only support host blocks with additional connection information.

Use the **block network** *ip-address/netmask* [**timeout** *minutes*] command in privileged EXEC mode to block a network. Use the **no** form of the command to remove a block on a network. You must have blocking configured before you can set up network blocks. You can also view a list of networks that are being blocked.

**Note**

If you do not configure the amount of time for the network block, it is permanent.

The following options apply:

- *ip-address/netmask*—Network subnet to be blocked in *X.X.X.X/nm* format, where *X.X.X.X* specifies the sensor IP address as a 32-bit address written as 4 octets separated by periods where *X* = 0-255, and *nm* specifies the number of bits (1032) in the netmask.
- *minutes*—(Optional) Duration of the network block in minutes. The valid range is 0 to 70560 minutes.

To block a network, follow these steps:

---

**Step 1** Log in to the CLI using an account with administrator or operator privileges.

**Step 2** Configure the network block for 15 minutes, for example.

```
sensor# block network 10.0.0.0/8 timeout 15
```

The network block ends in 15 minutes.

**Step 3** Start a network block.

```
sensor# block network 10.0.0.0/8
```

The network block lasts until you remove it.

**Step 4** End the network block.

```
sensor# no block network 10.0.0.0/8
sensor#
```

---

# Configuring Connection Blocking

**Note**

Connection blocks and network blocks are not supported on security appliances. Security appliances only support host blocks with additional connection information.

Use the **block connection** *source-ip-address destination-ip-address* [**port** *port-number*] [**protocol** *type*] [**timeout** *minutes*] command in privileged EXEC mode to block a connection between two IP addresses. Use the **no** form of the command to remove the connection block. You must have blocking configured before you can set up connection blocks. You can also view a list of connections that are being blocked.

**Note**

If you do not configure the amount of time for the connection block, it is permanent.

The following options apply:

- *source-ip-address*—Source IP address in a connection block.
- *destination-ip-address*—Destination IP address in a connection block.
- *port-number*—(Optional) Destination port number. The valid range is 0 to 65535.
- *type*—(Optional) Protocol type. The valid types are **tcp** or **udp**.
- *minutes*—(Optional) Duration of the connection block in minutes. The valid range is 0 to 70560 minutes.

To block a connection, follow these steps:

- 
- Step 1** Log in to the CLI using an account with administrator or operator privileges.
- Step 2** Configure the connection block between a source IP address and a destination IP address specifying the port, protocol, and time, for example.
- ```
sensor# block connection 10.2.3.1 11.2.3.1 port 80 protocol tcp timeout 30
```
- The connection block ends in 30 minutes.
- Step 3** Start a connection block.
- ```
sensor# block connection 10.2.3.1 11.2.3.1
```
- The connection block lasts until you remove it.
- Step 4** End the connection block.
- ```
sensor# no block connection 10.2.3.1
sensor#
```
- 

## Obtaining a List of Blocked Hosts and Connections

Use the **show statistics** command to obtain a list of blocked hosts and blocked connections.

To obtain a list of blocked hosts and connections, follow these steps:

- 
- Step 1** Log in to the CLI.
- Step 2** Check the statistics for ARC.
- ```
sensor# show statistics network-access
Current Configuration
  LogAllBlockEventsAndSensors = true
  EnableNvramWrite = false
  EnableAclLogging = false
  AllowSensorBlock = false
```

```
BlockMaxEntries = 250
MaxDeviceInterfaces = 250
NetDevice
  Type = Cisco
  IP = 10.1.1.1
  NATAddr = 0.0.0.0
  Communications = telnet
  BlockInterface
    InterfaceName = fa0/0
    InterfaceDirection = in
State
  BlockEnable = true
  NetDevice
    IP = 10.1.1.1
    AclSupport = uses Named ACLs
    Version = 12.2
    State = Active
  BlockedAddr
    Host
      IP = 192.168.1.1
      Vlan =
      ActualIp =
      BlockMinutes = 80
      MinutesRemaining = 76
```

The `Host` entry indicates which hosts are being blocked and how long the blocks are.

---

■ Obtaining a List of Blocked Hosts and Connections